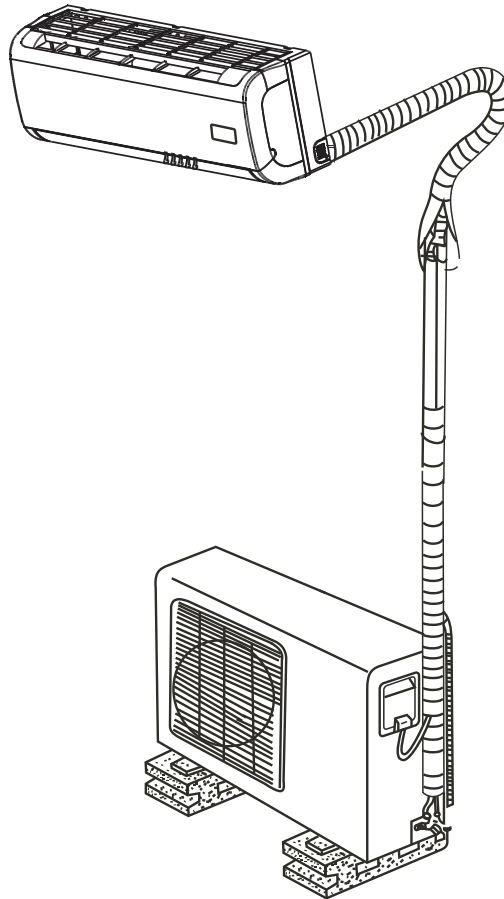


ComfortStar®

Installation Manual for Single Zone Mini-Split

Indoor Unit : CHP030CD(I) CHP036CD(I)

Outdoor Unit : CHP030CD(O) CHP036CD(O)



RECOGNIZE THIS SYMBOL AS A SAFETY PRECAUTION

ATTENTION INSTALLING PERSONNEL

Prior to installation, thoroughly familiarize yourself with this Installation Manual. Observe all safety warnings.

During installation or repair, caution is to be observed

It is your responsibility to install the product safely and to educate the customer on its safe use

Eair LLC

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www.comfortstarusa.com

CONTENTS

SAFETY PRECAUTIONS

Warning	2
Caution	2

INSTALLATION INSTRUCTIONS

Select the best location	3
Indoor unit	4
Outdoor unit	8

TROUBLE SHOOTING TIPS

Error Display	13
Diagnosis and Solution	15

Read This Manual

Inside you will find many helpful hints on how to install and test the air conditioner properly.

CAUTION

- Contact an authorised service technician for repair or maintenance of this unit.
- Contact an authorised installer for installation of this unit.
- This appliance is not intended for use by persons(including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
- Children should be supervised to ensure that they do not play with the appliance.
- If the power cord is to be replaced, replacement work shall be performed by authorised personnel only.
- Installation work must be performed in accordance with the national wiring Standards by authorised personnel only.

SAFETY PRECAUTIONS

- Please read this installation manual completely before installing the product.
- If the power cord is damaged, replacement work shall be performed by authorised personnel only.
- Installation work must be performed in accordance with the national wiring Standards by authorised personnel only.
- Contact an authorised service technician for repair, maintenance or installation of this unit.
- This appliance is not intended for use by persons(including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
- Children should be supervised to ensure that they do not play with the appliance.
- All the pictures in the instructions are for explanation purposes only. The actual shape should prevail.
- The design and specifications are subject to change without prior notice for product improvement. Consult with the sales agency or manufacturer for details.

- The seriousness is classified by the following indications.

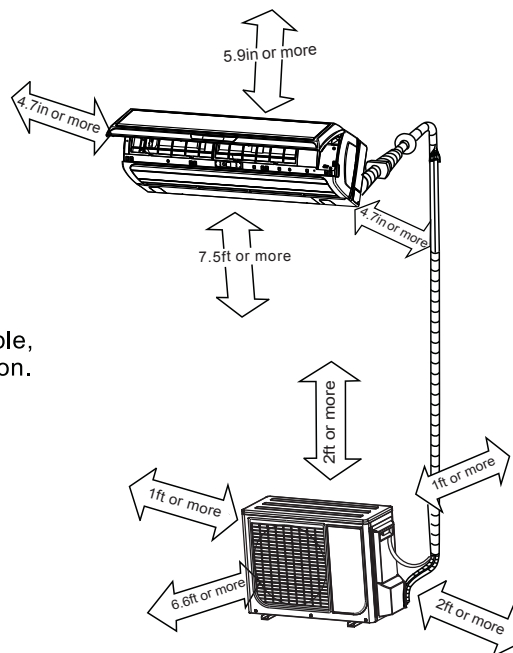
 WARNING	This symbol indicates the possibility of death or serious injury.
 CAUTION	This symbol indicates the possibility of injury or damage to property.

 WARNING
1) Install according to this installation instructions strictly. If installation is defective, it will cause water leakage, electrical shock fire.
2) Use the attached accessories parts and specified parts for installation, otherwise, it will cause the set to fall, water leakage, electrical shock fire.
3) Install at a strong and firm location which is able to withstand the set s weight. If the strength is not enough or installation is not properly done, the set will drop and cause injury.
4) For electrical work, follow the local national wiring standard, regulation and this installation instructions. An independent circuit and single outlet must be used. If electrical circuit capacity is not enough or defect found in electrical work, it will cause electrical shock fire.
5) Use the specified cable and connect tightly and clamp the cable so that no external force will be acted on the terminal. If connection or fixing is not perfect, it will cause heat-up or fire at the connection.
6) Wiring routing must be properly arranged so that control board cover is fixed properly. If control board cover is not fixed perfectly, it will cause heat-up at connection point of terminal, fire or electrical shock.
7) When carrying out piping connection, take care not to let air substances other than the specified refrigerant go into refrigeration cycle. Otherwise, it will cause lower capacity, abnormal high pressure in the refrigeration cycle, explosion and injury.
8) Do not modify the length of the power supply cord or use of extension cord, and do not share the single outlet with other electrical appliances. Otherwise, it will cause fire or electrical shock.
 CAUTION
1) This equipment must be earthed and installed with earth leakage current breaker. It may cause electrical shock if grounding is not perfect.
2) Do not install the unit at place where leakage of flammable gas may occur. In case gas leaks and accumulates at surrounding of the unit, it may cause fire.
3) Carry out drainage piping as mentioned in installation instructions. If drainage is not perfect, water may enter the room and damage the furniture.

SELECT THE BEST LOCATION

Indoor unit

- There should not be any heat source or stream near the unit.
- There should not be any obstacles blocking the air circulation.
- A place where air circulation in the room is good.
- A place where drainage can be easily done.
- A place where noise prevention is taken into consideration.
- Do not install the unit near the door way.
- Ensure the spaces indicated by arrows from the wall, ceiling, fence or other obstacles.
- There should not be any direct sunlight. If unavoidable, sunlight prevention should be taken into consideration.



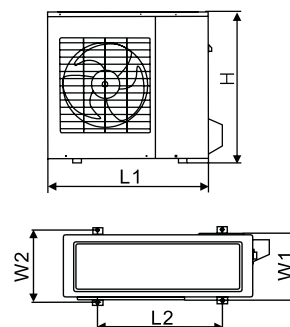
Outdoor unit

- If an awning is built over the unit to prevent direct sunlight or rain, be careful that heat radiation from the condenser is not obstructed.
- There should not be any animal or plant which could be affected by hot air discharged.
- Keep the spaces indicated by arrow from wall ceiling, fence or other obstacles.
- Do not place any obstacles which may cause a short circuit of the discharged air.

Settlement of outdoor unit

- Anchor the outdoor unit with a bolt and nut $\phi 0.4$ or $\phi 0.3$ tightly and horizontally on a concrete or rigid mount.

Capacity (Btu)	Outdoor unit dimension WxDxH (in)	Mounting dimensions	
		L2(in)	W2(in)
30K	38.4x13x33.9	23.2	13.1
36K	42.3x14x38	24.5	14.4



ACCESSORIES

Number	Name of Accessories			Qty
1	Installation Plate			1
2	Clip Anchor			5-8(depending on models)
3	Self-tapping Screw A ST3.9x25			5-8(depending on models)
4	Seal(For cooling & heating models only)			1
5	Drain Joint(For cooling & heating models only)			1
6	Connecting pipe Assembly	Liquid side	Φ0.25	Parts you must purchase. The pipe size differ from appliance to appliance. Consult the technician for the proper size.
			Φ0.37	
		Gasside	Φ0.5	
			Φ0.63	
			Φ0.75	
7	Remote controller			1
8	Self-tapping Screw B ST2.9x10		optional parts	2
9	Remote controller holder			1

NOTE: Except the above parts provided, the other parts needed during installation you must purchase.

1 FIT THE INSTALLATION PLATE

NOTE:

The mounting wall is strong and solid enough to prevent it from the vibration.

● Fit the Installation Plate

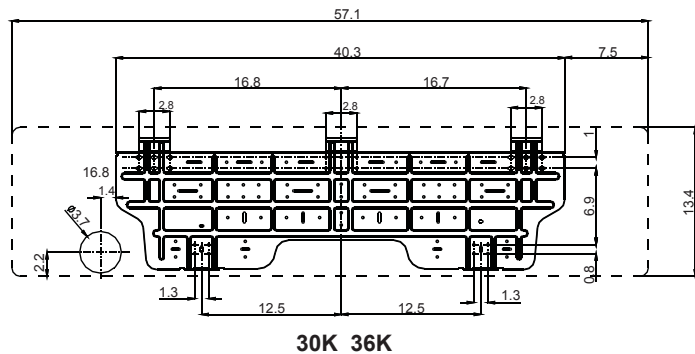
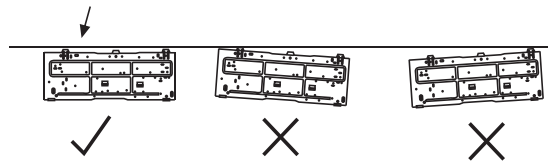
1. Fit the installation plate horizontally on structural parts of the wall with spaces around the installation plate.
2. If the wall is made of brick, concrete or the like, drill eight (8) 0.2in diameter holes in the wall. Insert Clip anchor for appropriate mounting screws.
3. Fit the installation plate on the wall with eight (8) type "A" screws.

NOTE:

Fit the Installation Plate and drill holes in the wall according to the wall structure and corresponding mounting points on the installation plate. The installation plate provided with the machine differ from appliance to appliance.

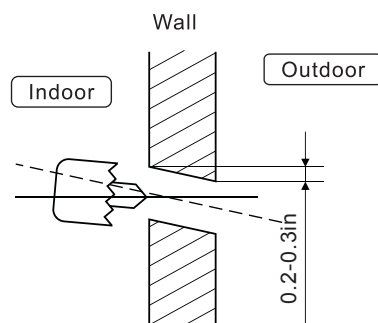
(Dimensions are in "in" unless otherwise stated)

Correct orientation of Installation Plate



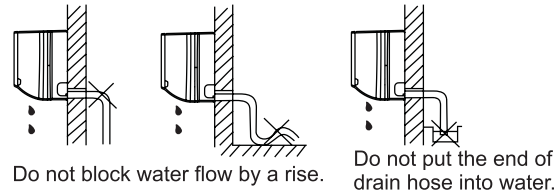
2 DRILL A HOLE IN THE WALL

1. Determine hole positions according to left and right side of the installation plate. The hole center is obtained by measuring the distance as shown in the diagram above.
2. Drill the piping plate hole with $\phi 2.6$ in hole-core drill.
3. Drill the piping hole at either the right or the left and the hole should be slightly slanted to the outdoor side.
4. Always use wall hole conduit when drilling metal grid, metal plate or the like.

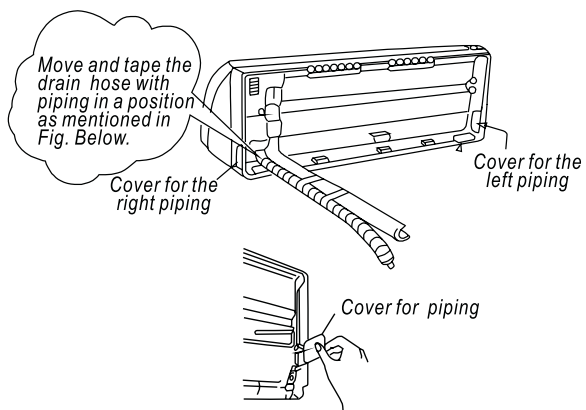


Drainage

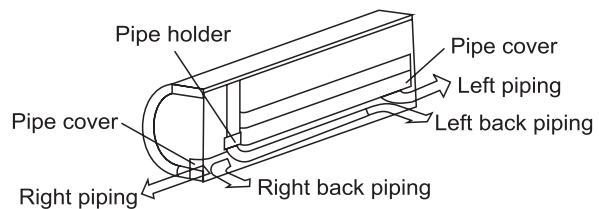
1. Run the drain hose sloping downward.
Do not install the drain hose as illustrated in Figures.
2. When connecting extension drain hose, insulate the connecting part of extension drain hose with a shield pipe, do not let the drain hose slack.

Connective pipe installation

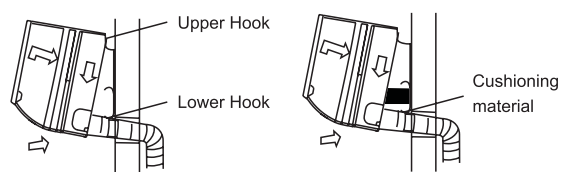
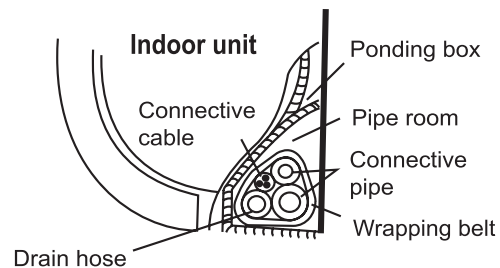
1. For the left-hand and right-hand piping, remove the pipe cover from the side panel.
2. For the rear-right-hand and rear-left-hand piping, install the piping as shown.
3. Bundle the tubing, connecting cable, and drain hose with tape securely, evenly as shown in Figure on the right.
 - Because the condensed water from rear of the indoor unit is gathered in ponding box and is piped out of room. Do not put anything else in the box.

CAUTION

- Connect the indoor unit first, then the outdoor unit.
- Do not allow the piping to let out from the back of the indoor unit.
- Be careful not to let the drain hose slack.
- Heat insulated both of the auxiliary piping.
- Be sure that the drain hose is located at the lowest side of the bundle. Locating at the upper side can cause drain pan to overflow inside the unit.
- Never intercross nor intertwist the power wire with any other wiring.
- Run the drain hose slopped downward to drain out the condensed water smoothly.

Indoor unit installation

1. Pass the piping through the hole in the wall.
2. Hook the indoor unit onto the upper portion of installation plate (Engage the indoor unit with the upper edge of the installation plate). Ensure the hooks are properly seated on the installation plate by moving it in left and right.
3. Piping can easily be made by lifting the indoor unit with a cushioning material between the indoor unit and the wall. Get it out after finish piping.
4. Press the lower left and right side of the unit against the installation plate until hooks engages with the their slots.



4 CONNECT THE CABLE TO THE INDOOR UNIT

Electrical work

Electric safety regulations for the initial Installation

1. If there is serious safety problem about the power supply, the technicians should refuse to install the air conditioner and explain to the client until the problem is solved.
2. Power voltage should be in the range of 90%~110% of rated voltage.
3. Wire between Indoor unit and Outdoor unit is 16# AGW. Power cable to Outdoor unit is : 14# (for 9K~30K), 12# (for 36K).
4. Ensure the air conditioner is grounded well.
5. According to the attached Electrical Connection Diagram located on the panel of the outdoor unit and indoor unit to connect the wire.
6. An individual branch circuit and single receptacle used only for this air conditioner must be available. See the following table for suggested wire sizes:

NOTE:

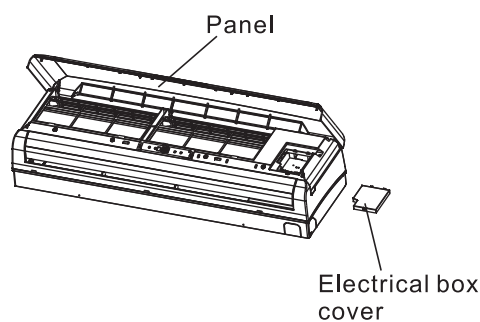
The cable size and the current of the fuse or switch are determined by the maximum current indicated on the nameplate which located on the side panel of the unit. Please refer to the nameplate before selecting the cable, fuse and switch.

NOTE: The air conditioner can be connected only to a supply with system impedance no more than 0.0538 ohm. In case necessary, please consult your supply authority for system impedance information.

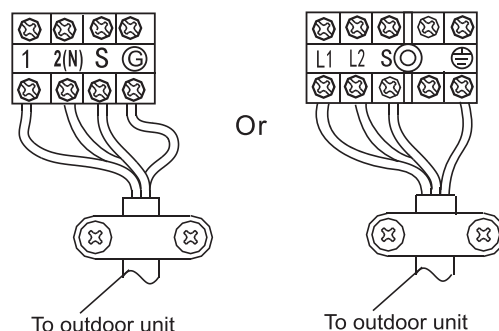
Connect the cable to the indoor unit

NOTE: Before performing any electrical work, turn off the main power to the system.

1. The inside and outside connecting cable can be connected without removing the front grille.
2. The indoor power cord type is H05VV-F or H05V2V2-F, the outdoor power cord and interconnected cord type is H07RN-F.
3. Lift the indoor unit panel up, remove the electrical box cover by loosening the screw.
4. Ensure the colour of wires of outdoor unit and the terminal Nos. are the same to the indoor's respectively.
5. Wrap those cables not connected with terminals with insulation tapes, so that they will not touch any electrical components. Secure the cable onto the control board with the cord clamp.

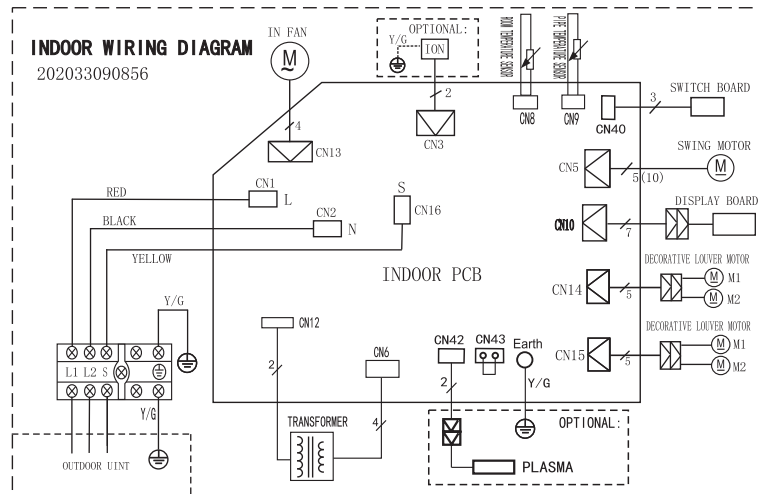


Terminal block of indoor unit



4

CONNECT THE CABLE TO THE INDOOR UNIT

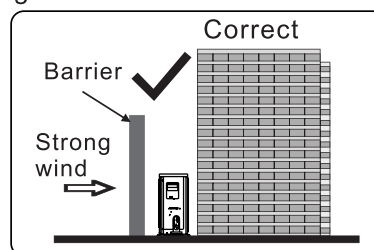
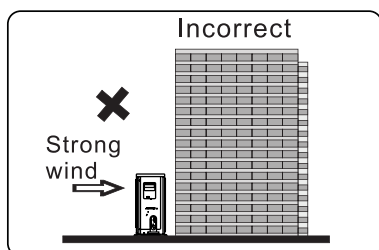


CHP030CD(I) & CHP036CD(I) WIRING DIAGRAM

INDOOR UNIT

1 OUTDOOR INSTALLATION PRECAUTION

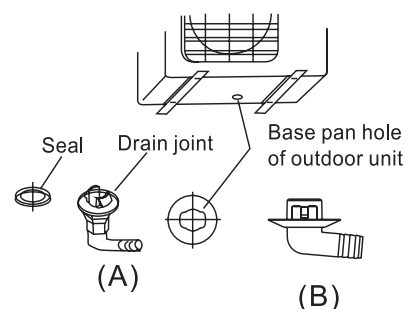
- Install the outdoor unit on a rigid base to prevent increasing noise level and vibration.
- Determine the air outlet direction where the discharged air is not blocked.
- In the case that the installation place is exposed to strong wind such as a seaside, make sure the fan operating properly by putting the unit lengthwise along the wall or using a dust or shield plates.
- Specially in windy area, install the unit to prevent the admission of wind. If need suspending installation, the installation bracket should accord with technique requirement in the installation bracket diagram. The installation wall should be solid brick, concrete or the same intensity construction, or actions to reinforce, damping supporting should be taken.
- The connection between bracket and wall, bracket and the air conditioner should be firm, stable and reliable.
- Be sure there is no obstacle which block radiating air.



2 DRAIN JOINT INSTALLATION

NOTE: The drain joint is slightly different according to the different outdoor unit.

For the drain joint with the seal (Fig.A), first fit the seal onto the drain joint, then insert the drain joint into the base pan hole of outdoor unit, rotate 90° to securely assemble them. To install drain joint as shown in Fig.B, insert the drain joint into the base pan hole of outdoor unit until it remains fixed with a clicking sound. Connecting the drain joint with an extension drain hose (Locally purchased), in case of the water draining off the outdoor unit during the heating mode.



3

REFRIGERANT PIPE CONNECTION

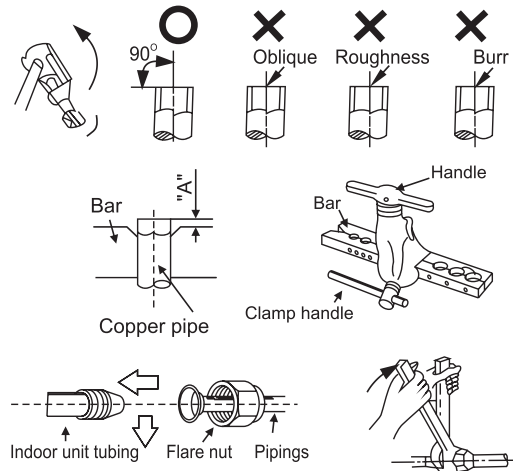
Flaring

1. Cut a pipe with a pipe cutter.
2. Remove flare nuts attached to indoor and outdoor unit, then put them on pipe/tube having completed burr removal and flare the pipe.
3. Firmly hold copper pipe in a die in the dimension shown in the table below.

Outer diam. (in)	A(in)	
	Max.	Min.
φ 0.25	0.05	0.03
φ 0.37	0.06	0.04
φ 0.50	0.07	0.04
φ 0.63	0.09	0.08
φ 0.75	0.09	0.08

Tightening connection

- Align pipes to be connected.
- Sufficiently tighten the flare nut with fingers, and then tighten it with a spanner and torque wrench as shown.
- Excessive torque can break nut depending on installation conditions.

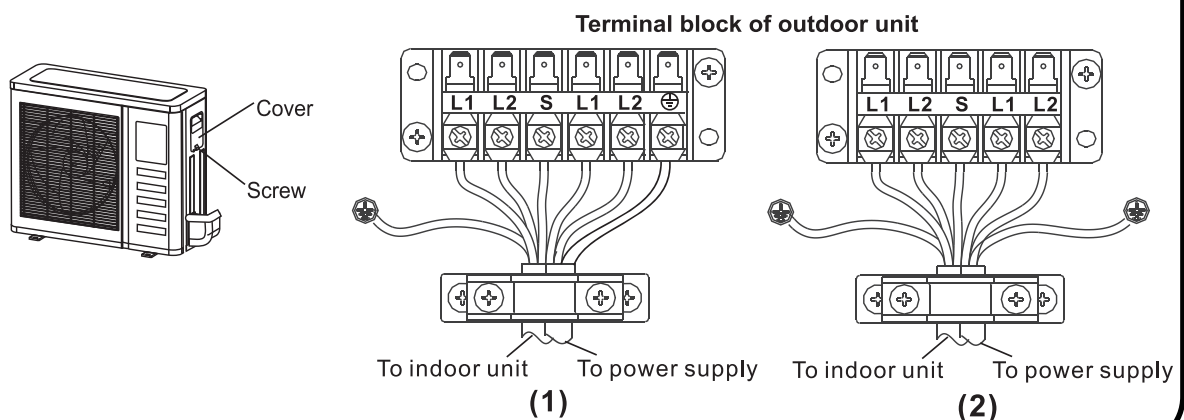


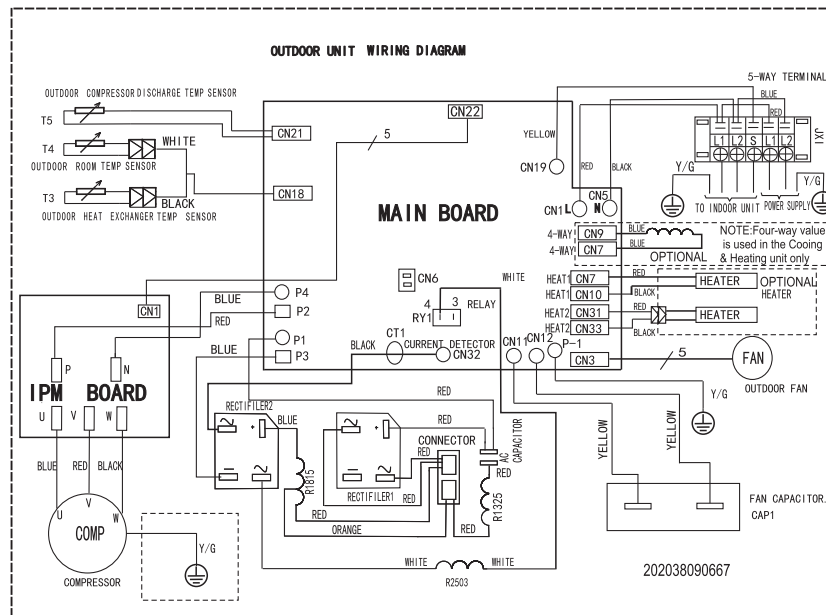
Outer diam.	Tightening torque(N.cm)	Additional tightening torque(N.cm)
φ 0.25in	1500 (153kgf.cm)	1600 (163kgf.cm)
φ 0.37in	2500 (255kgf.cm)	2600 (265kgf.cm)
φ 0.5in	3500 (357kgf.cm)	3600 (367kgf.cm)
φ 0.63in	4500 (459kgf.cm)	4700 (479kgf.cm)
φ 0.75in	6500 (663kgf.cm)	6700 (683kgf.cm)

4

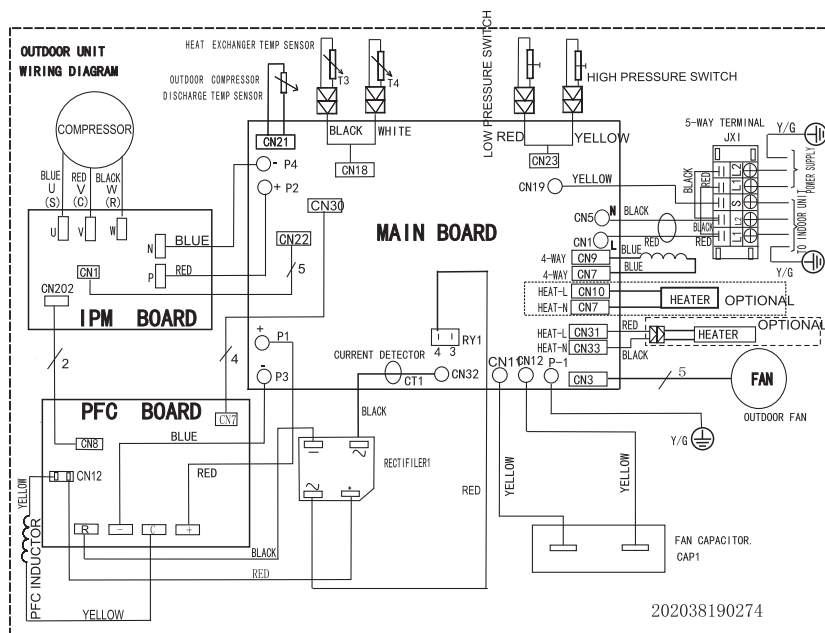
CONNECT THE CABLE TO THE OUTDOOR UNIT

1. Remove the electrical control board cover from the outdoor unit by loosening the screw.
2. Connect the connective cables to the terminals as identified with their respective matched numbers on the terminal block of indoor and outdoor units.
3. Secure the cable onto the control board with the cord clamp.
4. To prevent the ingress of water, form a loop of the connective cable as illustrated in the installation diagram of indoor and outdoor units.
5. Insulate unused cords (conductors) with PVC-tape. Process them so they do not touch any electrical or metal parts.





CHP030CD(O) WIRING DIAGRAM



CHP036CD(O) WIRING DIAGRAM

5 AIR PURGING AND TEST OPERATION

1. Airpurging

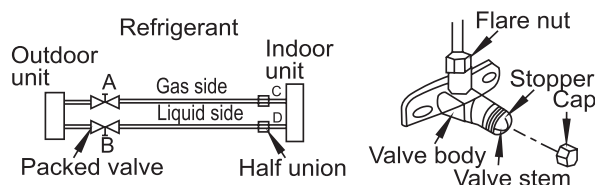
- Air and moisture in the refrigerant system have undesirable effects. Therefore, the indoor unit and tubing between the indoor and outdoor unit must be leak tested and evacuated to remove any noncondensables and moisture from the system.
- Check that each tube(both liquid and gas side tubes) between the indoor and outdoor units have been properly connected and all wiring for the test run has been completed.
- Pipe length and refrigerant amount:

Refrigerant : R410a		30K	36K
Piping Size (in)	Liquid	3/8"	3/8"
	Gas	5/8"	5/8"
Refrigerant Pre-Charge (ft)	ft	16	16
Additional charge for each extra ft	ozs/ft	0.423	0.423
Maximum line set run	ft	98	98
Maximum elevation between indoor and outdoor	ft	49	49

- For the R407C refrigerant model, make sure the refrigerant added into air conditioner is liquid form in any cases.
- When relocate the unit to another place, using vacuum pump to perform evacuation.

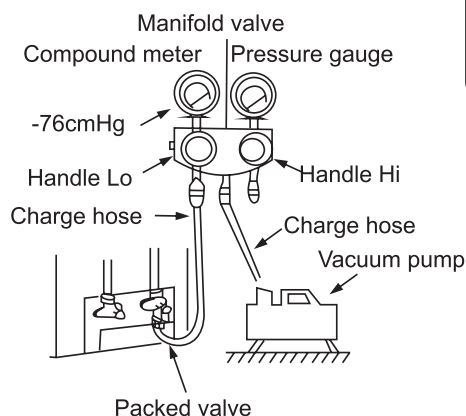
CAUTION

- Open the valve stem until it hits against the stopper. Do not try to open it further.
- Securely tighten the valve stem cap with a spanner or the like.
- Valve stem cap tightening torque. See Tightening torque table.



2. When using the Vacuum Pump

1. Completely tighten the flare nuts, A, B, C, D, connect the manifold valve charge hose to a charge port of the packed valve on the gas pipe side.
2. Connect the charge hose connection to the vacuum pump.
3. Fully open the handle Lo of the manifold valve.
4. Operate the vacuum pump to evacuate. After starting evacuation, slightly loose the flare nut of the packed valve on the gas pipe side and check that the air is entering. (Operation noise of the vacuum pump changes and a compound meter indicates 0 instead of minus)
5. After the evacuation is complete, fully close the handle Lo of the manifold valve and stop the operation of the vacuum pump.
- Make evacuation for 15 minutes and more and check that the compound meter indicates -76cmHg(-1.0x10⁵Pa).
6. Turn the stem of the packed valve B about 45° counter-clockwise for 6~7 seconds after the gas coming out, then tighten the flare nut again. Make sure the pressure display in the pressure indicator is a little higher than the atmosphere pressure.
7. Remove the charge hose from the Low pressure charge hose.
8. Fully open the packed valve stems B and A.
9. Securely tighten the cap of the packed valve.



3. Safety and leakage check

1. Soap water method:

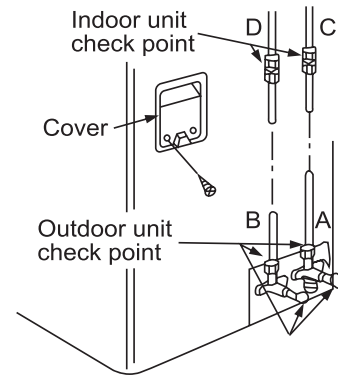
Apply a soap water or a liquid neutral detergent on the indoor unit connections and outdoor unit connections by a soft brush to check for leakage of the connecting points of the piping. If bubbles come out, it indicates that the pipes have leakage.

2. Leak detector

Use the leak detector to check for leakage.

CAUTION

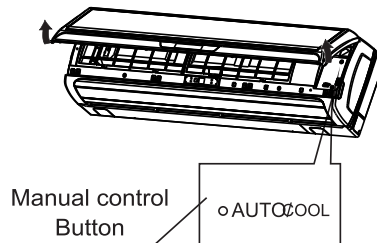
A: Lo packed valve B: Hi packed valve
C and D are ends of indoor unit connection.



4. Test running

Perform test operation after completing gas leak check at the flare nut connections and electrical safety check.

- Check that all tubing and wiring have been properly connected.
 - Check that the gas and liquid side service valves are fully open.
1. Connect the power, press the ON/OFF button on the remote controller to turn the unit on.
 2. Use the MODE button to select COOL, HEAT, AUTO and FAN to check if all the functions works well.
 3. When the ambient temperature is too low(lower than 62°F), the unit cannot be controlled by the remote controller to run at cooling mode, manual operation can be taken. Manual operation is used only when the remote controller is disable or maintenance necessary.
 - Hold the panel sides and lift the panel up to an angle until it remains fixed with a clicking sound.
 - Press the Manual control button to select the AUTO or COOL, the unit will operate under Forced AUTO or COOL mode(see User Manual for details).
 4. The test operation should last about 30 minutes.



TROUBLESHOOTING TIPS

Indoor Unit Error Display

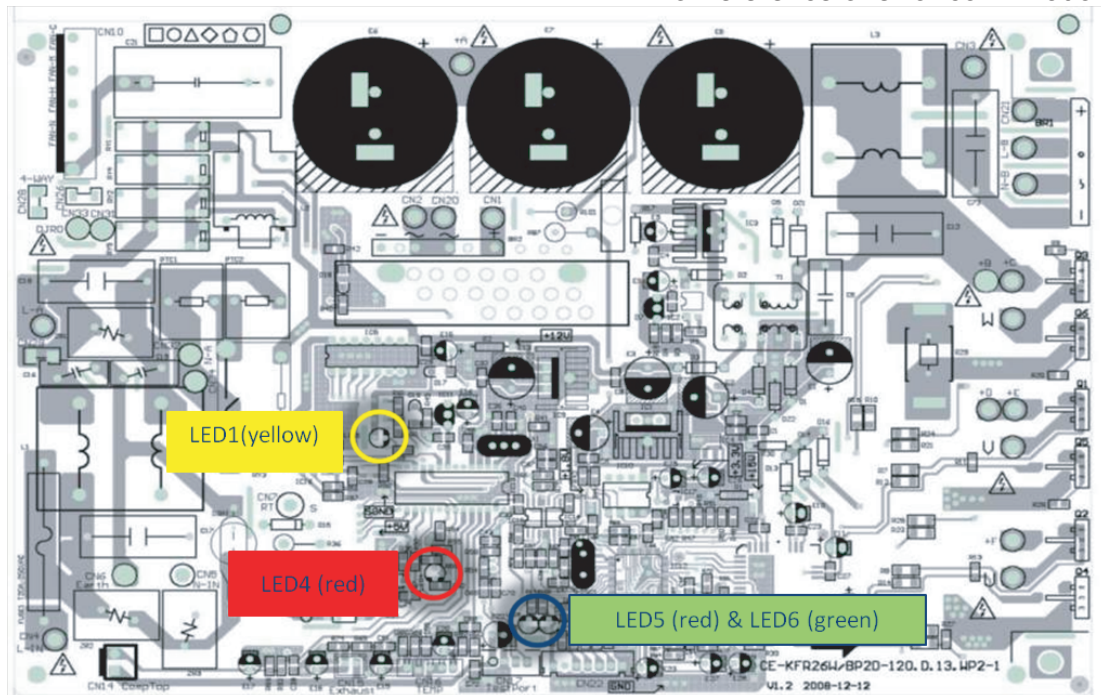
Display	LED STATUS
E0	EEPROM parameter error
E1	Indoor / outdoor units communication protection
E2	Zero-crossing signal error
E3	Indoor fan speed out of control
E5	Open or short circuit of outdoor temperature sensor
E6	Open or short circuit of room or evaporator temperature sensor
E7	Outdoor fan speed out of control (Only for BP3 model)
P0	IGBT over-strong current protection
P1	Over voltage or too low voltage protection
P2	Temperature protection of compressor top.
P4	Inverter compressor drive error

Note: E4 & P3: Reserved function

TROUBLESHOOTING TIPS

Outdoor Unit Error Display Overview

For reference of error confirmation



- ▶ LED 4 is a red light and for the PCB POWER
- ▶ LED 1 is a yellow light. Lighting is for unit is operating. Flashing quickly (2.5HZ) means having some problems. flashing slowing means standby(waiting for operation)
- ▶ LED 6 and 5 are two lights for controlling the compressor. The below is meanings for those lights.

No.	Problems	Green	Red	IU display
1	DC wiring over-high voltage or over-low voltage	ON	ON	P1
2	standby for normal	ON	OFF	
3	MCE problems (DC wiring over-high voltage or over-low voltage may lead to this problem)	ON	Flashing	P1
4	Operation normally	OFF	ON	
5	MCE start problem	OFF	Flashing	P4
6	MCE phrase lost problem.MCE zero speed protection. PWM synchronization error.	Flashing	ON	P4
7	IGBT over current	Flashing	OFF	Po
8	communication EEROR	Flashing	Flashing	P4

Diagnosis and Solution

E0 EEPROM Error

Shut off the power supply and turn on it 1 minute later

The problem comes out again

Replace the main PCB of indoor unit

E1 IDU & ODU Communication Error

Disconnect the power supply, after 1 minute, connect the power supply, turn on the unit with remote controller

Does the unit work normally?

NO

Check the wiring between indoor and outdoor unit. Is the connection of L1, L2, S and GND good? Is the GND connection on outdoor PCB good?

NO

Reconnect and retest again

Yes

Is the LED on outdoor PCB blinking right? (refer the outdoor PCB LED indicator)

Yes

Replace indoor PCB and repower on. Is the failure cleared?

No

The power supply for outdoor PCB is fail. Check the wiring on outdoor PCB comparing with wiring plate. Is the connection good?

Yes

NO

No

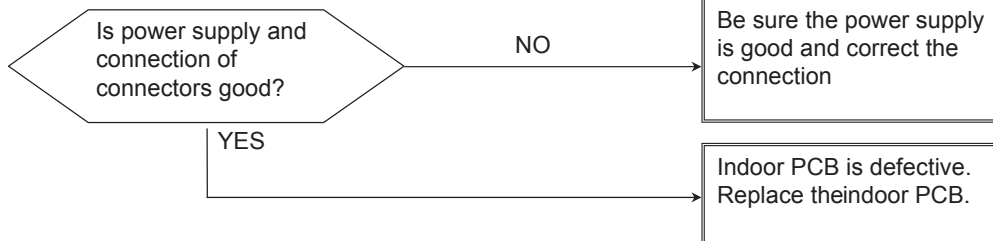
Correct the connection.

Replace outdoor e-box.

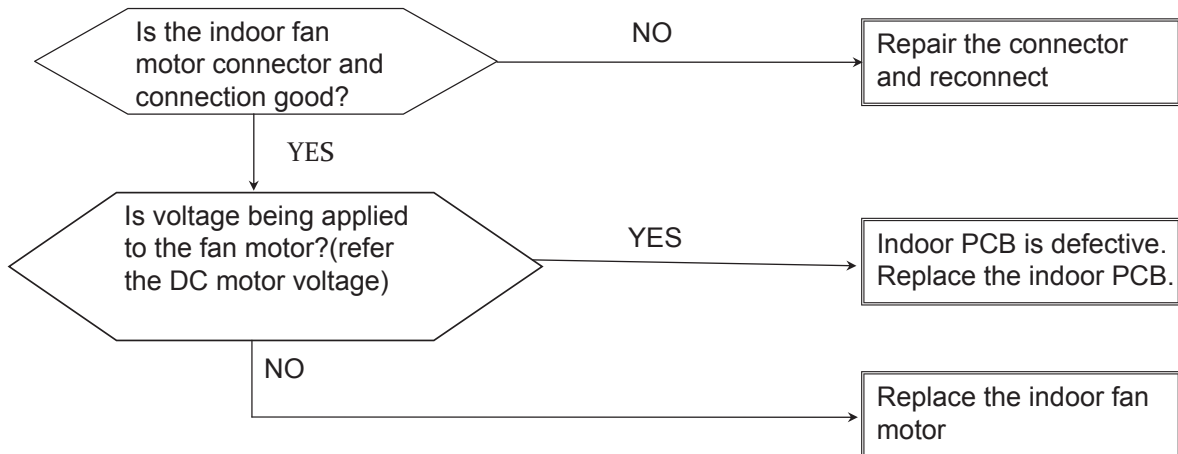
(note: if the indoor PCB is ok, $-24V < V_s < 24V$, V_s means the voltage between S and L2)

Diagnosis and Solution

E2 Zero-crossing Error

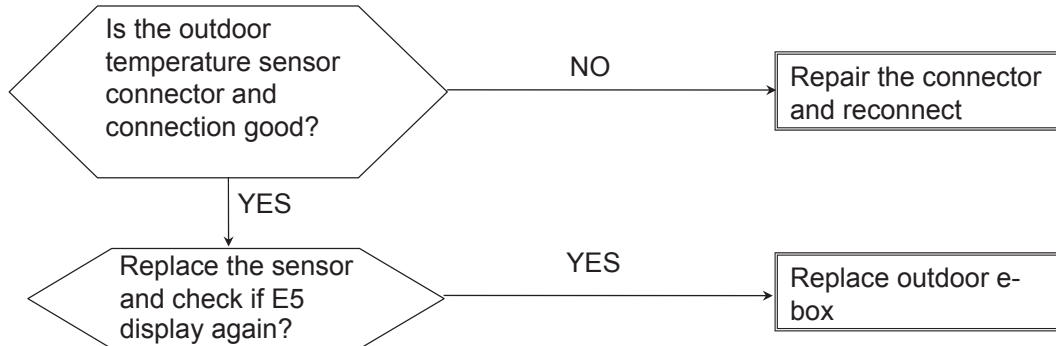


E3 Indoor Fan Speed Out of Control

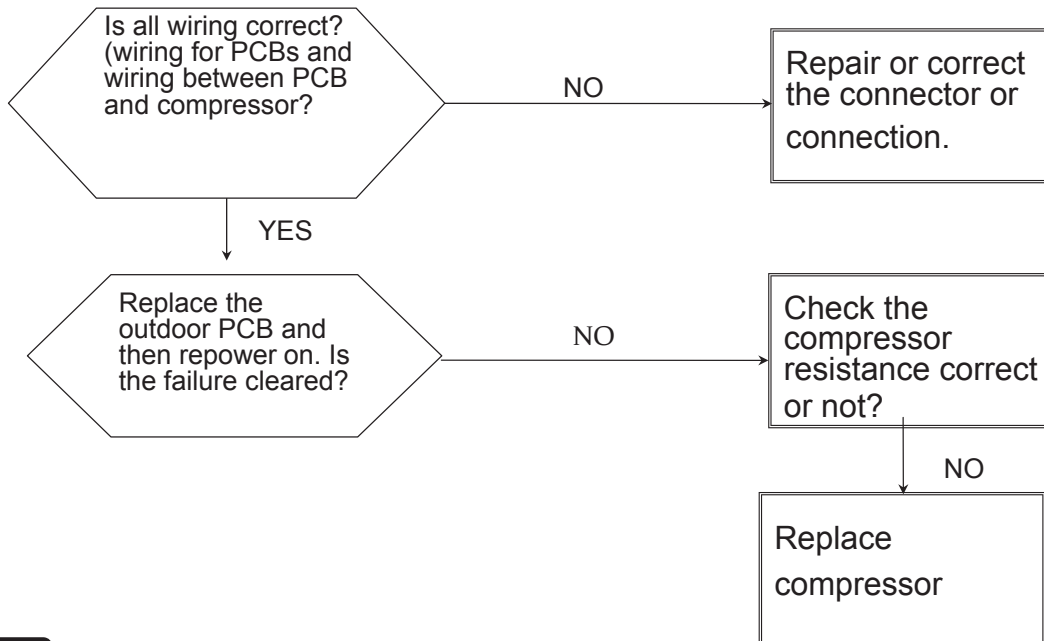


Diagnosis and Solution

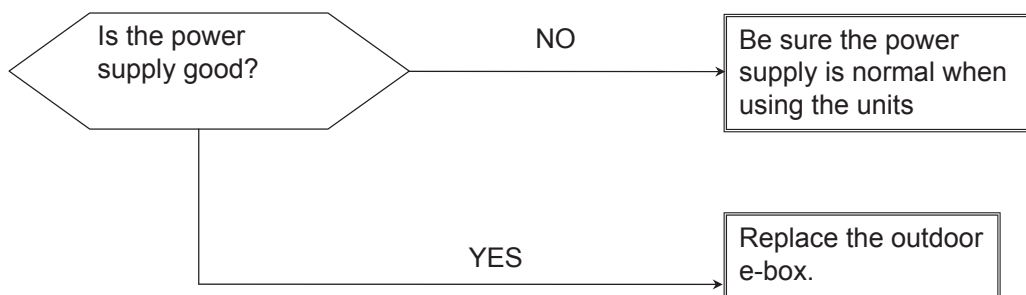
E5 E6 Temperature Sensor Error



P0 IPM Protection

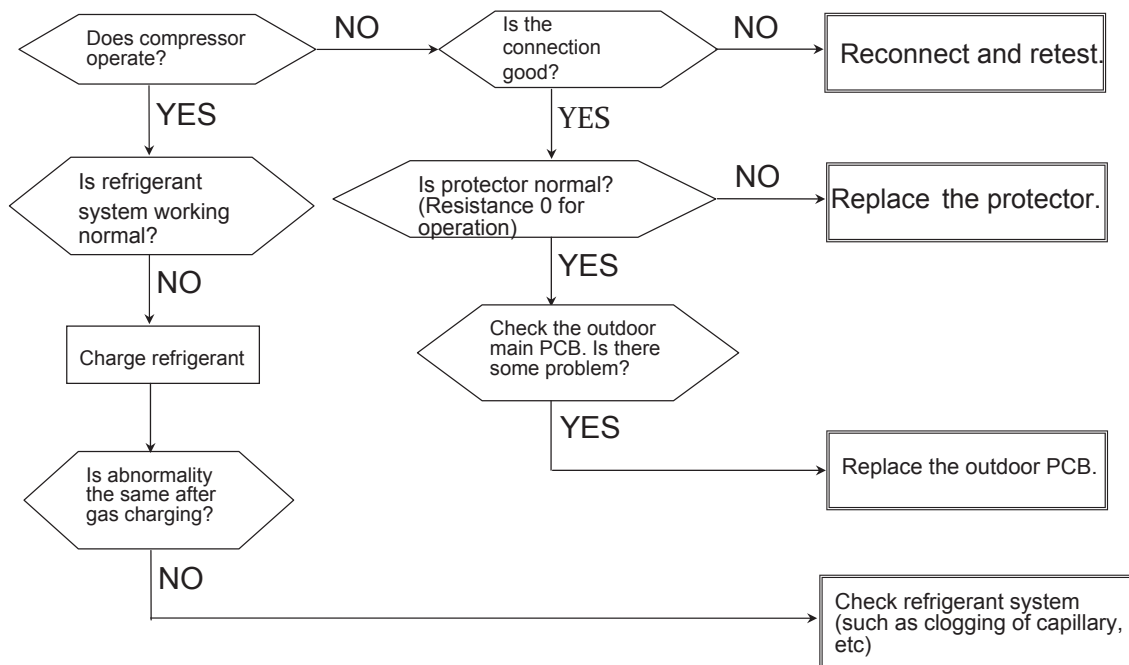


P1 Voltage protection



Diagnosis and Solution

P2 Over high Temperature Protection of Compressor Top



P4 Inverter Compressor Drive Error

