



Intelligent controller

Manual

Product type: Type KL swimming pool controller

Product model: CCYC001

Version: V1.1

Thank you for selecting our air to water heat pump!

This manual is for swimming pool series.

The appearance of the heat pump you buy from us maybe is different from on the manual, but it does not affect operating and using.

Before using heat pump, please read the manual carefully.

Please safe keeping the manual for checking in future!

To user

Dear user:

Please read this manual carefully before installing and using this product, we will not responsible for following condition: any improper installation, improper debugging, un-necessary maintenance, non-compliance with the provisions of the manual or guidance that lead to personal injury or unit damage. When installed, must be wired in accordance with the circuit diagram which is posted on the electric box of heat pump by the professionals that have the appropriate qualifications, and in the process of installation and use should pay attention to the following points:



1. When used incorrectly, it can cause dangerous situations, which may lead to personal injury or death
2. When used incorrectly, it can cause dangerous situations that may cause equipment damage or accelerated damage
3. Even precautions can lead to danger as conditions change
4. Please install on the metal and other non-flammable plate, and firmly install to avoid falling due to vibration
5. Do not install controllers with damaged or missing parts
6. Do not be exposed to direct sunlight, strong airflow and water mist during installation
7. Do not be exposed to corrosive or contaminated gases such as sulphide gases and salt spray during installation
8. When installing, please ensure that the temperature of the electrical box is between -10°C and $+50^{\circ}\text{C}$, and add the exhaust fan if necessary
9. When wiring, please confirm whether the power input is in the OFF state
10. Please ask the electrical staff to connect the wires when wiring
11. When wiring, the input terminal is a passive switch signal, do not connect to the power supply
12. Please add system level protection when wiring to avoid the danger caused by the failure of computer controller
13. Please observe the strong and weak electricity separation principle when wiring
14. Please use the wires in accordance with the technical specifications when wiring
15. When wiring, please use parallel grounding, grounding wire as thick as possible
Please use proper screwdriver to fix the screw when wiring. Too big or too small screwdriver may cause the screw head to slide
16. According to the machine configuration, set the relevant parameters to ensure the normal operation of the machine
17. According to the machine configuration, set the relevant jumper/code switch to ensure the normal operation of the machine
18. After confirming the correct connection during operation, the power supply shall be input
19. When running, make sure that the environmental conditions and the power supply voltage are within the allowable conditions before starting the operation
20. Do not get too close to the machine while running
21. Do not check the signal while running
22. Do not randomly change the parameter Settings when running
23. If you need any repair, please contact the manufacturer. Do not repair by yourself
24. Do not pull, twist the power line, communication line to avoid serious failure
25. Do not touch the components of the control panel directly by hand to avoid being damaged by static electricity
26. The company shall have the right to repair the defects caused by the defects in the computer controller software, but shall not be obligated to assume any responsibility
27. The company shall not be liable for the consequences caused by improper use
28. The company has the right to go to the end user site service, but no obligation.

1. Electrical Specification of Controller	1
1.1. Electrical properties.....	1
1.2. Electrical Input and Output port	1
1.3. Installation requirement	1
2. Remote controller	3
2.1. LED home screen	3
2.2. Display instructions	3
2.3. button definition and operation.....	3
2.3.1. “Prg” button	3
2.3.2. “Sle” button	3
2.3.3. Reset operation.....	4
3. Functionality Mode	4
3.1. Heating mode.....	4
3.1.1. Temperature setting.....	4
3.1.2. Heating running.....	4
3.1.3. Heating operation.....	5
3.2. Cooling mode.....	5
3.2.1. Temperature setting.....	5
3.2.2. Cooling running.....	5
3.2.3. Cooling operation.....	5
3.3. Defrosting mode.....	6
3.3.1. Conditions for entering defrosting.....	6
3.3.2. Conditions for exiting defrosting	6
3.3.3. Defrosting operation.....	6
3.3.4. Exiting defrosting operation.....	6
4. Control of outputs	7
4.1. Compressor	7
4.2. Fan	7
4.3. Four-way-valve.....	7
5. System protection	8
5.1. Low pressure protection	8
5.2. Low ambient temperature protection.....	8
5.3. Ambient over-temperature protection	8
5.4. Water temperature fault	8
5.5. Ambient temperature fault	8
5.6. Coil temperature fault.....	8
6. Others.....	8
6.1. Power off protection function	8
7. Failure code and parameter setting table	9
7.1. System failure (LED).....	9
7.2. System parameter setting table (LED).....	9

1. Electrical Specification of Controller

1.1. Electrical properties

Supply voltage	220V ±15%
Frequency	50HZ
Input signal	NTC 5k/50k
Protection class	IP00 (bare board)
Environmental condition	Ambient temperature range -10 ~ 70°C, 5%RH ≤ relative humidity ≤ 95%RH(no condensation)
Preservation environments	Temperature range -25 ~ 85°C, relative humidity ≤ 95% RH(nocondensation)

1.2. Electrical Input and Output port

Serial number	AD output	AD input	Analogue input	EEV
1	Fan	Lowpressure switch	Water inletwater temp	
2	4-way valve		Ambient temp	
3	compressor		Coil temp	



Electrical output rating is 250VAC/5A.This indicator refers to the load carrying capacity of resistive load, which should be reduced by at least 30% in practical engineering applications.

1.3. Installation requirement

Avoid installing motherboards in the following environments:

- ◆ Relative humidity is greater than 90%
- ◆ Strong vibration and turbulence
- ◆ Exposure to continuous jet water

- ◆ Exposure to corrosive gases (e.g. Sulphur or ammonia, salt and alkali mixed smoke);
- ◆ High energy electromagnetic fields and high frequency oscillation sources (avoid installing the control equipment near the transmitting antenna)
- ◆ Exposure to sunlight directly
- ◆ Environment with a large range of ambient temperature variations
- ◆ Explosive and flammable gases in the environment;
- ◆ Exposure to dust (corrosion reduces insulation due to oxidation);

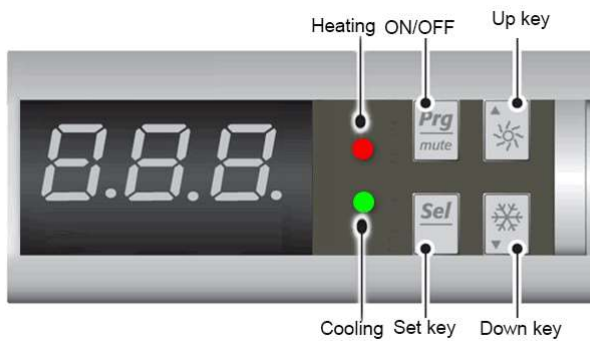
In order to properly connect the following warnings must be followed:

- ◆ Failure to meet the requirements of the power supply will cause serious damage to the system.
- ◆ Use plugs that match the cable used. Loosen the screws on each end, then install the plug on the cable, and finally guide the screws to tighten with approximately 0.5-0.6 N/m torque. After the operation, gently pull the cable by hand to check whether it is firm.
- ◆ Do not apply too much force when fixing the cable to the port with a screwdriver to avoid damage to the control panel.
- ◆ The signal line of the probe must be separated from the inductive load and power supply cables from the switch input. Avoid electromagnetic interference. Never use the same channel as the probe cable. Avoid the probe cable to be directly installed near the power equipment (contactor, circuit breaker). Do not combine power cable with probe cable or even other control signal cable with power wire.
- ◆ Minimize the length of the sensor cable and avoid winding on the electrical equipment, the probe connection must be shielded cable (minimum cross section 0.5mm).
- ◆ To prevent the operator from electrostatic discharge, avoid touching the electronic components on the motherboard directly;
- ◆ Separate the power cable of digital Output from that supplies the control panel, because the two types of power supply are different.

2. Remote controller



2.1. LED home screen



2.2. Display instructions

- ◆ 16mm
- ◆ The green light goes on during cooling mode
- ◆ Red lights and green lights flash during defrosting mode.

2.3. button definition and operation

2.3.1. "Prg" button

- ◆ Turn ON/OFF button.
- ◆ In the main interface, press this key to turn on or off.
- ◆ In the parameter query setting interface, press this button to return to the main interface.

2.3.2. "Sel" button

- ◆ The function keys

- ◆ Click to switch between cooling mode and heating mode under the main interface.
- ◆ Long press this button 5S to query parameters, combined with "▲" and "▼" button on the parameter page query
- ◆ Under the system parameter query state, press "Sel" button to enter the current parameter setting state (parameter value flashing).Now combined with "▲" and "▼" button can modify the corresponding parameter. Press "Sel" key to exit the parameter setting state to return the parameter query state when this parameter setting is completed.
- ◆ “▲”和“▼” button
- ◆ Page forward and backward query
- ◆ Adjust the current set temperature through the buttons under the main interface.
- ◆ Setting parameters combine with“Sel”button.

2.3.3. Reset operation

- ◆ Hold down "Sel" button + "Prg" button for 10 seconds to restore the default value of the parameters.

3. Functionality Mode

3.1. Heating mode

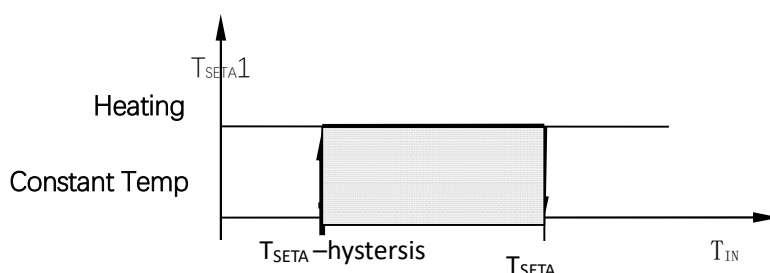
3.1.1. Temperature setting

- ◆ TSETH range of temperature setting value for heating backwater temp: 15°C ~ 40°C (parameter d, initial setting temperature: 27°C;)

3.1.2. Heating running

Determine the starting and stopping of the unit according to the values of the inlet water temperature T_{IN} and TSETH:

- ◆ When the inlet temperature $T_{IN} \leq T_{SETH} - \text{hysteresis of heat pump restart (parameter H)}$, the unit starts heating;
- ◆ When the inlet water temperature $T_{IN} \geq T_{SETH}$, the unit will stop at constant temperature;
- ◆ When the power is on for the first time,
- ◆ The unit will be directly switched on heating when the inlet water temperature $T_{IN} \leq T_{SETH}$ without the hysteresis.



3.1.3. Heating operation

- ◆ Start heating:
Press the start button to power up. When the heating condition is satisfied, turn on the fan, then turn on the compressor after 15s.
- ◆ Manual shutdown:
The compressor will be shut down first, and then the fan next after 30 seconds when press the shutdown button.

3.2. Cooling mode

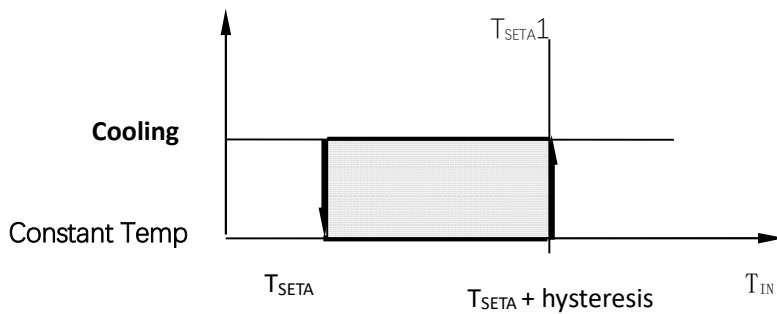
3.2.1. Temperature setting

- ◆ The temperature setting value of cooling backwater TSETH ranges from 8°C to 32°C (parameter G, the initial setting temperature is 12°C;)

3.2.2. Cooling running

Determine the starting and stopping of the unit according to the values of the inlet water temperature T_{IN} and TSETH:

- ◆ The unit starts to refrigerate when the inlet water temperature $T_{IN} \geq T_{SETH} + \text{return value of heat pump restart (parameter H)}$,
- ◆ The unit will stop at constant temperature when the inlet water temperature $T_{IN} \leq T_{SETH}$.
- ◆ When the power is on for the first time, the unit will be directly switched on cooling when the water inlet temperature $T_{IN} > T_{SETH}$ without hysteresis.



3.2.3. Cooling operation

- ◆ Start cooling
Press the start button to power on. When the cooling condition is satisfied, open the 4-way valve, then open the fan after 50s, and open the compressor at 75s.
- ◆ Manual shutdown
The compressor will be shut down first, then close fan after 30 seconds, and close the four-way valve after 2 minutes.

3.3. Defrosting mode

3.3.1. Conditions for entering defrosting

- ◆ The heating compressor of the unit begins to calculate continuous running time when the actual coil temperature $TP \leq 2^{\circ}\text{C}$ is detected. While the continuous running time is 40 minutes (parameter E), then detected $TP \leq -3^{\circ}\text{C}$ (parameter P), starts defrosting program.
- ◆ The defrost time is 10 minutes. When the outdoor coil temperature T_p of the system fails (P3), the ambient temperature is $< 18^{\circ}\text{C}$ and the heating compressor of the unit runs continuously for 40 minutes $<$ parameter E $>$ enters regular defrost. If the ambient temperature $\geq 18^{\circ}\text{C}$, timing reset.
- ◆ It is retimed after compressor shuts down.

3.3.2. Conditions for exiting defrosting

- ◆ If $T_p \geq 20^{\circ}\text{C}$ (parameter U) or defrosting time reaches 8 minutes (parameter F), the system exits defrosting.

3.3.3. Defrosting operation

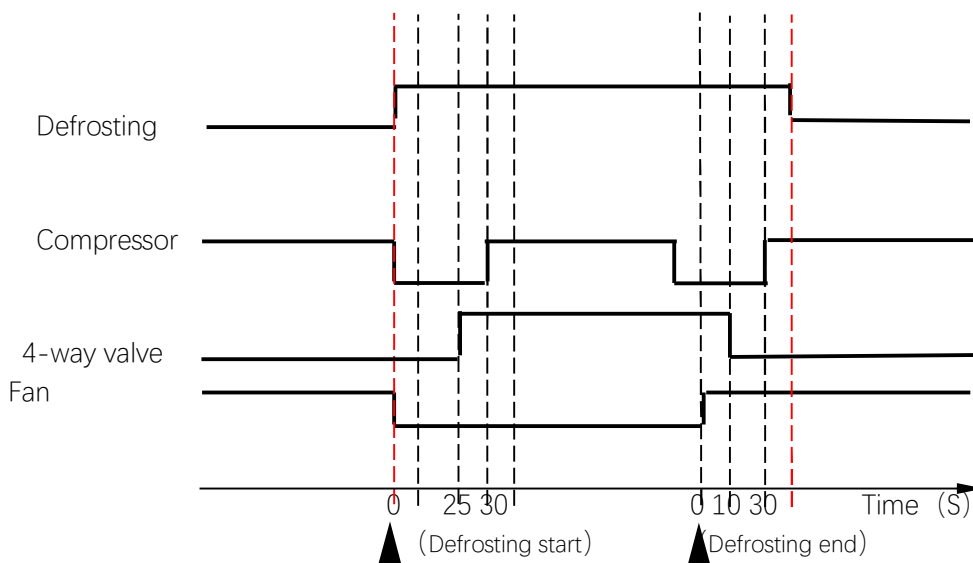
When defrosting conditions are satisfied, perform the following actions

- ◆ The controller sends out defrost indication signal and outputs defrost signal when the compressor and fan stop operation.
- ◆ Energize the 4-way valve after 25s.
- ◆ Energize the compressor after 30s.

3.3.4. Exiting defrosting operation

When the defrosting exit condition is satisfied, perform the following actions:

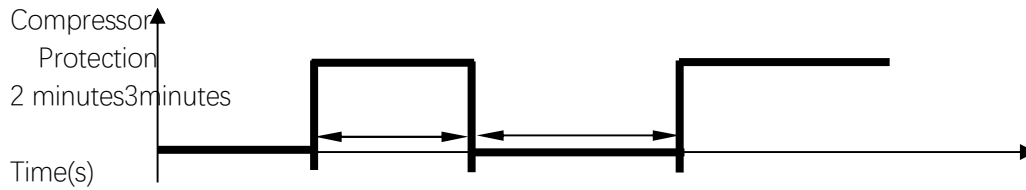
- ◆ After the system meets the defrosting exit condition, the defrosting is removed and the compressor turn off, fan turn on. And the 4-way valve power off after 10s.
- ◆ The compressor starts after the fan runs for 30 seconds. Then the normal heating operation is resumed. The running time of compressor is cleared.



4. Control of outputs

4.1. Compressor

- ◆ When heating, the compressor is on;
- ◆ The compressor must be on for 2 minutes before it can stop.
- ◆ The compressor stops and restarts, with 3 minutes delay protection.



4.2. Fan

- ◆ Under normal operation mode, the fan press starts 15 seconds in advance
- ◆ Turn off the fan 30 seconds after the compressor is closed.

4.3. Four-way-valve

- ◆ Under heating mode, the 4-way valve power off.
- ◆ The 4-way valve power on when defrosting, see the defrosting part for details;
- ◆ The 4-way valve power on under cooling mode.

5. System protection

5.1. Low pressure protection

- ◆ 5 minutes after the compressor starts, if the low-pressure switch of the system is detected to be disconnected for 10 seconds, the low-pressure protection function activated. When the low-pressure switch is detected to be closed, the low-pressure protection is withdrawn. If this failure occurs three times within 30 minutes, it can only be restored after re-energizing; Display the E6.

5.2. Low ambient temperature protection

- ◆ If the ambient temperature is detected to be less than 8°C (parameter O), the machine will stop operation and display P7. When the ambient temperature is more than 10°C (parameter O+2°C), exit the protection and resume normal heating operation;

5.3. Ambient over-temperature protection

- ◆ If the ambient temperature is found to be more than 43°C, the machine will stop operation and display P7. When the ambient temperature is no more than 40°C, exit protection and resume normal heating operation.

5.4. Water temperature fault

- ◆ If the short circuit or break of the inlet temperature sensor is detected, it is judged to be the fault of the inlet temperature sensor and the system is shut down for protection. Display the P1.

5.5. Ambient temperature fault

- ◆ If the ambient temperature sensor is detected to be short circuit or broken circuit, it is judged to be the fault of the ambient temperature sensor and the system runs as usual. Display the P5.

5.6. Coil temperature fault

- ◆ If the coil temperature sensor is short circuit or broken circuit, it is judged as coil sensor fault and the system runs as usual. Display the P3.

6. Others

6.1. Power off protection function

- ◆ System parameters can be set in advanced; the system will always store parameter values. The on-off state and the electric heating state are stored depends on the power off memory function.

- ◆ After abnormal power failure or shutdown, the system in standby state or to maintain the state of operation before power off when the power turns on again.

7. Failure code and parameter setting table

7.1. System failure(LED)

Protection/fault	Codes
Water temperature fault	P1
Coil temperature fault	P3
Ambient temperature fault	P5
Pool cryogenic protection	P7
System low voltage fault	E6
defrost	Green light flashing

7.2. System parameter settingtable (LED)

parameters	Significance	Range	Default	Remarks
A	Inlet water temperature	-19 ~ 99°C		Measured value
b	Coil temperature	-19 ~ 99°C		Measured value
c	Ambient temperature	-19 ~ 99°C		Measured value
d	Heating target temperature	15°C ~ 40°C	27°C	Adjustable
E	Enter the defrost interval	10 ~ 80min	40 min	Adjustable
F	Time of exit defrosting	5 ~ 30min	8 min	Adjustable
G	Cooling target temperature	8°C ~ 28°C	12°C	Adjustable
H	Thereturn value of restart heat pump	1°C ~ 10°C	3°C	Adjustable
J	Power off memory function.	0 ~ 1	1 (Yes)	Adjustable
O	Ambient temperature of anti-freezing	-10°C ~ 15°C	-5°C	Adjustable
P	Coil temp of enter defrosting	-19°C ~ 0°C	-3°C	Adjustable
U	Coil temp of quitting defrosting	1°C ~ 30°C	20°C	Adjustable
t	Inlet water temp of anti-freezing (reserved)	1°C ~ 15°C	4°C	Adjustable

