



**R410A Inverter Split System
17.5 SEER**

Technical Manual

**January 2021
Version A-TM-18SS-01**

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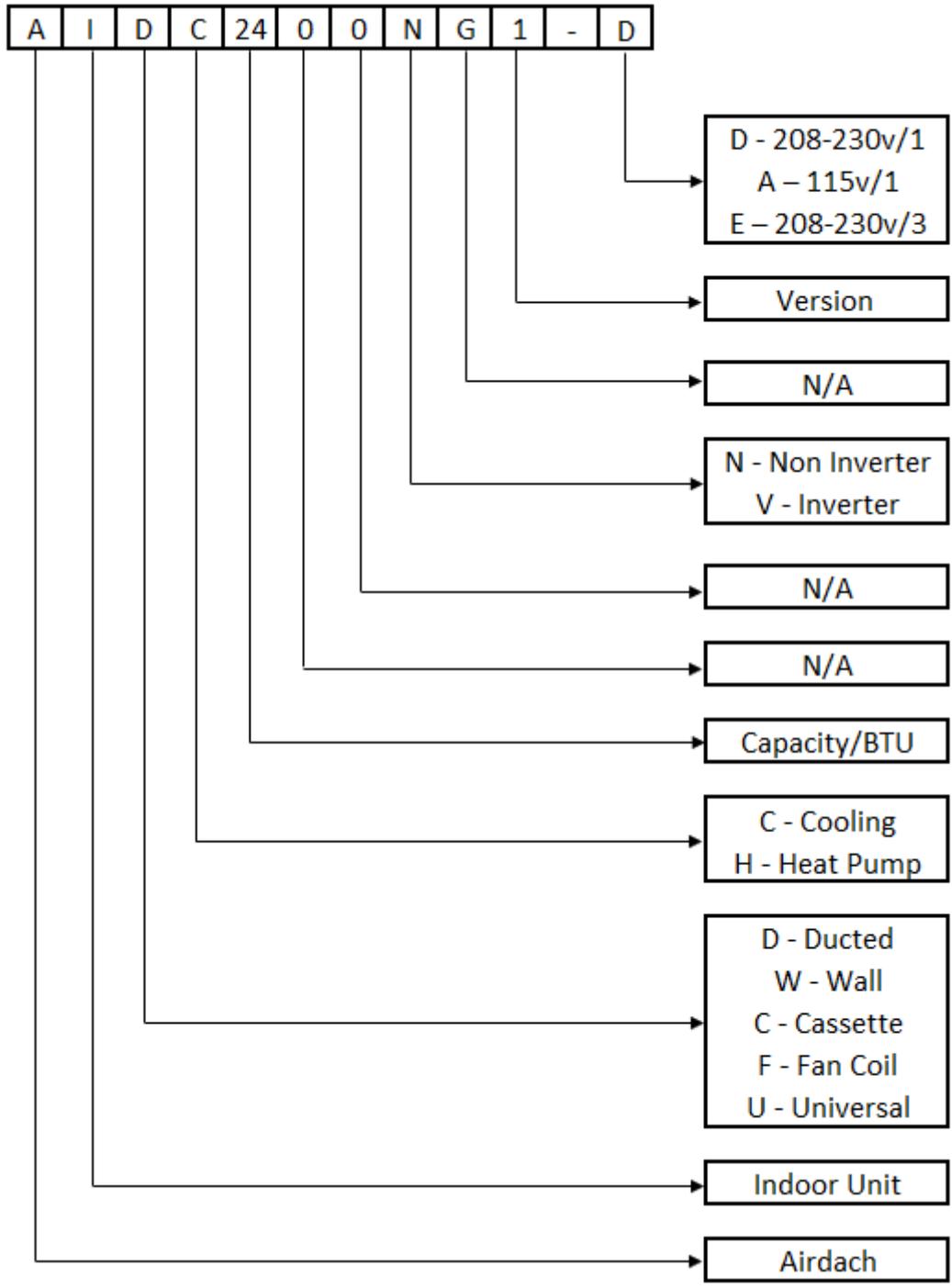
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Part 1. General Information

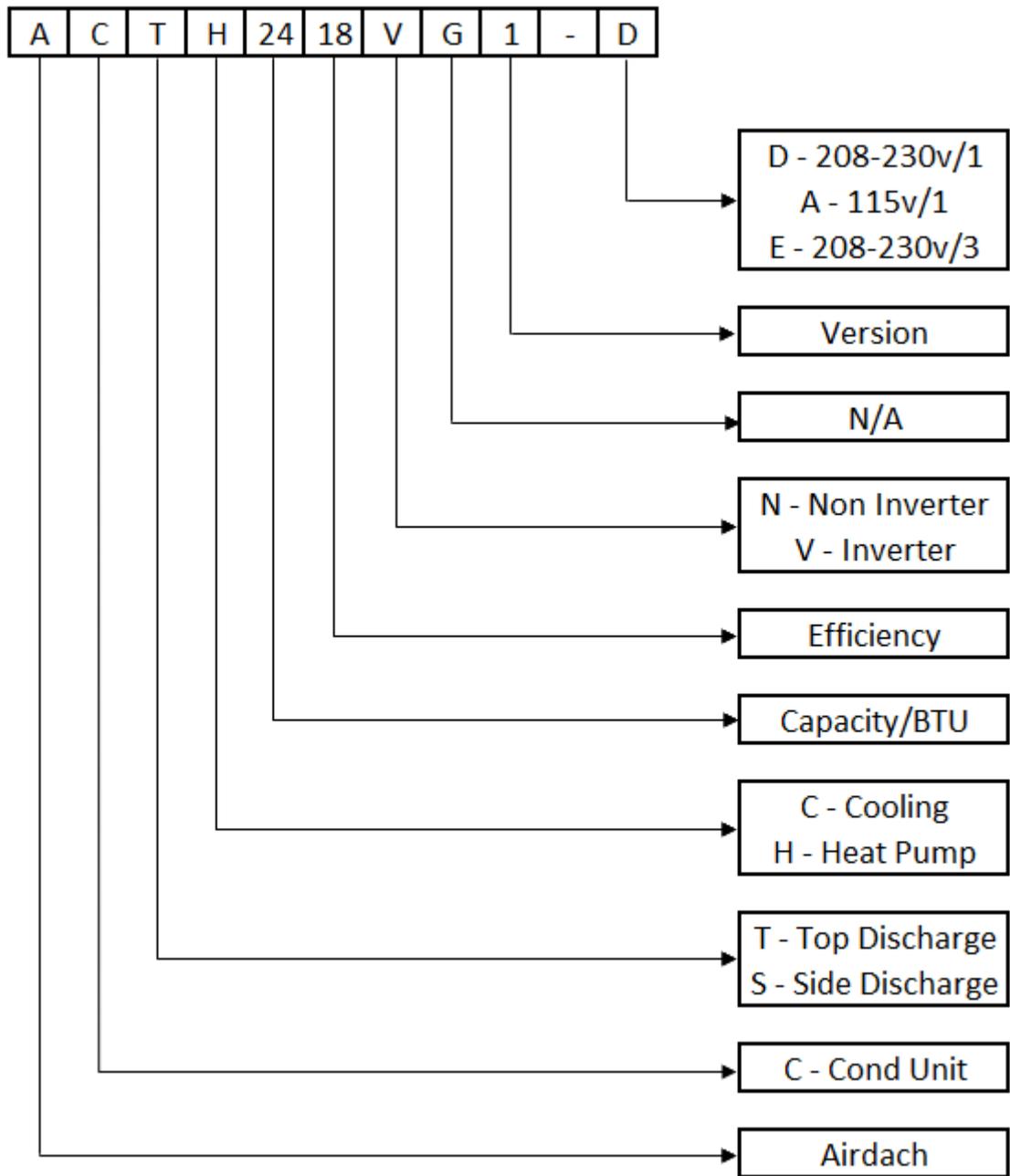
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1. Nomenclature

1.1 Indoor unit



1.2 Outdoor unit



2. Model Names of Indoor/Outdoor Units

2.1 Indoor Units

Model name	Dimension(H×W×D) (inch)	Power supply
AIDH2400VG1-D	45-3/4 × 19-2/3 × 22	208~230V-1Ph-60Hz
AIDH3600VG1-D	45-3/4 × 19-2/3 × 22	208~230V-1Ph-60Hz
AIDH4800VG1-D	53 × 22 × 24-1/2	208~230V-1Ph-60Hz
AIDH6000VG1-D	53 × 22 × 24-1/2	208~230V-1Ph-60Hz

2.2 Outdoor Units

Model name	Dimension(H×W×D) (inch)	Power supply
ACTH2418VG1-D	25 × 29-1/8 × 29-1/8	208~230V-1Ph-60Hz
ACTH3618VG1-D	25 × 29-1/8 × 29-1/8	208~230V-1Ph-60Hz
ACTH4818VG1-D	32-7/8 × 29-1/8 × 29-1/8	208~230V-1Ph-60Hz
ACTH6018VG1-D	32-7/8 × 29-1/8 × 29-1/8	208~230V-1Ph-60Hz

3. External Appearance

3.1 Indoor unit



3.2 Outdoor unit



Note: Standard outdoor unit is using plastic grill. Metal grill can be customized.

4. Features

4.1 Wide operation range, down to 10°F degree for heating.

4.2 Well-known brand inverter compressor, reliable quality.

4.3 Intelligent defrost programs, unit will choose different defrost program according to real condition.

4.4 Condenser coils constructed with copper tubing and enhanced aluminum fins.

4.5 Use EXV (heating) and TXV(cooling) as expansion device;

4.6 Direct drive motors, 3-speed, provide selections of air flow to meet desired applications.

4.7 24V control, time delay relay, fan relay and transformer included.

4.8 R410A environment friendly refrigerant.

4.9 AHRI certification, ETL certification.

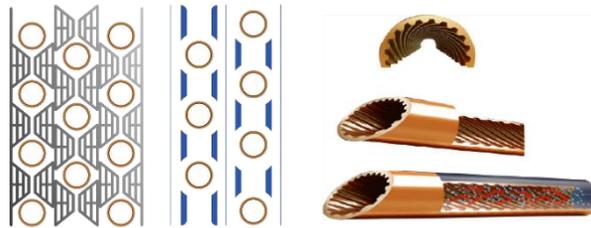
Part 2. Indoor Unit

Air Handler Type

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1. Features

(1) "A" shape coils, constructed with copper tubing and enhanced aluminum fins



(2) Direct drive motors, 3 speed, provide selections of air flow to meet desired applications. 10" big fan, powerful wind. Motor is covered with thermal insulator, keep motor running in safety status.

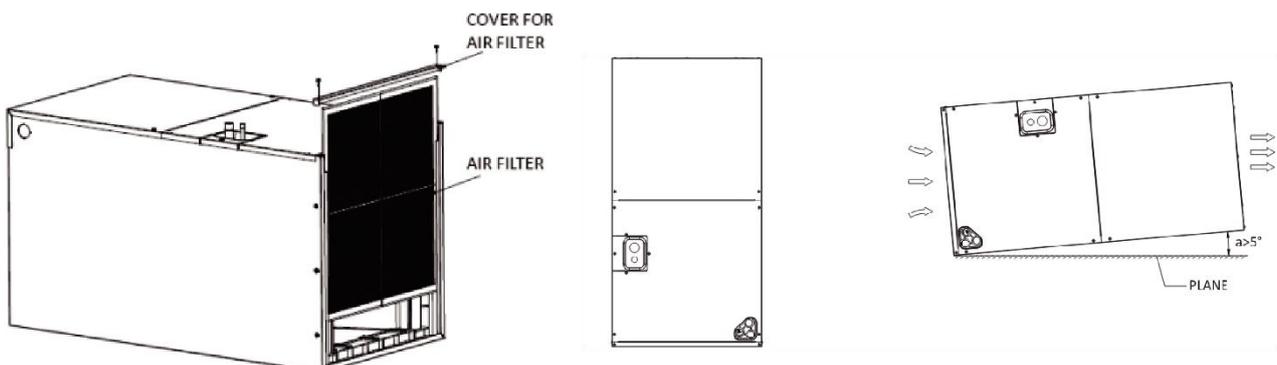


(4) Use TXV as expansion device (18 SEER air handler)



(5) Detachable air filter for cleaning or renewal

Versatile 4-way convertible design for vertical up airflow, horizontal right airflow.



2. Specification

Model		AIDH2400VG1-D	AIDH3600VG1-D	AIDH4800VG1-D	AIDH6000VG1-D	
Power supply		V/Ph/Hz	208-230V/1PH/60Hz			
Cooling	Capacity	Btu/h	24000	34500	47000	56000
	Minimum Circuit Ampacity	A	17.7	24.2	31.9	36.5
	Max. Overcurrent Protection	A	30	40	50	60
	SEER		17.5	17.5	17.5	17.5
Heating	Capacity	Btu/h	24000	34500	46500	55000
	HSPF		9.5	9.0	9.5	9.5
Indoor coil	Number of rows		4×2	4×2	4×2	5×2
	Tube outside dia. / Type	in	0.28 inch / Inner groove tube			
	Fin spacing / Thickness / Type	in. / in.	0.062 / 0.0037 / Hydrophilic aluminum			
	Tube pitch(a) × row pitch(b)	in	0.53 × 0.83	0.53 × 0.83	0.53 × 0.83	0.53 × 0.83
Indoor motor	Type		ECM			
	Rated HP		1/3	1/2	3/4	3/4
	Rated RPM	r/min	770	870	1050	1120
	FLA		2.8	4.1	6.0	6.0
Indoor fan	Material		Galvanized plate			
	Type		Centrifugal			
	Diameter	inch	11	11	11	11
	Height	inch	10-5/8	10-5/8	10-5/8	10-5/8
Indoor air flow		CFM	830	1100	1500	1750
ESP		Pa	25	37.5	50	50
Indoor noise level		dB(A)	63	66	67	68
Metering device	Throttle type		TXV			
	Model number		3TR	3TR	5TR	5TR
Electrical Data	Voltage-Phase-Hz	V-Ph-Hz	208/230V 1Ph 60Hz			
	Minimum Circuit Ampacity		3.5	5.1	7.5	7.5
	Max. Overcurrent Protection		15	15	15	15
	Min / Max Volts	V	187 / 253	187 / 253	187 / 253	187 / 253
	Dimension Unit (H×W×D)	in.	45-3/4 × 19-2/3 × 22		53 × 22 × 24-1/2	
	Packing (H×W× D)	in.	47-3/5×22-7/8×25-3/5		54-3/4×25-1/8×28	
	Net / Gross weight	lbs.	126 / 139	126 / 139	170 / 188	170 / 188
Refrigerant piping Liquid side / Gas side		in.	3/8 / 3/4	3/8 / 3/4	3/8 / 7/8	3/8 / 7/8

Notes:

- Nominal cooling capacities are based on the following conditions:
Indoor temp: 80°FDB, 66°FWB; Outdoor temp: 95°FDB; Equivalent ref. piping: 5m (horizontal)
- Nominal heating capacities are based on the following conditions:
Indoor temp: 68°FDB; Outdoor temp: 44°FDB, 43°FWB; Equivalent ref. piping: 5m (horizontal)
- Actual noise level may differ, depending on the room structure, etc., since these noise values are from an anechoic room.

3. Dimension

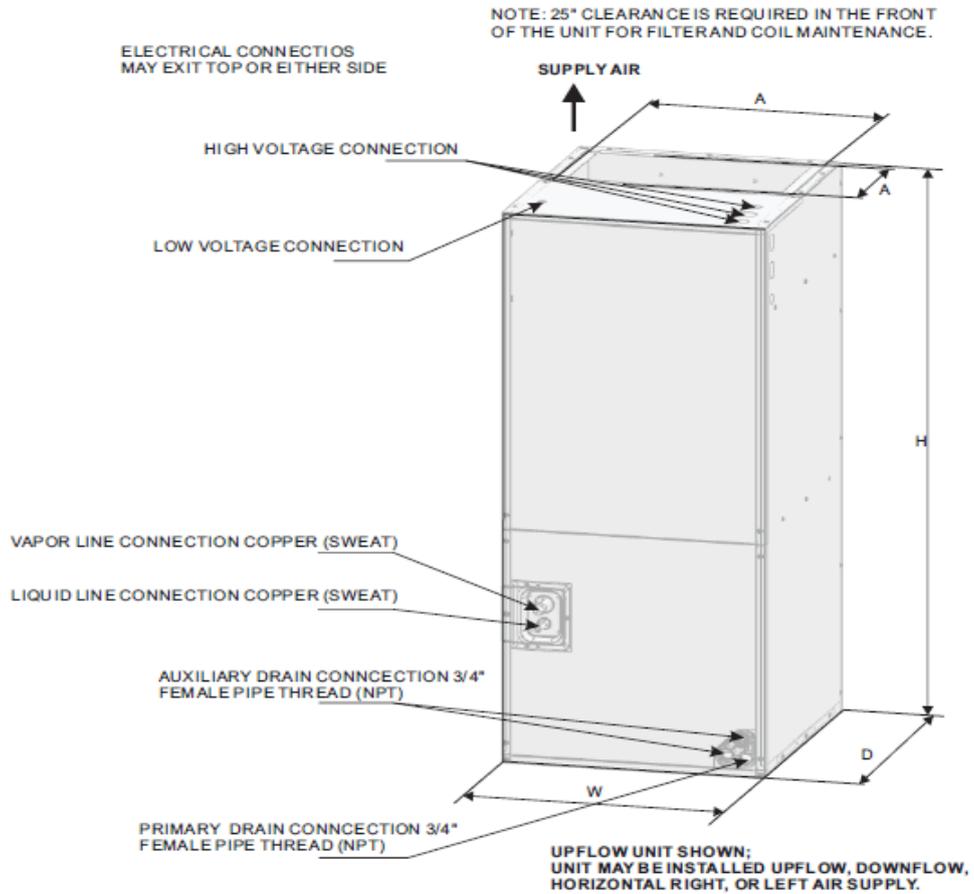


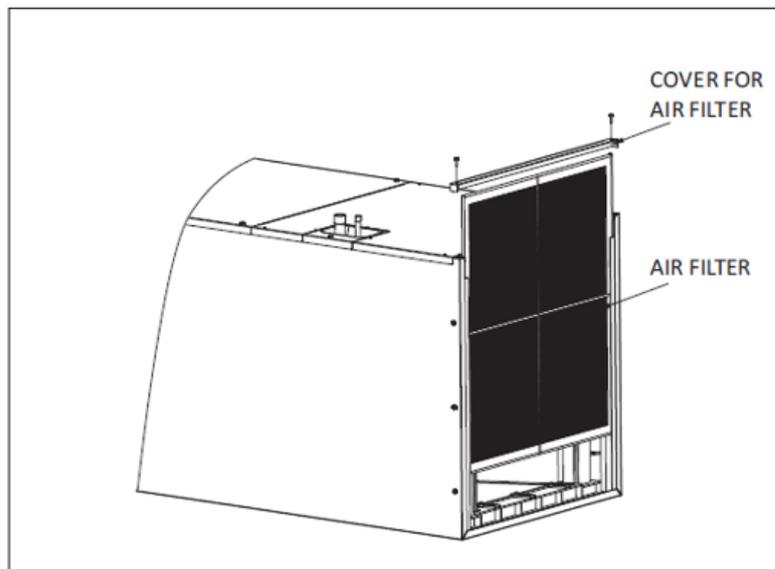
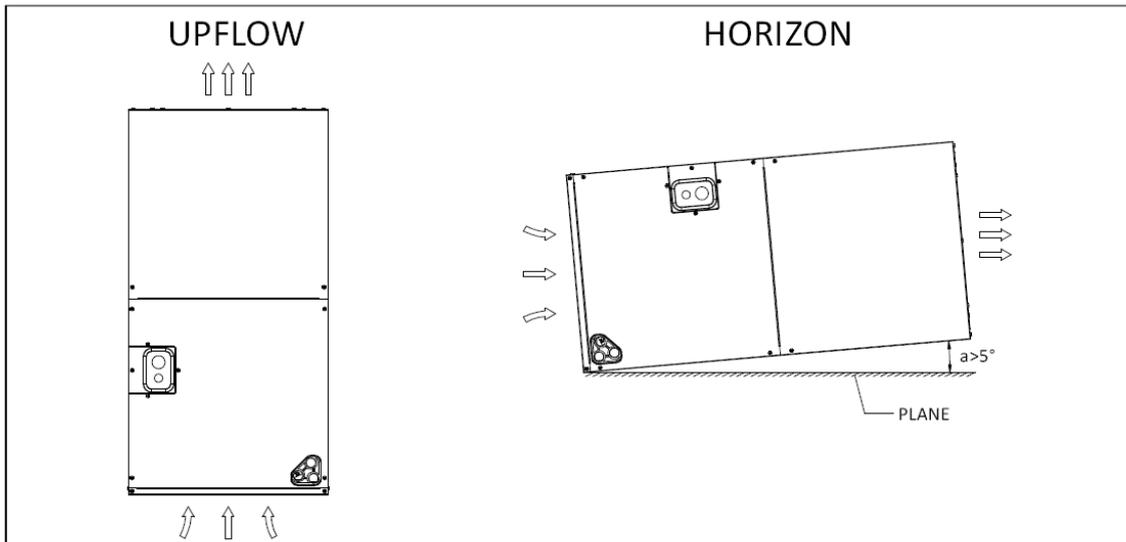
Fig.1 DIMENSIONS

DIMENSIONAL DATA					
MODEL SIZE	Dimensions				
	UNIT HEIGHT "H"/in	UNIT WIDTH "W"/in	UNIT LENGTH "D"/in	SUPPLY DUCT "A"/in	LIQUID LINE / VAPOR LINE IN
24K	45-3/4	19-2/3	22	17.87	3/8" / 7/8"
36K	45-3/4	19-2/3	22	17.87	3/8" / 7/8"
48K	53	22	24-1/2	19.53	3/8" / 7/8"
60K	53	22	24-1/2	19.53	3/8" / 7/8"

4. Service Space

The indoor unit should be installed in a location that meets the following requirements:
INSTALLATION NOTES:

1. Vertical up airflow: For the method of trapping or plugging all drains, see the pic on the left.
2. Horizontal right airflow: For the method of installation, see the pic on the right.
3. The seal-plugs are supplied as accessories and be screwed tightly only with hand.

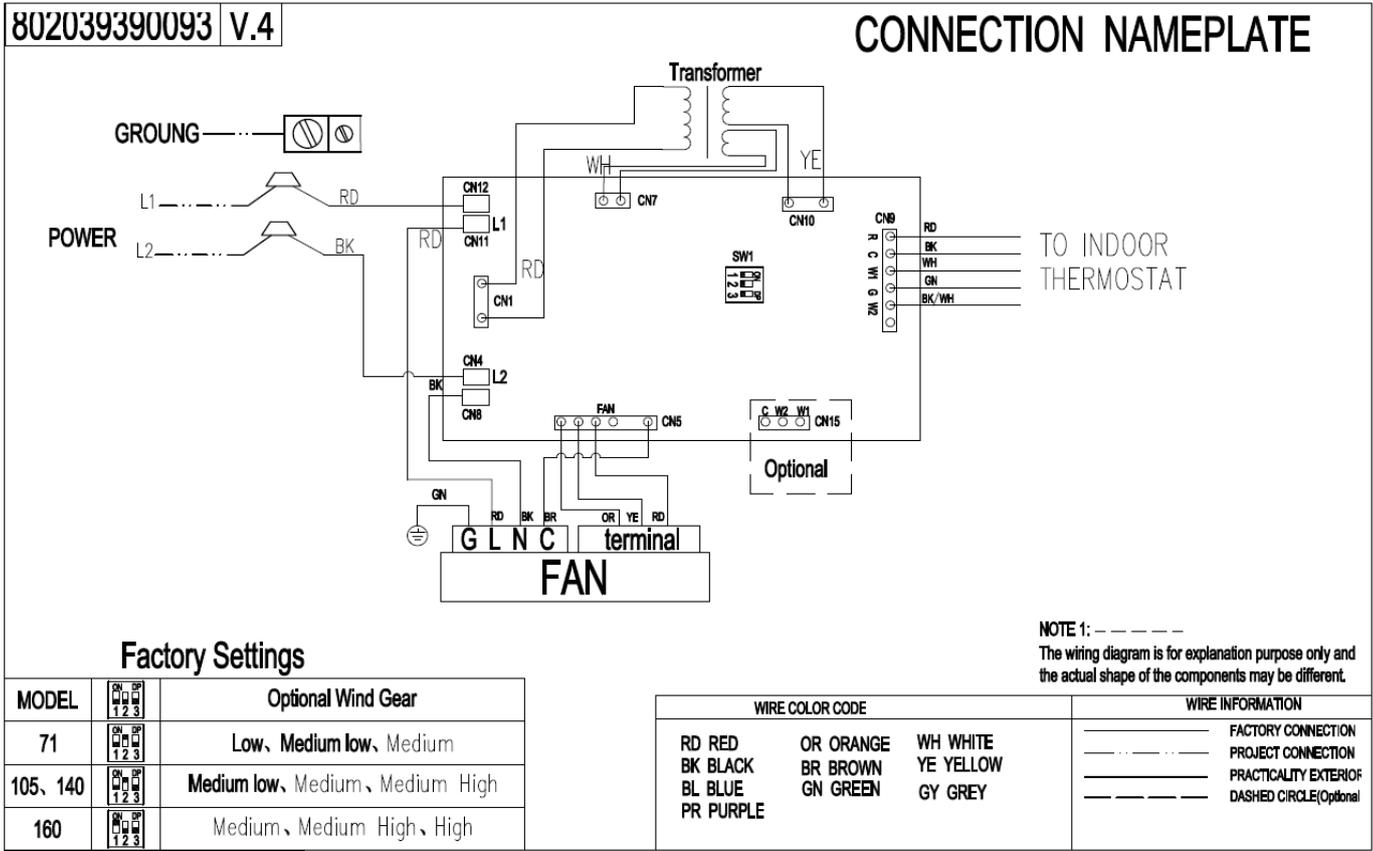


MODEL	FILTER SIZE (inches)
18/24/30/36/42	18x20
48/60	20x22

The thickness of the filter is 1 inch.

5. Wiring Diagrams

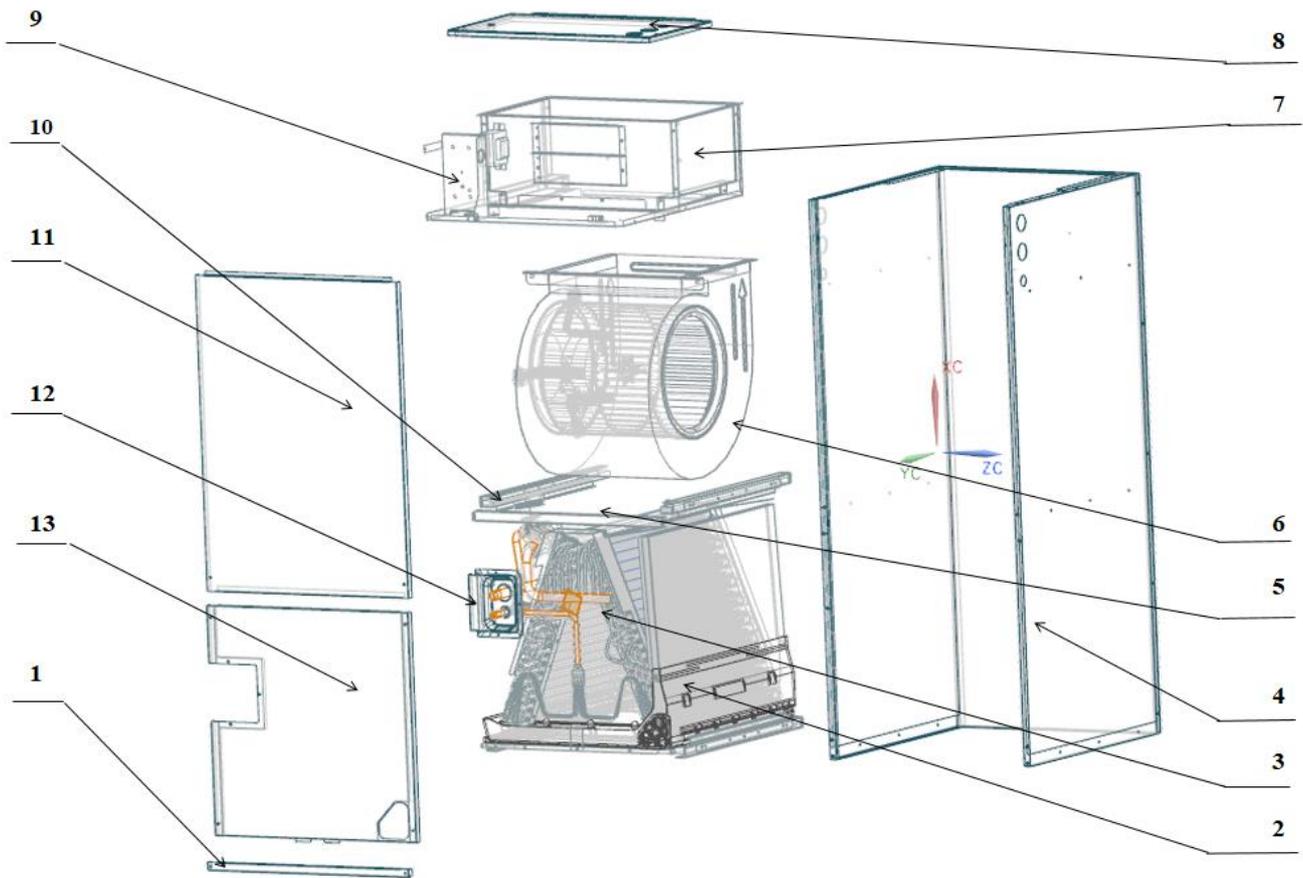
24K/36K/48K/60K



6. Electric Characteristics

Model	Indoor Units			
	Hz	Voltage	Min.	Max.
AIDC2400NG1-D	60	208-230V	198V	242V
AIDC3600NG1-D	60	208-230V	198V	242V
AIDC4800NG1-D	60	208-230V	198V	242V
AIDC6000NG1-D	60	208-230V	198V	242V

7. Exploded View



No.	Part Name	Quantity
1	Filter Cover plate	1
2	Water pan components	1
2.1	Water pan# 1	1
2.2	Water pan# 2	1
2.3	Water pan fixed block	1
2.4	Water pan brace	2
3	Evaporator pre-welded assembly	1
3.1	Air header Assembly	1
3.2	Diverter Assembly	1
3.3	TXV	1
3.4	Connecting pipe	1
3.5	Evaporator	2
3.6	Evaporator Baffle	1
3.7	Evaporator baffle welded assembly	1
3.8	Evaporator Water Baffle #1	2

3.9	Evaporator Water Baffle #2	1
3.10	Evaporator Water Baffle #3	1
3.11	Evaporator Fixing Plate #1	1
3.12	Evaporator Fixing Plate #2	1
3.13	Evaporator Junction Plate	1
4	Chassis assembly	1
5	Supporter	2
6.1	Right Volute Wind Wheel	1
6.2	Indoor Motor	1
7	Fan Motor Fixing plate assembly	1
7.1	Fan Motor Fixing plate	1
7.2	Wind Wheel Fixed Block	2
7.3	Fixed plate on air duct	1
7.4	Stator	2
7.5	air duct left stationary plate	1
7.6	air duct right stationary plate	1
8	Electronically Controlled Cover Plate Cotton Pasting Component	1
9	Electronic Control Components	1
9.1	Electronic Control Mounting Plate	1
9.2	Main Board	1
9.3	Transformer	1
10	Water pan supporter assembly	4
11	Upper side plate assembly	1
12	Pipe Cover plate assembly	1
13	Lower side plate assembly	1

8. The Specification of Wiring

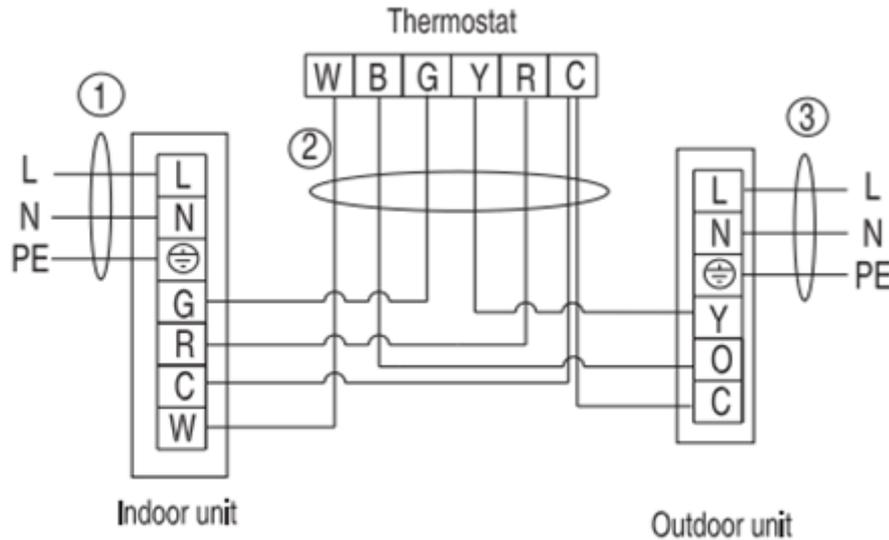
Note:

The cross-section areas of wires or lines should not be less than the corresponding ones listed in the table below; Besides, if the power wires is quite long from the unit, please choose the windings with larger cross-section area to guarantee the normal power supply.

Model	Type	Indoor power wire diameter	Thermostat communication wire diameter		Outdoor power wire diameter
			Indoor	Outdoor	
AIDC2400NG1-D	Cooling & heating	3*17Awg	4*18Awg	3*18Awg	3*14Awg
AIDC3600NG1-D	Cooling & heating	3*17Awg	4*18Awg	3*18Awg	3*14Awg
AIDC4800NG1-D	Cooling & heating	3*17Awg	4*18Awg	3*18Awg	3*12Awg
AIDC6000NG1-D	Cooling & heating	3*17Awg	4*18Awg	3*18Awg	3*12Awg

9. Field Wiring

1. To avoid the electrical shock, please connect the air conditioner with the ground lug. The main power plug in the air conditioner has been joined with the ground wiring, please don't change it freely.
2. The power socket is used as the air conditioner specially.
3. Don't pull the power wiring hard.
4. When connecting the air conditioner with the ground, observe the local codes.
5. If necessary, use the power fuse or the circuit, breaker or the corresponding scale ampere.



Applicable for 24k, 36k, 48k, 60k cooling & heating type

10. Troubleshooting

The fault codes for indoor unit as follows:

Display mode	Status description
Green light always on	No system alarm and error, normal standby
Red light always on	Evaporator tube temperature sensor(T 2) failure
Green light always on, yellow light flashing	Evaporator high and low temperature protection
Green light flashing	system is in normal operating status

Part 3 Outdoor Unit

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1. Specification

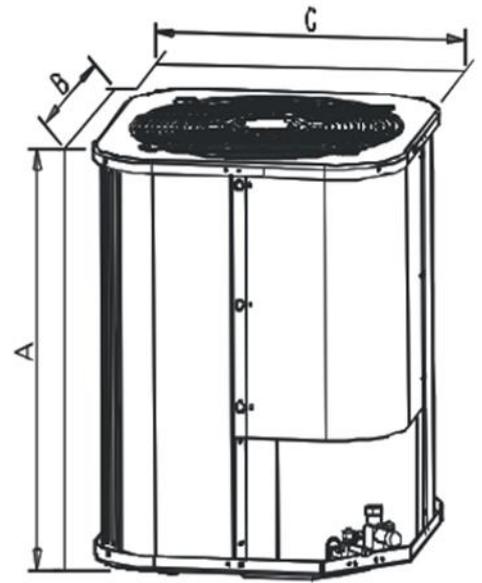
Model			ACTH2418VG1-D	ACTH3618VG1-D	ACTH4818VG1-D	ACTH6018VG1-D
Electrical Data	Voltage-Phase-Hz	V-Ph-Hz	208/230V-1Ph-60Hz			
	Minimum Circuit Ampacity	A	17.7	24.2	31.9	36.5
	Max. Overcurrent Protection	A	30	40	50	60
	Min / Max Volts	V	187 / 253	187 / 253	187 / 253	187 / 253
Cooling	Capacity	Btu/h	24000	34500	47000	56000
	EER	Btu/h.W	11.6	11.6	11.6	11.2
	SEER	Btu/h.W	17.5	17.5	17.5	17.5
Heating	Capacity	Btu/h	24000	34500	46500	55000
	HSPF	Btu/h.W	9.5	9.0	9.5	9.5
Compressor	Model		ATM240D57UMT	ATM240D57UMT	MNB42FCKMC-L	MNB42FCKMC-L
	Brand		GMCC	GMCC	Mitsubishi	Mitsubishi
	Type		Twin-rotary DC	Twin-rotary DC	Twin-rotary DC	Twin-rotary DC
	Capacity	W/h	7130±5%	7130±5%	13780±5%	13780±5%
	Input	W	2200±5%	2200±5%	4040±5%	4040±5%
	Rated current (RLA)	A	9.7	9.7	11.80	11.80
	Refrigerant oil	oz	29.42	29.42	47.34	47.34
	RLA		13.5	13.5	27.2	27.2
Outdoor motor	LRA		45	45	58.1	58.1
	Model		YDK-110-8P2-AL	YDK-110-8P2-AL	WZDK200-310G	WZDK200-310G
	Brand		Chigo	Chigo	Panasonic	Panasonic
	Type		AC	AC	DC	DC
	Rated HP	W	1/6	1/6	1/3	1/3
	Capacitor	µF	6	6	/	/
	Speed	rpm	40	40	60	60
Outdoor Fan	FLA	A	0.8	1	2.5	2.5
	Material		Metal			
	Type		Axial flow			
	Diameter	in.	23-5/8	23-5/8	23-5/8	23-5/8
	Height	in.	2-3/4	4-1/2	4-1/2	4-1/2
Outdoor coil	Air flow	CFM	2950	2950	4100	4100
	Number of row		1	2	2	2
Outdoor noise level	Tube outside dia	in	9/32	9/32	9/32	9/32
	Outdoor noise level	dB(A)	75	77	79	79
Outdoor unit	Dimension (H×W×D)	in.	24-15/16×29-1/8×29-1/8		32-7/8×29-1/8×29-1/8	
	Packing (H×W×D)	in.	26-1/4×30-1/5×30-1/5		34-1/2×30-1/5×30-1/5	
	Net / Gross weight	lbs.	157 / 165	157 / 165	201 / 211	201 / 211
Refrigerant system	Liquid side / Gas side	in.	3/8 / 3/4	3/8 / 3/4	3/8 / 7/8	3/8 / 7/8
	Factory charge R410A	oz	114	114	166	166
	Metering device		EEV	EEV	EEV	EEV
	Max. refrigerant pipe length	Ft	100	100	100	100
	Max. difference in level	Ft	50	50	50	50

2. Dimensions

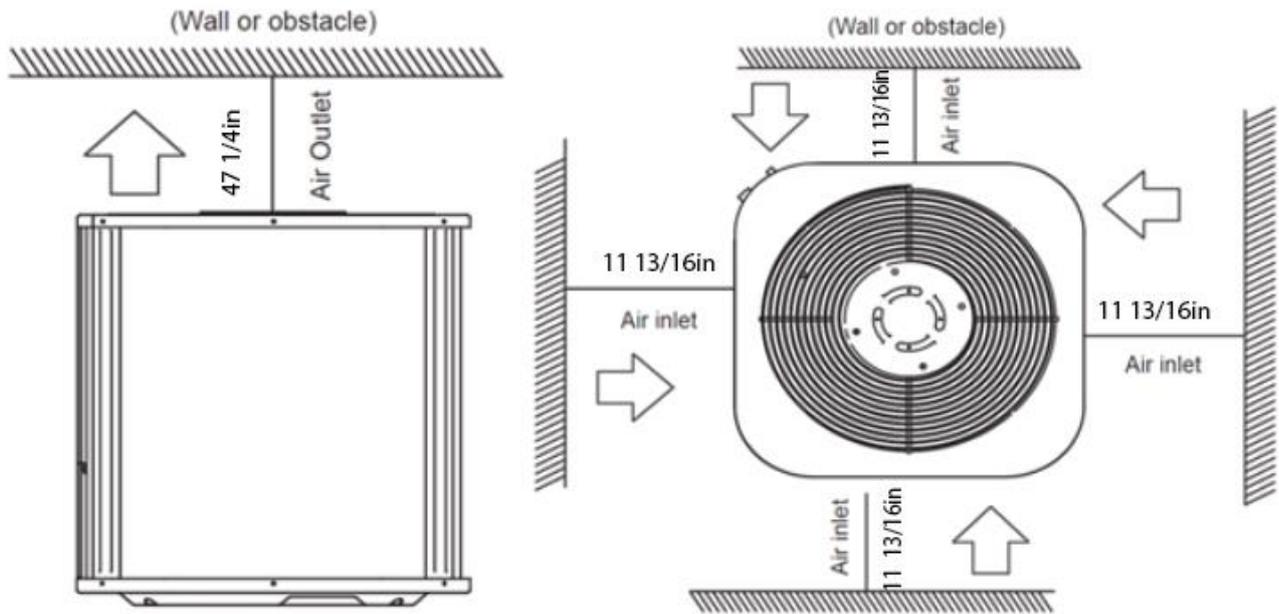
All dimensions are in inches. They are subject to change without notice. Certified dimensions will be provided upon request.

Unit Model	Dimensions (in)			Refrigerant Connection Line Size (in)			
	A	B	C	Liquid		Vapor	
				LF	RF	LF	RF
24	25	29-1/8	29-1/8	0.37		0.75	
36	25	29-1/8	29-1/8			0.75	
48	32-7/8	29-1/8	29-1/8			0.87	
60	32-7/8	29-1/8	29-1/8			0.87	

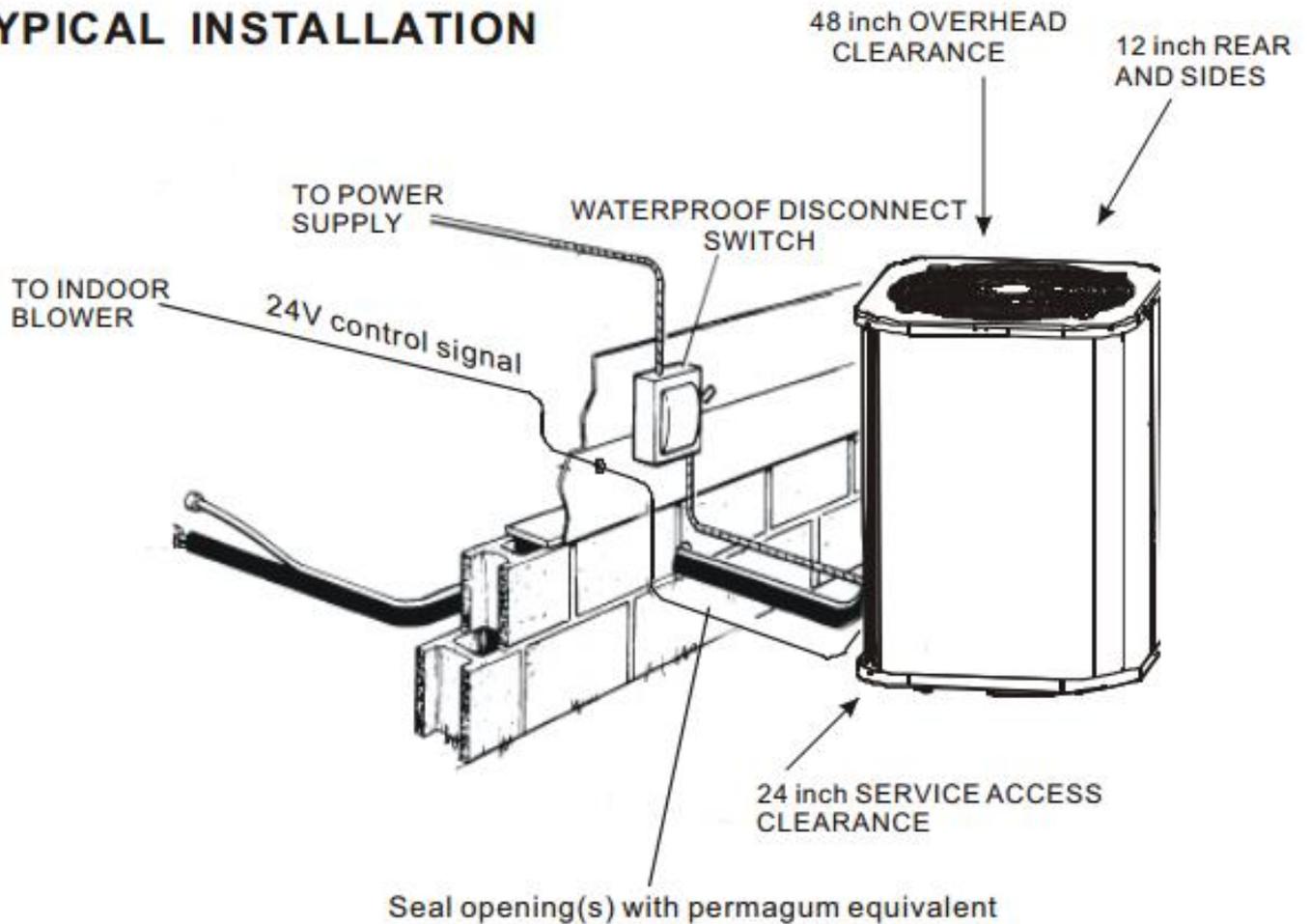
NOTE: LF means cooling only model; RF means heat pump model.



4. Service Space

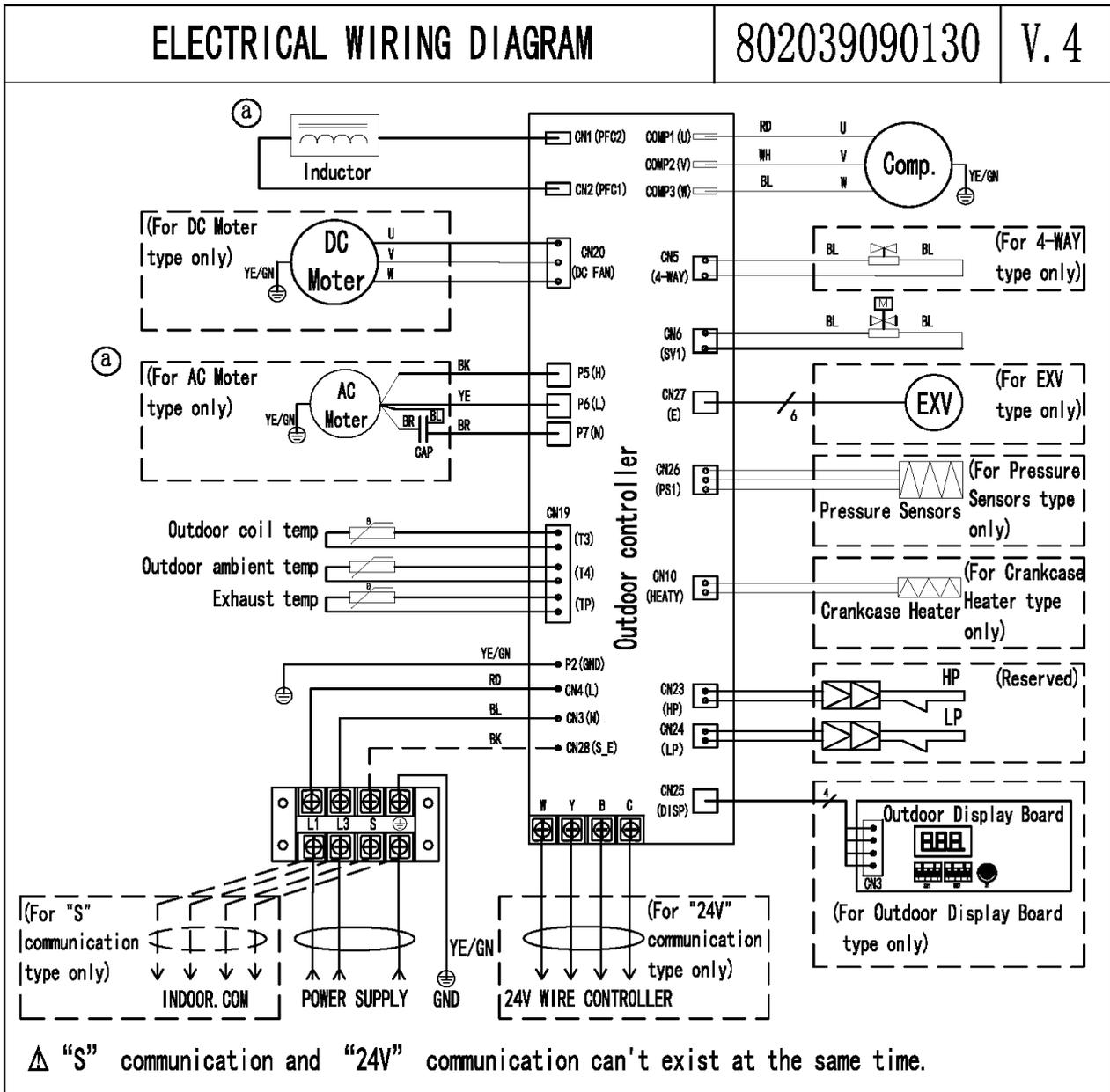


TYPICAL INSTALLATION



4. Wiring Diagrams

SEER 17.5 Heat pump



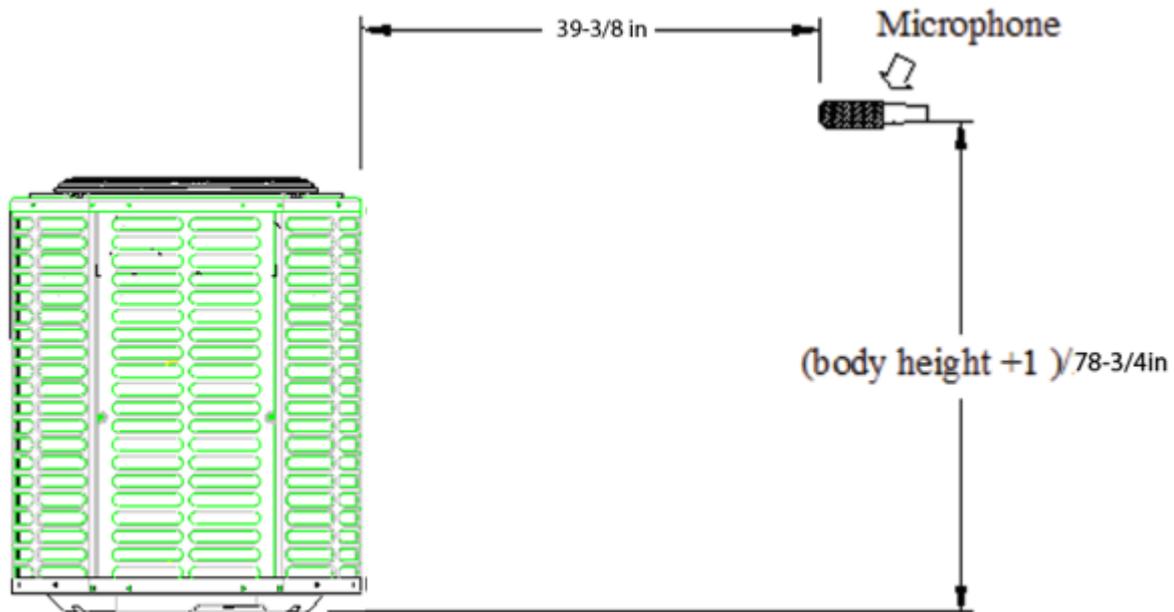
5. Electric Characteristics

Model	Outdoor Unit			
	Hz	Voltage	Min.	Max.
ACTH2418VG1-D	60	208~230V	187V	253V
ACTH3618VG1-D	60	208~230V	187V	253V
ACTH4818VG1-D	60	208~230V	187V	253V
ACTH6018VG1-D	60	208~230V	187V	253V

6. Operation Limits

Operation mode	Outdoor temperature (°F)	Room temperature (°F)
Cooling operation	50~118	≥61
Heating operation	5~75	<86

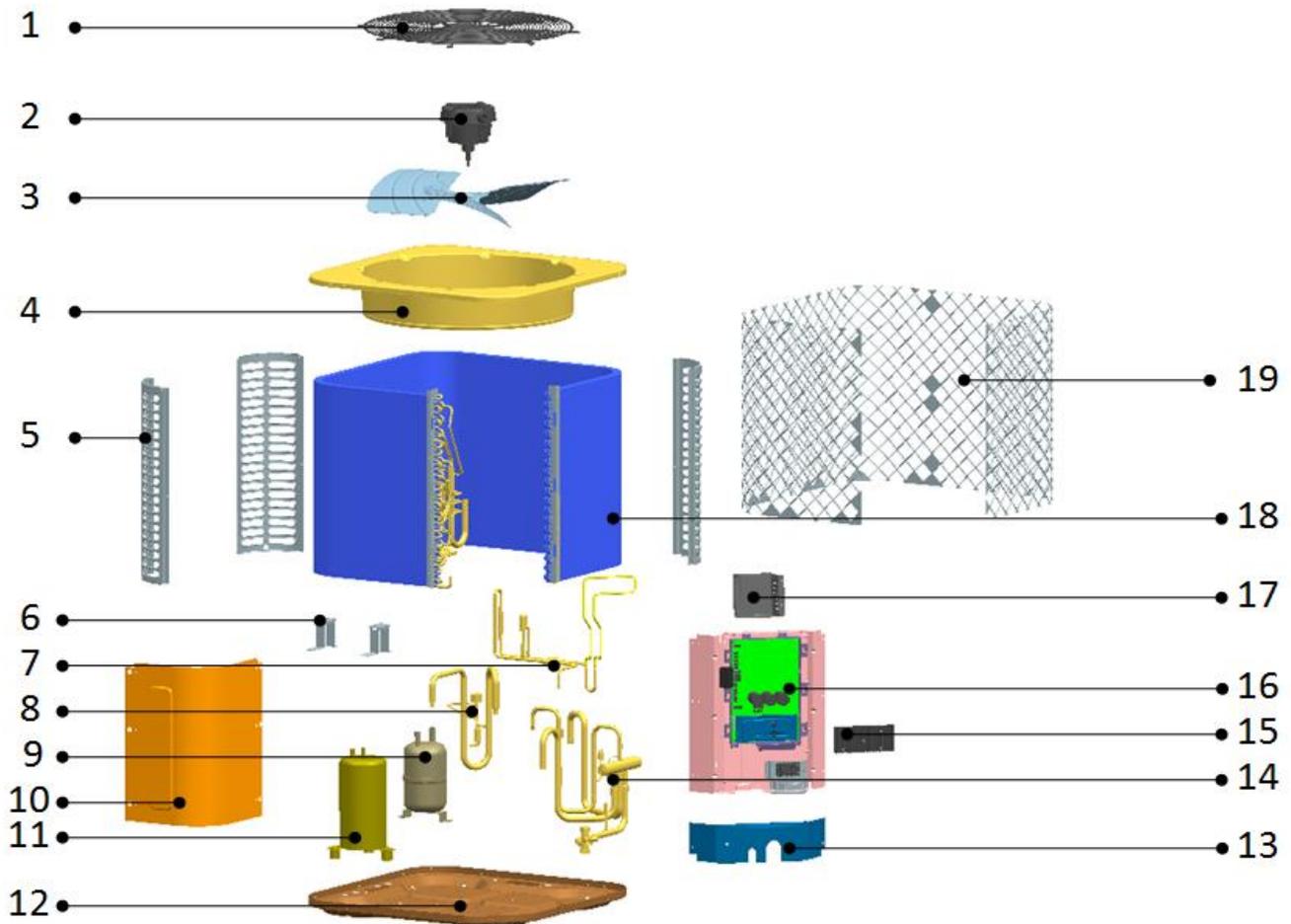
7. Sound Levels



Model	Noise level dB(A)
ACTH2418VG1-D	75
ACTH3618VG1-D	77
ACTH4818VG1-D	79
ACTH6018VG1-D	79

Note: Sound level is measured at a point 39.37in in front of the unit, at a height of (Unit body height +1)/78.74in.

8. Exploded View



No.	Part Name	Quantity
1	Cover net	1
2	Outdoor motor	1
3	Axial-flow fan	1
4	Top cover assembly	1
5	Support board	3
6	Piping support plate	2
7	Refrigerant radiating pipe component	1
8	Air return duct welding assembly	1
8.1	Solenoid Valve	1
8.2	Air return duct #1	1
8.3	Air return duct #2	1
8.4	Liquid bypass capillary assembly	1
8.5	Solenoid Valve coil	1
9	Gas-liquid separator	1
10	Top panel	1
11	Inverter Compressor	1
12	Chassis assembly	1

13	Left side panel	1
14	Pipeline component	1
14.1	High pressure valve welding assembly	1
14.1.1	High pressure valve connecting pipe	1
14.1.2	S.TL-ZL-FTF-A02	1
14.2	EXV welding assembly	1
14.2.1	Connecting pipe #1	1
14.2.2	Connecting pipe #2	1
14.2.3	Connecting pipe #3	1
14.2.4	Check valve	1
14.2.5	Bidirectional filter	1
14.2.6	Electronic expansion valve	1
14.2.7	Electronic expansion valve coil	1
14.3	Four-way valve welding assembly	1
14.3.1	Four-way valve	1
14.3.2	High pressure sensor	1
14.3.3	4-way valve connecting pipe #1 assembly	1
14.3.4	4-way valve connecting pipe #2 assembly	1
14.3.5	4-way valve connecting pipe #3 assembly	1
14.3.6	4-way valve connecting pipe #4 assembly	1
15	Radiator cover	1
16	Electronic components	1
16.1	Terminal	1
16.2	Outdoor display panel	1
16.3	Outdoor inverter integrated board	1
16.4	Reactor	1
16.5	Fan capacitor	1
16.6	Electronic controlled mounting plate welding parts	1
16.7	Mainboard mounting base	1
16.8	Communication board mounting base	1
16.9	Terminal mounting plate	1
17	Reactor mounting plate	1
18	Condenser unit	1
19	Top discharge outdoor unit protective net	1

9. Troubleshooting

9.1 Compressor driver chip

The compressor driver chip controls 2 LED lights, namely red light and green light, and the meaning of the fault light display is as follows:

Failure	Green light	Red light
<i>DC bus voltage over/low protection (MCE failure)</i>	ON	ON
<i>Normal standby</i>	ON	OFF
<i>EEPROM fault</i>	ON	FLASH
<i>Normal operation</i>	OFF	ON
<i>Compressor stall protection</i>	OFF	FLASH
<i>Phase protection, zero speed protection, synchronous fault</i>	FLASH	ON
<i>IGBT overcurrent or module protection</i>	FLASH	OFF
<i>Communication failure (host data cannot be received for 1min)</i>	FLASH	FLASH

* The flashing frequency is 2.5Hz, and display of fault code is based on the actual protection time.

9.2 Troubleshooting of sensor

Cooling mode:

Sensor	Operation mode in case of failure
T3	<i>The maximum operating temperature shall not exceed 140 °F</i>
T4	<i>Operate at T4 = 122°F</i>
TP	<i>Operate at T4 = 122°F for T4 temperature frequency limiting and current frequency limiting</i>

Heating mode:

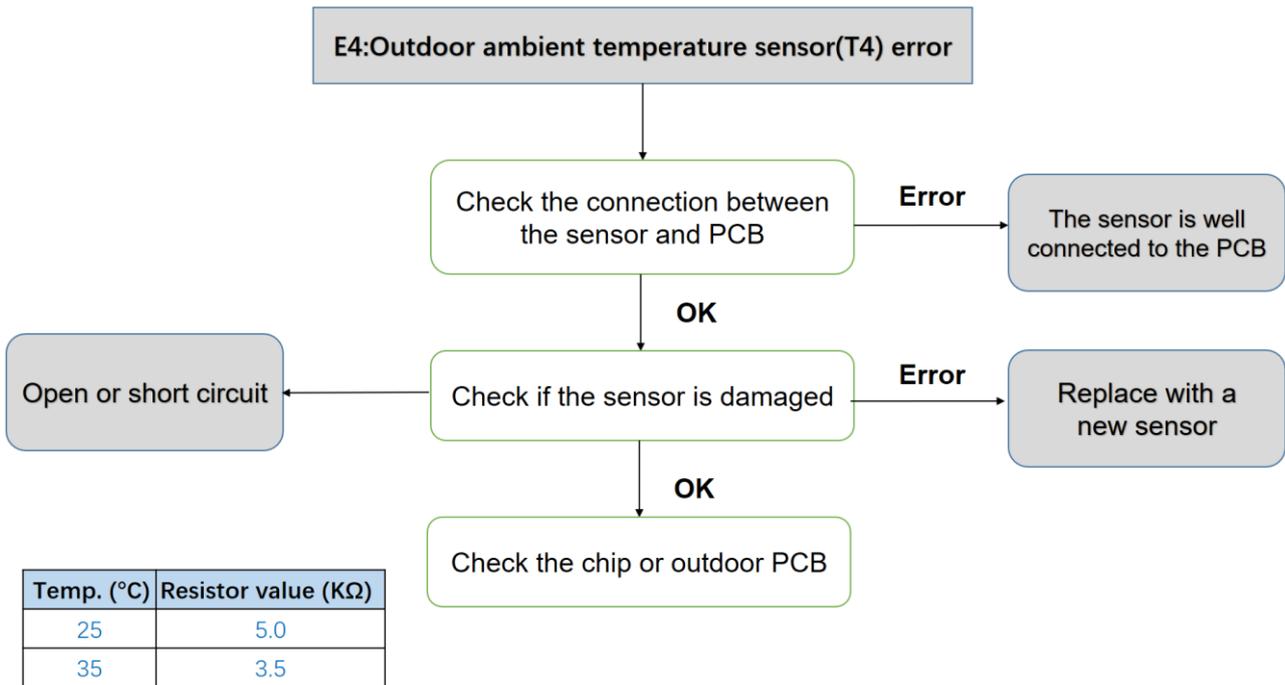
Sensor	Operation mode in case of failure
T3	<i>T4 <45°F: After 40 minutes of continuous operation, the compressor is forced to defrost once, and the defrosting time is 3 minutes. T4 ≥45°F: After 90 minutes of continuous operation, the compressor is forced to defrost once, and the defrosting time is 2 minutes.</i>
T4	<i>Operate at T4 = 59°F</i>
TP	<i>Operate at T4 = 59°F for T4 temperature frequency limiting and current frequency limiting Expansion valve operates at Tp = 266°F</i>

9.3 Error code

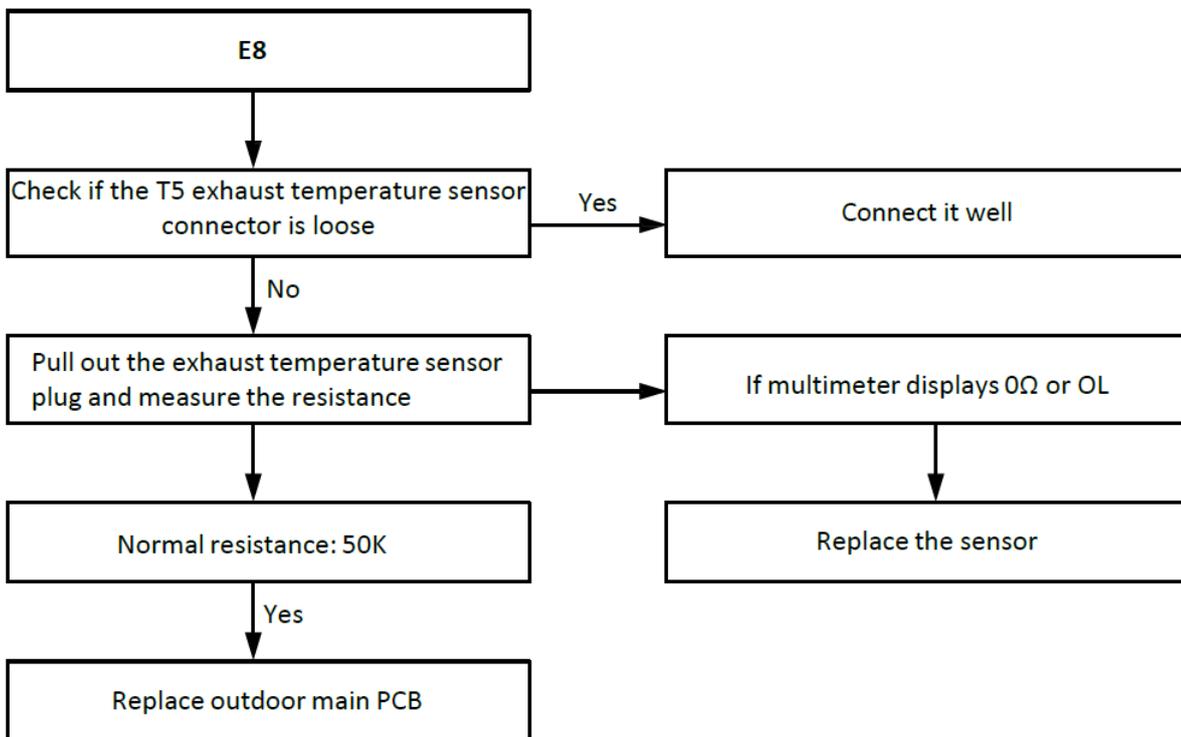
The fault codes for outdoor unit as follows:

NO	Error Code	Status description
1	E4	T4 outdoor ambient temperature sensor fault
2	E5	T5 Discharge temperature sensor fault
3	E6	T3 Outdoor heat exchanger temperature sensor fault
4	E9	AC voltage overvoltage / undervoltage protection
5	E10	EEPROM fault
6	H0	Communication fault of master board and driver chip
7	H4	IPM Module high temperature abnormal protection
8	H5	Refrigerant low pressure abnormal protection
9	H6	Exhaust high temperature abnormal protection
10	P1	High pressure protection
11	P2	Low pressure protection
12	P3	Inverter overcurrent protection
13	P4	Exhaust overheating protection
14	P5	T3 or T3B condenser pipe overheating protection
15	P6	IPM module protection
16	P9	DC fan motor fault
17	P11	T2 high temperature protection (Heating mode)

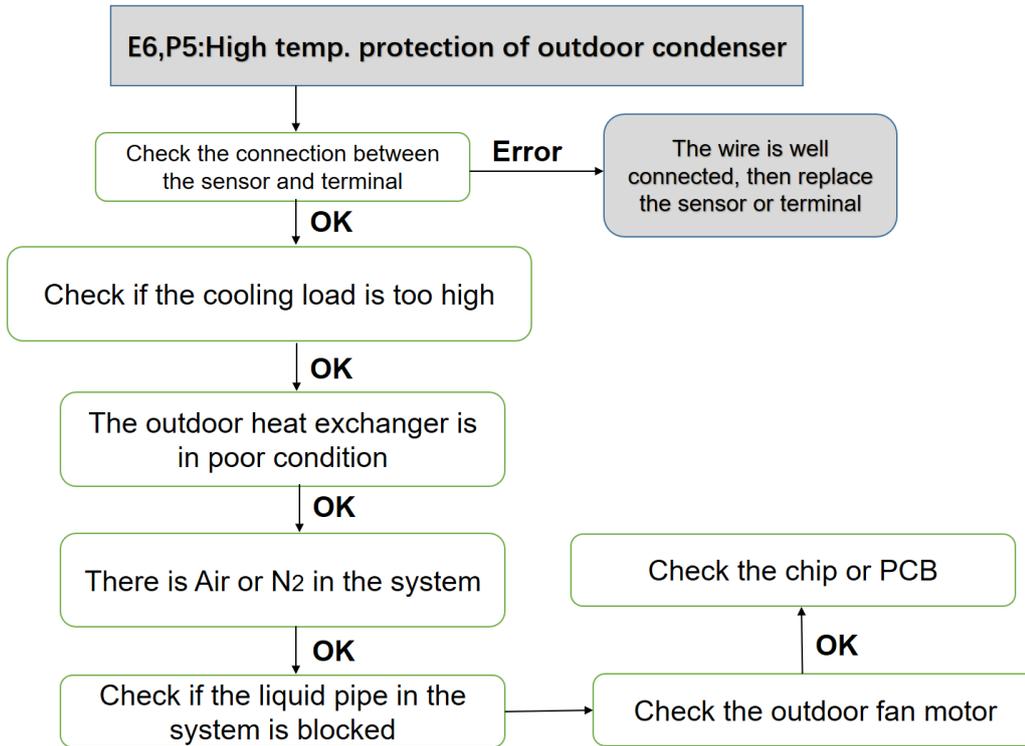
1. Error code: E4: T4 outdoor ambient temperature sensor fault



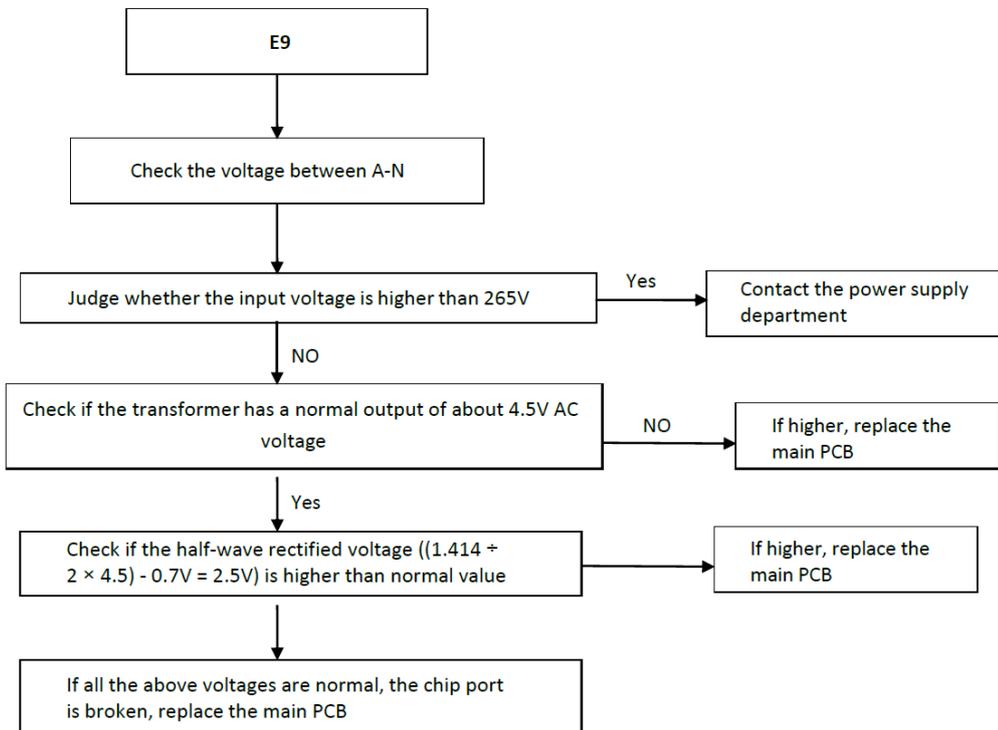
2. Error code: E5: T5 Discharge temperature sensor fault



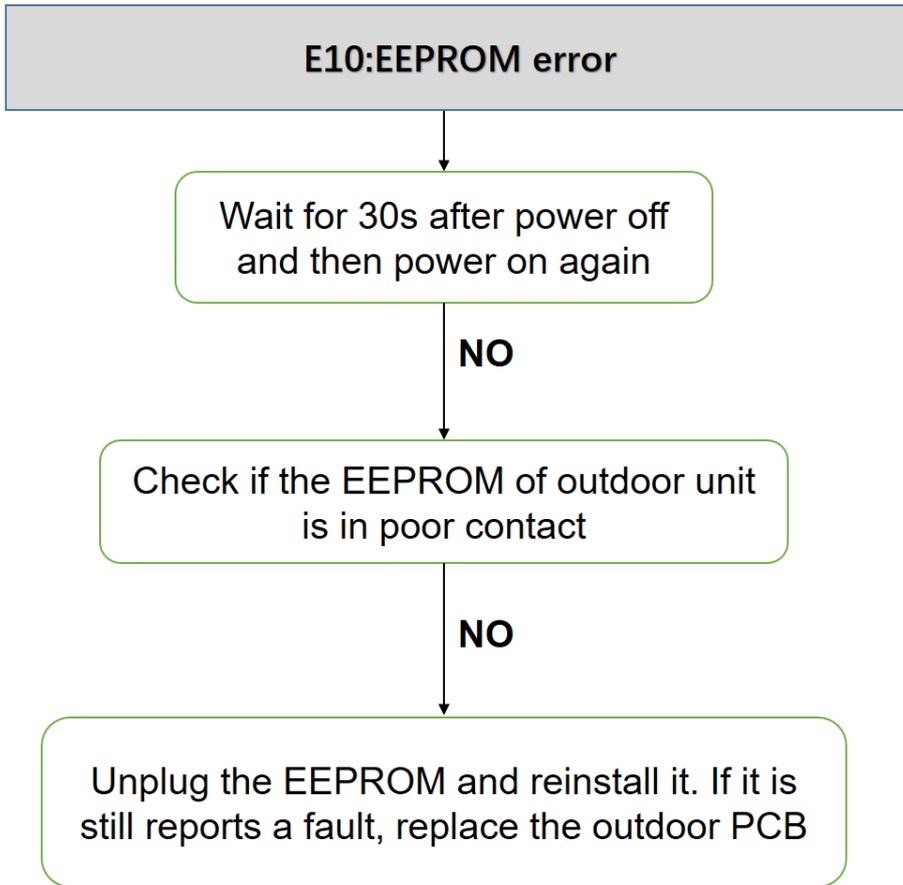
3. Error code: E6: T3 Condenser pipe temperature sensor fault (Outlet)



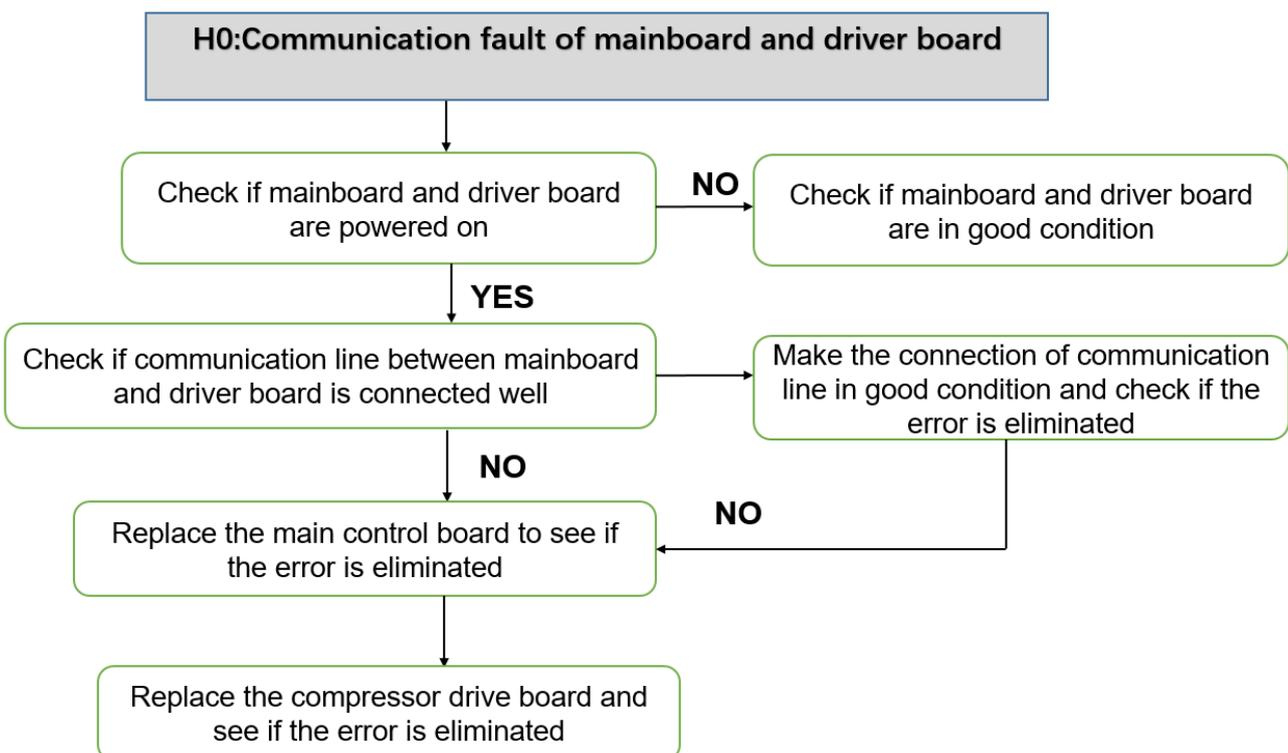
4. Error code: E9: AC voltage overvoltage / undervoltage protection



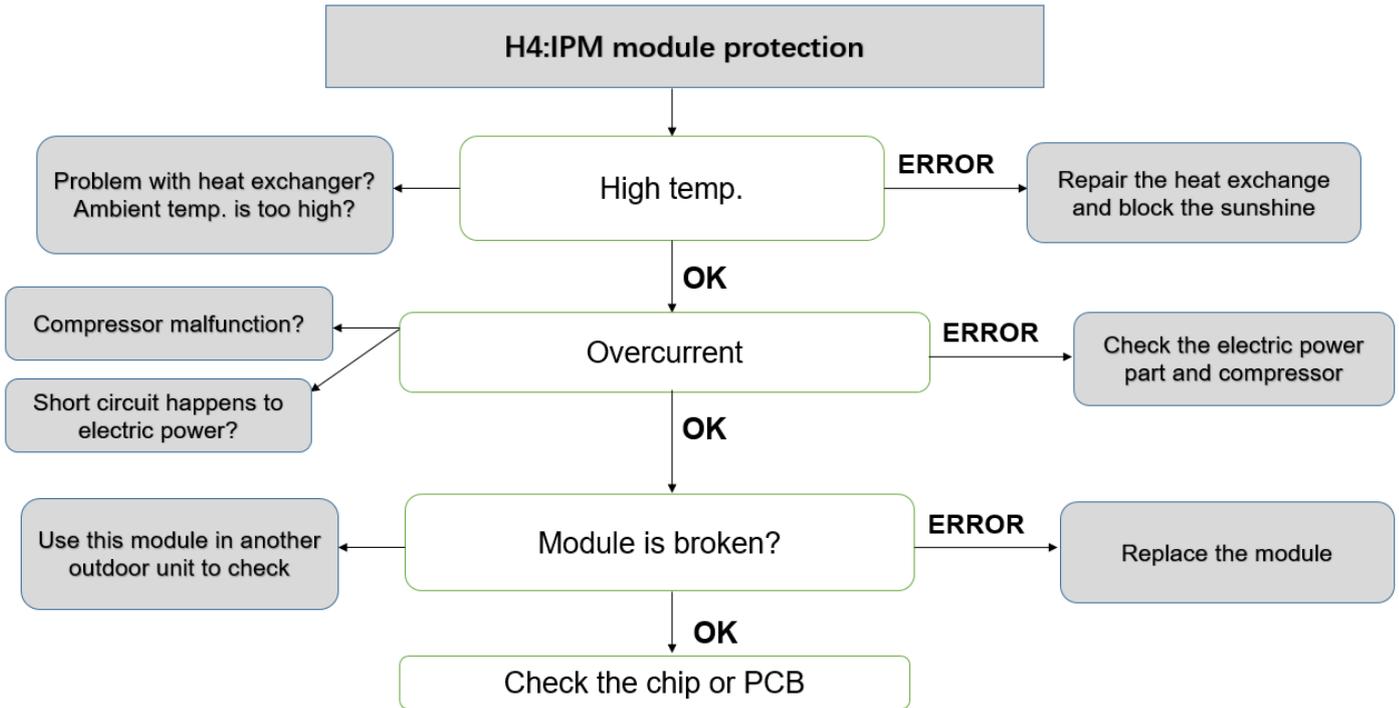
5. Error code: E10: EEPROM error



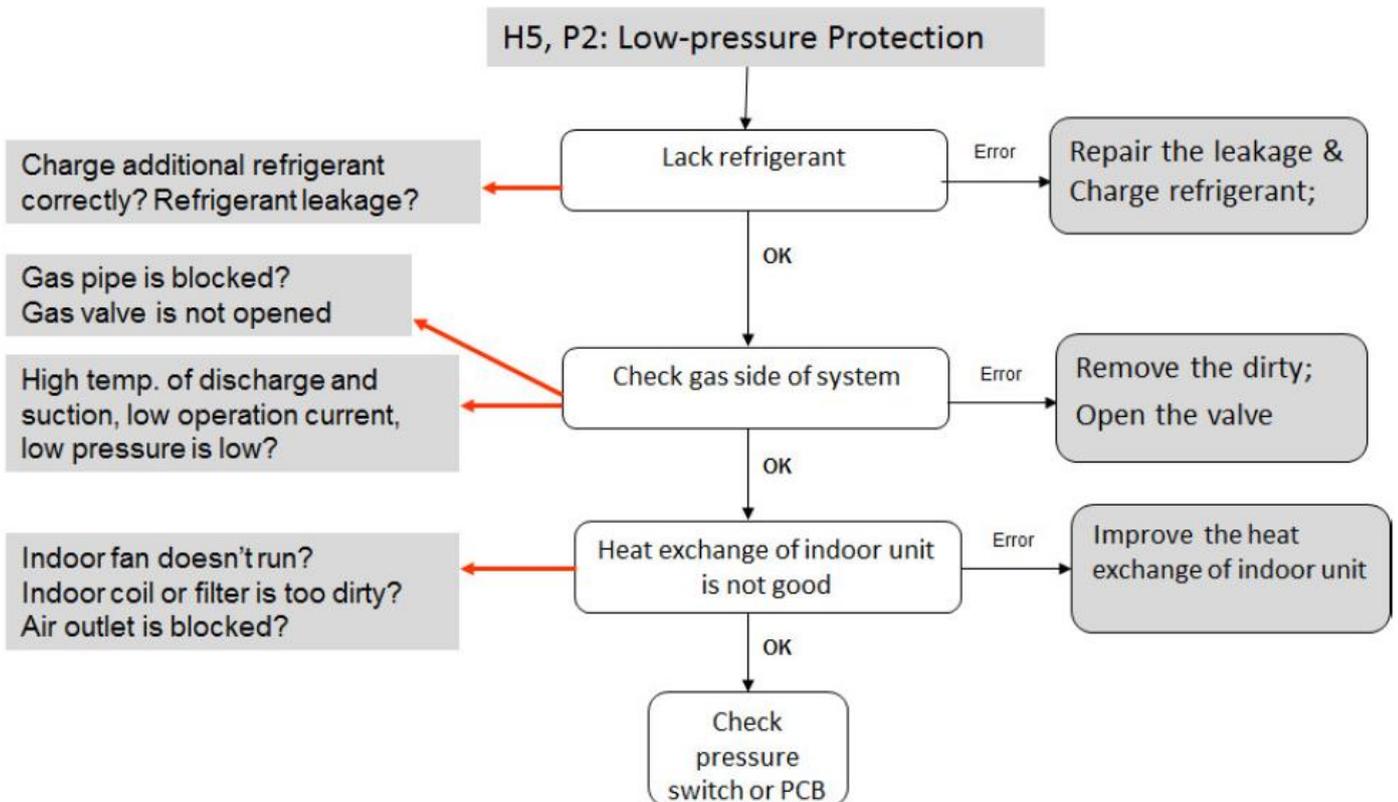
6. Error code: H0: Communication fault of master board and drive board



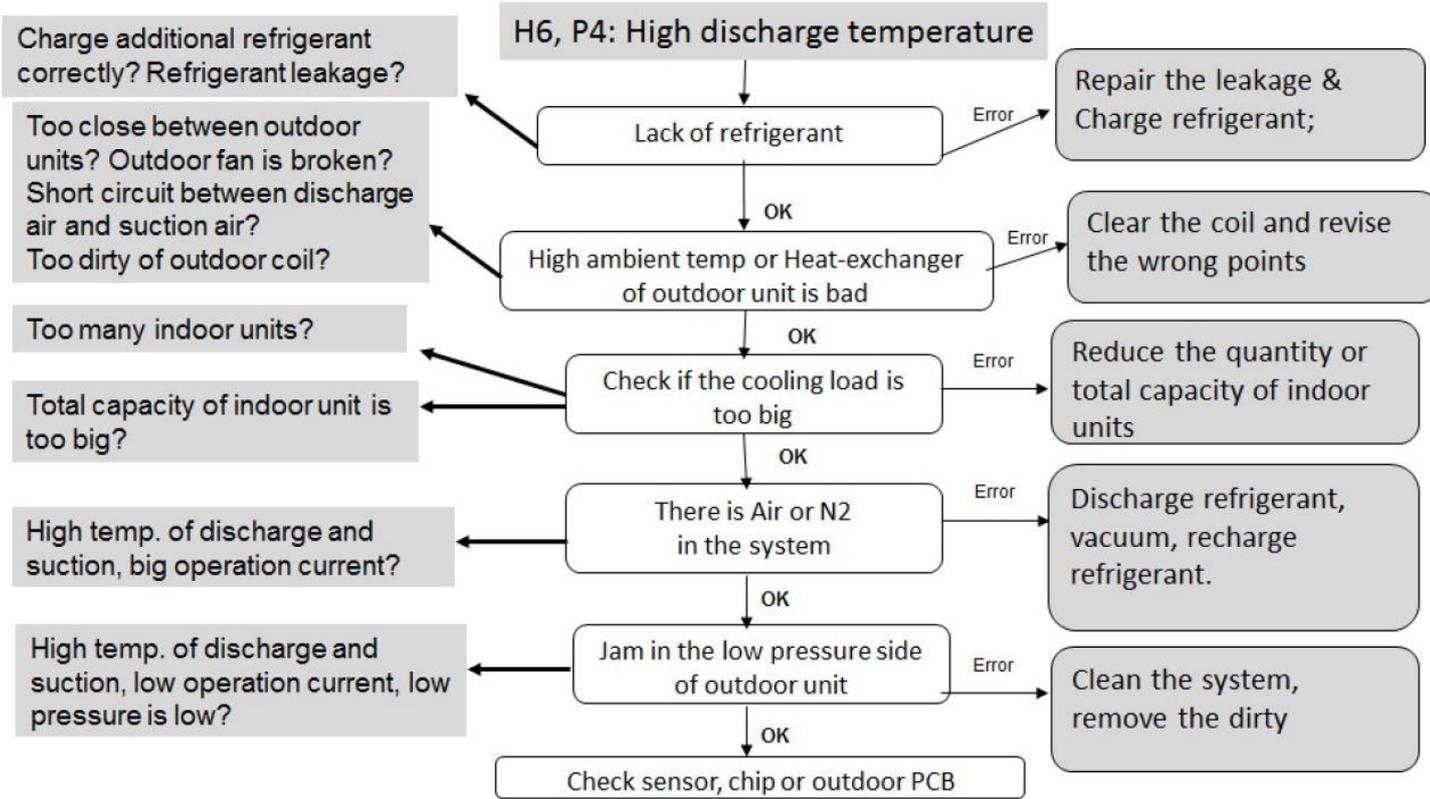
7. Error code: H4: Display P6 for 3 times within 30 mins (IPM module protection)



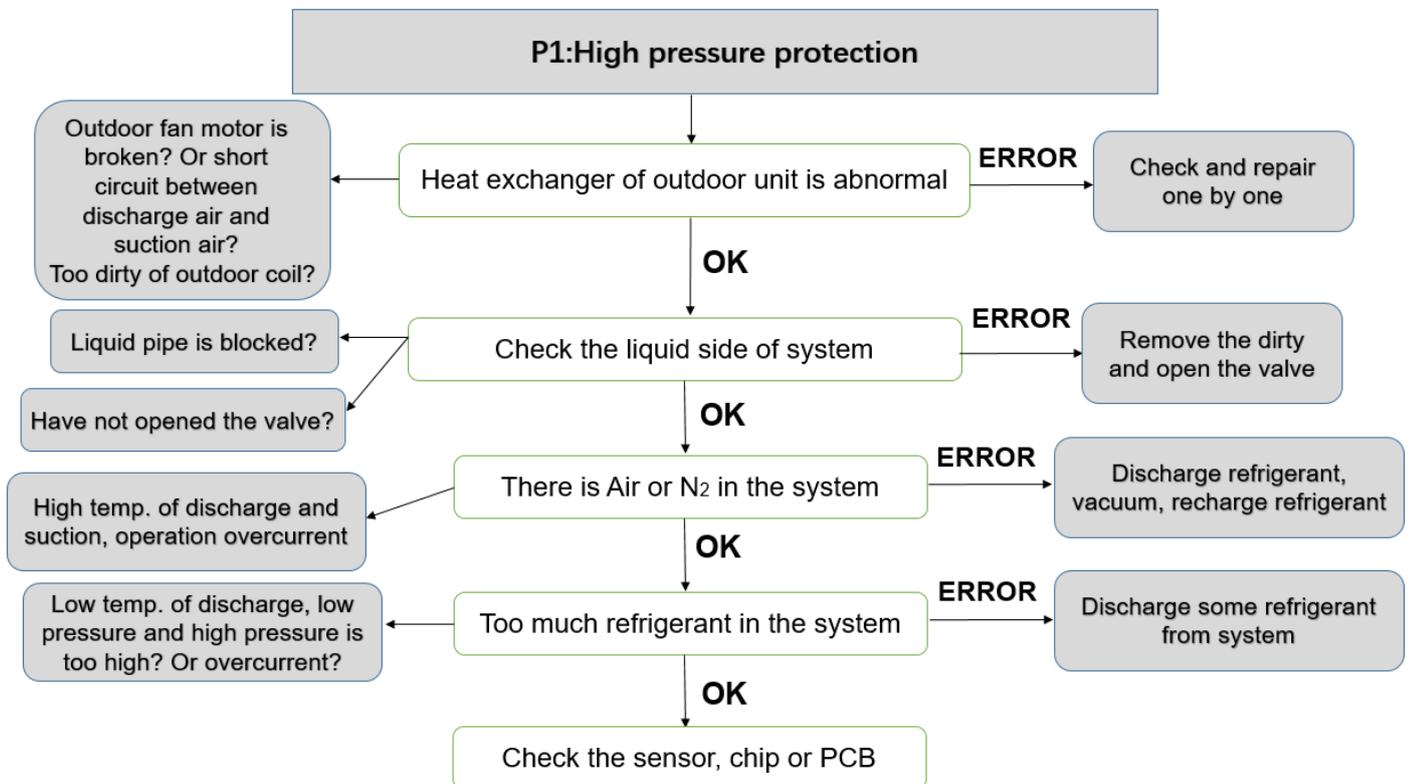
8. Error code: H5: Low pressure of system



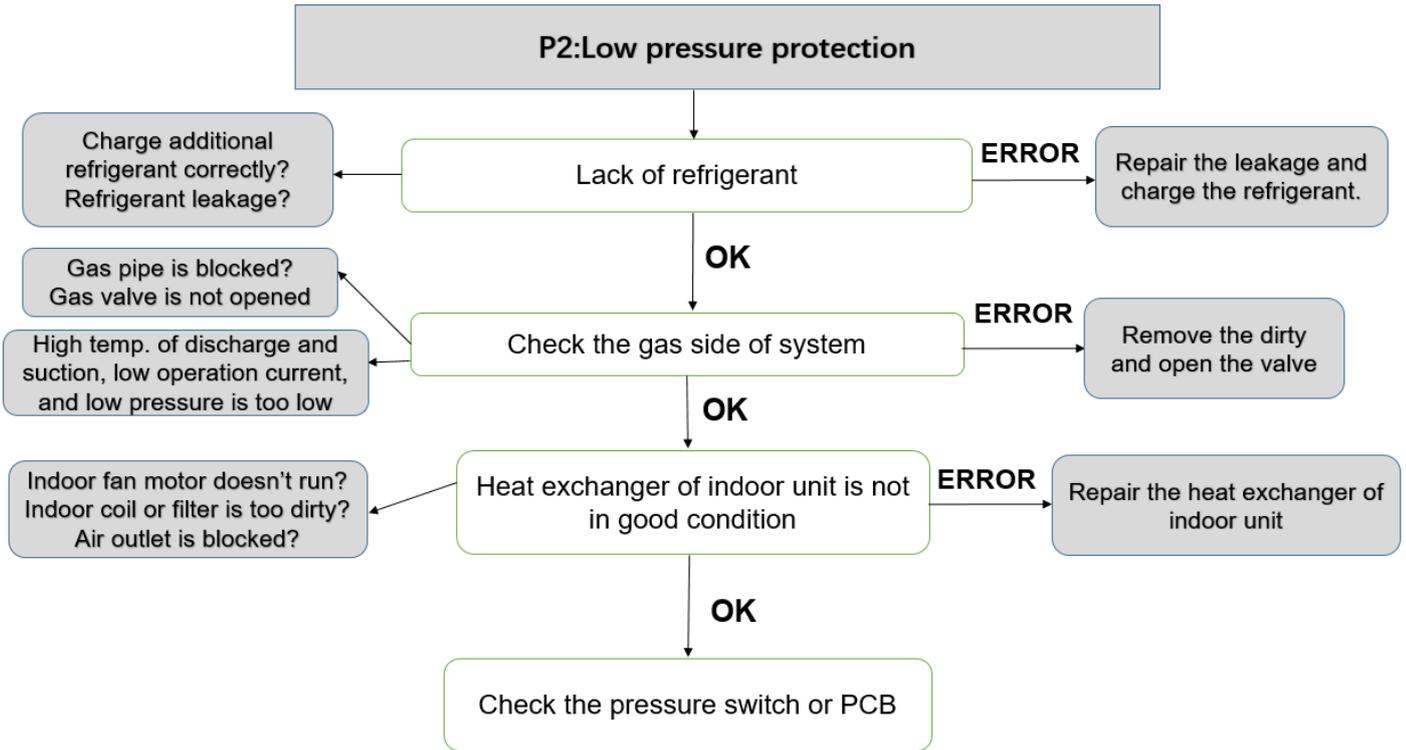
9. Error code: H6: Display P4 for 3 times within 100 minutes (T5 Temp. is too high)



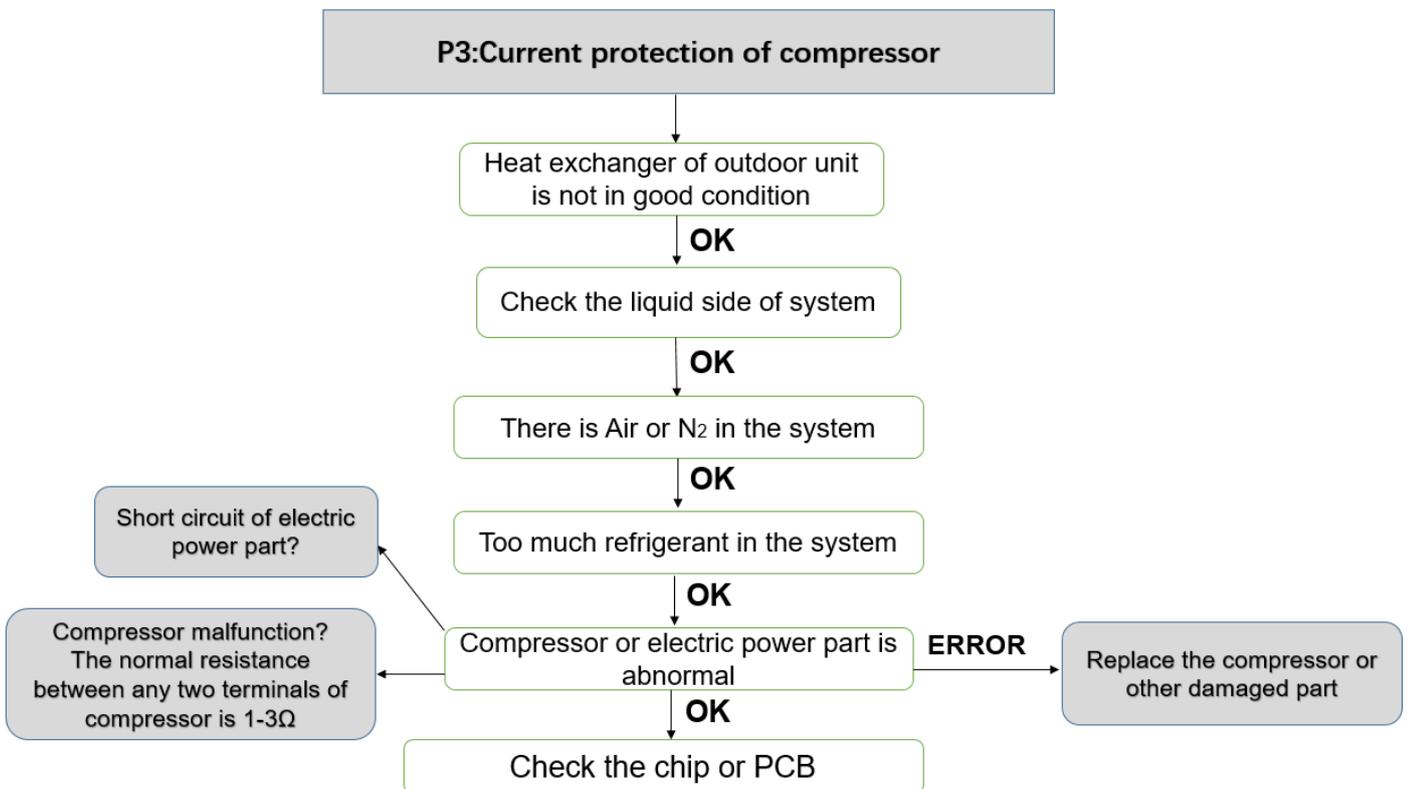
10. Error code: P1: High pressure protection



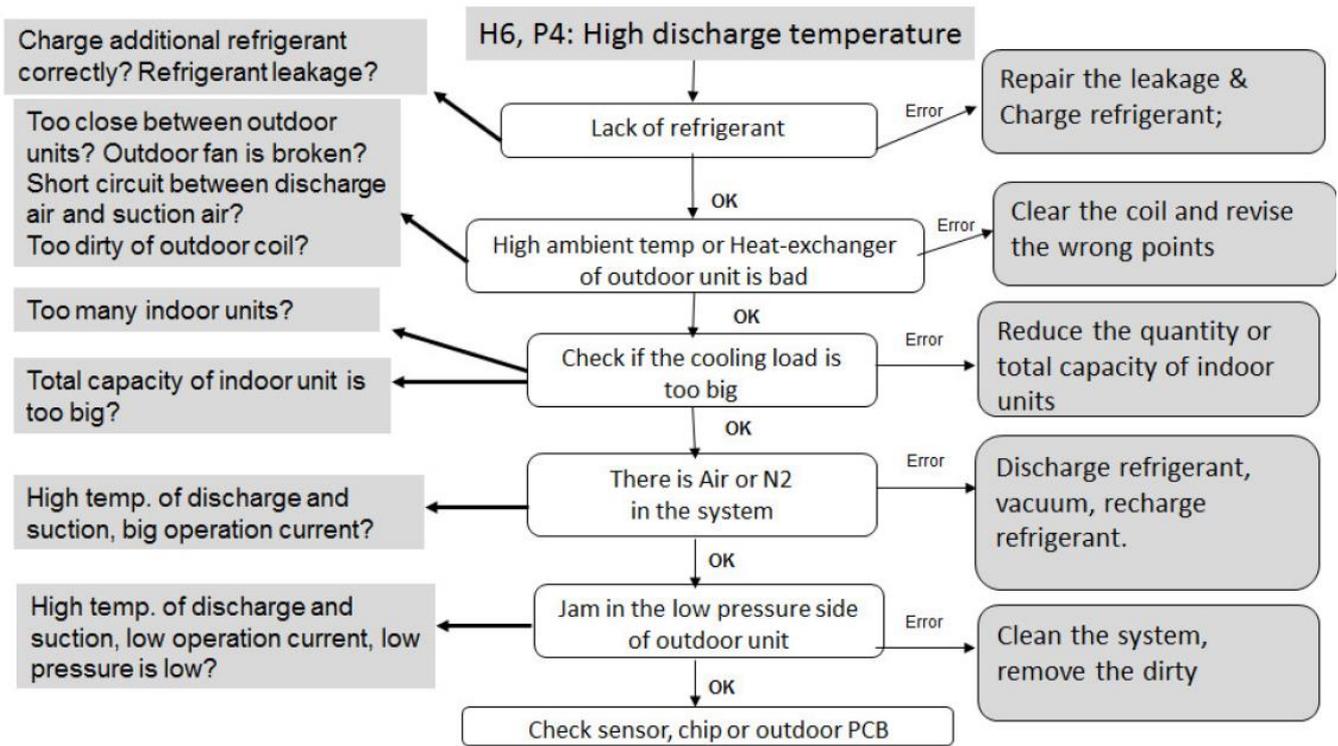
11. Error code: P2: Low pressure protection



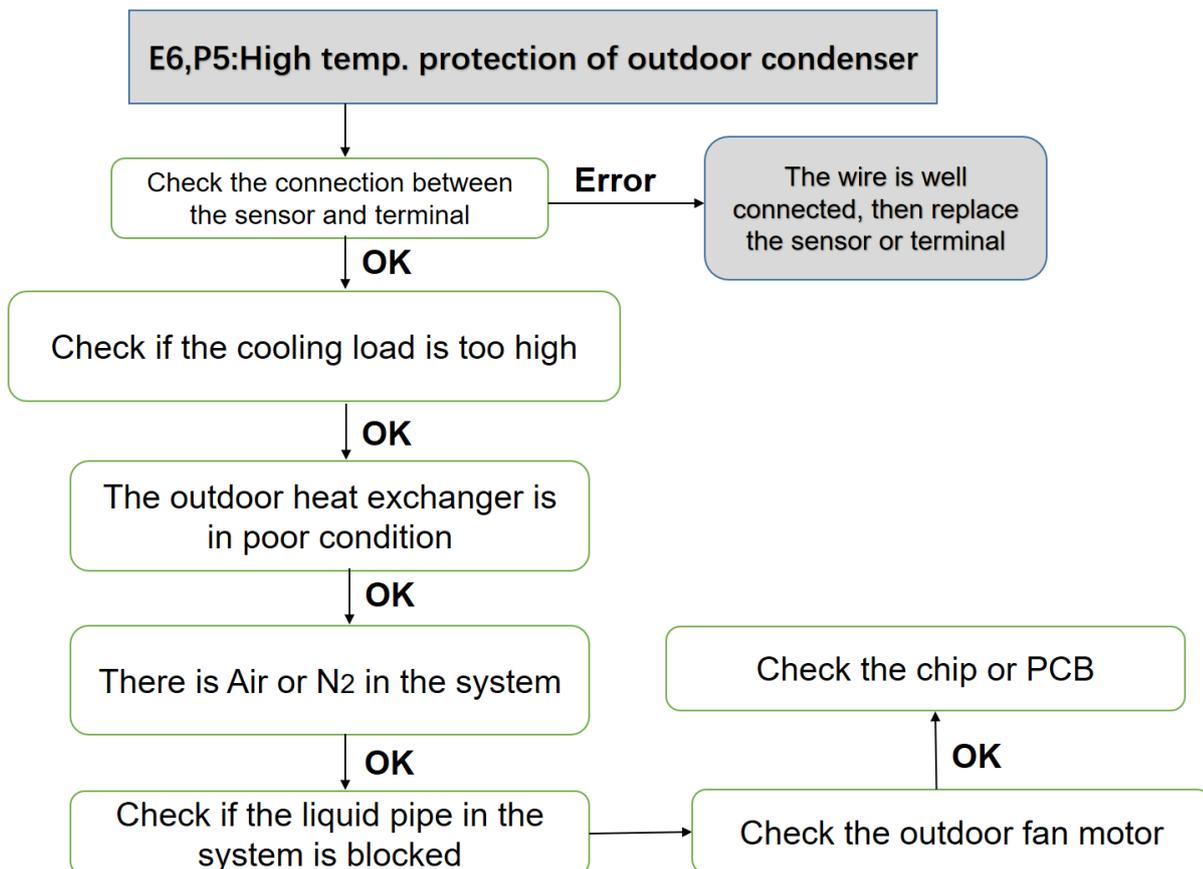
12. Error code: P3: Inverter overcurrent protection



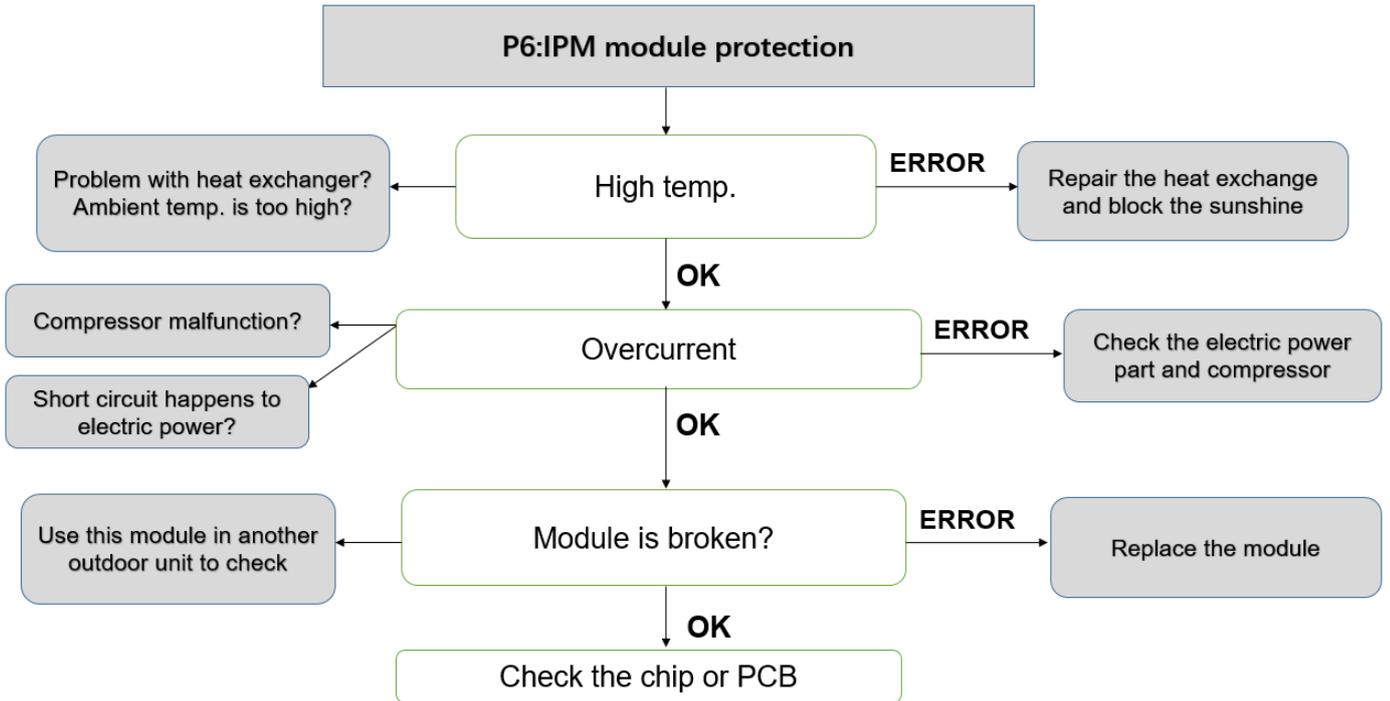
13. Error code: P4: Exhaust overheating protection



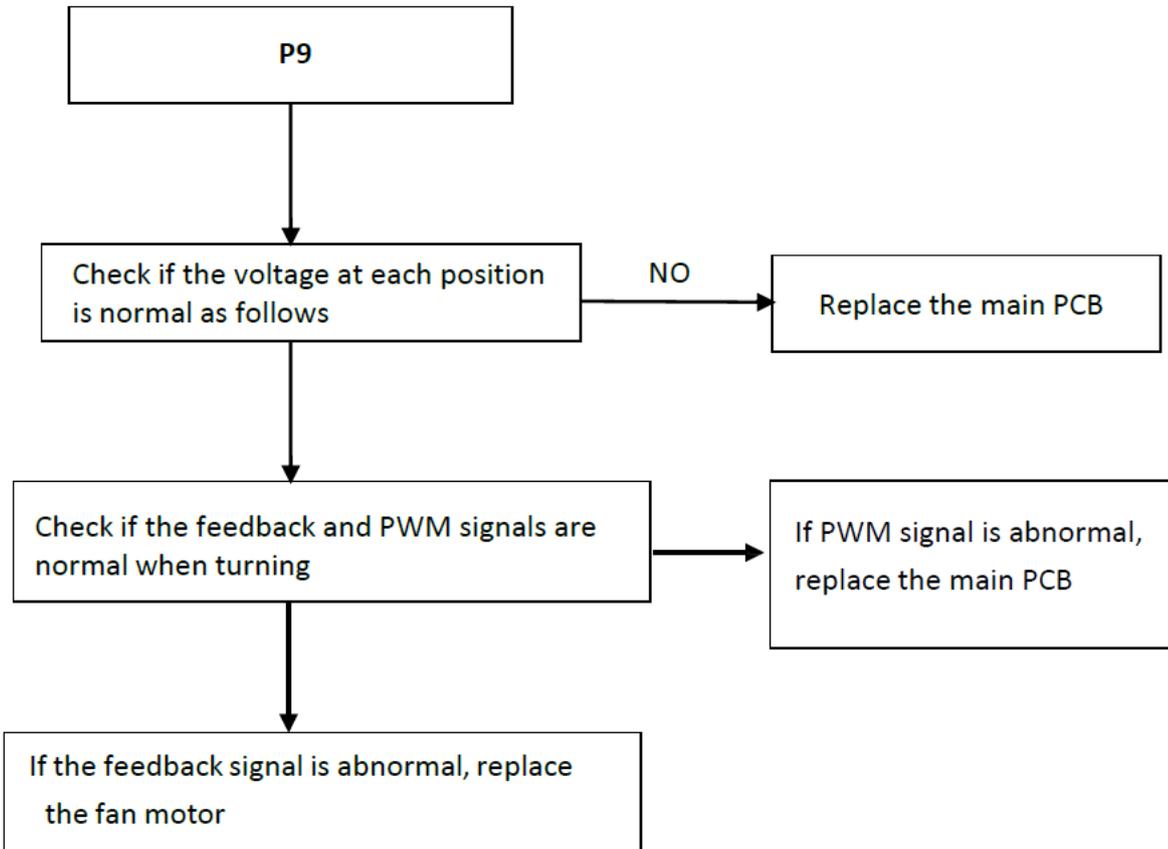
14. Error code: P5:T3 or T3B condenser pipe overheating protection



15. Error code: P6: IPM module protection



16. Error code: P9:DC fan motor fault



17. Error code: P11:T2 high temperature protection (Heating mode)

(1) Works:

- a) When T2 averages $>145^{\circ}\text{F}$ for a period of time, stop the compressor and display error code P11 for at least 30s;
- b) When T2 $<122^{\circ}\text{F}$, the protection is released.

The compressor's three-minute delay protection is effective.

(2) Effect: Prevent the four-way valve from being powered down and not recovering, jamming, or inserting the wrong end of the four-way valve.

(3) Solution: When checking the cooling, the four-way valve coil is still energized. If yes, please check if there is any problem with the coil wiring. If not, proceed to the next step. Check if the four-way valve is normal or not, and if the valve body is stuck.

Part 4 Installation

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1. Precaution on Installation

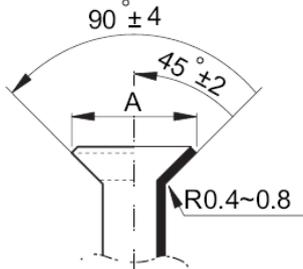
1.1. Measure the necessary length of the connecting pipe and make it by the following way.

- a. Connect the indoor unit at first, then the outdoor unit.
Bend the tubing in proper way. Do not harm them.

CAUTIONS:

- Daub the surfaces of the flare pipe and the joint nuts with frozen oil, and wrench it for 3~4 rounds
- With hands before fastening the flare nuts.

Be sure to use two wrenches simultaneously when you connect or disconnect the pipes.

Pipe gauge	Tightening torque	Flare dimension A		Flare shape
		Min (in)	Max	
1/4	11.07~11.80lbf.ft	5/16	3/8	
3/8	18.45~19.18lbf.ft	7/16	1/2	
1/2	25.83~26.56lbf.ft	9/16	5/8	
5/8	33.21~34.68lbf.ft	11/16	3/4	
3/4	47.97~49.44lbf.ft	13/16	7/8	

- b. The stop value of the outdoor unit should be closed absolutely (as original state). Every time you connect it, first loosen the nuts at the part of stop value, then connect the flare pipe immediately (in 5 minutes). If the nuts have been loosened for a long time, dusts and other impurities may enter the pipe system and may cause malfunction later. So please expel the air out of the pipe with refrigerant before connection.
- c. Expel the air after connecting the refrigerant pipe with the indoor unit and the outdoor unit. Then fasten the nuts at the repair-points.

1.2. Locate The Pipe

- a. Drill a hole in the wall (suitable just for the size of the wall conduit), then set on the fittings such as the wall conduit and its cover.
- b. Bind the connecting pipe and the cables together tightly with binding tapes. Do not let air in, which will cause water leakage by condensation.
- c. Pass the bound connecting pipe through the wall conduit from outside. Be careful of the pipe allocation to do no damage to the tubing.

1.3. Connect the pipes.

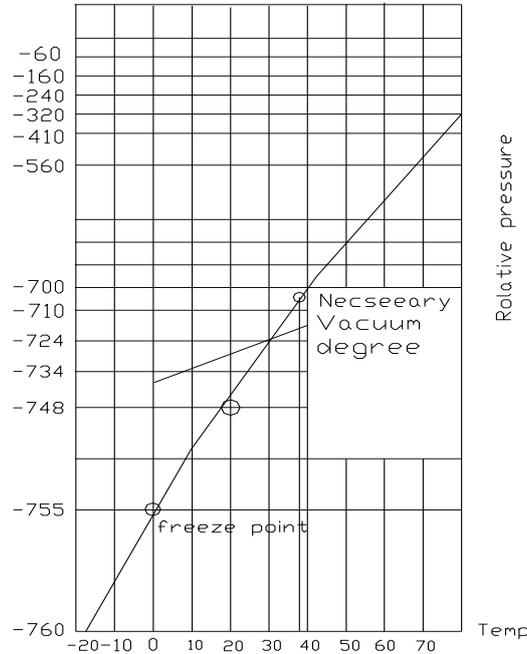
1.4. Then, open the stem of stop values of the outdoor unit to make the refrigerant pipe connecting the indoor unit with the outdoor unit in fluent flow.

1.5. Be sure of no leakage by checking it with leak detector or soap water.

1.6. Cover the joint of the connecting pipe to the indoor unit with the soundproof / insulating sheath (fittings) and bind it well with the tapes to prevent leakage.

2. Vacuum Dry and Leakage Checking

2.1 Vacuum Dry: use vacuum pump to change the moisture (liquid) into steam (gas) in the pipe and discharge it out of the pipe to make the pipe dry. Under one atmospheric pressure, the boiling point of water (steam temperature) is 212°F. Use vacuum pump to make the pressure in the pipe near vacuum state, the boiling point of water falls relatively. When it falls under outdoor temperature, the moisture in the pipe will be vaporized.

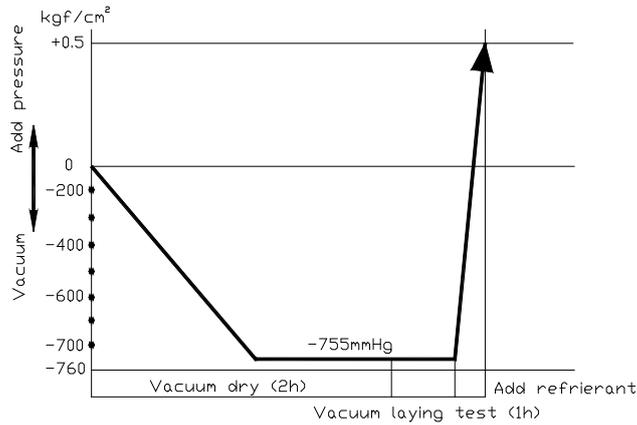


2.2 Vacuum dry procedure

There are two methods of vacuum dry due to different construction environment: common vacuum dry, special vacuum dry.

①. Common vacuum dry procedure

- Vacuum dry (for the first time)---connect the all-purpose detector to the inlet of liquid pipe and gas pipe, and run the vacuum pump more than two hours (the vacuum pump should be below -755mmHg)
- If the pump can't achieve below -755mmHg after pumping 2 hours, moisture or leakage point will still exist in the pipe. At this time, it should be pumped 1 hour more.
- If the pump can't achieve -755mmHg after pumping 3 hours, please check if there are some leakage points.
- Vacuum placement test: place 1 hour when it achieves -755mmHg, pass if the vacuum watch shows no rising. If it rises, it shows there's moisture or leakage point.
- Vacuuming from liquid pipe and gas pipe at the same time.
- Sketch map of common vacuum dry procedure.



②. Special vacuum dry procedure

- This vacuum dry method is used in the following conditions:
- There's moisture when flushing the refrigerant pipe.
- Rainwater may enter into the pipe.
- Vacuum dry for the first time 2h pumping

③. Vacuum destroy for the second time Fill nitrogen to 0.5Kgf/cm²

Because nitrogen is for drying gas, it has vacuum drying effect during vacuum destroy. But if the moisture is too much, this method can't dry thoroughly. So, please pay more attention to prevent water entering and forming condensation water.

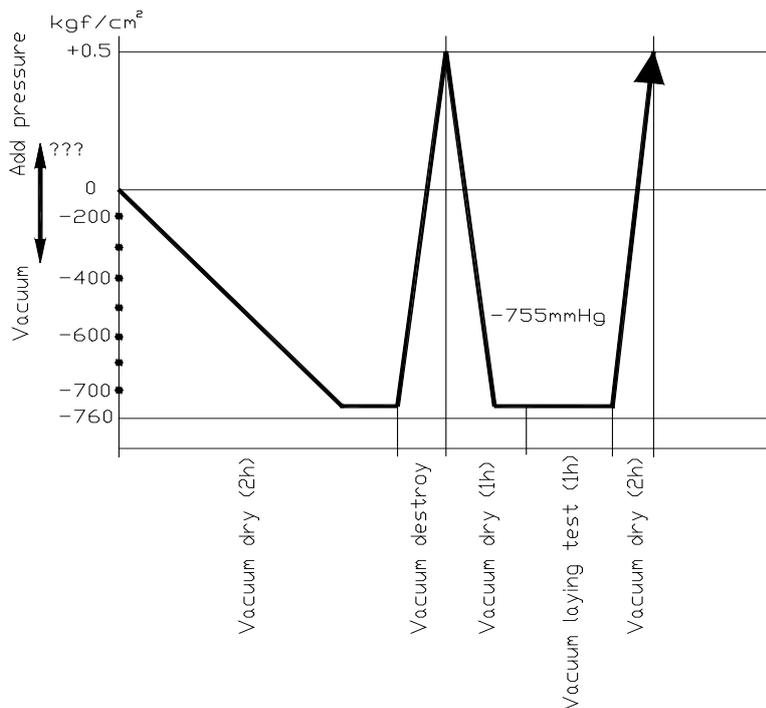
④. Vacuum dry for the second time 1h pumping

Determinant: Pass if achieving below -755mmHg. If -755mmHg can't be achieved in 2h, repeat procedure

③ and ④.

⑤. Vacuum placing test 1h

⑥. Sketch map of special vacuum dry procedure



3. Additional Refrigerant Charge

Caution

- Refrigerant cannot be charged until field wiring has been completed.
- Refrigerant may only be charged after performing the leak test and the vacuum pumping.
- When charging a system, care shall be taken that its maximum permissible charge is never exceeded, in view of the danger of liquid hammer.
- Charging with an unsuitable substance may cause explosions and accidents, so always ensure that the appropriate refrigerant is charged.
- Refrigerant containers shall be opened slowly.
- Always use protective gloves and protect your eyes when charging refrigerant.

The outdoor unit is factory charged with refrigerant. Calculate the added refrigerant according to the diameter and the length of the liquid side pipe of the outdoor unit/indoor unit

R(lbs) \ D(in)	¼ - inch	3/8 - inch	½ - inch
L(ft)			
Less than 16ft (One-way)	—	—	—
Added Refrigerant When Over 16ft(One-way)	0.013lbs/ft × (L-16)	0.026lbs/ft × (L-16)	0.039lbs/ft×(L-16)

Remark:

- R (lbs): Additional refrigerant to be charged
- L (ft): The length of the refrigerant pipe (one-way)
- D (in): Liquid side piping

4. Insulation Work

4.1 Insulation material and thickness

4.1.1. Insulation material

Insulation material should adopt the material which is able to endure the pipe's temperature: no less than 158°F in the high-pressure side, no less than 248°F in the low-pressure side (For the cooling type machine, no requirements at the low-pressure side.)

- ◆ Example: Heat pump type----Heat-resistant Polyethylene foam (withstand above 248°F)
Cooling only type----Polyethylene foam (withstand above 212°F)

4.1.2. Thickness choice for insulation material

Insulation material thickness is as follows:

	Pipe diameter (in)	Adiabatic material thickness
Refrigerant pipe	0.25—1	0.39in
	1.13—1.5	0.59in
Drainage pipe	Inner diameter 0.79—1.26	0.24in

4.2 Refrigerant pipe insulation

4.2.1. Work Procedure

- ① Before laying the pipes, the non-jointing parts and non-connection parts should be heat insulated.
- ② When the gas proof test is eligible, the jointing area, expanding area and the flange area should be heat insulated.

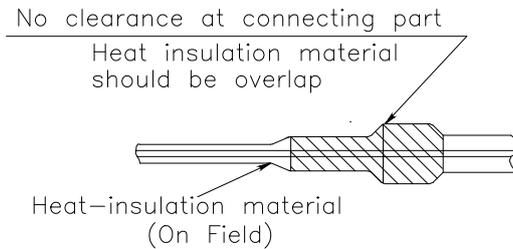
4.2.2. Insulation for non-jointing parts and non-connection parts

wrong	right	
Gas pipe and liquid pipe should not be put together to insulate	Insulate the gas pipe (cooling only)	Insulate the gas pipe and liquid pipe

For construction convenience, before laying pipes, use insulation material to insulate the pipes to be deal with, at the same time, at two ends of the pipe, remain some length not to be insulated, in order to be welded and check the leakage after laying the pipes.

4.2.3. Insulate for the jointing area, expanding area and the flange area

- ① Insulate for the jointing area, expanding area and the flange area should be done after checking leakage of the pipes
- ② Make sure there's no clearance in the joining part of the accessorial insulation material and local preparative insulation material.



4.3 Drainage pipe insulation

The connection part should be insulated, or else water will be condensing at the non-insulation part.

4.4 Note

5.4.1 The jointing area, expanding area and the flange area should be heat insulated after passing the pressure test.

4.4.2 The gas and liquid pipe should be heat insulated individually; the connecting part should be heat insulated individually.

4.4.3 Use the attached heat-insulation material to insulate the pipe connections (pipes' tie-in, expand nut) of the indoor unit.

5. Test Operation

(1) The test operation must be carried out after the entire installation has been completed.

(2) Please confirm the following points before the test operation.

- The indoor unit and outdoor unit are installed properly.
- Tubing and wiring are correctly completed.
- The refrigerant pipe system is leakage-checked.
- The drainage is unimpeded.
- The ground wiring is connected correctly.
- The length of the tubing and the added stow capacity of the refrigerant have been recorded.
- The power voltage fits the rated voltage of the air conditioner.
- There is no obstacle at the outlet and inlet of the outdoor and indoor units.
- The gas-side and liquid-side stop valves are both opened.
- The air conditioner is pre-heated by turning on the power.

(3) According to the user's requirement, install the remote controller when the remote controller's signal can reach the indoor unit smoothly.

(4) Test operation

Set the air conditioner under the mode of "COOLING" with the remote controller and check the following points.

Indoor unit

- Whether the switch on the remote controller works well.
- Whether the buttons on the remote controller works well.
- Whether the air flow louver moves normally.
- Whether the room temperature is adjusted well.
- Whether the indicator lights normally.
- Whether the temporary buttons work well.
- Whether the drainage is normal.
- Whether there is vibration or abnormal noise during operation.

Outdoor unit

- Whether there is vibration or abnormal noise during operation.
- Whether the generated wind, noise, or condensed of by the air conditioner have influenced your neighborhood.
- Whether any of the refrigerant is leaked.