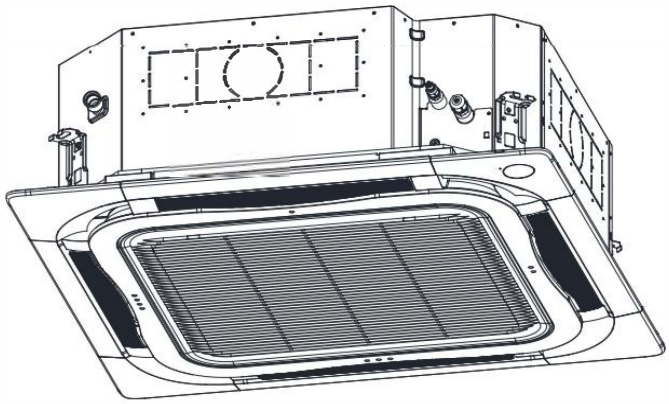
SPLIT INVERTER AIR CONDITIONERS

Service Manual

ComfortStar®

Indoor Unit: **CCT32-18(327)** **CCT32-24(328)**
CCT32-36(30G) **CCT32-48(329)**
CCT32-60(30H)



IMPORTANT NOTE:

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

Please check the applicable models, technical data, F-GAS(if any) and manufacturer information from the "Owner's Manual - Product Fiche " in the packaging of the outdoor unit.

Content

Part 1

General Information

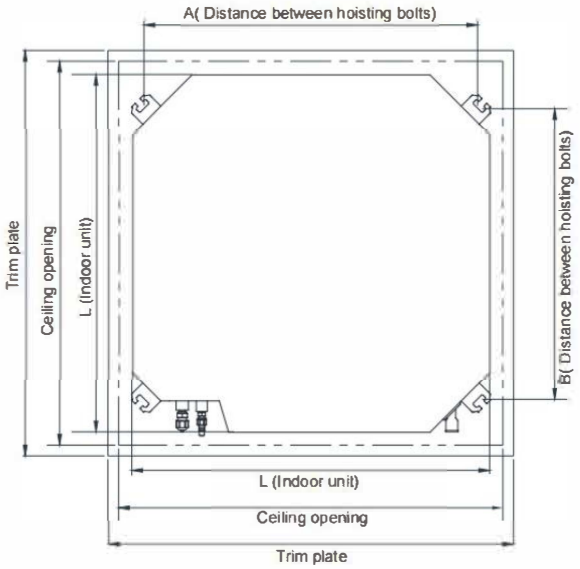
1 Product lineup

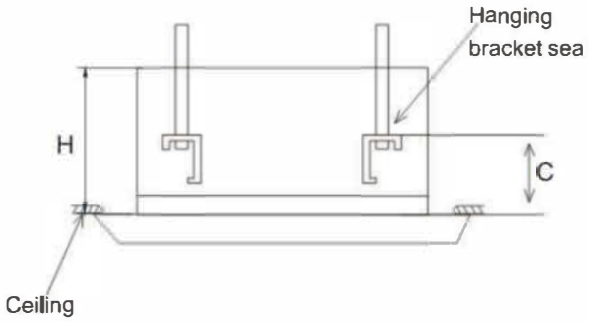
Model	Capacity(Btu/h)	Appearance
CCT32-18	18000	
CCT32-24	24000	
CCT32-36	36000	
CCT32-48	48000	
CCT32-60	55000	

2 Specifications

Indoor unit			CCT32-18	CCT32-24	CCT32-36	CCT32-48	CCT32-60
Power Supply	Rated Voltage	V, Ph, Hz	208/230V,1Ph, 60Hz				
Cooling	Capacity	Btu/h	18000	24000	36000	48000	55000
Heating	Capacity	Btu/h	N/A	N/A	N/A	N/A	N/A
Indoor MINIMUM CIRCUIT AMPACITY		A	0.4	0.8	0.9	1.5	1.5
Indoor MAX.FUSE		A	1	1	1	3	3
Indoor air flow		CFM	545	740	882	1188	1188
Indoor Noise level (H/L)		dB(A)	29-35	36-44	38-46	42-49	42-49
N.A. Design pressure		PSI	609/174	609/174	609/174	609/174	609/174
Indoor unit	Unpacking(W×D×H)	inch	33-5/64×33-5/64×8-5/64			33-5/64×33-5/64×11-27/64	
	Packing (W×D×H)	inch	36-1/32×36-1/32×11-1/32			36-1/32×36-1/32×14-11/64	
	Net/Gross Weight	lbs	46/53	49/57	49/57	57/67	57/67
Panel	Unpacking(W×D×H)		37-13/32×37-13/32×2-41/64			37-13/32×37-13/32×2-41/64	
	Packing (W×D×H)		40-3/4×40-3/4×3-47/64			40-3/4×40-3/4×3-47/64	
	Net/Gross Weight		14.5/19.9	14.5/19.9	14.5/19.9	14.5/19.9	14.5/19.9
Refrigerant pipe	Liquid side/Gas side	inch	(3/8) / (1/2)	(3/8) / (1/2)	(3/8) / (5/8)	(3/8) / (5/8)	(3/8) / (5/8)
Connection wiring			485: AWG 25*3 Shielded, 24V: AWG 20				
Comunication Type			24V / 485	24V / 485	24V / 485	24V / 485	24V / 485
Throttle type			Piston	Piston	Piston	Piston	Piston
Operating Temp. Range	Cooling	℉	62~90	62~90	62~90	62~90	62~90
	Heating	℉	N/A	N/A	N/A	N/A	N/A
SERVICE CODE			327	328	30G	329	30H

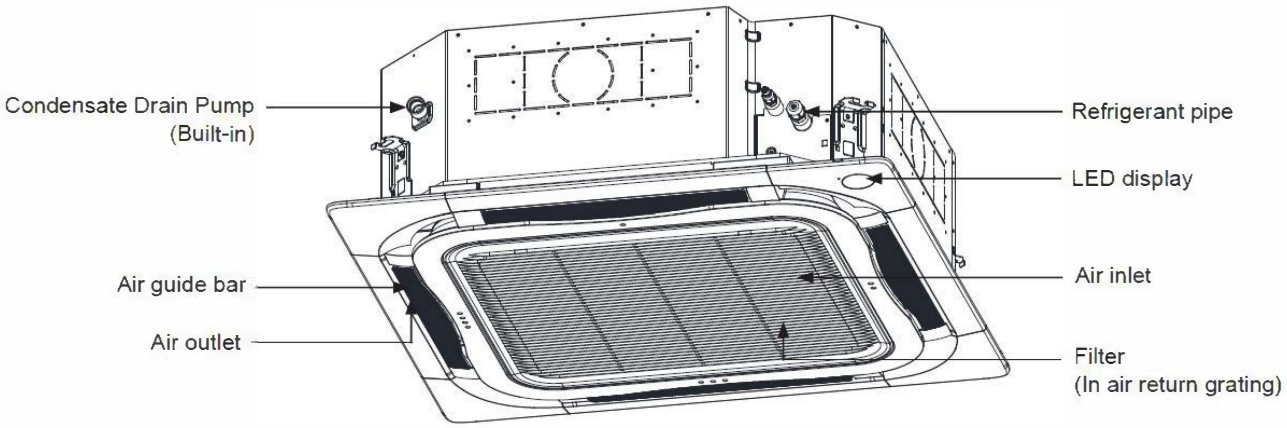
3 Dimensional drawings

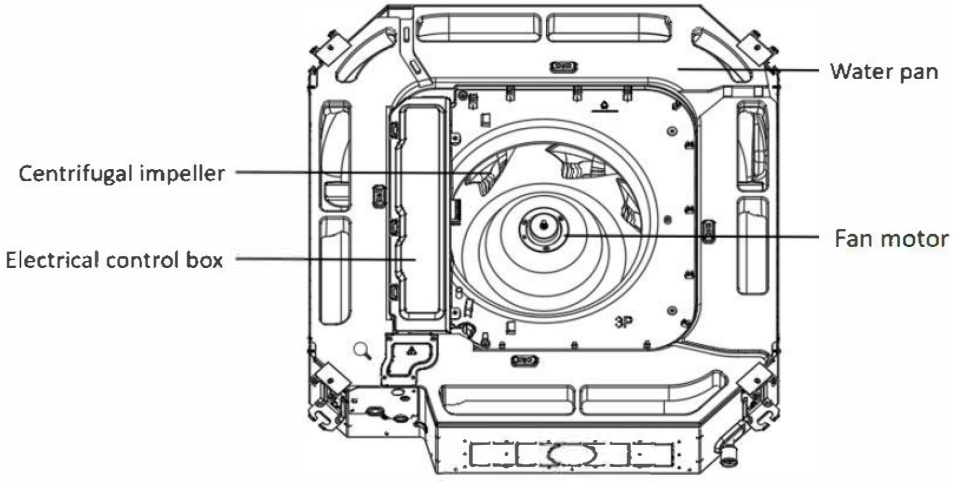




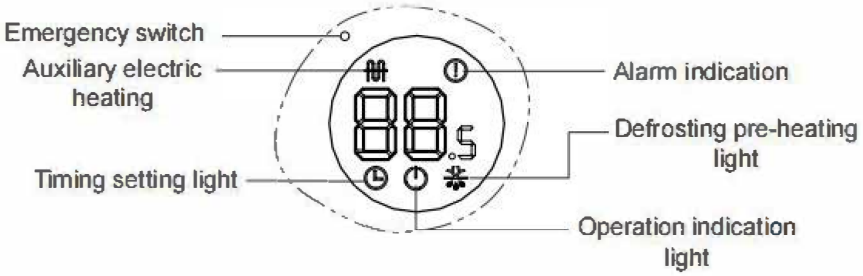
			18K~36K	48K~60K
Unit dimension （W*D*H）		mm	840*840*250	840*840*290
		inch	33-5/64×33-5/64×8-5/64	33-5/64×33-5/64×11-27/64
Panel dimension (W*D*H)		mm	950*950*65	950*950*65
		inch	37-13/32×37-13/32×2-41/64	37-13/32×37-13/32×2-41/64
Mounting dimension	A	mm	780	780
		inch	30-45/64	30-45/64
	B	mm	683	683
		inch	26-57/64	26-57/64
	C	mm	130	130
		inch	5-1/8	5-1/8

4 Layout Functional Components

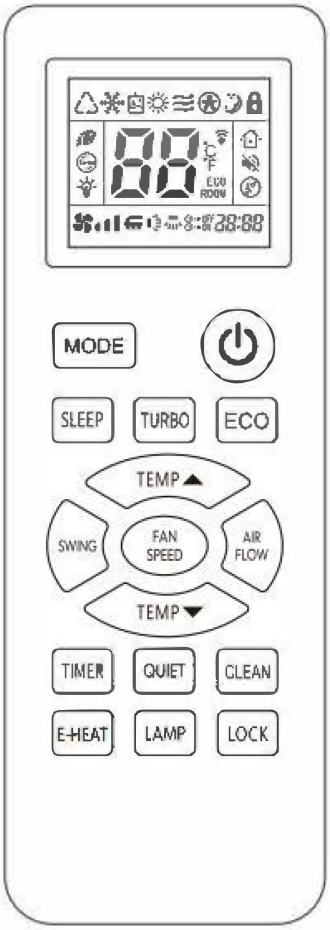




LED Display



Remote Controller



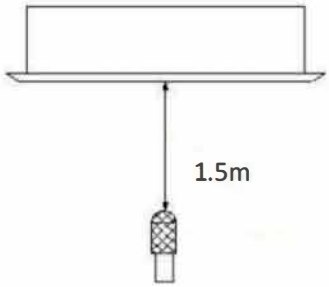
Button	Function Description
MODE	This button changes the operation mode:AUTO, COOL,DRY,HEAT,FAN.
⏻	This button, when pressed starts operation and stops when repressed.
SLEEP	This button changes to SLEEP operation.
TURBO	This button changes to TURBO operation (It does not work in AUTO,DRY,and FAN mode.)
ECO	This button is used to open and close the ECO(energy saving)operation function, which can only be entered when the remote control is set to power on, and the ECO mode switches between 0, 1, 2, 3. Every time change the ECO mode, the remote control shows the corresponding ECO mode for 10s (0 is not displayed, ECO1 shows C1, ECO2 shows C2, ECO3 shows C3),
TEMP▲ TEMP▼	This button sets the room temperature.
SWING	This button changes the flap mode:swing or fixed wind.
FAN SPEED	This button set air rate.
AIR FLOW	This button used for selection of the left/right air flow direction, whenever pressed the in flap will swing or fix(It just works on three-dimensional air flow model.)
TIMER	This button is used to set the switch-on or switch-off and the timer time.
E-HEAT	Only for models with electrical auxiliary heater This button used to control the auxiliary electric heating funcion, and the button only valid in the HEAT mode. Press the button to switch the auxiliary heating function between "auxiliary heat on → auxiliary heat off → automatic auxiliary heating".

Button	Function Description
QUIET	Press this button to make the AC keep quiet.
LAMP	Press this button to turn off the indications on the device.
CLEAN	Press this button to CLEAN when the device and remote control are OFF, and the cleaning icon will be displayed on the remote control. The cleaning icon shows that it will disappear automatically in 6 minutes, and the air conditioner will enter standby mode after the cleaning is completed logically. Press this button during the cleaning process to cancel the cleaning function. If the user implements the mode change and shutdown operation during the cleaning mode, the cleaning function will be terminated and the air conditioner will run according to the new mode.
LOCK	Press this button to lock or unlock the keyboard.
TURBO + TEMP▲	℃/°F function: Press TURBO button and TEMP▲ button at the same time to switch to Fahrenheit or Celsius temperature display on the remote control.
TURBO + TEMP▼	10℃ HEAT function: Press TURBO button and TEMP▼ button at the same time to start or stop the 10℃ HEAT function.

Note:

Remote controller can only be used when the outdoor unit and the indoor unit are communicating via RS485.

5 Sound level



Notes:

-Sound measured at 1.5m away from the center of the unit.

-Data is valid at free field condition.

-Data is valid at nominal operation condition.

-Reference acoustic pressure 0dB = 20μPa

-Sound level will vary depending on a range of f actors such as the construction -(acoustic absorption coefficient) of particular room, in which the equipment is installed.

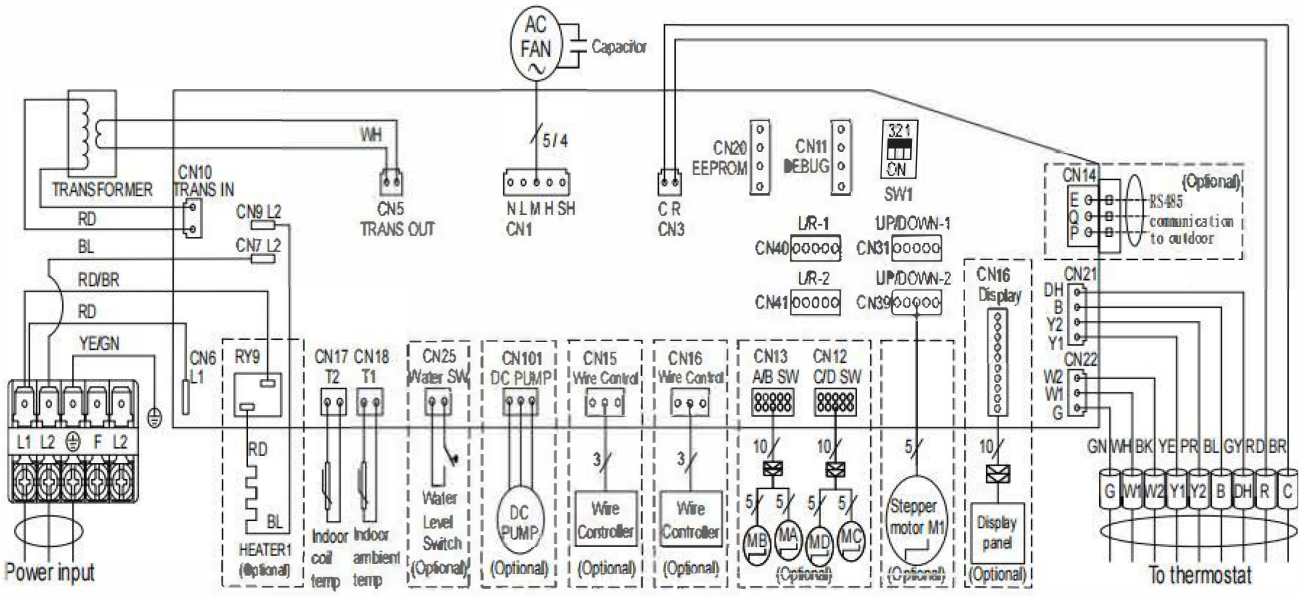
-The operating conditions are assumed to be standard.

Model	Indoor Noise level (H/L) dB(A)
CCT32-18	29-35
CCT32-24	36-44
CCT32-36	38-46
CCT32-48	42-49
CCT32-60	42-49

Part 2

Wiring Diagram

1 Electric wiring diagram



DIP switch status Indicate	
ON OFF 1	This Indicate OFF(the DIP switch is dialed to the digital side)
ON OFF 1	This Indicate ON(the DIP switch is dialed to Non-digital side)

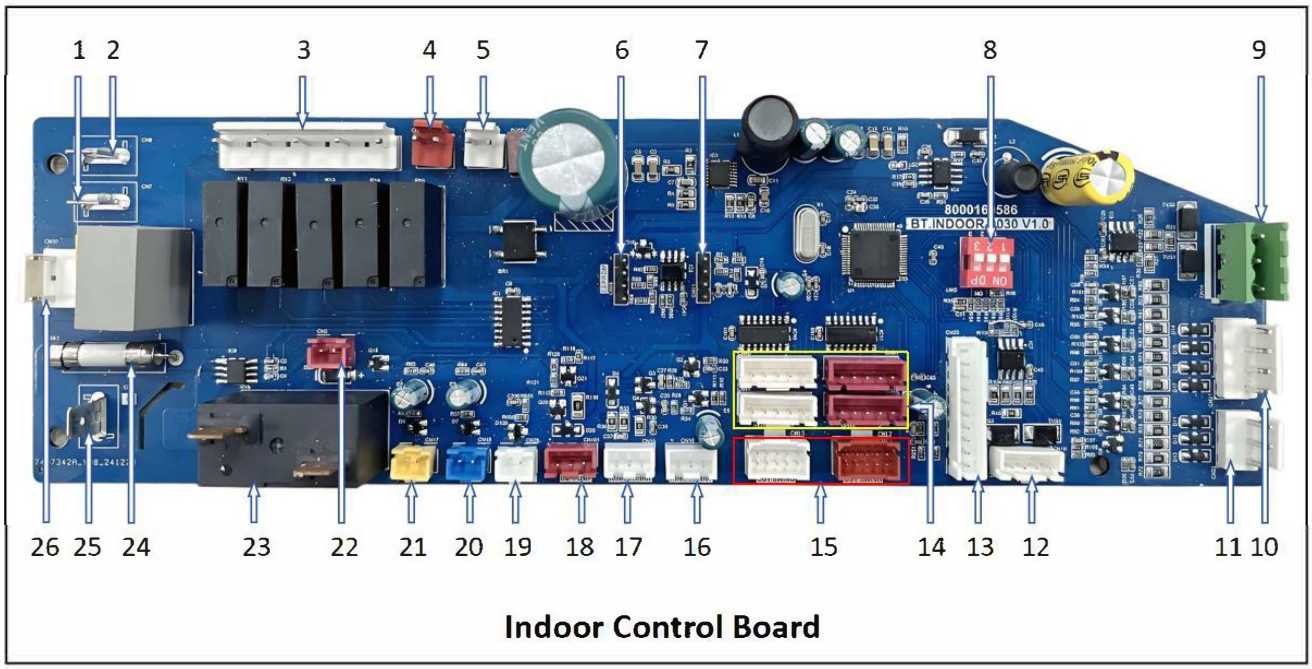
SW1 DIP switch selection		
SW1.1	OFF	24V Control
	ON	RS485 Comm. Mode
SW1.2	OFF	Anti-Cold Air Delay 90S
	ON	Disable Anti-Cold Air Delay
SW1.3	OFF	T1 from main board
	ON	T1 from thermostat

Wire Color Code			
RD	RED	OR	ORANGE
BL	BLUE	GN	GREEN
BR	BROWN	GY	GRAY
BK	BLACK	YE	YELLOW
WH	WHITE	PR	PURPLE

Line annotation

- Factory wiring
- Engineering connection
- Physical appearance
- Dashed box

2 PCB



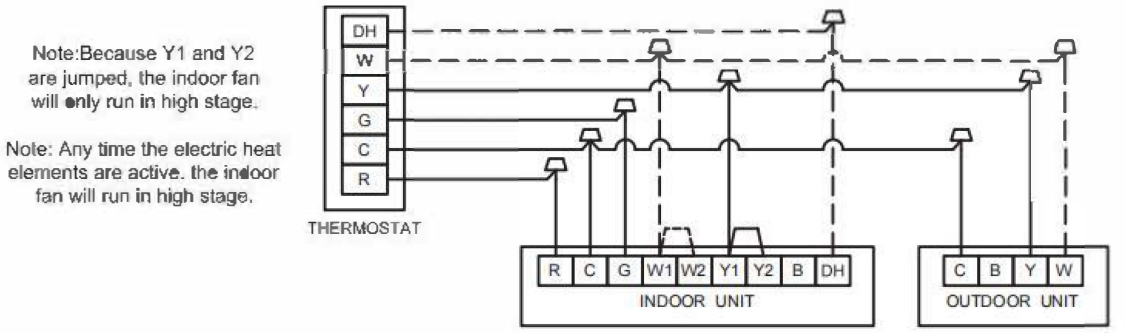
Indoor Control Board

No.	Port Names and Definitions	No.	Port Names and Definitions
1	220V tans in from power supply(L2)	14	Port for stepper motor(Floor Ceiling Unit)
2	220V trans out (reserved)	15	Port for stepper motor(Cassette Unit)
3	Port for indoor fan motor	16	Port to wired controller
4	Port to 24V thermostat	17	Port to wired controller(reserved)
5	24V trans in from transformer	18	Port for drainage water pump
6	Programming Port for EEPROM	19	Port for water level switch
7	Programming Port for debug	20	Port for room temperature sensor T1
8	DIP switch	21	Port for coil temperature sensor T2
9	RS-485 communication port	22	Reserved
10	Port to 24V thermostat	23	Relay for electrical heater(reserved)
11	Port to 24V thermostat	24	Fuse
12	Port for refrigerant concentration monitor	25	220V tans in from power supply(L1)
13	Port to the panel	26	220V trans out to transformer

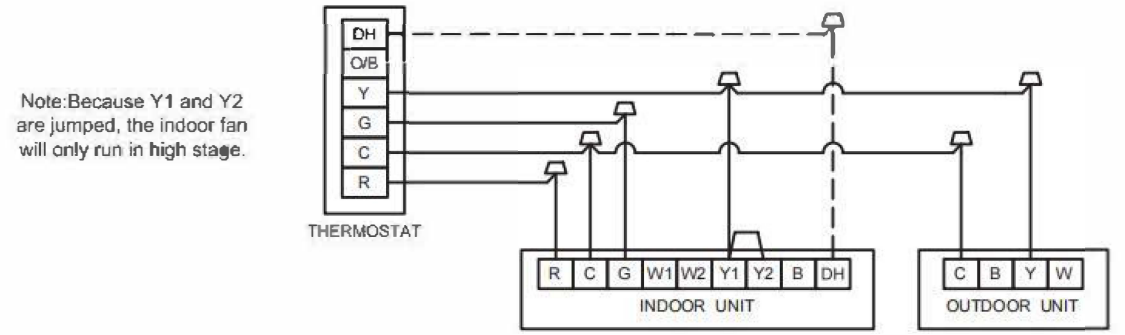
3 Low voltage wiring diagram

The following wiring diagram are suitable for the Indoor Unit and Outdoor Unit with 24V thermostat.

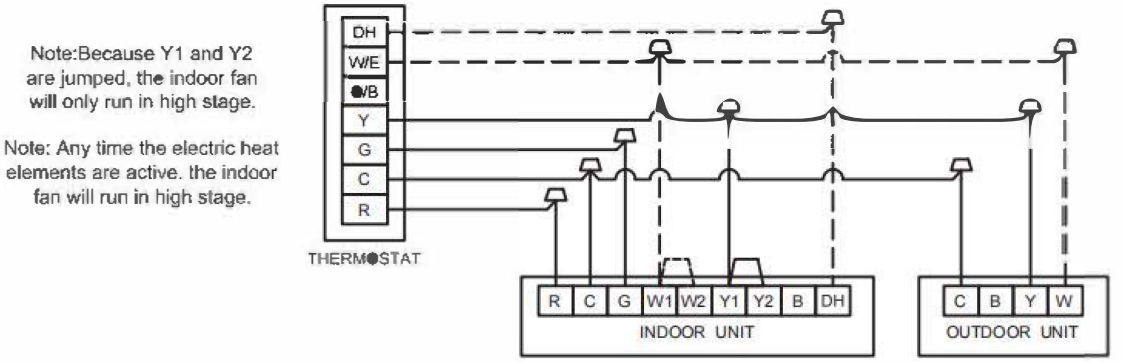
Wiring for 1H and 1C thermostat (no heat pump system model)



Wiring for 1H and 1C thermostat (no heat pump system model)

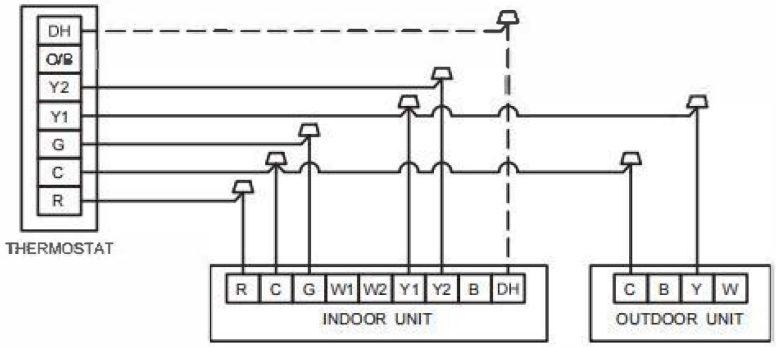


Wiring for 2H and 1C thermostat (no heat pump system model)



Wiring for 2H and 2C thermostat (no heat pump system model)

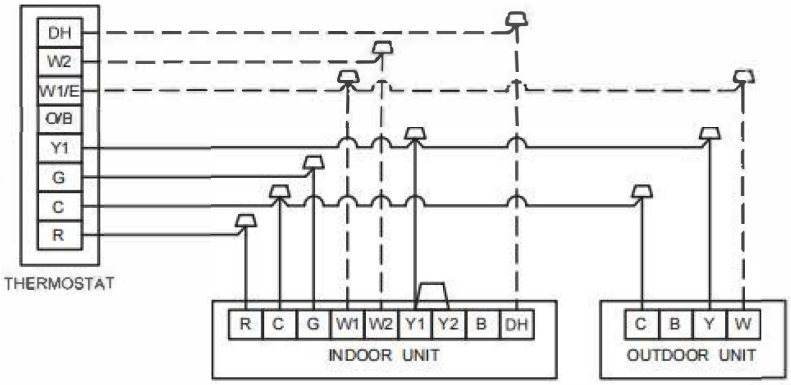
Note:Y1 and Y2 here represents 2 stages of fan cooling only, the compressor modulates separately from the fan.



Wiring for 3H and 1C thermostat (no heat pump system model)

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

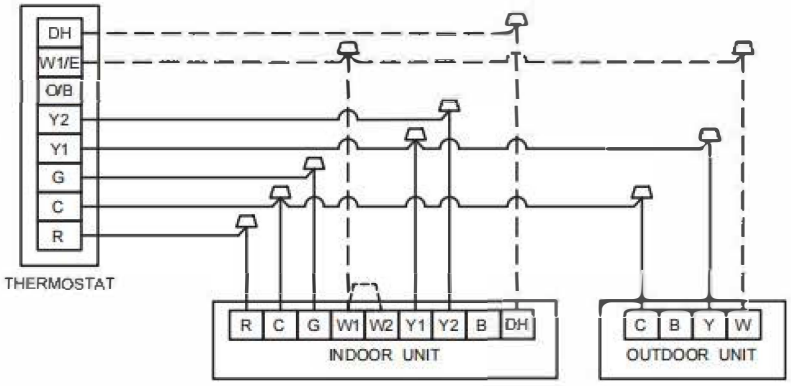
Note: Any time the electric heat elements are active. the indoor fan will run in high stage.



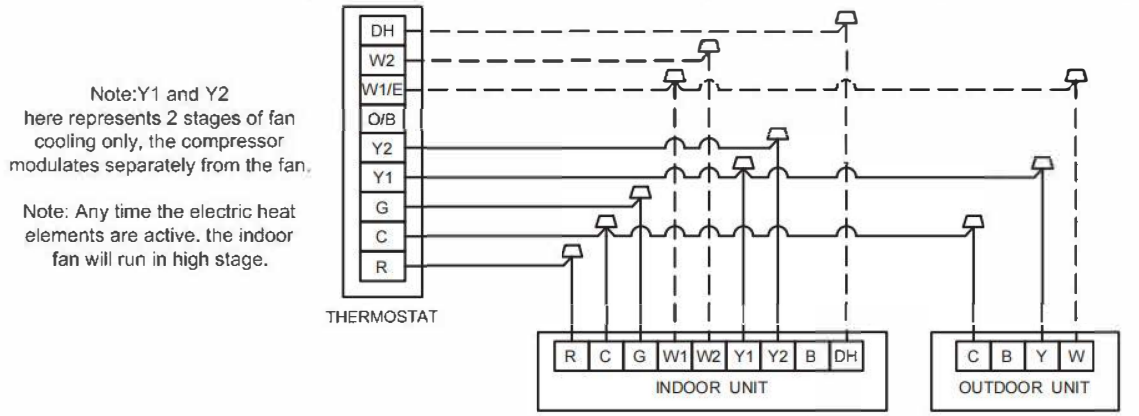
Wiring for 3H and 2C thermostat (no heat pump system model)

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 (no heat pump system model)



Control Logic:

Indoot unit connector

Connector	Purpose
R	24V Power Connection
C	Common
G	Fan Control
Y1	Low Cooling
Y2	High Cooling
B	Heating Reversing Valve
W1	Stage1 Electrical Heating
W2	Stage2 Electrical Heating
DH	Dehumidification

Outdoot 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.

4 Electrical parameters

Capacity(Btu/h)		18K	24K	36K	48K	60K
Power (indoor)	Phase	1	1	1	1	1
	Frequency and Volt	208/230, 60Hz				
Power (outdoor)	Phase	1	1	1	1	1
	Frequency and Volt	208/230, 60Hz				
Max.Fuse	Indoor unit(A)	15	15	15	15	15
	Outdoor unit(A)					
Indoor unit Powerline	Line quantity	3	3	3	3	3
	Line diameter(AWG)	16/1.5mm^2	16/1.5mm^2	16/1.5mm^2	16/1.5mm^2	16/1.5mm^2
Outdoor unit Powerline	Line quantity	3	3	3	3	3
	Line diameter(AWG)					
Outdoor unit Signal line	Line quantity	3	3	3	3	3
	Line diameter(AWG)	20/0.5mm^2	20/0.5mm^2	20/0.5mm^2	20/0.5mm^2	20/0.5mm^2
Thermostat Signal line	Line quantity	/	/	/	/	/
	Line diameter(AWG)	18/1.0mm^2	18/1.0mm^2	18/1.0mm^2	18/1.0mm^2	18/1.0mm^2

Part 3

Diagnosis and Troubleshooting

1 Error code table

Error code	Error definition
E1	Outdoor unit and indoor unit communication error
E2	Indoor unit T1 temperature sensor fault
E3	Indoor unit T2 temperature sensor fault
E4	Refrigerant concentration sensor fault (Only valid when connected to a refrigerant concentration sensor.)
E6	Refrigerant leakage protection
E8	Indoor fan motor current fault
E9	Wired controller communication fault
d3	Water level switch protection

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.

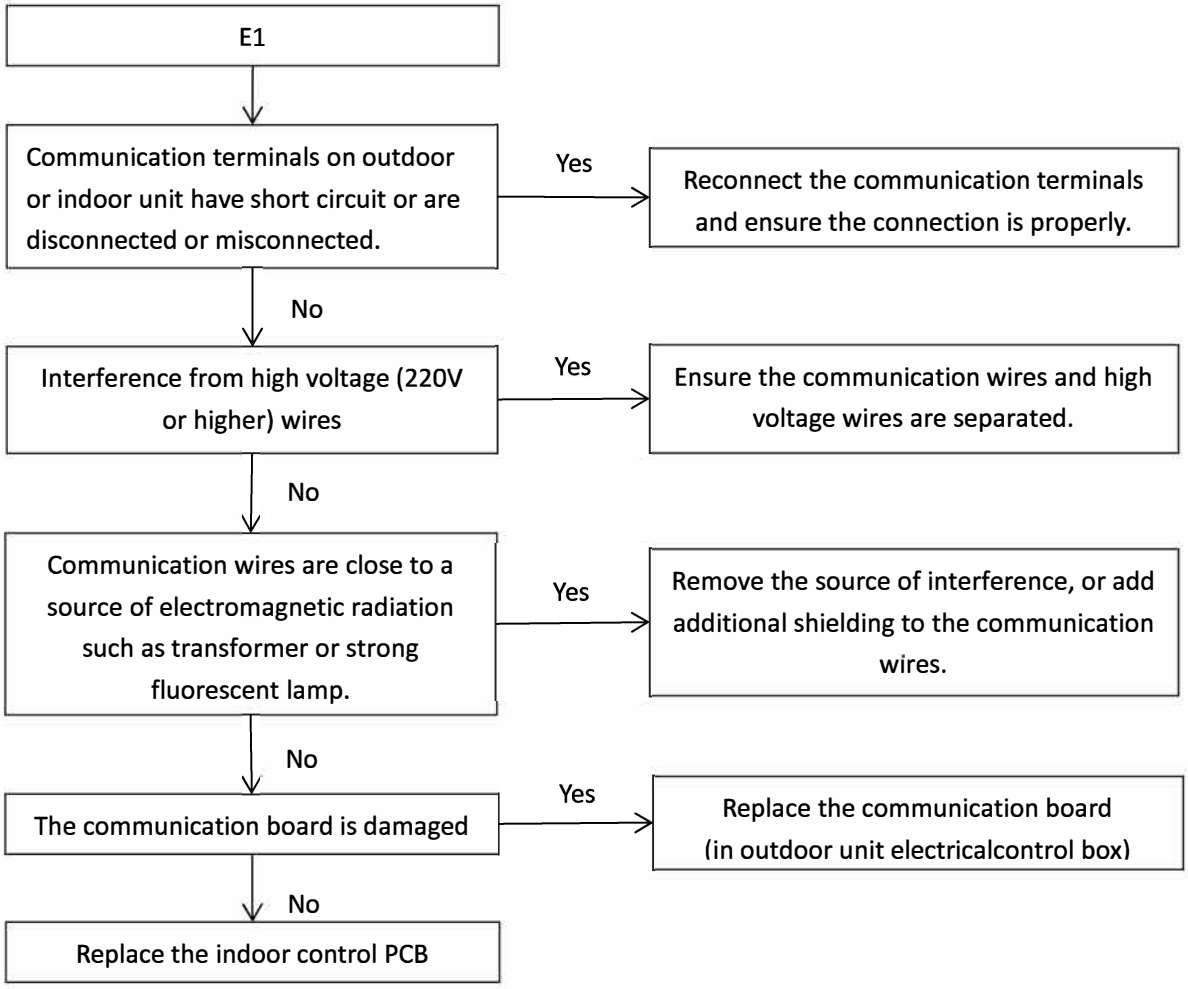
- Use a firm stool or step ladder according to manufacturer procedures when cleaning or maintaining the unit.

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.

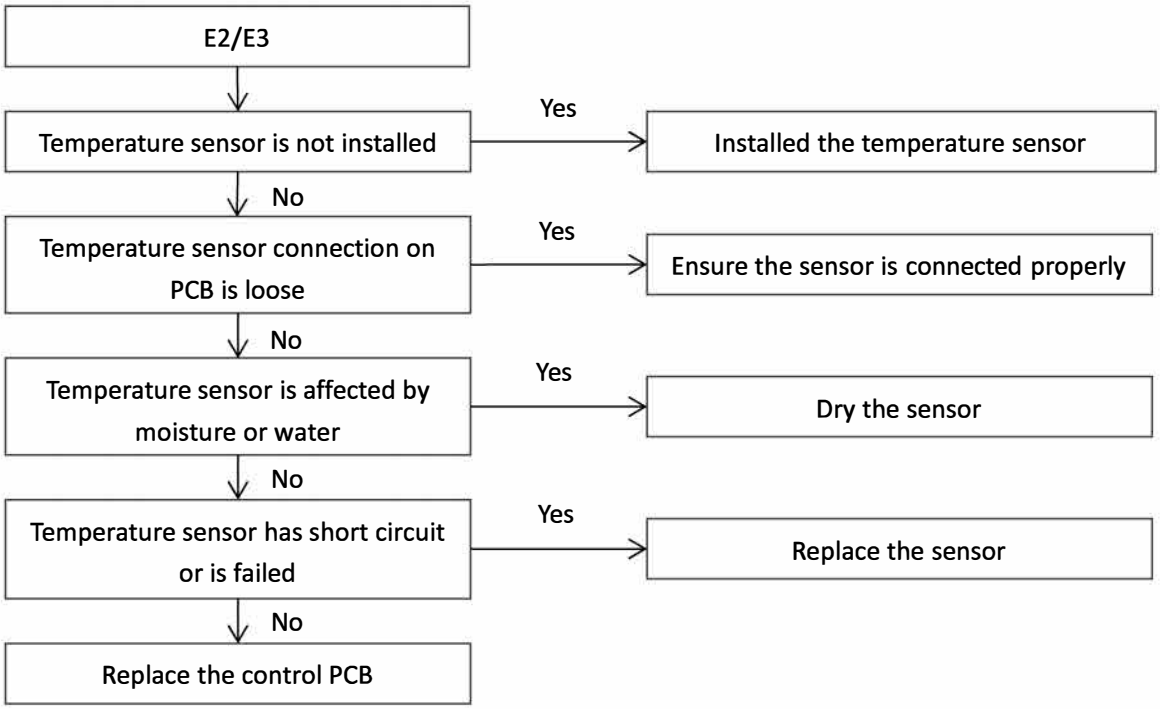
2.2 E1 Troubleshooting

- E1 indicates RS485 communication fault between outdoor unit and indoor unit.
- The unit stops running and error code is displayed on the LED display on the panel .



2.3 E2/E3 Troubleshooting

- E2 indicates indoor unit T1 temperature sensor fault
- E3 indicates indoor unit T2 temperature sensor fault
- The unit stops running and error code is displayed on the LED display on the panel.



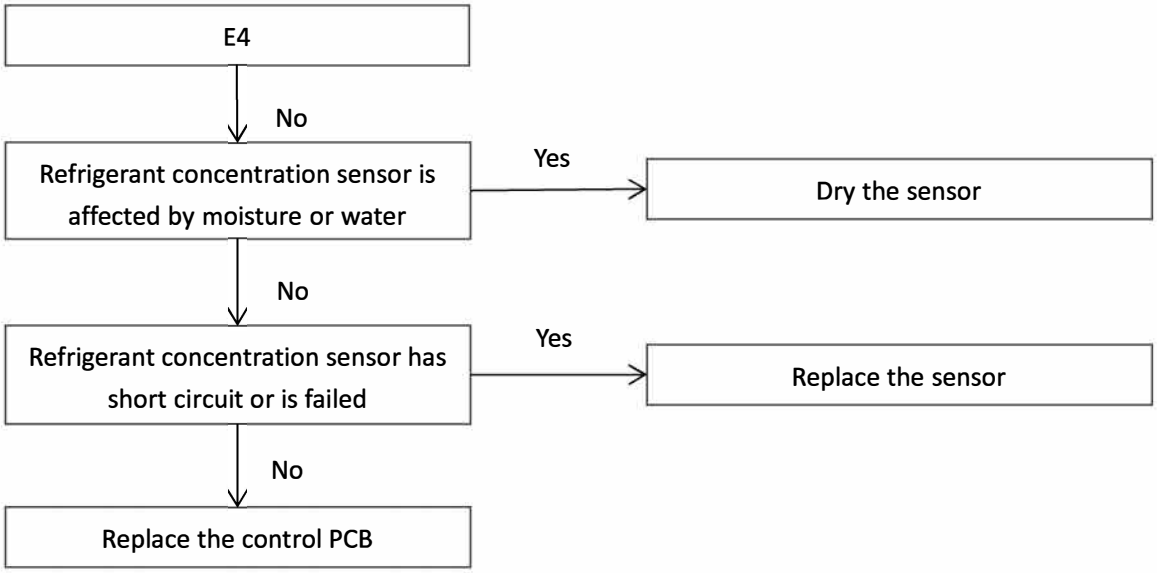
Note:

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.

2.4 E4 Troubleshooting

- E4 indicates refrigerant concentration sensor fault (Only valid when connected to a refrigerant concentration sensor.)
- The unit stops running and error code is displayed on the LED display on the panel.



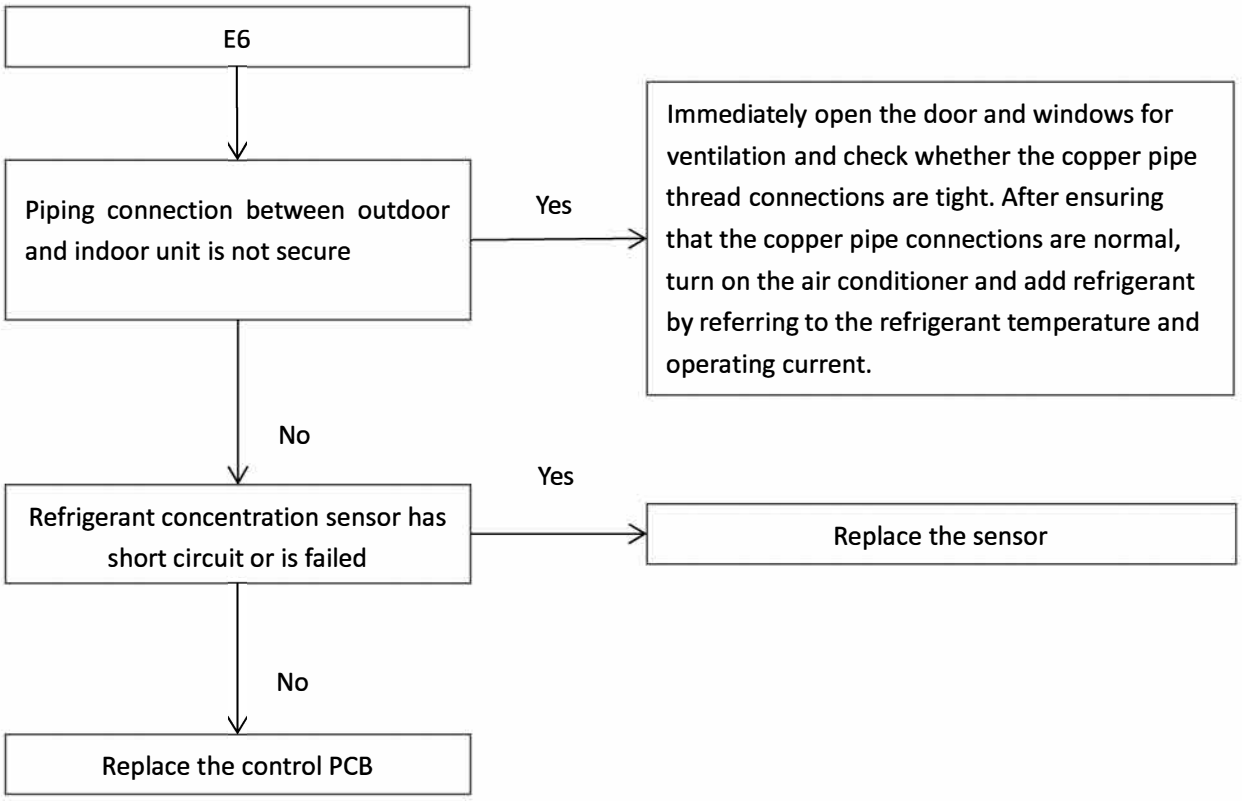
Note:

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 E6 Troubleshooting

- E6 Refrigerant leakage protection (Only valid when connected to a refrigerant concentration sensor.)
- The unit stops running and error code is displayed on the LED display on the panel.



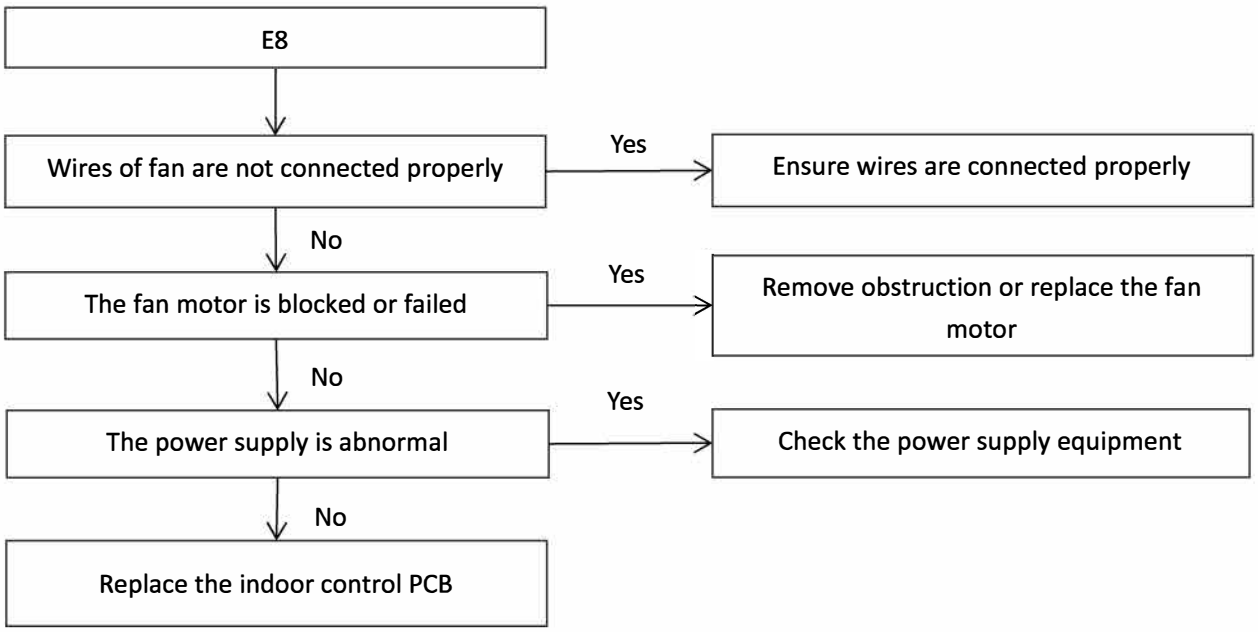
Note:

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.

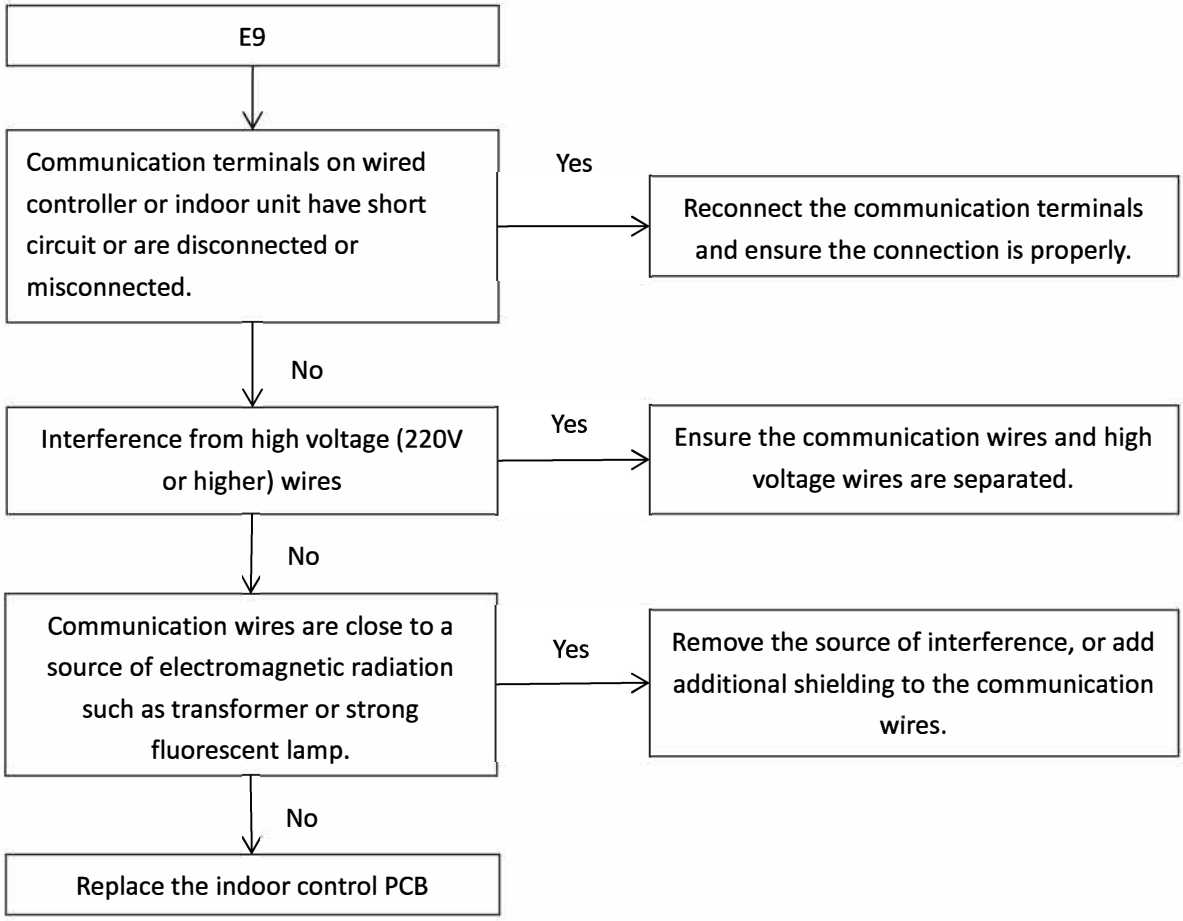
2.6 E8 Troubleshooting

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



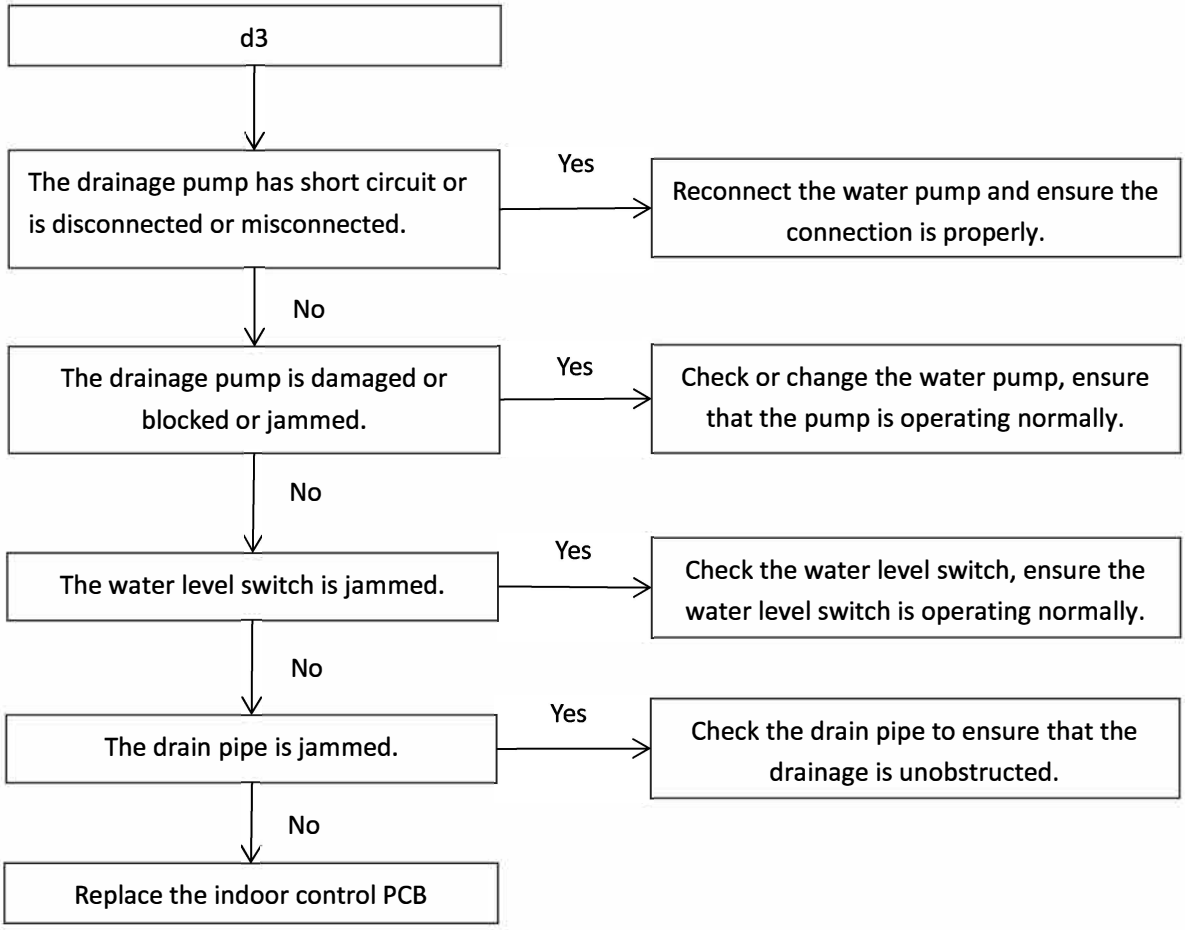
2.7 E9 Troubleshooting

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



2.8 d3 Troubleshooting

- d3 indicates water level switch protection.
- The unit stops running and error code is displayed on the LED display on the panel.



3. Temperature Sensor Resistance Characteristics

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

Temperature (℃)	Temperature (℉)	Resistance (kΩ)	Temperature (℃)	Temperature (℉)	Resistance (kΩ)
-25	-13	144.266	15	59	16.079
-24	-11	135.601	16	61	15.313
-23	-9	127.507	17	63	14.588
-22	-8	119.941	18	64	13.902
-21	-6	112.867	19	66	13.251
-20	-4	106.732	20	68	12.635
-19	-2	100.552	21	70	12.05
-18	0	94.769	22	72	11.496
-17	1	89.353	23	73	10.971
-16	3	84.278	24	75	10.473
-15	5	79.521	25	77	10
-14	7	75.059	26	79	9.551
-13	9	70.873	27	81	9.125
-12	10	66.943	28	82	8.721
-11	12	63.252	29	84	8.337
-10	14	59.784	30	86	7.972
-9	16	56.524	31	88	7.625
-8	18	53.458	32	90	7.296
-7	19	50.575	33	91	6.982
-6	21	47.862	34	93	6.684
-5	23	45.308	35	95	6.401
-4	25	42.903	36	97	6.131
-3	27	40.638	37	99	5.874
-2	28	38.504	38	100	5.63
-1	30	36.492	39	102	5.397
0	32	34.596	40	104	5.175
1	34	32.807	41	106	4.964
2	36	31.12	42	108	4.763
3	37	29.528	43	109	4.571
4	39	28.026	44	111	4.387
5	41	26.608	45	113	4.213
6	43	25.268	46	115	4.046
7	45	24.003	47	117	3.887
8	46	22.808	48	118	3.735
9	48	21.678	49	120	3.59
10	50	20.61	50	122	3.451
11	52	19.601	51	124	3.318
12	54	18.646	52	126	3.191
13	55	17.743	53	127	3.069
14	57	16.888	54	129	2.952

Temperature(℃)	Temperature(℉)	Resistance(kΩ)	Temperature(℃)	Temperature(℉)	Resistance(kΩ)
55	131	2.841	95	171	0.708
56	133	2.734	96	173	0.686
57	135	2.632	97	175	0.666
58	136	2.534	98	176	0.646
59	138	2.44	99	178	0.627
60	140	2.35	100	180	0.609
61	142	2.264	101	182	0.591
62	144	2.181	102	184	0.574
63	145	2.102	103	185	0.558
64	147	2.026	104	187	0.542
65	149	1.953	105	189	0.527
66	151	1.883			
67	153	1.816			
68	154	1.752			
69	156	1.69			
70	158	1.631			
71	160	1.574			
72	162	1.519			
73	163	1.466			
74	165	1.416			
75	167	1.367			
76	169	1.321			
77	171	1.276			
78	172	1.233			
79	174	1.191			
80	176	1.151			
81	178	1.113			
82	180	1.076			
83	181	1.041			
84	183	1.007			
85	185	0.974			
86	187	0.942			
87	189	0.912			
88	190	0.883			
89	192	0.855			
90	194	0.828			
91	196	0.802			
92	198	0.777			
93	199	0.753			
94	201	0.73			

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

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