Multi-Position Ducted Air Handler







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1、Product overview

2、Unique Selling Propositions

3、Installation Procedures

4、After-sale Maintenance

1.1 Product series

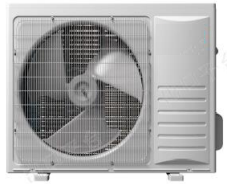
Type		24K	36K	48K	60K
Cooling-only		●	●	●	●
Heat-pump		●	●	●	●

1.2 Product Appearance

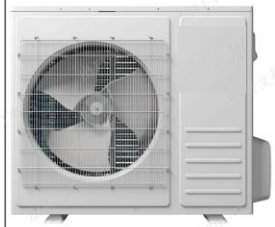
Indoor

Model (Btu/h)	Indoor Unit
24K 36K 48K 60K	

Cooling-only

	24K	36K	48K/60K
View			

Heat-pump

	24K	36K	48K/60K
View			

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2.1 Selling Propositions——Inverter & R410A

DC inverter power control uses its full capacity at startup to cool/warm quickly. As soon as the set temperature is reached, it carefully adjusts current frequency to prevent temperature fluctuation and energy loss.





Inverter:

Fast Cooling Heating

Energy Saving

Temperature Stable

R410A:

Incombustible

ODP=0

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1.3 Product Operation Range

Heat-pump

Power Supply

Working Voltage	198V ~ 253V
Voltage Imbalance	Within a 3% deviation from each voltage at the main terminal of outdoor unit
Starting Voltage	Higher than 85% of the Rated Voltage

Operating temperature range

This air conditioner is designed for the following outdoor operating temperatures.

Type	Mode	Outdoor operation temperature range [°F (°C)]	
		Maximum	Minimum
DC-Inverter Split Air Conditioner(Heat pump type)	Cooling Operation	122 (50)	5 (-15)
	Heating Operation	75 (24)	-13 (-25)

Storage condition

Temperature: -13~140°F (-25~60°C)

Humidity: 30%~80%

Cooling-only

Power Supply

Working Voltage	176V ~ 253V
Voltage Imbalance	Within a 3% deviation from each voltage at the main terminal of outdoor unit
Starting Voltage	Higher than 85% of the Rated Voltage

Operating temperature range

This air conditioner is designed for the following outdoor operating temperatures.

Type	Mode	Outdoor operation temperature range [°F (°C)]	
		Maximum	Minimum
DC-Inverter Split Air Conditioner(Cooling only type)	Cooling Operation	125 (52)	5 (-15)

Storage condition

Temperature: -13~140°F (-25~60°C)

Humidity: 30%~80%

Surge Protector



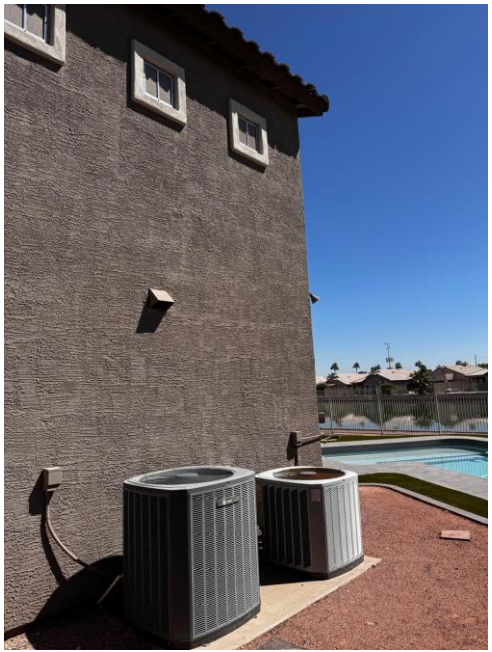


Reemplazo de unidades existentes





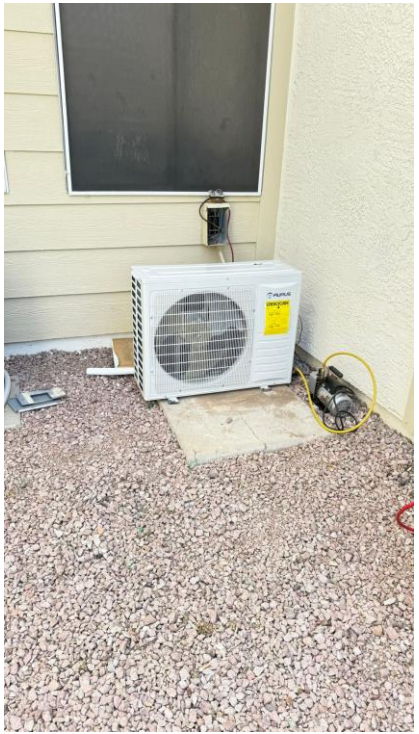
Reemplazo de unidades existentes





Reemplazo de unidades existentes



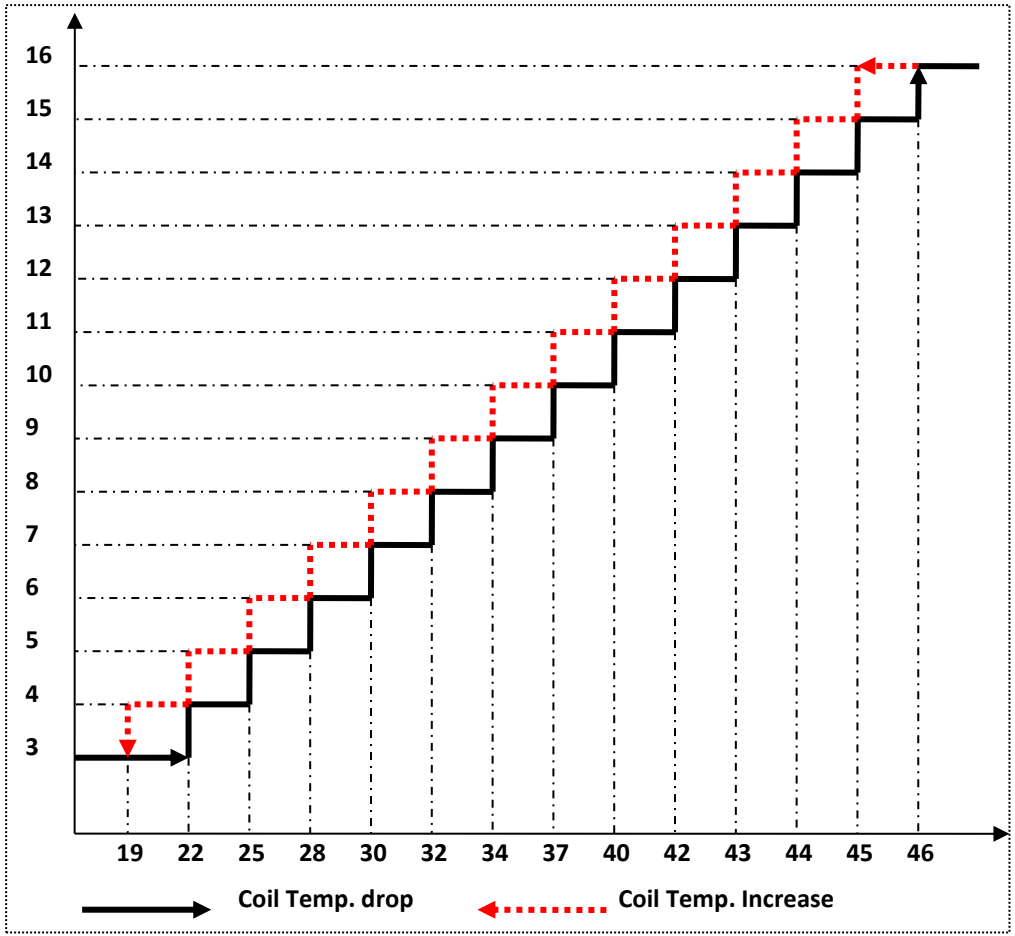


Reemplazo de unidades existentes





2.2 Selling Propositions——Outdoor mute



The outdoor fan motor can change with the cooling demand smartly. In night the outdoor unit can run mutely when Cooling demand decreases.

3.1 Installation of AHU Type——Preparation

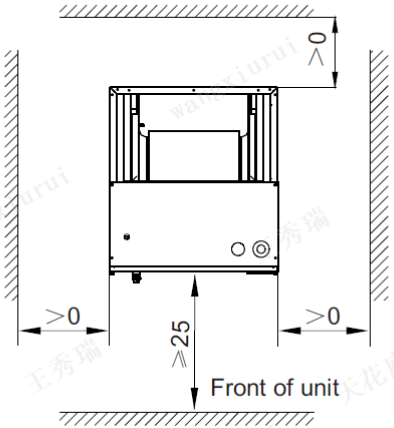
2. Installation of the Indoor Unit

2.1 Initial Check

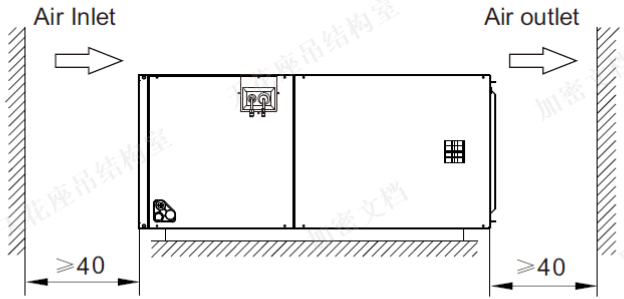
⚠ CAUTION

- When moving the unit after unpacking, make sure not to exert any pressure on other parts, especially the refrigerant piping, drain piping and flange parts.
- Wear protective gears when installing the unit.

(Unit: in.)



Clearance in the Vertical Position



Clearance in the Horizontal Position

Installation of AHU Type——Installation

2.2 Installation Location

Before choosing the installation site, obtain the user's approval.

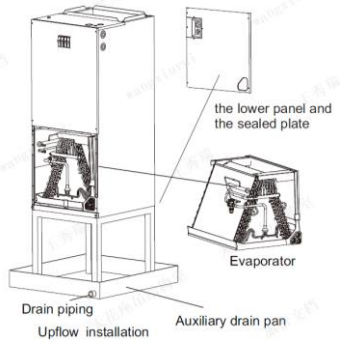
- Optimum air distribution is ensured.
- The air path is not blocked.
- Condensation can drain properly.
- Ensure sufficient clearance for maintenance and servicing.
- Piping between the indoor and outdoor units should be within the allowable limits. (Refer to the installation of the outdoor unit)
- The indoor unit, outdoor unit, power supply wiring and transmission wiring should be kept at least 1 meter away from televisions and radio, which prevents image interference and noise in those electrical appliances.
  (Noise may be generated depending on the conditions under which the electric wave is generated, even if a one-meter distance is maintained.)
- Do not install the indoor unit in a machinery shop or kitchen where vapor from oil or its mist flows to the indoor unit. The oil will deposit on the heat exchanger, thereby reducing the performance of the indoor unit, and may deform and in the worst case, break the plastic parts of the indoor unit.
- When the unit is installed in a hot and humid place, it is recommended to insulate the cabinet exterior and to use auxiliary drain pans.
- If installed above a finished living space, a auxiliary drain pan(as required by many building codes),must be installed under the entire unit and its condensate drain line must be routed to a location such that the user will see the condensate discharge.

2.3 Installation

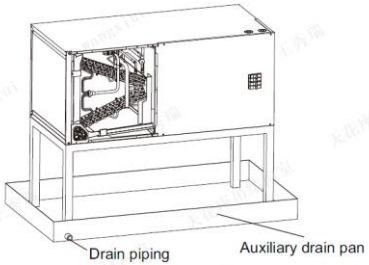
NOTE:

These appliances are designed for indoor installation only.

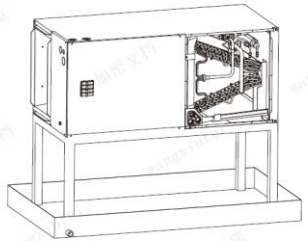
The indoor units can be installed in one of the upflow, horizontal left or horizontal right orientations as shown in Figures below.



Upflow installation



Horizontal right installation



Horizontal left installation

Minor field modifications are necessary to convert to horizontal left.

Up-flow installation method is selected by default.

When the unit is horizontal right mounted, rotate it to the right for 90 degrees, as shown in image horizontal right installation.

When the unit is horizontal left mounted, the following steps are required.

1). Disassemble the lower panel and the sealed plate;
2). Disassemble the retaining clips for the evaporator so that the evaporator can be pulled out along the lead rail easily;
3). Rotate the evaporator for 180 degrees and insert it into the upper side of the lead rail;
4). Rotate the unit to the left for 90 degrees, as shown in image horizontal left installation;
5). Reinstall the sealed plate and the lower panel.

2.4 Air duct

Field duct work must comply with the National Fire Protection Association NFPA 90NFPA 90B and any applicable local ordinance.

⚠ WARNING

Do not, under any circumstances, connect return duct work to any other heat producing device such as fireplace insert, stove, etc. Unauthorized use of such devices may result in fire, carbon monoxide poisoning, explosion, personal injury or property damage.

Sheet metal duct work run in unconditioned spaces must be insulated and covered with a vapor barrier. Fibrous duct work may be used if constructed and installed in accordance with SMACNA Construction Standard on Fibrous Glass Ducts. Duct work must comply with National Fire Protection Association as tested by U/L Standard181 for Class I Air Ducts. Check local codes for requirements on duct work and insulation.

Duct system must be designed within the range of external static pressure the unit is designed to operate against. It is important that the system airflow be adequate. Make sure supply and return duct work, grills, special filters, accessories, etc, are accounted for in total resistance.

Installation of AHU Type——Installation

3. Refrigerant Pipe

⚠ DANGER

Use the refrigerant according to outdoor nameplate. When carrying out the leakage check and test, do not mix in the oxygen, the acetylene and the flammable and the reactive gas, because these gases may result in explosion. It is suggested to use nitrogen to perform these experiments.

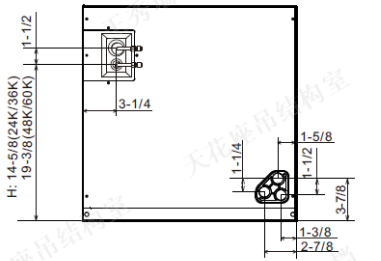
3.1 Pipe Material

(1) Prepare the copper pipe on the spot.
(2) Choose dustless, non-humid, clean copper pipe. Before installing the pipe, use nitrogen or dry air to blow away the dust and impurity on the pipe.
(3) Choose the copper pipe according to outdoor manual.

3.2 Piping Connection

(1) The connection positions of the pipe are shown below.

(Unit: in.)



Connection positions of the pipe

Refer to the outdoor unit Installation Instructions for details on piping size selection, piping installation, and charging information.
Coil is shipped filled with Nitrogen. Evacuate the system before charging with refrigerant.
Install refrigerant lines so that it does not block service access to the front of the unit.

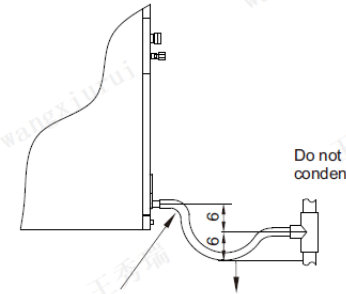
Nitrogen should flow through the refrigerant lines while brazing.
Use a wet rag or an approved heat paste to protect the TXV sensing bulb during the brazing process.

4. Drain Piping

The indoor units has field supplied primary and secondary 3/4-in. NPT drain connections.
When making drain fitting connections to the drain pan, use a thin layer of Teflon paste, Silicone or Teflon tape and install by hand tightening.
When making drain fitting connections to drain pan, do not over-tighten.
All horizontal drain pipes must be pitched downward away from the unit a minimum of 1/8" per foot to provide free drainage.

Condensate drain trap

(Unit: in.)



Do not connect the drain pipes directly to sewage pipes to avoid ammonia odour. The ammonia in the sewage might enter the indoor unit through the drain pipes and corrode the heat exchanger. Do not twist or bend the drain hose, because excessive force is applied during twisting or bending and may also cause leakage. The drain line should be insulated where necessary to prevent sweating and damage due to condensate forming on the outside surface of the pipe.Test condensate drain pan and drain pipe after installation is complete. Keep the case horizontal (horizontal left or horizontal right) to ensure a smooth drainage, or incline the case 0.5° to the drainage hole, making it the lowest point for draining.Pour water into drain pan, enough to fill drain trap and line. Check to make sure drain pan is draining completely, no leaks are found in drain pipe fittings, and water is draining from the termination of the primary drain pipe.

NOTES:

If unit is located in or above a living space where damage may result from condensate overflow, a field-supplied, external condensate pan should be installed underneath the entire unit, and a secondary condensate line (with appropriate trap) should be run from the unit into the pan. Any condensate in this external condensate pan should be drained to a noticeable place. The owner of the structure must be informed that when condensate flows from the secondary drain or external condensate pan, the unit requires servicing or water damage will occur. Install traps in the condensate lines as close to the coil as possible.

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3.1 Installation of AHU Type——Installation

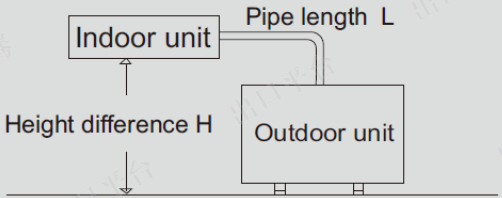
Heat pump series

Model	Outer Diameter of Pipe [in. (mm)]	
	Gas	Liquid
24K	5/8 (15.88)	3/8 (9.52)
36K	3/4 (19.05)	3/8 (9.52)
48K/60K	7/8 (22.22)	3/8 (9.52)

Cooling only series

Model	Outer Diameter of Pipe [in. (mm)]	
	Gas	Liquid
24K/36K	5/8 (15.88)	3/8 (9.52)
48K/60K	7/8 (22.22)	3/8 (9.52)

The shorter the refrigerant piping is, the better the performance will be. So the connecting pipe should be as short as possible.



Heat pump series

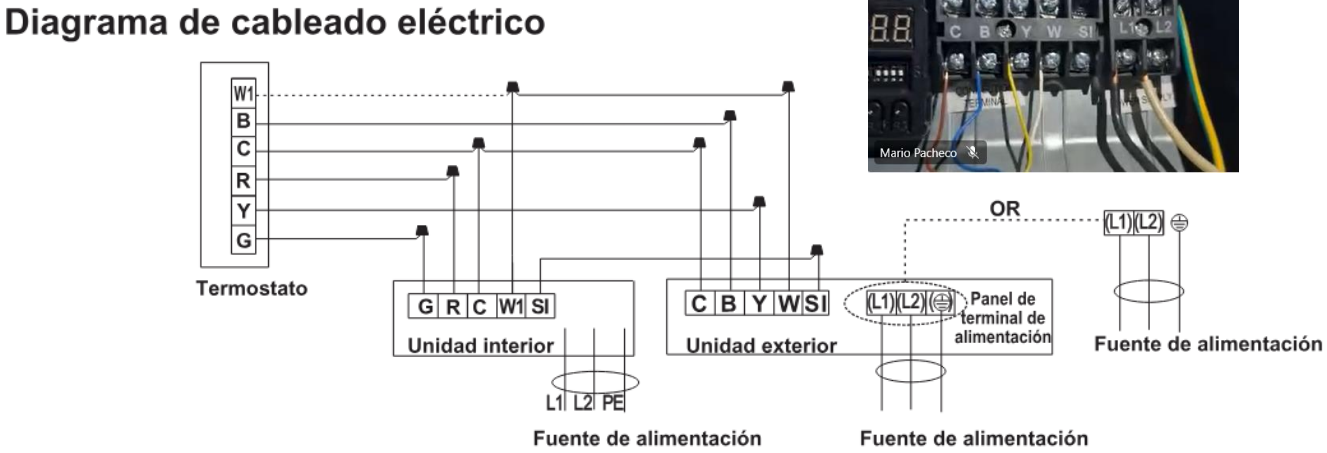
Model	Max. Pipe length (L)	Max. Height difference (H)	Add. Refrigerant [exceed 25ft 7.6m]
24K	164ft. (50m)	98ft. (30m)	0.38(oz/ft) [35(g/m)]
36K	246ft. (75m)	98ft. (30m)	0.38(oz/ft) [35(g/m)]
48K/60K	246ft. (75m)	98ft. (30m)	0.60(oz/ft) [56(g/m)]

Cooling only series

Model	Max. Pipe length (L)	Max. Height difference (H)	Add. Refrigerant [exceed 25ft 7.6m]
24K/36K	131ft. (40m)	98ft. (30m)	0.38(oz/ft) [35(g/m)]
48K/60K	164ft. (50m)	98ft. (30m)	0.38(oz/ft) [35(g/m)]

3.1 Installation of AHU Type——Installation

4.Power and Wiring



Nota:
El cable SI entre la unidad interior y la unidad exterior no es indispensable, especialmente cuando la unidad exterior está conectada a una unidad interior de una marca diferente. Se ahorra más energía cuando la unidad exterior está conectada, mediante un cable "SI", a una unidad interior de la misma marca. Sin embargo, también puede funcionar sin él.

3.1 Installation of AHU Type——Installation

4.Power and Wiring

Recommended Wire Size

Model (Btu/h)	Power Supply	ELB		Power Source Cable Size	Transmitting Cable Size	Thermostat Signal Size	Fuse or Circuit Breaker (A)
		Rated Current (A)	Nominal Sensitive Current (mA)				
24K~60K	208/230V ~/60Hz	15	30	3×16AWG	5×16AWG	5×18AWG/ 6×18AWG	15

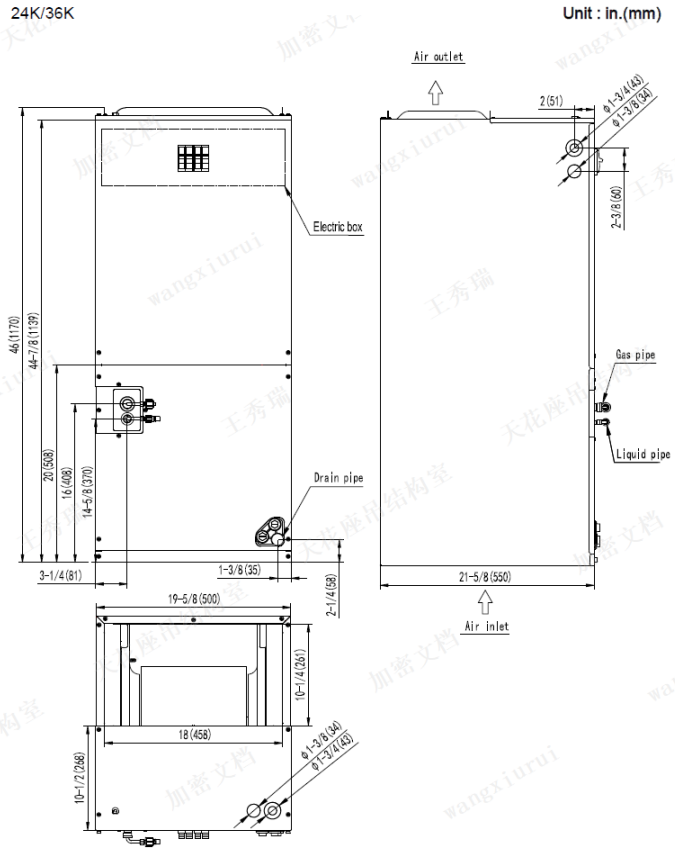
Max. Running Current (A): REFER TO NAMEPLATE

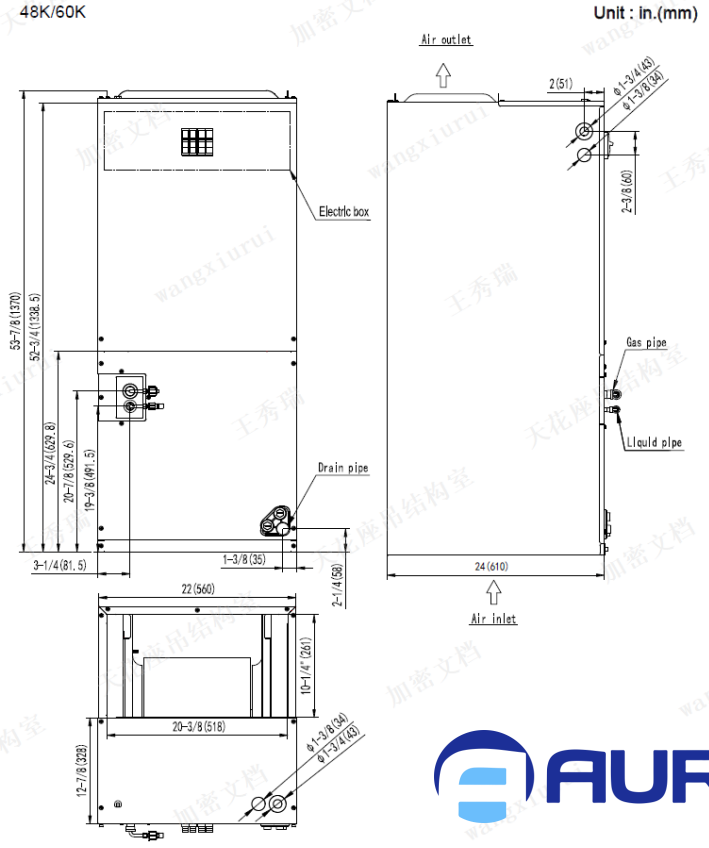
NOTE:

1. Follow local codes and regulations when selecting field wires, and all the above are the minimum wire size.
2. When transmitting cable is longer than 262ft. (80m), a larger wire size should be selected.
3. Install main switch and ELB for each system separately. Select the high response type ELB that is acted within 0.1 second.
4. If auxiliary heater is required and already installed on indoor unit, power source cable should be installed separately and the size should be selected in accordance with UL.

3.1 Installation of AHU Type——Preparation

Select an appropriate location and direction to install indoor unit, measure the location, and pay attention to reserve enough space for pipe connection, wiring and maintenance.





3.1 Installation of AHU Type——Notice 1



➢Requirements for installation location of duct type air conditions

1. Convenient for arrangement of drain piping which shall have enough slope (if the slope of drainage cannot be ensured, it is necessary to install a drain pump).
2. Well-circulated airflow organization.
3. Install in a space where the relative humidity is less than 80%.
4. The indoor unit shall not be installed in a space where there are oil mist or steam erosion (e.g. kitchen). If this is unavoidable, necessary protective measures shall be taken.
5. The places where will not be affected by direct sunlight.
6. The places where there is no food, tableware or computer, server or medical apparatus under the unit.
7. The ceiling to be installed to or any place which is very firm.

3.1 Installation of AHU Type——Filter

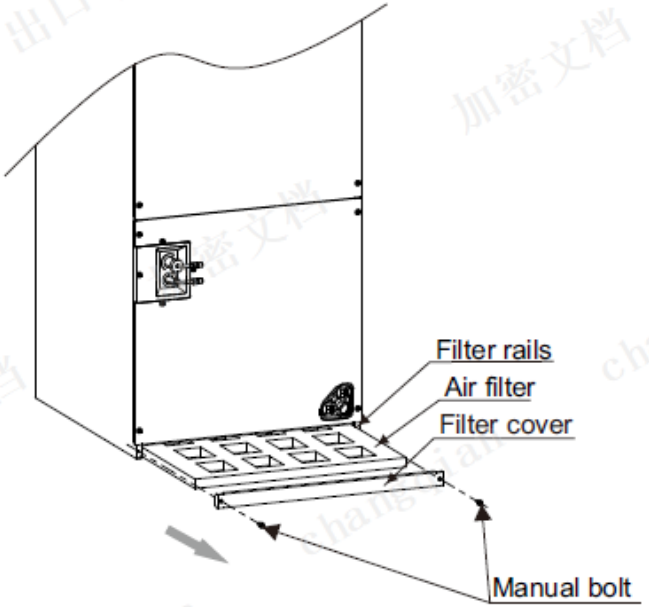
Air Filter (Not Factory-installed)

Please replace or clean the filter regularly, because there will be lots of dust accumulated on the surface of the filter after a period of time.

Follow these steps to properly replace the filter:

After removing the two manual bolts, take down the filter cover and pull out the filter from the case, then insert the new one into the case along the filter rail, at last fix the filter cover with manual bolts.

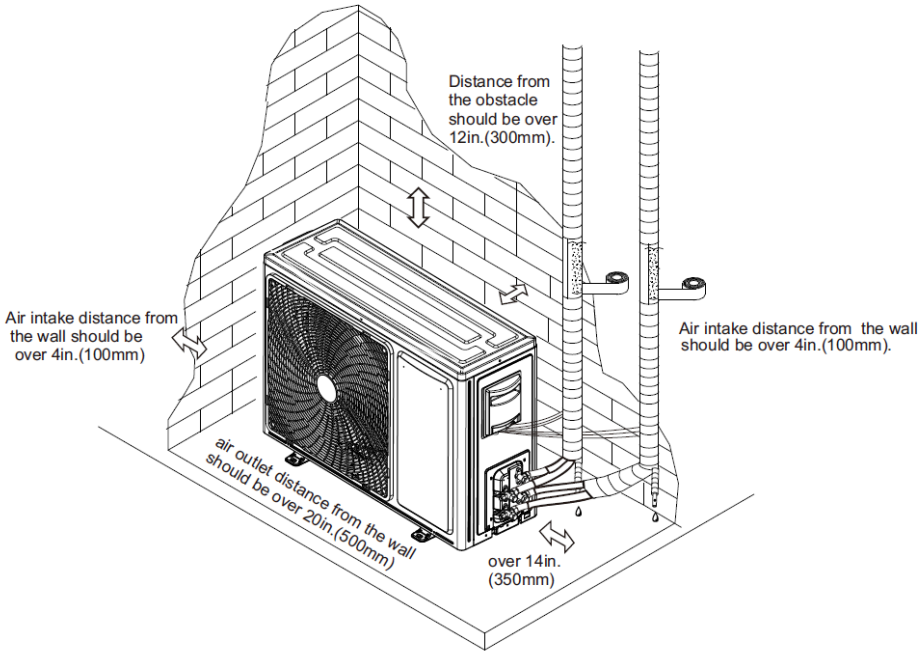
Model	Filter size (L×W×H) in.
24K/36K	20×18×1
48K/60K	22×20×1



3.3 Installation of Outdoor Unit

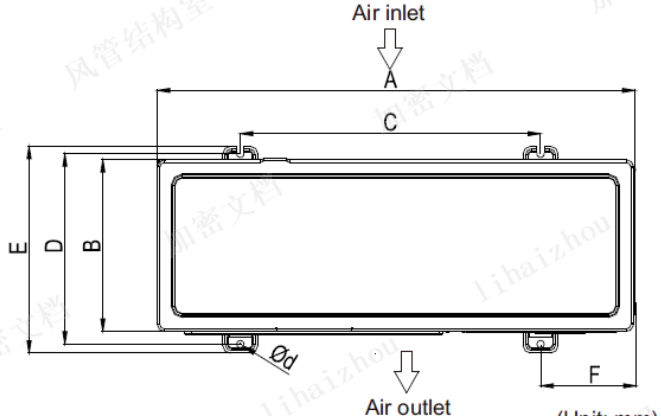
➢Requirements for installation space of outdoor unit:

Notice: the outdoor unit must be installed in a location that both the requirements for heat exchanging and maintenance are met, or it may cause hug losses in later period!



3.3 Installation of Outdoor Unit

➢Installation dimensions of each box are as follows:



[Unit: in. (mm)]

Series	Model	A	B	C	D	E	F	d
Heat pump series	24K	33-7/8 (860)	12-3/16 (310)	21-11/32 (542)	13-7/16 (341)	14-1/2 (368)	6-5/8 (168)	7/16*21/32 (11*17)
	36K/48K /60K	37-3/8 (950)	13-3/8 (340)	22-7/8 (580)	14-15/16 (380)	16-1/4 (414)	7-1/4 (185)	5/8 (15)
Cooling only series	24K	33-7/8 (860)	12-3/16 (310)	21-11/32 (542)	13-7/16 (341)	14-1/2 (368)	6-5/8 (168)	7/16*21/32 (11*17)
	36K	35-3/8 (900)	13-3/8 (340)	23-11/16 (608)	13-7/16 (340)	14-1/2 (368)	5-3/4 (146)	7/16*21/32 (10*20)
	48K/60K	37-3/8 (950)	13-3/8 (340)	22-7/8 (580)	14-15/16 (380)	16-1/4 (414)	7-1/4 (185)	5/8 (15)

3.3 Installation of Outdoor Unit——Piping Connection

➢Requirements for installation position of outdoor unit:

1. Select a well-ventilated place and avoid the unit from being affected by strong wind.
2. Outdoor unit of the air conditioner is generally arranged on roof, balcony or ground.
3. The installation place shall be selected in a way that there are enough maintenance space and heat dissipation effect is excellent.
4. Avoid arranging smoke outlet of kitchen at any accessory of outdoor unit, in order to avoid normal operation of the system from being influenced.
5. Vibration isolator or vibration pad shall be installed between the unit and installation plane according to design specifications.
6. The outdoor unit shall contact with installation surface closely, or greater vibration and noise may be produced.
7. According to law and safety provisions, a ground wire must be connected.
8. The place shall be selected in a way that the water accumulated during raining can be drained smoothly

3.3 Installation of Outdoor Unit——Piping Connection

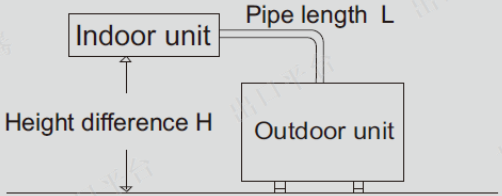
Heat pump series

Model	Outer Diameter of Pipe [in. (mm)]	
	Gas	Liquid
24K	5/8 (15.88)	3/8 (9.52)
36K	3/4 (19.05)	3/8 (9.52)
48K/60K	7/8 (22.22)	3/8 (9.52)

Cooling only series

Model	Outer Diameter of Pipe [in. (mm)]	
	Gas	Liquid
24K/36K	5/8 (15.88)	3/8 (9.52)
48K/60K	7/8 (22.22)	3/8 (9.52)

The shorter the refrigerant piping is, the better the performance will be. So the connecting pipe should be as short as possible.



Heat pump series

Model	Max. Pipe length (L)	Max. Height difference (H)	Add. Refrigerant [exceed 25ft 7.6m]
24K	164ft. (50m)	98ft. (30m)	0.38(oz/ft) [35(g/m)]
36K	246ft. (75m)	98ft. (30m)	0.38(oz/ft) [35(g/m)]
48K/60K	246ft. (75m)	98ft. (30m)	0.60(oz/ft) [56(g/m)]

Cooling only series

Model	Max. Pipe length (L)	Max. Height difference (H)	Add. Refrigerant [exceed 25ft 7.6m]
24K/36K	131ft. (40m)	98ft. (30m)	0.38(oz/ft) [35(g/m)]
48K/60K	164ft. (50m)	98ft. (30m)	0.38(oz/ft) [35(g/m)]

3.3 Installation of Outdoor Unit——Piping Connection

Refrigerant additional charge

The unit has been filled with refrigerant, but if exceeds 25 ft. (7.6m), additional refrigerant (R410A) change is required.

Heat pump series:

24K/36K: Additional refrigerant charge= (L-25) ft×0.38 oz/ft

48K/60K: Additional refrigerant charge= (L-25) ft×0.60 oz/ft

Cooling only series:

24K~60K: Additional refrigerant charge= (L-25) ft×0.38 oz/ft

2. Piping material

(1) Prepare locally-supplied copper pipes.

(2) Select clean copper pipes. Make sure that there is no dust and moisture inside of the pipes. Blow the inside of the pipes with nitrogen or dry air to remove any dust or foreign materials before connecting pipes.

(3) Piping thickness and material of the pipe are shown as below.

Diameter [in. (mm)]	Thickness [in. (mm)]
ø 1/4 (6.35)	1/32 (0.8)
ø 3/8 (9.52)	1/32 (0.8)
ø 1/2 (12.70)	1/32 (0.8)
ø 5/8 (15.88)	1/32 (1.0)
ø 3/4 (19.05)	1/32 (1.0)
ø 7/8 (22.22)	1/32 (1.0)

3.3 Installation of Outdoor Unit——Piping Connection

3. Processing of refrigerant piping

(1) Pipe cutting

Cut the cooper pipe correctly with pipe cutter.

(2) Burrs removal

Completely remove all burrs from the cut cross section of the pipe.

Put the end of the copper pipe downward to prevent burrs from dropping in the pipe.

4. Piping connection

(1) Confirm that the valves are closed.

(2) Connect the indoor unit and the outdoor unit with field-supplied refrigerant pipes. The refrigerant piping should be brazed with a phosphorous-copper alloy material such as Silfos-5 or equivalent.

Precautions and steps during brazing service valve:

a. Remove the caps from both the liquid and gas service valve service ports at the outdoor unit.

b. Braze the liquid piping and gas piping to valves at the outdoor unit.

Precautions should be taken to prevent heat damage to service valve by wrapping a wet cloth around it.

Also, a baffle can be set to protect all painted surfaces, insulation, during brazing.

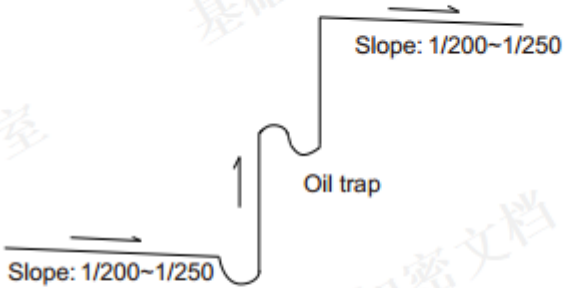
c. After brazing cool joint with wet rag.



3.3 Installation of Outdoor Unit——Piping Connection

Oil trap

When the indoor unit is lower than outdoor unit and height difference is larger than 5m, set an oil trap every 16.4 ft (5m) (height difference) on suction piping.



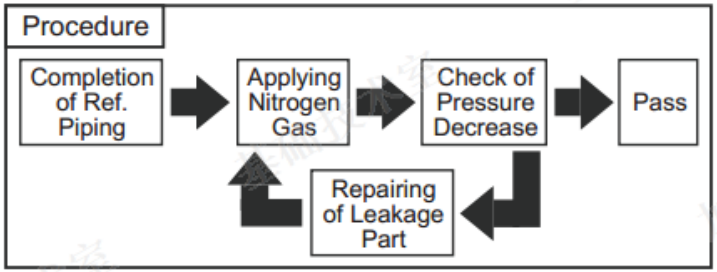
NOTE:

1) To avoid storing too much oil in the oil trap, the oil trap should be as short as possible.
2) The horizontal piping should slope down along the refrigerant flow direction, to bring the oil back to compressor, the slope is about 1/200 to1/250.
3) In order to ensure cooling/heating performance better, the refrigerant piping should be as short and straight as possible.

3.3 Installation of Outdoor Unit——Piping Connection

Air tight test

Do use nitrogen when performing air-tight test.
Connect the gauge manifold using charging hoses with a nitrogen cylinder to the check joints of the liquid line and the gas line stop valves. Perform the air-tight test. Don't open the gas line stop valves. Apply nitrogen gas pressure of 550psi. Check for any gas leakage at the flare nut connections, or brazed parts by gas leak detector or foaming agent. It is OK if gas pressure does not decrease. After the air tight test, release nitrogen gas.



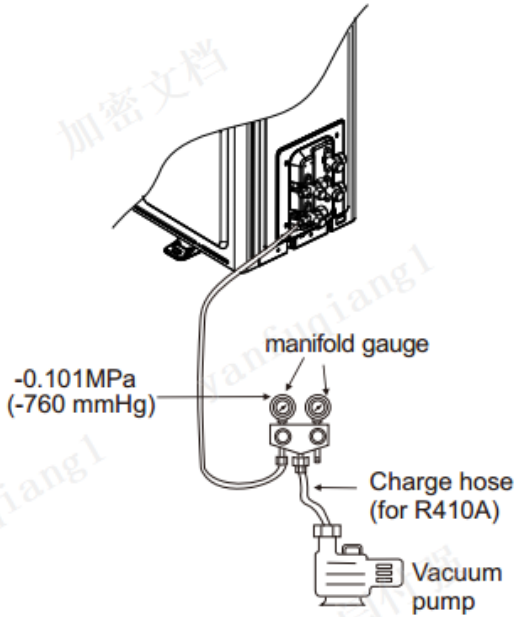
Air tight procedure

3.3 Installation of Outdoor Unit——Piping Connection

Vacuum pumping and charge refrigerant

● Vacuum pumping

(1) Remove the service port cap of the stop valve on the gas pipe side of the outdoor unit.
(2) Connect the manifold gauge and vacuum pump to the service port of the stop valve on the gas pipe side of the outdoor unit.
(3) Run the vacuum pump. (Work for more than 15 minutes.)
(4) Check the vacuum with the gauge manifold valve, then close the gauge manifold valve and stop the vacuum pump.
(5) Leave it as is for one or two minutes. Make sure the pointer of the manifold gauge remains in the same position. Confirm that the pressure gauge shows -14.7 psi(-0.101MPa or -760mHg).
(6)Remove the manifold gauge quickly from the service port of the stop valve.
(7) After refrigerant pipes are connected and evacuated, fully open all stop valves on both sides of gas pipe and liquid pipe.
(8) Open adjusted valve to add refrigerant (must be refrigerant is liquid).
(9) Tighten the cap to the service port .
(10) Retighten the cap.
(11) Leak test foam with halogen leak detector to check the flare nut and brazing Carolina Department leaks. Use foam that not generate ammonia (NH3) in the reaction.



AURUS

3.3 Installation of Indoor Unit——DSW

24/36/48/60K

DIP Switch S2 Setting	Blower Speed Tap	Fan Speed Select	Static Pressure (W.C.[kPa]) 24K	Static Pressure (W.C.[kPa]) 36K	Static Pressure (W.C.[kPa]) 48K/60K
	2	Medium Low (Default setting)	0.18[0.045]	0.24[0.057]	0.28[0.07]
	3	Medium	0.25[0.08]	0.4[0.1]	0.4[0.1]
	4	Medium High	0.58[0.145]	0.58[0.145]	0.58[0.145]
	5	High	0.8[0.2]	0.8[0.2]	0.8[0.2]

NOTE: Symbol " ■ " indicates the position of the DIP switch.
Symbol " ▯ " indicates any position of ON or OFF.

3.3 Installation of Outdoor Unit——DSW

24/36/48/60K

DIP Switch Setting of Outdoor Unit

Turn off all power sources before setting.
Without turning off,the switches do not work and the content of the setting are invalid.
Mark of "■" indicates the position of DIP switches.

S4 DIP switch setting		S5 DIP switch setting	
select setting		select setting	
Factory setting		Factory setting	
Pump Down Switch		Capacity Hi —Low	
Forced defrost		Cooling Only	

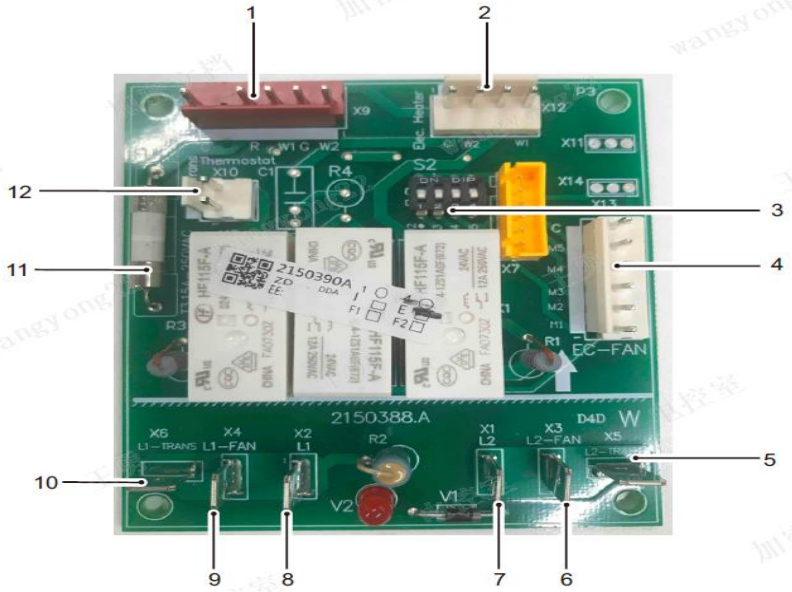
3.4 Electrical connection

Model (Btu/h)	Power Supply	ELB		Power Source Cable Size	Transmitting Cable Size	Fuse or Circuit Breaker (A)
		Rated Current (A)	Nominal Sensitive Current (mA)			
24K	208/230V ~/60Hz	25	30	3×12AWG	5×16AWG	25
36K	208/230V ~/60Hz	35	30	3×10AWG	5×16AWG	35
48K/60K	208/230V ~/60Hz	50	30	3×8AWG	5×16AWG	50

Cooling only model

Model (Btu/h)	Power Supply	ELB		Power Source Cable Size	Transmitting Cable Size	Fuse or Circuit Breaker (A)
		Rated Current (A)	Nominal Sensitive Current (mA)			
24K	208/230V ~/60Hz	25	30	3×12AWG	3×16AWG	25
36K	208/230V ~/60Hz	35	30	3×10AWG	3×16AWG	35
48K/60K	208/230V ~/60Hz	50	30	3×8AWG	3×16AWG	50

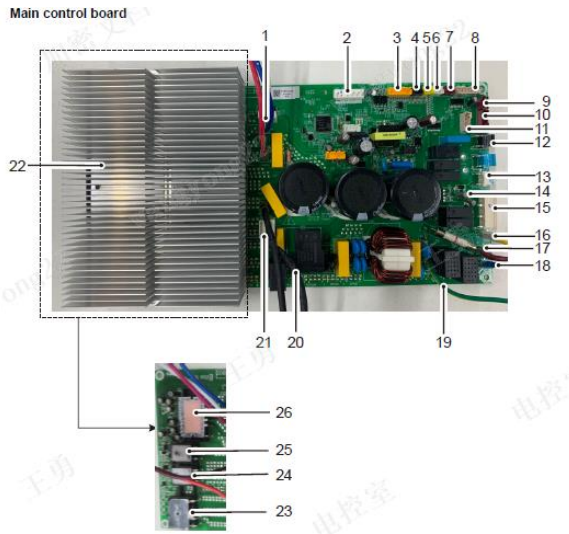
3.4 Electrical connection——In door control board 24/36/48/60K



NO.	Description	NO.	Description
1	Thermostat	7	AC Power L2
2	Electrical Heat Kit	8	AC Power L1
3	DIP Switch for Blower Speed	9	L1 for Fan Motor
4	Fan Motor Control	10	L1 for Transformer
5	L2 for Transformer	11	Fuse
6	L2 for Fan Motor	12	AC 24V from Transformer

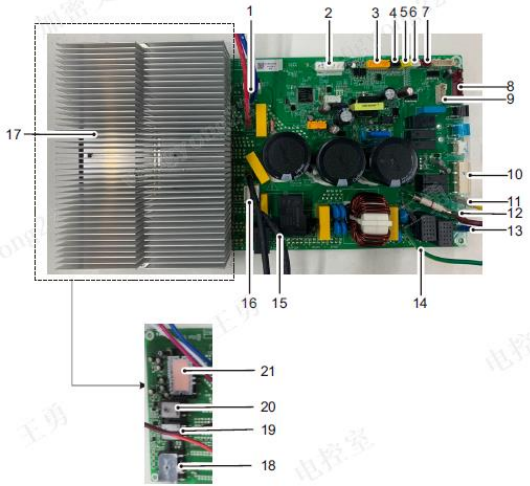
3.4 Electrical connection——Outdoor control board

24K/36K



NO.	Description	NO.	Description
1	Compressor	14	Heater
2	DC Fan	15	Communication Signal
3	EE	16	SI
4	Coil Temperature Sensor	17	AC Power Lin
5	Ambient Temperature Sensor	18	AC Power Nin
6	Discharge Temperature Sensor	19	GND
7	Overheat Protector	20	Reactor L2
8	Electronic Expansion Valve	21	Reactor L1
9	High Pressure	22	Radiator
10	SW	23	Rectifier Bridge
11	Computer/Checker	24	IGBT
12	4-way Valve	25	Diode
13	Electric Heating Belt	26	IPM

Cooling only model

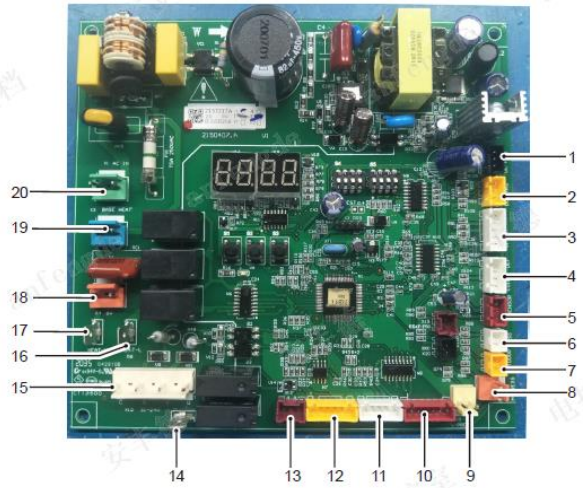


NO.	Description	NO.	Description
1	Compressor	12	AC Power Lin
2	DC Fan	13	AC Power Nin
3	EE	14	GND
4	Coil Temperature Sensor	15	Reactor L2
5	Ambient Temperature Sensor	16	Reactor L1
6	Discharge Temperature Sensor	17	Radiator
7	Overheat Protector	18	Rectifier Bridge
8	SW	19	IGBT
9	Computer/Checker	20	Diode
10	Communication Signal	21	IPM
11	SI		

3.4 Electrical connection——Outdoor control board

48K/60K

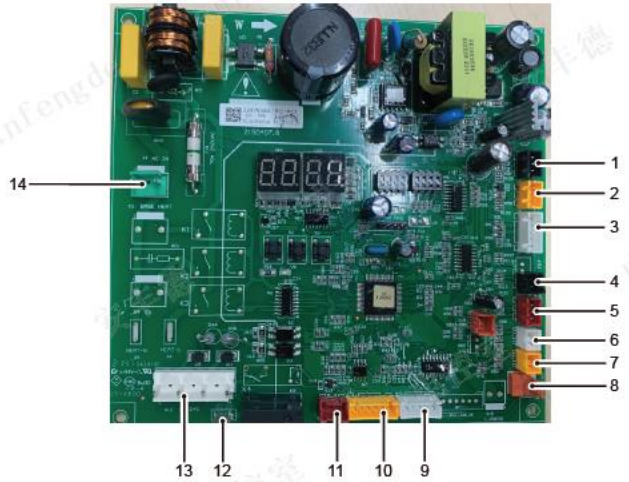
48K/60K
Main control board



NO.	Description	NO.	Description
1	DC Fan Driver1	11	Checker
2	DC Fan Driver2	12	EEPROM
3	IPM-SI	13	PTC Control Signal
4	Defrost /Coil Temperature Sensor	14	H Signal
5	Pressure Sensor	15	Communication Signal
6	Discharge Temperature Sensor	16	Electric Heating Belt
7	Ambient Temperature Sensor	17	Electric Heating Belt
8	High Pressure Switch	18	4-way Valve
9	Low Pressure Switch	19	Base Heater
10	Electronic Expansion Valve	20	AC Power

Cooling only model

48K/60K
Main control board

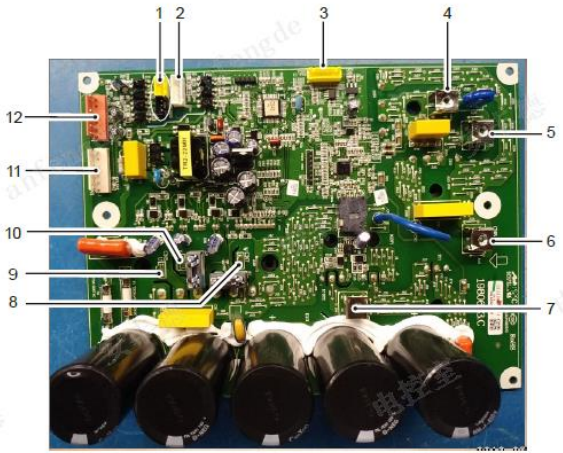


NO.	Description	NO.	Description
1	DC Fan Driver1	8	High Pressure Switch
2	DC Fan Driver2	9	Checker
3	IPM-SI	10	EEPROM
4	Coil Temperature Sensor	11	PTC Control Signal
5	Pressure Sensor	12	SI Signal
6	Discharge Temperature Sensor	13	Communication Signal
7	Ambient Temperature Sensor	14	AC Power

3.4 Electrical connection——Outdoor Drive board

48K/60K

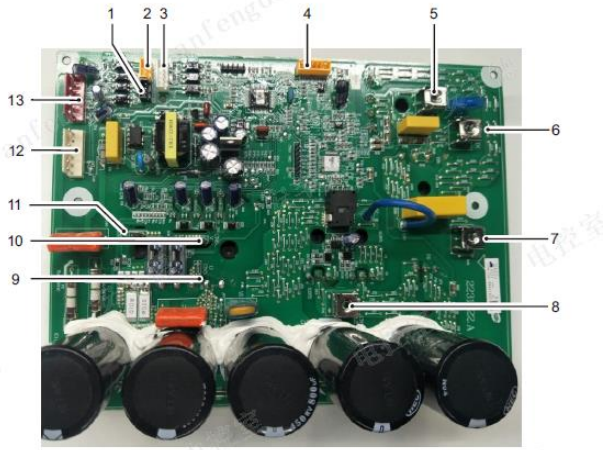
Drive board



NO.	Description	NO.	Description
1	DC Fan Drive Signal	7	Reactor L2
2	IPM-SI	8	Compressor W
3	EE	9	Compressor U
4	NIN	10	Compressor V
5	LIN	11	DC Fan 1
6	Reactor L1	12	DC Fan 2

Cooling only model

Drive board

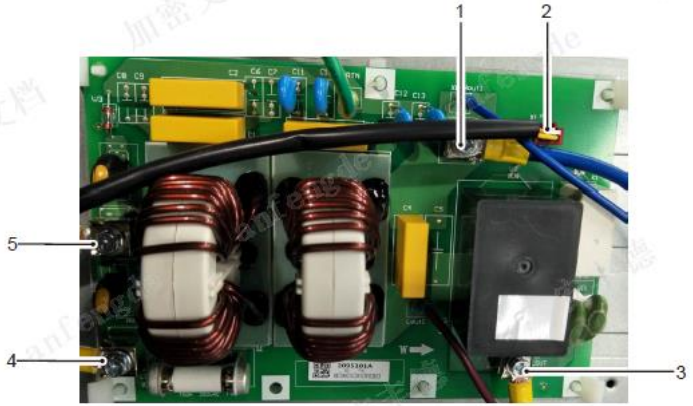


NO.	Description	NO.	Description
1	DC Fan Signal	8	Reactor L2
2	DC Fan Signal	9	Compressor U
3	IPM-SI	10	Compressor V
4	EEPROM	11	Compressor W
5	NIN	12	DC Fan 1
6	LIN	13	DC Fan 2
7	Reactor L1		

3.4 Electrical connection——Outdoor Drive board

48K/60K

Filter board

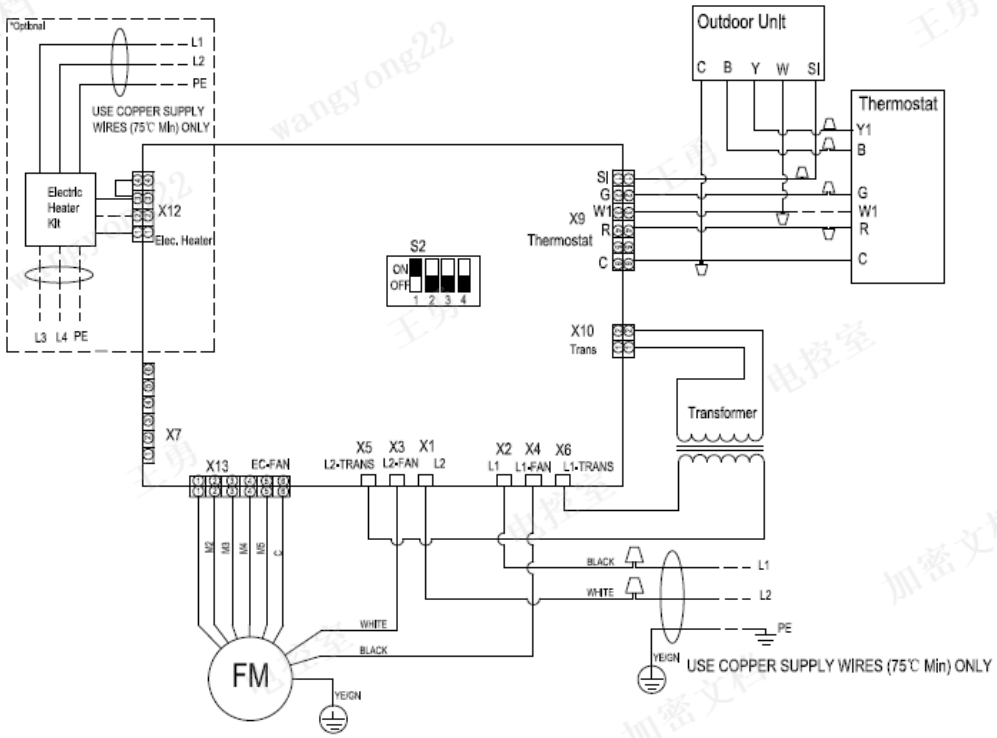


NO.	Description	NO.	Description
1	N Out	4	LIN
2	PTC Control Signal	5	NIN
3	L Out		

3.4 Electrical connection—Indoor Electric Wiring Diagram

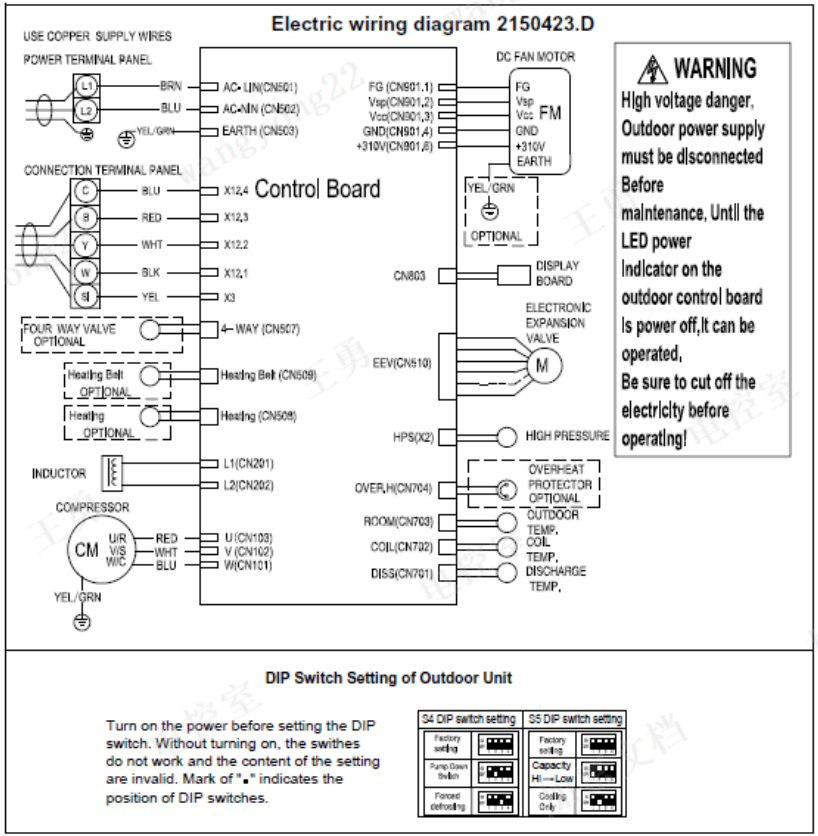
24/36/48/60K

Electrical Wiring Diagram 2157413.B



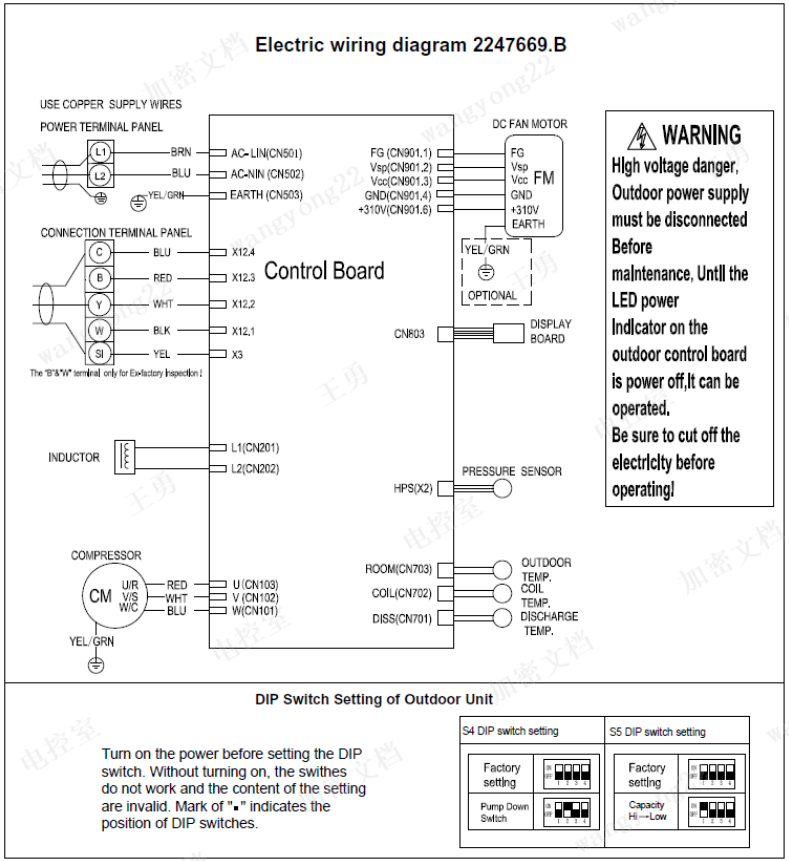
3.4 Electrical connection—Outdoor Electric Wiring Diagram

24/36K



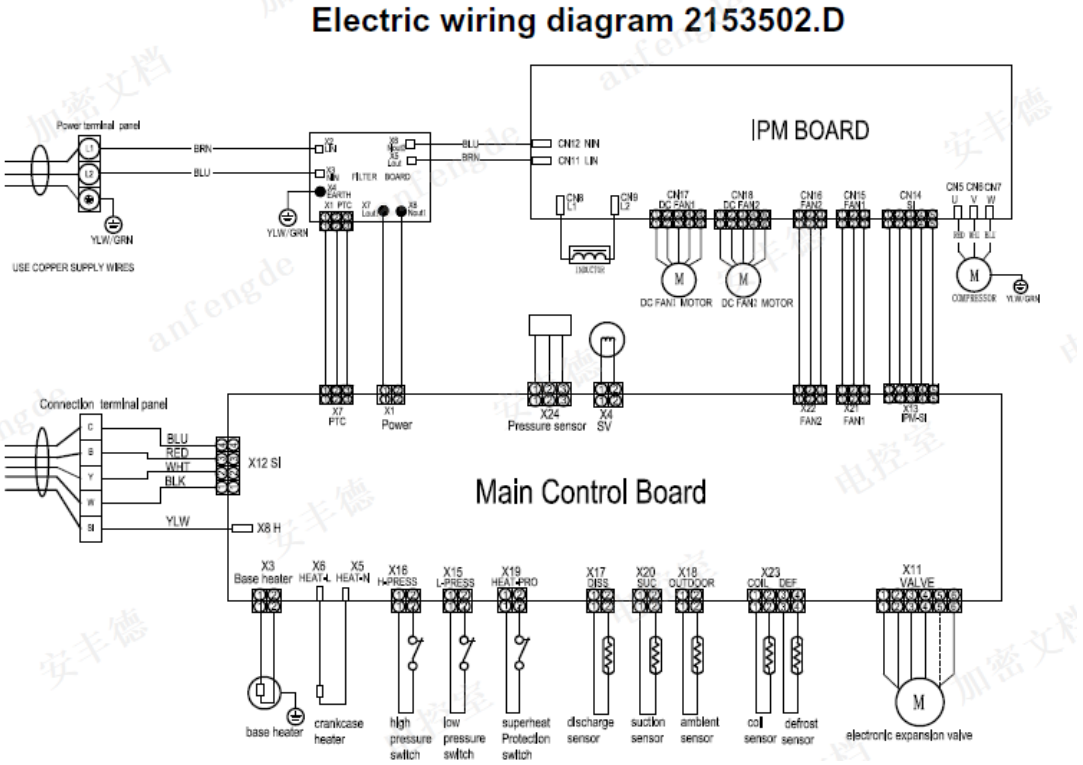
3.4 Electrical connection—Outdoor Electric Wiring Diagram

24/36K Cooling only model



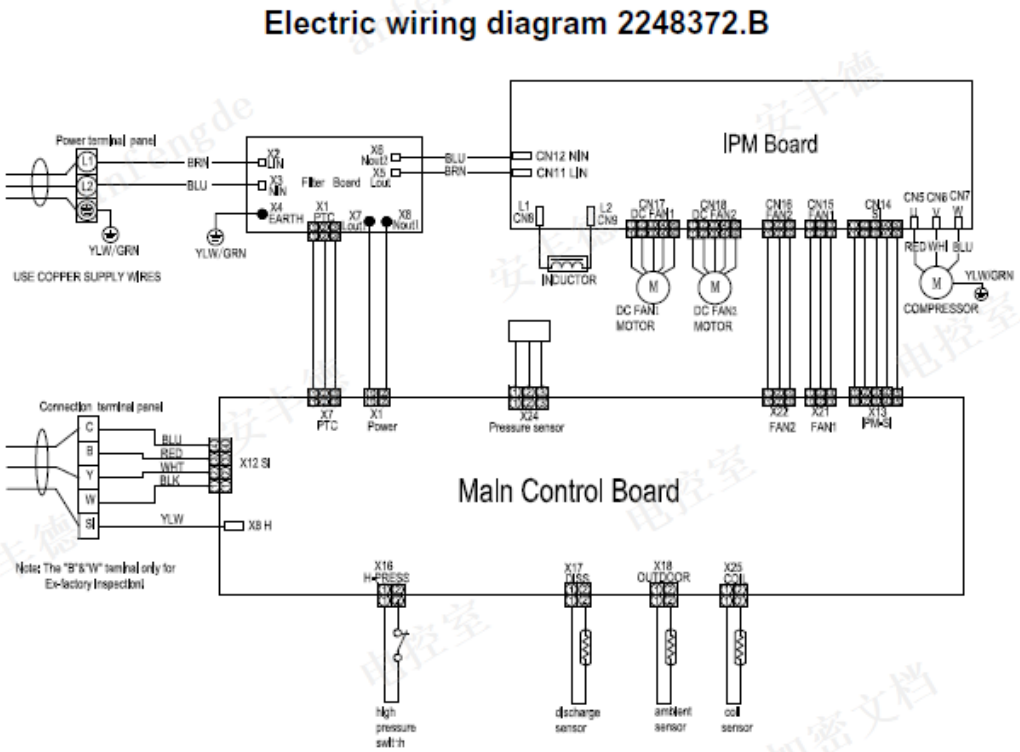
3.4 Electrical connection—Outdoor Electric Wiring Diagram

48/60k

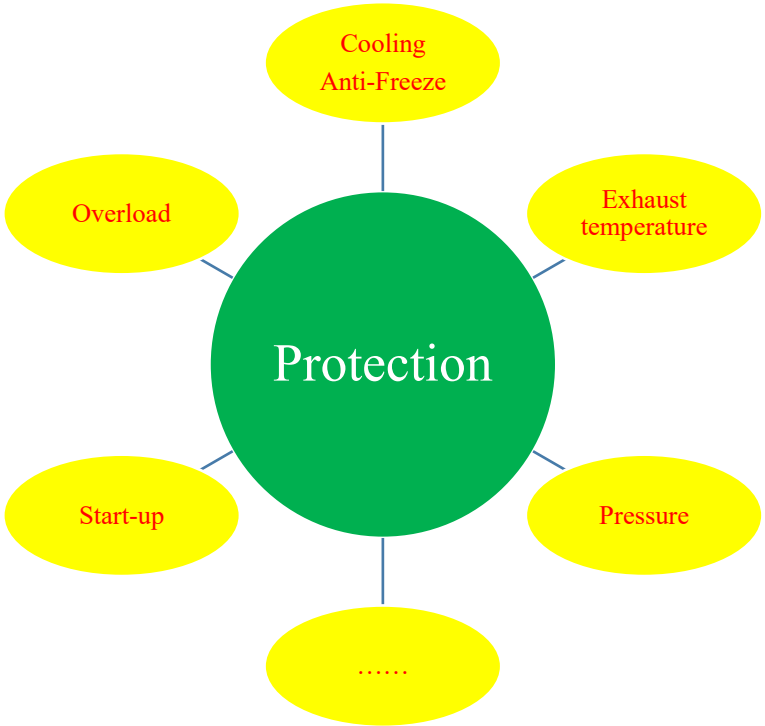


3.4 Electrical connection—Outdoor Electric Wiring Diagram

48/60K Cooling only model



4.1 Protection Design



4.1 Protection Design

1. Cooling Anti-Freeze Protection

   The outdoor pressure sensor functions as real time temperature detector of evaporator. It prevents the indoor unit evaporator temperature becoming too low. If the indoor coil temperature is too low, the compressor will automatically start protection mode.

2. Overload Protection

   To prevent system overload caused by excessive pressure, the machine will implement real-time detection when outdoor coil temperature is too high during cooling mode .

3. Exhaust temperature protection

   To prevent deterioration due to high exhaust temperature of compressor, the machine will realize the real-time detection of the exhaust gas temperature. If the temperature is too high compressor provides automatic protection.

4. Oil-return Control

   When the compressor runs at low frequencies for a long time, control system will start the oil-return mechanism. The oil in the system returns to the compressor.

5. Start-up Protection

   To prevent compressor from restarting frequently when the system pressure has not been completely balanced, it cannot be restarted within 3 minutes.

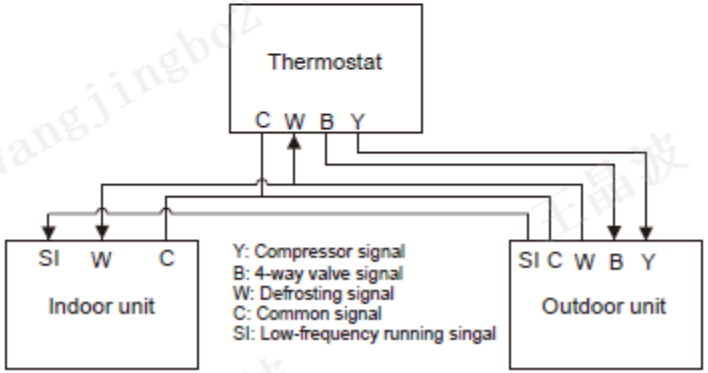
6. Pressure Protection

   When the pressure increases to a preset value, the pressure switch will automatically come to protection mode. The compressor will stop and report the fault code protection.

4.2 Control Logic

An illustration to outdoor unit signal

The communication between the outdoor unit, thermostat and the indoor unit is achieved through 24V alternating current, as shown in figure below.
The thermostat controls the signal output of Y and B, and the outdoor unit identifies its operation mode according to these two signals. If Y-C is high level, the outdoor unit starts in cooling mode; if both Y-C and B-C are high level, the outdoor unit starts in heating mode.
When the outdoor unit meets its defrosting conditions or anti-cold air conditions in heating mode, W-C is high level, and when it exits from defrosting function and anti-cold air function, W-C is low level. SI singnal is send when outdoor unit runs with low-frequncy mode.

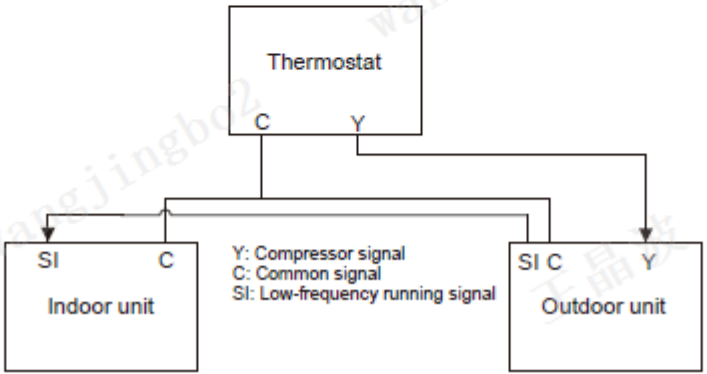


Cooling and Heating units

4.2 Control Logic

An illustration to outdoor unit signal

Communication between indoor and outdoor units:
The communication between the outdoor unit, thermostat and the indoor unit is achieved through 24V alternating current, as shown in figure below.
The thermostat controls the signal output of Y, if Y-C is high level, the outdoor unit starts in cooling mode. SI signal is send when outdoor unit runs with low-frequency mode.



Cooling only units

4.2 Control Logic

Cooling Mode

(1) Start conditions:

When high level compressor signal is received from the thermostat, that is Y-C is high level.

(2) Stopping operating:

① Stopping conditions:

When low level compressor signal is received from the thermostat, that is Y-C is low level.

② Actions:

The compressor keeps operating with its current frequency, and detects its system pressure at the same time.

(a) If the pressure changes more than 0.04MPa【e2】in 10 seconds, the compressor stops operating.

(b) If the pressure changes less than 0.04MPa【e2】in 10 seconds, the compressor keeps operating and the target pressure is set to increase by 0.2MPa【e2】based on the current system pressure. The motor and electronic expansion valve are controlled as usual, the protection function and oil-return control are valid.

③ Stopping conditions:

When the compressor signal received from the thermostat is high level, that is Y-C is high level, the unit restores the normal target pressure to operate or when the compressor has operated for 3min【e2】with the increased target pressure, it is taken as it has stopped operating.

4.2 Control Logic

Cooling Mode

Compressor running rules:

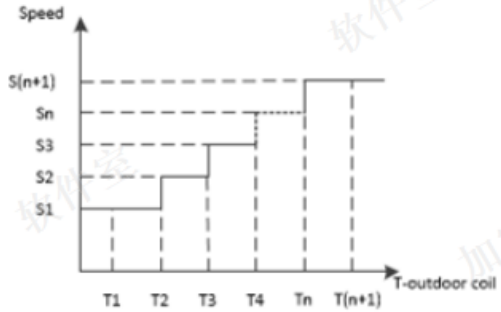
When the unit starts up in cooling mode, the compressor starts to work, and adjust its operating frequency according to the system target pressure and the actual pressure. If the actual pressure is higher than the target pressure, the compressor frequency will rise; if the actual pressure is lower than the target pressure, the compressor frequency decreases; when the target pressure is reached, the compressor frequency will keep stable.

Outdoor fan running rules:

Once the outdoor fan starts up, it will follow the rules below:

Single outdoor fan: First, it will run in an invariable speed for a short time; Then it will regulate the speed by the outdoor-coil temperature.

Double outdoor fan: If it has two outdoor fans, the upper fan regulates the speed by the rules, and the downer fan speed is lower than the upper fan speed for 30rpm~60rpm.



4.2 Control Logic

Heating Mode

(1) Start conditions:

When high level compressor signal and high level 4-way valve signal are received from the thermostat, that is both Y-C and and B-C are low level.

(2) Stopping operating in heating mode:

① Stopping conditions:

When low level compressor signal and low level 4-way valve signal are received from the thermostat, that is both Y-C and B-C are low level.

② Stopping actions:

The compressor keeps operating with its current frequency, and detects its system pressure at the same time.

(a) If the pressure keeps 3.6 MPa【e2】or more for 10 seconds, or it changes more than 0.1 MPa【e2】in 10 seconds, the compressor stops operating

(b) If the pressure changes less than 0.1MPa【e2】in 10 seconds, the compressor keeps operating and the target pressure is set to decrease by 0.3MPa【e2】based on the current system pressure. The motor and electronic expansion valve are controlled as usual, the protection function and oil-return control are valid.

4.2 Control Logic

Heating Mode

③ When the compressor signal and 4-way valve signal received from the thermostat are high level, that is Y-C and B-C are high level, the unit restores the normal target pressure to operate or when the compressor has operated for 3min【e2】with the decreased target pressure, it is taken as it has stopped operating.

Compressor running rules:
When the unit starts up in heating mode, the compressor starts to work, and adjust its operating frequency according to the system target pressure and the actual pressure. If the actual pressure is higher than the target pressure, the compressor frequency will decrease; if the actual pressure is lower than the target pressure, the compressor frequency increases; when the target pressure is reached, the compressor frequency will keep stable.

4.2 Control Logic

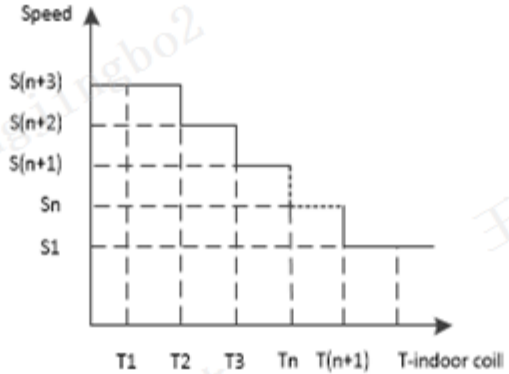
Heating Mode

Outdoor fan running rules:

Once the outdoor fan starts up, it will follow the rules below:

Single outdoor fan: First, it will run in an invariable speed for a short time; Then it will regulate the speed by the saturation temperature (which is got from high pressure cycling)

Double outdoor fan: If it has two outdoor fans, the upper fan regulates the speed by the rules, and the downer fan speed is lower than the upper fan speed for 30rpm~60rpm.



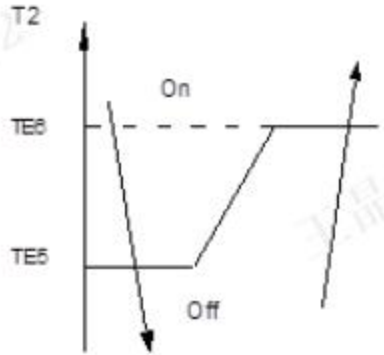
4.2 Control Logic

Evaporator Low-temperature Protection

DC-Inverter

AC will enter T2 protection if any of the following condition is satisfied.

Condition:



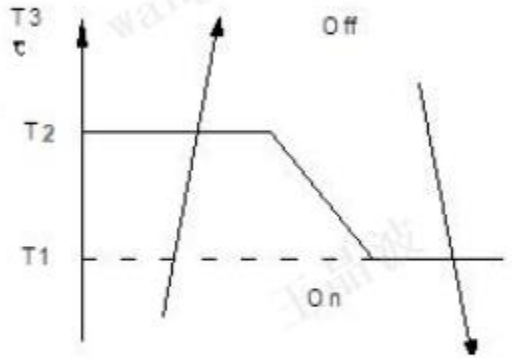
Cooling mode: When the saturation temperature（which is got from low pressure cycling) T2 keeps lower than TE5 for 120 seconds, the compressor and outdoor fan will shut off. When T2 is higher than TE6, the compressor and outdoor fan will restart up.

4.2 Control Logic

Condenser High-temperature Protection

DC-Inverter outdoor unit

AC will enter T3 protection if any of the following conditions is satisfied.



Cooling mode: When the outdoor coil temp. T3 keeps higher than T2 for 10 seconds, the compressor and outdoor fan will shut off. When T3 is lower than T1, the compressor and outdoor fan will restart up.

4.3 Fault Codes——Display

24K/36K

DC-Inverter unitary (Main control board upside-down)

1) Fault code displayed by LED lamps on outdoor main control board.

There are 3 LED lamps on control board, LED1, LED2 and LED3.

LED1 indicates the ten's place of the fault code, LED2 indicates the unit's place of the fault code and LED3 indicates outdoor drive control fault.

When LED3 is off, LED1 and LED 2 indicate main control fault code.

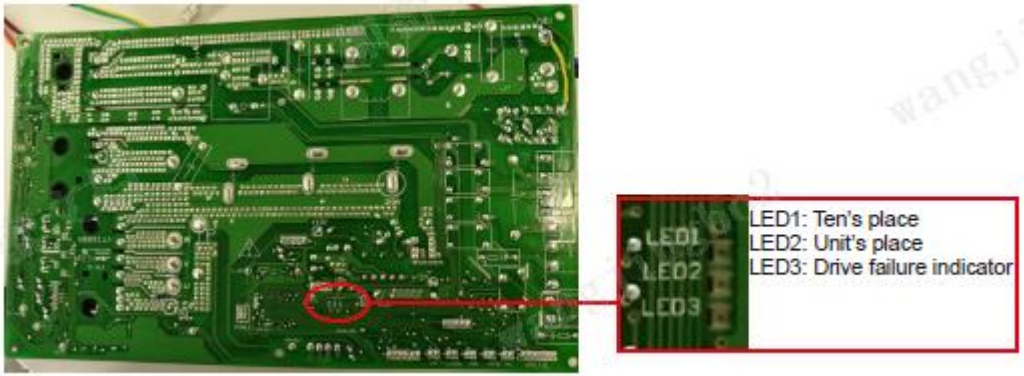
When LED3 is on, LED1 and LED 2 indicate drive control fault code.

When LED3 is flickering and LED1, LED 2 are all off, it indicates the compressor is preheating.

Failures display with 5s interval. It means LED will be off for 5s to report the next fault code.

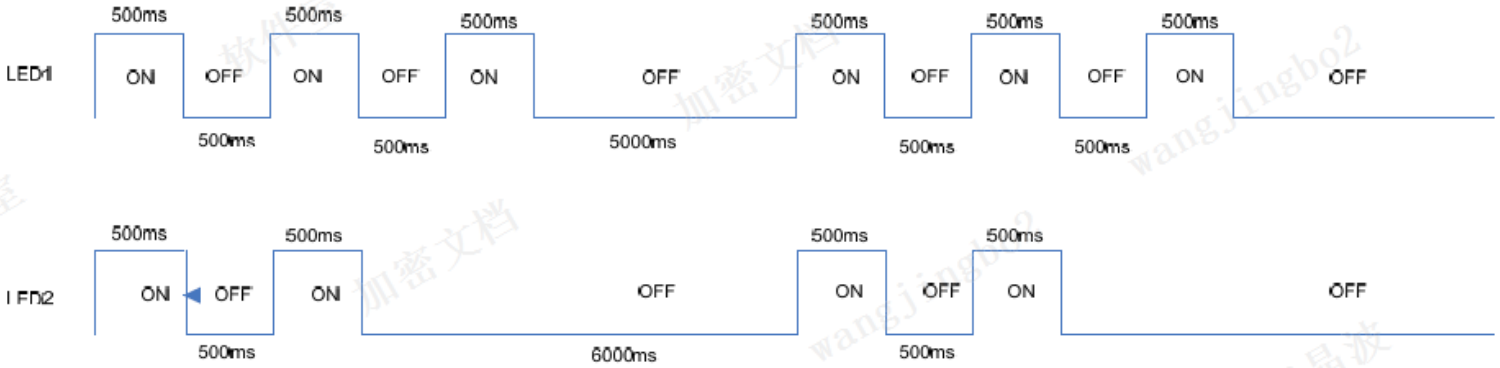
System protection codes display method is the same with main control fault code.

LED lamps will be off when there is no failure, protection or preheating.

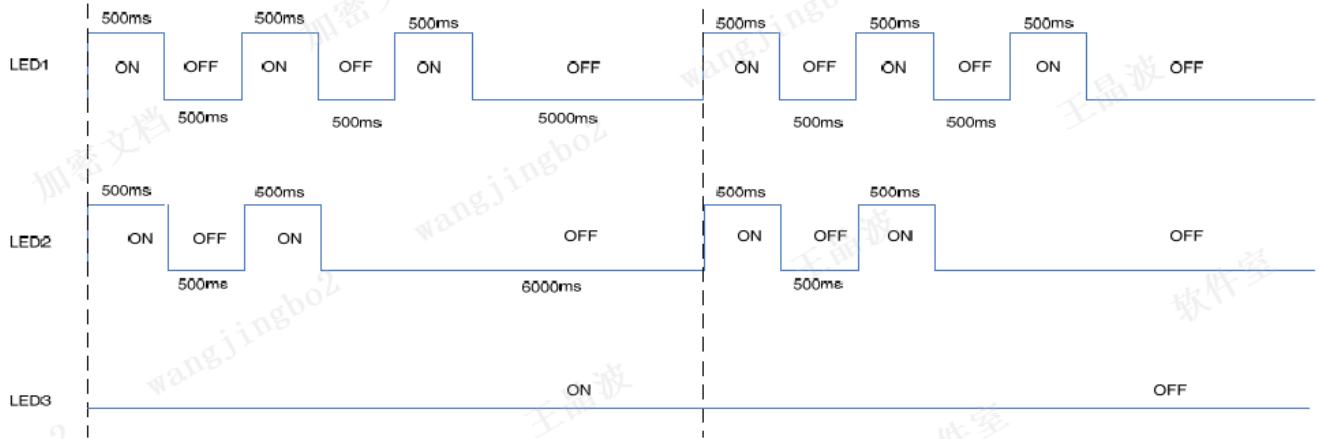


4.3 Fault Codes——Display

For example, outdoor main control fault 32:



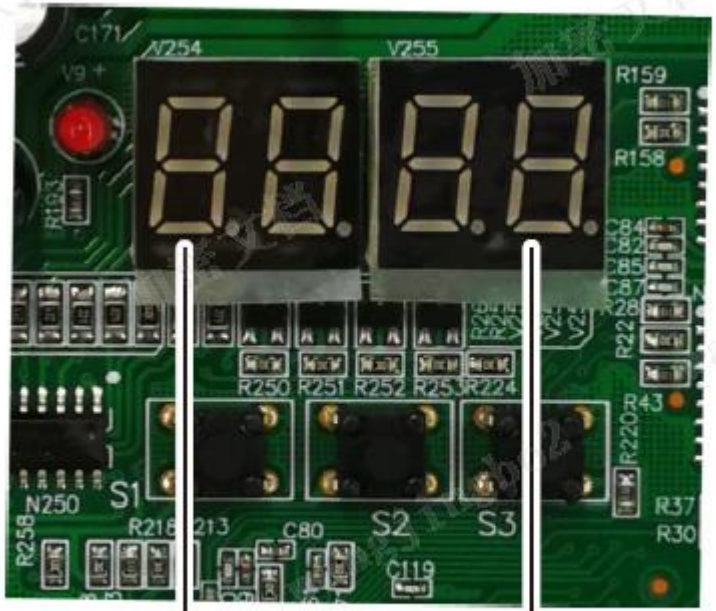
For example, outdoor drive fault 32:



4.3 Fault Codes——Display

2) Display by 7 segment display board.

Fault code will be displayed directly on 7 segment display board.



E : Show failure occur.

Display ERROR code.

4.3 Fault Codes——Display

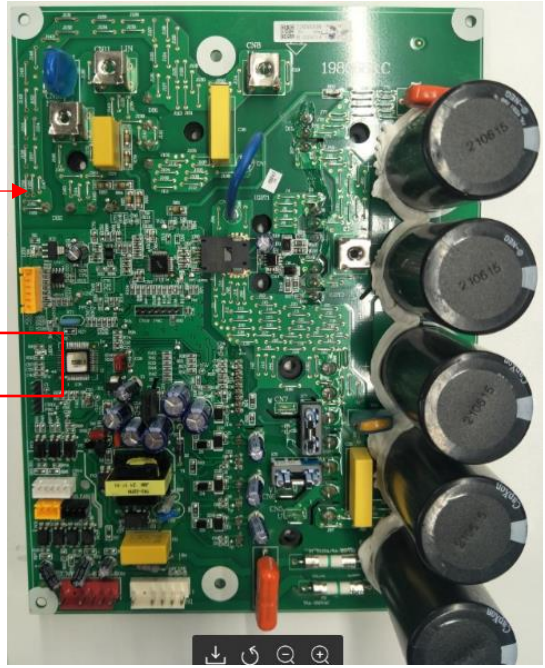
Drive fault code display

The lamp of drive board flashing shows failure occurs.

How many times the drive failure lamp flicker will show the failure code.

Driver board

LED2:
driver board
failure indicator



AURUS

4.3 Fault Codes——Trouble shooting

Table 1 Outdoor fault code

Fault code	Fault description	Possible reasons for abnormality	How to deal with	Remarks
1	Outdoor ambient temperature sensor fault	1.The outdoor ambient temperature sensor is connected loosely; 2.The outdoor ambient temperature sensor fails to work; 3.The sampling circuit fails.	1.Reconnect the outdoor ambient temperature sensor; 2.Replace the outdoor ambient temperature sensor components; 3.Replace the outdoor control board components.	
2	Outdoor coil temperature sensor fault	1.The outdoor coil temperature sensor is connected loosely; 2.The outdoor coil temperature sensor fails to work; 3.The sampling circuit fails.	1.Reconnect the outdoor coil temperature sensor; 2.Replace the outdoor coil temperature sensor components; 3.Replace the outdoor control board components.	
3	The unit over-current turn off fault	1. Control board current sampling circuit fails; 2. The current is over high because the supply voltage is too low; 3. The compressor is blocked; 4. Overload in cooling mode.	1. Replace the electrical control board components; 2. Normal protection; 3. Replace the compressor; 4. Please see Table 2.	
4	EEprom Data error	1.EE components fails; 2.EE components control circuit fails; 3.EE components are inserted incorrectly.	1.Replace the EE components; 2.Replace the outdoor control board components; 3.Reassemble the EE components.	

4.3 Fault Codes——Trouble shooting

Fault code	Fault description	Possible reasons for abnormality	How to deal with	Remarks
5	Cooling freezing protection (the indoor coil temperature is too low)	1.The indoor unit can not blow air normally; 2.The room temperature is too low in cooling mode or the room temperature is too high in heating; 3.The filter is dirty; 4.The duct resistance is too high to resulting in low air flow; 5.The setting fan speed is too low; 6.The indoor unit is not installed in accordance with the installation standards, and the air inlet is too close to the air outlet .	1.Check whether the indoor fan, indoor fan motor and evaporator work normally; 2.Normal protection; 3.Clean the filter; 4.Check the volume control valve, duct length etc.; 5.Set the speed with high speed; 6.Reinstall the indoor unit referring to the user manual to change the distance between the indoor unit and the wall or ceiling.	
7	The communication fault between the indoor unit and outdoor unit	1.The connection cable is connected improperly between the indoor unit and outdoor unit; 2.The communication cable is connected loosely; 3.The communication cable fails; 4.The indoor control board fails; 5.The outdoor control board fails; 6.Communication circuit fuse open; 7.The specification of communication cable is incorrect.	1.Reconnect the connection cable referring to the wiring diagram; 2.Reconnect the communication cable; 3.Replace the communication cable; 4.Replace the indoor control board; 5.Replace the outdoor control board; 6.Check the communication circuit, adjust the DIP switch and the short-circuit fuse; 7.Choose suitable communication cable referring to the user manual.	

4.3 Fault Codes——Trouble shooting

Fault code	Fault description	Possible reasons for abnormality	How to deal with	Remarks
13	Compressor overheat protector device	1. The wiring of the overload protector is connected loosely. 2. The overload protector fails . 3. The refrigerant is not enough; 4. The installation pipe is much longer than the normal one, but extra refrigerant is not added ; 5. The expansion valve fails; 6. The outdoor control board fails.	1. Reconnect the wiring of the overload protector; 2. Replace the overload protector; 3. Check the welding point of the unit to confirm whether it is leakage, and then recharge the refrigerant; 4. Add the refrigerant; 5. Replace expansion valve; 6. Replace the outdoor control board.	
14	The high pressure switch operation or the unit is turned off for high pressure protection	1.The wiring of the high pressure protector is connected loosely; 2.The high pressure protector fails; 3.The outdoor control board is abnormal; 4.Overload in cooling.	1. Reconnect the wiring of the high pressure protector; 2. Replace the high pressure protector; 3. Replace the outdoor control board; 4. Please refer to Table 2.	Applied to models with high pressure switch or pressure sensor
16	Overload protection in cooling mode	System overload	Please refer to Table 2.	

4.3 Fault Codes——Trouble shooting

Fault code	Fault description	Possible reasons for abnormality	How to deal with	Remarks
17	Discharge temperature sensor fault	1.The wiring of the discharge tempe-rature sensor is connected loosely; 2. The discharge temperature sensor fails; 3.The sampling circuit is abnormal.	1. Reconnect the wiring of the discharge temperature sensor; 2. Replace the discharge temperature sensor; 3. Replace the outdoor control board.	
18	AC voltage is abnormal	1.The AC voltage>275V or <160V; 2.The AC voltage of sampling circuit on the driver board is abnormal.	1. Normal protection, please check the supply power; 2. Replace the driver board.	
43	High Pressure sensor fault	1. The wiring of the high-pressure pressure sensor connect is loose; 2. The high-pressure pressure sensor fails; 3. The sampling circuit of the high-pressure pressure sensor fails.	1. Reconnect the wiring of the high-pressure pressure sensor; 2. Replace the high-pressure pressure sensor; 3. Replace the outdoor control board.	
45	IPM fault	There are many reasons for this failure. You can check the driver board fault LED to further analyze the fault code of the drive board and to learn about what leads to the fault and how to operate it. Specific information can be seen in table 3,table 4.	See attached "analysis of the driving board fault".	

4.3 Fault Codes——Trouble shooting

Fault code	Fault description	Possible reasons for abnormality	How to deal with	Remarks
46	IPM and control board communication fault	1.The cable between the control board and the driver board is connected loosely; 2.The cable between the control board and the driver board fails; 3.The driver board fails ; 4.The control board fails.	1.Reconnect the cable between the control board and the driver board; 2.Replace the communication cable between the control board and the driver board; 3.Replace the driver board; 4.Replace the control board.	
47	Too high discharge temperature fault	1. The refrigerant of the unit is not enough; 2.The refrigerant of the unit is not enough due to that the installation pipe is longer; 3.Throttling service fails; 4.The outdoor ambient temperature is too high.	1.Check the welding point to confirm whether the unit has leakage point, and then add some refrigerant; 2.Add some refrigerant referring to the installation user manual; 3.Replace the throttling service (such as capillary, expansion valve); 4.Normal protection.	
48	The outdoor DC fan motor fault (upper fan motor)	1.The connecting wiring of the up DC fan motor is loose; 2.The cord of the upper DC fan motor fails; 3.The upper DC fan motor fails; 4.The drive circuit of the upper DC fan motor fails; 5.The outdoor fan has been blocked.	1.Reconnect the wiring of the up DC fan motor; 2.Replace the upper DC fan motor; 3.Replace the upper DC fan motor; 4.Replace the driver board of the fan motor; 5.Check the outdoor fan and ensure the outdoor fan can run normally.	

4.3 Fault Codes——Trouble shooting

Fault code	Fault description	Possible reasons for abnormality	How to deal with	Remarks
49	The outdoor DC fan motor fault (down fan motor)	1.The connecting wiring of the down DC fan motor is loose; 2.The cord of the down DC fan motor fails; 3. The down DC fan motor fails; 4. The drive circuit of the down DC fan motor fails; 5. The outdoor fan has been blocked.	1. Reconnect the wiring of the down DC fan motor; 2. Replace the down DC fan motor; 3. Replace the down DC fan motor; 4. Replace the driver board of the fan motor; 5. Check the outdoor fan and ensure the outdoor fan can run normally.	
91	The unit turn off due to the IPM board over heating fault	1. The outdoor ambient temp. is too high; 2. The speed of the out fan motor is too low if the fan motor is AC fan motor; 3. The outdoor unit is not installed in accordance with the standard; 4.The supply power is too low.	1. Normal protection; 2. Check the fan capacitor, and replace the fan capacitor if it is a failure; 3. Reinstalled the outdoor unit referring to the installation user manual; 4. Normal protection.	
96	Lacking of refrigerant	The refrigerant of the unit is not enough.	Discharge the refrigerant and charge the refrigerant referring to the rating label.	

4.3 Fault Codes——Trouble shooting

NOTE :

Overload in cooling mode

Table 2 Overload in cooling mode

sr.	The root cause	Corrective measure
1	The refrigerant is excessive.	Discharge the refrigerant, and recharge the refrigerant referring to the rating label.
2	The outdoor ambient temperature is too high.	Please use it within allowable temperature range
3	Short-circuit occurs in the air outlet and air inlet of the outdoor unit.	Adjust the installation of the outdoor unit referring to the user manual.
4	The outdoor heat exchanger is dirty, such as condenser.	Clean the heat exchanger of the outdoor unit, such as condenser.
5	The speed of the outdoor fan motor is too low.	Check the outdoor fan motor and fan capacitor.
6	The outdoor fan is broken or the outdoor fan is blocked.	Check the outdoor fan.
7	The air inlet and outlet have been blocked.	Remove the obstructions.
8	The expansion valve or the capillary fails.	Replace the expansion valve or the capillary.

4.3 Fault Codes——Trouble shooting

NOTE 4: Over load in heating mode

	Overload in heating mode	
sr.	**The root cause**	**Corrective measures**
1	The refrigerant is excessive.	Discharge the refrigerant, and recharge the refrigerant referring to the rating label.
2	The indoor ambient temperature is too high.	Please use it within allowable temperature range.
3	Short-circuit occurs in the air outlet and air inlet of the indoor unit.	Adjust the installation of the indoor unit referring to the user manual.
4	The indoor filter is dirty.	Clean the indoor filter.
5	The speed of the indoor fan motor is too low.	Check the indoor fan motor and fan capacitor.
6	The indoor fan is broken or the outdoor fan is blocked.	Check the indoor fan.
7	The air inlet and outlet have been blocked.	Remove the obstructions.
8	The expansion valve or the capillary fails.	Replace the expansion valve or the capillary.

4.3 Fault Codes——Trouble shooting

Table 3 Drive fault code (24K/36K)

Fault code	Fault description	Possible reasons for abnormality	How to deal with
1	Inverter DC voltage overload fault	1. Power supply input is too high or too low; 2. Driver board fault.	1. Check power supply; 2. Change driver board.
2	Inverter DC low voltage fault		
3	Inverter AC current overload fault		
4	Out-of-step detection	1. Compressor phase lost ; 2. Bad driver board components ; 3. The compressor insulation fault.	1. Check compressor wire connection; 2. Change the driver board; 3. Change compressor.
5	Loss phase detection fault (speed pulsation)		
6	Loss phase detection fault (current imbalance)		
7	Inverter IPM fault (edge)	1. System overload or current overload; 2. Driver board fault; 3. Compressor oil shortage, serious wear of crankshaft ; 4. The compressor insulation fault.	1. Check the system. 2. Change the driver board; 3. Change the compressor; 4. Change the compressor.
8	Inverter IPM fault (level)		
9	PFC_IPM fault (edge)		
10	PFC_IPM fault (level)		
11	PFC power detection of failure	1. The power supply is not stable; 2. Instantaneous power off; 3. Driver board failure.	1. Check the power supply. 2. No need to deal with. 3. Change the driver board.
12	PFC overload current detection of failure.	1. System overload, current is too high; 2. Driver board fails; 3. PFC fails.	1.Check the system; 2.Change the driver board; 3.Change the PFC.
13	DC voltage detected abnormal .	1. Input voltage is too high or too low; 2. Driver board fails.	1. Check the power supply; 2. Change the driver board.
14	PFC LOW voltage detected failure.		
15	AD offset abnormal detected failure.	Driver board fails.	Change the driver board.
16	Inverter PWM logic set fault.		
17	Inverter PWM initialization failure		
18	PFC_PWM logic set fault.		
19	PFC_PWM initialization fault.		
20	Temperature abnormal.		

4.3 Fault Codes——Trouble shooting

Fault code	Fault description	Possible reasons for abnormality	How to deal with
21	Shunt resistance unbalance adjustment fault		
22	Communication failure.	1. Communication wire connection is not proper; 2. Driver board fails; 3. Control board fails.	1. Check the wiring; 2. Change the driver board; 3. Change the control board.
23	Motor parameters setting of failure	Initialization is abnormal.	Reset the power supply.
26	DC voltage mutation error	1. Power input changes suddenly 2. Driver board fails.	1.Check power supply, to provide stable power supply; 2.Change driver board.
27	D axis current control error	1. System overload, phase current is too high; 2. Driver board fails.	1. Check system to see if it works normally. 2. Check stop valve to see if it is open; 3. Change the driver board.
28	Q axis current control error	1. System overloads, phase current is too high ; 2. Driver board fails.	1. Check system to see if it works normally. 2. Check stop valve to see if it is open; 3. Change the driver board.
29	Saturation error of d axis current control integral	1. System overload suddenly; 2. Compressor parameter is not suitable; 3. Driver board fails.	1. Check system to see if it works normally. 2. Check stop valve to see if it is open; 3. Change the driver board.
30	Saturation error of q axis current control integral	1. System overload suddenly; 2. Compressor parameter is not suitable; 3. Driver board fails.	1. Check system to see if it works normally. 2. Check stop valve to see if it is open; 3. Change the driver board.
35	EE data abnormal	Driver board EEPROM is abnormal	1. Change EEPROM ; 2. Change the driver board.

4.3 Fault Codes——Trouble shooting

Table 4 Drive fault code (48K/60K)

Fault code	Fault description	Possible reasons for abnormality	How to deal with
1	Q axis current detection, failure in drive control	1. Compressor wire is not connected properly; 2. Bad driver board components; 3. Compressor start load is too large; 4. Compressor demagnetization; 5. Compress or oil shortage serious wear of crankshaft; 6. The compressor insulation fails.	1. Check the wire of the compressor; 2. Change the driver board ; 3. Turn on the machine after the pressure is balanced again; 4. Change the compressor; 5. Change the compressor; 6. Change the compressor.
2	Phase current detection, failure in drive control	1.Compressor voltage default phase; 2.Bad driver board components; 3.The compressor insulation fault.	1.Check compressor wire connection; 2.Change the driver board; 3.Change the compressor.
3	Initialization, phase current imbalance	Bad driver board components.	Change the driver board .
4	Speed estimation, failure in drive control	1.Bad driver board components; 2.Compressor shaft clamping; 3.The compressor insulation fails.	1.Change the driver board ; 2.Change the compressor ; 3.Change the compressor .
5	IPM FO output fault	1. System overload or current overload. 2. Driver board fails; 3. Compressor oil shortage,serious wear of crankshaft; 4. The compressor insulation fault.	1.Check the air conditioner system; 2.Change the driver board; 3.Change the compressor; 4. Change the compressor.
6	Communication between driver board and control board fault	1.Communication wire is not connected well; 2. Driver board fault; 3. Control board fault;	1. Check compressor wire connection. 2. Change the driver board; 3. Change the control board ;
7	AC voltage,overload voltage	1. Supply voltage input is too high or too low; 2. Driver board fails;	1.Check power supply; 2.Change the driver board;
8	DC voltage,overload voltage	1. Supply voltage input is too high ; 2. Driver board fault;	1. Check power supply; 2. Change the driver board;
9	AC voltage imbalance	Driver board fails;	Change the driver board;

4.3 Fault Codes——Trouble shooting

Fault code	Fault description	Possible reasons for abnormality	How to deal with
10	The PFC current detection circuit fault before compressor is ON	Bad driver board components;	Change the driver board
11	AC voltage supply in outrange	1.Power supply abnormal, power frequency out of range; 2.Driver board fails;	1. Check the system; 2. Change the driver board;
12	Products of single-phase PFC over-current, FO output low level	1. System overload, current is too large; 2. Driver board fault; 3. PFC fault.	1. Check the system; 2. Change the driver board; 3. Change PFC.
	Inverter over current (3-phase power supply air conditioners)	1. System overload, current is too large; 2. Driver board fault; 3. Compressor oil shortage, serious wear of crankshaft; 4. The compressor insulation fault.	1. Check the system; 2. Change the driver board; 3. Change the compressor; 4. Change the compressor.
13	Inverter over current	1. System overload, current is too large; 2. Driver board fault; 3. Compressor oil shortage,serious wear of crankshaft; 4. The compressor insulation fault.	1. Check the system; 2. Change the driver board; 3. Change the compressor; 4. Change the compressor.
14	PFC over current(single-phase air-conditioner)	1. System overload, current is too large; 2. Driver board fault; 3. PFC fault.	1. Check the system; 2. Change the driver board; 3. Change PFC.
	Phase imbalance or phase lacks or the instantaneous power failure (only for 3-phase power supply air conditioners)	1.3-Phase voltage imbalance; 2.The 3-phase power supply phase lost; 3. Power supply wiring is wrong; 4. Driver board fault.	1, Check the power supply; 2. Check the power supply; 3. Check the power supply wiring connection; 4. Change the driver board.
15	The instantaneous power off detection	1.The power supply is not stable ; 2.The instantaneous power failure ; 3.Driver board fault;	1. Check the power supply; 2. Not fault; 3. Change the driver board.

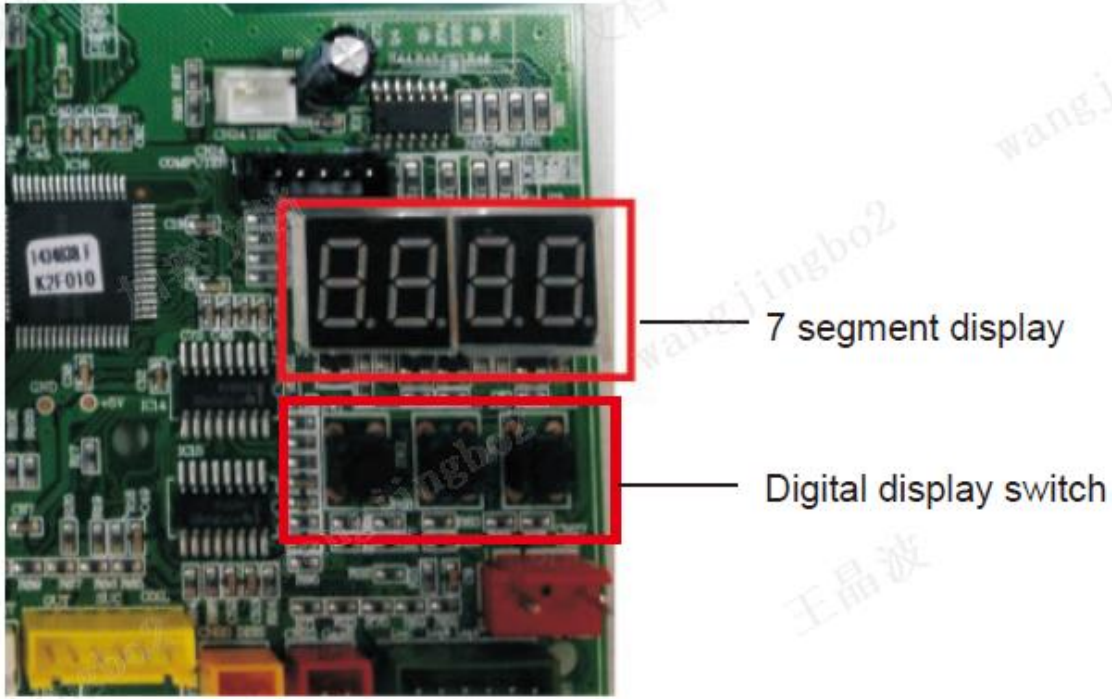
4.3 Fault Codes——Trouble shooting

Fault code	Fault description	Possible reasons for abnormality	How to deal with
16	Low DC voltage 200V	1. Voltage input is too low; 2. Drive board fault.	1. Check the power supply. 2. Change the driver board.
18	Driver board read EE data error	1. EEPROM has no data or data error; 2. EEPROM circuit fault.	1. Change EEPROM component; 2. Change the driver board.
19	PFC chip receives data fault	Abnormal communication loop.	Change the drive board.
20	PFC soft start abnormally	Abnormal PFC drive loop.	Change the drive board.
21	The compressor drive chip could not receive data from PFC chip.	Communication loop fault.	Change the drive board.

4.6 Running Parameter Query ——7 segment display

Running parameter check

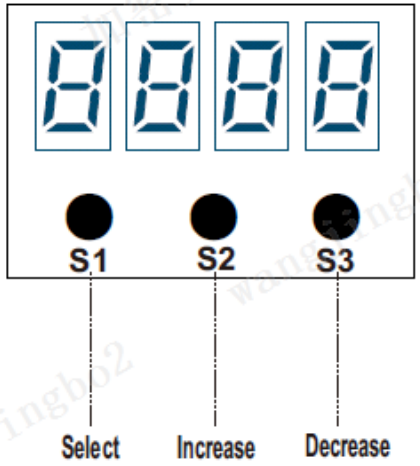
Query by 7 segment display



4.6 Running Parameter Query ——7 segment display

7-segment display Introduction

24K/36K



There are 3 buttons on the digital display board :
1) Select button: Select to display outdoor/indoor unit parameter.

"P." -- Parameter of outdoor unit

2) INCREASE button : Each time it is pressed, the number rises by 1.
3) DECREASE button : Each time it is pressed, the number lowers by 1.
The parameter content will be automatically displayed after the parameter code is selected for 3s.

4.6 Running Parameter Query ——7 segment display

Parameters can be checked in the following table below.

Parameter code	Descriptions
P.0	Fault codes
P.1	Compressor actual frequency
P.2	Compressor driving frequency
P.4	Compressor target frequency
P.5	Compressor exhaust temperature
P.7	Outdoor ambient temperature
P.8	Outdoor coil temperature
P.10	IPM module temperature
P.11	Outdoor capacity requirement
P.13	Outdoor DC Motor target speed
P.14	AC input current
P.15	AC input voltage
P.16	DC bus voltage
P.17	Compressor phase current
P.18	Frequency limit code
P.21	Target exhaust overheating

NOTE: The right is therefore reserved to EE changing without notice.