



FULL DC INVERTER SYSTEMS

SERVICE MANUAL

AHU KIT AHUKZ-xxD

COMMERCIAL AIR CONDITIONERS SDV5

Original instructions

IMPORTANT NOTE:

Read this manual carefully before installing or operating your new air conditioning unit. Make sure to save this manual for future reference.

CONTENTS

1 Introduction	3
2 System Layout	4
3 VRF-AHU System Schematic	5
4 Product Lineup	5
5 Nomenclature	6
6 Typical Applications	6
7 Main PCB Ports	8
8 Dip Switch Definitions	10
9 Piping Diagrams	16
10 Wiring Diagram	17
11 Troubleshooting	18
12 Accessories.....	50
13 Appendix.....	51

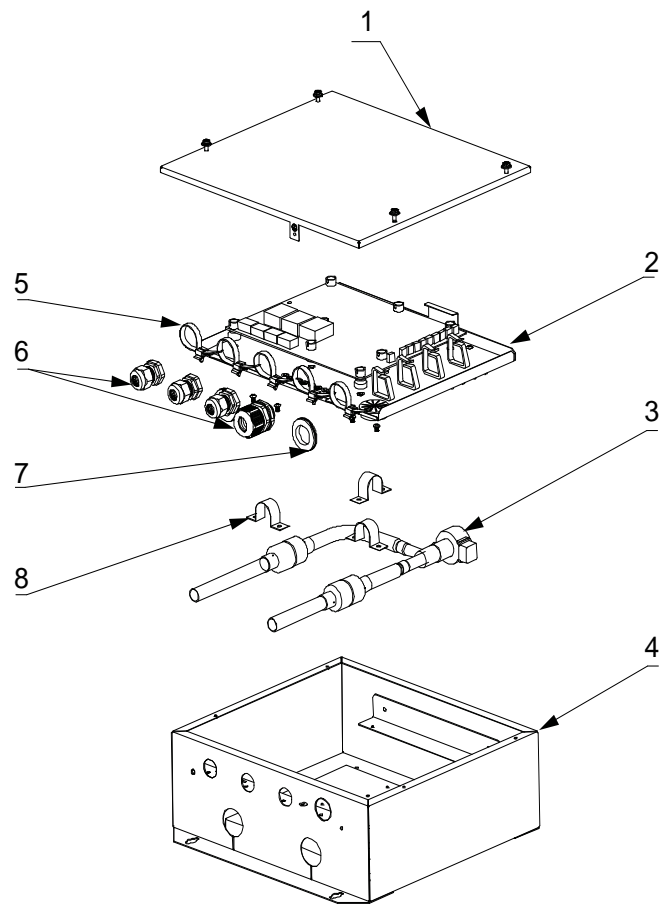
1 Introduction

The AHU control box can be connected to the heat pump/heat recovery/cooling only ODU and the third party AHU. Every third party AHU can be connected to one AHU control box or to several AHU control boxes in a parallel connection (up to four). This manual describes how to install and operate an AHU control box.

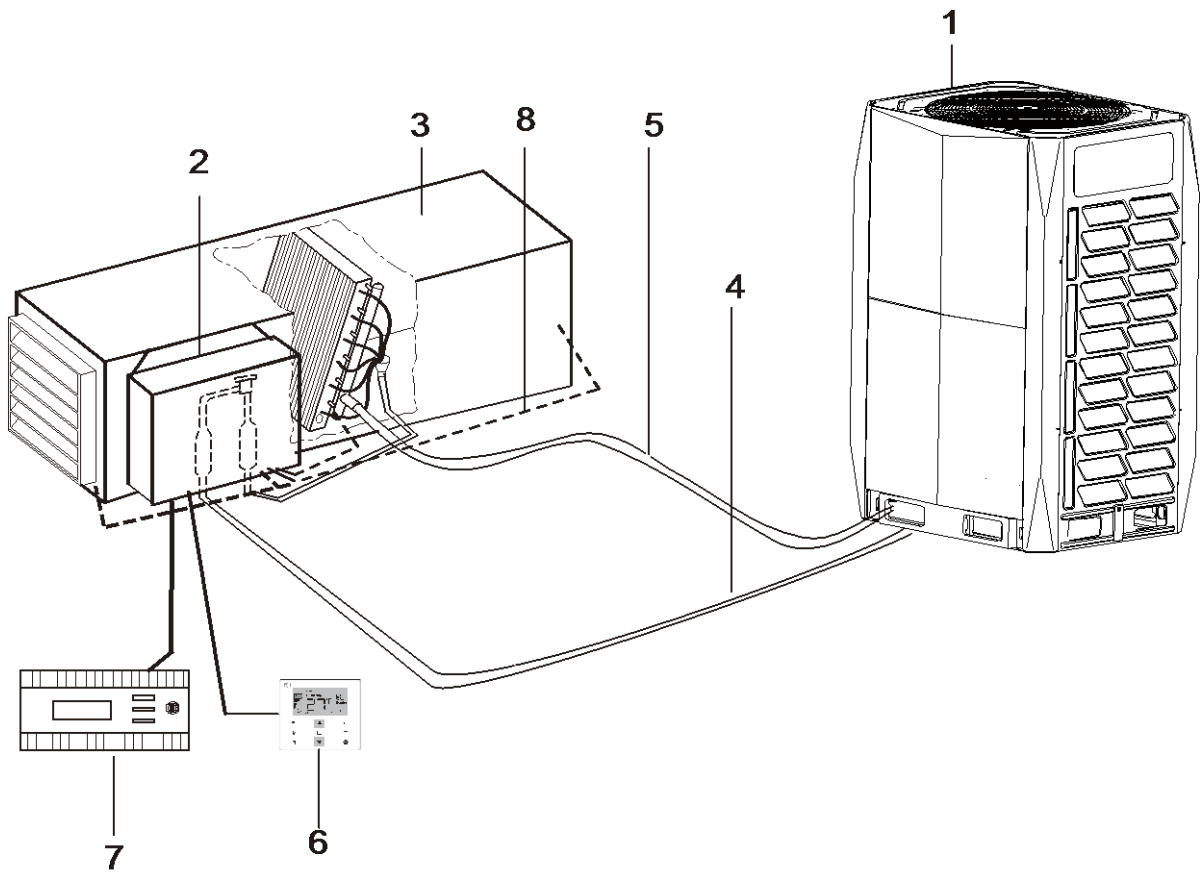
Using an AHU control box, a unit can be controlled by either return air temperature or by outlet air temperature.

- When return air temperature control is selected, the connected AHU can be considered to be a standard IDU.
- Users can opt to use the factory controller or a third party controller.
- The AHU control box has an input port of 0-10V. A third party controller is required to provide 0-10V of input. The system capacity requirement or temperature can be set based on 0-10V input.
- **Appearance of the AHU Control Box:**

No	Parts
1	Electric control Box Cover Assembly
2	E- part box assembly
3	Electronic Expansion Valve Assembly
4	Electric Control Box Welding Assembly
5	Clip
6	Cable Gland
7	Rubber Ring
8	Fixing board, pipes



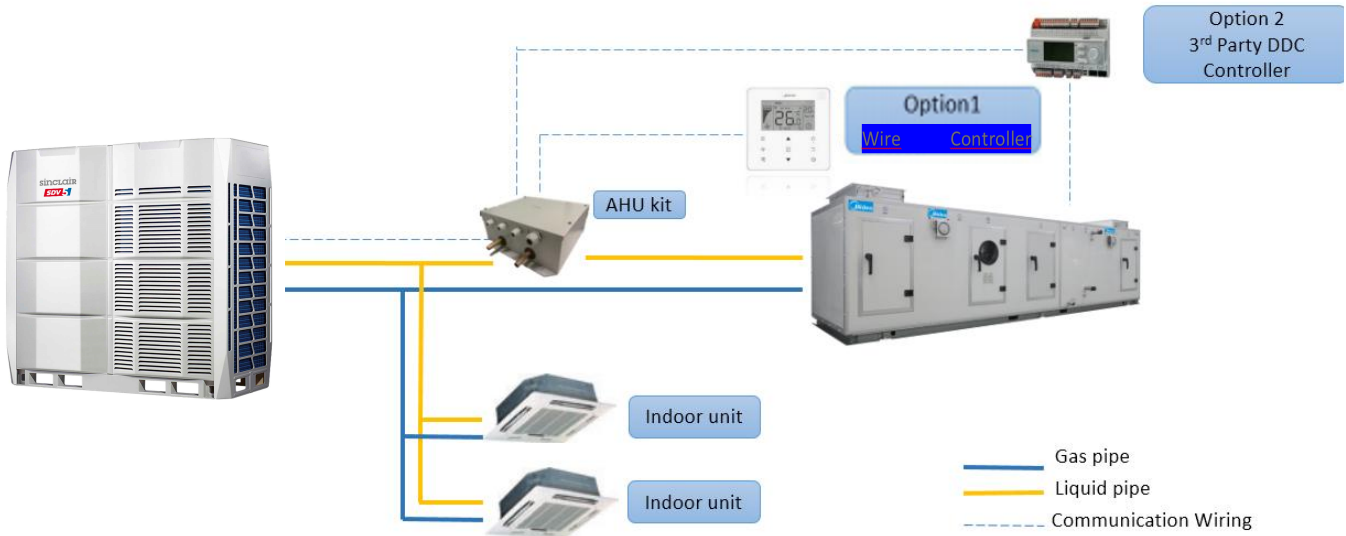
2 System Layout



No.	Name	Description
1	ODU	Outdoor unit
2	AHU control box	-
3	Air handling unit (AHU)	Field supply
4	Liquid pipe	Field supply
5	Gas pipe	Field supply
6	Wired controller	Factory controller
7	Third party controller	Field supply
8	Temperature sensor wiring	-

3 VRF-AHU System Schematic

Figure 1-1.1: System schematic



The system is composed by largely indoor and outdoor parts. Outdoor part is Sinclair VRF outdoor unit. Indoor part includes other brand direct expansion type AHU (Local supply) or Sinclair brand direct expansion type AHU and Sinclair AHU control box. AHU control box forms the connection between Sinclair VRF outdoor unit and other brand direct expansion type AHU.

1. Outdoor: Sinclair VRF outdoor unit
Small SDV4, SDV4, SDV4F, SDV5, SDV5-3P
2. Indoor: Direct expansion type AHU (Local supply)
Direct Expansion type AHU supplied by local market
3. AHU Control Box

PCBs, EXV, EXV Coil, Temperature sensors (Coil in/out temperature, coil temperature, ambient temperature), Wired controller and Display board.

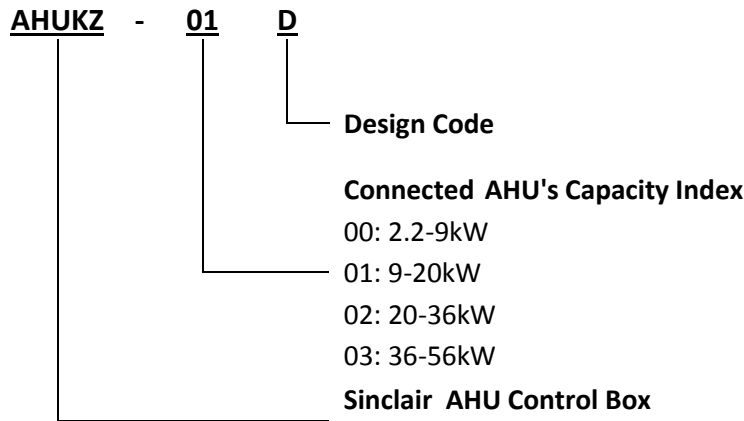
4.DDC (Direct Digital Control) controller

DDC controller is optional. It's supplied by the third party such as SIEMENS. Through DDC, some functions such as temperature setting control and capacity setting control can be realized.

Product Lineup

Model	Appearance
AHUKZ-00D	
AHUKZ-01D	
AHUKZ-02D	
AHUKZ-03D	

4 Nomenclature

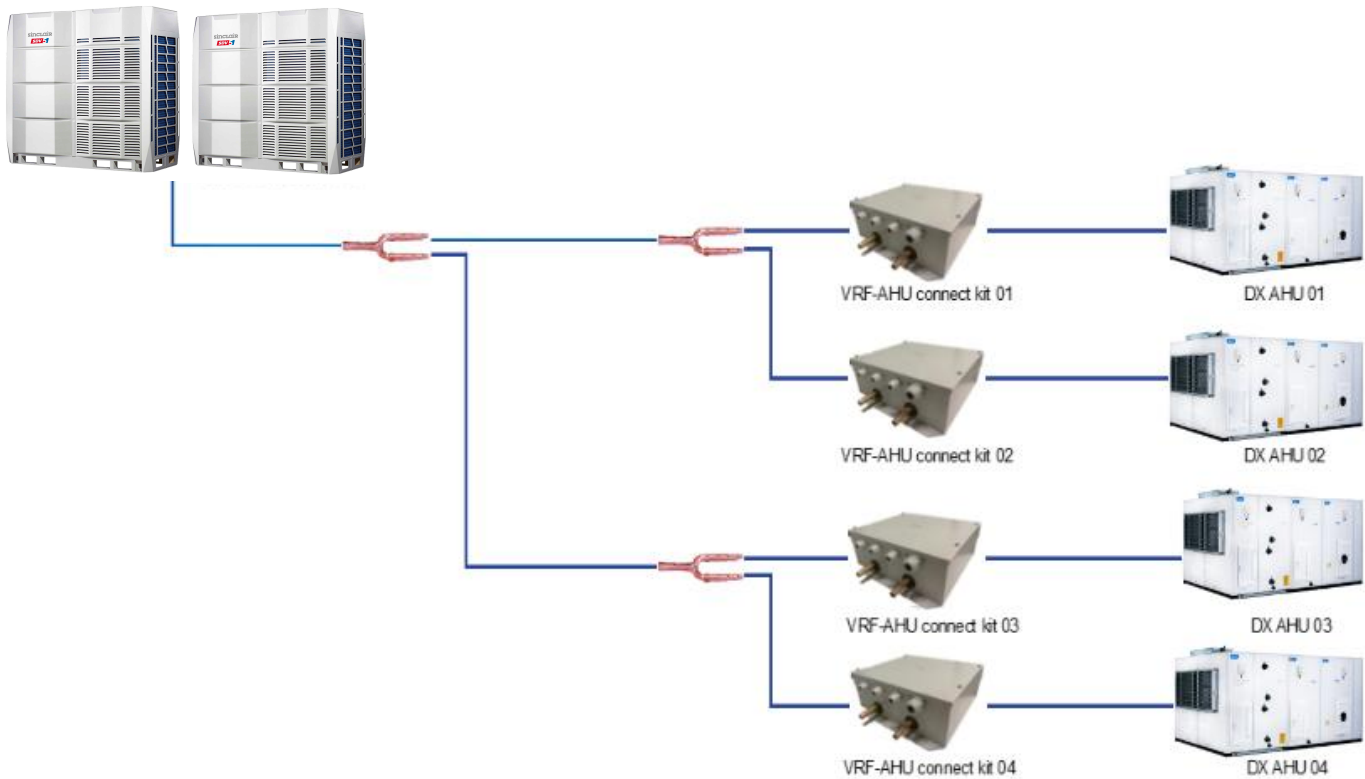


5 Typical Applications

5.1 Single VRF DX AHU Control Box connects to one AHU

When the DX type AHU's capacity is less than 56kW, single DX VRF AHU control box connects to one AHU, method is suggested as below.

Figure 1-4.1: Single VRF DX AHU Control Box connect to one AHU

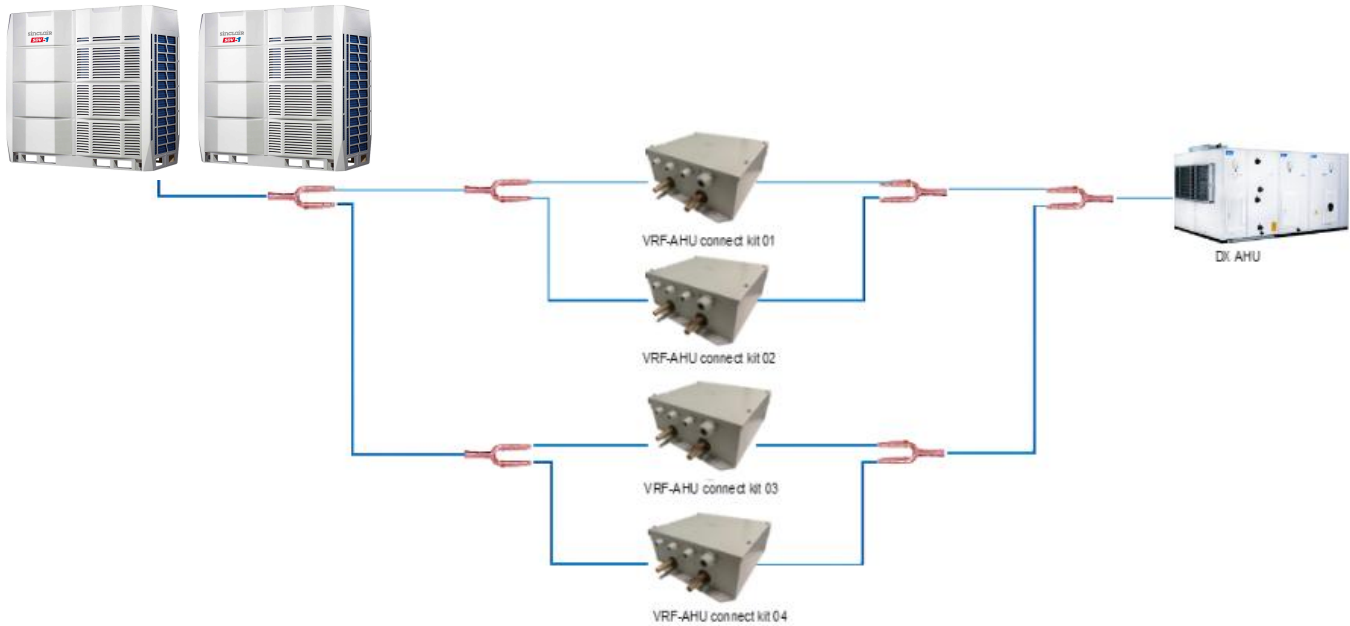


Notes: The example is just for application illustration.

5.2 Multiple DX VRF AHU Control Boxes connect with one AHU

When the DX type AHU's capacity is large than 56kW, multiple VRF- AHU control boxes connect to one AHU, method is suggested. Maximum 4 VRF- AHU control boxes can be combined to connect large capacity AHU.

Figure 1-4.2: Multiple VRF DX AHU Control Boxes connect to one AHU

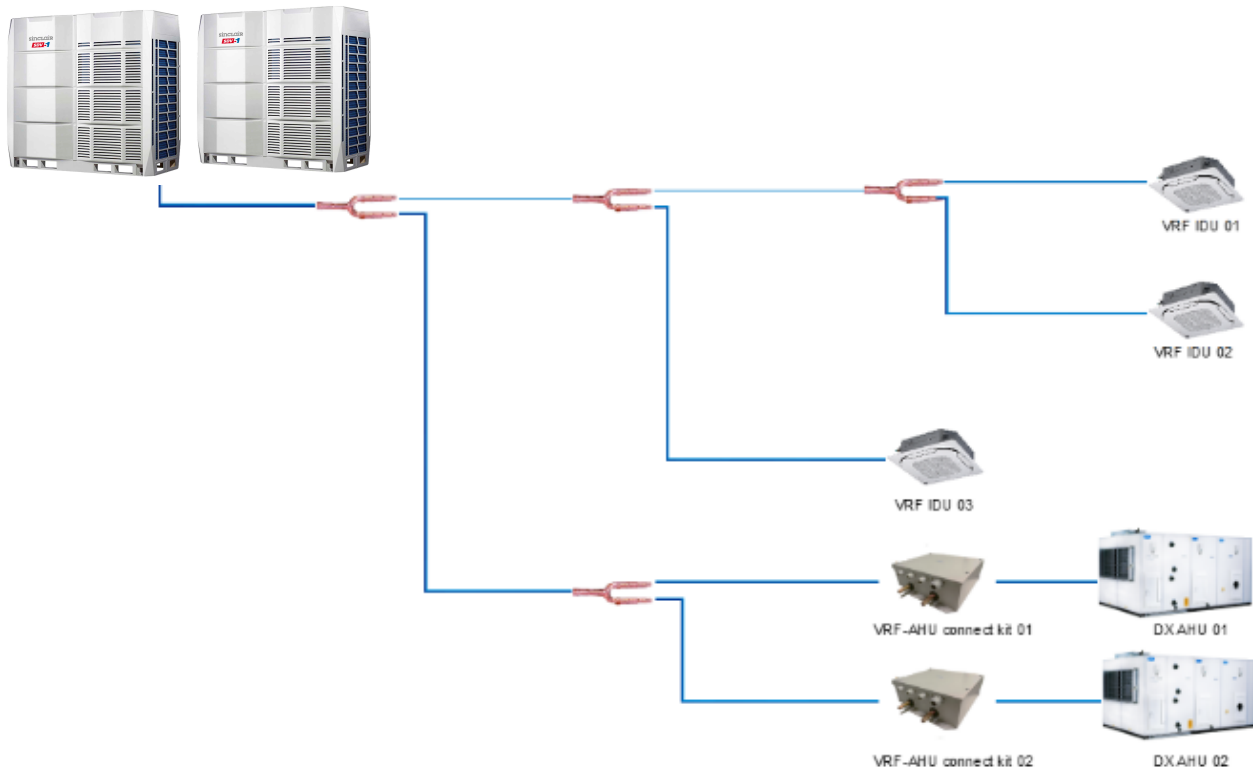


Notes: The example is just for application illustration.

5.3 AHU and VRF IDU Combination

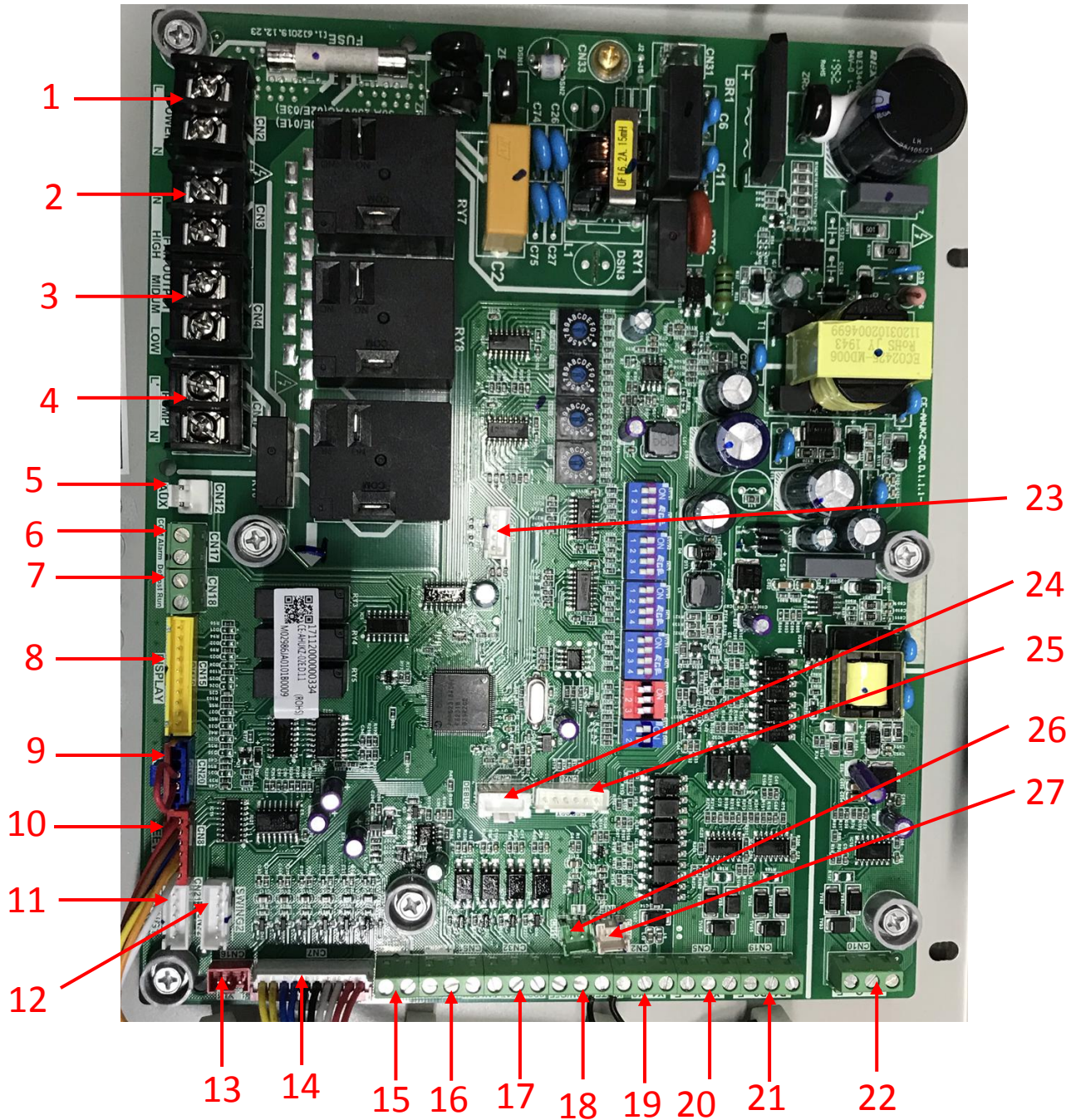
DX type AHU and VRF indoor units can be combined in the same refrigerant system.

Figure 1-4.3: AHU and VRF IDU combination application



Notes: The example is just for application illustration.

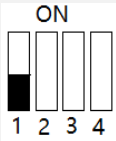

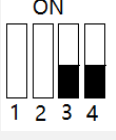


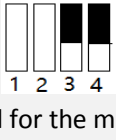
7 Main PCB Ports



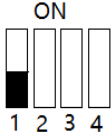

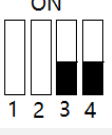


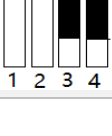
Label in Figure 5-2.1	Port code	Content	Port voltage
1	CN2	Power input of main board	220V
2	CN3	Fan motor drive port	0V or 220V AC
3	CN4	Fan motor drive port	0V or 220V AC
4	CN5	Pump drive port	0V or 220V AC
5	CN12	AUX signal output port	0V or 12V DC
6	CN17	Alarm signal output port	0V or 12V DC
7	CN18	Defrost and run signal output port	0V or 12V DC
8	CN15	Display board drive port	0 or 12V DC
9	CN20	Network module drive port(reserved)	0 or 12V DC
10	CN8	EEV drive port	0V or 12V DC
11	C22	Swing motor 1 drive port	0V or 12V DC
12	C21	Swing motor 2 drive port	0V or 12V DC
13	CN16	Pressure sensor connection (reserved)	0-5V DC (varying)
14	CN7	Temperature sensor connection (T1,T2,T2A,T2B,TA)	0-5V DC (varying)
15	CN62	0-10V output	0-10V DC (varying)
16	CN61	0-10V input	0-10V DC (varying)
17	CN32	Signal input port	0 or 5V DC
18	CN9	Water level switch connection	0V or 12V DC
19	CN23	Communication port to wire controller(X1X2)	18V DC
20	CN5	Communication port to another AHU Control Box (X,Y,E)	0 or 5V DC
21	CN19	Communication port to wire controller(D1,D2,E)	0 or 5V DC
22	CN10	Communication port to outdoor units	0 or 5V DC
23	CN30	M-smart connection	0V or 12V DC
24	CN25	Debug port for main control	0 or 5V DC
25	CN26	Debug port	0 or 5V DC
26	CN11	Infrared sensor connection (reserved)	0 or 5V DC
27	CN35	Temperature sensor connection (reserved for TL)	0-5V DC (varying)

8 Dip Switch Definitions

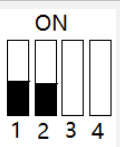

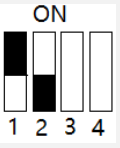
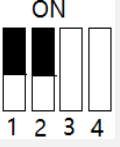



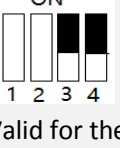
1) Definitions of each bit of SW1:

 <p>Valid for the master unit only</p>	<ul style="list-style-type: none"> SW1-1 is 0: shutdown compensation temperature (cooling) is 0°C (factory default) SW1-1 is 1: shutdown compensation temperature (cooling) is 2°C (outlet air temperature control is invalid)
 <p>Valid for the master unit only</p>	<ul style="list-style-type: none"> SW1-2 is 0: AHU control box provides three fan speeds (factory default) SW1-2 is 1: only high fan speed
 <p>Valid for the master unit only</p>	<ul style="list-style-type: none"> SW1-3 and SW1-4 are 00: the number of slave AHU control boxes connected in parallel is 0 (factory default); valid for the master unit
 <p>Valid for the master unit only</p>	<ul style="list-style-type: none"> SW1-3 and SW1-4 are 01: the number of slave AHU control boxes connected in parallel is 1
 <p>Valid for the master unit only</p>	<ul style="list-style-type: none"> SW1-3 and SW1-4 are 10: the number of slave AHU control boxes connected in parallel is 2
 <p>Valid for the master unit only</p>	<ul style="list-style-type: none"> SW1-3 and SW1-4 are 11: the number of slave AHU control boxes connected in parallel is 3

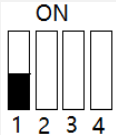

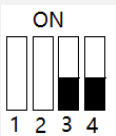
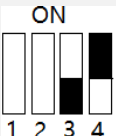
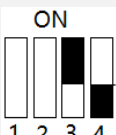

2) Definitions of each bit of SW2:

 <p>ON 1 2 3 4</p>	<ul style="list-style-type: none"> • SW2-1 is 0: automatic addressing (factory default) • SW2-1 is 1: clearing AHU control box address
 <p>ON 1 2 3 4</p>	<ul style="list-style-type: none"> • SW2-2 is 0: no self-check (factory default) • SW2-2 is 1: self-check
 <p>ON 1 2 3 4</p>	<ul style="list-style-type: none"> • SW2-3 and SW2-4 are 00: master AHU control box
 <p>ON 1 2 3 4</p>	<ul style="list-style-type: none"> • SW2-3 and SW2-4 are 01: slave AHU control box 1
 <p>ON 1 2 3 4</p>	<ul style="list-style-type: none"> • SW2-3 and SW2-4 are 10: slave AHU control box 2
 <p>ON 1 2 3 4</p>	<ul style="list-style-type: none"> • SW2-3 and SW2-4 are 11: slave AHU control box 3


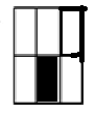

3) Definitions of each bit of SW3:

	Return Air Temperature Control (SW4-1: 0)	Outlet Air Temperature Control (SW4-1: 1)
 <p>Valid for the master unit only</p>	<ul style="list-style-type: none"> SW3-1 and SW3-2 are 00: anti-cold air temperature value in heating mode is 15°C (factory default) 	<ul style="list-style-type: none"> SW3-1 and SW3-2 are 00: anti-cold air temperature value in heating mode is 14°C (factory default)
 <p>Valid for the master unit only</p>	<ul style="list-style-type: none"> SW3-1 and SW3-2 are 01: anti-cold air temperature value in heating mode is 20°C 	<ul style="list-style-type: none"> SW3-1 and SW3-2 are 01: anti-cold air temperature value in heating mode is 12°C
 <p>Valid for the master unit only</p>	<ul style="list-style-type: none"> SW3-1 and SW3-2 are 10: anti-cold air temperature value in heating mode is 24°C 	<ul style="list-style-type: none"> SW3-1 and SW3-2 are 10: anti-cold air temperature value in heating mode is 16°C
 <p>Valid for the master unit only</p>	<ul style="list-style-type: none"> SW3-1 and SW3-2 are 11: anti-cold air temperature value in heating mode is 26°C 	<ul style="list-style-type: none"> SW3-1 and SW3-2 are 11: anti-cold air temperature value in heating mode is 18°C
 <p>Valid for the master unit only</p>	<ul style="list-style-type: none"> SW3-3 and SW3-4 are 00: temperature compensation in heating mode is 6°C (factory default) 	<ul style="list-style-type: none"> SW3-3 and SW3-4 are 00: Outlet air temperature control is invalid
 <p>Valid for the master unit only</p>	<ul style="list-style-type: none"> SW3-3 and SW3-4 are 01: temperature compensation in heating mode is 2°C 	<ul style="list-style-type: none"> SW3-3 and SW3-4 are 01: Outlet air temperature control is invalid
 <p>Valid for the master unit only</p>	<ul style="list-style-type: none"> SW3-3 and SW3-4 are 10: temperature compensation in heating mode is 4°C 	<ul style="list-style-type: none"> SW3-3 and SW3-4 are 10: Outlet air temperature control is invalid
 <p>Valid for the master unit only</p>	<ul style="list-style-type: none"> SW3-3 and SW3-4 are 11: temperature compensation in heating mode is 0°C (Follow Me function) 	<ul style="list-style-type: none"> SW3-3 and SW3-4 are 11: No temperature compensation for outlet air temperature control by default


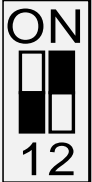

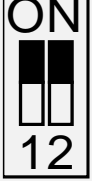
4) Definitions of each bit of SW4:

 <p>Valid for the master unit only</p>	<ul style="list-style-type: none"> SW4-1 is 0: return air temperature control (factory default) SW4-1 is 1: outlet air temperature control
	<ul style="list-style-type: none"> SW4-2 indicates high bit (ON indicates + 16)
 <p>Valid for the master unit only</p>	<ul style="list-style-type: none"> SW4-3 and SW4-4 are 00: factory controller mode (factory default)
 <p>Valid for the master unit only</p>	<ul style="list-style-type: none"> SW4-3 and SW4-4 are 01: capacity output mode of a third party controller
 <p>Valid for the master unit only</p>	<ul style="list-style-type: none"> SW4-3 and SW4-4 are 10: set temperature control mode of a third party controller
 <p>Valid for the master unit only</p>	<ul style="list-style-type: none"> SW4-3 and SW4-4 are 11: set temperature control mode of a third party controller (reserved)



5) Definitions of each bit of SW9:

<p style="text-align: center;">ON</p>  <p>Valid for the master unit only</p>	<ul style="list-style-type: none"> • SW9-1 is 0: 2-digit digital display panel (factory default) • SW9-2 is 1: 3-digit digital display panel
<p style="text-align: center;">ON</p>  <p>Valid for the master unit only</p>	<ul style="list-style-type: none"> • SW9-2 is 0: One or more DX AHU Control Boxes are connected in parallel to one AHU; one coil is connected to multiple control boxes;(hiding faults from the slave unit's temperature sensors: T1, T2, T2A & T2B) (Factory Default) • SW9-2 is 1: Multiple AHU control boxes are connected in parallel. In the case of multiple coils, one coil is connected to one control box (hiding the errors from slave unit's temperature sensors, T1 & TA)
<p style="text-align: center;">ON</p>  <p>Valid for the master unit only</p>	<ul style="list-style-type: none"> • SW9-3 is 0: no swing control • SW9-3 is 1: swing control

6) Definitions of each bit of SW10:

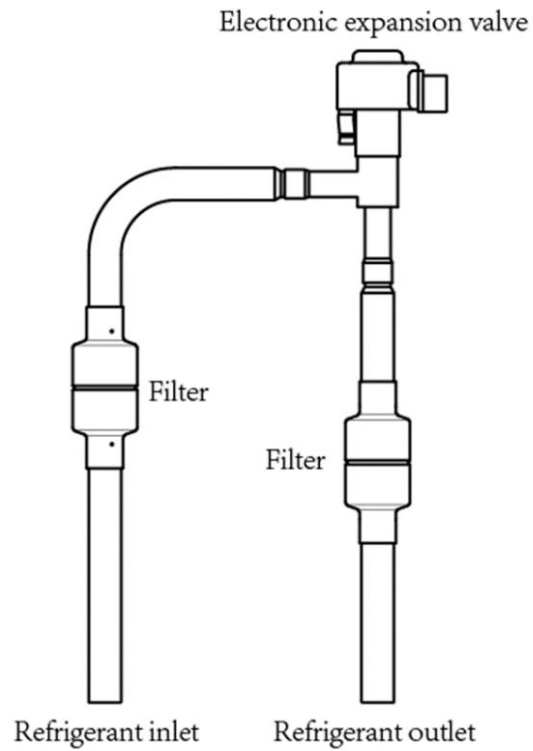
	<ul style="list-style-type: none"> • 00: AHUKZ-00D model
	<ul style="list-style-type: none"> • 01: AHUKZ-01D model
	<ul style="list-style-type: none"> • 10: AHUKZ-02D model
	<ul style="list-style-type: none"> • 11: AHUKZ-03D model

7) Definitions of J1:

 <p>J1</p>	<ul style="list-style-type: none"> • Without jumper; no short circuit indicates a power failure memory function (factory default)
 <p>J1</p>	<ul style="list-style-type: none"> • With jumper, short circuit indicates no power failure memory function

9 Piping Diagrams

AHUKZ-00D / AHUKZ-01D/ AHUKZ-02D / AHUKZ-03D



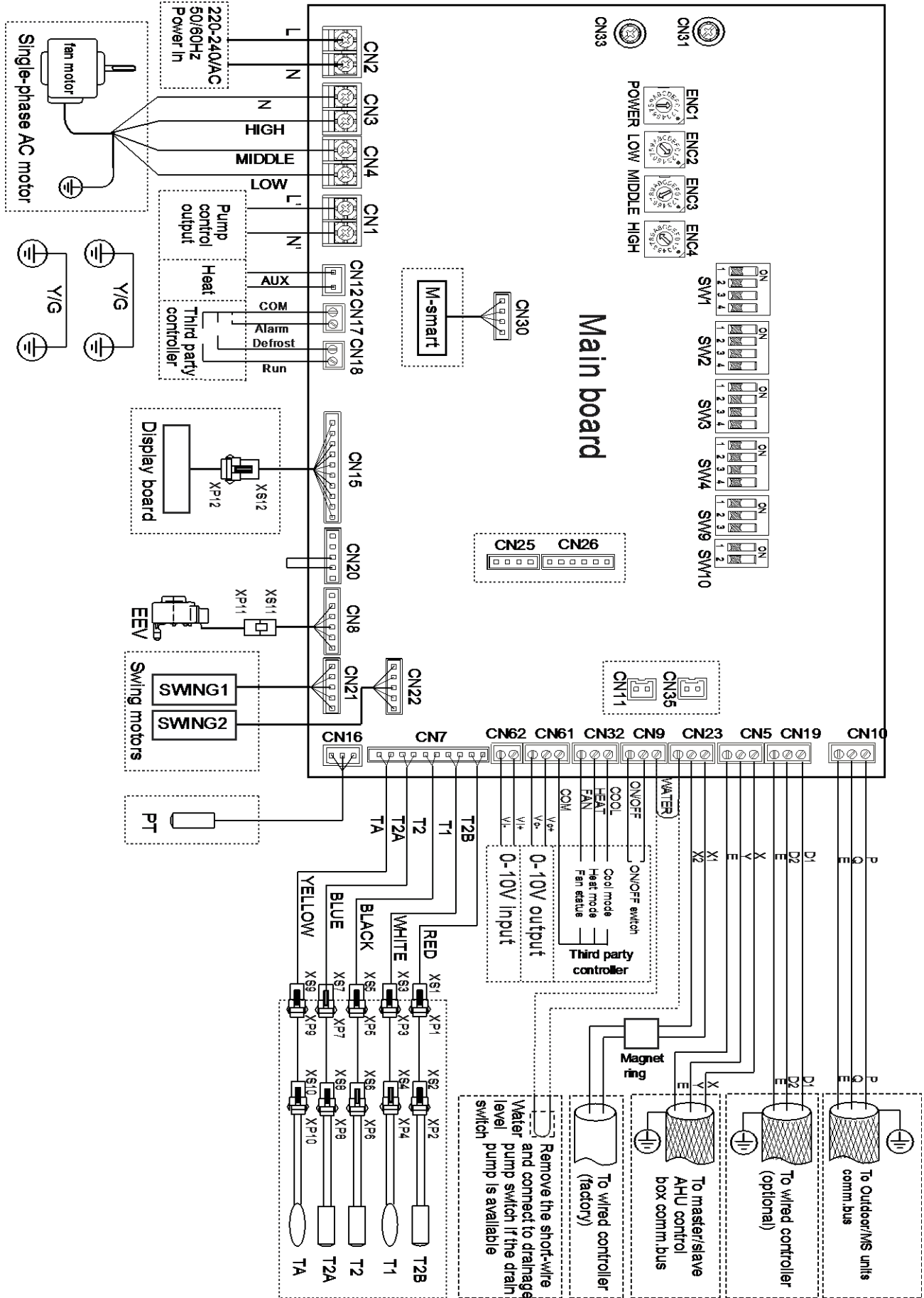
Key components:

1. **Electronic Expansion Valve (EXV):**
Controls refrigerant flow and reduces refrigerant pressure.
2. **Filter:**
Protects the EXV. Prevents the rust and dust going into the EXV.

10 Wiring Diagram

AHUKZ-00D / AHUKZ-01D / AHUKZ-02D/AHUKZ-03D

Figure 2-6.1 AHUKZ-(00,01,02,03) D wiring diagram



11 Troubleshooting

11.1 Error Code

Priority	Definition	Displayed Content
1	Refrigerant leak error	A1
2	Emergency Shutdown	A0
3	No address is set	FE(Only displayed on the display board)
4	IDU address code repeated- F7+repeated address, displayed alternately every 1 sec	F7+repeated address
5	Mode Conflict error	E0
6	Communication error between IDU and ODU	E1
7	T1 sensor error	E2
8	T2 sensor error	E3
9	T2B sensor error	E4
10	T2A sensor error	E5
11	TA sensor error	E8 (the error is not reported when return air temperature control is applied)
12	IDU fan error	E6 (reserved)
13	EEPROM error	E7
14	Communication error with the wired controller	E9 (only for wired controller)
15	Error of electronic expansion valve coils	Eb (Restored after power ON again)
16	ODU Error	Ed
17	Low temperature alarm	H2
18	High temperature alarm	H3
19	Number of AHU control boxes detected is inconsistent with number of dialed sets or communication error between master and slave units	H6
20	Capacity DIP switch of the AHU control box is inconsistent with the model/total parallel capacity out of range	H8 (restored after power-on)
21	(ENC2, ENC3, ENC4) incorrect DIP switch for 0-10V fan signal. The DIP switch value ensures ENC2 < ENC3 < ENC4	H9 (Restored after power ON again)
22	Pressure sensor error	P1 (reserved)
23	Water level alarm error	EE
24	MS/SDB error mode	F8
25	MS/SDB self-check error	U4 (restore after power on again)
26	Slave unit error	Hb (only displayed on the display board, not sent to a centralized or wired controller)
27	Water Level Alarm	EE

11.2 Query

Wired controller query

No.	No. Parameter displayed on the wired controller during control box check
1	Control box address
2	Capacity (HP) of control box
3	Control box network address (the same as the address)
4	Set temperature Ts
5	Room temperature T1
6	T2 Sensor Value
7	T2A Sensor Value
8	T2B Sensor Value
9	Ta temperature
10	Target superheat degree (reserved)
11	EEV position/8
12	Software version No.
13	Error Code

11.3 General

- Sections 11.2 and 11.3 describe some initial troubleshooting steps that can be taken when an error occurs. If these steps do not resolve the issue, arrange for a professional technician to investigate the problem. Do not attempt further investigations or troubleshooting yourself.
- If any of the following errors occur, power the unit off, contact a professional technician immediately and do not attempt troubleshooting yourself:
 - A safety device such as a fuse or circuit breaker frequently blows/trips.
 - An object or water enters the unit.
 - Water is leaking from the unit.

Caution Notes

Caution

- Do not attempt to inspect or repair the unit by yourself. Arrange for a qualified technician to carry out all servicing and maintenance

11.4 A1: Refrigerant leak error (Only connect to single MS/SDB box)

11.4.1 Display Output:

Wired controller display: A1.



11.4.2 Description

- Refrigerant leak protection.
- AHU control box stop running.
- Wired controller connected to this AHU control box displays "A1" fault code.

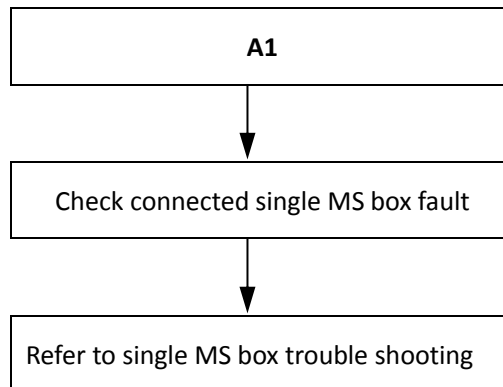
11.4.3 Trigger / recover condition

- Trigger condition: single MS box main board send "A1" fault to AHU control box
- Recover condition: single MS box has no "A1" fault
- Reset method: Resume automatically.

11.4.4 Possible causes

Single MS box send the fault code to AHU control box.

11.4.5 Procedure



11.5 A0: Emergency shut down

11.5.1 Display Output:

Wired controller display: A0.



11.5.2 Description

- Emergency shut down
- AHU control box stop running.
- Wired controller connected to this AHU control box displays "A0" fault code.

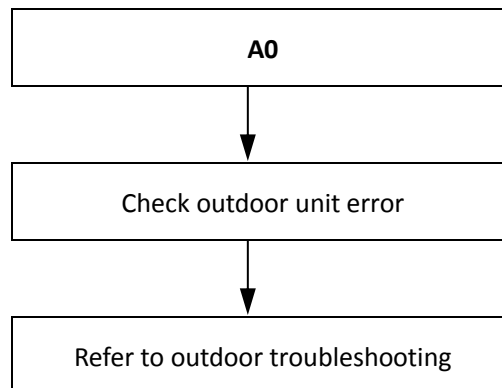
11.5.3 Trigger / recover condition

- Trigger condition: Outdoor send "A0" to AHU control box.
- Recover condition: Outdoor go back to normal
- Reset method: Resume automatically.

11.5.4 Possible causes

Outdoor send "A0" signal.

11.5.5 Procedure



11.6 E1: Communication error between AHU control box and outdoor unit/MS/SDB

11.6.1 Display Output:

Wired controller display: E1



11.6.2 Description

- Communication failure between AHU control box and outdoor unit or MS.
- AHU control box stop running.
- Wired controller connected to this AHU control box displays "E1" fault code.

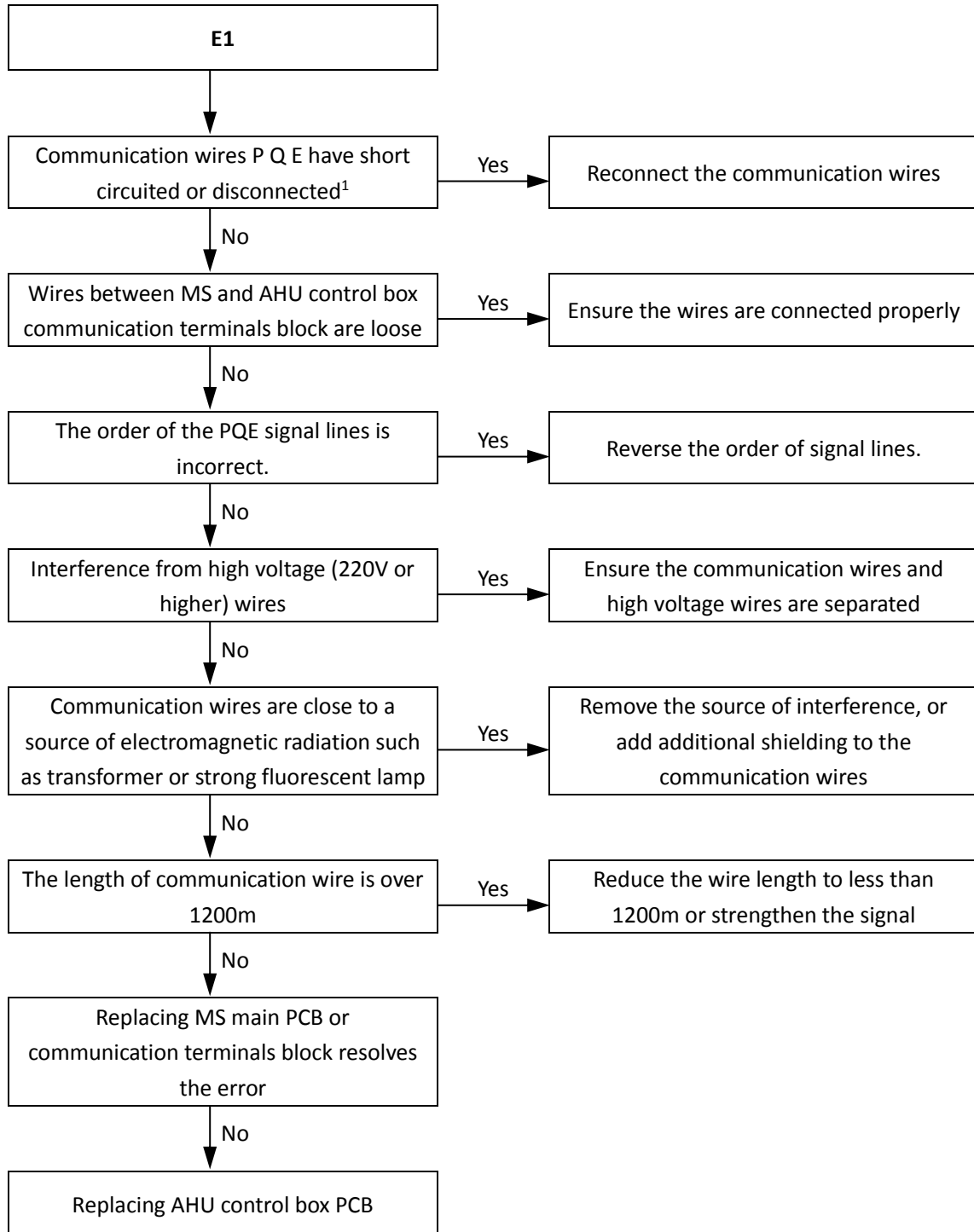
11.6.3 Trigger / recover condition

- Trigger condition: AHU control box and outdoor unit or MS cannot communication for 1 minutes after the system power on.
- Recover condition: Communication go back to normal.
- Reset method: Resume automatically.

11.6.4 Possible causes

- Communication wires between AHU control box and outdoor unit or MS not connected properly.
- Loosened wiring within electric control box.
- The order of the PQE signal lines is incorrect.
- Interference from high voltage wires or other sources of electromagnetic radiation.
- Communication wire too long.
- Damaged outdoor or MS PCB or AHU control box communication terminals block.

11.6.5 Procedure



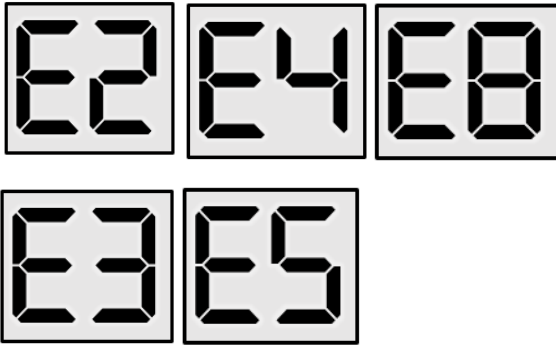
Notes:

1. Measure the resistance among P, Q and E. The normal resistance between P and Q is $120\Omega/60\Omega$, between P and E is 510Ω , between Q and E is 510Ω .

11.7 E2/E3/E4/E5/E8: T1/T2/T2B/T2A/TA Temperature sensor error

11.7.1 Display Output

wired controller display: E2/E3/E4/E5/E8



11.7.2 Description

- E2 indicates malfunction of T1 thermistor (inlet air temp.).
- E3 indicates malfunction of T2 thermistor (Middle pipe temp.)
- E4 indicates malfunction of T2B thermistor (Outlet pipe temp.)
- E5 indicates malfunction of T2A thermistor (Inlet pipe temp.)
- E8 indicates malfunction of TA thermistor (outlet air temp.), only for the model of air supply
- AHU control box stop running.
- Wired controller connected to this AHU control box displays "E2/E3/E4/E5/E8" fault code.

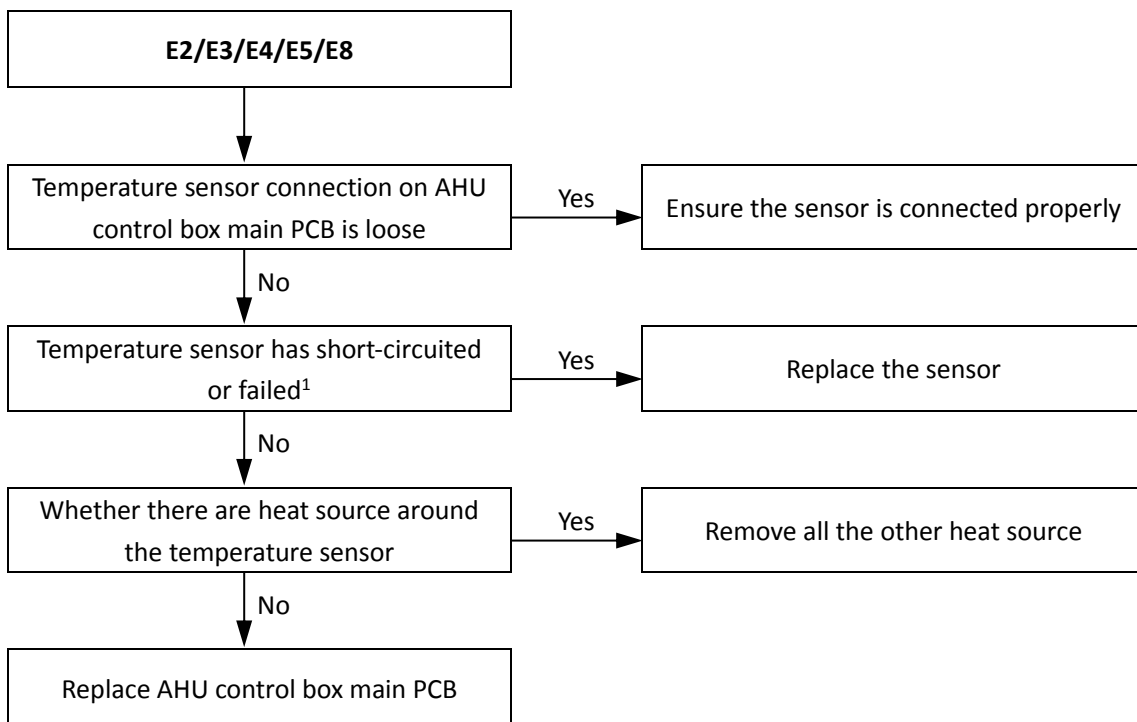
11.7.3 Trigger / recover condition

- Trigger condition: Temperature sensor T1/T2/T2B/T2A/TA is open or short-circuited.
- Recover condition: Temperature sensor T1/T2/T2B/T2A/TA connection ports can detect temperature signal.
- Reset method: Resume automatically.

11.7.4 Possible causes

- Temperature sensor not connected properly or has malfunction.
- Disturbance from other heat source
- Damaged AHU control box PCB.

11.7.5 Procedure



Notes:

1. Measure sensor resistance. If the resistance is too low, the sensor has short-circuited. If the resistance is not consistent with the sensor's resistance characteristics table, the sensor has failed. Refer to Table 6-4.1 in Part 6, 4.1 "Temperature Sensor Resistance Characteristics".

11.8 E7: EEPROM error

11.8.1 Display Output

wired controller display: E7



11.8.2 Description

- EEPROM error.
- AHU control box stop running.
- Wired controller connected to this AHU control box displays "E7" fault code.

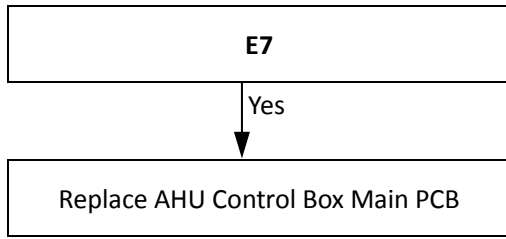
11.8.3 Trigger / recover condition

- Trigger condition: AHU control box EEPROM parameter is mismatch.
- Recover condition: Cannot recover.
- Reset method: Manually restart.

11.8.4 Possible causes

- AHU control box PCB damaged.

11.8.5 Procedure



11.9 E9: Communication error between the wired controller and AHU control box

11.9.1 Display Output

Wired controller display: E9



11.9.2 Description

- Communication failure between AHU control box and wired controller.
- The wired controller can't control the AHU control box.
- Wired control connected to this AHU control box displays "E9" fault code.

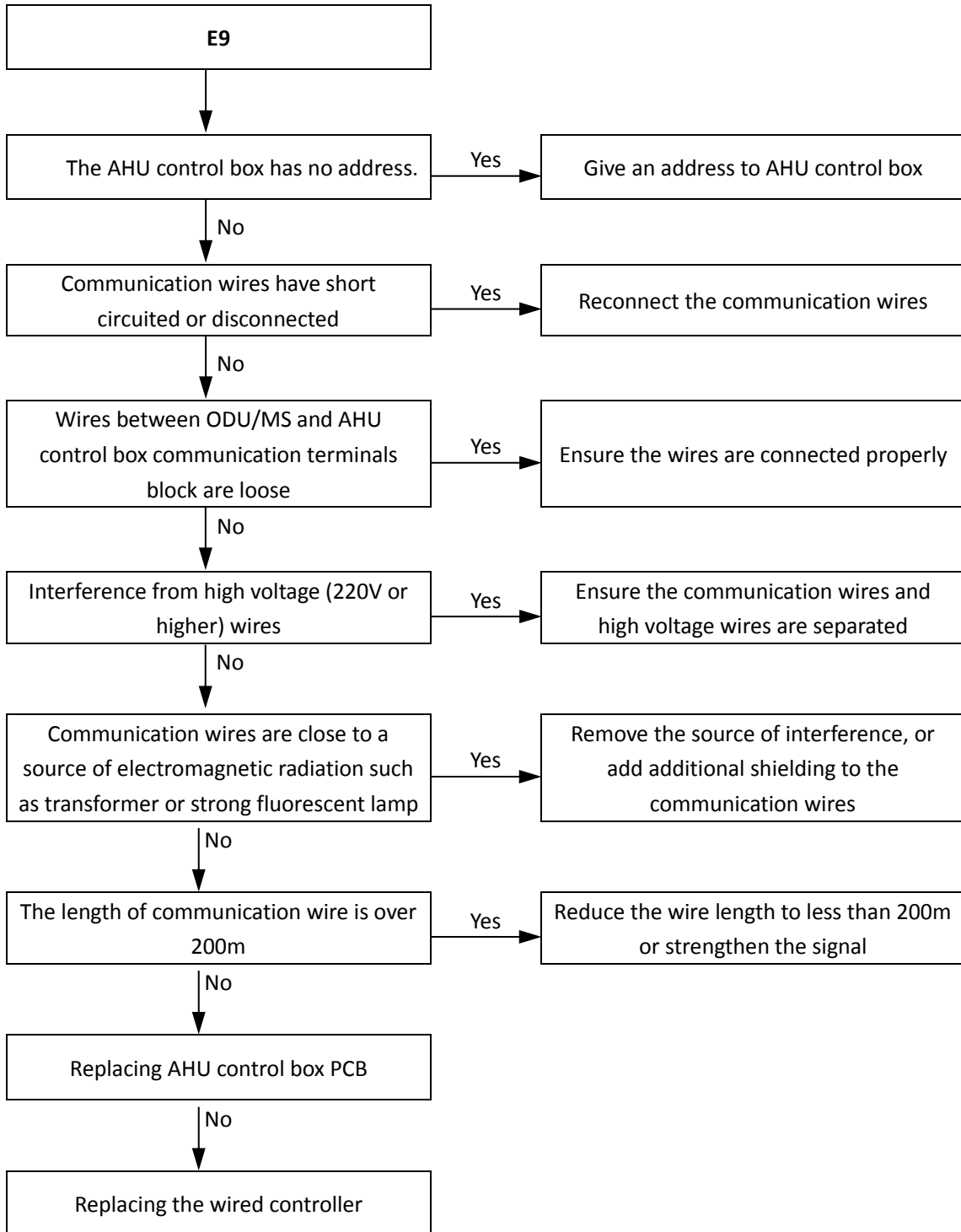
11.9.3 Trigger / recover condition

- Trigger condition: AHU control box and wired controller cannot communication for 1 minutes after the system power on
- Recover condition: Communication go back to normal.
- Reset method: Resume automatically.

11.9.4 Possible causes

- The AHU control box has no address.
- Communication wire is short, open, or loosened
- Interference from high voltage wires or other sources of electromagnetic radiation.
- Communication wire too long.
- Damaged the wired controller.
- Damaged AHU control box PCB.

11.9.5 Procedure



11.10 Eb: Electronic expansion valve failure

11.10.1 Display Output

Wired controller display: Eb



11.10.2 Description

- Electronic expansion valve connection failure.
- AHU control box stop running.
- Wired controller connected to this AHU control box displays "Eb" fault code.

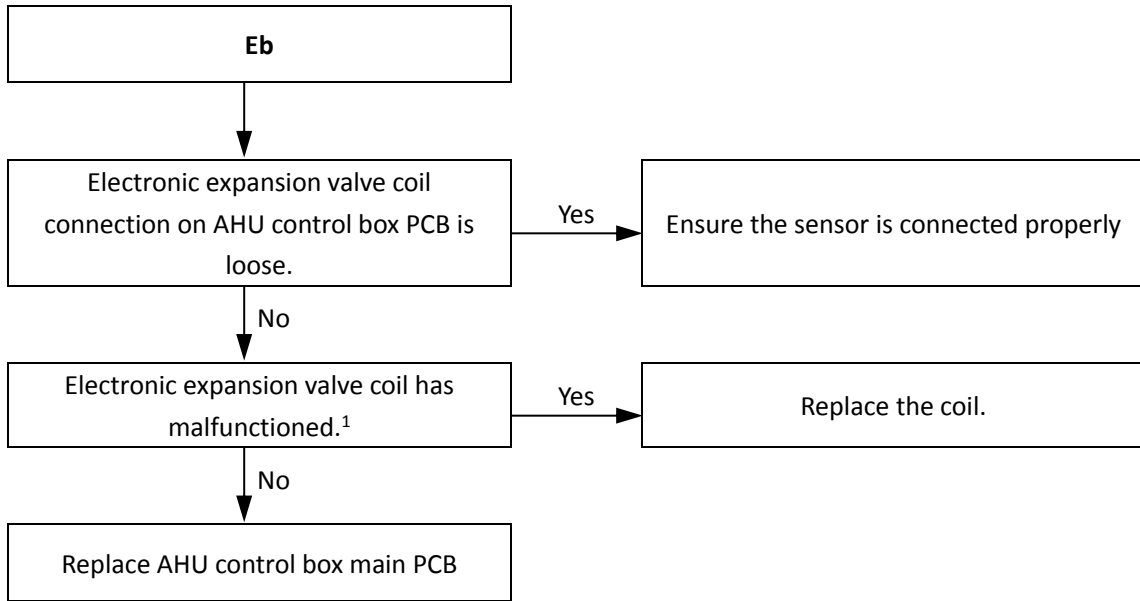
11.10.3 Trigger / recover condition

- Trigger condition: The main control board cannot receive the feedback signal of EEV.
- Recover condition: The main control board can receive the feedback signal of EEV.
- Reset method: Manually restart.

11.10.4 Possible causes

- Electronic expansion valve coil not connected properly or has malfunctioned.
- AHU control box PCB damaged.

11.10.5 Procedure



11.11 H2: Low temperature alarm

11.11.1 Display Output:

Wired controller display: H2



11.11.2 Description

- Low temperature alarm.
- AHU control box stop running.
- Wired controller connected to this AHU control box displays "H2" fault code.

11.11.3 Trigger / recover condition

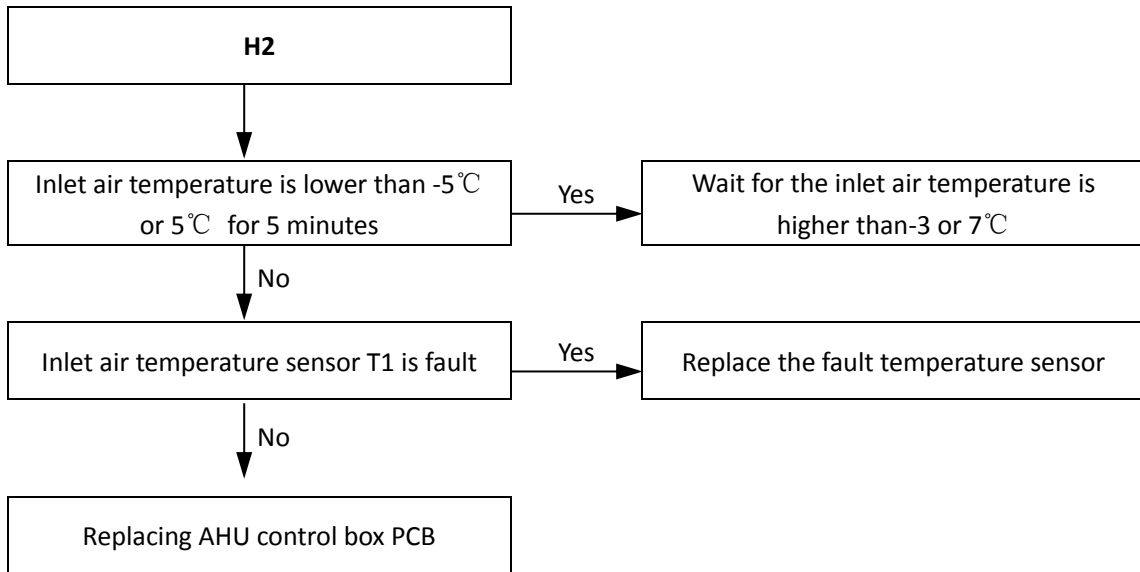
- Trigger condition: When the ability to dial >0+ high (10hp), when $T1 < -5^{\circ}\text{C}$ was detected, the independent control box reported T1 low-temperature fault H2; when the ability to dial $\leq 0+$ high (10hp), when $T1 < 5^{\circ}\text{C}$ was detected within 5 minutes, the independent control box reported T1 low-temperature fault H2.
- Recover condition: When the ability to dial >0+ high (10hp), $T1 \geq -3^{\circ}\text{C}$ was detected. When the capacity dial $\leq 0+$ high (10hp), when $T1 \geq 7^{\circ}\text{C}$ is detected, the fault is recovered
- Reset method: Resume automatically.

11.11.4 Possible causes

The return air temperature is below the allowable temperature.

Inlet air temperature sensor detection is not accurate.

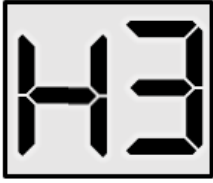
11.11.5 Procedure



11.12 H3: High temperature alarm

11.12.1 Display Output:

Wired controller display: H3



11.12.2 Description

- High temperature alarm
- AHU control box stop running.
- Wired controller connected to this AHU control box displays "H3" fault code.

11.12.3 Trigger / recover condition

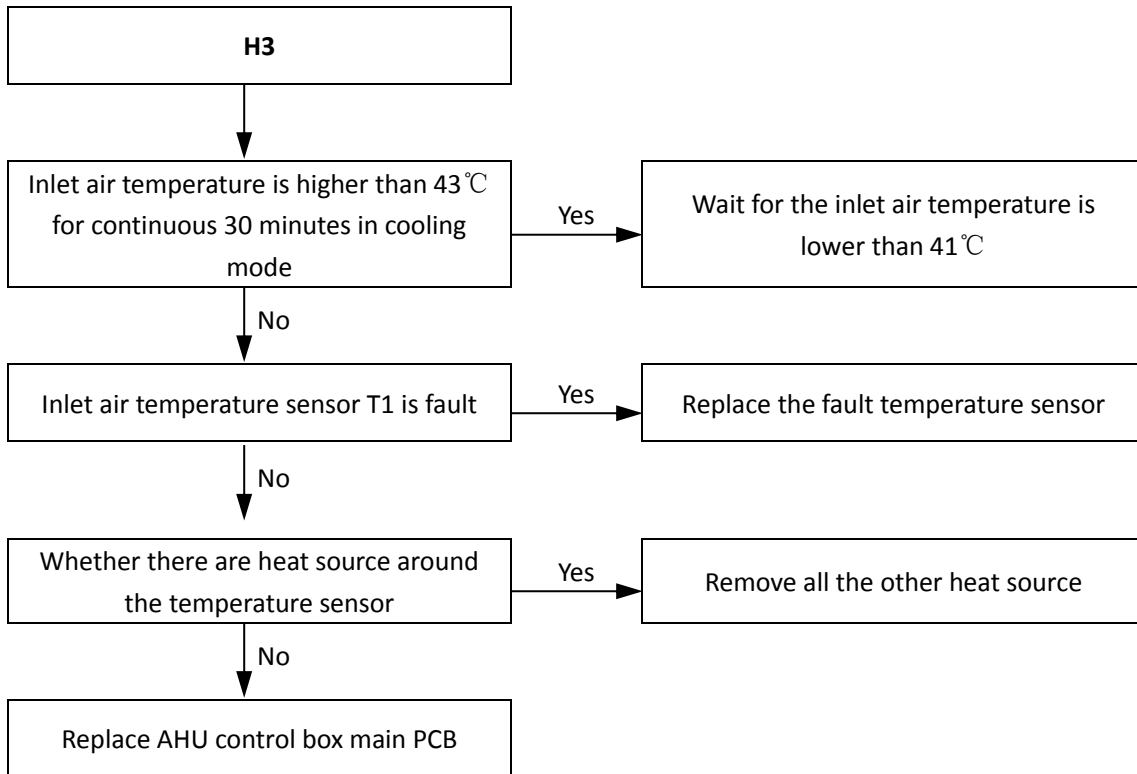
- Trigger condition: When $T1 > 43^{\circ}\text{C}$ for continuous 30 minutes in cooling mode, AHU control box displays "H3" fault code.
- Recover condition: $T1 \leq 41^{\circ}\text{C}$.
- Reset method: Resume automatically.

11.12.4 Possible causes

Inlet air temperature higher than 43°C .

Inlet air temperature sensor detection is not accurate.

11.12.5 Procedure



11.13 H6: Number of AHU control boxes detected is inconsistent with number of dialed sets or communication error between master and slave units

11.13.1 Display Output:

Weird controller display: H6



11.13.2 Description

- Number of AHU control boxes detected is inconsistent with number of dialed sets or communication error between master and slave units.
- AHU control box stop running.
- Wired controller connected to this AHU control box displays "H6" fault code.

11.13.3 Trigger / recover condition

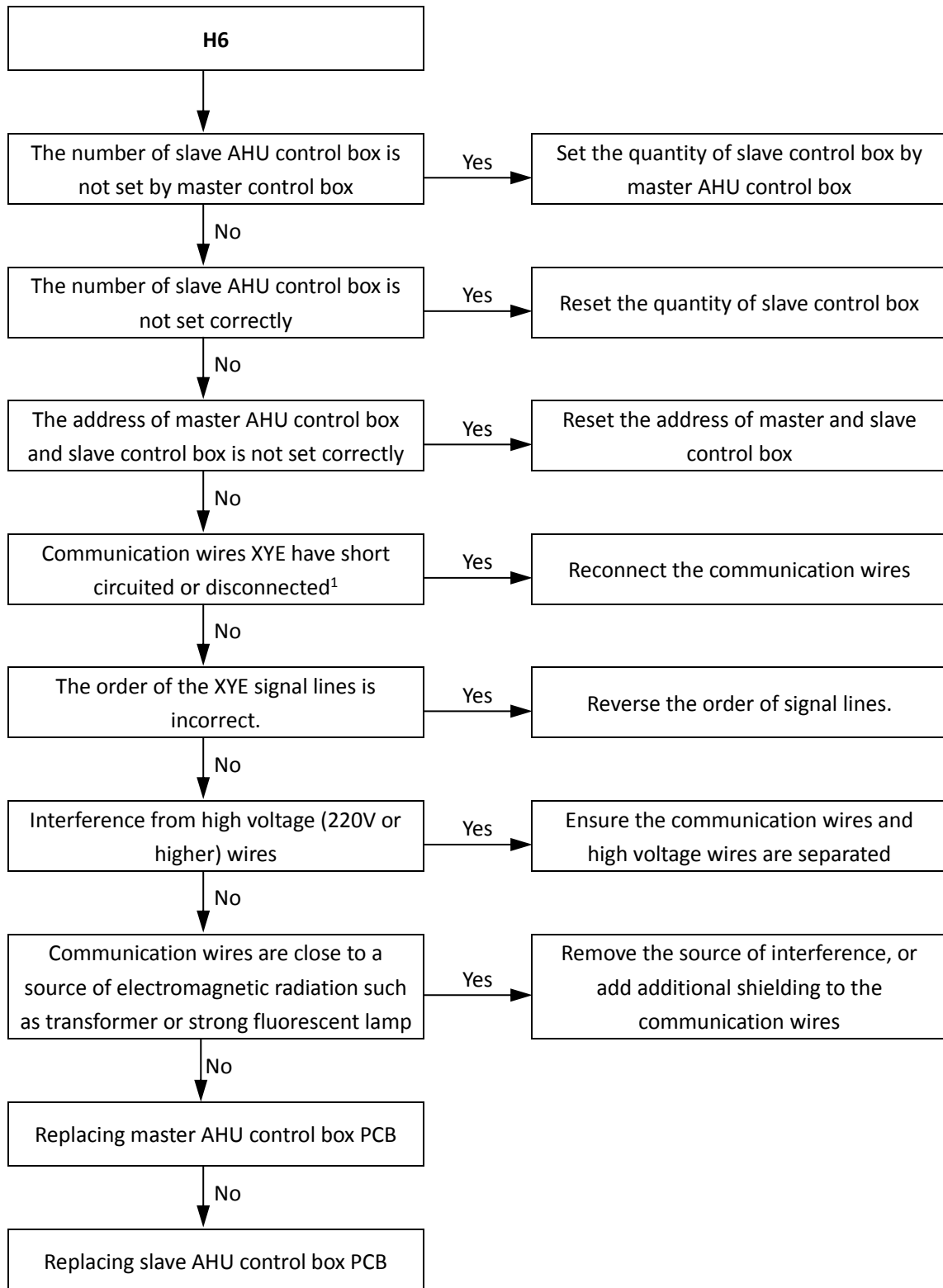
- Trigger condition: Detect number of AHU control boxes is inconsistent with number of dialed set for one minute
- Recover condition: Set the number of the units as the actual number.
- Reset method: Manually restart.

11.13.4 Possible causes

- The quantity of slave AHU control boxes set by master AHU control box through SW1_3 and SW1_4 has error.
- The address of master AHU control box and slave control box need to set by SW2_3 and SW2_4.
- Have communication trouble between master AHU control box and slave control box.
- Damaged master AHU control box PCB or slave AHU control box PCB.

11.13.5 Procedure

VRF DX AHU Control Box



11.14 H8: Capacity DIP switch of the AHU control box is inconsistent with the model or total parallel capacity out of range

11.14.1 Display Output:

Wired controller display: H8



11.14.2 Description

- Capacity DIP switch of the AHU control box is inconsistent with the model or total parallel capacity out of range.
- AHU control box stop running.
- Wired controller connected to this AHU control box displays "H8" fault code.

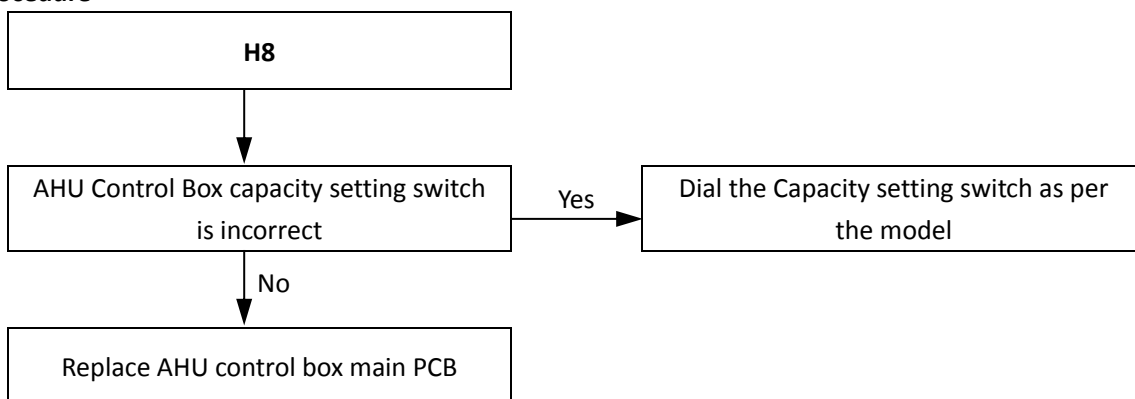
11.14.3 Trigger / recover condition

- Trigger condition: Capacity DIP switch of the AHU control box is inconsistent with the model or total parallel capacity out of range
- Recover condition: Set the capacity of the unit is consistent with the model and total parallel capacity in the range.
- Reset method: Manually restart.

11.14.4 Possible causes

- The dial switch capacity setting is not the same as the unit capacity

11.14.5 Procedure



11.15 H9: Incorrect DIP switch for 0-10V fan signal. The DIP switch value must ensure $ENC2 < ENC3 < ENC4$

11.15.1 Display Output:

Wired controller display: H9



11.15.2 Description

- Dials for fan speed is set incorrectly, can't meet $ENC2 < ENC3 < ENC4$.
- AHU control box stop running.
- Wired controller connected to this AHU control box displays "H9" fault code.

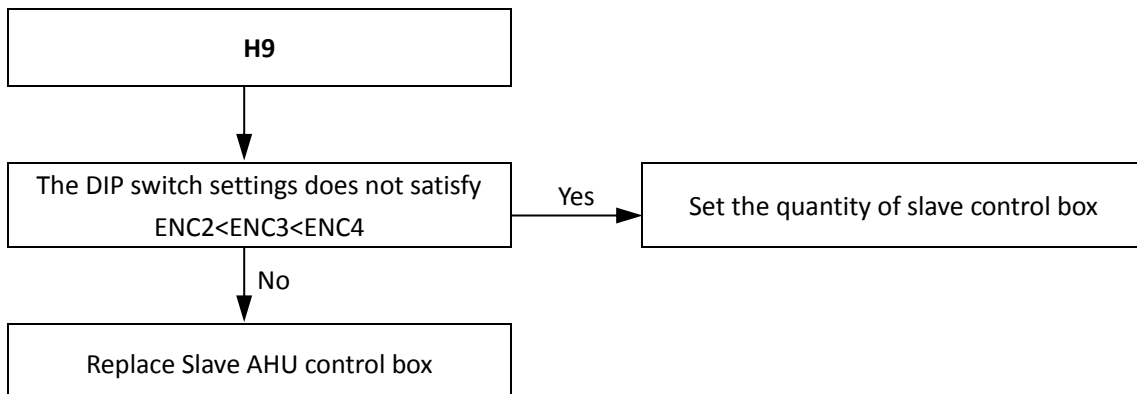
11.15.3 Trigger / recover condition

- Trigger condition: Detect the DIP switch not satisfy $ENC2 < ENC3 < ENC4$.
- Recover condition: Ensure DIP switch $ENC2 < ENC3 < ENC4$.
- Reset method: Manually restart that is power off and power on

11.15.4 Possible causes

- The DIP switch does not satisfy $ENC2 < ENC3 < ENC4$.
- Damaged AHU control box PCB

11.15.5 Procedure:



11.16 EE: Water level alarm

11.16.1 Display Output

Wired controller display: EE



11.16.2 Description

- AHU control box main PCB detect the water level switch is open
- AHU control box stop running.
- Wired controller connected to this AHU control box displays "EE" fault code.

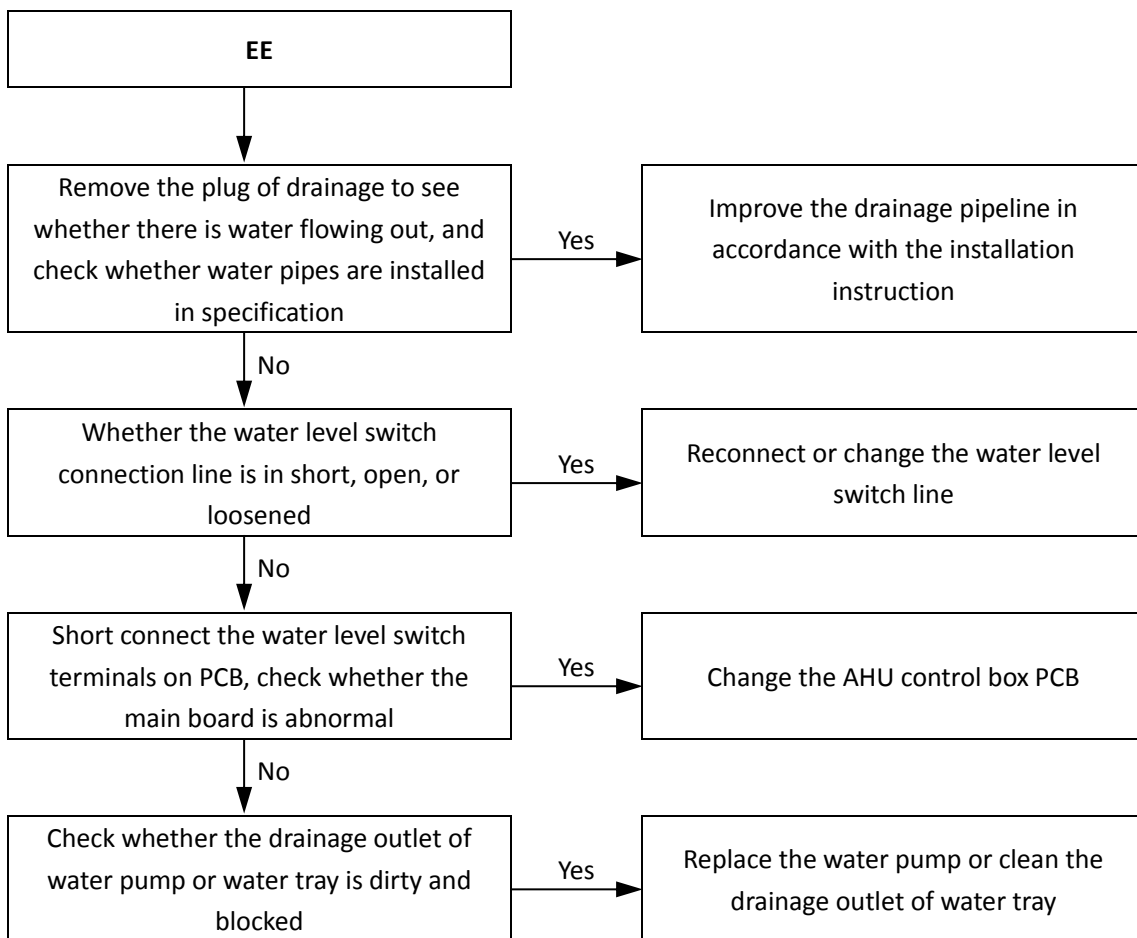
11.16.3 Trigger / recover condition

- Trigger condition: water level switch is open.
- Recover condition: water level switch is closed.
- Reset method: Manually restart.

11.16.4 Possible causes

- Line to the water level switch loosened or broken.
- The water level switch stuck
- The water tray of AHU in poor drainage, or the water pump damaged
- Damaged AHU control box PCB

11.16.5 Procedure



11.17 F8: MS/SDB error mode

11.17.1 Display Output

Wired controller display: F8



11.17.2 Description

- MS error.
- AHU control box stop running.
- Wired controller connected to this AHU control box displays "F8" fault code.

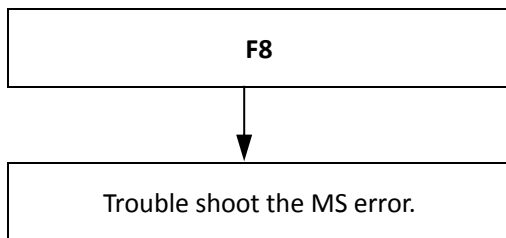
11.17.3 Trigger / recover condition

- Trigger condition: MS connected to AHU control box has error.
- Recover condition: Trouble shoot the MS error.
- Reset method: Resume automatically.

11.17.4 Possible causes

- MS box has error

11.17.5 Procedure



11.18 E0: Mode conflict error

11.18.1 Display Output

Wired controller display: E0



11.18.2 Description

- Different running modes for AHU control box and ODU or MS/SDB
- AHU control box stop running.
- Wired controller connected to this AHU control box displays "E0" fault code.

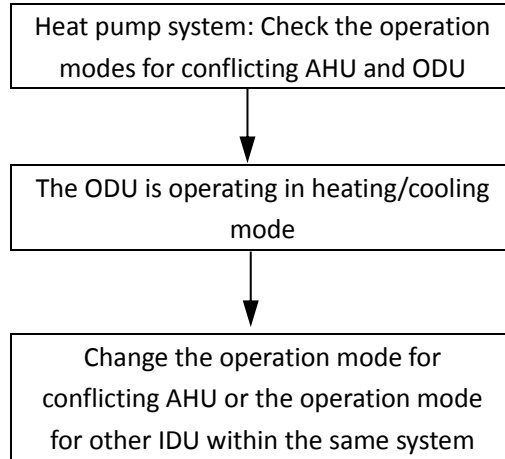
11.18.3 Trigger / recover condition

- Trigger condition: AHU control box detect the different running modes for AHU control box and ODU or MS
- Recover condition: Be the same mode for AHU control box and ODU or MS
- Reset method: Manually restart.

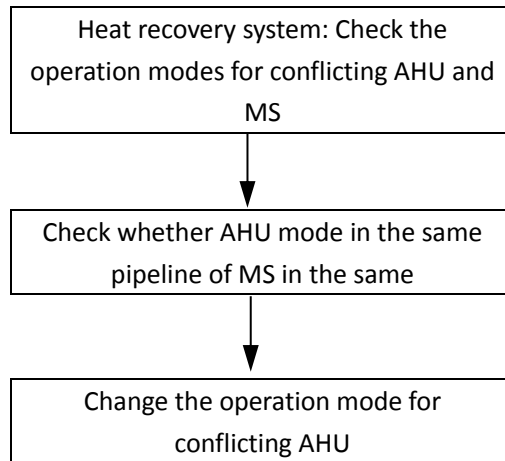
11.18.4 Possible causes

- Heat pump for ODU -- the ODU is operating in heating mode, while the AHU control box is operating in cooling, ventilating or dehumidification mode
- Heat pump for ODU -- the ODU is operating in cooling mode, while the AHU control box is operating in heating mode
- Heat recovery for ODU -- the MS is operating in heating mode, while the AHU control box is operating in cooling, ventilating or dehumidification mode within the same pipeline system
- Heat recovery for ODU -- the MS is operating in cooling mode, while the AHU control box is operating heating mode within the same piping system

**11.18.5 Procedure
For Heat pump system**



For Heat recovery system



11.19 Ed: ODU error

11.19.1 Display Output

Wired controller display: Ed



11.19.2 Description

- ODU error.
- AHU control box stop running.
- In the event of a slow, flashing "Ed", the AHU control box can be powered on and off normally with this error

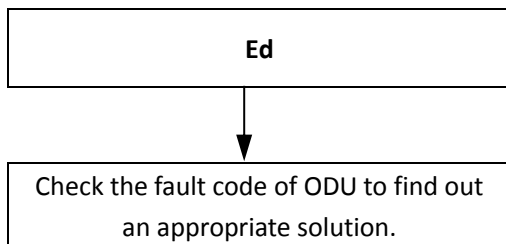
11.19.3 Trigger / recover condition

- Trigger condition: ODU has error.
- Recover condition: Trouble shoot the ODU error.
- Reset method: Resume automatically.

11.19.4 Possible causes

- Powered failure of malfunction in ODU and MS

11.19.5 Procedure



11.20 U4: MS or SDB self-check error

11.20.1 Display Output

Wired controller display: U4



11.20.2 Description

- MS self-check error.
- AHU control box stop running.

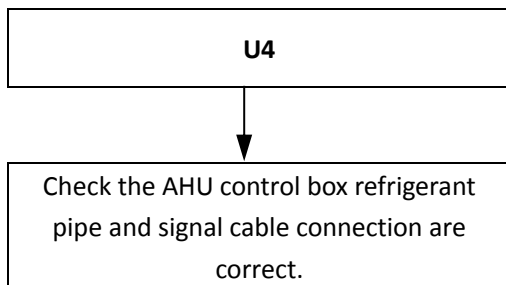
11.20.3 Trigger / recover condition

- Trigger condition: AHU control box refrigerant pipe and signal cable connection are inconsistent. MS box send self-check error to AHU control box.
- Recover condition: Trouble shoot the MS error.
- Reset method: Manually restart.

11.20.4 Possible causes

- AHU control box refrigerant pipe and signal cable connection are inconsistent.

11.20.5 Procedure



11.21 FE: AHU control box has no address when first powered on

11.21.1 Display Output

Wired controller display: FE



11.21.2 Description

- AHU control box has no address when first powered on.
- AHU control box stop running.
- Wired controller connected to this AHU control box displays "EF" or "E9" fault code.

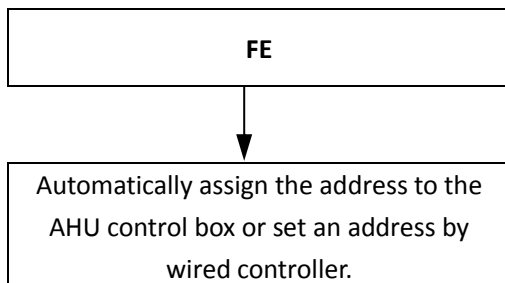
11.21.3 Trigger / recover condition

- Trigger condition: AHU control box has no address when first powered on.
- Recover condition: Outdoor unit automatically assigns address to AHU control box or manually set the address through wired controller.
- Reset method: Resume automatically.

11.21.4 Possible causes

- The outdoor unit or MS is not powered on or the address assignment is unsuccessful.

11.21.5 Procedures



11.22 Hb: Slave unit error

11.22.1 Display Output

Only displayed on the display board, not sent to centralized or wired controller.



11.22.2 Description

- Slave AHU control box has fault when several units are parallel.
- AHU control box stop running.
- Display board show “Hb” in master unit

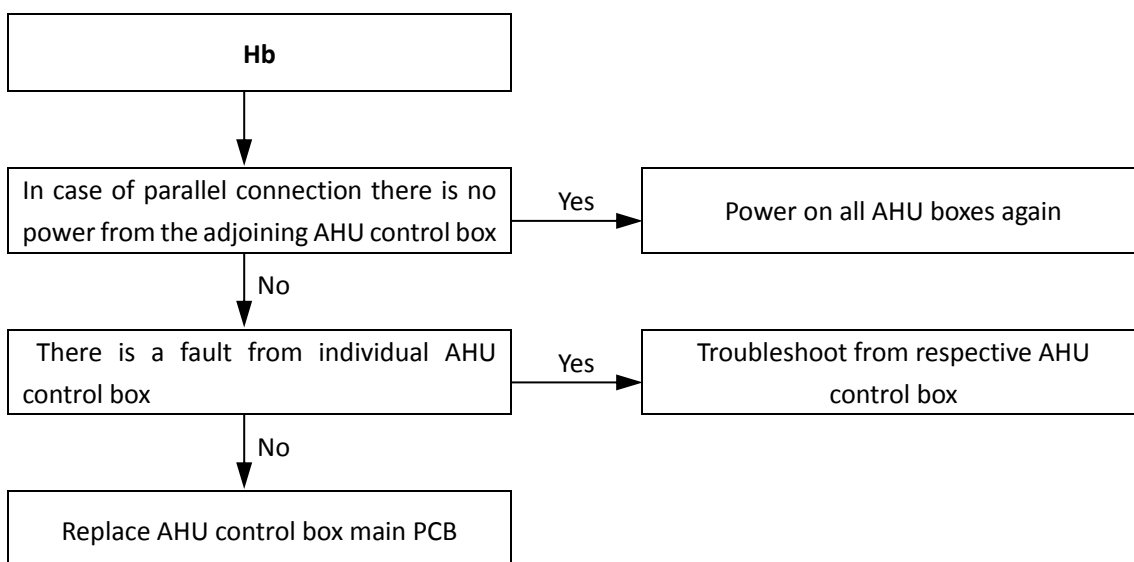
11.22.3 Trigger / recover condition

- Trigger condition: Slave AHU control box has error.
- Recover condition: all slave AHU control boxes have no fault.
- Reset method: Resume automatically.



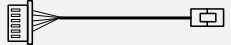

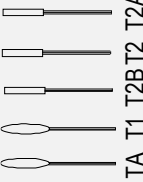
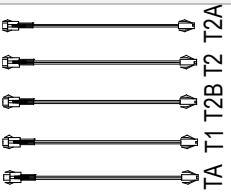


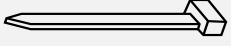

11.22.4 Possible causes

- The slave AHU control box is not powered on or has malfunction.
- Slave AHU control box PCB has fault.

11.22.5 Procedures



12 Accessories

Name	Shape	Quantity	Function
Installation & Owner's Manual		1	-
Wired controller		1	Wired controller
Electronic Expansion valve extension cable		1	-
Fixed clamp of temperature sensor		3	-
Temperature sensors	 TA T1 T2B T2 T2A	5	-
Temperature sensors extension cables	 TA T1 T2B T2 T2A	5	-
Screw ST 3.9x25		8	Secure the installation board
Plastic expanded tube		8	-
Zip Tie		5	-
Sleeve		3	-

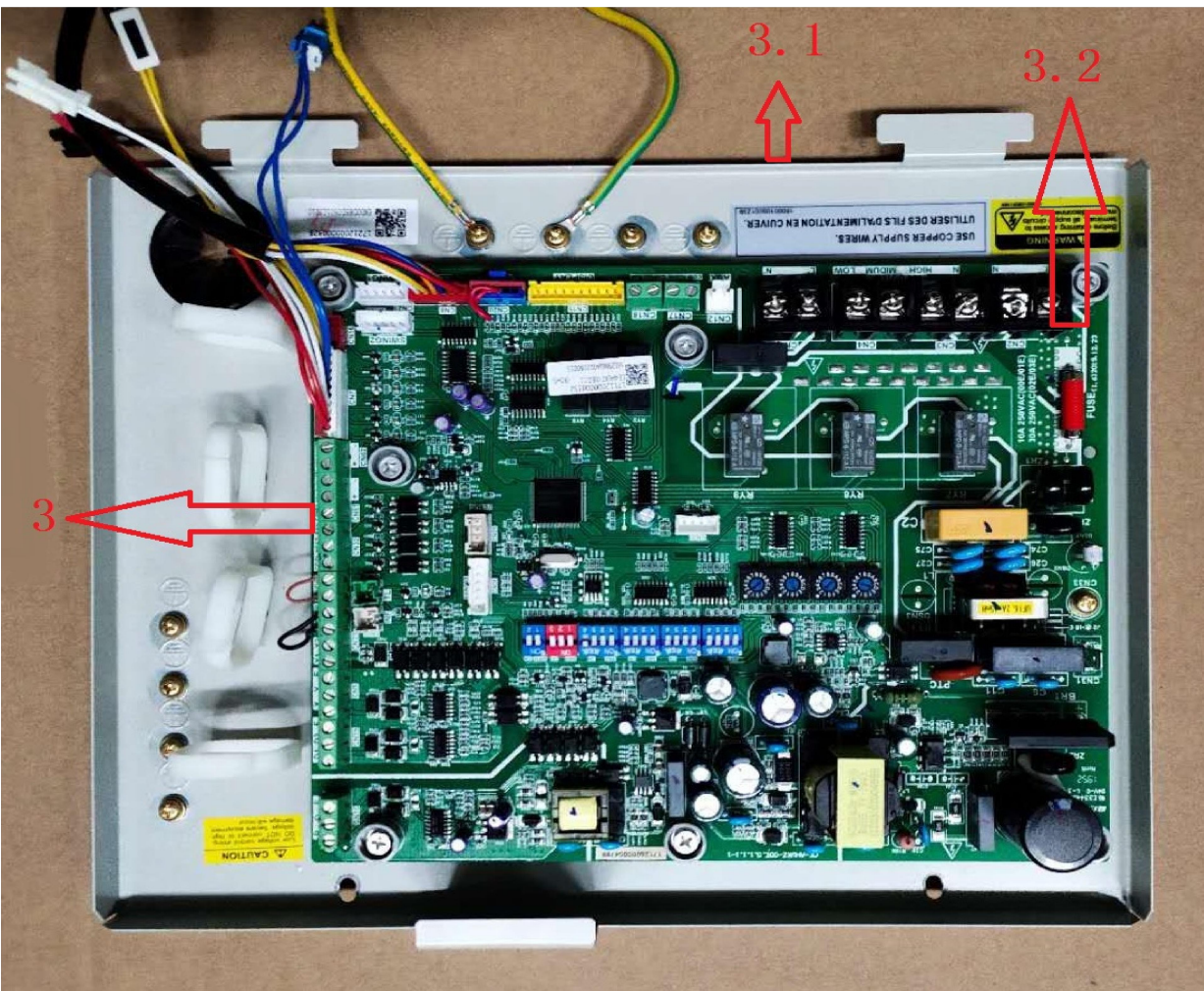
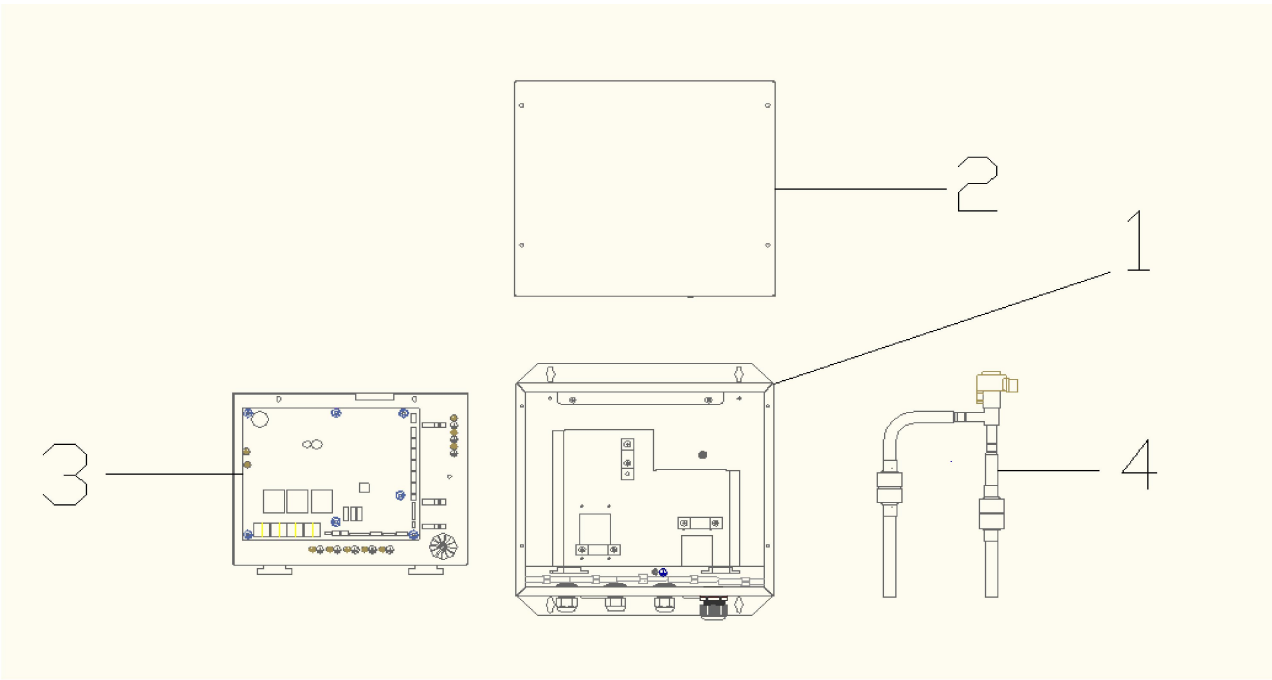
13 Appendix

13.1 Temperature Sensor Resistance Characteristics

Table 5.1: Indoor ambient temperature sensor, indoor heat exchanger mid-point temperature sensor and indoor heat exchanger outlet

Temperature (°C)	Resistance (kΩ)	Temperature (°C)	Resistance (kΩ)	Temperature (°C)	Resistance (kΩ)	Temperature (°C)	Resistance (kΩ)
-20	115.3	20	12.64	60	2.358	100	0.6297
-19	108.1	21	12.06	61	2.272	101	0.6115
-18	101.5	22	11.50	62	2.191	102	0.5939
-17	96.34	23	10.97	63	2.112	103	0.5768
-16	89.59	24	10.47	64	2.037	104	0.5604
-15	84.22	25	10.00	65	1.965	105	0.5445
-14	79.31	26	9.551	66	1.896	106	0.5291
-13	74.54	27	9.124	67	1.830	107	0.5143
-12	70.17	28	8.720	68	1.766	108	0.4999
-11	66.09	29	8.336	69	1.705	109	0.4860
-10	62.28	30	7.971	70	1.647	110	0.4726
-9	58.71	31	7.624	71	1.591	111	0.4596
-8	56.37	32	7.295	72	1.537	112	0.4470
-7	52.24	33	6.981	73	1.485	113	0.4348
-6	49.32	34	6.684	74	1.435	114	0.4230
-5	46.57	35	6.400	75	1.387	115	0.4116
-4	44.00	36	6.131	76	1.341	116	0.4006
-3	41.59	37	5.874	77	1.291	117	0.3899
-2	39.82	38	5.630	78	1.254	118	0.3796
-1	37.20	39	5.397	79	1.2133	119	0.3695
0	35.20	40	5.175	80	1.174	120	0.3598
1	33.33	41	4.964	81	1.136	121	0.3504
2	31.56	42	4.763	82	1.100	122	0.3413
3	29.91	43	4.571	83	1.064	123	0.3325
4	28.35	44	4.387	84	1.031	124	0.3239
5	26.88	45	4.213	85	0.9982	125	0.3156
6	25.50	46	4.046	86	0.9668	126	0.3075
7	24.19	47	3.887	87	0.9366	127	0.2997
8	22.57	48	3.735	88	0.9075	128	0.2922
9	21.81	49	3.590	89	0.8795	129	0.2848
10	20.72	50	3.451	90	0.8525	130	0.2777
11	19.69	51	3.318	91	0.8264	131	0.2708
12	18.72	52	3.192	92	0.8013	132	0.2641
13	17.80	53	3.071	93	0.7771	133	0.2576
14	16.93	54	2.959	94	0.7537	134	0.2513
15	16.12	55	2.844	95	0.7312	135	0.2451
16	15.34	56	2.738	96	0.7094	136	0.2392
17	14.62	57	2.637	97	0.6884	137	0.2334
18	13.92	58	2.540	98	0.6682	138	0.2278
19	13.26	59	2.447	99	0.6486	139	0.2223

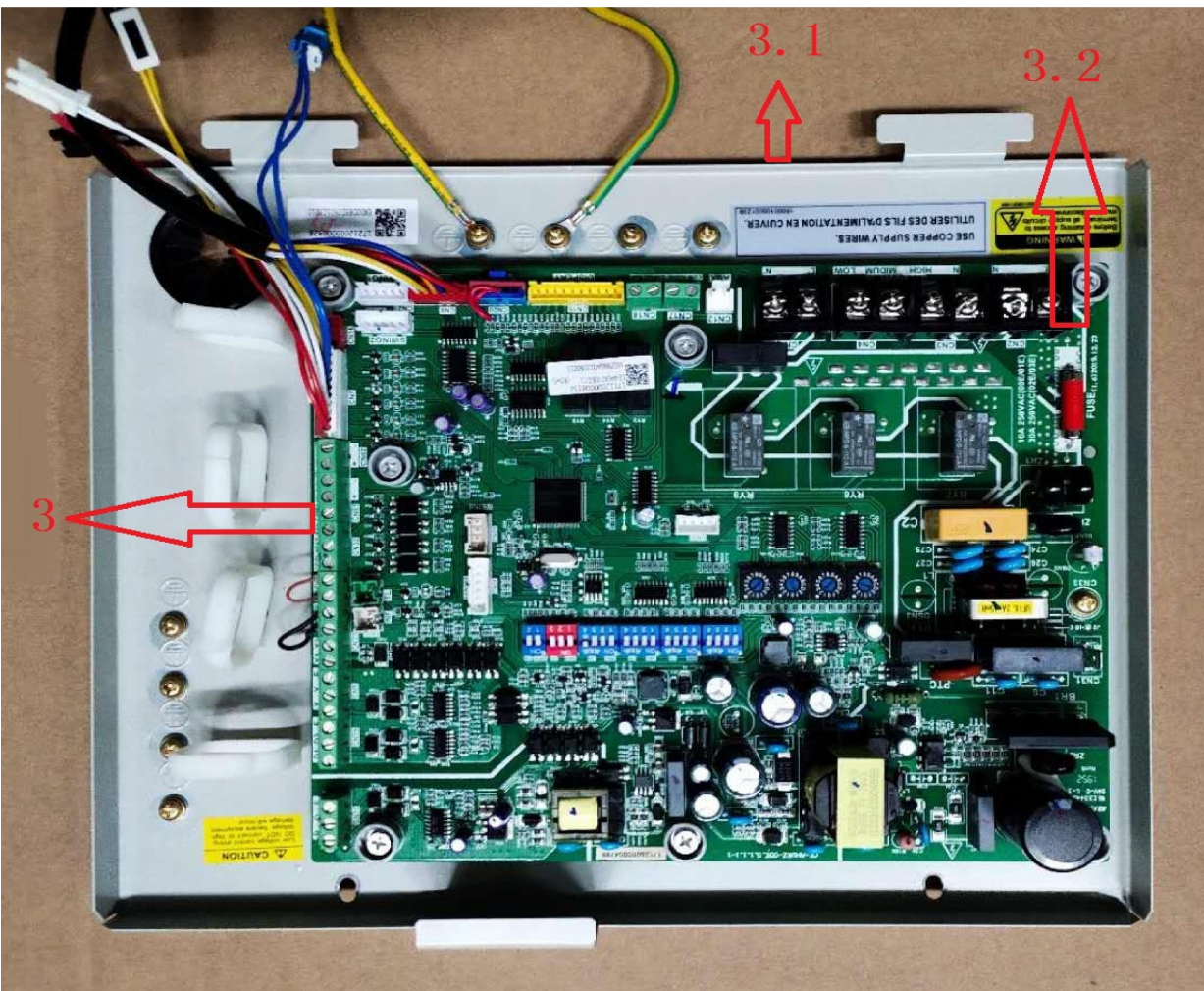
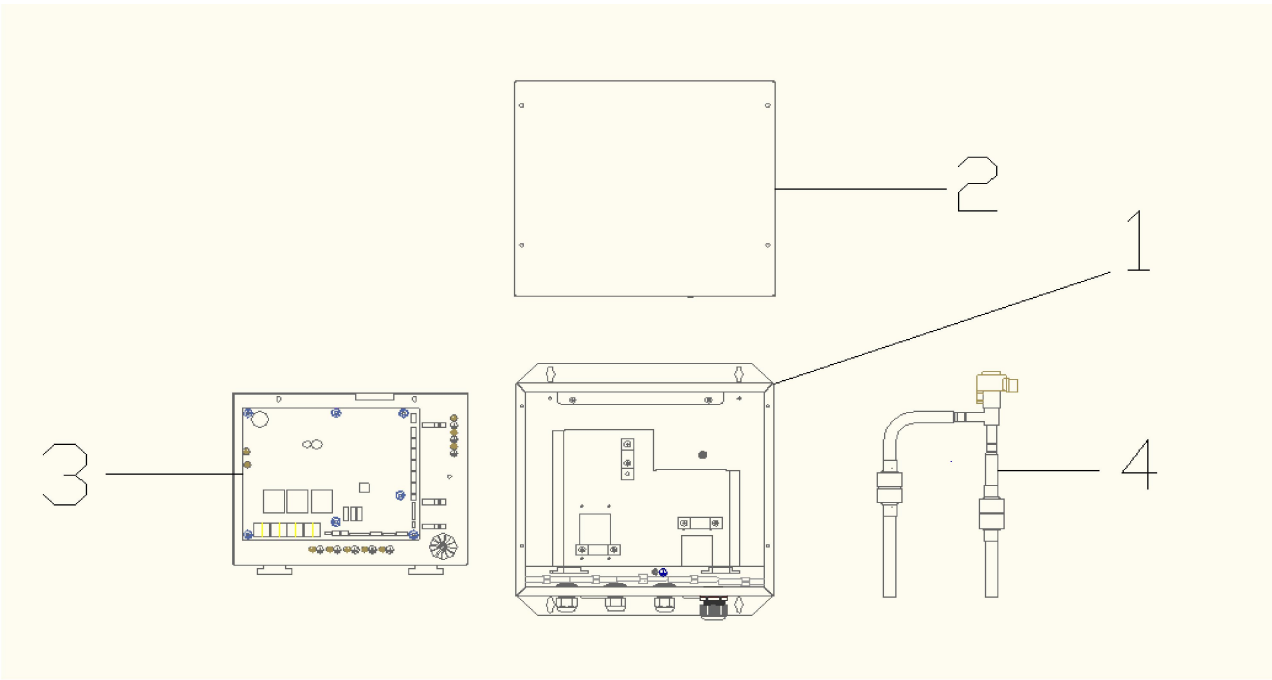
AHUKZ-00D



No	Description	Part Code	Note	Qty	Price Code
MODEL: AHUKZ-00D					
1	Electric control box welding assembly	12212000000344		1	AW
2	Electric control box cover assembly	12212000000341		1	AM
3	E-part box assembly	17212000000649		1	
3.1	Electrical box separator assembly	12212000000337		1	AQ
3.2	Indoor unit main control board	17112000000514		1	BS
4	Electronic expansion valve assembly	15412000000067		1	BC

The data are subject to change without notice.

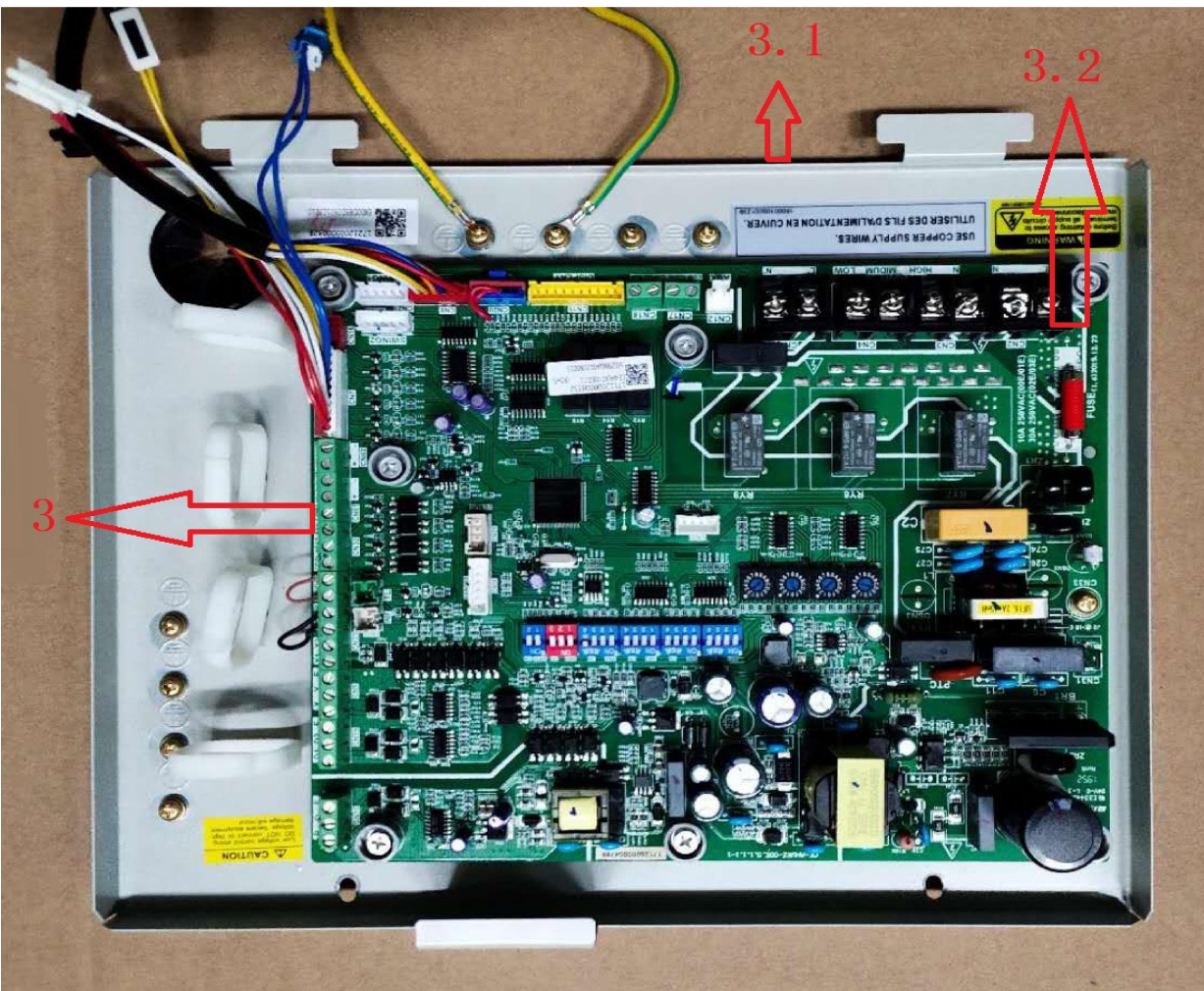
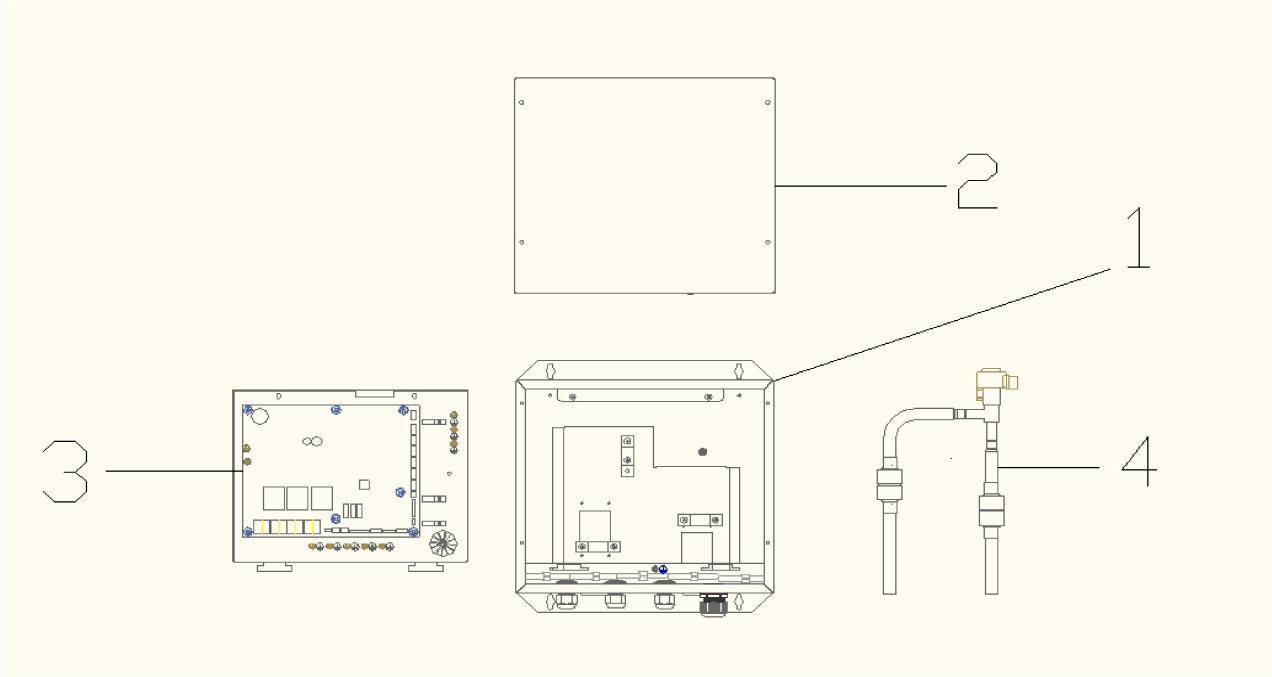
AHUKZ-01D



No	Description	Part Code	Note	Qty	Price Code
MODEL: AHUKZ-01D					
1	Electric control box welding assembly	12212000000344		1	AW
2	Electric control box cover assembly	12212000000341		1	AM
3	E-part box assembly	17212000000649		1	
3.1	Electrical box separator assembly	12212000000337		1	AQ
3.2	Indoor unit main control board	17112000000514		1	BS
4	Electronic expansion valve assembly	15412000000065		1	BC

The data are subject to change without notice.

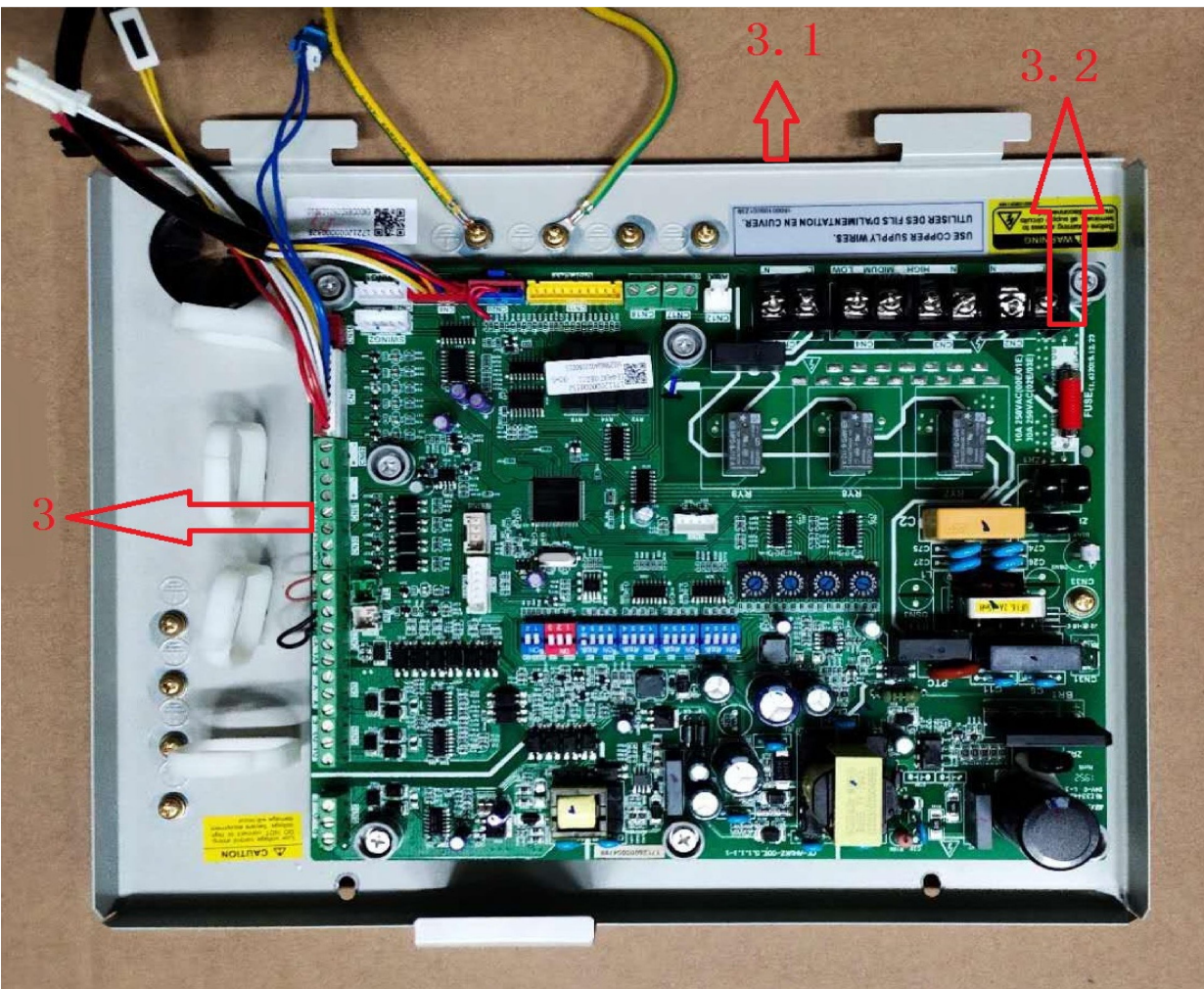
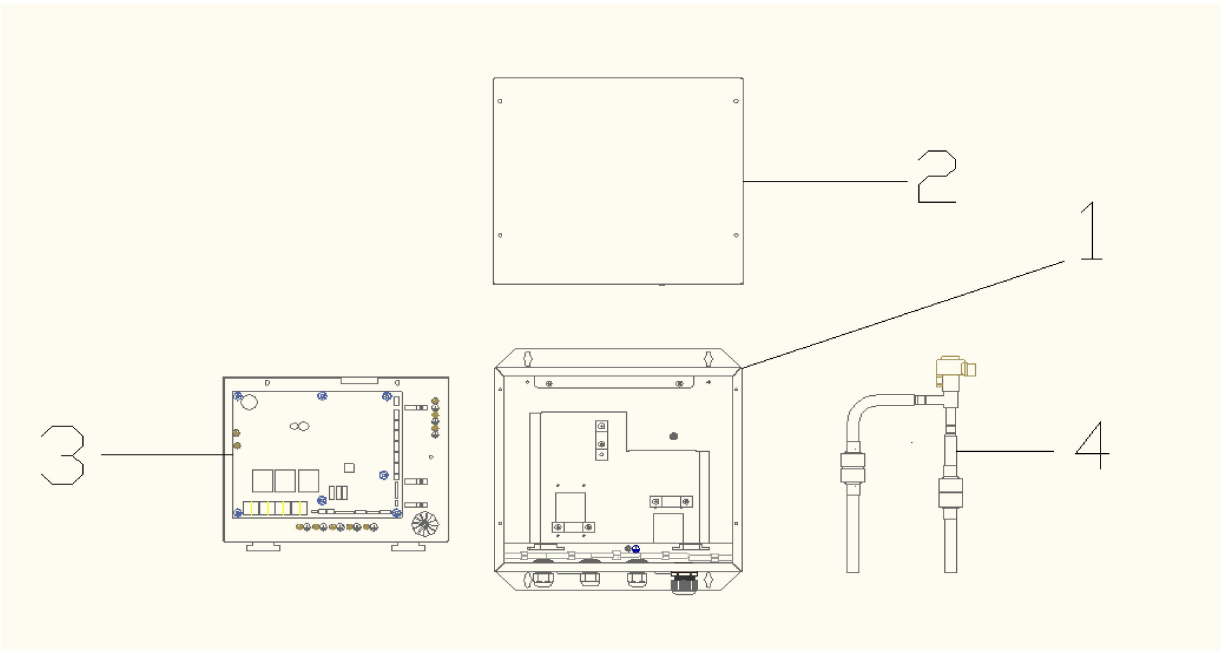
AHUKZ-02D



No	Description	Part Code	Note	Qty	Price Code
MODEL: AHUKZ-02D					
1	Electric control box welding assembly	12212000000344		1	AW
2	Electric control box cover assembly	12212000000341		1	AM
3	E-part box assembly	17212000000648		1	
3.1	Electrical box separator assembly	12212000000337		1	AQ
3.2	Indoor unit main control board	17112000000512		1	BS
4	Electronic expansion valve assembly	15412000000066		1	BF

The data are subject to change without notice.

AHUKZ-03D



No	Description	Part Code	Note	Qty	Price Code
MODEL: AHUKZ-03D					
1	Electric control box welding assembly	12212000000344		1	AW
2	Electric control box cover assembly	12212000000341		1	AM
3	E-part box assembly	17212000000648		1	
3.1	Electrical box separator assembly	12212000000337		1	AQ
3.2	Indoor unit main control board	17112000000512		1	BS
4	Electronic expansion valve assembly	15412000000064		1	BP

The data are subject to change without notice.

NOTE CONCERNING PROTECTION OF ENVIRONMENT



This product must not be disposed of via normal household waste after its service life, but must be taken to a collection station for the recycling of electrical and electronic devices. The symbol on the product, the operating instructions or the packaging indicate such disposal procedures. The materials are recyclable in accordance with their respective symbols. By means of re-use, material recycling or any other form of recycling old appliances you are making an important contribution to the protection of our environment. Please ask your local council where your nearest disposal station is located.

INFORMATION CONCERNING USED REFRIGERANT MEDIUM

This unit is containing fluorinated gases included in the Kyoto protocol. The maintenance and the liquidation must be carried out by qualified personnel.

Type of refrigerant: R410A

The composition of the cooling medium R410A: (50% HFC-32, 50% HFC-125)

The quantity of the refrigerant: please see the unit label.

The value GWP: 2088 (1 kg R410A = 2,088 t CO₂ eq)

GWP = Global Warming Potential

In case of quality problem or other please contact your local supplier or authorized service center.

Emergency number: 112

PRODUCER

SINCLAIR CORPORATION Ltd.

1-4 Argyll St.

London W1F 7LD

Great Britain

www.sinclair-world.com

This product was manufactured in China (Made in China).

REPRESENTATIVE

SINCLAIR Global Group s.r.o.

Purkynova 45

612 00 Brno

Czech Republic

TECHNICAL SUPPORT

SINCLAIR Global Group s.r.o.

Purkynova 45

612 00 Brno

Czech Republic

Tel.: +420 800 100 285

Fax: +420 541 590 124

www.sinclair-solutions.com

info@sinclair-solutions.com

