Order No: PAPAMY1604059CE

Service Manual

Air Conditioner

Indoor Unit
CS-ME9SB4U

Destination
USA
Canada

Please file and use this manual together with service manual for Model No. CU-2E18SBU, CU-3E19RBU, CU-4E24RBU, CU-5E36QBU Order No. PAPAMY1604017CE, PAPAMY1505100CE, PAPAMY1312037CE.

⚠WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the products dealt with in this service information by anyone else could result in serious injury or death.

IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are important for safety. These parts are marked by ⚠ in the Schematic Diagrams, Circuit Board Diagrams, Exploded Views and Replacement Parts List. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire or other hazards. Do not modify the original design without permission of manufacturer.

⚠ PRECAUTION OF LOW TEMPERATURE

In order to avoid frostbite, be assured of no refrigerant leakage during the installation or repairing of refrigerant circuit.

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1. Safety Precautions

- Read the following “SAFETY PRECAUTIONS” carefully before perform any servicing.
- Electrical work must be installed or serviced by a licensed electrician. Be sure to use the correct rating of the power plug and main circuit for the model installed.
- The caution items stated here must be followed because these important contents are related to safety. The meaning of each indication used is as below. Incorrect installation or servicing due to ignoring of the instruction will cause harm or damage, and the seriousness is classified by the following indications.

⚠ **WARNING**	This indication shows the possibility of causing death or serious injury.
⚠ **CAUTION**	This indication shows the possibility of causing injury or damage to properties.

- The items to be followed are classified by the symbols:

⃠	This symbol denotes item that is PROHIBITED from doing.

- Carry out test run to confirm that no abnormality occurs after the servicing. Then, explain to user the operation, care and maintenance as stated in instructions. Please remind the customer to keep the operating instructions for future reference.

	⚠ **WARNING**	
1.	Do not modify the machine, part, material during repairing service.	
2.	If wiring unit is supplied as repairing part, do not repair or connect the wire even only partial wire break. Exchange the whole wiring unit.	
3.	Do not wrench the fasten terminal. Pull it out or insert it straightly.	
4.	Engage dealer or specialist for installation and servicing. If installation of servicing done by the user is defective, it will cause water leakage, electrical shock or fire.	
5.	Install according to this installation instructions strictly. If installation is defective, it will cause water leakage, electric shock or fire.	
6.	Use the attached accessories parts and specified parts for installation and servicing. Otherwise, it will cause the set to fall, water leakage, fire or electrical shock.	
7.	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.	
8.	For electrical work, follow the local national wiring standard, regulation and the installation instruction. 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 or fire.	
9.	This equipment is strongly recommended to install with Earth Leakage Circuit Breaker (ELCB) or Residual Current Device (RCD). Otherwise, it may cause electrical shock and fire in case equipment breakdown or insulation breakdown.	
10.	Do not use joint cable for indoor / outdoor connection cable. Use the specified Indoor/Outdoor connection cable, refer to installation instruction **CONNECT THE CABLE TO THE INDOOR UNIT** and connect tightly for indoor / outdoor connection. Clamp the cable so that no external force will be acted on the terminal. If connecting or fixing is not perfect, it will cause heat up or fire at the connection.	
11.	Wire 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 or fire at the connection point of terminal, fire or electrical shock.	
12.	When install or relocate air conditioner, do not let any substance other than the specified refrigerant, eg. air etc. mix into refrigeration cycle (piping). (Mixing of air etc. will cause abnormal high pressure in refrigeration cycle and result in explosion, injury etc.).	
13.	Do not install outdoor unit near handrail of veranda. When installing air-conditioner unit at veranda of high rise building, child may climb up to outdoor unit and cross over the handrail and causing accident.	
14.	This equipment must be properly earthed. Earth line must not be connected to gas pipe, water pipe, earth of lightning rod and telephone. Otherwise, it may cause electric shock in case equipment breakdown or insulation breakdown.	⃠
15.	Keep away from small children, the thin film may cling to nose and mouth and prevent breathing.	⃠
16.	Do not use unspecified cord, modified cord, joint cord or extension cord for power supply cord. Do not share the single outlet with other electrical appliances. Poor contact, poor insulation or over current will cause electrical shock or fire.	⃠
17.	Tighten the flare nut with torque wrench according to specified method. If the flare nut is over-tightened, after a long period, the flare may break and cause refrigerant gas leakage.	⃠
18.	For R410A model, use piping, flare nut and tools which is specified for R410A refrigerant. Using of existing (R22) piping, flare nut and tools may cause abnormally high pressure in the refrigerant cycle (piping), and possibly result in explosion and injury. Thickness or copper pipes used with R410A must be more than 1/32" (0.8 mm). Never use copper pipes thinner than 1/32" (0.8 mm). It is desirable that the amount of residual oil less than 0.0008 oz/ft (40 mg/10 m).	⃠
19.	During installation, install the refrigerant piping properly before run the compressor. (Operation of compressor without fixing refrigeration piping and valves at opened condition will caused suck-in of air, abnormal high pressure in refrigeration cycle and result in explosion, injury etc).	

⚠ WARNING	
20.	During pump down operation, stop the compressor before remove the refrigeration piping. (Removal of compressor while compressor is operating and valves are opened will cause suck-in of air, abnormal high pressure in refrigeration cycle and result in explosion, injury etc.)
21.	After completion of installation or service, confirm there is no leakage or refrigerant gas. It may generate toxic gas when the refrigerant contacts with fire.
22.	Ventilate if there is refrigerant gas leakage during operation. It may cause toxic gas when refrigerant contacts with fire.
23.	Do not insert your fingers or other objects into the unit, high speed rotating fan may cause injury.
24.	Must not use other parts except original parts described in catalog and manual.
25.	Using of refrigerant other than the specified type may cause product damage, burst and injury etc.

⚠ CAUTION	
1.	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.
2.	Carry out drainage piping as mentioned in installation instructions. If drainage is not perfect, water may enter the room and damage the furniture.
3.	Tighten the flare nut with torque wrench according to specified method. If the flare nut is over-tightened, after a long period, the flare may break and cause refrigerant gas leakage.
4.	Do not touch outdoor unit air inlet and aluminium fin. It may cause injury.
5.	Select an installation location which is easy for maintenance.
6.	Pb free solder has a higher melting point than standard solder; typically the melting point is 50°F – 70°F (30°C – 40°C) higher. Please use a high temperature solder iron. In case of the soldering iron with temperature control, please set it to 700 ± 20°F (370 ± 10°C). Pb free solder will tend to splash when heated too high (about 1100°F / 600°C).
7.	Do not release refrigerant during piping work for installation, servicing, reinstallation and during repairing a refrigerant parts. Take care of the liquid refrigerant, it may cause frostbite.
8.	Installation or servicing work: It may need two people to carry out the installation or servicing work.
9.	Do not install this appliance in a laundry room or other location where water may drip from the ceiling, etc.
10.	Do not sit or step on the unit, you may fall down accidentally.
11.	Do not touch the sharp aluminium fins or edges of metal parts. If you are required to handle sharp parts during installation or servicing, please wear hand glove. Sharp parts may cause injury.

2. Specifications

Model				Indoor	CS-ME9SB4U					
Performance Test Condition					ARI					
Power Supply				Phase, Hz	Single, 60					
				V	208			230		
					Min.	Mid.	Max.	Min.	Mid.	Max.
Cooling	Capacity			kW	1.80	2.52	2.90	1.80	2.52	2.90
				BTU/h	6100	8600	9900	6100	8600	9900
	Running Current			A	–	3.5	–	–	3.2	–
	Input Power			W	340	630	810	340	630	810
	EER			W/W	5.29	4.00	3.58	5.29	4.00	3.58
				BTU/hW	17.95	13.65	12.20	17.95	13.65	12.20
	Indoor Noise (H / L / QLo)			dB-A	36 / 30 / 27			36 / 30 / 27		
				Power Level dB	52 / – / –			52 / – / –		
Heating	Capacity			kW	1.20	3.60	4.30	1.20	3.60	4.30
				BTU/h	4100	12300	14700	4100	12300	14700
	Running Current			A	–	5.2	–	–	4.7	–
	Input Power			W	300	940	1.23k	300	940	1.23k
	COP			W/W	4.00	3.83	3.50	4.00	3.83	3.50
				BTU/hW	13.65	13.10	11.95	13.65	13.10	11.95
	Indoor Noise (H / L / QLo)			dB-A	36 / 32 / 29			36 / 32 / 29		
				Power Level dB	52 / – / –			52 / – / –		
Indoor Fan	Type				BACKWARD FAN					
	Material				ABS					
	Motor Type				DC / Transistor (8-poles)					
	Input Power			W	–					
	Output Power			W	40					
	Speed	QLo	Cool	rpm	330					
			Heat	rpm	410					
		Lo	Cool	rpm	370					
			Heat	rpm	460					
		Me	Cool	rpm	460					
			Heat	rpm	540					
		Hi	Cool	rpm	560					
			Heat	rpm	620					
		SHi	Cool	rpm	600					
			Heat	rpm	650					
Moisture Removal				L/h (Pt/h)	1.2 (2.5)					
Indoor Airflow		QLo	Cool	m^3/min (ft^3/min)	6.7 (240)					
			Heat	m^3/min (ft^3/min)	7.7 (270)					
		Lo	Cool	m^3/min (ft^3/min)	7.3 (260)					
			Heat	m^3/min (ft^3/min)	8.5 (300)					
		Me	Cool	m^3/min (ft^3/min)	8.8 (310)					
			Heat	m^3/min (ft^3/min)	9.8 (350)					
		Hi	Cool	m^3/min (ft^3/min)	10.5 (370)					
			Heat	m^3/min (ft^3/min)	11.1 (390)					
		SHi	Cool	m^3/min (ft^3/min)	11.2 (400)					
			Heat	m^3/min (ft^3/min)	11.6 (410)					

Model		Indoor	CS-ME9SB4U	
Dimension	Height (I/D / PANEL)	mm (inch)	260 (10-1/4) / 51 (2-1/32)	
	Width (I/D / PANEL)	mm (inch)	575 (22-21/32) / 700 (27-9/16)	
	Depth (I/D / PANEL)	mm (inch)	575 (22-21/32) / 700 (27-9/16)	
Weight	Net (I/D / PANEL)	kg (lb)	18 (40) / 2.5 (6)	
Piping	Pipe Diameter (Liquid / Gas)	mm (inch)	6.35 (1/4) / 9.52 (3/8)	
Drain Hose	Inner Diameter	mm (ft)	30 (0.098)	
	Length	mm (ft)	193 (0.633)	
Indoor Heat Exchanger	Fin Material		Aluminium (Pre Coat)	
	Fin Type		Slit Fin	
	Row × Stage × FPI		2 × 10 × 18	
	Size (W × H × L)	mm (ft)	1330:1270 × 210 × 25.4 (4.363:4.166 × 0.689 × 0.083)	
Air Filter	Material		–	
	Type		–	
Power Supply			Outdoor	
Power Supply Cord		A	Nil	
Thermostat			Electronic Control	
Protection Device			Electronic Control	
			Dry Bulb	Wet Bulb
Indoor Operation Range	Cooling	Maximum (°F/°C)	89.6/32	73.4/23
		Minimum (°F/°C)	60.8/16	51.8/11
	Heating	Maximum (°F/°C)	86.0/30	–/–
		Minimum (°F/°C)	60.8/16	–/–

1. Cooling capacities are based on indoor temperature of 27°C Dry Bulb (80.6°F Dry Bulb), 19.0°C Wet Bulb (66.2°F Wet Bulb) and outdoor air temperature of 35°C DRY BULB (95°F Dry Bulb), 24°C Wet Bulb (75.2°F Wet Bulb).
2. Heating capacities are based on indoor temperature of 20°C Dry Bulb (68°F Dry Bulb) and outdoor air temperature of 7°C Dry Bulb (44.6°F Dry Bulb), 6°C Wet Bulb (42.8°F Wet Bulb).
3. Specifications are subjected to change without prior notice for further improvement.

- **Multi split Combination Possibility:**
  - A single outdoor unit enables air conditioning of up to two separate rooms for CU-2E18SBU.
  - A single outdoor unit enables air conditioning of up to three separate rooms for CU-3E19RBU.
  - A single outdoor unit enables air conditioning of up to four separate rooms for CU-4E24RBU.
  - A single outdoor unit enables air conditioning of up to five separate rooms for CU-5E36QBU.

CONNECTABLE INDOOR UNIT			OUTDOOR UNIT														
			CU-5E36QBU					CU-4E24RBU				CU-3E19RBU			CU-2E18SBU	
Type \ ROOM			A	B	C	D	E	A	B	C	D	A	B	C	A	B
Wall	2.5 kW	CS-ME9SB4U	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	3.2 kW	CS-E12RB4UW	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	5.0 kW	CS-E18RB4UW	●	●	●	●	●	●	●	●	●	●	●	●	-	-
Capacity range of connectable indoor units			From 4.5 kW to 17.5 kW					From 4.5 kW to 13.6 kW				From 4.5 kW to 9.0 kW			From 3.2 kW to 6.4 kW	
Piping Length	1 room maximum pipe length (m (ft))		25 (82.0)					25 (82.0)				25 (82.0)			25 (82.0)	
	Allowable elevation (m (ft))		15 (49.2)					15 (49.2)				15 (49.2)			15 (49.2)	
	Total allowable pipe length (m (ft))		80 (262.4)					70 (229.6)				50 (164.0)			50 (164.0)	
	Total pipe length for maximum chargeless length (m (ft))		45 (147.6)					45 (147.6)				30 (98.4)			20 (65.6)	
	Additional gas amount over chargeless length (g/m (oz/ft))		20 (0.2)					20 (0.2)				20 (0.2)			20 (0.2)	

Note: "●" : Available

Remarks for CU-4E24RBU

1. At least two indoor units must be connected.
2. The total nominal cooling capacity of indoor units that will be connected to outdoor unit must be within connectable capacity range of indoor unit. (as shown in the table above)
   Example: The indoor units' combination below is possible to connect to CU-4E24RBU. (Total nominal capacity of indoor units is between 4.5 kW to 13.6 kW)
   1) Two CS-ME9SB4U only. (Total nominal cooling capacity is 5.0 kW)
   2) Three CS-E12RB4UW. (Total nominal cooling capacity is 9.6 kW)

3. Features

- **Inverter Technology**
  - Wider output power range
  - Energy saving
  - Quick Cooling
  - Quick Heating
  - More precise temperature control

- **Environment Protection**
  - Non-ozone depletion substances refrigerant (R410A)

- **Easy to use remote control**

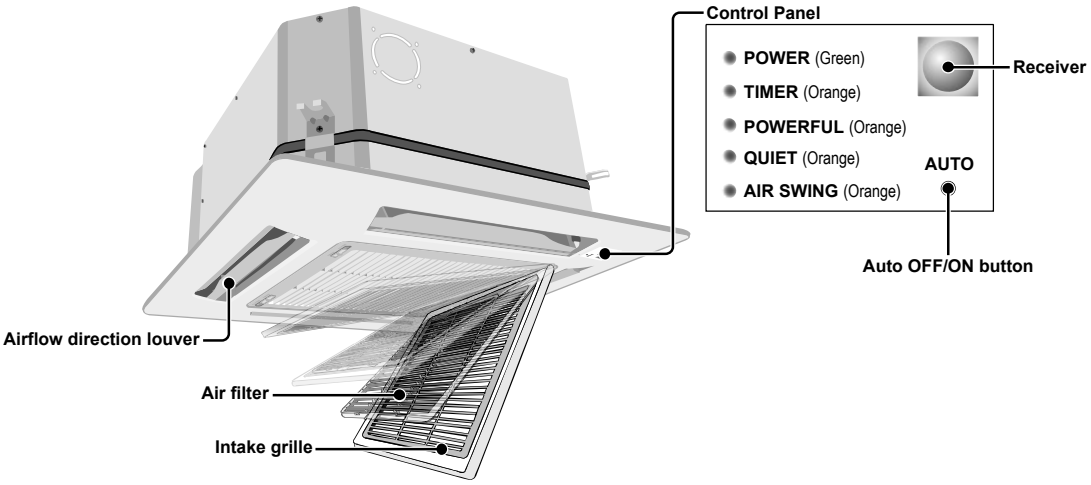
- **Quality Improvement**
  - Random auto restart after power failure for safety restart operation
  - Gas leakage protection
  - Prevent compressor reverse cycle
  - Inner protector to protect compressor
  - Noise prevention during soft dry operation
  - Blue coated condenser for high resistance to corrosion

- **Operation Improvement**
  - Quiet mode to reduce the indoor unit operating sound
  - Powerful mode to reach the desired room temperature quickly
  - 24-hour timer setting

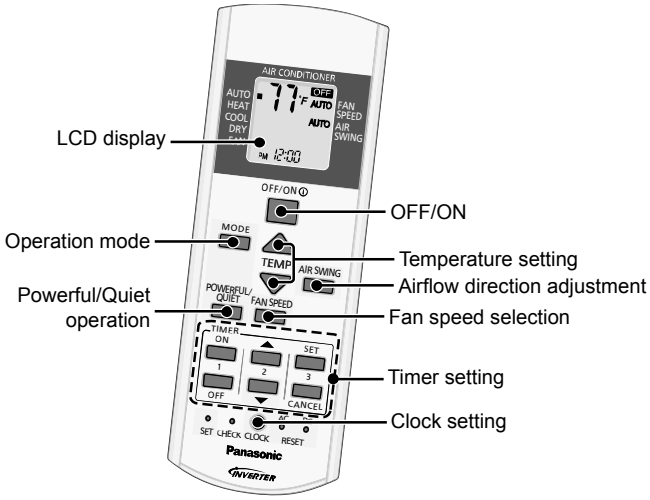
- **Serviceability Improvement**
  - Breakdown Self Diagnosis function

4. Location of Controls and Components

4.1 Indoor Unit

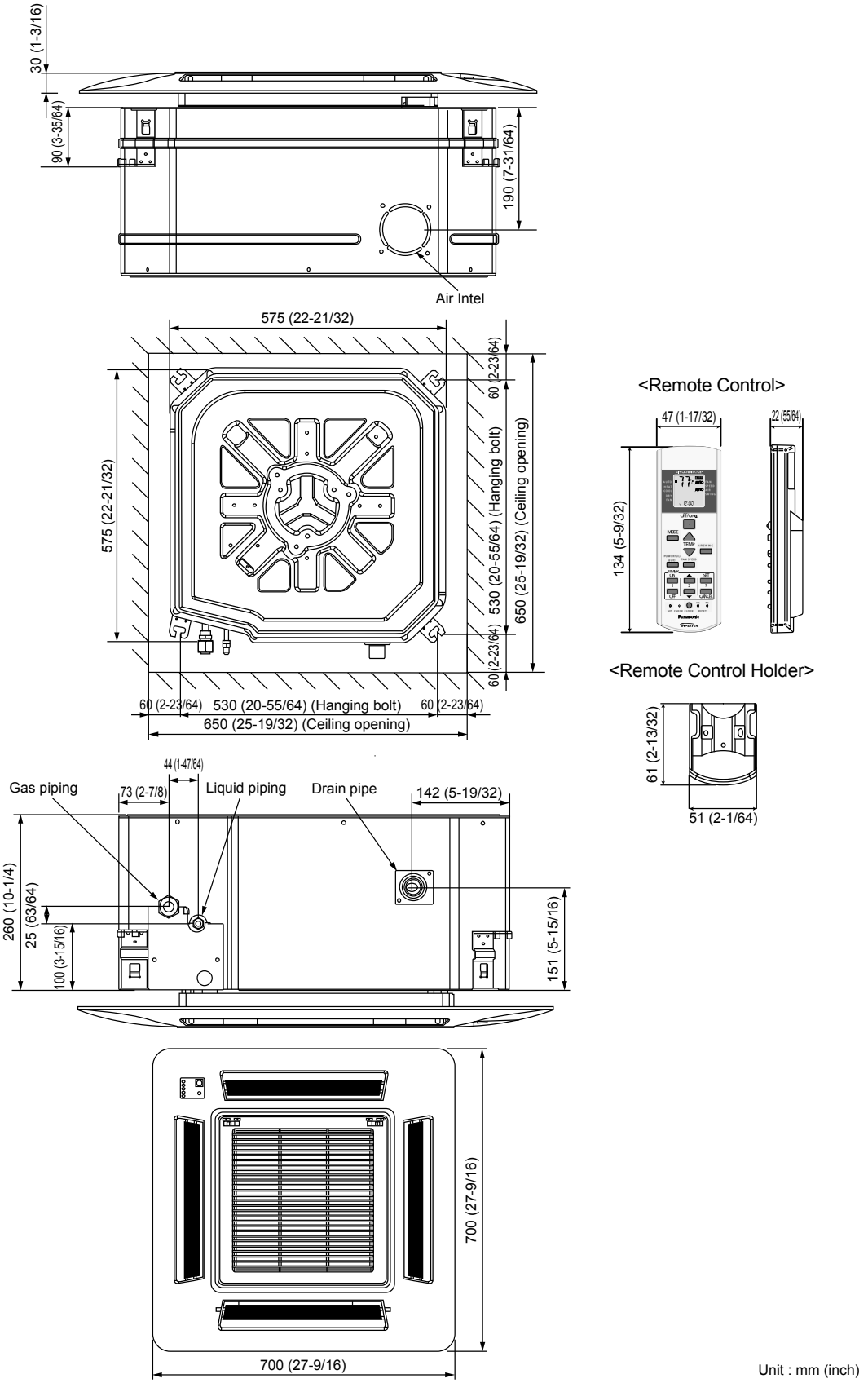


4.2 Remote Control



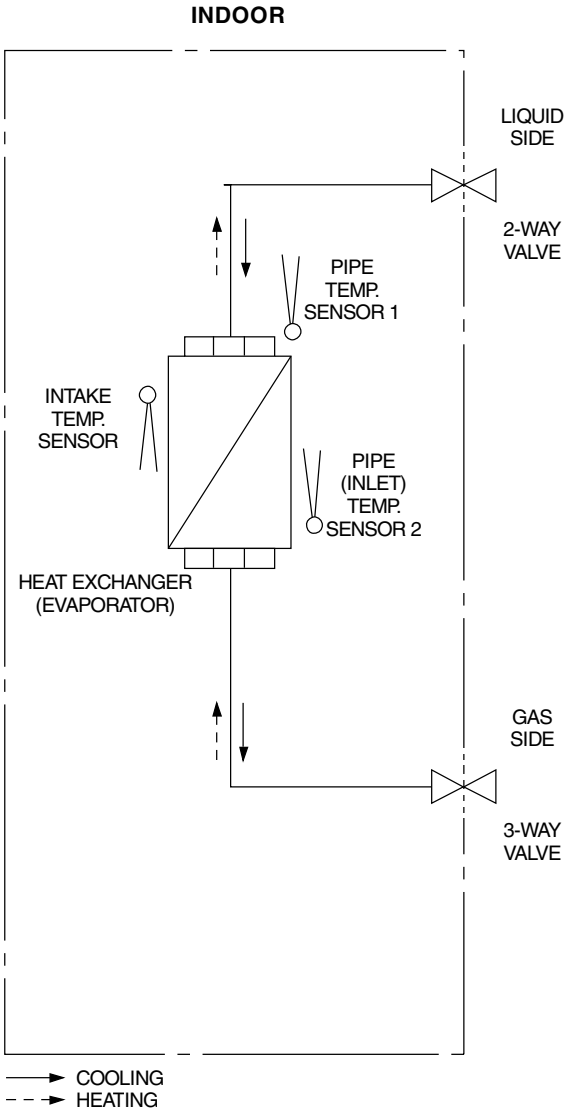
5. Dimensions

5.1 Indoor Unit

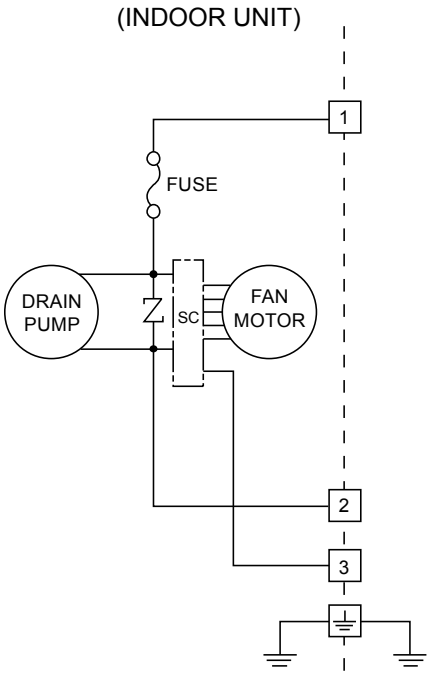


Unit : mm (inch)

6. Refrigeration Cycle Diagram

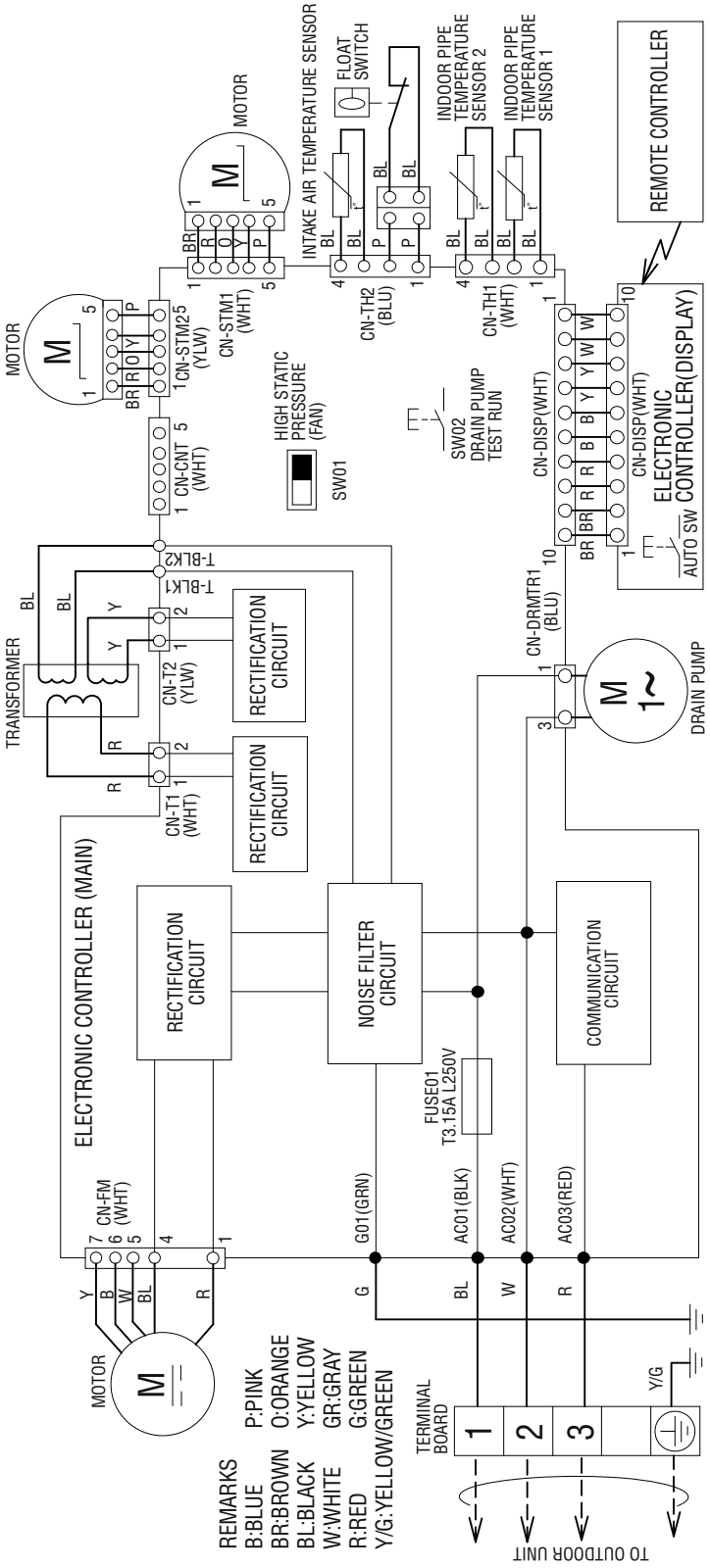


7. Block Diagram



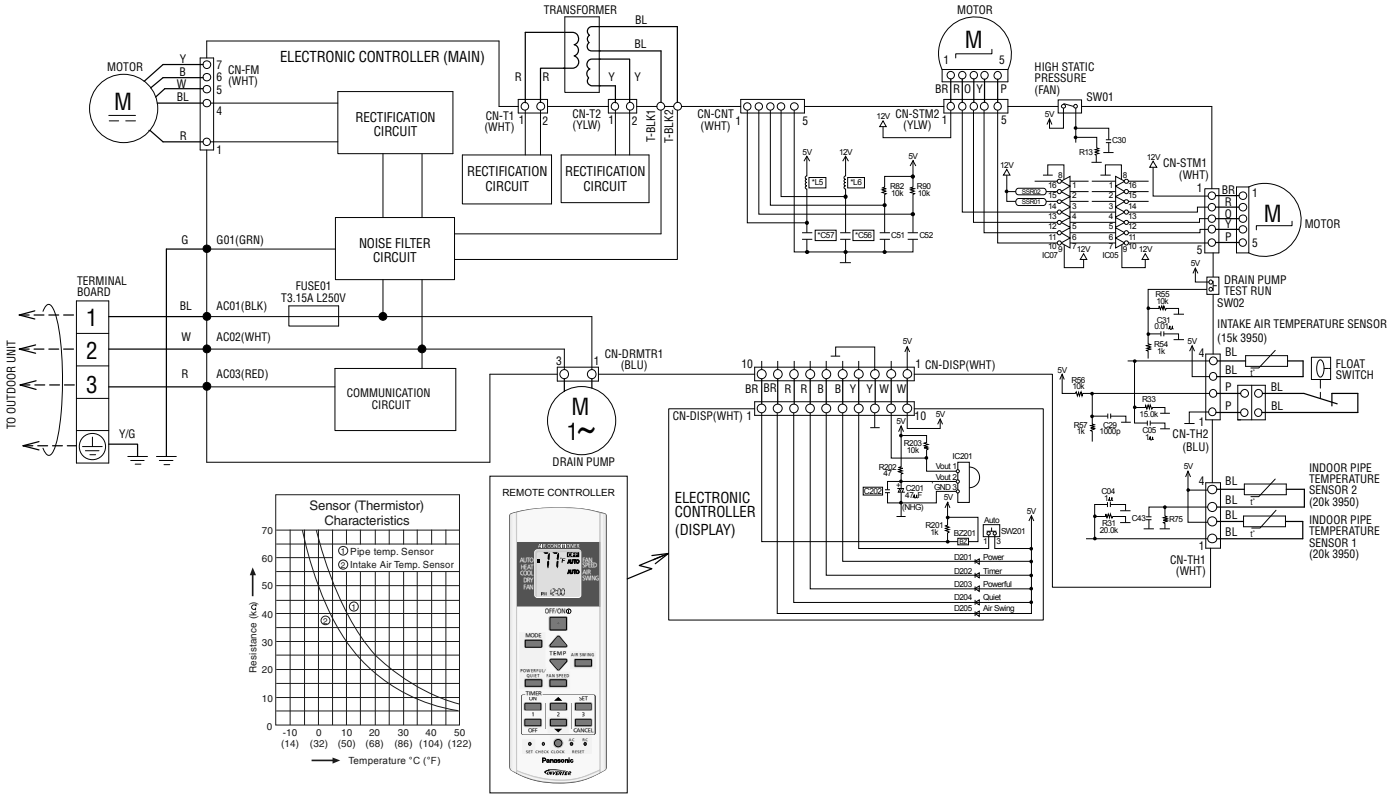
8. Wiring Connection Diagram

8.1 Indoor Unit



9. Electronic Circuit Diagram

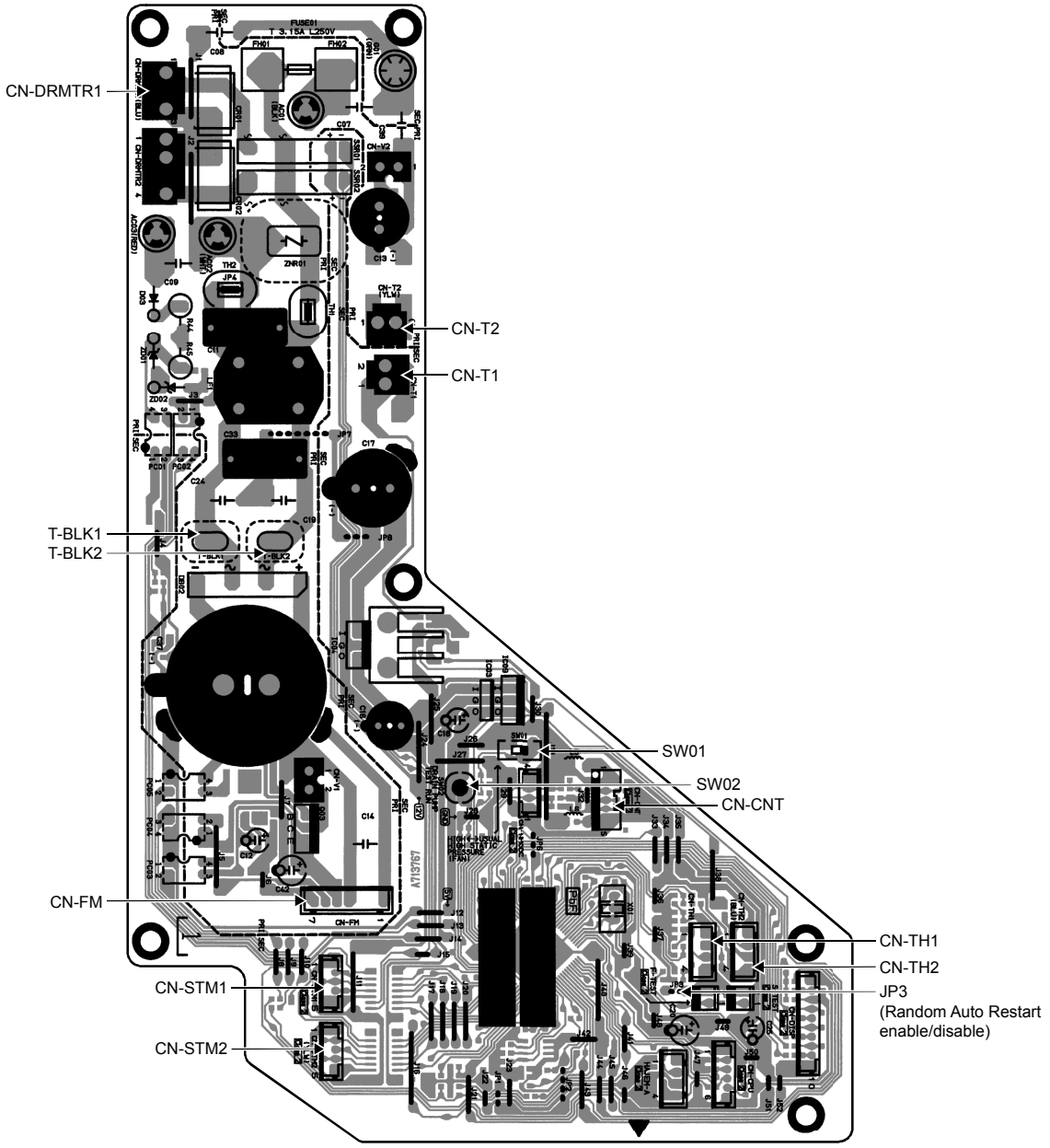
9.1 Indoor Unit



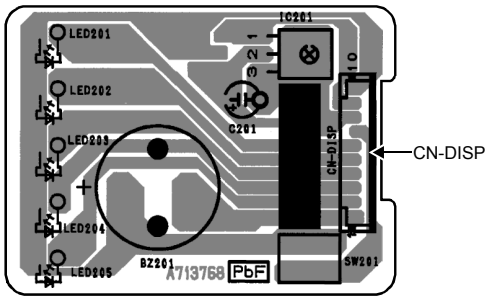
10. Printed Circuit Board

10.1 Indoor Unit

10.1.1 Main Printed Circuit Board



10.1.2 Display Printed Circuit Board

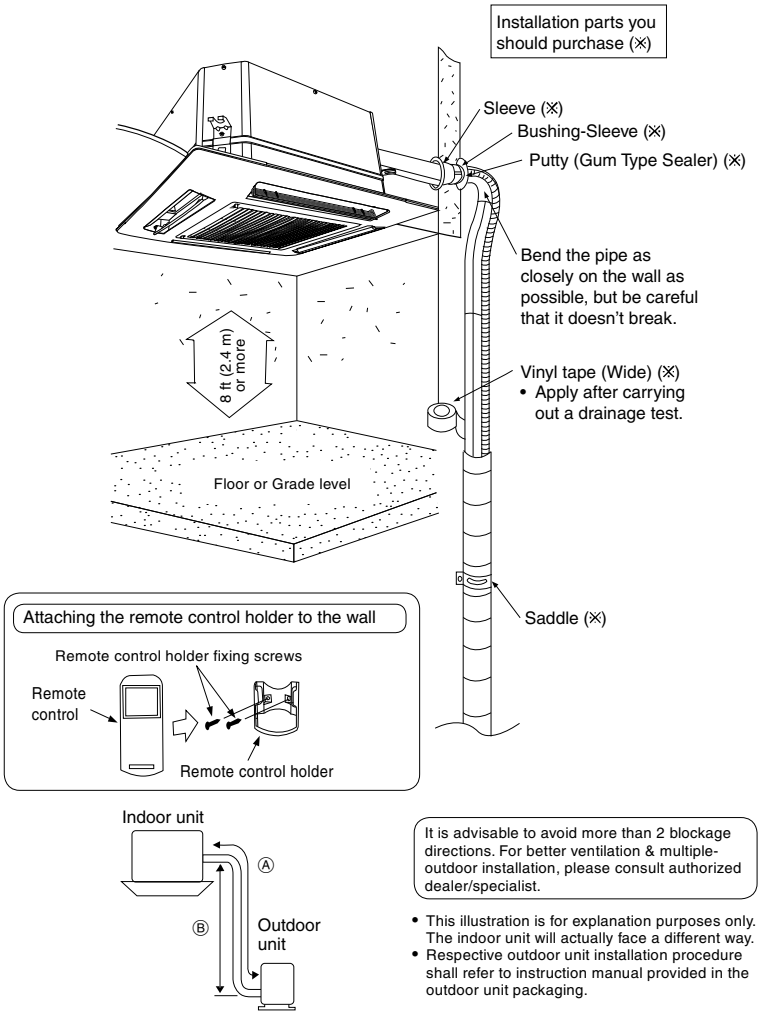


11. Installation Instruction

11.1 Attached Accessories

Name	Q'ty
Drain hose with a clip	1
Heat Insulator	2
Band	4
Flat washer for M10	8
Screw M5	4
Remote Control	1
Remote control holder	1
Remote control holder fixing screw	2
Battery	2

Applicable piping kit	Piping size	
	Gas	Liquid
CZ-3F5, 7BP	3/8" (9.52 mm)	1/4" (6.35 mm)
CZ-4F5, 7, 10BP	1/2" (12.7 mm)	1/4" (6.35 mm)

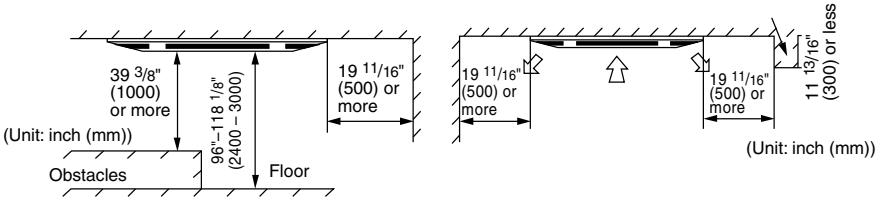


11.2 Indoor Unit

11.2.1 Selecting the Location for the Indoor Unit

Provide a check port on the piping side ceiling for repair and maintenance.

- Install the indoor unit once the following conditions are satisfied and after receiving the customer approval.
  1 The indoor unit must be within a maintenance space.
  2 The indoor unit must be free from any obstacles in path of the air inlet and outlet, and must allow spreading of air throughout the room.
  3 Mount with the lowest moving parts at least 8 ft (2.4 m) above floor or grade level.



* If the height from the floor to ceiling exceeds three meters, air flow distribution deteriorates and the effect is decreased.

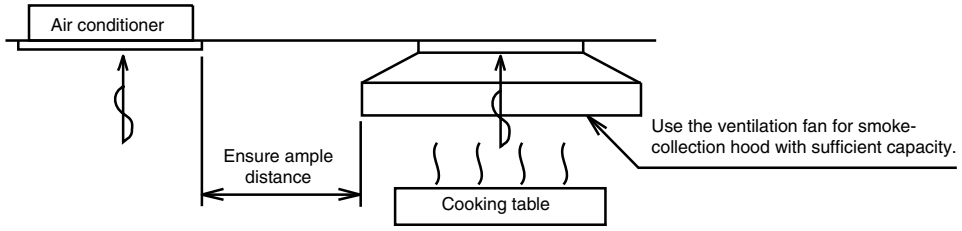
⚠ WARNING
4 The installation position must be able to support a load four times the indoor unit weight.

5 The indoor unit must be away from heat and steam sources, but avoid installing it near an entrance.

6 The indoor unit must allow easy draining.
7 The indoor unit must allow easy connection to the outdoor unit.
8 Place the indoor unit according to the height from the ceiling shown in the illustration below.
9 The indoor unit must be from at least 9.8 ft (3 m) away from any noise-generating equipment. The electrical wiring must be shielded with a steel conduit.
10 If the power supply is subject to noise generation, add a suppressor.
11 Do not install the indoor unit in a laundry. Electric shocks may result.

Note • Thoroughly study the following installation locations

1 In such places as restaurants and kitchens, considerable amount of oil steam and flour adhere to the turbo fan, the fin of the heat exchanger and the drain pump, resulting in heat exchange reduction, spraying, dispersing of water drops, drain pump malfunction, etc.
In these cases, take the following actions:
   - o Make sure that the ventilation fan for smoke-collecting hood on a cooking table has sufficient capacity so that it draws oily steam which should not flow into the suction of the air conditioner.
   - o Make enough distance from the cooking room to install the air conditioner in such place where it may not suck in oily steam.



2 Avoid installing the air conditioner in such circumstances where cutting oil mist or iron powder exist especially in factories, etc.
3 Avoid places where inflammable gas is generated, flows-in, contaminated, or leaked.
4 Avoid places where sulphurous acid gas or corrosive gas can be generated.
5 Avoid places near high frequency generators.

Model Name	Height in the ceiling
ME9***	11" (280 mm) or more

11.2.2 Installation of Indoor Unit

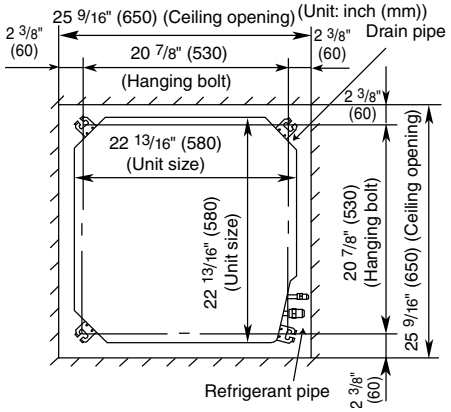
This air conditioner uses a drain up motor.
Horizontally install the unit using a level gauge.

CEILING OPENING DIMENSIONS AND HANGING BOLT LOCATION

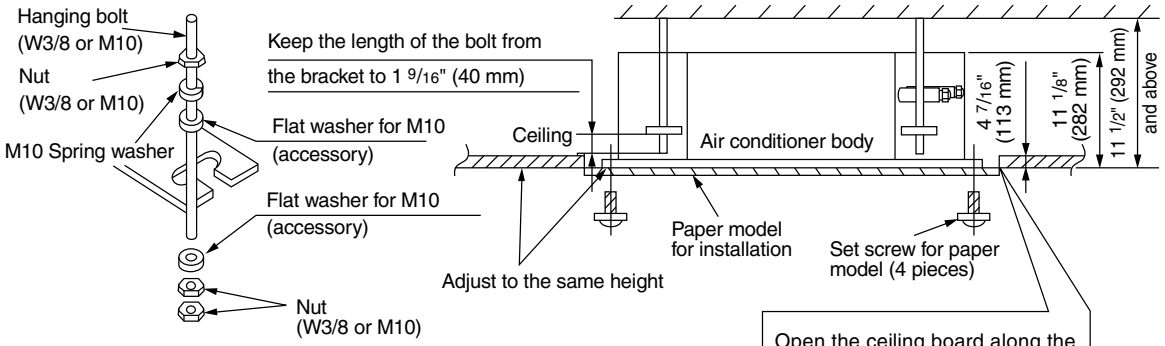
The paper model for installation expand or shrink according to temperature and humidity.
Check on dimensions before using it.

Caution	During the installation, care must be taken not to damage electric wires.

- The dimensions of the paper model for installation are the same as those of the ceiling opening dimensions.
- Be sure to discuss the ceiling drilling work with the workers concerned.



POSITIONS OF AIR CONDITIONER BODY AND CEILING SURFACE

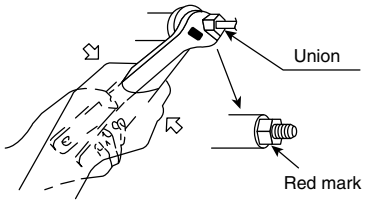


⚠ Warning	Tighten the nut and bolt to prevent unit from falling

11.2.3 Refrigerant Piping

Refrigerant is charged to the outdoor unit. For details, see the manual for installation work of outdoor unit. (Additional charging, etc.)

1 Brazing for piping.
   a. Execute brazing before tightening the flare nut.
   b. Brazing must be executed while blowing nitrogen gas. (This prevents generation of oxidized scale in copper pipe.)
2 When there is a lot of brazings for long piping, install a strainer midway of the piping. (The strainer is locally supplied.)
3 Use clean copper pipe with inner wall surface free from mist and dust. Blow nitrogen gas or air to blow off dust in the pipe before connection.
4 Form the piping according to its routing. Avoid bending and bending back the same piping point more than three times. (This will result in hardening of the pipe).
5 After deforming the pipe, align centers of the union fitting of the indoor unit and the piping, and tighten them firmly with wrenches.
6 Connect pipe to the service valve or ball valve which is located below the outdoor unit.
7 After completed the piping connection, be sure to check if there is gas leakage in indoor and outdoor connection.



- Confirm the red mark of the union (thin side) is always at lower direction after connecting piping.

Vacuum drying

After completing the piping connection, execute vacuum drying for the connecting piping and the indoor unit. The vacuum drying must be carried out by using the service ports of both the liquid and gas side valves.

CAUTION Use two wrenches and tighten with regular torque.

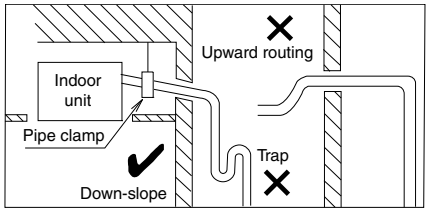
Do not overtighten, overtightening may cause gas leakage.	
Piping size	Torque
1/4" (6.35 mm)	13.3 lbf•ft [18 N•m (1.8 kgf•m)]
3/8" (9.52 mm)	31.0 lbf•ft [42 N•m (4.3 kgf•m)]
1/2" (12.7 mm)	40.6 lbf•ft [55 N•m (5.6 kgf•m)]
5/8" (15.88 mm)	47.9 lbf•ft [65 N•m (6.6 kgf•m)]
3/4" (19.05 mm)	73.8 lbf•ft [100 N•m (10.2 kgf•m)]

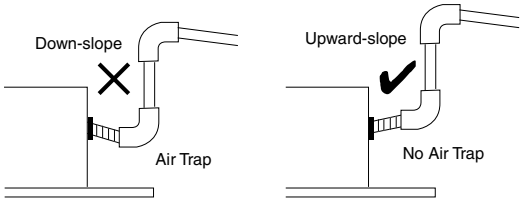
11.2.4 Indoor Unit Drain Piping

- During drain piping connection, be careful not to exert extra force on the drain port at the indoor unit.
- The outside diameter of the drain connection at the indoor unit is 1-1/4" (32 mm).

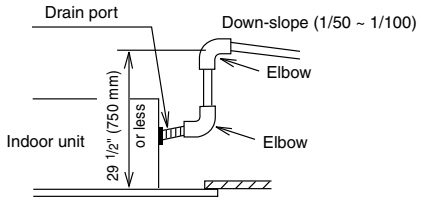
  Piping material: Polyvinyl chloride pipe VP-25 and pipe fittings.
- Be sure to perform heat insulation on the drain piping.

  Heat insulation material: Polyethylene foam with thickness more than 5/16" (8 mm) (local supply).
- Drain piping must have down-slope (1/50 to 1/100); be sure not to provide up-and-down slope to prevent reversal flow.
- Be sure to check no air trap on drain hose and to ensure smooth water flow and no abnormal sound.

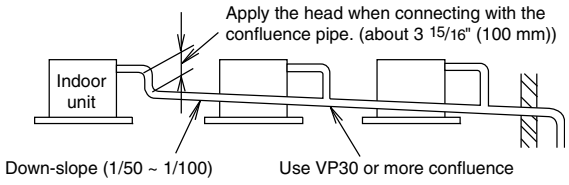




- The height of drain may be possible up to 29-1/2" (750 mm).



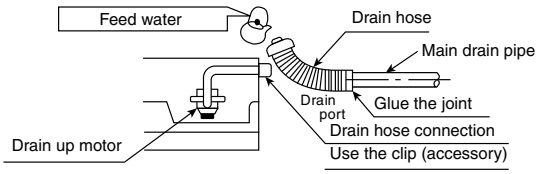
- When drain set piping, install as shown in the figure below.

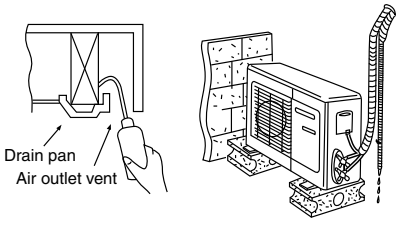


Drain Test

The air conditioner uses a drain up motor to drain water. Use the following procedure to test the drain up motor operation.

- Connect the main drain pipe to exterior and leave it provisionally until the test comes to an end.
- Feed water to the flexible drain hose and check the piping for leakage.
- Be sure to check the drain up motor for normal operating and noise when electric wiring is complete.
- When the test is complete, connect the flexible drain hose to the drain port.
- Pour about 600-700cc of water in the drain pan of the indoor unit. (Pour from the position specified in the drawing by using a water supply bottle or other suitable tool.)
- Press the drain pump test run on PCB to start the drain motor, and verify water drainage.
  (The drain motor will automatically stop after operating for about five minutes.)

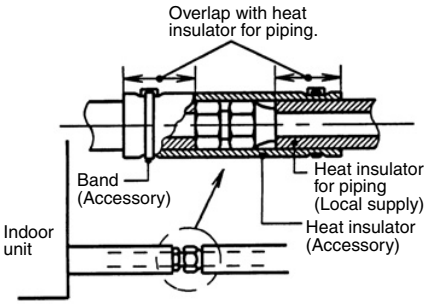


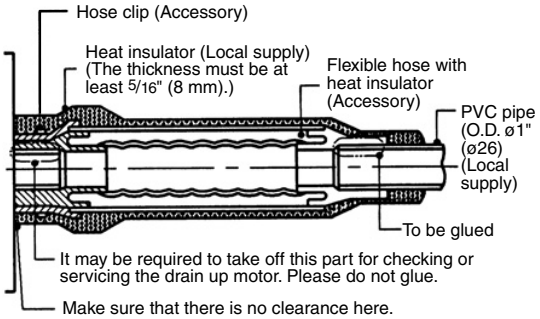


11.2.5 Heat Insulation

⚠ CAUTION	Be sure to perform heat insulation on the drain, liquid and gas piping. Imperfection in heat insulation work leads to water leakage.

1 Use the heat insulation material for the refrigerant piping which has an excellent heat-resistance (over 248°F (120°C)).

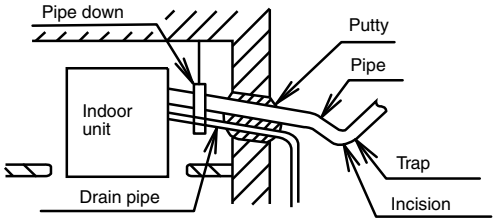




2 Precautions in high humidity circumstance.
This air conditioner has been tested according to the “JIS Standard Conditions with Mist” and have been confirmed that there are no faults. However, if it is operated for a long time in high humid atmosphere (dew point temperature: more than 73.4°F (23°C)), water drops are liable to fall. In this case, add heat insulation material according to the following procedure:
- Heat insulation material to be prepared… Adiabatic glass wool with thickness 3/8" to 1 3/16" (10 to 20 mm).
- Stick glass wool on all air conditioners that are located in ceiling atmosphere.
- In addition to the normal heat insulation (thickness: more than 5/16" (8 mm) for refrigerant piping (gas piping: thick piping) and drain piping, add a further of 3/8" (10 mm) to 1 3/16" (30 mm) thickness material.

Wall seal

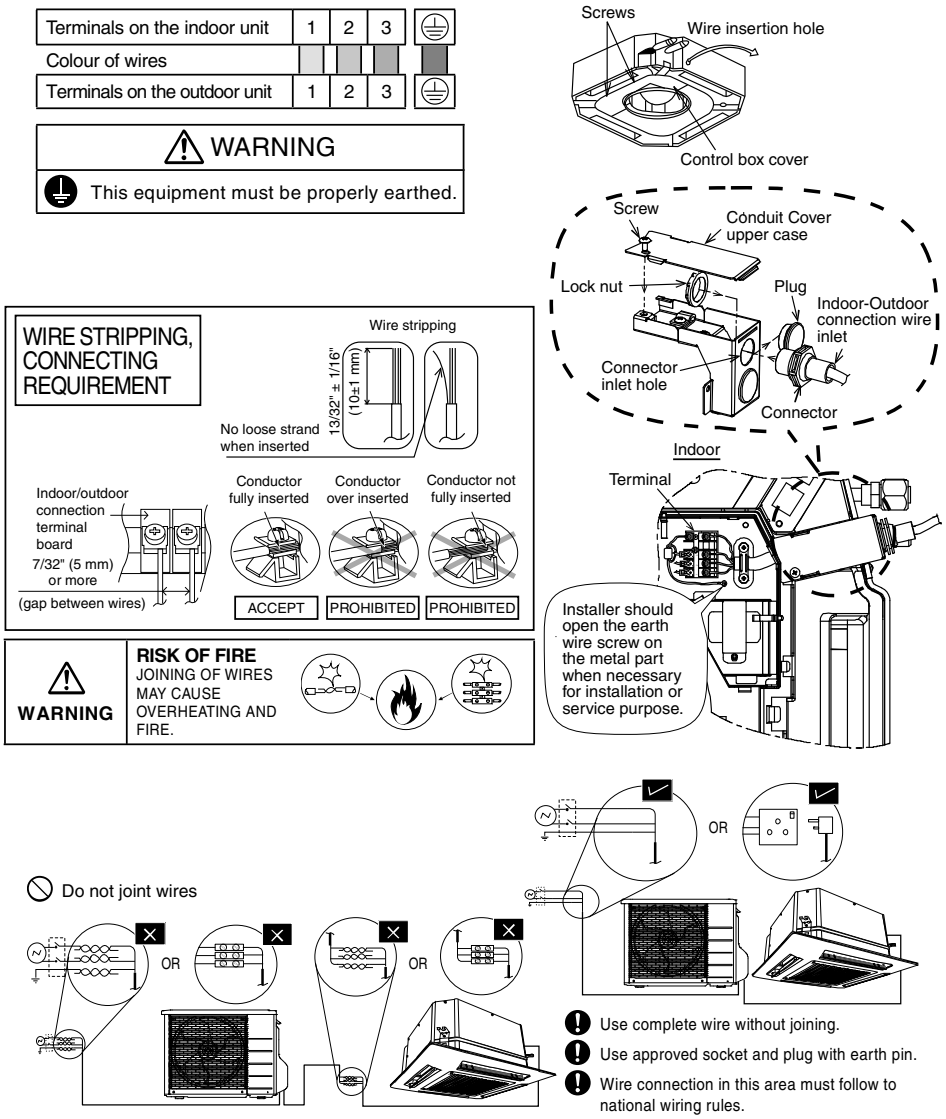
- When the outdoor unit is installed on a higher position than the indoor unit, install the trap so as not to instill rain water into the wall by transmitting in piping.
- Stuff the space among piping, the electric wire, and- the drain hose with “Putty” and seal the penetration wall hole.
  Make sure that rain water do not instill into the wall.



✳ Put the incision at the trap part of the heat insulator (for water drain)

11.2.6 Connect the Cable to the Indoor

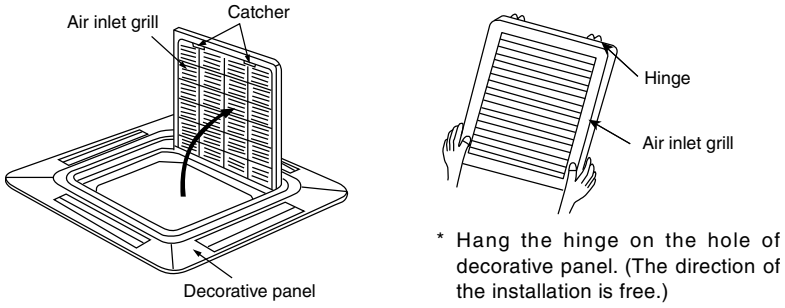
- Open the control board cover by removing 2 pcs of screw.
- Unscrew and open the conduit cover upper case. Remove the plug and fix the conduit connector to conduit cover with lock nut.
- Connecting wire between indoor unit and outdoor unit should be UL listed or CSA approved 4 conductor UL listed or CSA approved 4 conductor wires minimum AWG16 in accordance with local electric codes. Allowable connection cable length of each indoor unit shall be 98.4 ft (30 m) or less.
- Secure the connection cable onto the control board with the holder (clamper).
- Ensure the colour of wires of outdoor unit and the terminal Nos. are the same to the indoor's respectively.
- Earth wire shall be Yellow/Green (Y/G) in colour and longer than other AC wires for safety reason.



11.2.7 Installation of Decorative Panel

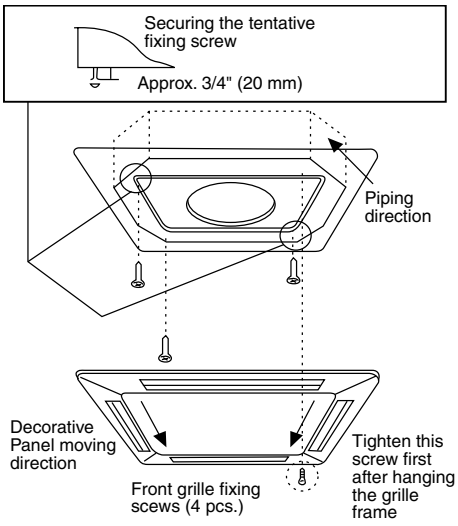
The decorative panel has its installation direction. Confirm the direction by displaying the piping side.

1 Remove the air inlet grille by moving the catchers to center.



* Hang the hinge on the hole of decorative panel. (The direction of the installation is free.)

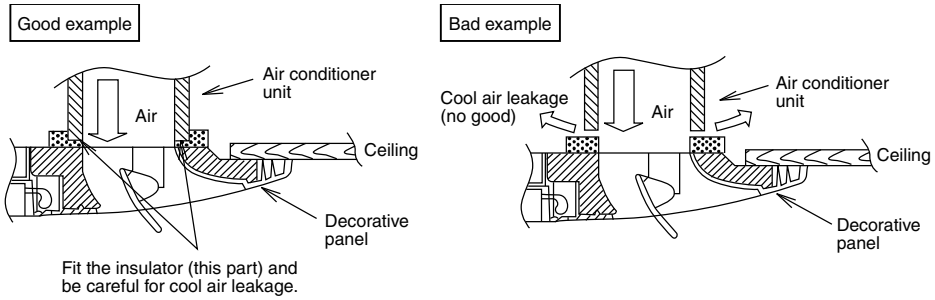
2 Fitting the decorative panel
   - o Temporarily secure the fixing screws (3 pcs.) before fitting the decorative panel. (For temporarily securing the front grille.)
   - o Place decorative panel on the screws (3 pcs.) before fitting, move decorative panel as illustrated and tighten all the screws (4 pcs.).



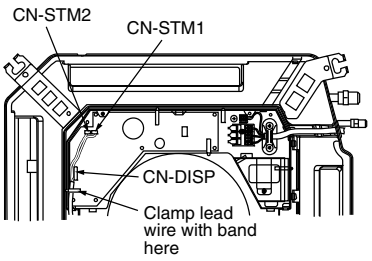
⚠ CAUTION

- Check before hand the height from the ceiling to the unit.
- The front grille fitting direction is determined by the unit direction.
- Only use the screws with the length of 1-3/8" (35 mm) which is provided, to fix the decorative panel.
- Do not use other screw which is longer it may cause damage to the drain-pan and other components.

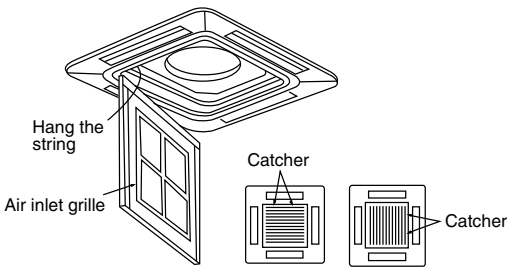
3 Fit the decorative panel and ceiling wall together and confirm no gap in between. Readjust indoor unit height, if there is a gap between ceiling wall and decorative panel.



4 Open the indoor control box cover by removing 2 pcs of screw.
5 Insert firmly the connector of cosmetic louver to indoor pcb CN-STM1, CN-STM2 and CN-DISP.
  Be caution not to clamp the cord in between control board and control board cover.
6 After complete, install back removed part follow reverse procedure.



⚠ WARNING	Be sure to hook the air inlet grill string, to prevent grill from falling and causing injury from it.

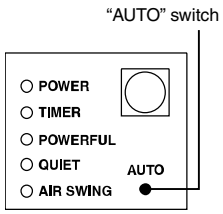


11.2.8 Auto Switch Operation

The following operations can be performed by pressing the “AUTO” switch.

1 AUTO OPERATION MODE
The Auto operation will be activated immediately once the Auto Switch is pressed.

2 TEST RUN OPERATION (FOR PUMP DOWN/SERVICING PURPOSE)
The Test Run operation will be activated if the Auto Switch is pressed continuously for more than 5 sec. to below 8 sec. A “pep” sound will occur at the fifth sec., in order to identify the starting of Test Run operation.



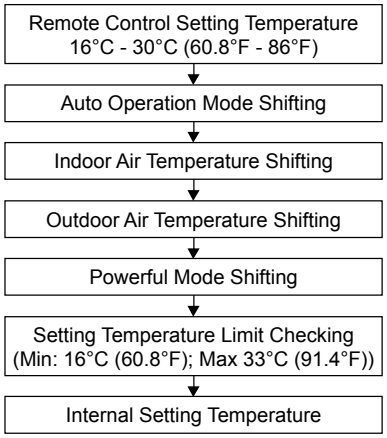
12. Operation Control

12.1 Basic Function

Inverter control, which equipped with a microcomputer in determining the most suitable operating mode as time passes, automatically adjusts output power for maximum comfort always. In order to achieve the suitable operating mode, the microcomputer maintains the set temperature by measuring the temperature of the environment and performing temperature shifting. The compressor at outdoor unit is operating following the frequency instructed by the microcomputer at indoor unit that judging the condition according to internal setting temperature and intake air temperature.

12.1.1 Internal Setting Temperature

Once the operation starts, remote control setting temperature will be taken as base value for temperature shifting processes. These shifting processes are depending on the air conditioner settings and the operation environment. The final shifted value will be used as internal setting temperature and it is updated continuously whenever the electrical power is supplied to the unit.



12.1.2 Cooling Operation

12.1.2.1 Thermostat control

- Compressor is OFF when Intake Air Temperature - Internal Setting Temperature < -1.5°C (-2.7°F) continue for 3 minutes.
- When compressor is OFF (Thermostat OFF) and AUTO FAN is set, the fan will stop periodically.
- Compressor is ON after waiting for 3 minutes, if the Intake Air Temperature - Internal Setting Temperature > Compressor OFF point.

12.1.3 Soft Dry Operation

12.1.3.1 Thermostat control

- Compressor is OFF when Intake Air Temperature - Internal Setting Temperature < -1.0°C (-1.8°F) continue for 3 minutes.
- When compressor is OFF (Thermostat OFF) and AUTO FAN is set, the fan will stop periodically.
- Compressor is ON after waiting for 3 minutes, if the Intake Air Temperature - Internal Setting Temperature > Compressor OFF point.

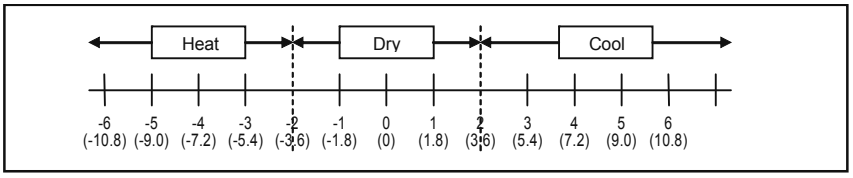
12.1.4 Heating Operation

12.1.4.1 Thermostat control

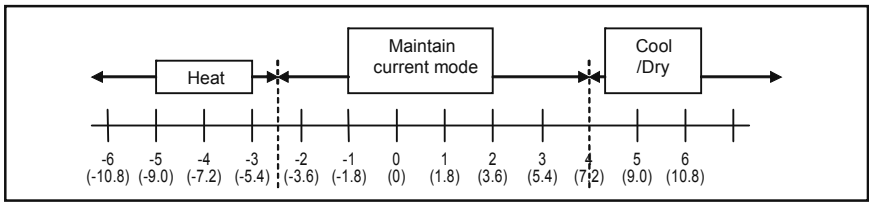
- Compressor is OFF when Intake Air Temperature - Internal Setting Temperature > +2.0°C (3.6°F) continue for 3 minutes.
- Compressor is ON after waiting for 3 minutes, if the Intake Air Temperature - Internal Setting Temperature < Compressor OFF point.

12.1.5 Automatic Operation

- This mode can be set using remote control and the operation is decided by remote control setting temperature, remote control operation mode and indoor intake air temperature.
- During operation mode judgment, indoor fan motor (with speed of Lo-) is running for 30 seconds to detect the indoor intake air temperature.
- Every 10 minutes, the indoor temperature is judged.
- For the 1st judgment
  - If indoor intake temperature - remote control setting temperature ≥ 2°C (3.6°F), COOL mode is decided.
  - If -2°C (-3.6°F) ≤ indoor intake temperature - remote control setting temperature < 2°C (3.6°F), DRY mode is decided.
  - If indoor intake temperature - remote control setting temperature < -2°C (-3.6°F), HEAT mode is decided.



- For the 2nd judgment onwards
  - If indoor intake temperature - remote control setting temperature ≥ 4°C (7.2°F), if previous operate in DRY mode, then continue in DRY mode. otherwise COOL mode is decided.
  - If -2.5°C (-4.5°F) ≤ indoor intake temperature - remote control setting temperature < 4°C (7.2°F), maintain with previous mode.
  - If indoor intake temperature - remote control setting temperature < -2.5°C (-4.5°F), HEAT mode is decided.



12.1.6 Fan Operation

- Fan operation is used to circulate air in the room.
- During operation, indoor fan run continuously but outdoor fan and compressor stop.
- Temperature setting is not applicable.

12.2 Indoor Fan Motor Operation

12.2.1 Basic Rotation Speed (rpm)

A. Basic Rotation Speed (rpm)

i. Manual Fan Speed

[Cooling, Dry]

- Fan motor's number of rotation is determined according to remote control setting.

Remote control	○	○	○	○	○
Tab	Hi	Me+	Me	Me-	Lo

[Heating]

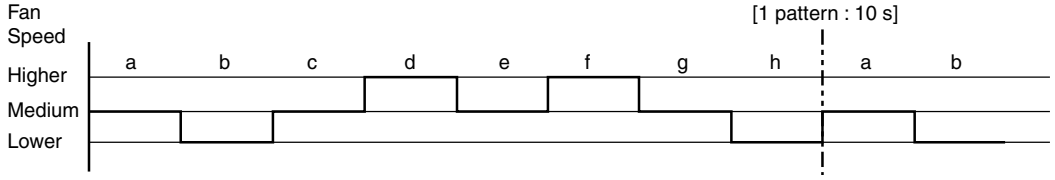
- Fan motor's number of rotation is determined according to remote control setting.

Remote control	○	○	○	○	○
Tab	SHi	Me+	Me	Me-	Lo

ii Auto Fan Speed

[Cooling, Dry]

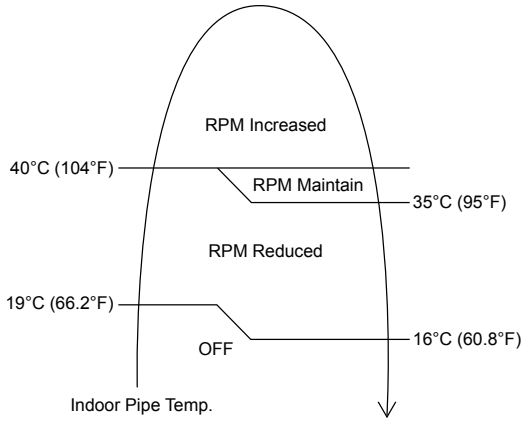
- According to room temperature and setting temperature, indoor fan speed is determined automatically.
- When set temperature is not achieved, the indoor fan will operate according to pattern below.



- When set temperature achieved, the indoor fan speed will be fixed. When thermostat off, the fan stop periodically.

[Heating]

- According to indoor pipe temperature, automatic heating fan speed is determined as follows.

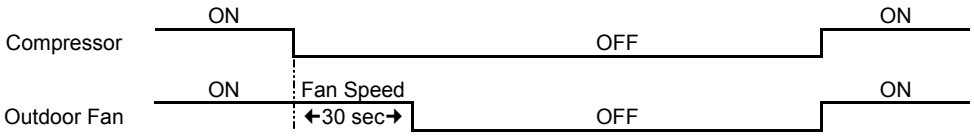


B. Feedback control

- Immediately after the fan motor started, feedback control is performed once every second.
- During fan motor on, if fan motor feedback ≥ 2550 rpm or < 50 rpm continue for 10 seconds, then fan motor error counter increase, fan motor is then stop and restart. If the fan motor counter becomes 7 times, then H19 - fan motor error is detected. Operation stops and cannot on back.

12.3 Outdoor Fan Motor Operation

- It starts when compressor starts operation and it stops 30 seconds after compressor stops operation.



12.4 Airflow Direction

1. There is one type of airflow, vertical airflow (directed by horizontal vane).
2. Control of airflow direction can be automatic (angles of direction is determined by operation mode, heat exchanger temperature and intake air temperature) and manual (angles of direction can be adjusted using remote control).

12.4.1 Vertical Airflow

Operation Mode	Airflow Direction			Upper Vane Angle (°)				
				1	2	3	4	5
Heating	Auto with Heat Exchanger	A	Upward fix	20				
		B	Downward fix	58				
	Temperature	C	Upward fix	20				
	Manual			20	33	45	58	70
Cooling	Auto			20 ~ 70				
	Manual			20	33	45	58	70
Soft Dry	Auto			20 ~ 70				
	Manual			20	33	45	58	70

1. Automatic vertical airflow direction can be set using remote control; the vane swings up and down within the angles as stated above. For heating mode operation, the angle of the vane depends on the indoor heat exchanger temperature as Figure 1 below. When the air conditioner is stopped using remote control, the vane will shift to close position.
2. Manual vertical airflow direction can be set using remote control; the angles of the vane are as stated above and the positions of the vane are as Figure 2 below. When the air conditioner is stopped using remote control, the vane will shift to close position.

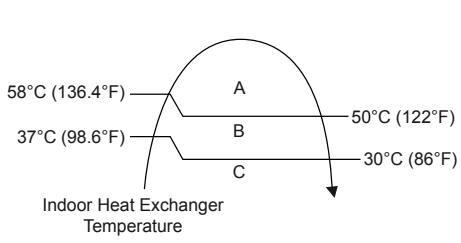


Figure 1

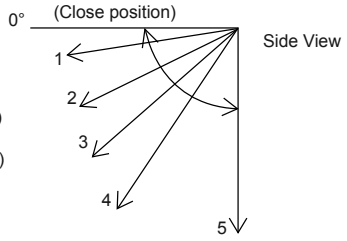


Figure 2

12.5 Quiet Operation (Cooling Mode/Cooling Area of Dry Mode)

- Purpose
  - To provide quiet cooling operation compare to normal operation.

- Control condition
  - Quiet operation start condition
    - When “POWERFUL/QUIET” button at remote control is pressed twice. POWERFUL/QUIET LED illuminates.

  - Quiet operation stop condition
    - When one of the following conditions is satisfied, quiet operation stops:
      - POWERFUL/QUIET button is pressed again.
      - Stop by OFF/ON switch.
      - Timer “off” activates.
    - When quiet operation is stopped, operation is shifted to normal operation with previous setting.
    - When fan speed is changed, quiet operation is shifted to quiet operation of the new fan speed.
    - When operation mode is changed, quiet operation is shifted to quiet operation of the new mode.
    - During quiet operation, if timer “on” activates, quiet operation maintains.
    - After off, when on back, quiet operation is not memorised.

- Control contents
  - Fan speed is changed from normal setting to quiet setting of respective fan speed. Fan speed for quiet operation is reduced from setting fan speed.

12.6 Quiet Operation (Heating)

- Purpose
  - To provide quiet heating operation compare to normal operation.

- Control condition
  - Quiet operation start condition
    - When “POWERFUL/QUIET” button at remote control is pressed.
      POWERFUL/QUIET LED illuminates.

  - Quiet operation stop condition
    - When one of the following conditions is satisfied, quiet operation stops:
      - POWERFUL/QUIET button is pressed again.
      - Stop by OFF/ON switch.
      - Timer “off” activates.
    - When quiet operation is stopped, operation is shifted to normal operation with previous setting.
    - When fan speed is changed, quiet operation is shifted to quiet operation of the new fan speed.
    - When operation mode is changed, quiet operation is shifted to quiet operation of the new mode, except fan mode only.
    - During quiet operation, if timer “on” activates, quiet operation maintains.
    - After off, when on back, quiet operation is not memorised.

- Control contents
  - Fan speed manual
    - Fan speed is changed from normal setting to quiet setting of respective fan speed.
    - Fan speed for quiet operation is reduced from setting fan speed.
  - Fan Speed Auto
    - Indoor FM RPM depends on pipe temp sensor of indoor heat exchanger.

12.7 Powerful Mode Operation

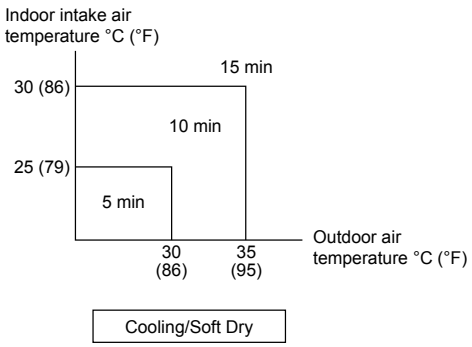
- When the powerful mode is selected, the internal setting temperature will shift lower up to 2°C (3.6°F) (for Cooling/Soft Dry) or higher up to 3.5°C (6.3°F) (for Heating) than remote control setting to achieve the setting temperature quickly.

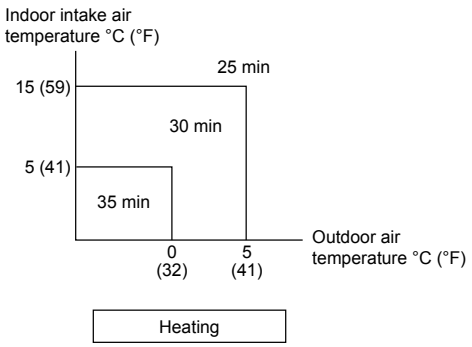
12.8 Timer Control

- There are 2 sets of ON and OFF timer available to turn the unit ON or OFF at different preset time.
- If more than one timer had been set, the upcoming timer will be displayed and will activate in sequence.

12.8.1 ON Timer Control

- ON timer 1 and ON timer 2 can be set using remote control, the unit with timer set will start operate earlier than the setting time.
  This is to provide a comfortable environment when reaching the set ON time.
- 60 minutes before the set time, indoor (at fan speed of Lo-) and outdoor fan motor start operate for 30 seconds to determine the indoor intake air temperature and outdoor air temperature in order to judge the operation starting time.
- From the above judgment, the decided operation will start operate earlier than the set time as shown below.





12.8.2 OFF Timer Control

OFF timer 1 and OFF timer 2 can be set using remote control, the unit with timer set will stop operate at set time.

12.9 Auto Restart Control

- When the power supply is cut off during the operation of air conditioner, the compressor will re-operate within three to four minutes (there are 10 patterns between 2 minutes 58 seconds and 3 minutes 52 seconds to be selected randomly) after power supply resumes.
- This type of control is not applicable during ON/OFF Timer setting.
- This control can be omitted by open the circuit of JP3 at indoor unit printed circuit board.

12.10 Indication Panel

LED	POWER	TIMER	POWERFUL	QUIET	AIR SWING
Color	Green	Orange	Orange	Orange	Orange
Light ON	Operation ON	Timer Setting ON	POWERFUL Mode ON	QUIET Mode ON	AIR SWING ON
Light OFF	Operation OFF	Timer Setting OFF	POWERFUL Mode OFF	QUIET Mode OFF	AIR SWING OFF

Note:

- If POWER LED is blinking, the possible operation of the unit are Hot Start, during Deice operation, operation mode judgment, or ON timer sampling.
- If Timer LED is blinking, there is an abnormality operation occurs.

12.11 Drain Pump Control Operation

Drain pump control

- This unit has built-in with drain pump.

Control content

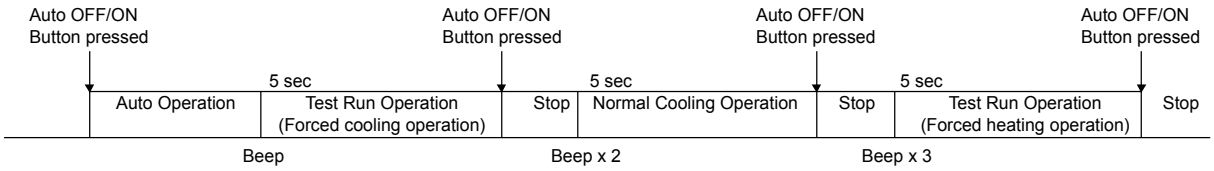
- During COOL/DRY mode.
  - During COOL/DRY mode, drain pump starts 10 seconds after indoor fan motor starts.
  - The drain pump is always ON.

- After COOL/DRY mode, when unit turns OFF (power standby) or changes to HEAT mode.
  - The drain pump turns ON for 90 seconds immediately.

- Error judgment
  - When float switch detects ON signal continuously for 2 minutes 30 seconds, error code H21 are shown.
  - When float switch ON has operated 2 times within 20 minutes, error code H35 are shown.

13. Servicing Mode

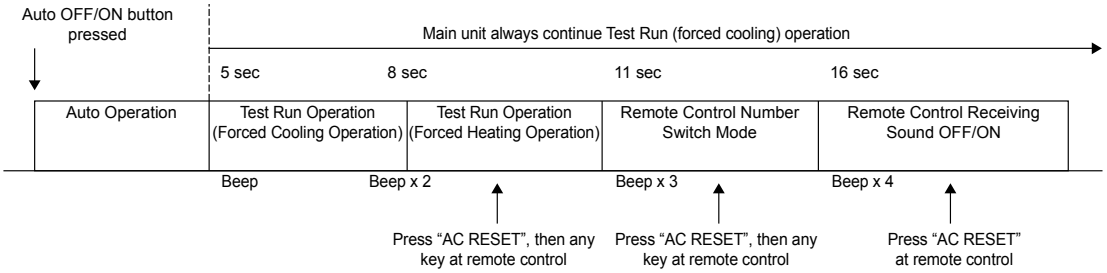
13.1 Auto OFF/ON Button



1 AUTO OPERATION MODE
The Auto operation will be activated immediately once the Auto OFF/ON button is pressed. This operation can be used to operate air conditioner with limited function if remote control is misplaced or malfunction.

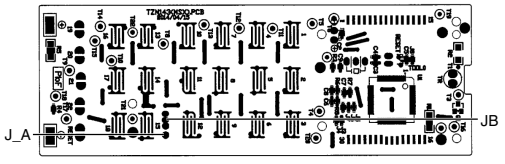
2 TEST RUN OPERATION (FOR PUMP DOWN/SERVICING PURPOSE)
The Test Run operation will be activated if the Auto OFF/ON button is pressed continuously for more than 5 seconds. A “beep” sound will heard at the fifth seconds, in order to identify the starting of Test Run operation (Forced cooling operation). Within 5 minutes after Forced cooling operation start, the Auto OFF/ON button is pressed for more than 5 seconds. A 2 “beep” sounds will heard at the fifth seconds, in order to identify the starting of Normal cooling operation.
Within 5 minutes after Normal cooling operation start, the Auto OFF/ON button is pressed for more than 5 seconds. A 3 “beep” sounds will be heard at the fifth seconds, in order to identify the starting of Forced heating operation.

The Auto OFF/ON button may be used together with remote control to set / change the advance setting of air conditioner operation.



3 REMOTE CONTROL NUMBER SWITCH MODE
The Remote Control Number Switch Mode will be activated if the Auto OFF/ON button is pressed continuously for more than 11 seconds (3 “beep” sounds will occur at 11th seconds to identify the Remote Control Number Switch Mode is in standby condition) and press “AC RESET” button and then press any button at remote control to transmit and store the desired transmission code to the EEPROM.

There are 4 types of remote control transmission code could be selected and stored in EEPROM of indoor unit. The indoor unit will only operate when received signal with same transmission code from remote control. This could prevent signal interference when there are 2 or more indoor units installed nearby together.
To change remote control transmission code, short or open jumpers at the remote control printed circuit board.



Remote Control Printed Circuit Board		
Jumper A (J_A)	Jumper B (JB)	Remote Control No.
Short	Open	A (Default)
Open	Open	B
Short	Short	C
Open	Short	D

- During Remote Control Number Switch Mode, press any button at remote control to transmit and store the transmission code to the EEPROM.

4 REMOTE CONTROL RECEIVING SOUND OFF/ON MODE
The Remote Control Receiving Sound OFF/ON Mode will be activated if the Auto OFF/ON button is pressed continuously for more than 16 seconds (4 “beep” sounds will occur at 16th seconds to identify the Remote Control Receiving Sound Off/On Mode is in standby condition) and press “AC Reset” button at remote control.

Press “Auto OFF/ON button” to toggle remote control receiving sound.
- Short “beep”: Turn OFF remote control receiving sound.
- Long “beep”: Turn ON remote control receiving sound.

After Auto OFF/ON Button is pressed, the 20 seconds counter for Remote Control Receiving Sound OFF/ON Mode is restarted.

13.2 Remote Control Button

13.2.1 SET Button

- To check remote control transmission code and store the transmission code to EEPROM:
  - Press “Set” button by using pointer.
  - Press “Timer Set” button until a “beep” sound is heard as confirmation of transmission code changed.

13.2.2 RESET (RC)

- To clear and restore the remote control setting to factory default.
  - Press once to clear the memory.

13.2.3 RESET (AC)

- To restore the unit’s setting to factory default.
  - Press once to restore the unit’s setting.

13.2.4 TIMER ▲

- To change indoor unit indicator’s LED intensity.
  - Press continuously for 5 seconds.

13.2.5 TIMER ▼

- To change remote control display from Degree Celsius (°C) to Degree Fahrenheit (°F).
  - Press continuously for 10 seconds.

14. Troubleshooting Guide

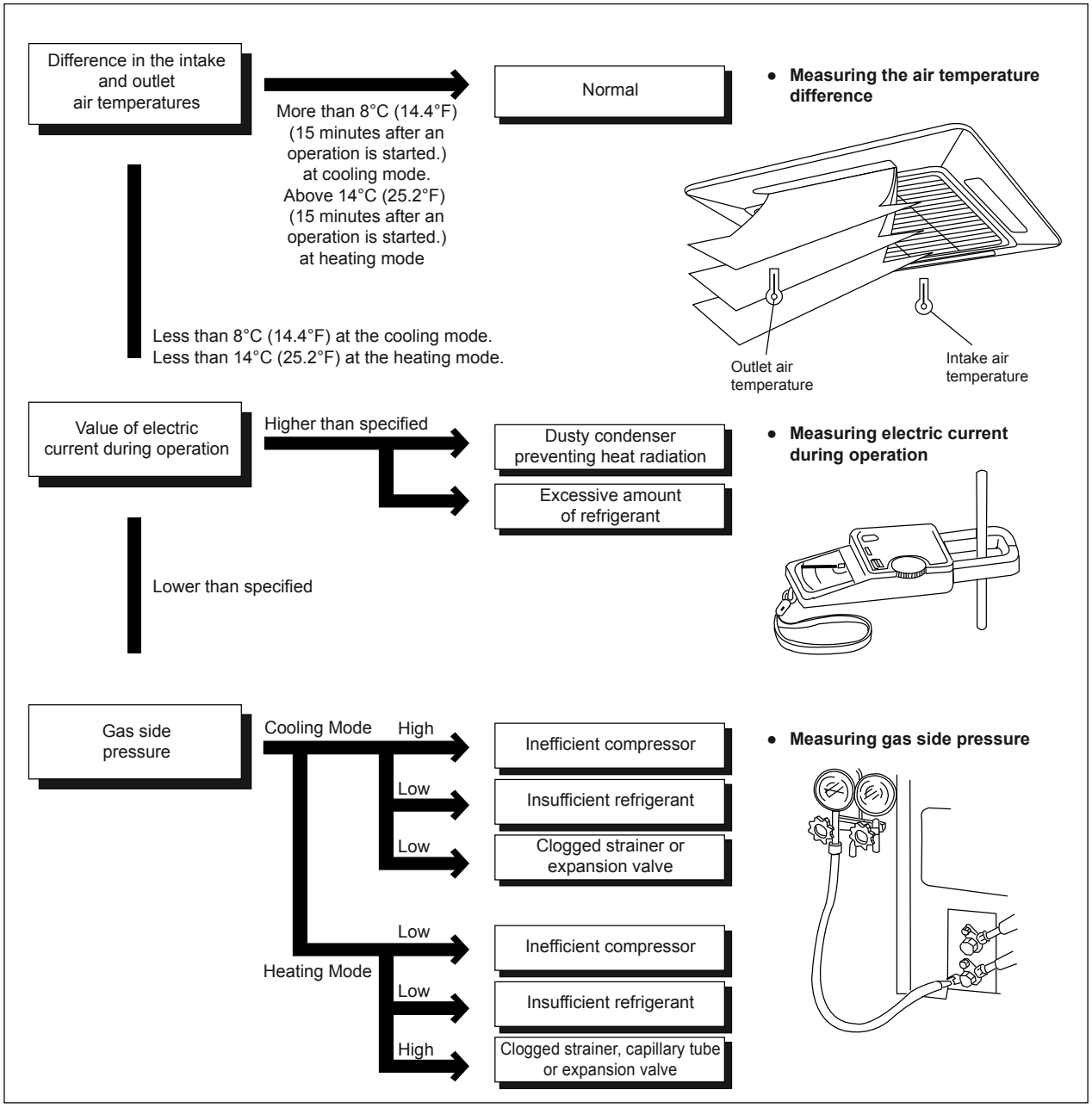
14.1 Refrigeration Cycle System

In order to diagnose malfunctions, make sure that there are no electrical problems before inspecting the refrigeration cycle. Such problems include insufficient insulation, problem with the power source, malfunction of a compressor and a fan.
The normal outlet air temperature and pressure of the refrigeration cycle depends on various conditions, the standard values for them are shown in the table on the right.

Normal Pressure and Outlet Air Temperature (Standard)

	Gas Pressure PSI (kg/cm^2G)	Outlet air Temperature °C (°F)
Cooling Mode	130.53 ~ 174.04 (9 ~ 12)	12 ~ 16 (53.6 ~ 60.8)
Heating Mode	333.58 ~ 420.60 (23 ~ 29)	36 ~ 45 (96.8 ~ 113)

*Condition:
- Indoor fan speed = High
- Outdoor temperature 35°C (95°F) at the cooling mode and 7°C (44.6°F) at the heating mode
- Compressor operates at rated frequency



14.1.1 Relationship Between the Condition of the Air Conditioner and Pressure and Electric Current

Condition of the air conditioner	Cooling Mode			Heating Mode		
	Low Pressure	High Pressure	Electric current during operation	Low Pressure	High Pressure	Electric current during operation
Insufficient refrigerant (gas leakage)	↘	↘	↘	↘	↘	↘
Clogged capillary tube or Strainer	↘	↘	↘	↗	↗	↗
Short circuit in the indoor unit	↘	↘	↘	↗	↗	↗
Heat radiation deficiency of the outdoor unit	↗	↗	↗	↘	↘	↘
Inefficient compression	↗	↘	↘	↗	↘	↘

• Carry out the measurement of pressure, electric current, and temperature fifteen minutes after an operation is started.

14.2 Breakdown Self Diagnosis Function

14.2.1 Self Diagnosis Function (Three Digits Alphanumeric Code)

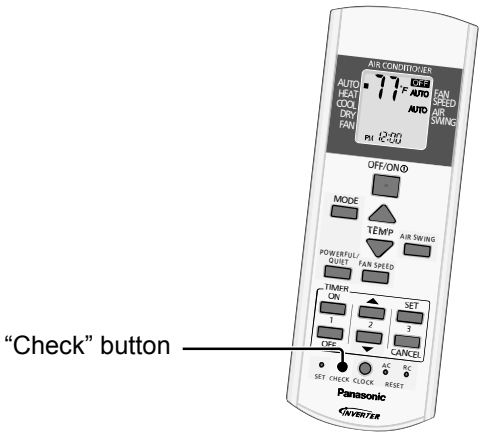
- Once abnormality has occurred during operation, the unit will stop its operation, and Timer LED blinks.
- Although Timer LED goes off when power supply is turned off, if the unit is operated under a breakdown condition, the LED will light up again.
- In operation after breakdown repair, the Timer LED will no more blink. The last error code (abnormality) will be stored in IC memory.

14.2.2 To Make a Diagnosis

1 Timer LED start to blink and the unit automatically stops the operation.
2 Press the CHECK button on the remote controller continuously for 5 seconds.
3 "- -" will be displayed on the remote controller display.
Note: Display only for "- -". (No transmitting signal, no receiving sound and no Power LED blinking.)
4 Press the "TIMER" ▲ or ▼ button on the remote controller. The code "H00" (no abnormality) will be displayed and signal will be transmitted to the main unit.
5 Every press of the button (up or down) will increase abnormality numbers and transmit abnormality code signal to the main unit.
6 When the latest abnormality code on the main unit and code transmitted from the remote controller are matched, power LED will light up for 30 seconds and a beep sound (continuously for 4 seconds) will be heard. If no codes are matched, power LED will light up for 0.5 seconds and no sound will be heard.
7 The breakdown diagnosis mode will be canceled unless pressing the CHECK button continuously for 5 seconds or operating the unit for 30 seconds.
8 The LED will be off if the unit is turned off or the RESET button on the main unit is pressed.

14.2.3 To Display Memorized Error Code (Protective Operation)

1 Turn power on.
2 Press the CHECK button on the remote controller continuously for 5 seconds.
3 "- -" will be displayed on the remote controller display.
Note: Display only for "- -". (No transmitting signal, no receiving sound and no Power LED blinking.)
4 Press the "TIMER" ▲ or ▼ button on the remote controller. The code "H00" (no abnormality) will be displayed and signal will be transmitted to the main unit. The power LED lights up. If no abnormality is stored in the memory, three beeps sound will be heard.
5 Every press of the button (up or down) will increase abnormality numbers and transmit abnormality code signal to the main unit.
6 When the latest abnormality code on the main unit and code transmitted from the remote controller are matched, power LED will light up for 30 seconds and a beep sound (continuously for 4 seconds) will be heard. If no codes are matched, power LED will light up for 0.5 seconds and no sound will be heard.
7 The breakdown diagnosis mode will be canceled unless pressing the CHECK button continuously for 5 seconds or operating the unit for 30 seconds.
8 The same diagnosis can be repeated by turning power on again.



14.2.4 To Clear Memorized Error Code after Repair (Protective Operation)

1 Turn power on (in standby condition).
2 Press the AUTO button for 5 seconds (A beep receiving sound) on the main unit to operate the unit at Forced Cooling Operation modes.
3 Press the CHECK button on the remote controller for about 1 second with a pointed object to transmit signal to main unit. A beep sound is heard from main unit and the data is cleared.

14.2.5 Temporary Operation (Depending On Breakdown Status)

1 Press the AUTO button (A beep receiving sound) on the main unit to operate the unit. (Remote control will become possible.)
2 The unit can temporarily be used until repaired.

14.3 Error Codes Table

Diagnosis display	Abnormality / Protection control	Abnormality Judgment	Protection Operation	Problem	Check location
H00	No memory of failure	—	Normal operation	—	—
H11	Indoor/outdoor abnormal communication	After operation for 1 minute	Indoor fan only operation can start by entering into force cooling operation	Indoor/outdoor communication not establish	• Indoor/outdoor wire terminal • Indoor/outdoor PCB • Indoor/outdoor connection wire
H12	Indoor unit capacity unmatched	90s after power supply	—	Total indoor capability more than maximum limit or less than minimum limit, or number of indoor unit less than two	• Indoor/outdoor connection wire • Indoor/outdoor PCB • Specification and combination table in catalogue
H14	Indoor intake air temperature sensor abnormality	Continuous for 5s	—	Indoor intake air temperature sensor open or short circuit	• Indoor intake air temperature sensor lead wire and connector
H15	Compressor temperature sensor abnormality	Continuous for 5s	—	Compressor temperature sensor open or short circuit	• Compressor temperature sensor lead wire and connector
H16	Outdoor current transformer (CT) abnormality	—	—	Current transformer faulty or compressor faulty	• Outdoor PCB faulty or compressor faulty
H19	Indoor fan motor mechanism lock	Continuous happen for 7 times	—	Indoor fan motor lock or feedback abnormal	• Fan motor lead wire and connector • Fan motor lock or block
H21	Indoor float switch operation abnormal	—	—	—	—
H23	Indoor heat exchanger temperature sensor abnormality	Continuous for 5s	—	Indoor heat exchanger temperature sensor open or short circuit	• Indoor heat exchanger temperature sensor lead wire and connector
H24	Indoor heat exchanger temperature sensor 2 abnormality	Continuous for 5s	—	Indoor heat exchanger temperature sensor 2 open or short circuit	• Indoor heat exchanger temperature sensor 2 lead wire and connector
H27	Outdoor air temperature sensor abnormality	Continuous for 5s	—	Outdoor air temperature sensor open or short circuit	• Outdoor air temperature sensor lead wire and connector
H28	Outdoor heat exchanger temperature sensor 1 abnormality	Continuous for 5s	—	Outdoor heat exchanger temperature sensor 1 open or short circuit	• Outdoor heat exchanger temperature sensor 1 lead wire and connector
H30	Outdoor discharge pipe temperature sensor abnormality	Continuous for 5s	—	Outdoor discharge pipe temperature sensor open or short circuit	• Outdoor discharge pipe temperature sensor lead wire and connector
H33	Indoor / outdoor misconnection abnormality	—	—	Indoor and outdoor rated voltage different	• Indoor and outdoor units check
H35	Indoor drain water adverse current abnormal	—	—	—	—
H38	Indoor/Outdoor mismatch (brand code)	—	—	Brand code not match	• Check indoor unit and outdoor unit
H97	Outdoor fan motor mechanism lock	2 times happen within 30 minutes	—	Outdoor fan motor lock or feedback abnormal	• Outdoor fan motor lead wire and connector • Fan motor lock or block
H98	Indoor high pressure protection	—	—	Indoor high pressure protection (Heating)	• Check indoor heat exchanger • Air filter dirty • Air circulation short circuit
H99	Indoor operating unit freeze protection	—	—	Indoor freeze protection (Cooling)	• Check indoor heat exchanger • Air filter dirty • Air circulation short circuit
F11	4-way valve switching abnormality	4 times happen within 30 minutes	—	4-way valve switching abnormal	• 4-way valve • Lead wire and connector
F90	Power factor correction (PFC) circuit protection	4 times happen within 10 minutes	—	Power factor correction circuit abnormal	• Outdoor PCB faulty
F91	Refrigeration cycle abnormality	2 times happen within 20 minutes	—	Refrigeration cycle abnormal	• Insufficient refrigerant or valve close
F93	Compressor abnormal revolution	4 times happen within 20 minutes	—	Compressor abnormal revolution	• Power transistor module faulty or compressor lock

Diagnosis display	Abnormality / Protection control	Abnormality Judgment	Protection Operation	Problem	Check location
F95	Outdoor cooling high pressure protection	4 times happen within 20 minutes	—	Cooling high pressure protection	• Check refrigeration system • Outdoor air circuit
F96	Power transistor module overheating protection	4 times happen within 30 minutes	—	Power transistor module overheat	• PCB faulty • Outdoor air circuit (fan motor)
F97	Compressor overheating protection	3 times happen within 30 minutes	—	Compressor overheat	• Insufficient refrigerant
F98	Total running current protection	3 times happen within 20 minutes	—	Total current protection	• Check refrigeration system • Power source or compressor lock
F99	Outdoor direct current (DC) peak detection	Continuous happen for 7 times	—	Power transistor module current protection	• Power transistor module faulty or compressor lock

14.4 Self-diagnosis Method

14.4.1 H11 (Indoor/Outdoor Abnormal Communication)

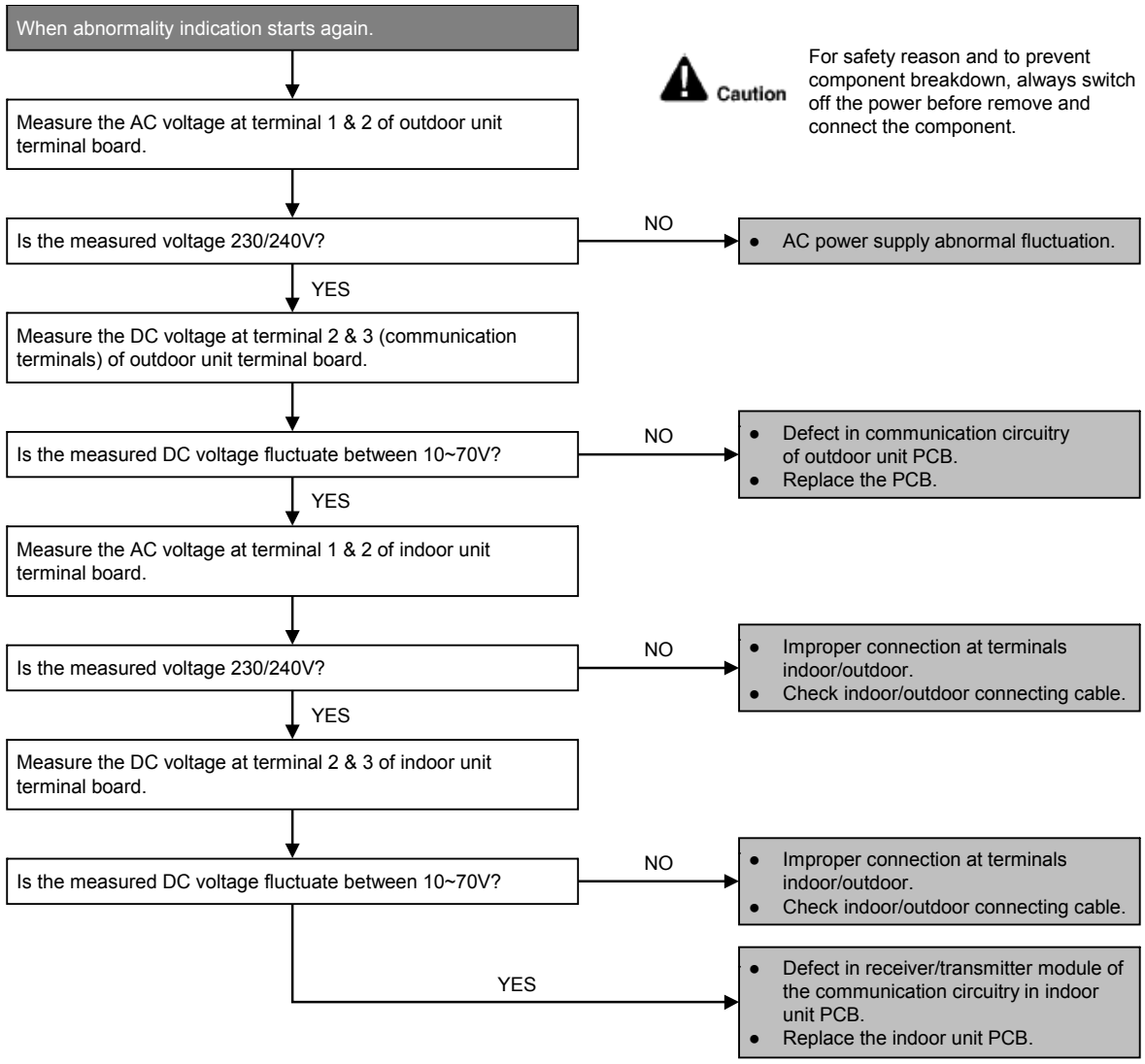
Malfunction Decision Conditions

- During startup and operation of cooling and heating, the data received from outdoor unit in indoor unit signal transmission is checked whether it is normal.

Malfunction Caused

- Faulty indoor unit PCB.
- Faulty outdoor unit PCB.
- Indoor unit-outdoor unit signal transmission error due to wiring error.
- Indoor unit-outdoor unit signal transmission error due to breaking of wire in the connection wires between the indoor and outdoor units.

Troubleshooting



14.4.2 H12 (Indoor/Outdoor Capacity Rank Mismatched)

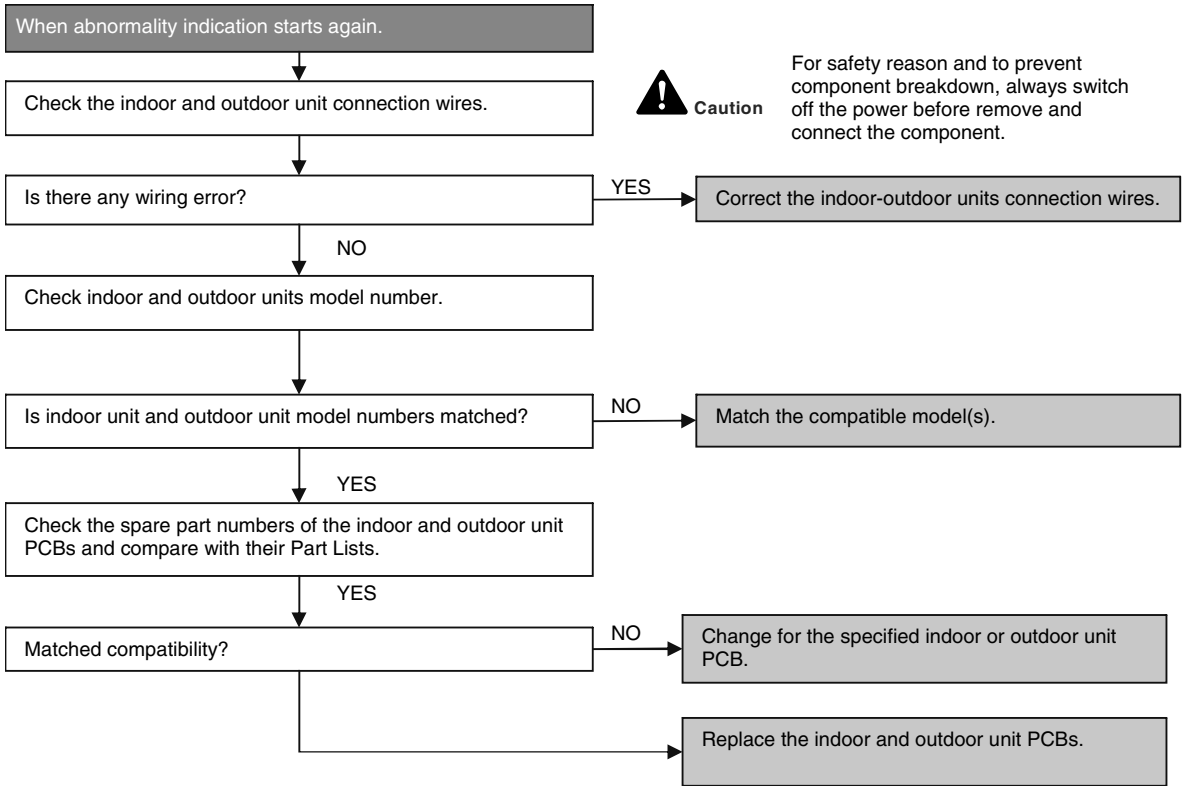
Malfunction Decision Conditions

- During startup, error code appears when different types of indoor and outdoor units are interconnected.

Malfunction Caused

- Wrong models interconnected.
- Wrong indoor unit or outdoor unit PCBs mounted.
- Indoor unit or outdoor unit PCBs defective.
- Indoor-outdoor unit signal transmission error due to wrong wiring.
- Indoor-outdoor unit signal transmission error due to breaking of wire 3 in the connection wires between the indoor and outdoor units.

Troubleshooting



14.4.3 H14 (Indoor Intake Air Temperature Sensor Abnormality)

Malfunction Decision Conditions

- During startup and operation of cooling and heating, the temperatures detected by the indoor intake air temperature sensor are used to determine sensor errors.

Malfunction Caused

- Faulty connector connection.
- Faulty sensor.
- Faulty PCB.

Troubleshooting

When abnormality indication starts again.

Check the connector connection:
- Turn off the power.
- Check the connector connection.

Caution For safety reason and to prevent component breakdown, always switch off the power before remove and connect the component.

Is the connector connection normal?

NO
- Connector poor contact.
- Correct the connection.

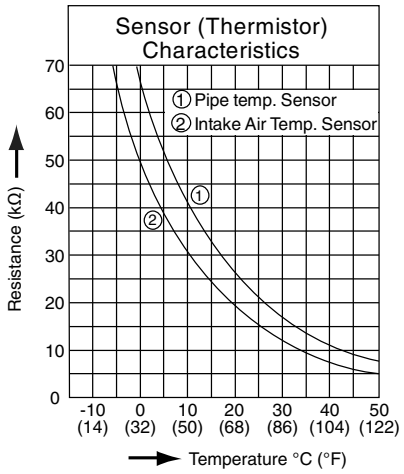
YES

Check the indoor intake air temperature sensor:
- Plug out connector from the indoor unit PCB.
- Measure the resistance of the indoor intake air temperature sensor.

Is the measured resistance of the indoor intake air temperature sensor matches the value specified in its characteristic chart?

NO
- Defect in indoor intake air temperature sensor.
- Replace the indoor intake air temperature sensor.

YES
- Defect in indoor unit PCB.
- Replace the indoor unit PCB.



14.4.4 H15 (Compressor Temperature Sensor Abnormality)

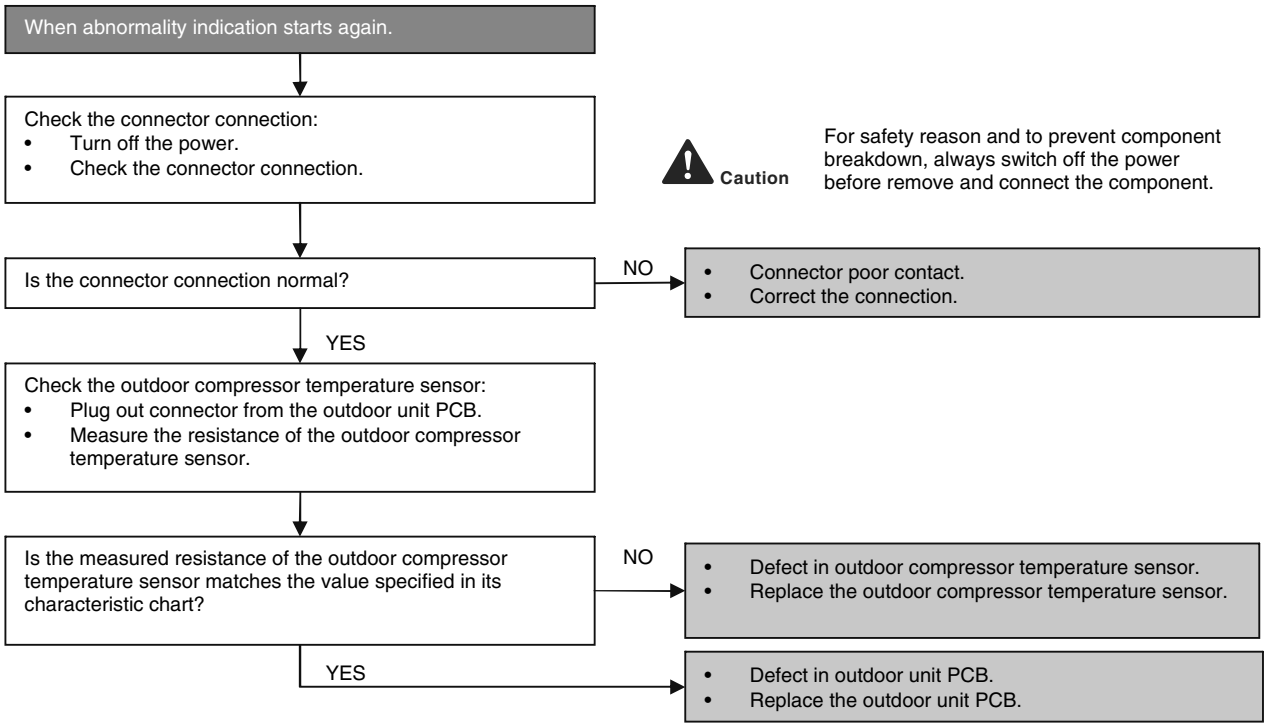
Malfunction Decision Conditions

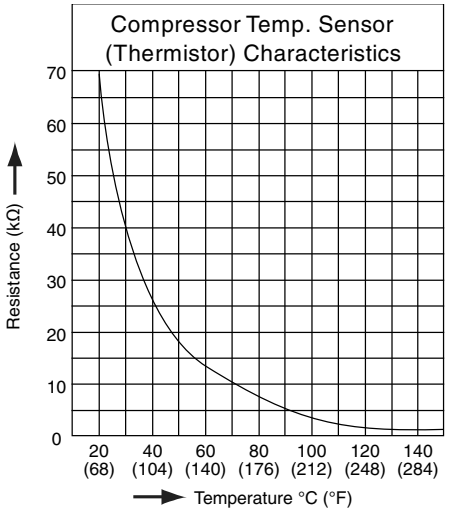
- During startup and operation of cooling and heating, the temperatures detected by the outdoor compressor temperature sensor are used to determine sensor errors.

Malfunction Caused

- Faulty connector connection.
- Faulty sensor.
- Faulty PCB.

Troubleshooting





14.4.5 H16 (Outdoor Current Transformer)

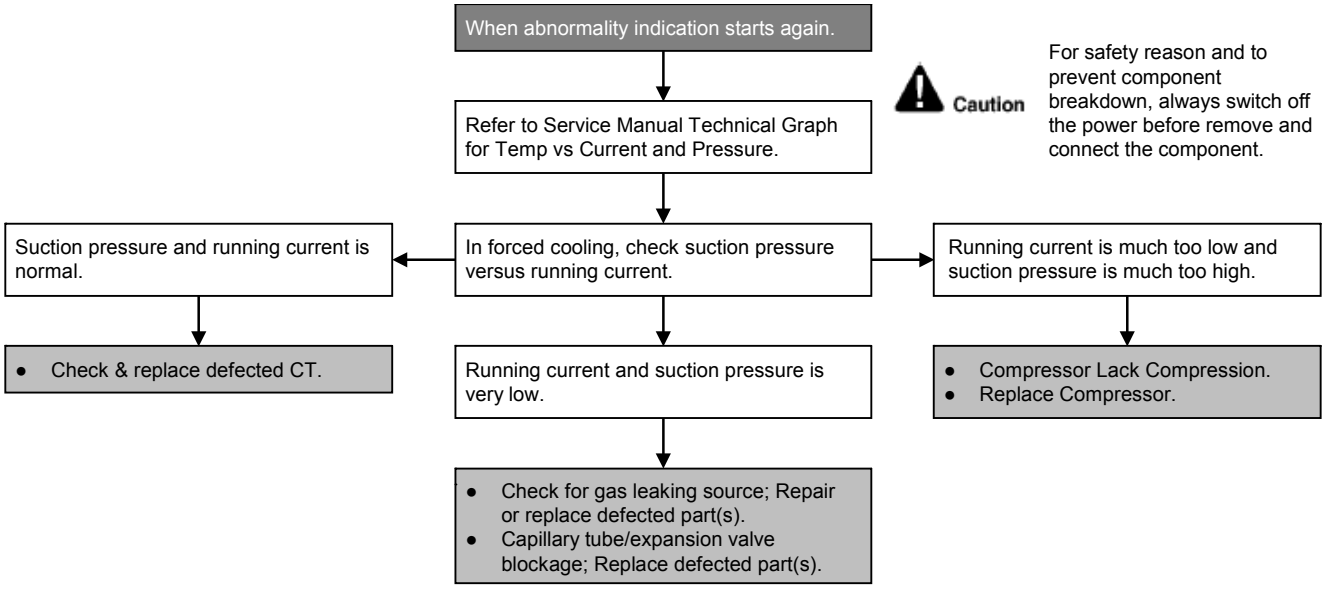
Malfunction Decision Conditions

- An input current, detected by Current Transformer CT, is below threshold value when the compressor is operating at certain frequency value for 3 minutes.

Malfunction Caused

- Lack of gas
- Broken CT (current transformer)
- Broken Outdoor PCB

Troubleshooting



14.4.6 H19 (Indoor Fan Motor – DC Motor Mechanism Locked)

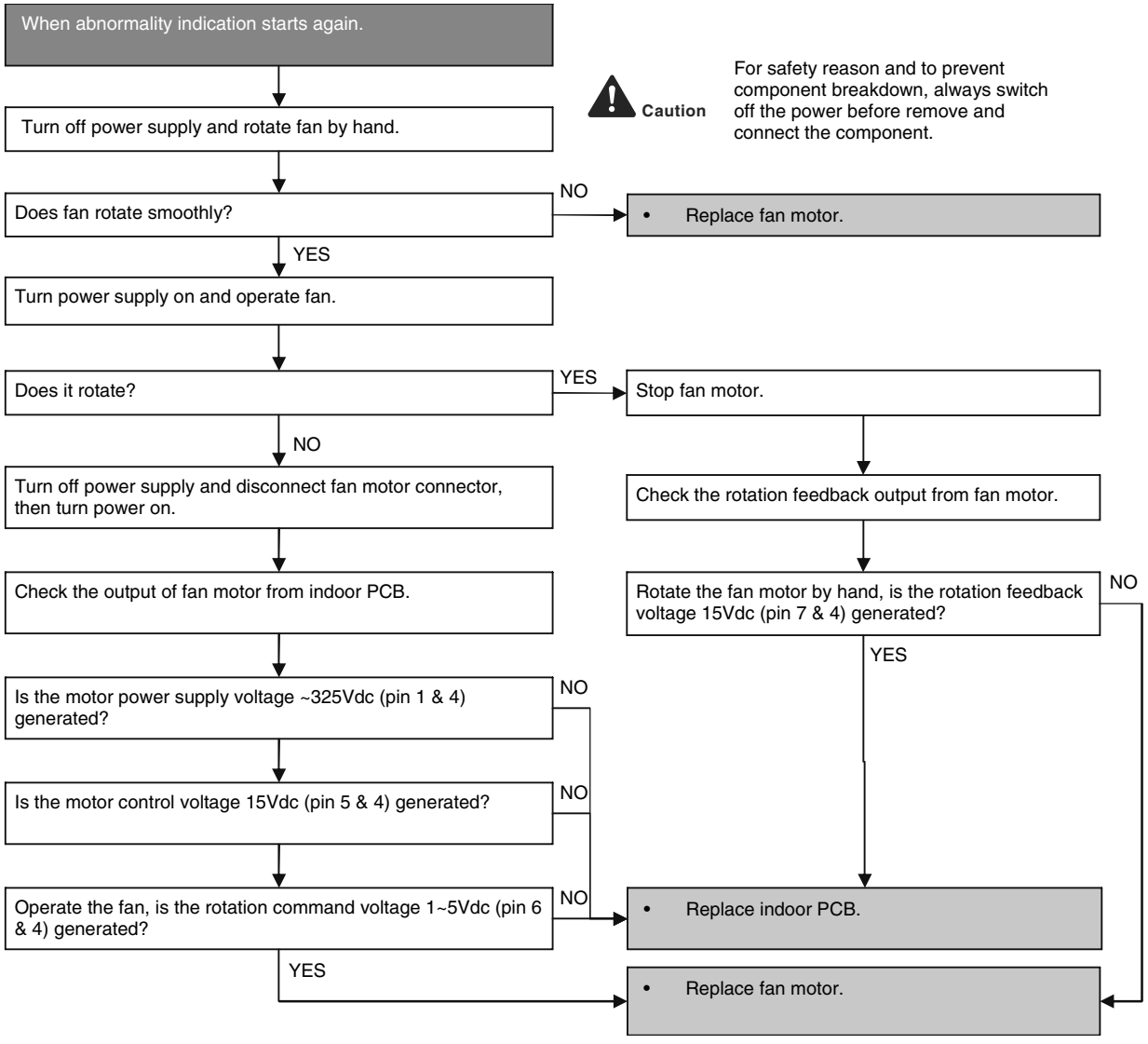
Malfunction Decision Conditions

- The rotation speed detected by the Hall IC during fan motor operation is used to determine abnormal fan motor (feedback of rotation > 2550rpm or < 50rpm)

Malfunction Caused

- Operation stops due to short circuit inside the fan motor winding.
- Operation stops due to breaking of wire inside the fan motor.
- Operation stops due to breaking of fan motor lead wires.
- Operation stops due to Hall IC malfunction.
- Operation error due to faulty indoor unit PCB.

Troubleshooting



14.4.7 H23 (Indoor Pipe Temperature Sensor Abnormality)

Malfunction Decision Conditions

- During startup and operation of cooling and heating, the temperatures detected by the indoor heat exchanger temperature sensor are used to determine sensor errors.

Malfunction Caused

- Faulty connector connection.
- Faulty sensor.
- Faulty PCB.

Troubleshooting

When abnormality indication starts again.

Check the connector connection:
- Plug out connector from the indoor unit PCB.
- Measure the resistance of the indoor pipe temperature sensor.

Caution For safety reason and to prevent component breakdown, always switch off the power before remove and connect the component.

Is the connector connection normal?

NO →
- Connector poor contact.
- Correct the connection.

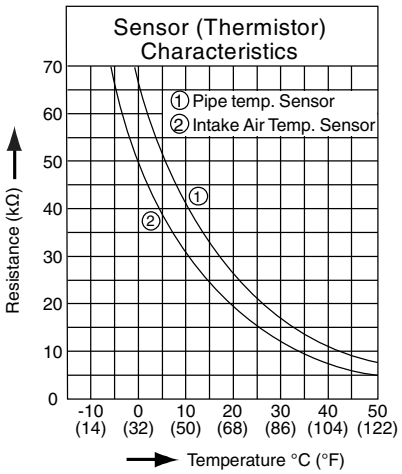
YES

Check the outdoor air temperature sensor:
- Plug out connector from the outdoor unit PCB.
- Measure the resistance of the outdoor intake air temperature sensor.

Is the measured resistance of the outdoor intake air temperature sensor matches the value specified in its characteristic chart?

NO →
- Defect in outdoor intake air temperature sensor.
- Replace the outdoor intake air temperature sensor.

YES →
- Defect in outdoor unit PCB.
- Replace the outdoor unit PCB.



14.4.8 H24 (Indoor Pipe Temperature Sensor 2 Abnormality)

Malfunction Decision Conditions

- During startup and operation of cooling and heating, the temperatures detected by the indoor heat exchanger temperature sensor 2 are used to determine sensor errors.

Malfunction Caused

- Faulty connector connection.
- Faulty sensor.
- Faulty PCB.

Troubleshooting

When abnormality indication starts again.

Check the connector connection:
- Plug out connector from the indoor unit PCB.
- Measure the resistance of the indoor pipe temperature sensor.

Caution: For safety reason and to prevent component breakdown, always switch off the power before remove and connect the component.

Is the connector connection normal?

NO →
- Connector poor contact.
- Correct the connection.

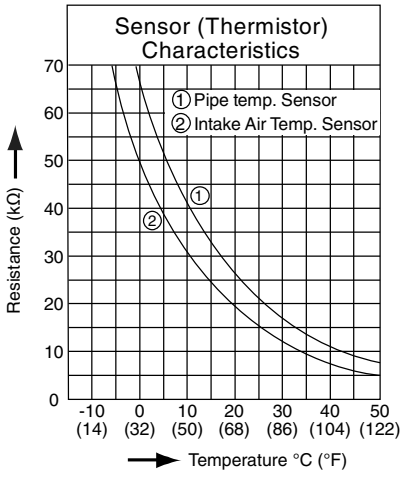
YES

Check the outdoor air temperature sensor:
- Plug out connector from the outdoor unit PCB.
- Measure the resistance of the outdoor intake air temperature sensor.

Is the measured resistance of the outdoor intake air temperature sensor matches the value specified in its characteristic chart?

NO →
- Defect in outdoor intake air temperature sensor.
- Replace the outdoor intake air temperature sensor.

YES →
- Defect in outdoor unit PCB.
- Replace the outdoor unit PCB.



14.4.9 H27 (Outdoor Air Temperature Sensor Abnormality)

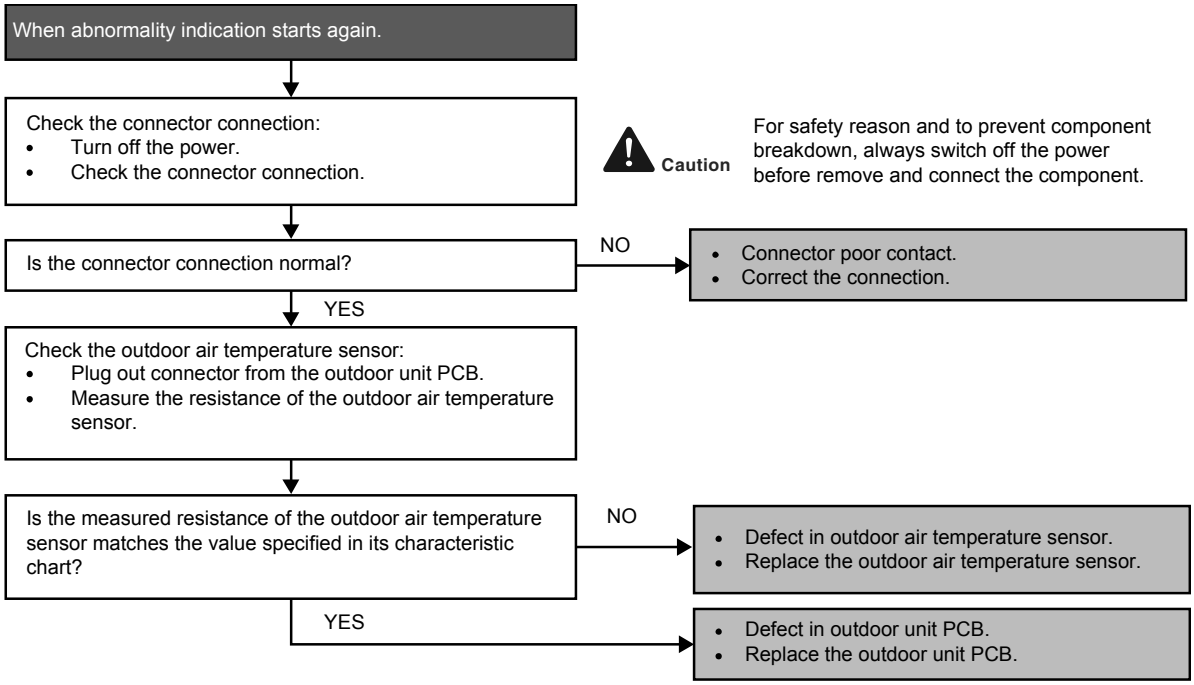
Malfunction Decision Conditions

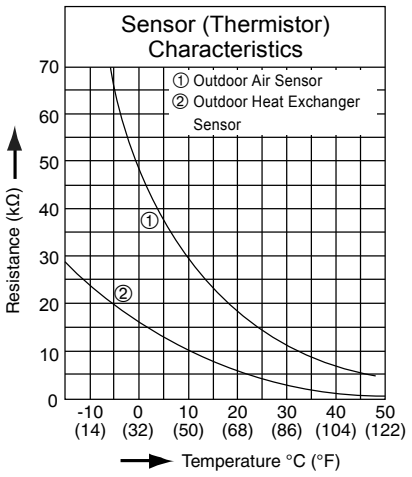
- During startup and operation of cooling and heating, the temperatures detected by the outdoor air temperature sensor are used to determine sensor errors.

Malfunction Caused

- Faulty connector connection.
- Faulty sensor.
- Faulty PCB.

Troubleshooting





14.4.10 H28 (Outdoor Pipe Temperature Sensor Abnormality)

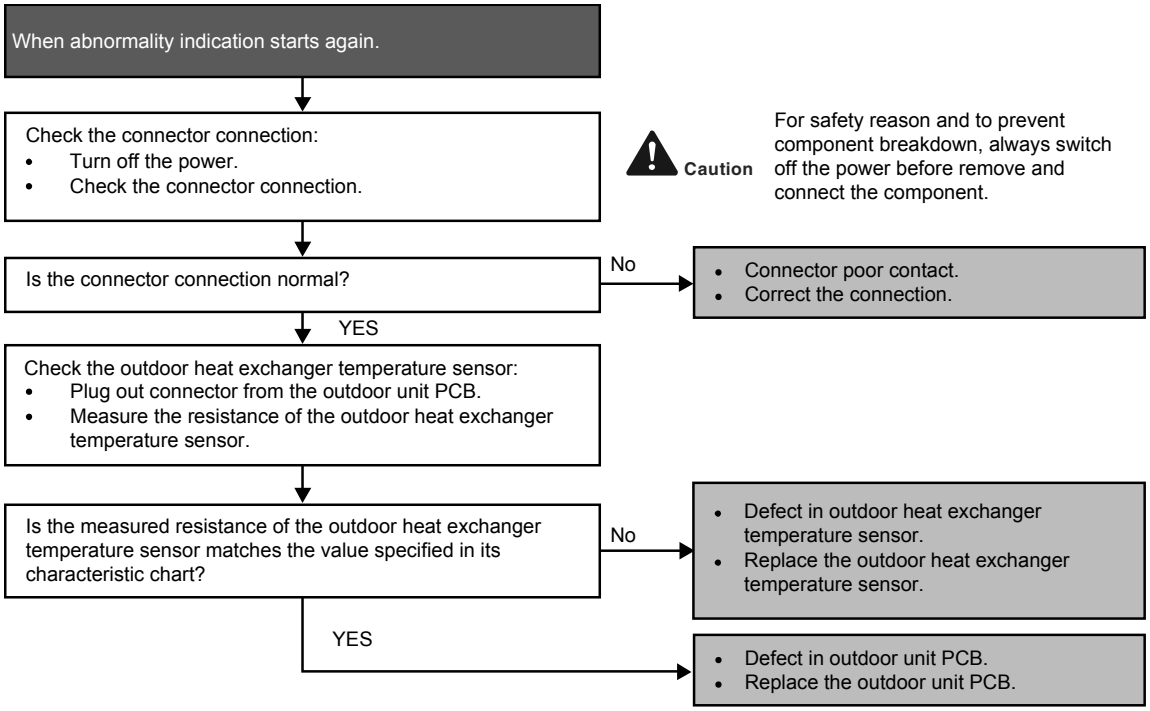
Malfunction Decision Conditions

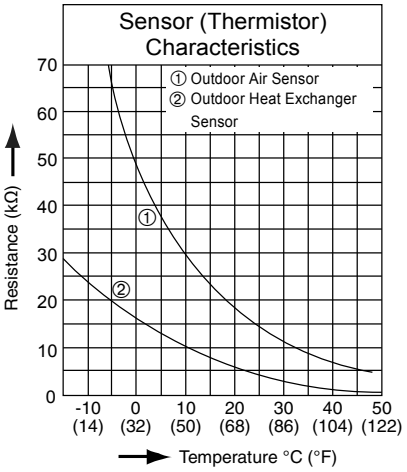
- During startup and operation of cooling and heating, the temperatures detected by the outdoor pipe temperature sensor are used to determine sensor errors.

Malfunction Caused

- Faulty connector connection.
- Faulty sensor.
- Faulty PCB.

Troubleshooting





14.4.11 H30 (Compressor Discharge Temperature Sensor Abnormality)

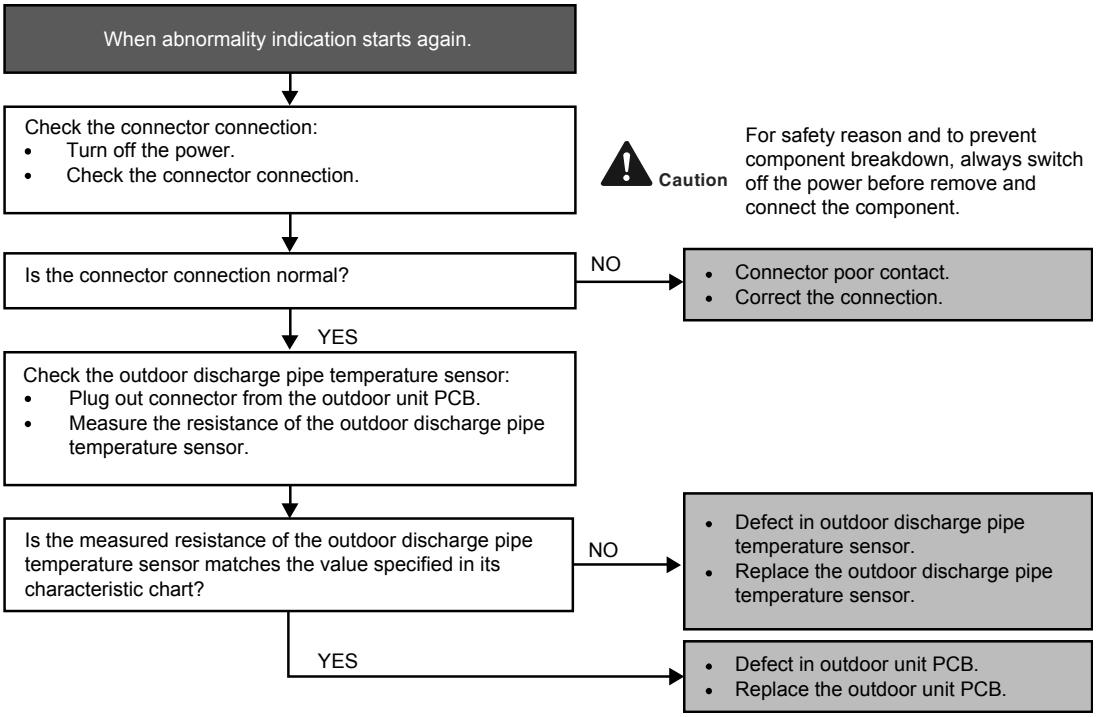
Malfunction Decision Conditions

- During startup and operation of cooling and heating, the temperatures detected by the outdoor discharge pipe temperature sensor are used to determine sensor errors.

Malfunction Caused

- Faulty connector connection.
- Faulty sensor.
- Faulty PCB.

Troubleshooting



14.4.12 H33 (Unspecified Voltage between Indoor and Outdoor)

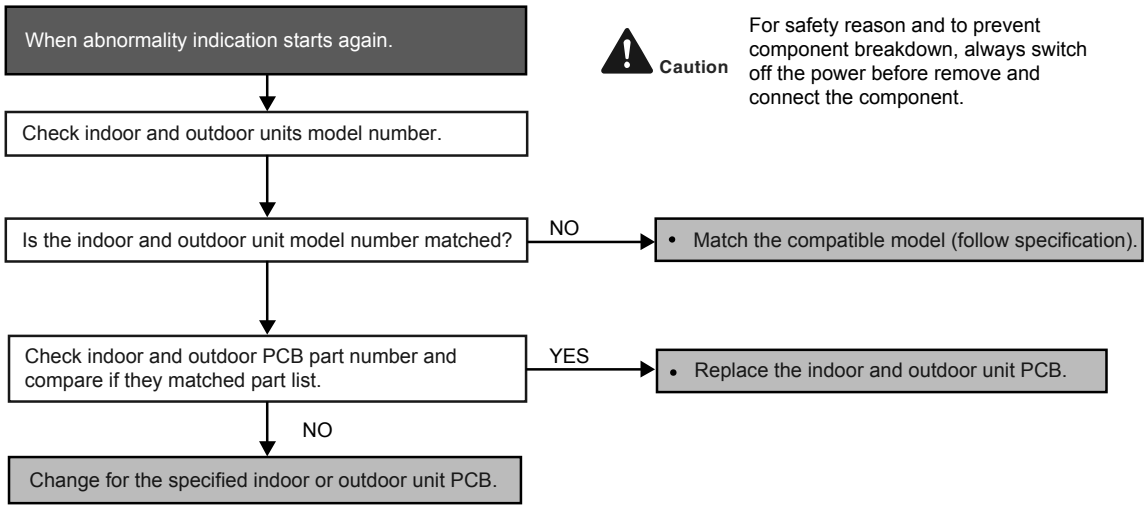
Malfunction Decision Conditions

- The supply power is detected for its requirement by the indoor/outdoor transmission.

Malfunction Caused

- Wrong models interconnected.
- Wrong indoor unit and outdoor unit PCBs used.
- Indoor unit or outdoor unit PCB defective.

Troubleshooting



14.4.13 H97 (Outdoor Fan Motor – DC Motor Mechanism Locked)

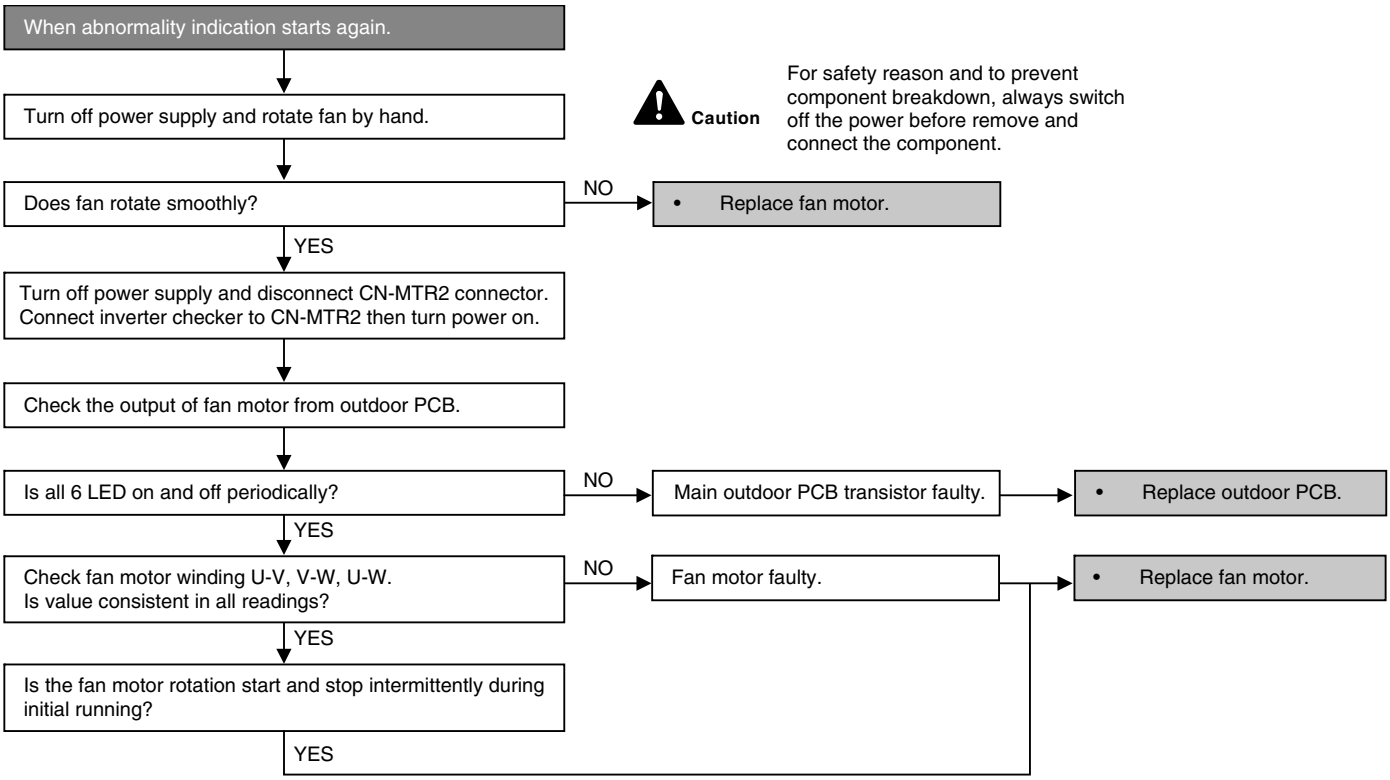
Malfunction Decision Conditions

- The rotation speed detected by the Hall IC during fan motor operation is used to determine abnormal fan motor.

Malfunction Caused

- Operation stops due to short circuit inside the fan motor winding.
- Operation stops due to breaking of wire inside the fan motor.
- Operation stops due to breaking of fan motor lead wires.
- Operation stops due to Hall IC malfunction.
- Operation error due to faulty outdoor unit PCB.

Troubleshooting



14.4.14 H98 (Error Code Stored in Memory and no alarm is triggered / no TIMER LED flashing)

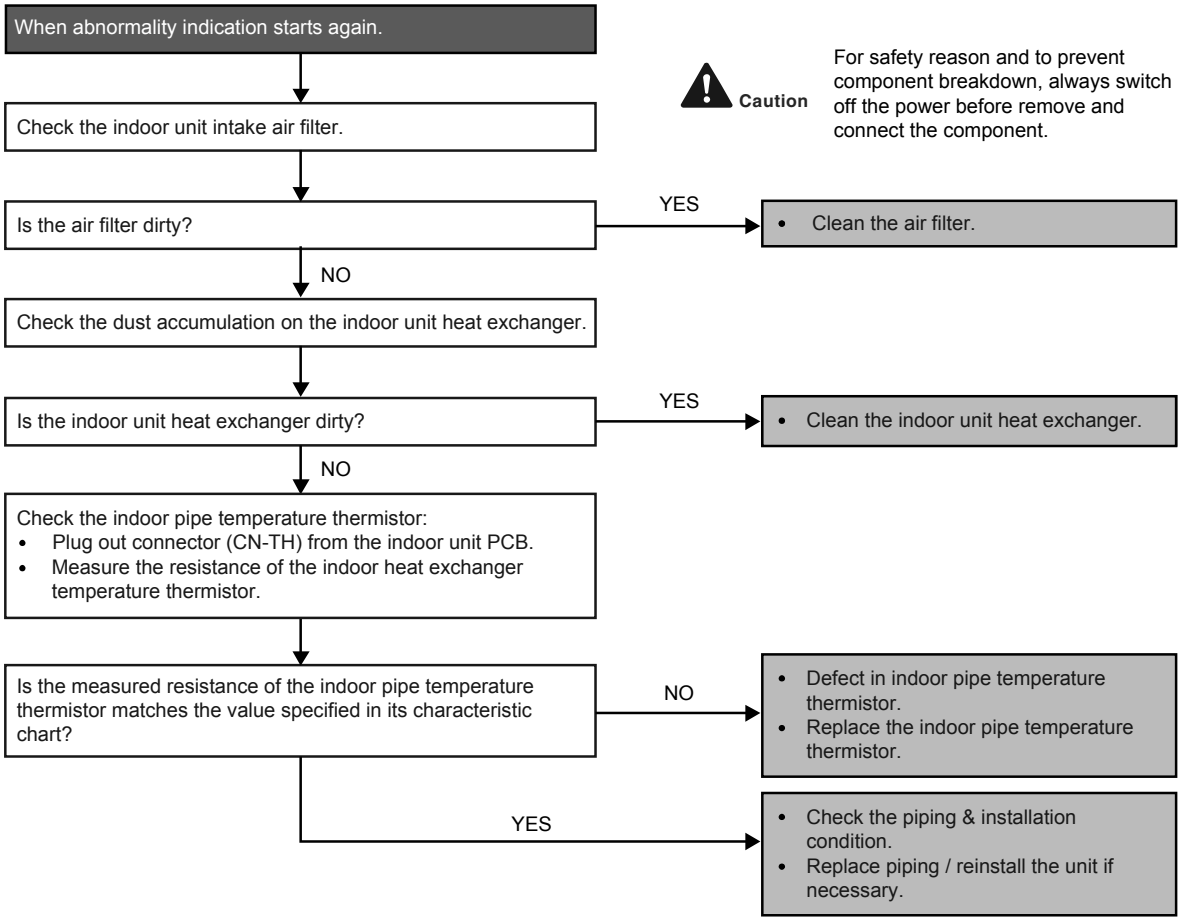
Malfunction Decision Conditions

- Indoor high pressure is detected when indoor heat exchanger is detecting very high temperature when the unit is operating in heating operation.
- Phenomena: unit is stopping and re-starting very often in heating mode.

Malfunction Caused

- Indoor heat exchanger thermistor
- Clogged air filter or heat exchanger
- Over-bent pipe (liquid side)

Troubleshooting



14.4.15 H99 (Indoor Freeze Prevention Protection: Cooling or Soft Dry)

Error Code will not display (no Timer LED blinking) but store in EEPROM

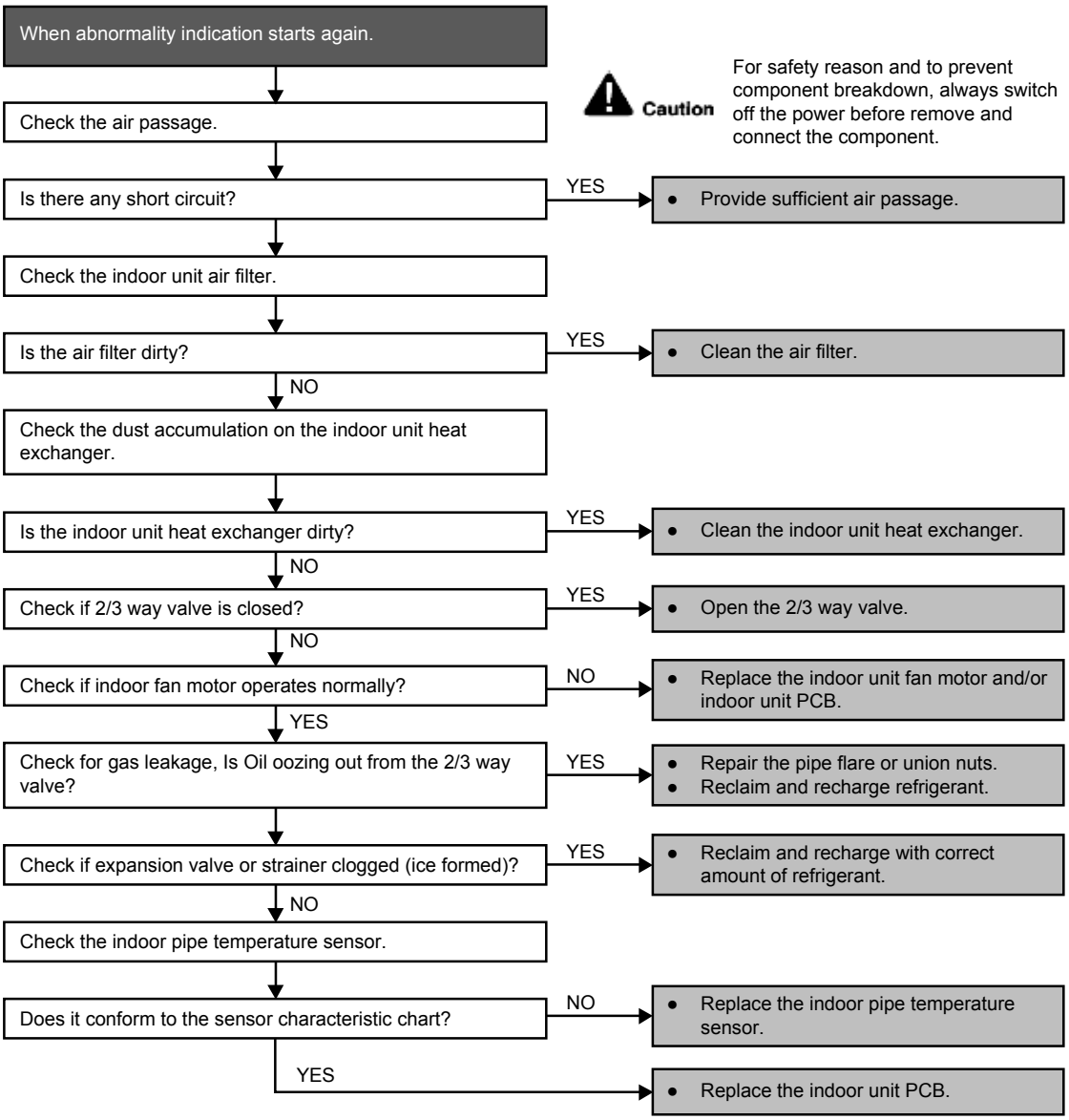
Malfunction Decision Conditions

- Freeze prevention control takes place (when indoor pipe temperature is lower than 2°C (35.6°F))

Malfunction Caused

- Air short circuit at indoor unit
- Clogged indoor unit air filter
- Dust accumulation on the indoor unit heat exchanger
- 2/3 way valve closed
- Faulty indoor unit fan motor
- Refrigerant shortage (refrigerant leakage)
- Clogged expansion valve or strainer
- Faulty indoor pipe temperature sensor
- Faulty indoor unit PCB

Troubleshooting



14.4.16 F11 (4-way Valve Switching Failure)

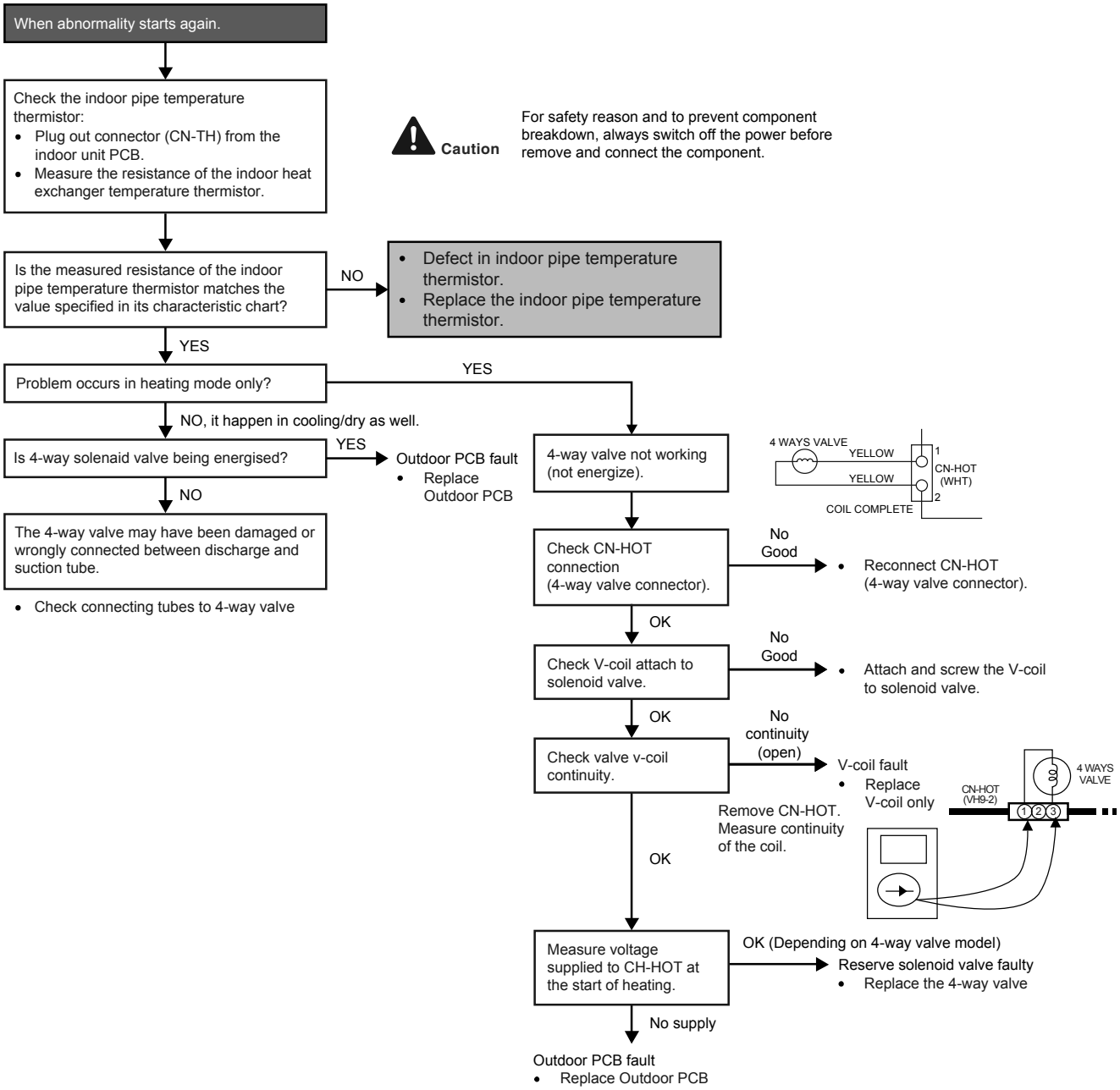
Malfunction Decision Conditions

- When indoor heat exchanger is cold during heating (except deice) or when indoor heat exchanger is hot during cooling and compressor operating, the 4-way valve is detected as malfunction.

Malfunction Caused

- Indoor heat exchanger (pipe) thermistor
- 4-way valve malfunction

Troubleshooting



* Check gas side pipe – for hot gas flow in cooling mode

14.4.17 F90 (Power Factor Correction Protection)

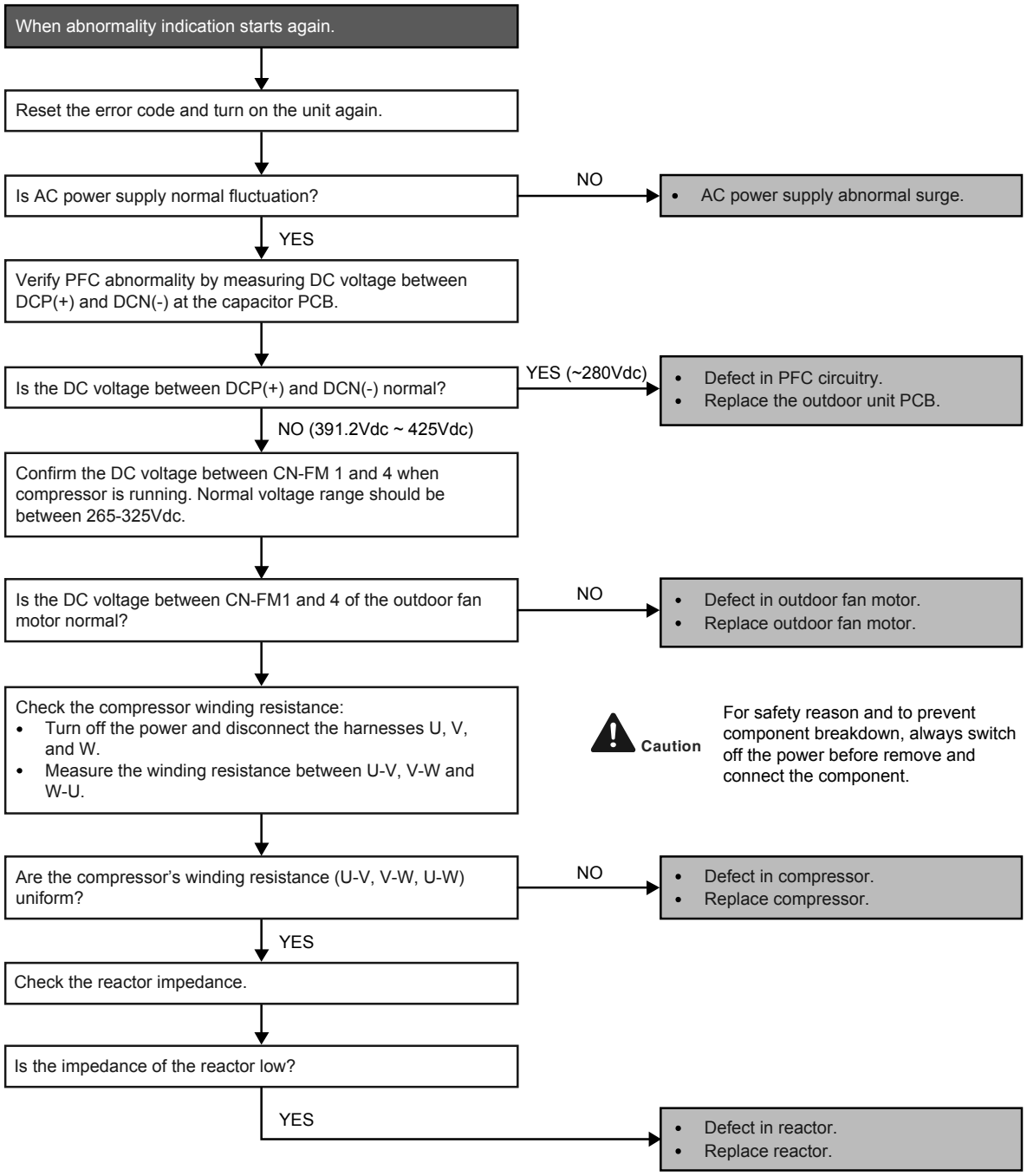
Malfunction Decision Conditions

- To maintain DC voltage level supply to power transistor.
- To detect high DC voltage level after rectification.

Malfunction Caused

- During startup and operation of cooling and heating, when Power Factor Correction (PFC) protection circuitry at the outdoor unit main PCB senses abnormal DC voltage level for power transistors.
- When DC voltage detected is LOW, transistor switching will turn ON by controller to push-up the DC level.
- When DC voltage detected is HIGH (391Vdc – 425Vdc), active LOW signal will send by the controller to turn OFF relay RY-C.

Troubleshooting



14.4.18 F91 (Refrigeration Cycle Abnormality)

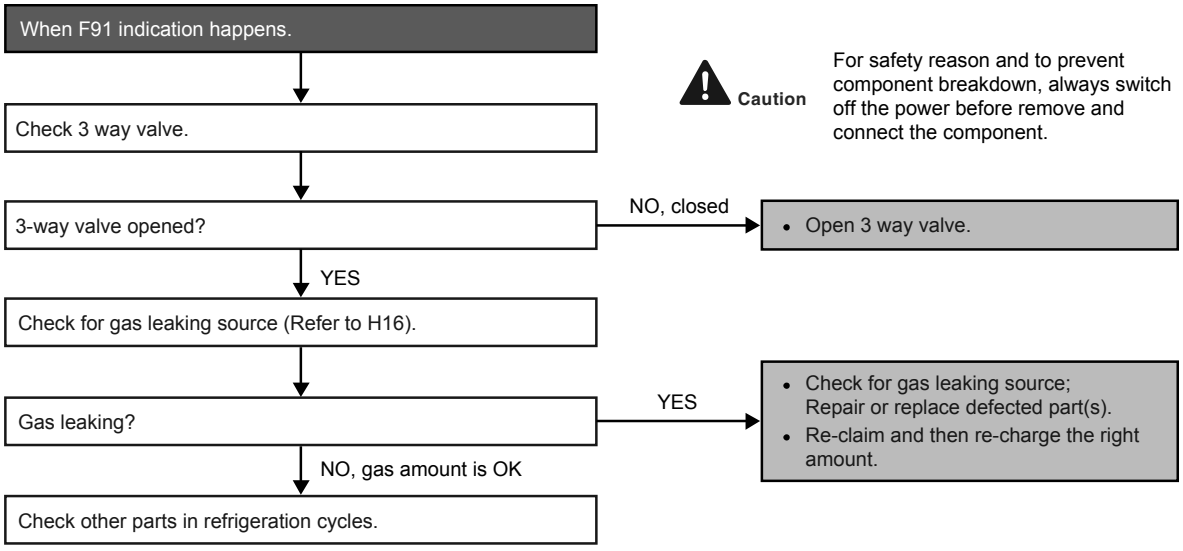
Malfunction Decision Conditions

- The input current is low while the compressor is running at higher than the setting frequency.

Malfunction Caused

- Lack of gas.
- 3-way valve close.

Troubleshooting



14.4.19 F93 (Compressor Rotation Failure)

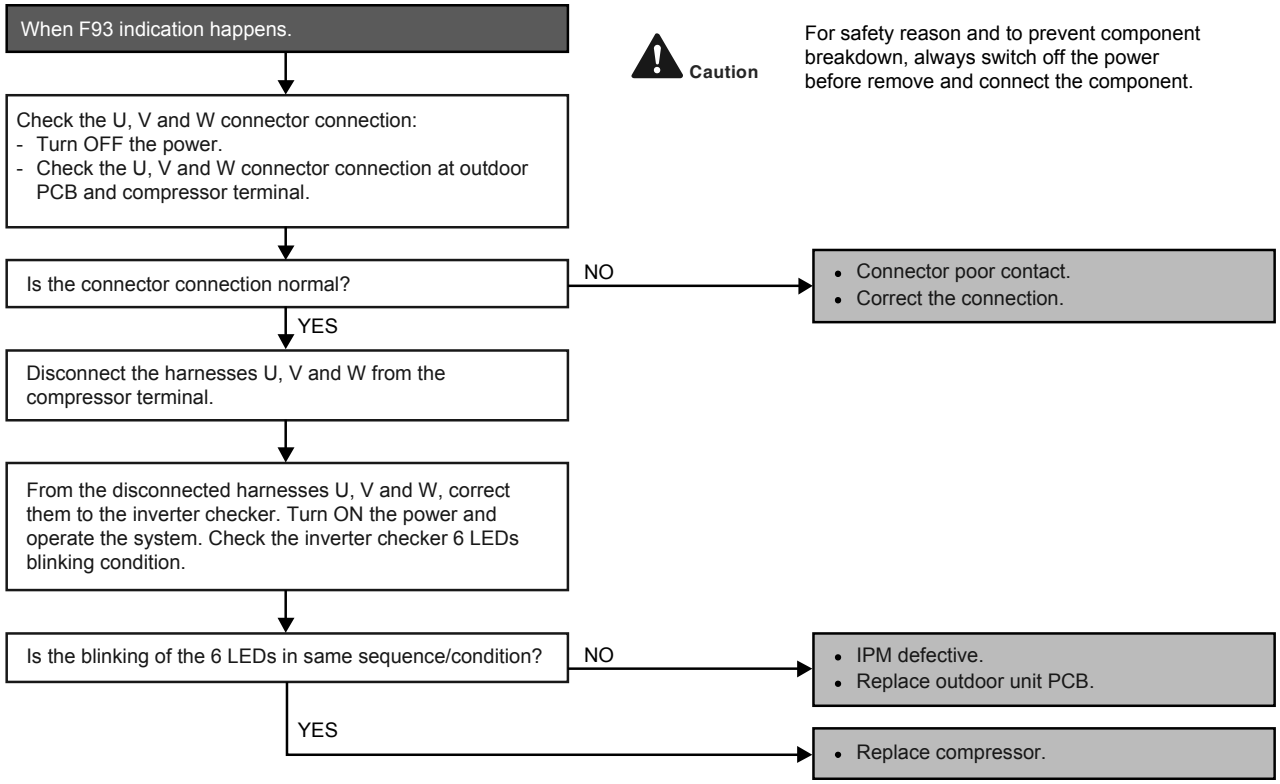
Malfunction Decision Conditions

- A compressor rotation failure is detected by checking the compressor running condition through the position detection circuit.

Malfunction Caused

- Compressor terminal disconnect
- Faulty Outdoor PCB
- Faulty compressor

Troubleshooting



14.4.20 F95 (Outdoor High Pressure Protection: Cooling or Soft Dry)

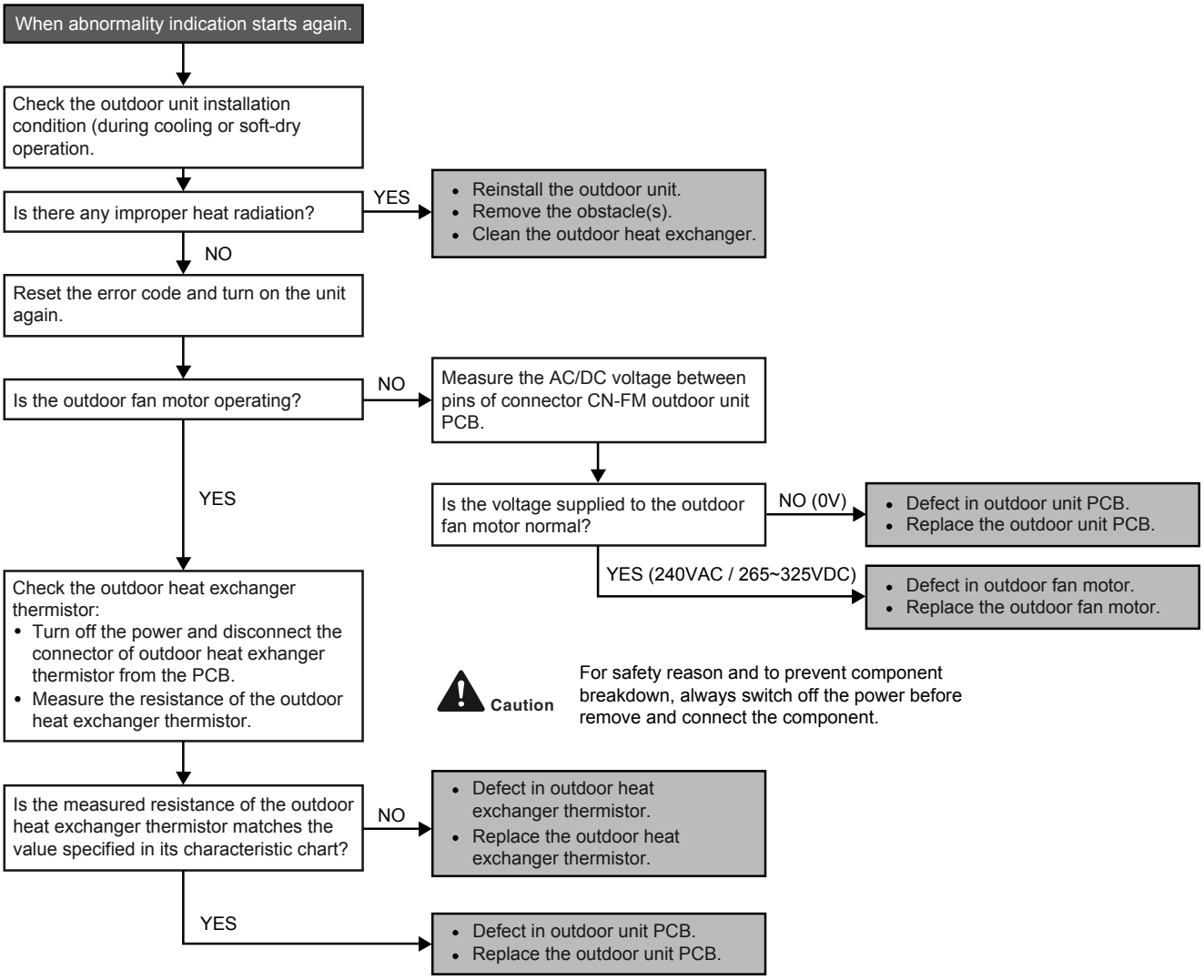
Malfunction Decision Conditions

- During operation of cooling or soft dry, when outdoor unit heat exchanger high temperature data is detected by the outdoor unit heat exchanger thermistor.

Malfunction Caused

- Outdoor heat exchanger temperature rise due to short-circuit of hot discharge air flow.
- Outdoor heat exchanger temperature rise due to defective of outdoor fan motor.
- Outdoor heat exchange temperature rise due to defective outdoor heat exchanger thermistor.
- Outdoor heat exchanger temperature rise due to defective of outdoor unit PCB.

Troubleshooting



14.4.21 F96 (IPM Overheating)

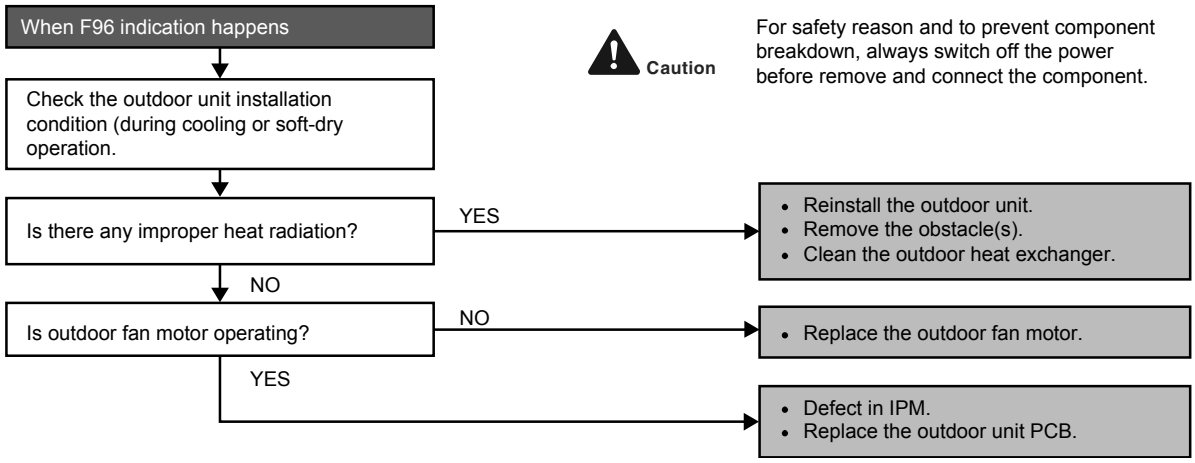
Malfunction Decision Conditions

- During operating of cooling and heating, when IPM temperature data (100°C (202°F)) is detected by the IPM temperature sensor.
  Multi Models only
  - Compressor Overheating: During operation of cooling and heating, when the compressor OL is activated.
  - Heat Sink Overheating: During operation of cooling and heating, when heat sink temperature data (90°C (194°F)) is detected by the heat sink temperature sensor.

Malfunction Caused

- IPM overheats due to short circuit of hot discharge air flow.
- IPM overheats due to defective of outdoor fan motor.
- IPM overheats due to defective of internal circuitry of IPM.
- IPM overheats due to defective IPM temperature sensor.
  Multi Models Only
  - Compressor OL connector poor contact.
  - Compressor OL faulty.

Troubleshooting



14.4.22 F97 (Compressor Overheating)

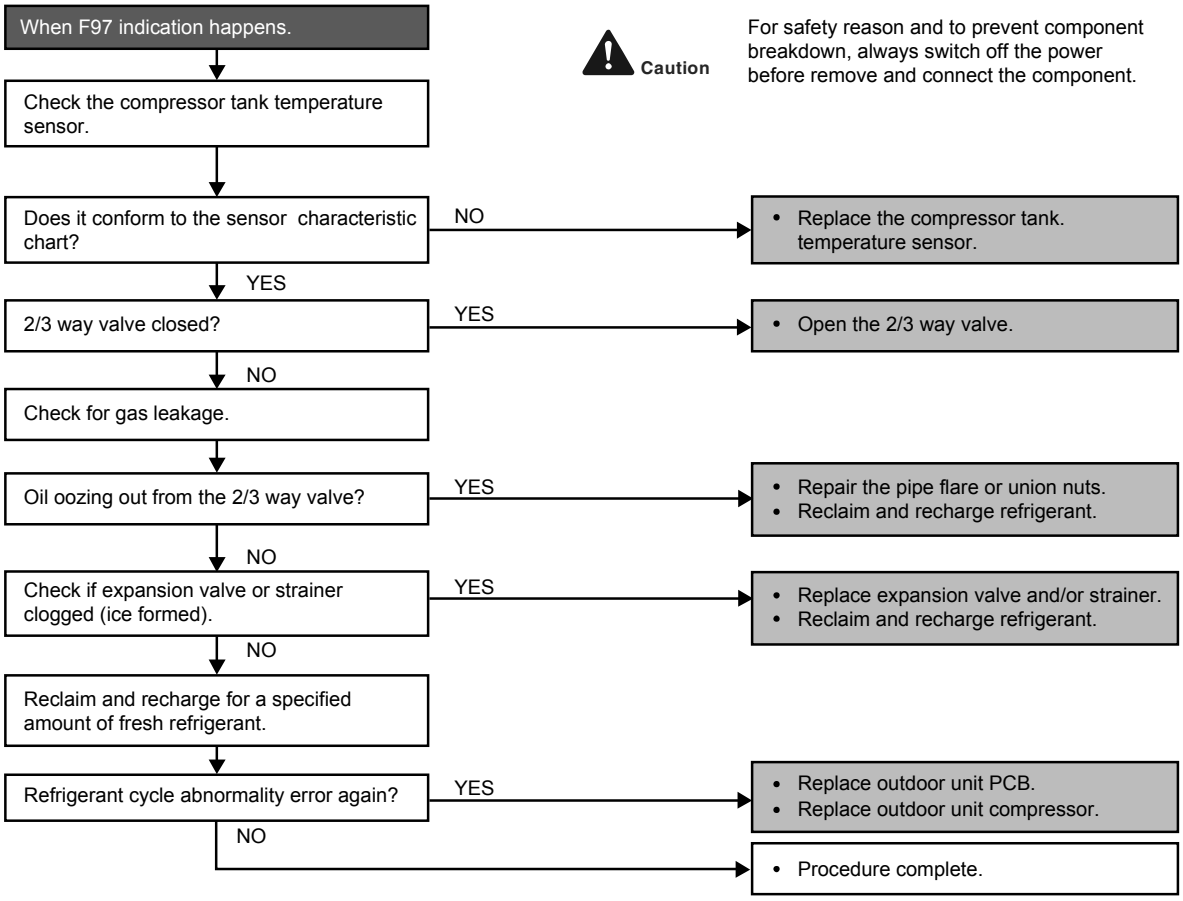
Malfunction Decision Conditions

- During operation of cooling and heating, when compressor tank temperature data (112°C (233.6°F)) is detected by the compressor tank temperature sensor.

Malfunction Caused

- Faulty compressor tank temperature sensor
- 2/3 way valve closed
- Refrigerant shortage (refrigerant leakage)
- Faulty outdoor unit PCB
- Faulty compressor

Troubleshooting



14.4.23 F98 (Input Over Current Detection)

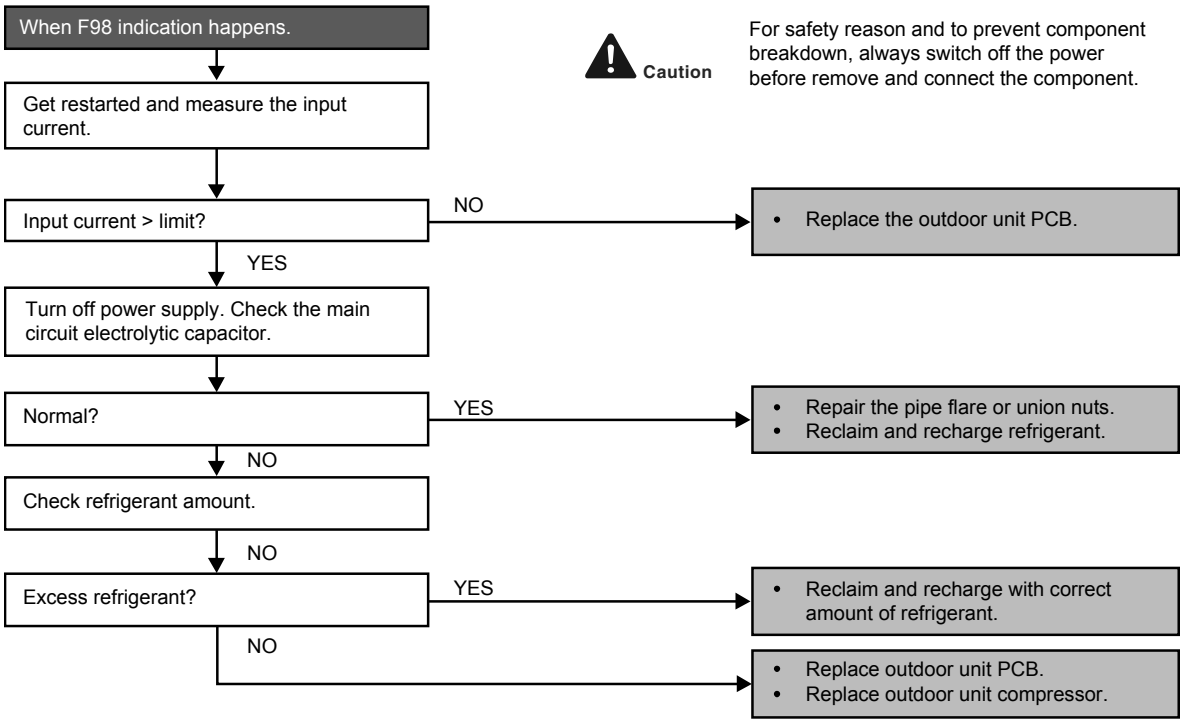
Malfunction Decision Conditions

- During operation of cooling and heating, when an input over-current (X value in Total Running Current Control) is detected by checking the input current value being detected by current transformer (CT) with the compressor running.

Malfunction Caused

- Excessive refrigerant.
- Faulty outdoor unit PCB.

Troubleshooting



14.4.24 F99 (DC Peak Detection)

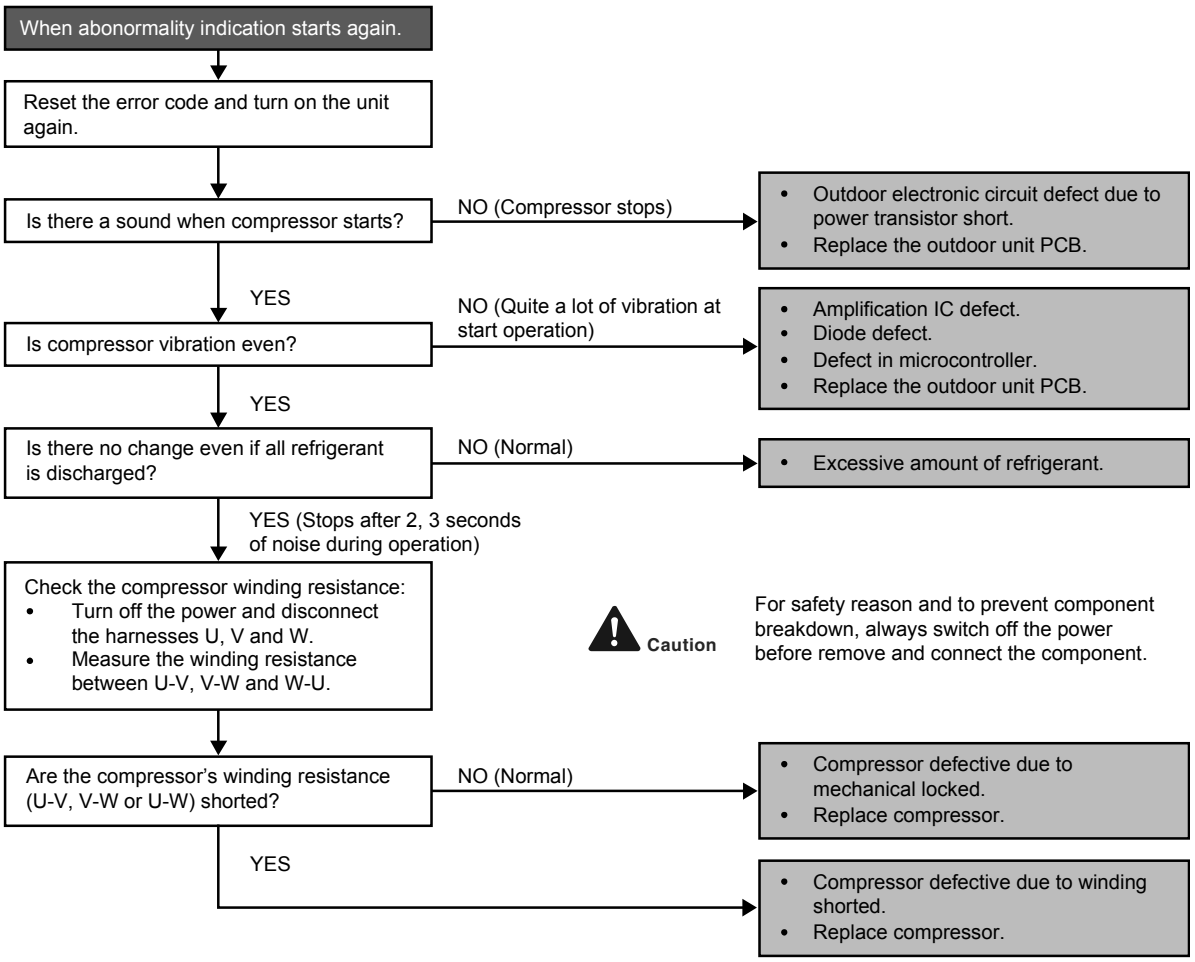
Malfunction Decision Conditions

During startup and operation of cooling and heating, when inverter DC peak data is received by the outdoor internal DC Peak sensing circuitry.

Malfunction Caused

- DC current peak due to compressor failure.
- DC current peak due to defective power transistor(s).
- DC current peak due to defective outdoor unit PCB.
- DC current peak due to short circuit.

Troubleshooting



15. Disassembly and Assembly Instructions

⚠ WARNING

High Voltage is generated in the electrical parts area by the capacitor. Ensure that the capacitor has discharged sufficiently before proceeding with repair work. Failure to heed this caution may result in electric shocks.

15.1 Disassembly of Parts

1 Open the Intake Grille from the Front Grille by moving the catchers to center (Fig.1).

Fig. 1

2 Remove the Control Board Cover by removing the screws (Fig. 2).

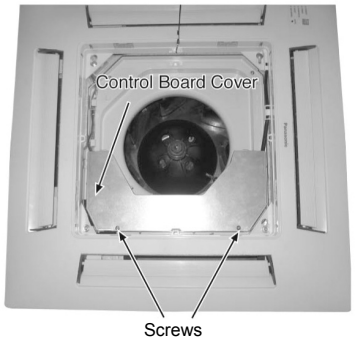


Fig. 2

3 Release the (Fig. 3):
- CN-STM1 (WHT) connector.
- CN-STM2 (YLW) connector.
- CN-DISP (WHT) connector.
- CN-FM (WHT) connector.
- CN-TH1 (WHT) connector.
- CN-TH2 (BLU) connector.
- CN-DRMTR1 (BLU) connector.
- AC01 (BLK), AC02 (WHT) and CN-DRMTR2 (RED) from Terminal Board.
- G01 (GRN) screw.
- Two T-BLK connectors.
- CN-T1 (WHT).
- CN-T2 (YLW).

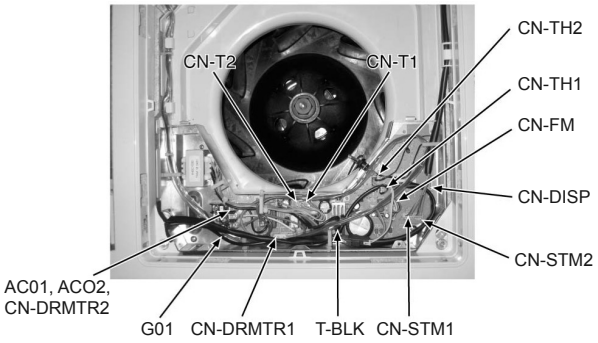


Fig. 3

4 To remove the Electronic Controller, release the 6 hooks that hold it to the Control Board (Fig. 4).

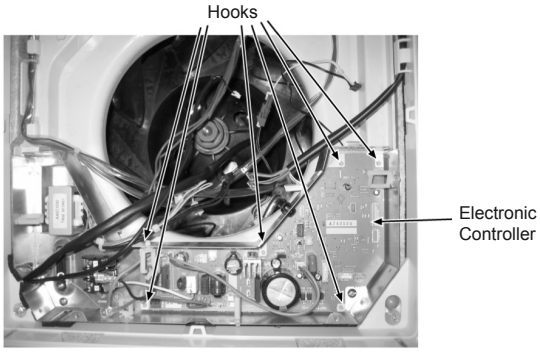


Fig. 4

5 Remove the Front Grille by removing the screw A and screws B, C & D half way open (Fig. 5).

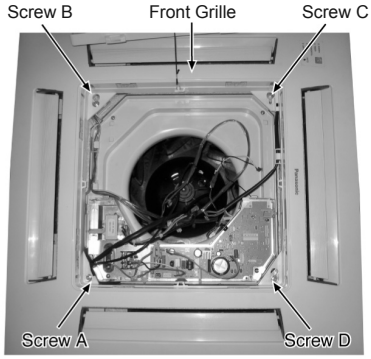


Fig. 5

6 Remove the Air Guider and Drain Pan complete by removing the screws (Fig. 6).

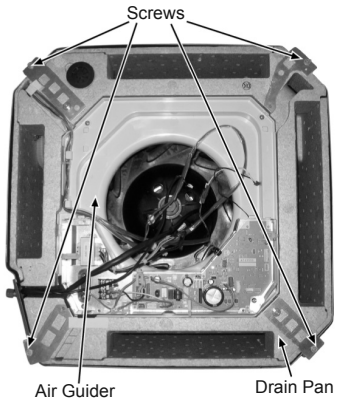


Fig. 6

7 Remove the Turbo Fan by removing the bolt (Fig. 7).

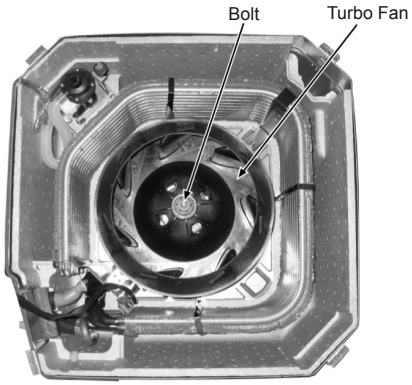


Fig. 7

8 Remove the Fan Motor by release the Fan Motor lead wire connectors and Fan Motor screws (Fig. 8).

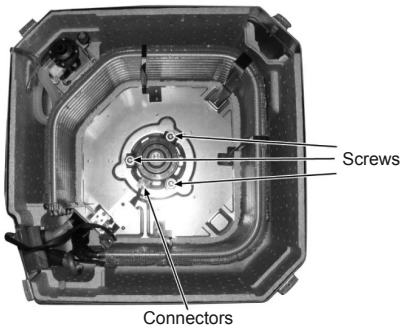
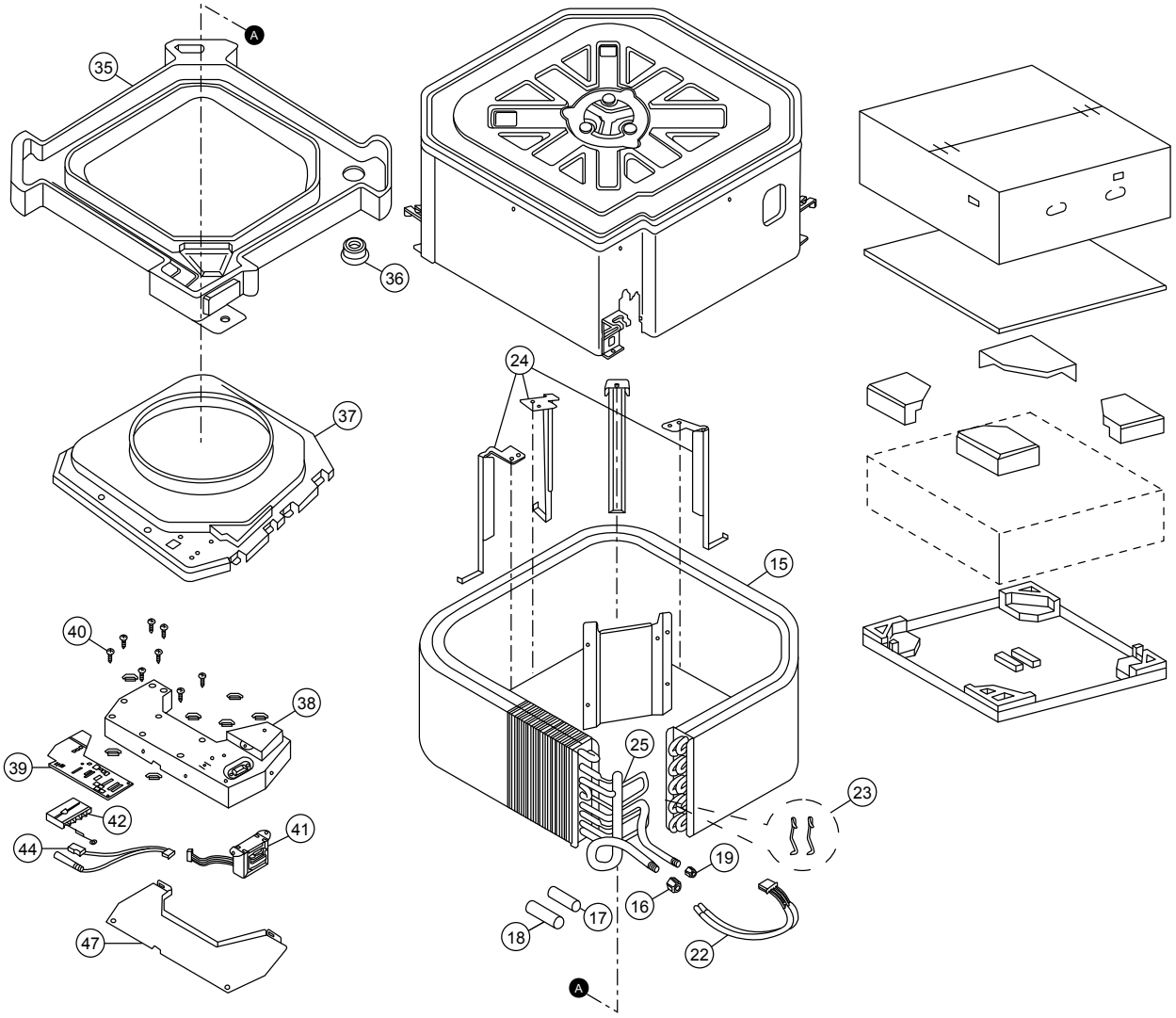
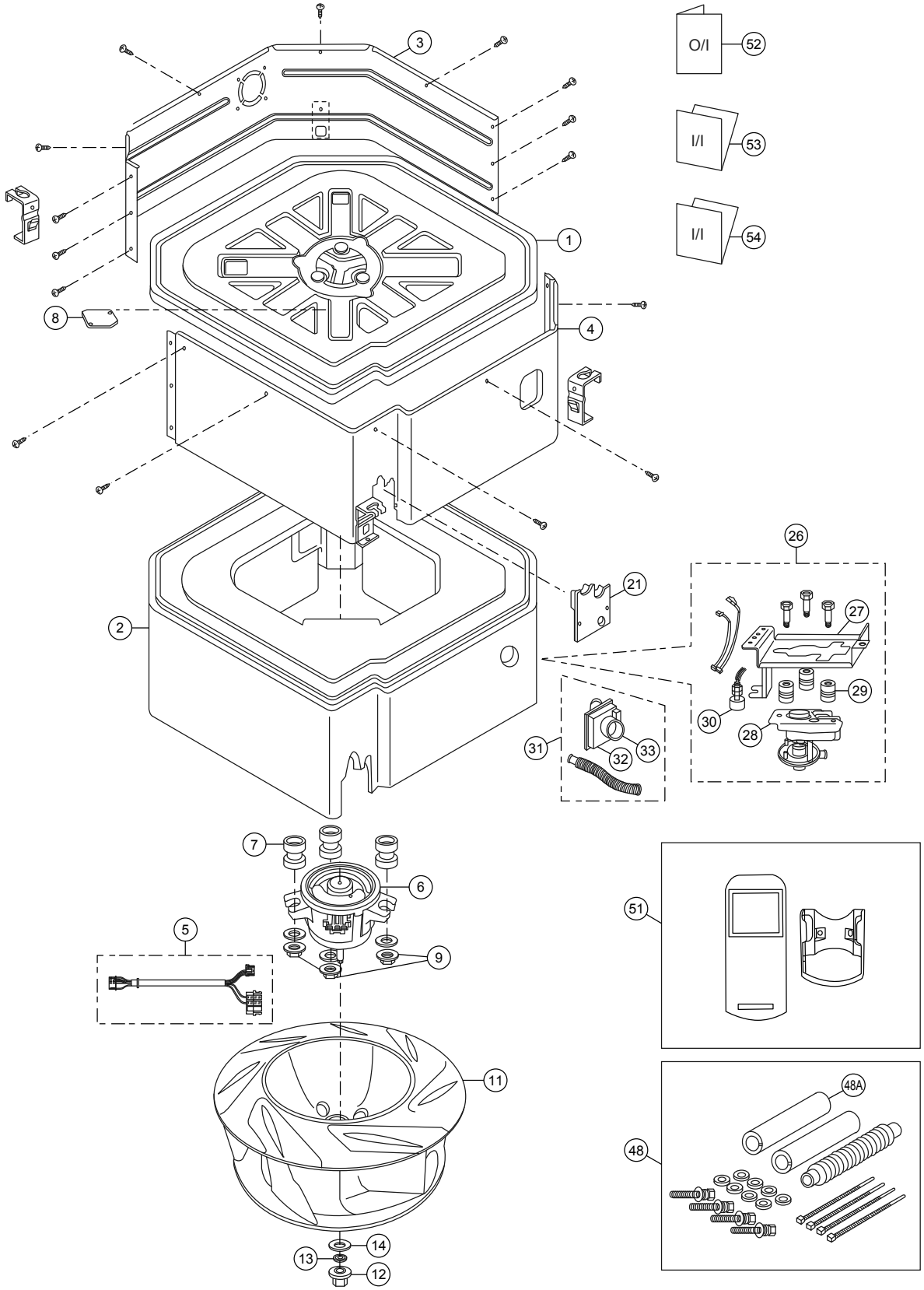


Fig. 8

16. Exploded View and Replacement Parts List

16.1 Indoor Unit





Note:
The above exploded view is for the purpose of parts disassembly and replacement.
The non-numbered parts are not kept as standard service parts.

<Model: CS-ME9SB4U>

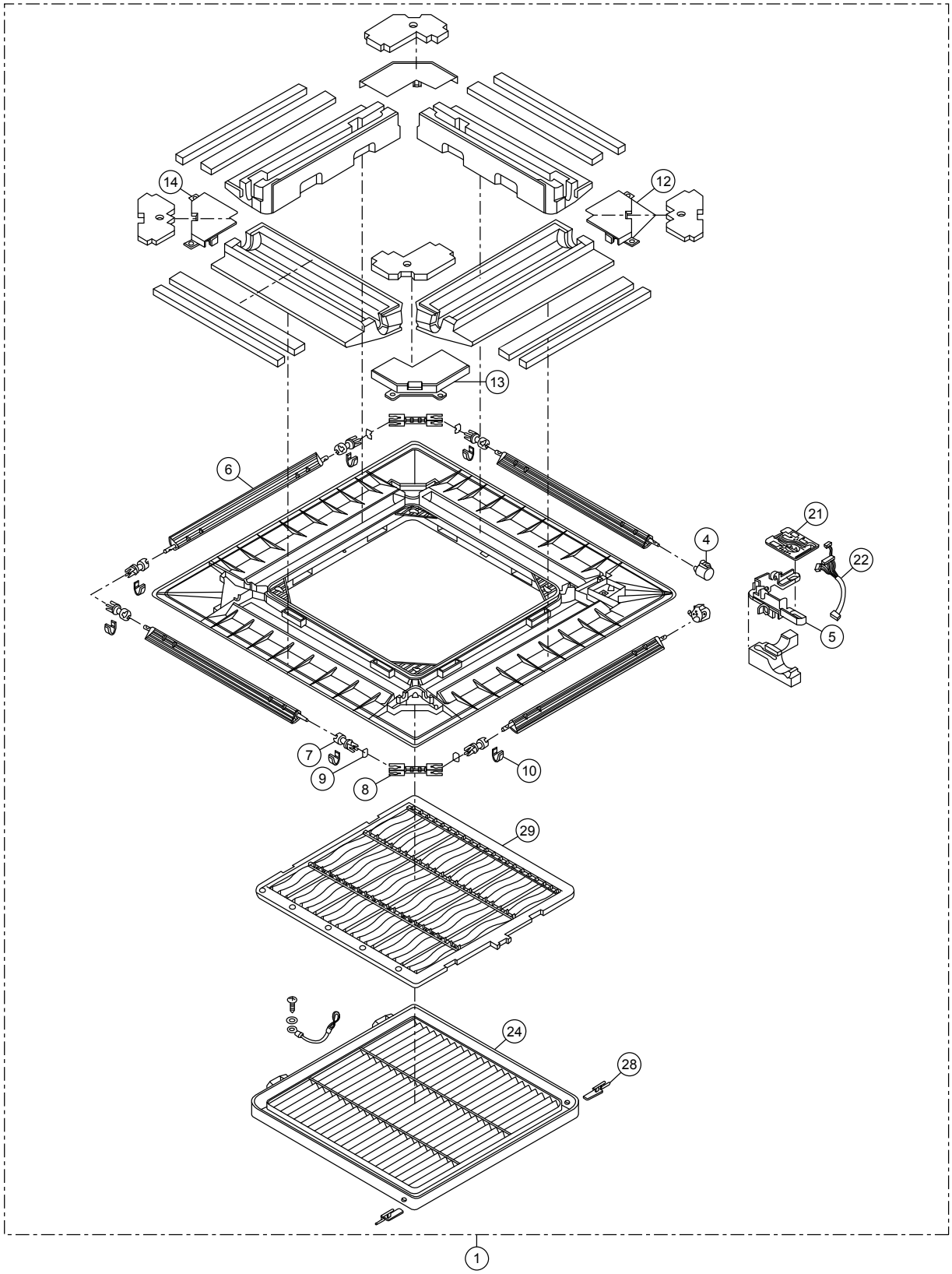
SAFETY	REF. NO.	PART NAME & DESCRIPTION	QTY	CS-ME9SB4U	REMARK
	1	BASE PAN ASS'Y	1	CWD52K1100	
	2	INNER POLYSTYRENE COMPLETE	1	CWG07C1047A	
	3	CABINET SIDE PLATE ASS'Y	1	CWE041121	
	4	CABINET SIDE PLATE ASS'Y	1	CWE041122	
	5	LEAD WIRE - FAN MOTOR	1	CWA67C5136	O
⚠	6	FAN MOTOR	1	EHDS50A40AC	O
	7	ANTI - VIBRATION BUSHING	3	CWH501065	
	8	CORD HOLDER	1	CWD741024	
	9	SCREW - FAN MOTOR	3	CWH561058	
⚠	11	TURBO FAN	1	CWH03K1022	
	12	NUT for TURBO FAN	1	CWH561042	
	13	SP WASHER	1	XWA8BFJ	
	14	WASHER	1	XWG8H22FJ	
	15	EVAPORATOR COMPLETE	1	ACXB30C01680	
	16	FLARE NUT (1/2")	1	CWT251049	
	17	HEATPROOF TUBE	1	CWG021024	
	18	HEATPROOF TUBE	1	CWG021064	
	19	FLARE NUT (1/4")	1	CWT251030	
	21	PIPE COVER	1	CWD93C1163	
	22	SENSOR - EVAPORATOR	1	CWA50C2549	
	23	HOLDER SENSOR	2	CWH32143	
	24	EVAPORATOR SUPPORTER	3	CWD911529A	
	25	TUBE ASS'Y (CAPIL. TUBE)	1	CWT07K1188	
	26	DRAIN PUMP COMPLETE	1	CWB53C1055	O
	27	PANEL DRAIN PUMP ASS'Y	1	CWD93K1021	
	28	DRAIN PUMP	1	CWB532122	
	29	ANTI - VIBRATION BUSHING	3	CWH501080	
⚠	30	FLOAT SWITCH - DRAIN PUMP	1	CWA121233	O
	31	FLEXIBLE PIPE	1	CWH85C1115	
	32	DRAIN NOZZLE	1	CWH411011	
	33	DRAIN HOSE HEAT INSULATION	1	CWG321116	
	35	DRAIN PAN - COMPLETE	1	CWH40C1116	
	36	DRAIN PLUG	1	CWB821008	
	37	AIR GUIDER BLOWER WHEEL	1	CWD321058	
	38	CONTROL BOARD CASING	1	CWH10K1102	
⚠	39	ELECTRONIC CONTROLLER (MAIN)	1	ACXA73C06980	O
	40	SPACER	6	CWH541026	
⚠	41	TRANSFORMER	1	CWA40C1030	O
⚠	42	TERMINAL BOARD ASS'Y	1	CWA28K1321	O
	44	LEADWIRE-AIR TEMP. SENSOR	1	CWA68C2214	O
	47	CONTROL BOARD COVER COM.	1	CWH13C1344	
	48	ACCESSORY COMPLETE	1	CWH82C2108	
	48A	HEATPROOF TUBE	1	CWG021116	
	51	WIRELESS REMOTE CONTROL COMPLETE	1	CWA75C4643	O
	52	OPERATING INSTRUCTION	1	ACXF55-01990	

SAFETY	REF. NO.	PART NAME & DESCRIPTION	QTY	CS-E12RB4UW	REMARK
	53	INSTALLATION INSTRUCTION	1	ACXF60-02800	
	54	INSTALLATION INSTRUCTION	1	ACXF60-02810	

(Note)

- All parts are supplied from PAPAMY, Malaysia (Vendor Code: 00029488).
- “O” marked parts are recommended to be kept in stock.

16.2 CZ-BT20U (Front Grille Complete)



Note:
The above exploded view is for the purpose of parts disassembly and replacement.
The non-numbered parts are not kept as standard service parts.

SAFETY	REF. NO.	PART NAME & DESCRIPTION	QTY	CZ-BT20U	REMARK
	1	FRONT GRILLE - COMPLETE	1	CWE11C6074	
⚠	4	A.S MOTOR DC SINGLE 12V 250 OHM	2	CWA981154J	O
	5	BRACKET - A.S.MOTOR	1	CWD932522	
	6	VANE	4	CWE241159	
	7	SHAFT	6	CWH631038	
	8	SHAFT	2	CWH631045	
	9	CONNECTOR - SHAFT	4	CWH081007	
	10	BEARING	6	CWH641008	O
	12	PLATE COVER FOR A.S.MOTOR	1	CWD911459	
	13	PLATE COVER FOR CONNECTING SHAFT	2	CWD911460	
	14	PLATE COVER FOR END SHAFT	1	CWD911461	
⚠	21	ELECTRONIC CONT. (RECEIVER & INDICATOR)	1	CWA748302	
	22	LEAD WIRE - COMPLETE	1	CWA67C5576	
	24	INTAKE GRILLE	1	CWE221131	
	28	LEVER ARM	2	CWH651029	
	29	AIR FILTER	1	CWD001142	O

(Note)

- All parts are supplied from PAPAMY, Malaysia (Vendor Code: 00029488).
- “O” marked parts are recommended to be kept in stock.

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