

SWIMMING POOL HEAT PUMP UNIT



Owner 's Manual



Applicable for:

AC - Model

P - Model



Safety Precautions

<p>CAUTION</p> <hr style="width: 50%; margin: auto;"/> <p>R32</p> <p>REFRIGERANT</p> <p>This heat pump contains and operates with refrigerant R32</p> <p>THIS PRODUCT MUST ONLY BE INSTALLED OR SERVICED BY QUALIFIED PERSONNEL.</p> <p>REFER TO NATIONAL AND INTERNATIONAL LEGISLATION, REFULATIONS, CODES, AND INSTALLATION & OPERATION MANUALS FOR THE TRANSPORTATION, STORAGE, INSTALLATION AND /OR SERVICE OF THIS PRODUCT.</p>





Keep this manual where the user can easily find it.

To prevent personal injury, injury to others, or property damage, read this section carefully before you use this product, and be sure to comply to the following safety precautions.

Incorrect operation due to failure to follow the instructions may cause harm or damage.

 <p>WARNING</p>	 <p>CAUTION</p>
Indicate potential hazardous situation, which could result in loss of life or serious injury.	Indicate potential hazardous situation, which could result in moderate injury or damage to property.

Explanation of symbols displayed on the unit.

	This symbol shows that this appliance uses a flammable refrigerant. If the refrigerant is leaked and exposure to an external ignition source, there is a risk of fire.
	This symbol shows that the Operation Manual should be read carefully.
	This symbol shows that a service personnel should be handling this equipment with reference to the Installation Manual
	This symbol shows that information is available such as the Operating Manual or Installation Manual

After reading, keep this manual in a convenient place so that you can refer to it whenever necessary. If the equipment is transferred to a new user, be sure also to hand over the manual.



WARNING

Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.

The appliance must be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater).

Do not pierce or burn.

Be aware that refrigerants may not contain odour.

To avoid fire, explosion or injury, do not operate the unit when harmful gases (e.g. flammable or corrosive) are detected near the unit.

Be aware that prolonged, direct exposure to cool or warm air from the heat pump or to air that is too cool or too warm, can be harmful to your physical condition and health.

Do not place objects, including rods, your fingers, etc., in the air inlet or outlet. Product damage or personal injury may result due to contact with the unit's high-speed fan blades.

Do not attempt to repair, dismantle, reinstall or modify the heat pump yourself as this may result in water leakage, electric shocks or fire hazards.

Do not use flammable sprays near the heat pump, or otherwise fire may result.

Do not use a refrigerant other than the one indicated on the outdoor unit (R32) when installing, moving or repairing. Using other refrigerants may cause trouble or damage to the unit, and personal injury.

To avoid electric shocks, do not operate with wet hands.

Beware of fire in case of refrigerant leakage. If the heat pump is not operating correctly, i.e. not heating, refrigerant leakage could be the cause. Consult your dealer for assistance. The refrigerant within the heat pump is safe and normally does not leak.

However, in the event of a leakage, contact with a naked burner, heater or cooker may result in generation of noxious gas.

Do not use the heat pump until a qualified service person confirms that the leakage has been repaired.

Do not attempt to install or repair the heat pump yourself. Improper workmanship may result in water leakage, electric shocks or fire hazards. Please contact your local dealer or qualified personnel for installation and maintenance work.

If the heat pump is malfunctioning (giving off a burning odours, etc.), turn off power to the unit and contact your local dealer. Continued operation under such circumstances may result in a failure, electric shocks or fire hazards.

Be sure to install an earth leakage circuit breaker. Failure to install an earth leakage circuit breaker may result in electric shocks or fire.

Be sure to earth the unit. Do not earth the unit to a utility pipe, lightning conductor or telephone earth lead. Imperfect earthing may result in electric shocks.

The appliance shall be installed at well ventilated location, the minimum floor area required please refer to national regulation.

Disposal of equipment using flammable refrigerants follow national regulations.

Always follow the local regulations on flammable refrigerant for transportation, storage, installation, repair, etc.



CAUTION

1. Installation (Space)

- That the installation of pipe-work shall be kept to a minimum.
- That pipe-work shall be protected from physical damage.
- That compliance with national gas regulations shall be observed.
- That mechanical connections shall be accessible for maintenance purposes.
- In cases that require mechanical ventilation, ventilation openings shall be kept clear of obstruction.
- When disposing of the product is used, be based on national regulations, properly processed

2. Servicing

2-1. Service personnel

- Any person who is involved with working on or breaking into a refrigerant circuit should hold a current valid certificate from an industry-accredited assessment authority, which authorizes their competence to handle refrigerants safely in accordance with an industry recognised assessment specification.
- Servicing shall only be performed as recommended by the equipment manufacturer. Maintenance and repair requiring the assistance of other skilled personnel shall be carried out under the supervision of the person competent in the use of flammable refrigerants.
- Servicing shall be performed only as recommended by the manufacturer.

2-2. Work

- Prior to beginning work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimised. For repair to the refrigerating system, the precautions in 2-2 to 2-8 shall be complied with prior to conducting work on the system.
- Work shall be undertaken under a controlled procedure so as to minimize the risk of a flammable gas or vapour being present while the work is being performed.
- All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out.
- Work in confined spaces shall be avoided.
- The area around the workspace shall be sectioned off.
- Ensure that the conditions within the area have been made safe by control of flammable material.

2-3. Checking for presence of refrigerant

- The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially flammable atmospheres.
- Ensure that the leak detection equipment being used is suitable for use with flammable refrigerants, i.e. non sparking, adequately sealed or intrinsically safe.

2-4. Presence of fire extinguisher

- If any hot work is to be conducted on the refrigeration equipment or any associated parts, appropriate fire extinguishing equipment shall be available at hand.
- Have a dry powder or CO2 fire extinguisher adjacent to the charging area.

2-5. No ignition sources

- No person carrying out work in relation to a refrigeration system which involves exposing any pipe work that contains or has contained flammable refrigerant shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion.
- All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which flammable refrigerant can possibly be released to the surrounding space.
- Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. "No Smoking" signs shall be displayed.

2-6. Ventilated area

- Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work.
- A degree of ventilation shall continue during the period that the work is carried out.
- The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

2-7. Checks to the refrigeration equipment

- Where electrical components are being changed, they shall be fit for the purpose and to the correct specification.
- At all times the manufacturer's maintenance and service guidelines shall be followed.
- If in doubt consult the manufacturer's technical department for assistance.
- The following checks shall be applied to installations using flammable refrigerants.
 - The charge size is in accordance with the room size within which the refrigerant containing parts are installed.
 - The ventilation machinery and outlets are operating adequately and are not obstructed.
 - If an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant.
 - Marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected.

- Refrigeration pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.

2-8. Checks to electrical devices

- Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures.
- If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with.
- If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used.
- This shall be reported to the owner of the equipment so all parties are advised.
- Initial safety checks shall include.
 - That capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking.
 - That there no live electrical components and wiring are exposed while charging, recovering or purging the system.
 - That there is continuity of earth bonding.

3.Repairs to sealed components

- During repairs to sealed components, all electrical supplies shall be disconnected from the equipment being worked upon prior to any removal of sealed covers, etc.
- If it is absolutely necessary to have an electrical supply to equipment during servicing, then a permanently operating form of leak detection shall be located at the most critical point to warn of a potentially hazardous situation.
- Particular attention shall be paid to the following to ensure that by working on electrical components, the casing is not altered in such a way that the level of protection is affected.
- This shall include damage to cables, excessive number of connections, terminals not made to original specification, damage to seals, incorrect fitting of glands, etc.
- Ensure that apparatus is mounted securely.
- Ensure that seals or sealing materials have not degraded such that they no longer serve the purpose of preventing the ingress of flammable atmospheres.
- Replacement parts shall be in accordance with the manufacturer's specifications.

NOTE: The use of silicon sealant may inhibit the effectiveness of some types of leak detection equipment. Intrinsically safe components do not have to be isolated prior to working on them.

4.Repair to intrinsically safe components

- Do not apply any permanent inductive or capacitance loads to the circuit without ensuring that this will not exceed the permissible voltage and current permitted for the equipment in use.
- Intrinsically safe components are the only types that can be worked on while live in the presence of a flammable atmosphere.
- The test apparatus shall be at the correct rating.
- Replace components only with parts specified by the manufacturer.
- Other parts may result in the ignition of refrigerant in the atmosphere from a leak.

5.Cabling

- Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects.
- The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.

6. Detection of flammable refrigerants

- Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks.
- A halide torch (or any other detector using a naked flame) shall not be used.

7. Leak detection methods

- Electronic leak detectors shall be used to detect flammable refrigerants, but the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.)
- Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used.
- Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed and the appropriate percentage of gas (25 % maximum) is confirmed.
- Leak detection fluids are suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.
- If a leak is suspected, all naked flames shall be removed/extinguished.
- If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak. Oxygen free nitrogen (OFN) shall then be purged through the system both before and during the brazing process.

8. Removal and evacuation

- When breaking into the refrigerant circuit to make repairs – or for any other purpose – conventional procedures shall be used. However, it is important that best practice is followed since flammability is a consideration.

The following procedure shall be adhered to:

- remove refrigerant
- purge the circuit with inert gas
- evacuate
- purge again with inert gas
- open the circuit by cutting or brazing
- The refrigerant charge shall be recovered into the correct recovery cylinders.
- The system shall be “flushed” with OFN to render the unit safe.
- This process may need to be repeated several times.
- Compressed air or oxygen shall not be used for this task.
- Flushing shall be achieved by breaking the vacuum in the system with OFN and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum.
- This process shall be repeated until no refrigerant is within the system.
- When the final OFN charge is used, the system shall be vented down to atmospheric pressure to enable work to take place.
- This operation is absolutely vital if brazing operations on the pipe work are to take place.
- Ensure that the outlet for the vacuum pump is not close to any ignition sources and there is ventilation available.

9. Charging procedures

- In addition to conventional charging procedures, the following requirements shall be followed.
 - Ensure that contamination of different refrigerants does not occur when using charging equipment.
 - Hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them.
 - Cylinders shall be kept upright.
 - Ensure that the refrigeration system is earthed prior to charging the system with refrigerant.

- Label the system when charging is complete (if not already).
- Extreme care shall be taken not to overfill the refrigeration system.
- Prior to recharging the system it shall be pressure tested with OFN.
- The system shall be leak tested on completion of charging but prior to commissioning.
- A follow up leak test shall be carried out prior to leaving the site.

10. Decommissioning

- Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its details.
- It is recommended good practice that all refrigerants are recovered safely.
- Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of reclaimed refrigerant.
- It is essential that electrical power is available before the task is commenced.
 - a) Become familiar with the equipment and its operation.
 - b) Isolate system electrically.
 - c) Before attempting the procedure ensure that:
 - mechanical handling equipment is available, if required, for handling refrigerant cylinders;
 - all personal protective equipment is available and being used correctly;
 - the recovery process is supervised at all times by a competent person;
 - recovery equipment and cylinders conform to the appropriate standards.
 - d) Pump down refrigerant system, if possible.
 - e) If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
 - f) Make sure that cylinder is situated on the scales before recovery takes place.
 - g) Start the recovery machine and operate in accordance with manufacturer's instructions.
 - h) Do not overfill cylinders. (No more than 80 % volume liquid charge).
 - i) Do not exceed the maximum working pressure of the cylinder, even temporarily.
 - j) When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.
 - k) Recovered refrigerant shall not be charged into another refrigeration system unless it has been cleaned and checked.

11. Labelling

- Equipment shall be labelled stating that it has been de-commissioned and emptied of refrigerant.
- The label shall be dated and signed.
- Ensure that there are labels on the equipment stating the equipment contains flammable refrigerant.

12. Recovery

- When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely.
- When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed.
- Ensure that the correct number of cylinders for holding the total system charge are available.
- All cylinders to be used are designated for the recovered refrigerant and labelled for that refrigerant (i.e. special cylinders for the recovery of refrigerant).
- Cylinders shall be complete with pressure relief valve and associated shut-off valves in good working order.

- Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.
- The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of flammable refrigerants.
- In addition, a set of calibrated weighing scales shall be available and in good work-ing order.
- Hoses shall be complete with leak-free disconnect couplings and in good condition.
- Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release. Consult manufacturer if in doubt.
- The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant Waste Transfer Note arranged.
- Do not mix refrigerants in recovery units and especially not in cylinders.
- If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant.
- The evacuation process shall be carried out prior to returning the compressor to the suppliers.
- Only electric heating to the compressor body shall be employed to accelerate this process.
- When oil is drained from a system, it shall be carried out safely.

Advice to customers

1. Please read this manual carefully before installing the product, otherwise you could damage the heat pump, injure users or incur financial losses.
2. As advances in science and technology are made, the product will also improve.
We would therefore urge you to keep up to date with the latest products.
3. If you require further technical information, please contact your local distributor.
4. Note:
 - 4.1 Before installing the heat pump, check that your local power supply meets the requirements of the heat pump.
For full details, check the unit's label or the performance information that appears in this manual.
 - 4.2 Fit the electrical protection devices in compliance with local regulations.
 - 4.3 You must earth the heat pump in order to prevent electric shocks caused by an unexpected short circuit in the unit.
 - 4.4 There is a diagram of the wiring in this manual.
 - 4.5 For safety reasons, you should not replace or repair the heat pump yourself. If it required repairs, please contact your local distributor for assistance.
 - 4.6 Do not place objects inside the heat pump while it is working. They could come into contact with the fan and damage it, as well as cause accidents (especially in the case of children).
 - 4.7 Do not use the heat pump without the grille or plaque, as this could cause accidents or the unit to malfunction.
 - 4.8 If the unit fills with water, contact your local distributor immediately.
The unit may only be reset following a full inspection by a qualified service engineer.
 - 4.9 Unqualified service engineers may not adjust the unit's switchboards, valves or controllers.

***This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved.
Children shall not play with the appliance.
Cleaning and user maintenance shall not be made by children without supervision.**

Warning:

- Do not place your hand or any other objects into the air outlet and fan. It could damage the heat pump and cause injuries;
- In case of any abnormality with the heat pump, cut off the power immediately and contact a professional technician;

It is strongly advised to place a protective guard around the unit to keep children away from the heat pump.

An authorized electrician must connect the Heat Pump to the power. (230V 1ph or 400V 3ph)



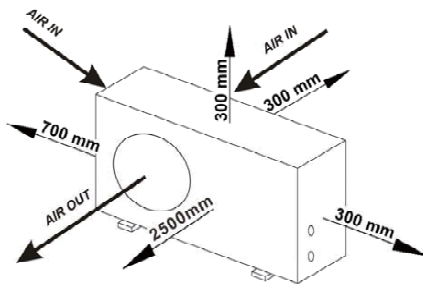
230V / 1ph / 50Hz



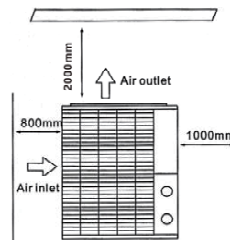
380-400V / 3ph / 50Hz

Remarks : Make sure that you have enough power.

Model	Voltage (volt)	Fuse T3/ slow blow (A)	Nominal current (A)	Cable diameter (mm ²) (for max. Length of 20 meters)
P5 / P6	220 - 240	10	3.9	2 x 1.5 mm ² + Ground
P8 / AC6	220 - 240	10	4.6	2 x 1.5 mm ² + Ground
P10 / AC10	220 - 240	16 / 13	6.7	2 x 2.5 mm ² + Ground
P13 / AC13	220 - 240	16 / 13	7.9	2 x 2.5 mm ² + Ground
P15 / AC15	220 - 240	16 / 13	9.9	2 x 2.5 mm ² + Ground
P15P3	380 - 400	16	4.2	4 x 2.5 mm ² + Ground
P17P3	380 - 400	16	4.2	4 x 2.5 mm ² + Ground
P20P3	380 - 400	16	6.3	4 x 2.5 mm ² + Ground
P17 / AC17	220 - 240	20 / 16	11.1	2 x 4.0 mm ² + Ground
P20 / P21	220 - 240	25 / 20	14.9	2 x 6.0 mm ² + Ground
P17-3	380 - 400	10	4.8	4 x 2.5 mm ² + Ground
P25 / AC25	380 - 400	16	6.4	4 x 2.5 mm ² + Ground
P30	380 - 400	16	7.5	4 x 2.5 mm ² + Ground
P35	380 - 400	16	9.4	4 x 2.5 mm ² + Ground



Air-flow: Horizontal



Air-flow: Vertical (Air flow: Upwards)

See diagram above for minimum distance from the wall

1. First time start-up

Note- In order for the unit to heat the pool (or spa), the filter pump must be running so that the water can circulate through the heat pump. Without this circulation, the heat pump will not start.

When all connections have been made and checked, the following steps should be followed:

- 1). Turn on the filter pump. Check for leaks.
- 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 elapsed.
- 3). When the unit has been running for a couple of minutes, check if the air leaving the unit is cooler than the ambient temp.
- 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.
- 5). The unit and the filter pump should run 24 hours a day until the desired pool water temperature has been reached. Once the set temperature is reached, the unit will switch itself off. As long as the filter pump is running, the unit will restart automatically when the temperature of the pool water drops more than 1°C below the 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.

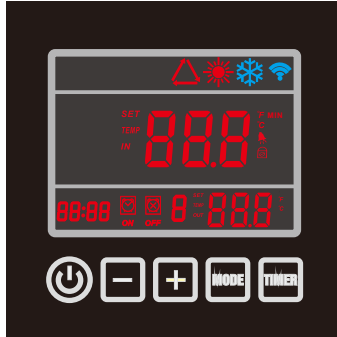
Water flow switch—the unit is equipped with a flow switch that is switched on when enough water has flowed through the unit and that is switched off when the water flow becomes too low. (E.g. When the filter pump is switched off).

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.

2. Operation of heat pump


2.1 Operation of control display

2.1.1 Control display illustration:



When heat pump is supplied with power, controller will display with full screen, shows that it is already connected. If connection fails in 10 seconds, please check connections between communication cable and control display, or replace with another control display.

Button functions:


 button: ON/OFF switch to start or stop heat pump.


TIMER button: Timer button to set timer on and timer off.


MODE button: To switch between heating, cooling and auto mode.
To enter parameter settings and confirm settings.


“+” “-” button: To increase or decrease value.

Icons definitions:

 --heating icon, showing heat pump is in heating mode.

 --cooling icon, showing heat pump is in cooling mode.

 --auto icon, showing heat pump is in auto mode.

 --alarm icon, showing system alarm.


 --key pad lock icon, showing buttons on the control display are locked.

 --wifi signal.

Note: 1. Heat pump is not equipped with electric heater internally, only provides terminal for external connection.

2. Fan speed is automatically controlled by ambient temperature, not manually.

2.1.2 Power ON/OFF heat pump

Press  button 5s to switch on heat pump.

Once the heat pump is powered on all related running component icons will be lightened as well as POWER displayed in the middle of display to show system is in running status.

Figure 2-2 shows heat pump in standby status and figure 2-3 shows heat pump in running status.

The left temperature shows flow water temperature while the right temperature is the return water temperature.



Figure 2-2

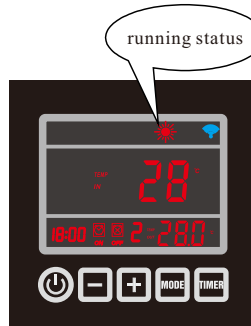





Figure 2-3

2.1.3 How to change mode

Press **MODE** button to select auto, heating or cooling mode, related indicator icon will be lightened as a symbol to show heat pump is in either auto , heating  or cooling  mode.

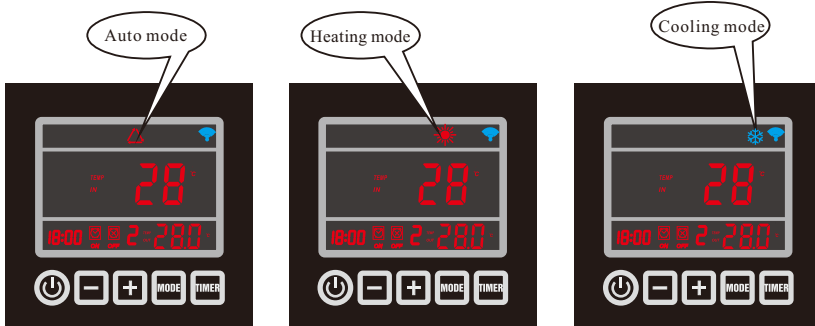


Figure 2-4

2.1.4 Adjust desired water temperature

1. First select desired mode, auto, heating or cooling.
2. No matter the heat pump is under standby status or running status, press “+” or “-”, display will show the desired water temp. of selected mode with a flashing value, then change the water temp. by moving “+” or “-” as requested.

2.1.5 Check and set parameters

When heat pump is in standby status, press **MODE** button for 5 seconds display will show parameter number with value flashing together.

Move “+” and “-” button to check required parameter settings.

Select desired parameter and press **MODE** button for resetting parameter. Parameter number stays fixed while parameter value remains flashing.

Move “+” and “-” button to adjust the value.

Press **MODE** button to confirm the setting.

Without any further movement on the display button in 2min it will return to main interface automatically.

See Parameter table for more details.

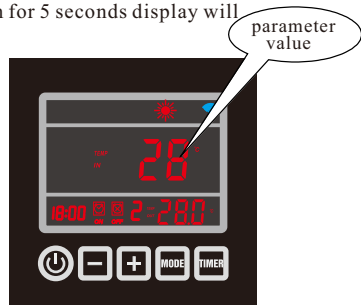


Figure 2-5

Note: All parameters can be changed ONLY under standby status !

2.1.6. Setting Time

Press **TIMER** button 5s in a quick stop to activate time setting.

When hour numbers are flashing it is available for revision, move “+” or “-” to fix hour numbers.

Press **TIMER** button to confirm hour setting.

Minute numbers start flashing once the hour numbers are confirmed, move “+” or “-” to fix minute numbers.

Press **TIMER** button to confirm minute setting.

2.1.7 Setting Timer on/ Timer off

Press **TIMER** button to enter timer setting for **TIMER 1**.

Hour data will be flashing with ON, move “+” or “-” to set it.

Confirm timer on hour setting by pressing **TIMER** button.

Minute data starts flashing once hour setting is confirmed, move “+” or “-” to set it.

Confirm timer on minute setting by pressing **TIMER** button.

Press **TIMER** button, and then **MODE** button. The “☑ ☒” signal will flash, then press “+” button to change to **TIMER 2** or **TIMER 3**.

Hour data will be flashing with ON, move “+” or “-” to set it.

Confirm timer on hour setting by pressing **TIMER** button.

Minute data starts flashing once hour setting is confirmed, move “+” or “-” to set it.

Confirm timer on minute setting by pressing **TIMER** button.

Once Timer on is set and confirmed Timer off will be activated.

Follow the same steps as setting Timer on to set Timer off.

2.1.8 Cancellation of Timer off

If the starting time is set to be the same as the finishing time, then the timer function is off.

The “☑ ☒” signal will be off.

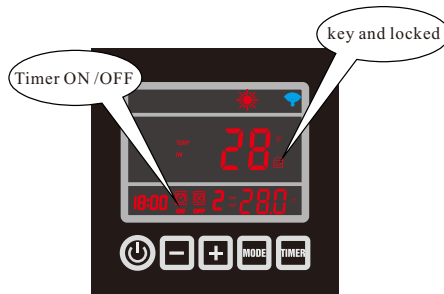


Figure 2-6

2.1.9 Key pad lock

Press “+” and “-” button together for 5 seconds, display will show lock icon. Do this again to unlock.

Parameter table overview (1)

Parameter	Control Display	APP Description	Range	Default	Remark
F0/00	Temp. Setting Cooling	Temp. Setting Cooling	8~37℃	12℃	Adjustable
F1/01	Temp. Setting Heating	Temp. Setting Heating	8~40℃	28℃	Adjustable
F2/02	Time between defrosting cycles	Time b/w Defrosting Cycles	10~90Min	45Min	By technician
F3/03	Evaporator temp. Defrost start	Evap. Temp. Defrost Start	-30~0℃	-7℃	By technician
F4/04	Evaporator temp. Defrost stop	Evap. Temp. Defrost Stop	2~30℃	13℃	By technician
F5/05	Defrosting time	Defrost Time	1~12Min	8Min	By technician
F6/06	Number of Refrigerant system	Number of Refrigerant System	1~4	1	By technician
F7/07	Power-off memory setting	Power-off Memory Setting	0(No)/1(Yes)	1 (Yes)	By technician
F8/08	Type of unit (0=only cooling/1=heat pump/ 2=EI. Heating/3=hot water)	Type of Unit	0~3	1 (heat pump)	By technician
F9/09*	Filter pump setting (0=always running/1=run 5 min/2hr)	Filter Pump Setting	0~1	0	By technician
F10/10	Cooling Heating AUTO Restart	Cool/Heat/Auto Restart	8~40℃	28℃	Adjustable
F11/11	Delta Temp. Start-Stop	Delta Temp. Start-Stop	1~20℃	2℃	By technician
F12/12	Setting of Superheating Target for Electric Expansion Valve (EEV)	Set. Target Superheat EEV	-15~15	5	N/A
F13/13	Setting of Calculating Factor for EEV	Set. Calc. Factor EEV	10~50	35	N/A
F14/14	Opening Setting of EEV	Opening Setting of EEV	10~50	35	N/A
F15/15**	EEV Setting	EEV Setting	0(manual)/ 1(auto)	1	N/A
F16/16	4 way valve direction	Four-way Valve Direction	0(heating)/ 1(cooling)	0	By technician
F17/17	Water freezing protection setting ambient temperature	Water Anti-freezing Air	0~15℃	0℃	By technician
F18/18	Water freezing protection setting inlet water temperature	Water Anti-freezing Inlet Water	2~14℃	4℃	By technician

Parameter table overview (2)

Parameter	Control Display	APP Description	Range	Default	Remark
F19/19	Setting of heat exchange overheat protection Tout-Tin(to low water flow)	Set W. Out Over-Cooling Prot.	3~20℃	5℃	By technician
F20/20	Protection setting of out-in water temperature(Only in Cooling Mode)	Protection In-Out Cooling	5~20℃	13℃	By technician
F21/21	Protection water outlet temp. heating	Set W. Out Over-Heating Prot.	20~90℃	60℃	By technician
F22/22	Time delay of compressor start (after filter pump start)	Time Delay Comp. Start	5~99S	60S	By technician
F23/23	Time delay of filter pump stop (after compressor stop)	Time Delay Pump Stop	5~99S	30S	By technician
F24/24	Setting Ambient temp. to Start bottom heater	Bottom Heater Start	0~20℃	7℃	By technician
F25/25	Setting Ambient temp. to change fan speed	Set Fan Speed Temp.	5~40℃	27℃	By technician
F26/26	Change Fahrenheit/Celsius(0=C/1=F)	Fahrenheit/Celsius	0(Centigrade)/ 1(Fahrenheit)	0	By technician
F27/27	Factory reset	Factory Reset	0(Reset)/ 1(existing setting)	1	By technician

Remarks: To change the factory default via the phone, password is required and only available for technician.

* Run 5min/2hr=filter pump stops 30s after compressor, filter pump runs for 5 min every 2hours checking inlet temp., in this period will disregard the flow switch.

** 0=manual, in manual parameter 13 and 14 is enabled; 1=automatic, in automatic parameter 13 & 14 disabled only Parameter 12 is valid.

System measure value overview

Parameter	Description	Range	Remark
T0	Water Inlet Temp.	-10~99℃	Measured Value
T1	Water Outlet Temp.	-10~99℃	Measured Value
T2	Evaporator Temp.	-10~99℃	Measured Value
T3	Ambient Temp.	-10~99℃	Measured Value
T4	Return Gas Temp.	-10~99℃	Measured Value
T5	Elec. Expansion Valve	10~50(1=10P)	Measured Value
T6	Not used	-10~99℃	Measured Value
T7	Not used	-10~99℃	Measured Value

Remarks: “Γ” = “T”, e.g. “Γ0” = “T0”.

2.2. Operation of APP controller

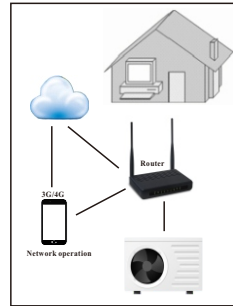
2.2.1 working principle of APP control

Requirements for Android System:

1. System version above 2.3.7 (2.3.7 not included).
2. Resolution 480*800 and above.
3. APK 40M and above, TF card or build-in storage.
4. Requiring the system to have remaining 100MB of storage.

Requirements for iPhone IOS System:

1. For IOS system version 8.x and above.
2. For iPhone 4s and latter ones.
3. At least 40M of storage remaining in the phone.

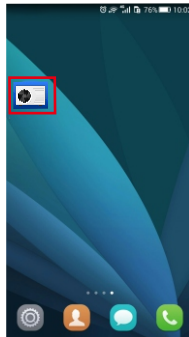


internet connection

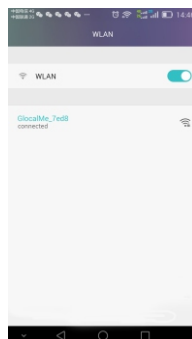
2.2.2 Set up of the network.

- 1). Download “POOL COMFORT” and install it.

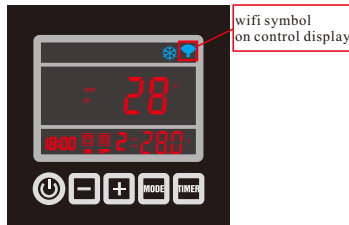
 POOL COMFORT APP



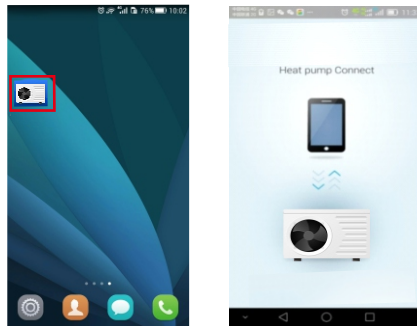
- 2). Make sure your phone is connected to your WIFI module.



- 3) Start the heat pump and press button "-" and button "TIMER" on the control display together for 3 seconds to activate the control display WIFI. WIFI icon starts blinking and search the WIFI nearby.



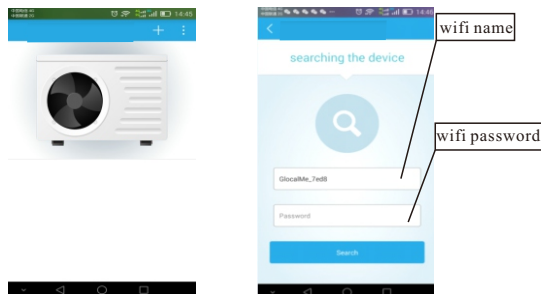
- 4).Click the "POOL COMFORT" icon and start it.



- 5) Click button "+" and choose "new device".

With the connected WIFI name shown, fill in WIFI password and click "Search". It will take maximum 120 seconds to connect the control display through the connected WIFI module.

Once the WIFI remains ON the connection between your phone and control display has been set up.

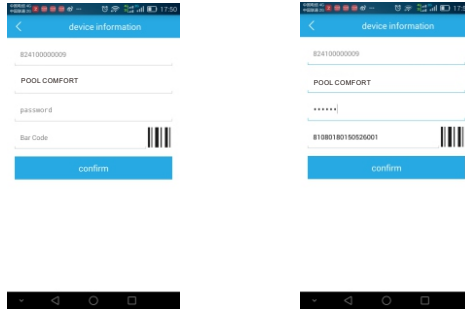


6) Insert default password of the device “123456”, and click “Bar code” to scan the serial number of heat pump which is below the data plate on the side panel of the heat pump.

Put the serial number inside the scanning area and make sure the red scanning line stay on the serial number.

Soon after the serial number is scanned press “confirm” to enter the main interface.

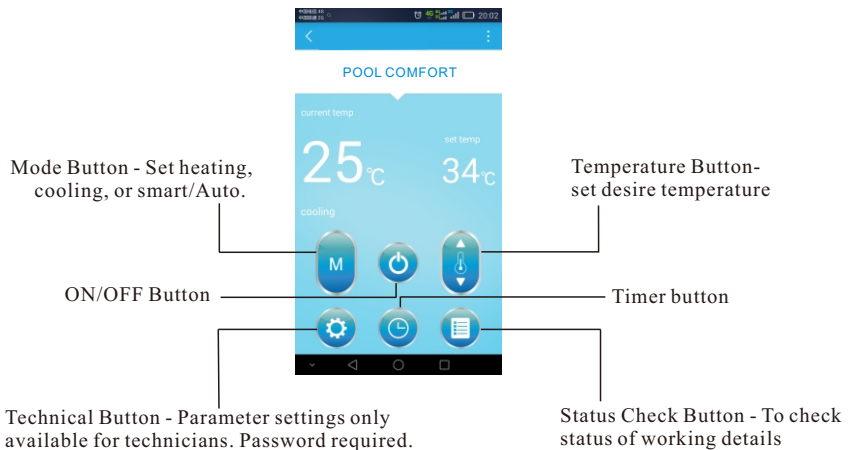
There will be a gentle reminder of changing the password. Set the new password and it will go to operational page.




Now the connection between your heat pump and APP are well set up !

2.2.3 APP operation


1). Illustration of operational page.



2).How to switch on/off the heat pump.

Click  Button to turn on/off the unit.


3).How to change mode

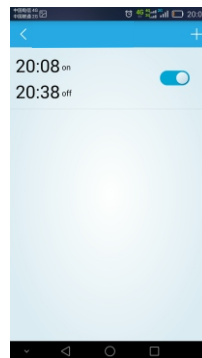
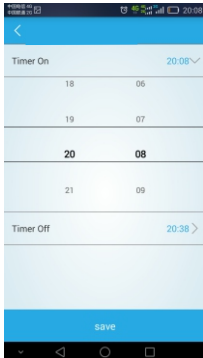
Press  to select auto(smart), heating, or cooling mode.

4).How to set desired water temperature


Click  to modify the water temperature.

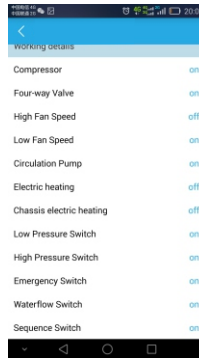
5).How to set timer

- a. Click the  to enter the timer page;
- b. Click “Timer On”, move up and down to set the time for Timer On
- c. Do the same to set “Timer Off”.
- d. Finally click “save” to confirm.
- e. The latest Timer On /Off will also show on the operational page.
- f. There are maximum 3 timers can be set.



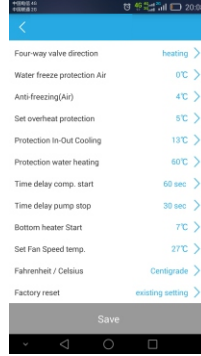
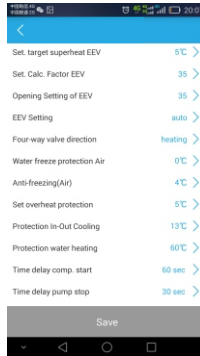
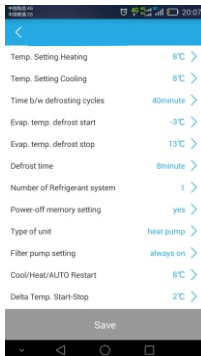
6).How to check details of running status

In running or standby status, click  to check system measured value and working details.

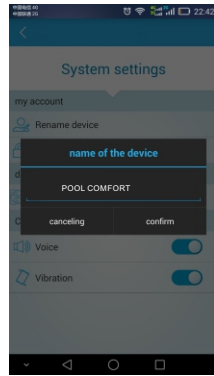
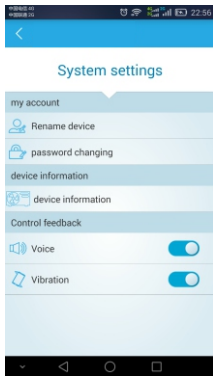
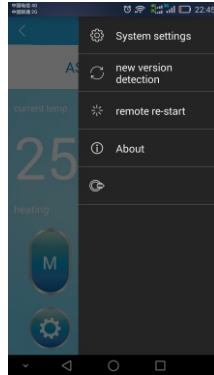


7).How to change parameter setting

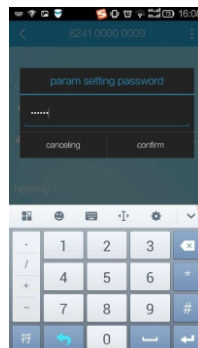
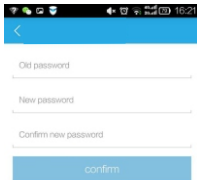
(Password is required to change the factory default setting , only available for technician.)
Insert technical password to enter technical setting page.



8).How to rename the device.



9).How to change user's password



3. Protection systems

3.1 Water flow switch

Equipped with flow switch the heat pump will not work when the filter pump is not working (and the water is not circulating).

This system prevents the heat pump from heating only the water present in the heat pump itself.

The protection also stops the heat pump if water circulation is cut off or stopped.

3.2 Refrigerant gas high and low pressure protection

The high pressure protection makes sure the heat pump is not damaged in case of over pressurisation of the gas. The low pressure protection emits a signal when refrigerant is escaping from the conduits and the unit can not be kept running.

3.3 Overheating protection on the compressor

This protection protects the compressor from overheating.

3.4 Automatic defrost control

When the air is very humid and cold, ice can form on the evaporator. In that event, a thin layer of ice appears that will grow increasingly bigger as long as the heat pump is running. When the temperature of the evaporator has become too low, automatic defrost control will be activated, which will reverse the heat pump cycle so that hot refrigerant gas is sent through the evaporator during a brief period of time to defrost it.

3.5 Temperature difference between inflowing and outflowing water

During normal operation of the heat pump, the temperature difference between inflowing and outflowing water will approximate 1 to 2°C. In the event that the pressure switch does not work and that the water stops circulating, the temperature probe monitoring the outflowing water will always detect a rise in temperature. As soon as the temperature difference between inflowing and outflowing water exceeds 13°C, the heat pump will be automatically turned off.

3.6 Low temperature cut-out

If, during cooling, the temperature of the outflowing water reaches 5°C or drops below this temperature, the heat pump will turn itself off until the water temperature reaches or exceeds 7°C again.

3.7 Anti-frost protection during winter

This protection can only be activated if the heat pump is in STAND-BY status.

3.8 First anti-frost protection

If the filter pump is controlled by the heat pump (regardless of the value for parameter 9) and when the water temperature lies between 2 and 4°C, and the air temperature is lower than 0°C, the filter pump will be automatically turned on to prevent the water from freezing in the piping. This protection is deactivated when the temperature rises again.

3.9 Second anti-frost protection

If the water temperature drops even more, that is, below 2°C (during long frost periods), the heat pump will also start running to heat the water until its temperature approximates 3°C. When this temperature is reached, the heat pump will stop, but anti-frost protection will remain active until conditions change.

4. Heat pump winterizing

Important: failure to take the necessary precautions for winterizing can damage the heat pump, which will invalidate the warranty.

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

1. Disconnect the electrical power supply to the heat pump
2. Close the water supply to the heat pump completely.
3. Disconnect water inlet and outlet coupling fittings of the heat pump and let the water drain out of the unit. Make sure all water is out of the heat pump.
4. Loosely reattach water inlet and outlet coupler fittings to the heat pump in order to prevent dirt from setting into the conduits.

Note: these precautions should not be taken if you choose to use the built-in anti-frost protection.

5. Restarting the pump after winter

If you emptied the heat pump for winterising, follow the steps below to restart it in spring:

1. First check that there is no dirt in the conduits and that there are no structural problems
2. Check that the water inlet and outlet fittings are adequately fastened. Check that "water inlet" and "water outlet" are correct according to the labels on the heat pump. (Water out from the filter unit = water inlet on heat pump)
3. Start the filter pump to start the water flow to the heat pump. Adjust the by-pass so there is enough water through the heat pump. Normally on small filter system the by-pass can be closed, so all circulated water goes through the heat pump.
4. Reconnect the electrical power supply to the heat pump and turn the heat pump ON.

6. Check-up

Our heat pumps have been built and developed to last long if they have been installed correctly and can operate in normal conditions. Regular check-ups are important if you want your heat pump to function efficiently for many years. Below are some recommendations to ensure optimal working conditions for your heat pump.

- 1). Make sure that the service panel is easily accessible.
- 2). Keep the area surrounding the heat pump free of organic waste.
- 3). Prune any vegetation around the heat pump so that there is sufficient free space around the pump.
- 4). Remove any water sprinklers that are near the heat pump as they could cause delectly onto the heat pump from a roof. Install proper drainage.
- 5). Prevent rain from running directly onto the heat pump from a roof. Install proper drainage.
- 6). Do not use the heat pump if it has been flooded. Immediately contact a qualified technician to inspect the heat pump and carry out necessary repair.

Condensation can occur when the heat pump is running. This condensation water can flow away through an opening in the base pan of the unit. The amount of condensation water will increase when humidity is high. Remove any dirt that could block the water outlet on the bottom pan. 5 to 20 liters per day of condensation water can be produced while the unit is running. If more condensation is produced, stop the heat pump and wait for one hour before checking for water leakage (Let the filter pump keep running).

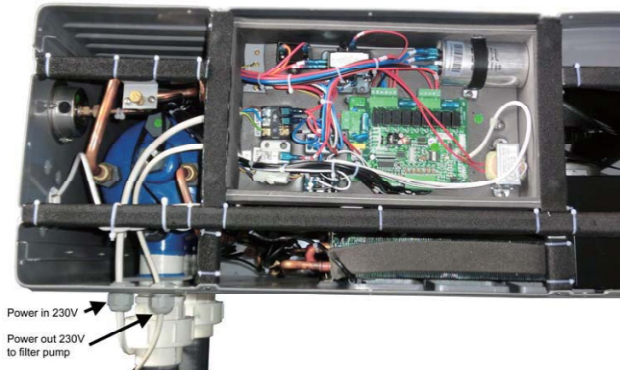
Note: a quick way to verify that the water running is because of the condensation. Shut off the unit and keep the pool pump running. If the water stops running out, it is condensation. AN EVEN QUICKER WAY IS TO TEST THE DRAIN WATER FOR CHLORINE. If no chlorine is detected, the drain water is a result of condensation.

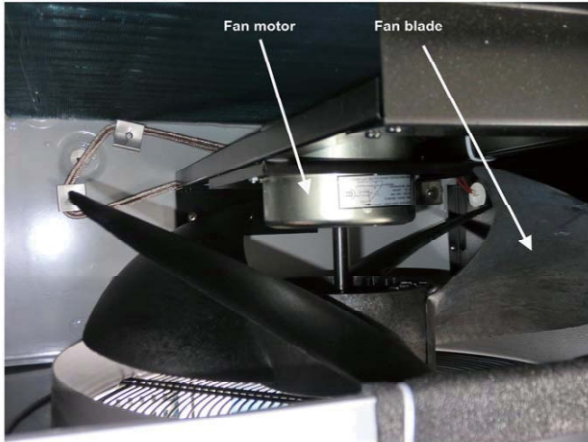
Also make sure that the air in and out passages are free, and prevent air out from immediately re-entering to the air in. (It is important to have min. 2m free space at the air out side of the heat pump).

7. Maintenance and Inspection

The picture below shows a heat pump with lid (top panel) off.

Do not open the Lid (Top panel) when the electrical power is connected to the heat pump.





8. Troubleshooting guide

Incorrect installation may result in an electrical charge that could lead to death or serious injury of users, installers or others by electrical shock and it may also cause damage to heat pump.

DO NOT attempt to modify the internal configuration of the heat pump.

1. Keep your hands and hair clear of the fan blades to avoid injury.
2. If you are not familiar with your pool filtration system and heat pump:
 - a. **Do not** attempt to carry out any adjustment or service without consulting your dealer, pool professional or air conditioning contractor.
 - b. Read the entire installation manual before attempting to use, service or make adjustments to the unit.
 - c. Wait for 24 hours after the installation before starting the heat pump to prevent damage to the compressor. (If the heat pump has been transported and carried all the time with the feet down, it can be started immediately).

Note: Switch off the power before carrying out any maintenance or repairs.

IMPORTANT REMARK: if a malfunction cannot be resolved immediately, in order to analyse the problem we will need to know the message (error code) that is showing on the display controller as well as the values for the settings (parameters 0-A). We also need to know the status of the heat pump: the ambient temperature, water inlet / outlet temperature, if there is cold air coming out from the heat pump, if the grill (evaporator) is cold, or if there is ice on the heat pump.

Please keep this information at hand when calling customer service (describe the issue).

On the following pages you will find an overview of the different types of failure problems that can occur together with instructions on how to solve them.

9. Failure code table overview

Control Display	Protection/Failure	Check	Solution
P1	Inlet water temp. sensor failure	<ol style="list-style-type: none"> 1. Check the connection of inlet water sensor. 2. Check if the sensor is broken. 	<ol style="list-style-type: none"> 1. Reconnect the sensor. 2. Replace the sensor.
P2	Outlet water temp. sensor failure	<ol style="list-style-type: none"> 1. Check the connection of outlet water sensor. 2. Check if the sensor is broken. 	<ol style="list-style-type: none"> 1. Reconnect the sensor. 2. Replace the sensor.
P3	Coil temp. sensor failure	<ol style="list-style-type: none"> 1. Check the connection of coil temperature sensor. 2. Check if the sensor is broken. 	<ol style="list-style-type: none"> 1. Reconnect the sensor. 2. Replace the sensor.
P4	Return gas temp. sensor failure	<ol style="list-style-type: none"> 1. Check the connection of return gas temperature sensor. 2. Check if the sensor is broken. 	<ol style="list-style-type: none"> 1. Reconnect the sensor. 2. Replace the sensor.
P5	Ambient temp. sensor failure	<ol style="list-style-type: none"> 1. Check the connection of ambient temperature sensor. 2. Check if the sensor is broken. 	<ol style="list-style-type: none"> 1. Reconnect the sensor. 2. Replace the sensor.
p7	Winter anti-freeze protection I	No action required	
p7	Winter anti-freeze protection II	No action required	
E1	High pressure protection	<ol style="list-style-type: none"> 1. Check if high pressure switch is broken. 2. Check if there is a blockage in water circuit or water flow is not enough. 3. Check if there is a blockage in refrigerant circuit. 	<ol style="list-style-type: none"> 1. Replace high pressure switch. 2. Remove cause of blockage or increase water flow. 3. Send heat pump to dealer for detailed check.
E2	Low pressure protection	<ol style="list-style-type: none"> 1. Check if low pressure switch is broken. 2. Check if refrigerant level is low. 3. Ambient temp. and water inlet temp. is too low. 	<ol style="list-style-type: none"> 1. Replace low pressure switch. 2. Fill up with enough refrigerant. 3. Decrease water flow. 4. Send heat pump to dealer for detailed check.
E3	Water flow switch failure	<ol style="list-style-type: none"> 1. Check if wiring connection of flow switch is in correct position. 2. Check water flow. 3. Check if flow switch is broken. 4. Check if water pump is working. 	<ol style="list-style-type: none"> 1. Reconnect the wiring. 2. Increase water flow. 3. Replace flow switch. 4. Repair or replace water pump.
E4	Order of phases incorrect (only for 3 phase model)	Order of phases incorrect	Reconnect the phases in right order.
E8	Communication failure	Check the connection	Reconnect the connection wire.
E12	Water Out Over-Cooled	<ol style="list-style-type: none"> 1. Check if there is any jam in the water circuit. 2. Check if the water flow volume is enough. 3. Check if the water pump has failed to work. 	<ol style="list-style-type: none"> 1. Remove the jam. 2. Increase the water flow volume. 3. Repair or replace the water pump.
E13	Water Out Over-Heated		
E14	Protection for excessive temp. difference between water inlet & outlet	<ol style="list-style-type: none"> 1. Check if there is any blockage in the water circuit. 2. Check if the water flow volume is enough. 3. Check if the water pump is working. 	<ol style="list-style-type: none"> 1. Remove the cause of the blockage. 2. Increase the water flow volume. 3. Repair or replace the water pump.



Average Energy Loss from outdoor swimming pools at different air temperatures

