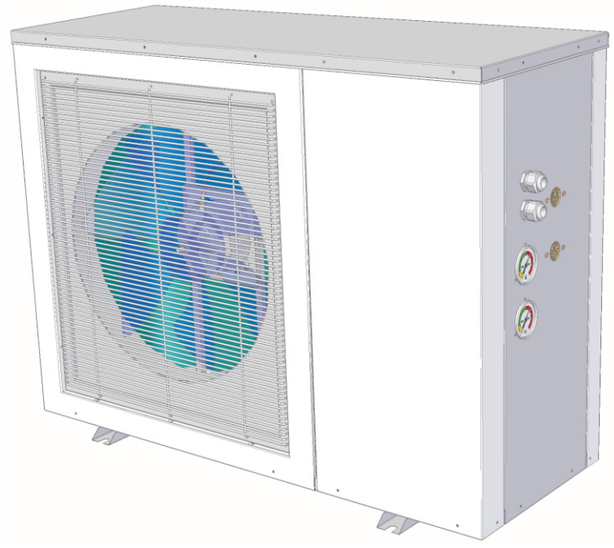
SUNJET

DC Inverter
Air Source Heat Pump

User Manual



Model: ZLAW-11C

Please properly keep this manual.
Please read this manual carefully before using the machine.

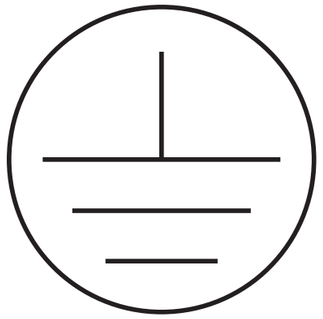
Note

Content

⚠Warning

The safety of you and your families is the most important !

This machine belongs to class I equipment.
Please ensure the reliable grounding before using it.



Note: Please don't use this machine if there is no grounding or the grounding is not reliable

If you are not sure if the grounding is reliable, please let the professional to check.

Please carefully read the safety precautions and notes about the machine before using it.

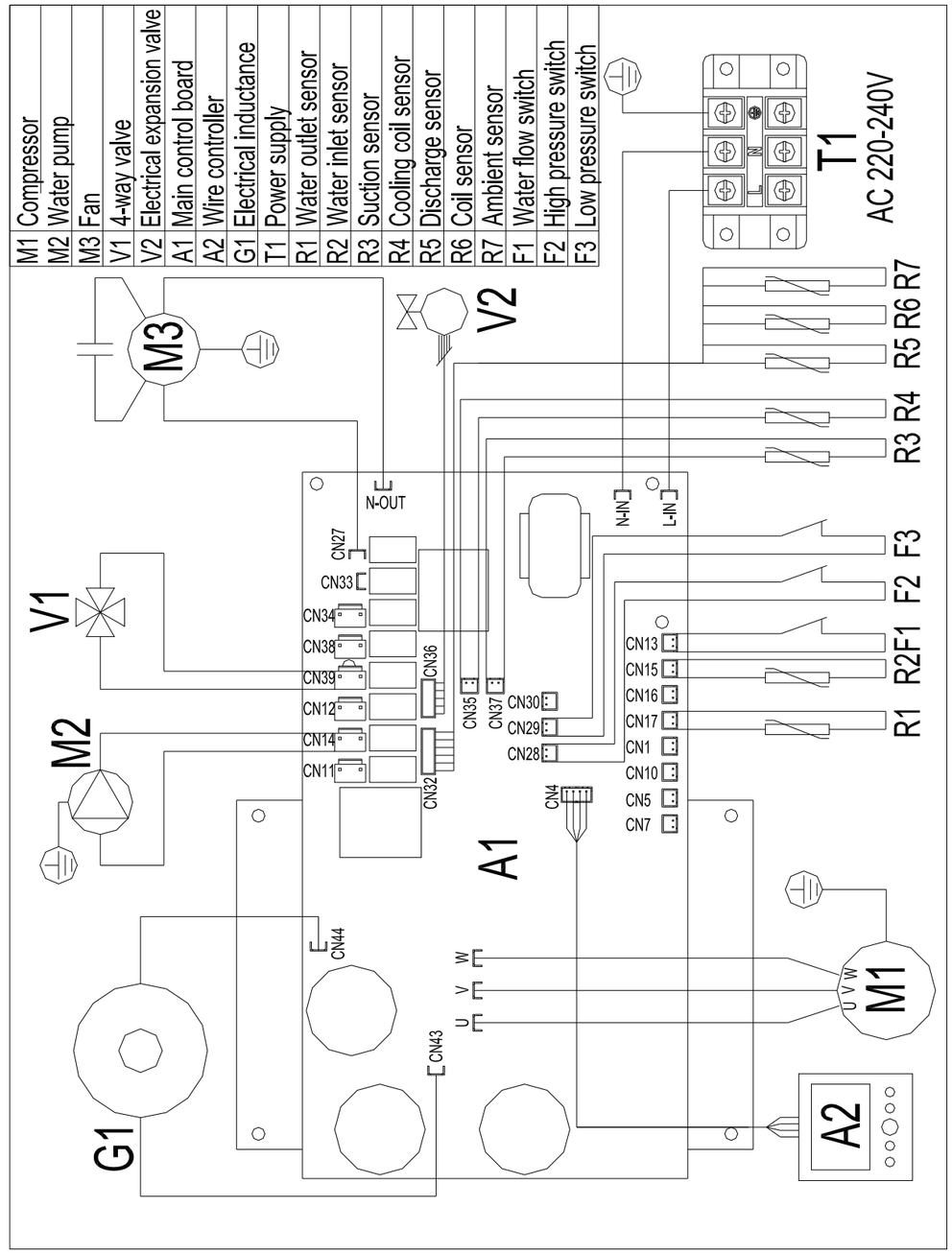
All the important notes and warning have the corresponding marks,the following is the meaning of the marks.

⚠ Attention ! There is potential risk to cause the physical injury.

⚠ Warning ! Please strictly obey the instructions, otherwise there would be life danger and serious injury.

9.Wiring diagram

Model: ZLAW-11C



8.Maintenance and trouble shooting

8-2 Malfunctions and treatment

⚠Warning

If any fault occurs and the unit stops running, please contact your dealer or after-sales technician to solve the problem. Please do not dismantle the unit and do repair by your own in order to avoid any unnecessary injury.

When the unit has abnormal fault, please immediately cut off the power supply, do not force it to run, otherwise there will be more damage.

8-3 Cleaning

⚠Warning

For the sake of safety, the unit much be turned off and the power supply is cut off before the cleaning.

Please take care to not damage the temp sensors during the cleaning.

1) Please be careful of those sharp metal edges and evaporator fins during the clearing to avoid the injury caused by improper operation.

2) Regularly check the air inlet and air out and see if there is any blockage.

8-4 Maintenance

⚠Attention

When the unit is prepared to be put in use again after a period of leaving unused, please check the air inlet and air outlet to see if there is any blockage. If there is blockage, please clean up immediately.

1)Before the use of the unit in each season, Please clean the filter on the water circuit system to make sure the smooth water flow

2)During the unit operation, when the water flow is mall and the water temp difference is too big, please check if the filter of the water circuit is clear.

3)Before the use of the unit in each season, please check if the heat exchanger surface is clean. If there is too much dirt or impurities, please contact your dealer or the after-sales serviceman to do the cleaning in order to make sure the good heat exchanging efficiency and using effect.

4)If there is plenty of snow in winter, please block up the unit before install it to avoid the blockage of the air outlet because of the deep snow.

8-5 After-sales service

When the unit can't work normally, please immediately turn off the unit and cut off the power supply, then contact the local dealer or professional technician to solve the problem.

1. Safety Precautions

⚠Warning

Requirements for the installation environment

The installation location must be ventilated, waterproof, sun-proof, and requires a convenient power supply, water supply and drainage channels.
Customer's electrical environment must be in accordance with local electrical safety regulations.
The power supply specifications conform to the requirements of the local rating. There must be reliable grounding, leakage protector and give the machine power supply directly by the leakage switch wiring way.

The wall or stand must meet the bearing requirements
The installation, maintenance and renovation must be done by the designated dealer and professionals.

If the operator does not have relevant professional knowledge and authorization, but install and repair to result in the damage on furniture and decoration, injury or electric shock, and even serious accidents such as fire, we'll not assume legal responsibility.

The requirement on installation accessories
Please use the accessories in the packing according to the requirement, do not replace them with any other similar.

The purchased parts must be the designated model or specification, if the parts beyond the specified are used and result in the accidents, we'll not take the responsibility.

⚠Attention

The household power supply, circuit to comply with relevant standards

The power circuit should be equipped with leakage protector.

Check whether the socket is qualified, after the unit runs for half an hour, remove the plug, if the pin is hot, that means the plug has more than 50 ℃ and must be replaced by another qualified one.

The location of the power supply should be not less than 1.8 meters from the ground, and be water-proof well and far from children.

The power lines have no damage. If there is any damage, please contact the relevant dealer or professional staff for replacement.

The unit should be installed firmly to run without vibration and the noise will not affect the neighbors.

Drainage piping can smoothly drain and will not lead to leakage or make the furniture wet.

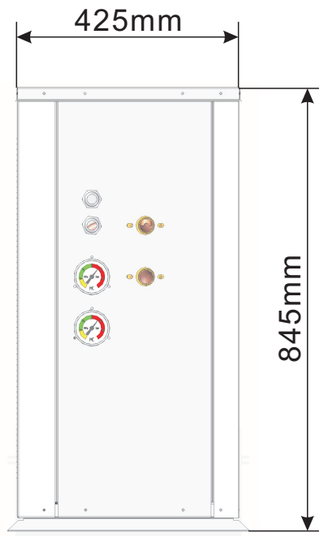
The installation space is well ventilated, once there is refrigerant leakage, the gas will not gather, so there is no combustible gas leak near the installation location.
If there is such risk, please change the installation environment, otherwise, it's easy to cause poisoning, fire accident, etc.

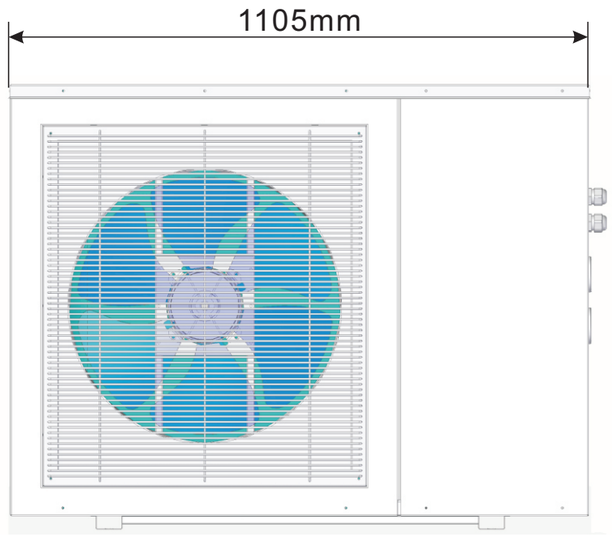
Do not keep the unit in the humid environment or exposed to the rain, otherwise it's easy to damage the unit.

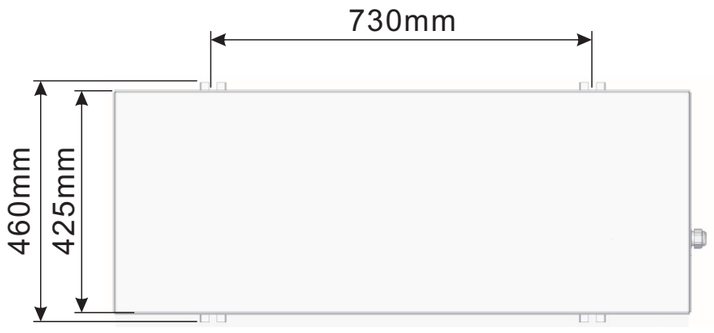
If there is refrigerant leak during the installation, ventilation measures must be taken immediately. Otherwise, if the leaked refrigerant meets fire, such as heater, stove or electric rice cooker, etc., poisonous gas maybe produced.

2.Structure

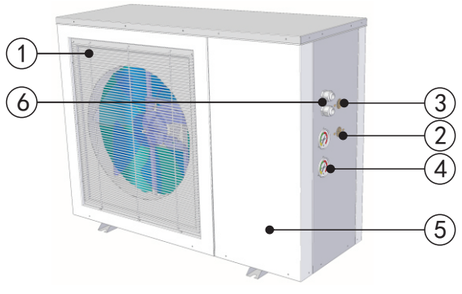
2-1 Outer Structure







1-Wind net
2-Water inlet
3-Water outlet
4-Pressure gauge
5-Maintenance panel
6-Through hole



Model:ZLAW-11C

The photo in this manual is only for explanations purpose. If the appearance, function are not in accordance with the real one, please in kind prevail.

8.Maintenance and trouble shooting

8-1 Fault code table

The unit will stop automatically if any fault happens during the operation, meanwhile, the fault code will display on the controller screen. Please contact the serviceman to check by referring to the flowing table and exclude the fault.

Fault code	Description
E01	Converter board/wired controller EEPROM error
E02	Water tank temp. sensor fault
E03	Supply water temp. sensor fault
E04	Water inlet temp. sensor
E05	Outdoor condenser temp. sensor fault
E06	Ambient temp. sensor fault
E07	Compressor discharge temp. sensor fault
E08	Communication fault between the wired controller and converter board
E09	Communication fault between the converter board and outdoor board
E10	Pressure relief protection in self-inspection
E11	Overlarge current
E12	Module board fault
E13	High/low voltage
E14	Water flow protection
E15	High pressure protection
E19	Suction temp. sensor fault
E20	Indoor coil temp. sensor fault
E21	Over-high water inlet temp. in heating
E22	Subcooled water outlet temp. in cooling
E23	Overlarge temp. difference between the water inlet and outlet
E24	Emergency switch open in self-inspection
E25	Anti-frosting protection
E26	Communication fault between the outdoor board and the drive board
E27	Low pressure protection
E28	Over-high compressor discharge temp.
E29	Over-high outdoor coil temp. in cooling
E30	Subcooled ambient temp.
E31	Outdoor DC fan motor fault (only machine with DC fan motor)

table 8. 1 fault code table

7.Unit operation and performance

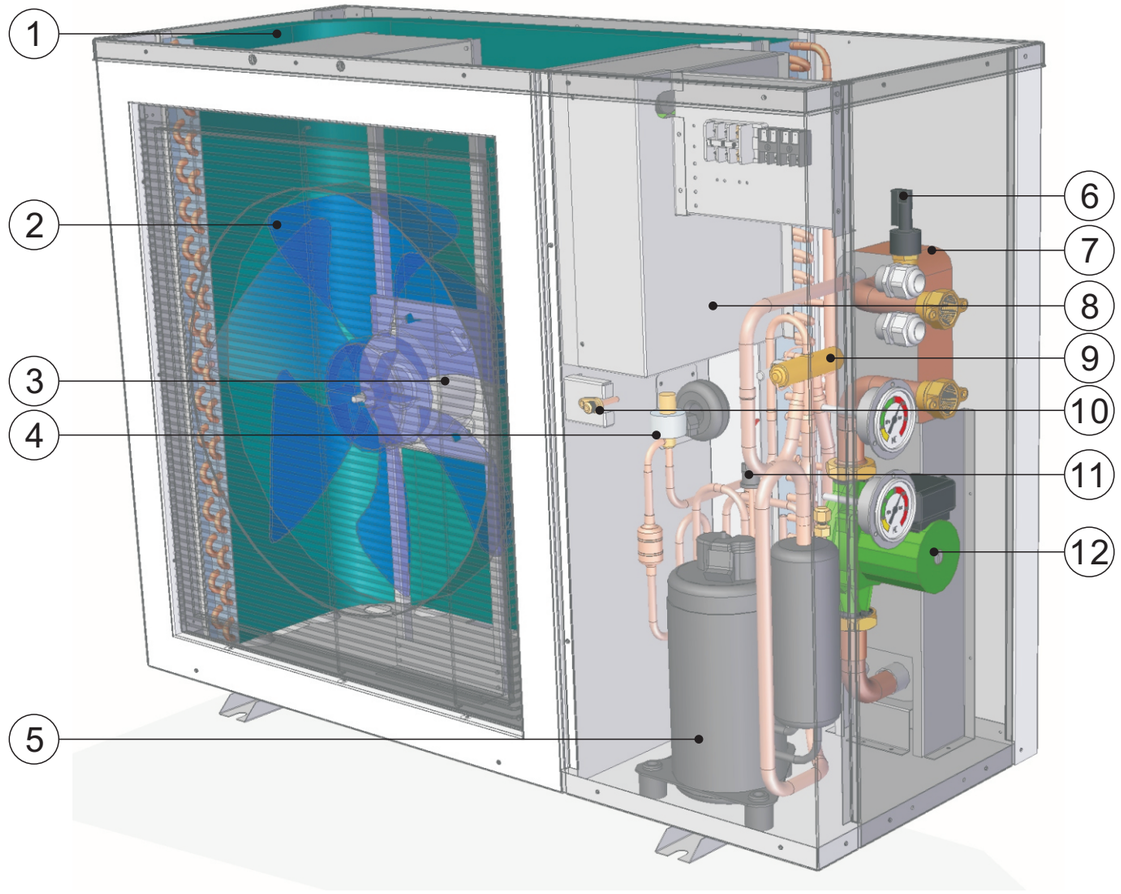
7-3 Performance parameter

Model	ZLAW	11C
Heating Capacity*	KW	9.1
Heating Power Input*	KW	2.11
Heating Capacity**	KW	7.9
Heating Power Input**	KW	2.27
Cooling Capacity#	KW	8.8
Cooling Power Input#	KW	2.19
Cooling Capacity##	KW	11.20
Cooling Power Input##	KW	2.07
Power supply		220V/1PH/50Hz
Max. water temp.	℃	60
Rated water temp.	℃	55
Water flow	m3/h	1.70
Water pressure drop	Kpa	22
Net weight	kg	90
Gross weight	kg	105
Noise	dB(A)	52
Water connection	mm	1 "
Net dimension	mm	1115*460*850
Packing dimension	mm	1200*520*1000

1、Unit working temperature : -20℃~43℃
2、Test condition :
* Ambient temp. : 7℃/6℃ , Water inlet/outlet : 30℃/35℃ ;
** Ambient temp. : 2℃/1℃ , Water inlet/outlet : 30℃/35℃ ;
# Ambient temp. : 35℃ , Water inlet/outlet : 7℃/12℃ ;
##Ambient temp. : 35℃ , Water inlet/outlet : 18℃/23℃ ;

2. Componenents name

2-2 The main components name



1- Evaporator	5- Compressor	9- 4-way valve
2- Axial fan blade	6- Water flow switch	10- Check valve
3- Axial fan motor	7- Condenser	11- High pressure switch
4-Expansion valve	8- Electric box	12- Circulation pump

3.Installation

⚠Attention

The following installation places may cause the malfunction of the machine

The places where there is mineral oil;
The place that contains salt in the air, such as the seaside;
The place that contains corrosive gas, such as hot spring area;
The place where the powers supply voltage fluctuates seriously;
In the car or cabin etc.;
The place where is full of oil gas and oil spray, such as the kitchen;
The place where there is strong electromagnetic waves;
The place where exists flammable gas or material;
The place where there is acidic or alkali gas evaporation;
Other places where belongs to special environmental conditions

3-1 The choice of the installation location

The unit can be installed on the balcony or external wall; meanwhile, please waterproof measures should be done well.

There is sufficient space for installation and maintenance.

There is no barrier in front of the heat pump air outlet and strong wind can't blow there.

The installation place should be well ventilated and avoid the environment where there is flammable, explosive gas and strong corrosive gas.

The installation place should be convenient to install the pipe and electric wiring.

The bearing surface is flat, can withstand the unit weight and doesn't increase the vibration and noise.

If the installation base is metal parts, insulation treatment must be done well, and to comply with relevant standards

The running noise and discharge cold air will not affect yourselves and your neighbors

The high voltage and strong magnetic field should be avoided.

There should be no water logging in the installation place.

The unit should be blocked up to install if sundries or snow may accumulate in the installation place.

7.Unit operation and performance

7-1 explanation for some phenomena during the unit operation

1）Start delay；

During the unit running, if the unit is turned off or stops automatically, if restart the unit, the unit has to wait for 3 minutes to start. This setting is the protection on compressor instead of fault.

2）Defrosting ；

In the heating mode, when the outdoor evaporator surface has white frost (when the air temp is low or the air is humid, this phenomenon will be more obvious), the heat exchanging and performance will be affected, so when the frost gets to a certain degree, the system will run the defrosting automatically.

In the defrosting mode, the outdoor fan motor will stop run. Sometimes there is while vapor from the outdoor evaporator. Those are normal defrosting phenomenon instead of fault.

3）Antifreeze protection；

In the cold winter, when the unit is standby mode, sometimes it will run the water pump automatically or even starts the compressor to run for a short time, in order to prevent the freezing of the water circuit at the low temp. Those are the antifreeze protection operation of the system instead of fault.

In the cold winter, if the unit is no longer used, please keep the unit energized. Please do not cut off the power supply, otherwise, it will be impossible to run the antifreeze protection mode and result in the water circuit freezing and damage on the unit.

If the unit will not be used for a long time, please make sure the water circuit system is completely drained before cutting off the power supply.

4）Fault displaying；

During the normal operation, if the unit suddenly stops, please immediately check the content displayed on the controller in order to make clear if it is the action of some protective device.

The unit system is set with many protection measures, if there is fault code on the controller displayer, please immediately contact your dealer or after service support to solve the problem.

Please refer the fault code table to get the fault meaning.

5）Screen lock function ；

In the running of the unit, if the controller can't be operated, please check if the controller screen is locked. Please refer to the item 7) "screen lock setting" in the part of 5-2.

7-2 Notes about unit running

Please keep the air inlet/outlet surroundings clean, do not block the air inlet/outlet channel in order to not affect the heat exchanging efficiency.

Set a comfortable water temp instead of over-high water temp, otherwise it will cause the electricity waste and overload operation of the compressor, possibly also affect the life span of the unit.

In any case, if the unit has abnormal noise and over vibration, please immediately contact your dealer or after-sales technician.

If any problem happens during the operation, please contact your dealer or after-sales technician to solve the problem. Please do not try to dismantle machine or repair the machine by your own in order to avoid unnecessary injury.

6.Trial operation

6-1 Inspection before the trial operation

Please check if the following items before the trial operation.

1)If the unit is installed correctly;

2)If the piping and wiring are correct;

3)If the drainage is smooth;

4)If the thermal insulation is well done;

5)If the grounding wire is connected properly;

6)If the power supply voltage fits the rated voltage of the unit;

7)If there is any barrier in front of the air inlet/outlet;

8)If the air inside the water circuit system is totally evacuated, if all the valves are opened;

9)The current leak protector can act effectively;

10)The inlet water pressure is no less than 0.15MPa.

6-2 Trial operation

When all the above items are normal, connect the power supply and start the unit.

During the trial operation, check the following items:

1) If the unit working performance is normal, if it can normally produce the demanded heating capacity or cooling capacity.

2) If the water connection is tightly fixed without water leak ;

3) If the fan blade runs normally;if the outlet air is smooth and if there is abnormal vibration from the fan motor;

4) During the unit running, if there is abnormal vibration and noise.

5) If the operation keys of the controller is flexible, reliable and responds normally.

6) If the controller display is normal, if there is missing or wrong segment, if the back light brightness is normal.

7) If there is any abnormal vibration and pipeline collision from the pipe system during the operation.

8) If the power line is hot abnormally during the unit operation;

If all the above is normal, the unit can be sent to the customer to put in use.

3.Installation

3-2 Movement

1)Because the gravity center of the unit is not in the middle, when you move the machine, please beware of the drumping.
2) Please do not hold the air inlet, or it will be deformed.
3) In the movement, please don't touch the fan blade by hand or other things in order to prevent from the damage on the fan blade.
4)Please don't lean it more than 45℃ or lie it down.
5) Please try to use the auxiliary equipment, such as the forklift or crane to prevent the body injury caused by the overweight in the movement of the big models such as RPAW-17CH/S,RPAW-24CH/S, RPAW-34CH/S.

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⚠Warning

Determine the feasible moving path.
Please try to move the unit under the condition of the original
Install the accessories according to the requirements..

3-3 Installation

The installation should be done by the qualified dealer or professional technicians.
If the installation is improper, it may cause the water leak, current leak or accidents such as fire.

The installation bearing surface should be flat and can support the weight of the unit.
Please install the unit firmly by using the MB expansion valve to fix it on the stand and anti-vibration rubber pads should be used to prevent the abnormal vibration and noise.

Please try to remove the barrier around the unit, otherwise the air circulation range will be too small and affect the performance.

If the unit is installed in the basement, indoor or in the other closed space, good air circulation between the unit and outdoor should be ensured. For the model RPAW-8CH/S, the circulated air volume needs to be more than 1800m3/h. For model RPAW-12CH/S, the circulated air volume needs to be more than 2500m3/h. For model RPAW-17CH/S and RPAW-24CH/S, the circulated air volume needs to be more than 4500m3/h. For RPAW-34CH/S, the circulated air volume needs to be more than 6300m3/h.
If the unit is installed at the seaside or in the high place where there is strong wind, to make sure the normal operation of the fan blade, it must be installed against the wall. If necessary please use the baffle.

In the place where there is strong wind, please make sure the air outlet of the unit and the strong wind are the same direction, in order to prevent the strong wind blow to the indoor unit and affects the performance. If the wind direction can't be ensured, please put baffle in front of wind net of the air outlet.

⚠Attention

The installation of the unit should comply with the GB 17790-2008 "household and similar purposes unit installation specification" regulations and requirements of the user manual.

When the unit is moved to another place, the movement and installation should be done by the professionals.

If the user installs the unit on their own, we'll not be responsible for the accidents such as the fire, current leak, etc.

3.Installation

3-4 The space of installation and maintenance

Please leave enough maintenance space as the below before the installation.

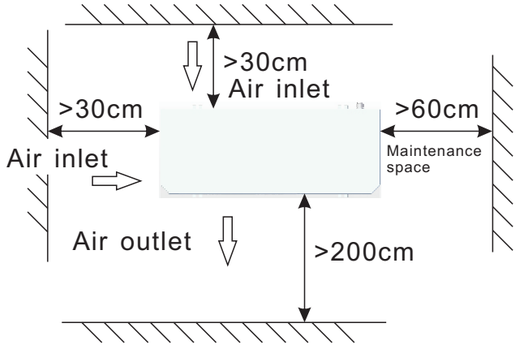
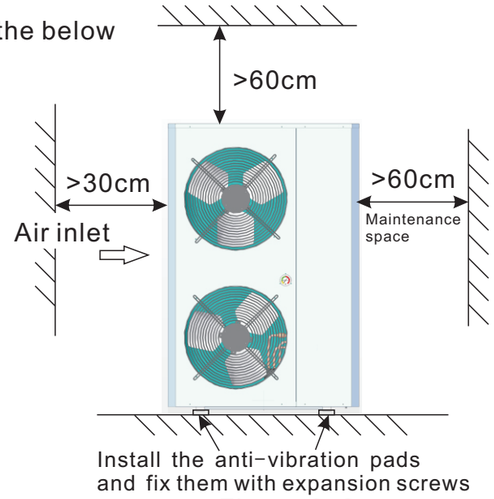
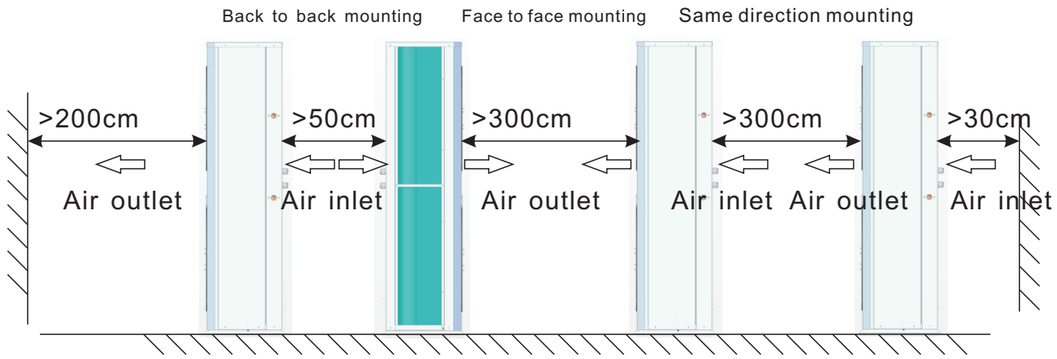


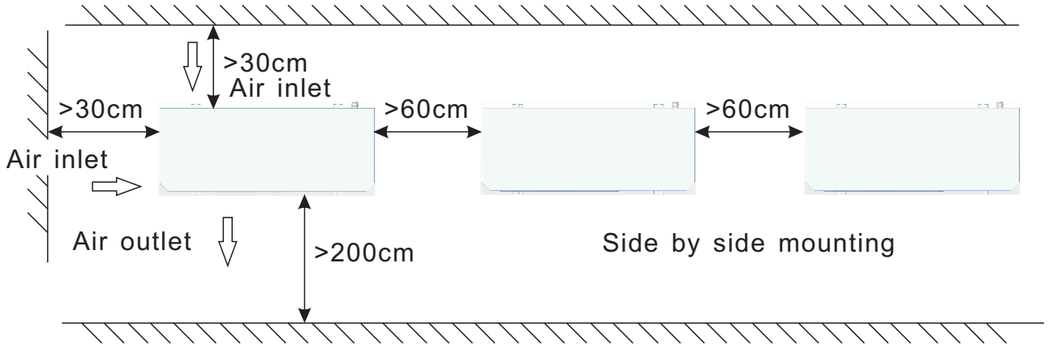
Figure 3. 1



Figture3. 2



Figture3. 3



Figture 3. 4

5.User instruction

5-3-2 Data Query

Press and to enter into the data query interface. Go to the page of parameter “d” by “UP” and “DOWN” keys. Check the values of parameter “d” via “UP” and “DOWN” keys. Press to exit from the data query interface.

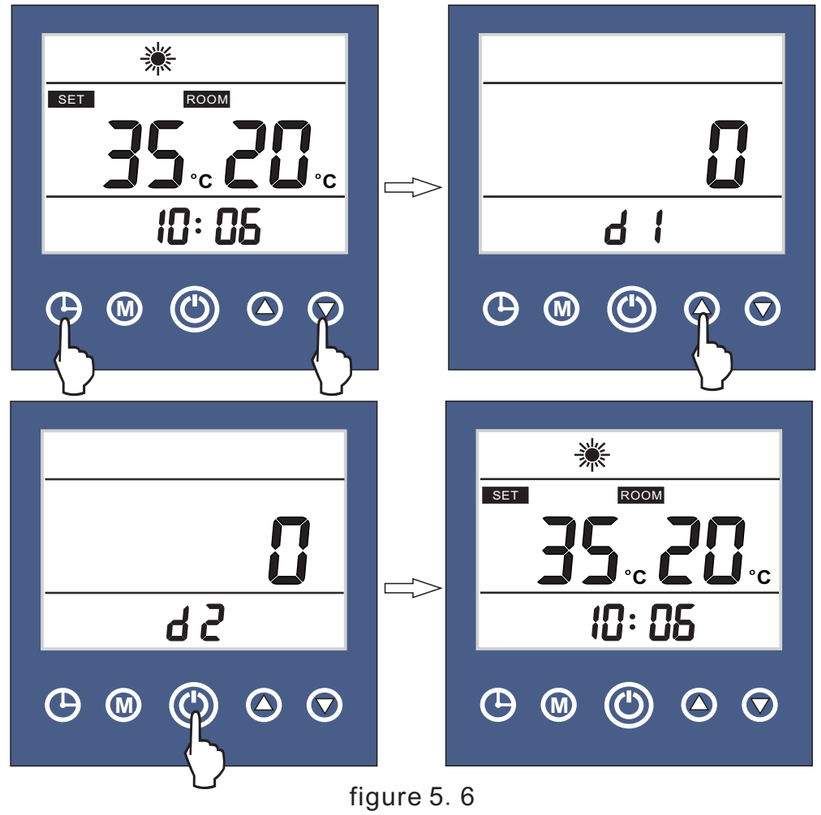


figure 5. 6

Data Code	Data Name	Data Code	Data Name
D1	Running frequency	D10	Suction temperature
D2	Current value	D11	Indoor coil temperature
D3	Inlet water temperature	D12	Opening of the electronic expansion valve
D4	Water tank temperature	D13	Protection code
D5	Supply water temperature	D14	Shutdown code
D6	Solar collector temperature	D15	Shutdown time （min）
D7	Outdoor discharge temperature	D16	Outdoor fan speed
D8	Ambient temperature	D17	Target frequency
D9	Outdoor coil temperature		

table5.2 Data table

5.User instruction

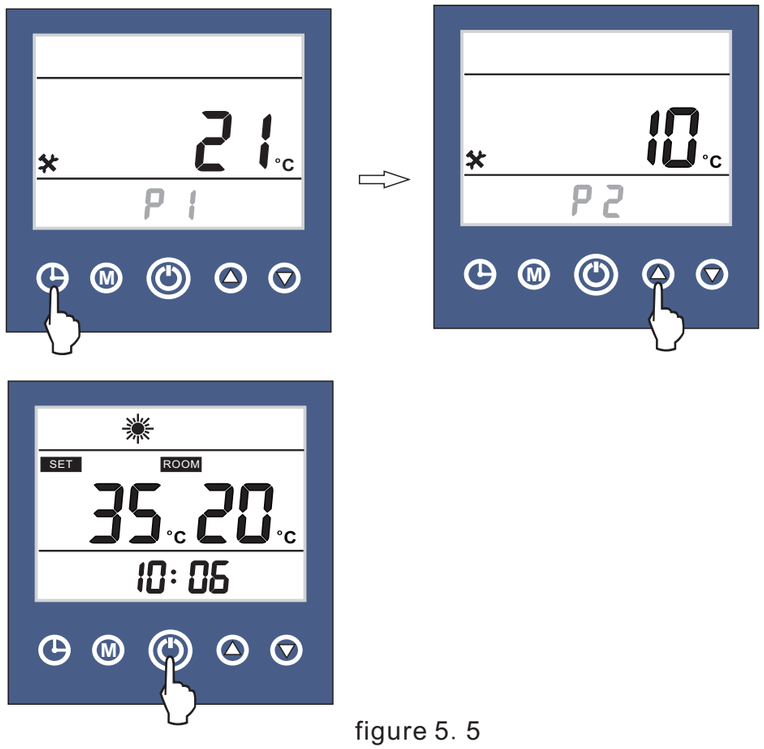


figure 5. 5

Code	Parameter meaning	Ajustment range	Default
P1	Room floor heating set temp.	15-45℃	35℃
P2	Set temp. in cooling mode	5-35℃	10℃
P3	Temp. difference to restart the room heating	2-15℃	3℃
P4	Thermostatic temp. difference to restart the heap pump	0-6	2
P5	On/off of the eletrical heater in room heating	0/1 (0:auto, 1: force off)	0
P6	The duration of no heating to start the electrical heater	2-90min	30min
P7	Max. water outlet temp. in room heating	25-60℃	45℃
P8	Subcooled ambient temp. setting	-1~-25℃	-20℃
P9	Defrosting mode	0/1 (0:auto, 1:manually)	0
P10	Temp. to start the defrosting	-15~-2℃	-4℃
P11	Temp. to exit from the defrosting	8-20℃	15℃
P12	Defrosting cycle	25-70min	40min
P13	Defrosting duration	2-20min	12min
P14	Inlet water temp. compensation	-5~5℃	0℃

table5.1 Parameter table

3.Installation

3-5 Installation of the water pipes

1)To reduce the resistance of the water pipe as much as possible , reducing the elbow position and variable diameter can be adopted.

2) In the process of the piping connection, please make sure the whole system to be clean, no rust and no other dirt, in order to prevent the piping blockage.

3) Leak test should be done after the piping connection is finished. The test should focus on the screw thread connection to ensure the whole system without leakage, then thermal insulation should be done.

4) After all the piping are connected and tested leakage, 20mm thick thermal insulation must be packed on the piping in order to reduce the heat loss and prevent the water pipe freezing in winter.

5) Expansion tank needs to be installed in the highest point of the water circuit. The water level of the expansion tank should be at least 0.5 M higher than the highest point
6) Check the water flow of the water circuit system to ensure the normal water flow rate. If there is water flow fault, check the installation of the water circuit system. In order to make sure the protection on the unit when the system has no water, do not bridge the water flow switch casually.

7) Auto vent valve should be installed in the highest point of the water circuit, to prevent the air trapping which will affect the operating effect.

8)Thermometer and pressure gauge should be installed for the water inlet and water outlet, in order to monitor and inspect the system running.

3-6 Water injection and evacuation

1) Vent valve needs to be installed in the highest point of the water circuit system and drain valve needs to be installed in the lowest point of the water circuit system.

2) When the installation is finished, please keep the power supply off.

3) When the inlet valve is opened, the water injection begins. At this time, please keep the vent valve open, the air in the system will evacuated via the vent valve outlet, and there is sound “tehee” from the vent valve.

4) Double check all the connections and elbows of the water circulation system, make sure there is no leak.
5) If there is no leak, then start the water pump to run the water circuit and double check if there is leak from the connections and elbows.

6) When the sound “tehee” disappears from the vent valve, the water injection is finished and water pump can be stopped, then prepare to energize the unit and start it.

3.Installation

3-7 Antifreezing measures

1) When the ambient is lower than minus 5℃, please make sure the unit is energized.

2)The unit is set with anti-freeze protection program, in the state of power on, when the ambient temp gets to the protection value, the unit will run the water pump automatically and even start the heating to prevent the freeze of the water circuit, in order to make sure the normal operation of the system.

3)If the unit can't be energized for a long time, please make sure the water in the buffer tank and water circuit system is totally drained to prevent from the freezing of the water system and the damage on the unit.

4) If the power failure or power off happen, and the water is not timely drained from the water circuit system, then cause the damage on the unit and crack of the water system, our company will not take the responsibility of the maintenance.

⚠Warning

In the situation of the power failure or power off, if the water circuit is not timely drained, it will cause the crack of the water pipe system, even damage the heat exchanger and compressor, and then the whole system will scrap, so please strictly obey the anti-freeze requirements.

⚠Attentions

Choose one of the water supply valves to install.
The temp of the water supply to the buffer tank needs to be less than 50℃.
The water quality needs to meet the requirements in the following table, otherwise, the heat exchanger and the floor heating pipes will scaling after a period of using. It will affect the heat exchange efficiency

Ph value	total hardness	conductivity	sulfide	chloridion	ammonia ion
6.5-8.0	200μV/cm(25℃)	<50ppm	No	<50ppm	No
sulfate ions	silicon	iron content	sodion	calcium ion	——
<50ppm	<30ppm	<0.3ppm	no requirement	<50ppm	——

5.User instruction

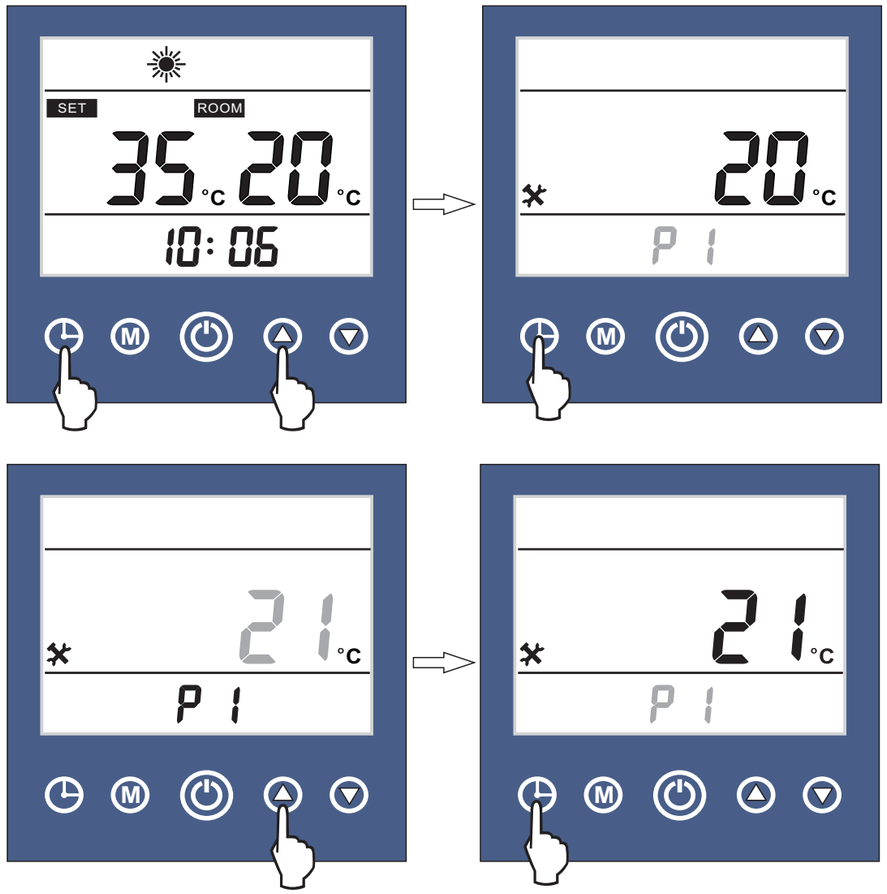
5-3 Function

5-3-1 Parameter setting

Press ◷ and ▲ for the same time to enter into the parameter setting page;

Go to the setting page of Parameter P by "UP" and "DOWN" keys. The P is flashing, and then press ◷ to enter into the setting of P, adjust the value by "UP" and "DOWN" keys.

Press "UP" and "DOWN" keys for the same time, when there is alarm sound, each of the parameters resets and displays the default value; The running mode defaults to water tank heating. If there is no operation after 2s, all the settings are saved. Press ⏻ to exit from the setting mode.



5.User instruction

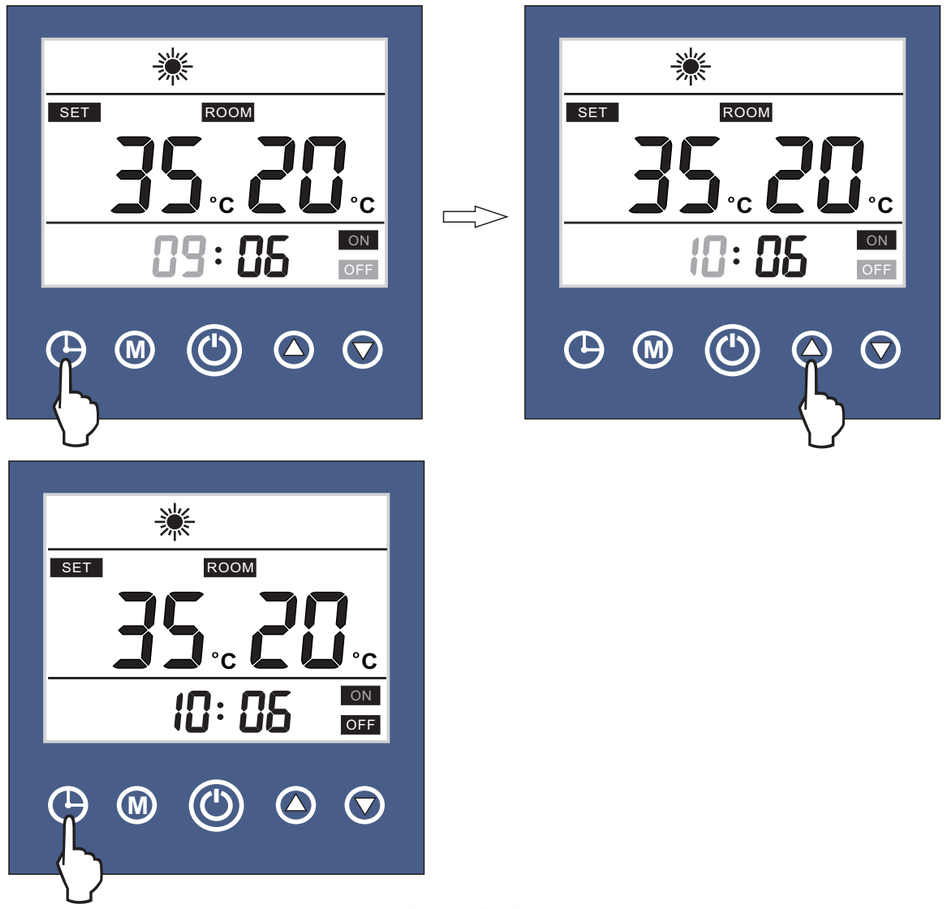


figure 5. 4

3) Cancel the timing

After setting the timing, press ON/OFF in the unlock status, then the timing is cancelled.

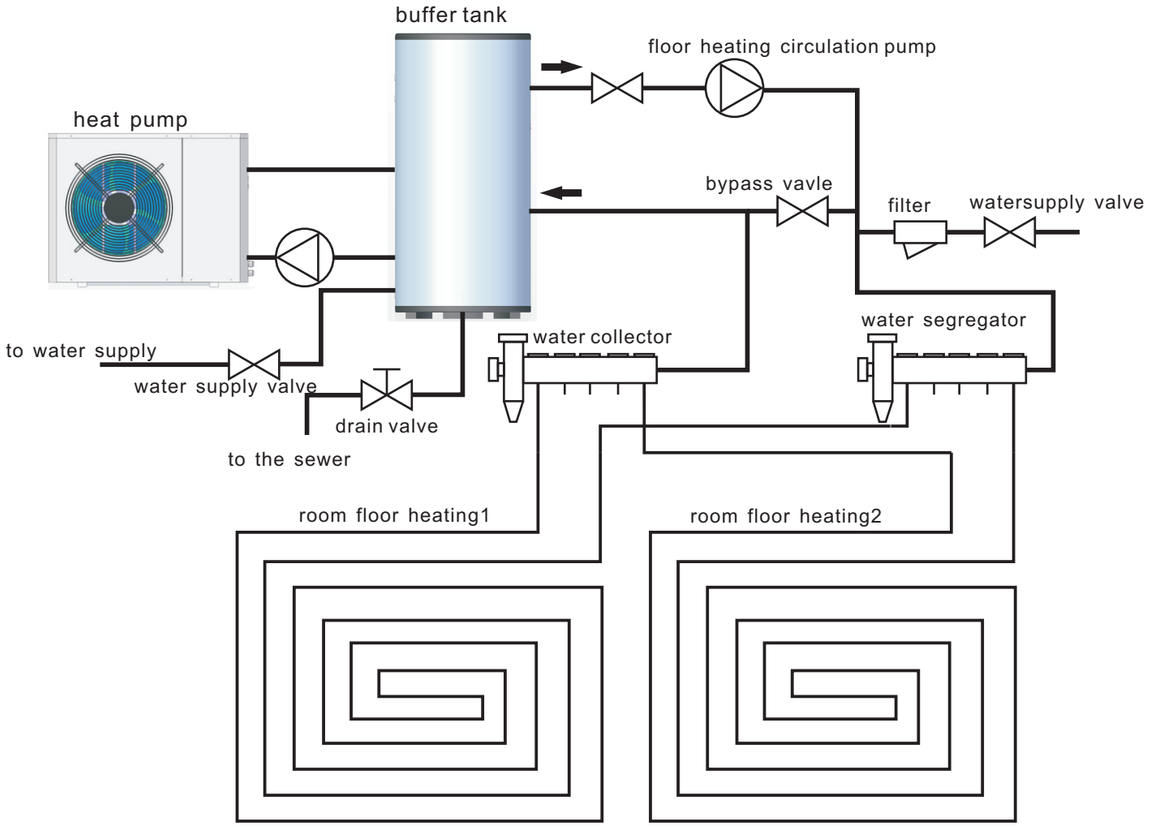
5-2-4 Up key & Down key

Adjust the temperature setting;
Check the parameters;
Adjust the parameters setting.

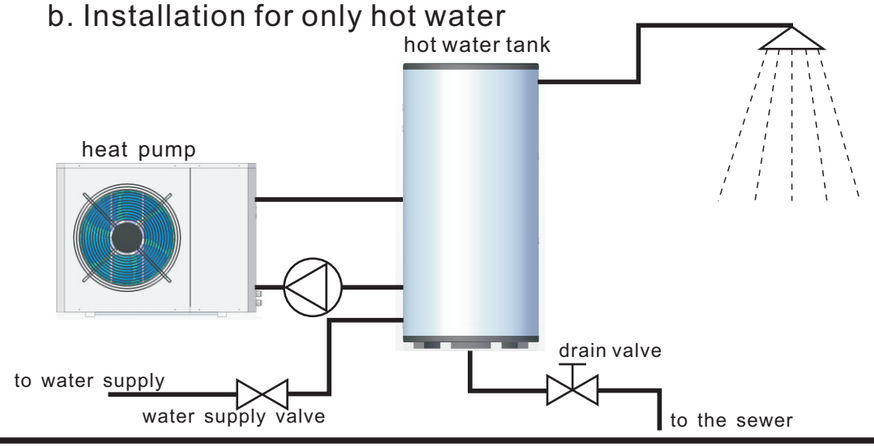
3.Installation

3-8 Installation diagram

a. Installation for only heating



b. Installation for only hot water



3.Installation

c. Installation for hot water & heating

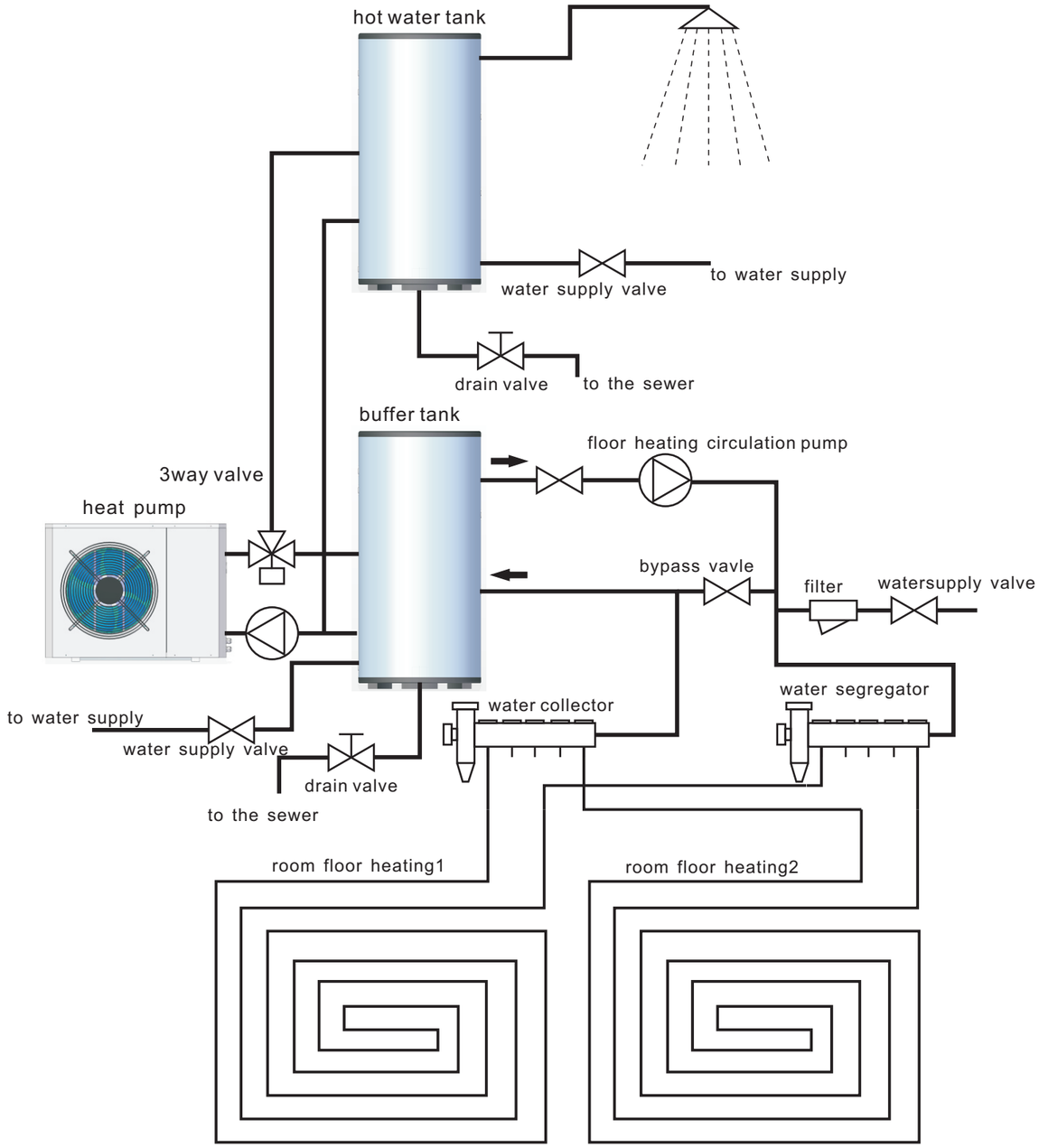
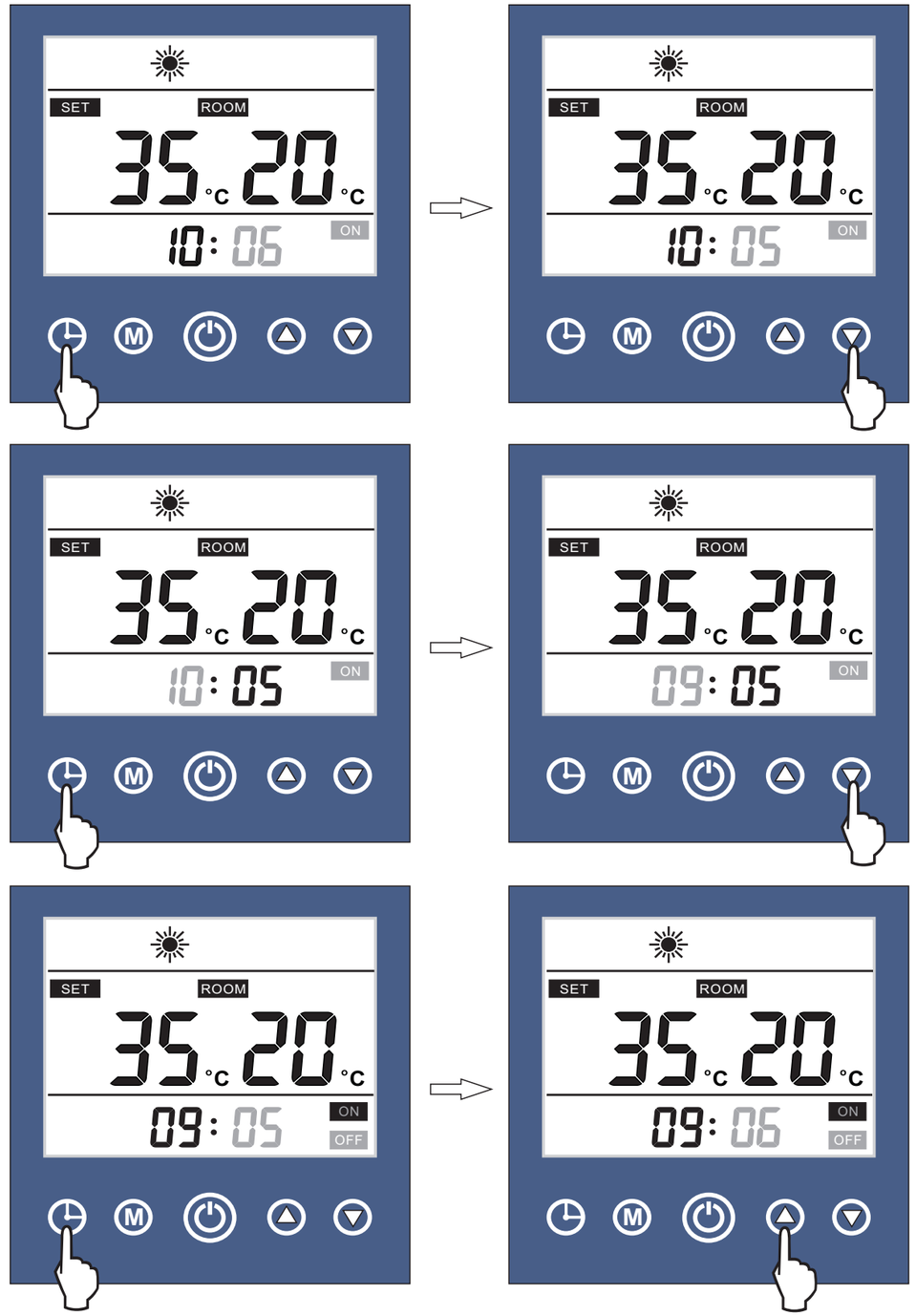


Figure 3. 5 recommended installation way

5.User instruction



5.User instruction

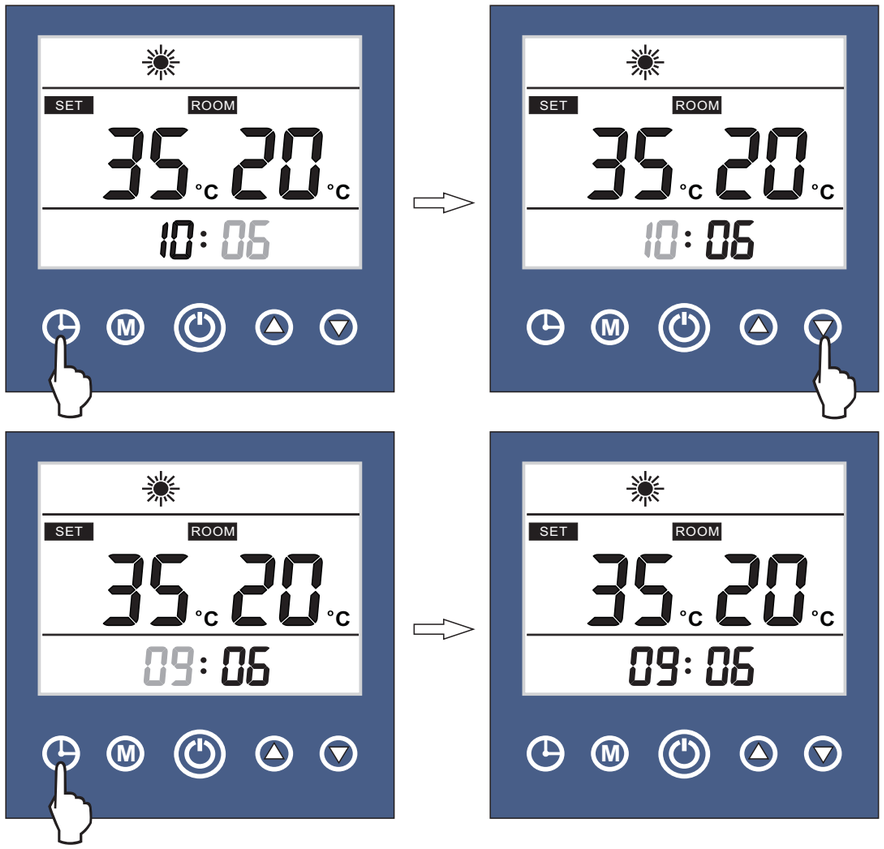


figure 5. 3

2) Timer setting

Press the clock key, the set timing on time displays and icon “ON” is flashing; press again the clock icon, the hour display area will flash. Adjust the timing on time by “UP” and “DOWN” keys. Press Clock key to confirm the timing on time and Icon “OFF” is always on. Or if there is no operation with 10s, the timing on time is automatically confirmed and the system exits from the timing on setting.

After the timing on time is set, press the Clock key, the set timing off time displays and icon “OFF” is flashing; press again the clock icon, the hour display area will flash. Adjust the timing off time by “UP” and “DOWN” keys. Press Clock key to confirm the timing off time and Icon “OFF” is always on. Or if there is no operation with 10s, the timing off time is automatically confirmed and the system exits from the timing off setting.

4.Electric connection

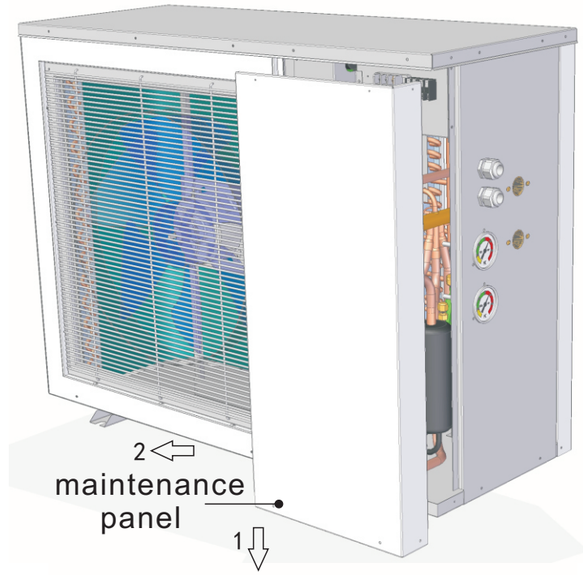
4-1 Electric wiring

⚠Attention

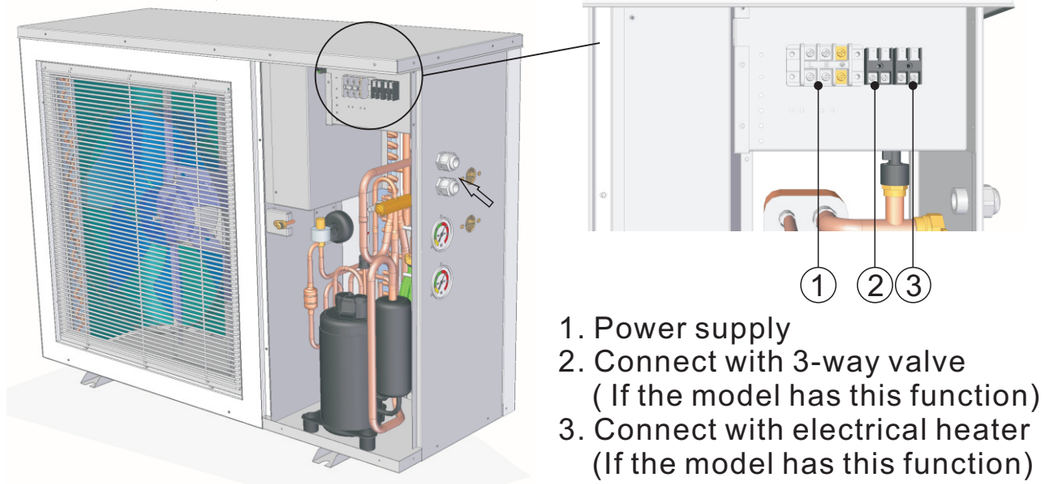
1) The unit should use the dedicated power supply; the power supply voltage should consist with the local rules of the rated voltage.
2) The external power supply circuit must have grounding and the unit power supply grounding wire should be connected to the external grounding wire reliably.

4-2 Electric wiring steps

3) The electrical wiring construction must be carried out by the professional technician based on the circuit diagram.
4) The leakage protection device must be set up in accordance with the local relevant technical standard of the electrical equipment.
5) The power supply line and the signal line should be arranged reasonably and neatly. They can’t interfere with each other and contact with the connection pipe and valve body.
6) When all the wiring construction is finished, the power should be connected after all is checked to be no problem.



Remove the screws of the maintenance panel, push it down off the top panel, then take it out.



1. Power supply
2. Connect with 3-way valve
   (If the model has this function)
3. Connect with electrical heater
   (If the model has this function)

Through the power line from the hole, and connect the line with the terminal.

figure 4. 2 wiring step

5.User instruction

The unit can be pre-programmed by the wire controller and will then be run automatically.

5−1 Controller description

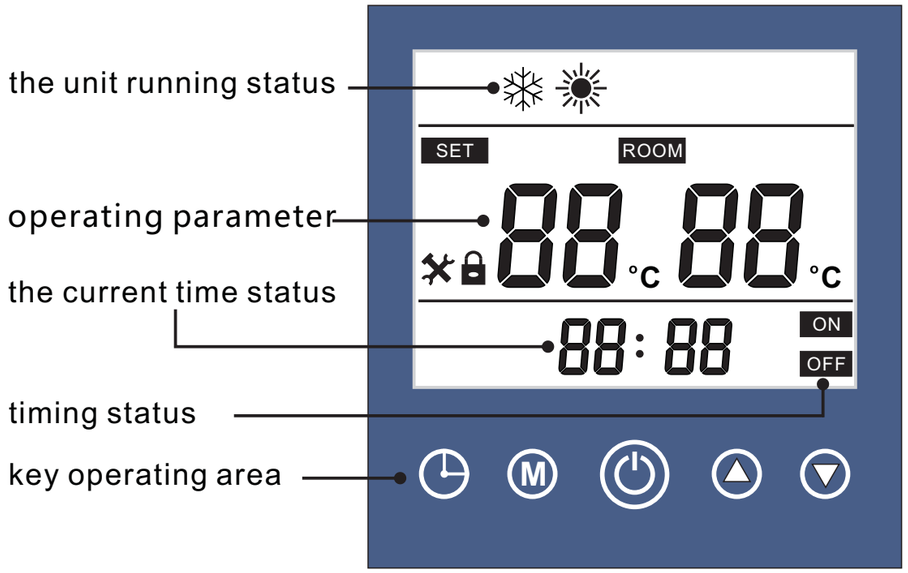


figure 5. 1

5−2 Key function

Remarks: The control panel will be locked automatically if there is no key operation within 30s and icon is displayed on the screen.

Press on/off key for 3s to unlock it.

5-2-1 On/off key

Press On/off key to switch on the machine and press the key again to switch off the machine.

5.User instruction

5-2-2 Mode key M

1) Press this key to switch modes: room heating, room cooling. The corresponding icon will be lit.

2) In the off status of the main interface, press this key for 3s to enter into the refrigerant recycling mode and the icon is flashing. Press again this key for 3s or press key on/off to exit from the refrigerant recycling mode and the icon will not display.

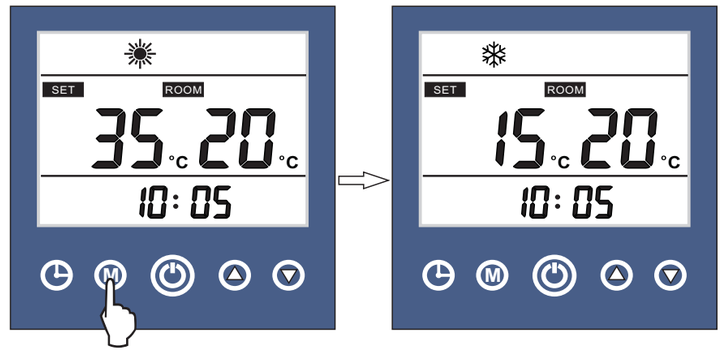


figure 5. 2

5-2-3 Clock key

1) Clock setting

Press the clock icon and the minutes display area is flashing, press again the clock icon, the hour display area will flash. Adjust the clock time by “UP” and “DOWN”keys. Press clock key to confirm the clock time. Or if there is no operation with 10s, the clock time is automatically confirmed and the system exits from the clock setting mode.