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ACCESSORIES

Unit	Installation & Operation Manual	Temperature testing components of total water outlet	Transformer	Installation manual of wired controller
Qty.	1	1	1	1
Shape				
Purpose	_____	Use for installation (only need for setting the main module)		

1. INTRODUCTION

1.1 Main characteristics

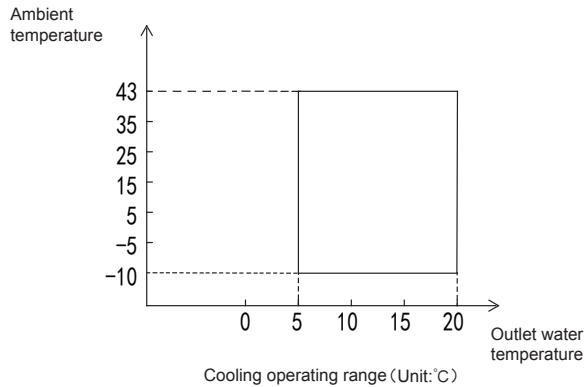
Air-cooled heat pump unit consists of one or more modules. Each module has an independent electronic control unit. In addition, there is also a network in the unit enabling communications among modules. Compact and easy to transport and install, the air-cooled heat pump unit requires less auxiliary facilities, such as cooling tower and cooling pump, and therefore costs less for consumers. The unit is provided together with central air conditioning equipment or cold, hot water terminal equipment. As a completely independent model, the unit is able to be installed outdoors, such as on the ground and on the roof. The unit's each module features efficient, low-noise and modular compressor, air-cooled condenser, plate evaporator and microcomputer control centre and so on, all of which are installed on a steel structure reliably. The unit's microcomputer control system is able to adjust energy input according to the load, to most closely match the conditions and reduce energy losses. 16 Modular units can be combined in parallel at most, with the number of units at the discretion of the user depending on the actual situation. The product can be widely applied to air conditioning schemes in new and reconstructed buildings for industrial and civil use, for example, restaurants, hotels, apartments, office buildings, hospitals, and industrial parks. For scenarios requiring silence and with higher requirements for the surroundings and water supply, the air-cooled heat pump modular unit is definitely the best choice.

1.2 Use conditions of the unit

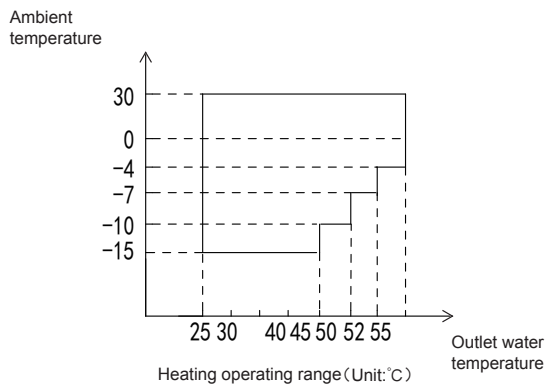
a. The standard voltage of power supply is 380-415V 3N~50Hz, the minimum allowable voltage is 342V, and the maximum voltage is 456V.

b. To maintain better performance, please operate the unit under the following outdoor temperature:

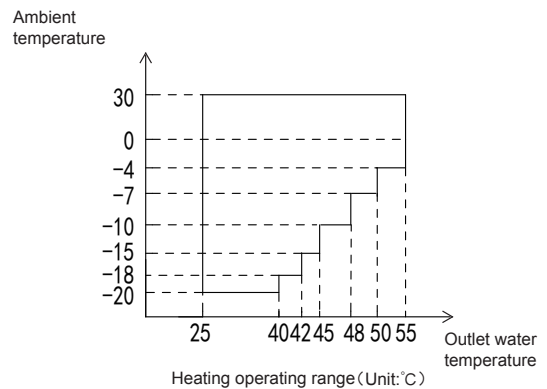
HTW-MCSU30RN1L
HTW-MCSU60RN1L
HTW-MCSU90RN1L



HTW-MCSU30RN1L
HTW-MCSU60RN1L



HTW-MCSU90RN1L



2. SAFETY CONSIDERATION

To prevent injuries or property losses, make sure to observe the following instructions. Failure to do so may cause injuries or losses.

There are two types of safety instructions: warning and caution. Whichever type it is, you must read the information listed under it carefully.



WARNING

Failure to observe a warning may result in death.



CAUTION

Failure to observe a caution may result injury or damage to the equipment.



WARNING

- Get your distributor or a professional to install the product. The installation personnel must be equipped with the professional knowledge. When you install on your own, any mistake you made during the operations may lead to a fire, electric shock, injury or water leakage.
- When purchasing items locally, purchase those designated by our company.
- Failure to do so may result in a fire, electric shock, or water leakage. Note to entrust a professional to install those items.
- When powering the unit, follow the regulations of the local electric company.
- Make sure the unit is grounded reliably in accordance with the laws. Otherwise, it may cause electric shock. When moving or reinstalling the modular unit, get your distributor or a professional to do so.
- If installed improperly, a fire, electric shock, injury or water leakage may occur. Never modify or repair the unit on your own.
- Otherwise, a fire, electric shock, injury or water leakage may occur. Get your distributor or a professional to do so.



CAUTION

- Ensure that the residual current device (RCD) is installed. The RCD must be installed. Failure to install it may result in electric shock.
- Connect the cable properly. Otherwise, it may cause damage to electrical parts.
- Do not operate the unit near flammables (paint, coating, gasoline and chemical reagents) lest fire or explosion may occur. In the unlikely event of a fire, please turn off the main power immediately and put out the fire using an extinguisher.
- Do not touch refrigerant discharge parts to prevent being burnt.
- Service the unit regularly according to the manual, to ensure that the unit is in good condition. When the unit stops due to a fault, refer to the Fault Analysis and Troubleshooting in this manual, or contact the local customer service centre of Midea. Do not start the unit until the fault is eliminated.
- When finding refrigerant or chilled water (cooling water) leaks, turn off all the switches immediately. If you cannot do so through operating the controller, do not restart the unit unless the fault is located and eliminated.
- Use fuses with designated capacity. Do not use iron wires or copper wires, as doing so may result in serious damages to the unit or a fire.

3. BEFORE INSTALLATION

3.1 Handling of the unit

The angle of inclination should not be more than 15° when carrying the unit in case of overturn of the unit.

a. Rolling handling: several rolling rods of the same size are placed under the base of the unit, and the length of each rod must be more than the outer frame of the base and suitable for balancing of the unit.

b. Lifting: each lifting rope (belt) should be able to bear 4 times the weight of the unit. Check the lifting hook and ensure that it is firmly attached to the unit. To avoid damages to the unit, a protective block made of wood, cloth or hard paper should be placed between the unit and rope when lifting, and its thickness should be 50mm or more. It is strictly forbidden to stand under the machine when it is hoisted.

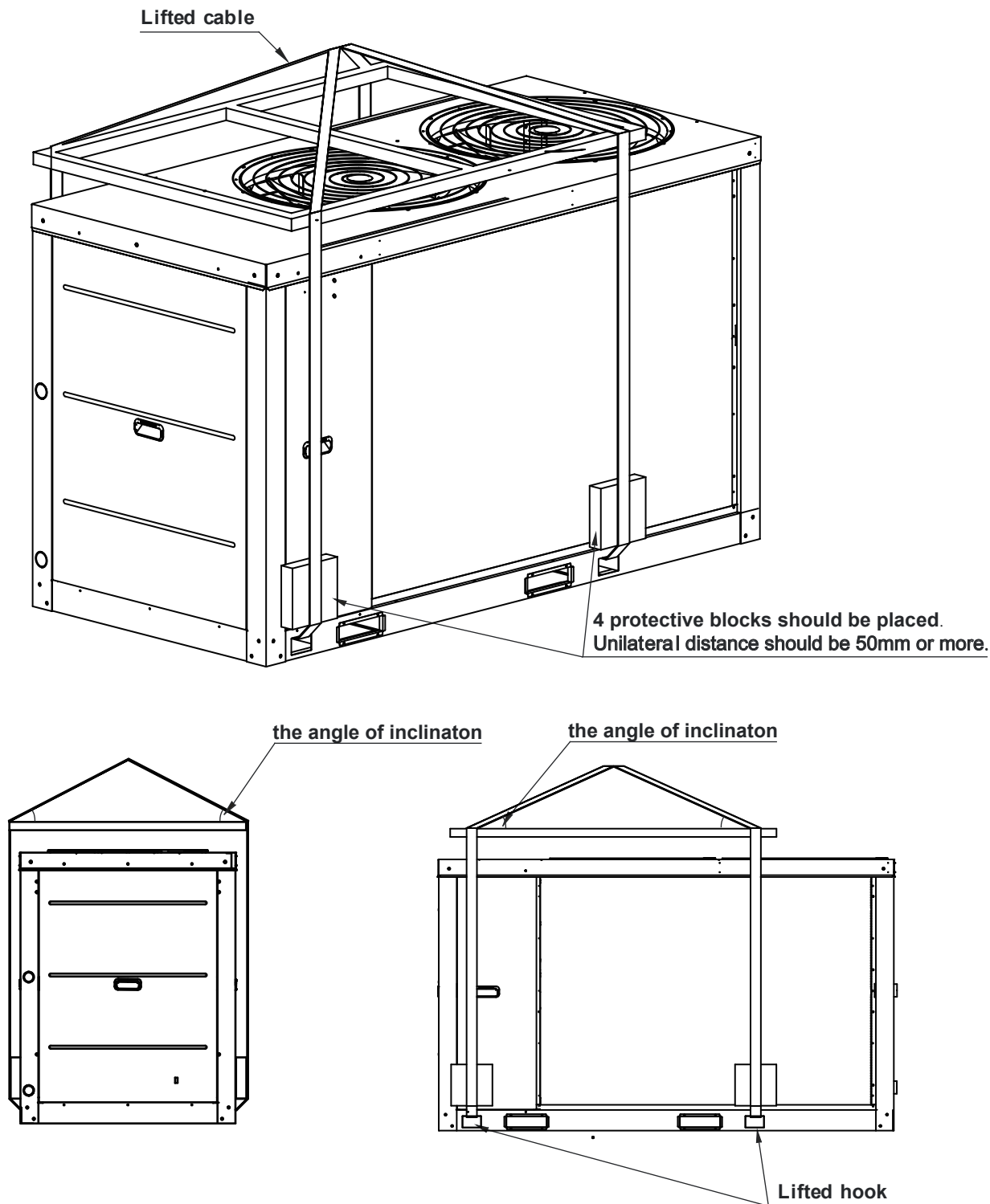


Fig. 3-1 lifting of the unit

4. IMPORTANT INFORMATION ON REFRIGERANT

This product contains fluorinated greenhouse gases covered by the Kyoto Protocol. Do not vent gases into the atmosphere.

Refrigerant type: R410A

GWP(1) value: 2088

(1) GWP = global warming potential

The refrigerant quantity is indicated on the unit name plate

- Add the refrigerant

Amount of factory -charged refrigerant is

HTW-MCSU30RN1L	10.5kg
HTW-MCSU60RN1L	17kg
HTW-MCSU90RN1L	27kg

5. SELECTION OF INSTALLATION SITE

5.1 Units can be installed on the ground or proper place on a roof, provided that sufficient ventilation can be guaranteed.

5.2 Do not install the unit in a scenario with requirements on noise and vibration.

5.3 When installing the unit, take measures to avoid exposure to direct sunlight, and keep the unit away from boiler pipeline and surroundings which might corrode the condenser coil and copper pipes.

5.4 If the unit is within the reach of unauthorized personnel, take protective measures for safety considerations, such as installing a fence. These measures can prevent man-caused or accidental injuries, and can also prevent the electrical parts in operation from being exposed when the main control box is opened.

5.5 Install the unit on a foundation at least 300 mm high above the ground, where the floor drain is provided, to ensure that water does not accumulate.

5.6 If installing the unit on the ground, put the steel base of the unit on the concrete foundation, which must be as deep as into the frozen soil layer. Ensure the installation foundation is separated from buildings, as the noises and vibration of the unit may adversely affect the latter. By means of the installation holes on the unit base, the unit can be fastened on the foundation reliably.

5.7 If the unit is installed on a roof, the roof must be strong enough to bear the weight of the unit and the weight of maintenance personnel. The unit can be placed on the concrete and groove-shaped steel frame, similar to the case when the unit is installed on the ground. The weight-bearing groove-shaped steel must match the installation holes of the shock absorber and is wide enough to accommodate the shock absorber.

5.8 For other special requirements for installation, please consult the building contractor, architectural designer or other professionals.



NOTE

The selected installation site of the unit should facilitate connection of water pipes and wires, and be free from water inlet of oil fume, steam or other heat sources. Besides, the noise of the unit and cold and hot air should not influence the surrounding environment.

6. PRECAUTIONS ON INSTALLATION

6.1 Outline dimensional drawing

6.1.1 HTW-MCSU30RN1L

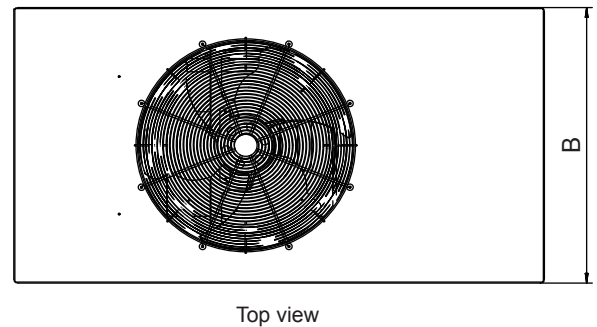
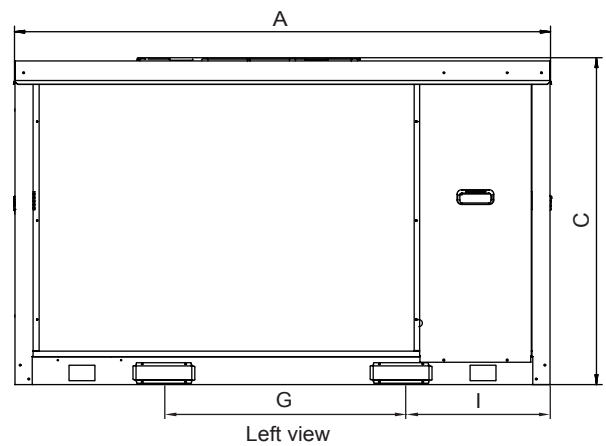
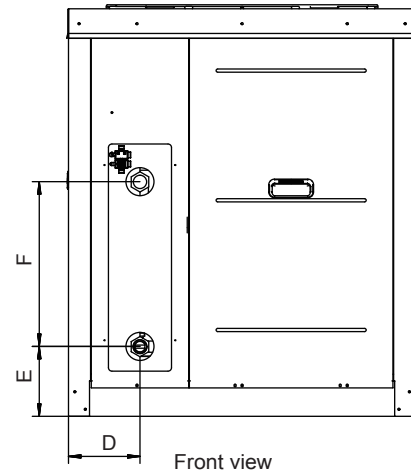
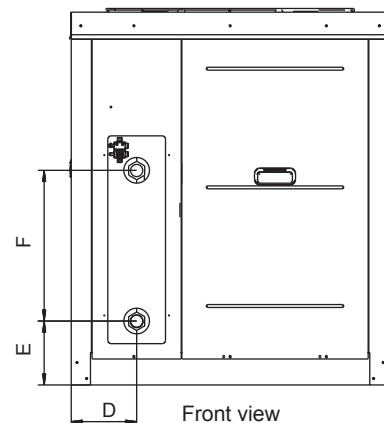


Fig. 6-1 outline dimensional of HTW-MCSU30RN1L

6.1.2 HTW-MCSU60RN1L



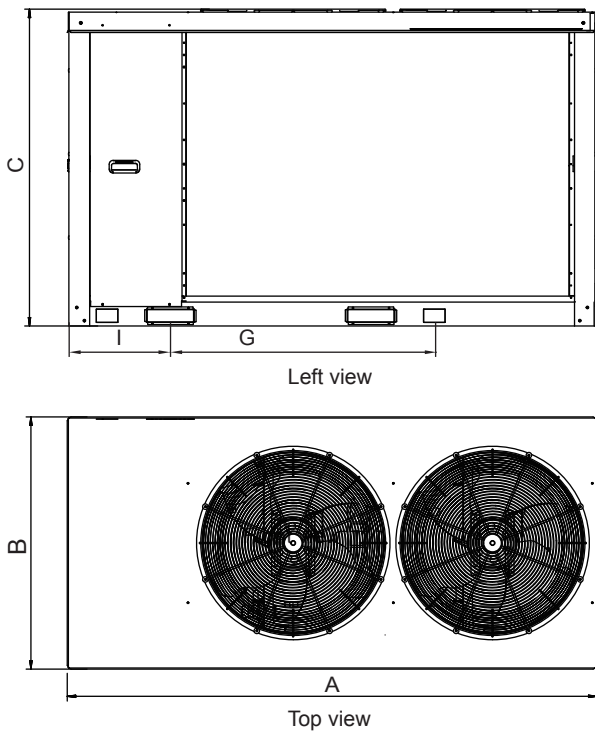


Fig. 6-2 outline dimensional of HTW-MCSU60RN1L

6.1.3 HTW-MCSU90RN1L

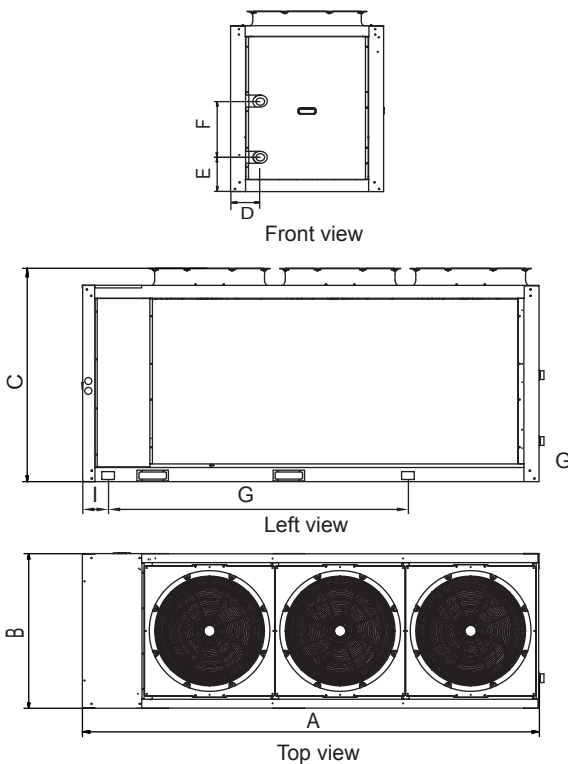


Fig. 6-3 outline dimensional of HTW-MCSU90RN1L

Table 6-1

Model	HTW-MCSU30RN1L	HTW-MCSU60RN1L	HTW-MCSU90RN1L
A	1870	2220	3220
B	1000	1055	1095
C	1175	1325	1513
D	204	234	286
E	200	210	210
F	470	470	470
G	788	1105	2116
H	880	958	1008
I	530	425	180



NOTE

- After installing the spring damper, the total height of the unit will increase by 135mm or so.

6.2 Requirements of arrangement space of the unit

1. To ensure adequate airflow entering the condenser, the influence of descending airflow caused by the high-rise buildings around upon the unit should be taken into account when installing the unit.
2. If the unit is installed where the flowing speed of air is high, such as on the exposed roof, the measures including sunk fence and Persian blinds can be taken, to prevent the turbulent flow from disturbing the air entering the unit. If the unit needs to be provided with sunk fence, the height of the latter should not be more than that of the former; if Persian blinds are required, the total loss of static pressure should be less than the static pressure outside the fan. The space between the unit and sunk fence or Persian blinds should also meet the requirement of the minimum installation space of the unit.
3. If the unit needs to operate in winter, and the installation site may be covered by snow, the unit should

Table 6-2

Installation space (mm)	
A	≥800
B	≥2000
C	≥2000
D	≥800
E	≥300
F	≥600
G	≥6000

6.3 Space requirements for parallel installation of multiple Modular units

To avoid back flow of the air in the condenser and operational faults of the unit, the parallel installation of multiple Modular units can follow the direction A and D as shown in Fig. 6-5, the spaces between the unit and the obstacle are given in Table 6-2, and the space between adjacent Modular units should not be less than 300mm; the installation can also follow the direction B and C as shown in Fig. 6-5, the spaces between the unit and the obstacle are given in Table 6-2, and the space between adjacent Modular units should not be less than 600mm; the installation can also follow the direction

combination of A and D, and B and C, the spaces between the unit and the obstacle are given in Table 6-2, the space between adjacent Modular units in the direction A and D should not be less than 300mm, and the space between adjacent Modular units in the direction B and C should not be less than 600mm. If the spaces mentioned above cannot be met, the air passing from the unit to the coils may be restricted, or back flow of air discharge may occur, and the performance of the unit may be affected, or the unit may fail to operate.

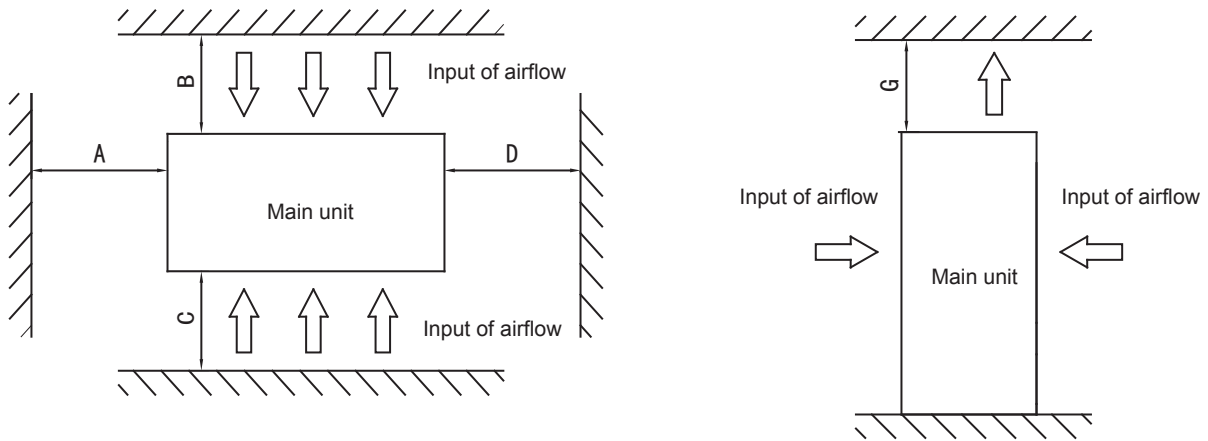


Fig. 6-4 single unit installation

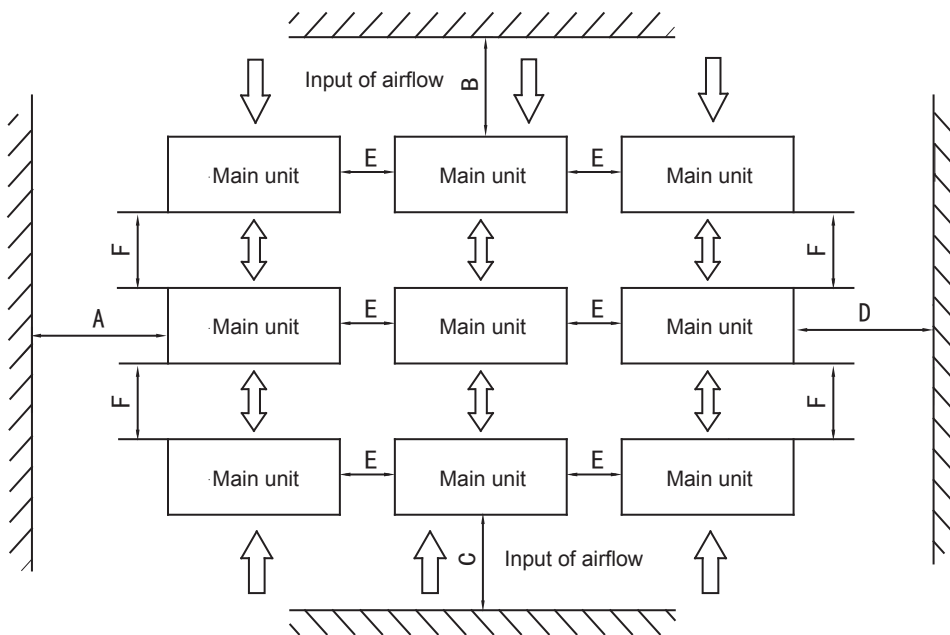


Fig. 6-5 multiple units installation

6.4 Installation foundation

- The unit should be located on the horizontal foundation, the ground floor or the roof which can bear operating weight of the unit and the weight of maintenance personnel. Refer to Table 12-1 (Table of applicable models and parameters) for operating weight.
- If the unit is located so high that it is inconvenient for maintenance personnel to conduct maintenance, the suitable scaffold can be provided around the unit.
- The scaffold must be able to bear the weight of maintenance personnel and maintenance facilities.
- The bottom frame of the unit is not allowed to be embedded into the concrete of installation foundation.

6.4.1 Location drawing of installation foundation of the unit: (unit: mm)

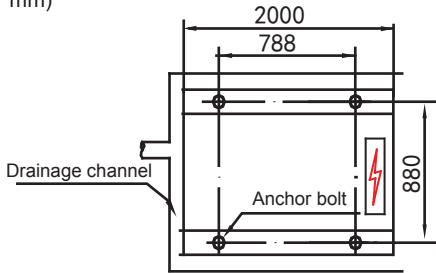


Fig. 6-6 Schematic diagram of installation dimension of HTW-MCSU30RN1L

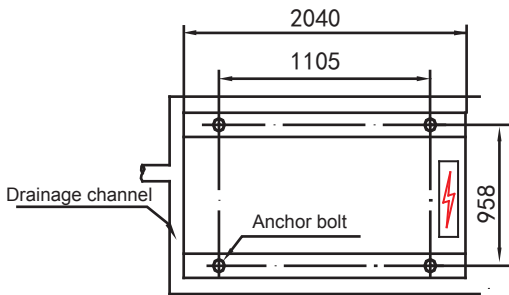


Fig. 6-7 Schematic diagram of installation dimension of HTW-MCSU60RN1L

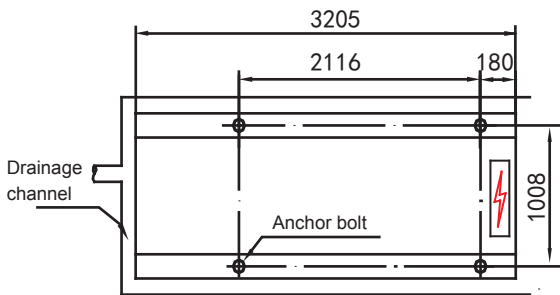


Fig. 6-8 Schematic diagram of installation dimension of HTW-MCSU90RN1L

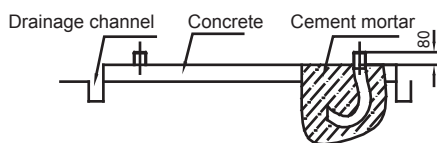


Fig. 6-9 diagram of installation foundation

6.5 Installation of damping devices

6.5.1 Damping devices must be provided between the unit and its foundation.

By means of the $\Phi 15$ mm diameter installation holes on the steel frame of the unit base, the unit can be fastened on the foundation through the spring damper. See Fig.6-6, 6-7,6-8(Schematic diagram of installation dimension of the unit) for details about center distance of the installation holes. The damper does not go with the unit, and the user can select the damper according to the relevant requirements. When the unit is installed on the high roof or the area sensitive to vibration, please consult the relevant persons before selecting the damper.

6.5.2 Installation steps of the damper

- Step 1. Make sure that the flatness of the concrete foundation is within ± 3 mm, and then place the unit on the cushion block.
- Step 2. Raise the unit to the height suitable for installation of the damping device.
- Step 3. Remove the clamp nuts of the damper. Place the unit on the damper, and align the fixing bolt holes of the damper with the fixing holes on the unit base.
- Step 4. Return the clamp nuts of the damper to the fixing holes on the unit base, and tighten them into the damper.
- Step 5. Adjust the operational height of the damper base, and screw down the leveling bolts. Tighten the bolts by one circle to ensure equal height adjustment variance of the damper.
- Step 6. The lock bolts can be tightened after the correct operational height is reached.



NOTE

It is recommended that the damper should be fastened on the foundation with the provided holes. After the unit is placed on the foundation, the damper connected with the unit should not be moved, and the central clamp nut is not allowed to be tightened before the damper sustains load.

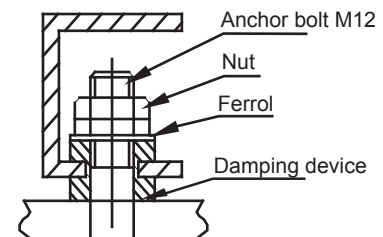


Fig. 6-10 installation of the damper

7. TYPICAL APPLICATION EXAMPLES

7.1 Application 1

Space heating only application without room thermostat connected to the unit. The temperature in each room is controlled by a valve on each water circuit. Heating is provided through floor heating loops.

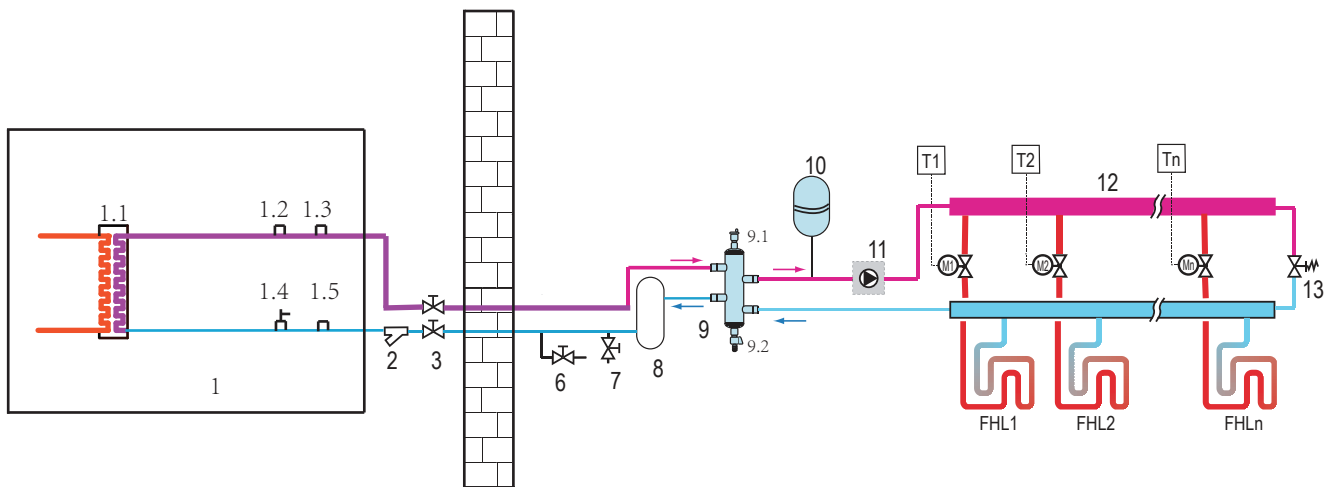


Fig.7-1 diagram of application 1

Table 7-1

No.	component	No.	component	No.	component
1	main unit	3	stop valve (field supply)	10	expansion vessel (field supply)
1.1	water side heat exchanger	6	drain valve (field supply)	11	P_o:outside circulation pump (field supply)
1.2	safety valve	7	fill valve (field supply)	12	collector (field supply)
1.3	manual air purge valve	8	buffer tank (field supply)	13	bypass valve (field supply)
1.4	water flow switch	9	balance tank (field supply)		FHL 1...n floor heating loop
1.5	manual water drain valve	9.1	air purge valve		M1...n motorized valve (field supply)
2	y-shape filter	9.2	drain valve		T1...n room thermostat (field supply)

7.2 Application 2

Space cooling and heating application without a room thermostat connected to the unit, but with heating/cooling thermostat controlling the fan coil units. Cooling is provided through the fan coil units only.

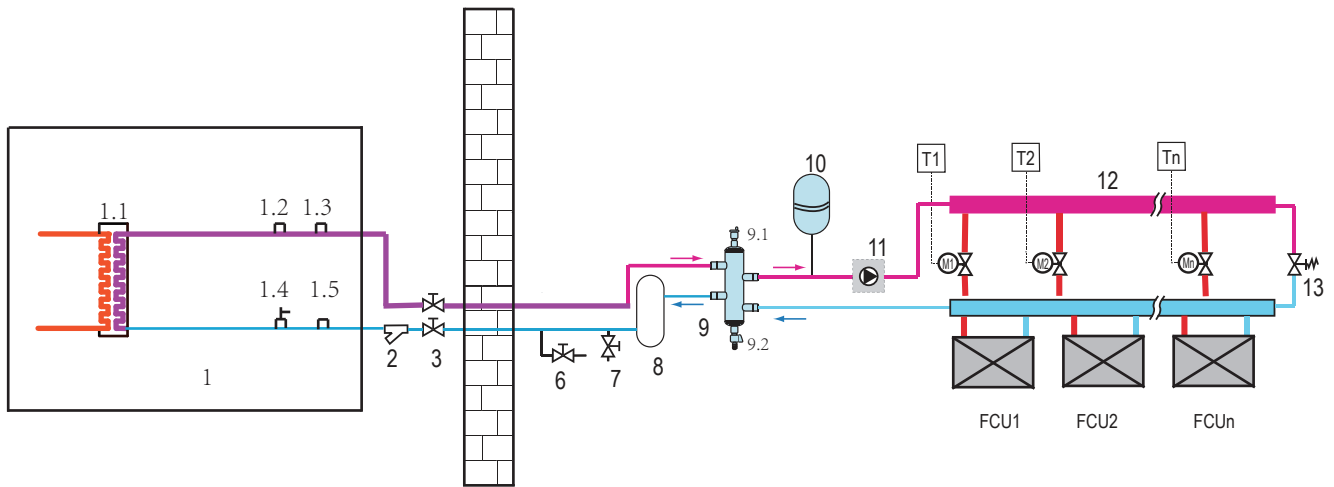


Fig.7-2 diagram of application 2

Table 7-2

No.	component	No.	component	No.	component
1	main unit	3	stop valve (field supply)	10	expansion vessel (field supply)
1.1	water side heat exchanger	6	drain valve (field supply)	11	P_o:outside circulation pump (field supply)
1.2	safety valve	7	fill valve (field supply)	12	collector (field supply)
1.3	manual air purge valve	8	buffer tank (field supply)	13	bypass valve (field supply)
1.4	water flow switch	9	balance tank (field supply)		FCU 1...n fan coil units
1.5	manual water drain valve	9.1	air purge valve		M1...n motorized valve (field supply)
2	y-shape filter	9.2	drain valve		T1...n room thermostat (field supply)

7.3 Application 3

Space cooling and heating application without a room thermostat connected to the unit, but with heating/cooling thermostat controlling the fan coil units. Heating is provided through floor heating loops and fan coil units. Cooling is provided through the fan coil units only.

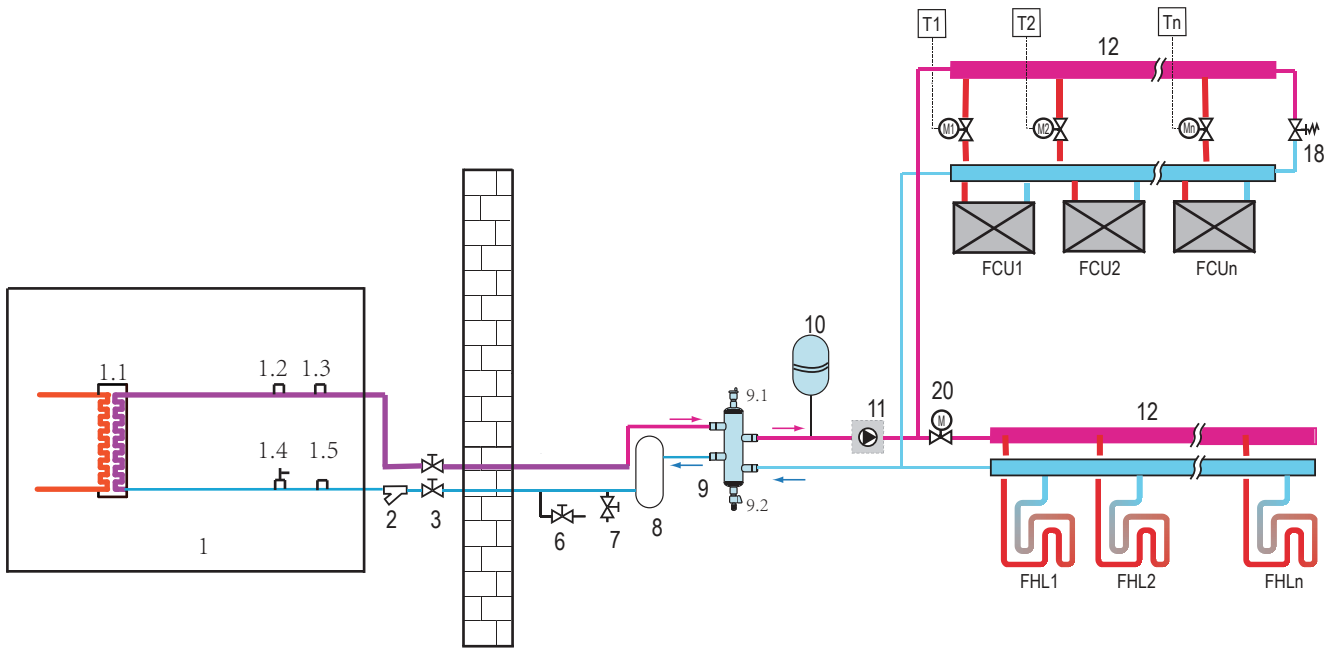


Fig.7-3 diagram of application 3

Table 7-3

NO.	component	NO.	component	NO.	component
1	main unit	7	fill valve (field supply)		FHL 1...n floor heating loop
1. 1	water side heat exchanger	8	buffer tank (field supply)		FCU 1...n fan coil units
1. 2	safety valve	9	balance tank (field supply)		M 1...n motorized valve (field supply)
1. 3	manual air purge valve	9. 1	air purge valve		
1. 4	water flow switch	9. 2	drain valve		
1. 5	manual water drain valve	10	expansion vessel (field supply)		
2	y-shape filter	11	P_o:outside circulation pump (field supply)		
3	stop valve (field supply)	12	collector (field supply)		
6	drain valve (field supply)	18	bypass valve (field supply)		
	T1...n room thermostat (field supply)	20	SV2: 2-way valve (field supply)		

8. OVERVIEW OF THE UNIT

8.1 Main parts of the unit

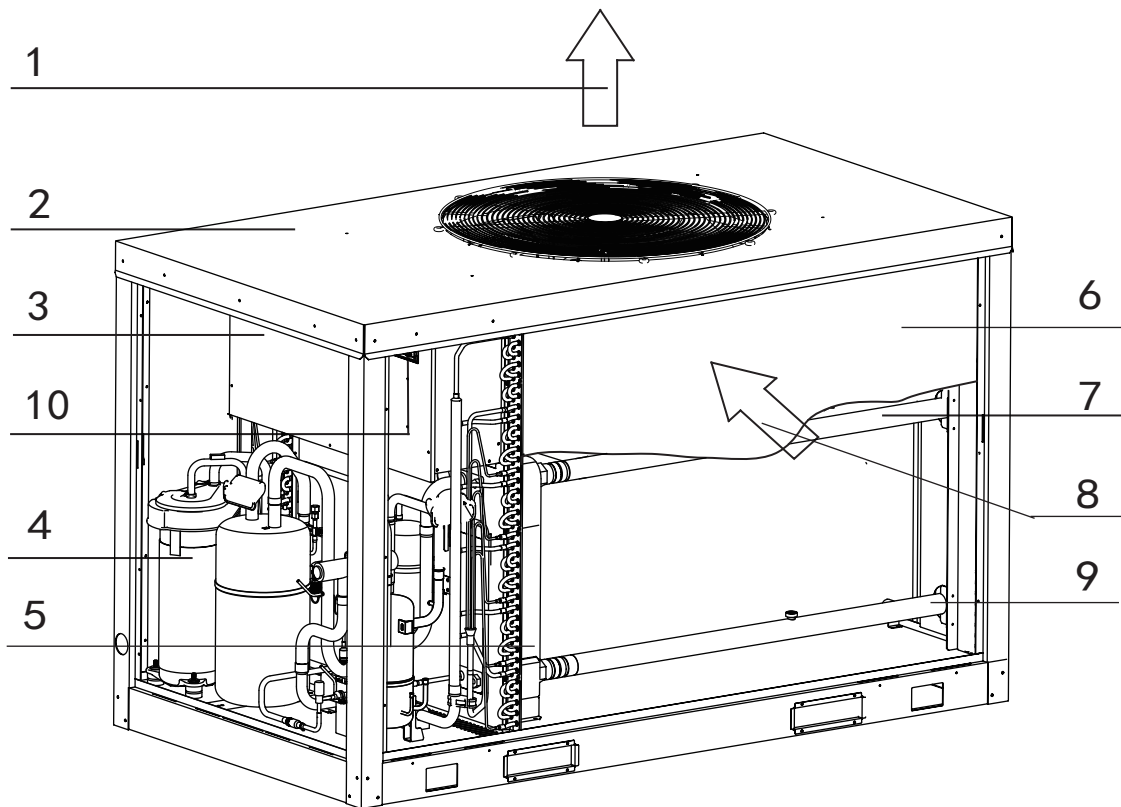


Fig. 8-1 main parts of HTW-MCSU30RN1L

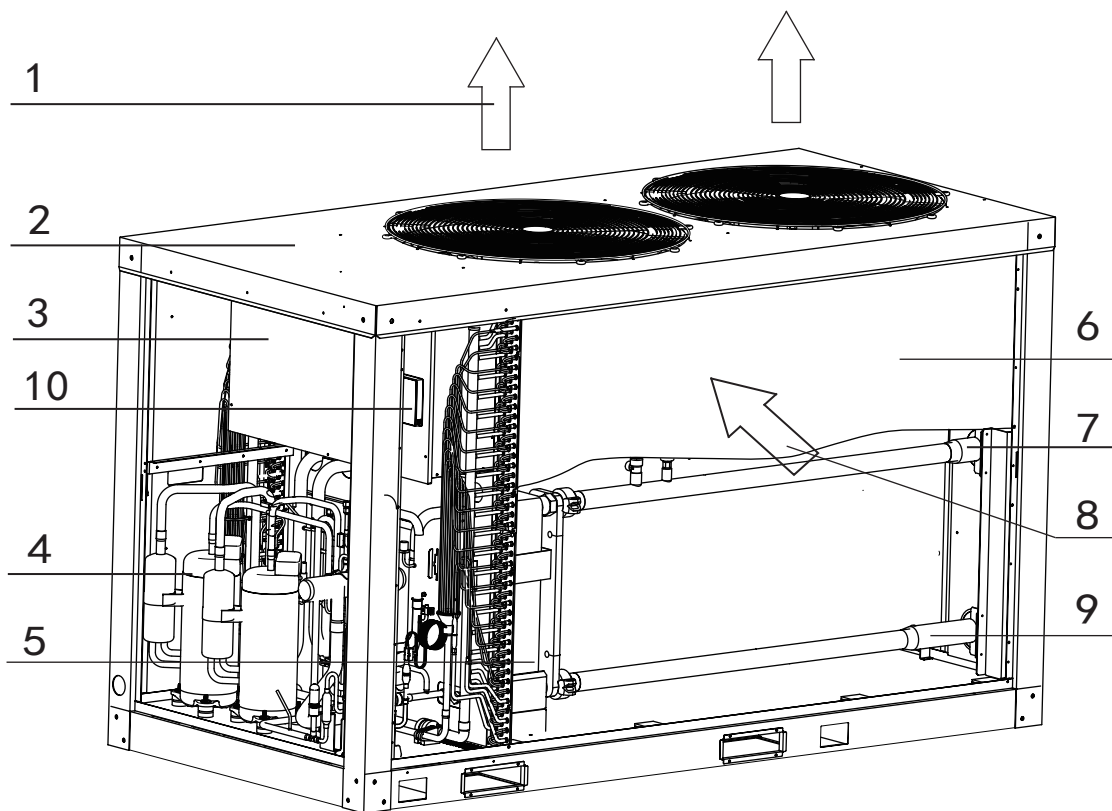


Fig. 8-2 main parts of HTW-MCSU60RN1L

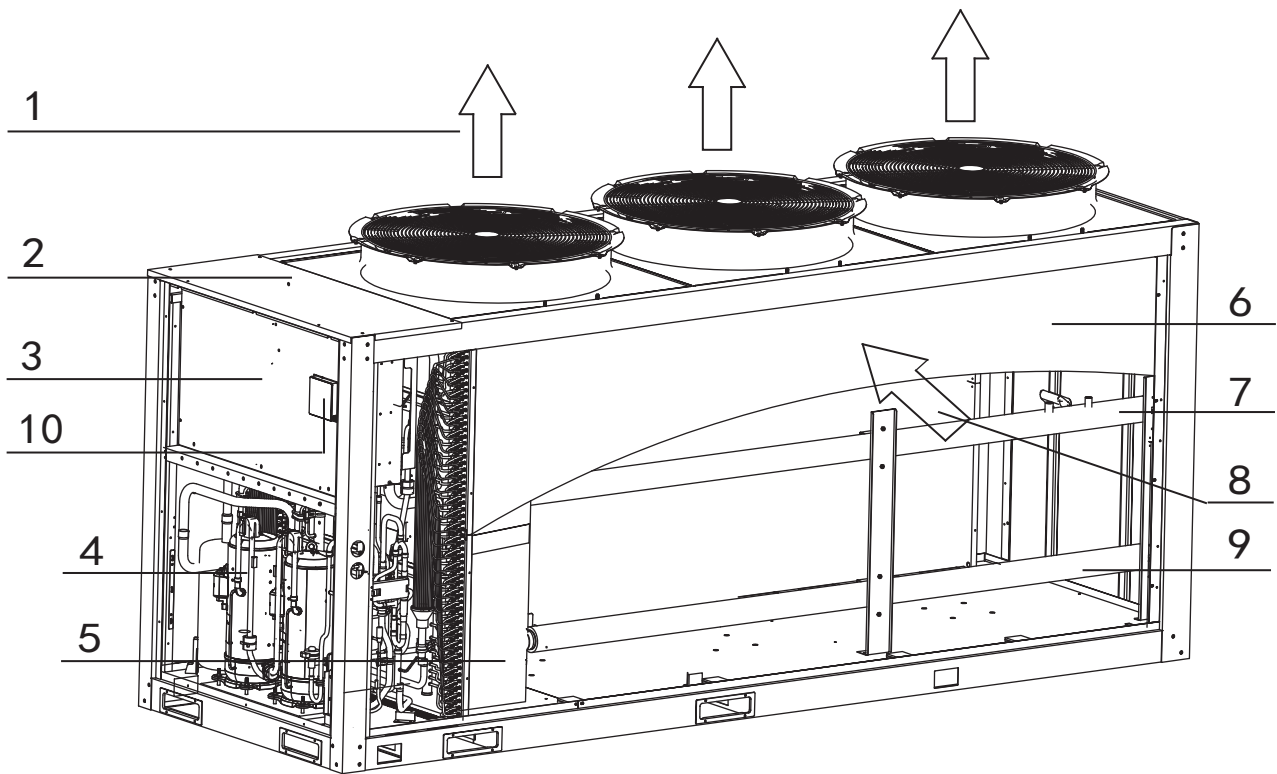


Fig. 8-3 main parts of HTW-MCSU90RN1L

NO.	1	2	3	4	5	6	7
NAME	Air outlet	Top cover	Electric control box	Compressor	Evaporator	Condenser	Water inlet
NO.	8	9	10				
NAME	Air inlet	Water outlet	wire controller (It can be placed indoors)				

8.2 Opening the unit

By means of a detachable service panel, the maintenance personnel can easily access the interior components of the unit.

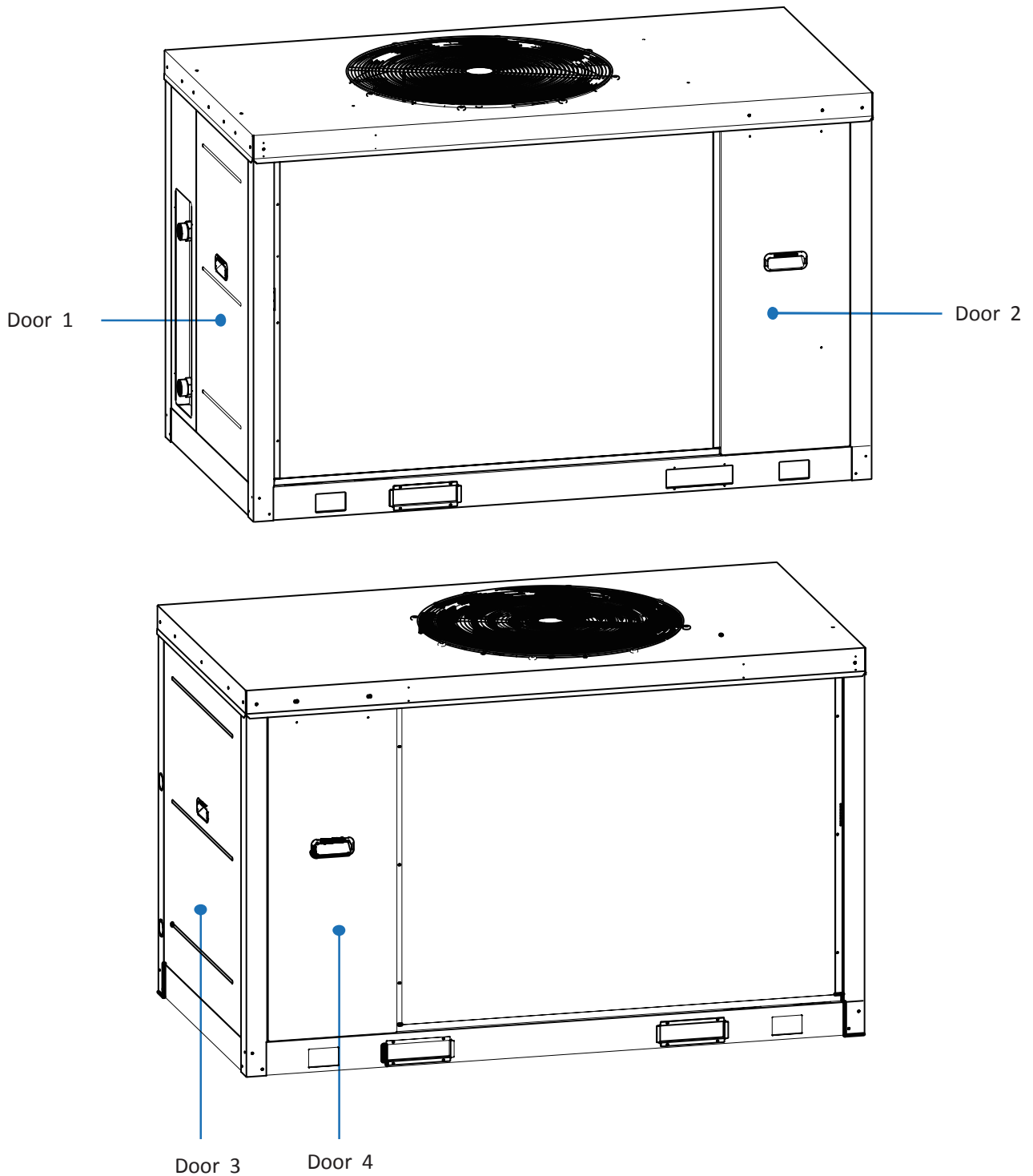


Fig. 8-4 doors of HTW-MCSU30RN1L

Door 1 give access to the compartment of water pipes and water side heat exchanger.

Door 2/3/4 give access to the hydraulic compartment and electrical parts.

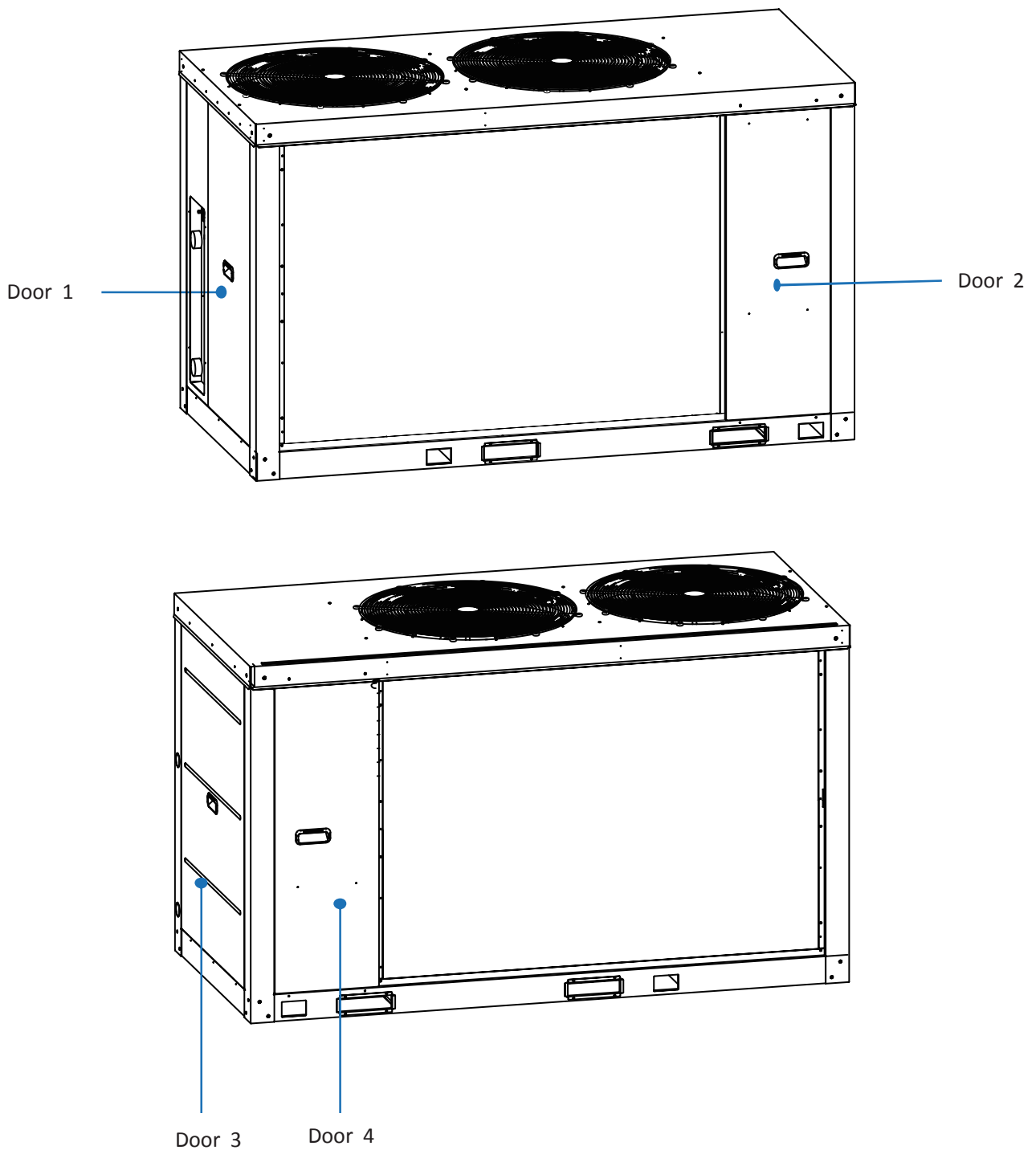


Fig. 8-5 doors of HTW-MCSU60RN1L

Door 1 give access to the compartment of water pipes ,water side heat exchanger,acculator and liquid-vapor separator.
 Door 2/3/4 give access to the hydraulic compartment and electrical parts.

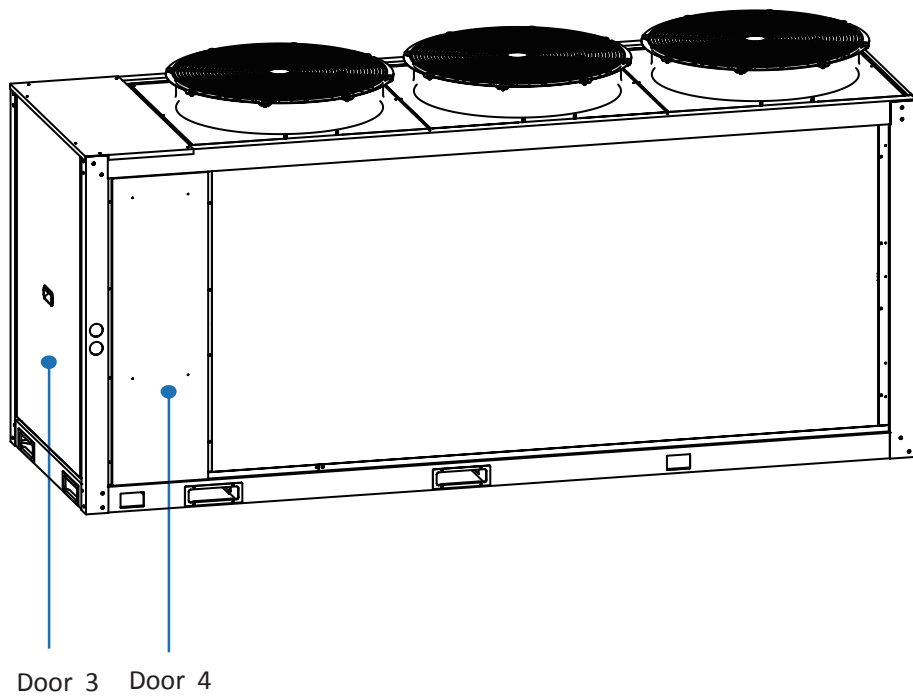
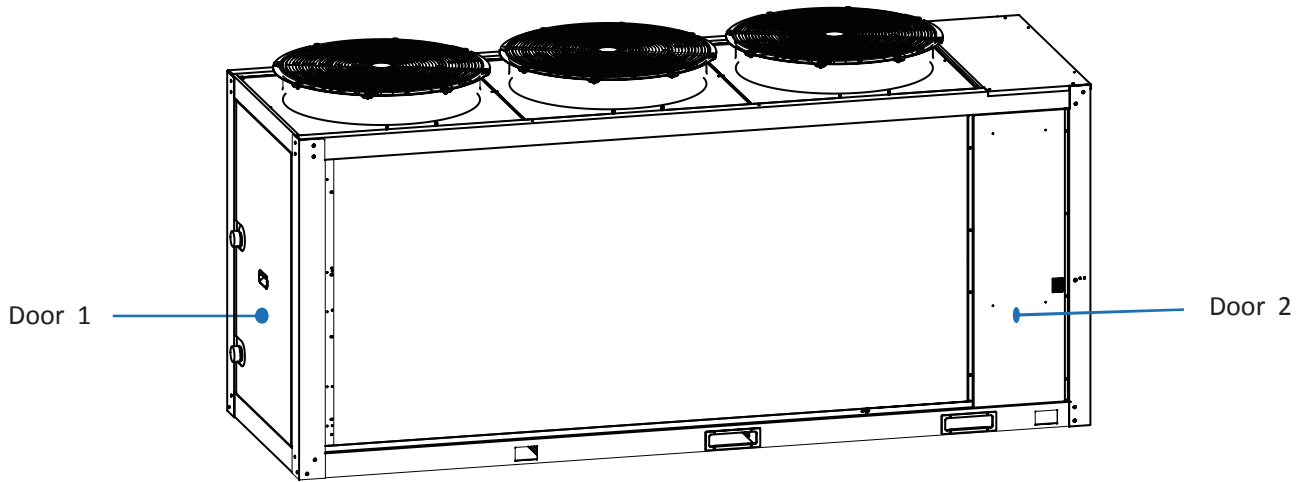


Fig. 8-6 doors of HTW-MCSU90RN1L

Door 1 give access to the compartment of water pipes ,water side heat exchanger,acculator and liquid-vapor separator.
 Door 2/3/4 give access to the hydraulic compartment and electrical parts.

8.3 main components

8.3.1 main components of HTW-MCSU30RN1L

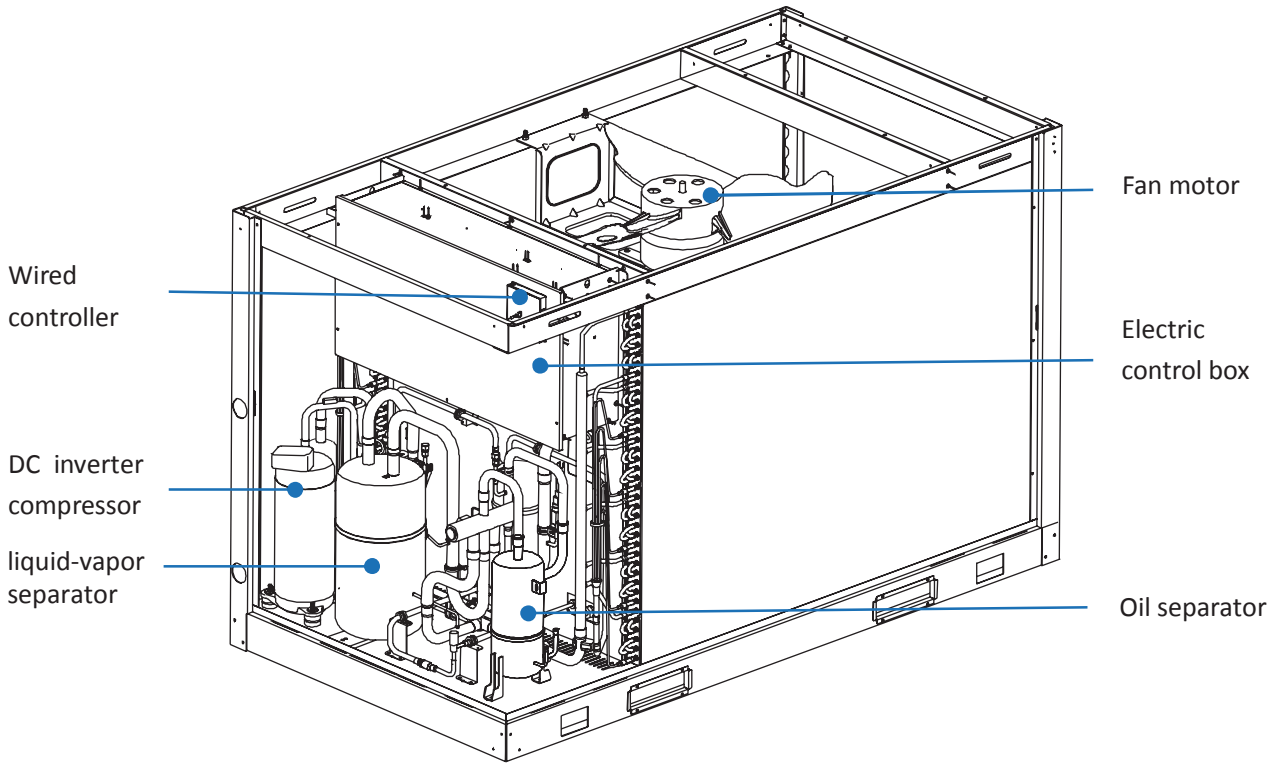


Fig. 8-7 HTW-MCSU30RN1L rear view

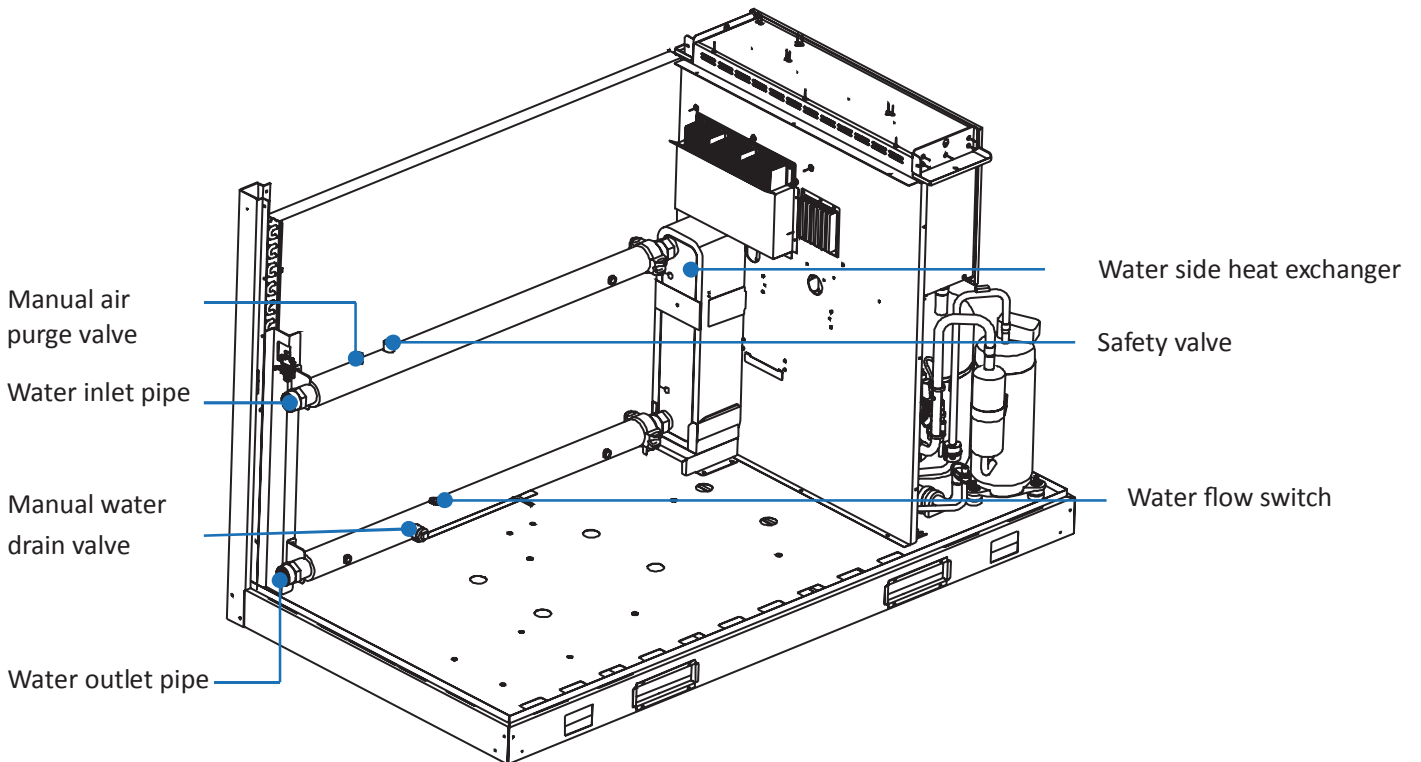


Fig. 8-8 HTW-MCSU30RN1L front view

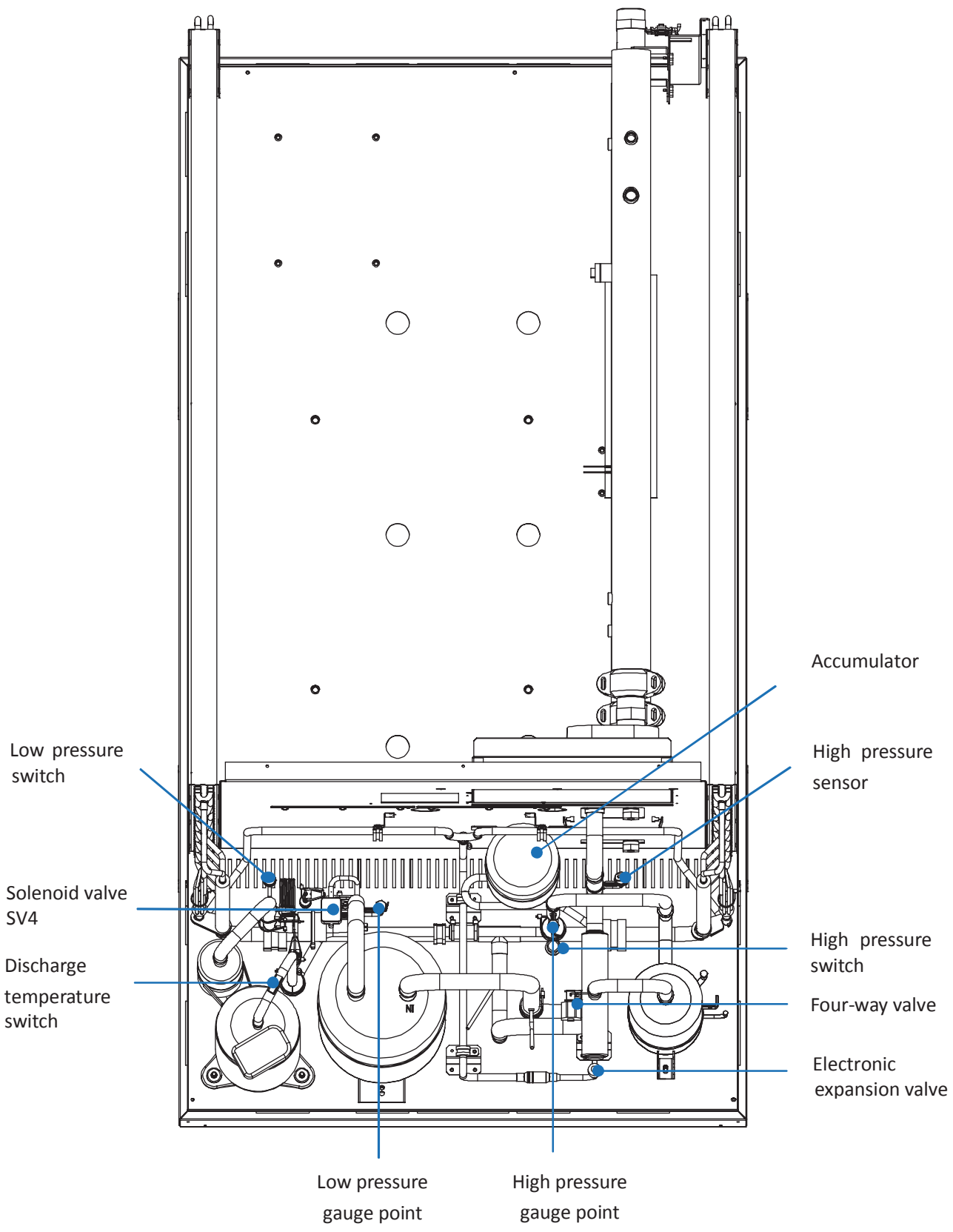


Fig.8-9 HTW-MCSU30RN1L top view

8.3.2 main components of HTW-MCSU60RN1L

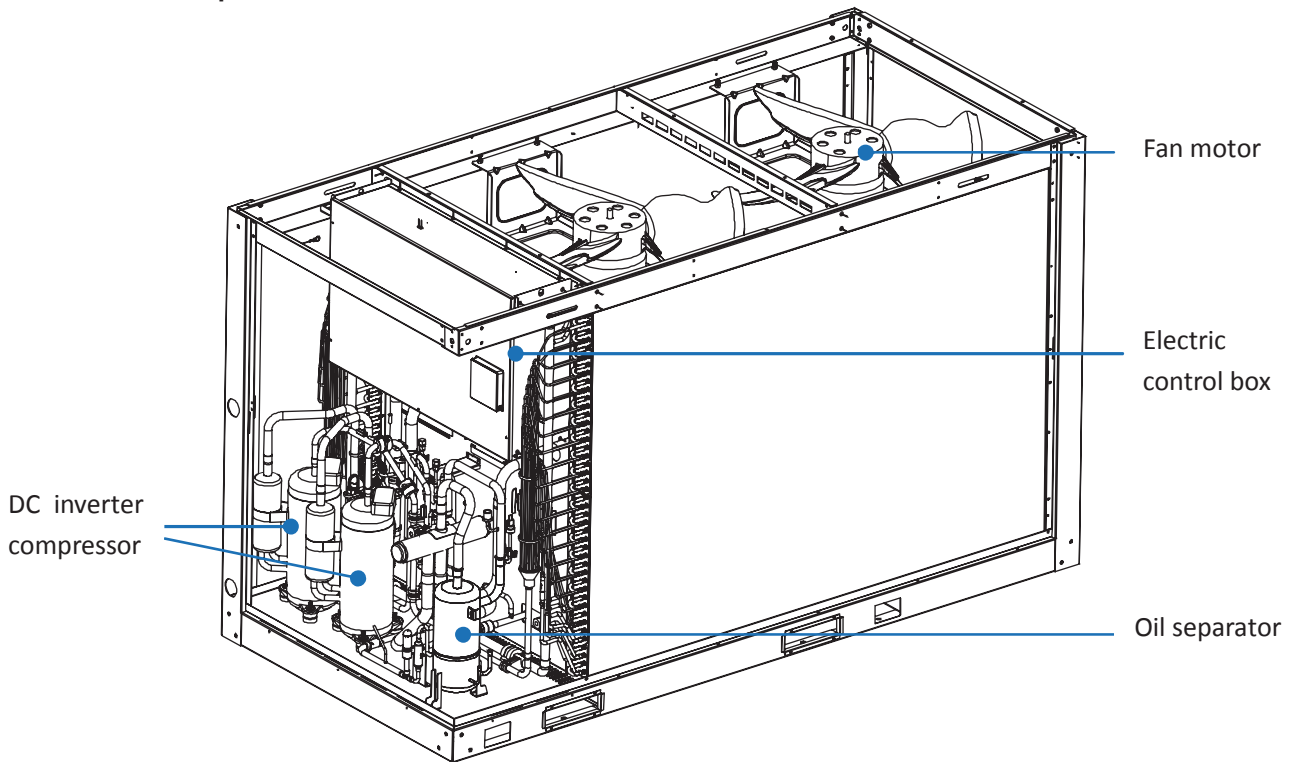


Fig.8-10 HTW-MCSU60RN1L rear view

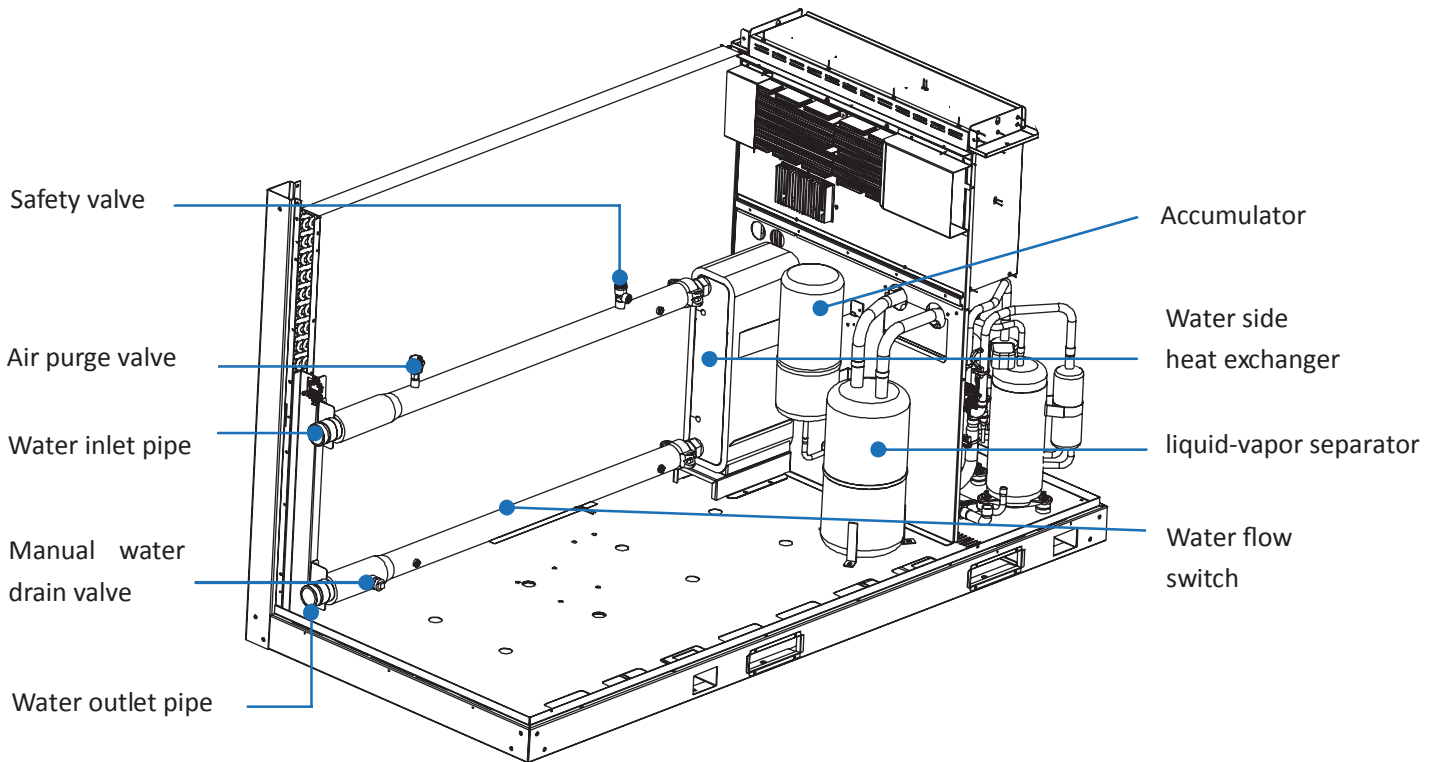


Fig.8-11 HTW-MCSU60RN1L front view

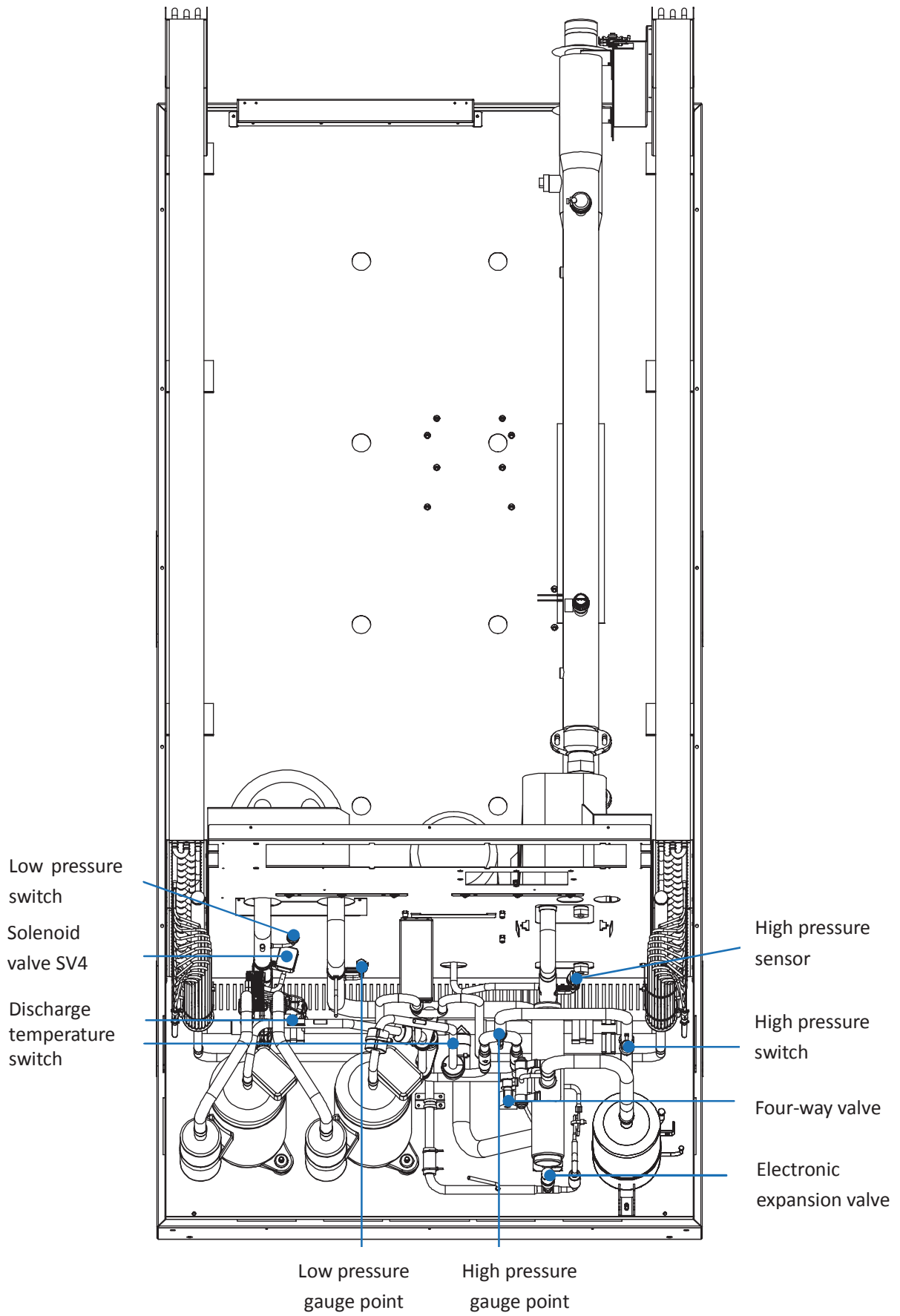


Fig.8-12 HTW-MCSU60RN1L top view

8.3.3 main components of HTW-MCSU90RN1L

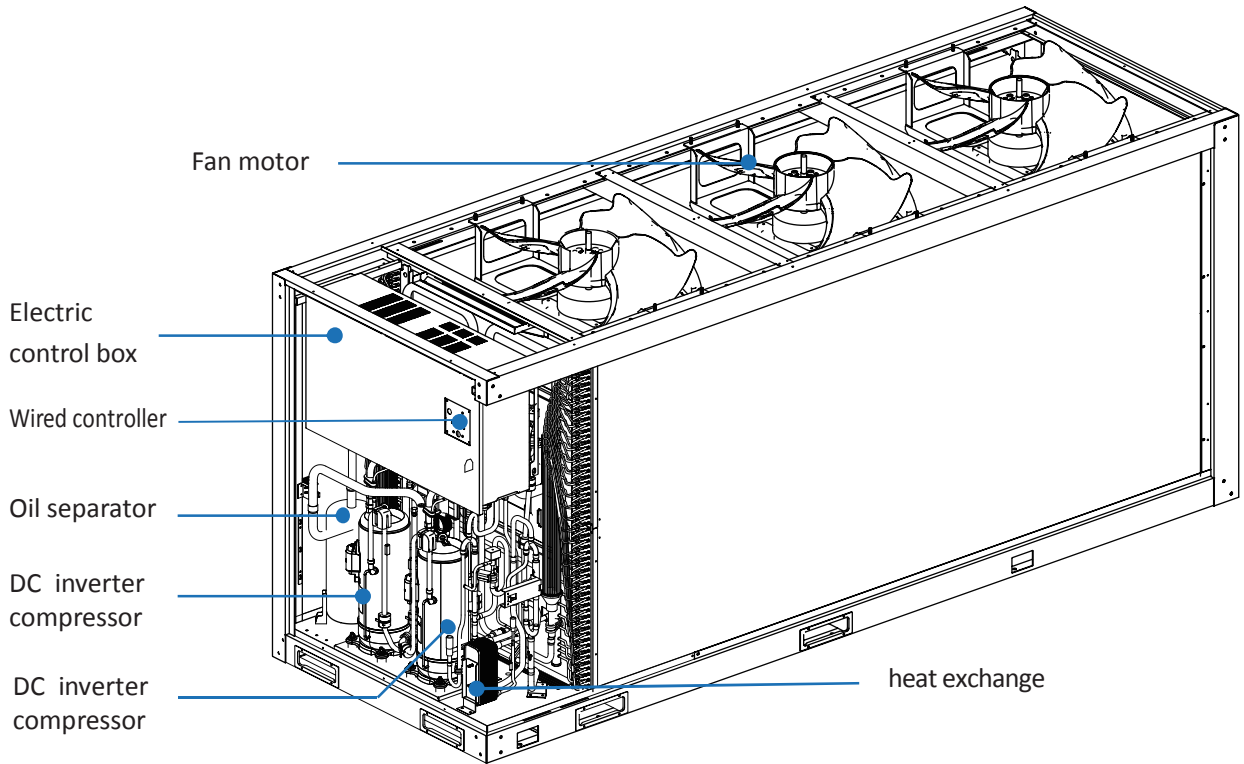


Fig.8-13 HTW-MCSU90RN1L rear view

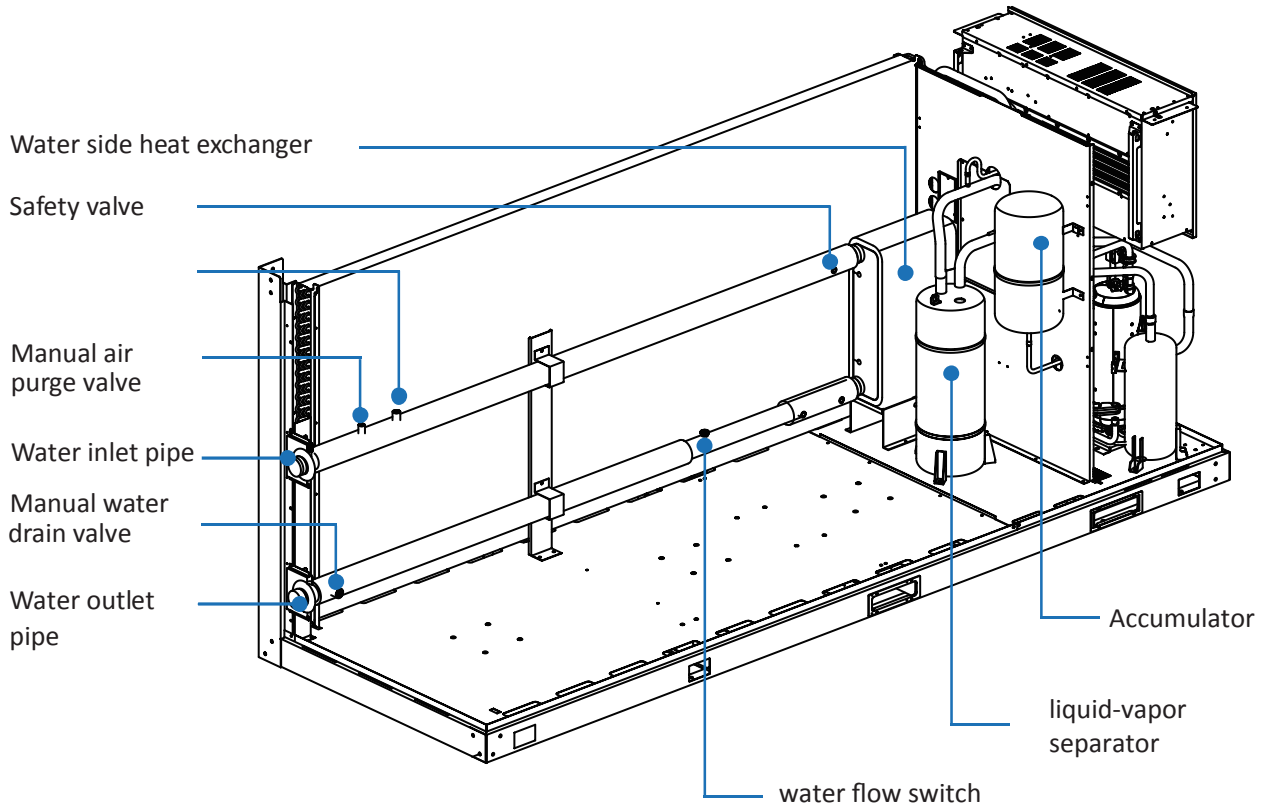


Fig.8-14 HTW-MCSU90RN1L front view

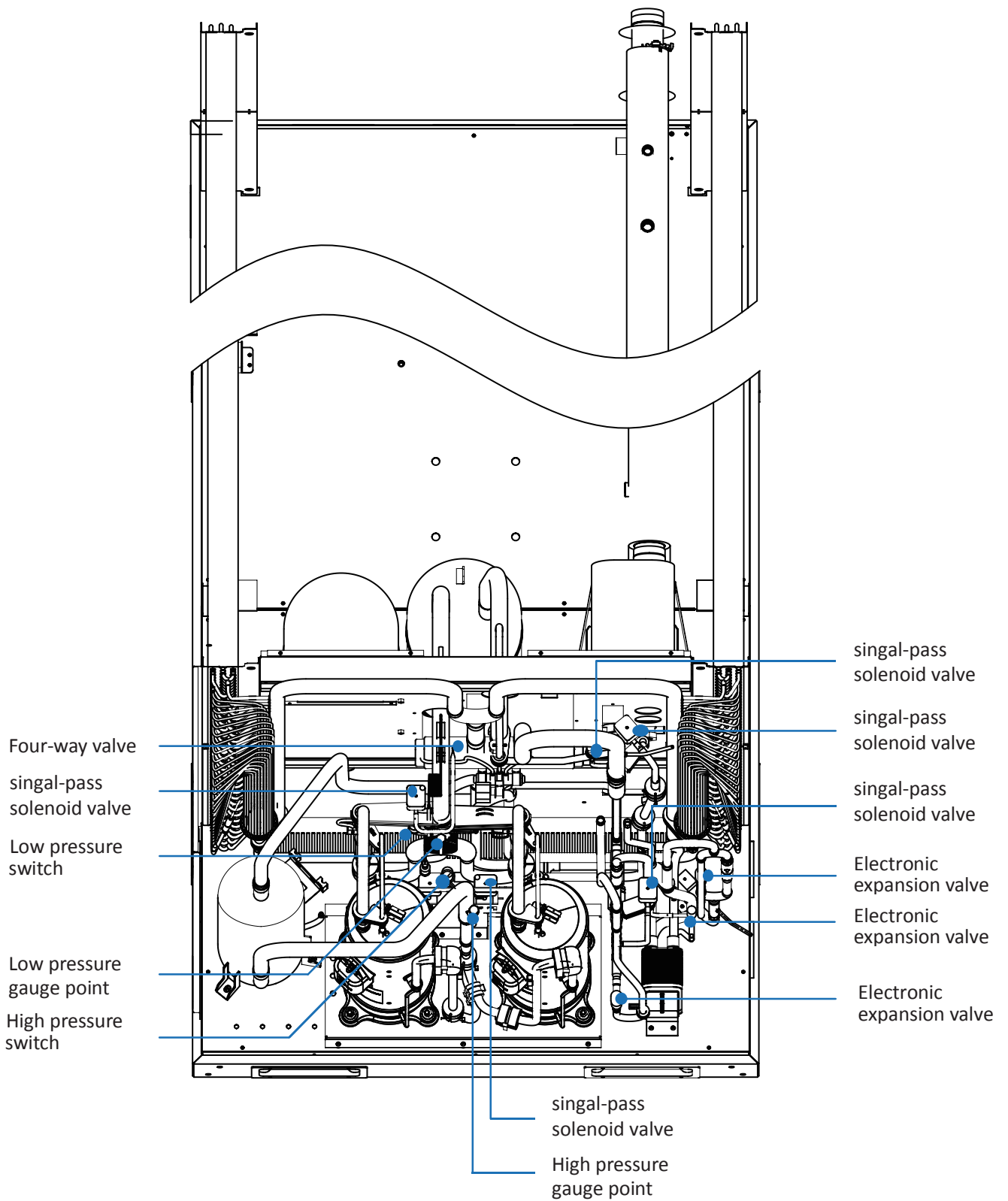


Fig.8-15 HTW-MCSU30RN1L top view

8.4 System diagram

8.4.1 diagram of HTW-MCSU30RN1L

Fig.8-16, 8-17,8-18 are the function diagrams of the 30、60、90 kW Full-DC Inverter Modular Air-cooled Heat Pump Unit and it shows the internal system structure to users, which is made up of main components (such as compressors, electronic expansion valves, Condenser, plate heat exchanger and so on)、 pipeline and sensors. The unit is equipped with cooling and heating mode with full-DC inverter technology, and the two mode can switch each other by component 7、11(4-way-valve).The system has two electronic expansion valve EXVA and EXVB. The EXVA is mainly used in heating mode, by which is controlled superheat, and in cooling mode it is at maximum opening. The EXVB is used in cooling mode and it is also controlled by the superheat.

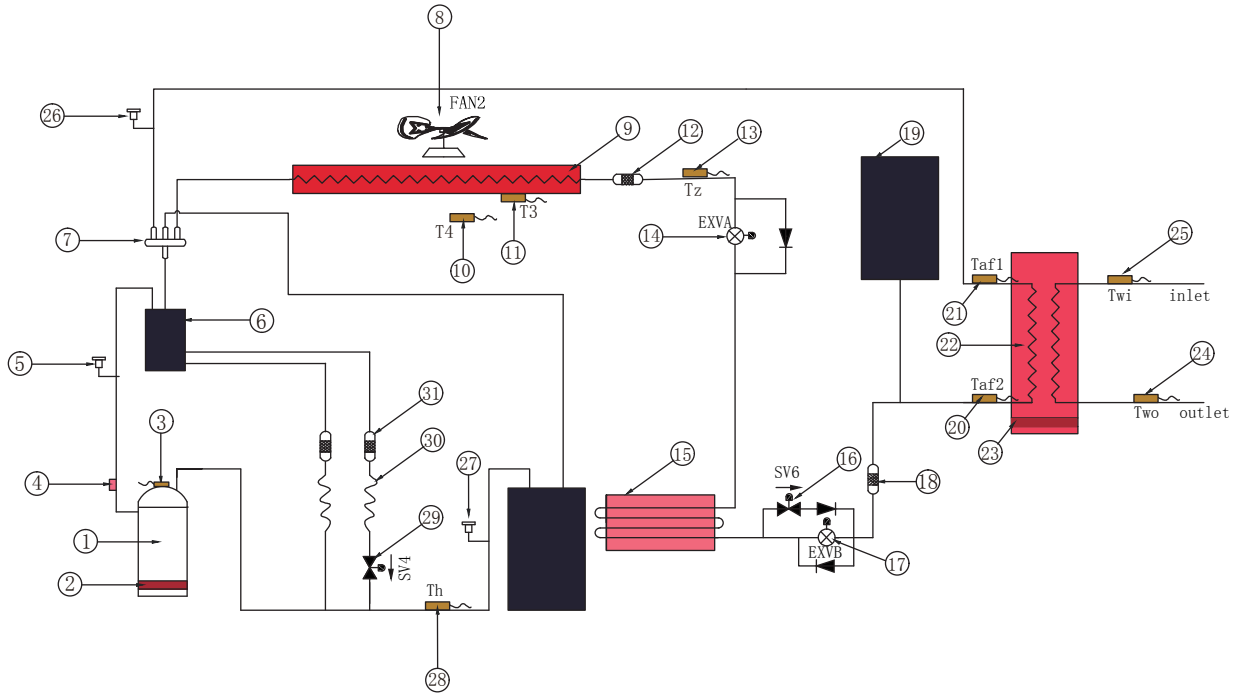


Fig.8-16 HTW-MCSU30RN1L piping diagram

Table 8-1

Legend			
1	Compressor	2	CCH (Crankcase heater)
3	Tp (DC inverter compressor discharge temperature)	4	Switch_Tp(Discharge temperature control switch)
5	PRO-H (High pressure switch)	6	Oil seperator
7	4-way-valve	8	FAN
9	Condenser	10	T4 (Outdoor ambient temperature)
11	T3 (coiloutlet temperature)	12	Filter
13	TZ (coil final outlet temperature)	14	EXVA (System electronic expansion valve 1)
15	Unit for cooling electronic control board	16	SV6 (Liquid side bypass solenoid valve)
17	EXVB (System electronic expansion valve 2)	18	Filter
19	High pressure tank	20	Taf2 (Water side antifreeze temperature)
21	Taf1 (Water side antifreeze temperature)	22	Plate heat exchanger
23	Antifreeze heater of plate heat exchanger	24	Two (Unit water outlet temperature)
25	Twi (Unit water inlet temperature)	26	System pressure sensor
27	PRO-L (Low pressure switch)	28	Th (System suction temperature)
29	SV4 (Fast oil return solenoid valve)	30	Capillary
31	Filter		

8.4.2 diagram of HTW-MCSU60RN1L

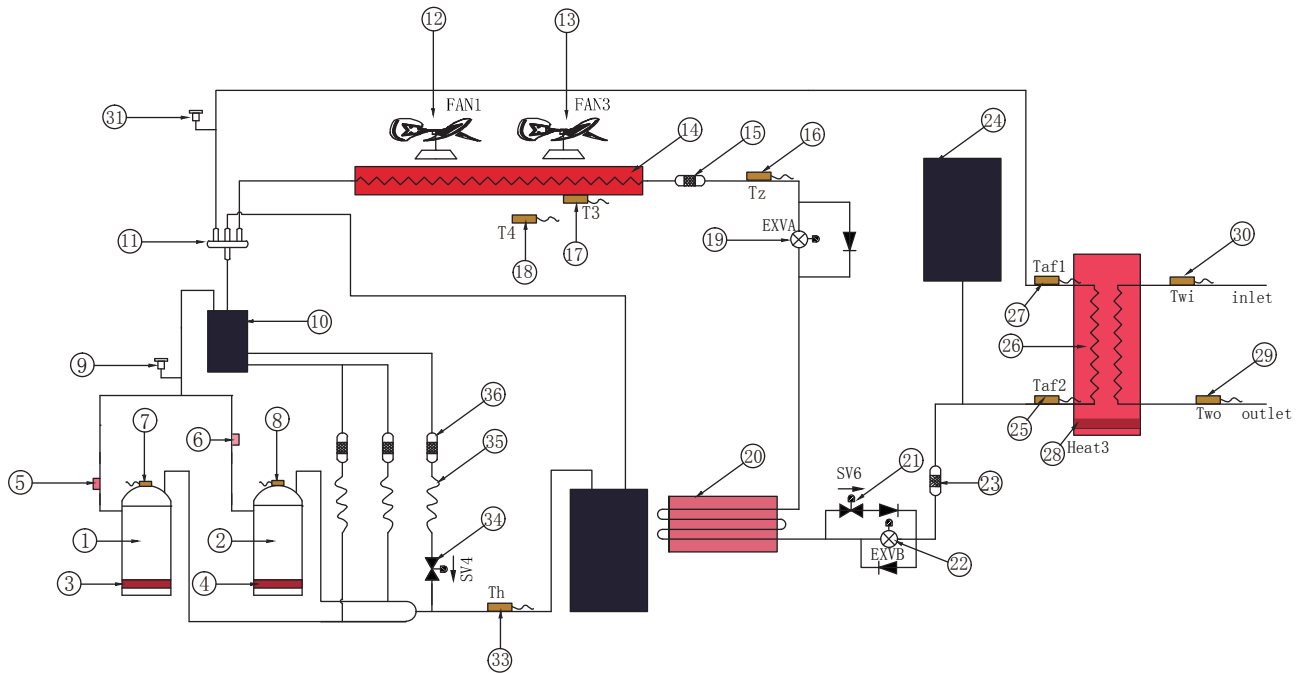


Fig.8-17 HTW-MCSU60RN1L piping diagram

Table 8-2

Legend			
1	Compressor1	2	Compressor2
3	CCHA (Crankcase heater A)	4	CCHB (Crankcase heater B)
5	Switch_TpA (Discharge temperature control switch A)	6	Switch_TpB (Discharge temperature control switch B)
7	Tp1 (DC inverter compressor 1 discharge temperature)	8	Tp2 (DC inverter compressor 2 discharge temperature)
9	PRO-H (High pressure switch)	10	Oil seperator
11	4-way-valve	12	FAN1
13	FAN2	14	Condenser
15	Filter	16	TZ (coil final outlet temperature)
17	T3 (coiloutlet temperature)	18	T4 (Outdoor ambient temperature)
19	EXVA (System electronic expansion valve 1)	20	Unit for cooling electronic control board
21	SV6 (Liquid side bypass solenoid valve)	22	EXVB (System electronic expansion valve 2)
23	Filter	24	High pressure tank
25	Taf2 (Water side antifreeze temperature)	26	Plate heat exchanger
27	Taf1 (Water side antifreeze temperature)	28	Antifreeze heater of plate heat exchanger
29	Two (Unit water outlet temperature)	30	Twi (Unit water inlet temperature)
31	System pressure sensor	32	PRO-L (Low pressure switch)
33	Th (System suction temperature)	34	SV4 (Fast oil return solenoid valve)
35	Capillary	36	Filter

8.4.3 diagram of HTW-MCSU90RN1L

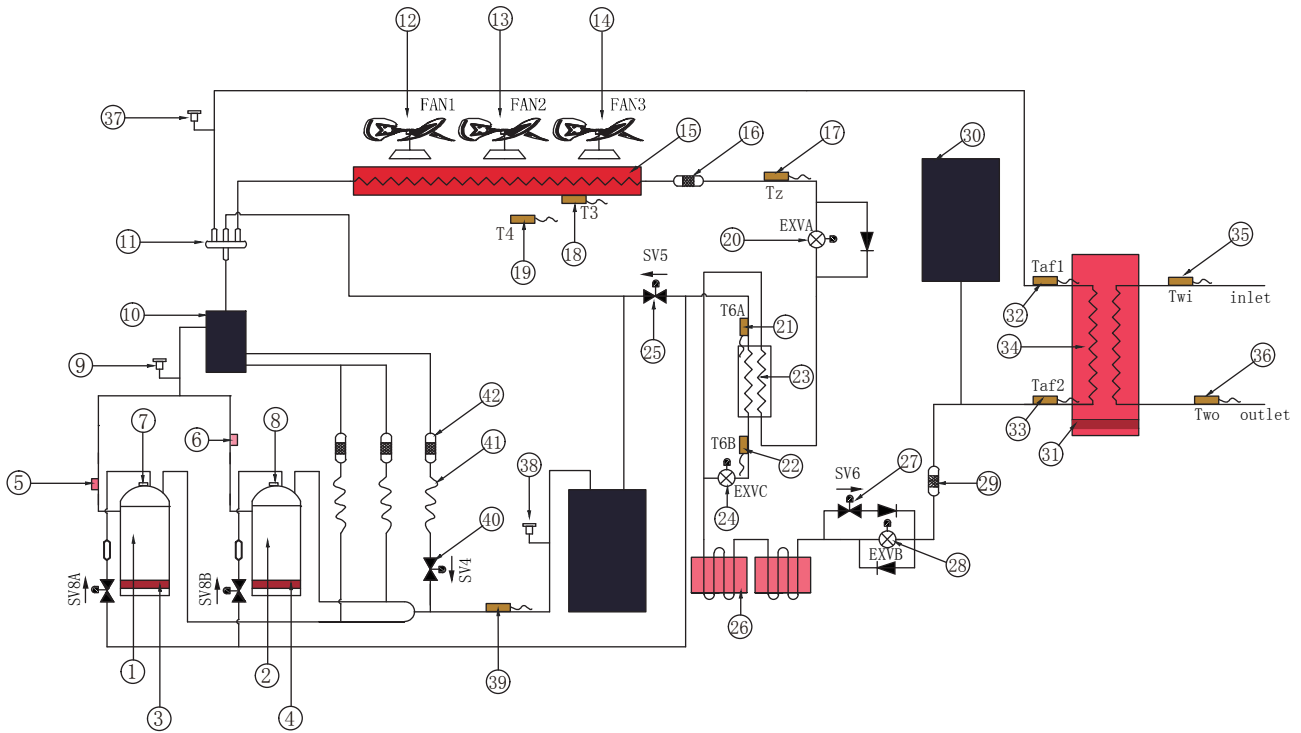


Fig.8-18 HTW-MCSU90RN1L piping diagram

Table 8-3

Legend			
1	Compressor1	2	Compressor2
3	CCHA (Crankcase heater A)	4	CCHB (Crankcase heater B)
5	Switch_TpA (Discharge temperature control switch A)	6	Switch_TpB (Discharge temperature control switch B)
7	Tp1 (DC inverter compressor 1 discharge temperature)	8	Tp2 (DC inverter compressor 2 discharge temperature)
9	PRO-H (High pressure switch)	10	Oil seperator
11	4-way-valve	12	FAN1
13	FAN2	14	FAN3
15	Condenser	16	Filter
17	TZ (coil final outlet temperature)	18	T3 (coiloutlet temperature)
19	T4 (Outdoor ambient temperature)	20	EXVA (System electronic expansion valve 1)
21	T6B (Refrigerant outlet temperature ofEVI plate heat exchanger)	22	T6A (Refrigerant inlet temperature ofEVI plate heat exchanger)
23	economizer	24	EXVC (EVI electronic expansion valve)
25	SV5 (Multifunctional solenoid valve)	26	Unit for cooling electronic control board
27	SV6 (Liquid side bypass solenoid valve)	28	EXVB (System electronic expansion valve 2)
29	Filter	30	High pressure tank
31	Antifreeze heater of plate heat exchanger	32	Taf1 (Water side antifreeze temperature)
33	Taf2 (Water side antifreeze temperature)	34	Plate heat exchanger
35	Two (Unit water outlet temperature)	36	Twi (Unit water inlet temperature)
37	System pressure sensor	38	PRO-L (Low pressure switch)
39	Th (System suction temperature)	40	SV4 (Fast oil return solenoid valve)
41	Capillary	42	Filter

8.5 Outdoor unit PCBs

8.5.1 MAIN PCB

Label descriptions are given in Table 8-4

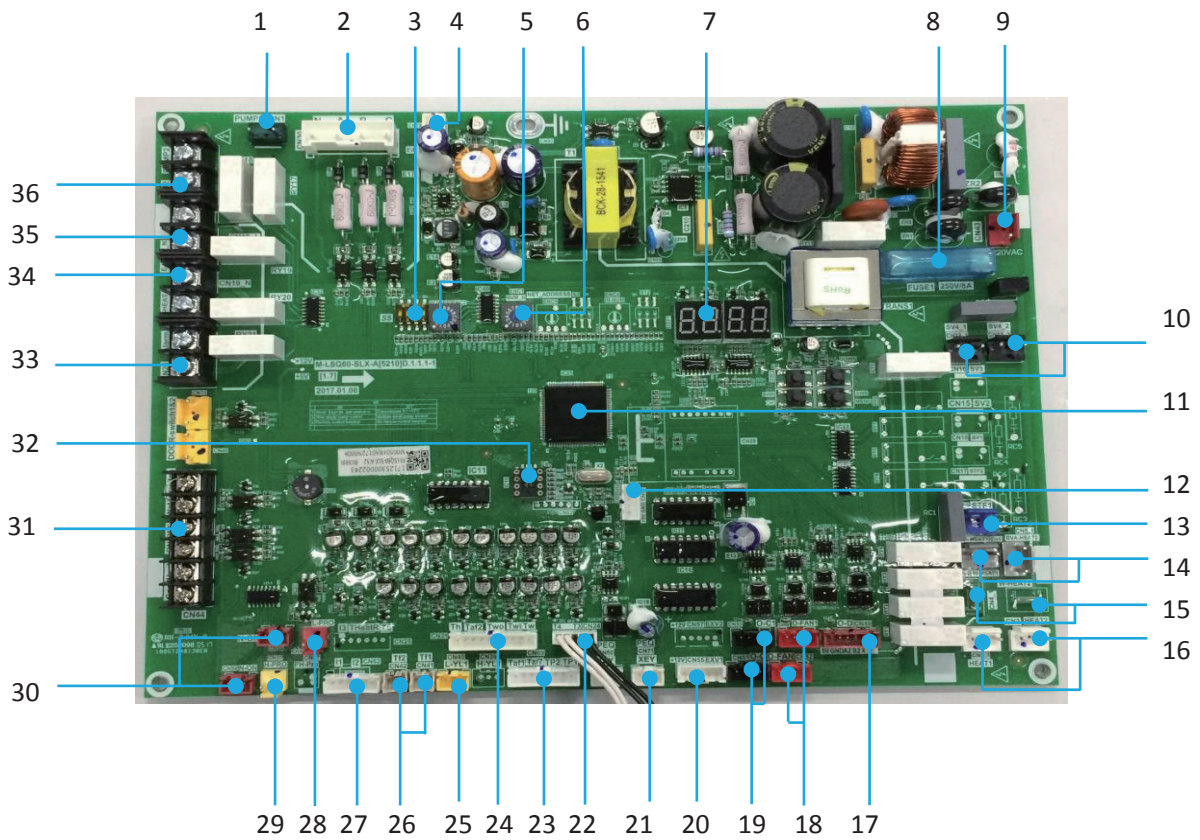


Figure 8-19 Main PCB of HTW-MCSU30RN1L and HTW-MCSU60RN1L

Table 8-4

No.	Content
1	CN1: Pump 1 connection
2	CN30: Power sequence detection connection
3	S5: DIP switches
4	CN72: Power supply to user interface
5	ENC1: Unit capacity dial switch

6	ENC3: Address dial switch
7	DSP1: Digital display
8	FUS1:Fuse
9	CN43: Power input
10	CN12_1,CN12_2: Solenoid valve (SV4) drive ports
11	IC25: Main control chip
12	CN64: Debug port
13	CN16: Four-way valve drive port
14	CN5,CN5_1: Water side heat exchanger heaters connection
15	CN4,CN4_1: Water flow switch heater connection
16	CN3,CN3_1: Compressor crankcase heater connections
17	CN49: Reserved communication port
18	CN52,CN53: Fan inverter module communication ports
19	CN50,CN51: Compressor inverter module communication ports
20	CN55: EXV drive port
21	CN60,CN71: Wired controller communication ports
22	CN24: Outdoor ambient temperature sensor and air side heat exchanger refrigerant outlet temperature sensor connections
23	CN69: Water side heat exchanger anti-freezing temperature sensor1, air side heat exchanger refrigerant total outlet temperature sensor, discharge temperature sensor 2 and discharge temperature sensor 1 connections
24	CN31: Air suction temperature sensor , water side heat exchanger anti-freezing temperature sensor 2, water side heat exchanger water outlet temperature sensor, water side heat exchanger water inlet temperature sensor and combined water outlet temperature sensor connections
25	CN40: Pressure sensor connection
26	CN41,CN42: Inverter module temperature sensor 1 and Inverter module temperature sensor 2 connections
27	CN62: AC indicator A and AC indicator B connections
28	CN65:Low pressure switch connection
29	CN47:High pressure switch and discharge temperature switch (es) connections
30	CN58,CN59: AC filter board communication ports
31	CN44:Water flow switch, additional control and Cool/heat connections.
32	IC10: EEPROM
33	CN21: Remote alarm connection
34	CN19_N: Electric auxiliary heater N line connection
35	CN19_L: Electric auxiliary heater N line connection
36	CN2: Pump 2 connection

Label descriptions are given in Table 8-5

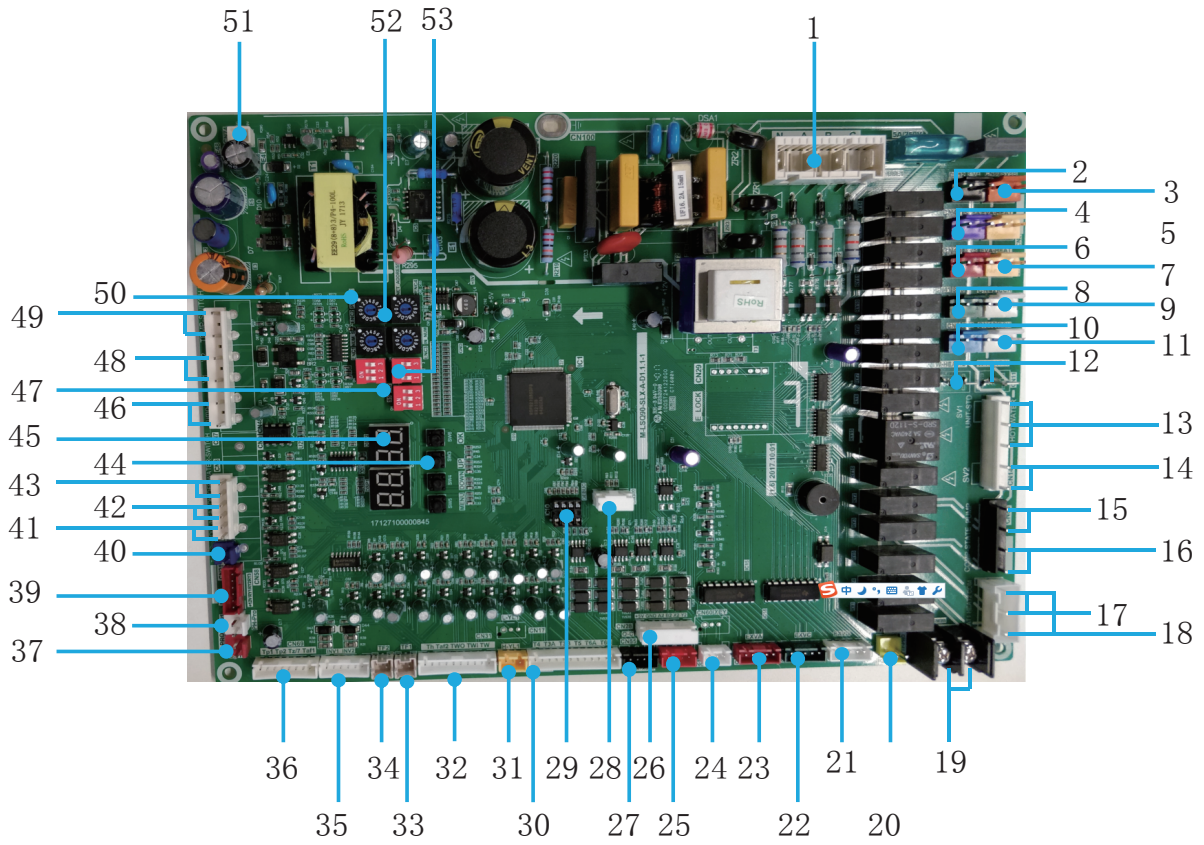


Figure 8-20 Main PCB of HTW-MCSU90RN1L

Table 8-5

No.	Detail information
1	CN30: Input of three-phase four-wire power supply (fault code E1) Input of transformer, 220-240V AC current. (only valid for the main unit) Three phases A, B and C of power supply should exist simultaneously, and the difference of phase angle should be 120° among them. If the conditions are not met, fault of phase sequence or phase lack may occur, and fault code will be displayed. When the power supply returns to normal condition, fault is removed. Attention: phase lacement and phase dislocation of power supply are detected only in the early period after the power supply is connected, and they are not detected while the unit is in operation.
2	CN12:Quick return oil solenoid valve
3	CN80:Injection solenoid valve of compressor system B
4	CN47:Injection solenoid valve of compressor system A
5	CN5:Electric heating belt for plate heat exchanger
6	CN40:Multi-function solenoid valve
7	CN13:Electric heating belt for plate heat exchanger
8	CN41:Liquid bypass solenoid valve
9	CN42:Crankcase heater
10	CN6:Four-way valve
11	CN43:Crankcase heater
12	CN4/CN11:Electric heater of water flow switch
13	CN14:Three-way valve(hot-water valve)
14	CN14:Two-way valve(not used)
15	CN83:Pump 1) After receiving start-up instruction, the pump will be started up instantly, and will maintain start-up state always in the process of operation. 2) In case of refrigerating or heating shutdown, the pump will be shut down 2 minutes after all modules stop operating. 3) In case of shutdown under the pump mode, the pump can be directly shut down.
16	CN83:COMP-STATE,connect with an ac light to indicate the state of the compressor Attention: the control port value of the pump actually detected is ON/OFF but not 220-230V control power supply, so special attention should be paid when installing the light.

No.	Detail information
17	CN2:HEAT2.Water Tank Auxiliary Heater Attention: the control port value of the pump actually detected is ON/OFF but not 220-230V control power supply, so special attention should be paid when installing the water tank auxiliary heater.
18	CN2:HEAT1.Pipeline Auxiliary Heater Attention: the control port value of the pump actually detected is ON/OFF but not 220-230V control power supply, so special attention should be paid when installing the pipeline auxiliary heater.
19	CN85: The alarm signal output of the unit(ON/OFF signal) Attention: the control port value of the pump actually detected is ON/OFF but not 220-230V control power supply, so special attention should be paid when installing the alarm signal output.
20	discharge temperature switch protection (protection code P0,provent the compressor from over temperature 115 C)
21	CN71:System electronic expansion valve2.Used for cooling.
22	CN72:EVI electronic expansion valve.Used for EVI.
23	CN70:System electronic expansion valve1.Used for heating.
24	CN61:signal communication port (fault code E2)
25	CN64:Outdoor fan , controlled by T4.Fan system drive boards communication port. Fault code 1PP:Fan system A IPM module communication failure. Fault code 2PP:Fan system B IPM module communication failure. Fault code 3PP:Fan system C IPM mokule communication failure.
26	CN28:Modelbus communication port
27	CN64:Compressor system drive boards communication port. Fault code 1F0:Compressor system A IPM module communication failure. Fault code 2F0:Compressor system B IPM module communication failure.
28	CN300:Program burn in port(WizPro200RS programming device).
29	IC10: Parameter chip
30	CN1:temperature sensors input port. T4: outdoor ambient temperature sensor (10kΩ corresponds to 25°C, B=4100) T3A/T3B:pipe temperature sensor of the condenser (10kΩ corresponds to 25°C, B=4100) T5:wtater tank temperature sensor (17kΩ corresponds to 50°C) T6A:Refrigerant inlet temperature of EVI plate heat exchanger(10kΩ corresponds to 25°C, B=4100) T6B:Refrigerant inlet temperature of EVI plate heat exchanger(10kΩ corresponds to 25°C, B=4100)
31	CN1:System pressure sensor(fault code Fb)

No.	Detail information
32	CN31:Temperature sensors input port Th:System suction temperature sensor(10kΩ corresponds to 25°C, B=4100). Taf2:Water side antifreeze temperature sensor(10kΩ corresponds to 25°C, B=4100). Two:Unit water outlet temperature sensor(10kΩ corresponds to 25°C, B=4100). Twi:Unit water inlet temperature sensor(10kΩ corresponds to 25°C, B=4100). Tw:Total water outlet temperature sensor when several units are connected in parallel(10kΩ corresponds to 25°C, B=4100).
33	CN3:Module 1 temperature sensor(10kΩ corresponds to 25°C, B=4100).
34	CN10:Module 2 temperature sensor(10kΩ corresponds to 25°C, B=4100).
35	CN15:Detection of current of the compressor system input port INV1 : Detection of current of the compressor A (protection code P4) INV2 : Detection of current of the compressor B (protection code P5)
36	CN69:Temperature sensors input port Tp1:DC inverter compressor 1 discharge temperature sensor.(5kΩ corresponds to 90°C, B=3950) Tp2:DC inverter compressor 2 discharge temperature sensor.(5kΩ corresponds to 90°C, B=3950) Tz/7:coil final outlet temperature sensor.(10kΩ corresponds to 25°C, B=4100) Taf1:Water side antifreeze temperature.(10kΩ corresponds to 25°C, B=4100)
37	CN19:Low voltage protection switch.(Protection code P1)
38	CN91:Three-phase protector output switch.(Protection code E8)
39	CN58:Fan really driver port.
40	CN21:The thermostat switch.(not used)
41	CN8:Remote mode signal
42	CN8:Remote stop signal
43	CN8:Water flow switch signal
44	SW3:Up button a) Select different menus when enter menu selection. b) For sopt inspection in conditions. SW4:Down button a) Select different menus when enter menu selection. b) For sopt inspection in conditions. SW5:Menu button Press to enter menu selection, short press to return to the previous menu. SW6:OK button Enter the submenu or confirm the function selected by short pressing.
45	Numerical code tube 1) In case of stand-by, the address of the module is displayed; 2) In case of normal operation, 10. is displayed (10 is followed by dot). 3) In case of fault or protection, fault code or protection code is displayed.
46	CN7:Inverter water pump signal.(0-10VDC output)
47	S5:Dip switch S5-1/S5-2:Low static pressure mode, OFF of S5-1 and S5-2 are enabled(factory default). Middle static pressure mode, OFF of S5-1 and ON of S5-2 are enabled. High static pressure mode, ON of S5-1 and either of S5-2 are enabled. S5-3: No remote controll, OFF of S5-3 is enabled(factory default). Remote controll, ON of S5-3 is enabled
48	CN7:Demand restricted port.(0-10VDC input)

No.	Detail information
49	CN7:Target water temperature switching port.
50	ENC2:POWER DIP switch of outdoor unit capacity: 1, 60KW; 2, 90KW
51	CN74:The power supply port of the wired controller .(DC9V)
52	ENC4:NET_ADDRESS DIP switch 0-F of outdoor unit network address is enabled, which represent address 0-15
53	S12:Dip switch S12-1:ON of S12-1 is enable(factory default) S12-2:Single water pump controll, OFF of S12-2 is enabled(factory default) Multiple water pumps controll, ON of S12-2 is enabled S12-3:Outlet water temp. in normal cooling, OFF of S12-3 is enabled(factory default) Outlet water temp. in low temperature cooling, ON of S12-3 is enabled



CAUTION

1. Faults

When the main unit suffers faults, the main unit stops operating, and all other units also stop running;

When the subordinate unit suffers faults, only the unit stops operating, and other units are not affected.

2. Protection

When the main unit is under protection, only the unit stops operating, and other units keep running;

When the subordinate unit is under protection, only the unit stops operating, and other units are not affected.

8.6 Electric wiring

8.6.1 Electric wiring



CAUTION

1. The air-conditioner should apply special power supply, whose voltage should conform to rated voltage.
2. Wiring construction must be conducted by the professional technicians according to the labeling on the circuit diagram.
3. The power wire and the grounding wire must be connected the suitable terminals.
4. The power wire and the grounding wire must be fasten up by suitable tools.
5. The terminals connected the power wire and the grounding wire must be fully fastened and regularly checked, in case to become flexible.
6. Only use the electric components specified by our company, and require installation and technical services from the manufacturer or authorized dealer. If wiring connection fails to conform to electric installation norm, failure of the controller, electronic shock, and so on may be caused.
7. The connected fixed wires must be equipped with full switching-off devices with at least 3mm contact separation.
8. Set leakage protective devices according to the requirements of national technical standard about electric equipment.
9. After completing all wiring construction, conduct careful check before connecting the power supply.
10. Please carefully read the labels on the electric cabinet.
11. The user's attempt to repair the controller is prohibited, since improper repair may cause electric shock, damages to the controller, and so on. If the user has any requirement of repair, please contact the maintenance center.
12. The power cord type designation is H07RN-F.

8.6.2 Power supply specification

Table 8-6

Model	Item	Outdoor power supply			
		Power supply	Manual switch	Fuse	Wiring
HTW-MCSU30RN1L		380-415V 3N~50Hz	50A	36A	10mm ² (<20m)
HTW-MCSU60RN1L		380-415V 3N~50Hz	100A	70A	25mm ² (<20m)
HTW-MCSU90RN1L		380-415V 3N~50Hz	125A	100A	25mm ² (<20m)

8.6.3 Requirements of wiring connection

1. No additional control components are required in the electric cabinet (such as relay, and so on), and the power supply and control wires not connected with the electric cabinet are not allowed to go through the electric box. Otherwise, electromagnetic interference may cause failure of the unit and control components
2. All cables led to the electric box should be supported independently but by the electric box.
3. The strong current wires generally pass the electric box, and 220-230V alternating current may also pass the control board, so wiring connection should conform to the principle of separation of strong current and weak current, and the wires of power supply should be kept more than 100 mm away from the control wires.
4. All electric wires must conform to local wiring connection norm. The suitable cables should be connected to power supply terminal through wiring connection holes at the bottom of the electric cabinet. According to Chinese standard, the user is responsible for providing voltage and current protection for the input power supply of the unit.

5. All power supplies connected to the unit must pass one manual switch, to ensure that the voltages on all nodes of electric circuit of the unit are released when the switch is cut off.
6. The cables of correct specification must be used to supply power for the unit. The unit should use independent power supply, and the unit is not allowed to use the same power supply together with other electric devices, to avoid over-load danger. The fuse or manual switch of the power supply should be compatible with working voltage and current of the unit. In case of parallel connection of multiple modules, the requirements of wiring connection mode and configuration parameters for the unit are shown in the following figure.
7. Some connection ports in the electric box are switch signals, for which the user needs to provide power, and the rated voltage of the power should be 220-230VAC. The user must be aware that all power supplies they provided should be obtained through power circuit breakers (provided by the user), to ensure that all voltages on the nodes of the provided power supply circuit are released when the circuit breakers are cut off.
8. All inductive components provided by the user (such as coils of contactor, relay, and so on) must be suppressed with standard resistance-capacitance suppressors, to avoid electromagnetic interference, thus leading to failure of the unit and its controller and even damages to them.
9. All weak current wires led to the electric box must apply shielded wires, which must be provided with grounding wires. The shield wires and power supply wires should be laid separately, to avoid electromagnetic interference.
10. The unit must be provided with grounding wires, which are not allowed to be connected with the grounding wires of gas fuel pipelines, water pipelines, lightning conductors or telephones. Improper earth connection may cause electric shock, so please check whether earth connection of the unit is firm or not frequently.

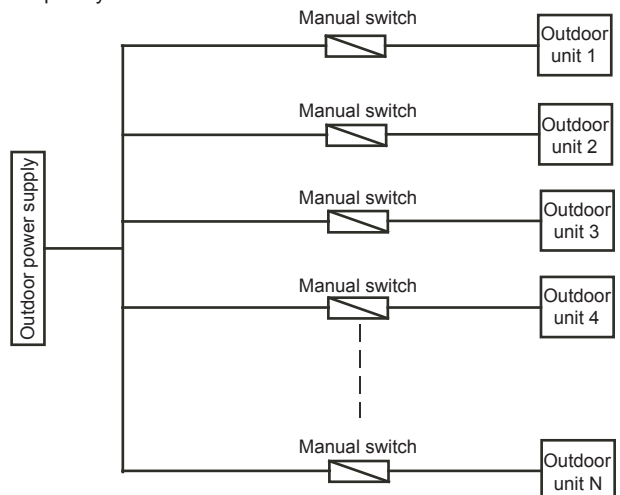


Figure 8-21



NOTE

Only 16 Modular units can be combined at most.

8.4 Wiring steps

- Step 1. Check the unit and ensure that it is connected with grounding wires correctly, to avoid leakage, and the grounding devices should be mounted in strict accordance with the requirements of electrical engineering rules. The grounding wires can prevent electric shock.
- Step 2. The control box of the main power switch must be mounted in a proper position.
- Step 3. Wiring connection holes of the main power should be provided with glue cushion.
- Step 4. The main power and neutral wires and grounding wires of power supply are led into the electric box of the unit.