



Atecpool
Reversible Cycle Heat Pump

DESIGNED AND ENGINEERED BY ATECPOOL IN BARCELONA, SPAIN.

atecpool.com

SWIMMING POOL HEAT PUMP UNIT

Installation & Instruction Manual



To our customers

1. Dear customers, please read this manual carefully before you install the product, otherwise it may lead to damage to the heat pump or may injure operators as well as cause financial loss.
2. With the development of science and technology, the product will be improved as well, so you are invited to keep up with the latest products.
3. If you need any further technical information, please contact our local distributor.
4. Attention:
 - 4.1 Before install the heat pump, please check whether the local power supply corresponds with the requirement of the heat pump.
For details, refer to the label on the unit or performance data in this manual.
 - 4.2 Please install the electrical protection devices, according to the local regulations.
 - 4.3 Connecting the heat pump to a ground wire is necessary, in order to prevent electrical shock caused by an unexpected short circuit inside the unit.
 - 4.4 An electrical wiring diagram is provided in this manual.
 - 4.5 For safety reasons, please do not change or repair the heat pump by yourself. If it is necessary, please contact your local distributor for help.
 - 4.6 Do not put any objects into the heat pump when running. It may touch the fan and damage it or lead to accidents (especially for the children).
 - 4.7 Do not use the heat pump without the grid or plate work since it may lead to accidents or abnormal operation of the unit.
 - 4.8 If the unit is soaked in water, please contact our local distributor immediately.
The unit can only be restarted after a completed inspection by professional technicians.
 - 4.9 Unqualified technicians are not allowed to adjust any switches, valves or controllers in the unit.

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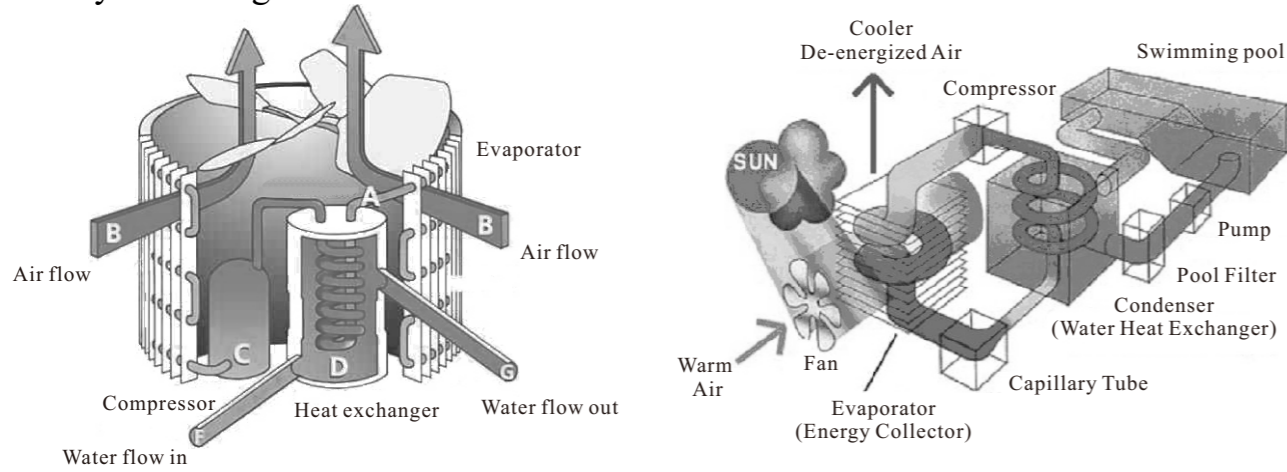
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1. Performance data and specifications

1.1 Performance and features

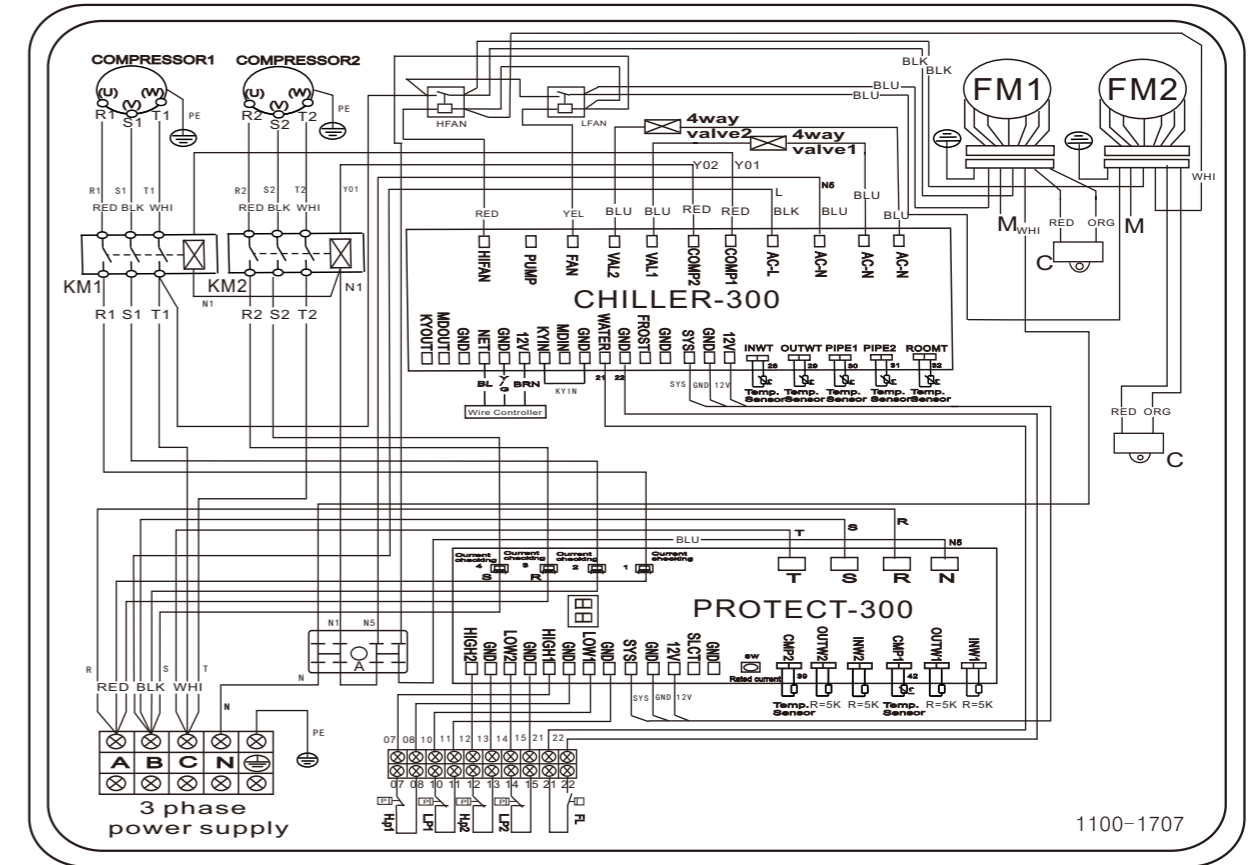
- High efficiency
With a COP value up to 5.0 our heat pumps are very efficient when transferring heat from the air to the swimming pool water. You can save as much as 80% of cost compared to an electrical heater.
- Long life-span
The heat exchanger is made of PVC & Titanium tube, which can withstand and prolong exposure to swimming pool water.
- Easy control and operation
The unit is very easy to operate: simply switch it on and set the desired pool water temperature. The system includes a micro-computer controller, allowing all operation parameters to be set. Operation status can be displayed on the controller with LCD display.

1.2 System diagram

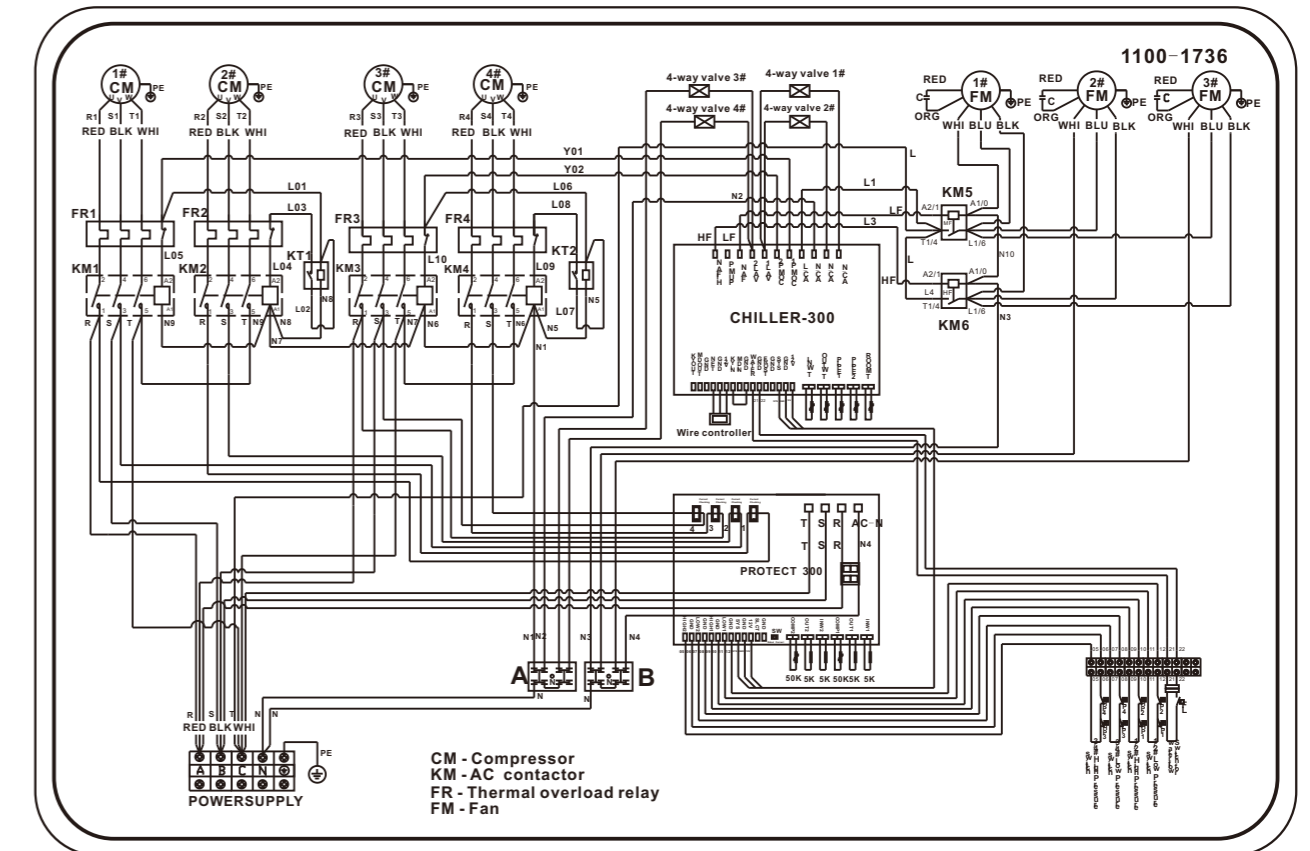


- Heat pumps utilize the sun's free heat by collecting and absorbing energy from the outside air. This energy is then compressed and transferred to the pool water. Your existing water pump circulates the water through the heater, usually next to the pool equipment, and the water warms up. The heat pump timer could be set to operate during daylight hours, for example, usually 9am to 5pm.
- The unit contains a fan that draws in outside air and directs it over the surface of the EVAPORATOR (energy collector). The liquid refrigerant within the EVAPORATOR coil absorbs the heat from the outside air becomes a gas.
- The warm gas in the coil passes through the COMPRESSOR concentrating and increasing the heat to form a very hot gas which then passes to the CONDENSER (water heat exchanger). It is here that the heat exchange occurs as the hot gas gives off heat to the cool swimming pool water circulating through the coil.
- The pool water becomes warmer, and the hot gas cooling as it flows through the CONDENSER coil-returns to its liquid form and, after passing on through the CAPILLARY TUBE, the whole process begins again.
- The state of the heat pump technology can efficiently collect heat from the outside air down to the 7°C to 10 range. For tropic and subtropical climates, this means that the pool can be maintained at 26°C to 32°C.

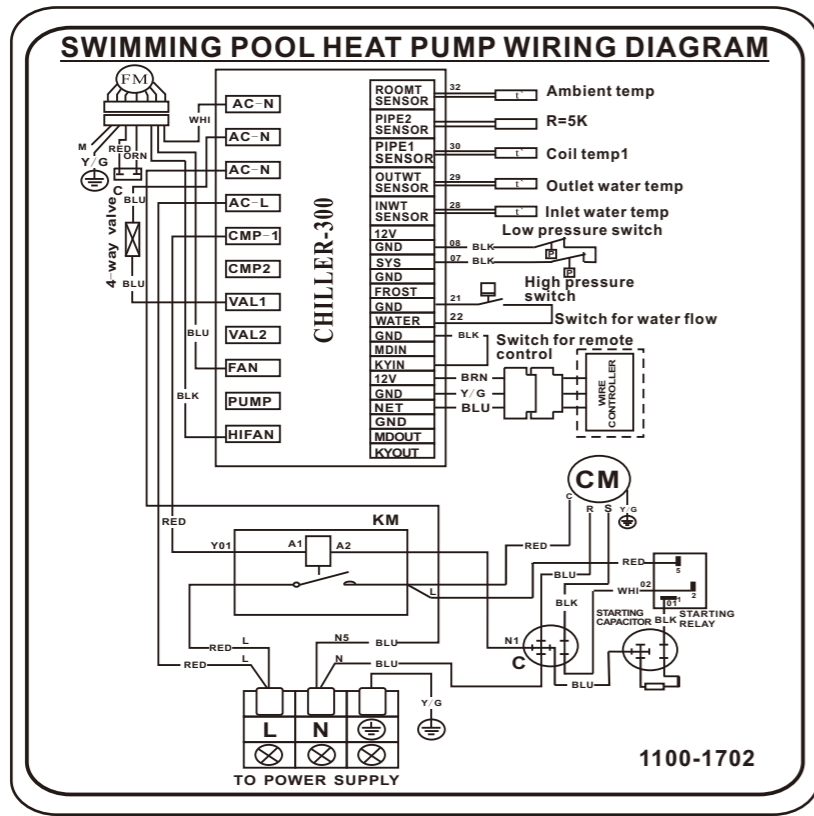
Applicable model: 03300080, 03300090, 03310070



Applicable model: 03310120



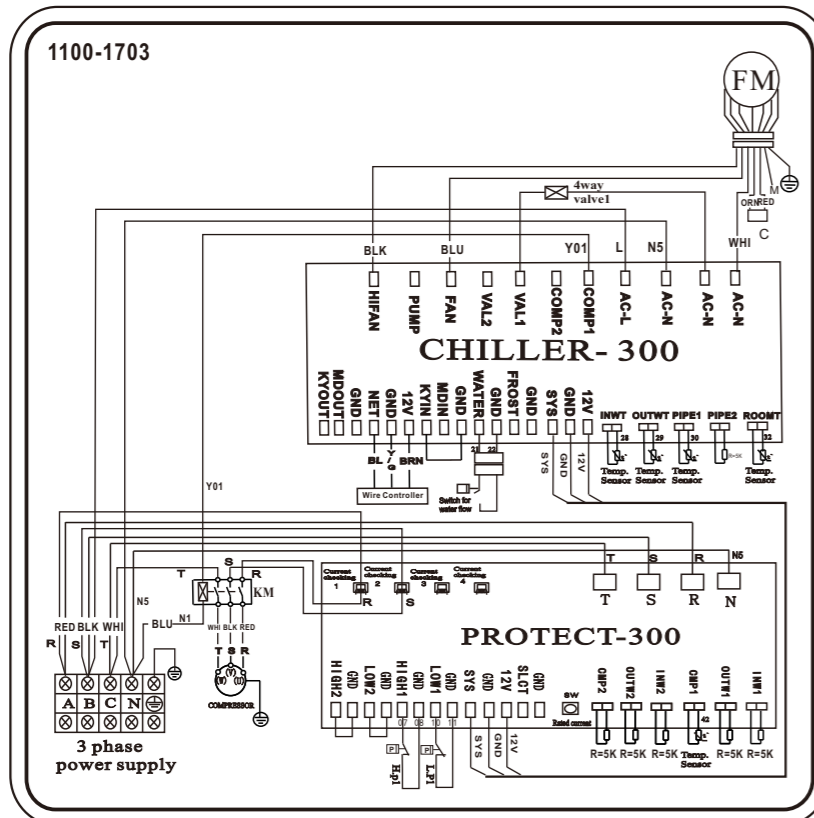
Applicable model: 03300040



1.3 Performance Data of Swimming Pool Heat Pump Unit

Code		03310020H	03300030	03300040	03300050	03300060
Heating Capacity	kW	8.8	13	17	21	25
	BTU/h	30000	44000	58000	72000	86000
Cooling Capacity	kW	5.8	8.8	12	14.5	17.4
	BTU/h	19720	30000	41000	49500	59500
Heating/Cooling Input	kW	1.9/2.1	2.65/2.85	3.7/3.9	4.6/5.2	5/5.8
Running current (H/C)	A	8.6/9.6	13.6/14.3	18.0/19.1	7.1/7.35	8.91/10.33
Power Supply	V/PH/Hz	230/1/50	230/1/50	230/1/50	380/3/50	380/3/50
Compressor Number		1	1	1	1	1
Compressor		Rotary	Rotary	Scroll	Scroll	Scroll
Heat Exchanger	Titanium in PVC					
Fan Number		1	1	1	1	1
Fan Power Input		150	200	200	200	200
Fan Rotation Speed		850	830	830	830	830
Fan Direction		Horizontal	Vertical	Vertical	Vertical	Vertical
Noise	dB(A)	56	58	58	59	59
Water Connection	mm	50	50	50	50	50
Water Flow Volume	m ³ /h	3	6	7.5	8	9
Water Pressure Drop	KPa	8	8	10	12	12
Dimension (Net/Packing)	L	1010	660	660	660	660
	W	420	660	660	660	660
	H	650	860	860	880	880
Weight	Net weight	Kg	77	86	101	125

Applicable model: 03300050, 03300060



Code		03310060H	03310070	03300080	03300090	03310120
Heating Capacity	kW	25	35	45	55	105
	BTU/h	86000	120000	150000	187000	357000
Cooling Capacity	kW	17.4	25	34	42	88
	BTU/h	59500	86000	116000	143000	300000
Heating/Cooling Input	kW	5/5.8	7.5/8.4	9.5/9	11/10.3	22.5/24.7
Running current (H/C)	A	8.91/10.33	14.5/13.2	16.4/15.7	19.2/18.0	40.1/44.0
Power Supply	V/PH/Hz	380/3/50	380/3/50	380/3/50	380/3/50	380/3/50
Compressor Number		1	2	2	2	4
Compressor		Scroll	Scroll	Scroll	Scroll	Scroll
Heat Exchanger	Titanium in PVC					
Fan Number		2	2	2	2	3
Fan Power Input		200x2	200x2	200x2	200x2	200x3
Fan Rotation Speed		830	830	830	830	830
Fan Direction		Horizontal	Vertical	Vertical	Vertical	Vertical
Noise	dB(A)	59	60	61	61	62
Water Connection	mm	50	50	63	63	110
Water Flow Volume	m ³ /h	9	10	14	18	32
Water Pressure Drop	KPa	12	15	15	15	16
Dimension (Net/Packing)	L	1450	1448	1450	1450	2170
	W	750	725	730	730	1065
	H	920	976	1080	1280	1930
Weight	Net weight	Kg	139	200	239	695

Remarks:

1. Measurement conditions: air temp: DB/WB 24°C/19°C, inlet water temp: 27°C, ambient temperature range: 0~35°C.
2. If any discrepancies of data is found between above list and nameplate on the heat pump please refer to the data on the nameplate as updated one.

2. Installation of the heat pump unit

2.1 Remarks

The factory only provides the heat pump unit; the other parts, including a contingent by-pass, are to be provided by the user or the installer.

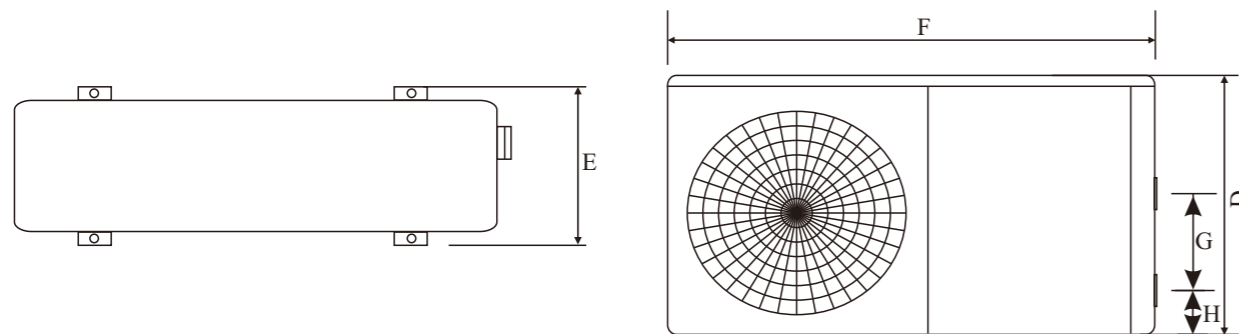
Attention:

Please take the following steps when installing the heat pump:

1. Each addition of chemicals has to be performed through the conduits located downstream of the heat pump.
2. Install a by-pass when the flow of the pool pump exceeds the authorized flow through the heat exchanger of the heat pump with 20%.
3. Always place the heat pump on a solid base and use the supplied silent blocks in order to avoid vibrations and noise.
4. Always keep the heat pump in upright position. If the unit has been tilted, you should wait for at least 24 hours before turning it on .

2.2 Dimensions for Swimming Pool Heat Pump Unit- Monobloc

Vertical series

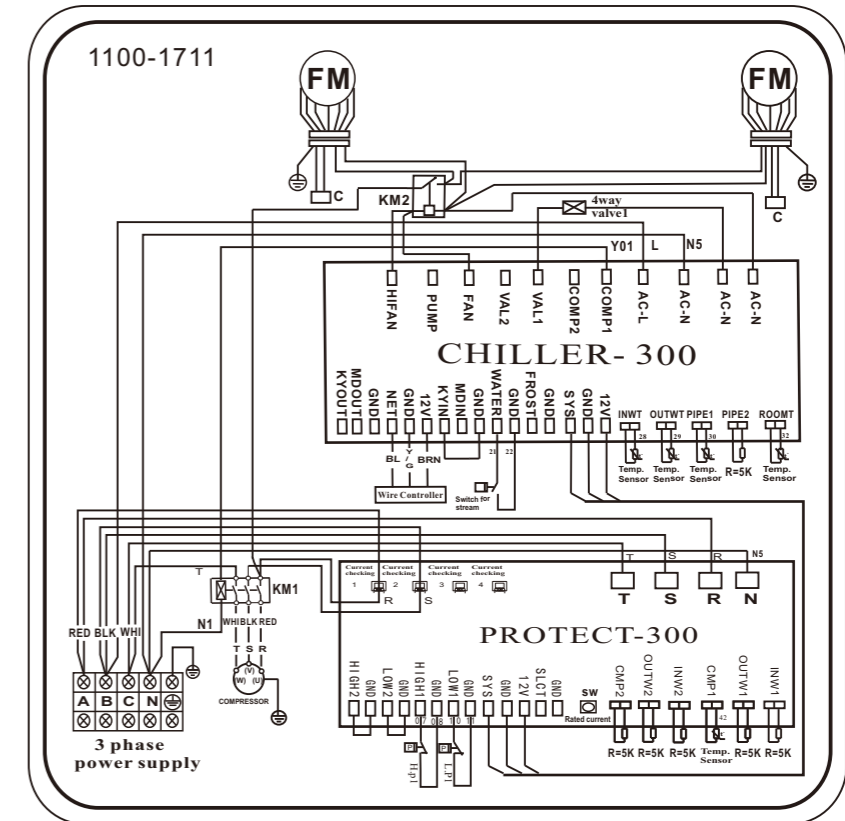


Unit: mm

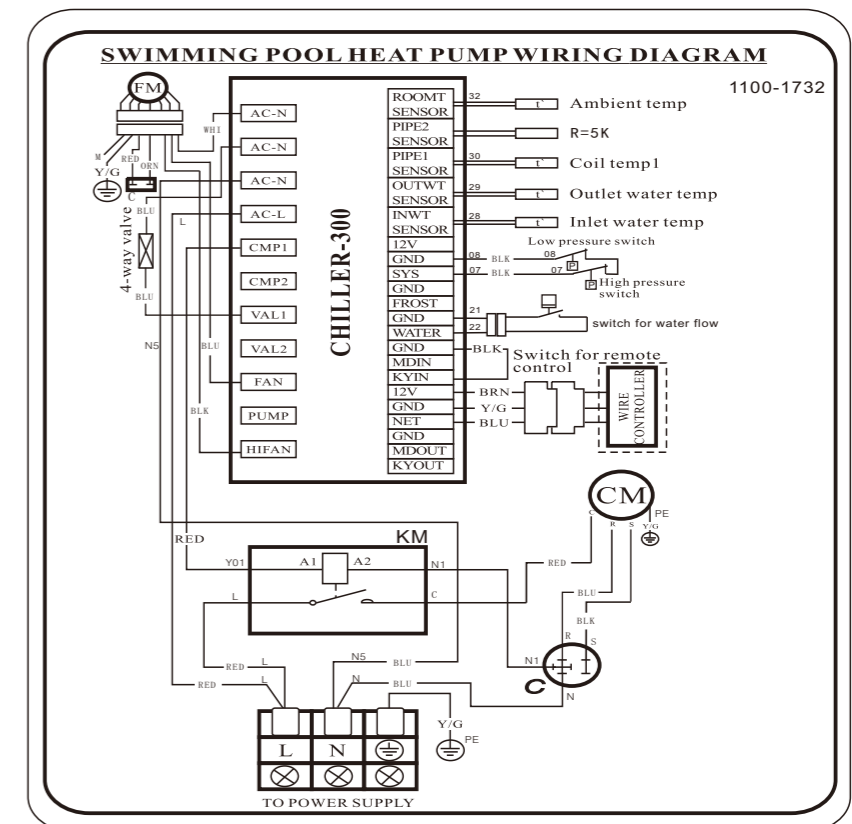
Unit Model	Size	D	E	G	F	H
03310020H		615	360	115	1005	390

7. Wiring diagram

Applicable model: 03310060H

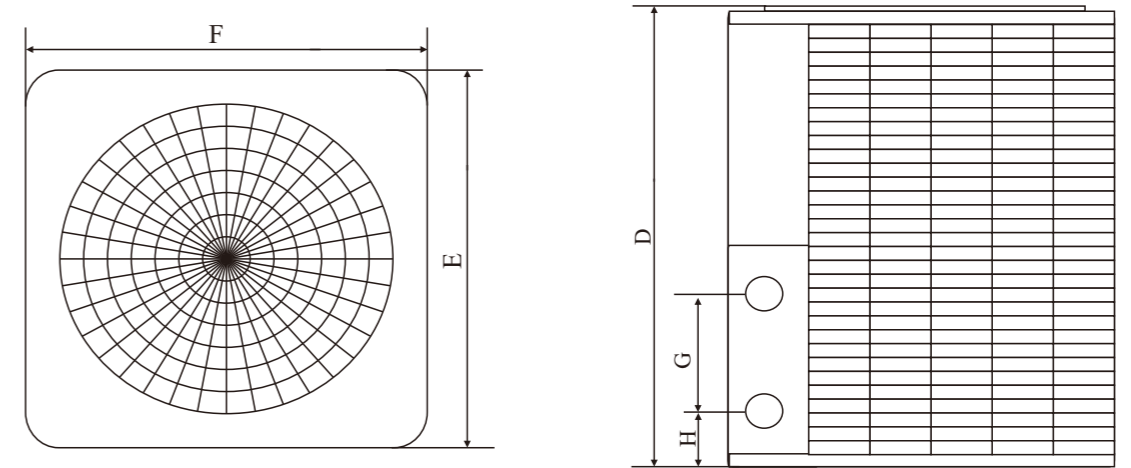


Applicable model: 03310020H, 03300030



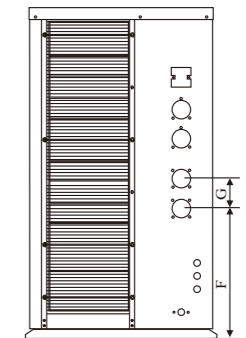
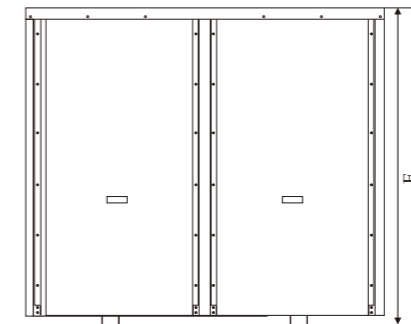
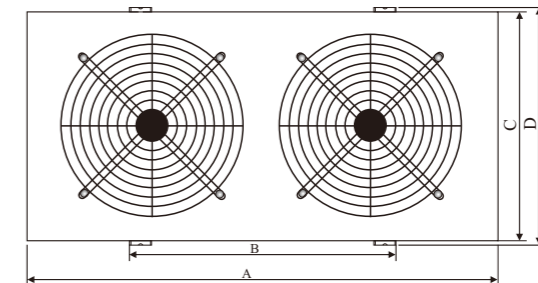
6.4 Overview of protect-300 failure code (3 phase unit)

Protect/Failure	Wire Controller	failure Code
System 1 Low pressure protection	EE1	38
System 1 High pressure protection	EE1	68
System 1 Over current protection	EE1	58
System 1 Refrigerant anti-freeze protection	EE1	18
System 1 Exhaust gas over-high temp. protection	EE1	48
System 1 Refrigerant leakage protection	EE1	28
System 1 Refrigerant in temp. sensor failure	EE1	78
System 1 Refrigerant out temp. sensor failure	EE1	88
System 1 Exhaust gas temp. sensor failure	EE1	98
System 2 Low pressure protection	EE2	83
System 2 High pressure protection	EE2	86
System 2 Over current protection	EE2	85
System 2 Refrigerant anti-freeze protection	EE2	81
System 2 Exhaust gas over-high temp. protection	EE2	84
System 2 Refrigerant leakage protection	EE2	82
System 2 Refrigerant in temp. sensor failure	EE2	87
System 2 Refrigerant out temp. sensor failure	EE2	88
System 2 Exhaust gas temp. sensor failure	EE2	89
Wrong phase or lack of phase	EE4	EE



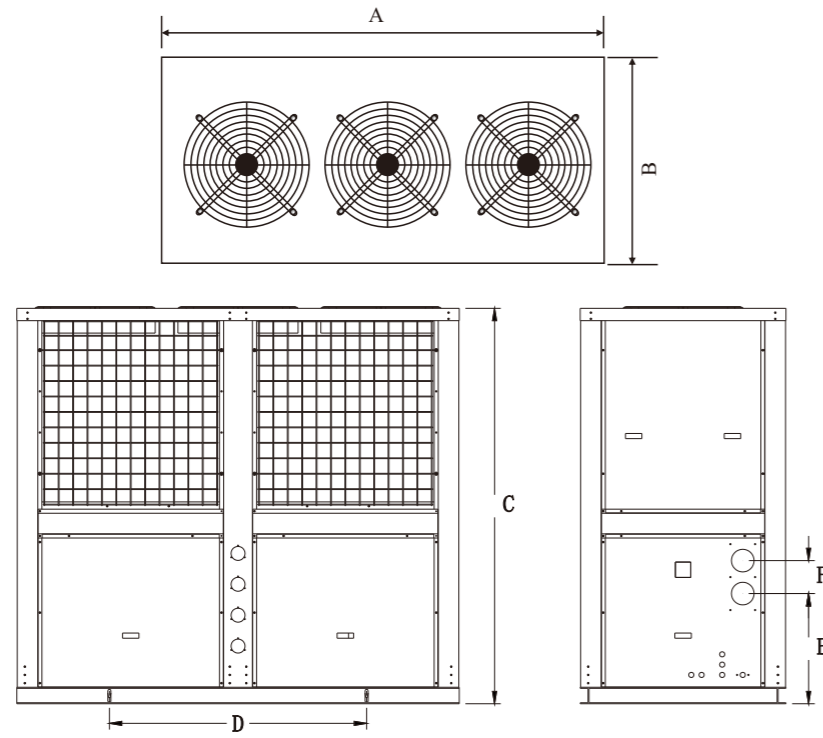
Unit: mm

Unit Model \ Size	D	E	G	F	H
03300030 03300040	855	660	370	660	105
03300050 03300060	955	660	370	660	105



Unit: mm

Unit Model \ Size	A	B	C	D	E	F	G
03310070	1450	750	700	730	1060	495	115
03300080	1450	750	700	730	1260	495	115
03300090	1450	750	700	730	1260	495	115



Unit: mm

Unit Model \ Size	A	B	C	D	E	F
03310120	2150	1000	1920	1250	535	160

6.3 Overview of CHILLER-300 failure code

Protection/Failure	Wire controller	Running/Failure indicator	Check	Solution
Standby status		Off		
Running status		On		
Inlet water temp. sensor failure	PP1/PP01	☆● (flashes once & stops)	1. Check the connection of inlet water sensor. 2. Check if the sensor is broken.	1. Reconnect the sensor. 2. Replace the sensor.
Outlet water temp. sensor failure	PP2/PP02	☆☆● (flashes twice & stops)	1. Check the connection of inlet water sensor. 2. Check if the sensor is broken.	1. Reconnect the sensor. 2. Replace the sensor.
Coil 1 temp. sensor failure	PP3/PP03	☆☆☆● (flashes 3 times & stops)	1. Check the connection of inlet water sensor. 2. Check if the sensor is broken.	1. Reconnect the sensor. 2. Replace the sensor.
Coil 2 temp. sensor failure	PP4/PP04	☆☆☆☆● (flashes 4 times & stops)	1. Check the connection of inlet water sensor. 2. Check if the sensor is broken.	1. Reconnect the sensor. 2. Replace the sensor.
Ambient temp. sensor failure	PP5/PP05	☆☆☆☆☆● (flashes 5 times & stops)	1. Check the connection of inlet water sensor. 2. Check if the sensor is broken.	1. Reconnect the sensor. 2. Replace the sensor.
Protection for excessive temp. difference between water inlet & outlet	PP6/PP06	On	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.	1. Remove the jam. 2. Increase the water flow volume. 3. Repair or replace the water pump.
Anti-freeze protection for cooling	PP7/PP07	On	Refer to PP 6.	Refer to PP 6.
Winter anti-freeze protection I	PP7/PP07	Off	No action required	
Winter anti-freeze protection II	PP7/PP07	Off	No action required	
Water flow switch failure	EE3/EE03	☆☆☆☆☆☆☆☆● (flashes 8 times & stops)	1. Check if wiring connection of flow switch is in position. 2. Check if enough water flow. 3. Check if flow switch is broken. 4. Check if water pump failure.	1. Reconnect the wiring. 2. Increase enough water flow. 3. Replace flow switch. 4. Repair or replace water pump.
High / Low pressure protection	EE4/EE04	☆☆☆☆☆☆☆☆● (flashes 9 times & stops)	1. Check if high or low pressure switch is broken 2. Check if lack of refrigerant. (For low pressure) 3. Ambient temp. and water inlet temp. is too low. (For low pressure) 4. Check if there's jam in water circuit or water flow not enough. (For high pressure) 5. Check if refrigerant circuit jam. (For high pressure)	1. Replace new pressure switch. 2. Charge enough refrigerant. 3. Adjust less water flow. 4. Remove jam or adjust bigger water flow. 5. Send heat pump to dealer for detailed check.
Failure of excessive temp. difference between water inlet & outlet	EE5/EE05	☆☆☆☆☆☆☆☆☆☆● (flashes 10 times & stops)	1. Check if there is enough water flow volume. 2. Check if inlet / outlet water temp. sensor failure.	1. Adjust bigger water flow. 2. Replace related sensor.
Defrosting	No display	☆☆☆☆☆☆☆☆... (flashing continuously)		
Communication failure	EE8/EE08	(Available in wire controller)	Check the connection	Reconnect the connection wire.

Notes:

After water pump starts for one minute, it starts to sense water inlet & outlet temperature. When temp. difference is over 13 degree for continuous 10 seconds, PCB will stop heat pump and controller displays PP6; after 3 minutes, heat pump restarts, if in 30 minutes the heat pump stops 3 times for PP6, controller displays EE5, and heat pump would only restart unless is disconnected to electricity and connect again. When water pump is not working or in heating mode, system will not inspect protection for over-big temp. difference between water inlet and outlet(PP6).

Problem	water leak
Observation:	there's an amount of water under the heat pump
Possible cause	Solution
1. Condensation due to atmospheric humidity	1. No action required
2. Water leak	2. Try to localize the leak and check for the presence of chlorine in the water. If that is the case, the heat pump must be temporarily replaced during repair.

Problem	abnormal amount of ice formed on the evaporator
Observation:	the evaporator is for the most part covered in ice
Possible cause	Solution
1. Insufficient air inflow	1. Check the location of the heat pump and remove any dirt that could be present on the evaporator
2. High water temperature	2. If the pool water is already quite hot (warmer than 29 °C), the probability of ice formation increases. Lowering the set temperature is a possible option
3. Incorrect setting of automatic defrost control	3. Check the setting of the defrosting function together with your installer.
4. The 4-way valve is out of order	4. Check the voltage in the electrical wiring to the 4-way valve. If electric potential is measured, replace the coil. If the problem persists, have the heat pump checked by a refrigeration technician.
5. Not enough refrigerant	5. Have the heat pump checked by a refrigeration technician.

2.3 Location of the heat pump

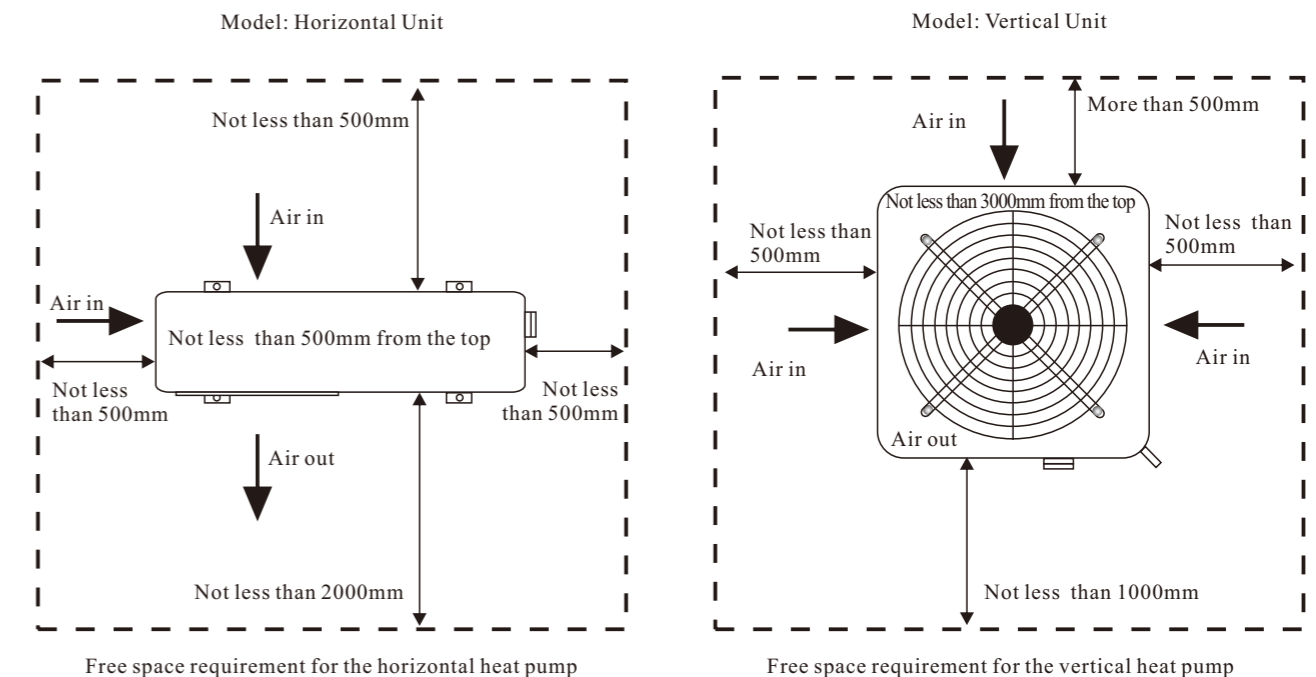
The unit will perform well on any location provided three factors are present:

- 1. Fresh air 2. Electricity 3. Pool filter piping**

The unit may be installed virtually anywhere **outdoors** providing minimum distance requirements are met with respect to other objects (see diagram below). For indoor pools please consult your installer. If the unit is placed in a windy area, no problems occur with e.g. the pilot light, as opposed to what is often the case with gas heaters.

Attention: Do not place the unit in an enclosed area with a limited air volume where the unit's discharged air will be re-circulated or near shrubs that could block the air inlet. These locations deny the unit a continuous fresh air supply, which reduces its efficiency and may prevent adequate heat yield.

See diagram below for minimum required distances.



Cautions

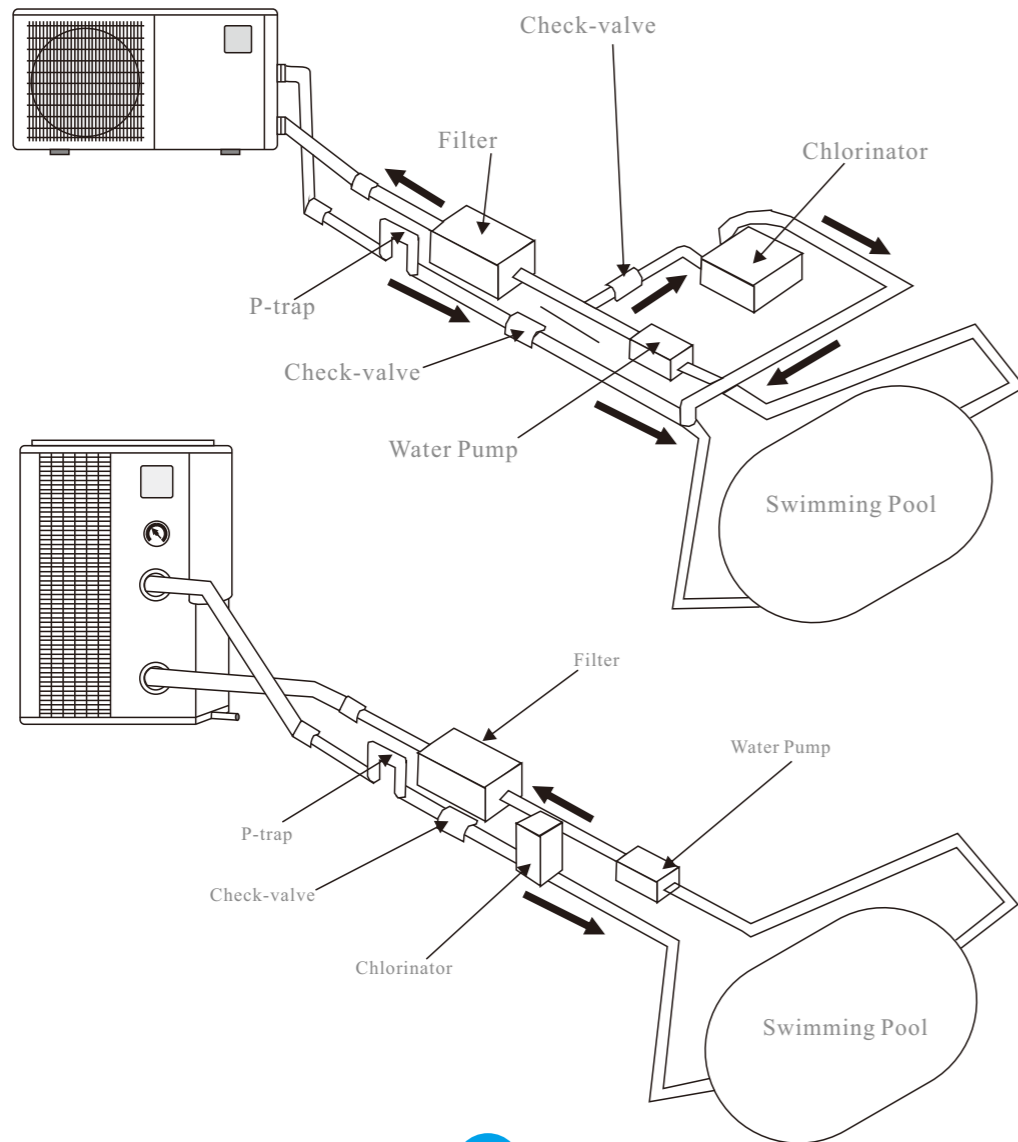
- Do not put your hands or any other object into the air outlet and fan. It could damage the heat pump and cause injuries.
- In case any abnormality was found in the heat pump, please cut off the power at once and contact a professional technician.
- It is strongly suggested to place a guard around the machine to keep children away from the heat pump.

2.4 Distance from the pool

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

2.5 Installation of the check-valve

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



Problem	the screen does not light up and the fan/compressor doesn't make a sound	
Observation:	the screen does not light up and the fan/compressor doesn't make a sound	
	Possible cause	Solution
	No electrical power supply	Check power supply (wiring, fuses,.....)

Problem	the heat pump works normally but there is no or insufficient heating	
Observation:	The screen displays the temperature but no error codes	
	Possible cause	Solution
	1. In sufficient capacity of the heat pump in proportion to the size of the swimming pool	1. Install a larger sized model or an extra heat pump. Cover the pool to limit heat loss
	2. The compressor works but the fan doesn't	2. Check the electrical wiring of the fan. Replace the condenser or the fan motor if necessary.
	3. The fan works but the compressor doesn't	3. Check the electrical wiring of the compressor. Replace the condenser or the compressor if necessary.
	4. The heat pump has not been placed on an optimal location	4. Make for sufficient air circulation(see manual for details)
	5. Faulty temperature setting	5. Set the correct temperature
	6. By-pass not adjusted	6. Have the by-pass readjusted by the installer
	7. Massive ice formation on the evaporator	7. Have the settings for automatic defrost control checked by the installer
	8. Not enough refrigerant	8. Have the heat pump checked by a refrigeration technician

Problem	The heat pump works normally but the water is cooling down instead of heating up	
Observation:	The screen displays the temperature but no error codes	
	Possible cause	Solution
	1.The wrong mode has been selected	1. Verify the parameters, select the correct mode
	2. The controller is out of order	2. Check the voltage in the electrical wiring to the 4-way valve. If no electric potential is measured, replace the controller
	3. The 4-way valve is out of order	3. Check the voltage in the electrical wiring to the 4-way valve. If electric potential is measured, replace the coil. If the problem persists, have the heat pump checked by a refrigeration technician

Problem	the heat pump doesn't work	
Observation:	the screen does not light up and the fan/compressor doesn't make a sound	
	Possible cause	Solution
	1. Wrong setting of parameters	1. Check the set parameters and adjust them if necessary (settings just above the capacity of the heat pump)
	2. Pressure switch out of order	2. Check operation of the pressure switch by turning off the filter pump and restarting it. If the heat pump doesn't react to this, the pressure switch must be adjusted or replaced.
	3. Electrical failure	3. Contact your installer

6. Maintenance and inspection

6.1 Maintenance

1. Check the water inlet and drainage often. The water and air inflow into the system should be sufficient so that its performance and reliability does not get compromised. You should clean the pool filter regularly to avoid damage to the unit caused by clogging of the filter.
2. The area around the unit should be spacious and well ventilated. Clean the sides of the heat pump regularly to maintain good heat exchange and to save energy.
3. Check if all processes in the unit are operational and pay special attention to the operation pressure of the refrigerant system.
4. Check the power supply and cable connections regularly. Should the unit begin to function abnormally or should you notice a smell from an electrical component, arrange for timely repair or replacement.
5. You should also purge the water if the unit will not work for an extended period of time. You should check all parts of the unit thoroughly and completely fill the system with water before turning it on again afterwards.

6.2 Trouble shooting guide

Improper installation may result in an electrical discharge that could lead to death of-or serious injury to-pool users, installers or others due to electrical shock and may also cause damage to property.

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 filtering systems and heat pump:
 - a. **Do not** attempt to adjust or service without consulting your dealer or your professional pool or air conditioning contractor.
 - b. Read the entire installation and user manual before attempting to use, service or adjust the unit.
 - c. Start the heat pump at least 24 hours after its installation in order to prevent damage to the compressor.

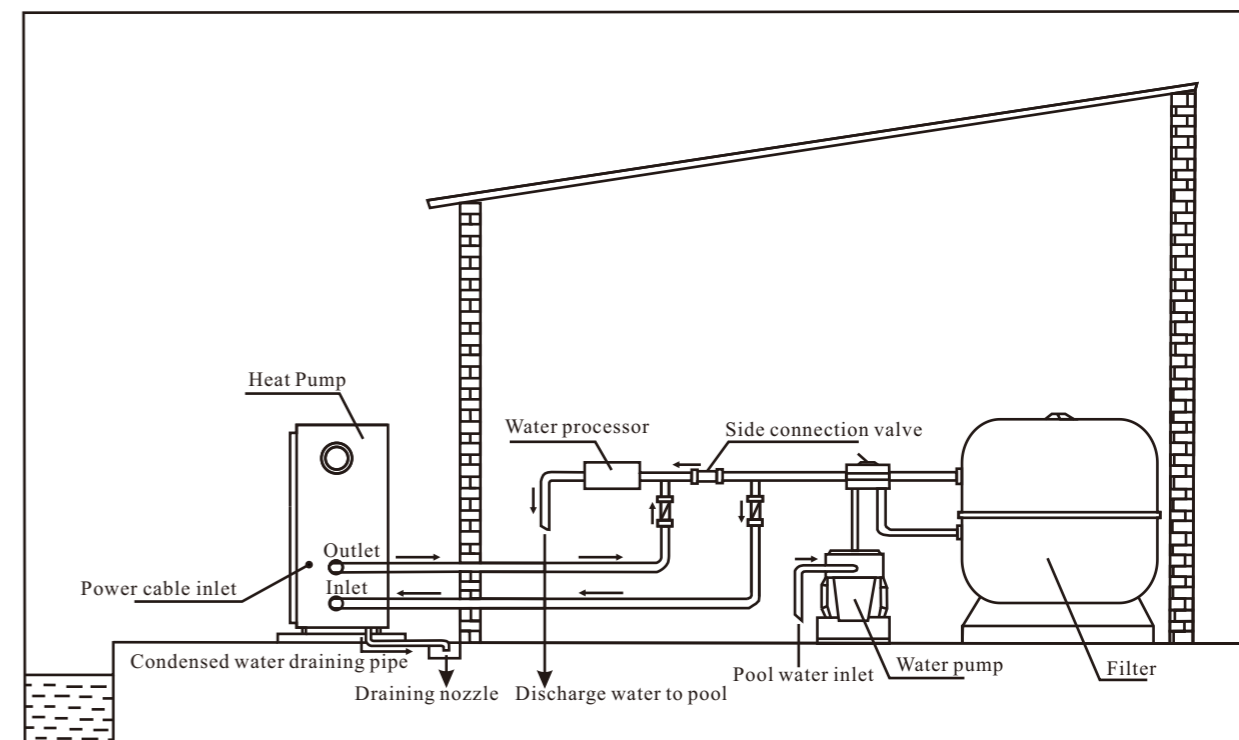
Note: Switch off the power prior to maintenance or repairs.

IMPORTANT REMARK: if a malfunction can not be resolved immediately, in order to analyse the problem itself, we will need to know the message(error code)that is displayed on the controller, as well as the values for the settings (parameter 00-10 for LCD display while parameter 0-A for LED display) and for status of the heat pump (ambient temperature, water inlet/outlet temperature and system coil temperature) just before the failure or, if this is impossible, just after it.

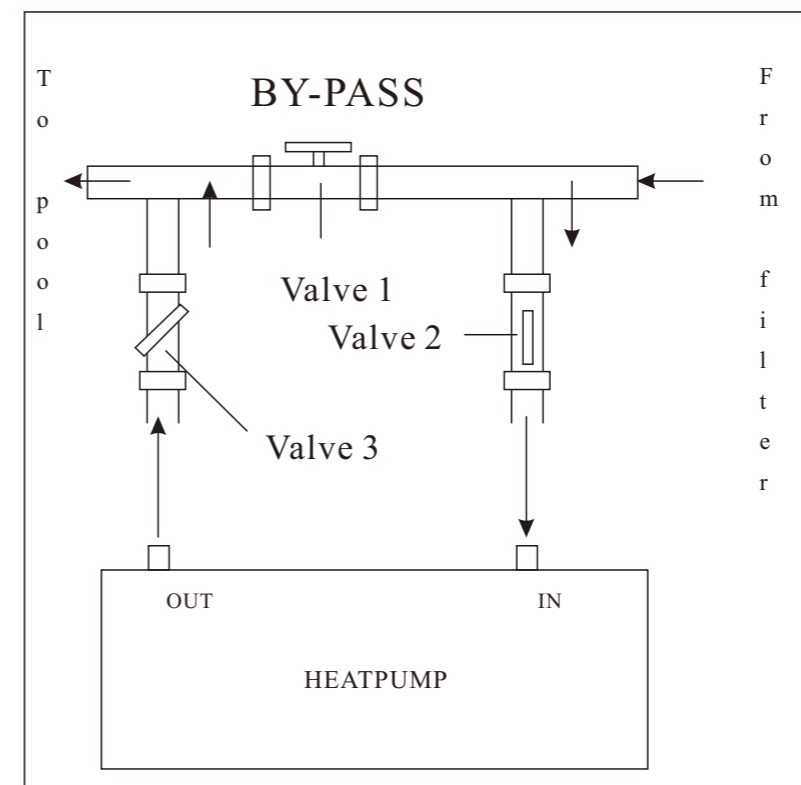
Please keep this information at hand when calling customer service.

On the following pages, you will find an overview of the different types of failure problems that can occur, along with directions to solve them.

2.6 Pool system set up



2.7 Connecting the by-pass



Adjust the by-pass as follows:
 open the 3 valves completely
 slightly close valve 1 until water pressure has increased with approximately 100 to 200 grams,
 close valve 3 about halfway to adjust the pressure of the refrigerant gas in the unit

2.8 Electrical hook-up

Important—Although the heat pump is electrically isolated from the rest of the unit, this only prevents the passage of electricity to or from the pool water. Grounding the unit is still required to protect yourself from short circuits inside the unit. Make for adequate ground connection.

Check if the electrical mains voltage corresponds with the operating voltage of the heat pump prior to hooking up the unit.

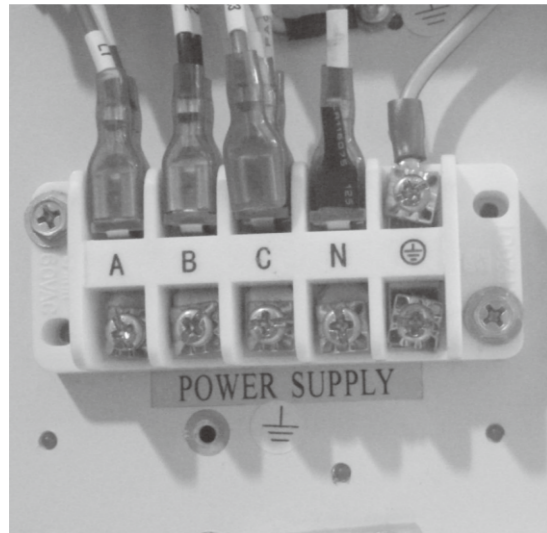
It is recommended to use a separate fuse (slow type-D-curve) as well as adequate wiring (see table below).

For horizontal models : remove the panel on the right of the fan opening.

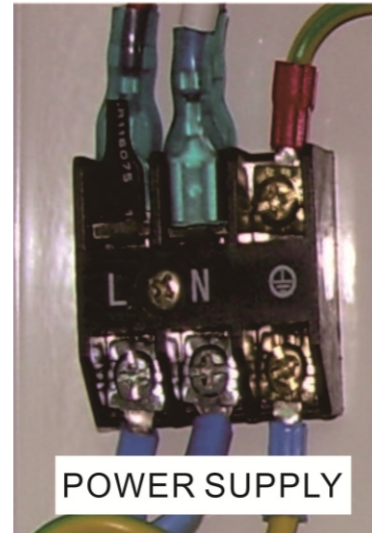
For vertical models: remove the curve panel in the front side.

Connect the electrical wires with the terminal block labelled “Power Supply” .

See further at Parameter setting table (Parameter 9) for the different possibilities.



380V/3ph/50Hz



230V/1ph/50Hz

Remarks—for models with 3 phases, switching 2 phases may cause inversion in the rotational direction of electrical motors, which could damage the unit. Therefore, a protection device has been built in, which will interrupt the circuit if the connection has not been performed correctly.

Model	Voltage(volt)	Fuse(A)	Nominal current(A)	Cable diameter(mm ²) (for max.length of 15 meters)
03310020H	220-240	25	8.4	2x2.5+2.5
03300030	220-240	25	13.9	2x4.0+4.0
03300040	220-240	25	16.7	2x4.0+4.0
03300050	3x380	16	7.9	4x2.5+2.5
03300060	3x380	16	9.7	4x2.5+2.5

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.

5.3 Restarting the pump after winter

If you purged your heat pump for winterizing, you should undertake the following steps to restart it in spring:

1. Check first if there is no dirt in the conduits and if there are no structural problems
2. Check if the water inlet and outlet coupler fittings are adequately fastened to the heat pump
3. Start the filter pump to start the water flow to the heat pump. Set the by-pass again.
4. Reconnect the electrical power supply to the heat pump and turn it ON.

5.4 Check-up

Our heat pumps have been developed and built to last, that is, if they have been installed correctly and can run under normal conditions. Regular check-ups are important if you want your heat pump to function safely and efficiently for years on end.

1. Make for easy access to the service panel.
2. Keep the area surrounding the heat pump free of contingent organic waste.
3. Prune the vegetation near the heat pump so that there is enough free space around the pump.
4. Remove contingent water sprinklers from the vicinity of the heat pump. They can damage the heat pump.
5. Prevent rain from directly running off a roof onto the heat pump. 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 repair it if should prove necessary.

Condensation can occur when the heat pump is running. This condensation can flow away through an opening in the base pan of the unit. The amount of condensation water will increase when atmospheric humidity is high. Remove any dirt that could possibly hamper the evacuation of condensation.

10 to 20 litres 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 leaks in the conduits.

Note: a quick way to verify that the water running through the condensation drain is indeed condensation, is to shut off the unit and keep the pool pump running. If the water stops running out of the condensation drain, 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 take care to leave air inlet and exhaust passages free. Prevent exhaust air from immediately re-entering the unit through the inlet.

4.8 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.

4.9 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.

5. Direction

5.1 Swimming pool water chemistry

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

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

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

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

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

5.2 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 the freezing point, Evacuate all water from the heat pump as follows:

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

Model	Voltage(volt)	Fuse(A)	Nominal current(A)	Cable diameter(mm ²) (for max.length of 15 meters)
03310070	3x380	16	12.5	4x4.0+4.0
03300080	3x380	25	16.4	4x4.0+4.0
03300090	3x380	32	18.2	4x4.0+4.0
03310120	3x380	80	40.6	3x16.0+2x10.0

2.9 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, you should follow these steps:

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

2.10 Condensation

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

3. Control the heat pump

Preparation before startup







A) Inspection of the heat pump

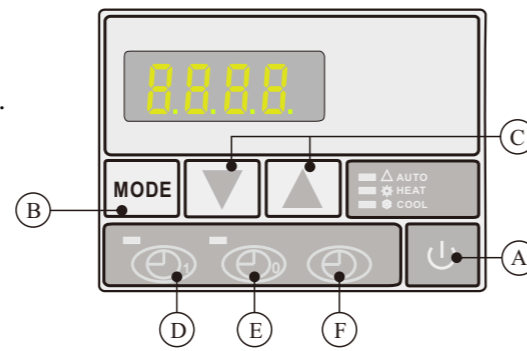
- Check whether the outer appearance of the unit or pipeline system in the unit is damaged during transportation.
- Check whether the ventilator fan does not touch any part of the unit

B) Verifying the electrical connections

- Check whether power supply complies with specifications in this manual or on the label placed on the unit.
 - Check whether the power cabling is connected correctly and firm according to the wiring diagram.
- Adequate grounding is required to protect against electrical shock.

3.1 Illustration of controller(LED)

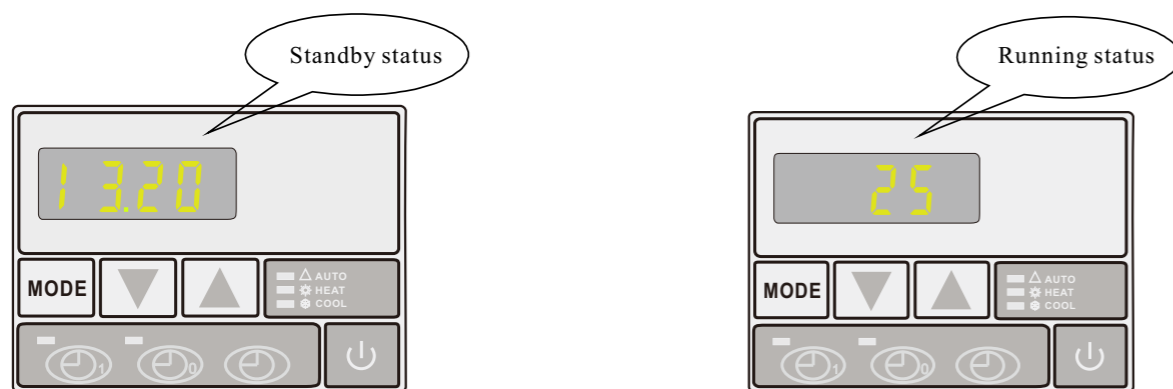
- A.  : Switch on or off heat pump.
- B. **MODE** : Select auto, heating or cooling mode.
Relevant indicator would be on when selected.
- C.  or  : Press to change figures.
- D.  : Timer on setting button.
- E.  : Timer off setting button.
- F.  : Time setting button.



3.2 How to start heat pump (LED)

Connected with power, the controller will display the time. This means the unit is in standby.

Press  to start the Heat pump. The controller display will show inlet water temperature now.



3.3 How to change mode (LED)

Press **MODE** button to select auto, heating or cooling mode, related indicator light on the right side of controller will be on as a symbol.

4. Protection systems

4.1 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.

4.2 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.

4.3 Overheating protection on the compressor

This protection protects the compressor from overheating.

4.4 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.

4.5 Temperature difference between inflowing and outflowing water

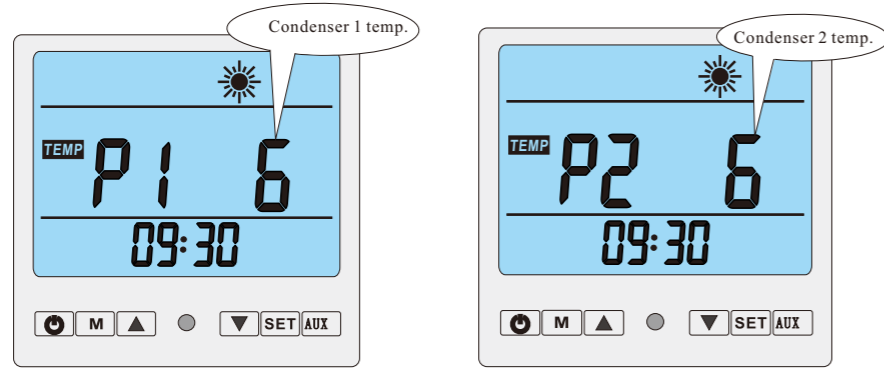
During normal operation of the heat pump, the temperature difference between inflowing and outflowing water will approximate 1 to 2°C. In the event that the pressure switch does not work and that the water stops circulating, the temperature probe monitoring the outflowing water will always detect a rise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

4.6 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.

4.7 Anti-frost protection during winter

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

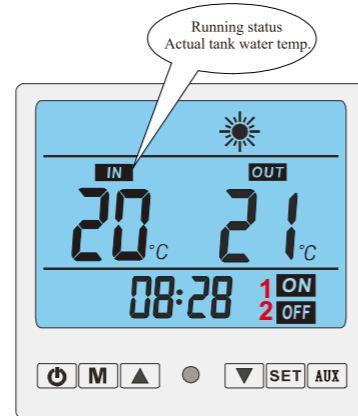


3.15 Setting time (LCD)

- ✓ Press "SET" 5s to activate time setting.
- ✓ When data of hour is flashing move ▲ or ▼ to fix it and confirm setting by pressing "SET" again.
- ✓ When data of minute is flashing move ▲ or ▼ to fix it and confirm setting by pressing SET again.

3.16 Setting TIMER ON / OFF (LCD)

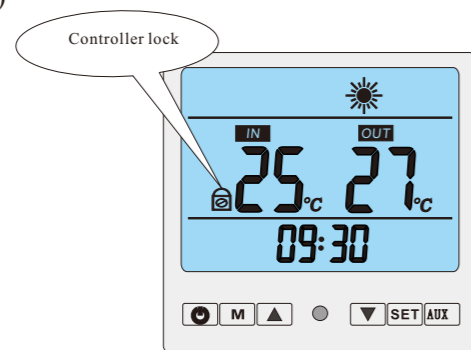
- ✓ Press "AUX" 5s to activate timer setting for ON, 00:00 and ON icon will be flashing together.
- ✓ Press "AUX" again, controller displays with flashing hour and ON icon only, move "▲" or "▼" to fix the hour on the timer to start on the unit.
- ✓ Operate in the same way to set the minute on the timer.
- ✓ After TIMER ON is completed continue to press "AUX" to activate timer OFF setting, 00:00 and will be flashing with OFF icon, set and operate in the same way.
- ✓ Press "AUX" for final confirmation.
- ✓ Controller will display with ON and OFF if the timer has been set.
- ✓ "Timer 2" set and operate in the same way.



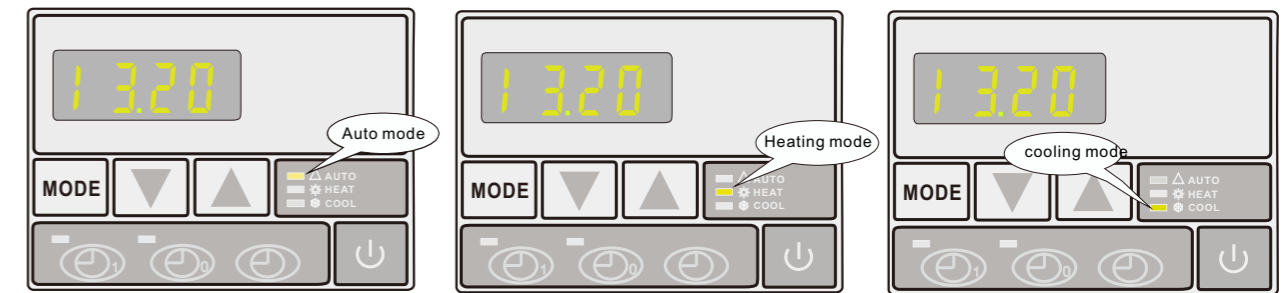
3.17 Cancellation of TIMER ON / OFF (LCD)

1. Press "AUX" to activate, timer and ON/OFF will be both flashing.
 2. Only reset "timer 1" and "timer 2" Parameters to 00:00 that can cancel timer.
 3. When ON and OFF doesn't display on the controller timer has been cancelled.
- NOTE: TIME AND TIMER SETTING CAN BE CHANGED UNDER STANDBY OR RUNNING STATUS.

3.18 Controller lock (LCD)

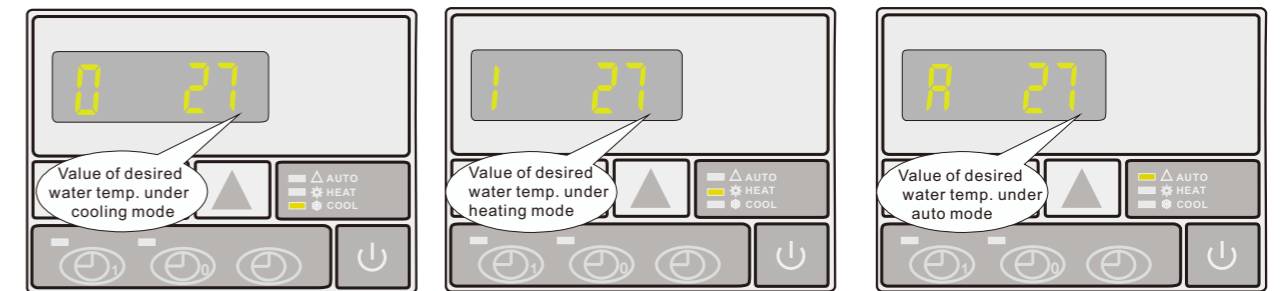


Regardless the heat pump is in running or standby status, press ▲ and ▼ at the same time for 3 seconds, all buttons will be locked and display as above. Press ▲ and ▲ for 3 seconds for unlocking.



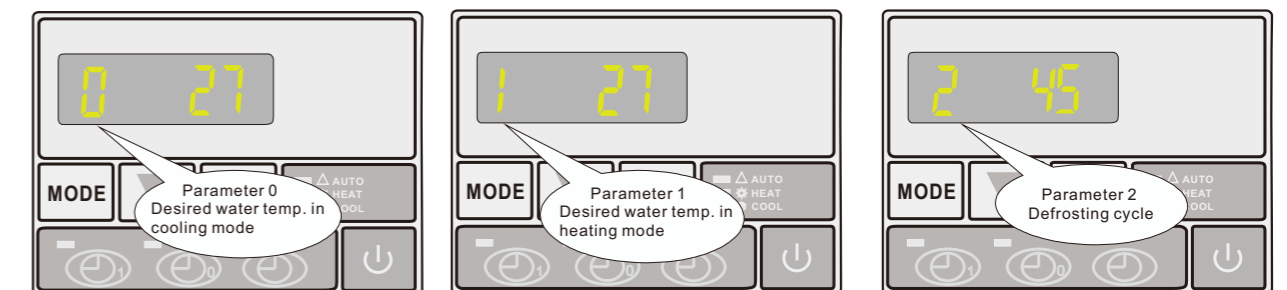
3.4 How to set your desired water temperature (LED)

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.



3.5 How to change parameter setting (LED)

1. In standby status press ▼ or ▲ to find parameter 0-A and measured values of current status B-F.
2. Press ▼ & ▲ at the same time for 5 seconds continuously to activate parameter setting.
3. Change value on setting until a BEEP is heard while display remains indicating parameter with its value flashing.
4. No pressing the controller for 5s PCB will store data automatically and return to standby status.



The heat pump's running setting parameter can be set on the wire controller.

Please set the parameter according to the below table:

Parameter	Definition	Range	Default	Remark
00	Desired water temperature in cooling mode	8~28℃	27℃	Ajusted by Technicians
01	Desired water temperature in heating mode	15~40℃	27℃	Ajusted by Technicians
02	Defrosting cycle	30~90Min	45Min	Ajusted by Technicians
03	Evaporator temperature set point for starting defrosting	-30~0℃	-6℃	"-" is not displayed Ajusted by Technicians
04	Evaporator temperature set point for stopping defrosting	2~30℃	12℃	Ajusted by Technicians
05	Maximum duration for defrosting	2~12Min	8Min	Ajusted by Technicians
06	Number of compressors in the system	1~2	1 or 2	Ajusted by Technicians
07	Restart after power failure	0~1	1 (Yes)	Ajusted by Technicians
08	Type of system: 0/Cooling only 1/Heating & cooling 2/Heating & cooling + Auxiliary heating 3/Heating only	0~3	1	Ajusted by Technicians
09	Different working mode of water pump: water pump keeps working always 0/ water pump works in accordance with heat pump 1 /	0~1	0	Ajusted by Technicians
10	Desired water temperature in auto mode	8~40℃	27℃	Ajusted by Technicians

Important:Parameter 03 Icon “-” which stands for below “0” degree **CAN NOT** be displayed here. Default setting “7℃” actually stands for “-7℃”.

3.14 How to know current status (LCD)

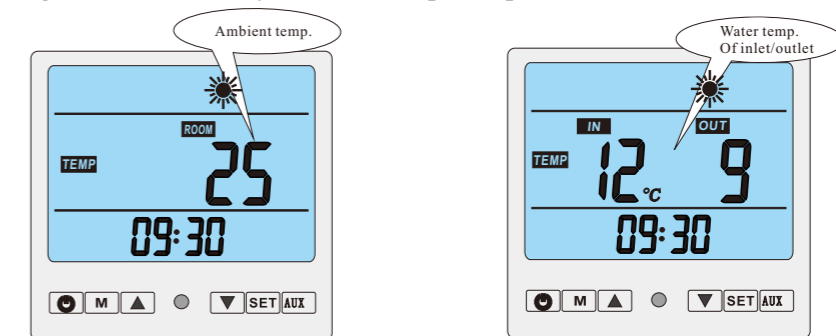
When heat pump is in running status, press SET button to check the current status of the unit.

When heat pump is in standby status, you can check water-in / water-out temperature, condenser temperature and ambient temperature by pressing ▲ and ▼.

Please note no press on the controller for 5 seconds, controller will return to main interface, which displays water-in and water-out temperature.

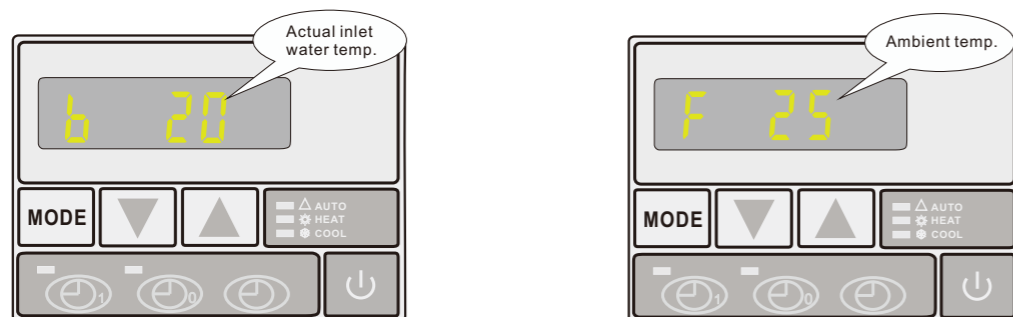
When heat pump is in standby status, controller will display only ambient temperature.

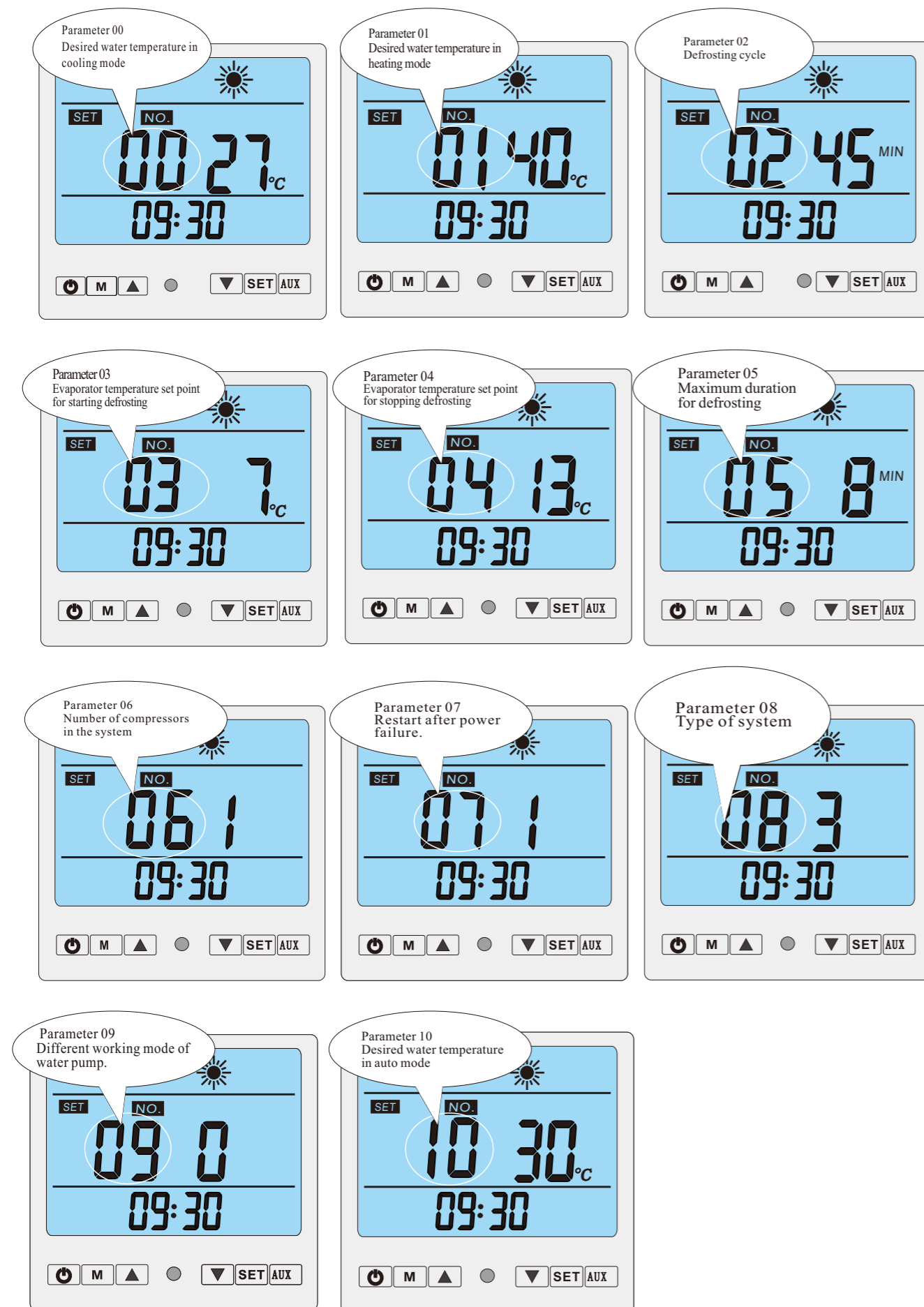
Remarks: Standby status means the unit is connected with electricity but not running. Parameter 00-10 can **ONLY** be changed under standby status, except the parameter from 00-01.



3.6 How to check parameter setting & measured values of current status (LED)

In standby or running status press ▼ or ▲ to find parameter 0-A and measured values of current status.





Parameter table overview

Parameter	Definition	Range	Default	Remark
0	Desired water temperature in cooling mode	8~28°C	27°C	Ajusted by Technicians
1	Desired water temperature in heating mode	15~40°C	27°C	Ajusted by Technicians
2	Defrosting cycle	30~90Min	45Min	Ajusted by Technicians
3	Evaporator temperature set point for starting defrosting	-30~0°C	-6°C "--" is not displayed	Ajusted by Technicians
4	Evaporator temperature set point for stopping defrosting	2~30°C	12°C	Ajusted by Technicians
5	Maximum duration for defrosting	1~12Min	8Min	Ajusted by Technicians
6*	Number of refrigerant circuit	1~2	*1 or 2	Ajusted by Technicians
7	Restart after power failure	0~1	1 (Yes)	Ajusted by Technicians
8	Type: 0 Cooling only 1 Heating & cooling 2 Heating & cooling + Auxiliary heating 3 Heating only	0~3	1	Ajusted by Technicians
9*	Different working mode of water pump: 0 water pump keeps working always 1 water pump works in accordance with heat pump	0~1	0	Ajusted by Technicians
A	Desired water temperature in auto mode	8~40°C	27°C	Ajusted by Technicians
B	Actual inlet water temp.	-9~99°C		Measured Value
C	Actual outlet water temp.	-9~99°C		Measured Value
D	Coil temp. in system 1	-9~99°C		Measured Value
E	Coil temp. in system 2	-9~99°C		Measured Value
F	Ambient temp.	-9~99°C		Measured Value

***Remarks:**

- Value of Parameter 6 will due to different model to be 1 or 2.
- Parameter 9 water pump working mode, heat pump will only provide a signal to control water pump, not to provide power.

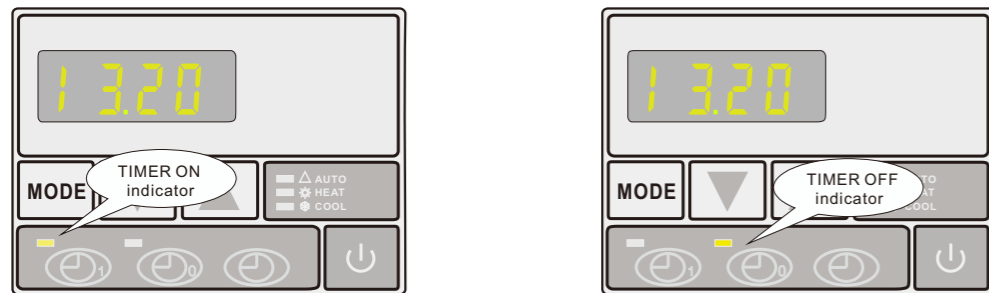
3.7 How to set clock (LED)

1. In standby status press button, hour figures will be flashing and ready to be modified by or .
 2. Press button for second time, minute figures will be flashing and ready to be modified by or .
 3. Press button for final confirmation of time setting.
- After the time is set LED display will show time when the heat pump is under standby status.

3.8 How to set timer on and timer off (LED)

- a) Press to activate timer on setting, hour and minute figures will be flashing together.
- b) Press again to have active hour setting, hour figure will be flashing and ready to be modified by or .
- c) Press again to have active minute setting, minute figure will be flashing and ready to be modified by or .
- d) Press to confirm the setting and display will return to standby status. Timer on indicator green light would be on as a symbol.
- e) Operate the same to timer off by using instead of . timer off indicator red light would be on as a symbol.

Note: Timer on and timer off can be selected both or separately.



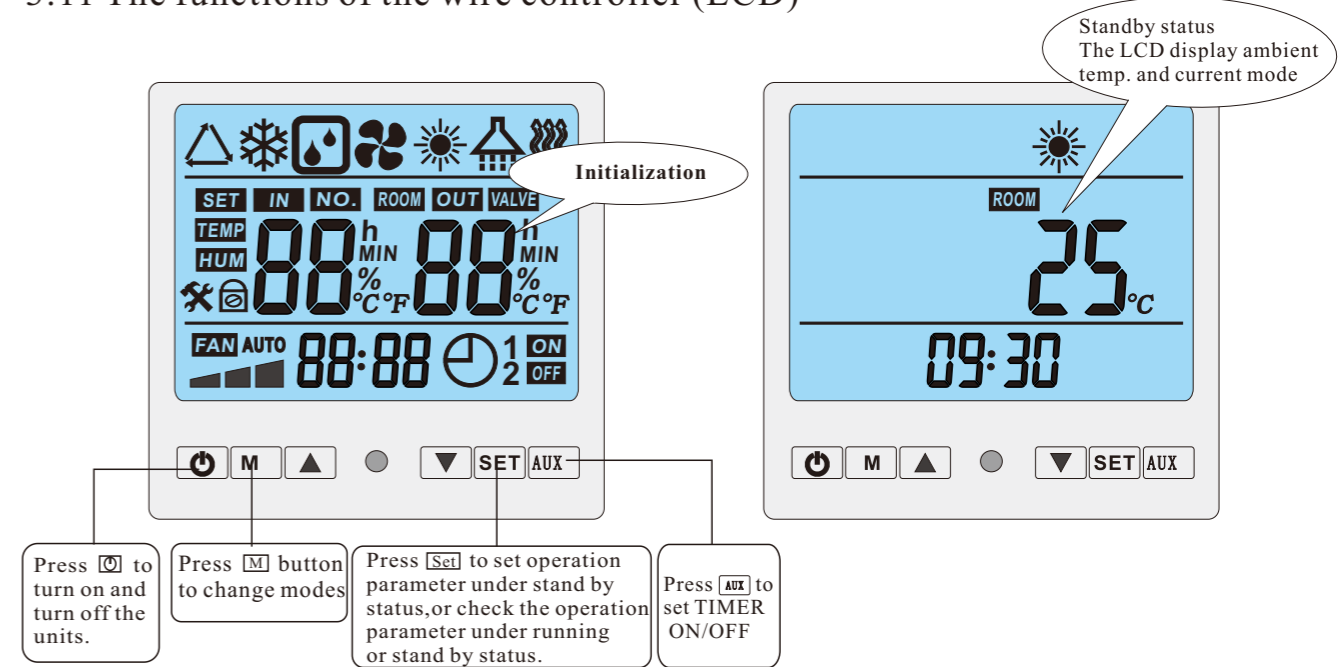
3.9 How to cancel timer on and timer off (LED)

Press or to activate, relative indicator light would be flashing, press for cancellation of timer on or timer off.

3.10 Keypad lock and unlock (LED)

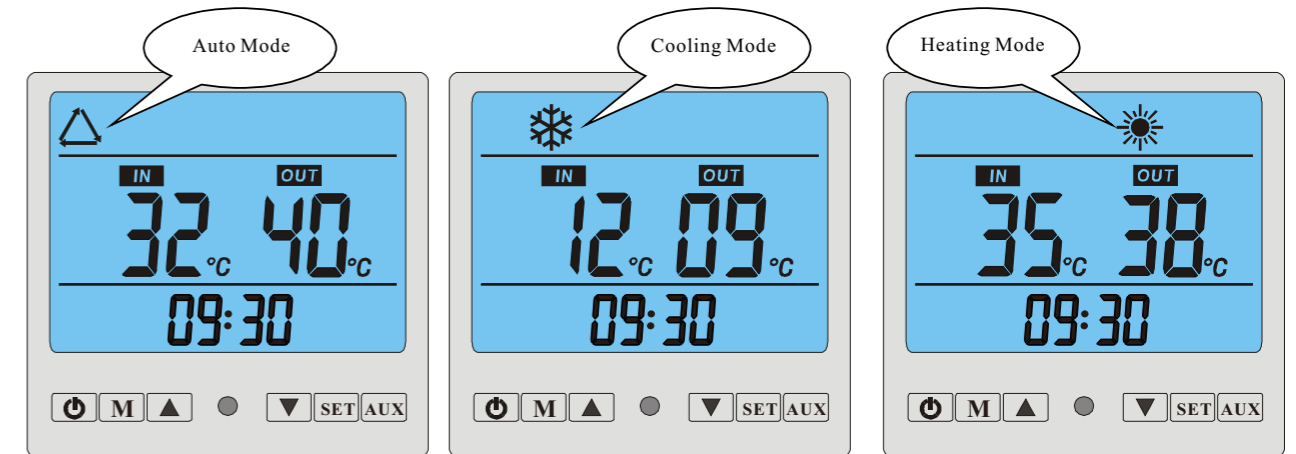
Except parameter setting, in other situation press & at the same for 3 s, keypad would be locked after BEEP. To unlock it please press both buttons together again for another 3 s.

3.11 The functions of the wire controller (LCD)



3.12 How to set operation parameter (LCD)

Press “M” , to choose the (Auto ,cooling ,heating)mode one by one under the stand by status and running status.



3.13 How to change parameter (LCD)

1. When heat pump is in standby status, Press “SET” button to start setting Parameter from 00 -10 (see Parameter Table).
2. In parameter setting Parameter 00-01 can be changed only by pressing or .
3. Parameter 02-10 must be firstly unlocked by pressing and at the same time for 3-5 seconds until a sound of “Beep” is heard. Then press or to change the setting.
4. Data will be stored in 3-5 seconds without any press on the controller and display will return to main interface. Parameter 02-10 must be adjusted by professional technicians.

Important: Whilst running, all parameters can be only checked by pressing “SET” button, but never be changed, except the parameter from 00-01.