Technical & Service Manual

R32 Split

Air to Water Heat Pump

Capacity	ODU models	Hydraulic module models
4kw	ACHP-H04/4R3HA-O	ACHP-H04/4R3HA-I
6kw	ACHP-H06/4R3HA-O	ACHP-H06/4R3HA-I
8kw	ACHP-H08/4R3HA-O	ACHP-H08/5R3HA-I
10kw	ACHP-H10/4R3HA-O	ACHP-H10/5R3HA-I
12kw	ACHP-H12/5R3HA-O	ACHP-H12/5R3HA-I
14kw	ACHP-H14/5R3HA-O	ACHP-H14/5R3HA-I
16kw	ACHP-H16/5R3HA-O	ACHP-H16/5R3HA-I

Version 3

2022-08-15

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Part1 General information

1. Nomenclature

Outdoor Unit

1	2	3	4		5	6	7		8	9	10	11	12		13
A	C	H	P	-	H	0	4	/	4	R	3	H	A	-	O

NOTE:

1、A: AUX

2、C:chiller

3、H: heat

4、P: pump

5、H: cooling and heating

6-7、capacity：04:4kW; 06:6kW; 08:8kW; 10:10kW; 12:12kW; 14:14kW; 16:16kW;

8、power supply：4：220V-240V-1N~50Hz；5：380V-415V-3N~50Hz

9-10、R3：R32

11、H：high efficiency

12、A: design number

13、O：outdoor unit

hydraulic module

1	2	3	4		5	6	7		8	9	10	11	12		13
A	C	H	P	-	H	0	4	/	4	R	3	H	A	-	O

NOTE:

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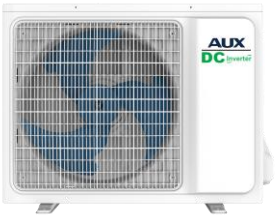
9-10、R3：R32

11、H：high efficiency

12、A: design number

13、I：indoor unit

2. Unit appearance

Capacity	Outdoor unit		hydraulic module	
	Model	Appearance	Model	Appearance
4kW	ACHP-H04/4R3HA-O		ACHP-H04/4R3HA-I	
6kW	ACHP-H06/4R3HA-O		ACHP-H06/4R3HA-I	
8kW	ACHP-H08/4R3HA-O		ACHP-H08/5R3HA-I	
10kW	ACHP-H10/4R3HA-O		ACHP-H10/5R3HA-I	
12kW	ACHP-H12/5R3HA-O		ACHP-H12/5R3HA-I	
14kW	ACHP-H14/5R3HA-O		ACHP-H14/5R3HA-I	
16kW	ACHP-H16/5R3HA-O		ACHP-H16/5R3HA-I	

3. Product line

Capacity	Outdoor unit models	hydraulic module models	Power supply(V)
4KW	ACHP-H04/4R3HA-O	ACHP-H04/4R3HA-I	220V-240V-1N~50Hz
6KW	ACHP-H06/4R3HA-O	ACHP-H06/4R3HA-I	
8KW	ACHP-H08/4R3HA-O	ACHP-H08/5R3HA-I	ODU: 220V-240V-1N~50Hz IDU : 380V-415V-3N~50Hz
10KW	ACHP-H10/4R3HA-O	ACHP-H10/5R3HA-I	
12KW	ACHP-H12/5R3HA-O	ACHP-H12/5R3HA-I	380V-415V-3N~50Hz
14KW	ACHP-H14/5R3HA-O	ACHP-H14/5R3HA-I	
16KW	ACHP-H16/5R3HA-O	ACHP-H16/5R3HA-I	

4. Selection and System Design

4.1 Selection procedure

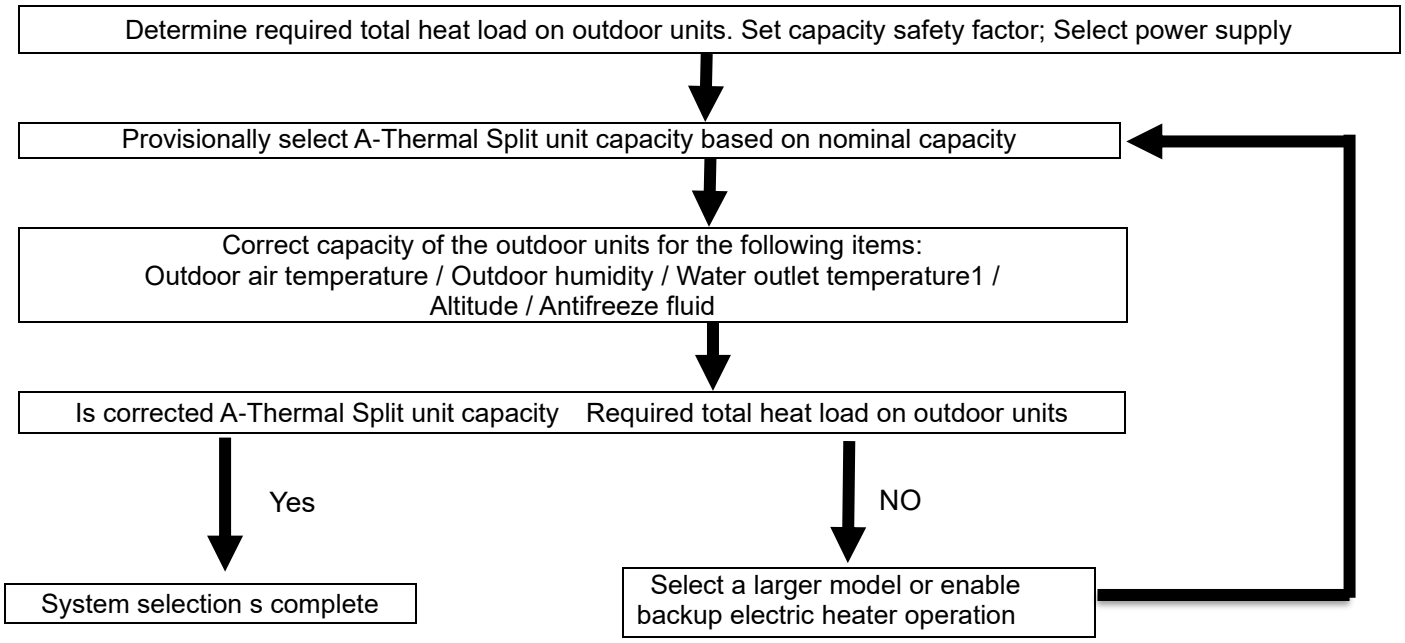
Step 1 Total heat load calculation

Calculate conditioned surface area Select the heat emitters (type, quantity, water temperature and heat load)

Step 2 System configuration

Decide whether to include AHS (auxiliary heat source) and set AHS switching temperature Decide whether backup electric heater is enabled or disabled

Step3Selection of outdoor units



Notes:

1. If the required water temperatures of the heat emitters are not all the same, the A-Thermal Splits outlet water temperature setting should be set at the highest of the heat emitter required water temperatures. If the water outlet design temperature falls between two temperatures listed in the outdoor unit's capacity table, calculate the corrected capacity by interpolation.
2. If the outdoor unit selection is to be based on total heating load and total cooling load, select Split units which satisfy not only the total heating load requirements but also the total cooling load requirements.

4.2 Leaving Water Temperature (LWT) Selection

The recommended design LWT ranges for different types of heat emitter are

- For floor heating: 30 to 35℃
- For fan coil units: 30 to 45℃
- For radiators: 40 to 50℃

The recommended design LWT ranges for different type of cooling emitter are

- For fan coil units: 7 to 18℃
- For floor cooling: 18 to 25℃

The recommended design water tank temperature for domestic hot water

- Water tank: 50 to 55℃

4.3 Selection of water tank(Procured locally by customers

Capacity(kW)	4-6kW	8-10kW	12~16kW
Water Tank Volume (L)	100~250	150~300	200~500
Minimum heat exchange area of Stainless steel coil (㎡)	1.4	1.4	1.6
Minimum heat exchange area of enamel coil (㎡)	2.0	2.0	2.5

4.4 Selection of water pump(Procured locally by customers)

Type	Recommended Brand	Recommended model
External circulation pump	grundfos	UPMM25-95
	wilo	Para25/9
Floor heating mixing water pump	grundfos	UPMM25-95
	wilo	Para25/9
DHW water pump	wilo	RS15/6
solar water pump	wilo	Para25/8

4.5 Optimizing System Design

To get the most comfort with the lowest energy consumption with A-Thermal, it is important to take account of the

following considerations:

- Choose heat emitters that allow the heat pump system to operate at as low a hot water temperature as possible whilst still providing sufficient heating.
- Make sure the correct weather dependency curve is selected to match the installation environment (building structure, climate) as well as users demands.
- Connecting room thermostats (field supplied) to the hydraulic system helps prevent excessive space heating by stopping the outdoor unit and circulating pump when the room temperature is above the thermostat set point

Part2 Features

1. Heating + Cooling +Domestic hot water

2. DC INVERTER Technology, High Energy Efficient

Full DC INVERTER system, INVERTER compressor + DC external fan + INVERTER water pump. Leading in the energy efficiency industry, the highest SCOP=5.2(A+++), far exceeding the EU energy efficiency standard by 14.4%

3. Wide ambient temperature and water temperature operation ranges

4. Floating water temperature control more comfort

Changes in outdoor air temperature, changes in heat required indoors, But fix water temperature, provide constant heat, overheating, waste

5. Long piping length

Maximum piping length for outdoor unit and hydraulic module -- 30m, see amend table below

Minimum piping length for outdoor unit and hydraulic module -- 3m

Maximum piping height difference for outdoor unit and hydraulic module -- 20m

When the water tank is connected,

Maximum length between the 3-way valve and hydraulic module -- 3m

Maximum length between the water tank and hydraulic module -- 10m

single connection pipe(m)			amend factor					
			5	10	15	20	25	30
height difference between the hydraulic module and ODU	hydraulic module above the ODU	0m	1	0.98	0.96	0.94	0.92	0.9
		5m	-	0.97	0.95	0.93	0.91	0.89
		10m	-	-	0.94	0.92	0.9	0.88
		15m	-	-	-	0.91	0.89	0.87
		20m	-	-	-	-	0.88	0.86
	hydraulic module under the ODU	0m	1	0.98	0.96	0.94	0.92	0.9
		5m	-	0.98	0.96	0.94	0.92	0.9
		10m	-	-	0.96	0.94	0.92	0.9
		15m	-	-	-	0.94	0.92	0.9
		20m	-	-	-	-	0.92	0.9

Note:

1) It is recommended that the single pipe length of the connecting pipe should not exceed 30m.

2) When the single pipe length of the connecting pipe exceeds 30m, it may affect the performance of the unit.so It is not recommended that the single pipe length exceeds 30m.

6. Backup electric heating

7. Sterilization function

8. User interface

New type touch key wired controller; Real-time check of operating parameters

Built-in temperature sensor; Built-in WIFI module; Multiple languages

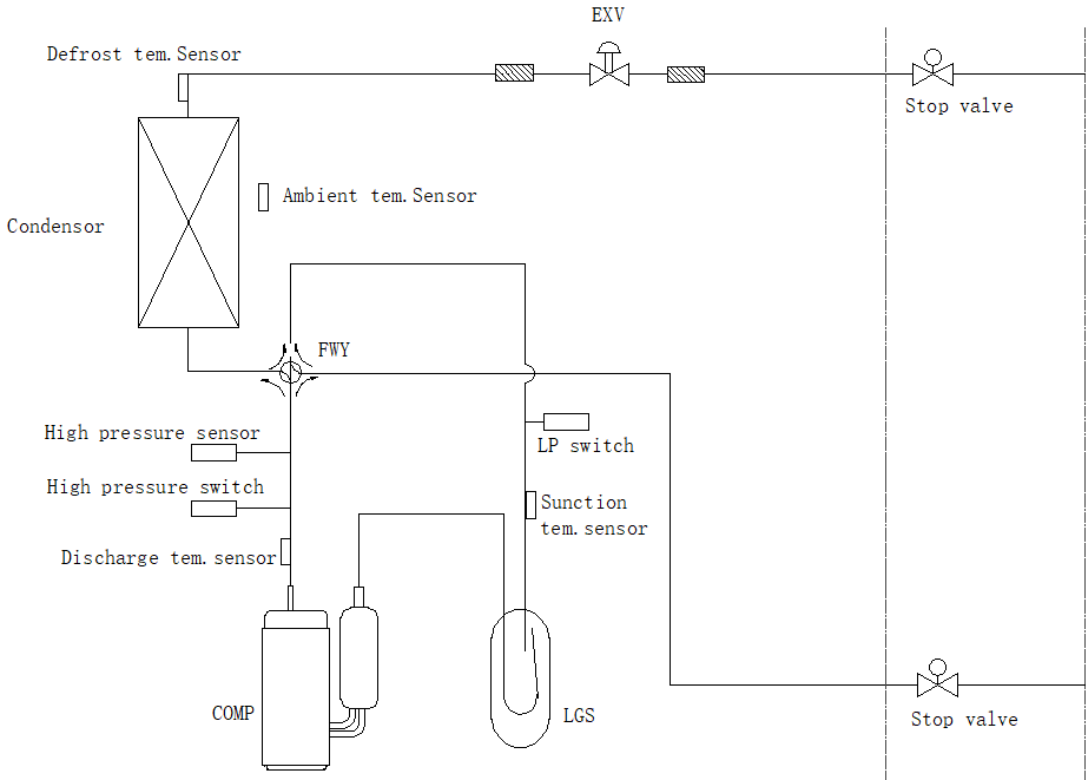
MODBUS protocol and network flexibility, etc.

Note：for more information，please refer to the product introduction PPT

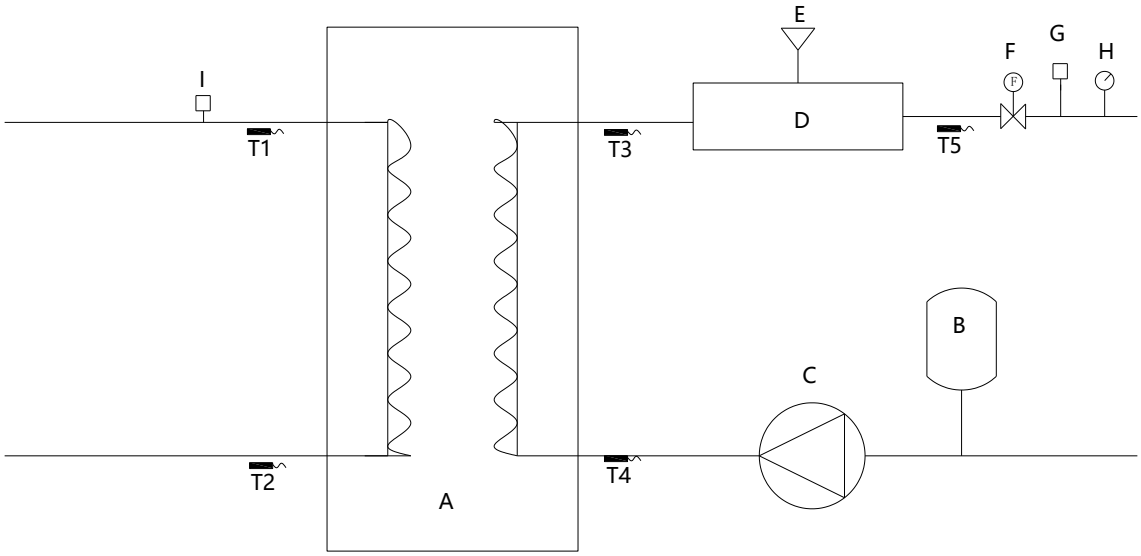
Part3 Piping System

1 Piping diagram

1.1 Outdoor Unit

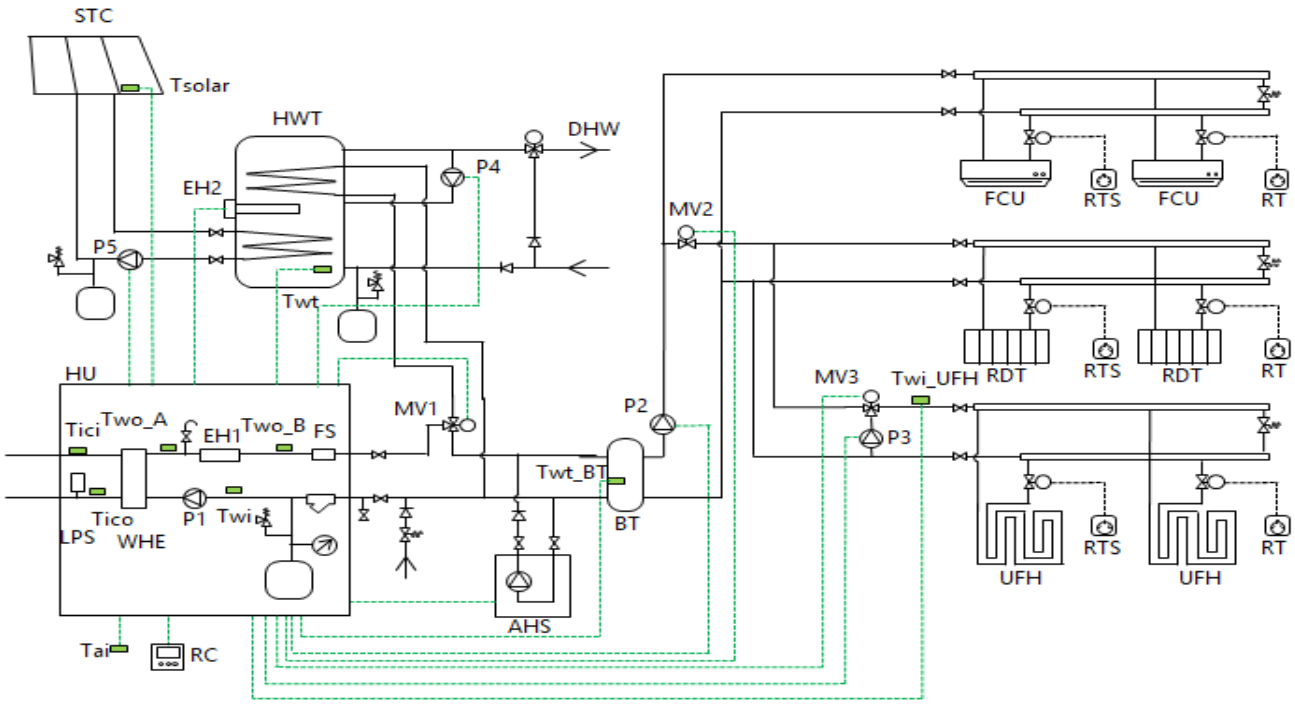


1.2 Hydraulic module



A	Plate heat exchanger(PHE)	H	Pressure gauge
B	Expansion tank	T1	Gas pipe Temp.sensor
C	Inverter water pump	T2	Liquid pipe Temp.sensor
D	E-heater	T3	PHE outlet Temp.sensor
E	Discharge valve	T4	PHE inlet Temp.sensor
F	Flow switch	T5	Hydronic box outlet Temp.sensor
G	Safty valve	I	Anti-freeze pressure switch

1.3 A-Thermal system



Tsolar	Solar panel temp. sensor	**MV3**	Three-way valve
Twt	Temperature of domestic hot water tank	**EH1**	E-heater in hydraulic module
Tici	Plate heater liquid temp. sensor	**EH2**	E-heater in tank
Tico	Plate heater gas temp. sensor	**LPS**	Antifreeze low pressure switch
Tai	Room temp. sensor (reserved spot)	**FS**	Float switch
Two_A	Plate heater outlet temp. sensor	**RC**	Wired controller
Two_B	hydraulic module outlet temp. sensor	**HU**	hydraulic module
Twi	hydraulic module inlet temp. sensor	**WHE**	Plate heater exchange
Twt_BT	Balance tank temp. sensor (reserved spot)	**HWT**	Domestic hot water tank

Twi_UFH	Floor heating inlet temp. sensor	**STC**	Solar panels
P1	Water pump for hydraulic module	**AHS**	auxiliary heat source (Gas boiler)
P2	Water pump for outside	**BT**	Balance tank
P3	Water pump for floor heating	**UFH**	Floor heating
P4	Water pump for hot water tank	**RDT**	Heating radiator
P5	Water pump for Solar	**FCU**	Fan coil unit
MV1	Three way valve	**RTS**	Room thermostat
MV2	Two way valve		

R32 Split Type Air Source heat pump unit is an integrated air to water system which can supply heating, cooling and domestic hot water. The outdoor heat pump system extracts heat from the outdoor air and transfers this heat through refrigerant piping to the plate heater exchange in the hydraulic module. The heated water in the hydraulic module circulates to low temperature heat emitters (underfloor heating loops or low temperature radiators) to provide heating, and to the domestic hot water tank to provide domestic hot water. The 4way valve in the outdoor unit can reverse the refrigerant cycle so that the hydraulic module can provide chilled water for cooling using fan coil units

The heating capacity decreases under low ambient temperature. Backup electric heater is optional to provide additional heating capacity for user during extremely cold weather when the heat pump capacity is insufficient.

2.System Configurations

R32 Split Type Air Source heat pump unit can be configured to run with the electric heater either enabled or disabled and can also be used in conjunction with an auxiliary heat source such as a boiler.

The chosen configuration affects the size of heat pump that is required. Three typical configurations are described below.

Configuration 1: Heat pump only

- The heat pump covers the required capacity and no extra heating capacity is necessary.
- Requires selection of larger capacity heat pump and implies higher initial investment.
- Ideal for new construction in projects where energy efficiency is paramount

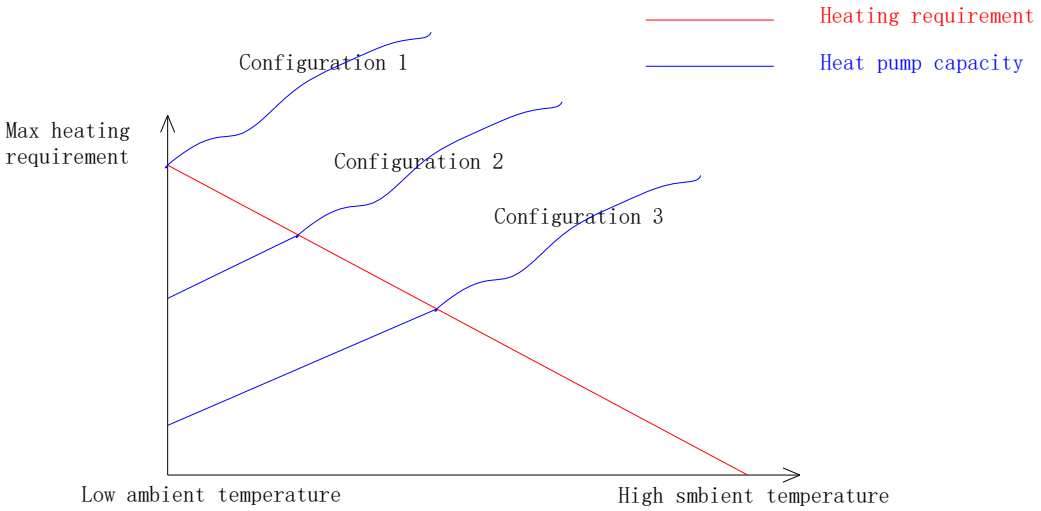
Configuration 2: Heat pump and backup electric heater

- Heat pump covers the required capacity until the ambient temperature drops below the point at which the heat pump is able to provide sufficient capacity. When the ambient temperature is below this equilibrium point, the backup electric heater supplies the required additional heating capacity
- Best balance between initial investment and running costs, results in lowest life cycle cost
- Ideal for new construction.

Configuration 3:Heat pump conjunction with auxiliary heat source

- Heat pump covers the required capacity until the ambient temperature drops below the point at which the heat pump is able to provide sufficient capacity. When the ambient temperature is below this equilibrium point, depending on the system settings, either the auxiliary heat source supplies the required additional heating capacity or the heat pump does not run and the auxiliary heat source covers the required capacity.
- Enables selection of lower capacity heat pump.
- Ideal for refurbishments and upgrades.

System configurations

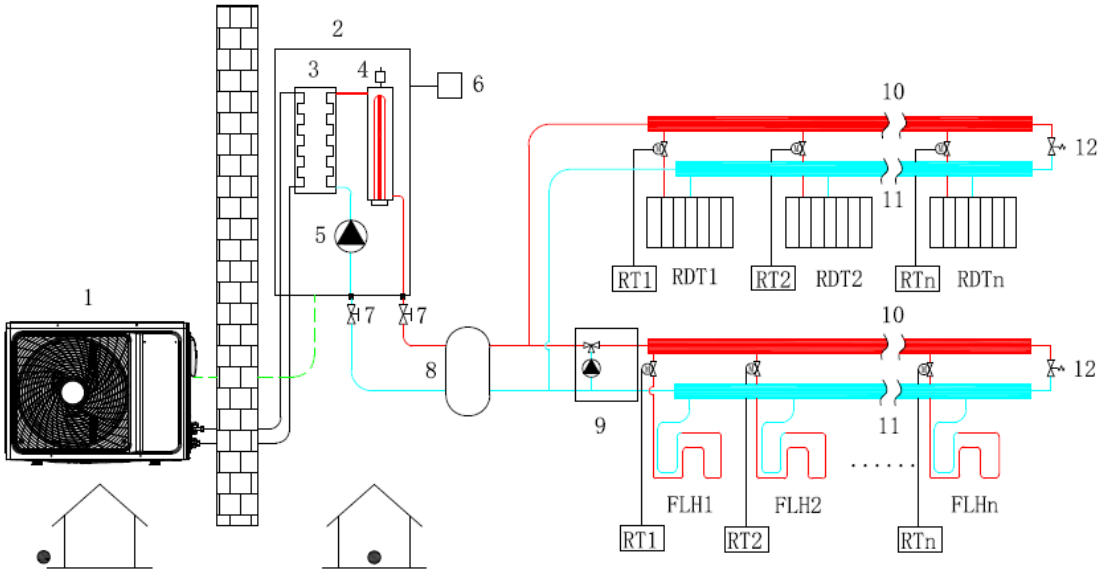


3. Typical Applications

3.1 Space Heating Only

The room thermostat is used as a switch. When there is a heating request from the room thermostat, the unit operates to achieve the target water temperature set on the Wired controller. When the room temperature reaches the thermostats set temperature, the unit stops.

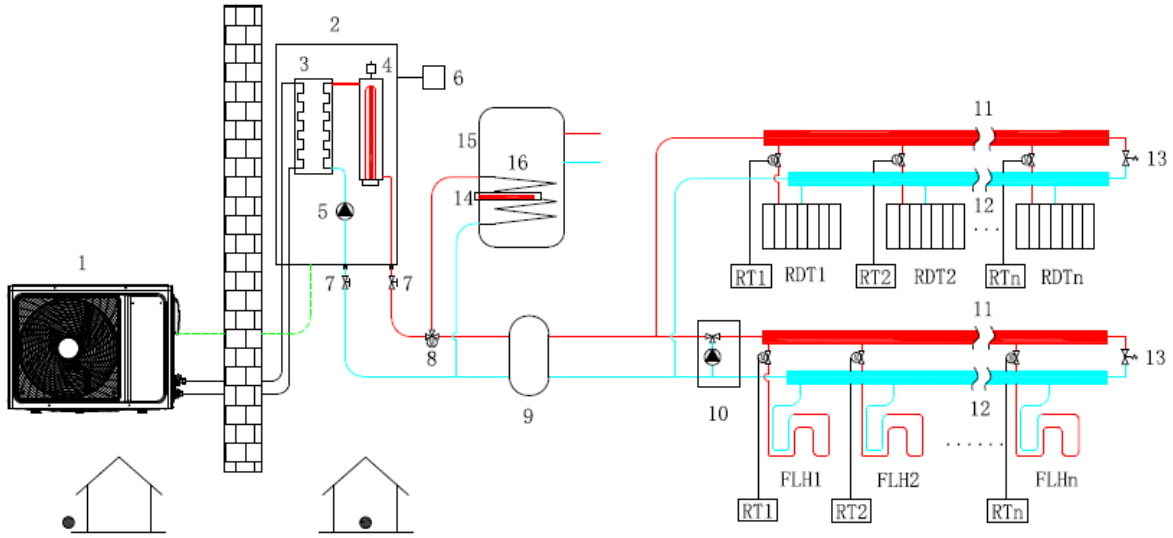
When the heating terminal uses floor heating and Heating radiator at the same time, the two ends of the floor heating and low temperature radiator require different working water temperatures. In order to meet these two different working water temperatures at the same time, it is necessary to install a mixing valve and a mixing water pump at the inlet and outlet of the floor heating , The outlet water temperature of the unit is set to the water temperature required by the heating radiator, and the water mixing valve and water mixing pump are set to reduce the inlet water temperature of the floor heating.



REMARK			
1	Outdoor unit	9	Mixing valve and mixing water pump
2	hydraulic module	10	Distributor
3	Plate heater exchange	11	Collector
4	Backup electric heater(optional)	12	Bypass valve
5	Internal circulating pump	RDT	Heating radiator
6	Wired controller	FLH	Floor heating loops
7	Stop valve (local)	RT	Room thermostats
8	Balance water tank		

3.2 Space Heating and Domestic Hot Water

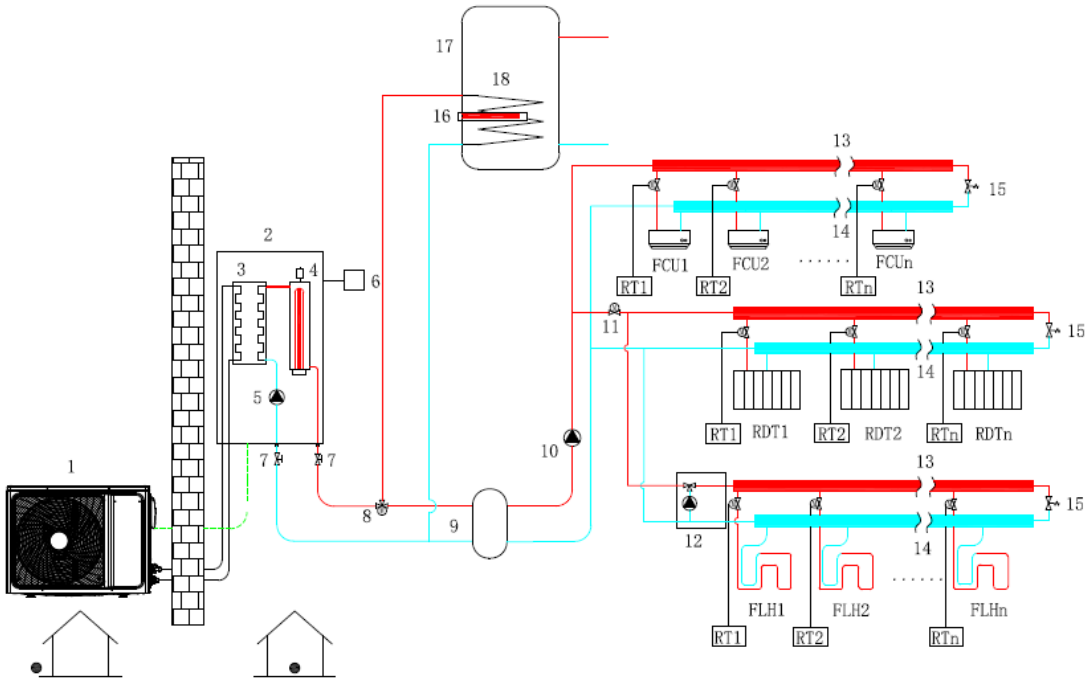
The room thermostats also can connect to a motorized valve. Each rooms temperature is regulated by the motorized valve on its water circuit. Domestic hot water is supplied from the domestic hot water tank connected to the hydraulic module. The water tank should built in a temperature sensor which connect to the hydraulic module. A bypass valve is required



REMARK			
1	Outdoor unit	11	Distributor
2	hydraulic module	12	Collector
3	Plate heater exchange	13	Bypass valve
4	Backup electric heater	14	Electric heating
5	Internal circulating pump	15	Domestic hot water tank
6	Wired controller	16	Coil in the water tank
7	Stop valve (field supplied)	RDT	Heating Radiator
8	Motorized 3way valve	FLH	Floor heating loops
9	Balance water tank	RT	Room thermostats
10	Mixing valve and mixing water pump		

3.3 Space Heating, Space Cooling and Domestic Hot Water

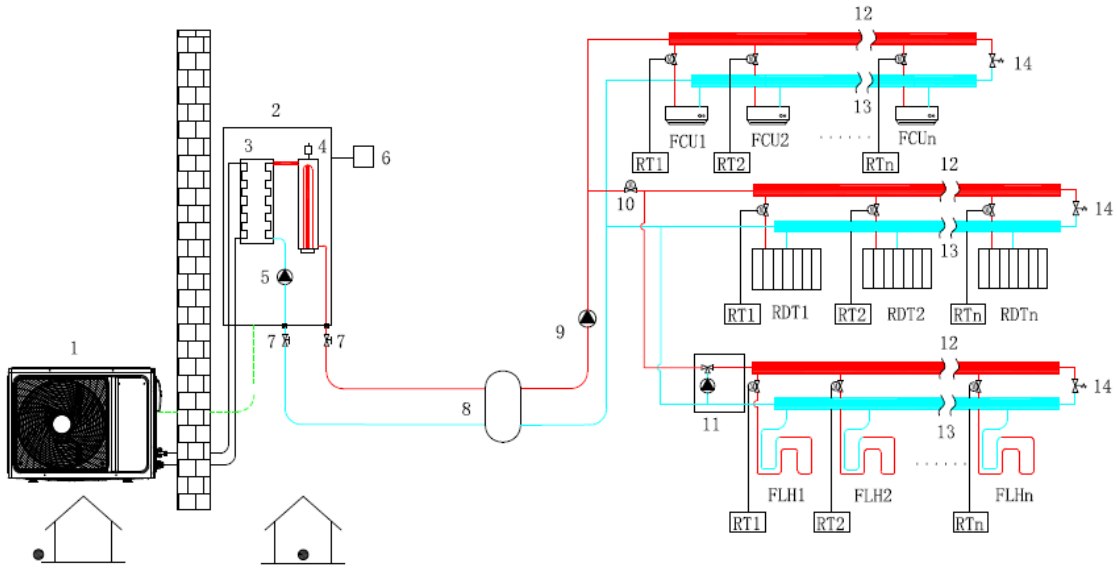
Floor heating loops & Heating radiator & Fan coil units are used for space heating , fan coil units are used for space cooling. Domestic hot water is supplied from the domestic hot water tank connected to the hydraulic module. The unit switches to heating or cooling mode according to the temperature detected by the room thermostat. In space cooling mode, the 2way valve is closed to prevent cold water entering the floor heating loops & Heating radiator.



REMARK			
1	Outdoor unit	12	Mixing valve and mixing water pump
2	hydraulic module	13	Distributor
3	Plate heater exchange	14	Distributor
4	Backup electric heater(optional)	15	Bypass valve
5	Internal circulating pump	16	Electric heating
6	Wired controller	17	Domestic hot water tank
7	Stop valve	18	Coil in the water tank
8	Motorized 3way valve	RDT	Heating Radiator
9	Balance water tank	FLH	Floor heating loops
10	External circulation pump	FCU	Fan coil units
11	Two way valve	RT	Room thermostats

3.4 Space Heating and Space Cooling

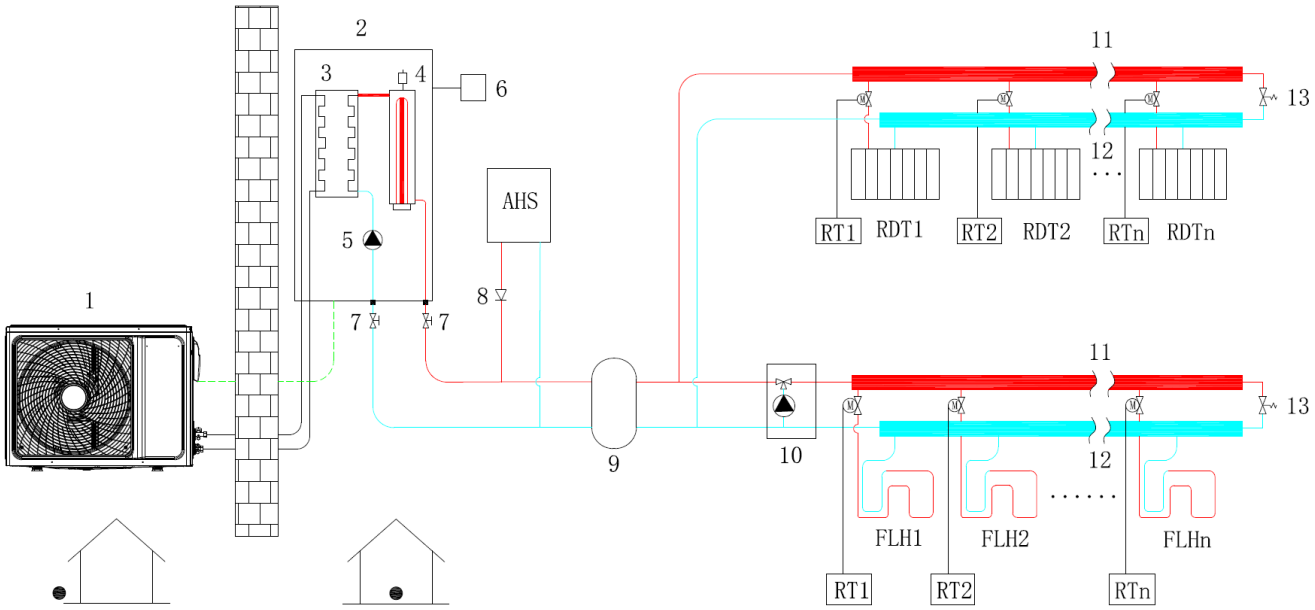
Floor heating loops & Heating radiator & fan coil units are used for space heating , fan coil units are used for space cooling. In space cooling mode, the 2way valve is closed to prevent cold water entering the floor heating loops & Heating radiator.



Remark			
1	Outdoor unit	10	Two way valve
2	hydraulic module	11	Mixing valve and mixing water pump
3	Plate heater exchange	12	Distributor
4	Backup electric heater(optional)	13	Distributor
5	Internal circulating pump	14	Bypass valve
6	Wired controller	RDT	Radiator
7	Stop valve	FLH1n	Floor heating loops
8	Balance water tank	FCU	**Fan coil units**
9	External circulation pump	RT	Room thermostats

3.5 Auxiliary heat source provides space heating only

Users can also use only gas water heaters for heating



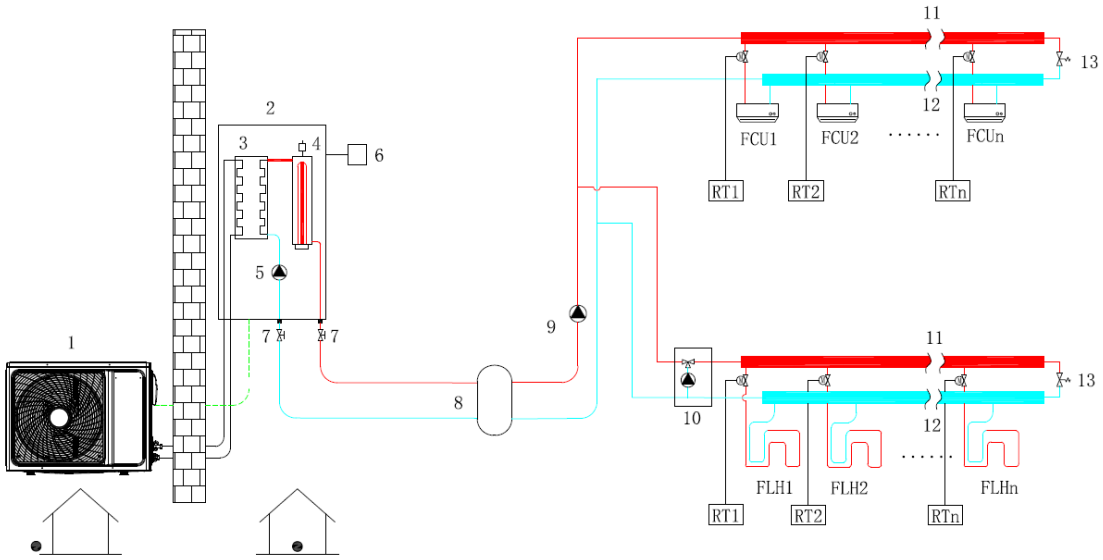
REMARK			
1	Outdoor unit	10	Mixing valve and mixing water pump
2	hydraulic module	11	Distributor
3	Plate heater exchange	12	Water collector
4	Backup electric heater(optional)	13	Bypass valve
5	Internal circulating pump	RDT	Heating Radiator
6	Wired controller	FLH	Floor heating loops
7	Stop valve	AHS	Auxiliary heating source
8	One way valve	RT	Room thermostats
9	Balance water tank		

3.6 Space Heating Through Floor Heating Loops and Fan Coil Units

The floor heating loops and fan coil units require different operating water temperatures. To achieve these two set points, a mixing station is required. Room thermostats for each zone are optional.

The outlet water temperature of the unit is set to the water temperature required by the fan coil unit, and the mixing valve and mixing pump are set to reduce the inlet water temperature of the floor heating

Figure 3.6: Space heating through floor heating loops and fan coil units

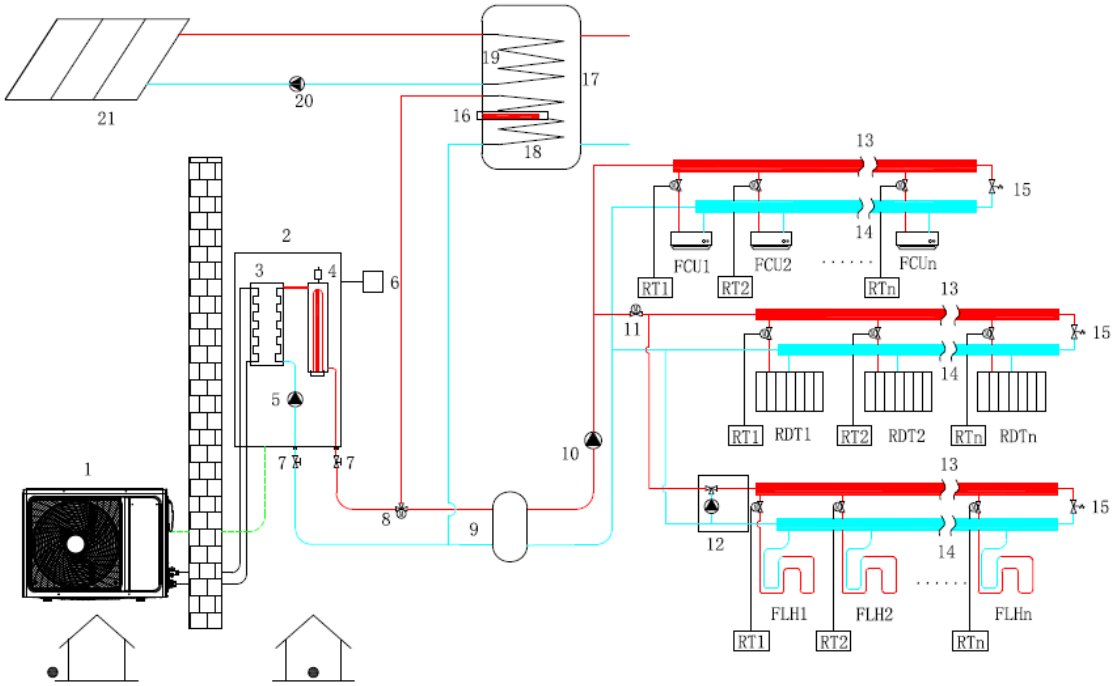


REMARK			
1	Outdoor unit	9	External circulation pump
2	hydraulic module	10	Mixing valve and mixing water pump
3	Plate heater exchange	11	Distributor
4	Backup electric heater(optional)	12	Distributor
5	Internal circulating pump	13	Bypass valve
6	Wired controller	FCU	Fan coil units
7	Stop valve	FLH	Floor heating loops
8	Balance water tank	RT	Room thermostats

3.7 Space Heating, Space Cooling and Domestic Hot Water Compatible with Solar Water Heater

Floor heating loops & Heating Radiator &fan coil units are used for space heating, and fan coil units are used for space cooling. The temperature in the domestic hot water tank is controlled by the hydraulic module. A temperature sensor needs to be placed in the domestic hot water tank and connected to the hydraulic module. When it is detected that the temperature of the domestic hot water tank is lower than the set temperature and meets the requirements for solar hot water activation When conditions are met, turn on the solar water pump to realize the solar hot water function.

Figure 3.7 Space heating, space cooling and domestic hot water compatible with solar water heater

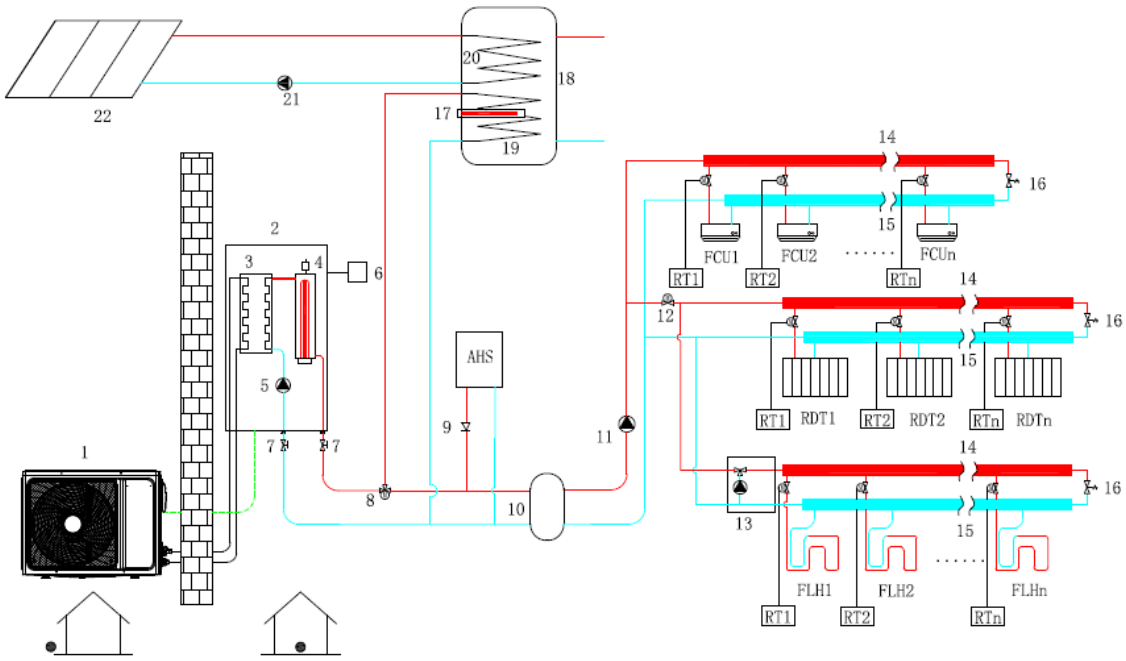


REMARK			
1	Outdoor unit	14	Water collector
2	hydraulic module	15	Bypass valve
3	Plate heater exchange	16	Electric heating
4	Backup electric heater(optional)	17	Domestic hot water tank
5	Internal circulating pump	18	Coil 1 in the water tank
6	Wired controller	19	Coil 2 in the water tank
7	Stop valve	20	solar water pump
8	Motorized 3way valve	21	Solar panel
9	Balance water tank	RDT	Heating Radiator
10	External circulation pump	FLH	Floor heating loops
11	Two way valve	FCU	Fan coil units
12	Mixing valve and mixing water pump	RT	Room thermostats
13	Distributor		

3.8 Space Heating with heat pump and AHS, space cooling with heat pump and solar for hot water

When the heating insufficient, the gas boiler (AHS) is used as an additional heat source, and floor heating or fan coils or low temperature radiators are used for space heating (also can be used in combination with various types of terminals), The fan coil is used for space cooling. The temperature in the domestic hot water tank is controlled by the hydraulic module. A temperature sensor needs to be placed in the domestic hot water tank and connected to the hydraulic module. When it is detected that the temperature of the domestic hot water tank is lower than the set temperature and meets the requirements for solar hot water activation When conditions are met, turn on the solar water pump to realize the solar hot water function.

Figure 3.8Space Heating with heat pump and AHS, space cooling with heat pump and solar for hot water

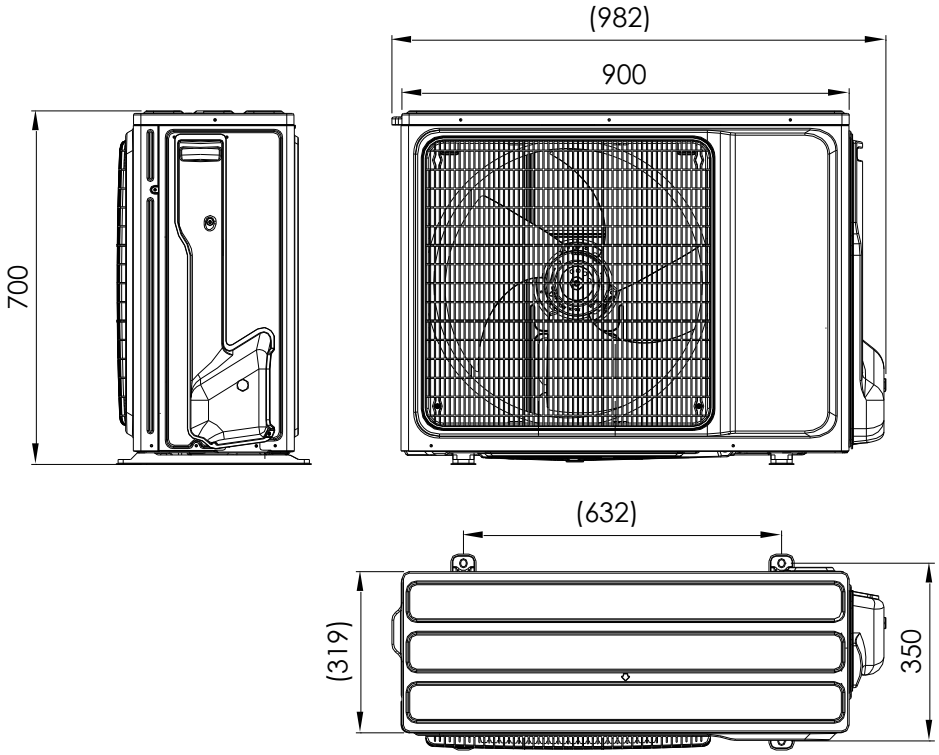


REMARK			
1	Outdoor unit	14	Distributor
2	hydraulic module	15	Water collector
3	Plate heater exchange	16	Bypass valve
4	Backup electric heater(optional)	17	Electric heating
5	Internal circulating pump	18	Domestic hot water tank
6	Wired controller	19	Coil 1 in the water tank
7	Stop valve	20	Coil 2 in the water tank
8	Motorized 3way valve	21	solar water pump
9	One way valve	22	Solar panel
10	Balance water tank	RDT	Radiator
11	External circulation pump	FLH	Floor heating loops
12	One way valve	FCU	Fan coil units
13	Mixing valve and mixing water pump	RT	Room thermostats

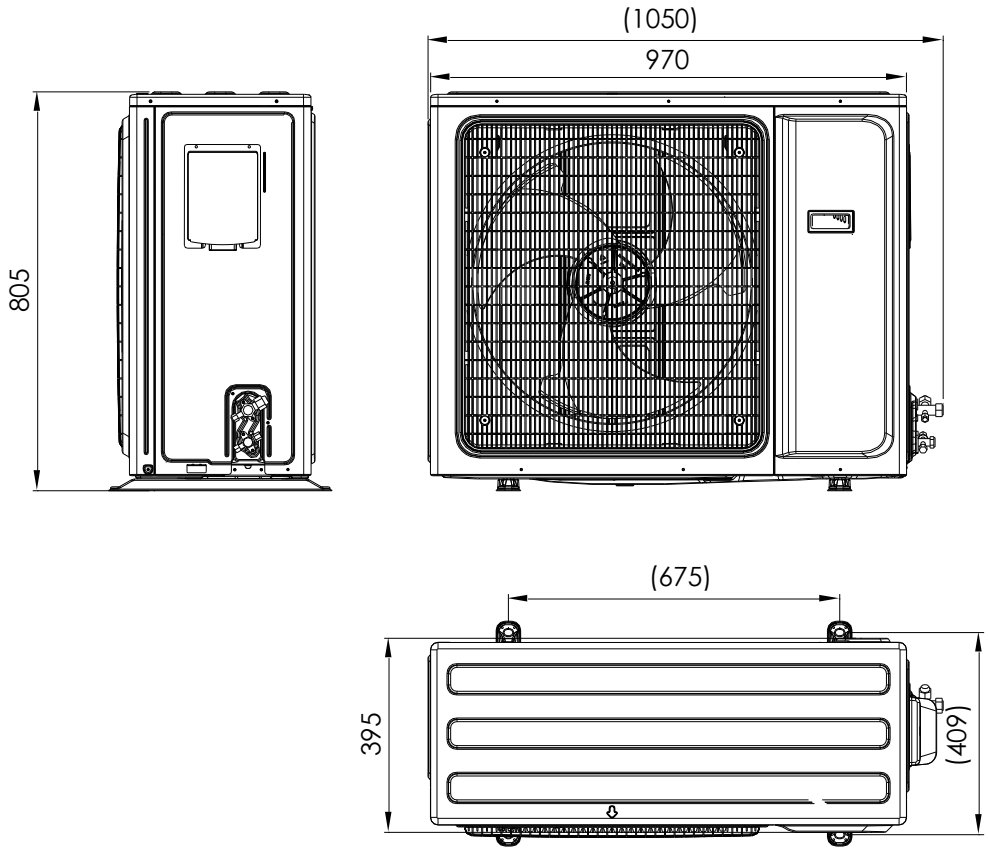
Part4 Dimension

1. Outdoor Unit

4kW, 6kW
ACHP-H04/4R3HA-O / ACHP-H06/4R3HA-O

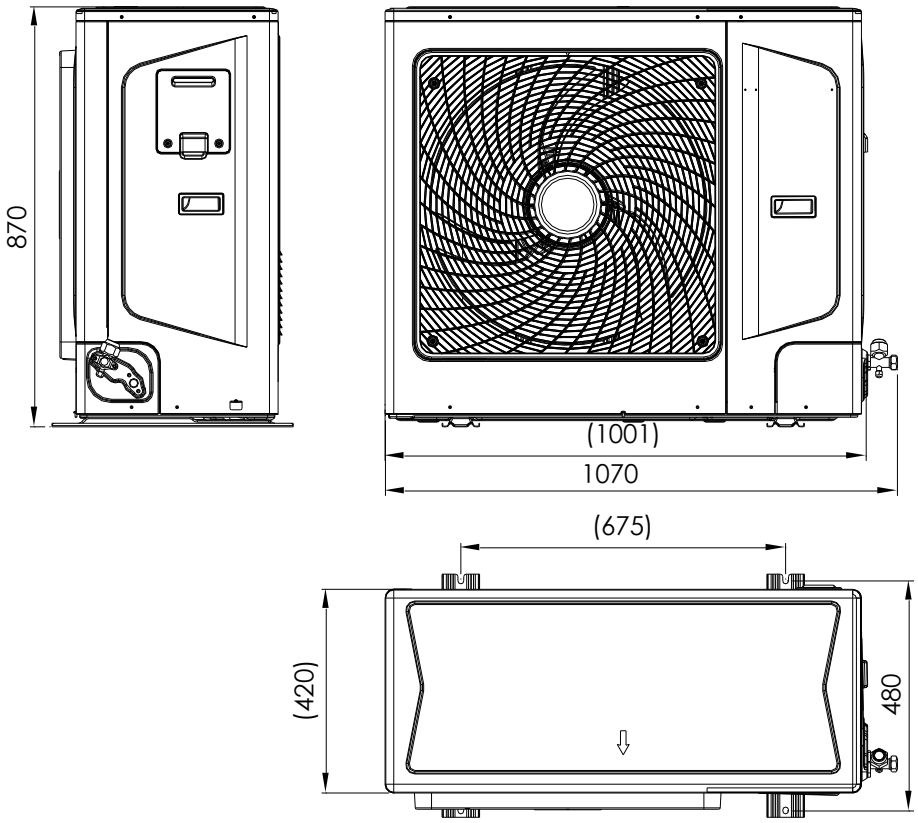


8kW, 10kW
ACHP-H08/4R3HA-O / ACHP-H10/4R3HA-O



12kW, 14kW, 16kW

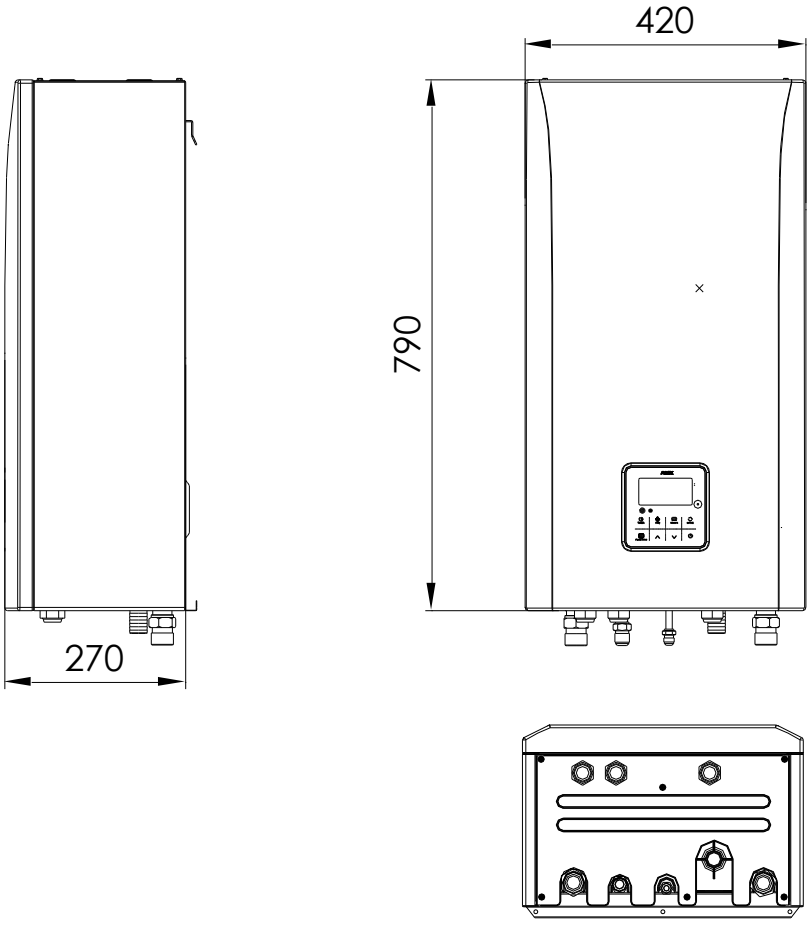
ACHP-H12/5R3HA-O；ACHP-H14/5R3HA-O；ACHP-H16/5R3HA-O；



2. Hydraulic module

ACHP-H04/4R3HA-I; ACHP-H06/4R3HA-I; ACHP-H08/5R3HA-I; ACHP-H10/5R3HA-I

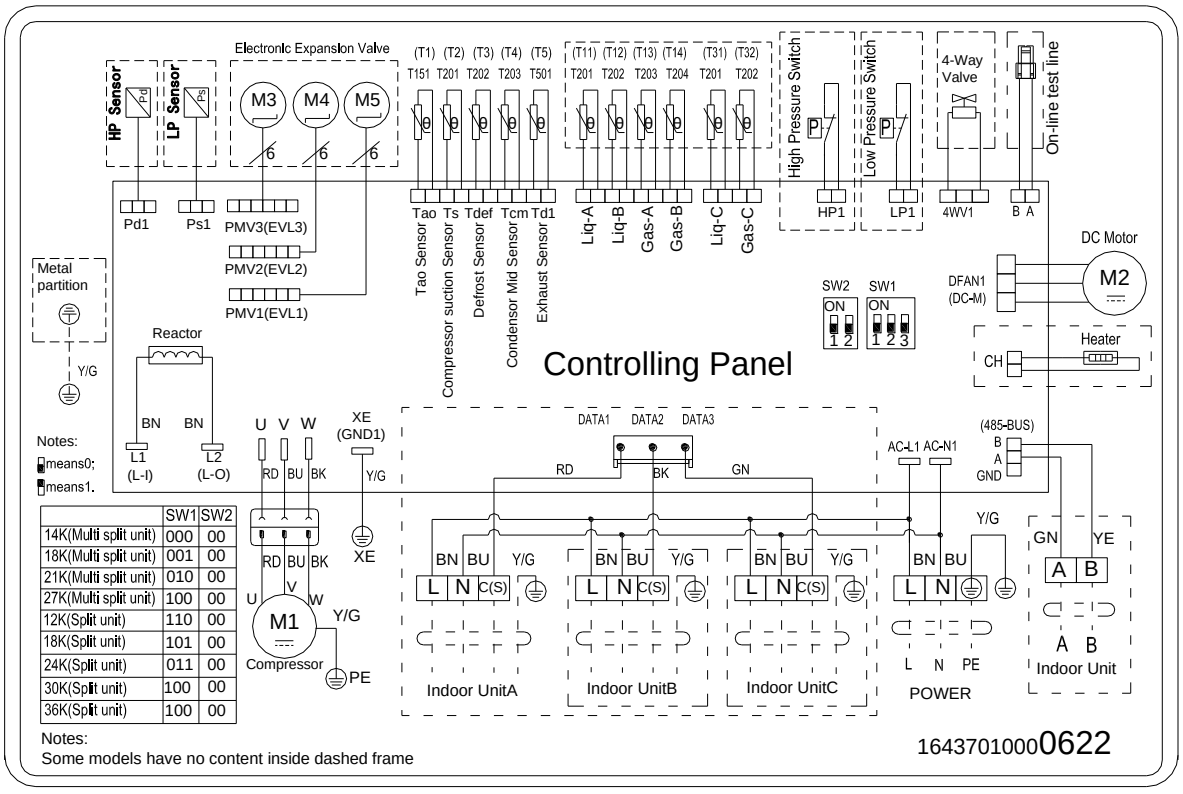
ACHP-H12/5R3HA-I; ACHP-H14/5R3HA-I; ACHP-H16/5R3HA-I



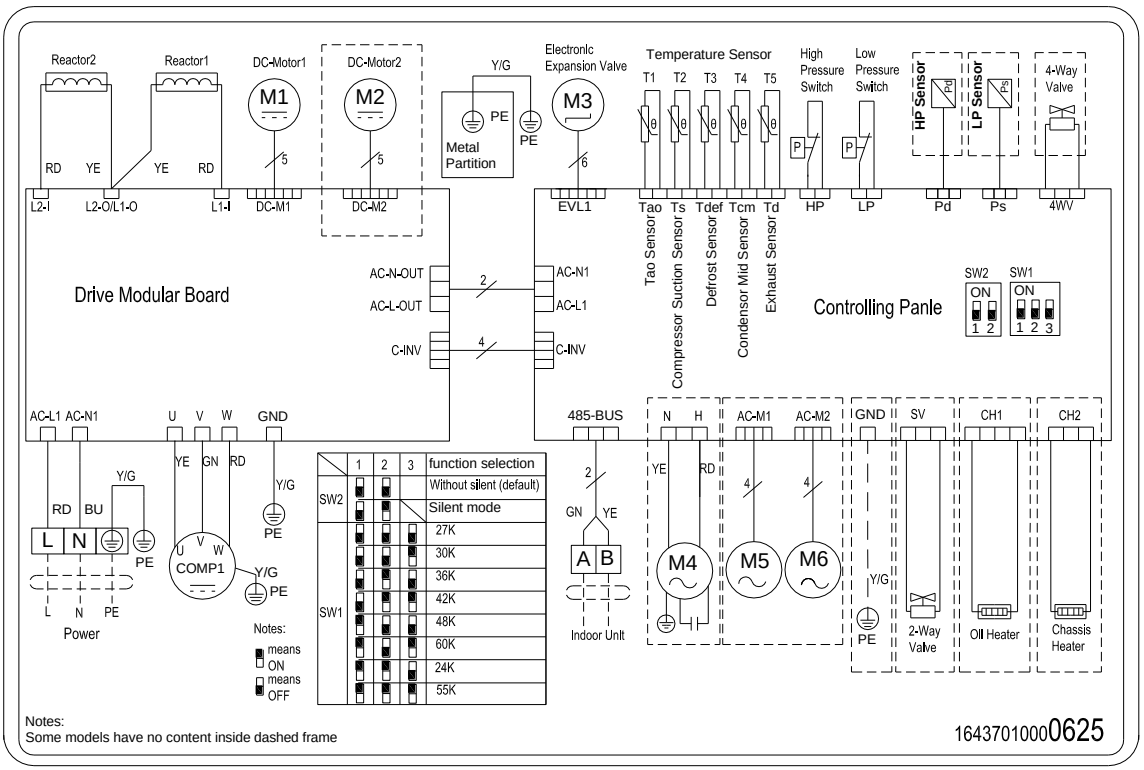
Part5 Electrical Principle Diagram

1. Outdoor Unit

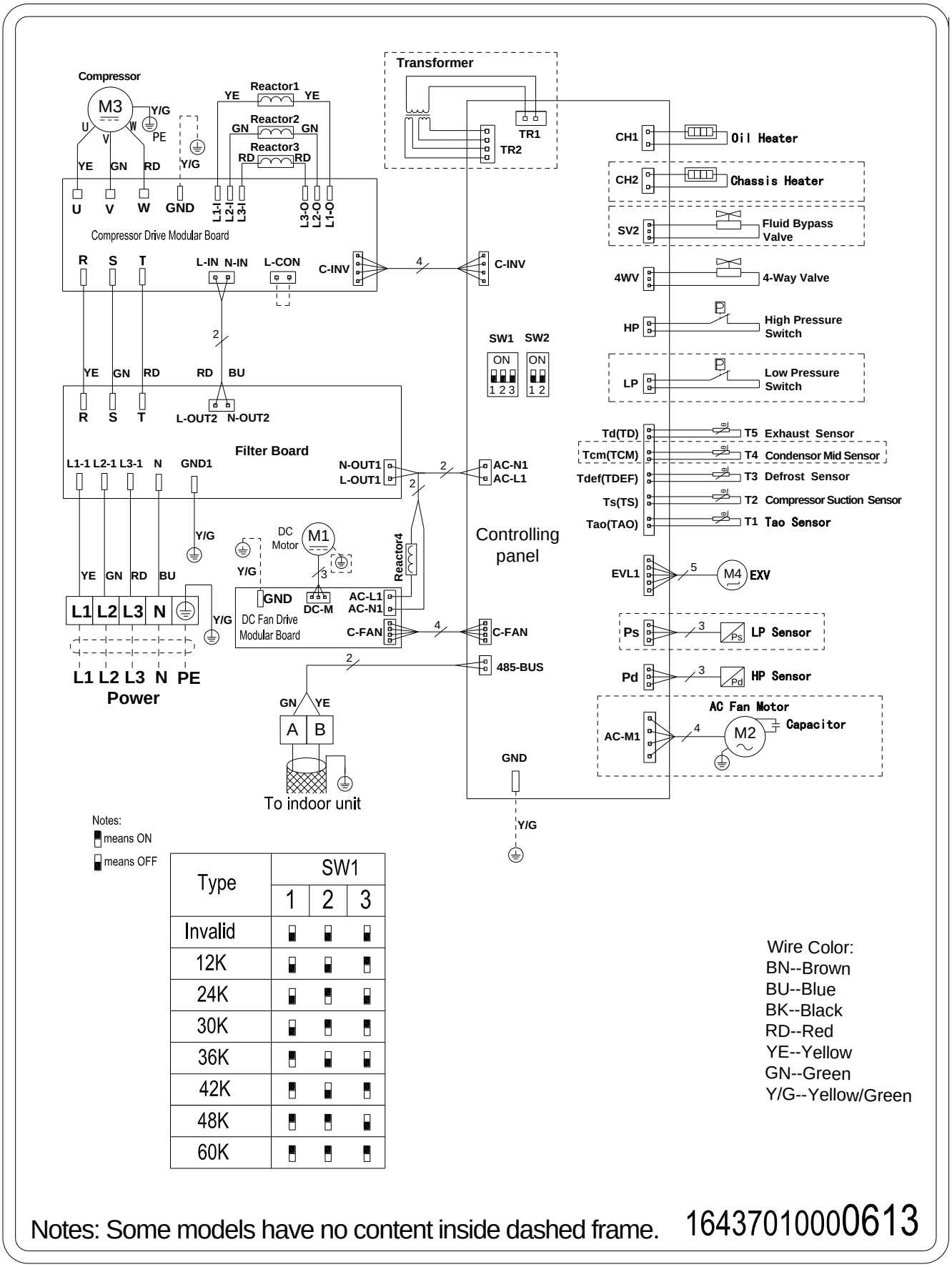
4kW(ACHP-H04/4R3HA-O), 6kW (ACHP-H06/4R3HA-O)



8kW (ACHP-H08/4R3HA-O), 10kW (ACHP-H10/4R3HA-O)



12kW(ACHP-H12/5R3HA-O), 14kW (ACHP-H14/5R3HA-O), 16kW (ACHP-H16/5R3HA-O)



Notes:
■ means ON
□ means OFF

Type	SW1		
	1	2	3
Invalid	□	□	□
12K	□	□	■
24K	□	■	□
30K	□	■	■
36K	■	□	□
42K	■	□	■
48K	■	■	□
60K	■	■	■

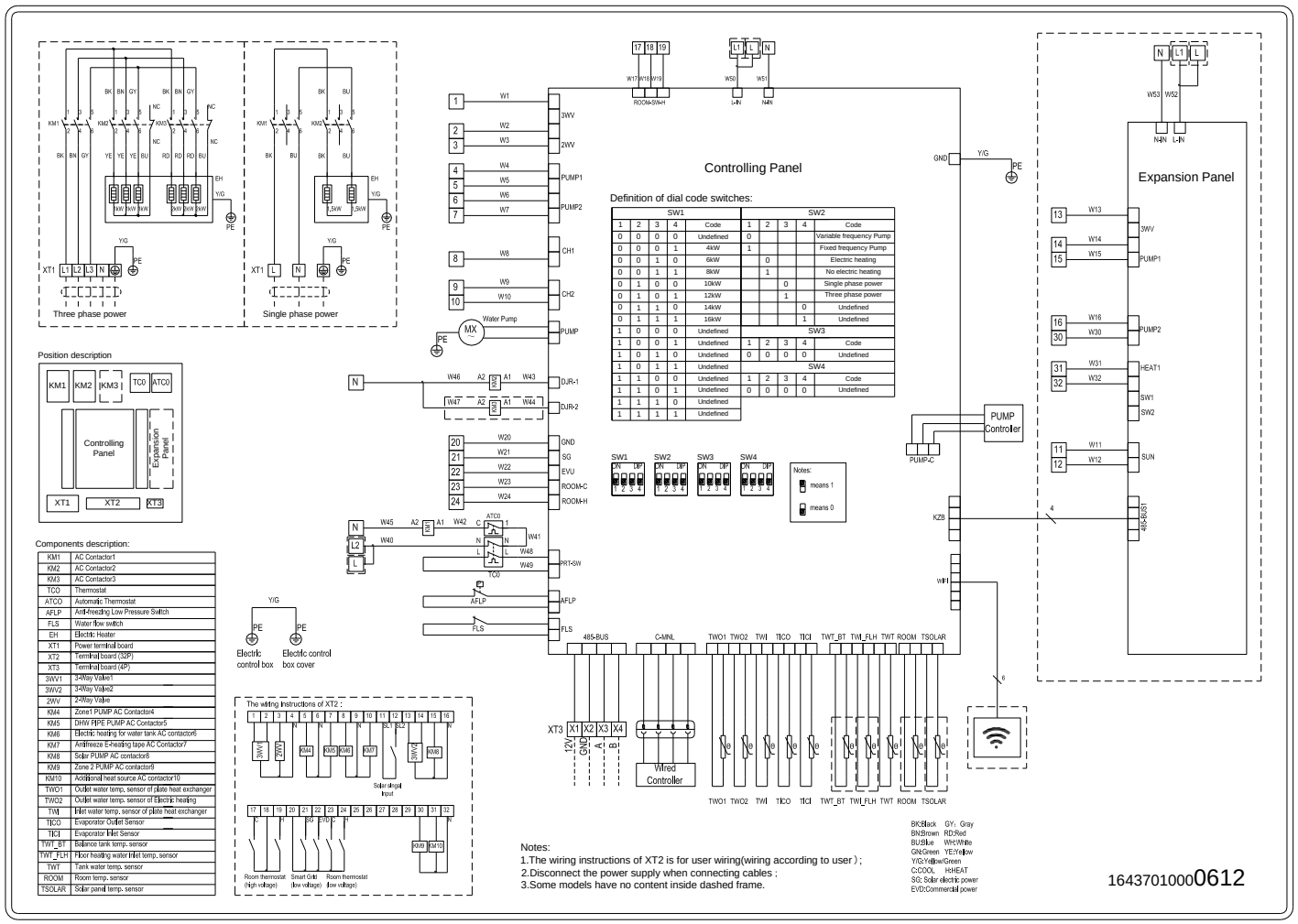
Wire Color:
BN--Brown
BU--Blue
BK--Black
RD--Red
YE--Yellow
GN--Green
Y/G--Yellow/Green

Notes: Some models have no content inside dashed frame. 164370100000613

2. Hydraulic module

ACHP-H04/4R3HA-I；ACHP-H06/4R3HA-I；ACHP-H08/5R3HA-I；ACHP-H10/5R3HA-I

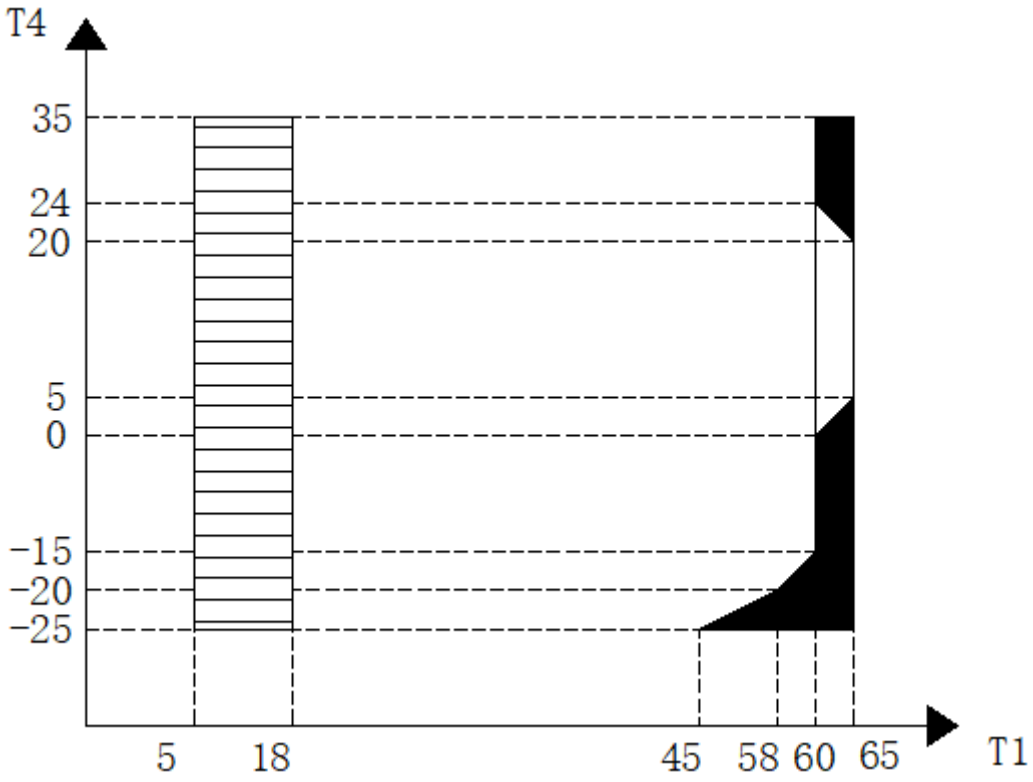
ACHP-H12/5R3HA-I；ACHP-H14/5R3HA-I；ACHP-H16/5R3HA-I



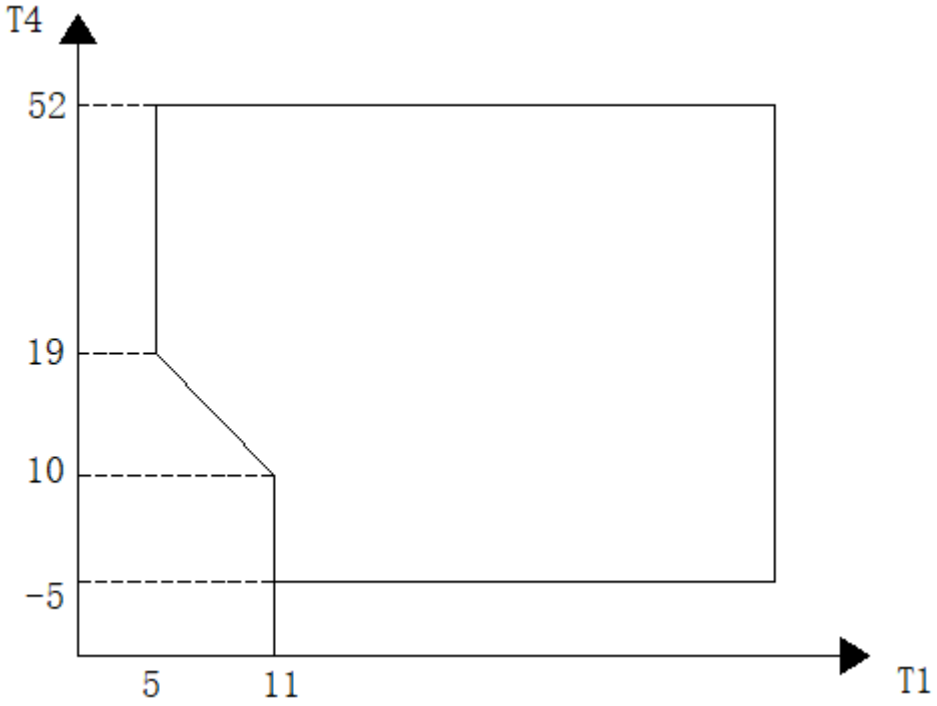
Part6 Capacity Amendment

1. Operating Limits

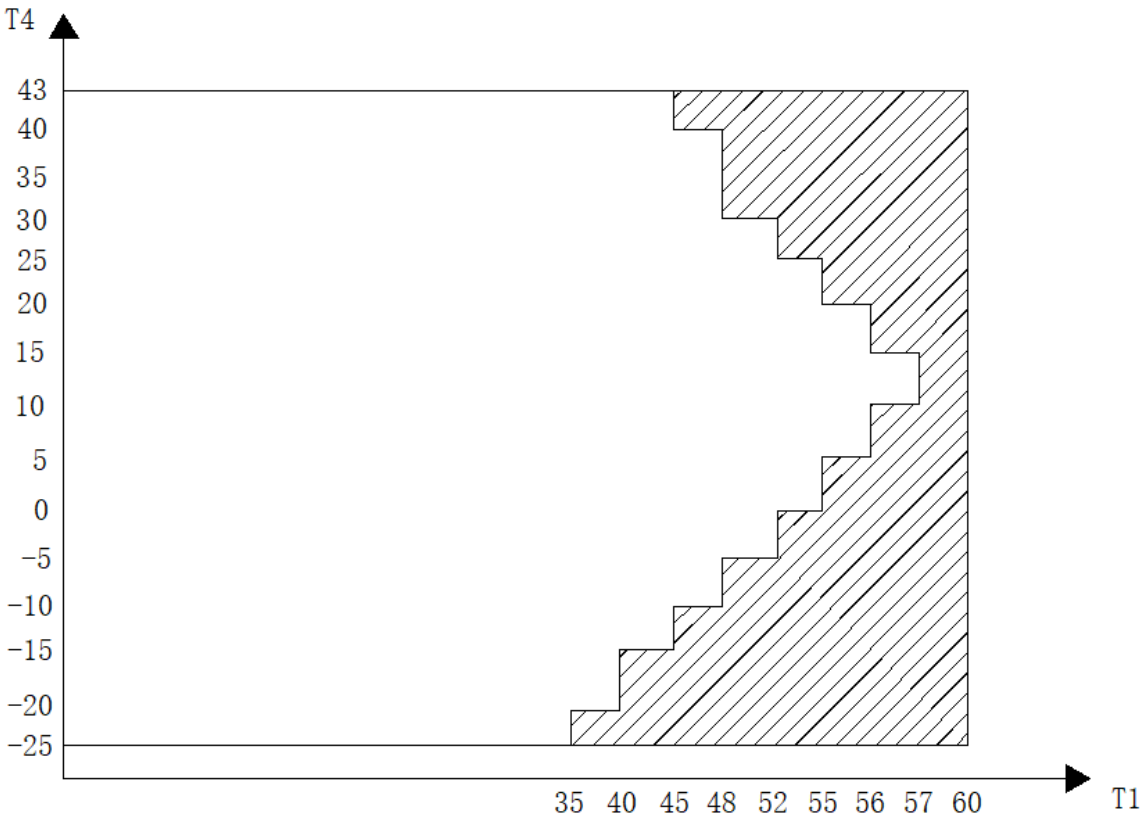
1.1 Heating operating limits



1.2 Cooling operating limits



1.3 Domestic hot water operating limits



Abbreviations:

T4:Outdoor temperature(℃)

T1:Leaving water temperature(℃) / watertank temperature(℃)

Notes:

1. If the auxiliary electric heating/auxiliary heat source is set to be valid, only the auxiliary electric heating/auxiliary heat source is running; if the auxiliary electric heating/auxiliary heat source is set to be invalid, only the heat pump is running

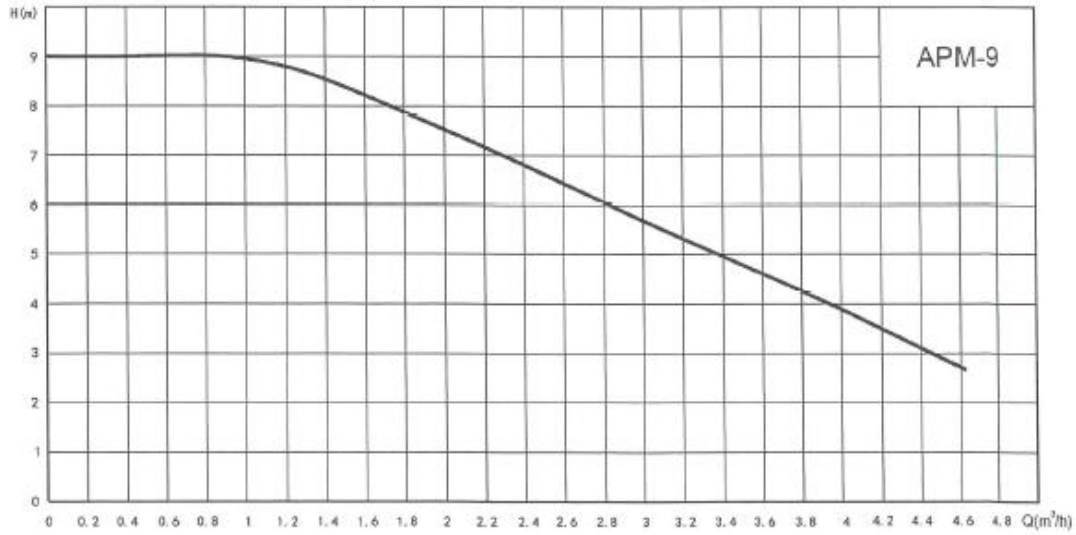
2. The rise or fall of water temperature is regulated by the water system(Use water tank electric heating to raise to desired temperature).

3. Only auxiliary electric heating/auxiliary heat source operate

Note：please refer to the Capacity table for more information

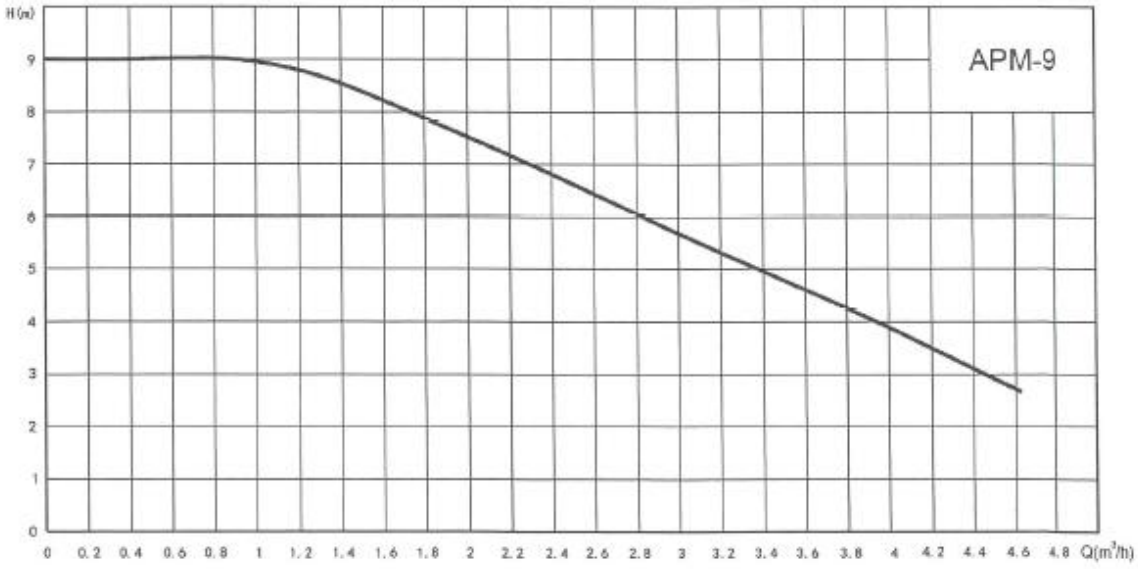
Part7 Hydraulic Performance

ACHP-H04/4R3HA-I; ACHP-H06/4R3HA-I



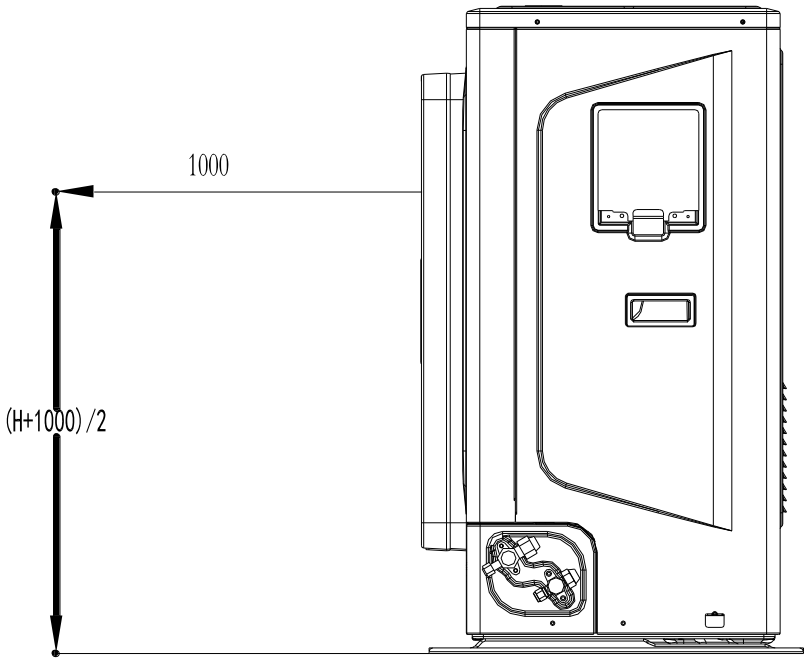
ACHP-H08/5R3HA-I; ACHP-H10/5R3HA-I; ACHP-H12/5R3HA-I

ACHP-H14/5R3HA-I; ACHP-H16/5R3HA-I



Part8 Sound Levels

1. Outdoor unit sound pressure levels[1]



Outdoor unit sound pressure level measurement(unit:mm)

ODU Models	dB(A)
ACHP-H04/4R3HA-O	38
ACHP-H06/4R3HA-O	38
ACHP-H08/4R3HA-O	45
ACHP-H10/4R3HA-O	48
ACHP-H12/5R3HA-O	49
ACHP-H14/5R3HA-O	50
ACHP-H16/5R3HA-O	54

Notes

1.Sound pressure level is measured at a position1m in front of the unit and (1+H)/2m (where H is the height of the unit)above the floor in a semi an-echoic chamber.During actual operation,sound pressure levels may be higher as a result of ambient noise.

2. Outdoor air temperature：dry bulb7℃. Wet bulb 6℃;EWT30℃,LWT35℃.

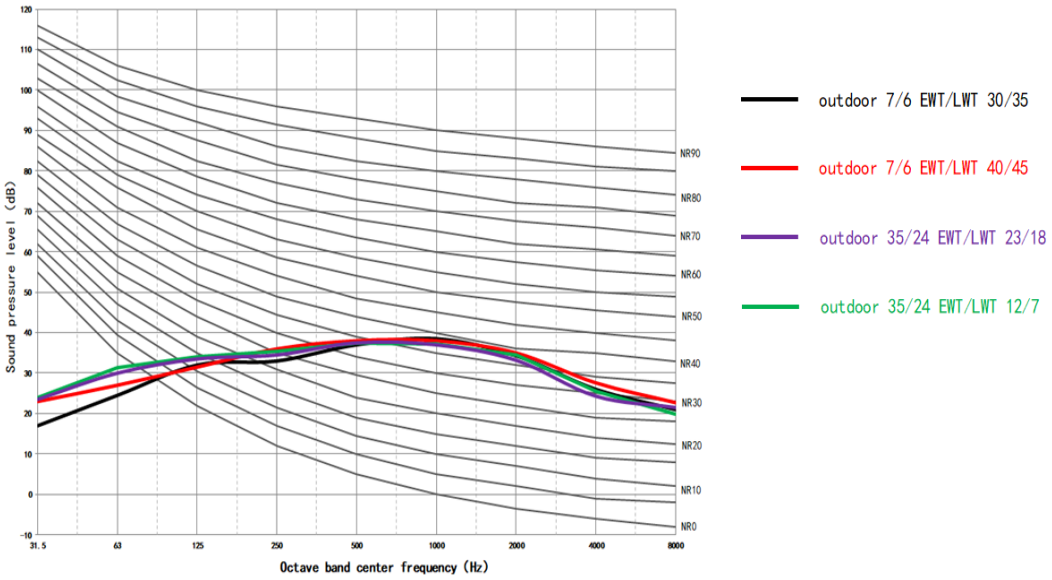
3. Outdoor air temperature：dry bulb 7℃ Wet bulb 6℃; EWT 40℃, LWT 45℃.

4. Outdoor air temperature：dry bulb 7℃ Wet bulb 6℃; EWT 47℃,LWT 55℃.

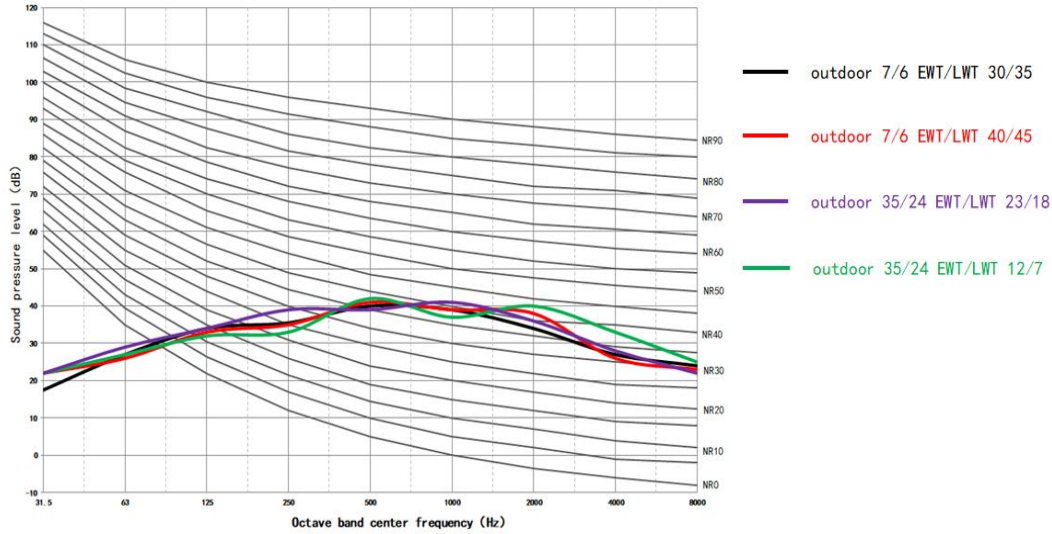
5. Sound pressure level is the maximum value tested under the three conditions of Notes2, Notes3 and Notes4.

2. ODU Octave band levels

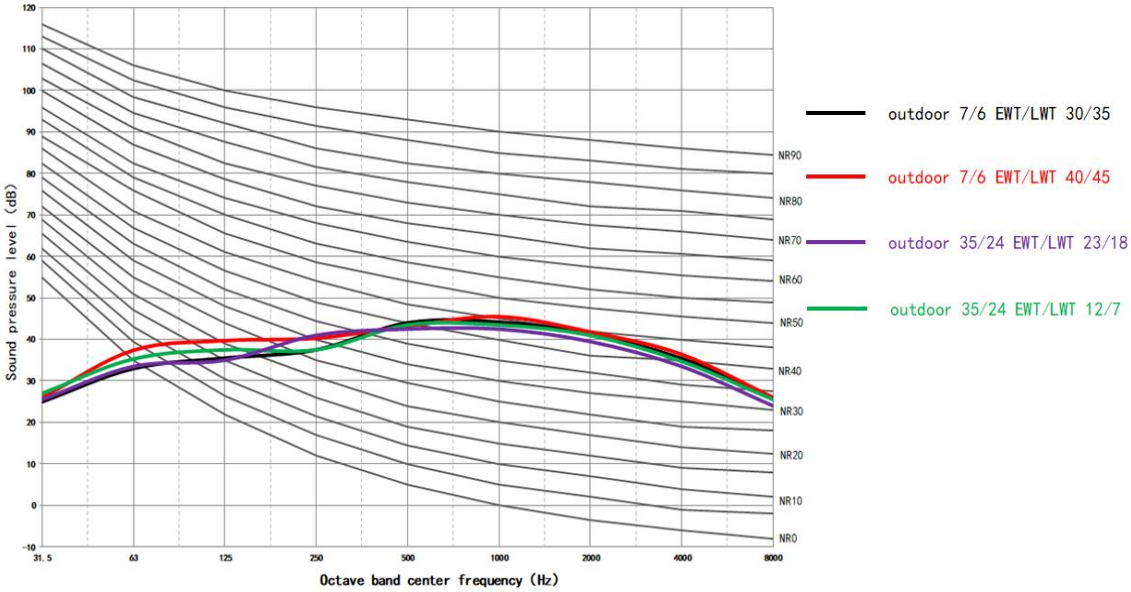
ACHP-H04/4R3HA-O



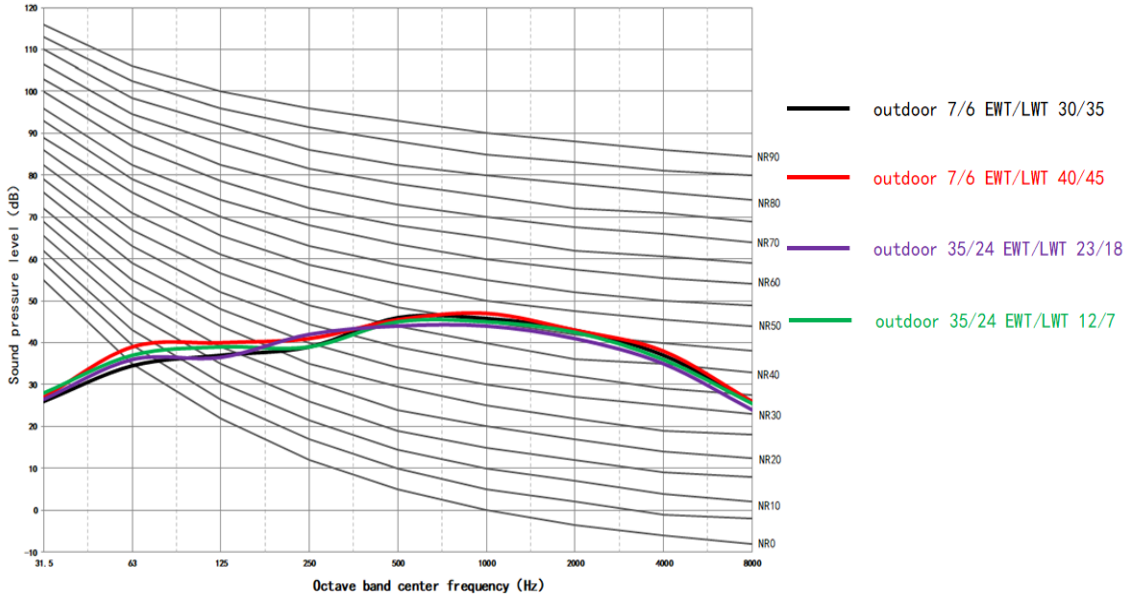
ACHP-H06/4R3HA-O



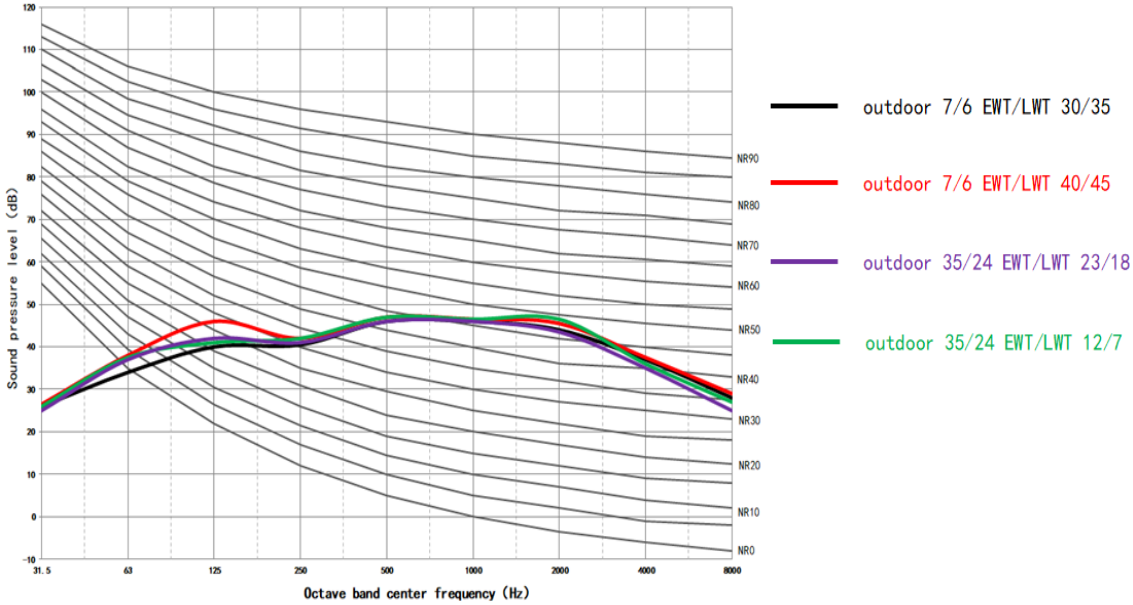
ACHP-H08/4R3HA-O



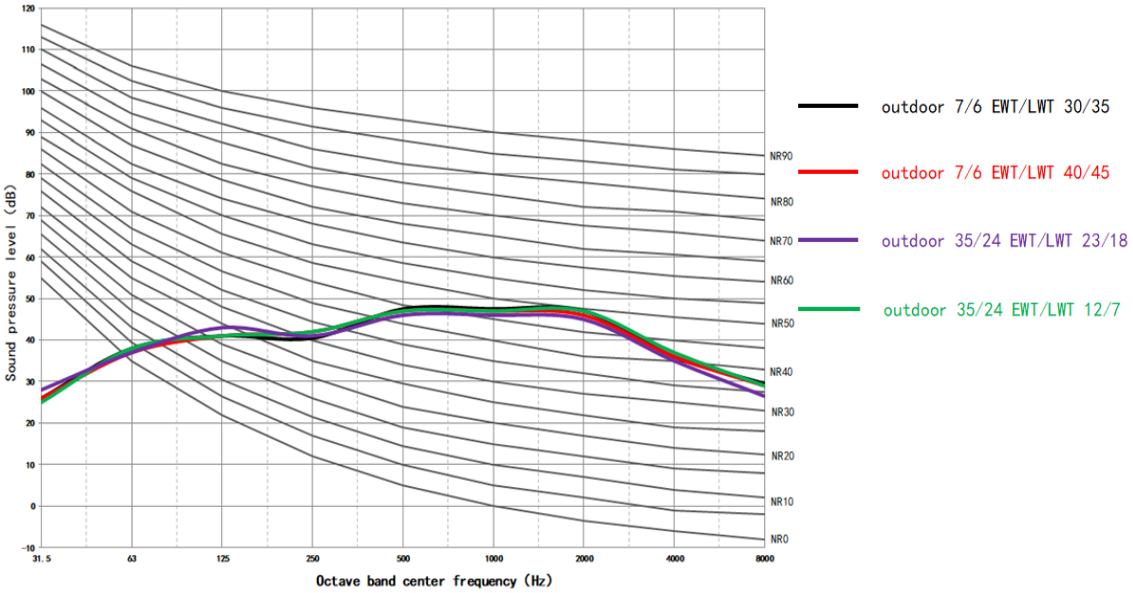
ACHP-H10/4R3HA-O



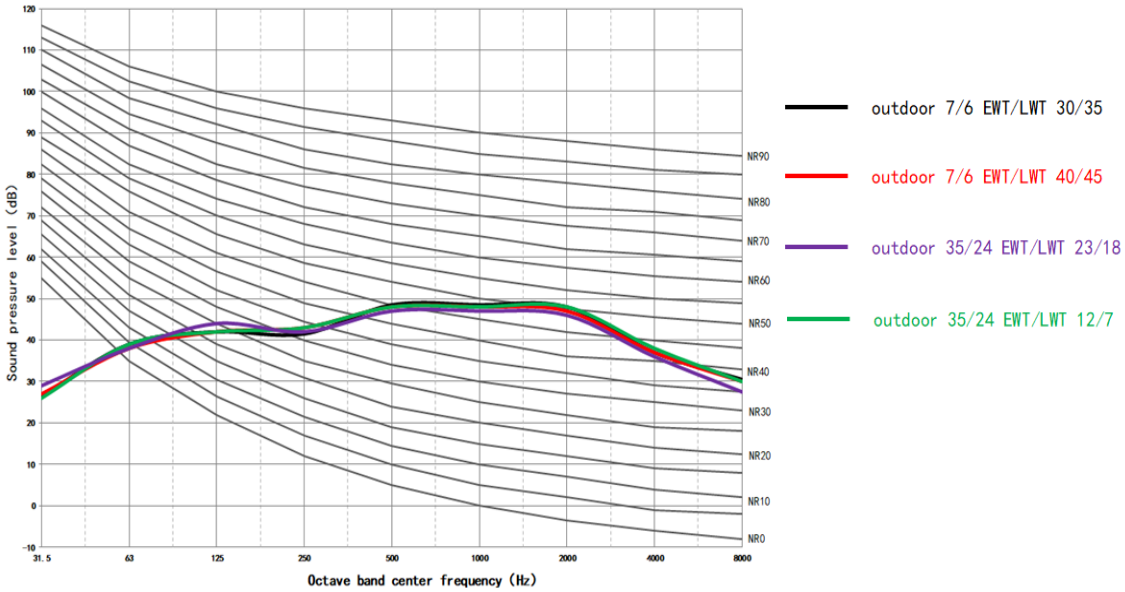
ACHP-H12/5R3HA-O



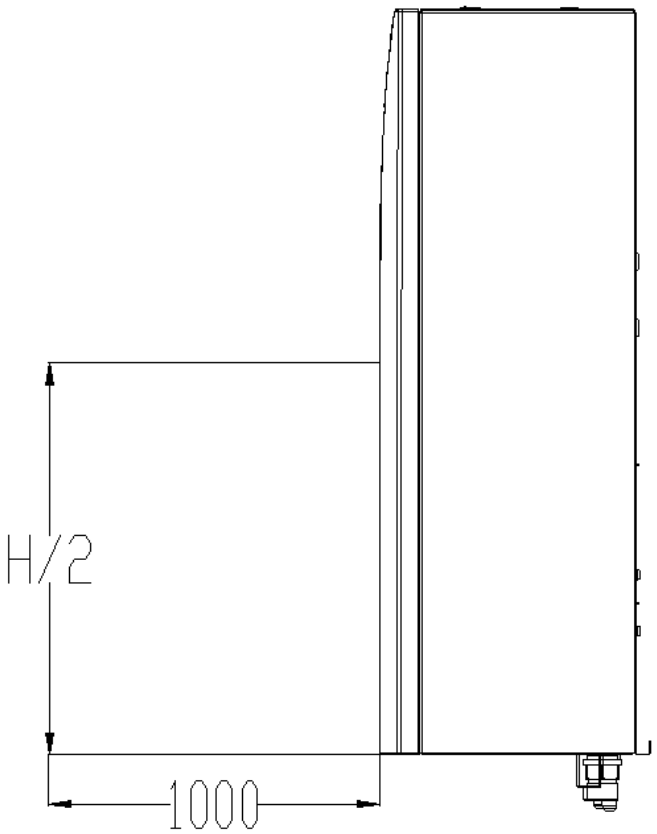
ACHP-H14/5R3HA-O



ACHP-H16/5R3HA-O



3. Indoor unit sound pressure levels



Indoor unit sound pressure level measurement(unit:mm)

ODU Models	dB(A)
ACHP-H04/4R3HA-I	28
ACHP-H06/4R3HA-I	28
ACHP-H08/5R3HA-I	31
ACHP-H10/5R3HA-I	31
ACHP-H12/5R3HA-I	31
ACHP-H14/5R3HA-I	31
ACHP-H16/5R3HA-I	31

Notes

1.Sound pressure level is measured at a position1m in front of the unit and H/2 (where H is the height of the unit)at the bottom of the unit in a semi an-echoic chamber.During actual operation,sound pressure levels may be higher as a result of ambient noise.

2. Outdoor air temperature：dry bulb7℃. Wet bulb 6℃;EWT30℃,LWT35℃.

3. Outdoor air temperature：dry bulb 7℃ Wet bulb 6℃; EWT 40℃, LWT 45℃.

4. Outdoor air temperature：dry bulb 7℃ Wet bulb 6℃; EWT 47℃,LWT 55℃.

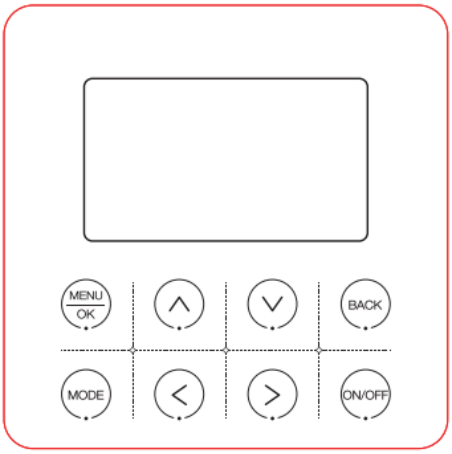
5. Sound pressure level is the maximum value tested under the three conditions of Notes2, Notes3 and Notes4.

Part9 Wired Controller

1. Introduction

During installation, the parameter settings should be configured by the installer to suit the installation configuration, climate conditions and user preferences. The relevant settings are accessible and programmable through the FOR SERVICEMAN menu on the wired controller.

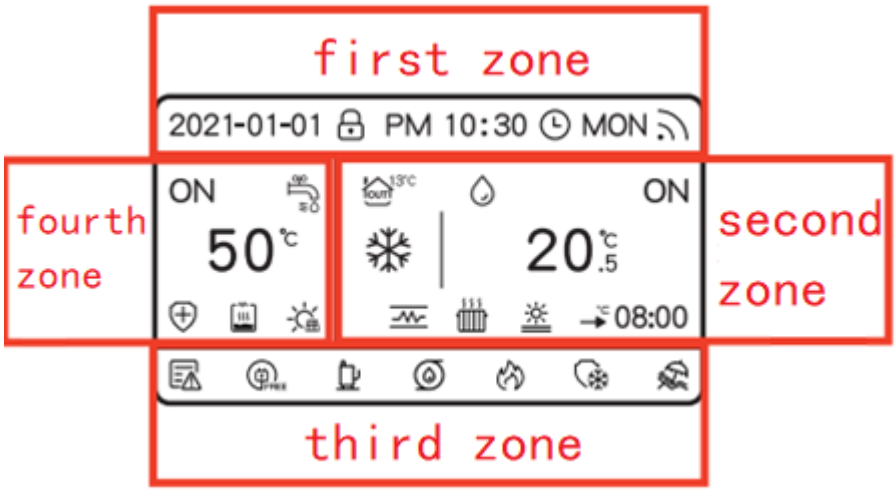
Wired controller



The wired controller button

NO	Name	Logo	Description
1	Menu/Confirm	MENU OK	Enter the next menu interface/setting confirmation
2	Up	∧	Upward selection/value increase or content change
3	Down	∨	Downward selection/decrease value or content change
4	Back	BACK	Return to the previous level/View current fault
5	Mode	MODE	Mode Switch
6	Left	<	Change selected item
7	Right	>	Change selected item
8	ON/OFF	ON/OFF	Control unit on/off

Illustration：



zone division

1# zone：

Name	icon	Name	icon
date	0000-00-00	Monday	MON
time	00:00	Tuesday	TUE
screen lock		Wednesday	WED
schedule		Thursday	THU
time appointment		Friday	FRI
WIFI distribution network successfully		Saturday	SAT
morning	AM	Sunday	SUN
afternoon	PM	WIFI distribution network failed	

2# zone：

Name	icon	Name	icon
heating		temperature unit	℃
refrigeration		temperature hold	08:00
automatic		Temperature drop	08:00
open	ON	The temperature rises	08:00
close	OFF	fan coil unit	
water temperature icon		ON	

Automatic water temperature	AUTO	fan coil unit	
water temperature	38(setting)	OFF	
Electric tube heat source		heat sink	
floor preheating		ON	
floor drying		heat sink	21 ℃
emergency			

3# zone：

Name	icon	Name	icon
temperature unit		antifreeze	
temperature hold		defrost	
Temperature drop		vacation	
The temperature rises		mute	
Fan coil unit ON		energy saving	
Fan coil OFF		Additional heat source	

4# zone：

Name	icon	Name	icon
Hot water ON		disinfect	
Hot water OFF		solar enabled	
Quick hot water ON		Water tank electric heating ON	
hot water on	ON	set/tank temperature	50(setting)
Hot water shutdown	OFF	temperature unit	℃

Other：

Name	icon	Name	icon
	enabled		Not enabled

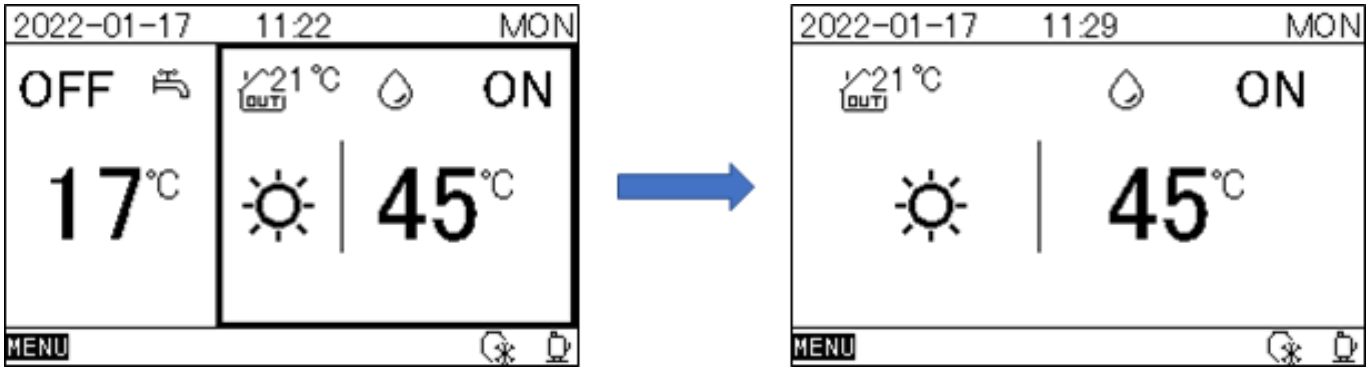
Note: more detailed information please refer to the wired controller instructions

Part10 Control

1. DHW mode

1.1 Whether DHW mode is enabled(DHW mode)

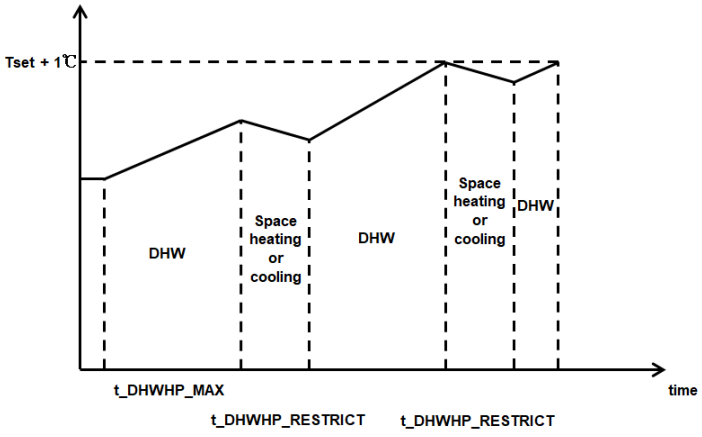
Set whether to enable the DHW mode through the wired controller. When it is set to enable, the unit operates according to the control logic of the DHW mode. When the DHW mode is not enabled, the unit will turn off the hot water function. The interface is as shown below：



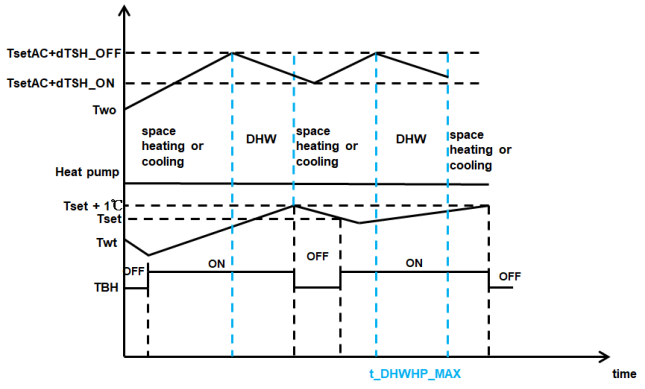
1.2 Whether DHW PRIORITY is enabled (DHW PRIORITY)

When both the DHW mode and the air conditioner (cooling/heating mode) are turned on, you can set whether to turn on the DHW priority through the wired controller. After reaching water tank the set target temperature or the DHW mode reaching maximum time (t_DHWHP_MAX), switch to AC (cooling mode/heating mode), and the AC (cooling mode/heating mode) will run until the heat pump heating/cooling limit time (t_DHWHP_RESTRICT), then switch to DHW mode.

If the DHW priority is not enabled, the heat pump will run the AC (cooling mode/heating mode) first. After running until the water outlet temperature of the hydraulic module reaches the set target temperature, it will switch to DHW mode, and the DHW mode will keep running until the water tank temperature reaching the water tank set target temperature or the maximum time (t_DHWHP_MAX), then switch to the AC (cooling mode/heating mode) operation。



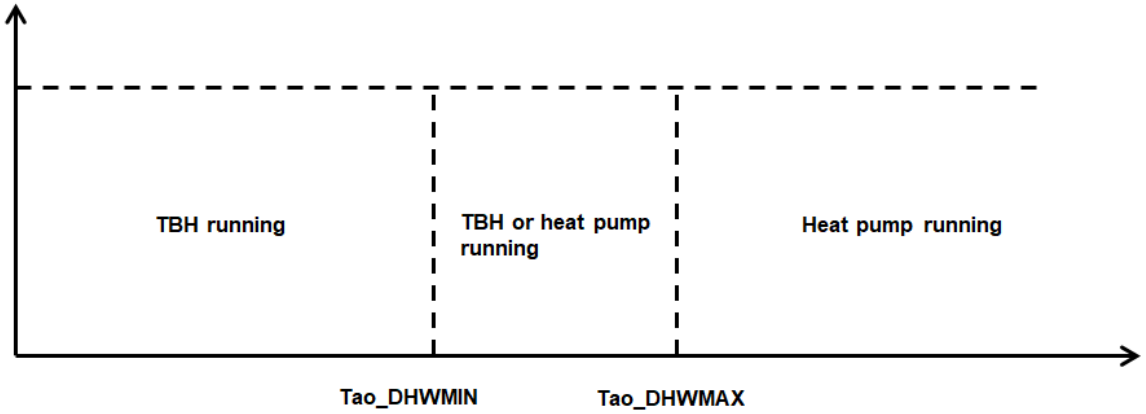
DHW PRIORITY



without DHW PRIORITY

1.3 Maximum ambient temperature (Tao_DHWMAX)、Minimum ambient temperature (Tao_DHWMIN)

In the DHW mode setting interface, you can set the maximum ambient temperature (Tao_DHWMAX) and the minimum ambient temperature (Tao_DHWMIN) of the heat pump in DHW mode. When the outside ambient temperature＞Tao_DHWMAX or ＜Tao_DHWMIN, only the water tank electric heating (TBH) is turned on to produce hot water. Only When the outside ambient temperature＞ Tao_DHWMIN and＜ Tao_DHWMAX) ， the heat pump will produce hot water



1.4 Delay time of water tank electric heating start after compressor start(t_TBH_DELAY)、Ambient temperature that allows water tank electric heating to start(Tao_TBS_ON)

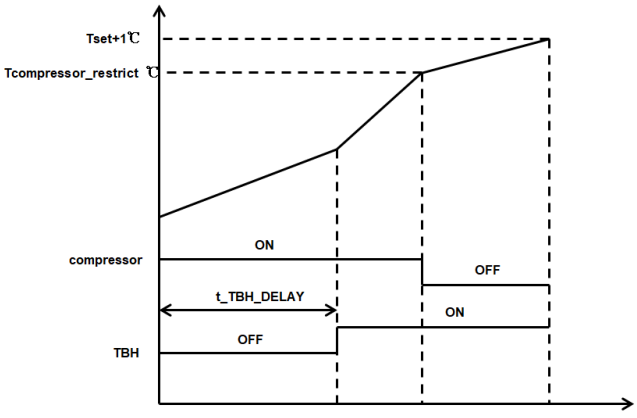
Set the delay time of water tank electric heating start after compressor start (t_TBH_DELAY) by the wired controller， When the heat pump running time ≥ t_TBH_DELAY, and the outdoor ambient temperature <Tao_TBS_ON), if the temperature of the water tank does not reach the target temperature, turn on the electric heating of the water tank, and run together with the heat pump to produce hot water

1.5 Whether DHW PUMP is enabled (DHW PUMP)

Set whether the DHW pump is enabled or not through the wired controller. When the setting is enabled, set the start time and running duration of the DHW pump (DHW PUMP RUN TIME),When it is time to start the pump, the pump will start running, and when the running duration reaches the DHW PUMP RUN TIME, the pump will turn off.

1.6 DHW mode operation

The unit can heat water by controlling the operation of the compressor and the water tank electric heating (TBH). As shown below：



When the water tank temperature < Tset of the water tank, the compressor will turn on to produce hot water. When the compressor running time ＞t_TBH_DELAY and the outside ambient temperature <Tao_TBS_ON, if the water tank temperature＜ Tset, the electric heating of the water tank will turn on, and it runs together with the heat pump to produce hot water. When the water temperature in the water tank＞the max temperature of the water tank that the compressor can run, the compressor will turn off, and only use water tank electric heating to produce hot water. When the water tank temperature > the set target setting water tank temperature Tset+1℃, the electric heating of the water tank will turn off

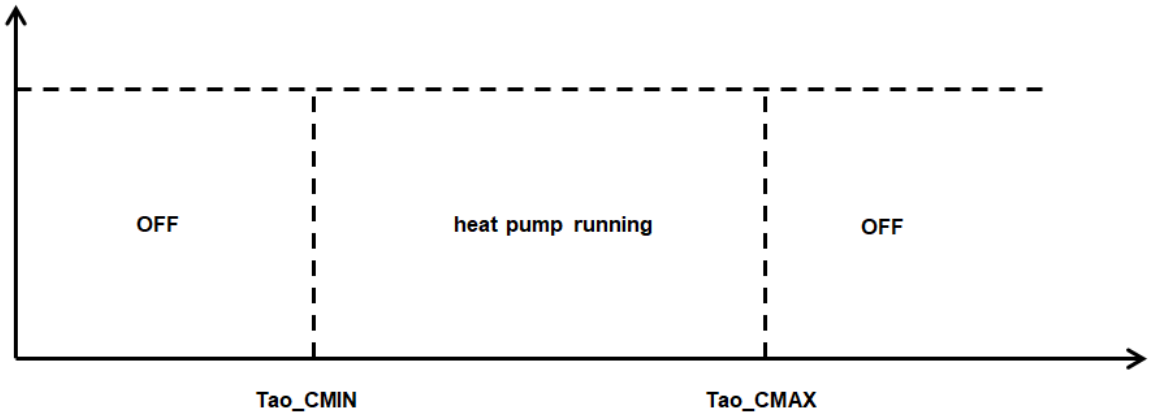
2. Cooling mode

2.1 Whether cooling mode is enabled

Set whether to enable the cooling mode through the wired controller. When it is set to enable, the unit will operate cooling mode. When the cooling mode is set to be disabled, the unit will turn off cooling function.

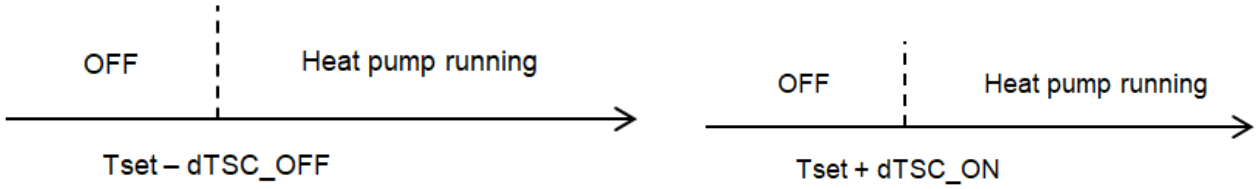
2.2 Maximum outdoor ambient temperature (Tao_CMAX)、Minimum Outdoor Ambient Temperature (Tao_CMIN)

by setting the maximum cooling outdoor ambient temperature (Tao_CMAX) and the minimum outdoor ambient temperature (Tao_CMIN) to limit the operating temperature range of cooling mode. When outdoor ambient temperature ＞Tao_CMAX or＜Tao_CMIN, the unit will stop cooling operation



2.2 cooling stop-operating temperature difference (dTSC_OFF)、cooling start-operating temperature difference (dTSC_ON)

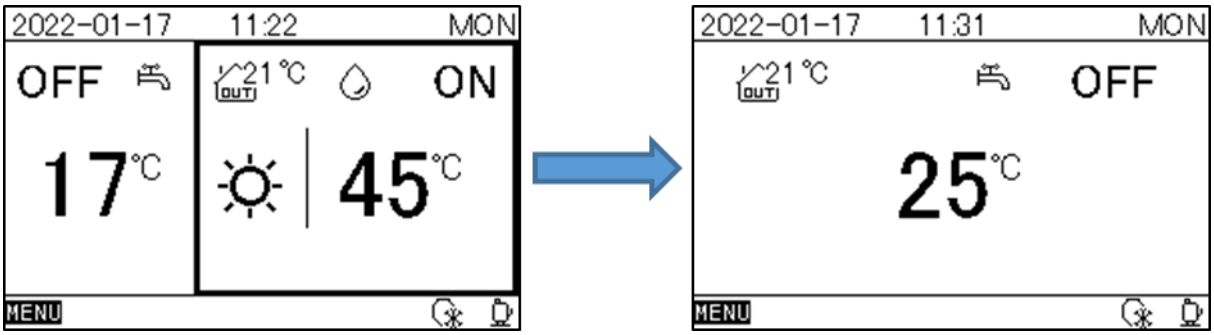
In cooling mode, when the outlet water temperature of Hydraulic module reaches (Tset – dTSC_OFF), the heat pump is stopped and only the water pump is turned on; When it is detected that the outlet water temperature of Hydraulic module reaches (Tset + dTSC_ON), the heat pump is turned on for cooling operation



3. Heating mode

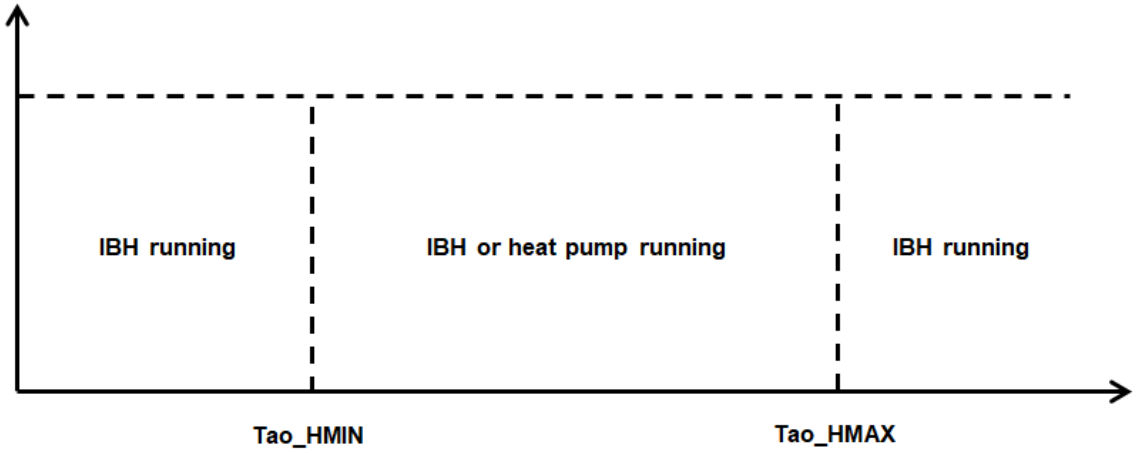
3.1 Whether heating mode is enabled (heat MODE)

Set whether to enable the heating mode through the wired controller. When enabled, the unit operates in the heating mode. When it is not enabled, the unit can not operate heating function. If both the heating mode and the cooling mode are set to be disabled, the figure as shown below：



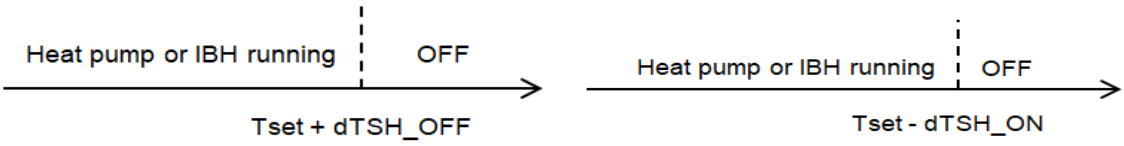
3.2 Maximum outdoor ambient temperature (Tao_HMAX)、Minimum Outdoor Ambient Temperature (Tao_HMIN)

by setting the maximum heating outdoor ambient temperature (Tao_HMAX) and the minimum outdoor ambient temperature (Tao_HMIN) to limit the operating temperature range of heating mode. When the outdoor ambient temperature＞Tao_CMAX or＜ Tao_CMIN, the unit will stop heating operation



3.3 heating stop-operating temperature difference (dTSH_OFF)、heating start-operating temperature difference (dTSH_ON)

In heating mode, when the outlet water temperature reaches (Tset + dTSH_OFF), the heat pump will stop operation and only the water pump is turned on; When the outlet water temperature reaches (Tset - dTSH_ON), the heat pump is turned on for heating operation



3.4 Delay time of Hydraulic module electric heating start after compressor start (t_IBH_DELAY)、Ambient temperature that allows Hydraulic module electric heating to start (Tao_IBH_ON)

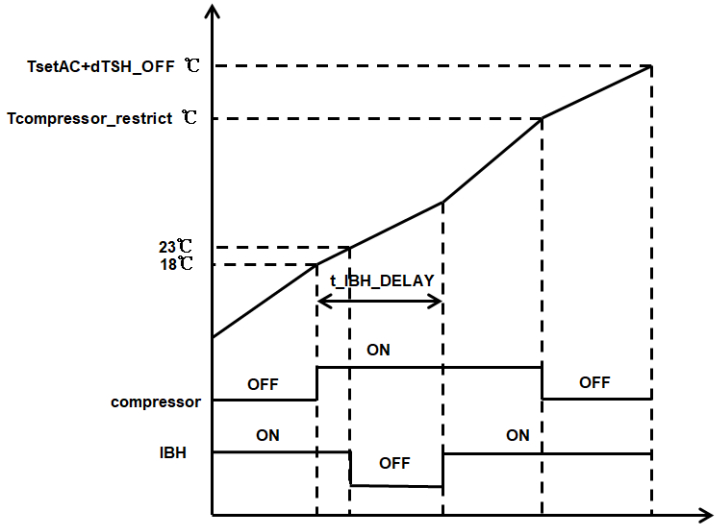
Set Delay time of Hydraulic module electric heating start after compressor start (t_IBH_DELAY) by Wired controller， When the heat pump running time ≥ (t_IBH_DELAY), and the outdoor ambient temperature < (Tao_TBS_ON), if the outlet water temperature does not reach the set target outlet water temperature TsetAC, the unit will turn on the electric heating, and run together with the heat pump to produce hot water

3.5 The ambient temperature at which the gas water heater is allowed to start (Tao_AHS_ON)

Set (Tao_AHS_ON) by Wired controller, when the gas water heater is enabled, and the outdoor ambient temperature < (Tao_AHS_ON), and the outlet water temperature ＜TsetAC, the gas water heater will be turned on

3.6 Heating mode operation

The unit can produce hot water by controlling the operation of the compressor, electric heating (IBH), and gas water heater (AHS). As shown below：

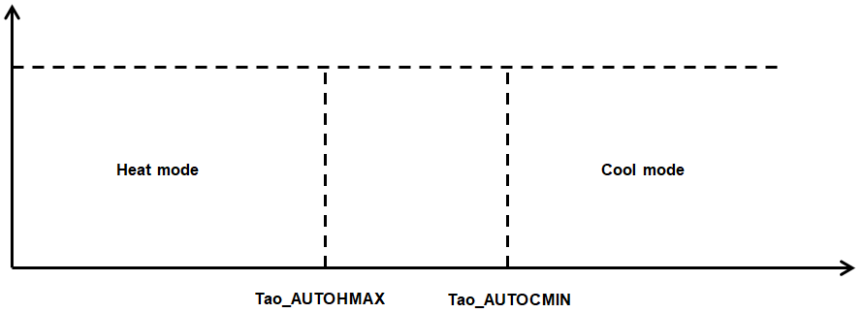


When the heating mode is turned on, if the outlet water temperature ＜18°C, turn on the electric heating first, and then turn on the compressor after the outlet water temperature ＞ 18°C， After the outlet water temperature ＞23℃, turn off the electric heating and only the compressor keeps running。When the compressor running time ＞t_IBH_DELAY) And when the outdoor ambient temperature <Tao_IBH_ON, the electric heating starts to run, and when the outlet water temperature reaches the maximum outlet water temperature (Tcompressor_restrict) the compressor stops running, and the outlet water temperature reaches (TsetAC+dTSH_OFF), the electric heating stops running。

4. Automatic mode

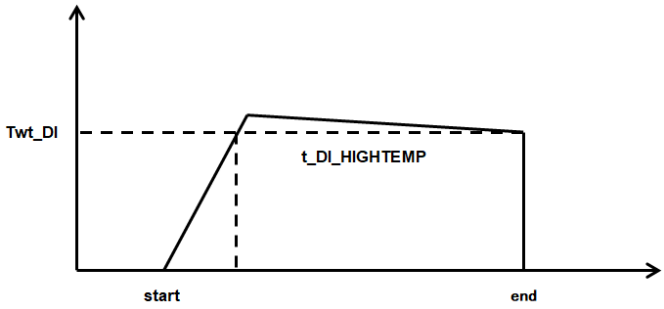
When the user selects the automatic mode, the operation mode is automatically switched according to the set cooling minimum temperature (Tao_AUTOCMIN) and heating maximum temperature (Tao_AUTOHMAX). When the outdoor ambient temperature <Tao_AUTOHMAX, the heat pump operates in

the heating mode, and when the outdoor ambient temperature>Tao_AUTOCMIN), the heat pump operates in the cooling mode



5. Disinfect

Set whether the water tank sterilization is enabled or not by the wire controller. When it is set to enable, after reaching the set opening time, the unit automatically turns on the water tank sterilization function, and runs according to the set sterilization water temperature and sterilization time. When it is not enabled, the unit will close the tank sterilization function



After the sterilization function of the water tank is turned on, the unit runs DHW mode and turns on the electric heating of the water tank, so that the temperature of the water tank rises.;After rising to the sterilization water temperature (Twt_DI)+1℃, the heat pump and the electric heating of the water tank are turned off, and the temperature in the water tank＞the sterilization water temperature (Twt_DI) ,operation time ≥ sterilization duration (t_DI_HIGHTEMP), exit the water tank for sterilization

6. Fast DHW

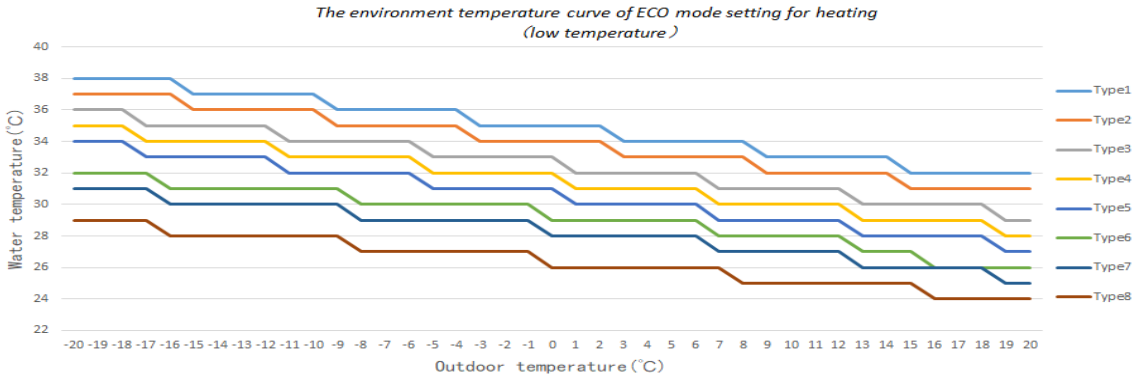
Set whether to enable the fast DHW function by the wired controller. After entering the fast DHW function, the heat pump operation mode is immediately switched to the DHW mode, and the electric heating of the water tank is turned on immediately. When the water tank temperature ≥ (Tset+1)℃ , exit the fast DHW, the electric heating of the water tank is turned off, and the heat pump returns to normal operation

7. ECO mode

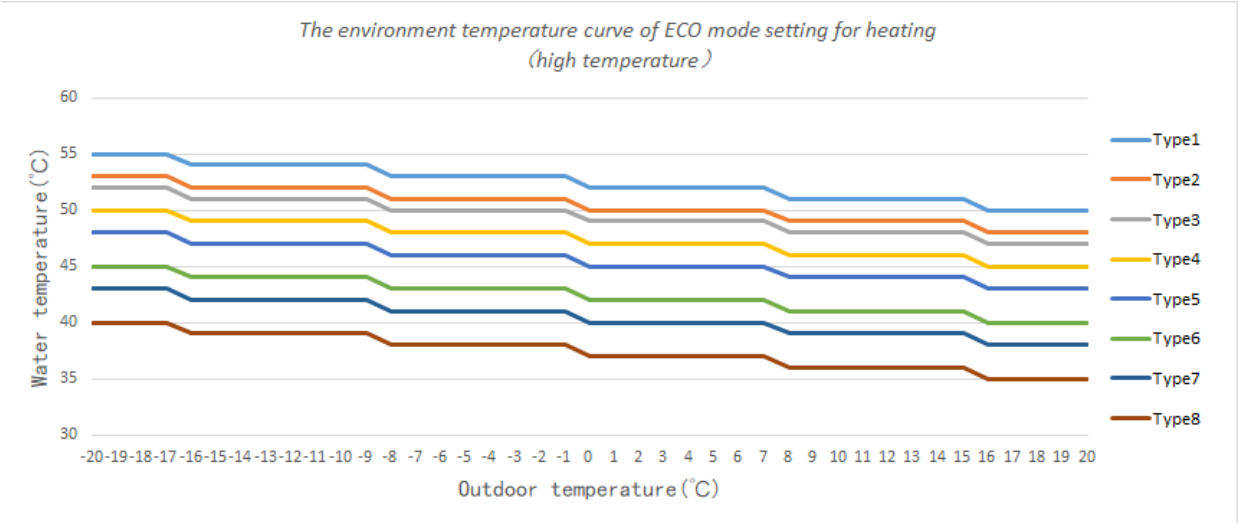
The user can enter the ECO mode by the wired controller. the user selects one of the 8 built-in curves in the wired controller.then enter ECO mode, The heat pump automatically sets the target outlet water temperature TsetAC according to the set terminal type、the selected operating curve and outdoor ambient temperature

When the user selects the heating mode, there are high water temperature curves and low water

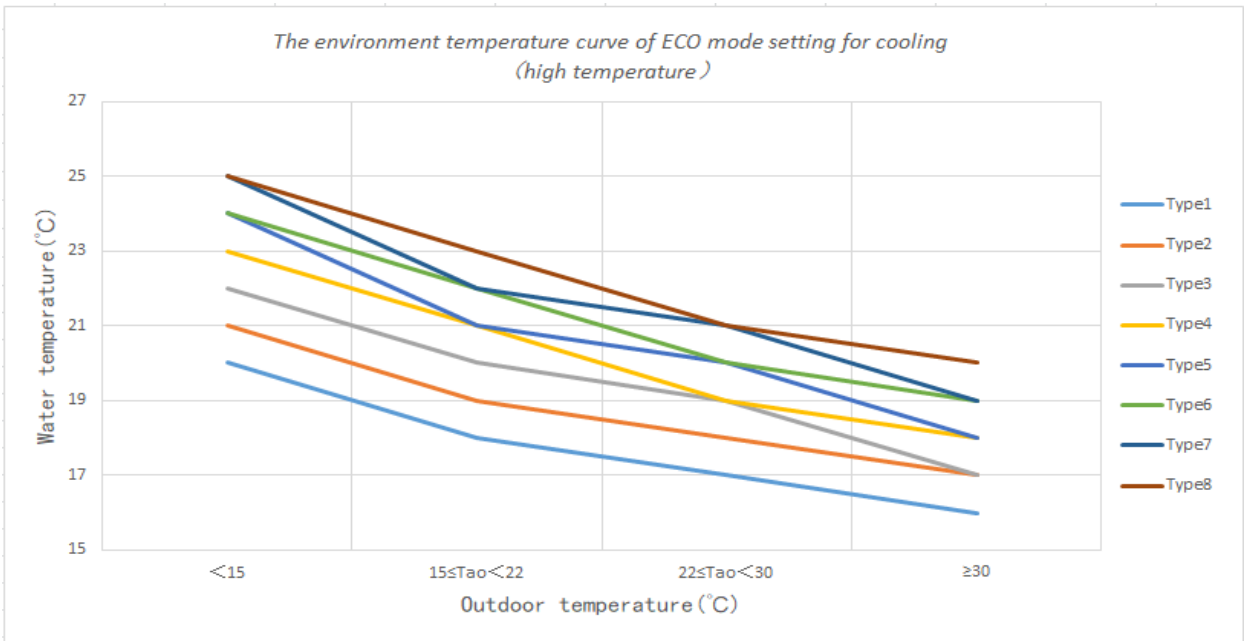
temperature curves. If the terminal type selected by the user is only floor heating (FLH), the low water temperature curve of the heating mode will be run, as shown in the figure below.:



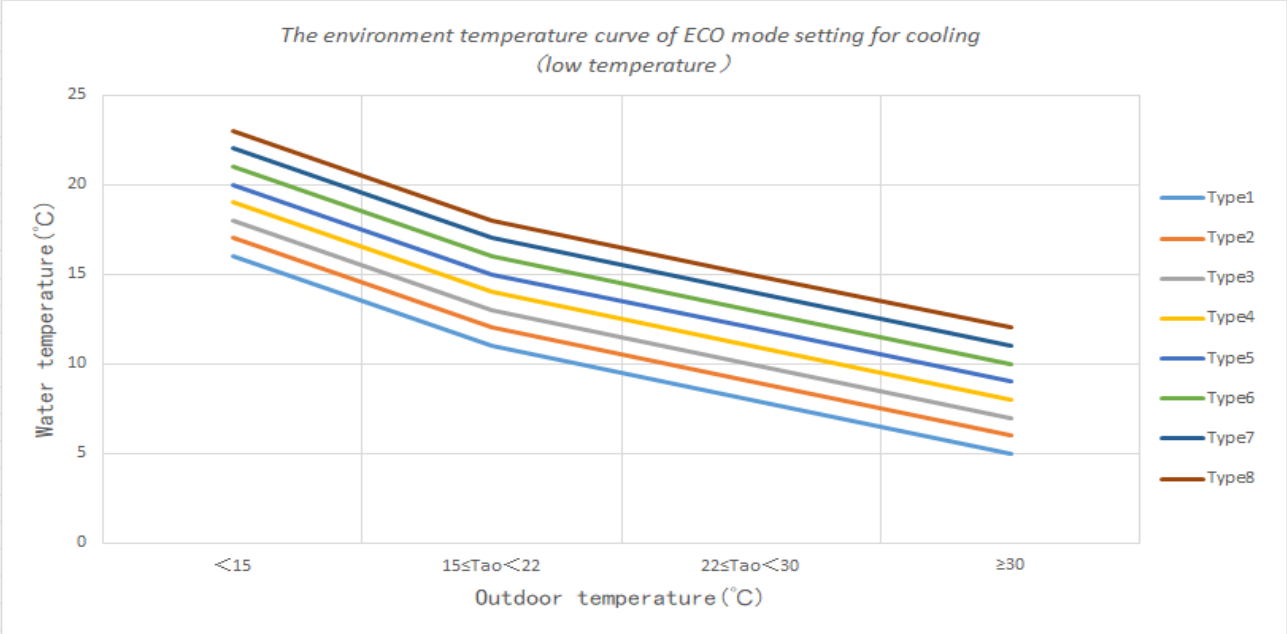
When the user selects the heating mode, if the selected terminal type contains radiator (RAD) or fan coil (FCU), the high water temperature curve of the heating mode will be run, as shown in the figure below:



When the user selects the cooling mode, there are two water temperature curves: the high water temperature curve and the low water temperature curve. If the terminal type selected by the user contains floor heating (FLH) or radiator (RAD), the high water temperature curve of the cooling mode will be run, as shown in the figure below.:

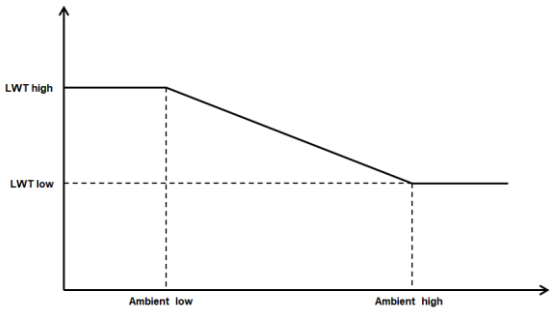


When the user selects the cooling mode, if there is only fan coil (FCU) in the selected terminal type, the low water temperature curve of the cooling mode will be run, as shown in the figure below.：



8. Automatic water temperature function of Hydraulic module

When setting the automatic water temperature, the user can customize the running curve of the water temperature. The user only needs to set two outdoor ambient temperatures and two water temperatures as needed, and then a water temperature curve can be drawn, as shown in the figure.：



In this mode, the heat pump automatically sets the target outlet water temperature according to the drawn water temperature curve。

9. Mute function

After entering the mute function, according to the selected mute level, limit the maximum operating frequency of the compressor of the outdoor unit and the maximum speed of the fan to achieve mute function。

10. Holiday-away

After entering the holiday mode, the unit operates according to the setting heating outlet water temperature and DHW temperature during the holiday。

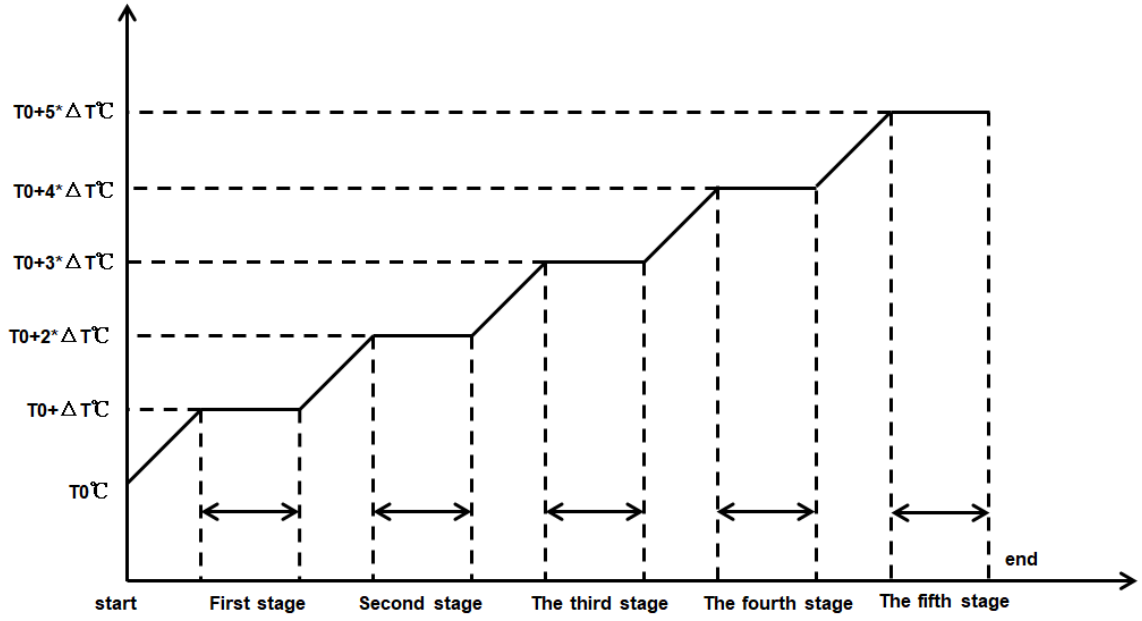
11. Holiday- home

After entering the holiday-home function, the unit operates according to the setting operation mode, outlet water temperature, water tank temperature, etc. during the holiday-home period.。

12. Floor Preheating

The floor preheating function is divided into 5 stages, and the heat pump calculates the target outlet water temperature of each stage according to the detected outlet water temperature T0 and the set value of the outlet water temperature(Tset_B_PREHEATING). Calculate the running time of each stage according to the set duration t_fristFH of the floor preheating function。

After entering the floor preheating function, the heat pump operates in the heating mode. When the outlet water temperature reaches the target outlet water temperature of the current stage, the timing starts.; After the temperature is maintained for the running time of the current stage, the unit will enter next stage until the end of the 5th stage of operation. After the fifth stage, the unit enters the normal operation state。



13. Floor drying

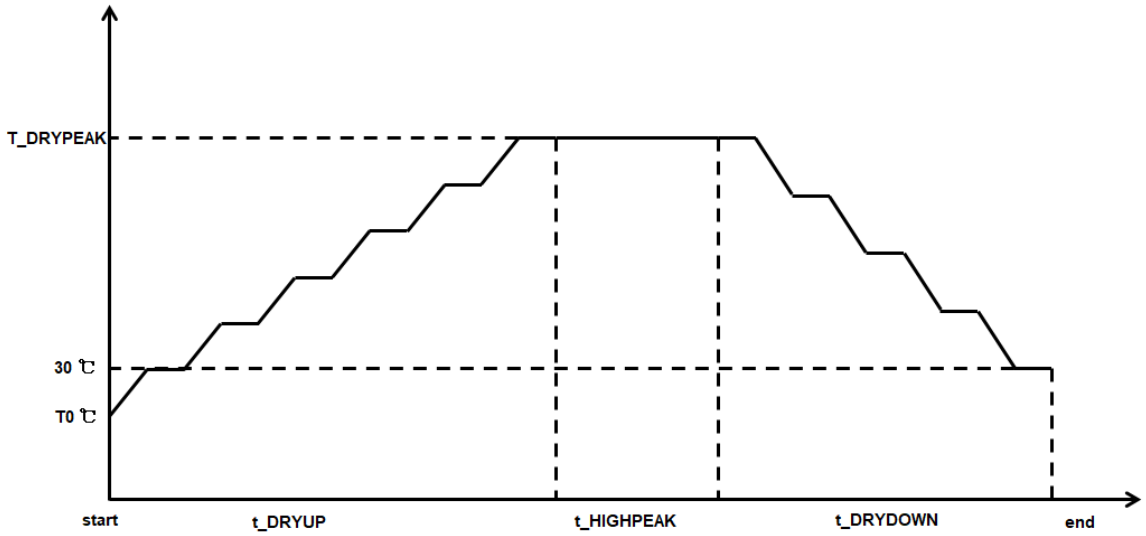
The floor drying function is divided into 3 operation cycles: heating cycle, holding cycle and cooling cycle. Each cycle is divided into different stages according to the settings.。

During the heating cycle, the heat pump calculates the target outlet water temperature at each stage according to the outlet water temperature T0, the maximum floor drying water temperature T_DRYPEAK, and the heating cycle duration t_DRYUP. When the outlet water temperature reaches the target outlet water temperature of this stage, the timing starts. After the time meets the duration of the current stage, the next stage is entered. After the heating cycle is completed, the unit will enter holding cycle。

During the holding period, the target outlet water temperature of the heat pump is the maximum dry floor water temperature T_DRYPEAK. After the running time reaches the holding period duration t_HIGHPEAK, the unit will enter the cooling period。

During the cooling cycle, the heat pump calculates the target outlet water temperature for each stage according to the maximum drying water temperature T_DRYPEAK and the duration of the cooling cycle t_DRYDOWN. When the outlet water temperature reaches the target outlet water temperature of this stage, the timing starts. After the time meets the duration of the current stage, the unit will enter next stage. After

the cooling cycle is completed,the unit will exit the floor drying mode。



14. Power-down memory function

When the power-down memory function is enabled, after power-on, the unit will continue to run according to the operation mode, the set target water temperature before the power-off

15. Forced run function

Turn on the forced operation function, which can control the switch status of the system circulating water pump, electric heating, water tank electric heating, external circulating water pump, floor heating mixed water pump, solar water pump, domestic hot water (DHW) water pump, electric valve, etc.

16. Automatic exhaust function of water system

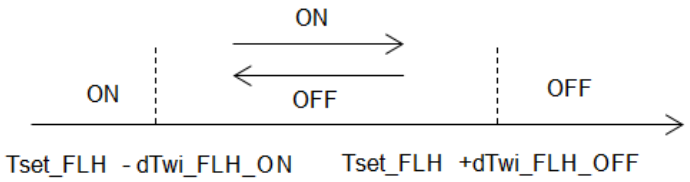
After the installation of the water system and the completion of adding water, the automatic exhaust function of the water system can be used to drain the water in the system.。

After entering the automatic exhaust function of the water system, the pump runs for 5 minutes and stops for 1 minute as a cycle.。

The electric valve works as follows: 1) Electric valve MV1 is OFF, electric valve MV2 is ON, and 4 pump cycles are run; 2) Electric valve MV1 is ON, electric valve MV2 is OFF, and 2 pump cycles are run; cyclic operation

17. Floor heating mixing pump control

When using a floor heating mixed pump, the user need to install temperature sensors at the floor heating water inlet to detect the floor heating water inlet temperature. The start and stop of the floor heating mixed water pump is controlled by ①the detected floor heating water inlet temperature, ②the target floor heating water temperature Tset_FLH, ③the floor heating mixed water pump on temperature difference dTwi_FLH_ON, and ④the floor heating mixed water pump off temperature difference dTwi_FLH_OFF. When Twi_FLH>(Tset_FLH + dTwi_FLH_OFF), the floor heating mixing pump is turned off, and when Twi_FLH < (Tset_FLH - dTwi_FLH_ON), the floor heating mixing pump is turned on



18. Heating water by gas water heater

When the heating function of the gas water heater is set to be enabled, set the outdoor ambient temperature Tao_AHS_ON that allows the gas water heater to be turned on by the wired controller. When the outdoor ambient temperature <Tao_AHS_ON and the outlet water temperature of the Hydraulic module < (TsetAC -dTSH_ON), the gas water heater is turned on. When the outdoor ambient temperature ≥ Tao_AHS_ON or the Hydraulic module outlet water temperature Two_B ≥(TsetAC + dTSH_OFF), the gas water heater is turned off。

19. heating water by Solar

The user can use solar energy to heat water by controlling the start and stop of the solar water pump. There are two control methods: signal control and temperature control.

Temperature control: when solar panel temperature Tsolar > water tank temperature Twt+8℃, and water tank temperature Twt < 65℃, the solar water pump is turned on; when solar panel temperature Tsolar < water tank temperature Twt+3℃ or water tank temperature Twt≥70 ℃, the solar water pump is turned off.

Signal control: when it is detected that the solar input signal is closed and the water tank temperature Twt<65℃, the solar water pump is turned on; when it is detected that the solar energy input signal is disconnected or the water tank temperature Twt≥70℃, the solar water pump is turned off。

Abbreviation

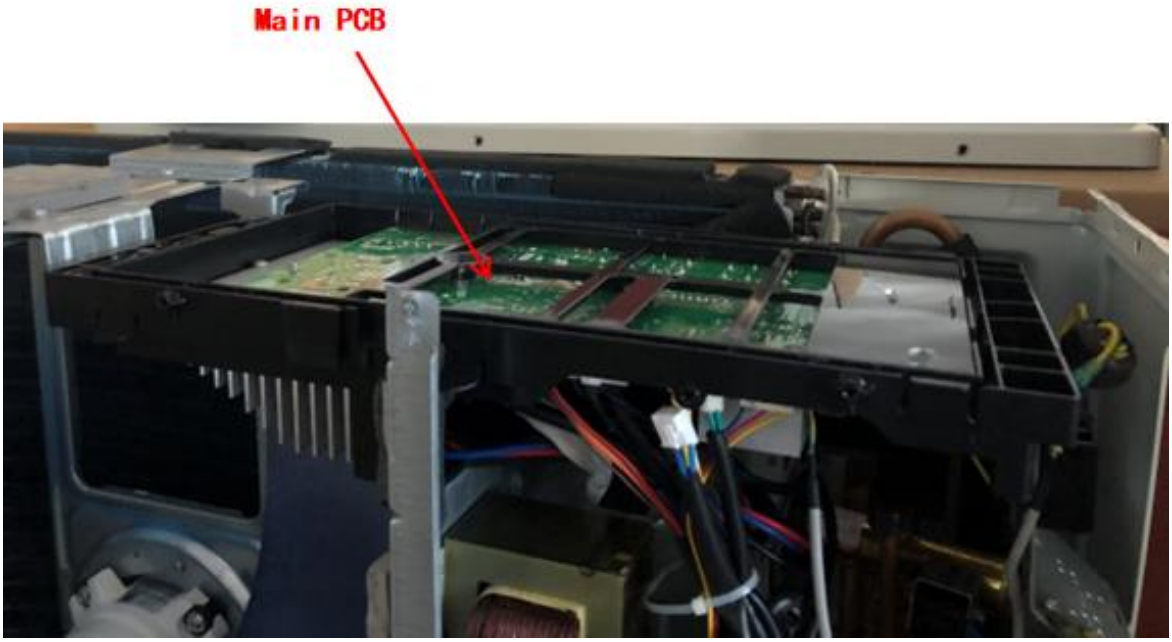
No	description	Unit	Range	Default	abbreviation
1	Maximum ambient temperature of DHW mode	℃	35-43	43	Tao_DHWMAX
2	Minimum ambient temperature of DHW mode	℃	-25-5	-10	Tao_DHWMIN
3	Delay time of water tank electric heating start after compressor start	min	10-240	30	t_TBH_DELAY
4	the sterilization water temperature	℃	60-70	65	Twt_DI
5	sterilization duration	min	5-60	15	t_DI_HIGHTEMP.
6	sterilization max duration	min	90-300	210	t_DI_MAX
7	the heat pump heating/cooling limit time	min	10-600	30	t_DHWHP_RESTRICT
8	maximum time of DHW mode	min	10-600	90	t_DHWHP_MAX
9	Water pump operation time of DHW mode	min	5-120	5	DHW PUMP RUNNING TIME
10	Maximum outdoor ambient temperature of cooling mode	℃	35-52	43	Tao_CMAX
11	Minimum outdoor ambient temperature of cooling mode	℃	-5-25	10	Tao_CMIN
12	Maximum outdoor ambient temperature of heating mode	℃	20-35	35	Tao_HMAX
13	Minimum outdoor ambient temperature of heating mode	℃	-25-15	-15	Tao_HMIN

14	Automatic water temperature 1 of heating mode	℃	25-60	35	TsetAC_H1
15	Automatic water temperature 2 of heating mode	℃	25-60	28	TsetAC_H2
16	outdoor ambient temperature 1 of heating mode	℃	-25-35	-5	Tao_H1
17	outdoor ambient temperature 2 of heating mode	℃	-25-35	7	Tao_H2
18	Automatic water temperature 1 of cooling mode	℃	5-25	10	TsetAC_C1
19	Automatic water temperature 2 of cooling mode	℃	5-25	16	TsetAC_C2
20	outdoor ambient temperature 1 of cooling mode	℃	-5-52	35	Tao_C1
21	outdoor ambient temperature 2 of cooling mode	℃	-5-52	25	Tao_C2
22	Cooling minimum temperature of auto mode	℃	20-29	25	Tao_AUTOCMIN
23	Heating maximum temperature of auto mode	℃	10-17	17	Tao_AUTOCMAX
24	Delay time of Hydraulic module electric heating start after compressor start	min	20-120	50	t_IBH_DELAY
25	Delay time of gas water heater start after compressor start	min	5-120	30	t_AHS_DELAY
26	outdoor ambient temperature that allows the gas water heater to be turned on	℃	-25-10	-5	Tao_AHS_ON
27	set value of the outlet water temperature of floor preheating	℃	30-45	30	Tset_B_PREHEATING
28	Duration of floor preheating	HOURS	24-72	72	t_fristFH
29	heating cycle of floor drying	days	2-8	8	t_DRYUP
30	holding cycle of floor drying	days	1-5	5	t_HIGHPEAK
31	cooling cycle of floor drying	days	0-5	5	t_DRYDOWN
32	maximum water temperature of floor drying	℃	35-45	45	T_DRYPEAK
33	the floor heating mixed water pump on temperature difference	℃	5-10	5	dTwi_FLH_ON
34	the floor heating mixed water pump off temperature difference	℃	-10- -5	-5	dTwi_FLH_OFF
35	the target floor heating water temperature	℃	30-35	35	Tset_FLH
36	cooling stop-operating temperature difference	℃	2-10	2	dTSC_OFF
37	cooling start-operating temperature difference	℃	5-10	5	dTSC_ON
38	heating stop-operating temperature difference	℃	2-10	2	dTSH_OFF
39	heating start-operating temperature difference	℃	5-10	5	dTSH_ON
40	Ambient temperature that allows Hydraulic module electric heating to start	℃	-15-10	-5	Tao_IBH_ON
41	Ambient temperature that allows water tank electric heating to start	℃	-5-20	5	Tao_TBH_ON

Part11 PCB Instruction

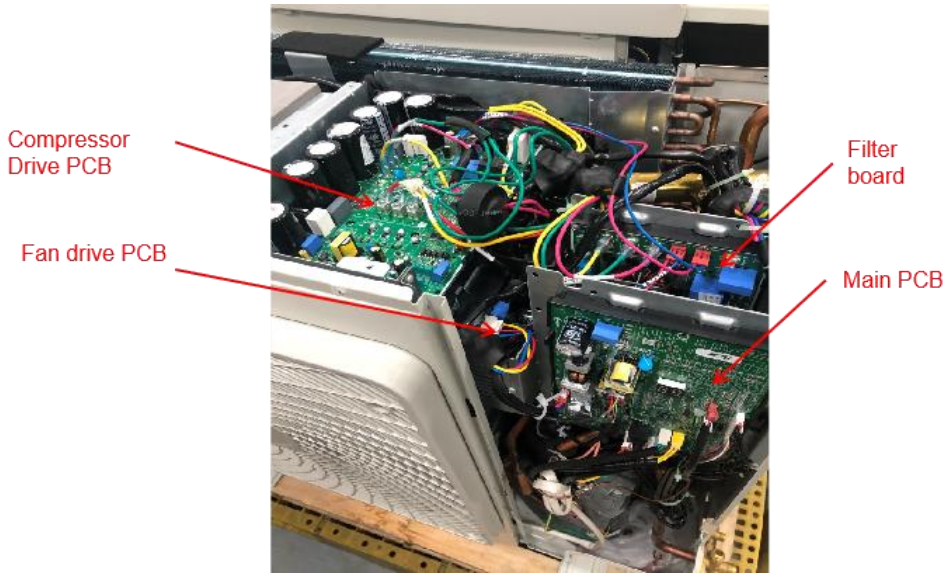
1.ODU electrical control box

ACHP-H04/4R3HA-O； ACHP-H06/4R3HA-O：



ACHP-H08/4R3HA-O；ACHP-H10/4R3HA-O：

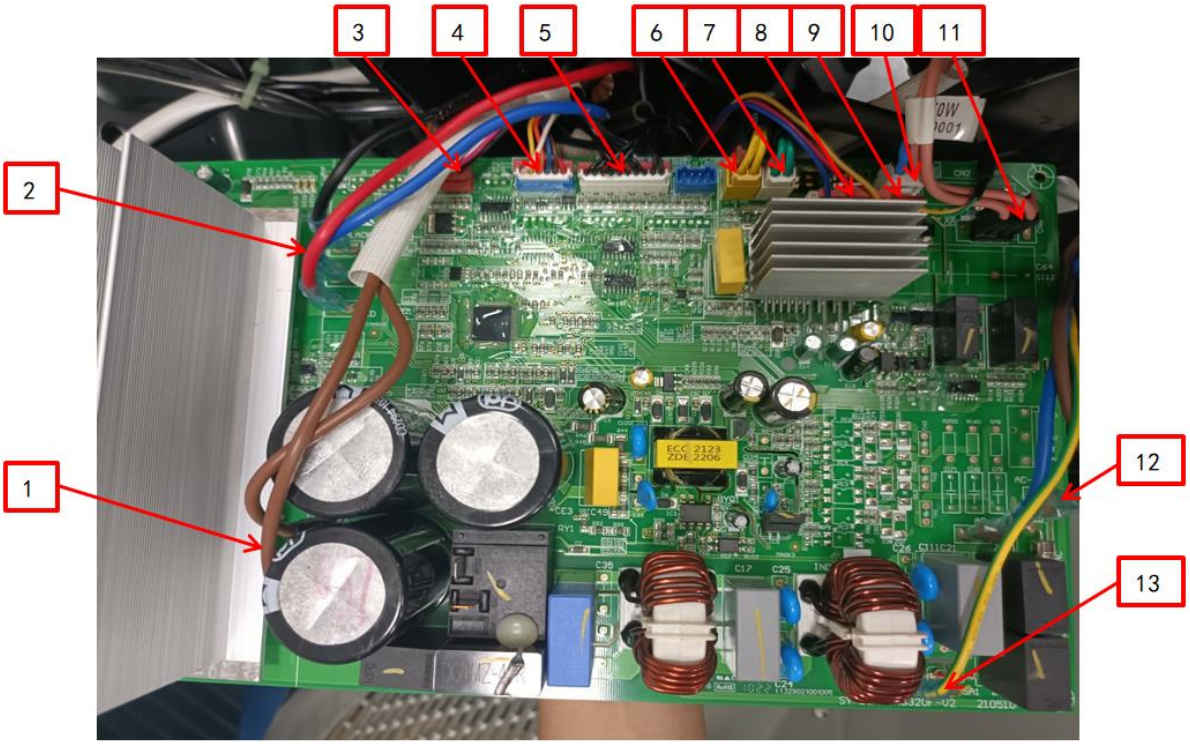
ACHP-H12/5R3HA-O；ACHP-H14/5R3HA-O；ACHP-H16/5R3HA-O：



2.ODU control PCB

2.1 4-6kW (ACHP-H04/4R3HA-O、ACHP-H06/4R3HA-O)

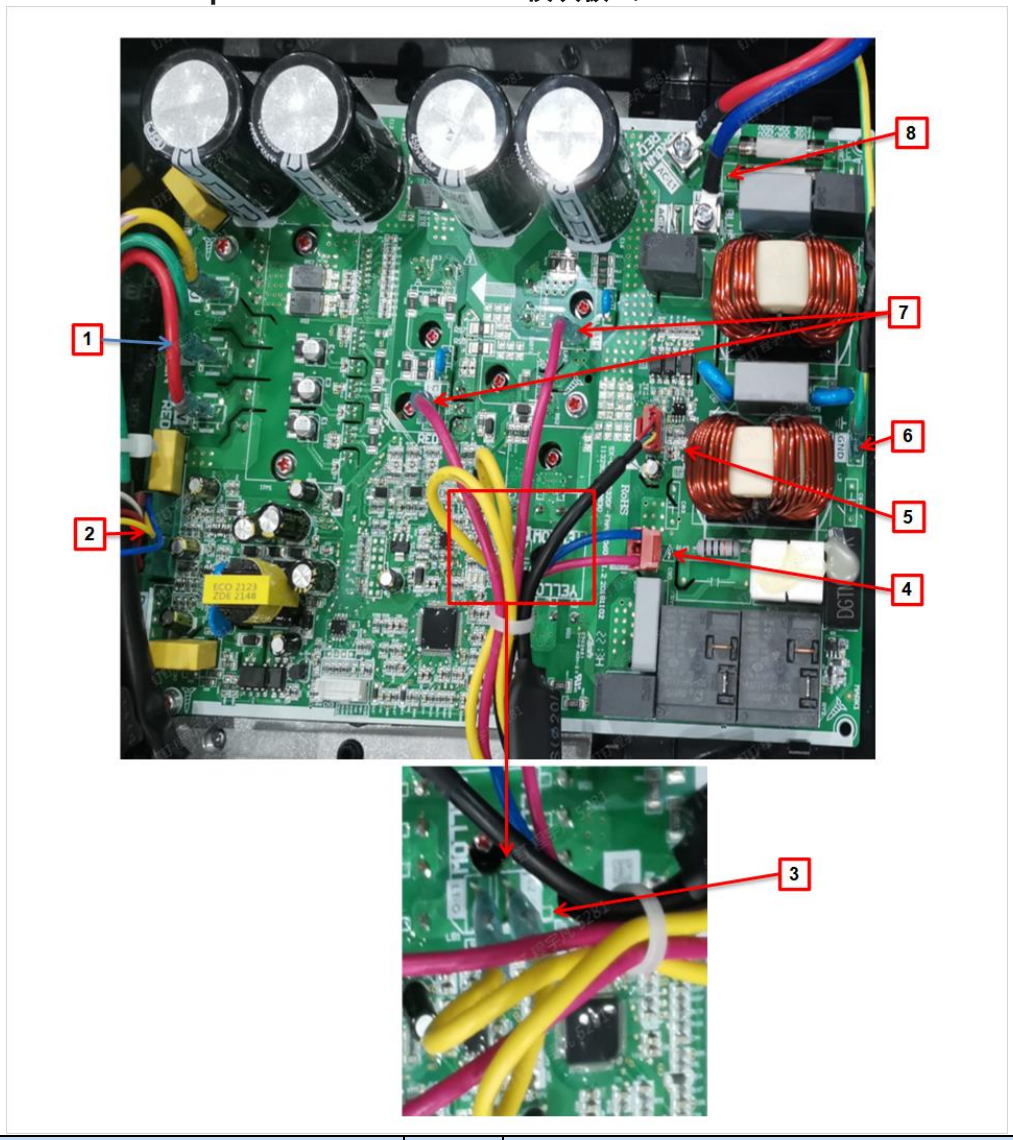
11222542000150 Main PCB CJ 控制板 RSW-BP-DC4-2P-R32-E1(SY



Num.	Remark	Num.	Remark
1	Reactor	8	Fan motor
2	Compressor line UVW	9	Communication line between indoor unit and out door unit
3	High pressure sensor	10	Four-way valve
4	Electronic expansion valve	11	Chassis electric heating
5	Temperature Sensor	12	Power supply
6	High switch	13	Ground lead
7	Low switch		

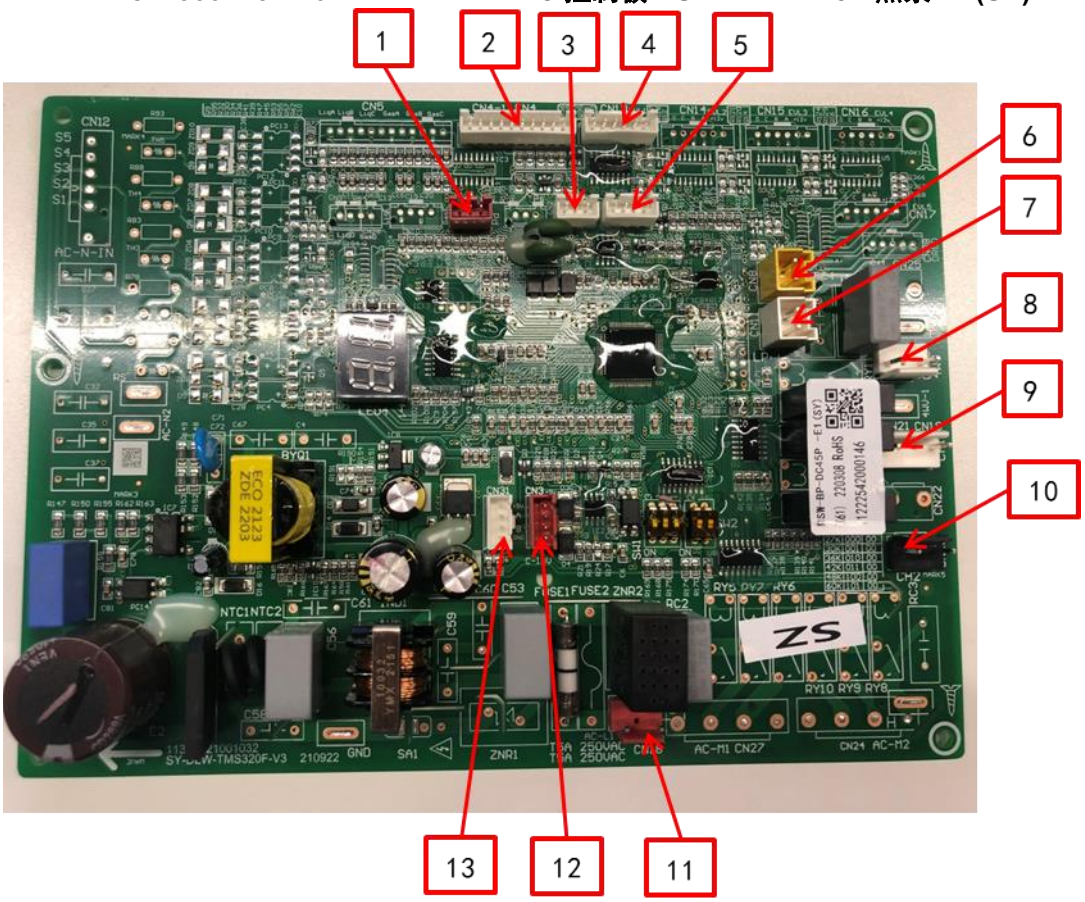
2.2 8-10kW(ACHP-H08/4R3HA-O、ACHP-H10/4R3HA-O)

11222543000075 Compressor drive PCB CJ 模块板 QD-12321F-EKTM225D63UFZR-1(SY)



Num.	Remark	Num.	Remark
1	Compressor line UVW	5	Communication line between driver board and main PCB
2	Fan motor	6	Driver board ground wire
3	Reactor (yellow wire)	7	Reactor (red wire)
4	Driver board -main PCB power cable	8	Terminal board -driver board LN power cable

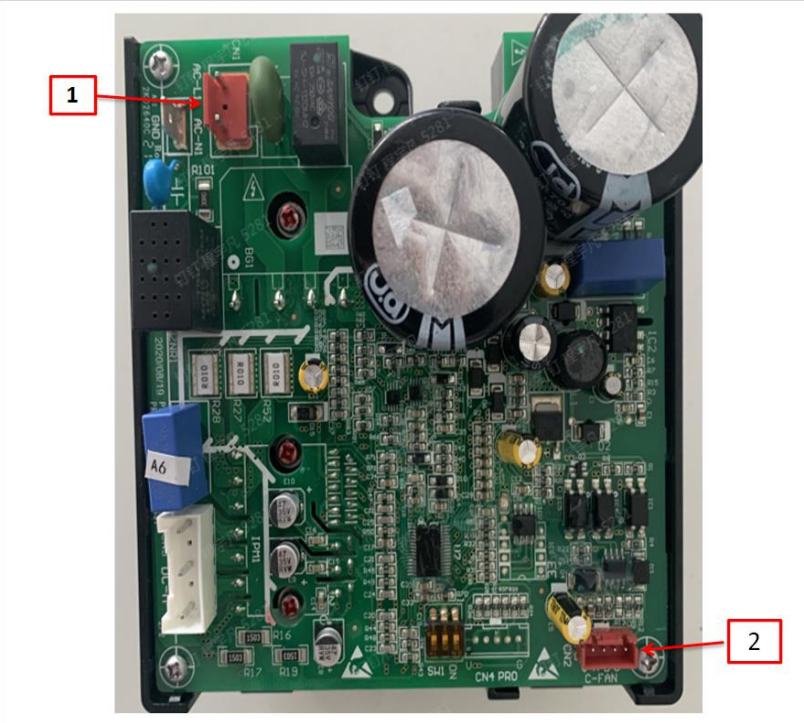
11222542000146 Main PCB CJ 控制板 RSW-BP-DC45P 热泵-E1(SY)



Num.	Remark	Num.	Remark
1	High pressure pressure sensor	7	Low pressure switch
2	Temperature Sensor	8	Four-way valve
3	Internal and external communication	9	Oil temperature heating
4	Electronic expansion valve	10	chassis heating
5	reserved	11	Main PCB power supply
6	High pressure switch	12	Main PCB and fan driver communication
		13	Reserved

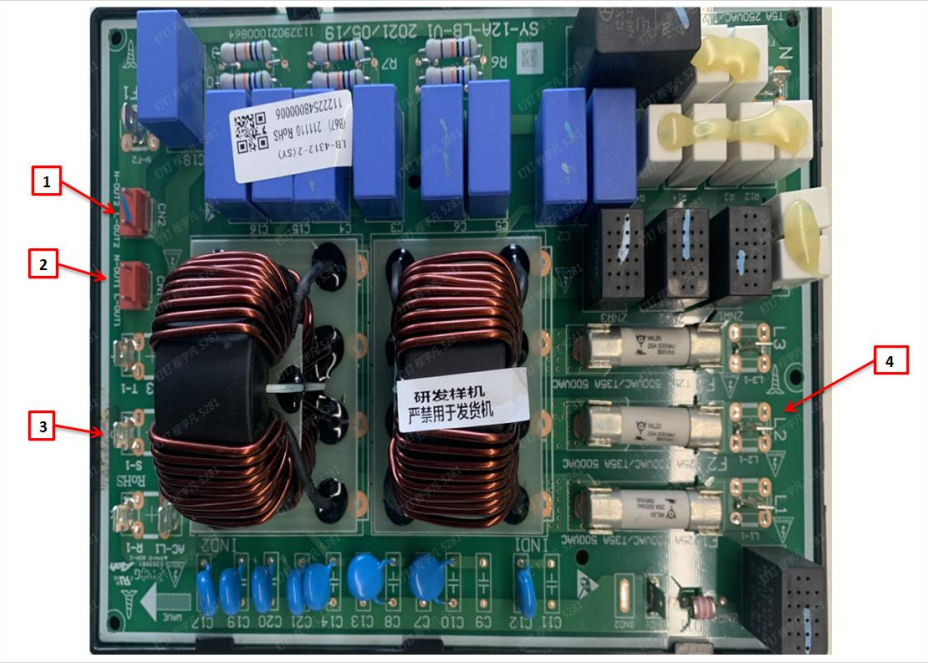
2.3 12-16kW(ACHP-H12/5R3HA-O、ACHP-H14/5R3HA-O、ACHP-H16/5R3HA-O)

11222543000074 Fan drive PCB



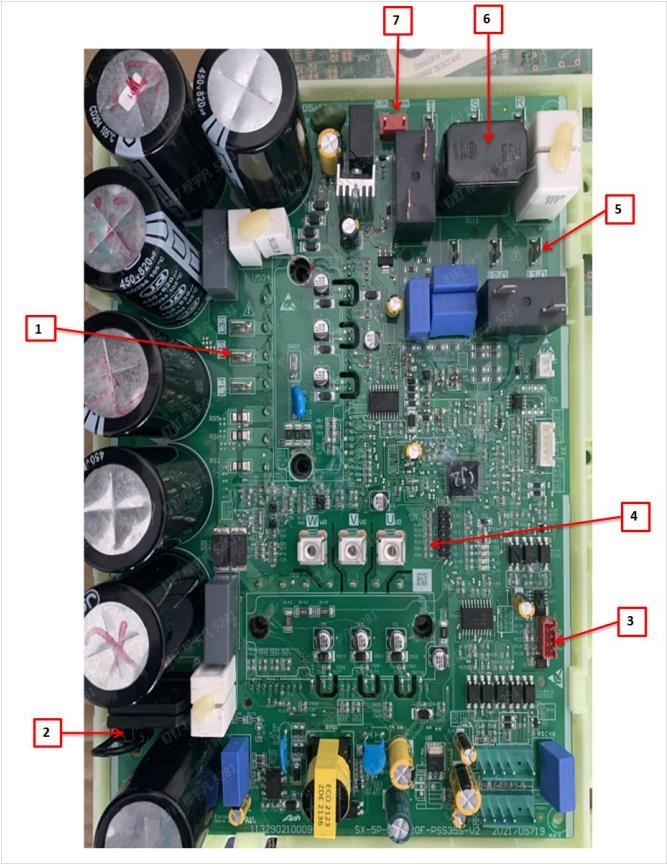
Num.	Remark	Num.	Remark
1	Filter board and fan driver PCB power cable	2	Communication between the main PCB and the fan driver PCB

11222548000006 Filter PCB



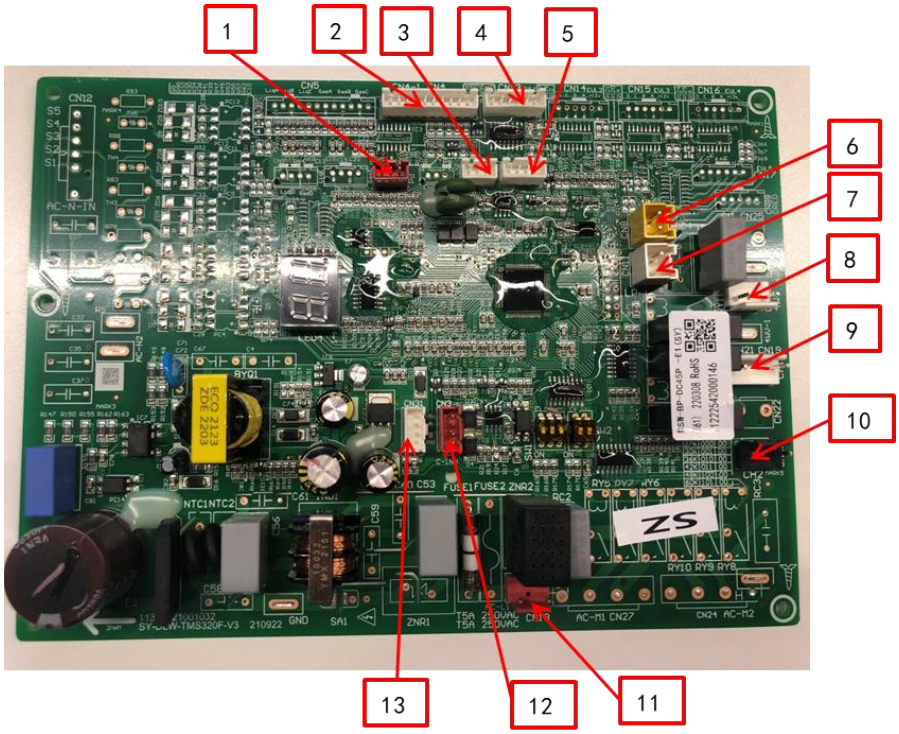
Num.	Remark	Num.	Remark
1	Filter-compressor LN power wire	3	Filter-compressor 3 PHASE power wire,L3/L2/L1;red/green/yellow from top to bottom
2	Filter- Fan-main PCB LN power wire	4	Terminal board- Filter 3 PHASE power wire,L3/L2/L1;red/green/yellow from top to bottom

11222543000073 Compressor drive PCB :



Num.	Remark	Num.	Remark
1	Reactor Insert,L3/L2/L1; red/green/yellow from top to bottom	5	Reactor Insert, L3/L2/L1;red/green/yellow from left to right
2	Reactor reserved	6	Filter- **Compressor drive** 3 PHASE power wire ,T/S/R ,red/green/yellow from left to right
3	Main PCB- **Compressor drive communication wire**	7	Filter- **Compressor drive** LN power wire
4	**Compressor wire,** red/green/yellow from left to right		

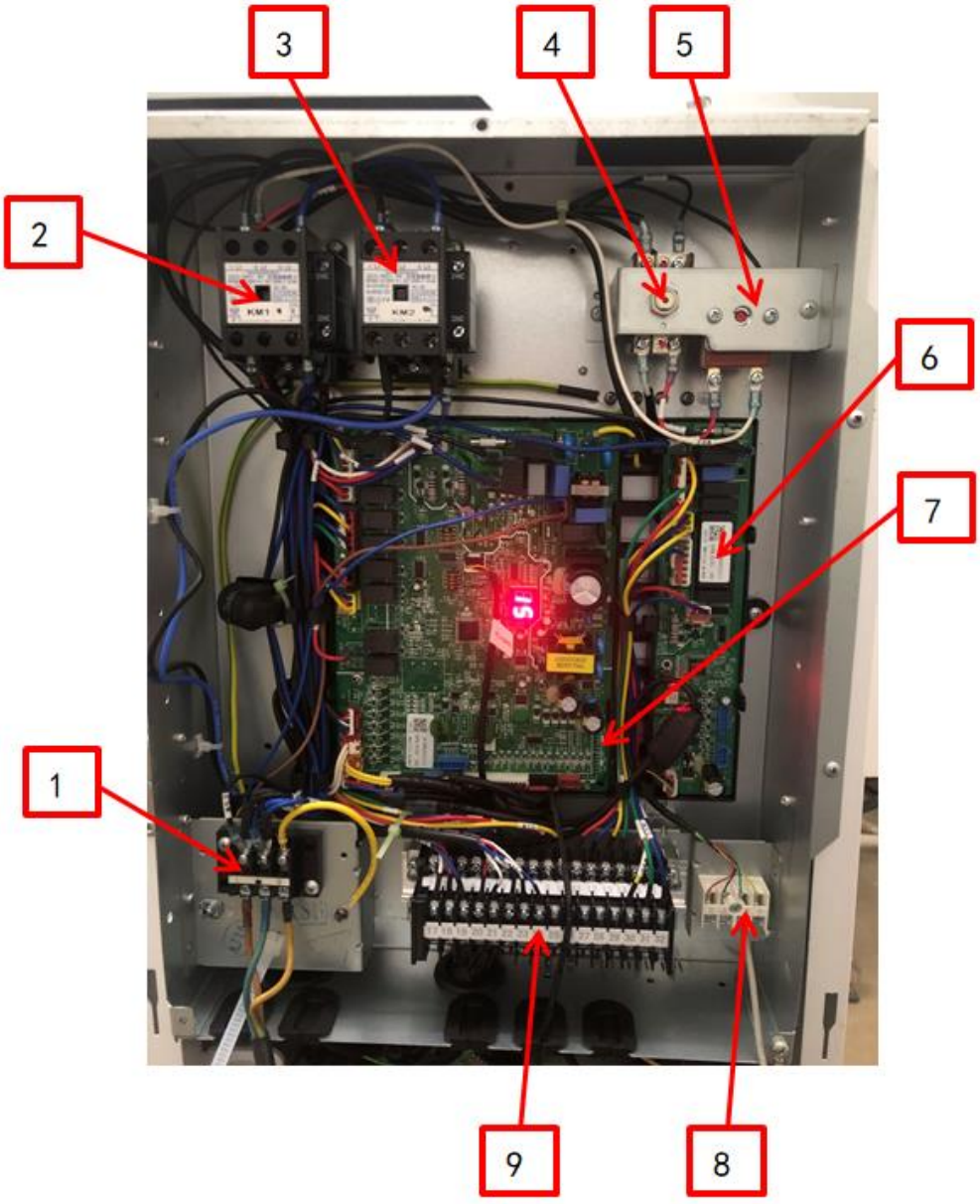
11222542000146 Main PCB



Num.	Remark	Num.	Remark
1	High pressure pressure sensor	7	Low pressure switch
2	Temperature Sensor	8	Four-way valve
3	Internal and external communication	9	Oil temperature heating
4	Electronic expansion valve	10	chassis heating
5	4G module (reserved)	11	Main PCB power supply
6	High pressure switch	12	Main PCB and fan driver communication

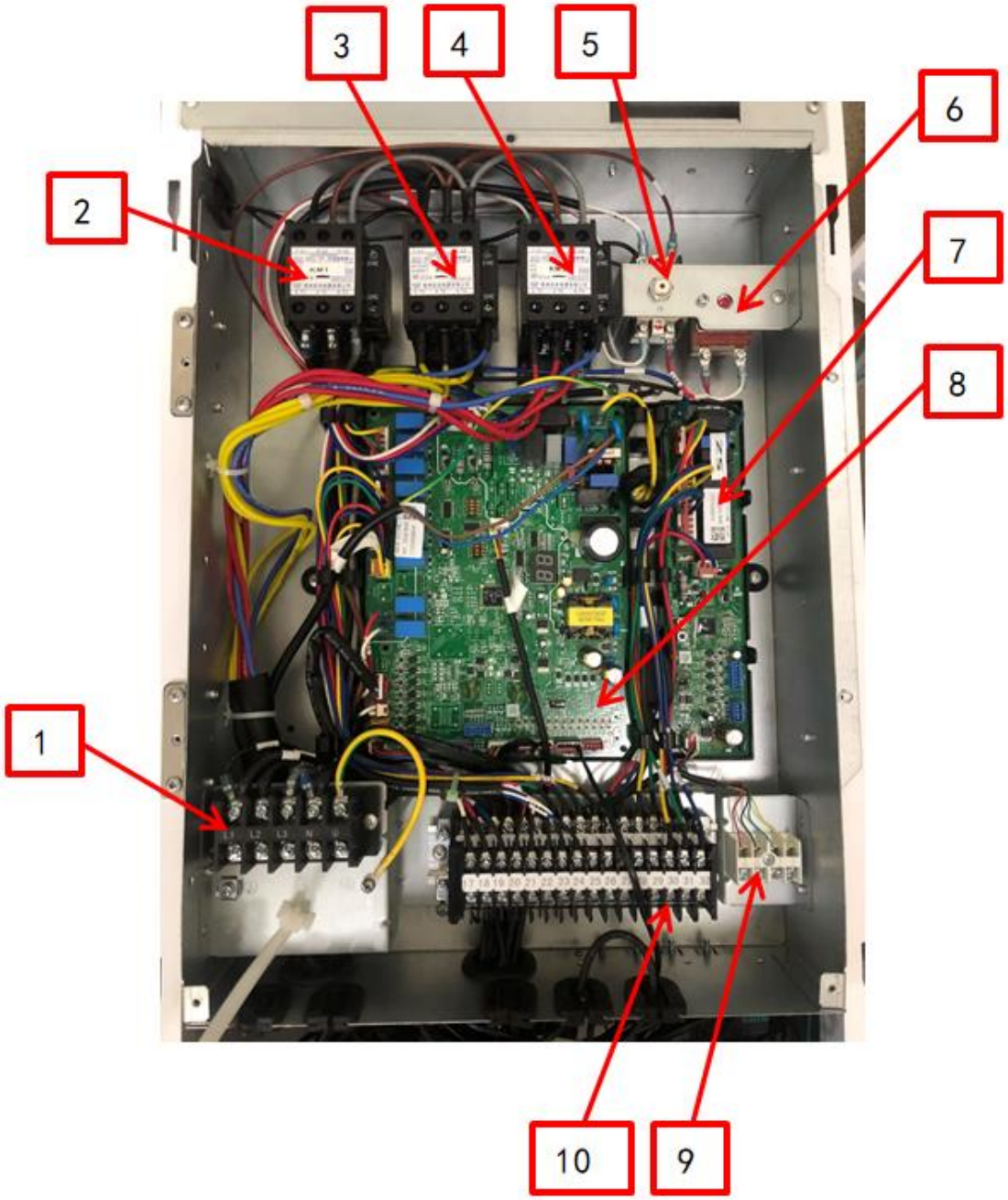
3.Hydraulic module electrical control box

ACHP-H04/4R3HA-I；ACHP-H06/4R3HA-I；



Num.	Remark	Num.	Remark
1	Power supply terminal	6	Extended PCB
2	Power supply relay	7	Main PCB
3	Electric heating relay	8	Communication terminal
4	Electric heater thermal protector (manual recovery)	9	Load wiring terminal
5	Electric heater thermal protector (automatic recovery)		

ACHP-H08/5R3HA-I；ACHP-H10/5R3HA-I
ACHP-H12/5R3HA-I；ACHP-H14/5R3HA-I；ACHP-H16/5R3HA-I



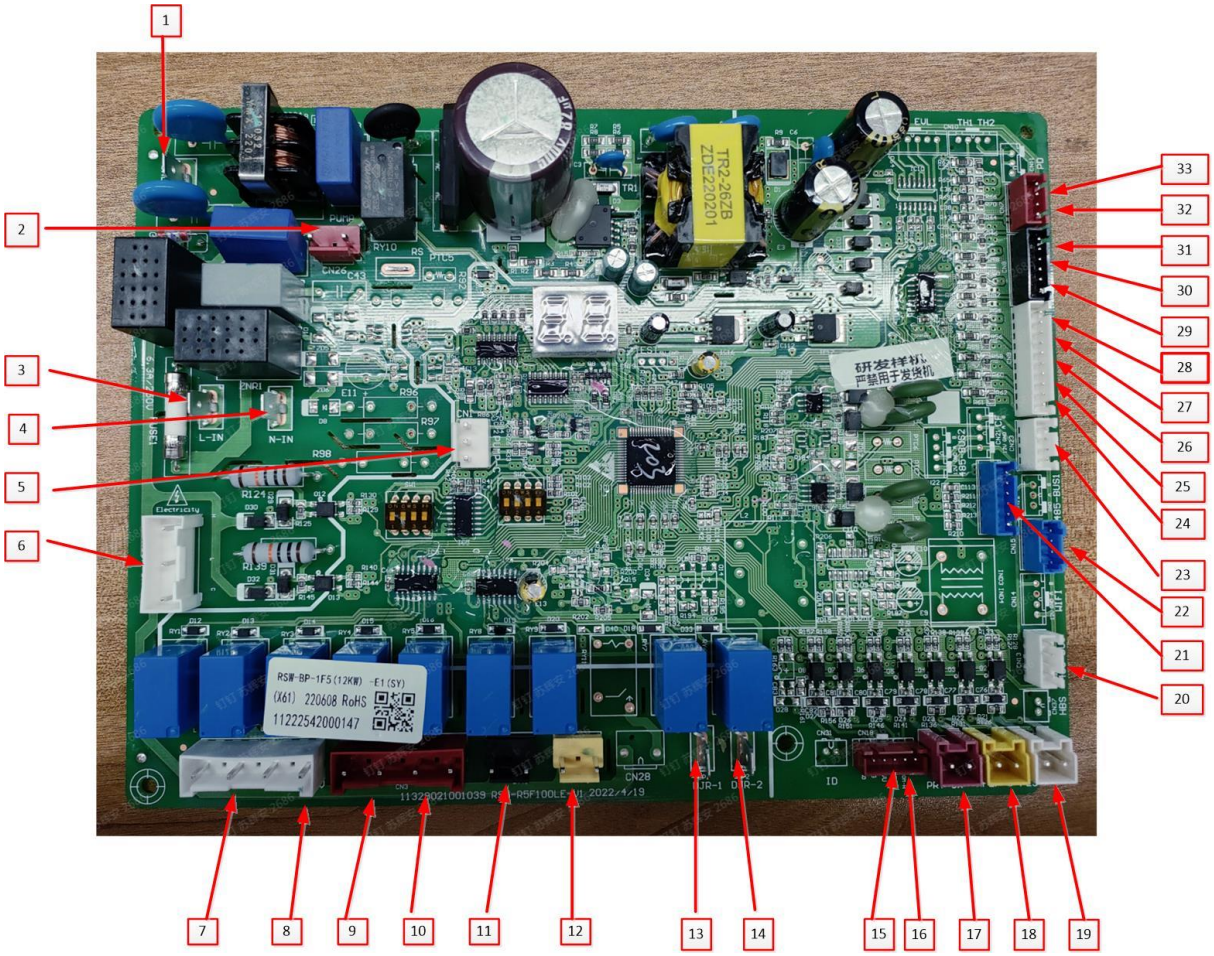
Num.	Remark	Num.	Remark
1	Power supply terminal	6	Electric heater thermal protector (automatic recovery)
2	Power supply relay	7	Expansion PCB
3	Electric heating relay (3kW)	8	Main PCB
4	Electric heating relay (6kW)	9	Communication terminal
5	Electric heater thermal protector (manual recovery)	10	Load wiring terminal

4.Hydraulic module control PCB

ACHP-H04/4R3HA-I；ACHP-H06/4R3HA-I；ACHP-H08/5R3HA-I；ACHP-H10/5R3HA-I

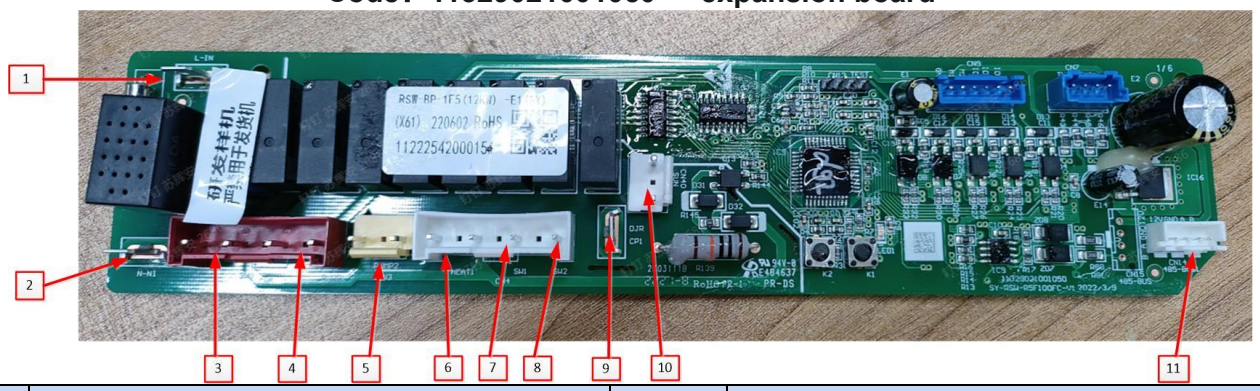
ACHP-H12/5R3HA-I；ACHP-H14/5R3HA-I；ACHP-H16/5R3HA-I

Code：11222542000147 Main PCB



Num.	Abbreviation	Remark	Num.	Abbreviation	Remark
1	/	ground wire	17	/	Electric heating protection switch
2	/	Inverter water pump power wire	18	AFLP	low voltage switch for Antifreeze
3	/	live wire	19	FLS	target flow switch
4	/	Neutral wire	20	/	Communication between IDU &ODU
5	/	Inverter water pump signal wire	21	/	WiFi
6	/	reserved	22	/	Wired controller
7	3W	Three-way valve	23	/	expanding board
8	2W	two-way valve	24	TWO1	Outlet water Temp.
9	KM4	water pump 1	25	TWO2	Electric heating outlet water Temp.
10	KM5	water pump 2	26	TWI	Inlet water Temp.
11	KM6	Electric heating for water tank	27	TICO	Indoor coil outlet temperature
12	KM7	antifreeze heating belt	28	TICI	Indoor coil inlet temperature
13	EH	electric heating 1	29	TWT-BT	Balance tank Temp.
14	EH	electric heating 2	30	TWT-FLH	Floor heating inlet Temp.
15		Smart grid switch	31	TWT	Hot water tank Temp.
16		reserved	32	ROOM	Room Temp.
			33	TSOLAR	Solar panels Temp.

Code：11329021001050 expansion board



Num.	Remark	Num.	Remark
1	live wire	7	Defrost signal
2	Neutral wire	8	compressor signal
3	Three-way valve	9	Electric heating
4	solar water pump	10	solar switch
5	Floor heating mixing water pump	11	Communicate with the water module
6	Additional heat		

Part12 Trouble Shooting

1.ODU Error Code Table

Table39.1:Error code table

1)LED state: ○light off ● light on ★ the llight is flashing

2)When a variety of faults occur, each fault light will be displayed for 5s and execute in turn

3)Digital tube display"00": No fault, The command to start the compressor has been sent, but the actual frequency is 0

priority	LED1	LED2	LED3	Code display	Failure
/	○	○	○	No display/ Number of indoor units	Normal (compressor stopped)
/	★	★	★	No display/ Operating frequency	Normal operation (compressor on)
/	●	●	●	0D/JH	Forced operation or fixed frequency operation
1	○	○	●	36	AC voltage under-voltage protection
2	○	○	★	35	overcurrent protection
3	○	●	○	H4	Low voltage switch protection
				H1	High voltage switch protection
6	○	★	○	39	IPM/PFC over temperature protection
8	○	★	★	C1	Outdoor temperature sensor failure
11	●	○	★	C6	Return air temperature sensor failure
12	●	●	○	E3	Compressor discharge temperature is too high protection
13	●	●	○	FH	Compressor discharge temperature is too low protection
15	●	●	★	E1	Four-way valve reversing abnormal protection
19	●	★	★	C2	Outdoor defrost sensor failure
20	★	○	○	3H	Outdoor DC fan failure
21	★	○	●	J7	Outdoor unit master control EE fault/dial code abnormal fault
22	★	○	★	C3	Compressor discharge sensor fault
23	★	●	○	H4	Heating/cooling low voltage frequency limiting/frequency reduction/protection
24	★	●	●	J2	Communication failure between outdoor unit and indoor unit
25	★	●	★	3E	Compressor start failure/running out of step failure
26	★	★	○	3F	PFC protection fault/PFC bias voltage error
27	★	★	●	31	Module protection fault / compressor phase current bias voltage error
29	/	/	/	J3	The communication between the driver board and the main control board is faulty

30	/	/	/	32	Drive EE failure
31	/	/	/	37	IPM/PFC module temperature sensor abnormality
32	/	/	/	33	Drive module software protection
33	○	●	●	F1	High pressure pressure sensor failure
35	●	○	●	F3	High pressure high pressure protection
37	●	★	●	J5	The number of outdoor units and the number of addresses are incorrectly set

2.Hydraulic module Error code table

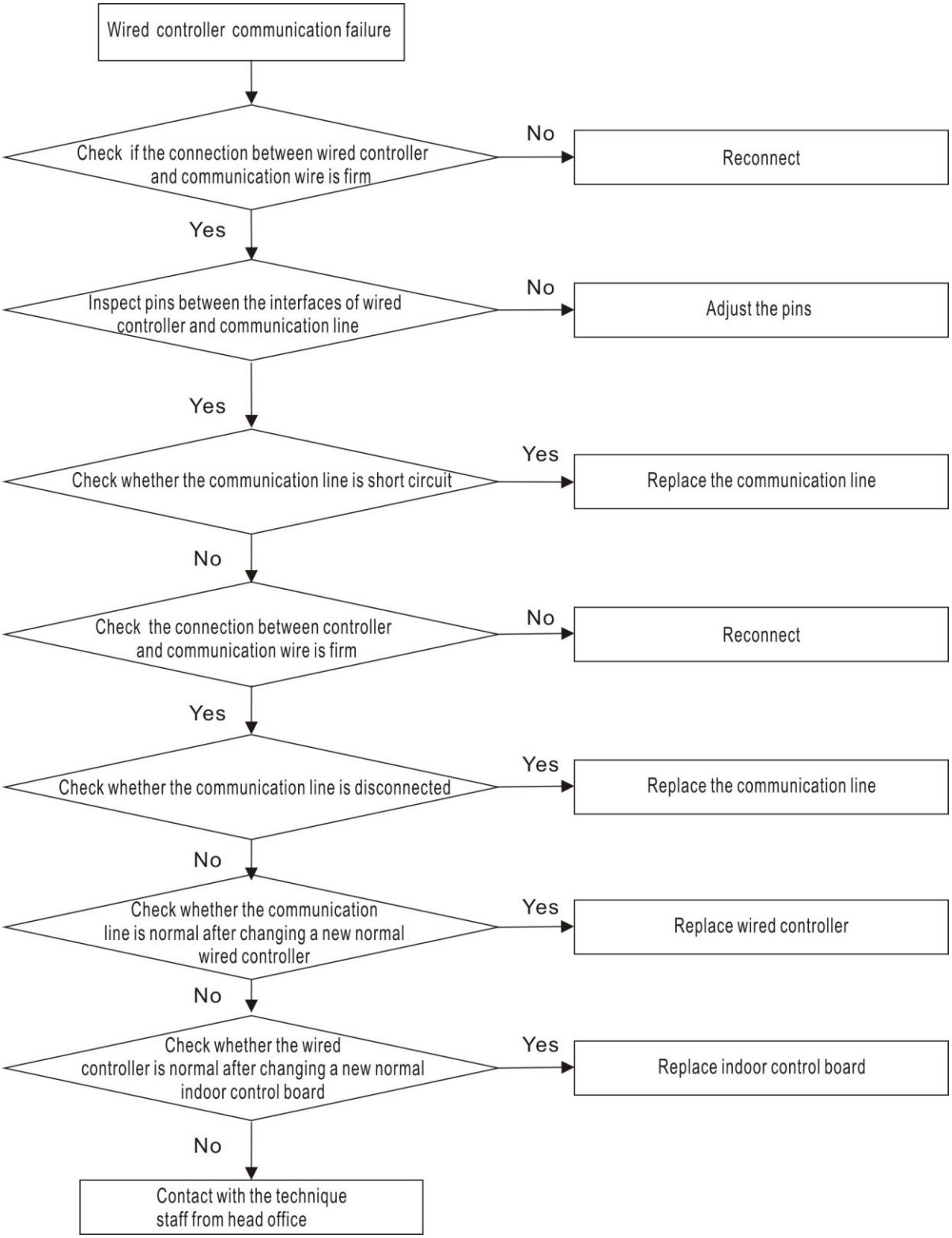
error code	malfuction or protection	failure cause and corrective action
A7	Water flow falut	1.The wire circuit is short connected or open.Reconnect the Wire correctly
		2.Water flow rate is too low
		3.Water flow switch is failed,switch is open or close continuously,change the water flow switch
AA	Communication fault between cotroller and indoor unit	1.Wire doesn't connect wired controller and unit. Connect the wire
		2.Communication wire sequence is not right, Reconnet the communication fault wire in the right sequence between controller
		3.Whether there is a high magnetic field or power and indoor unit interfere,such as lifts,large power transformers,etc
		4.To add a barrier to protect the unit or to the other place
93	Final outlet water temp.sensor(Two2) fault	1.Check the resistance of the sensor
		2.The Two2 sensor connect is loosen.Reconnect it
		3.The Two2 sensor connect is wet or there is water in.Remove the water,make the connector dry,Add waterproof adhesive
		4.The Two2 sensor failure,change a new sensor
96	Water tank temp.sensor(Twt) fault	1.Check the resistance of the sensor
		2.The Twt sensor connector is loosen.Reconnect it
		3.The Twt sensor connector is wet or there is water in.remove the water , make the connector dry,Add waterproof adhesive
		4. The Twt sensor failure,change a new sensor
		5.If you want to close the dometic water heating when T5 sensor do not connected to the system,then T5 sensor can not be detected refer to "DHW MODE SETTING"
94	Inlet water temp.sensor(Twi) malfuction	1.Check the resistance of the sensor
		2.The Twi sensor connector is loosen.Reconnect it.inlet water temp.sensor
		3. The Twi sensor connector is wet or there is water in.(Twi) malfunction remove the water , make the connector dry,Add waterproof adhesive
		4. The Twi sensor failure,change a new sensor

error code	malfuction or protection	failure cause and corrective action
A9	Commnuication fault between indoor unit and outdoor unit	1.Wire doesn't connect between outdoor unit and main control board of indoor unit.connect the wire
		2.Communication wire sequence is not right.Reconnect the wire in the right sequence
		3.Whether there is a high magnetic feid or high power interfere ,such as lifts,large power transformers,etc…To add a barrier to protect the unit or to move the unit to the place
A3	Refrigerant liquid temp.sensor(Tici) fault	1.Check the resistance of the sensor
		2.The Tici sensor connector is loosen.Reconnect it
		3.The Tici sensor connector is wet or there is water in.remove the water , make the connector dry,Add waterproof adhesive
		4. The Tici sensor failure,change a new sensor
A4	Refrigerant gas temp.sensor (Tico)fault	1.Check the resistance of the sensor
		2.The Tico sensor connector is loosen.Reconnect it
		3.The Tico sensor connector is wet or there is water in.remove the water , make the connector dry,Add waterproof adhesive
		4. The Tico sensor failure,change a new sensor
95	Outlet water temp.sensor (Two1)fault	1.The Two1 sensor connector is loosen.Reconnect it
		2.The Two1 sensor connector is wet or there is water in.remove the water , make the connector dry,Add waterproof adhesive
		3. The Two1 sensor failure,change a new sensor
7F	Solar temp.sensor(Tsolar)fault	1.Check the resistance of the sensor
		2.The Tsolar sensor connector is loosen.Reconnect it
		3.The Tsolar sensor connector is wet or there is water in.remove the water , make the connector dry,Add waterproof adhesive
		4. The Tsolar sensor failure,change a new sensor
7E	Floor heating water inlet temp.snesor(TWI_FLH)	1.Check the resistance of the sensor
		2.The TWI_FLH sensor connector is loosen.Reconnect it
		3.The TWI_FLH sensor connector is wet or there is water in.remove the water , make the connector dry,Add waterproof adhesive
		4. The TWI_FLH sensor failure,change a new sensor
A5	IDU water pump fault	1.Check whether the water valve is open
		2.Check whether the water pump control line is loose
		3.Check whether filter is dirty and blocked
		4.Check whether pump voltage is lower than 170v or higher than 270v
		5.The water pump failure,change a new water pump

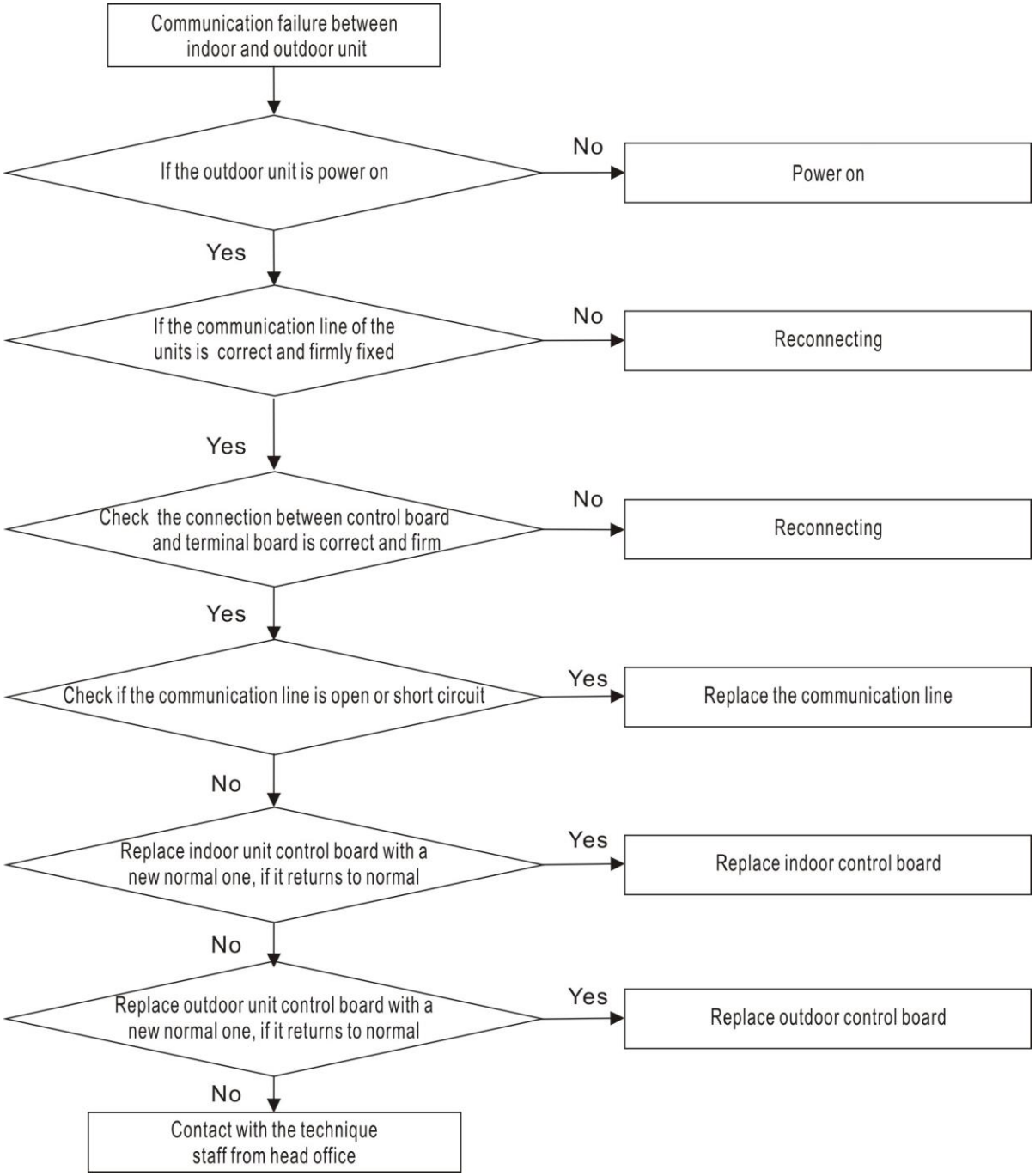
error code	malfuction or protection	failure cause and corrective action
98	Early closing fault of water flow switch	1.Check whether the wiring of water flow switch is correct
		2.Check whether other equipment is connected in series with the host
		3.Water flow switch failture,change a new water flow switch
97	Anti-freezing Low Pressure Switch(AFLP) protection	1.Check whether AFLPis loose
		2.Check whether there is insufficient refrigerant
		3.Check whether the filter is dirty and blocked
		4.The AFLP failure,change a new AFLP
7D	Expansion Board comm fault	Check whether the connection line is normal
AF	Electric heating overheat protection	1.Check whether the filter is dirty and blocked
		2.Check whether the thermal protection switch falls off
A8	EE fault	1.Check whether the internal and external connecting lines are connected normally
		2.The control panel failure,change a new control panel

3. Failure analysis

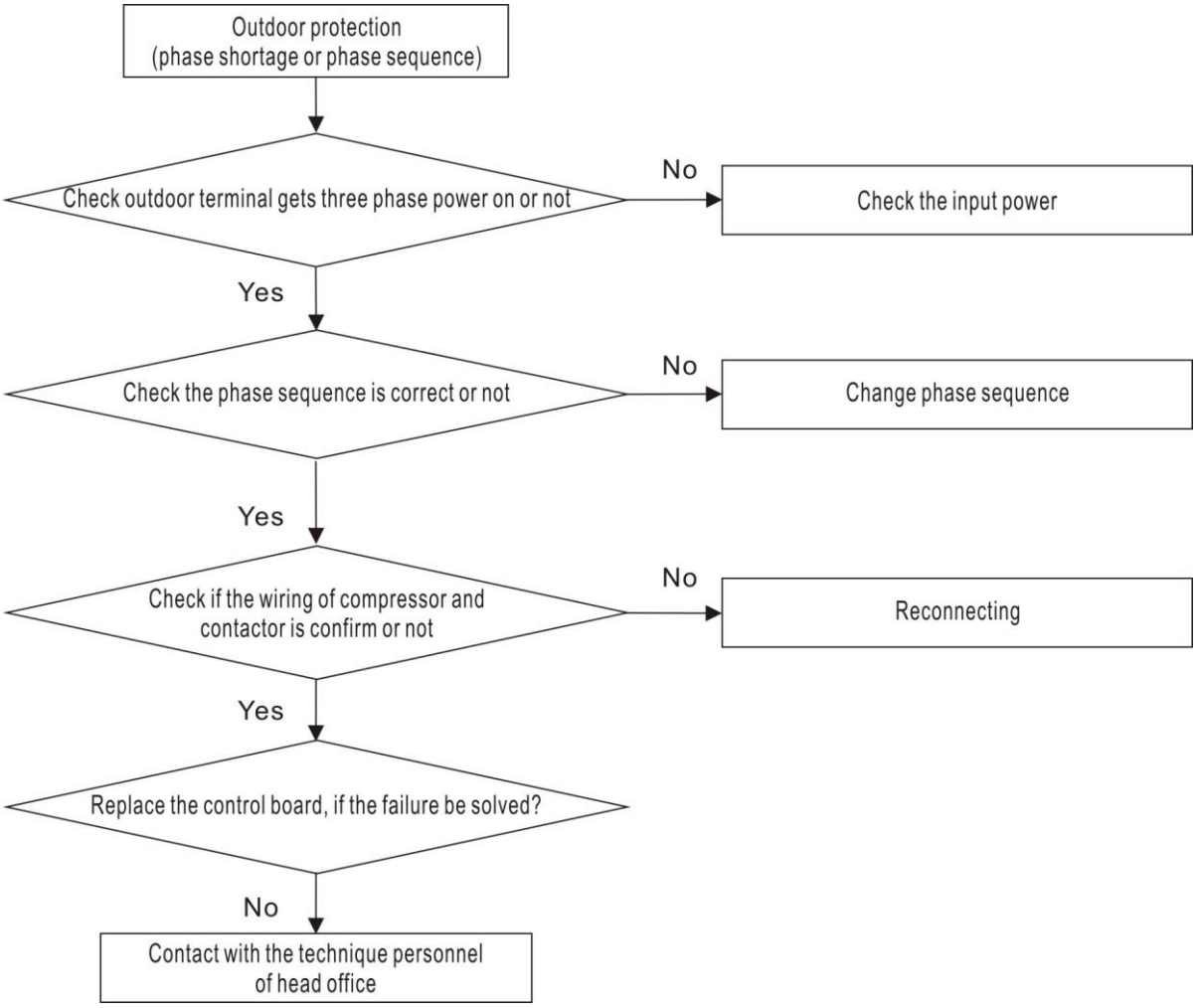
2.1【AA】Wired controller communication failure



2.2 A9 Communication failure between indoor and outdoor unit

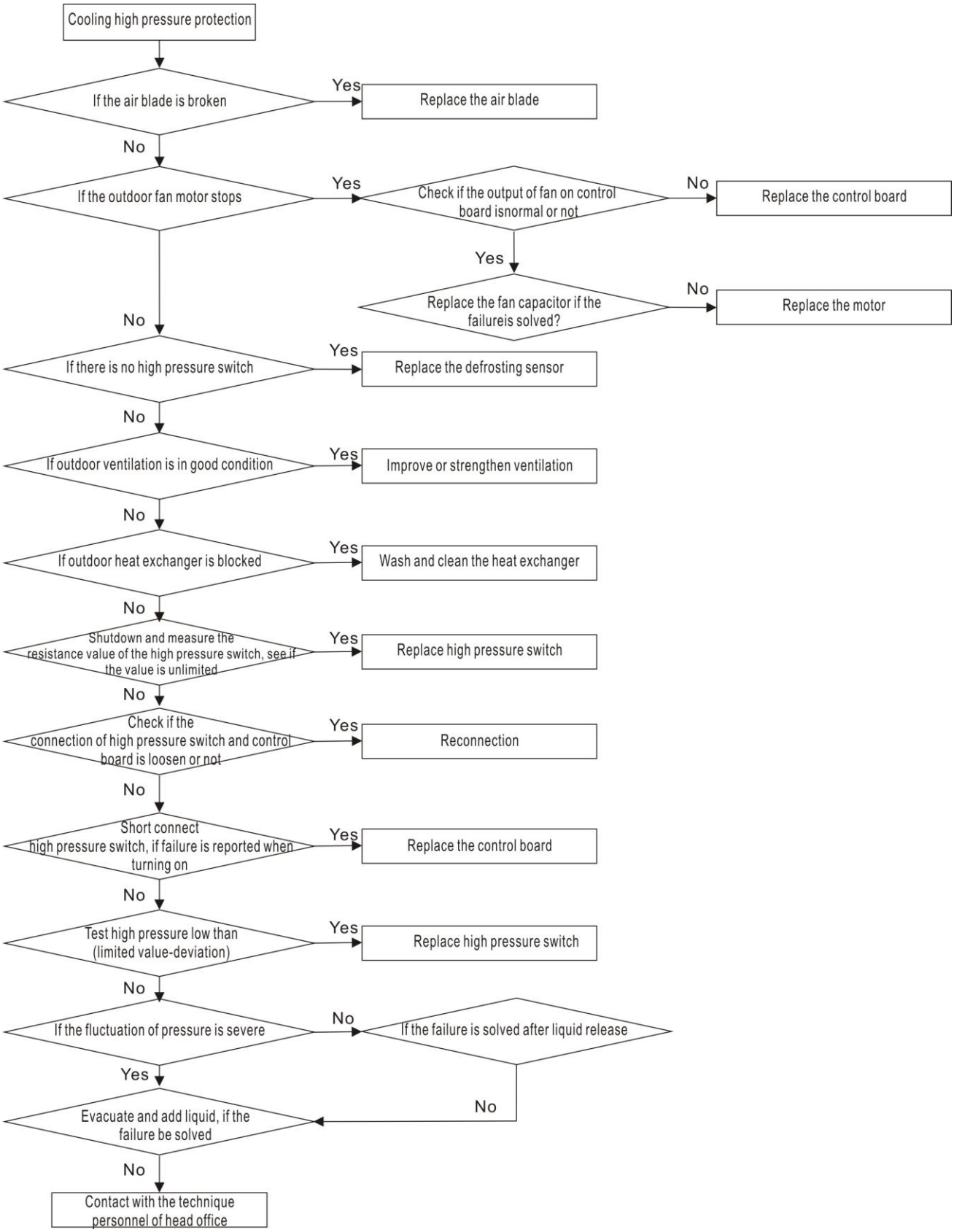


Outdoor protection(phase sequence)

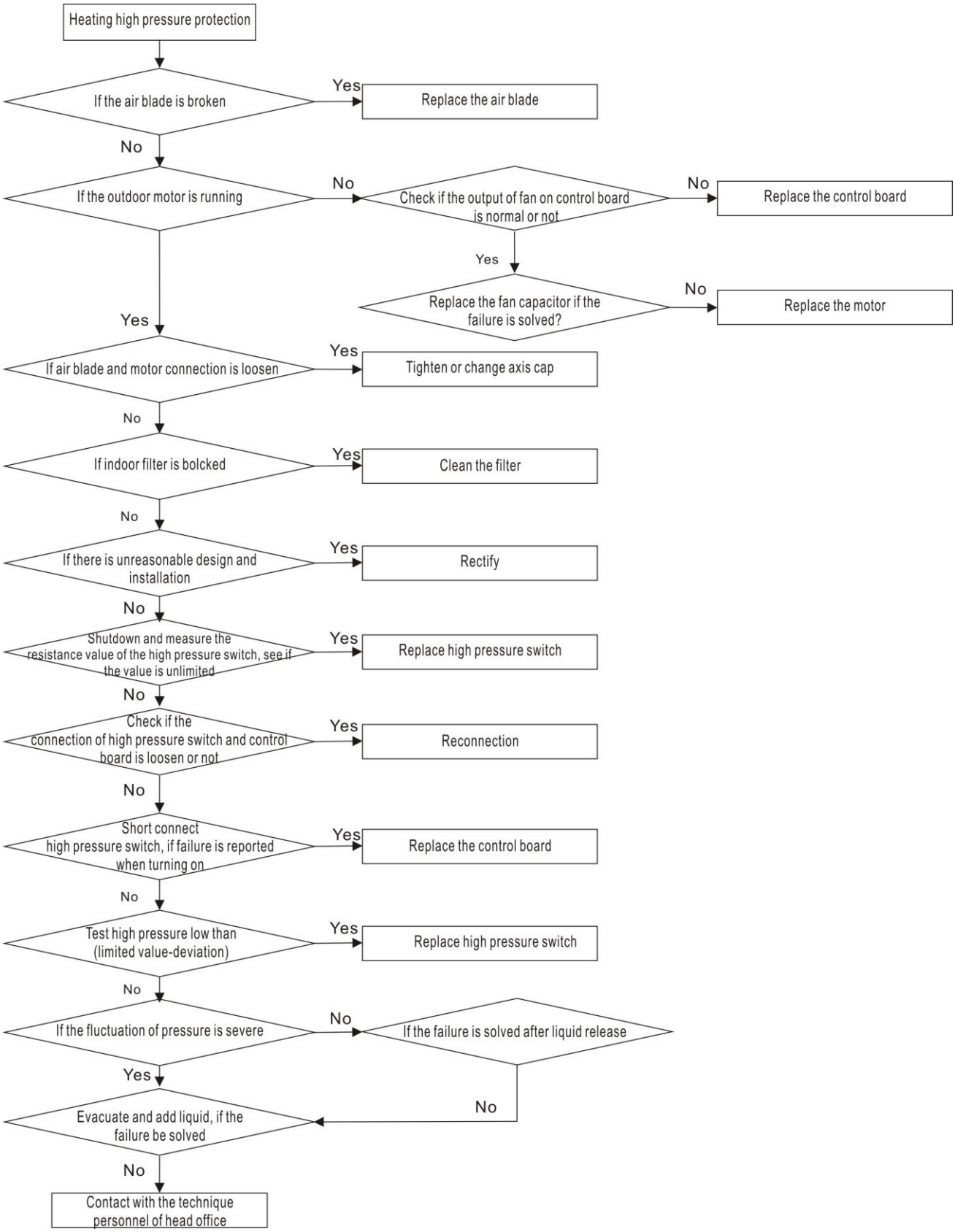


2.3 H1 high pressure protection

Cooling high pressure protection

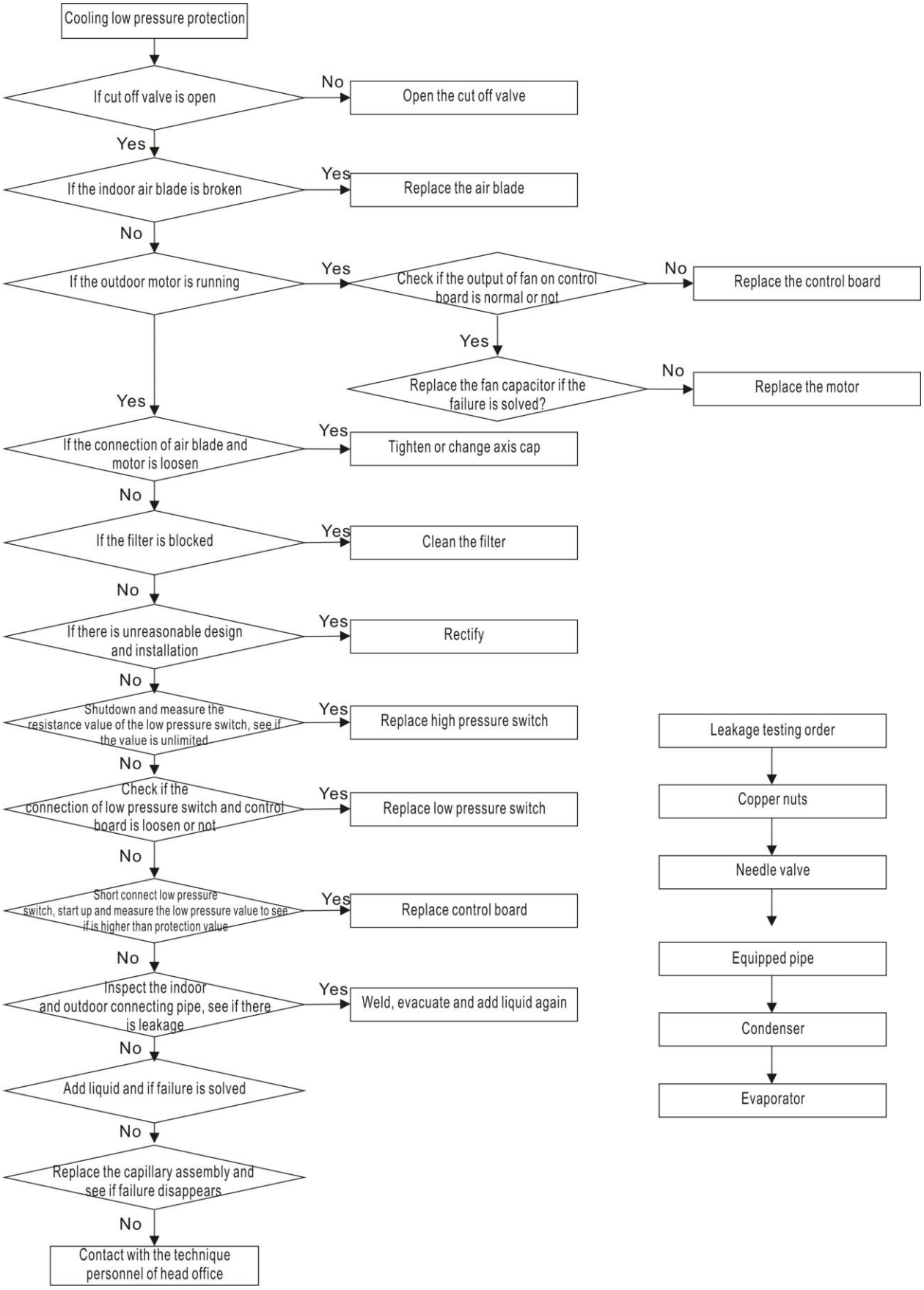


Heating high pressure protection



2.4 H4 low pressure protection

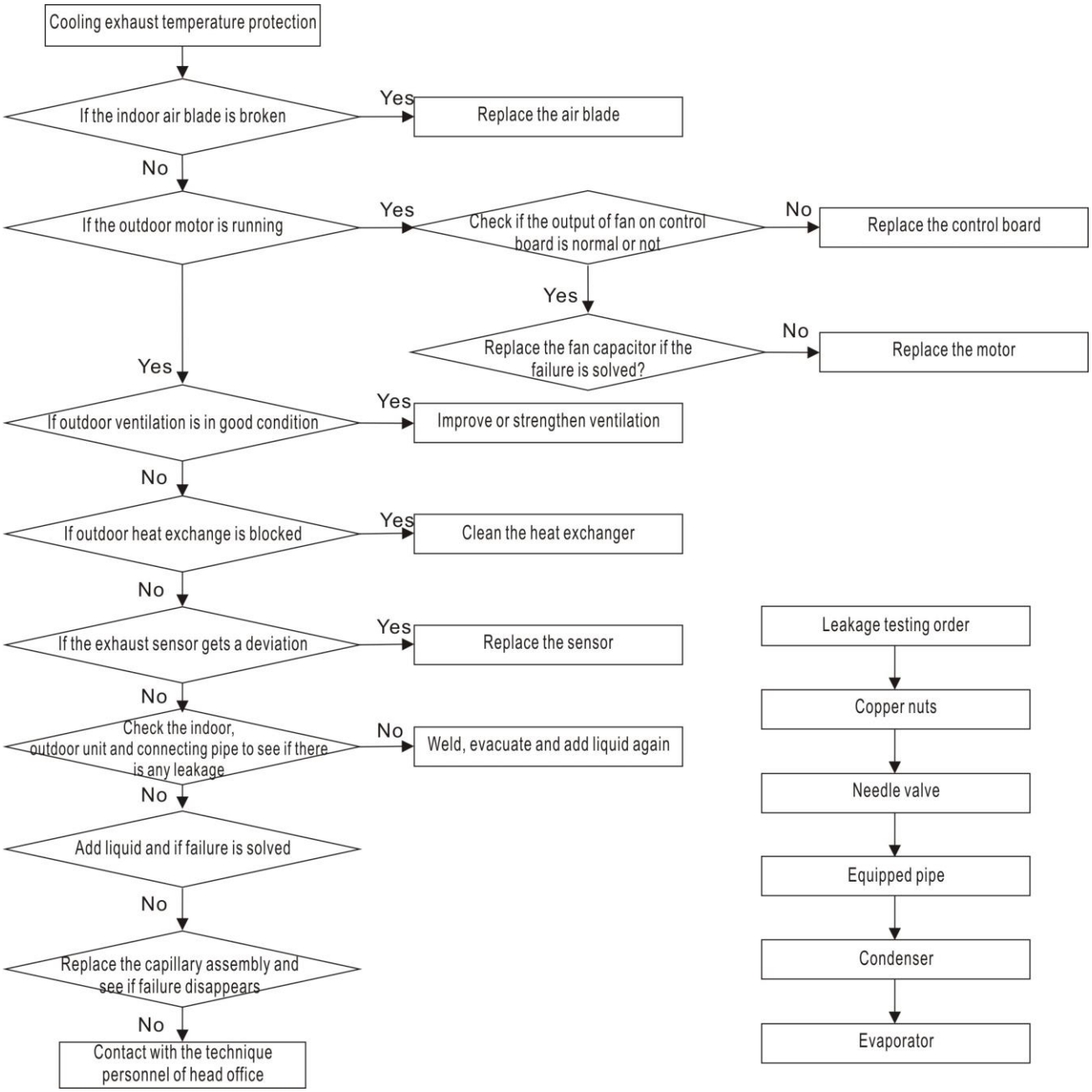
2.4.1 Cooling low pressure protection



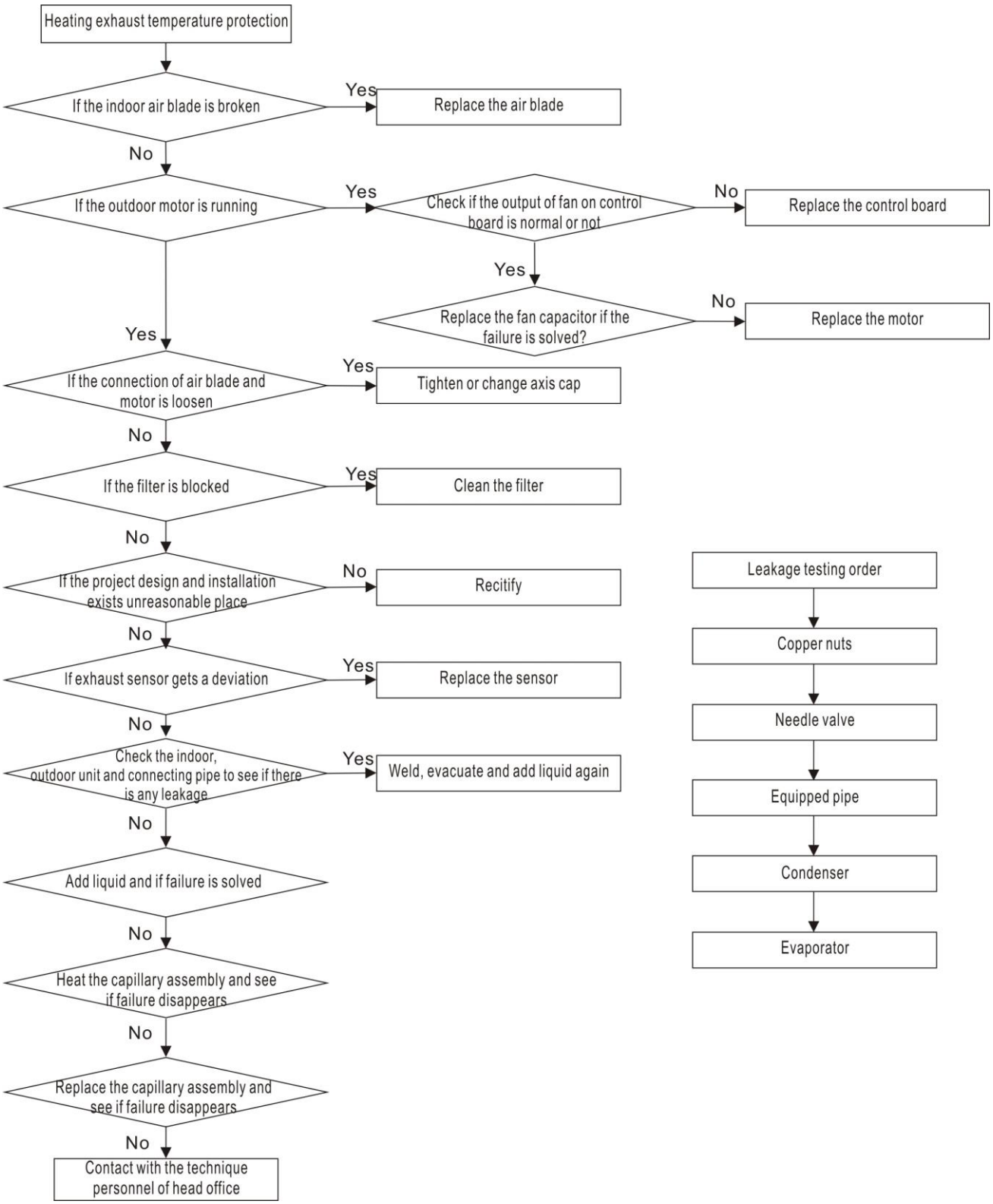
2.4.2 Heating low pressure protection

2.5 E3 High exhaust temperature protection

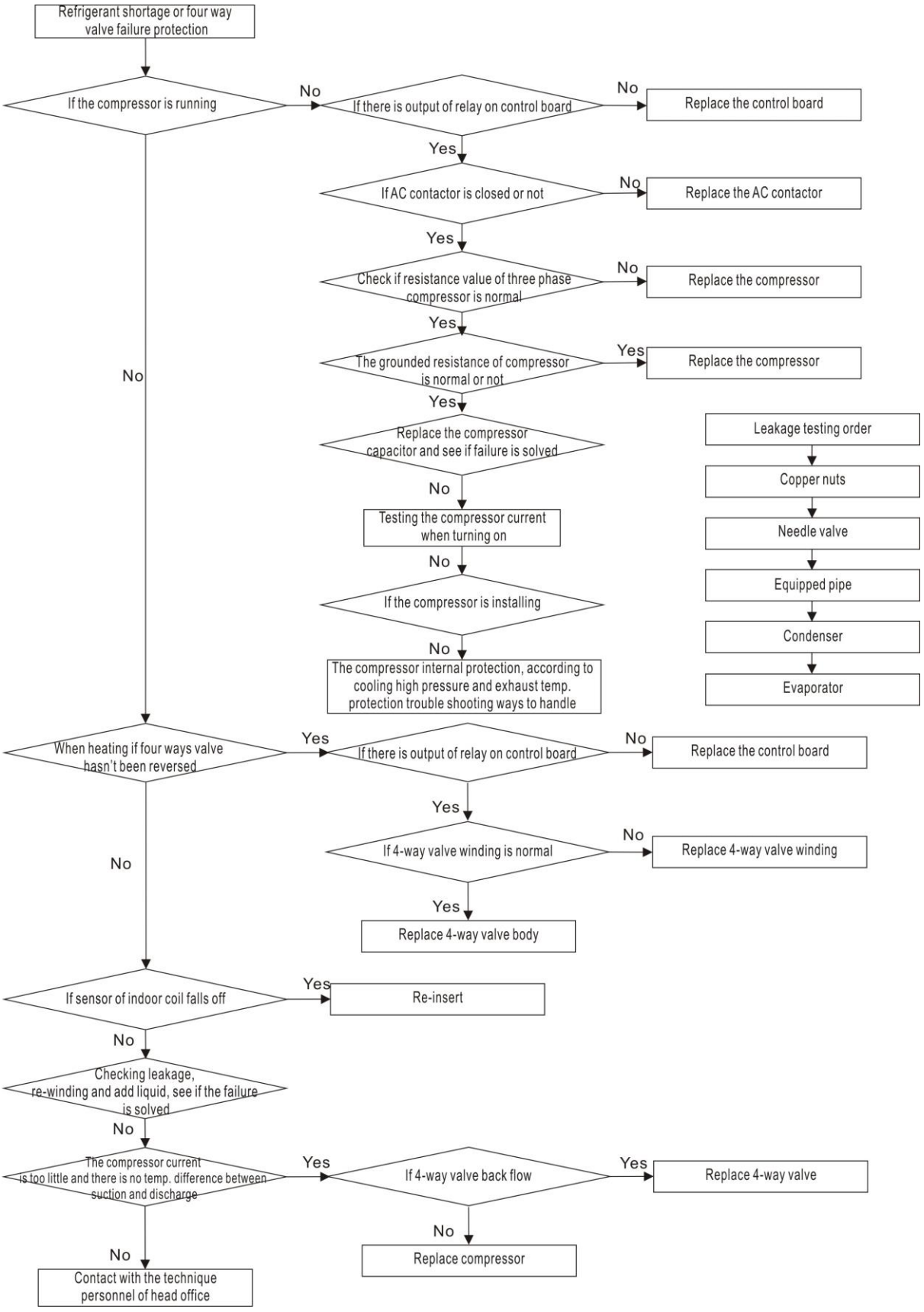
Cooling exhaust temperature protection



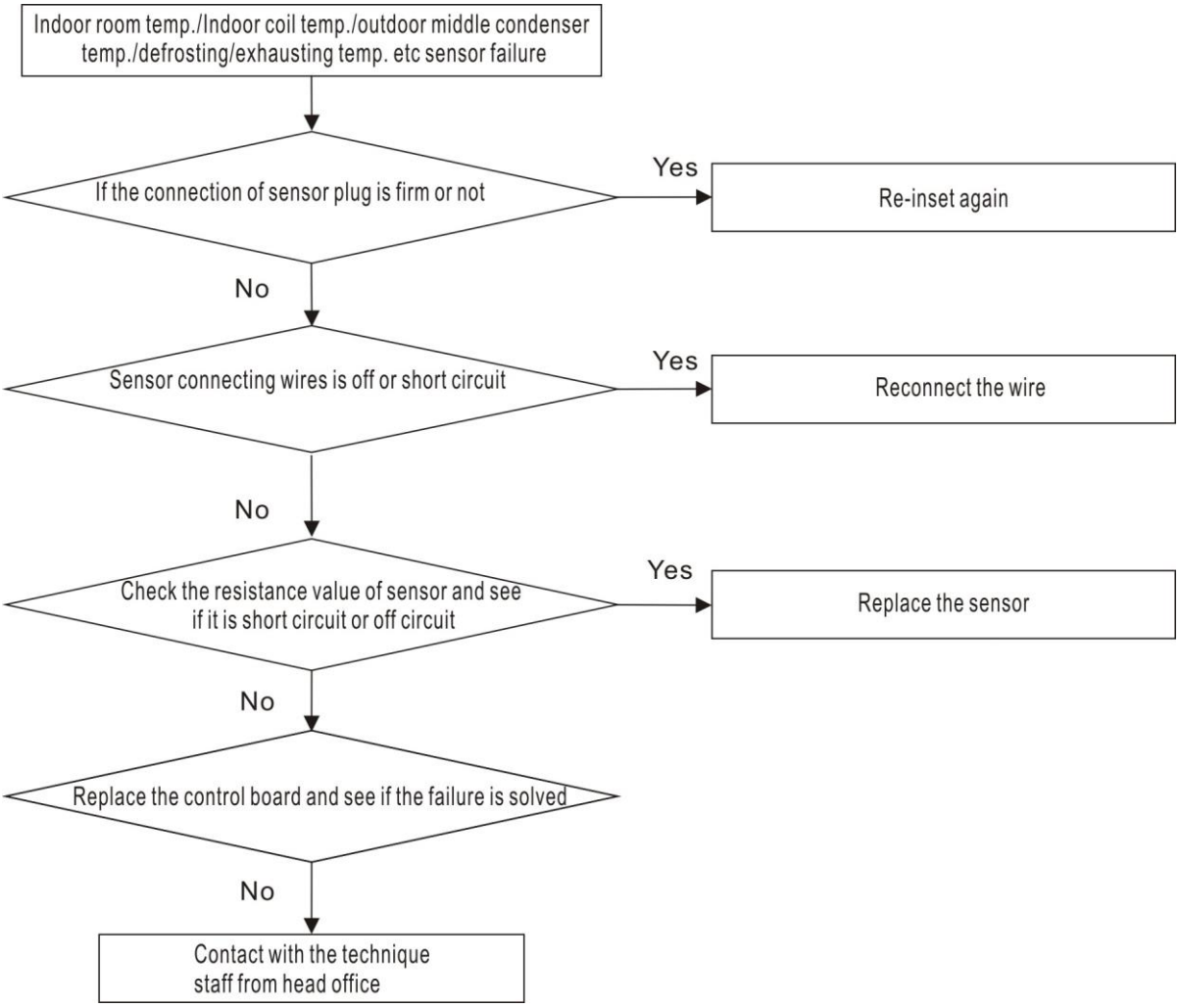
Heating exhaust temperature protection



2.6 E1 four way valve failure protection



2.7 Sensor failure protection



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The above designs and specifications are subject to charge without prior notice. Final specifications please refer to latest technical specification provided by sales representative. 201810 Technical Support Department

Updated record

Version	Name	Data	Updated remark
Version 2	Summer	2022-06-15	1. Updated electrical wiring 2. Updated PCB Instruction
Version 3	Summer	2022-08-10	1. Add control part 2. Updated error code