

WAB-WYB SERIES SINGLE SPLIT DC INVERTER

AIR CONDITIONER / HEAT PUMP SYSTEMS

SERVICE MANUAL

Mono DC

COVERING 16 SEER and 20 SEER FAMILY OF WAB-WYB MODELS

Revision A: 1312030001, Content updated.

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Cooling Only Model Numbers (Indoor + Outdoor Units):	Heat Pump Model Numbers (Indoor + Outdoor Units):
	WYB009GMFI16RL (WB009GMFI16HLD + YN009GMFI16RPD)
WAB009AMFI20RL (WB009AMFI20CLD + AN009AMFI20RPD)	WYB009AMFI20RL (WB009AMFI20HLD + YN009AMFI20RPD)
WAB012AMFI20RL (WB012AMFI20CLD + AN012AMFI20RPD)	WYB012AMFI20RL (WB012AMFI20HLD + YN012AMFI20RPD)
	WYB012GMFI16RL (WB012GMFI16HLD + YN012GMFI16RPD)
WAB012GMFI20RL (WB012GMFI20CLD + AN012GMFI20RPD)	WYB012GMFI20RL (WB012GMFI20HLD + YN012GMFI20RPD)
	WYB018GMFI16RL (WB018GMFI16HLD + YN018GMFI16RPD)
WAB018GMFI20RL (WB018GMFI20CLD + AN018GMFI20RPD)	WYB018GMFI20RL (WB018GMFI20HLD + YN018GMFI20RPD)
	WYB024GMFI16RL (WB024GMFI16HLD + YN024GMFI16RPD)
WAB024GMFI20RL (WB024GMFI20CLD + AN024GMFI20RPD)	WYB024GMFI20RL (WB024GMFI20HLD + YN024GMFI20RPD)

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WARNING

- Installation MUST conform with local building codes or, in the absence of local codes, with the National Electrical Code NFPA70/ANSI C1-1993 or current edition and Canadian Electrical Code Part1 CSA C.22.1.
- The information contained in the manual is intended for use by a qualified service technician familiar with safety procedures and equipped with the proper tools and test instruments
- Installation or repairs made by unqualified persons can result in hazards to you and others.
- Failure to carefully read and follow all instructions in this manual can result in equipment malfunction, property damage, personal injury and/or death.
- This convice is only for convice engineer to use



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1. Precaution

1.1 Safety Precaution

- To prevent injury to the user or other people and property damage, the following instructions must be observed carefully.
- Incorrect operation due to ignoring instructions will cause harm or damage.
- Before servicing the unit, be sure to read this service manual entirely.

1.2 Warning

> Installation

■ Do not use a defective or underrated circuit breaker. Use this appliance on a dedicated circuit.

There is risk of fire or electric shock.

■ For electrical work, contact the dealer, seller, a qualified electrician, or an authorized service center.

Do not disassemble or repair the product, there is risk of fire or electric shock.

■ Always ground the product.

There is risk of fire or electric shock.

■ Install the panel and the cover of control box securely.

There is risk of fire of electric shock.

Always install a dedicated circuit and properly rated breaker.

Improper wiring or installation may cause electric shock.

Use the correctly rated breaker or fuse.

There is risk of fire or electric shock.

■ Do not modify or extend the power cable.

There is risk of fire or electric shock.

■ Do not install, remove or reinstall the unit by yourself (End User).

There is risk of fire, electric shock, explosion, or injury.

■ Be cautious when unpacking and installing the product.

Sharp edges could cause injury, be especially careful of the case edges and the fins on the condenser and evaporator.

- For installation, always contact the dealer or an authorized service center.
- Do not install the product on weak or defective structures or stands.
- Be sure the installation area does not deteriorate with age.

If the base collapses, the air conditioner could fall with it, causing property damage, product failure, and personal injury.

- Do not let the air conditioner run for a long time when the humidity is very high and a door or a window is left open.
- Take care to ensure that power cable could not be pulled out or damaged during operation.

There is risk of fire or electric shock.

Do not place anything on the power cable.

There is risk of fire or electric shock.

■ Do not plug or unplug the power supply during operation.

There is risk of fire or electric shock.

- Do not touch the product with wet hands during operation.
- Do not place a heater or other appliance near the power cable.

There is risk of fire and electric shock.

■ Do not allow water to run into electrical parts.

It may cause fire, failure of the product, or electric shock.

■ Do not store or use flammable gas or combustibles near the product.

There is risk of fire or failure of product.

■ Do not use the product in a tightly closed space for a long time.

Oxygen deficiency could occur.

- When flammable gas leaks, turn off the gas and open a window for ventilation before turning the product on.
- If strange sounds or smoke comes from product, turn the breaker off or disconnect the power supply cable.

There is risk of electric shock or fire.

■ Stop operation and disconnect the power during storm or hurricane. If possible, further secure the product before the hurricane arrives.

There is risk of property damage, failure of product, or electric shock.

■ Do not open the inlet grill of the product during operation. (Do not touch the electrostatic filter, if the unit is so equipped.)

There is risk of physical injury, electric shock, or product failure.

■ If the indoor section gets wet, contact an authorized service center.

There is risk of fire or electric shock.

■ Be cautious that water should not enter the product.

There is risk of fire, electric shock, or product damage.

■ Ventilate the product from time to time when operating it together with a nearby stove etc.

There is risk of fire or electric shock.

■ Turn the main power off when cleaning or maintaining the product.

There is risk of electric shock.

■ When the product will not be used for a long time, disconnect the power supply by turning off the breaker.

There is risk of product damage or failure, or unintended operation.

■ Take care to ensure that nobody could step on or fall onto the outdoor unit.

This could result in personal injury and product damage.

> CAUTION

■ Always check several times for refrigerant leakage after installation or repairing the product.

Low refrigerant levels may cause failure of product.

■ Install the drain hose to ensure that water is drained away properly.

A bad connection may cause water leakage.

■ Keep perfect level when installing the

product.

To avoid vibration of water leakage.

■ Do not install the product where the noise or hot air from the outdoor unit could disturb the neighbors.

It may cause disturbance for your neighbors.

- Use two or more people to lift and transport the product.
- Do not install the product where it will be exposed to sea wind (salt spray) directly.

It may cause corrosion on the product.

Corrosion, particularly on the condenser and evaporator fins, could cause product malfunction or inefficient operation.

> Operational

- Do not expose the skin directly to cool air for long time. (Do not sit in the path of the air draft).
- Do not use the product for special purposes, such as preserving foods, works of art etc. It is a consumer air conditioner, not a precision refrigeration system.

There is risk of damage or loss of property.

- Do not block the inlet or outlet of air flow.
- Use a soft cloth to clean. Do not use harsh detergents, solvents, etc.

There is risk of fire, electric shock, or damage to the plastic parts of the product.

- Do not touch the metal parts of the product when removing the air filter. They are very sharp.
- Do not step on or put anything on the product. (outdoor unit)
- Always insert the filter securely. Clean the filter every two weeks or more often if necessary.

A dirty filter reduces the efficiency of the air conditioner and could cause product malfunction or damage.

- Do not insert hands or other objects through air inlet or outlet while the product is operating.
- Do not drink the condensate water drained from the product.

■ Use a firm stool or ladder when cleaning or maintaining the product.

Be careful and avoid personal injury.

■ Replace the all batteries in the remote control with new ones of the same type. Do not mix old and new batteries or different types of batteries.

There is risk of fire or explosion.

■ Do not recharge or disassemble the batteries. Do not dispose of batteries in a fire.

They may burn of explode.

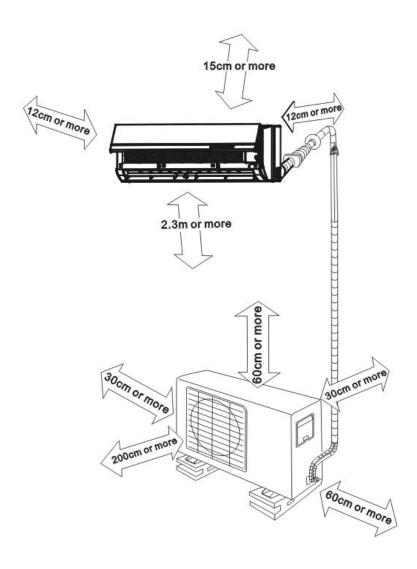
■ If the liquid from the batteries gets onto your skin or clothes, wash it well with clean water. Do not use the remote if the batteries have leaked.

2. Part Names And Functions

2.1 Model Names of Indoor/Outdoor units

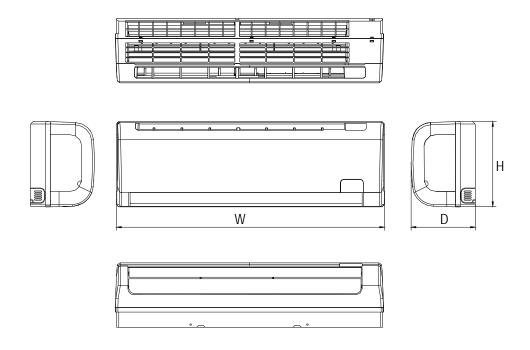
Series	Capacity	Indoor units	Outdoor units		
	9k	WB009AMFI20CLD	AN009AMFI20RPD		
		WB009AMFI20HLD	YN009AMFI20HLD		
		WB009GMFI16HLD	YN009GMFI16RPD		
		WB012GMFI20CLD	AN012GMFI16RPD		
		WB012GMFI20HLD	YN012GMFI16RPD		
	12k	WB012GMFI16HLD	YN012GMFI16RPD		
Inverter					
		WB012AMFI20CLD	AN012AMFI20RPD		
		WB012AMFI20HLD	YN012AMFI20RPD		
		WB018GMFI16HLD	YN018GMFI16RPD		
	18k	WB018GMFI20CLD	AN018GLFI20RPD		
		WB018GMFI20HLD	YN018GMFI20RPD		
		WB024GMFI16HLD	YN024GLFI16RPD		
	24k	WB024GMFI20CLD	AN024GLFI20RPD		
		WB024GLFI20HLD	YN024GLFI20RPD		

2.2 Part names of Indoor/Outdoor units

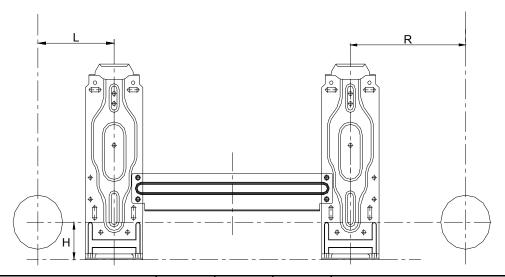


3. Dimension

3.1 Indoor Unit

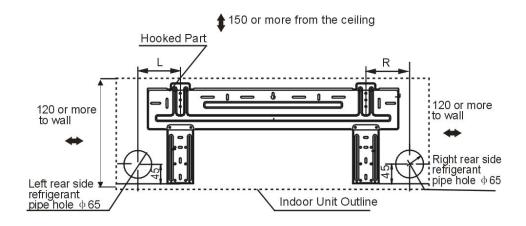


Model	W	D	Н	
WB009GMFI16HLD	790mm	198mm	265mm	
WB009GINFTTOHLD	(31.1in)	(7.8in)	(10.43in)	
WB009AMFI20CLD				
WB009AMFI20HLD				
WB012GMFI20CLD				
WB012GMFI20HLD	920mm	223mm	292mm	
	(36.22in)	(8.78in)	(10.5in)	
WB012GMFI16HLD				
WB012AMFI20CLD				
WB012AMFI20HLD				
WB018GMFI16HLD				
WB018GMFI20CLD	998mm	240mm	322mm	
WB018GMFI20HLD	(39.29in)	(9.45in)	(12.68in)	
WB024GMFI16HLD				

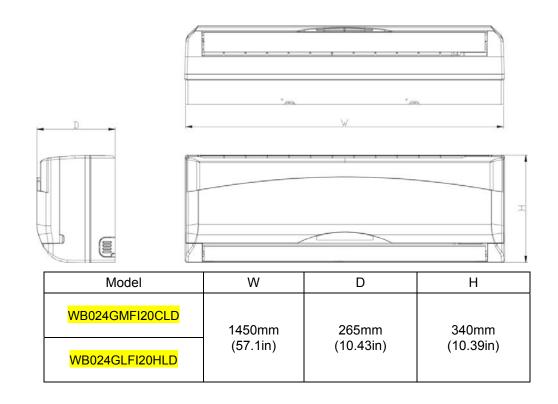


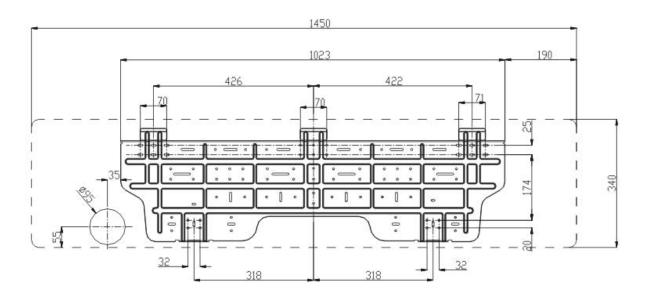
Model	R	L	Н	Dimension of installation hole
WB024GMFI20CLD	150mm	100mm	45mm	Ф65mm
WB024GLFI20HLD	(5.91in)	(3.94in)	(1.77in)	(2.56in)

Model	R	L	Н	Dimension of installation hole	
WB009AMFI20CLD					
WB009AMFI20HLD					
WB012GMFI20CLD					
WB012GMFI20HLD	185mm	150mm	45mm	Ф65mm	
	(7.28in)	(5.91in)	(1.77in)	(2.56in)	
WB012GMFI16HLD					
WB012AMFI20CLD					
WB012AMFI20HLD					

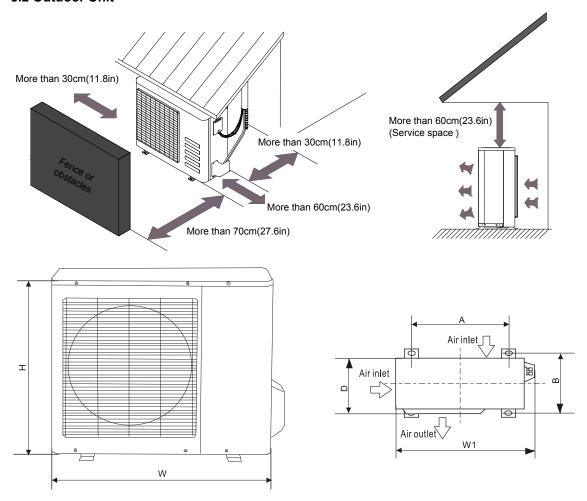


Model	R	L	Н	Dimension of installation hole
WB018GMFI16HLD				
WB018GMFI20CLD	120mm	100mm	45mm	Ф65mm
WB018GMFI20HLD	(4.72in)	(3.94in)	(1.77in)	(2.56in)
WB024GMFI16HLD				





3.2 Outdoor Unit

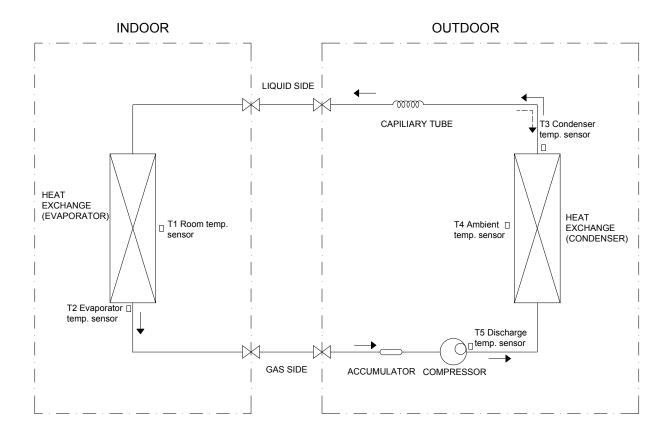


Note: The above drawing is only for reference. The appearance of your units may be different.

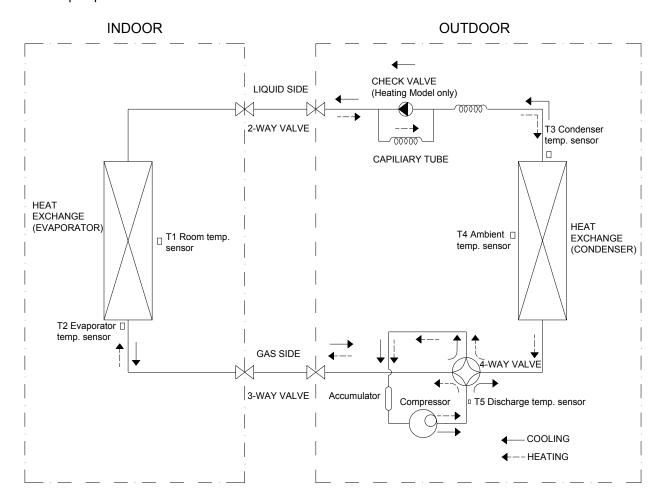
Model	W	D	Н	W1	Α	В
AN009AMFI20RPD						
YN009AMFI20HLD						
YN009GMFI16RPD						
AN012GMFI16RPD	700,00	005	F00:	000	F20::	200
YN012GMFI16RPD	760mm	285mm	590mm	823mm	530mm	290mm
	(29.9in)	(11.2in)	(23.2in)	(32.4in)	(20.9in)	(11.4in)
YN012GMFI16RPD						
AN012AMFI20RPD						
YN012AMFI20RPD						
YN018GMFI16RPD						
AN018GLFI20RPD	845mm	320mm	700mm	908mm	560mm	335mm
YN018GMFI20RPD	(33.3in)	(12.6in)	(27.6in)	(35.7in)	(22.0in)	(13.2in)
YN024GLFI16RPD						
AN024GLFI20RPD	900mm	315mm	860mm	980mm	590mm	333mm
YN024GLFI20RPD	(35.43in)	(12.40in)	(33.86in)	(38.58in)	(23.23in)	(13.11in)

4. Refrigerant Cycle Diagram

For cooling only models:



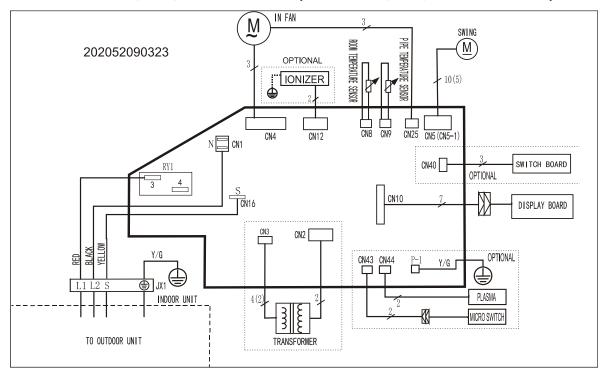
For heat pump models:



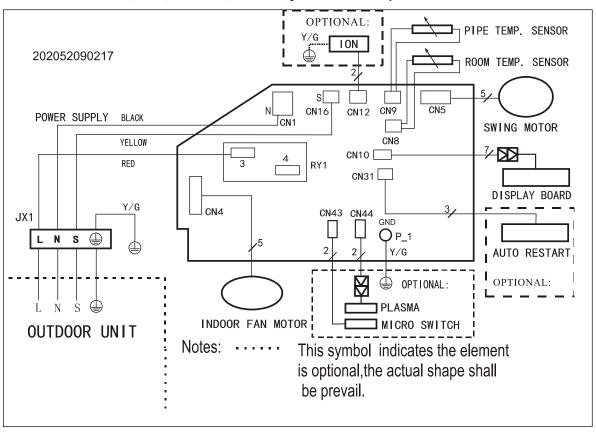
5. Wiring Diagram

5.1 Indoor Unit

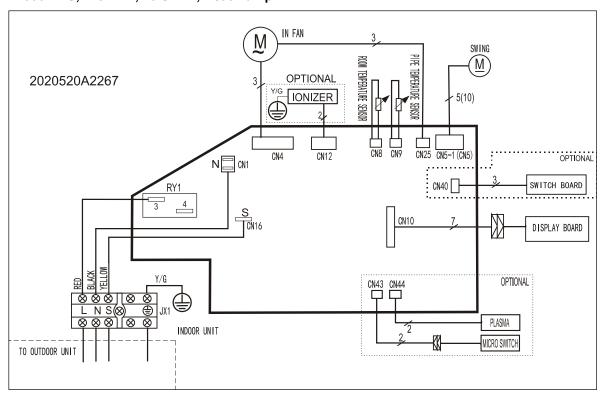
9000 BTU-12000BTU, 230V, 16 SEER Heat Pump / 12000 BTU, 230V, 20 SEER Heat Pump



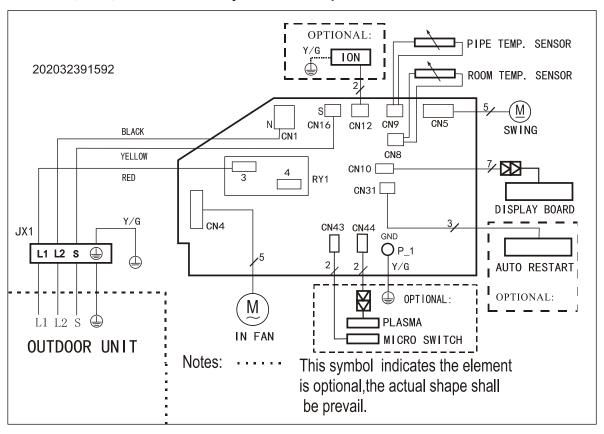
9000 BTU-12000BTU, 115V, 20 SEER, Cool Only and Heat Pump



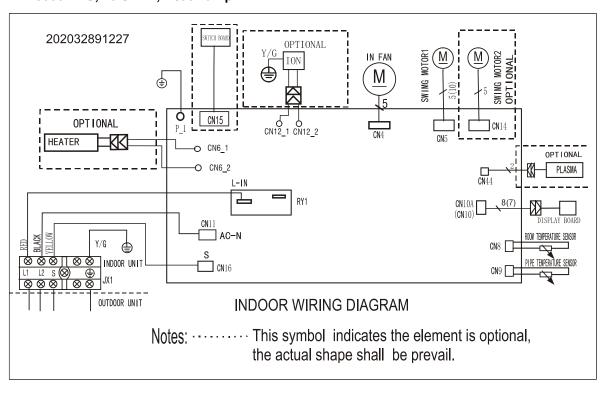
12000 BTU, 115 VAC, 20 SEER, Heat Pump



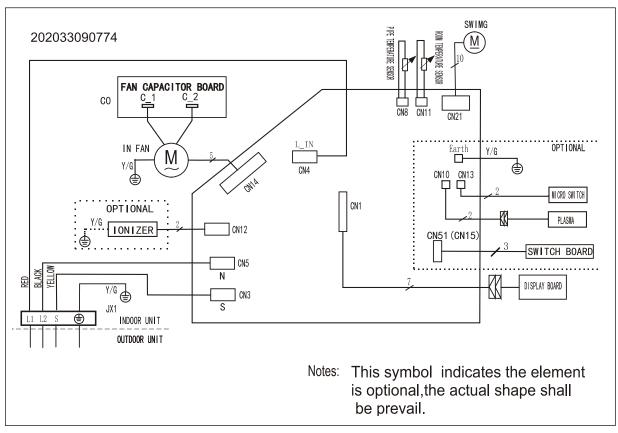
12000 BTU, 230V, 20 SEER Cool Only and Heat Pump



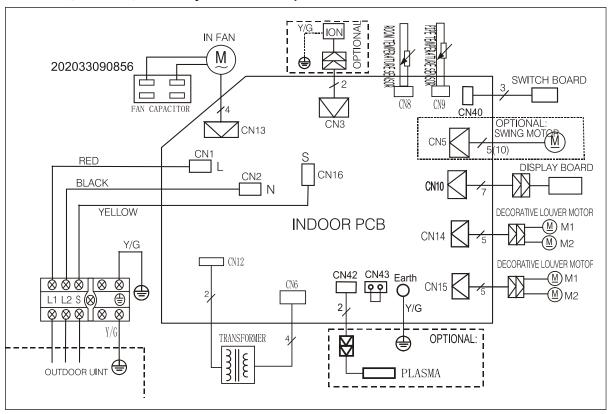
18000 BTU, 20 SEER, Heat Pump



18000 BTU / 24000 BTU, 16 SEER Heat Pump

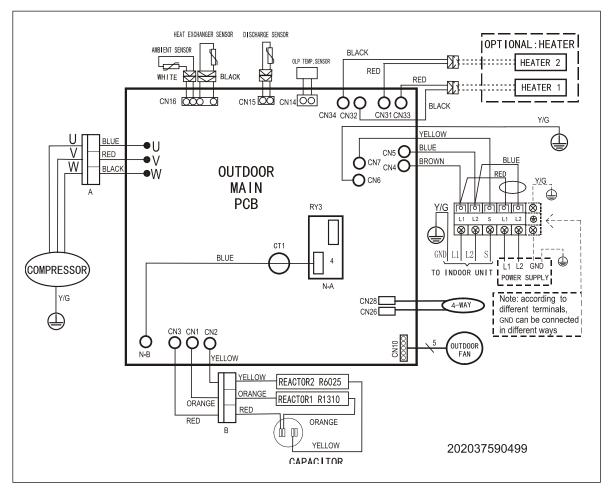


24000 BTU, 20 SEER, Cool Only and Heat Pump

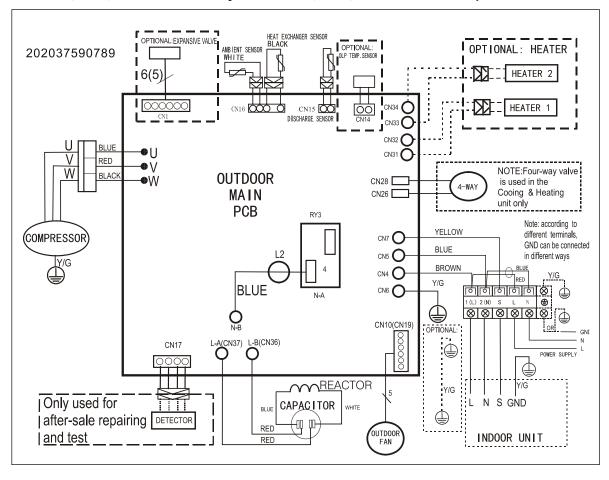


5.2 Outdoor Unit

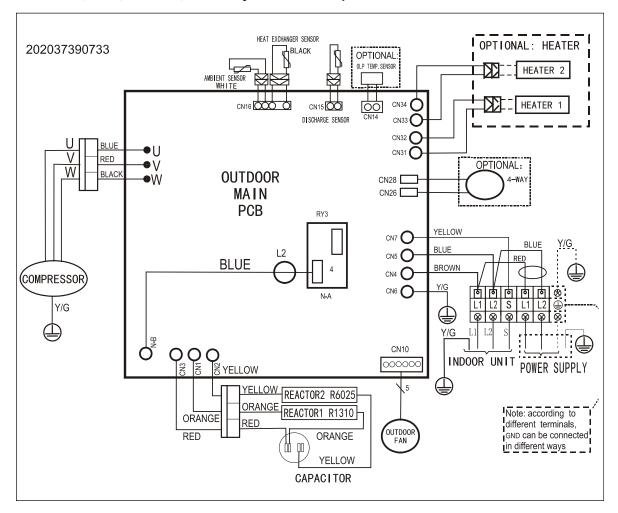
9000 BTU and 12000 BTU, 230 V, 16 SEER, Heat Pump



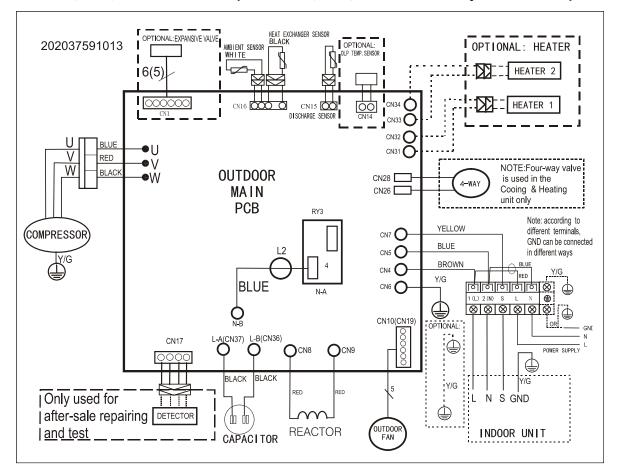
9000 BTU, 115V, 20 SEER Cool Only / 12000 BTU, 115V, 20 SEER Heat Pump



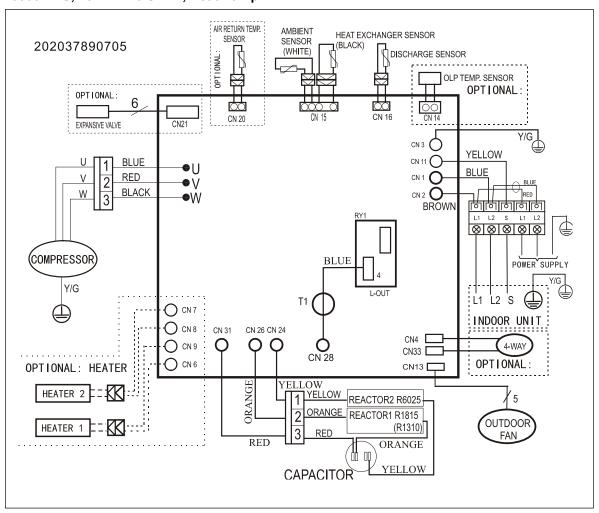
12000 BTU, 230V, 20 SEER, Cool Only and Heat Pump



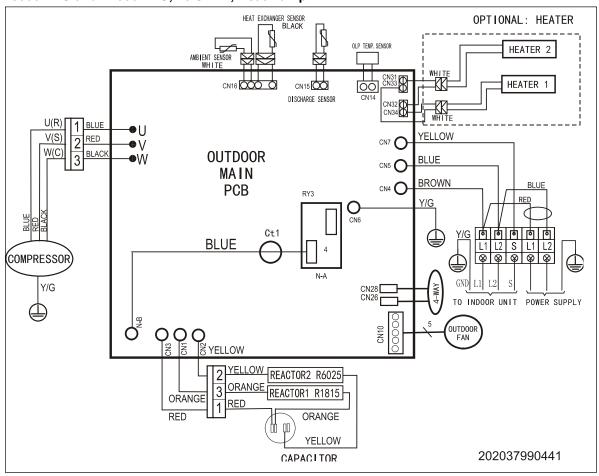
9000 BTU, 115V, 20 SEER Heat Pump / 12000 TU, 115V, 20 SEER Cool Only and Heat Pump



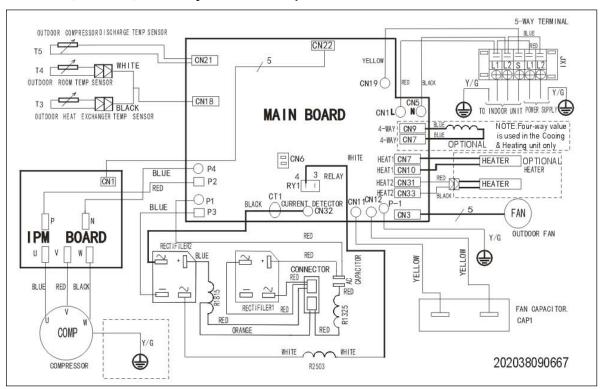
18000 BTU, 16 AND 20 SEER, Heat Pump



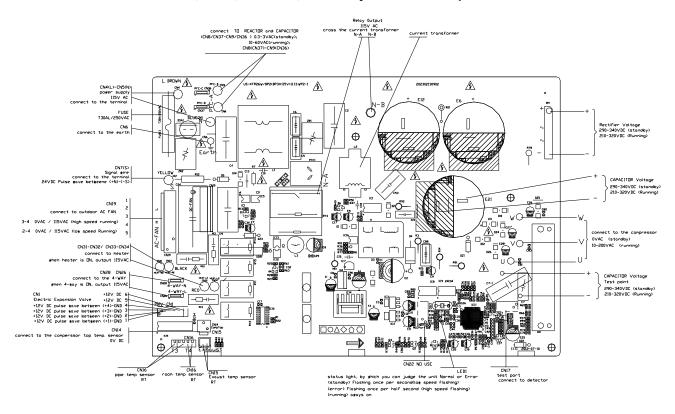
18000 BTU and 24000 BTU, 16 SEER, Heat Pump



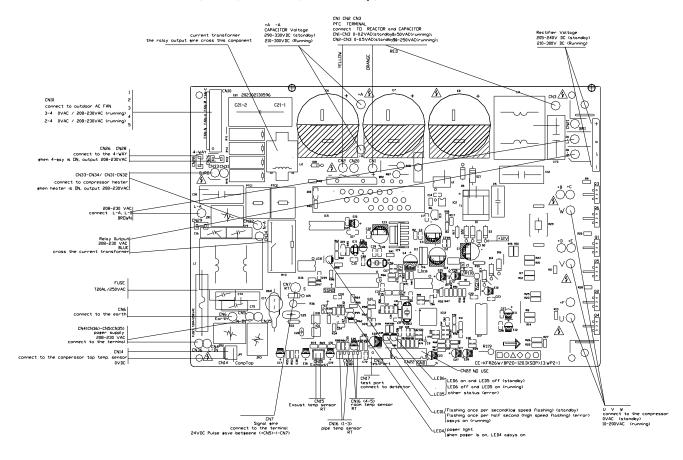
24000 BTU, 20 SEER, Cool Only and Heat Pump



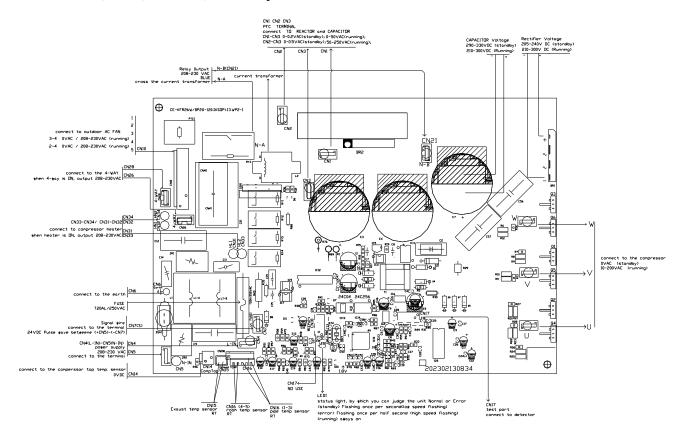
For 9000 BTU and 12000 BTU, 115 V, 20 SEER, Cool Only and Heat Pump



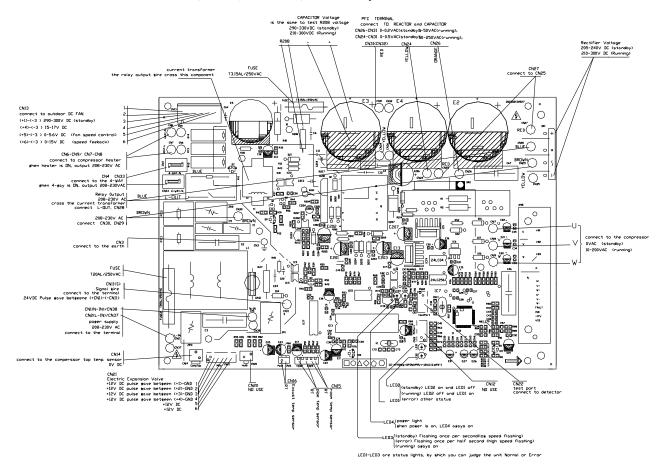
For 9000 BTU and 12000 BTU, 230V, 16 SEER, Heat Pump,



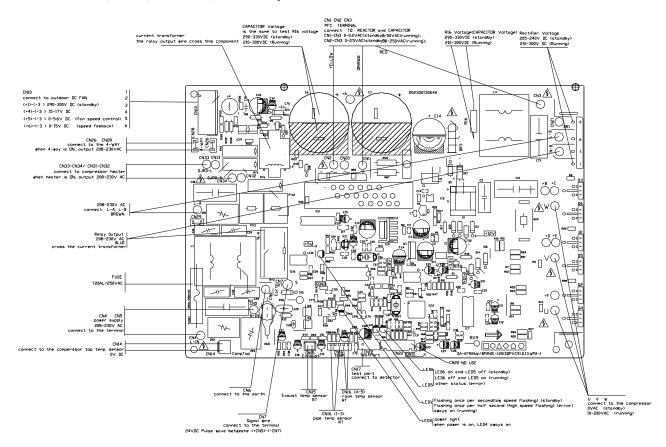
For 12000 BTU, 230 V, 20 SEER, Cool Only



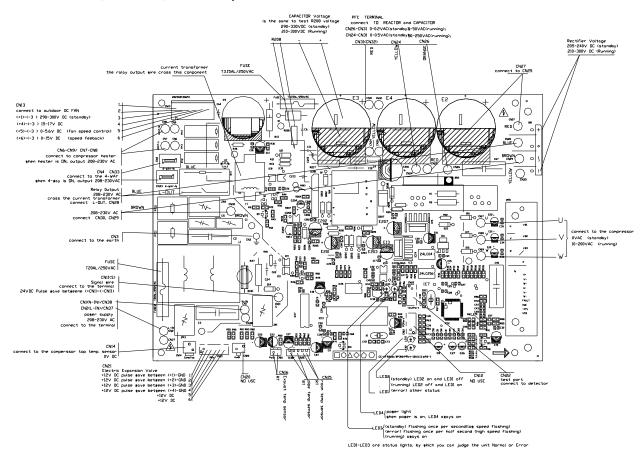
For 12000 BTU and 18000 BTU, 230 V, 20 SEER, Heat Pump



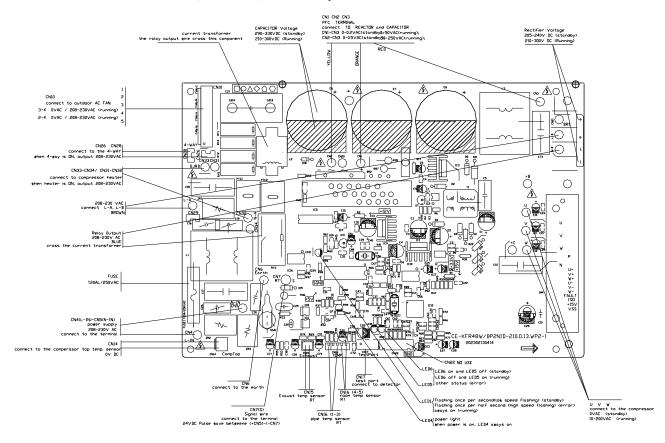
For 12000 BTU, 230 V, 20 SEER, Heat Pump



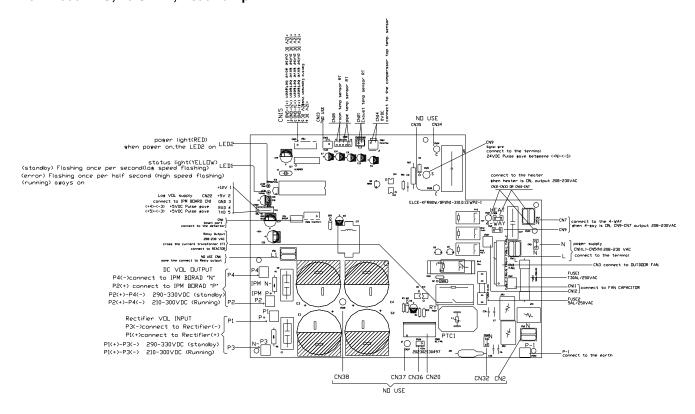
For 18000 BTU, 16 SEER, Heat Pump



For 18000 BTU and 24000 BTU, 16 SEER, Heat Pump



For 24000 BTU, 20 SEER, Heat Pump



6 Installation Details

6.1 Wrench torque sheet for installation

Outside diameter		Torque	Additional tightening			
Ф6.35mm	1/4in	1500N.cm (11 Lbf.Ft).	1600N.cm (12 Lbf.Ft.)			
Ф9.52mm	3/8in	2500N.cm (18 Lbf.Ft.)	2600N.cm (19 Lbf.Ft)			
Ф12.7mm	1/2in	3500N.cm (26 Lbf.Ft)	3600N.cm (27 Lbf.Ft)			
Ф15.9mm	5/8in	4500N.cm (33 Lbf.Ft)	4700N.cm (35 Lbf.Ft)			
Ф19тт	3/4in	6500N.cm (48 Lbf.Ft.)	6700N.cm (50Lbf.Ft)			

6.2 Connecting the cables

The power cord should be selected according to the following specifications sheet.

Appliance Amps	AWG Wire Size
10	18
13	16
18	14
25	12
30	10

The cable size and the current of the fuse or switch are determined by the maximum current indicated on the nameplate which located on the side panel of the unit. Please refer to the nameplate before selecting the cable, fuse and switch.

6.3 Pipe length and the elevation

	Pipe	size
Models	Gas	Liquid
WB009AMFI20CLD+AN009AMFI20RPD	3/8in (Ф9.52mm)	1/4in (Ф6.35mm)
WB009AMFI20HLD+ YN009AMFI20HLD	3/8in (Ф9.52mm)	1/4in (Ф6.35mm)
WB009GMFI16HLD+ YN009GMFI16RPD	3/8in	1/4in
WB012GMFI20CLD+ AN012GMFI16RPD	(Ф9.52mm) 1/2in	(Φ6.35mm) 1/4in
WB012GMFI20HLD+ YN012GMFI16RPD	(Φ12.7mm) 1/2in	(Φ6.35mm) 1/4in
WB012GMFI16HLD+ YN012GMFI16RPD	(Φ12.7mm) 1/2in	(Ф6.35mm) 1/4in
WB012AMFI20CLD+ AN012AMFI20RPD	(Φ12.7mm) 1/2in	(Ф6.35mm) 1/4in
	(Φ12.7mm) 1/2in	(Ф6.35mm) 1/4in
WB012AMFI20HLD+ YN012AMFI20RPD	(Φ12.7mm) 1/2in	(Ф6.35mm) 1/4in
WB018GMFI16HLD+ YN018GMFI16RPD	(Φ12.7mm)	(Φ6.35mm)
WB018GMFI20CLD+ AN018GLFI20RPD	5/8in (Φ15.9mm)	3/8in (Ф9.52mm)
WB018GMFI20HLD+ YN018GMFI20RPD	5/8in (Φ15.9mm)	3/8in (Ф9.52mm)
WB024GMFI16HLD+ YN024GLFI16RPD	5/8in (Φ15.9mm)	3/8in (Ф9.52mm)
WB024GMFI20CLD+ AN024GLFI20RPD	5/8in (Φ15.9mm)	3/8in (Ф9.52mm)
WB024GLFI20HLD+ YN024GLFI20RPD	5/8in (Φ15.9mm)	3/8in (Ф9.52mm)

Models	Standard length	Max. Elevation	Max. Length A	Additional refrigerant
WB009AMFI20CLD+AN009AMFI20RPD	7.5m	10m	25m	15g/m
	(24.6ft)	(32.8ft)	(82.0ft)	(0.16oz/ft)
WB009AMFI20HLD+ YN009AMFI20HLD	7.5m	10m	25m	15g/m
	(24.6ft)	(32.8ft)	(82.0ft)	(0.16oz/ft)
WB009GMFI16HLD+ YN009GMFI16RPD	7.5m	10m	25m	15g/m
	(24.6ft)	(32.8ft)	(82.0ft)	(0.16oz/ft)
WB012GMFI20CLD+ AN012GMFI16RPD	7.5m	10m	25m	15g/m
	(24.6ft)	(32.8ft)	(82.0ft)	(0.16oz/ft)
WB012GMFI20HLD+ YN012GMFI16RPD	7.5m	10m	25m	15g/m
	(24.6ft)	(32.8ft)	(82.0ft)	(0.16oz/ft)
WB012GMFI16HLD+ YN012GMFI16RPD	7.5m	10m	25m	15g/m
	(24.6ft)	(32.8ft)	(82.0ft)	(0.16oz/ft)
WB012AMFI20CLD+ AN012AMFI20RPD	7.5m	10m	25m	15g/m
	(24.6ft)	(32.8ft)	(82.0ft)	(0.16oz/ft)
WB012AMFI20HLD+ YN012AMFI20RPD	7.5m	10m	25m	15g/m
	(24.6ft)	(32.8ft)	(82.0ft)	(0.16oz/ft)
WB018GMFI16HLD+ YN018GMFI16RPD	7.5m	20m	30m	15g/m
	(24.6ft)	(65.6ft)	(98.4ft)	(0.16oz/ft)
WB018GMFI20CLD+ AN018GLFI20RPD	7.5m	20m	30m	30g/m
	(24.6ft)	(65.6ft)	(98.4ft)	(0.32oz/ft)
WB018GMFI20HLD+ YN018GMFI20RPD	7.5m	20m	30m	30g/m
	(24.6ft)	(65.6ft)	(98.4ft)	(0.32oz/ft)
WB024GMFI16HLD+ YN024GLFI16RPD	7.5m	25m	50m	30g/m
	(24.6ft)	(82.0ft)	(164ft)	(0.32oz/ft)
WB024GMFI20CLD+ AN024GLFI20RPD	7.5m	25m	50m	30g/m
	(24.6ft)	(82.0ft)	(164ft)	(0.32oz/ft)
WB024GLFI20HLD+ YN024GLFI20RPD	7.5m	25m	50m	30g/m
	(24.6ft)	(82.0ft)	(164ft)	(0.32oz/ft)

6.4 Installation for the first time

Air and moisture in the refrigerant system will cause undesirable effects as below:

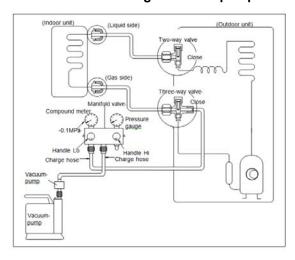
- Pressure in the system rises.
- Operating current rises.
- Cooling or heating efficiency drops.
- Moisture in the refrigerant circuit may freeze and block capillary tubing.
- Water may lead to corrosion of parts in the refrigerant system (compressor damage).

Therefore, the indoor units and the pipes between indoor and outdoor units must be leak tested and evacuated to remove the air and moisture from the system.

Gas leak check (Soap water method):

Apply soap water or a liquid neutral detergent on the indoor unit connections or outdoor unit connections by a soft brush to check for leakage of the connecting points of the piping. If bubbles come out, the pipes have leakage.

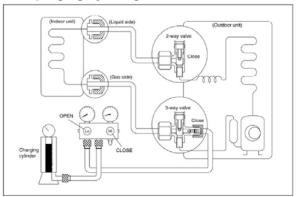
1. Air evacuation using a vacuum pump



- Completely tighten the flare nuts of the indoor and outdoor units, confirm that both the 2-way and 3-way valves are set to the closed position.
- Connect the charging manifold's Low Side hose with the push pin to the 3-way valve's gas service port. (it is a 5/16" SAE Port).
- 3) Connect the charging manifold's Center hose the vacuum pump.
- Fully open the Low Side Valve of the manifold.

- 5) Operate the vacuum pump to evacuate.
- 6) Make evacuation for 30 minutes and check whether the compound meter indicates -0.1Mpa(14.5Psi). If the meter does not indicate -0.1Mpa(14.5Psi) after pumping 30 minutes, it should be pumped 20 minutes more. If the pressure can't achieve -0.1Mpa(14.5Psi) after pumping 50 minutes, please check if there are some leakage points. Fully close the Low side valve of the manifold and stop the vacuum pump. Confirm that the gauge needle does not rise (approximately 15 minutes after turning off the vacuum pump).
- 7) Turn the 3-way valve's stem about 45° counterclockwise to open a little for 6 or 7 seconds. Then tighten the valve stem again. Make sure the pressure display in the pressure indicator is a higher than the atmosphere pressure. Then remove the charge hose from the 3 way valve.
- 8) Fully open the 2 way valve and 3 way valve and securely tighten the caps of both valves. CHECK FOR LEAKS AGAIN.

2. Air purging by refrigerant



Procedure:

- 1). Confirm that both the 2-way and 3-way valves are set to the closed position.
- 2). Connect the charge manifold set and a charging cylinder to the service port of the 3-way valve (5/16" SAE Port).
- 3). Air purging.

Open the valves on the charging cylinder and the charge manifold set. Purge the air by loosening the flare nut on the 2-way valve approximately 45' for 3 seconds then closing it for 1 minute; repeat 3 times.

After purging the air, use a torque wrench to tighten the flare nut on the 2-way valve.

4). Check for gas leakage.

Check the flare connections for gas leakage.

5). Discharge the refrigerant.

Close the valve on the charging cylinder and discharge the refrigerant by loosening the flare nut on the 2-way valve approximately 45' until the gauge indicates 0.3Mpa(43.5Psi) to 0.5 Mpa(72.5Psi).

6). Disconnect the charge set and the charging cylinder, and open both the 2-way and 3-way valves to the fully open position.

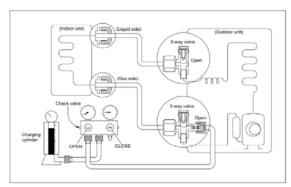
Be sure to use proper sized hexagonal (Allen) wrench to operate the valve stems.

7). Mount the valve stem caps and the service port cap.

Be sure to use a torque wrench to tighten the service port cap to a torque 18N·m.

Be sure to check the gas leakage.

7.5 Adding the refrigerant after running the system for many years (Only recommended for systems that lack 10% of less of their total refrigerant volume. If more refrigerant needs to be added, than remove the remaining refrigerant and recharge entirely).



Procedure

1). Connect the charge hose to the 3-way valve's service port, while the 2-way valve and the 3-way valves are fully open.

Connect the charge hose to the valve at the bottom of the cylinder. If the refrigerant is R410A, make the cylinder upside down to ensure liquid charge.

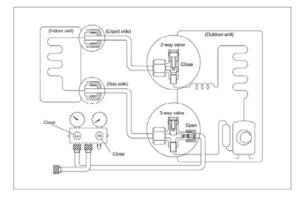
- 2). Purge the air from the charge hose.
 Open the valve at the bottom of the cylinder and press the check valve on the charge set to purge the air (be careful of the liquid refrigerant).
- 3) Put the charging cylinder onto the electronic scale and record the weight.
- 4) Operate the air conditioner at the cooling mode.
- 5) Open the valves (Low side) on the charging manifold set and charge the system with liquid refrigerant.
- 6). When the electronic scale displays the proper weight (refer to the gauge and the pressure of the low side), disconnect the charge hose from the 3-way valve's service port immediately and turn off the air conditioner before disconnecting the hose.
- 7). Mount the valve stem caps and the service port cap.

Use torque wrench to tighten the service port cap to a torque of 18N.m.

Be sure to check for gas leakage.

7.6 Re-installation while the indoor unit needs to be repaired

1. Collecting the refrigerant into the outdoor unit



Procedure

- 1). Confirm that both the 2-way and 3-way valves are set to the opened position Remove the valve stem caps and confirm that the valve stems are in the opened position. Be sure to use a proper size hexagonal (Allen) wrench to operate the valve stems.
- 2). Connect the Low side hose of the charging

manifold hose with the push pin to the 3-way valve's gas service port.

3). Air purge of the charge hose.

Open the Low side valve of the manifold slightly to purge air from the charge hose for 5 seconds and then close it quickly.

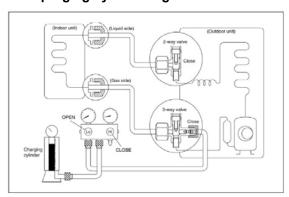
- 4). Set the 2-way valve to the close position.
- 5). Operate the air conditioner at the cooling cycle and stop it when the gauge indicates 0.1Mpa(14.5Psi).
- 6). Set the 3-way valve to the closed position immediately

Do this quickly so that the gauge ends up indicating 0.3Mpa(43.5Psi) to 0.5 Mpa(72.5Psi). Disconnect the charge set, and tighten the 2-way and 3-way valve's stem nuts.

Use a torque wrench to tighten the 3-way valves service port cap to a torque of 18N.m.

Be sure to check for gas leakage.

2. Air purging by the refrigerant



Procedure:

- 1). Confirm that both the 2-way and 3-way valves are set to the closed position.
- Connect the charge set and a charging cylinder to the service port of the 3-way valve Leave the valve on the charging cylinder closed.
- 3). Air purging.

Open the valves on the charging cylinder and the charge set. Purge the air by loosening the flare nut on the 2-way valve approximately 45' for 3 seconds then closing it for 1 minute; repeat 3 times.

After purging the air, use a torque wrench to tighten the flare nut on the 2-way valve.

Check the gas leakage
 Check the flare connections for gas leakage.

5). Discharge the refrigerant.

Close the valve on the charging cylinder and discharge the refrigerant by loosening the flare nut on the 2-way valve approximately 45' until the gauge indicates 0.3Mpa(43.5Psi) to 0.5 Mpa(72.5Psi).

6). Disconnect the charge set and the charging cylinder, and set the 2-way and 3-way valves to the fully open position

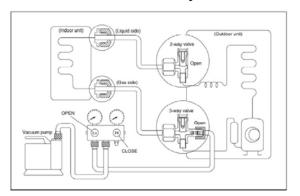
Be sure to use a proper size hexagonal (Allen) wrench to operate the valve stems.

7). Mount the valve stems nuts and the service port cap

Be sure to use a torque wrench to tighten the service port cap to a torque 18N.m.
Be sure to check the gas leakage.

7.7 Re-installation while the outdoor unit needs to be repaired

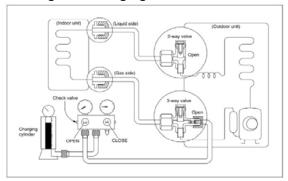
1. Evacuation for the whole system



Procedure:

- 1). Confirm that both the 2-way and 3-way valves are set to the opened position.
- 2). Connect the vacuum pump to 3-way valve's service port.
- 3). Evacuate for approximately one hour. Confirm that the pressure gauge indicates -0.1Mpa(14.5Psi).
- 4). Close the valve (Low side) on the charge set, turn off the vacuum pump, and confirm that the gauge needle does not move up (approximately 15 minutes after turning off the vacuum pump).
- 5). Disconnect the charging hose from the vacuum pump.

2. Refrigerant charging



Procedure:

1). Connect the charge hose to the charging cylinder, open the 2-way valve and the 3-way valve

Connect the charge hose which you disconnected from the vacuum pump to the valve at the bottom of the cylinder. If the refrigerant is R410A, make the cylinder upside down to ensure liquid charge.

- 2). Purge the air from the charging hose Open the valve at the bottom of the cylinder and press the check valve on the charge set to purge the air (be careful of the liquid refrigerant).
- 3) Put the charging cylinder onto the electronic scale and record the weight.
- 4). Open the valve (Low side) on the charge set and charge the system with liquid refrigerant. ASSURE TO CHARGE a little at a time (approximately 150g or 5 Ounces each time), while operating the air conditioner in the cooling cycle; wait approximately 1 minute in between each charging load and then repeat the procedure.
- 5). When the electronic scale displays the proper weight, disconnect the charge hose from the 3-way valve's service port immediately If the system has been charged with liquid refrigerant while operating the air conditioner, turn off the air conditioner before disconnecting the hose.
- 6). Mount the valve stem caps and the service port. Use torque wrench to tighten the service port cap to a torque of 18N.m. Be sure to check for gas leakage.

7. Operation Characteristics

Temperature Mode	Cooling operation	Heating operation	Drying operation
Do om tomporatura	≥17℃	≤30℃	> 10℃
Room temperature	(62 °F)	(86°F)	(50°F)
	0℃~50℃		
	(32°F ~ 122°F)		
Outdoor tomporature	-15℃ ~ 50℃	-15℃ ~30℃	0℃~50℃
Outdoor temperature	(5°F ~122°F)	(5°F ~86°F)	(32°F ~ 122°F)
	(For the models with		
	low temperature cooling system)		

Notes:

$^{\circ}$	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
°F	50	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80	82
$^{\circ}$	28	29	30	31	32	33	34	35	36	37	38	39	40)	41	42	43	3
°F	84	86	86	90	92	94	96	98	98	99	100	102	2 10)4	106	108	10	9
$^{\circ}$ C	44	45	4	-6	47	48	49	9	50									
°F	111	11	3 1	115	117	118	12	20	122									

$$\Delta T(^{\circ}F) = \frac{9\Delta T(^{\circ}C)}{5}$$

CAUTION:

- 1. If the air conditioner is used beyond the above conditions, certain safety protection features may come into operation and cause the unit to operate abnormally.
- 2. The room relative humidity should be less than 80%. If the air conditioner operates beyond this figure, the surface of the air conditioner may attract condensation. Please set the vertical air flow louver to its maximum angle (vertically to the floor), and set HIGH fan mode.
 - 3. The optimum performance will be achieved during this operating temperature zone.

8. Electronic Function

8.1 Abbreviation

T1: Indoor room temperature

T2: Coil temperature of evaporator

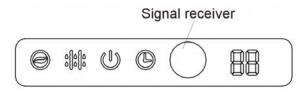
T3: Coil temperature of condenser

T4: Outdoor ambient temperature

T5: Compressor discharge temperature

8.2 Display function

8.2.1 Icon explanation on indoor display board.



	ION indication lamp (optional function): This lamp illuminates when Clean Air feature is activated.
0000	DEFROST indication lamp (For HEAT PUMP models only): Lights up when the air conditioner starts defrosting automatically or when the warm air control feature (WARM START) is activated in heating operation.
	OPERATION indication lamp: This lamp illuminates when the air conditioner is in operation.
	TIMER indication lamp: Lights up during Timer operation.
	Temperature indicator: Displays the temperature settings when the air conditioner is operational. Displays the malfunction code.

8.3 Main Protection

8.3.1 Three minutes delay at restart for compressor

1 minute delay for the 1st time start-up and 3 minute delay for subsequent starts.

8.3.2 Temperature protection of compressor top surface.

The unit will stop working when the compressor top temp. protector activates, and will restart after the compressor top temp. protector resets.

8.3.3 Temperature protection of compressor discharge pipe

When the compressor discharge temp. is getting higher, the running frequency will be limited as per the below rules:

- ---Compressor discharge temp. T5>115°C for 5s, compressor stops.
- ---108<T5<115°C, decrease the frequency to one lower level every 3 minutes.
- ---90<T5<105℃, keep running at the current frequency.
- ----T5<90°C, no limit for frequency.

8.3.4 Fan speed is out of control

When Indoor Fan Speed is measured too low (<300 RPM) for certain time, the unit will stop and the LED will display the failure.

8.3.5 Inverter module protection

The Inverter module has a protection function based on current, voltage and temperature. If these protections activate, the corresponding code will display on the indoor unit and the unit will stop working.

8.3.6 Indoor fan delayed start function

When the unit starts up, the louver will be activated immediately and the indoor fan will start 10s later. If the unit runs in heating mode, the indoor fan will be also controlled by anti-cold draft (Warm Start) function. Indoor fan will start operating only after the indoor coil's surface temperature becomes hot enough. During this delay period, the defrost light will be illuminated

8.3.7 Compressor preheating functions

Preheating permitting condition:

If T4 (outdoor ambient temperature)<3°C and the machine is connected to the power supply recently or if T4<3°C and compressor has stopped for over 3 hours, the compressor heating circuit will activate.

Preheating mode:

A weak current flow through the coil of compressor through the wiring terminal of the compressor, then the compressor is kept warm without operating.

Preheating release condition:

If T4>5°C or the compressor starts running, the preheating function will stop.

8.3.8 Zero crossing detection error protection

If IC detects that time interval is not correct continuously for 240s, the unit will stop and the LED will display the failure. The correct zero crossing signal time interval should be between 6-13ms.

8.3.9 Condenser temperature protection

- ---55 $^{\circ}$ C<T3<60 $^{\circ}$ C, the compressor frequency will decrease to the lower level until to F1 and then runs at F1. If T3<54 $^{\circ}$ C, the compressor will keep running at the current frequency.
- ---T3<52 $^{\circ}$ C, the compressor will not limit the frequency and resume to the former frequency.
- ---T3>60°C for 5 seconds, the compressor will stop until T3<52°C.

8.3.10 Evaporator temperature protection

- ---T2<0℃, the compressor will stop and restart when T2>=5℃.
- ---0°C \leq T2<4°C, the compressor frequency will be limited and decreased to the lower level
- ---4°C≤T2≤7°C, the compressor will keep the current frequency.
- ---T2>7°C, the compressor frequency will not be limited.

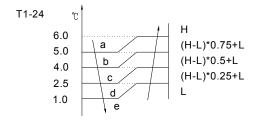
8.4 Operation Modes and Functions

8.4.1 Fan mode

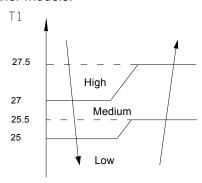
8.4.1 Fan only mode

- (1) Outdoor fan and compressor stop.
- (2) Temperature setting function is disabled, and no set temperature is displayed.
- (3) Indoor fan can be set to high/med/low/auto.
- (4) The louver operates same as in cooling mode.
- (5) Auto fan:

For 9000 BTU, 12000 BTU and 18000 BTU, 20 SEER Cool Only and Heat Pump models:

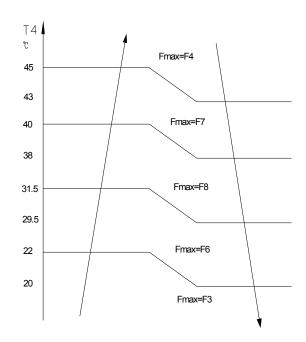


For other models:



8.4.2 Cooling Mode8.4.2.1 Compressor running rules

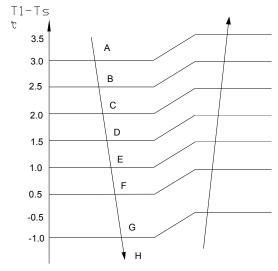
The maximum operation frequency of compressor after starting submits to following rule.



Fmax: The maximum operation frequency of compressor.

F1~F8: The detailed value of the compressor operation frequency.

If users switch on AC by remote controller, the compressor will run at the Fmax frequency for 7 minutes according to the outdoor ambient temp. During the 7 minutes, the frequency limitation is active. 7 minutes later, the compressor running frequency will be controlled as below:



While the zones of A,B,C... are corresponding to different compressor running frequency.

Note:

When T1-Ts stays in the same temp. zone for 3 minutes, the compressor will run as the below rules:

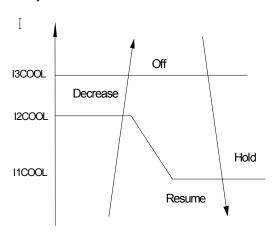
A~E: Increase the frequency to the higher level until reaching F8.

F: Keep the current frequency.

G: Decrease the frequency to the lower level until reaching F1.

H: Run at F1 for 1h. (if T1-Ts<-2 $^{\circ}$ C, the compressor will stop)

Meanwhile, the compressor running frequency is limited by the current.



I3COOL, I2COOL,I1COOL mean different running current value.

Off: Compressor stops.

Decrease: Decrease the running frequency to

the lower level.

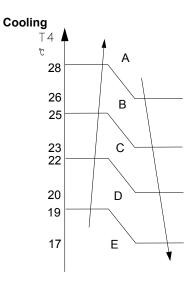
Hold: Keep the current frequency. Resume: No limitation for frequency.

Note:

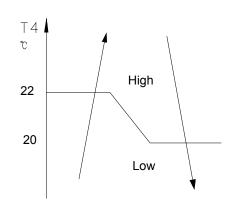
When AC is in "hold" zone for 3 minutes, the compressor frequency will rise to the higher level.(frequency will increase twice at most)

8.4.2.2 Outdoor fan running rules

For For 9000 BTU, 12000 BTU and 18000 BTU, 20 SEER Cool Only and Heat Pump models:



For other models:



8.4.2.3 Indoor fan running rules

In cooling mode, indoor fan runs all the time and the speed can be selected as high,

medium, low, auto.

For For 9000 BTU, 12000 BTU and 18000 BTU, 20 SEER Cool Only and Heat Pump models:

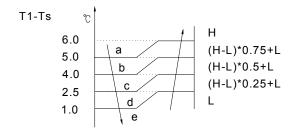
When the compressor is running, the indoor fan is controlled as below:

Setting Fan speed	T1-Ts	Actual fan speed
	4.5	★ H+(H+=H+G)
н	3.0 A	H (=H)
"	1.5 B	H- (H=H-G)
	\	M +(M+=M+Z)
М	4. 5 3. 0	M (M = M)
IVI	1.5 E	M-(M-=M-Z)
20	4.5	↑ L+(L+=L+D)
L	3.0 G	L(L=L)
-	1.5 H	L-(L-=L-D)

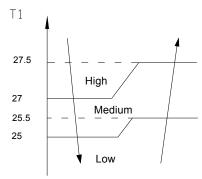
For other models, when the compressor is running, the indoor fan will run at setting fan speed. When the setting temp. is reached, the indoor fan will run at lowest fan speed.

Auto fan running rules:

For 9000 BTU, 12000 BTU and 18000 BTU, 20 SEER Cool Only and Heat Pump models:

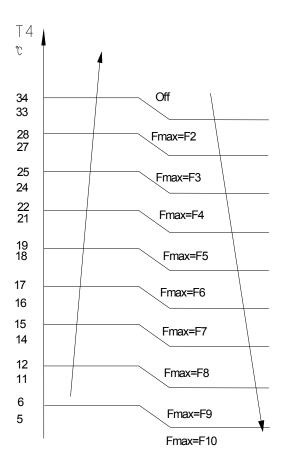


For other models:



8.4.3 Heating Mode8.4.3.1 Compressor running rules

The maximum operation frequency of the compressor after starting submits to the following rule.

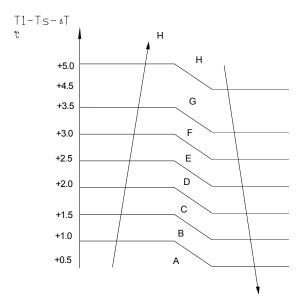


Fmax: The maximum operation frequency of compressor.

F1~F8: The detailed value of the compressor operation frequency.

If users switch on AC by remote controller, the compressor will run at the Fmax frequency for 7 minutes according to outdoor ambient temp. During the 7 minutes, the frequency limitation is active.

7 minutes later, the compressor running frequency will be controlled as below:



While the zones of A,B,C... are corresponding to different compressor running frequency. ΔT =0°C as default.

Note:

When T1-Ts stays in the same temp. zone for 3 minutes, the compressor will run as per the below rules:

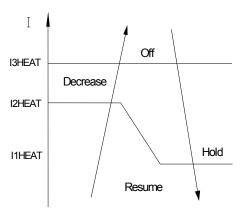
A~E: Increase the frequency to the higher level until to F10.

F: Keep the current frequency.

G: Decrease the frequency to the lower level until to F1.

H: Run at F1 for 1h.(if T1-Ts- Δ T >6°C, the compressor will stop)

Meanwhile, the compressor running frequency is limited by the current.



I3HEAT, I2HEAT,I1HEAT mean different running current value.

Off: Compressor stops.

Decrease: Decrease the running frequency to the lower level.

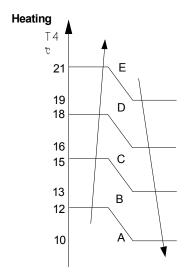
Hold: Keep the current frequency. Resume: No limitation for frequency.

Note:

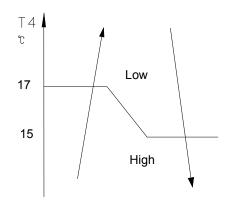
When AC is in "hold" zone for 3 minutes, the compressor frequency will rise to the higher level. (The frequency will increase twice at most)

8.4.3.2 Outdoor fan running rules

For 9000 BTU, 12000 BTU and 18000 BTU, 20 SEER Cool Only and Heat Pump models:



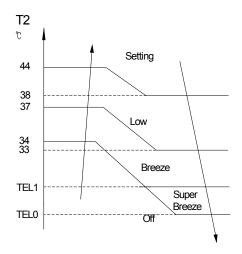
For other models:



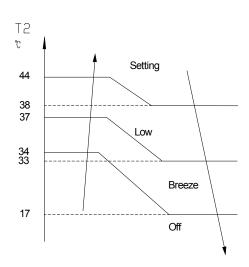
8.4.3.3 Indoor fan running rules

Indoor fan speed can be set as high, medium, low, silent mode or auto grade. During all the fan speeds, the anti-cold-(WARM START) function has preference.

For 9000 BTU, 12000 BTU, 20 SEER Cool Only and Heat Pump models, the anti-cold (Warm Start) function is as below for :

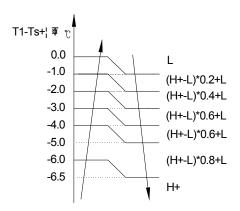


For other models:

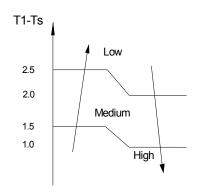


Auto fan action in heating mode.

For 9000 BTU, 12000 BTU and 18000 BTU, 20 SEER Cool Only and Heat Pump models:



For other models:



8.4.3.4 Defrosting mode Condition of defrosting:

When the units are running, if the following two items are satisfied, the units start defrosting: The units run with T3 < 3°C for 40 minutes and T3 stays lower than TCDI°C for more than 3 minutes.

The unit runs with T3<3 $^{\circ}$ C for 80 minutes and T3 stays lower than TCDI+2 $^{\circ}$ C for more than 3 minutes.

If the 1st condition and 2nd condition items are satisfied, then the program judges if T2 has decreased more than 5 $^{\circ}$ C.When T2 has decreased more than 5 $^{\circ}$ C, system enters the defrosting mode.

----No matter what value T4 is, if the machine runs with T3<3 $^{\circ}$ C for more than 120 minutes and T3 keeps lower than TCDI+4 $^{\circ}$ C for more than 3 minutes, the machine will enter defrosting mode no matter if T2 drops more

than 5℃ or not.

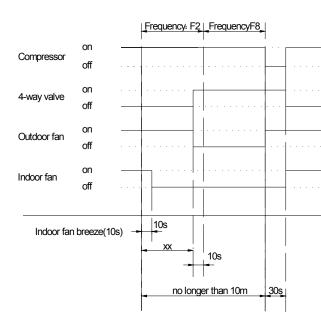
Condition of ending defrosting:

If any one of the following items is satisfied, the defrosting will end and the machine will turn to normal heating mode.

- ----T3 rises to be higher than TCDE1℃.
- ----The machine has run for 10 minutes in defrosting mode.

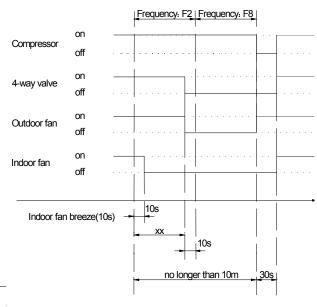
Defrosting action:

For 9k,12k models:



xx=60s.

For 18k,24k models:



8.4.3.5 Evaporator coil temperature protection

----T2> TEH2°C, the compressor running frequency decreases to the lower level and runs for 20s.

When the frequency decreases to F2 and the T2 is still over TEH2 $^{\circ}$ C for 3 minutes, the compressor will stop.

----T2<48 $^{\circ}$ C or T2 stays in 48 $^{\circ}$ C ~ TEH2 $^{\circ}$ C for 6 minutes, the frequency will not be limited by T2. ----T2>60 $^{\circ}$ C, the compressor will stop and restart when T2<48 $^{\circ}$ C.

8.4.4 Auto-mode

xx=90

This mode can be chosen with remote controller and the setting temperature can be changed between 17~30℃.

In auto mode, the machine will choose cooling, heating or fan-only mode according to ΔT (ΔT =T1-Ts).

ΔT=T1-Ts	Running mode			
ΔT>1°C	ΔT>1°C Cooling			
-1<ΔT≤1℃	Fan-only			
ΔT≤-1 °C	Heating			

Indoor fan will run at auto fan of the relevant mode.

The louver operates same as in relevant mode. If the machine switches mode between heating

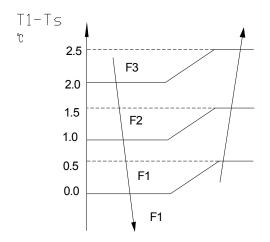
and cooling, the compressor will keep stopping for 15 minutes and then choose mode according to T1-Ts.

If the setting temperature is modified, the machine will choose running function again.

8.4.5 Drying mode

8.4.5.1 Indoor fan speed is fixed at breeze and can't be changed. The louver angle is the same as in cooling mode.

8.4.5.2 Compressor running rules



8.4.5.3 Low indoor room temperature protection In drying mode, if room temperature is lower than 10° C, the compressor will stop and not resume until room temperature exceeds 12° C. 8.4.5.4 Evaporator anti-freezing protection, condenser high temperature protection and outdoor unit frequency limit are active and the same as that in cooling mode.

8.4.5.5 The outdoor fan operates the same as in cooling mode.

8.4.6 Forced operation function

8.4.6.1 Enter forced operation function:
When the machine is off, pressing the
EMERGENCY touch button will switch the unit
into forced auto mode. While in Auto Mode,
pressing and holding the button once again
within 5 seconds, will switch the unit into forced
cooling mode. In forced auto, forced cooling or
any other operation mode, pressing touch
button will turn off the system.

8.4.6.2 In forced operation mode, all general protections and remote control are available.

8.4.6.3 Operation rules:

Forced cooling mode:

The compressor runs at F2 frequency and indoor fan runs as breeze. After running for 30 minutes, the machine will turn to auto mode as 24°C setting temperature.

Forced auto mode:

The action of forced auto mode is the same as normal auto mode with 24 $^{\circ}\mathrm{C}$ setting temperature.

8.4.7 Timer function

8.4.7.1 Timing adjustable range is 24 hours.

8.4.7.2 Timer on. The system will turn on automatically when reaching the set time.

8.4.7.3 Timer off. The system will turn off automatically when reaching the set time.

8.4.7.4 Timer on/off. The system will turn on automatically when reaching the set "on" time, and then turn off automatically when reaching the set "off" time.

8.4.7.5 Timer off/on. The system will turn off automatically when reaching the set "off" time, and then turn on automatically when reaching the set "on" time.

8.4.7.6 The timer function will not change the unit's current operation mode. If the unit is off now, it will not start after setting the "timer off" function. And when reaching the setting time, the timer LED will be off and the running mode will not be changed.

8.4.7.7 The setting time is relative time.

8.4.8 Sleep function mode

8.4.8.1 Operation time in sleep mode is 7 hours. After 7 hours the system quits this mode and turns off.

8.4.8.2. Operation process in sleep mode is as follows:

When cooling, the setting temperature rises 1° C (if room is lower than 30° C) every one hour, 2 hours later the setting temperature stops rising and indoor fan is fixed as low speed.

When heating, the setting temperature decreases 1° C (if room is higher than 17° C) every one hour, 2 hours later the setting

temperature stops rising and indoor fan is fixed as low speed. (Warm-Start function has the priority)

8.4.8.3 Timer setting is available
8.4.8.4 When user uses timer off function in
sleep mode (or sleep function in timer off mode),
if the timing is less than 7 hours, sleep function
will be cancelled when reaching the setting time.
If the timing is more than 7 hours, the machine
will not stop until reaching the set time in sleep
mode.

8.4.9 Auto-Restart function

The indoor unit is equipped with auto-restart function, which is carried out through an auto-restart memory module. In case of a sudden power failure, the module memorizes the setting conditions before the power failure. The unit will resume the previous operation setting (not including swing function) automatically after 3 minutes when power returns.

If the auto restart condition occurs in forced cooling mode, the unit will run in cooling mode for 30 minutes and turn to auto mode at 24°C set temp.

If system is off before power goes out it will stay off. When the unit is started up by the user, the compressor will have 1 minute delay. For other conditions, the compressor will have 3 minutes delay when restarts.

- When the follow me function is available, the PCB will control the unit according to the room temperature from the remote controller and the setting temperature.
- 2) The PCB will take action to the mode change information from remote controller signal, but it will not affected by the setting temperature.
- 3) When the unit is running with follow me function, if the PCB doesn't receive any signal

from remote controller for 7 minutes or pressing FOLLOW ME button again, the follow me function will be turned off automatically, and the temperature will control the unit according to the room temperature detected from its own room temperature sensor and setting temperature.

8.4.11 Self clean

For heat pump models which are provided with this function, after running in cooling or drying mode, if the user press "Self Clean" button on remote controller, firstly, indoor unit runs in fan only mode for a while, then low heat operation and finally runs in fan only again. This function can keep the inside of indoor unit dry and prevent breeding of mold.

8.4.12 Refrigerant Leakage Detection

With this new technology, the display area will show "EC" when the outdoor unit detects refrigerant leakage.

8.4.13 Louver Position Memory Function

When starting the unit again after shutting down, its louver will restore to the angle originally set by the user, but the precondition is that the angle must be within the allowable range, if it exceeds, it will memorize the maximum angle of the louver. During operation, if the power fails or the end user shuts down the unit in the turbo mode, the louver will restore to the default angle.

8.4.14 8[°]C Heating(optional)

In heating operation, the preset temperature of

the air conditioner can be as lower as 8° C, which keeps the room temperature steady at 8° C and prevents household things freezing when the house is unoccupied for a long time in severe cold weather.

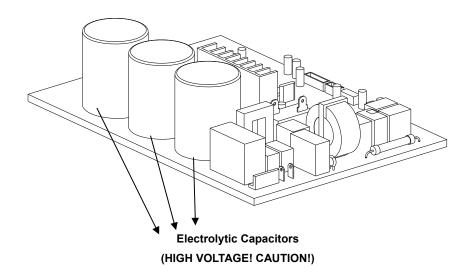
Press the "silence" button on remote controller to initiate SILENCE function. When the Silence function is activated, the compressor running frequency will keep lower than F2 and the indoor unit will bring faint breeze, which will reduce the noise to the lowest level and create a quiet and comfortable room for you.

8.4.15 Silence operation(optional)

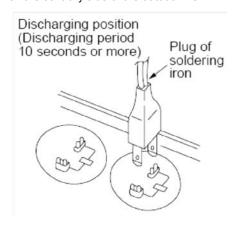
9. Troubleshooting

Safety

Electricity power is still kept in capacitors even the power supply is shut off. Do not forget to discharge the electricity power in capacitor.



For other models, please connect discharge resistance (approx.100 Ω 40W) or soldering iron (plug) between +, - terminals of the electrolytic capacitor on the contrary side of the outdoor PCB.



Note: The picture above is only for reference. The plug of your side may be different.

9.1 Indoor Unit Error Display

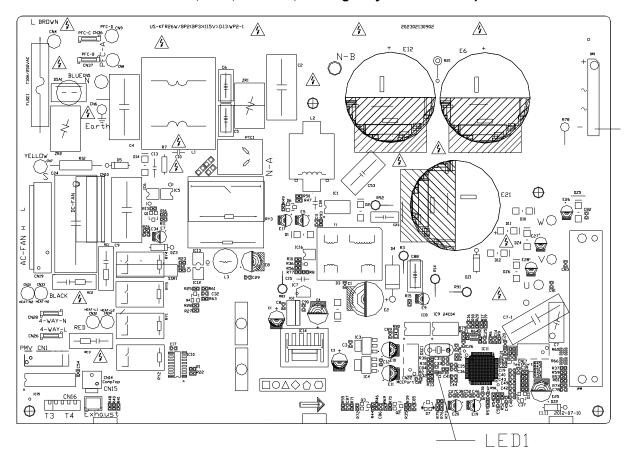
For All Models, (EXCEPT 18000 BTU, 16 SEER, Heat Pump).

Display	LED STATUS					
E0	Indoor unit EEPROM parameter error					
E1	Indoor / outdoor units communication error					
E2	Zero crossing signal detection error(except 3D inverter models)					
E3	Indoor unit fan speed has been out of control					
E5	Outdoor unit temperature sensor open circuit or short circuit/Outdoor unit					
⊑ 5	EEPROM malfunction					
E6	Indoor unit temperature sensor open circuit or short circuit					
	Outdoor unit fan speed has been out of control(except MS9A-09HRDN1-MP0W,					
E7	MS9A-12CRFN1-MS0W(B) , MS9A-18HRDN1-MP0W ,MS9A-24HRDN1-MP0W,					
MS9A-24HRDN1-MS0W)						
P0	IPM malfunction or IGBT over-strong current protection					
P1	Over voltage or over low voltage protection					
DO	High temperature protection of compressor top diagnosis and solution(except					
P2	24000 BTU, 16 SEER, Heat Pump)					
P4	Inverter compressor drive error					

For 18000 BRY, 16 SEER Heat Pump

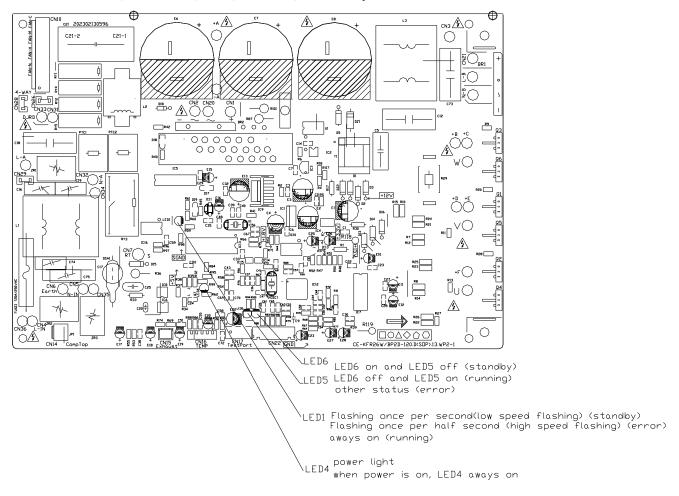
Display	LED STATUS
E0	Indoor unit EEPROM parameter error
E1	Indoor / outdoor units communication error
E2	Zero crossing signal detection error(except 3D inverter models)
E3	Indoor unit fan speed has been out of control
E4	Indoor room temperature sensor open circuit or short circuit
E5	Evaporator coil temperature sensor open circuit or short circuit
E7	Outdoor unit fan speed has been out of control
F1	Outdoor ambient temperature sensor open circuit or short circuit
F2	Condenser coil temperature sensor open circuit or short circuit
F3	Outdoor unit discharge temperature sensor open circuit or short circuit
F4	Outdoor unit EEPROM parameter error
F5	Outdoor unit fan speed has been out of control
P0	IPM malfunction or IGBT over-strong current protection
P1	Over voltage or over low voltage protection
P2	High temperature protection of compressor top diagnosis and solution
P4	Inverter compressor drive error

9.2 Outdoor unit error display For 9000 BTU and 12000 BTU, 115V, 20 SEER, Cooling Only and Heat Pump



status light, by which you can judge the unit Normal or Error (standby) Flashing once per second(low speed flashing)
(error) Flashing once per half second (high speed flashing)
(running) aways on

For 9000 BTU and, 12000 BTU, 230V, 16 SEER, Heat Pump.

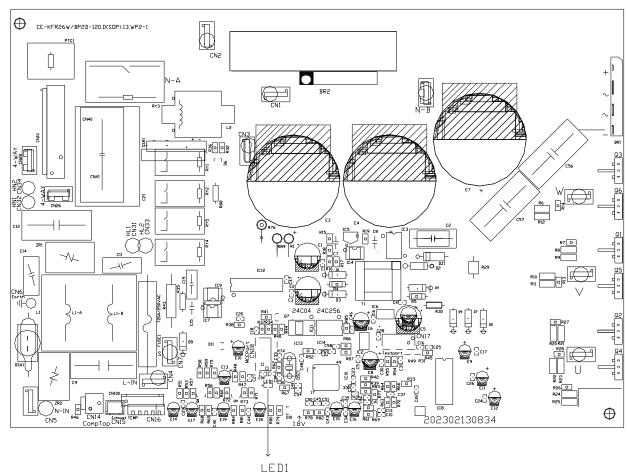


After power on, LED1(Blue color) will be slow flash(0.2Hz) when the unit is in standby and quick flash (2.5Hz) if the unit has some problems.

No.	Problems	LED6 (Green)	LED5 (Red)	IU display
1	standby for normal	О	x	
2	Operation normally	х	О	
3	IPM malfunction or IGBT over-strong current protection	☆	х	P0
4	Over voltage or too low voltage protection	0	О	P1
5	Over voltage or too low voltage protection	О	☆	P1
6	Inverter compressor drive error	х	☆	P4
7	Inverter compressor drive error	☆	О	P4
8	Inverter compressor drive error	☆	☆	P4

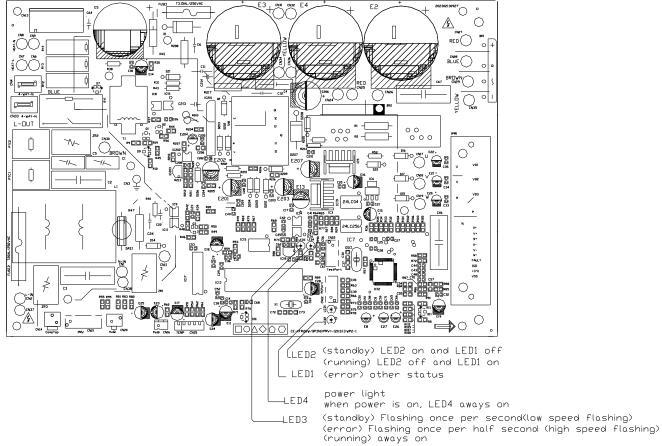
O (light) X (off) $\stackrel{\wedge}{\cancel{\sim}}$ (2.5Hz flash)

For 12000 BTU, 230V, 20 SEER, Cool Only.



status light, by which you can judge the unit Normal or Error (standby) Flashing once per second(low speed flashing) (error) Flashing once per half second (high speed flashing) (running) aways on

For 12000 BTU and 18000 BTU, 230V, 20 SEER, Heat Pump.



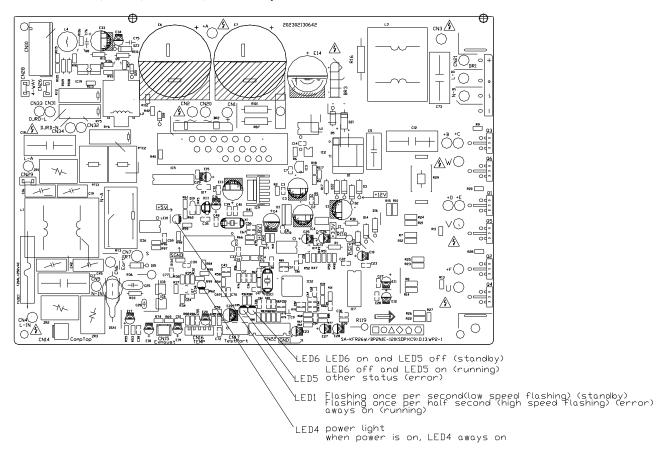
LED1-LED3 are status lights, by which you can judge the unit Normal or Error

After power on, LED3(Blue color) will be slow flash(0.2Hz) when the unit is in standby and quick flash (2.5Hz) if the unit has some problems.

No.	Problems	LED2 (Green)	LED1 (Red)	IU display
1	standby for normal O X			
2	Operation normally X O		0	
3	IPM malfunction or IGBT over-strong current protection	☆	Х	P0
4	Over voltage or too low voltage protection	0	0	P1
5	Over voltage or too low voltage protection	0	☆	P1
6	Inverter compressor drive error	х	☆	P4
7	Inverter compressor drive error	☆	0	P4
8	Inverter compressor drive error	☆	☆	P4

O (light) X (off) $\stackrel{\wedge}{\cancel{x}}$ (2.5Hz flash)

For 12000 BTU, 230 V, 20 SEER, Heat Pump

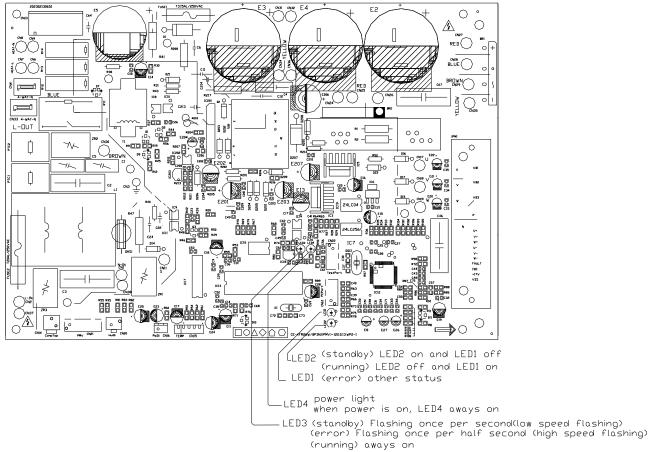


After power on, LED1(Blue color) will be slow flash(0.2Hz) when the unit is in standby and quick flash (2.5Hz) if the unit has some problems.

No.	Problems	LED6 (Green)	LED5 (Red)	IU display
1	standby for normal	О	Х	
2	Operation normally	х	0	
3	IPM malfunction or IGBT over-strong current protection	☆	Х	P0
4	Over voltage or too low voltage protection	О	0	P1
5	Over voltage or too low voltage protection	О	☆	P1
6	Inverter compressor drive error	х	☆	P4
7	Inverter compressor drive error	☆	0	P4
8	Inverter compressor drive error	☆	☆	P4

O (light) X (off) \Leftrightarrow (2.5Hz flash)

For 18000 BTU, 16 SEER, Heat Pump



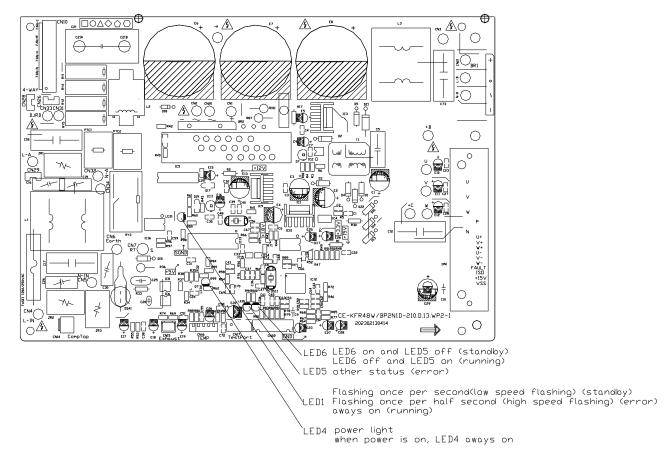
LED1-LED3 are status lights, by which you can judge the unit Normal or Error

After power on, LED3(Blue color) will be slow flash(0.2Hz) when the unit is in standby and quick flash (2.5Hz) if the unit has some problems.

No.	Problems	LED2 (Green)	LED1 (Red)	IU display
1	standby for normal	О	х	
2	Operation normally	х	0	
3	IPM malfunction or IGBT over-strong current protection	$\stackrel{\wedge}{\sim}$	х	P0
4	Over voltage or too low voltage protection	О	0	P1
5	Over voltage or too low voltage protection	0	☆	P1
6	Inverter compressor drive error	х	☆	P4
7	Inverter compressor drive error	☆	0	P4
8	Inverter compressor drive error	☆	☆	P4

O (light) X (off) $\stackrel{\wedge}{\Rightarrow}$ (2.5Hz flash)

For 18000 BTU and 24000 BTU, 20 SEER, Heat Pump

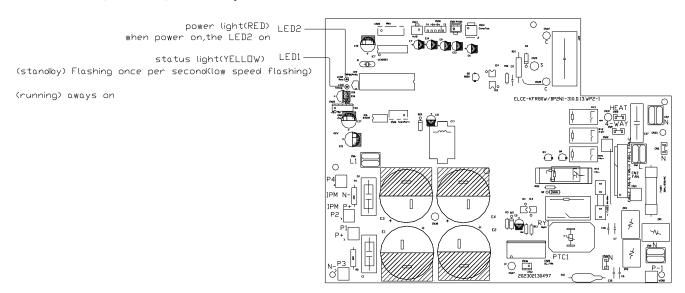


After power on, LED1(Blue color) will be slow flash(0.2Hz) when the unit is in standby and quick flash (2.5Hz) if the unit has some problems.

No.	Problems	LED6 (Green)	LED5 (Red)	IU display
1	standby for normal	0	Х	
2	Operation normally	Х	0	
3	IPM malfunction or IGBT over-strong current protection	☆	Х	P0
4	Over voltage or too low voltage protection	0	0	P1
5	Over voltage or too low voltage protection	0	☆	P1
6	Inverter compressor drive error	Х	☆	P4
7	Inverter compressor drive error	☆	0	P4
8	Inverter compressor drive error	☆	☆	P4

O (light) X (off) $\stackrel{\wedge}{\cancel{x}}$ (2.5Hz flash)

For 24000 BTU, 16 SEER, Heat Pump

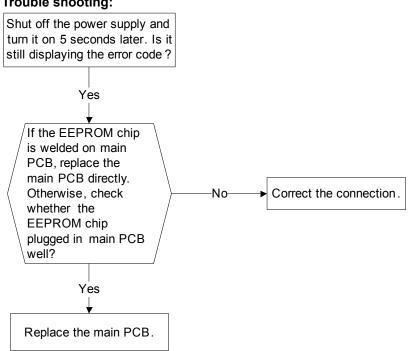


9.3 Diagnosis and Solution

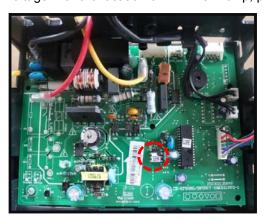
9.3.1 EEPROM parameter error diagnosis and solution(E0/F4)

Error Code	E0/F4
Malfunction decision	Indoor or outdoor PCB main chip does not receive feedback
conditions	from EEPROM chip.
Supposed causes	Installation mistake
	PCB faulty

Trouble shooting:



EEPROM: a read-only memory whose contents can be erased and reprogrammed using a pulsed voltage. For the location of EEPROM chip, please refer to the below photos.





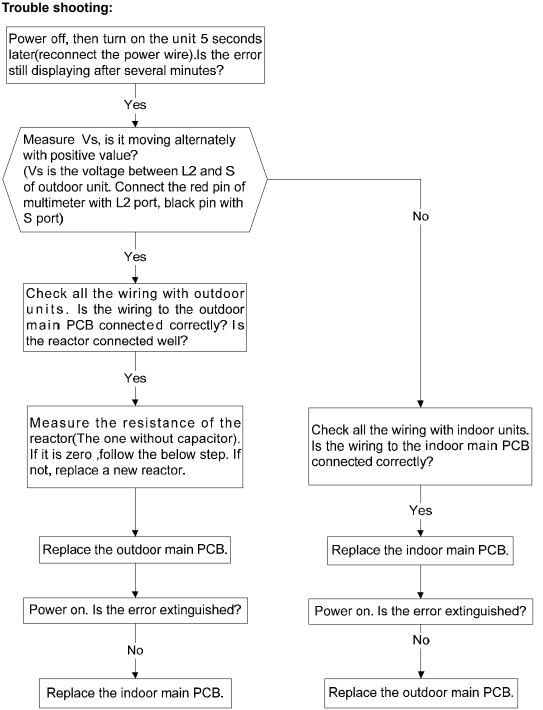
Indoor PCB

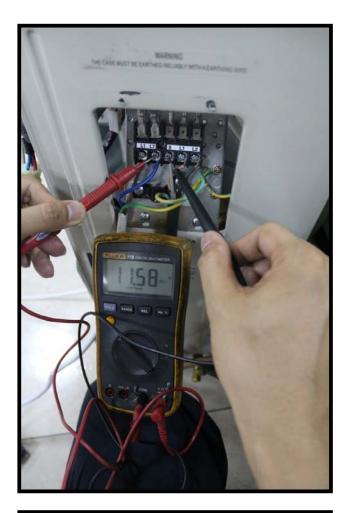
Outdoor PCB

Note: The two photos above are only for reference, it's may be not same totally with the ones on your side.

9.3.2 Indoor / outdoor unit's communication diagnosis and solution(E1)

Error Code	E1	
Malfunction decision	Indoor unit does not receive the feedback from outdoor unit during	
conditions	110 seconds and this condition happens four times continuously.	
Supposed causes	Wiring mistake	
	Indoor or outdoor PCB faulty	





Remark:

Use a multimeter to test the DC voltage between L2 (or N for 115V) port and S port of outdoor unit. The red pin of multimeter connects with L2 (or N for 115V) port while the black pin is for S port.

When AC is normal running, the voltage will move alternately between -50V to 50V.

If the outdoor unit has malfunction, the voltage will move alternately with positive value.

While if the indoor unit has malfunction, the voltage will be a certain value.



Remark:

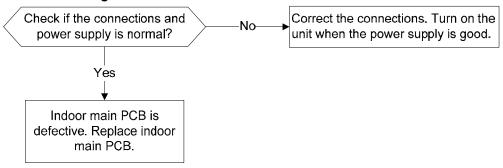
Use a multimeter to test the resistance of the reactor which does not connect with capacitor.

The normal value should be around zero ohm. Otherwise, the reactor must have malfunction and need to be replaced.

9.3.3 Zero crossing detection error diagnosis and solution(E2)

Error Code	E2
Malfunction decision conditions	When PCB does not receive zero crossing signal feedback for 4 minutes or the zero crossing signal time interval is abnormal.
Supposed causes	Connection mistake PCB faulty

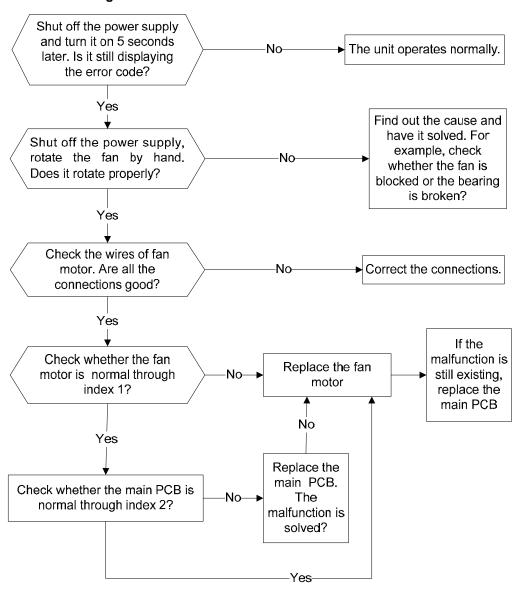
Trouble shooting:



9.3.4 Fan speed has been out of control diagnosis and solution (E3/E7/F5)

Error Code	E3
Malfunction decision conditions	When indoor fan speed keeps too low (300RPM) for certain time, the unit will stop and the LED will display the failure.
Supposed causes	 Wiring mistake Fan ass'y faulty Fan motor faulty PCB faulty

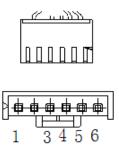
Trouble shooting:



Index 1:

1.Indoor or Outdoor DC Fan Motor (control chip is in fan motor)

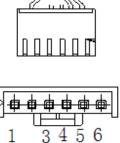
Measure the resistance value of each winding by using the tester. If any resistance value is zero, the fan motor must has problems and need to be replaced.



Index2:

1:Indoor or Outdoor DC Fan Motor(control chip is in fan motor)

Power on and when the unit is in standby, measure the voltage of pin1-pin3, pin4-pin3 in fan motor connector. If the value of the voltage is not in the range showing in below table, the PCB must has problems and need to be replaced.



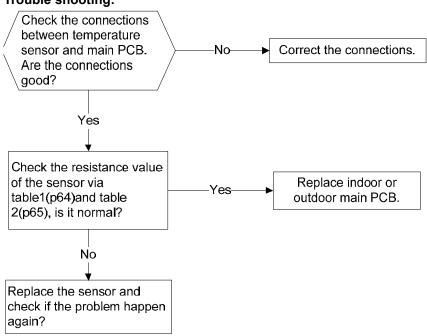
DC motor voltage input and output

NO.	Color	Signal	Voltage
1	Red	Vs/Vm	280V~380V
2			
3	Black	GND	0V
4	White	Vcc	14-17.5V
5	Yellow	Vsp	0~5.6V
6	Blue	FG	14-17.5V

9.3.5 Open circuit or short circuit of temperature sensor diagnosis and solution (E5)

Error Code	E5
Malfunction decision conditions	If the sampling voltage is lower than 0.06V or higher than 4.94 V, the LED will display the failure.
Supposed causes	Wiring mistake Sensor faulty

Trouble shooting:

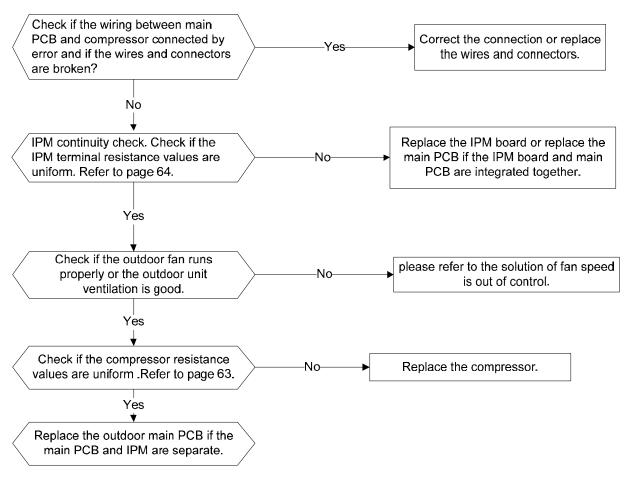




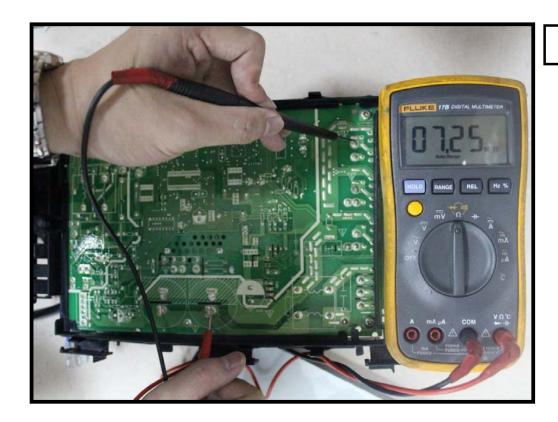
9.3.6 IPM malfunction or IGBT over-strong current protection diagnosis and solution (P0)

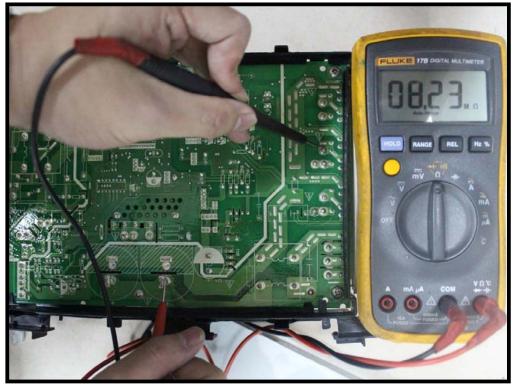
Error Code	P0
Malfunction decision conditions	When the voltage signal that IPM send to compressor drive chip is abnormal, the display LED will show "P0" and AC will turn off.
Supposed causes	 Wiring mistake IPM malfunction Outdoor fan ass'y faulty Compressor malfunction Outdoor PCB faulty

Trouble shooting:



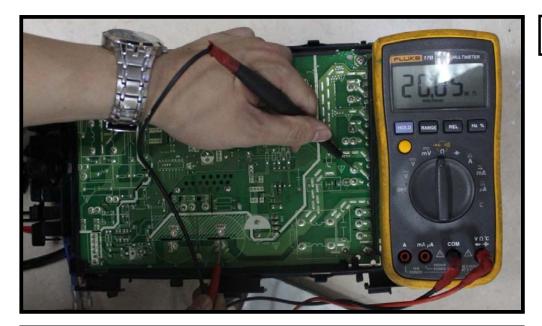
P-U



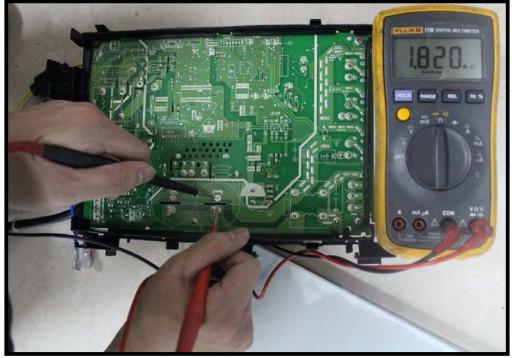


P-V

P-W



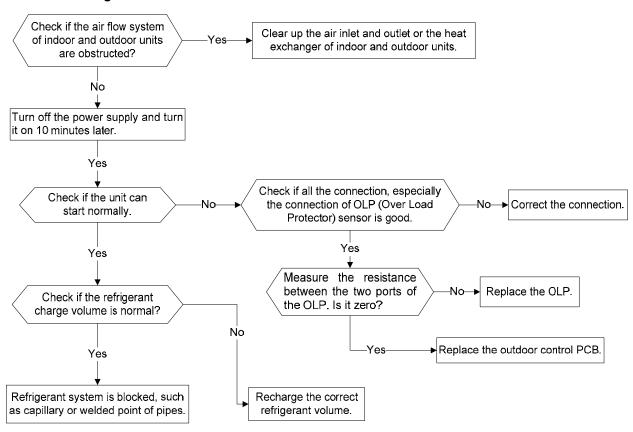




9.3.7 High temperature protection of compressor top diagnosis and solution (P2)

Error Code	P2
Malfunction decision conditions	If the sampling voltage is not 5V, the LED will display the failure.
Supposed causes	 Power supply problems. System leakage or block PCB faulty

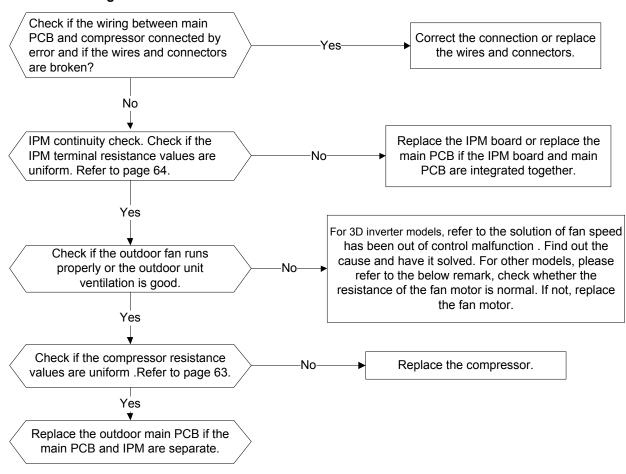
Trouble shooting:



9.3.8 Inverter compressor drive error diagnosis and solution (P4)

Error Code	P4
Malfunction decision conditions	An abnormal inverter compressor drive is detected by a special detection circuit, including communication signal detection, voltage detection, compressor rotation speed signal detection and so on.
Supposed causes	 Wiring mistake IPM malfunction Outdoor fan ass'y faulty Compressor malfunction Outdoor PCB faulty

Trouble shooting:



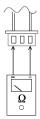
Remark:

- 1) 9K and 12K 16 Seer and 12K 20 Seer (230V) models: Measure the **black** pin and **red** pin of the motor connector, the resistance should be around **293**Ω at 20°C (68°F)
- 2) 18K, 16 SEER model: Measure the **black** pin and **red** pin of the motor connector, the resistance should be around **56Ω** at 20℃(68℉)
- 3) 24K 16 SEER model: Measure the black pin and red pin of the motor connector, the resistance should be around 88.5Ω at 20°C (68°F)
- 4) 24K, 20 SEER model: Measure the black pin and red pin of the motor connector, the resistance should be around 56.5Ω at 20℃(68℃)

Main parts check

1. Temperature sensor checking

Disconnect the temperature sensor from PCB, measure the resistance value with a tester.



Tester

Temperature Sensors.

Room temp.(T1) sensor,

Indoor coil temp.(T2) sensor,

Outdoor coil temp.(T3) sensor,

Outdoor ambient temp.(T4) sensor,

Compressor discharge temp.(T5) sensor.

Measure the resistance value of each winding by using the multi-meter.

Appendix 1 Temperature Sensor Resistance Value Table for T1,T2,T3,T4 (°C--K)

1-1		omporataro	0011001	1 1001010	arioo valao	iable le	,	.,13,14 (C	11)		
$^{\circ}$	Ŧ	K Ohm	ပ္	ፑ	K Ohm	င္	Ŧ	K Ohm	ပ္	Ŧ	K Ohm
-20	-4	115.266	20	68	12.6431	60	140	2.35774	100	212	0.62973
-19	-2	108.146	21	70	12.0561	61	142	2.27249	101	214	0.61148
-18	0	101.517	22	72	11.5	62	144	2.19073	102	216	0.59386
-17	1	96.3423	23	73	10.9731	63	145	2.11241	103	217	0.57683
-16	3	89.5865	24	75	10.4736	64	147	2.03732	104	219	0.56038
-15	5	84.219	25	77	10	65	149	1.96532	105	221	0.54448
-14	7	79.311	26	79	9.55074	66	151	1.89627	106	223	0.52912
-13	9	74.536	27	81	9.12445	67	153	1.83003	107	225	0.51426
-12	10	70.1698	28	82	8.71983	68	154	1.76647	108	226	0.49989
-11	12	66.0898	29	84	8.33566	69	156	1.70547	109	228	0.486
-10	14	62.2756	30	86	7.97078	70	158	1.64691	110	230	0.47256
-9	16	58.7079	31	88	7.62411	71	160	1.59068	111	232	0.45957
-8	18	56.3694	32	90	7.29464	72	162	1.53668	112	234	0.44699
-7	19	52.2438	33	91	6.98142	73	163	1.48481	113	235	0.43482
-6	21	49.3161	34	93	6.68355	74	165	1.43498	114	237	0.42304
-5	23	46.5725	35	95	6.40021	75	167	1.38703	115	239	0.41164
-4	25	44	36	97	6.13059	76	169	1.34105	116	241	0.4006
-3	27	41.5878	37	99	5.87359	77	171	1.29078	117	243	0.38991
-2	28	39.8239	38	100	5.62961	78	172	1.25423	118	244	0.37956
-1	30	37.1988	39	102	5.39689	79	174	1.2133	119	246	0.36954
0	32	35.2024	40	104	5.17519	80	176	1.17393	120	248	0.35982
1	34	33.3269	41	106	4.96392	81	178	1.13604	121	250	0.35042
2	36	31.5635	42	108	4.76253	82	180	1.09958	122	252	0.3413
3	37	29.9058	43	109	4.5705	83	181	1.06448	123	253	0.33246
4	39	28.3459	44	111	4.38736	84	183	1.03069	124	255	0.3239
5	41	26.8778	45	113	4.21263	85	185	0.99815	125	257	0.31559
6	43	25.4954	46	115	4.04589	86	187	0.96681	126	259	0.30754
7	45	24.1932	47	117	3.88673	87	189	0.93662	127	261	0.29974
8	46	22.5662	48	118	3.73476	88	190	0.90753	128	262	0.29216
9	48	21.8094	49	120	3.58962	89	192	0.8795	129	264	0.28482
10	50	20.7184	50	122	3.45097	90	194	0.85248	130	266	0.2777
11	52	19.6891	51	124	3.31847	91	196	0.82643	131	268	0.27078
12	54	18.7177	52	126	3.19183	92	198	0.80132	132	270	0.26408
13	55	17.8005	53	127	3.07075	93	199	0.77709	133	271	0.25757
14	57	16.9341	54	129	2.95896	94	201	0.75373	134	273	0.25125
15	59	16.1156	55	131	2.84421	95	203	0.73119	135	275	0.24512
16	61	15.3418	56	133	2.73823	96	205	0.70944	136	277	0.23916
17	63	14.6181	57	135	2.63682	97	207	0.68844	137	279	0.23338
18	64	13.918	58	136	2.53973	98	208	0.66818	138	280	0.22776
19	66	13.2631	59	138	2.44677	99	210	0.64862	139	282	0.22231

Appendix 2 Temperature Sensor Resistance Value Table for T5 (°C--K)

${f c}$	Ŧ		°C	Ŧ	K Ohm	°C	下 下	· ·	°C	Ŧ	K Ohm
		K Ohm	.		K Ohm			K Ohm			K Ohm
-20	-4	542.7	20	68	68.66	60	140	13.59	100	212	3.702
-19	-2	511.9	21	70	65.62	61	142	13.11	101	214	3.595
-18	0	483	22	72	62.73	62	144	12.65	102	216	3.492
-17	1	455.9	23	73	59.98	63	145	12.21	103	217	3.392
-16	3	430.5	24	75	57.37	64	147	11.79	104	219	3.296
-15	5	406.7	25	77	54.89	65	149	11.38	105	221	3.203
-14	7	384.3	26	79	52.53	66	151	10.99	106	223	3.113
-13	9	363.3	27	81	50.28	67	153	10.61	107	225	3.025
-12	10	343.6	28	82	48.14	68	154	10.25	108	226	2.941
-11	12	325.1	29	84	46.11	69	156	9.902	109	228	2.86
-10	14	307.7	30	86	44.17	70	158	9.569	110	230	2.781
-9	16	291.3	31	88	42.33	71	160	9.248	111	232	2.704
-8	18	275.9	32	90	40.57	72	162	8.94	112	234	2.63
-7	19	261.4	33	91	38.89	73	163	8.643	113	235	2.559
-6	21	247.8	34	93	37.3	74	165	8.358	114	237	2.489
-5	23	234.9	35	95	35.78	75	167	8.084	115	239	2.422
-4	25	222.8	36	97	34.32	76	169	7.82	116	241	2.357
-3	27	211.4	37	99	32.94	77	171	7.566	117	243	2.294
-2	28	200.7	38	100	31.62	78	172	7.321	118	244	2.233
-1	30	190.5	39	102	30.36	79	174	7.086	119	246	2.174
0	32	180.9	40	104	29.15	80	176	6.859	120	248	2.117
1	34	171.9	41	106	28	81	178	6.641	121	250	2.061
2	36	163.3	42	108	26.9	82	180	6.43	122	252	2.007
3	37	155.2	43	109	25.86	83	181	6.228	123	253	1.955
4	39	147.6	44	111	24.85	84	183	6.033	124	255	1.905
5	41	140.4	45	113	23.89	85	185	5.844	125	257	1.856
6	43	133.5	46	115	22.89	86	187	5.663	126	259	1.808
7	45	127.1	47	117	22.1	87	189	5.488	127	261	1.762
8	46	121	48	118	21.26	88	190	5.32	128	262	1.717
9	48	115.2	49	120	20.46	89	192	5.157	129	264	1.674
10	50	109.8	50	122	19.69	90	194	5	130	266	1.632
11	52	104.6	51	124	18.96	91	196	4.849			
12	54	99.69	52	126	18.26	92	198	4.703			
13	55	95.05	53	127	17.58	93	199	4.562			
14	57	90.66	54	129	16.94	94	201	4.426			
15	59	86.49	55	131	16.32	95	203	4.294			
16	61	82.54	56	133	15.73	96	205	4.167			
17	63	78.79	57	135	15.16	97	207	4.045			
18	64	75.24	58	136	14.62	98	208	3.927			
19	66	71.86	59	138	14.09	99	210	3.812			

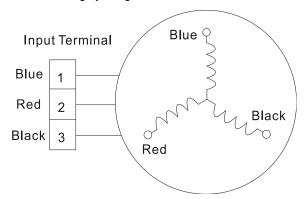
Appendix 3:

$^{\circ}$	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
°F	50	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80	82
$^{\circ}\!\mathbb{C}$	28	29	30	31	32	33	34	35	36	37	38	39	4	0	41	42	43	3
°F	84	86	86	90	92	94	96	98	98	99	100	10	2 1	04	106	108	10	9
$^{\circ}\!\mathbb{C}$	44	45	4	6	47	48	49	9 ;	50									
°F	111	11	3 1	15	117	118	12	20 1	22									

$$\Delta T(^{\circ}F) = \frac{9\Delta T(^{\circ}C)}{5}$$

2.Compressor checking

Measure the resistance value of each winding by using the tester.



Position	Resistance Value								
	DA108X1C-20FZ3	DA150S1C-20FZ	DA250S2C-30MT						
Blue - Red	0.71Ω	0.95Ω	0.55Ω						
Blue - Black	(20° C/68°F)	(20 ℃/68℉)	(20 ℃/68℉)						
Red - Blue									



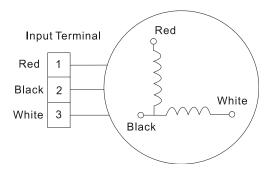
3. IPM continuity check

Turn off the power, let the large capacity electrolytic capacitors discharge completely, and dismount the IPM. Use a digital tester to measure the resistance between P and UVWN; UVW and N.

Digi	ital tester	Normal resistance value	Digital	l tester	Normal resistance value	
(+)Red	(-)Black		(+)Red	(-)Black		
	N		U			
Р	U	∞	V	N.	∞	
P	V	(Several MΩ)	W	N	(Several MΩ)	
	W		(+)Red			

4: Indoor AC Fan Motor

Measure the resistance value of each winding by using the tester.



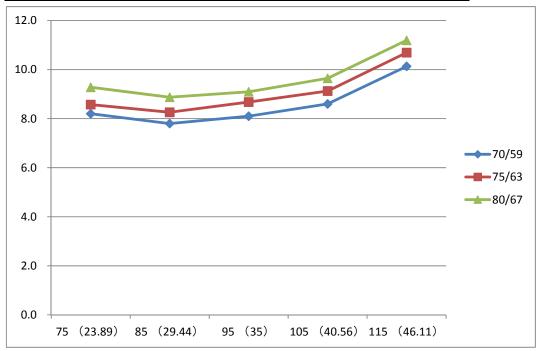
Position		Resista	nce Value		
	RPG20B RPG28H		RPG28H	RPG28A	
Black - Red	381Ω±8%	342Ω±8%	183.6Ω±8%	70.3Ω±8%	
(20°C/68°F) (20°C/68°F)		(20 ℃/68℉)	(20 ℃/68℉)	(20 ℃/68℉)	
	(Brand: Weiling)	(Brand: Dayang)	(Brand: Weiling)	(Brand: Dayang)	
White - Black	267Ω±8%	253Ω±8%	206Ω±8%	66.8Ω±8%	
	(20 ℃/68°F)	(20 ℃/68℉)	(20 ℃/68°F)	(20 ℃/68°F)	
	(Brand: Weiling)	(Brand: Dayang)	(Brand: Weiling)	(Brand: Dayang)	

5: Pressure On Service Port Cooling chart:

°F	IDT	75	85	95	105	115
(℃)	ODT	(23.89)	(29.44)	(35)	(40.56)	(46.11)
BAR	70/59	8.2	7.8	8.1	8.6	10.1
BAR	75/63	8.6	8.3	8.7	9.1	10.7
BAR	80/67	9.3	8.9	9.1	9.6	11.2

°F	IDT	75	85	95	105	115
(℃)	ODT	(23.89)	(29.44)	(35)	(40.56)	(46.11)
PSI	70/59	119	113	117	125	147
PSI	75/63	124	120	126	132	155
PSI	80/67	135	129	132	140	162

°F	IDT	75	85	95	105	115
(℃)	ODT	(23.89)	(29.44)	(35)	(40.56)	(46.11)
MPA	70/59	0.82	0.78	0.81	0.86	1.01
MPA	75/63	0.86	0.83	0.87	0.91	1.07
MPA	80/67	0.93	0.89	0.91	0.96	1.12

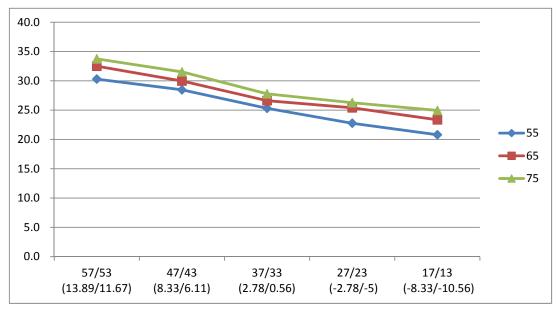


Heating Chart:

°F	IDT	57/53	47/43	37/33	27/23	17/13
(℃)	ODT	(13.89/11.67)	(8.33/6.11)	(2.78/0.56)	(-2.78/-5)	(-8.33/-10.56)
BAR	55	30.3	28.5	25.3	22.8	20.8
BAR	65	32.5	30.0	26.6	25.4	23.3
BAR	75	33.8	31.5	27.8	26.3	24.9

°F	IDT	57/53	47/43	37/33	27/23	17/13
(℃)	ODT	(13.89/11.67)	(8.33/6.11)	(2.78/0.56)	(-2.78/-5)	(-8.33/-10.56)
PSI	55	439	413	367	330	302
PSI	65	471	435	386	368	339
PSI	75	489	457	403	381	362

°F	IDT	57/53	47/43	37/33	27/23	17/13
(℃)	ODT	(13.89/11.67)	(8.33/6.11)	(2.78/0.56)	(-2.78/-5)	(-8.33/-10.56)
MPA	55	3.03	2.85	2.53	2.28	2.08
MPA	65	3.25	3.00	2.66	2.54	2.33
MPA	75	3.38	3.15	2.78	2.63	2.49



10. Exploded Views: (Available as a separate Document)

11. Disassembly Instructions

Note: This part is for reference, the photos may have slight difference with your machine.

11.1 Indoor unit

No.	Parts name	Procedures	Remarks
1	Front panel	How to remove the front panel.	Overview:
		 Pull the below side of the panel and release the clips. Remove the filter and horizontal louver. Remove the fixing screw and open the 	Clip
		cover.	One screw fixing the cover
		3) Lift the panel and release the connector of display ass'y. Then remove the front panel.	Connector for
			display ass'y
		4) Remove the five screws and release the panel frame ass'y.	5 screws

Coil temp. 2 Electrical How to remove the Grounding sensor screws electrical parts. parts 1) After remove the front panel from procedure 1, pull out the room temp. sensor and evaporator coil sensor. Room temp. sensor Remove the grounding Screw for cover screws. 2) Remove the fixing screw and open the cover of electronic control box. 3) Pull out the connectors of swing motor, fan motor, room temp. sensor and coil temp. sensor. . Fan motor connector Swing motor Temp. sensor connector connectors 4) Remove the fixing screw and then remove the electronic control box and air outlet ass'y. One screw

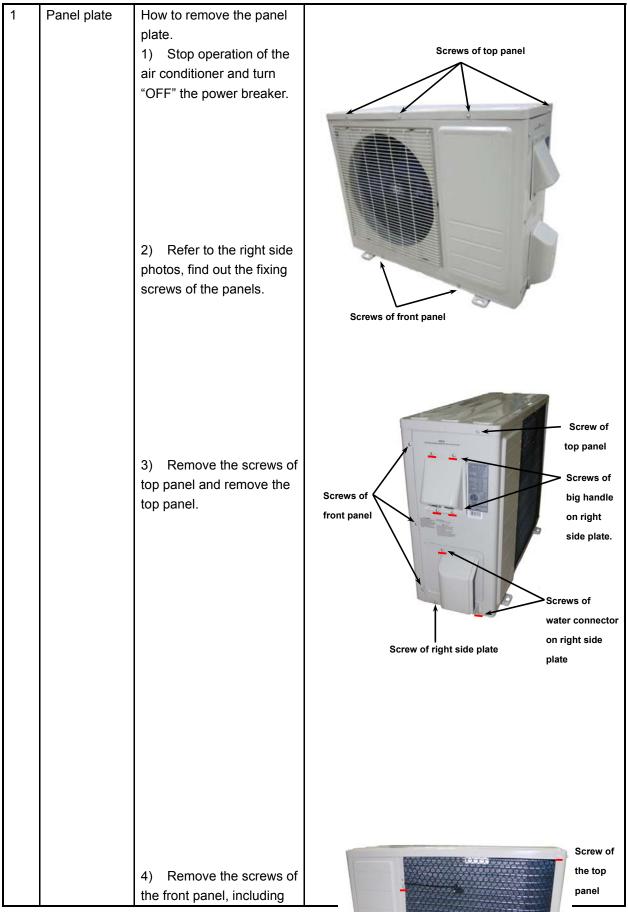
Evaporator 3 How to remove evaporator. 1) After remove the front panel ass'y and electrical parts following procedure 1 and procedure 2, remove the pipe holder at the rear side of the unit. Screw of pipe holder 2) Remove the three screws on the evaporator at the base bearing side. 3 screws 3) Remove two screws on the evaporator at the fixed plates and then lift the evaporator ass'y. 2 screws

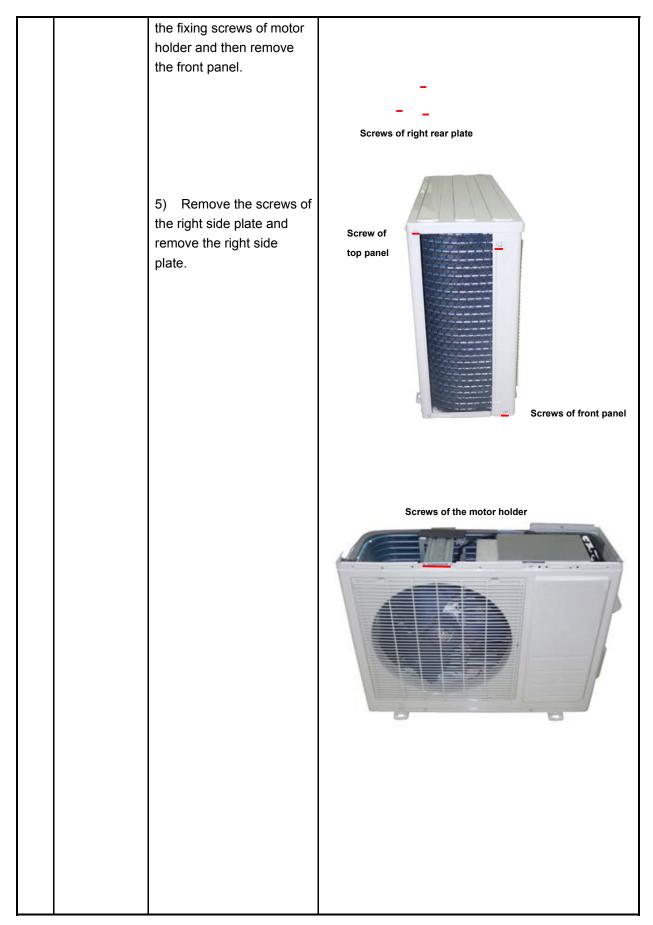
		•	
4	Fan and motor	How to remove the fan and motor. 1) After remove the evaporator ass'y following procedure 1, procedure 2 and procedure 3, remove the four screws fixing the cover	Four screws
		2) Remove the screw fixing the motor and then pull out the motor.	1-Screw

11.2 Outdoor unit

> 12000 BTU, 230 V, 20 SEER and 9000 / 12000 BTU, 115V, 20 SEER Heat Pumps.

No. Part nar	ne Procedures	Remarks
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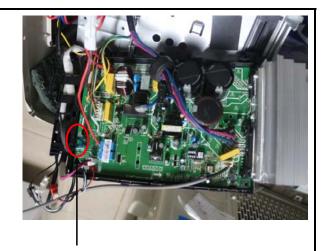




Fan ass'y How to remove the fan Electronic control box ass'y. Fan ass'y 1) After remove the panel plate following procedure 1, remove the hex nut fixing the fan and then remove the fan. Reactor Compressor and liquid-gas separator Nut fixing the fan 2) Unfix the hooks and then open the electronic control box cover.

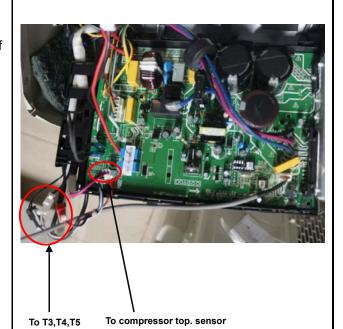
3) Disconnect the connector for fan motor from the electronic control board. Fan motor connector 4) Remove the four fixing screws of the fan screws motor. 5) Then remove the fan motor. Electrical How to remove the parts electrical parts. 1) After finish work of item 1 and item 2, remove the three connectors for compressor, crankcase heater and capacitor. Compressor crankcase heater Capacitor connector Compressor connector

2) Pull out the two black wires connected with the four way valve.

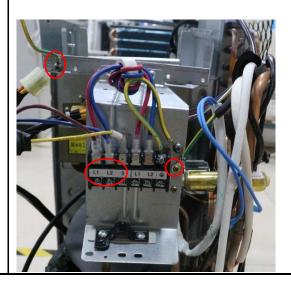


Two black wires of four way valve

3) Pull out connectors of the compressor top temp. sensor, condenser coil temp. sensor(T3),outdoor ambient temp. sensor(T4) and discharge temp. sensor(T5).



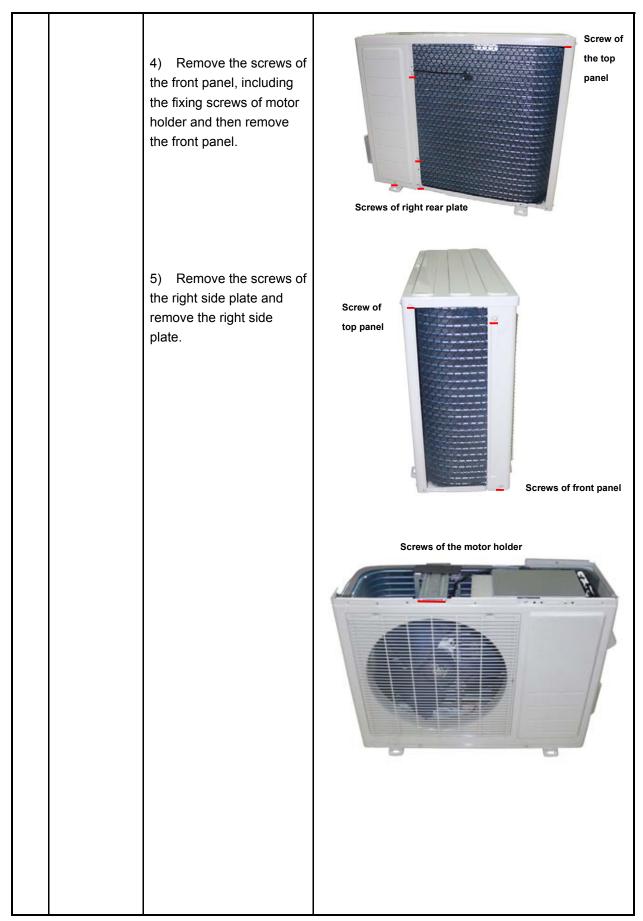
- 4) Remove the ground wires .
- 5) Remove the power supply wires(L1,L2,S).
- 6) Then remove the electronic control box.

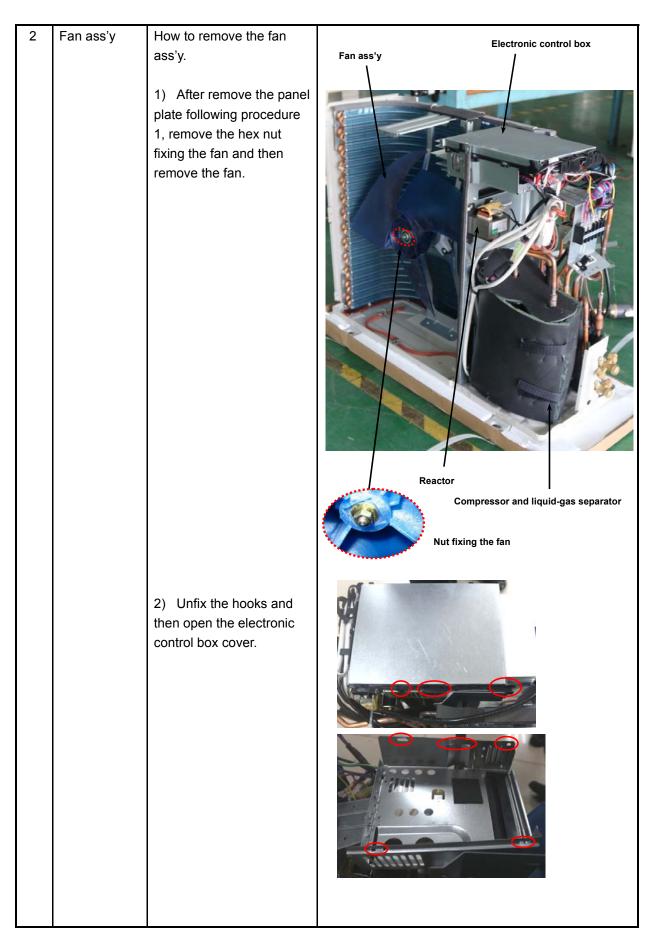


How to remove the Four-way valve The picture of four-way valve may be different from four-way valve. 1) Perform work of item the one on your side. 1,2,3. 2) Recover refrigerant Four-way from the refrigerant circuit. valve 3) Remove the screw of Welded the coil and then remove parts the coil. 4) Detach the welded parts of four-way valve and pipe. 5) Then the four-way valve ass'y can be removed Coil of four-way valve, fixing by one screw. 5 Compressor How to remove the compressor. 1) After perform work of item1,2,3. 2) Remove the discharge pipe and suction pipe with a burner. 3) Remove the hex nuts Discharge and washers fixing the pipe and suction compressor on bottom pipe plate. 4) Lift the compressor from the base pan assembly. compressor

> 9000 BTU and 12000 BTU, 230V, 16 SEER

		2000 BTU, 230V, 16 SEER	
No.	Part name	Procedures	Remarks
1	Panel plate	How to remove the panel plate. 1) Stop operation of the air conditioner and turn "OFF" the power breaker.	Screws of top panel
		2) Refer to the right side photos, find out the fixing screws of the panels.	Screws of front panel
		3) Remove the screws of top panel and remove the top panel.	Screws of top panel Screws of big handle on right side plate. Screws of water connector on right side plate Screw of right side plate





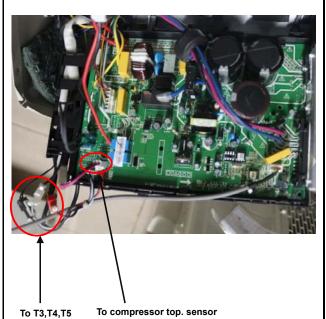
3) Disconnect the connector for fan motor from the electronic control board. Fan motor connector 4) Remove the four fixing screws of the fan motor. Four screws 5) Then remove the fan motor. Electrical How to remove the parts electrical parts. 1) After finish work of item 1 and item 2, remove the three connectors for compressor, crankcase heater and capacitor. Compressor crankcase heater Capacitor connector Compressor connector

2) Pull out the two black wires connected with the four way valve.



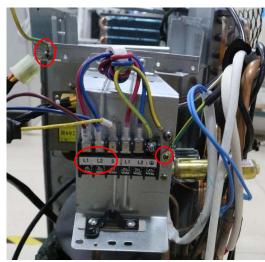
Two black wires of four way valve

3) Pull out connectors of the compressor top temp. sensor, condenser coil temp. sensor(T3),outdoor ambient temp. sensor(T4) and discharge temp. sensor(T5).



To compressor top. sensor

- 4) Remove the ground wires .
- 5) Remove the power supply wires(L1,L2,S).
- 6) Then remove the electronic control box.



How to remove the Four-way valve The picture of four-way valve may be different from four-way valve. 1) Perform work of item the one on your side. 1,2,3. 2) Recover refrigerant Four-way from the refrigerant circuit. valve 3) Remove the screw of Welded the coil and then remove parts the coil. 4) Detach the welded parts of four-way valve and pipe. 5) Then the four-way valve ass'y can be removed Coil of four-way valve, fixing by one screw. 5 Compressor How to remove the compressor. 1) After perform work of item1,2,3. 2) Remove the discharge pipe and suction pipe with a burner. 3) Remove the hex nuts Discharge and washers fixing the pipe and suction compressor on bottom pipe plate. 4) Lift the compressor from the base pan assembly. compressor

> 18000 BTU, Both 16 and 20 SEER Models.

No.	Part name	Procedures	Remarks
	Panel plate	How to remove the panel	
		plate.	Screws of top panel
		1) Stop operation of	Screws of top parter
		the air conditioner and turn	
		"OFF" the power breaker. 2) Refer to the right side	
		photos, find out the fixing	Sorous of front name
		screws of the panels.	Screws of front panel
		3) Remove the screws of top panel and remove the top panel.	Screw of top panel Screws of big handle on right side plate.
			Screws of Screws of
			front panel water connector
			on right side
			plate
			101

4) Remove the screws of the front panel, including the fixing screws of motor holder and then remove the front panel.



Screws of right rear plate

5) Remove the screws of the right side plate and remove the right side plate.

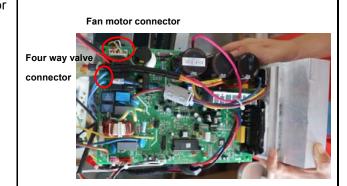


Screws of the motor holder

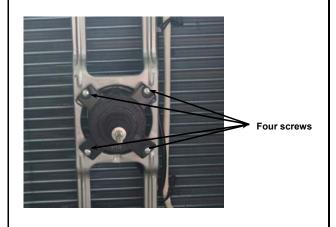


Fan ass'y How to remove the fan Electronic control box Fan ass'y. 1) After remove the panel plate following procedure 1, remove the hex nut fixing the fan and then remove the fan. Two reactors Compressor and liquid-gas separator Nut fixing the fan 2) Remove the one fixing screw. Unfix the hooks and then open the electronic control box cover.

Release the fan motor connector and four way valve connector.



- Remove the four fixing screws of the fan motor.
- 5) Then remove the fan motor.



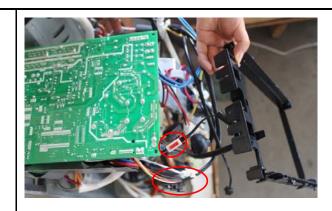
3 Electrical parts

How to remove the electrical parts.

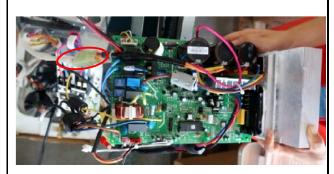
1) After finish work of item 1 and item 2, remove the two connectors for the compressor and the compressor crankcase heater.



Release the three temp. sensor connectors.



3) Remove the connector of reactor.



Remove the connector of electronic expansion valve.



- 5) Remove the grounding screw.
- 6) Remove the power supply wires(L1,L2,S).
- 7) Then remove the electronic control box.



4	Four-way valve	How to remove the four-way valve. 1) Perform work of item1,2,3. 2) Recover refrigerant from the refrigerant circuit. 3) Remove the screw of the coil and then remove the coil. 4) Detach the welded parts of four-way valve and pipe. 5) Then the four-way valve removed	The picture of four-way valve may be different from the one on your side. Four-way valve Welded parts
5	Compressor	How to remove the compressor. 1) After perform work of item1,2,3. 2) Remove the discharge pipe and suction pipe with a burner. 3) Remove the hex nuts and washers fixing the compressor on bottom plate. 4) Lift the compressor from the base pan assembly.	Coil of four-way valve, fixing by one screw. Discharge pipe and suction pipe Nuts of

compressor

> 18000 BTU, 16 SEER

No.	Part name	Procedures	Remarks
140.	Panel plate	How to remove the panel	Tomare
	'	plate.	
		Stop operation of	Screws of top panel
		the air conditioner and turn	
		"OFF" the power breaker.	
		2) Refer to the right side	
		photos, find out the fixing	
		screws of the panels.	Screws of front panel
		3) Remove the screws of top panel and remove the top panel.	Screws of big handle on right side plate. Screws of water connector on right side plate
			107

4) Remove the screws of the front panel, including the fixing screws of motor holder and then remove the front panel.



Screws of right rear plate

5) Remove the screws of the right side plate and remove the right side plate.



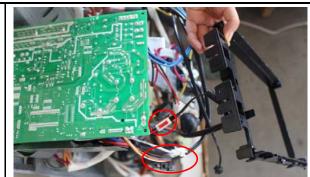
Screws of the motor holder



Fan ass'y How to remove the fan Electronic control box Fan ass'y. 1) After remove the panel plate following procedure 1, remove the hex nut fixing the fan and then remove the fan. Two reactors Compressor and liquid-gas separator Nut fixing the fan 2) Remove the one fixing screw. Unfix the hooks and then open the electronic control box cover.

	I	<u> </u>	
		3) Release the fan motor connector and four way valve connector.	Four way valve connector
		4) Remove the four fixing screws of the fan motor.5) Then remove the fan motor.	Four screws
3	Electrical parts	How to remove the electrical parts. 1) After finish work of item 1 and item 2, remove the two connectors for the compressor and the compressor crankcase heater.	

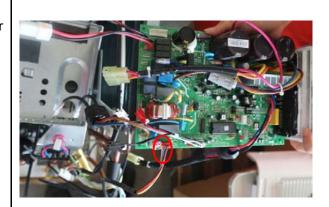
2) Release the three temp. sensor connectors.



3) Remove the connector of reactor.



Remove the connector of electronic expansion valve.



- 5) Remove the grounding screw.
- 6) Remove the power supply wires(L1,L2,S).
- 7) Then remove the electronic control box.

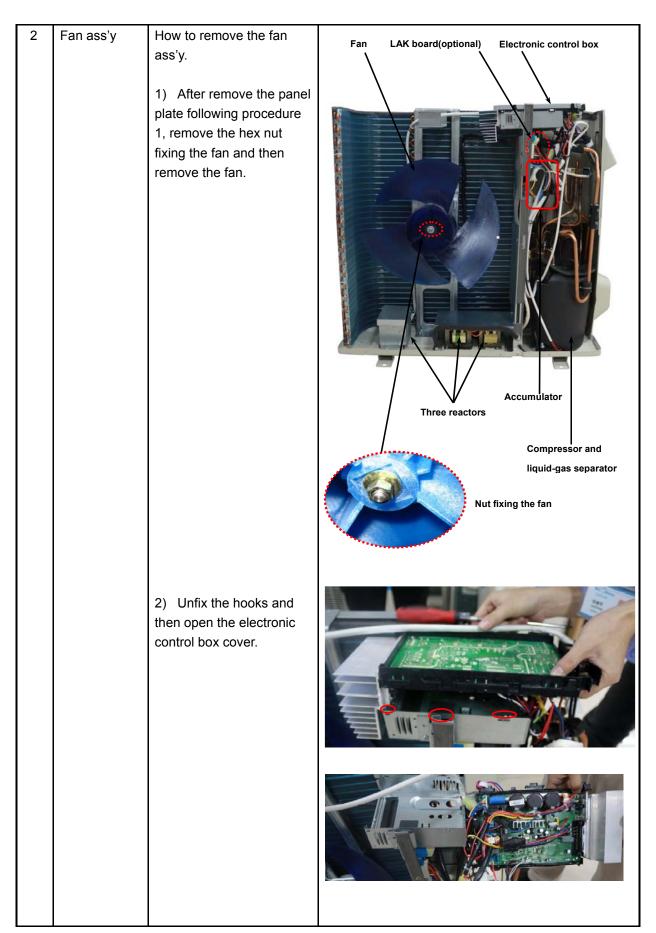


4	Four-way valve	How to remove the four-way valve. 1) Perform work of item1,2,3. 2) Recover refrigerant from the refrigerant circuit. 3) Remove the screw of the coil and then remove the coil. 4) Detach the welded parts of four-way valve and pipe. 5) Then the four-way valve removed	The picture of four-way valve may be different from the one on your side. Four-way valve Welded parts Coil of four-way valve, fixing by one screw.
5	Compressor	How to remove the compressor. 1) After perform work of item1,2,3. 2) Remove the discharge pipe and suction pipe with a burner. 3) Remove the hex nuts and washers fixing the compressor on bottom plate. 4) Lift the compressor from the base pan assembly.	Discharge pipe and suction pipe Nuts of compressor

> 24000 BTU, 16 and 20 SEER Models.

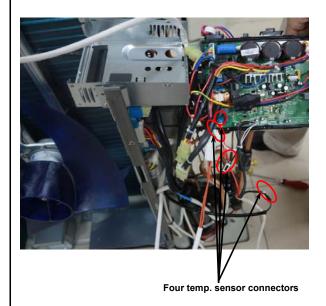
Panel plate Panel plate Panel plate Panel plate Panel plate Panel plate 1) Stop operation of the air conditioner and turn "OFF" the power breaker. 2) Refer to the right side photos, find out the fixing screws of the panels. Screws of front panel Screws of the right side photos front panel Screws of top panel and remove the top panel and remove the top panel. Screws of side panel Screws of side plate. Screws of ront panel Screws of ront panel side plate.	No.	Part name	Procedures	Remarks
plate. 1) Stop operation of the air conditioner and turn "OFF" the power breaker. 2) Refer to the right side photos, find out the fixing screws of the panels. Screws of front panel Screws of the right side photos, find out the fixing screws of the panels. 3) Remove the screws of top panel and remove the top panel and remove the top panel. Screws of the right side panel Screws of the right side panel Screws of tront panel	140.			Remains
1) Stop operation of the air conditioner and turn "OFF" the power breaker. 2) Refer to the right side photos, find out the fixing screws of the panels. Screws of front panel Screws of the right side photos, find out the fixing screws of the panels. 3) Remove the screws of top panel and remove the top panel. Screws of the right side phase on right side plate. Screws of top panel.		r and plate		
the air conditioner and turn "OFF" the power breaker. 2) Refer to the right side photos, find out the fixing screws of the panels. Screws of tront panel Screws of the right side panel 3) Remove the screws of top panel and remove the top panel. Screws of the right side panel Screws of big handle on right side plate. Screws of water connector on right side plate.				Screws of top panel
2) Refer to the right side photos, find out the fixing screws of the panels. Screws of front panel Screws of the right side panel 3) Remove the screws of top panel and remove the top panel. Screws of top panel. Screws of top panel. Screws of top panel and remove the top panel.				
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screws of big handle on right side plate. Screws of water connector on right side			Refer to the right side photos, find out the fixing	Screws of the right
			top panel and remove the	big handle on right side plate. Screws of water connector on right side

4) Remove the screws of the front panel, including the fixing screws of motor holder and then remove the front panel. Screws of right rear plate 5) Remove the screws of Screw of the right side plate and top panel remove the right side plate. Screws of front panel Screws of the motor holder



		3) Disconnect the connector for fan motor from the electronic control board.	Fan motor connector
		4) Remove the four fixing screws of the fan motor.5) Then remove the fan motor.	Four screws
3	Electrical parts	How to remove the electrical parts. 1) After finish work of item 1 and item 2, remove the three connectors for the compressor and the reactors and the compressor crankcase heater.	
		2) Pull out the two blue wires connected with the four way valve.	Two blue wires of four way valve

3) Pull out connectors of the compressor top temp. sensor, condenser coil temp. sensor(T3),outdoor ambient temp. sensor(T4) and discharge temp. sensor(T5).



4) Remove the grounding screw.



Grounding screw

5) Remove the power supply wires(L1,L2,S).6) Then remove the electronic control box.



Four-way How to remove the valve four-way valve. The picture of four-way valve may be different from 1) Perform work of the one on your side. item1,2,3. 2) Recover refrigerant Four-way from the refrigerant circuit. valve 3) Remove the screw of Welded the coil and then remove parts the coil. 4) Detach the welded parts of four-way valve and pipe. 5) Then the four-way valve ass'y can be removed Coil of four-way valve, fixing by one screw How to remove the 5 Compressor compressor. 1) After perform work of item1,2,3. 2) Remove the discharge pipe and suction pipe with a burner. 3) Remove the hex nuts and washers fixing the compressor on bottom Discharge plate. pipe and 4) Lift the compressor suction from the base pan pipe assembly. Nuts of

compressor