

Air Source Water Chiller and Heat Pump

Floor heating and air con unit (with super heater)

Installation and Instruction Manual n Manual

For: HOME-10A
HOME-20A
HOME-26A



CONTENT

1 Preface	1
2 Safety Precautions	2
1 Message explanations	2
2 Icon explanations	2
3 Warnings	3
4 ATTENTION	4
3 Specifications	5
1 Appearance and structure of the unit	5
2 Unit features	6
3 Unit dimensions	7
4 Installation	8
1 Hooking on the heat pump	8
2 Choosing the right heat pump	9
3 Location	11
4 Installation method	12
5 Water loop connection	12
6 Power supply connection	12
7 Position of the unit	12
8 Moving the unit	13
9 Trial run	13
5 Operating instructions	13
1 Control panel instructions	13
2 Meaning of control panel symbols	14
3 Using the control panel	15
6 Maintenance	19
1 General maintenance	19
2 Common malfunctions and troubleshooting	20
7 Appendices	21
Appendix 1	21
Appendix 2	22
Appendix 3	22
Appendix 4	22
Appendix 5	22

1 Preface

■ ~~Appendix 6 provide our customers with a high quality, very reliable and versatile product, this heat pump has been produced according to strict designing and manufacturing standards.~~

This manual includes all the necessary information about installation, troubleshooting, draining and maintenance. Please read this manual carefully before opening or servicing the unit.

The manufacturer of this product will not be held responsible for injury or damage to the unit resulting from improper installation or troubleshooting or unnecessary maintenance that are not in line with this manual.

The unit must be installed by qualified personnel.

■ It is vital that the instructions mentioned below are followed at all times to preserve the validity of the warranty.

- The unit can only be opened or repaired by qualified installers or authorised dealers.
- Maintenance and operation must be carried out according to the recommendations featured in this manual.
- Use genuine standard spare parts only.

Failure to comply with these recommendations will invalidate the warranty.

■ The air source water chiller and heat pump is a high efficiency, energy saving and environmentally friendly piece of equipment, which is mainly used for domestic heating purposes. It can work with any kind of indoor unit, such as a fan coil, a radiator or floor heating pipes, by providing hot or cold water. One monoblock heat pump can also work with several indoor units. The air source water heat pump is designed to recover heat by using a super heater that is able to provide hot sanitary water.

This series of heat pump units has the following features:

1 Advanced controlling

The microcomputer-based PC (programmable control panel) allows users to review or set the running parameters of the heat pump. The centralized controlling system can control several units via the PC.

2 Nice look

The heat pump has been given a beautiful design. The monoblock model is equipped with an incorporated water pump, which allows for easy installation.

3 Flexible installation

The unit's structure has been well thought through and its body is compact. Only simple outdoor installation is required.

4 Silent operation

The compressor, fan and water pump are high quality, efficient and insulated, which accounts for low noise levels when the unit is running.

5 Good heat exchange rate

The heat pump units are equipped with especially designed heat exchangers that enhance their overall efficiency.

6 Wide operating range

This series of heat pumps has been designed to provide heating under different operating conditions, ranging to temperatures as low as -15 °C.

2 Safety Precautions

To protect users and third parties from harm caused by this unit, to avoid damage to the unit or other property and to use the heat pump properly, please read this manual carefully and ascertain that you have understood the information included in it.

1 Message explanations	
Message	Explanation
	Wrong operation may lead to death or serious injuries.
	Wrong operation may lead to physical or material damage.
2 Icon explanations	

Icon	Explanation
	Prohibited action. What is prohibited will be mentioned nearby this icon.
	Compulsory implementation. The suggested action must be performed.
	ATTENTION (or WARNING) Pay attention to what is indicated.

Shut off power

In case of malfunction or when a strange smell is produced, the power supply needs to be shut off to stop the unit. Keeping the unit running may cause short-circuits or fire.

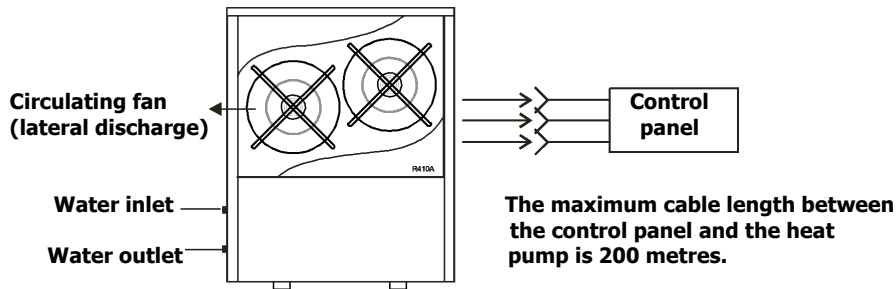
Moving and repairs	Explanation
	When the heat pump needs to be moved or reinstalled, please entrust these operations to the dealer or a qualified person. Improper installation may lead to water leakage, electrical shock, injuries or fire.
	The user is not authorized to repair the unit on his own device; doing this can cause electrical shock or fire.
	When the heat pump needs to be repaired, please entrust these operations to the dealer or a qualified person only in order to avoid improper installation, which may lead to water leakage, electrical shock, injuries or fire.

Please ascertain that the unit and power connection are adequately earthed. Improper thing may cause electrical shock.

Safety Precautions	
	Explanation
	DO NOT put fingers or objects into the fans and the evaporator of the unit. This can cause bodily harm or material damage.
	Explanation

3 Specifications

1 Appearance and structure of the unit



Specifications

2 Unit features

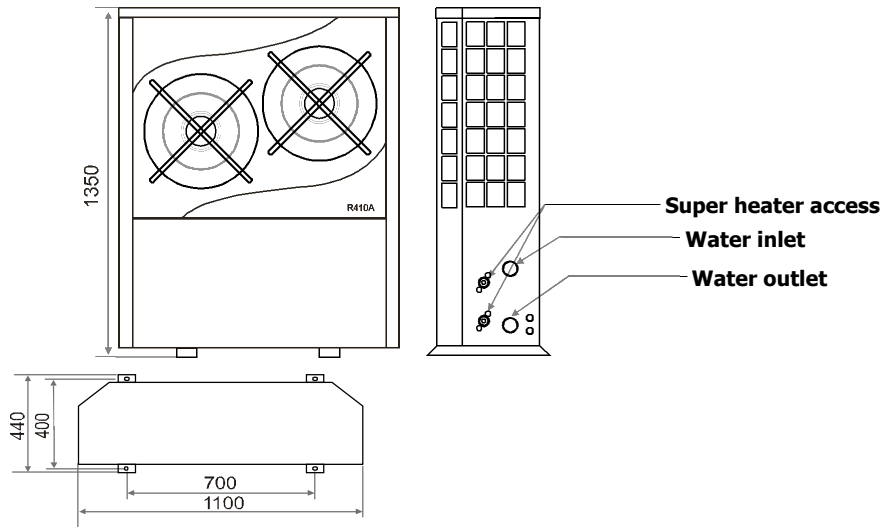
Unit model		HOME-10A	HOME-20A	HOME-26A
Cooling capacity	kW	10	16	22.0
	BTU/h	35000	55000	75000
Heating capacity	kW	12	17.5	24.0
	BTU/h	42000	60000	81800
Cooling power input	kW	3.0	5.2	7.1
Heating power input	kW	3.2	5.5	7.6
Operating current (Cooling/Heating)	A	13.6/14.5	11.3/12.0	12.6/13.2
Power supply	V/Ph/Hz	230/1/50	380/3/50	380/3/50
Number of compressors		2	2	2
Compressor type		Rotary	Rotary	Rotary
Number of fans		2	2	2
Fan power input	W	240	240	400
Fan rotation speed	RPM	850	850	830
Noise	dB(A)	56	56	59
Hot water volume	l/h	47	57	57
Water pump input	kW	0.2	0.2	0.75
Water head	m	10	10	24
Water connection	inches	1	1	1.5
Water flow-rate	m ³ /h	1.7	2.8	3.8
Water pressure drop	kPa	32	38	36
Net unit dimensions (L/W/H)	mm	See drawing of the units		
Unit shipping dimensions (L/W/H)	mm	See package label		
Net weight	kg	See unit label		
Shipping weight	kg	See package label		

Cooling: Ambient temperature: 35 °C/24 °C, Inlet/outlet water temperature: 12 °C/7 °C
 Heating: Ambient temperature: 7 °C/6 °C, Inlet/outlet water temperature: 40 °C/45 °C

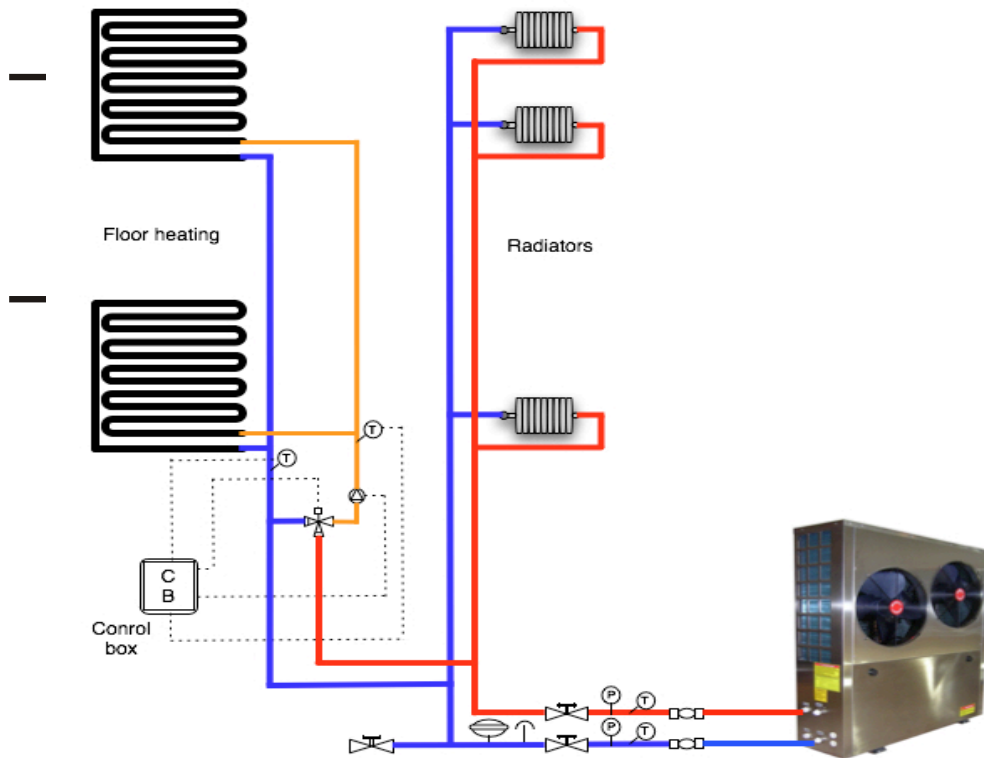
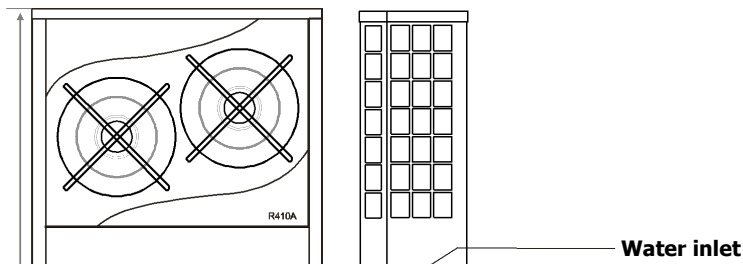
Specifications

3 Unit dimensions

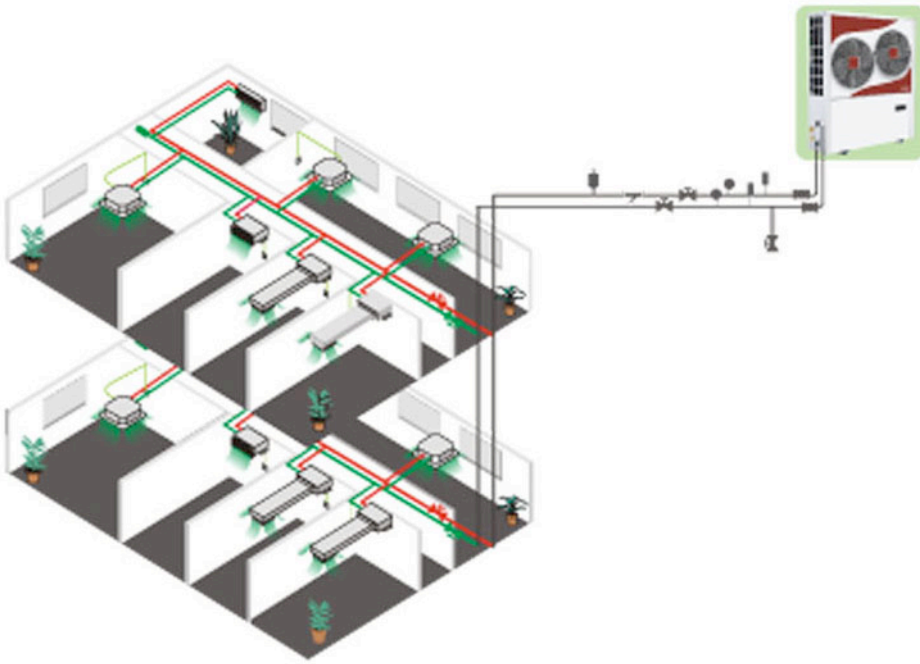
Models: HOME-10A
HOME-20A











Model: HOME-26A



- ⊖ Thermometer
- ⊕ Pressure gauge
- ⊙ Pump
- ⊗ Automated 3-way valve
- Flexible connection
- ⊘ Valve



-  WATER HOOK-UP
-  AUTOMATIC AIR VENT
-  WATER CHECK-VALVE
-  FLEXIBLE WATER HOOK-UP
-  WASTE WATER DRAIN
-  WATER THERMOMETER
-  WATER PRESSURE METER
-  WATER FILTER

4 Installation method

The heat pump can be installed onto a concrete pedestal by means of expansion screws or onto a steel frame by means of rubber feet that can be placed on the ground or on the rooftop. See to it that the unit is placed horizontally.

Installation

5 Choosing the right heat pump

- When connecting the pipes, you should pay attention to the following things:
 - 2.1 Depending on the local climate conditions, construction features and insulation level, calculate the required cooling (heating) capacity per square metre.
 - 2.2 Extrapolate the total capacity that will be needed by the construction.
 - 2.3 Depending on the total capacity needed, choose the right model by consulting the heat pump features below:

Installation

- Heat pump features
 - Unit for cooling only: cold water outlet temp.: 5-15 °C, maximum ambient temp.: 43 °C.
 - Unit for heating and cooling: cold water outlet temp.: 5-15 °C, maximum ambient temp.: 43 °C. For heating, cold water inlet temp.: 40-50 °C, maximum ambient temp.: 10-15 °C.
- Select the inlet pipe: pressure is limited to 10 bar. It must be connected together with the heat pump.
- An expansion tank must be present at the highest point of the water loop and the water level in the tank must be at least 0.5 metres higher than the highest point of the water loop.
- The air source water chiller and heat pump can be used in a home, an office, etc. that needs separate heating and cooling. The flow switch is installed inside the heat pump, check to ensure that the wiring and the switch action are normal and are both of which controllable.
- Try to evacuate any residual air from the water pipe; there must be an air vent on the highest point of the water loop.

3 Location

- At the installation and pressure meter must be present at the water inlet and outlet, which will allow for easy inspection when the pump is running.
 - The unit can be installed in any outdoor location able to carry heavy loads, such as a terrace, a roof top, the ground, etc.

6. Power supply connection

- On the front panel, there are terminals for power supply and gas. The location must be well ventilated.
- The power supply must go through the wire access and must be connected to the power supply terminals in the control box. A cover is needed during winter to protect the heat pump from the snow.
- Subsequently, you connect the 3-wire plugs of the control panel and the main controller.
- If the air inlet and outlet of the heat pump must not be hindered by obstacles, the outside water pump is needed, and insert the power supply wire through the wire access and connect the water pump terminals. The location must be sheltered from the wind.
- If an additional auxiliary heater that is controlled by the heat pump control panel is needed, the relay (or power source) of the auxiliary heater must be connected to the relevant output of the control panel.
- There must be enough space around the unit for maintenance.

7 Position of the unit

Installation

8 Moving the unit

If the unit needs to be lifted during installation, an 8 metre cable is needed. Make sure to apply soft material between the cable and the unit to prevent damage to the heat pump casing (see Fig. 1).

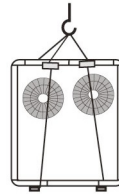
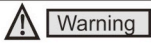


Fig. 1



Warning


DO NOT touch the heat exchanger of the heat pump with fingers or objects.

9 Trial run

Inspection before trial run

- Check the indoor unit and make sure that the pipe connection has been affixed correctly and that the relevant valves are open.
- Check the water loop in order to ascertain that there is enough water inside the expansion tank, that water is supplied correctly and that the water loop is full of water without air pockets. Also make sure that the water pipe has been insulated well.
- Check the electrical wiring. See to it that the power voltage is normal, that the screws are fastened, that the wiring has been installed in line with the diagram and that the system is earthed.
- Check the heat pump unit, including all of its screws and parts in order to see whether they are in good order. With the power on, check the screen of the control panel for any failure indication. The gas gauge can be connected to the check-valve to observe high (or low) pressure of the system during the trial run.

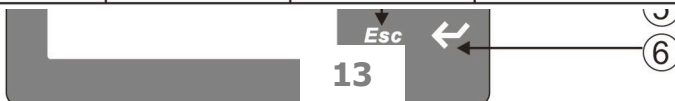
Trial run

- Start the heat pump by pressing the  key on the control panel. Check whether the water pump is running; if it runs normally, the water pressure meter will indicate 0.2 MPa.
- After the water pump has been running for 1 minute, the compressor will start. Listen for any strange noises coming from the compressor. If an abnormal noise is produced, stop the unit and check the compressor. If the compressor runs well, check the pressure meter of the refrigerant.
- Subsequently, check whether the power input and running current are in line with what is mentioned in the manual. If not, stop the unit and check.
- Adjust the valves on the water loop to make sure that the hot/cold water supply to each feed-channel is adequate and meets the heating/cooling requirements.
- Examine if the water outlet temperature is stable.

- ⑥ **Enter Key**
 The Enter key of the control panel are factory-set; the user is not allowed to change them on his own device.
 Press the up/down keys to access the parameter menu; press the enter key to access the parameter list and modify the data.

10 Opening of control panel symbols

Symbol	Meaning	Symbol	Meaning
	Compressor		Cooling
	Pump		Heating
	Fan		

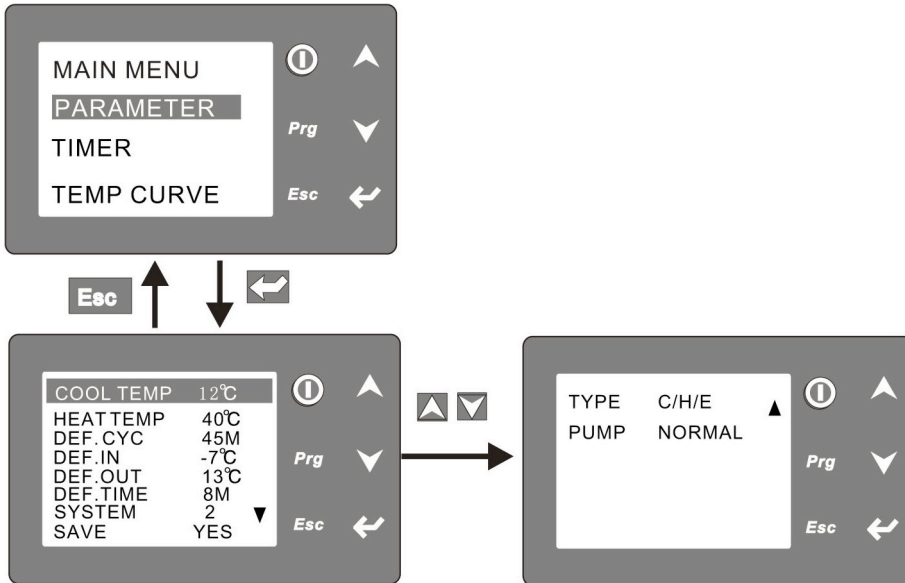


- ① **Switch Key**
Press this key to switch on or **12**
- ② **④ Up/Down Keys**
Press these keys to read the parameters when in standby mode or switched off.
Press these keys to modify the parameters in setup mode.
- ③ **Menu Key**
Press this key to access the menu screen when in standby mode or when the power is on.
- ⑤ **Exit**
Press this key to confirm the parameters in setup mode.
In other modes, press this key to return to the previous screen.

Operating instructions

d) Parameters

With the unit in standby mode, press the **Prg** key to access the menu screen. Then, press the **▲ ▼** keys to select **PARAMETER**, subsequently press the **←** key to select a parameter. You can use the **▲ ▼** keys to modify the parameter (modifying the timer parameters is done in exactly the same way). Press the **←** key again to confirm your settings and use the **Esc** key to return to the previous screen.

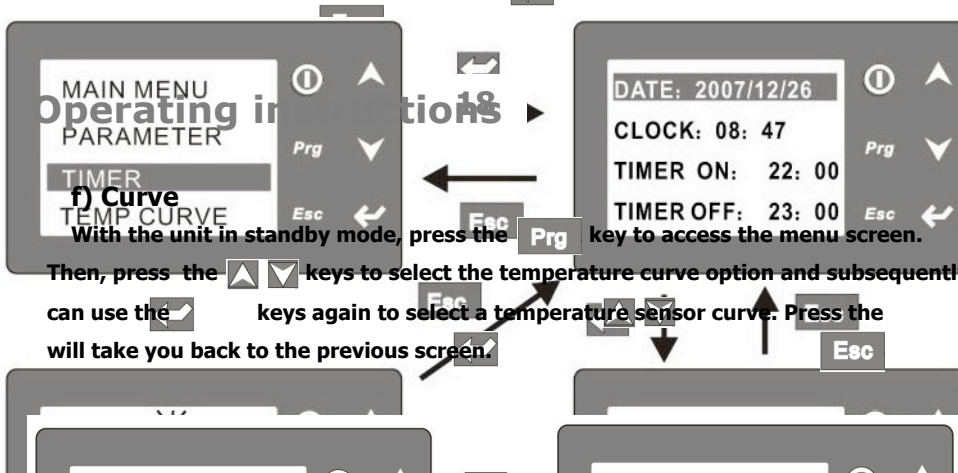


Operating instructio 17

keys to change data
key to confirm modified data

e) Timer

Proceed the same way to modify settings for the clock. With the unit in standby mode, press the **Prg** key to access the menu screen. Then, press the **▲ ▼** keys to select the timer setup mode and subsequently press the **←** key to begin setting timer parameters. Next, you can use the **▲ ▼** keys to select a timer parameter. You modify timer parameters exactly in the same way as you do for the other parameters. Press the **←** key again to confirm your modification and use the **Esc** key to return to the previous screen.



f) Curve

With the unit in standby mode, press the **Prg** key to access the menu screen. Then, press the **▲ ▼** keys to select the temperature curve option and subsequently press the **←** key to confirm. Next, you can use the **▲ ▼** keys again to select a temperature sensor curve. Press the **←** key to check it. Pressing the **Esc** key will take you back to the previous screen.

6 Maintenance

1 General maintenance

- Check the water supply and air vent frequently in order to prevent water shortage or the apparition of air pockets in the water loop. Clean the water filter regularly to preserve water quality. Water shortage and using dirty water may cause damage to the unit. The heat pump will activate the water pump every 72 hours when it is not running in order to prevent the water from freezing.
- Keep the unit in a dry and clean place that is well ventilated. Clean the heat exchanger every 1 or 2 months in order to keep up an adequate heat exchange rate and to save energy.
- Check each part of the unit as well as the pressure of the system. Replace malfunctioning parts (if applicable) and add/replace refrigerant if necessary.
- Check the power supply and the electrical system; make sure the components and the wiring are fine. Should any part malfunction or produce an abnormal smell, make sure to replace it in time.
- If the heat pump will not be used for a long time, drain all the water from the unit and wrap the unit for safekeeping. Drain the water from the lowest point of the heat exchanger to prevent it from freezing in winter. Before restarting the heat pump, it will have to be refilled with water and fully inspected.
- Drain out the water in the super heater of the heat pump unit in winter if the super heater is not used.
- The water loop of the heat pump **MUST** be protected from freezing in winter. Follow the instructions below. Failure to observe these instructions will invalidate the heat pump's warranty.

(1) Do not shut off the power supply to the heat pump in winter, because if the air temperature is lower than 0 °C and the inlet water temperature is higher than 2 °C and lower than 4 °C, the water pump will be activated to prevent the water from freezing. If the inlet water is colder than 2 °C, the heat pump will start to run in order to heat it.

(2) Use antifreeze (glycol water)

- 1) refer to the table below for the glycol concentration
- 2) the glycol-water mixture can be added into the system via the expansion tank of the water loop.

Glycol percentage (%)	10	20	30	40	50
Ambient temp. (°C)	-3	-8	-14	-22	-33
Cooling/heating capacity fluctuation	0.991	0.982	0.972	0.961	0.946
Power input fluctuation	0.996	0.992	0.986	0.976	0.966
Water flow fluctuation	1.013	1.040	1.074	1.121	1.178
Water pressure drop fluctuation	1.070	1.129	1.181	1.263	1.308

Note: if the glycol concentration is too high, the water flow and the water pump will be influenced and the heat exchange rate will decrease. This table is for reference; please use an antifreeze mixture that is adapted to the real climate conditions.

Maintenance

20

2 Common malfunctions and troubleshooting

- 1) Depending on the failure code indicated by the control panel, it is possible to identify and solve the problem.

Malfunction	Indicator	Reason	Solution
Water inlet temp. sensor failure	1 flash	The sensor is open or short-circuited	Check or replace sensor
Water outlet temp. sensor failure	2 flashes	The sensor is open or short-circuited	Check or replace sensor
Coil 1 sensor failure	3 flashes	The sensor is open or short-circuited	Check or replace sensor
Coil 2 sensor failure	4 flashes	The sensor is open or short-circuited	Check or replace sensor
Ambient sensor failure	5 flashes	The sensor is open or short-circuited	Check or replace sensor
Temp. difference between inflowing and outflowing water is too great		Insufficient water flow volume, water pressure difference too small	Check water flow volume and check if water loop is blocked
Anti-freezing action in cooling mode		Insufficient water flow volume	Check water flow volume and check if water loop is blocked
First-time frost protection in winter		The ambient temp. is too low	
Second-time frost protection in winter		The ambient temp. is too low	
Flow switch failure	8 flashes	No or little water in the water loop.	Check water flow volume and check if the water pump is malfunctioning
Wrong connection or missing connection (for 3 PH power)	9 flashes	The unit stops and the alarm goes off	Check connections
Pressure protection (for 1 PH power)	6 flashes	The unit stops and the alarm goes off	Check pressure switch and switch system

Compressor does not run	<ol style="list-style-type: none"> 1. Power supply failure 2. Compressor contactor is broken 	<ol style="list-style-type: none"> 1. Check power supply 2. Replace compressor contactor 3. Tighten power cable
	<ol style="list-style-type: none"> 3. Power cable is loose 4. Compressor protection system active 5. Wrong setting of return water temp. 6. Insufficient water flow 	<ol style="list-style-type: none"> 4. Check compressor exhaust temp. 5. Reset the return water temp. 6. Clean water filter and discharge air present in water loop
Compressor produces a lot of noise	<ol style="list-style-type: none"> 1. Liquid refrigerant enters compressor 2. Compressor failure 	<ol style="list-style-type: none"> 1. Bad evaporation; check the cause of this problem and solve it 2. Use a new compressor
Fan does not run	<ol style="list-style-type: none"> 1. Fan relay failure 2. Fan motor is broken 	<ol style="list-style-type: none"> 1. Replace fan relay 2. Replace fan motor
Compressor runs but heat pump has no heating or cooling capacity	<ol style="list-style-type: none"> 1. No gas in the heat pump 2. Heat exchanger is broken 3. Compressor failure 	<ol style="list-style-type: none"> 1. Check the system for leaks and add refrigerant 2. Find the cause and replace the heat exchanger 3. Replace the compressor
Low temp. of outlet water	<ol style="list-style-type: none"> 1. Low water flow rate 2. Low setting for desired water temp. 	<ol style="list-style-type: none"> 1. Clean water filter and discharge air in water loop 2. Set desired water temperature
Low water flow protection	<ol style="list-style-type: none"> 1. Not enough water in the system 2. Flow switch failure 	<ol style="list-style-type: none"> 1. Clean water filter and discharge air in water loop 2. Replace flow switch

7 Appendices

22

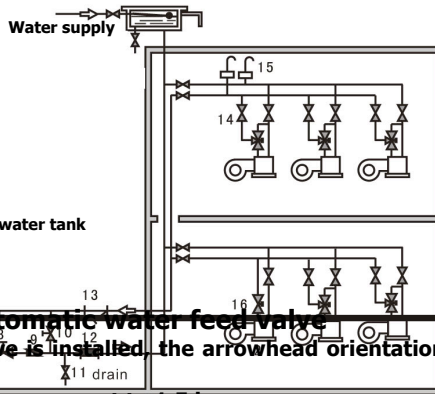
Appendix 1: Installation diagrams

• Standard installation

(For open and expandable water tank)

Figure legend:

- | | |
|------------------------------|-----------------------------------|
| 1 main unit | 9 flow meter |
| 2 fan coil | 10 bypass valve |
| 3 flexible rubber connection | 11 drain valve |
| 4 thermometer | 12 water processor |
| 5 pressure meter | 13 Y-filter |
| 6 water pump | 14 three-way valve |
| 7 check valve | 15 automatic ventilation |
| 8 ball valve | 16 two-way valve |
| | 17 open and expandable water tank |



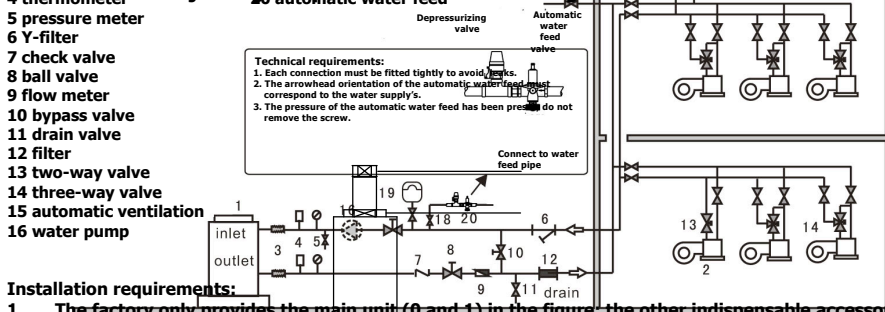
Appendix 2:

Installation diagram for the automatic water feed valve

1. When the automatic water feed valve is installed, the arrowhead orientation of the water inlet must correspond to the orientation of the valve.
2. The automatic water feed valve has been preset to 1.5 bar.
3. If you wish to adjust the pressure of the incoming water, proceed as follows:
 a. The factory only provides the main unit (0 and 1) in the figure, the other indispensable accessories are provided by the users or the installation company.
 b. To reduce the pressure of the incoming water, loosen the screw (B).
 c. To increase the pressure of the incoming water, tighten the screw (B).
 d. The automatic ventilation system (15) is installed at the highest point of the water loop.
4. To feed water into the system for the first time, turn the handle (A) of the water feed system. When the system is full of water, turn the handle (A) back into its original position (closed).
5. The automatic water feed valve needs to be cleaned periodically. To do so, close the tap, unscrew the plug (D) and remove the filter mesh that is located inside the device. Reassemble the valve after cleaning it.

Figure legend:

- NOTE: There are two connectors for a water pressure meter in the central section of the automatic water feed valve. On these locations, you can readily connect a water pressure meter that will display water pressure. The screw cap (C) must be tightened after adjusting the pressure of the incoming water.



Installation requirements:

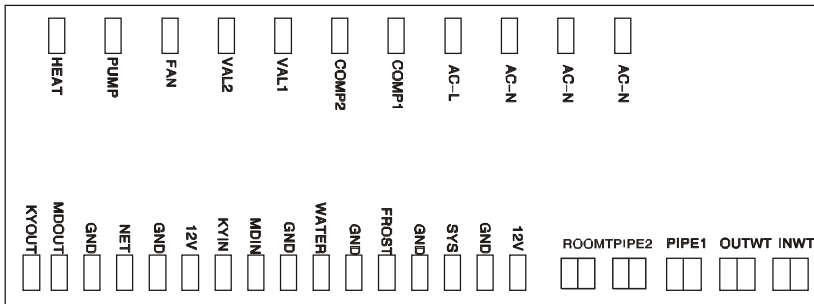
1. The factory only provides the main unit (0 and 1) in the figure, the other indispensable accessories are provided by the users or the installation company.
2. The reference code contains the letter B has an internal water pump; therefore, one does not need to install an external water pump (16).
3. The automatic ventilation system (15) is installed at the highest point of the water loop.
4. Proportions of 2-way (13) and 3-way (14) valves are provided in the technical notes; a 3-way valve is installed on the remotest part of the water loop.

Appendix 3:

1. The pressure released by the depressurizing valve reaches values over 3 bar (when the valve is open), but the pressure cannot be regulated.
2. The valve will open automatically in order to keep the water loop of the air con system safe when the water pressure on the backwater side is higher than the set pressure.

Appendices

DEF. IN	-7°C	TYPE	C/H/E
DEF OUT	13°C	PUMP	NORMAL



Appendices 25

Appendix 6:
Connection codes for the chiller (main PCB)

CHILLER 300

Connection details:

Appendices

Nr.	Symbol	Meaning	Nr.	Symbol	Meaning
1	HEAT	Auxiliary electrical heating (220 VAC)	12	NET GND	Control panel
2	PUMP	Water pump (220 VAC)	13	12V	
3	FAN	Fan motor (220 VAC)	14	KYIN	On/Off switch (input)
4	VAL2	Solenoid valve (220 VAC)	18	MDIN	Model (input)
5	VAL1	4-way valve of system 1 (220 VAC)	17	WATER	Flow switch (input) (normally closed)
6	COMP2	Compressor of system 2 (220 VAC)	18	FROST	Defrosting signal
7	COMP1	Compressor of system 1 (220 VAC)	17	GND	
8	AC-L	Fire wire	17	SYSGND	System protection (normally closed)
9	AC-N	Neutral wire	18	12V	
10	KYOUT	On/Off switch	19	ROOMT	Ambient temp. (input)
11	MDOUT	Model	19	PIPE2	Temp. of fan coil 2 (input)
12	KYIN	On/Off switch	20	PIPE1	Temp. of fan coil 1 (input)
13	GND		20	...	
14	NET		21	OUTWT	Temp. of outflowing water (output)
15	GND		22	INTWT	Temp. of inflowing water (output)

1. This method allows to connect several air con terminals in parallel.
2. The air con terminals must be installed on the same water loop. The live wire power (220 VAC) of the water valves of the air con terminals must be derived to a low voltage signal via relays; subsequently, the low voltage signals must be connected in parallel to the KYIN and GND terminal on the control panel.
3. When any water valve of an air con terminal is open, the control system can start or stop the unit. When all the water valves of the air con terminals are closed, the control system can switch the unit either on or off.
4. When the heat pump is switched on, any signal that a water valve is open can start the unit. When the heat pump is switched off, none of the signals that a water valve is open can start the unit.
5. Running mode and parameter settings can be reached via the control panel.

B. Connection to control panel only

Explanation:

If the KYIN and GND terminals on the PCB can be connected, the control panel can help control the status, the running mode and the parameter settings of the unit.



