ComfortStar®

Air Conditioning & Heating Products

STAR PRO™ SERIES

Service Manual

Outdoor Unit:

CSV24-32(29V) CSV36-32(29W)
CSV48-32(29X) CSV60-32(29Y)

⚠ RECOGNIZE THIS SYMBOL AS A SAFETY PRECAUTION

ATTENTION INSTALLING PERSONNEL

Prior to installation, thoroughly familiarize yourself with this Installation Manual. Observe all safety warnings.
During installation or repair, caution is to be observed
It is your responsibility to install the product safely and to educate the customer on its safe use

Eair LLC

12201 N.W. 107th Avenue, Medley, FL 33178

www.comfortstarusa.com

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Part 1

General Information

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1 Product lineup

Model	Cooling Capacity (Btu/h)	Appearance
CSV32-24	24000	
CSV32-36	36000	
CSV32-48	48000	
CSV32-60	55000	

2 Specifications

Model		CSV24-32	CSV36-32	CSV48-32	CSV60-32
Power supply	V-Ph-Hz	208~230V/1PH/60HZ			
Cooling	Capacity(Btu/h)	24000	34600	48000	55000
	EER2(Btu/h/W)	9.90	8.20	9.30	8.60
	SEER2(Btu/h/W)	15.20	13.80	14.60	13.40
Heating	Capacity(Btu/h/W)	24000	36000	48000	57000
	HSPF2(Btu/h/W)	7.20	7.10	8.20	8.0
Compressor	RLA(A)	16.00	19.00	23.00	27.00
	LRA(A)	/	/	/	/
	Type	DC Inverter Rotary			
Condenser Fan Motor	Number of Motors	1	1	1	1
	R.P.M.	200~950R.P.M.	200~950R.P.M.	200~900R.P.M.	200~900R.P.M.
	Horsepower	1/3HP	1/3HP	1/3HP	1/3HP
	F.L. A/L.R. Amps(A)	2.1/-	2.1/-	2.1/-	2.1/-
Evaporator Fan Motor	Number of Motors	1	1	1	1
	R.P.M.	750R.P.M.	1030R.P.M.	1030R.P.M.	1080R.P.M.
	Horsepower	1/3HP	3/5HP	3/5HP	3/4HP
	CFM	760@0.50''	1060@0.50''	1400@0.50''	1600@0.50''
Refrigerant	Type	R32	R32	R32	R32
	Charging volume(oz)	63.5	63.5	100.5	100.5
Electrical Data	Minimum Circuit Ampacity(A)	23.88	29.33	34.33	39.70
	Max. Overcurrent Protection(A)	38.20	46.90	54.93	65.90
	Min. / Max. Volts(V)	173 / 269	173 / 269	173 / 269	173 / 269
Dimension and Weight	Unit (W×D×H)	50-45/64×35-3/64×46-27/32		51-9/16×44-13/16×51-7/16	
	Packing (W×D×H)	51-27/64×35-43/64×48-11/32		52-9/32×45-7/16×51-21/32	
	Net / Gross weight(lbs)	390/403	390/403	507/525	507/525

Part 2

Component Layout and Refrigerant Circuit

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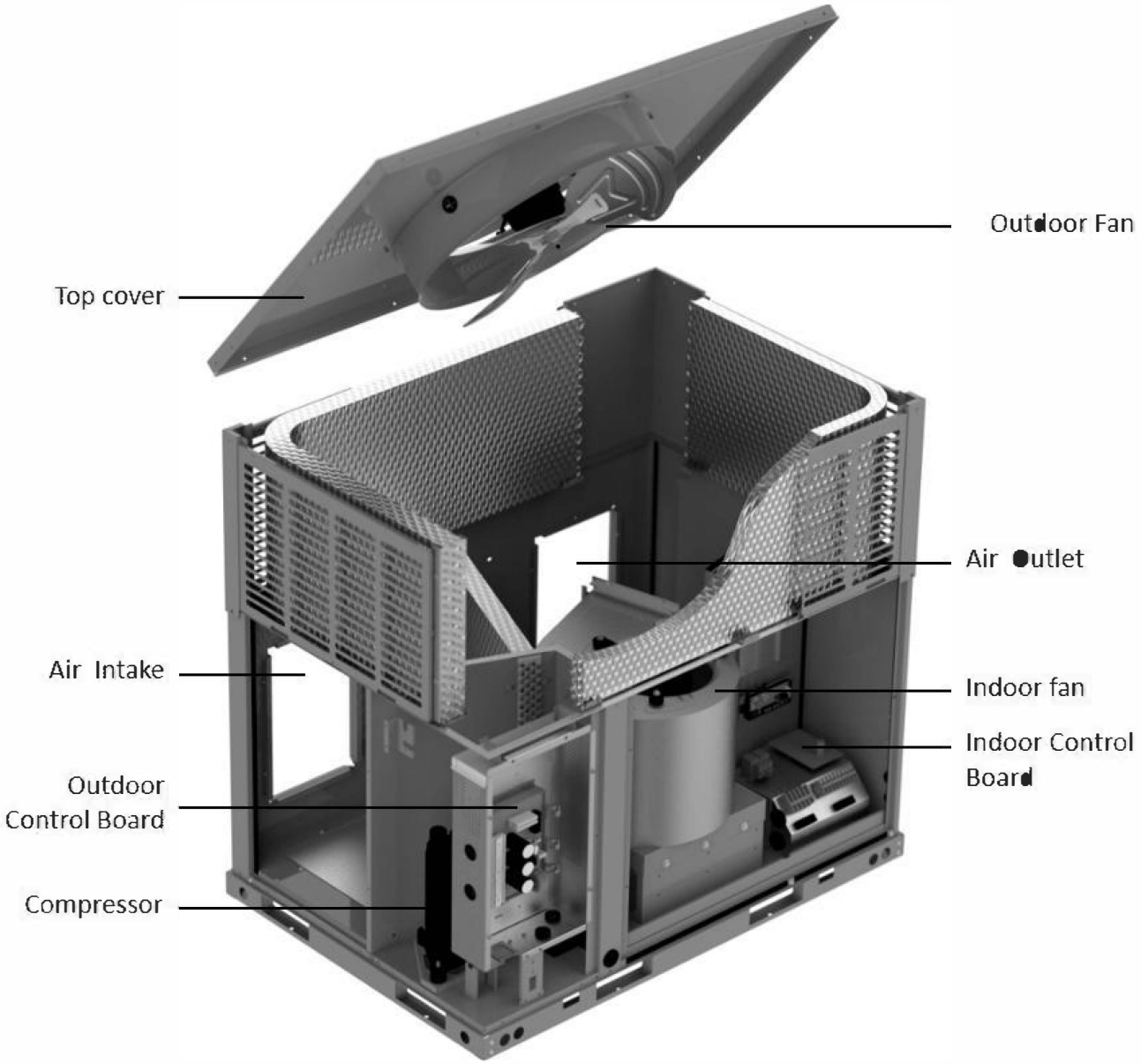
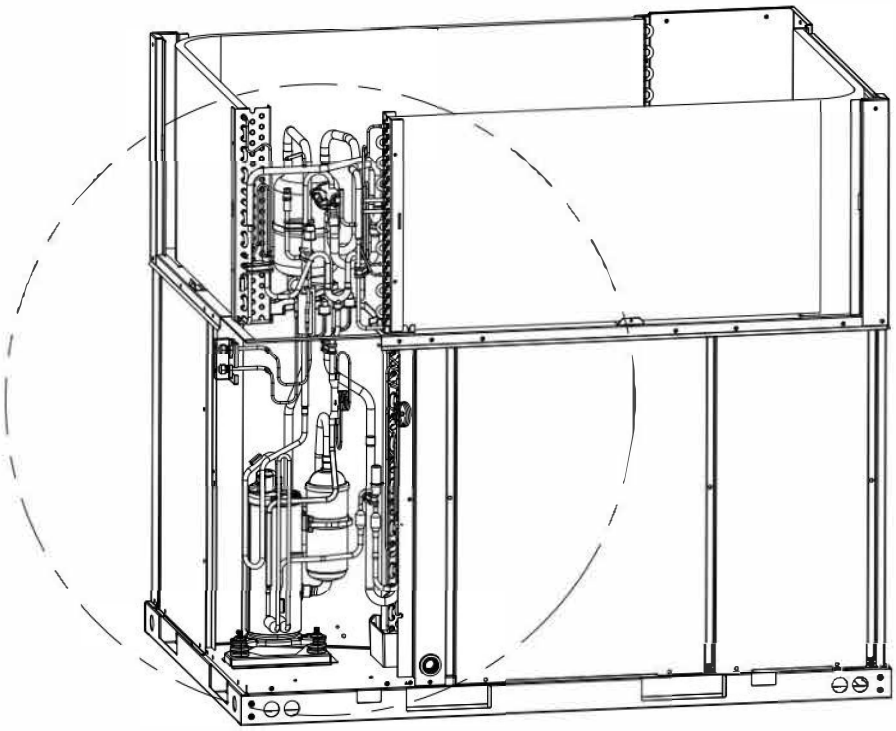
1 Layout Functional Components

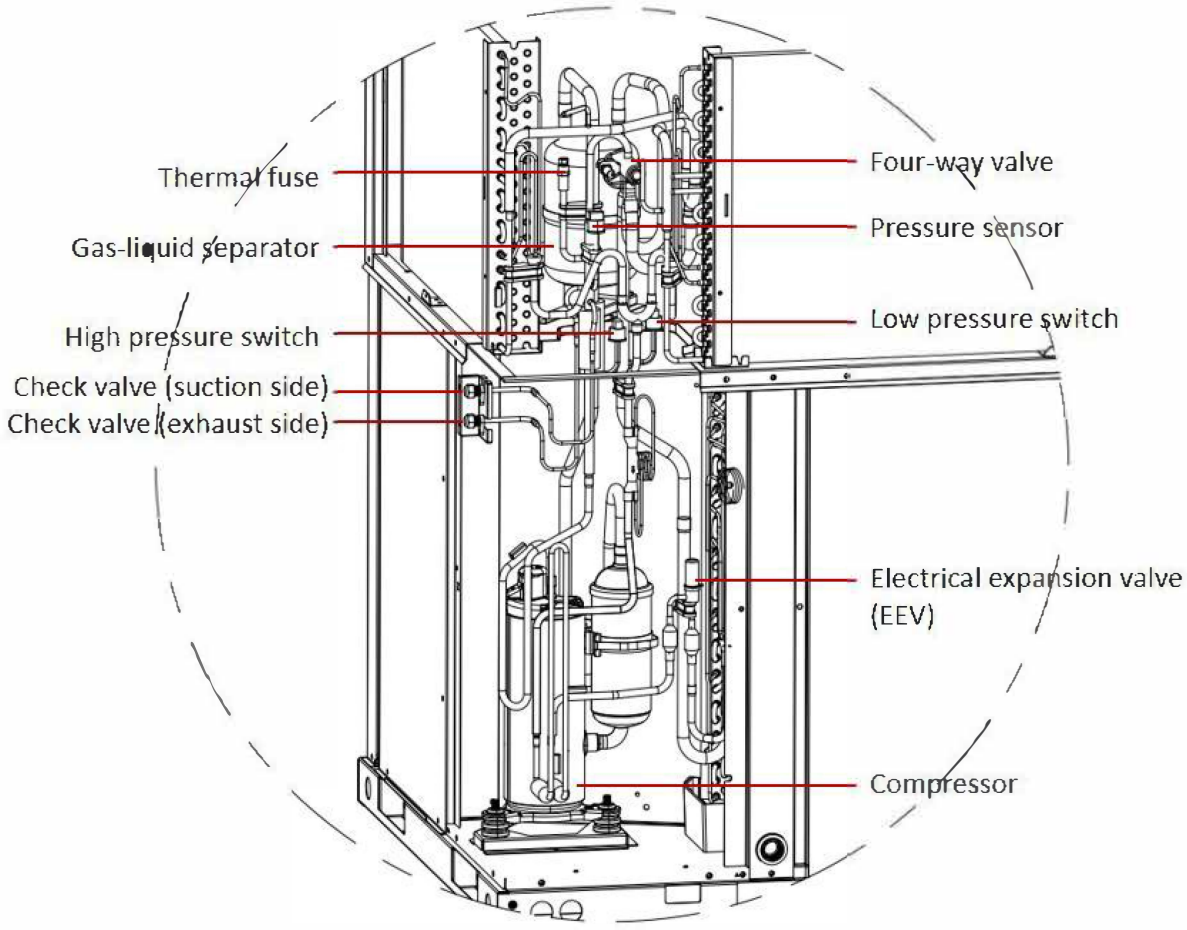
1.1 Structure of the unit and main components



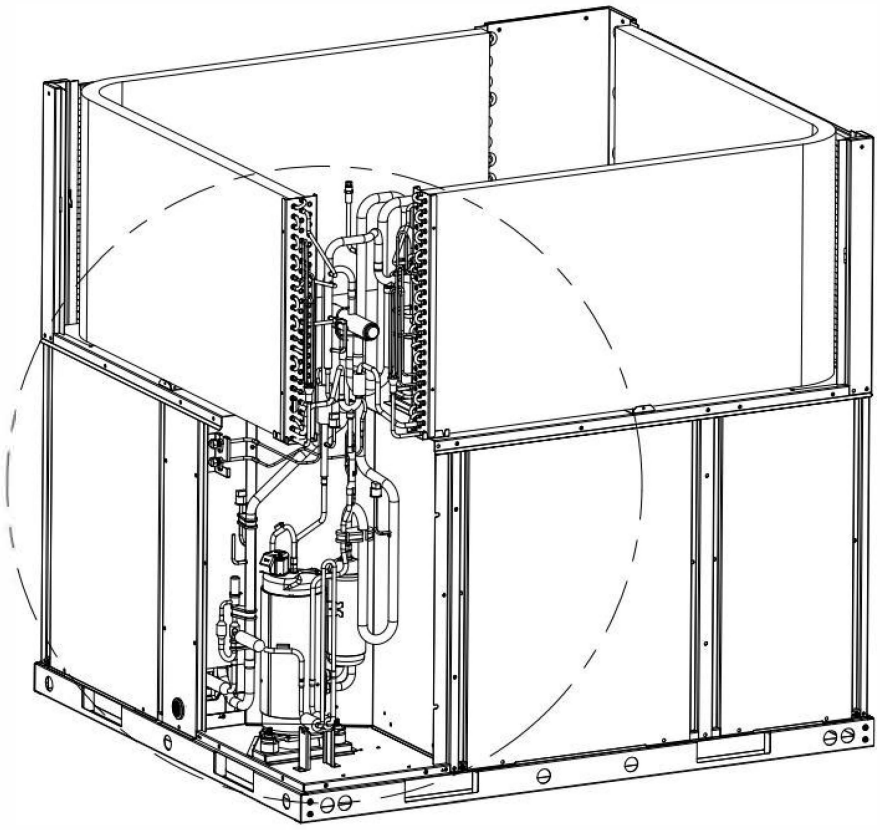
1.2 Refrigerant system and main components

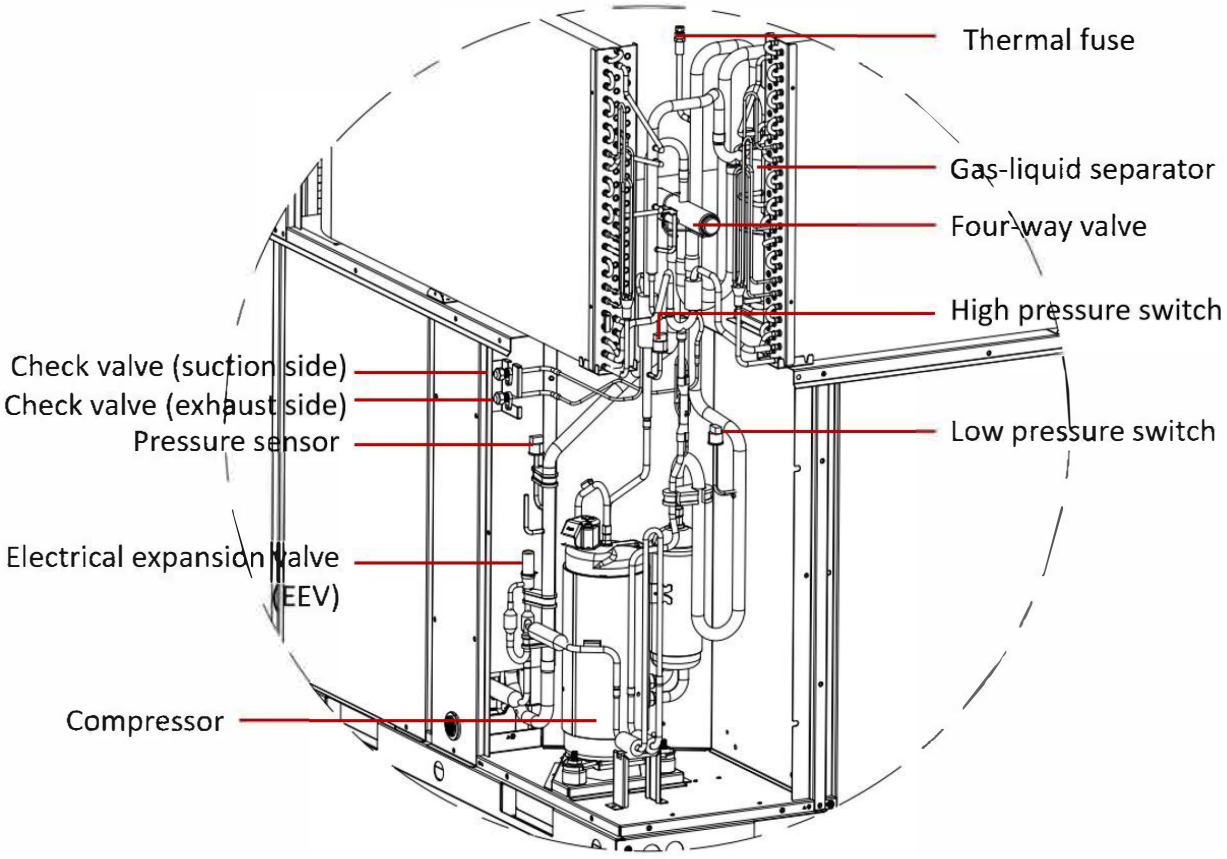
CSC32-24, CSV32-36



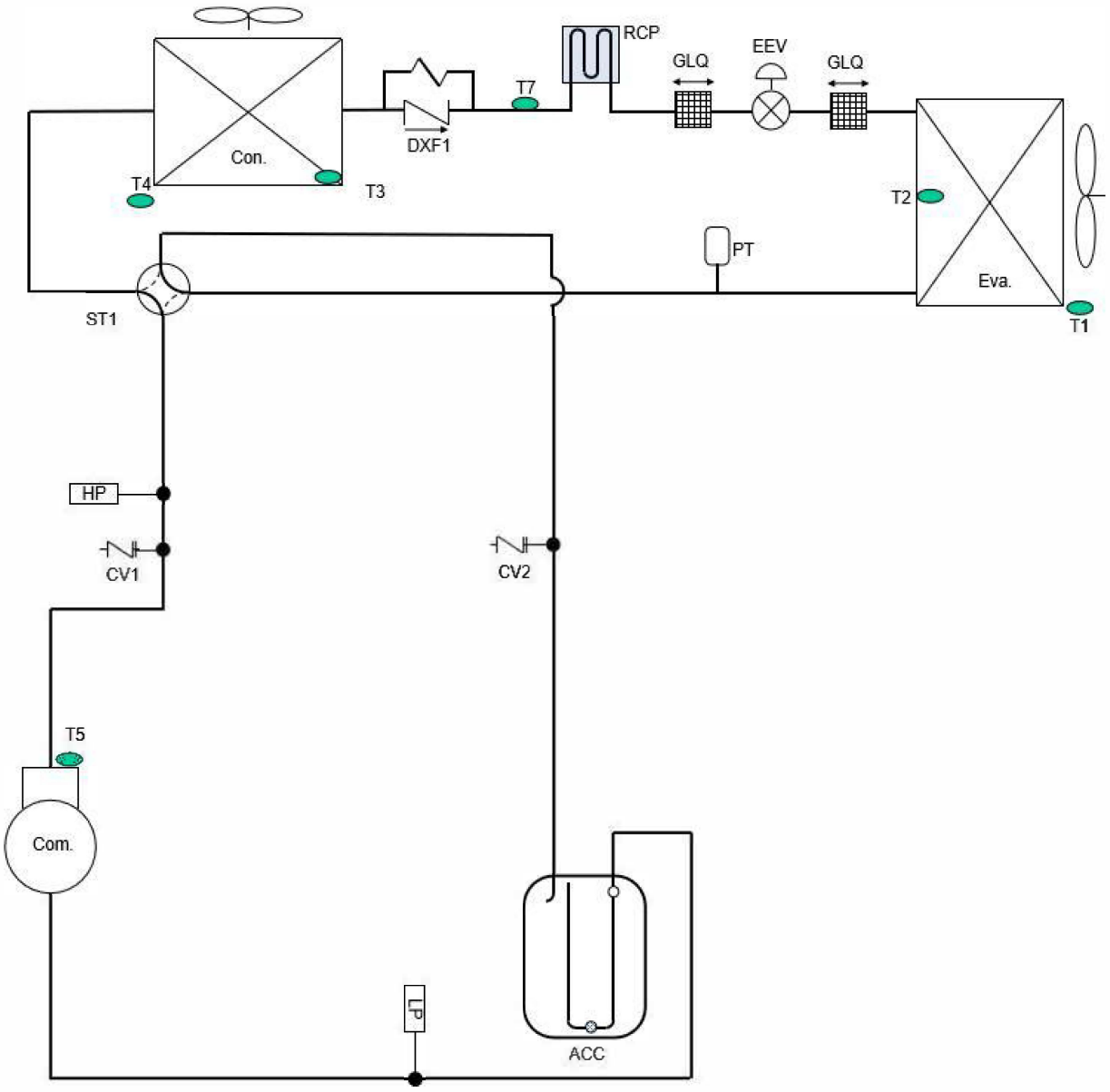


CSV32-48, CSV32-60





2 Piping diagrams



NO.	Component(Outdoor unit)	NO.	Component(Outdoor unit)
Com.	Compressor	T7	Refrigerant cooling pipe inlet temperature sensor
T5	Exhaust temperature sensor	RCP	Refrigerant cooling pipe
CV1	Check valve1	GLQ	Filter
HP	High pressure switch	EEV	Electrical expansion valve
PT	Pressure transducer	Eva.	Evaporator
ST1	Four-way valve	T1	Room temperature sensor
Con.	Condenser	T2	Indoor pipe temperature sensor
T3	Condenser coil temperature sensor	CV2	Check valve2
T4	Ambient temperature sensor	ACC	Gas-liquid separator
DXF1	One-way valve	LP	Low pressure switch

Part 3

Wiring Diagram

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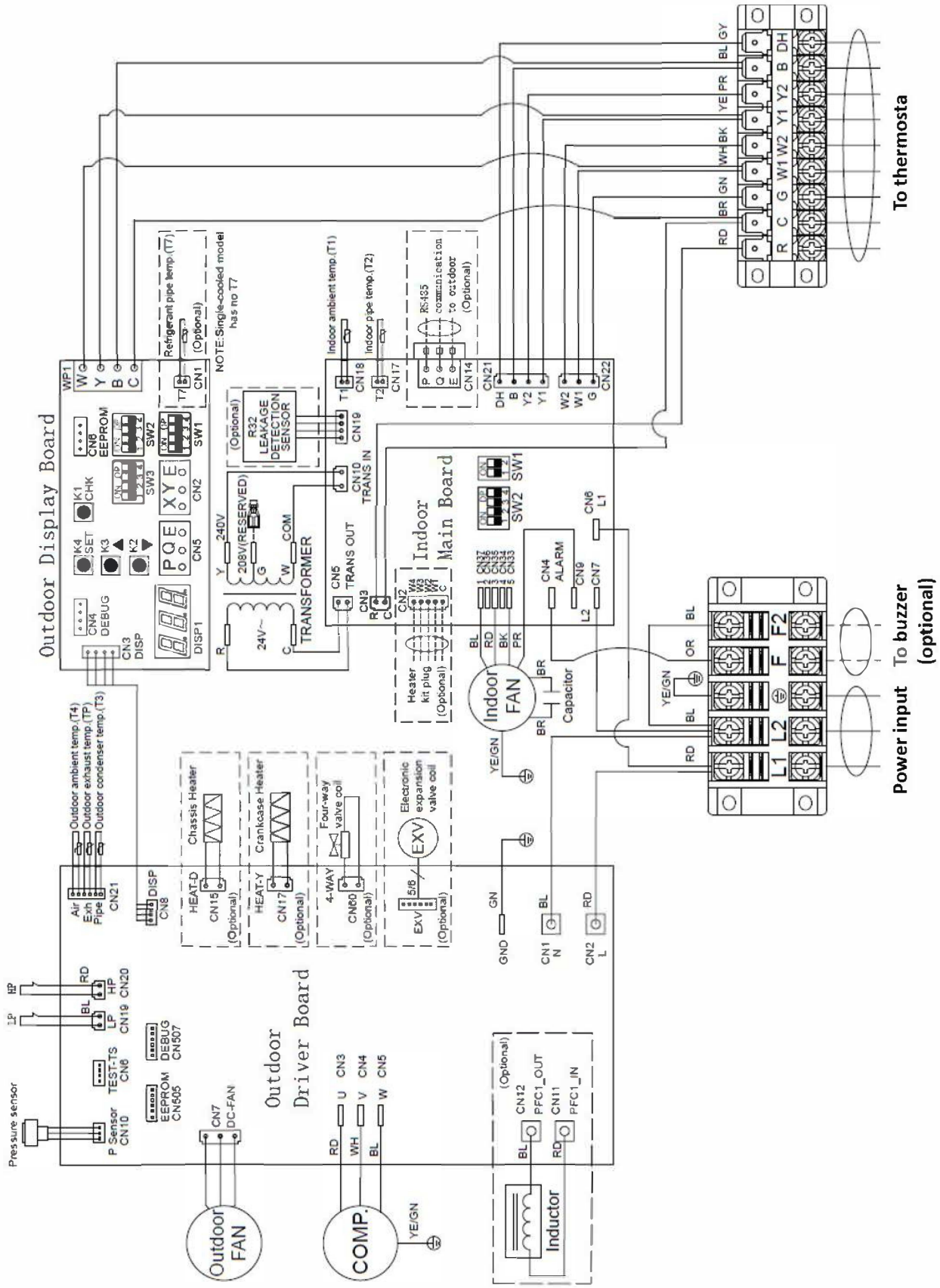
1 Electric wiring diagram

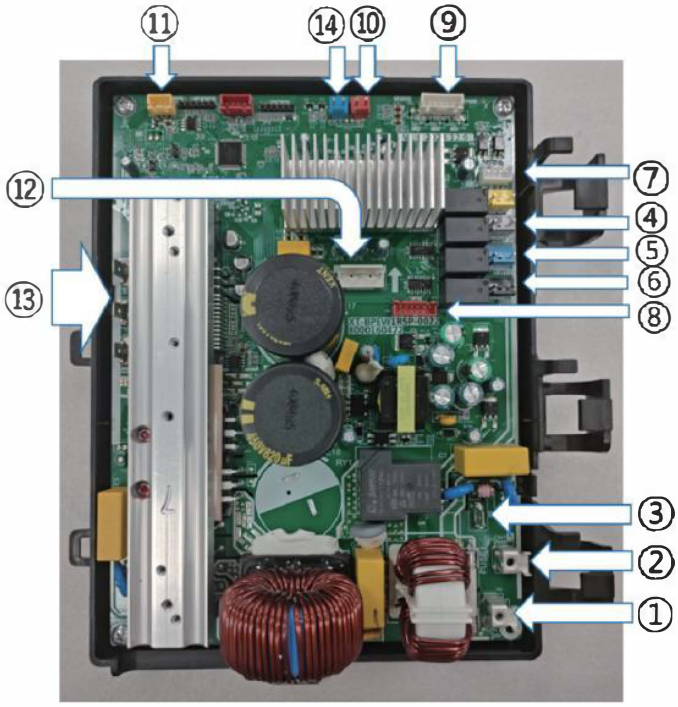


Definition of SW1~SW3

Wire Color Code			DIP switch status Indicate		Outdoor Display Board SW1 DIP switch selection			Outdoor Display Board SW2 DIP switch selection		
RD RED	OR ORANGE		ON OFF 1	This Indicate OFF (The DIP switch is dialed to the digital side)	SW1.1	OFF	24V Control	SW2.1	OFF	Auto Defrosting
BL BLUE	GN GREEN					ON	RS485 Comm. Mode		ON	Periodically Defrosting
BR BROWN	GY GRAY				SW1.2	OFF	°F for Fahrenheit	SW2.2	OFF	Defrost interval 60 minutes
BK BLACK	YE YELLOW		ON OFF 1	This Indicate ON (The DIP switch is dialed to the non-digital side)		ON	°C for Celsius		ON	Defrost interval 30 minutes
WH WHITE	PR PURPLE				SW1.3	OFF	Heating and cooling	SW2.3	OFF	Normal Defrosting
						ON	Single-cooled		ON	Accelerate Defrosting
					SW1.4	OFF	Normal Cooling	SW2.4	OFF	Normal Thermostat
						ON	Accelerate Cooling		ON	O/B Thermostat

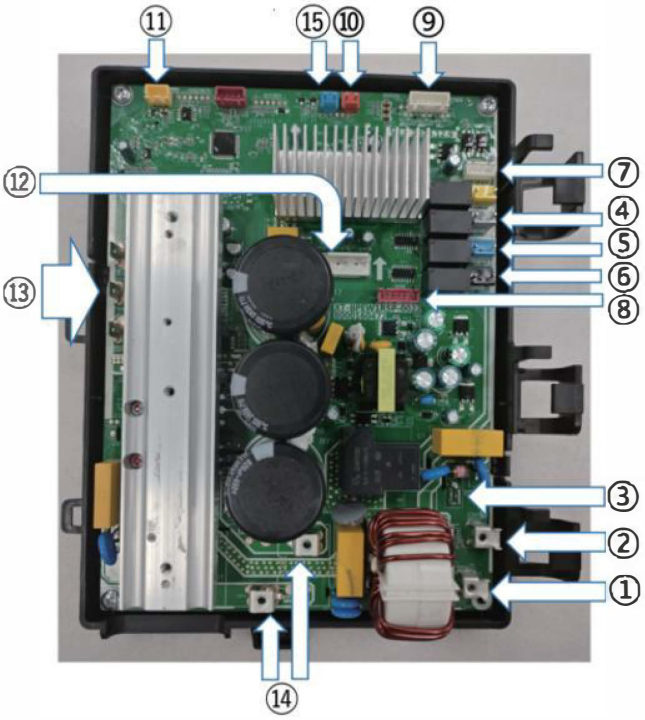
Outdoor Display Board SW3 DIP switch selection						Indoor Main Board SW1 DIP switch selection (Indoor FAN speed)				Indoor Main Board SW2 DIP switch selection		
SW3.1	OFF	Normal energy efficiency				SW1.1	SW1.2	High speed (Y1+Y2 OR W)	Low speed (Y1 OR G)	SW2.1	OFF	24V Control
	ON	High energy efficiency (SE18)									ON	RS485 Comm. Mode
SW3.2	OFF	SW3.3	OFF	Model	24K					SW2.2	OFF	Anti-Cold Air Delay
	OFF		ON		36K						ON	Disable Anti-Cold Air Delay
	ON		OFF		48K	OFF	OFF	2	1	SW2.3	OFF	T1 from main board
	ON		ON		60K	OFF	ON	3	1		ON	T1 from thermostat
SW3.4	OFF	Normal Heating				ON	OFF	4	1	SW2.4	OFF	Indoor AC FAN
	ON	Accelerate Heating				ON	ON	5	1		ON	Indoor ECM FAN

2 PCB



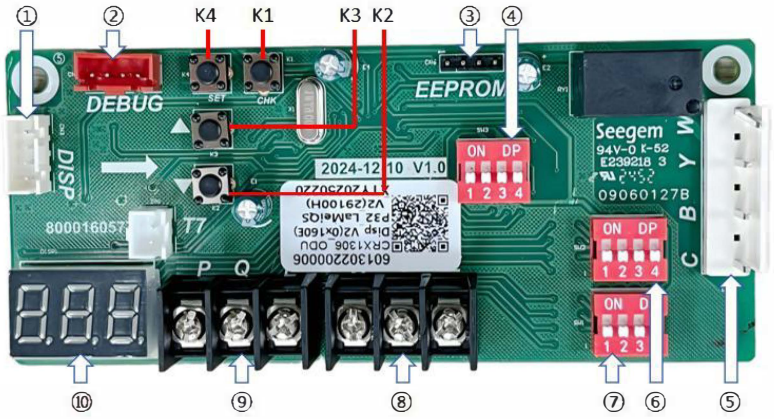
No.	Functional description
1	Power supply input L(L1)
2	Power supply input N(L2)
3	Ground wire
4	Crankshaft heating port
5	Four-way valve port
6	Solenoid Valve port
7	Display board ports
8	Electronic expansion valve port
9	T3 T4 TP sensor port
10	High pressure protection switch port
11	Pressure sensor port
12	DC motor port
13	Compressor port U V W
14	Low pressure protection switch port

24/36K Outdoor Main Control Board



No.	Functional description
1	Power supply input L(L1)
2	Power supply input N(L2)
3	Ground wire
4	Crankshaft heating port
5	Four-way valve port
6	Solenoid Valve port
7	Display board ports
8	Electronic expansion valve port
9	T3 T4 TP sensor port
10	High pressure protection switch port
11	Pressure sensor port
12	DC motor port
13	Compressor port U V W
14	Reactor port
15	Low pressure protection switch port

48/60K Outdoor Main Control Board



No.	Function description
1	Communicaition port to main board
2	Port for program update
3	Port for EEPROM update
4	Dip Switch SW1
5	24V communication port
6	Dip Switch SW2
7	Dip Switch SW3
8	Port for wired controller
9	RS-485 communication port
10	LED dispaly
K1~K4	Button for checking or setting

Display Board (Communicaition board)

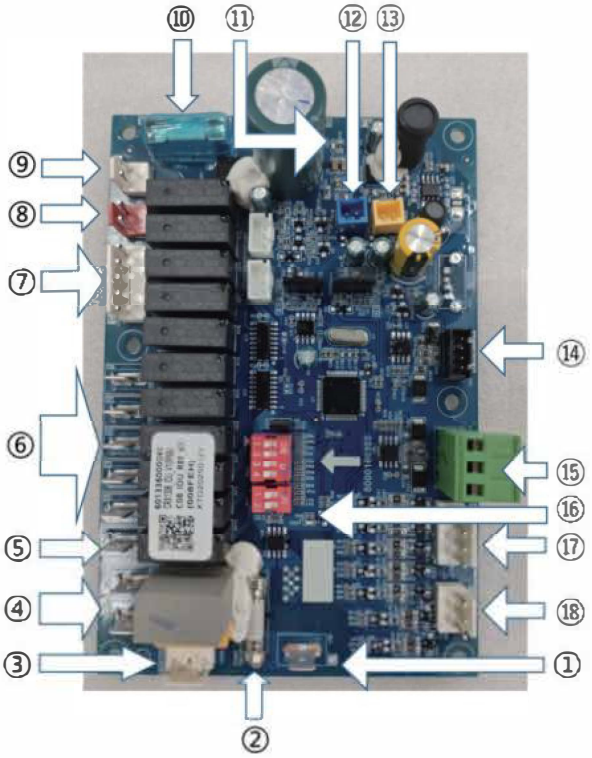
Definition and uses of the button

K1: Press “K1” once to enter the outdoor unit parameter inspection.

K2: Press “K2” to view the parameters in sequence.

K3: Press “K3” to view the parameters in reverse order.

K4: "SET” button used to enter forced cooling mode to recover the refrigerant.



NO.	Functional description
1	Power supply input L (L1)
2	FUSE2 (high voltage)
3	TRANS IN port
4	Power supplyinput N (L2)
5	ALARM port
6	AC FAN gear port
7	Electric heater control port
8	24V communication port (R/C)
9	TRANS OUT port
10	FUSE1 (low voltage)
11	Red LED for power indicator
12	T1 sensor port
13	T2 sensor port
14	Refrigerant leakage detection sensor port
15	RS-485 communication port
16	Red LED for status indicator
17	24V communication port (Y1/2/B/DH)
18	24V communication port (G/W1/W2)

AC Indoor Main Control Board

3 Auxiliary electrical heater

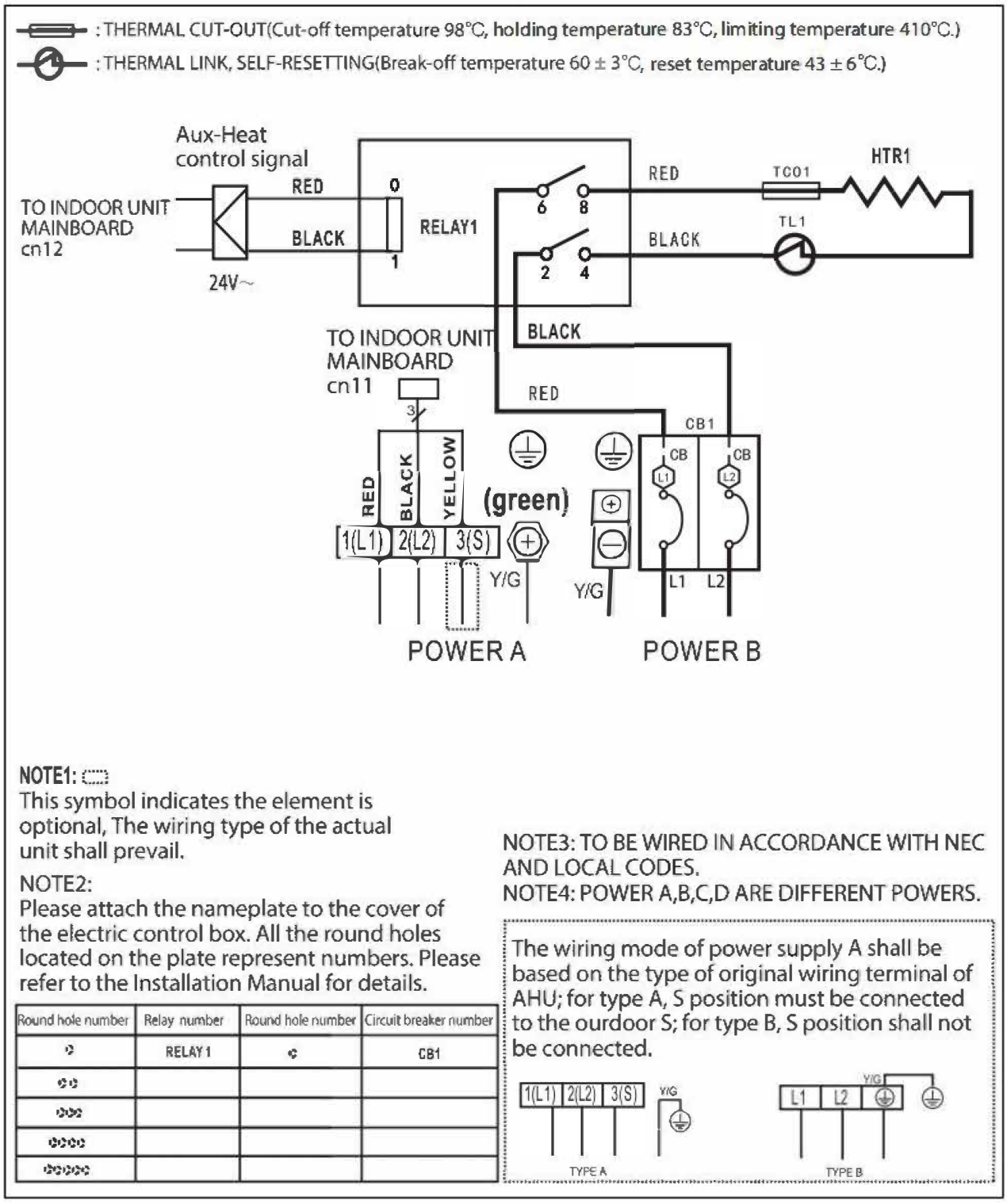
3.1 electrical data

Model	kW 208/240	Heater Kit FLA (A)	Minimum CKT AMPS (A)	Rating of overcurrent protective device or HACR breaker (A)
EHK-05	3.8/5	18.2/20.8	23/26	2
EHK-08	5.6/7.5	27.9/31.9	35/40	2
EHK-10	7.5/10	36.3/41.7	46/53	2
EHK-15	11.3/15	55.1/62.6	69/79	3
EHK-20	15/20	72.8/83.3	91/105	3

3.2 Wiring diagram

Specification	Number of circuit breakers	Number of relays	Number of power cord groups	Number of power cord grounding screws
5kW	1	1	2	2
8kW	1	2	2	2
10kW	1	2	2	2
15kW	2	4	3	3
20kW	2	4	3	3

5kW Heat Kit

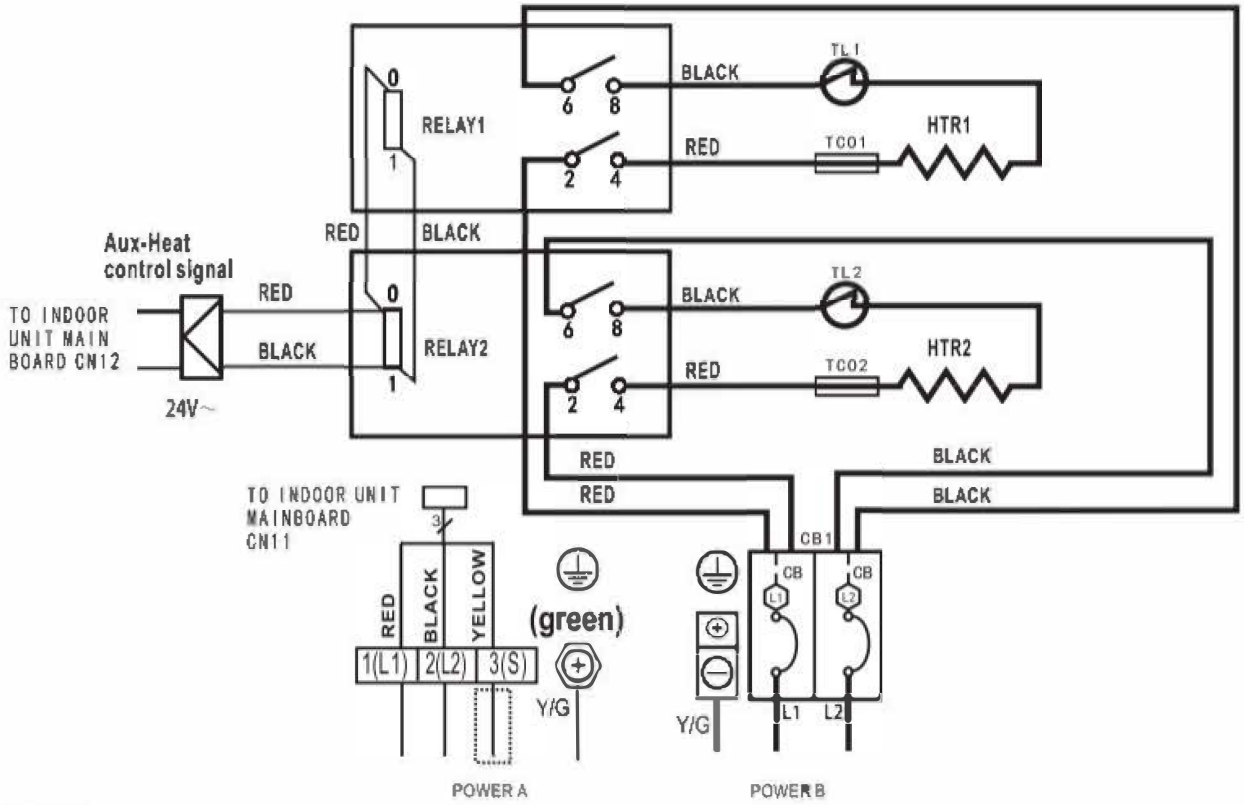


Round hole number	Relay number	Round hole number	Circuit breaker number
○	RELAY1	○	CB1
○○			
○○○			
○○○○			
○○○○○			

8/10kW Heat Kit

: THERMAL CUT-OUT(Cut-off temperature 98°C, holding temperature 83°C, limiting temperature 410°C.)

: THERMAL LINK, SELF-RESETTING(Break-off temperature 60 ± 3°C, reset temperature 43 ± 6°C.)



NOTE1: ▭

This symbol indicates the element is optional, The wiring type of the actual unit shall prevail.

NOTE2:

Please attach the nameplate to the cover of the electric control box. All the round holes located on the plate represent numbers. Please refer to the Installation Manual for details.

Round hole number	Relay number	Round hole number	Circuit breaker number
○	RELAY1	○	CB1
○○	RELAY2		
○○○			
○○○○			
○○○○○			

NOTE3: TO BE WIRED IN ACCORDANCE WITH NEC AND LOCAL CODES.

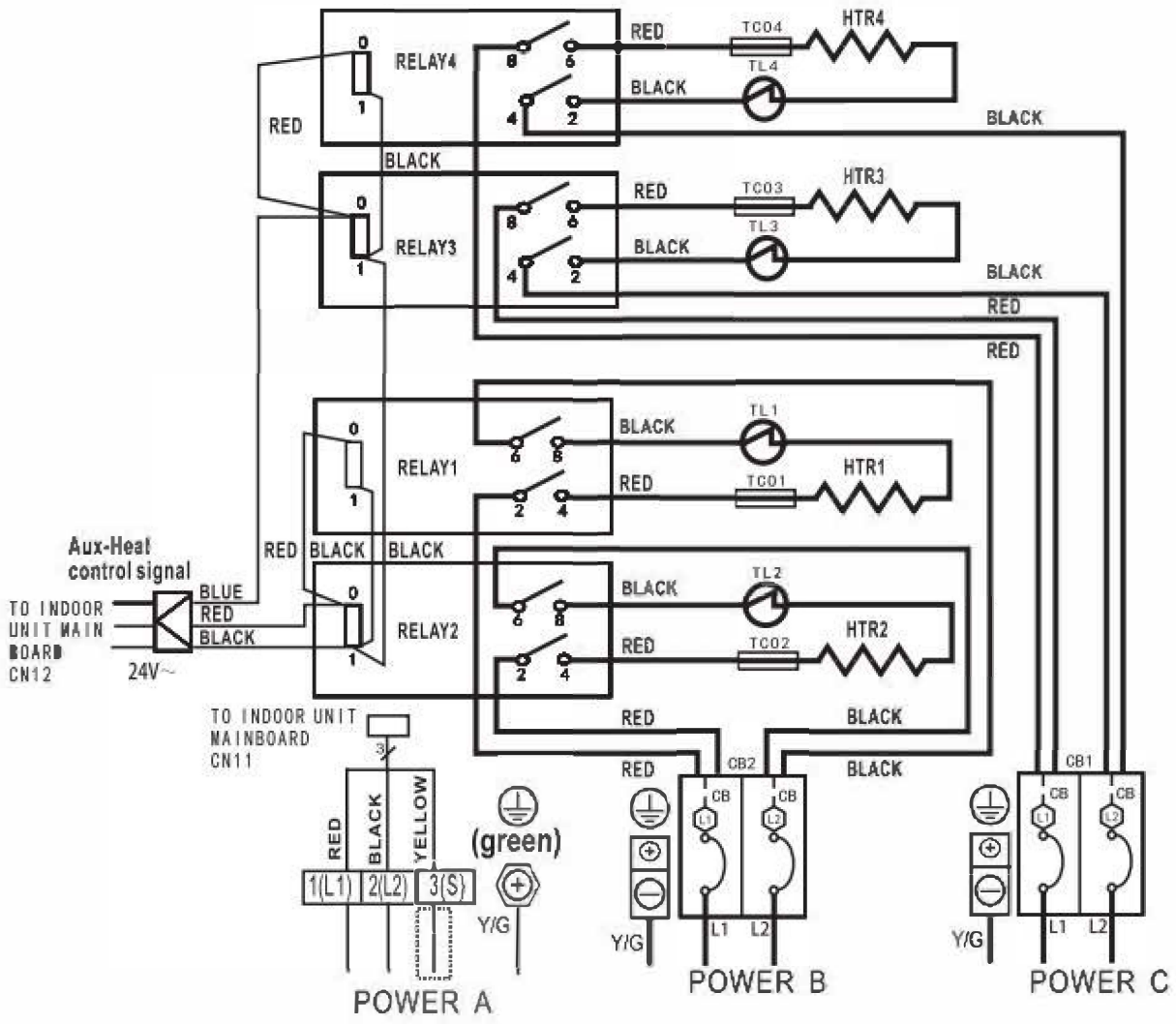
NOTE4: POWER A,B,C,D ARE DIFFERENT POWERS.

The wiring mode of power supply A shall be based on the type of original wiring terminal of AHU; for type A, S position must be connected to the ourdoor S; for type B, S position shall not be connected.

15/20kW Heat Kit

: THERMAL CUT-OUT(Cut-off temperature 98°C, holding temperature 83°C, limiting temperature 410°C.)

: THERMAL LINK, SELF-RESETTING(Break-off temperature 60 ± 3°C, reset temperature 43 ± 6°C.)



NOTE1:
This symbol indicates the element is optional, The wiring type of the actual unit shall prevail.

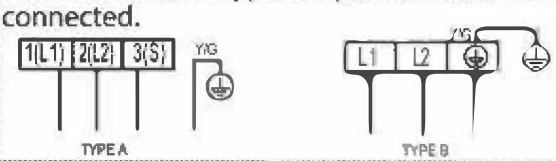
NOTE2:
Please attach the nameplate to the cover of the electric control box. All the round holes located on the plate represent numbers. Please refer to the Installation Manual for details.

Round hole number	Relay number	Round hole number	Circuit breaker number
○	RELAY1	○	CB1
○○	RELAY2	○○	CB2
○○○	RELAY3		
○○○○	RELAY4		
○○○○○			

NOTE3: TO BE WIRED IN ACCORDANCE WITH NEC AND LOCAL CODES.

NOTE4: POWER A,B,C,D ARE DIFFERENT POWERS.

The wiring mode of power supply A shall be based on the type of original wiring terminal of AHU; for type A, S position must be connected to the ourdoor S; for type B, S position shall not be connected.

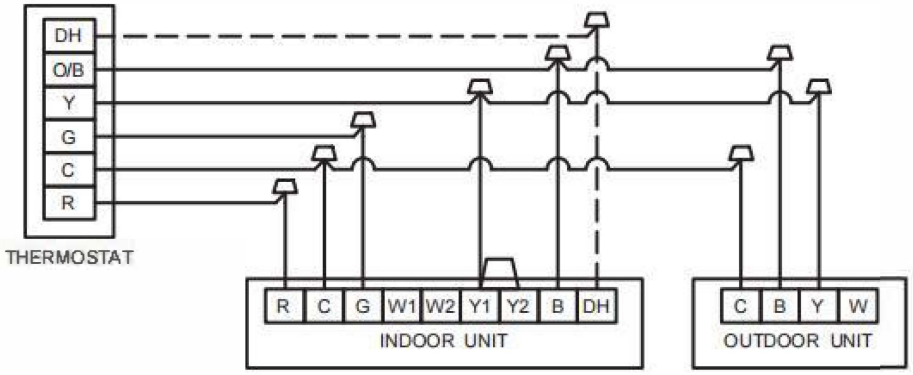


4 Low voltage wiring diagram

The following wiring diagram are suitable for the unit with 24V thermostat.

Wiring for 1H and 1C thermostat (heat pump system model)

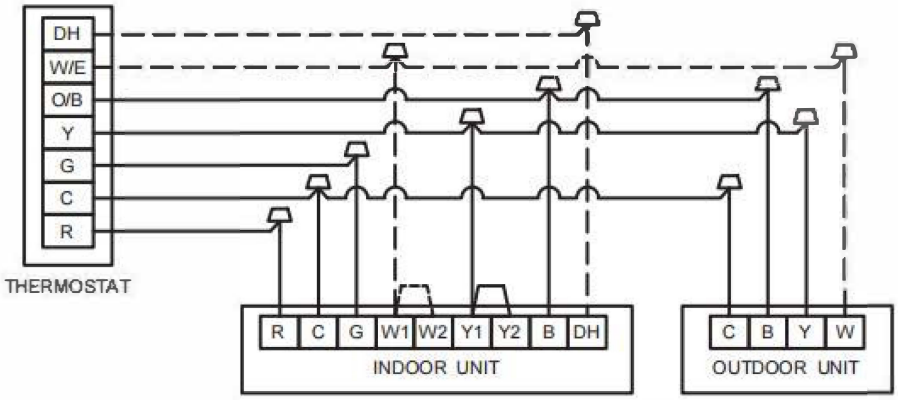
Note:Because Y1 and Y2 are jumped, the indoor fan will only run in high stage.



Wiring for 2H and 1C thermostat (heat pump system model)

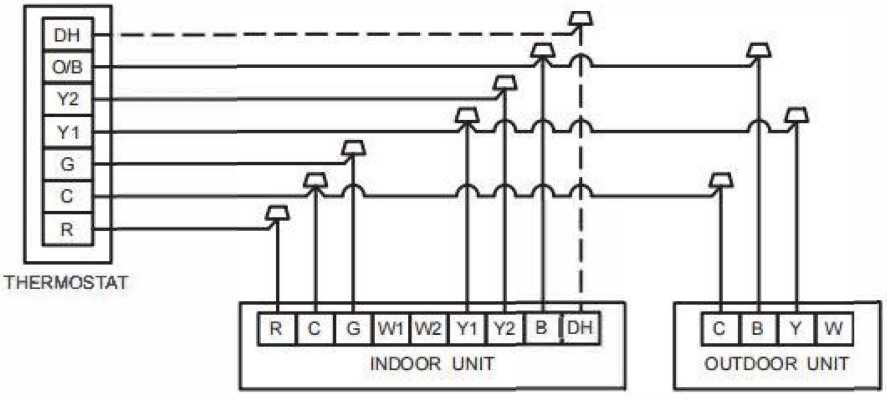
Note:Because Y1 and Y2 are jumped, the indoor fan will only run in high stage.

Note: Any time the electric heat elements are active. the indoor fan will run in high stage.



Wiring for 2H and 2C thermostat (heat pump system model)

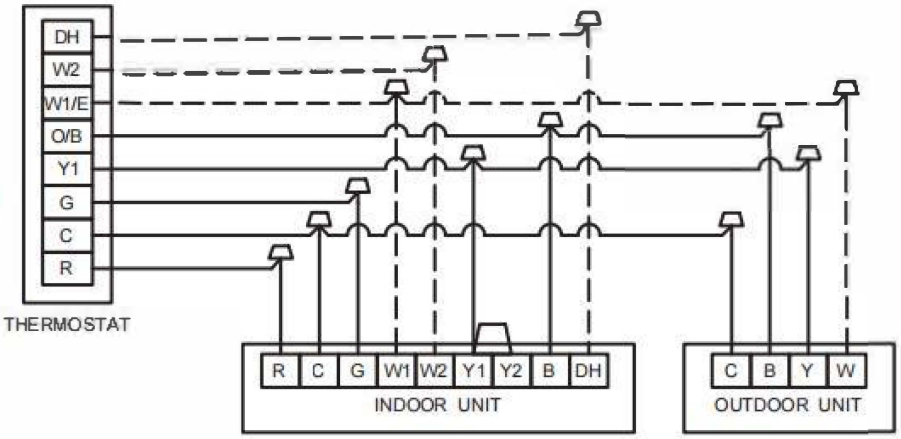
Note:Y1 and Y2 here represents 2 stages of fan cooling only, the compressor modulates separately from the fan.



Wiring for 3H and 1C thermostat (heat pump system model)

Note:Because Y1 and Y2 are jumped, the indoor fan will only run in high stage.

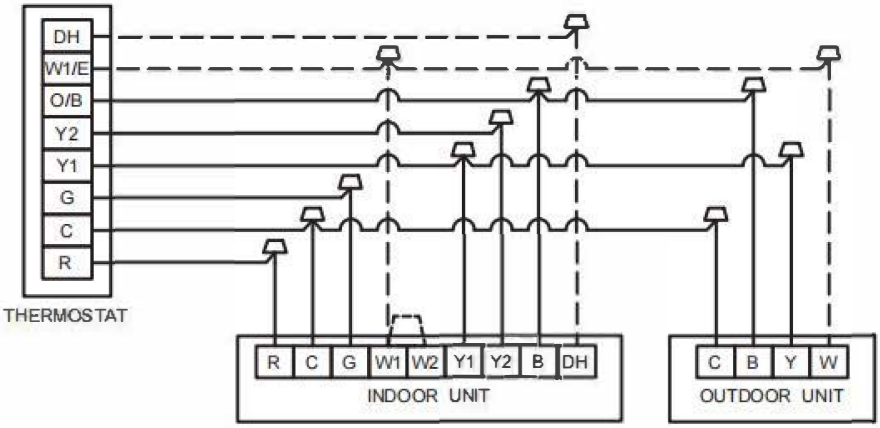
Note: Any time the electric heat elements are active. the indoor fan will run in high stage.



Wiring for 3H and 2C thermostat (heat pump system model)

Note:Y1 and Y2 here represents 2 stages of fan cooling only, the compressor modulates separately from the fan.

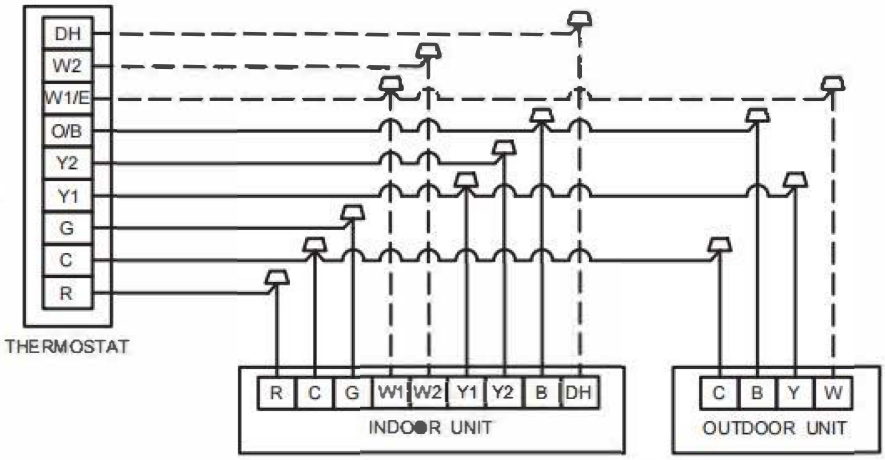
Note: Any time the electric heat elements are active. the indoor fan will run in high stage.



Wiring for 4H and 2C thermostat (heat pump system model)

Note:Y1 and Y2 here represents 2 stages of fan cooling only, the compressor modulates separately from the fan.

Note: Any time the electric heat elements are active. the indoor fan will run in high stage.



Control Logic:

Indoor unit connector

Connector	Purpose
R	24V Power Connection
C	Common
G	Fan Control
Y1	Low Cooling
Y2	High Cooling
B	Heating Reversing Valve
W1	Stage 1 Electric Heating
W2	Stage 2 Electric Heating
DH	Dehumidification

Outdoor unit connector

Connector	Purpose
C	Common
Y	Cooling
B	Heating Reversing Valve
W	Defrost control

Note:

1) DH wiring is optional and requires a thermostat with a humidistat. DH functions as Passive Dehumidification and will downstage the indoor fan to first stage. System will operate according to normal sequence of operations if DH wiring is absent.

2) Dashed lines in the above thermostat wiring diagrams refer to optional wiring (wiring for Passive Dehumidification Function and/OR Electric Heat). For thermostat wiring please refer to the Owner's Manual of the thermostat.

3) B wire must be used with heat pump system only, the reversing valve energizes in heating.

Part 4

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1 Error code table

Error code	Error definition
E1	Communication error (Indoor side)
E2	T1- Room temperature sensor fault
E3	T2 -Indoor coil temperature sensor fault
E4	Refrigerant concentration sensor fault
E6	Refrigerant leakage protection
E8	Indoor fan motor current fault
E9	Wired controller communication fault
EE	EEPROM failure (indoor unit)
F0	Communication error(Outdoor side)
F4	T4 - Ambient temperature sensor fault
F5	T5 - Discharge temperature sensor fault
F6	T3 - Coil temperature sensor fault
F7	T7 - refrigerant cooling pipe inlet temperature sensor fault
F8	T7 temp sensor error in detecting condensate risks
F9	AC voltage is too high or too low protection
FA	EEPROM fault (on main PCB)
FB	EEPROM fault (on inverter module)
FC	IPM temperature sensor fault
FD	Pressure sensor fault
FE	T3/T5 temperature sensor loose protection
FF	High pressure switch fault for 20 minutes
H0	Inverter module and main PCB communication error
H1	P5 protection appears 3 times in 180 minutes can't be recovered until re-power on
H2	FF protection appears 3 times in 150 minutes can't be recovered until re-power on
H3	PD protection appears 3 times in 180 minutes can't be recovered until re-power on

H4	P8 protection appears 3 times in 120 minutes can't be recovered until re-power on
H5	P2 protection appears 3 times in 240 minutes can't be recovered until re-power on
H6	P4 protection appears 3 times in 100 minutes can't be recovered until re-power on
H7	PC protection appears 3 times in 200 minutes can't be recovered until re-power on
H8	FE protection appears 3 times in 120 minutes can't be recovered until re-power on
HC	F7 protection appears 3 times in 180 minutes can't be recovered until re-power on
HE	F8 protection appears 3 times in 60 minutes can't be recovered until re-power on
L0	DC bus low voltage protection
L1	DC bus high voltage protection
P1	High pressure switch fault for 4 seconds
P2	Low pressure protection
P3	Over current protection
P4	Discharge temperature protection
P5	T3 high temperature protection in cooling mode
P6	Compressor inverter module protection
P7	Indoor unit anti-freezing protection
P8	IPM high temperature protection
P9	Outdoor fan motor fault
PC	Overwet operation protection
PD	High pressure protection in heating mode
ATL	Ambient temperature out of bounds protection

Other codes

Code	Code Definition
D0	Oil return
Df	Defrost
DC	Force cooling
LA	Frequency limitation by voltage
LB	Frequency limitation or decline by high pressure
LC	Frequency limitation by condenser temp
LD	Frequency limitation by discharge temp
LE	Frequency limitation by IPM modular high temp
LF	Frequency limitation by current
PRH	Crankcase heater preheating, can not start

2 Troubleshooting

2.1 Safety Precautions

The following precautions here are quite important, so be sure to follow them carefully. Read these instructions carefully before installation. Keep this manual in a handy for future preference.

Failure to adhere to all precautionary measures listed in this section may result in personal injury, damage to the unit or to property, or in extreme cases, death.

WARNING

- Indicates a potentially hazardous situation which if not avoided, could result in death or serious injury.

CAUTION

- Indicates a potentially hazardous situation which if not avoided, may result in minor or moderate injury.
- It is also used to alert against unsafe practices.

2.1.1 In case of Accidents or Emergency

WARNING

- If a gas leak is suspected, immediately turn off the gas and ventilate the area if a gas leak is suspected before turning the unit on.
- If strange sounds or smoke is detected from the unit, turn the breaker off and disconnect the power supply cable.
- If the unit comes into contact with liquid, contact an authorized service center.
- If liquid from the batteries makes contact with skin or clothing, immediately rinse or wash the area well with clean water.
- Do not insert hands or other objects into the air inlet or outlet while the unit is plugged in.
- Do not operate the unit with wet hands.

CAUTION

- Clean and ventilate the unit at regular intervals when operating it near a stove or near similar devices.
- Do not use the unit during severe weather conditions. If possible, remove the product from the window before such occurrences.

2.1.2 Information servicing(For flammable materials)

WARNING

- Use this unit only on a dedicated circuit.
- Damage to the installation area could cause the unit
- to fall, potentially resulting in personal injury, property damage, or product failure.
- Only qualified personnel should disassemble, install, remove, or repair the unit.
- Only a qualified electrician should perform electrical work. For more information, contact your dealer, seller, or an authorized service center.

CAUTION

- While unpacking be careful of sharp edges around the unit as well as the edges of the fins on the condenser and evaporator.

2.1.3 Operation and Maintenance

WARNING

- Do not use defective or under-rated circuit breakers.
- Ensure the unit is properly grounded and that a dedicated circuit and breaker are installed.
- Do not modify or extend the power cable. Ensure the power cable is secure and not damaged during operation.
- Do not unplug the power supply plug during operation.
- Do not store or use flammable materials near the unit.
- Do not open the inlet grill of the unit during operation.
- Do not touch the electrostatic filter if the unit is equipped with one.
- Do not block the inlet or outlet of air flow to the unit.
- Do not use harsh detergents, solvents, or similar items to clean the unit. Use a soft cloth for cleaning.
- Do not touch the metal parts of the unit when removing the air filter as they are very sharp.
- Do not step on or place anything on the unit or outdoor units.
- Do not drink water drained from the unit.
- Avoid direct skin contact with water drained from the unit.

- Use a firm stool or step ladder according to manufacturer procedures when cleaning or maintaining the unit.

CAUTION

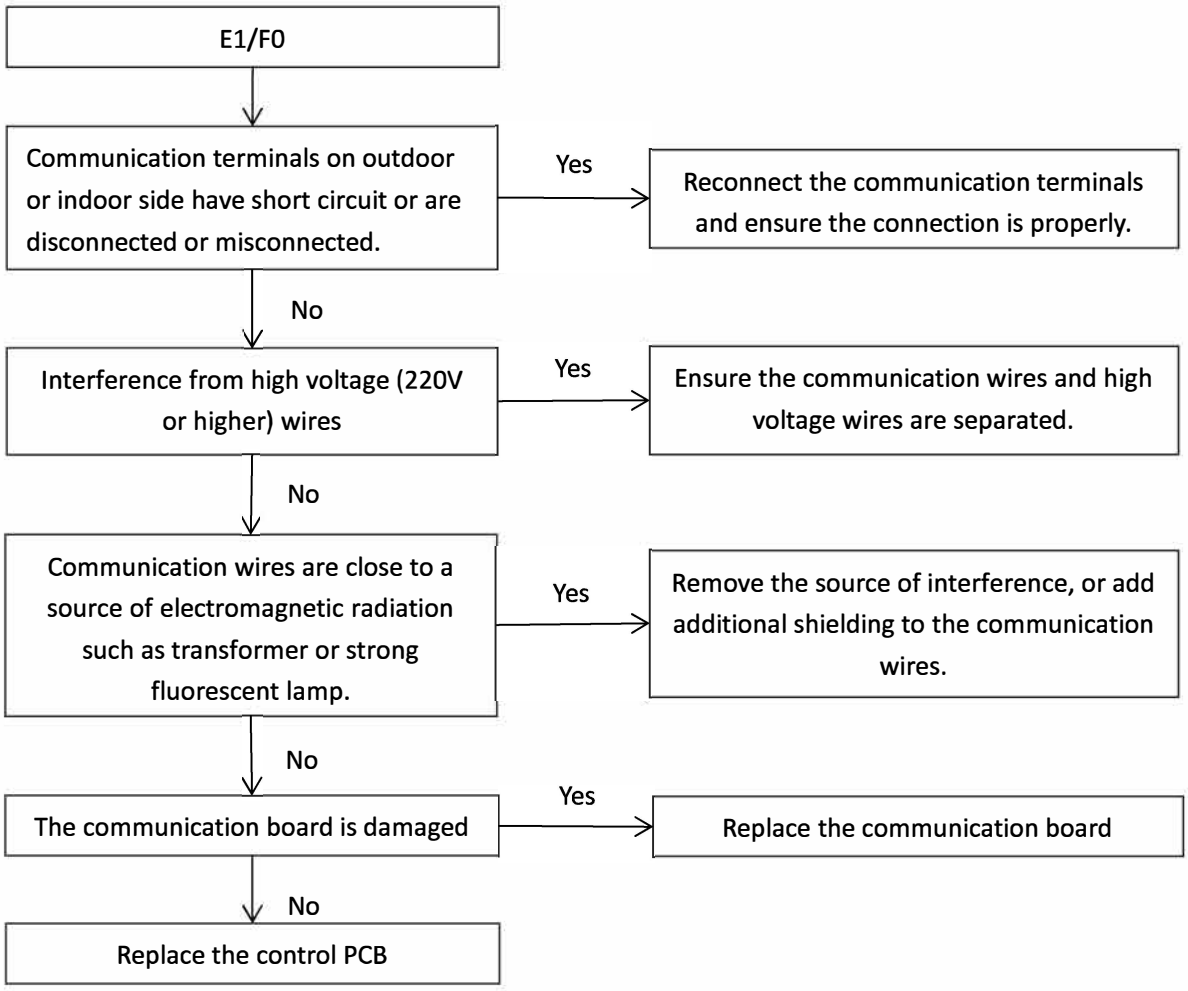
- Do not install or operate the unit for an extended period of time in areas of high humidity or in an environment directly exposing it to sea wind or salt spray.
- Do not install the unit on a defective or damaged installation stand, or in an unsecured location.
- Ensure the unit is installed at a level position
- Do not install the unit where noise or air discharge
- Created by the outdoor unit will negatively impact the environment or nearby residences.
- Do not expose skin directly to the air discharged by the unit for prolonged periods of time.
- Ensure the unit operates in areas water0r other liquids.
- Ensure the drain hose is installed correctly to ensure proper water drainage.
- When lifting or transporting the unit, it is recommended that two or more people are used for this task.
- When the unit is not to be used for an extended time, disconnect the power supply or turn off the breaker.

2.2 ATL Troubleshooting

- ATL indicates ambient temperature out of bounds protection.
- The unit stops running and will not start operating until the ambient temperature returns to the allowable temperature range, error code is displayed on the communication board.
- The allowable ambient temperature range is 5~125℉(-15~52℃).

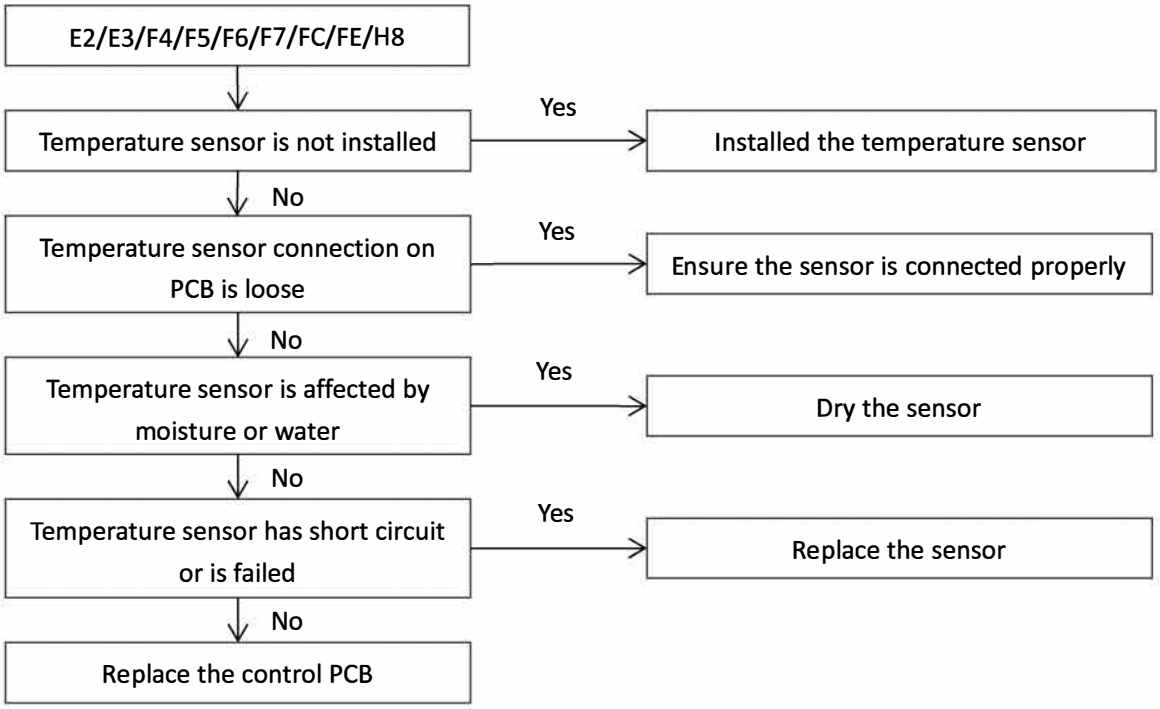
2.3 E1/F0 Troubleshooting

- E1 indicates RS485 communication error(indoor side).
- F0 indicates RS485 communication error(outdoor side).
- The unit stops running and error code is displayed on the communication board



2.4 E2/E3/F4/F5/F6/F7/FC/FE/H8 Troubleshooting

- E2 indicates indoor unit T1-roomtemperature sensor fault
- E3 indicates indoor unit T2-indoor coil temperature sensor fault
- F4 indicates T4-ambient temperature sensor fault
- F5 indicates T5-discharge temperature sensor fault
- F6 indicates T3-outdoor coil temperature sensor fault
- F7 indicates T7-refrigerant cooling pipe inlet temperature sensor fault
- FC indicates IPM temperature sensor fault
- FE indicates T3/TP temperature sensor loose protection
- H8 indicates FE protection appears 3 times in 120 minutes can't be recovered until re-power on.
- The unit stops running and error code is displayed on the communication board



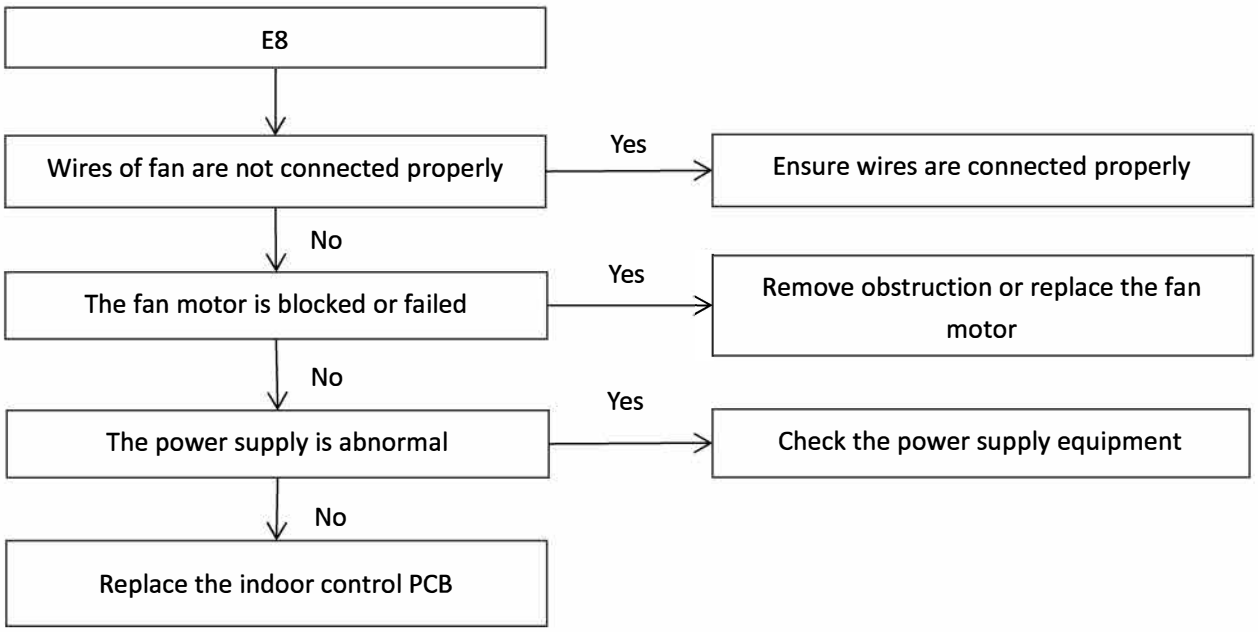
Note:

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.

2) E2/E3 is applicable only when communication is established between the ComfortStar outdoor unit and the ComfortStar indoor unit via RS-485.

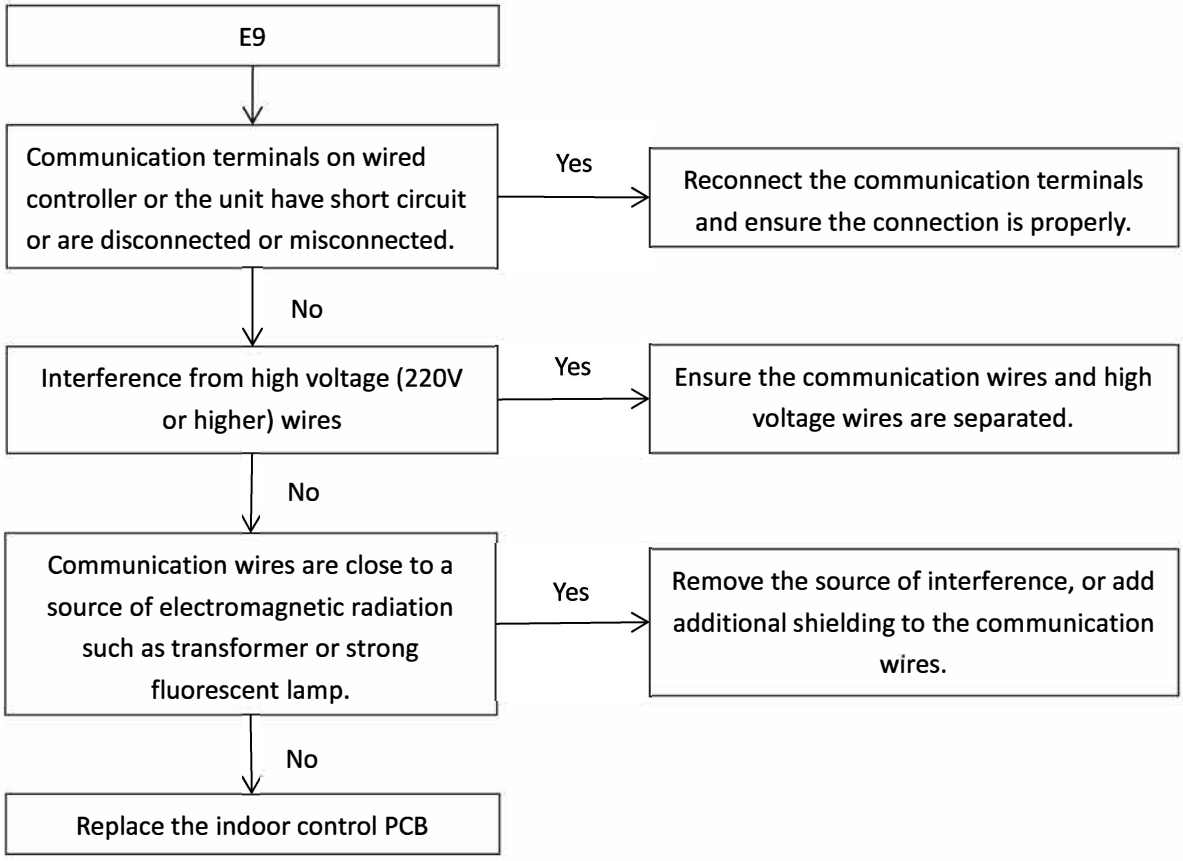
2.5 E8 Troubleshooting

- E8 indicates indoor fan motor current fault.
- The unit stops running and error code is displayed on the communication board



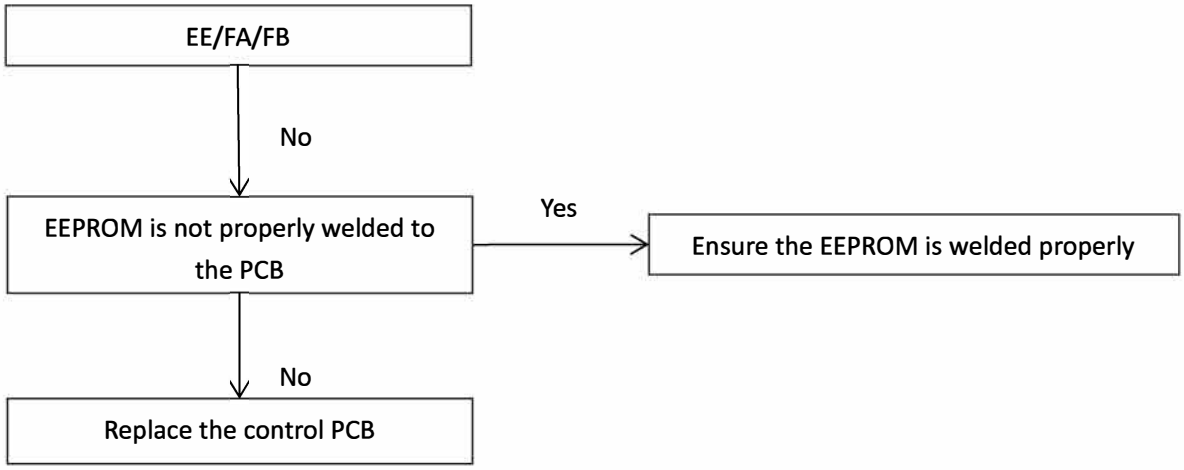
2.6 E9 Troubleshooting

- E9 indicates wired controller communication fault.
- The unit stops running and error code is displayed on the communication board



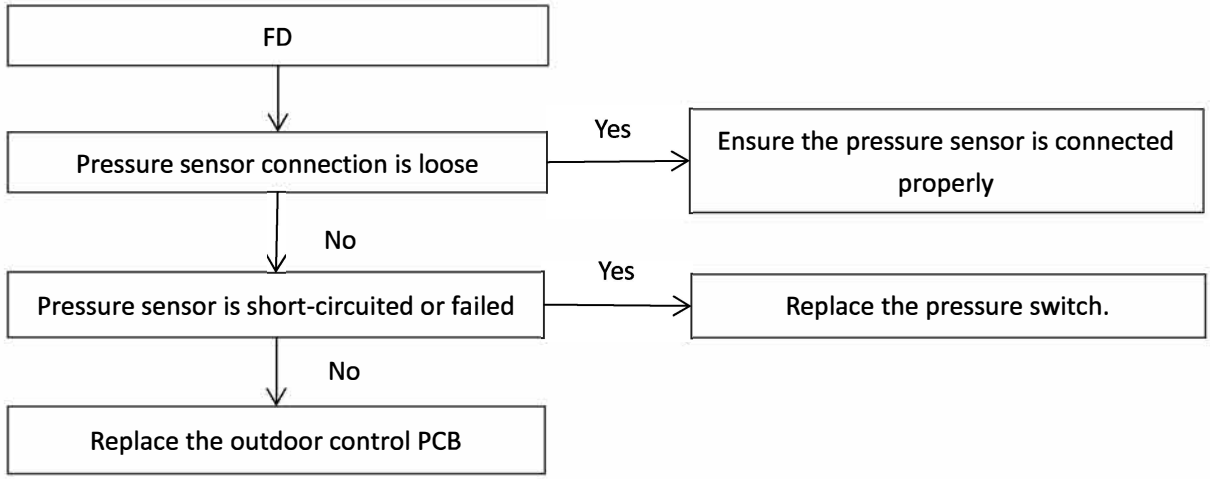
2.7 EE/FA/FB Troubleshooting

- EE indicates EEPROM fault (indoor unit)
- FA indicates EEPROM fault on the main PCB
- FB indicates EEPROM fault on the inverter module
- The unit stops running and error code is displayed on the communication board



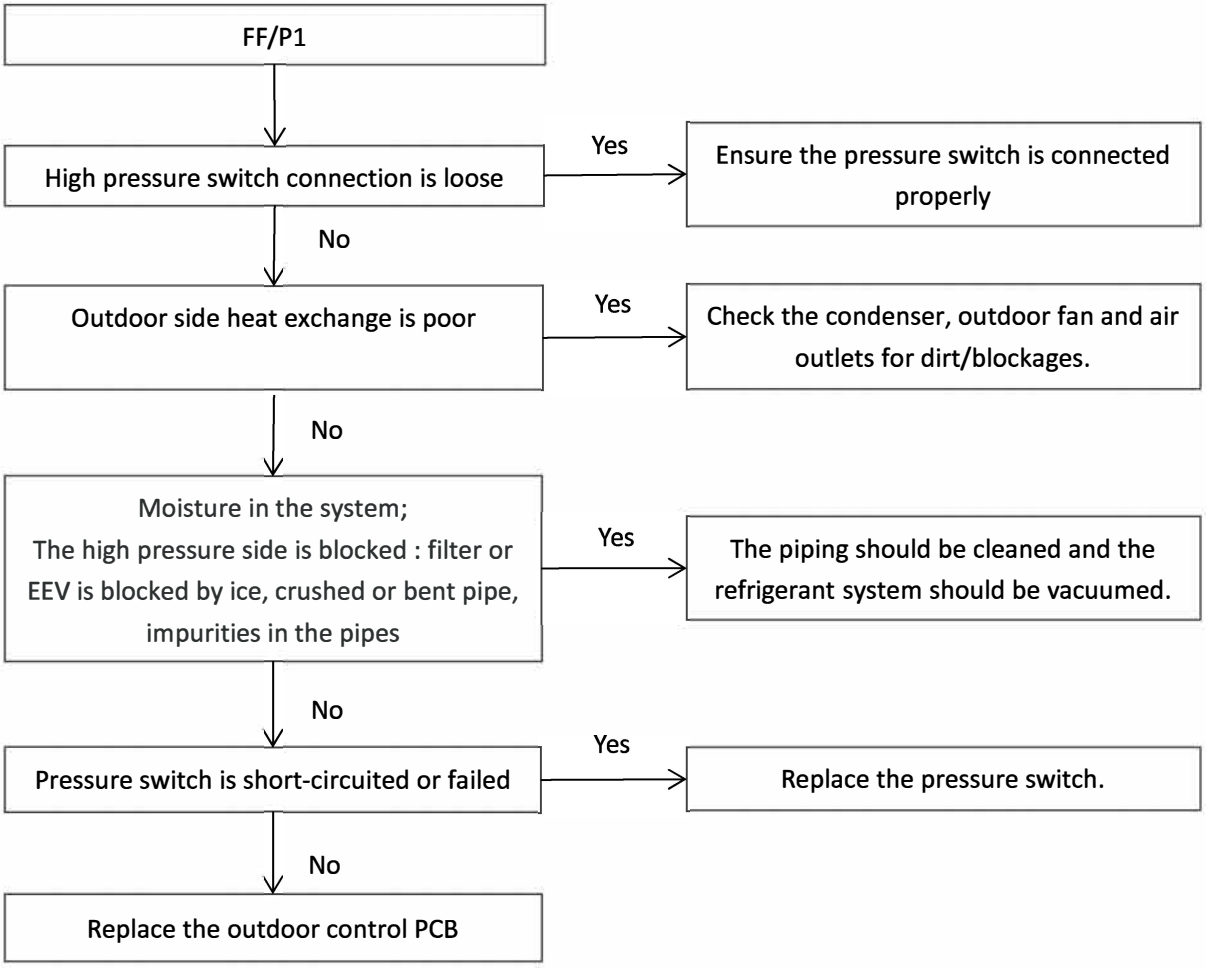
2.8 FD Troubleshooting

- FD indicates pressure sensor fault
- The unit stops running and error code is displayed on the communication board



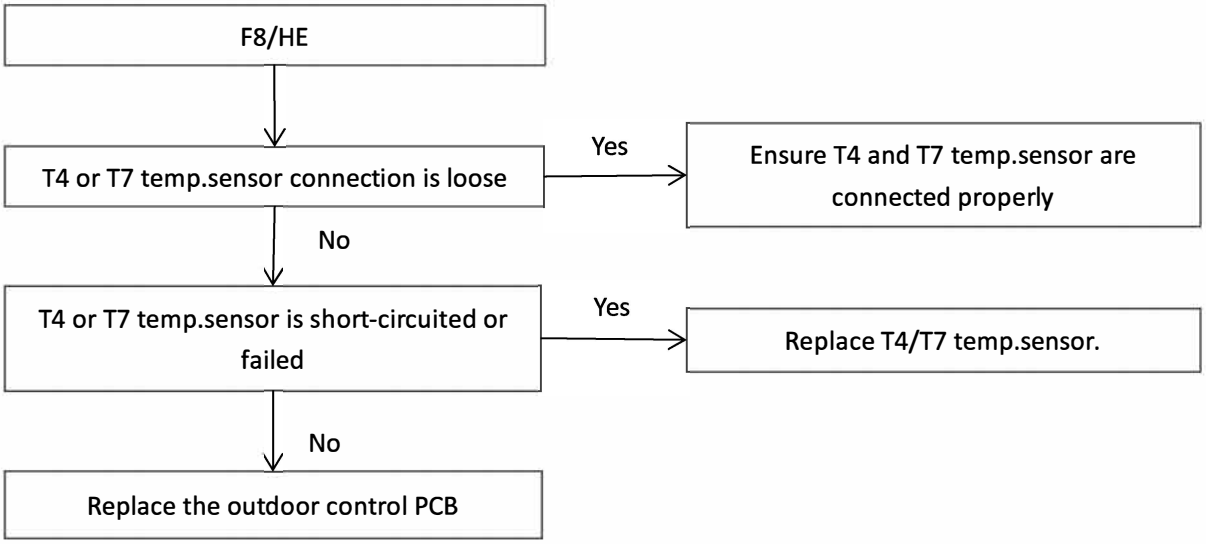
2.9 FF/P1/H2 Troubleshooting

- FF indicates high pressure switch fault for 20 minutes.
- P1 indicates high pressure switch fault for 4 seconds.
- H2 indicates FF protection appears 3 times in 150 minutes can't be recovered until re-power on.
- The unit stops running and error code is displayed on the communication board



2.10 F8/HE Troubleshooting

- FF indicates T7 temp sensor error in detecting condensate risks.
- HE indicates F8F protection appears 3 times in 60 minutes can't be recovered until re-power on.
- The unit stops running and error code is displayed on the communication board

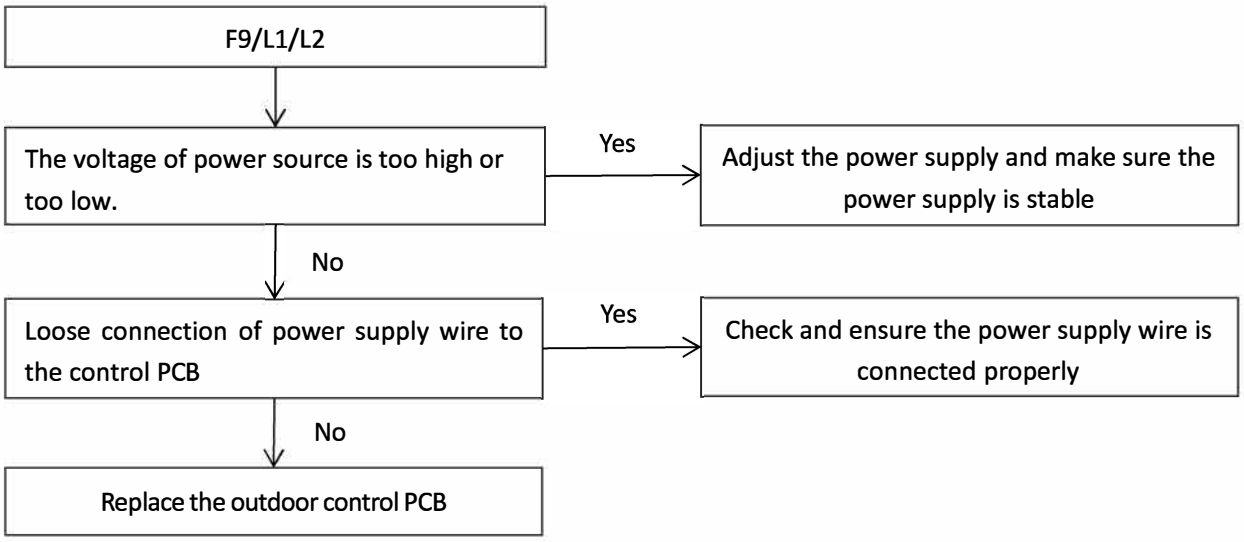


2.11 F9/L0/L1 Troubleshooting

- F9 indicates AC voltage is too high or too low protection
- L0 indicates DC bus low voltage protection
- L1 indicates DC bus high voltage protection

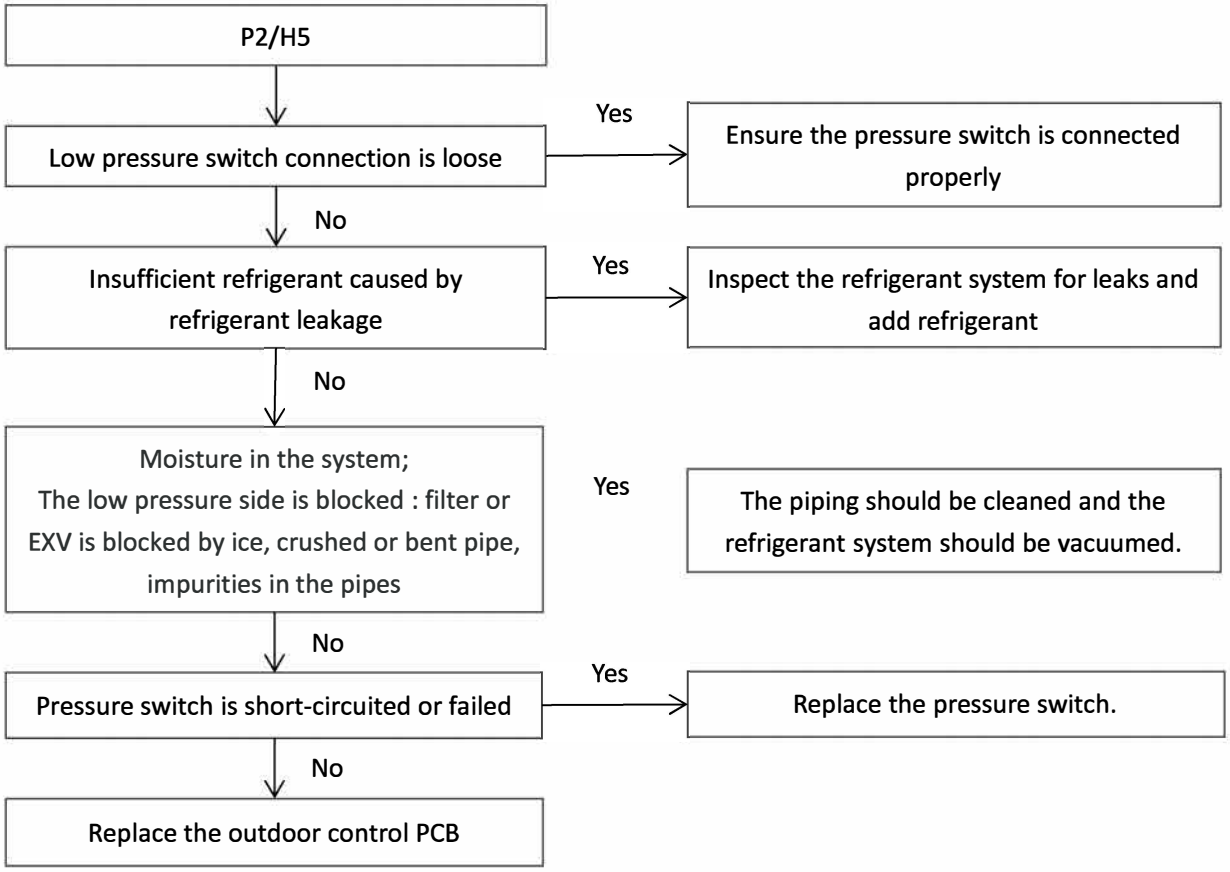
Allowable voltage range of power source	178~265V
Upper limit of DC generatrix voltage	430V
Lower limit of DC generatrix voltage	150V

- The unit stops running and error code is displayed on the communication board



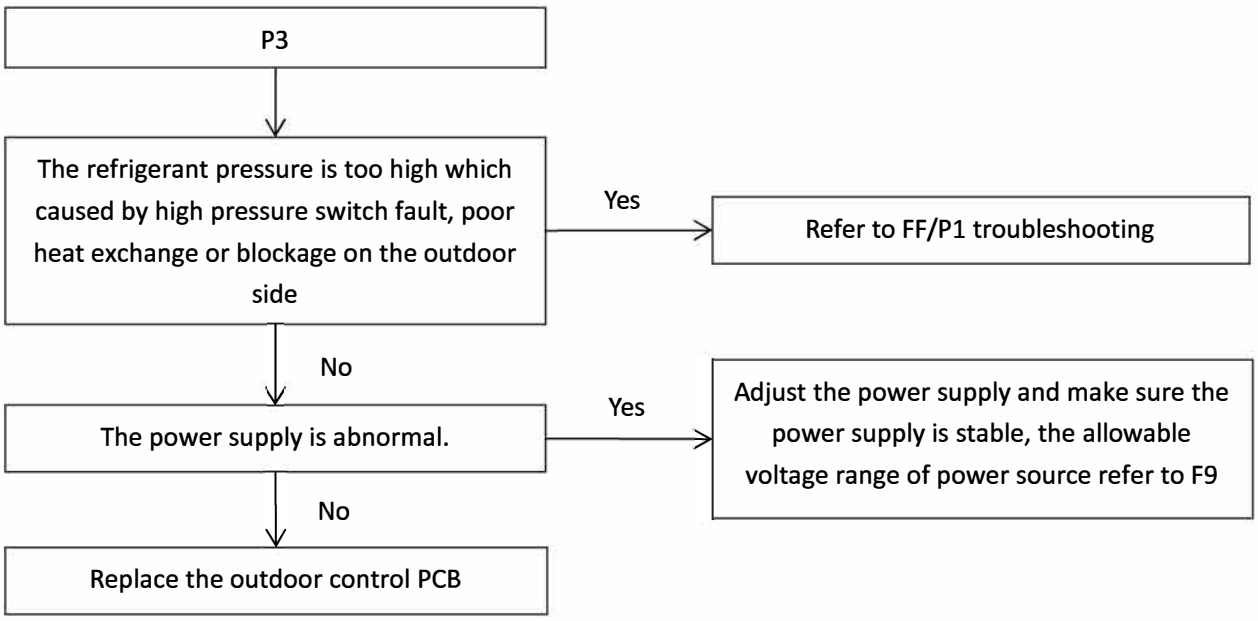
2.12 P2/H5 Troubleshooting

- P2 indicates low pressure protection .
- H5 indicates P2 protection appears 3 times in 240 minutes can't be recovered until re-power on.
- The unit stops running and error code is displayed on the communication board



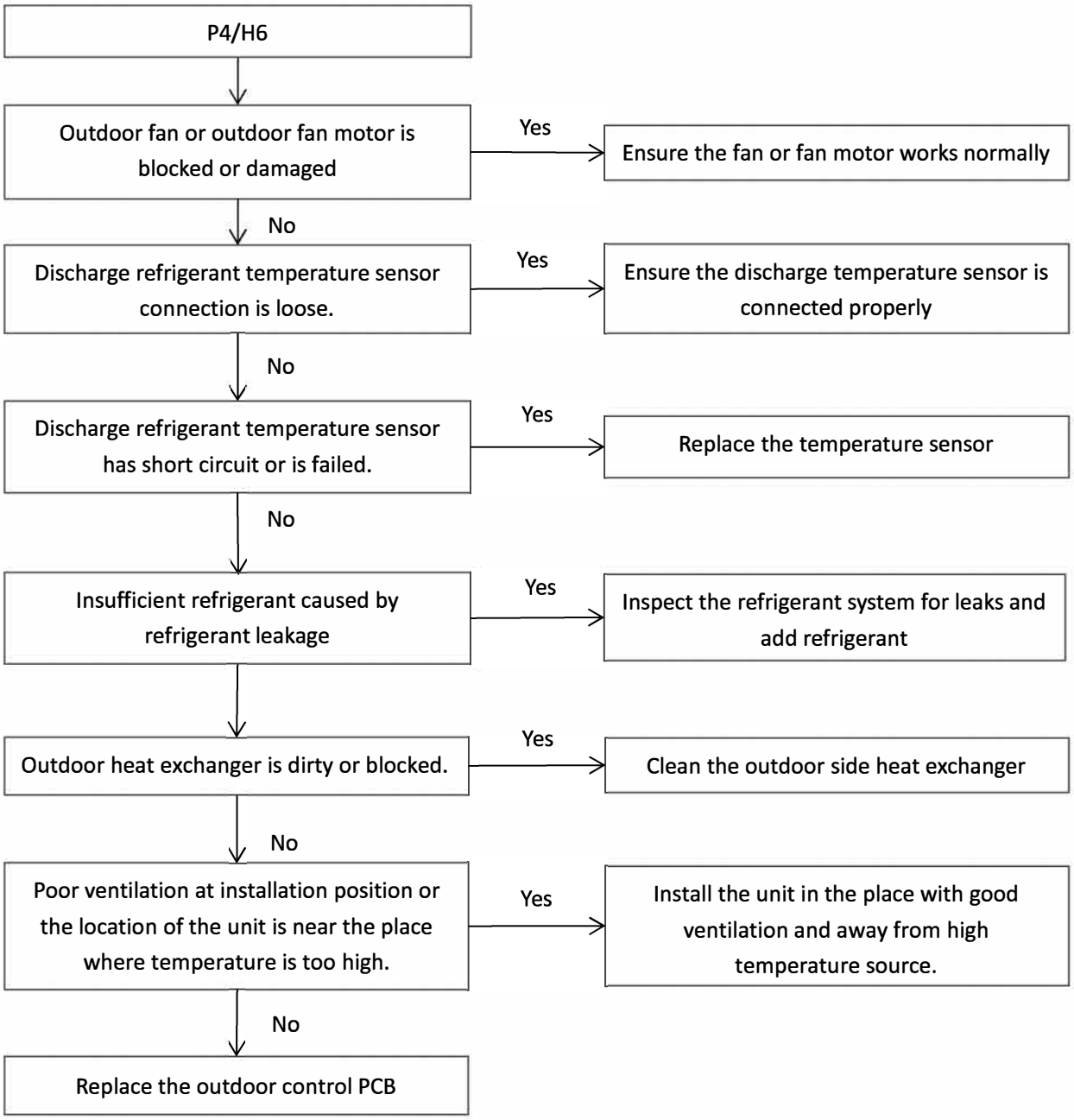
2.13 P3 Troubleshooting

- P3 indicates over current protection
- The unit stops running and error code is displayed on the communication board



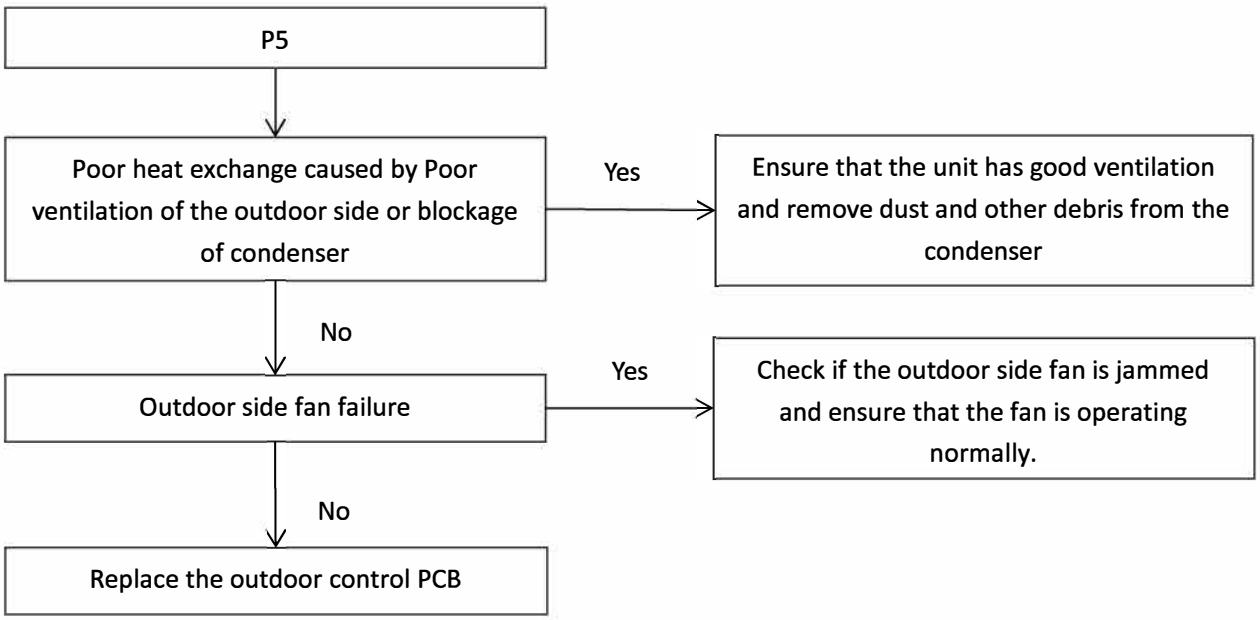
2.14 P4/H6 Troubleshooting

- P4 indicates discharge temperature protection
- H6 indicates P4 protection appears 3 times in 100 minutes can't be recovered until re-power on.
- The unit stops running and error code is displayed on the communication board.



2.15 P5 Troubleshooting

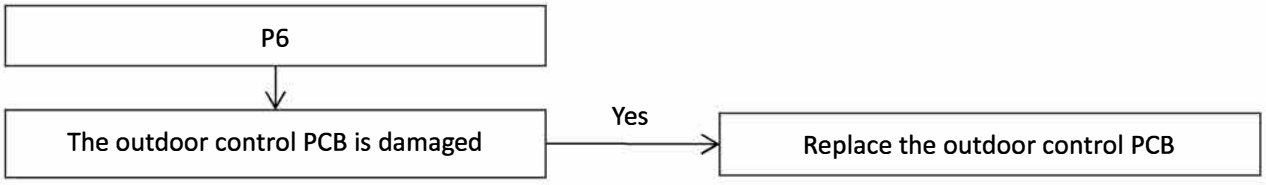
- P5 indicates T3 high temperature protection in cooling mode
- The unit stops running and error code is displayed on the communication board.



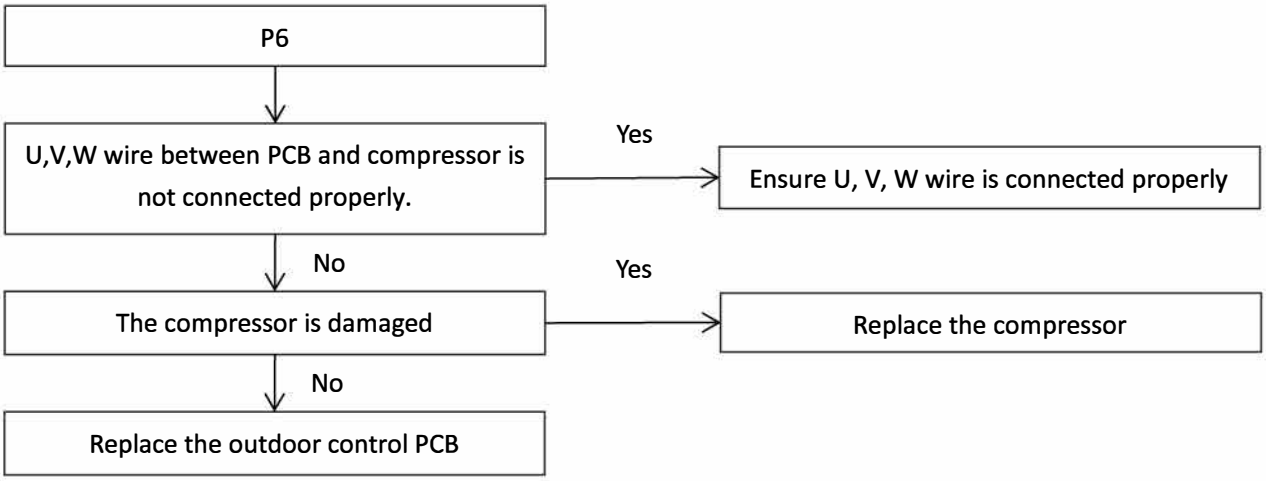
2.16 P6 Troubleshooting

- P6 indicates compressor inverter module protection.
- The unit stops running and error code is displayed on the communication board.

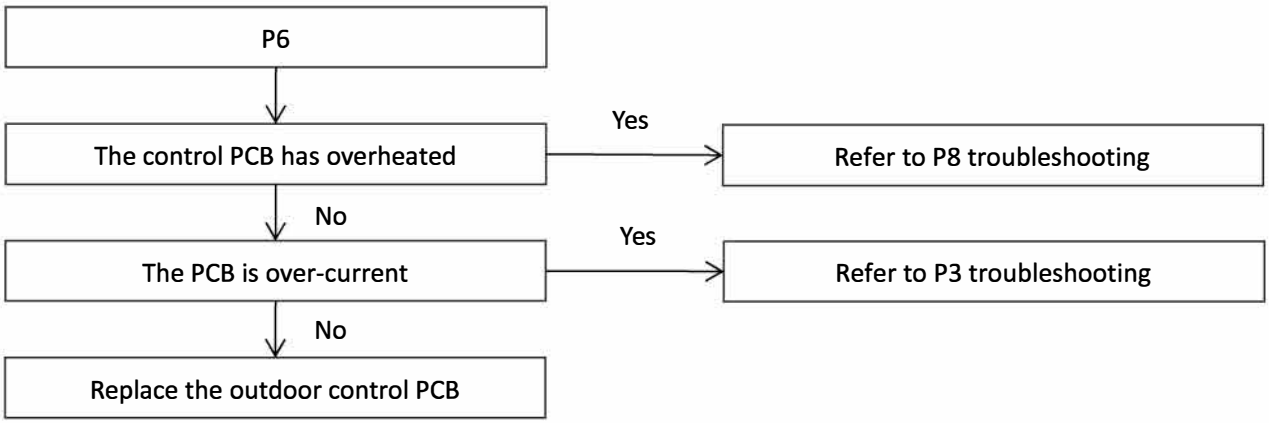
Situation1: P6 appears immediately when the outdoor unit is powered-on



Situation2: P6 appears immediately after the compressor starts up

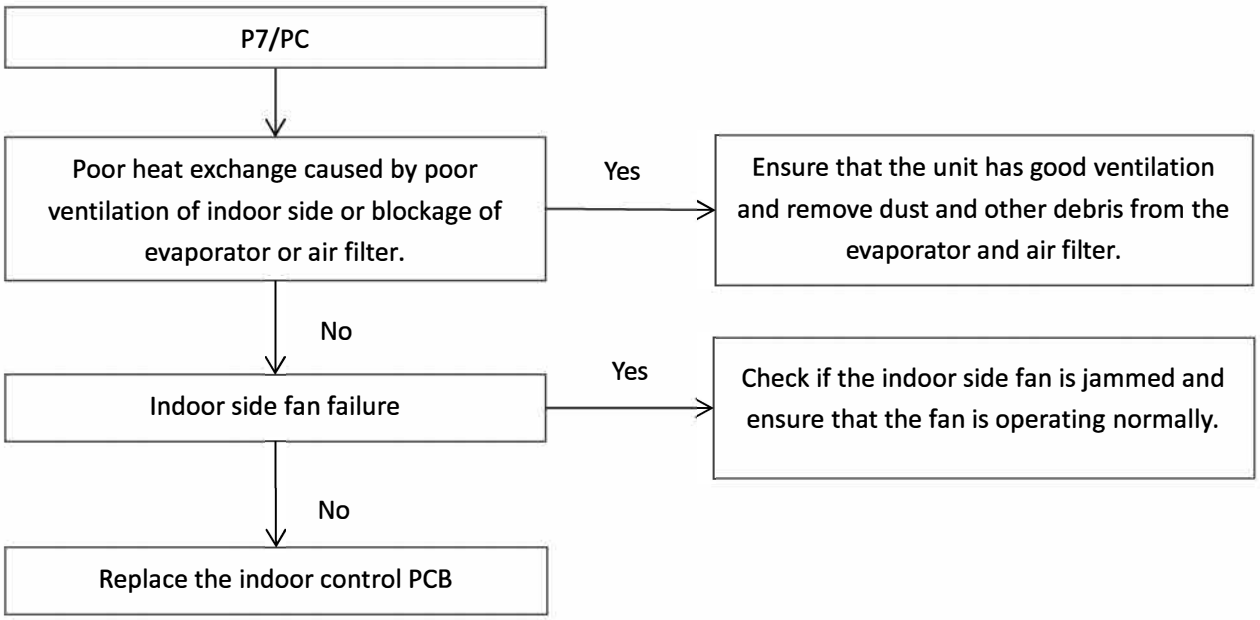


Situation3: P6 appears after the compressor has been running for a period of time.



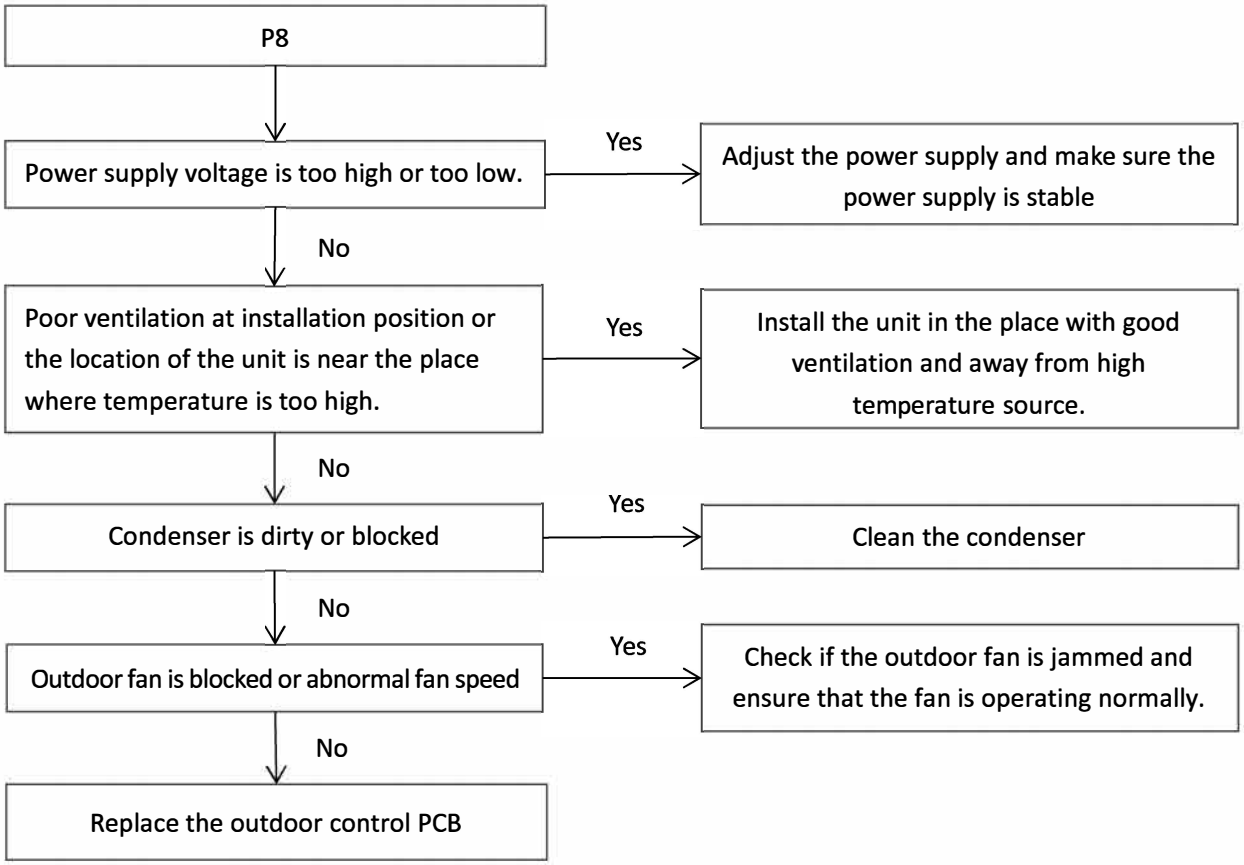
2.17 P7/PC Troubleshooting

- P7 indicates Indoor unit anti-freezing protection.
- PC indicates overwet operation protection.
- The unit stops running and error code is displayed on the communication board.



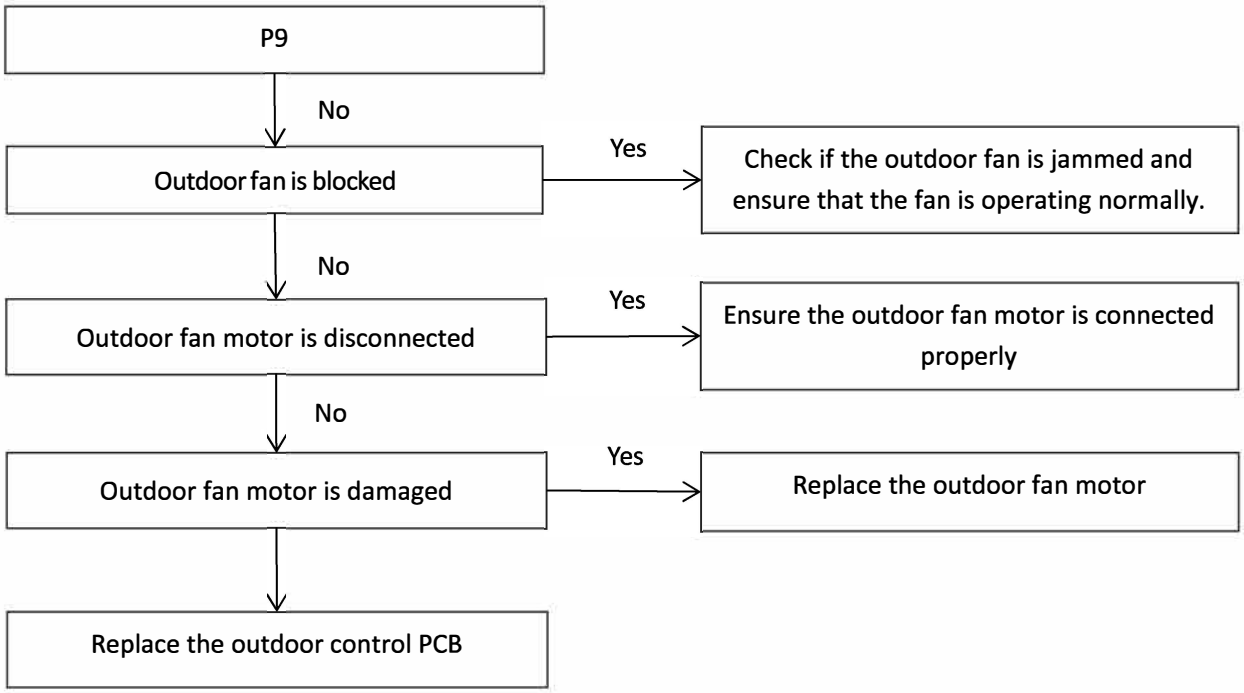
2.18 P8 Troubleshooting

- P8 indicates IPM high temperature protection.
- The unit stops running and error code is displayed on the communication board.



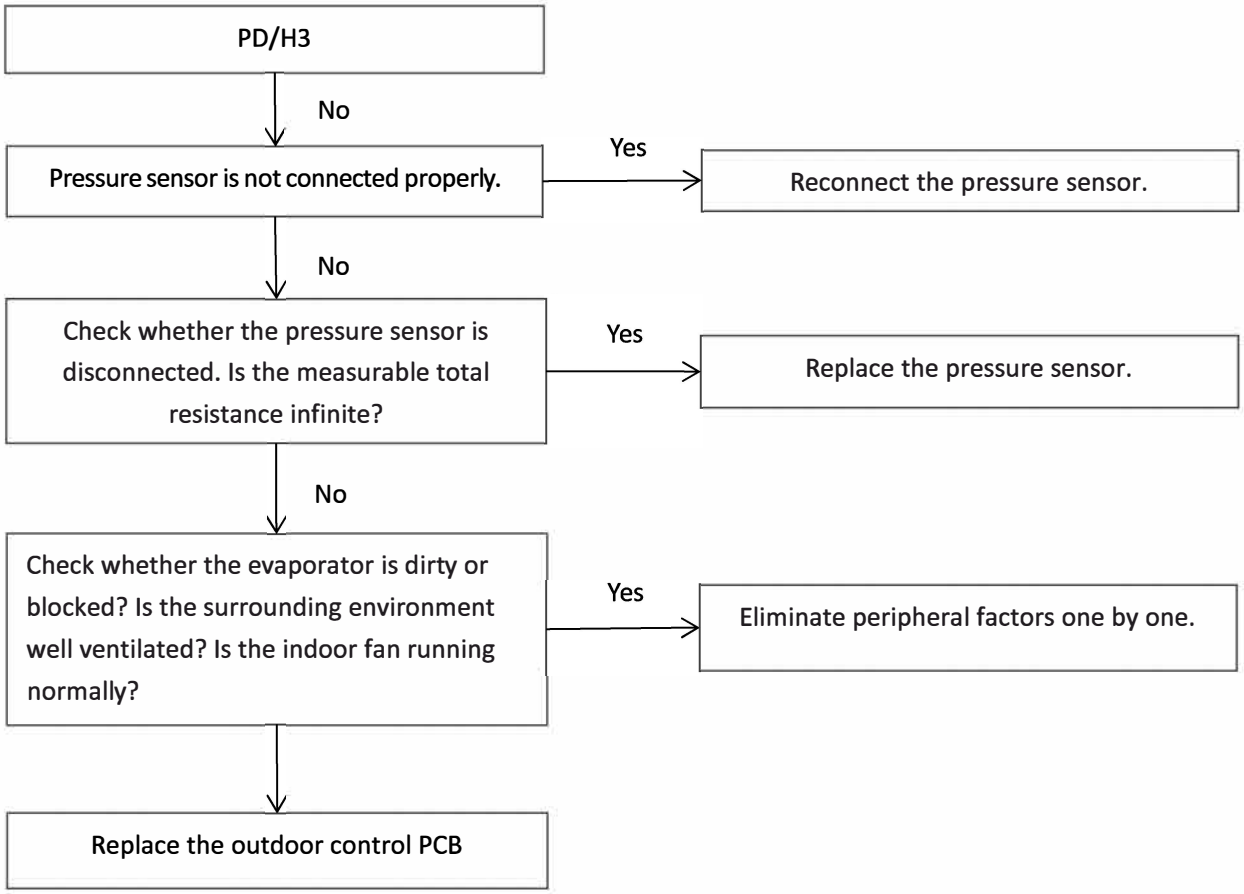
2.19 P9 Troubleshooting

- P9 indicates outdoor fan motor fault
- The unit stops running and error code is displayed on the communication board.



2.20 PD/H3 Troubleshooting

- PD indicates high pressure protection in heating mode
- H3 indicates PD protection appears 3 times in 180 minutes can't be recovered until re-power on
- The unit stops running and error code is displayed on the communication board.



2.21 H0 Troubleshooting

- H0 indicates Communication fault of master board and driver chip
- The unit stops running and error code is displayed on the communication board.

There is only one control PCB in the electric control box which integrates the functions of main control board and inverter module, maintenance personnel has to replace the PCB when H0 fault occurs.

3. Temperature Sensor Resistance Characteristics

Outdoor ambient temperature sensor(T4) and condenser coil temperature sensor(T3) resistance characteristics.

Temperature (℃)	Resistance (kΩ)	Temperature (℃)	Resistance (kΩ)	Temperature (℃)	Resistance (kΩ)	Temperature (℃)	Resistance (kΩ)
-25	144.266	15	16.079	55	2.841	95	0.708
-24	135.601	16	15.313	56	2.734	96	0.686
-23	127.507	17	14.588	57	2.632	97	0.666
-22	119.941	18	13.902	58	2.534	98	0.646
-21	112.867	19	13.251	59	2.44	99	0.627
-20	106.732	20	12.635	60	2.35	100	0.609
-19	100.552	21	12.05	61	2.264	101	0.591
-18	94.769	22	11.496	62	2.181	102	0.574
-17	89.353	23	10.971	63	2.102	103	0.558
-16	84.278	24	10.473	64	2.026	104	0.542
-15	79.521	25	10	65	1.953	105	0.527
-14	75.059	26	9.551	66	1.883		
-13	70.873	27	9.125	67	1.816		
-12	66.943	28	8.721	68	1.752		
-11	63.252	29	8.337	69	1.69		
-10	59.784	30	7.972	70	1.631		
-9	56.524	31	7.625	71	1.574		
-8	53.458	32	7.296	72	1.519		
-7	50.575	33	6.982	73	1.466		
-6	47.862	34	6.684	74	1.416		
-5	45.308	35	6.401	75	1.367		
-4	42.903	36	6.131	76	1.321		
-3	40.638	37	5.874	77	1.276		
-2	38.504	38	5.63	78	1.233		
-1	36.492	39	5.397	79	1.191		
0	34.596	40	5.175	80	1.151		
1	32.807	41	4.964	81	1.113		
2	31.12	42	4.763	82	1.076		
3	29.528	43	4.571	83	1.041		
4	28.026	44	4.387	84	1.007		
5	26.608	45	4.213	85	0.974		
6	25.268	46	4.046	86	0.942		
7	24.003	47	3.887	87	0.912		
8	22.808	48	3.735	88	0.883		
9	21.678	49	3.59	89	0.855		
10	20.61	50	3.451	90	0.828		
11	19.601	51	3.318	91	0.802		
12	18.646	52	3.191	92	0.777		
13	17.743	53	3.069	93	0.753		
14	16.888	54	2.952	94	0.73		

Compressor exhaust temperature sensor (T5) resistance characteristics.

Temperature (°C)	Resistance (kΩ)	Temperature (°C)	Resistance (kΩ)	Temperature (°C)	Resistance (kΩ)	Temperature (°C)	Resistance (kΩ)
-20	542.7	20	68.66	60	13.59	100	3.702
-19	511.9	21	65.62	61	13.11	101	3.595
-18	483	22	62.73	62	12.65	102	3.492
-17	455.9	23	59.98	63	12.21	103	3.392
-16	430.5	24	57.37	64	11.79	104	3.296
-15	406.7	25	54.89	65	11.38	105	3.203
-14	384.3	26	52.53	66	10.99	106	3.113
-13	363.3	27	50.28	67	10.61	107	3.025
-12	343.6	28	48.14	68	10.25	108	2.941
-11	325.1	29	46.11	69	9.902	109	2.86
-10	307.7	30	44.17	70	9.569	110	2.781
-9	291.3	31	42.33	71	9.248	111	2.704
-8	275.9	32	40.57	72	8.94	112	2.63
-7	261.4	33	38.89	73	8.643	113	2.559
-6	247.8	34	37.3	74	8.358	114	2.489
-5	234.9	35	35.78	75	8.084	115	2.422
-4	222.8	36	34.32	76	7.82	116	2.357
-3	211.4	37	32.94	77	7.566	117	2.294
-2	200.7	38	31.62	78	7.321	118	2.233
-1	190.5	39	30.36	79	7.086	119	2.174
0	180.9	40	29.15	80	6.859	120	2.117
1	171.9	41	28	81	6.641	121	2.061
2	163.3	42	26.9	82	6.43	122	2.007
3	155.2	43	25.86	83	6.228	123	1.955
4	147.6	44	24.85	84	6.033	124	1.905
5	140.4	45	23.89	85	5.844	125	1.856
6	133.5	46	22.89	86	5.663	126	1.808
7	127.1	47	22.1	87	5.488	127	1.762
8	121	48	21.26	88	5.32	128	1.717
9	115.2	49	20.46	89	5.157	129	1.674
10	109.8	50	19.69	90	5	130	1.632
11	104.6	51	18.96	91	4.849		
12	99.69	52	18.26	92	4.703		
13	95.05	53	17.58	93	4.562		
14	90.66	54	16.94	94	4.426		
15	86.49	55	16.32	95	4.294		
16	82.54	56	15.73	96	4.167		
17	78.79	57	15.16	97	4.045		
18	75.24	58	14.62	98	3.927		
19	71.86	59	14.09	99	3.812		

Room temperature sensor(T1) and condenser coil temperature sensor(T2) resistance characteristics.

Temperature (℃)	Resistance (kΩ)	Temperature (℃)	Resistance (kΩ)	Temperature (℃)	Resistance (kΩ)	Temperature (℃)	Resistance (kΩ)
-25	144.266	15	16.079	55	2.841	95	0.708
-24	135.601	16	15.313	56	2.734	96	0.686
-23	127.507	17	14.588	57	2.632	97	0.666
-22	119.941	18	13.902	58	2.534	98	0.646
-21	112.867	19	13.251	59	2.44	99	0.627
-20	106.732	20	12.635	60	2.35	100	0.609
-19	100.552	21	12.05	61	2.264	101	0.591
-18	94.769	22	11.496	62	2.181	102	0.574
-17	89.353	23	10.971	63	2.102	103	0.558
-16	84.278	24	10.473	64	2.026	104	0.542
-15	79.521	25	10	65	1.953	105	0.527
-14	75.059	26	9.551	66	1.883		
-13	70.873	27	9.125	67	1.816		
-12	66.943	28	8.721	68	1.752		
-11	63.252	29	8.337	69	1.69		
-10	59.784	30	7.972	70	1.631		
-9	56.524	31	7.625	71	1.574		
-8	53.458	32	7.296	72	1.519		
-7	50.575	33	6.982	73	1.466		
-6	47.862	34	6.684	74	1.416		
-5	45.308	35	6.401	75	1.367		
-4	42.903	36	6.131	76	1.321		
-3	40.638	37	5.874	77	1.276		
-2	38.504	38	5.63	78	1.233		
-1	36.492	39	5.397	79	1.191		
0	34.596	40	5.175	80	1.151		
1	32.807	41	4.964	81	1.113		
2	31.12	42	4.763	82	1.076		
3	29.528	43	4.571	83	1.041		
4	28.026	44	4.387	84	1.007		
5	26.608	45	4.213	85	0.974		
6	25.268	46	4.046	86	0.942		
7	24.003	47	3.887	87	0.912		
8	22.808	48	3.735	88	0.883		
9	21.678	49	3.59	89	0.855		
10	20.61	50	3.451	90	0.828		
11	19.601	51	3.318	91	0.802		
12	18.646	52	3.191	92	0.777		
13	17.743	53	3.069	93	0.753		
14	16.888	54	2.952	94	0.73		

ComfortStar®

The design and specifications are subject to change without prior notice for product improvement.Consult with the sales agency or manufacturer for details.