

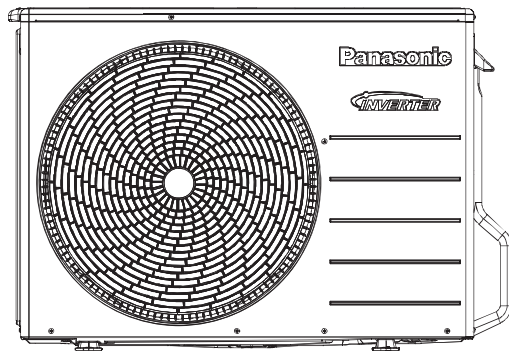
# Service Manual

## Air Conditioner



**Indoor Unit**  
**CS-CE9PKE**  
**CS-CE12PKE**

**Outdoor Unit**  
**CU-CE9PKE**  
**CU-CE12PKE**




**Destination**  
**North Europe**

### **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 product or 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.

 <b>WARNING</b>	This indication shows the possibility of causing death or serious injury.
 <b>CAUTION</b>	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.
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- 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.

 <b>WARNING</b>	
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 authorized dealer or specialist for installation and servicing. If installation or 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 be installed 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 connection 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 of copper pipes used with R410A must be more than 0.8 mm. Never use copper pipes thinner than 0.8 mm. It is desirable that the amount of residual oil less than 40 mg/10 m.	

**WARNING**

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 cause suck-in of air, abnormal high pressure in refrigeration cycle and result in explosion, injury etc).
20. During pump down operation, stop the compressor before remove the refrigeration piping. (Removal of refrigeration piping while compressor is operating and valves are opened condition 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 the 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 describe 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. Power supply connection to the room air conditioner.  
Use power supply cord 3 × 1.5 mm<sup>2</sup> type designation 245 IEC 57 or heavier cord.  
Connect the power supply cord of the air conditioner to the mains using one of the following method.  
Power supply point should be in easily accessible place for power disconnection in case of emergency.  
In some countries, permanent connection of this air conditioner to the power supply is prohibited.  
1) Power supply connection to the receptacle using power plug.  
Use an approved 15/16A power plug with earth pin for the connection to the socket.  
2) Power supply connection to a circuit breaker for the permanent connection.  
Use an approved 16A circuit breaker for the permanent connection. It must be a double pole switch with a minimum 3.0 mm contact gap.
8. 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. 
9. Installation or servicing work: It may need two people to carry out the installation or servicing work.
10. Do not install this appliance in a laundry room or other location where water may drip from the ceiling, etc. 
11. Do not sit or step on the unit, you may fall down accidentally. 
12. 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-CE9PKE			
			Outdoor	CU-CE9PKE			
Performance Test Condition			EUROVENT				
Power Supply			Phase, Hz	Single, 50			
			V	230			
			Min.	Mid.	Max.		
Cooling	Capacity		kW	0.85	2.50	3.00	
			BTU/h	2900	8530	10200	
			kcal/h	730	2150	2580	
	Running Current		A	–	2.60	–	
	Input Power		W	190	545	740	
	Annual Consumption		kWh	–	273	–	
	EER		W/W	4.47	4.59	4.05	
			BTU/hW	15.26	15.65	13.78	
			kcal/hW	3.84	3.94	3.49	
	ErP	Pdesign	kW	2.5			
		SEER	(W/W)	6.8			
		Annual Consumption	kWh	129			
		Class		A++			
	Power Factor		%	–	91	–	
	Indoor Noise (H / L)		dB-A	39 / 25			
			Power Level dB	55 / -			
	Outdoor Noise (H / L)		dB-A	46 / -			
			Power Level dB	61 / -			
Heating	Capacity		kW	0.85	3.40	5.10	
			BTU/h	2900	11600	17400	
			kcal/h	730	2920	4390	
	Running Current		A	–	3.55	–	
	Input Power		W	185	740	1.35k	
	COP		W/W	4.59	4.59	3.78	
			BTU/hW	15.68	15.68	12.89	
			kcal/hW	3.95	3.95	3.25	
	ErP	Pdesign	kW	2.8			
		Tbivalent	°C	-10			
		SCOP	(W/W)	3.9			
		Annual Consumption	kWh	1005			
		Class		A			
	Power Factor		%	–	91	–	
	Indoor Noise (H / L)		dB-A	40 / 27			
			Power Level dB	56 / -			
	Outdoor Noise (H / L)		dB-A	47 / -			
			Power Level dB	62 / -			
Low Temp. : Capacity (kW) / I. Power (W) / COP			3.70 / 1.19k / 3.11				
Extr Low Temp. : Capacity (kW) / I. Power (W) / COP			3.22 / 1.23k / 2.62				
Max Current (A) / Max Input Power (W)			6.0 / 1.35k				
Starting Current (A)			3.55				

Model			Indoor	CS-CE9PKE		
			Outdoor	CU-CE9PKE		
Compressor	Type			Hermetic Motor (Rotary)		
	Motor Type			Brushless (6 poles)		
	Output Power		W	900		
Indoor Fan	Type			Cross-flow Fan		
	Material			ASG20K1		
	Motor Type			DC / Transistor (8-poles)		
	Input Power		W	47.3		
	Output Power		W	40		
	Speed	Lo	Cool/Fan	rpm	690	
			Heat	rpm	750	
		Me	Cool/Fan	rpm	890	
			Heat	rpm	970	
		Hi	Cool/Fan	rpm	1090	
			Heat	rpm	1200	
Outdoor Fan	Type			Propeller Fan		
	Material			PP		
	Motor Type			AC / Induction (6-poles)		
	Input Power		W	—		
	Output Power		W	25		
	Speed	Hi	Cool	rpm	840	
			Heat	rpm	840	
Moisture Removal			L/h (Pt/h)	1.5 (3.2)		
Indoor Airflow	Lo	Cool/Fan	m³/min (ft³/min)	6.58 (230)		
		Heat	m³/min (ft³/min)	7.27 (260)		
	Me	Cool/Fan	m³/min (ft³/min)	8.88 (310)		
		Heat	m³/min (ft³/min)	9.91 (350)		
	Hi	Cool/Fan	m³/min (ft³/min)	11.3 (400)		
		Heat	m³/min (ft³/min)	11.9 (420)		
Outdoor Airflow	Hi	Cool	m³/min (ft³/min)	31.3 (1105)		
		Heat	m³/min (ft³/min)	31.3 (1105)		
Refrigeration Cycle	Control Device			Check Valve & Capillary Tube		
	Refrigerant Oil		cm³	FV50S (450)		
	Refrigerant Type		g (oz)	R410A, 1.00k (35.3)		
Dimension	Height (I/D / O/D)		mm (inch)	290 (11-7/16) / 622 (24-1/2)		
	Width (I/D / O/D)		mm (inch)	870 (34-9/32) / 824 (32-15/32)		
	Depth (I/D / O/D)		mm (inch)	214 (8-7/16) / 299 (11-25/32)		
Weight	Net (I/D / O/D)		kg (lb)	9 (20) / 36 (79)		
Piping	Pipe Diameter (Liquid / Gas)		mm (inch)	6.35 (1/4) / 9.52 (3/8)		
	Standard length		m (ft)	5.0 (16.4)		
	Length Range (min – max)		m (ft)	3 (9.8) ~ 15 (49.2)		
	I/D & O/D Height Different		m (ft)	5.0 (16.4)		
	Additional Gas Amount		g/m (oz/ft)	20 (0.2)		
	Length for Additional Gas		m (ft)	7.5 (24.6)		
Drain Hose	Inner Diameter		mm	16		
	Length		mm	650		

Model		Indoor	CS-CE9PKE	
		Outdoor	CU-CE9PKE	
Indoor Heat Exchanger	Fin Material		Aluminium (Pre Coat)	
	Fin Type		Slit Fin	
	Row × Stage × FPI		2 × 15 × 19	
	Size (W × H × L)	mm	610 × 315 × 25.4	
Outdoor Heat Exchanger	Fin Material		Aluminium	
	Fin Type		Corrugated Fin	
	Row × Stage × FPI		2 × 28 × 17	
	Size (W × H × L)	mm	36.4 × 588 × 606.6	
Air Filter	Material		Polypropelene	
	Type		One-touch	
Power Supply			Indoor Power Supply	
Power Supply Cord		A	Nil	
Thermostat			Electronic Control	
Protection Device			Electronic Control	
			Dry Bulb	Wet Bulb
Indoor Operation Range	Cooling	Maximum °C	32	23
		Minimum °C	16	11
	Heating	Maximum °C	30	–
		Minimum °C	16	–
Outdoor Operation Range	Cooling	Maximum °C	43	26
		Minimum °C	16	11
	Heating	Maximum °C	24	18
		Minimum °C	-15	-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. Heating low temperature capacity, Input Power and COP measured at 230 V, indoor temperature 20°C, outdoor 2/1°C.
4. Heating extreme low temperature capacity, Input Power and COP measured at 230 V, indoor temperature 20°C, outdoor -7/-8°C.
5. Specifications are subjected to change without prior notice for further improvement.
6. Maximum heating capacity shown are the values based on powerful operation.
7. If the EUROVENT Certified models can be operated under the “extra-low” temperature condition, -7°C DB and -8°C WB temperature with rated voltage 230V shall be used.
8. The annual consumption is calculated by multiplying the input power by an average of 500 hours per year in cooling mode.
9. SEER and SCOP classification is at 230V only in accordance with EN-14825. For heating, SCOP indicates the value of only Average heating season. Other fiche data indicates in an attached sheet.

Model			Indoor	CS-CE12PKE		
			Outdoor	CU-CE12PKE		
Performance Test Condition			EUROVENT			
Power Supply			Phase, Hz	Single, 50		
			V	230		
			Min.	Mid.	Max.	
Cooling	Capacity		kW	0.85	3.50	4.00
			BTU/h	2900	11900	13600
			kcal/h	730	3010	3440
	Running Current		A	—	4.40	—
	Input Power		W	195	950	1.16k
	Annual Consumption		kWh	—	475	—
	EER		W/W	4.36	3.68	3.45
			BTU/hW	14.87	12.53	11.72
			kcal/hW	3.74	3.17	2.97
	ErP	Pdesign	kW	3.5		
		SEER	(W/W)	6.4		
		Annual Consumption	kWh	191		
		Class		A++		
	Power Factor		%	—	94	—
	Indoor Noise (H / L)		dB-A	42 / 28		
			Power Level dB	58 / -		
	Outdoor Noise (H / L)		dB-A	48 / -		
			Power Level dB	63 / -		
Heating	Capacity		kW	0.85	4.00	6.60
			BTU/h	2900	13600	22500
			kcal/h	730	3440	5680
	Running Current		A	—	4.60	—
	Input Power		W	190	990	1.99k
	COP		W/W	4.47	4.04	3.32
			BTU/hW	15.26	13.74	11.31
			kcal/hW	3.84	3.47	2.85
	ErP	Pdesign	kW	3.6		
		Tbivalent	°C	-10		
		SCOP	(W/W)	3.8		
		Annual Consumption	kWh	1326		
		Class		A		
	Power Factor		%	—	94	—
	Indoor Noise (H / L)		dB-A	42 / 33		
			Power Level dB	58 / -		
	Outdoor Noise (H / L)		dB-A	50 / -		
			Power Level dB	65 / -		
Low Temp. : Capacity (kW) / I. Power (W) / COP			4.78 / 1.76k / 2.72			
Extr Low Temp. : Capacity (kW) / I. Power (W) / COP			4.00 / 1.85k / 2.16			
Max Current (A) / Max Input Power (W)			8.8 / 1.99k			
Starting Current (A)			4.60			

Model				Indoor	CS-CE12PKE	
				Outdoor	CU-CE12PKE	
Compressor	Type				Hermetic Motor (Rotary)	
	Motor Type				Brushless (6 poles)	
	Output Power			W	900	
Indoor Fan	Type				Cross-flow Fan	
	Material				ASG20K1	
	Motor Type				DC / Transistor (8-poles)	
	Input Power			W	47.3	
	Output Power			W	40	
	Speed	Lo	Cool/Fan	rpm	790	
			Heat	rpm	990	
		Me	Cool/Fan	rpm	1010	
			Heat	rpm	1130	
		Hi	Cool/Fan	rpm	1240	
			Heat	rpm	1280	
Outdoor Fan	Type				Propeller Fan	
	Material				PP	
	Motor Type				AC / Induction (6-poles)	
	Input Power			W	—	
	Output Power			W	30	
	Speed	Hi	Cool	rpm	880	
			Heat	rpm	880	
	Moisture Removal			L/h (Pt/h)	2.0 (4.2)	
Indoor Airflow	Lo	Cool/Fan	m³/min (ft³/min)	7.48 (260)		
		Heat	m³/min (ft³/min)	9.72 (340)		
	Me	Cool/Fan	m³/min (ft³/min)	10.06 (360)		
		Heat	m³/min (ft³/min)	11.40 (400)		
	Hi	Cool/Fan	m³/min (ft³/min)	12.5 (440)		
		Heat	m³/min (ft³/min)	12.8 (450)		
Outdoor Airflow	Hi	Cool	m³/min (ft³/min)	33.3 (1175)		
		Heat	m³/min (ft³/min)	33.3 (1175)		
Refrigeration Cycle	Control Device			Check Valve & Capillary Tube		
	Refrigerant Oil		cm³	FV50S (450)		
	Refrigerant Type		g (oz)	R410A, 1.06k (37.4)		
Dimension	Height (I/D / O/D)		mm (inch)	290 (11-7/16) / 622 (24-1/2)		
	Width (I/D / O/D)		mm (inch)	870 (34-9/32) / 824 (32-15/32)		
	Depth (I/D / O/D)		mm (inch)	214 (8-7/16) / 299 (11-25/32)		
Weight	Net (I/D / O/D)		kg (lb)	9 (20) / 36 (79)		
Piping	Pipe Diameter (Liquid / Gas)		mm (inch)	6.35 (1/4) / 9.52 (3/8)		
	Standard length		m (ft)	5.0 (16.4)		
	Length Range (min – max)		m (ft)	3 (9.8) ~ 15 (49.2)		
	I/D & O/D Height Different		m (ft)	5.0 (16.4)		
	Additional Gas Amount		g/m (oz/ft)	20 (0.2)		
	Length for Additional Gas		m (ft)	7.5 (24.6)		
Drain Hose	Inner Diameter		mm	16		
	Length		mm	650		

Model		Indoor	CS-CE12PKE	
		Outdoor	CU-CE12PKE	
Indoor Heat Exchanger	Fin Material		Aluminium (Pre Coat)	
	Fin Type		Slit Fin	
	Row × Stage × FPI		2 × 15 × 21	
	Size (W × H × L)	mm	610 × 315 × 25.4	
Outdoor Heat Exchanger	Fin Material		Aluminium	
	Fin Type		Corrugated Fin	
	Row × Stage × FPI		2 × 28 × 17	
	Size (W × H × L)	mm	36.4 × 588 × 606.6	
Air Filter	Material		Polypropelene	
	Type		One-touch	
Power Supply			Indoor Power Supply	
Power Supply Cord		A	Nil	
Thermostat			Electronic Control	
Protection Device			Electronic Control	
			Dry Bulb	Wet Bulb
Indoor Operation Range	Cooling	Maximum °C	32	23
		Minimum °C	16	11
	Heating	Maximum °C	30	–
		Minimum °C	16	–
Outdoor Operation Range	Cooling	Maximum °C	43	26
		Minimum °C	16	11
	Heating	Maximum °C	24	18
		Minimum °C	-15	-16

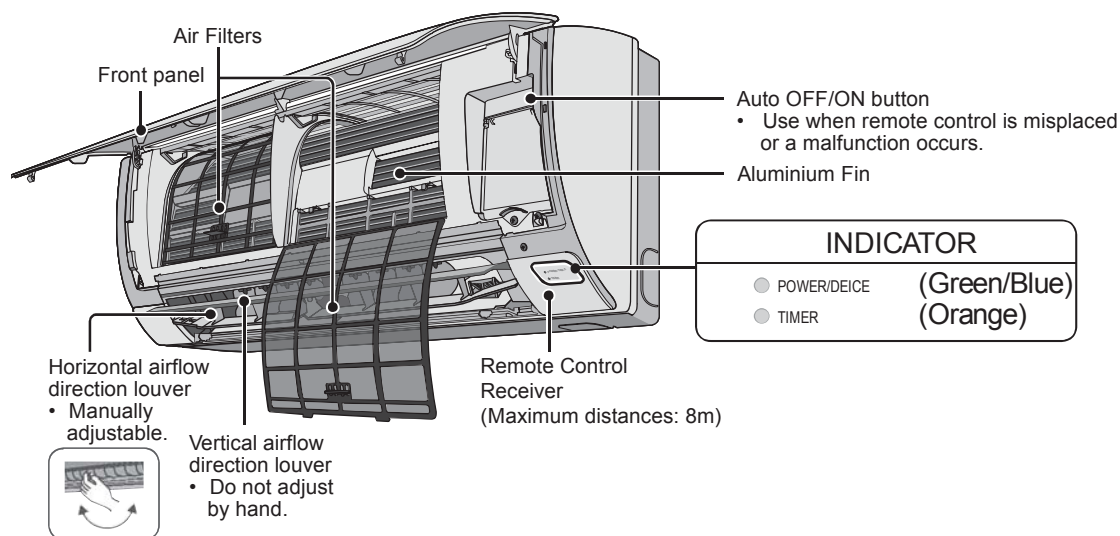
- Cooling capacities are based on indoor temperature of 27°C Dry Bulb (80.6°F Dry Bulb), 19.0°C Wet Bulb (66.2°F Wet Bulb) and outdoor air temperature of 35°C Dry Bulb (95°F Dry Bulb), 24°C Wet Bulb (75.2°F Wet Bulb)
- Heating capacities are based on indoor temperature of 20°C Dry Bulb (68°F Dry Bulb) and outdoor air temperature of 7°C Dry Bulb (44.6°F Dry Bulb), 6°C Wet Bulb (42.8°F Wet Bulb)
- Heating low temperature capacity, Input Power and COP measured at 230 V, indoor temperature 20°C, outdoor 2/1°C.
- Heating extreme low temperature capacity, Input Power and COP measured at 230 V, indoor temperature 20°C, outdoor -7/-8°C.
- Specifications are subjected to change without prior notice for further improvement.
- Maximum heating capacity shown are the values based on powerful operation.
- If the EUROVENT Certified models can be operated under the "extra-low" temperature condition, -7°C DB and -8°C WB temperature with rated voltage 230V shall be used.
- The annual consumption is calculated by multiplying the input power by an average of 500 hours per year in cooling mode.
- SEER and SCOP classification is at 230V only in accordance with EN-14825. For heating, SCOP indicates the value of only Average heating season. Other fiche data indicates in an attached sheet.

### 3. Features

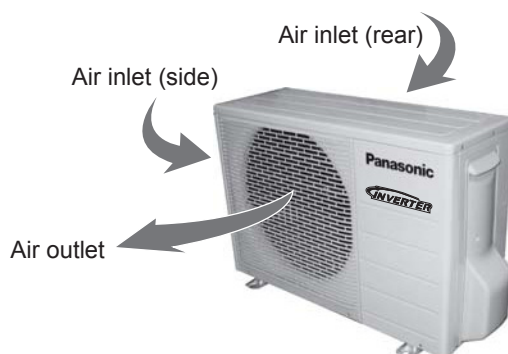
- **Inverter Technology**
  - Wider output power range
  - Energy saving
  - More precise temperature control
- **Environment Protection**
  - Non-ozone depletion substances refrigerant (R410A)
- **Long Installation Piping**
  - Long piping up to 15 meters during single split connection only
- **Easy 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
- **Operation Improvement**
  - 24-hour timer setting
- **Serviceability Improvement**
  - Breakdown Self Diagnosis function

## 4. Location of Controls and Components

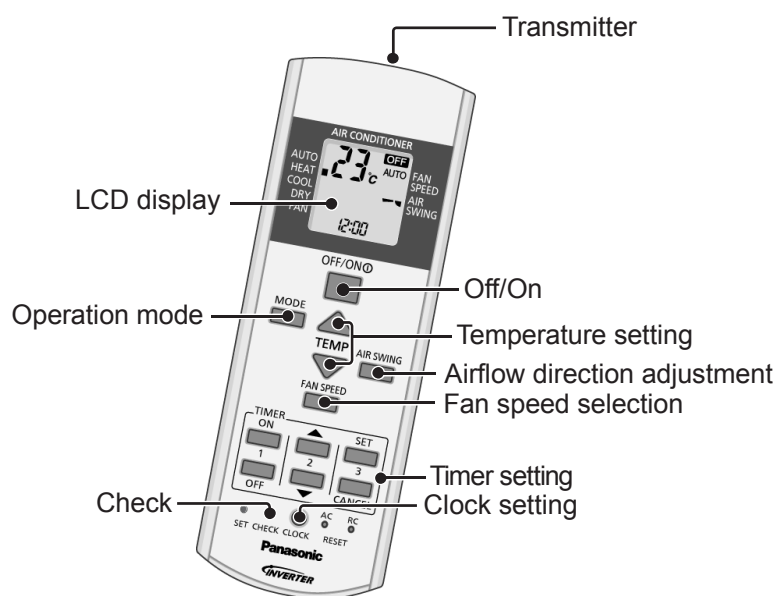
### 4.1 Indoor Unit



### 4.2 Outdoor Unit



### 4.3 Remote Control

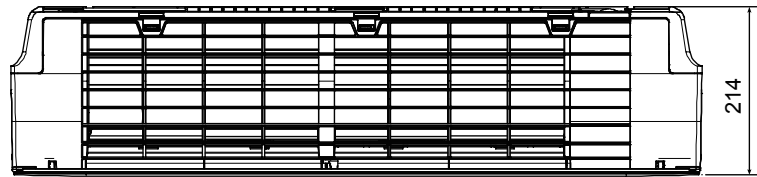




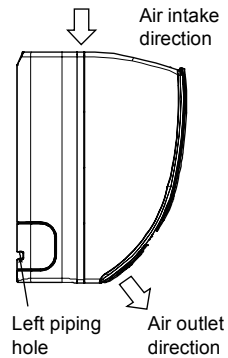
## 5. Dimensions

### 5.1 Indoor Unit

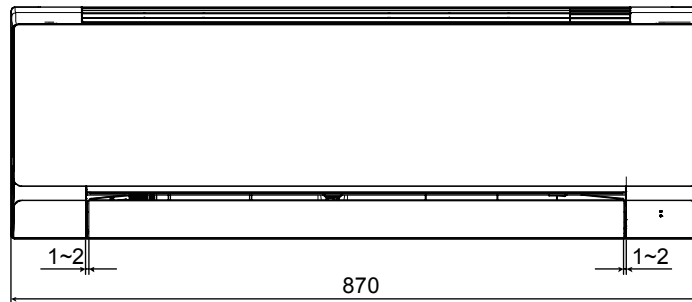
<Top View>



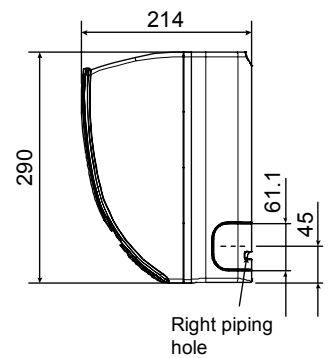
<Side View>



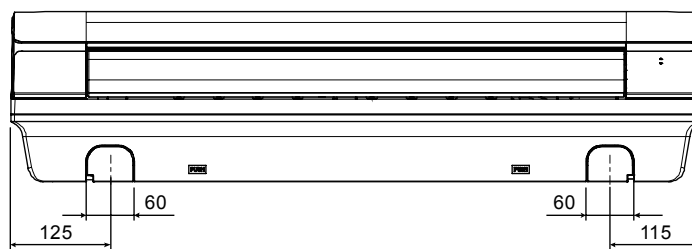
<Front View>



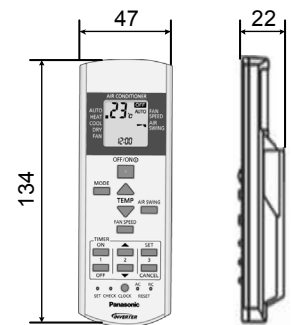
<Side View>



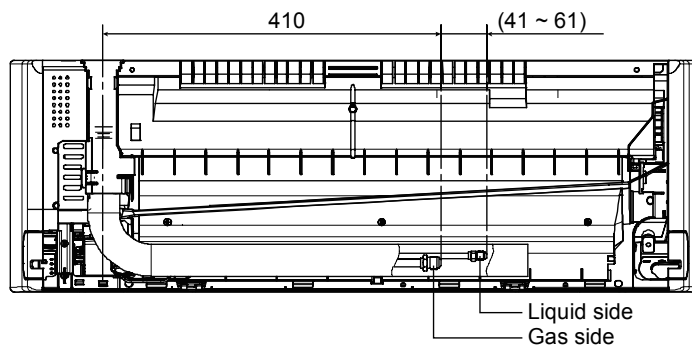
<Bottom View>



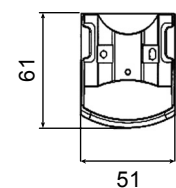
<Remote Control>



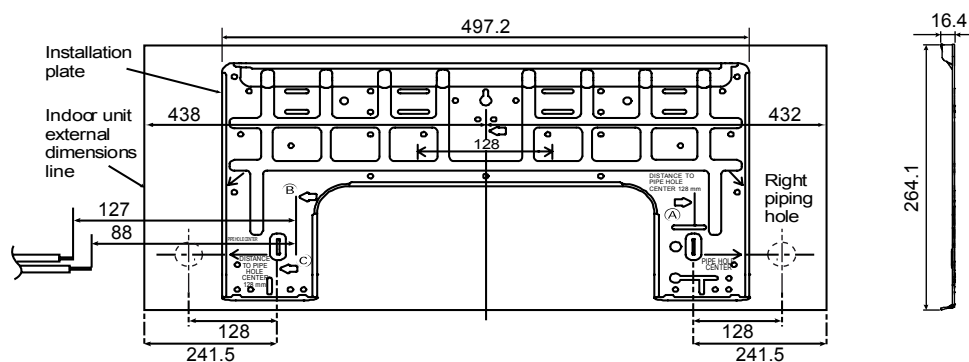
<Rear View>



<Remote Control Holder>

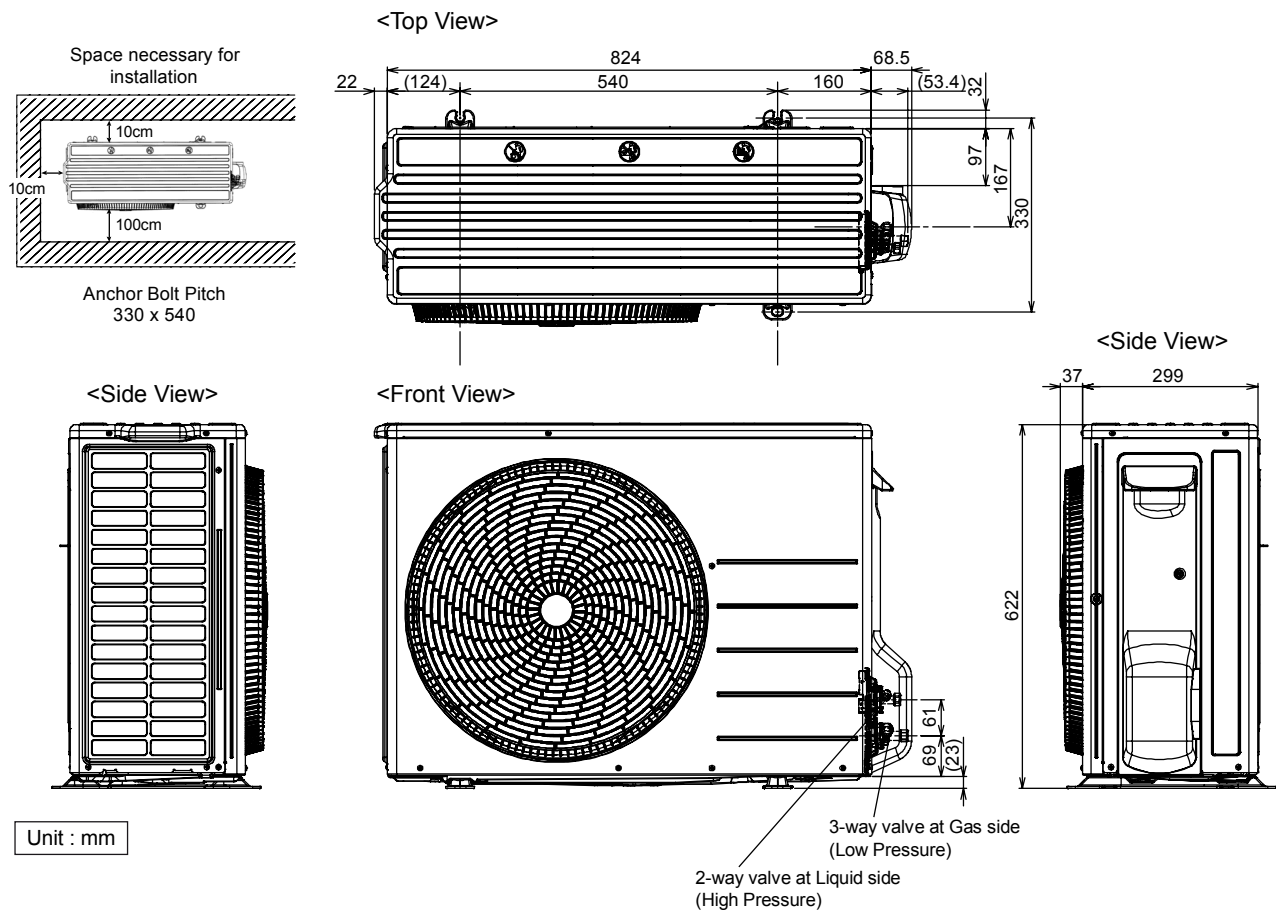


Relative position between the indoor unit and the installation plate <Front View>



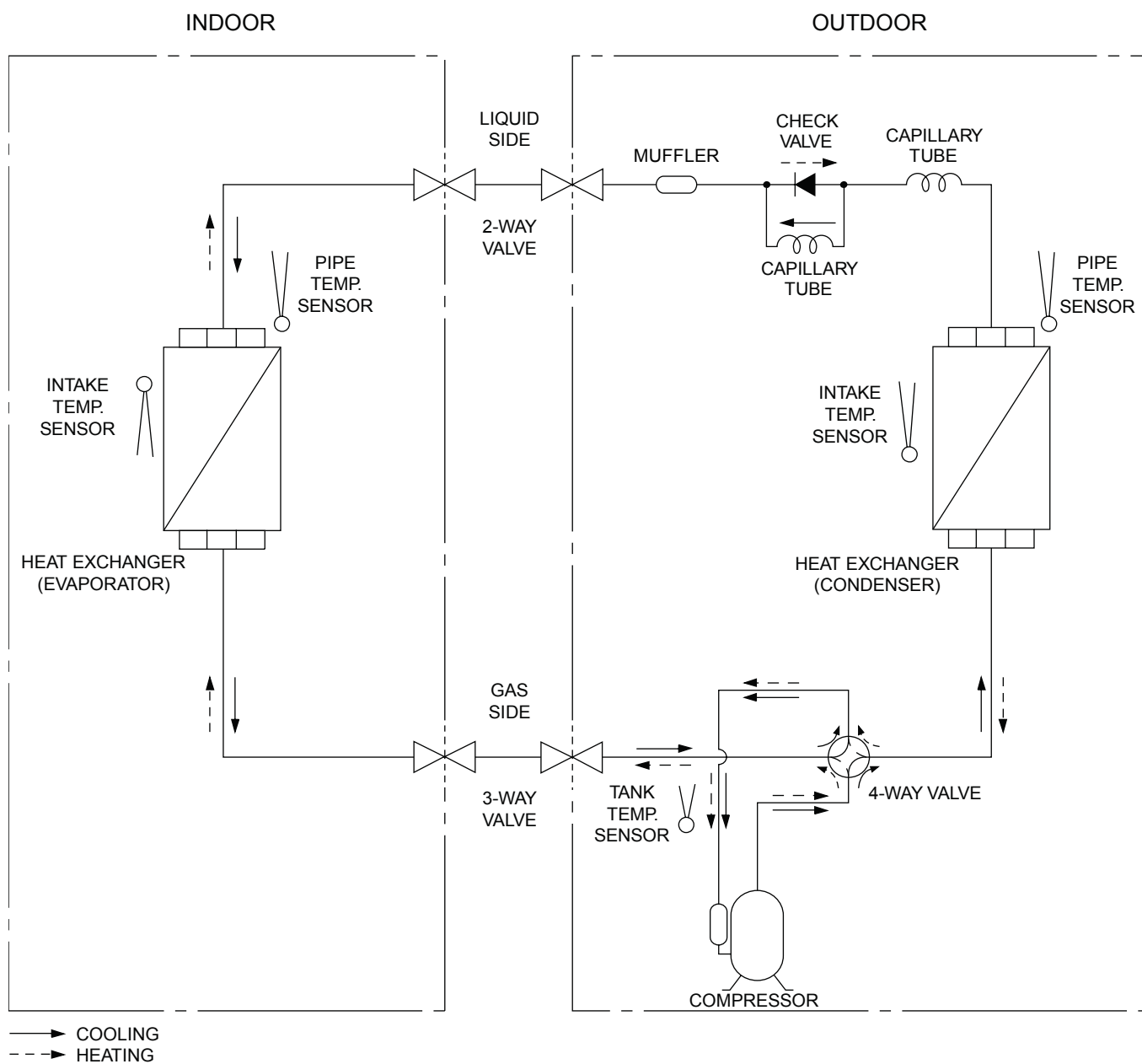
Unit : mm

5.2 Outdoor Unit

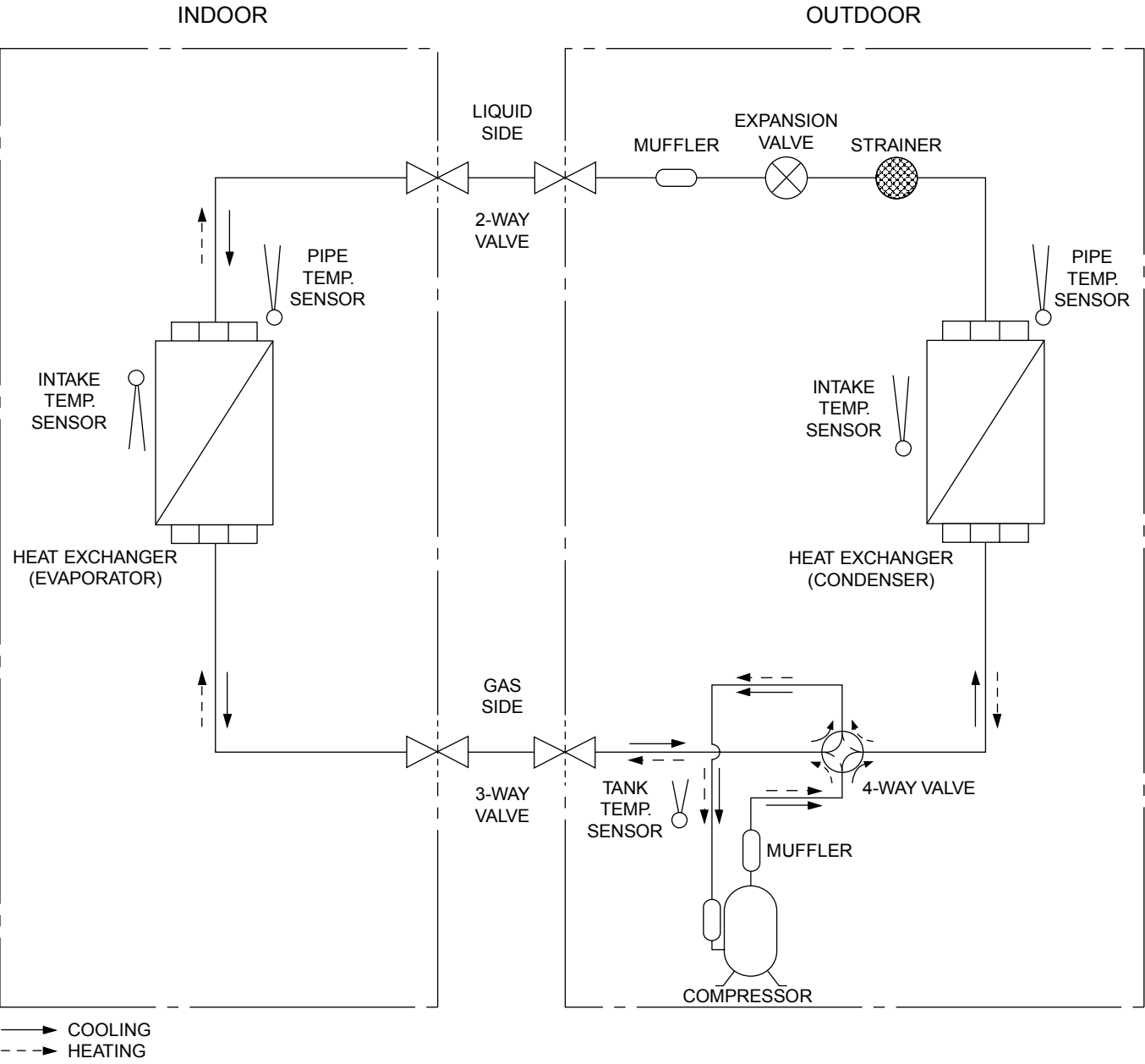


## 6. Refrigeration Cycle Diagram

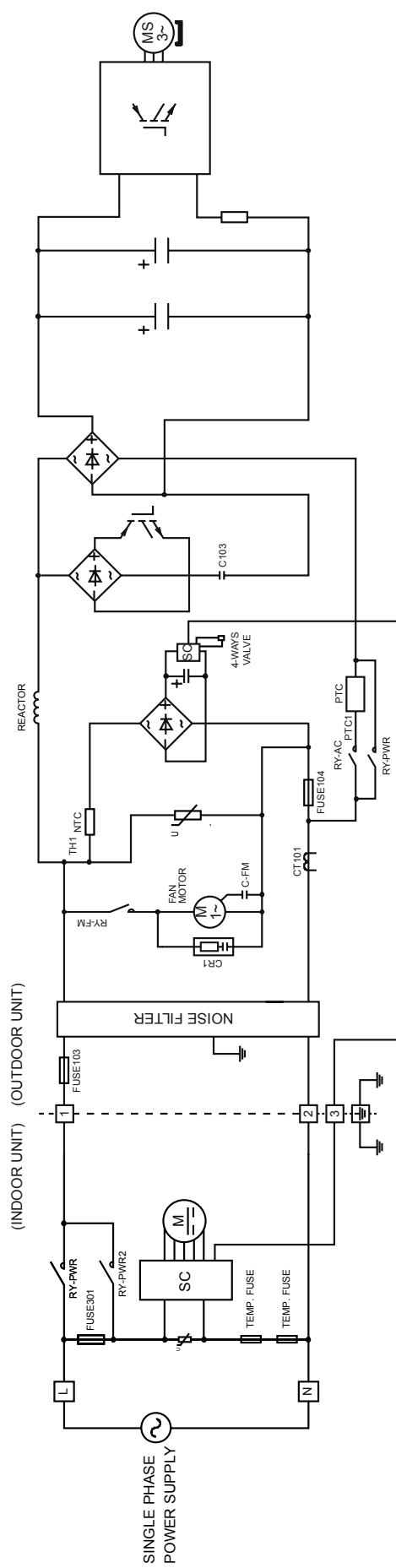
### 6.1 CS-CE9PKE CU-CE9PKE



6.2 CS-CE12PKE CU-CE12PKE

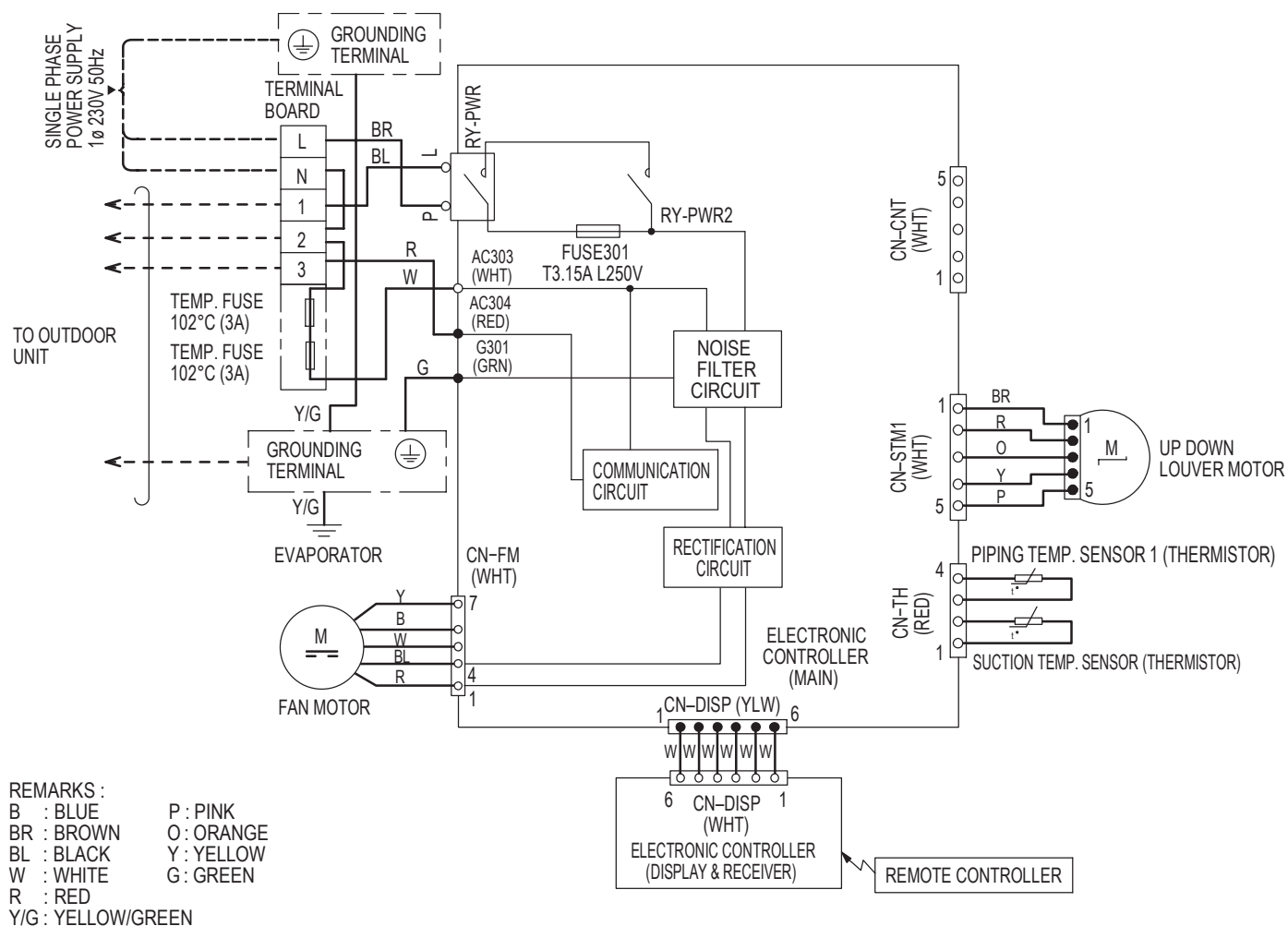


## 7. Block Diagram



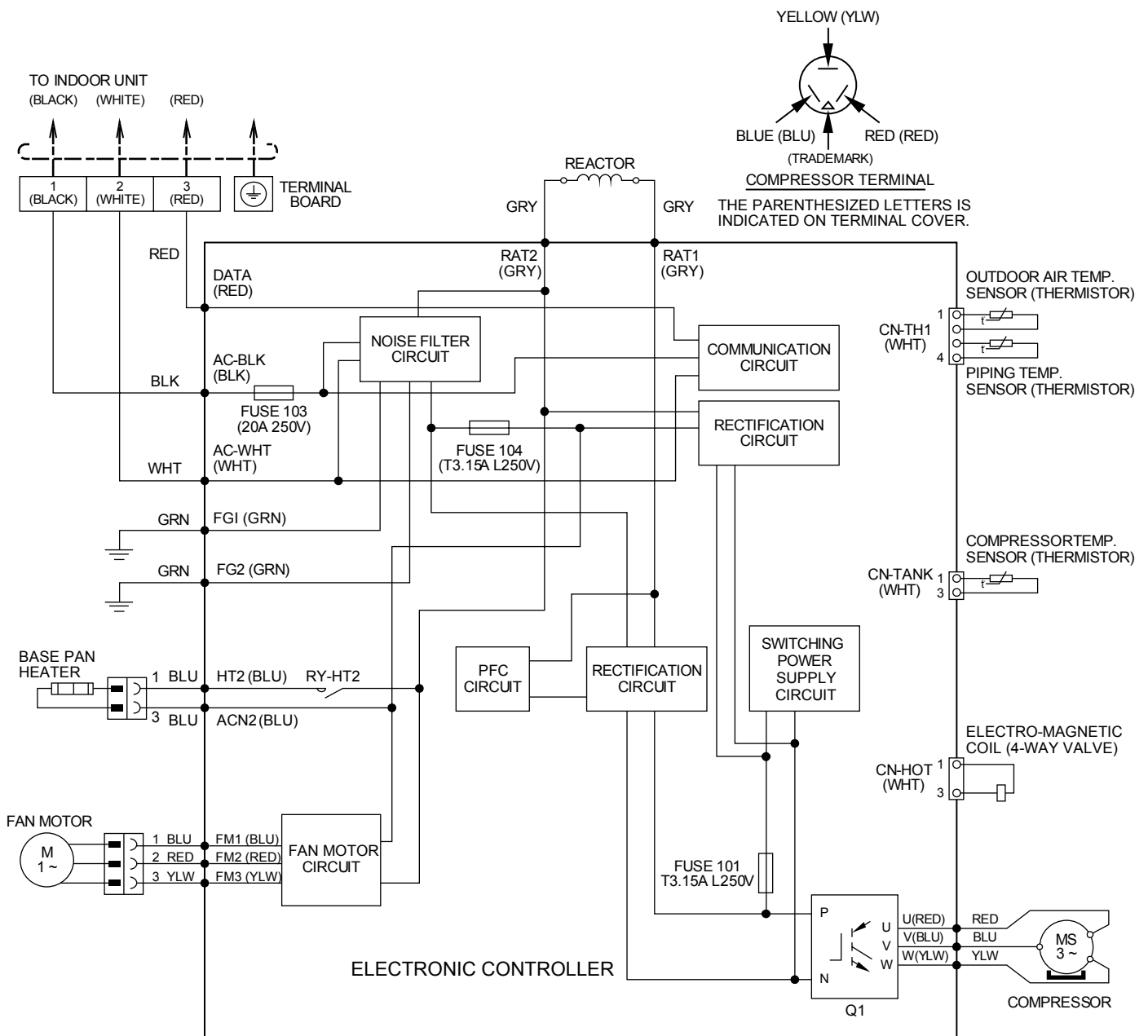
## 8. Wiring Connection Diagram

### 8.1 Indoor Unit



## 8.2 Outdoor Unit

### 8.2.1 CU-CE9PKE



Resistance of Compressor Windings

CONNECTION	5RD132XFD21
U - V	1.152Ω
U - W	1.152Ω
V - W	1.152Ω

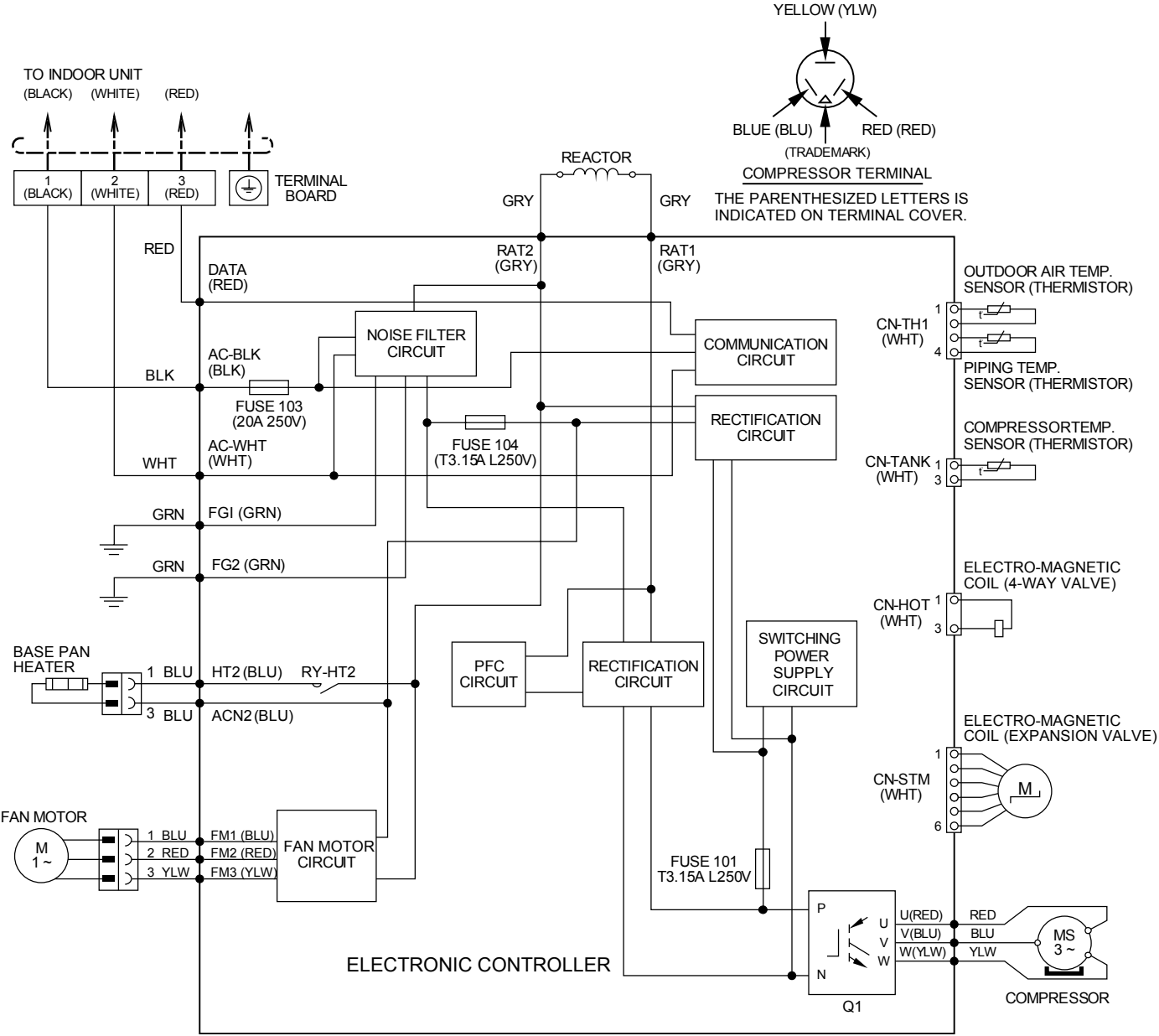
Winding resistance at 20°C.

Resistance of Outdoor Fan Motor Windings

CONNECTION	CWA951853
YELLOW- BLUE	300Ω
YELLOW-RED	202Ω

Winding resistance at 20°C.

8.2.2 CU-CE12PKE



Resistance of Compressor Windings

CONNECTION	5RD132XFD21
U - V	1.152Ω
U - W	1.152Ω
V - W	1.152Ω

Winding resistance at 20°C.

Resistance of Outdoor Fan Motor Windings

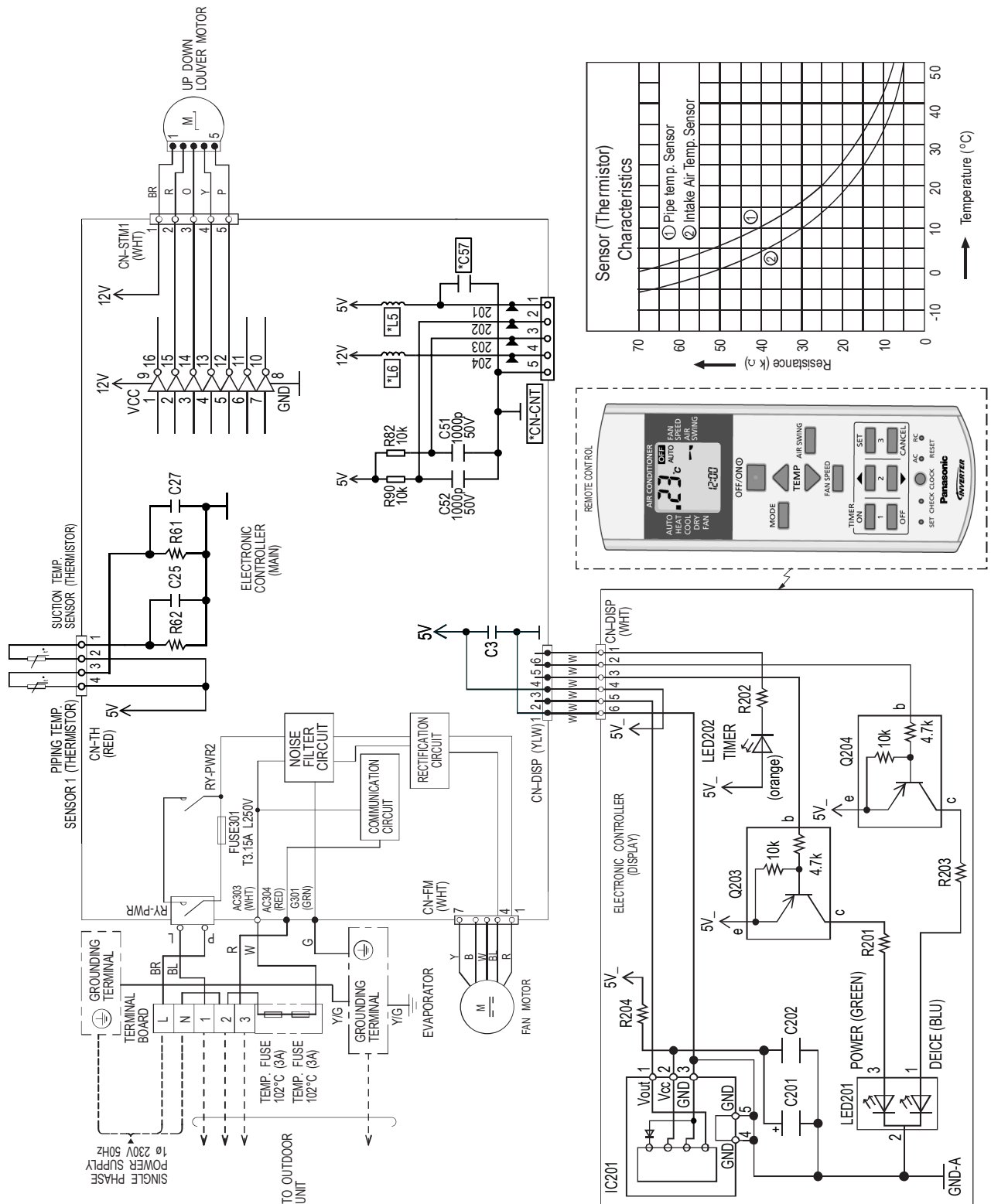
CONNECTION	CWA951854
YELLOW- BLUE	264Ω
YELLOW- RED	250Ω

Winding resistance at 20°C.



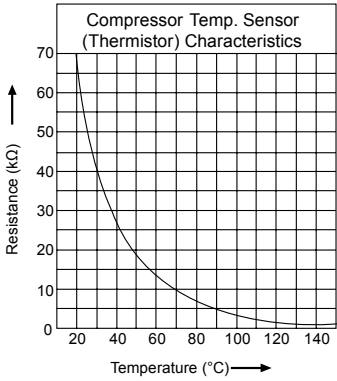
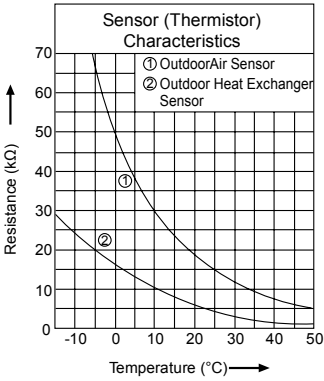
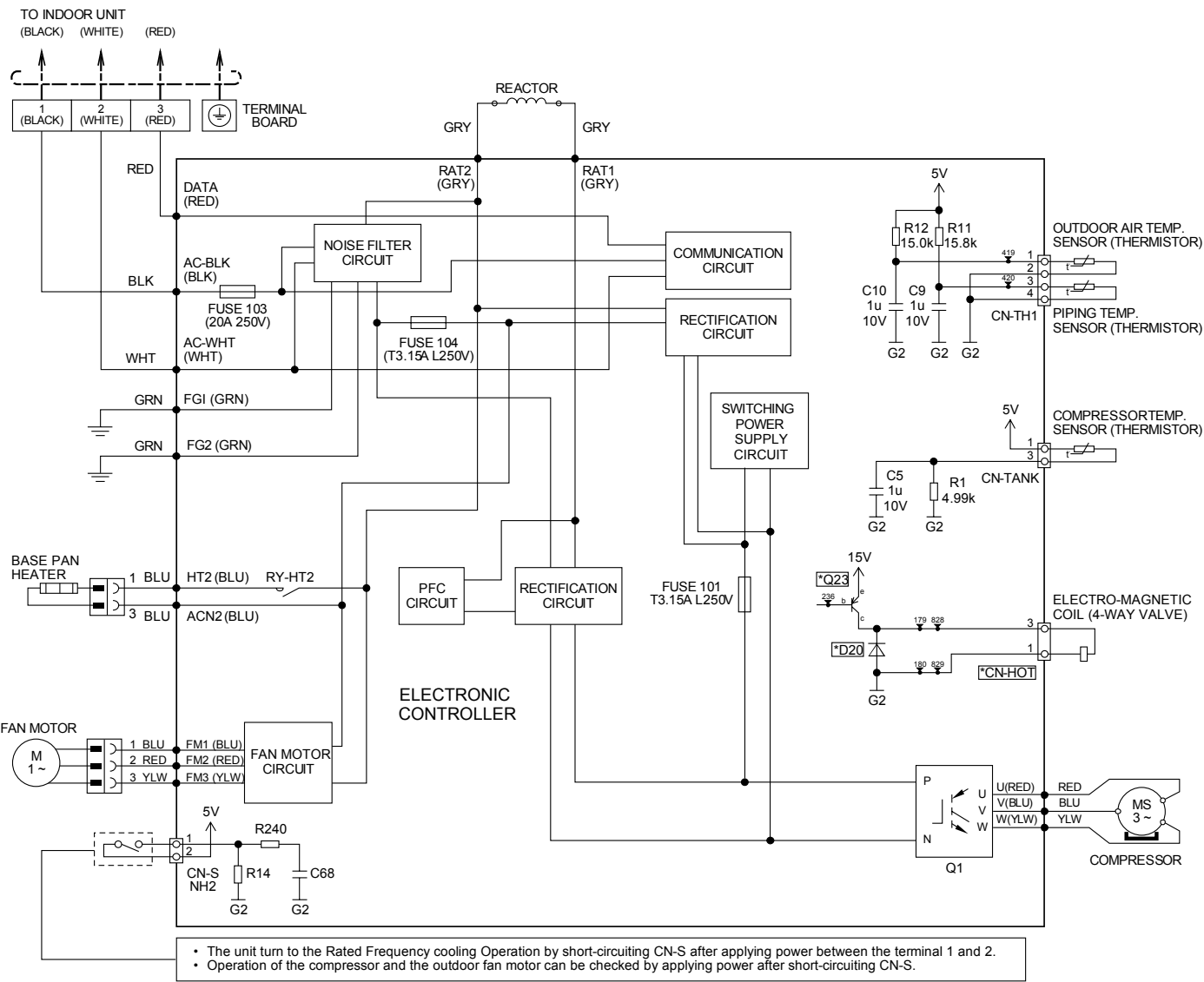
## 9. Electronic Circuit Diagram

### 9.1 Indoor Unit

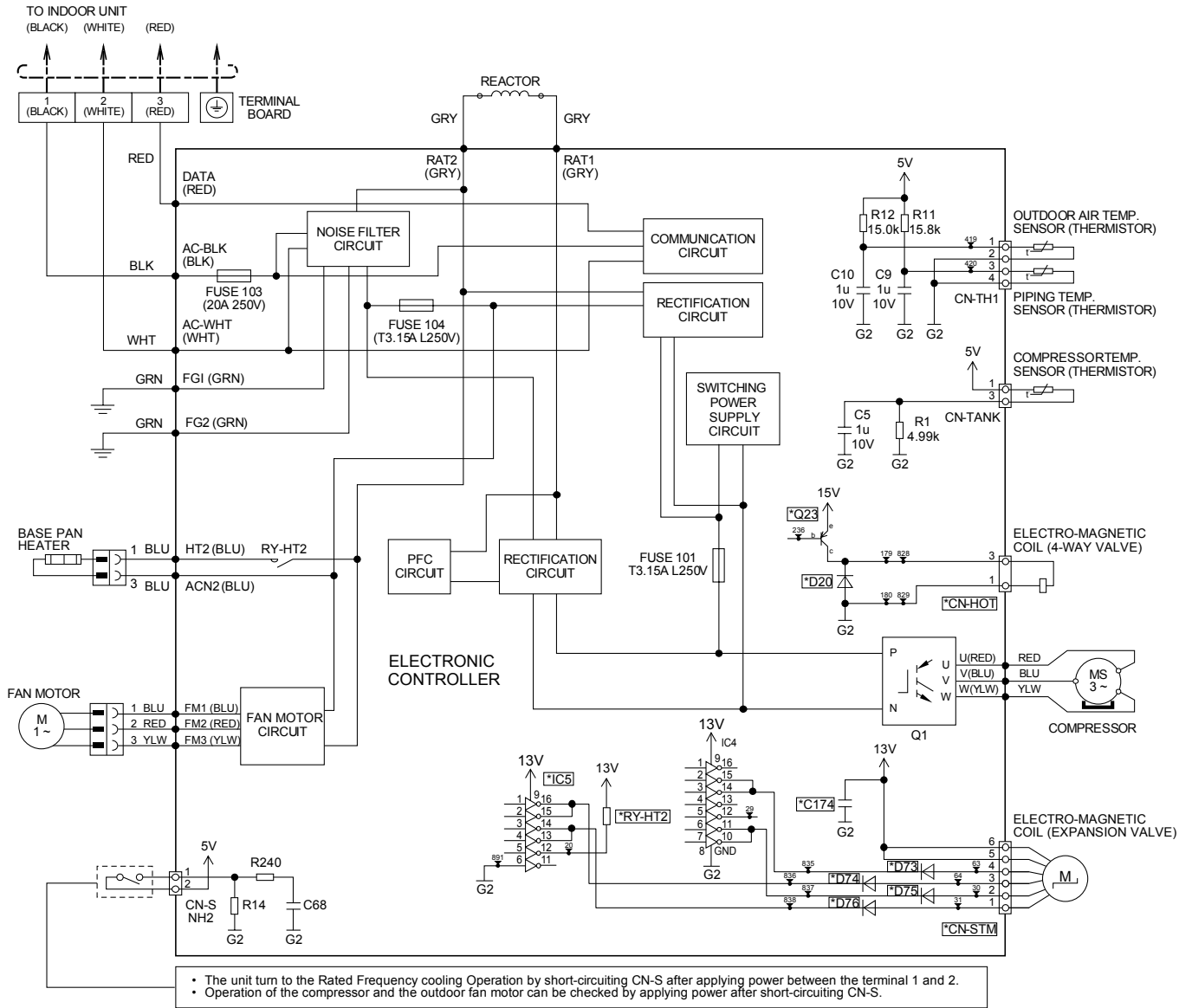


9.2 Outdoor Unit

9.2.1 CU-CE9PKE

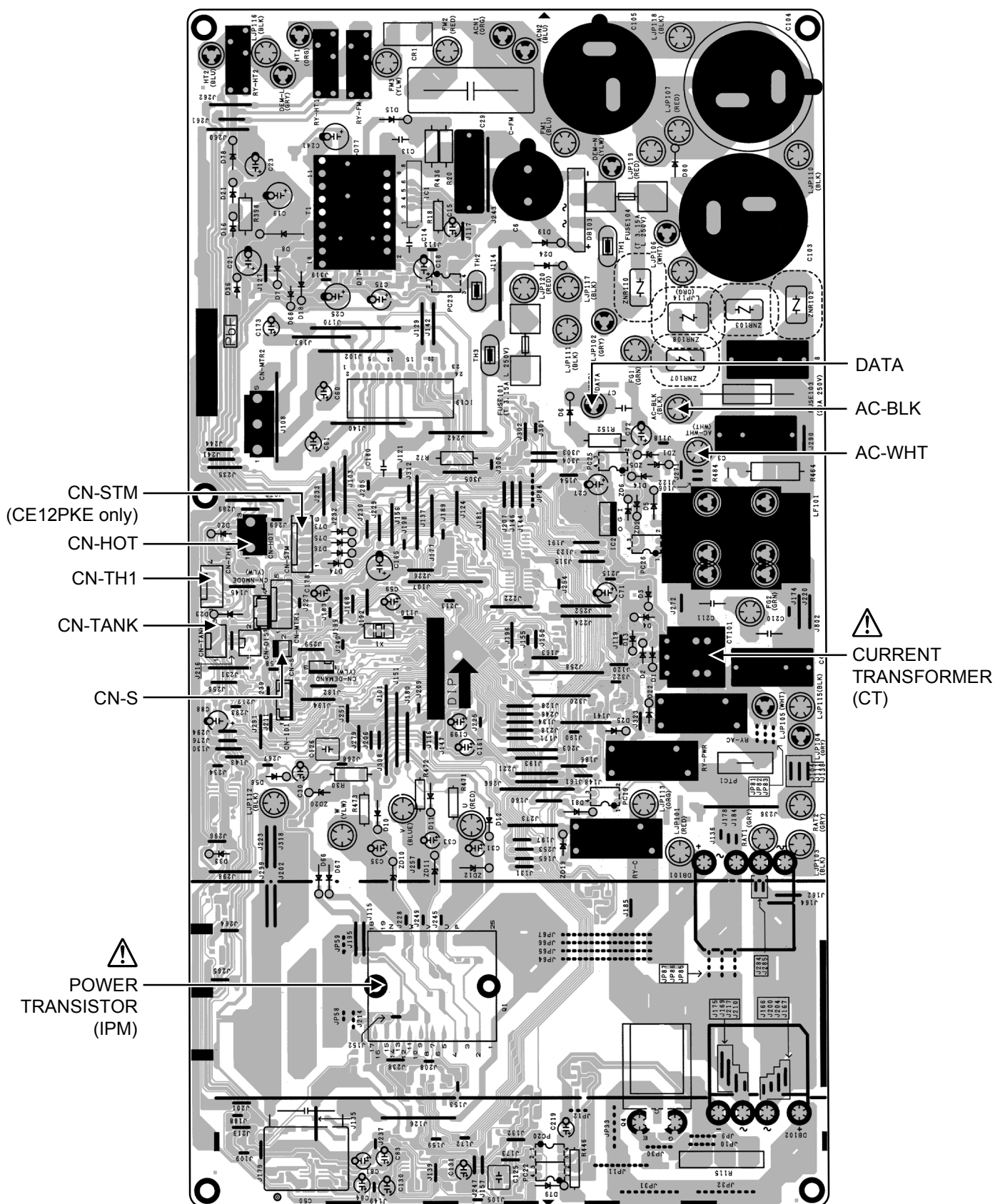


## 9.2.2 CU-CE12PKE





## 10.2 Outdoor Unit



# 11. Installation Instruction

## 11.1 Select the Best Location

### 11.1.1 Indoor Unit

- Do not install the unit in excessive oil fume area such as kitchen, workshop and etc.
- There should not be any heat source or steam 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.
- Recommended installation height for indoor unit shall be at least 2.5 m.

### 11.1.2 Outdoor Unit

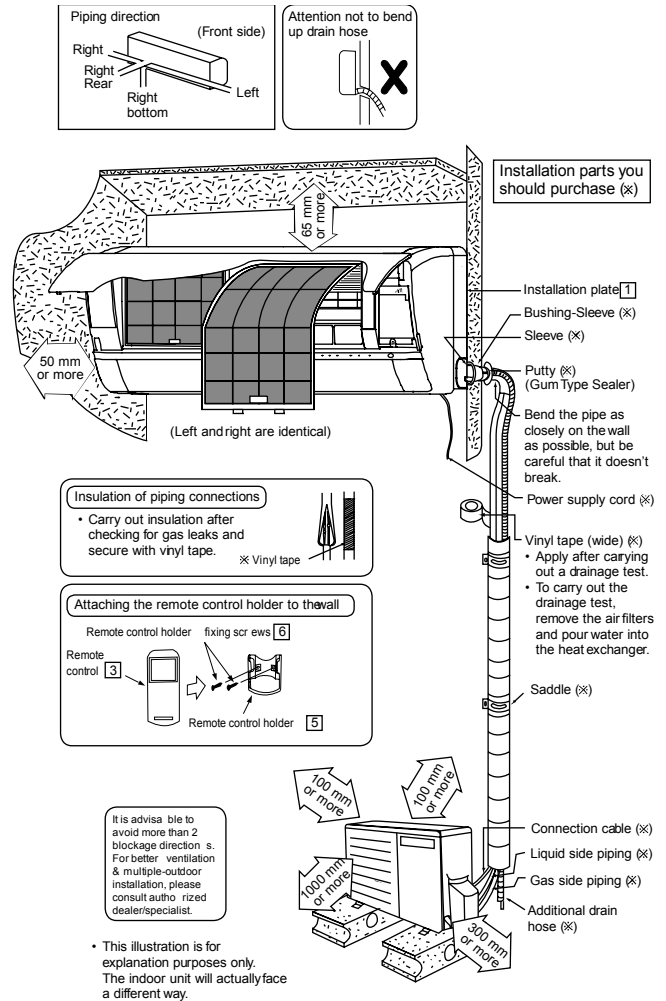
- If an awning is built over the unit to prevent direct sunlight or rain, be careful that heat radiation from the condenser is not obstructed.
- There should not be any animal or plant which could be affected by hot air discharged.
- Keep the spaces indicated by arrows from wall, ceiling, fence or other obstacles.
- Do not place any obstacles which may cause a short circuit of the discharged air.
- If piping length is over the [piping length for additional gas], additional refrigerant should be added as shown in the table.

Model	Horse Power (HP)	Piping size		Std. Length (m)	Max. Elevation (m)	Min. Piping Length (m)	Max. Piping Length (m)	Additional Refrigerant (g/m)	Piping Length for add. gas (m)
		Gas	Liquid						
CE9***	1.0HP	9.52mm	6.35mm	5	5	3	15	20	7.5
CE12***	1.5HP	(3/8")	(1/4")		5	3	15	20	7.5

Example: For CE9\*\*\*

If the unit is installed at 10 m distance, the quantity of additional refrigerant should be 50 g .... (10-7.5) m × 20 g/m = 50 g.

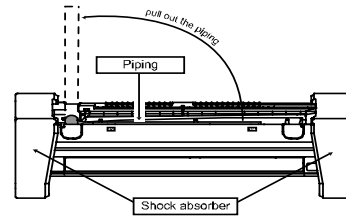
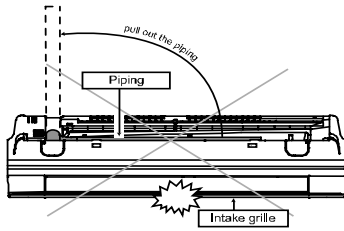
### 11.1.3 Indoor/Outdoor Unit Installation Diagram





## 11.2.3 Indoor Unit Installation

- Do not turn over the unit without its shock absorber during pull out the piping. It may cause intake grille damage.
- Use shock absorber during pull out the piping to protect the intake grille from damage.



### 11.2.3.1 For the right rear piping

Step-1 Pull out the Indoor piping

Step-2 Install the Indoor Unit

Step-3 Secure the Indoor Unit

Step-4 Insert the connection cable

### 11.2.3.2 For the right and right bottom piping

Step-1 Pull out the Indoor piping

Step-2 Install the Indoor Unit

Step-3 Insert the connection cable

Step-4 Secure the Indoor Unit

### 11.2.3.3 For the embedded piping

Step-1 Replace the drain hose

Step-2 Bend the embedded piping

- Use a spring bender or equivalent to bend the piping so that the piping is not crushed.

Step-3 Pull the connection cable into Indoor Unit

- The inside and outside connection cable can be connected without removing the front grille.

Step-4 Cut and flare the embedded piping

- When determining the dimensions of the piping, slide the unit all the way to the left on the installation plate.
- Refer to the section "Cutting and flaring the piping".

Step-5 Install the Indoor Unit

Step-6 Connect the piping

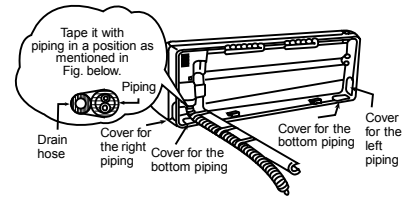
- Please refer to "Connecting the piping" column in outdoor unit section. (Below steps are done after connecting the outdoor piping and gas-leakage confirmation.)

Step-7 Insulate and finish the piping

- Please refer to "Insulation of piping connection" column as mentioned in indoor/outdoor unit installation.

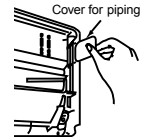
Step-8 Secure the Indoor Unit

#### Right Rear piping

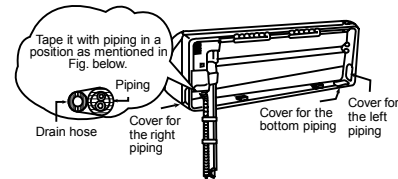


#### How to keep the cover

In case of the cover is cut, keep the cover at the rear of chassis as shown in the illustration for future reinstallation. (Left, right and 2 bottom covers for piping.)

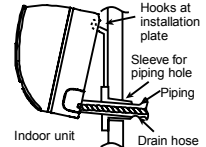


#### Right and Right Bottom piping



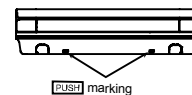
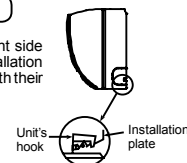
#### Install the indoor unit

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.



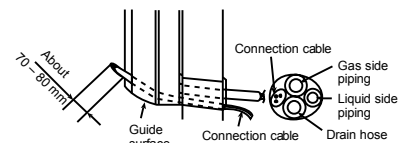
#### Secure the Indoor Unit

1. Press the lower left and right side of the unit against the installation plate until hooks engages with their slot (sound click).



To take out the unit, push the **PUSH** marking at the bottom unit, and pull it slightly towards you to disengage the hooks from the unit.

#### Insert the connection cable

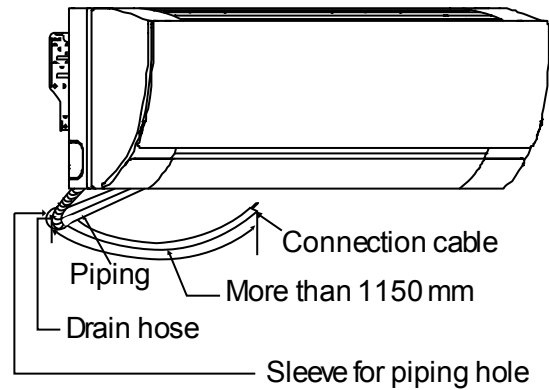
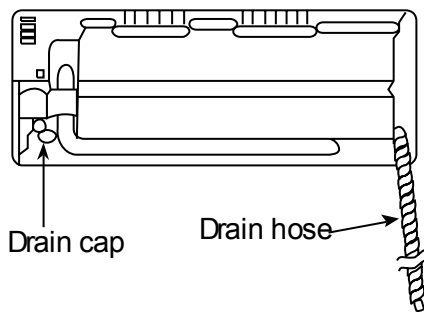


(This can be used for left rear piping and bottom piping also.)

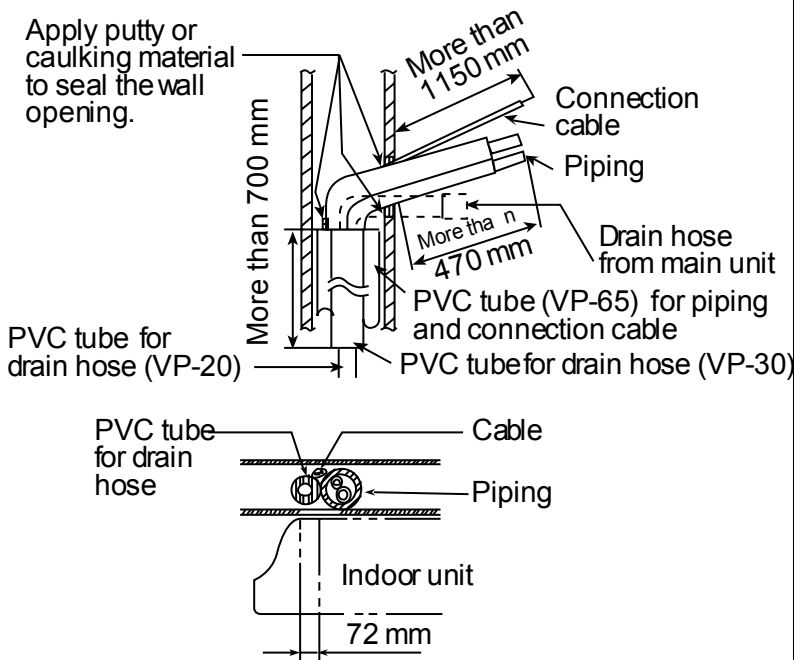


### Replace the drain hose

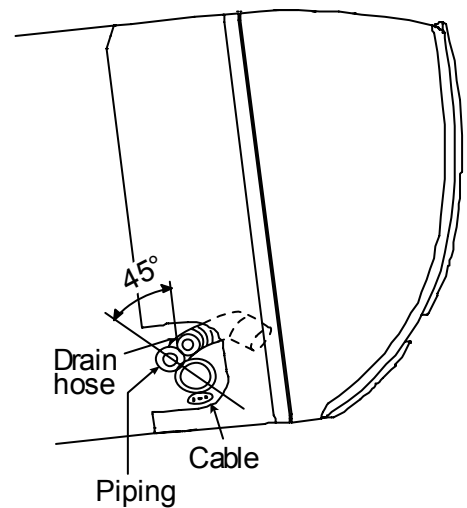
Rear view for left piping installation



- How to pull the piping and drain hose out, in case of the embedded piping .



- In case of left piping how to insert the connection cable and drain hose.



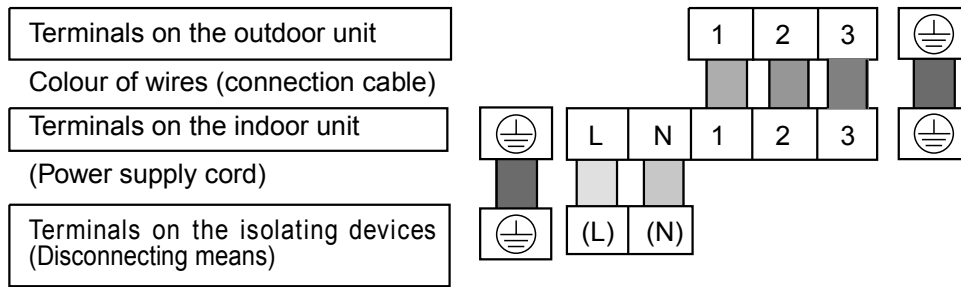
(For the right piping, follow the same procedure)

## 11.2.4 Connect the Cable to the Indoor Unit

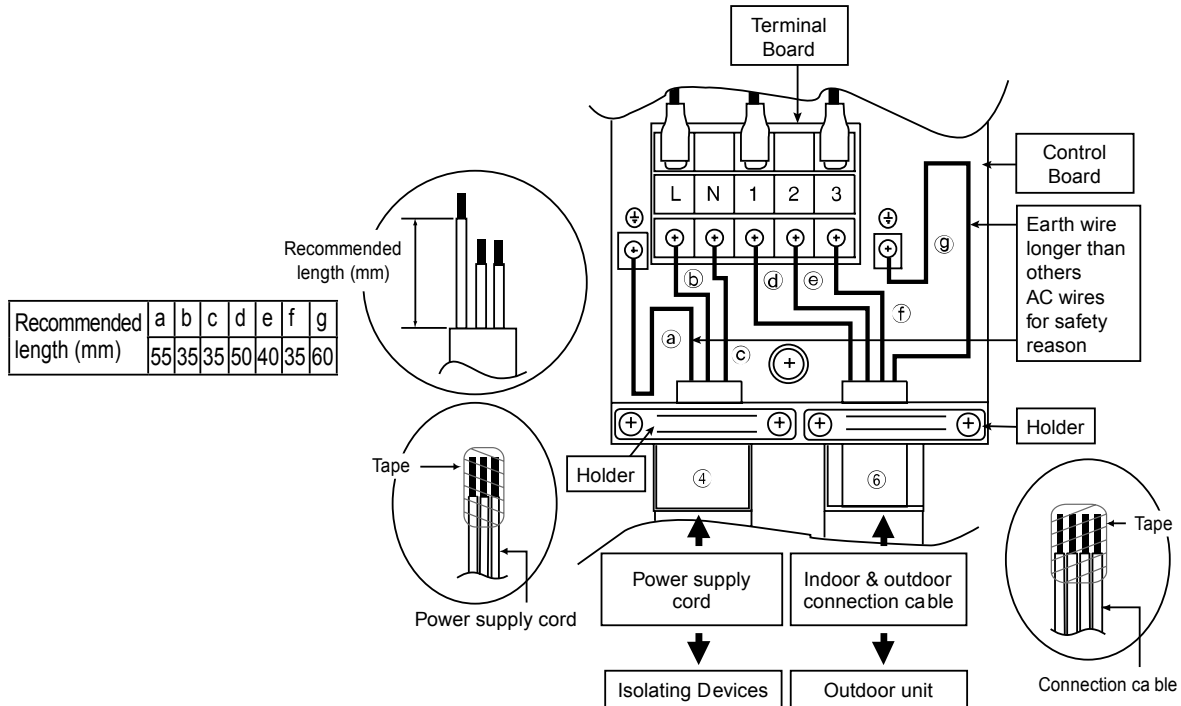
The power supply cord, indoor and outdoor unit connection cable can be connected without removing the front grille.

- 1 Install the indoor unit on the installing holder that mounted on the wall.
- 2 Open the front panel and grille door by loosening the screw.
- 3 Cable connection to the power supply through Isolating Devices (Disconnecting means).
  - Connect the approved polychloroprene sheathed **power supply cord**  $3 \times 1.5 \text{ mm}^2$ , type designation 245 IEC 57 or heavier cord to the terminal board, and connect the other end of the cable to Isolating Devices (Disconnecting means).
  - Do not use joint power supply cord. Replace the wire if the existing wire (from concealed wiring, or otherwise) is too short.
  - In unavoidable case, joining of power supply cord between isolating devices and terminal board of air conditioner shall be done by using approved socket and plug with earth pin rated 15/16A. Wiring work to both socket and plug must follow to national wiring standard.
- 4 Bind all the power supply cord lead wire with tape and route the power supply cord via the left escapement.
- 5 **Connection cable** between indoor unit and outdoor unit shall be approved polychloroprene sheathed  $4 \times 1.5 \text{ mm}^2$  flexible cord, type designation 245 IEC 57 or heavier cord. Do not use joint connection cable. Replace the wire if the existing wire (from concealed wiring, or otherwise) is too short.
- 6 Bind all the indoor and outdoor connection cable with tape and route the connection cable via the right escapement.

- 7 Remove the tapes and connect the power supply cord and connection cable between indoor unit and outdoor unit according to the diagram below.

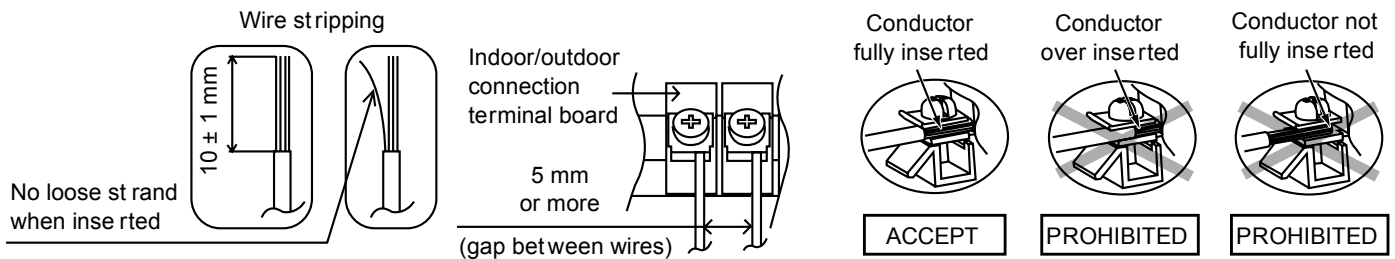



- 8 Secure the power supply cord and connection cable onto the control board with the holder.  
9 Close grille door by tighten with screw and close the front panel.



Note:

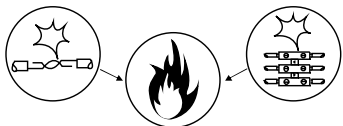
- Isolating Devices (Disconnecting means) should have minimum 3.0 mm contact gap.
- Ensure the colour of wires of outdoor unit and the terminal Nos. are the same to the indoor's respectively.
- Earth wire shall be Yellow/Green (Y/G) in colour and longer than other AC wires as shown in the figure for the electrical safety in case of the slipping out of the cord from the anchorage.



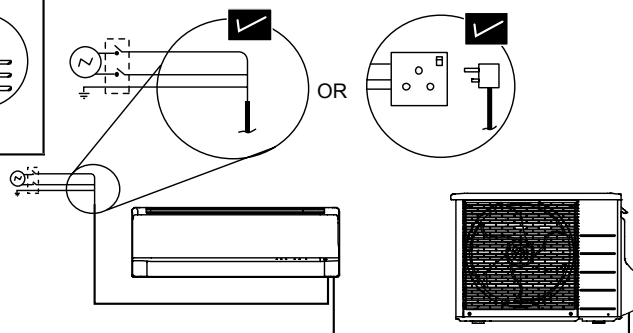
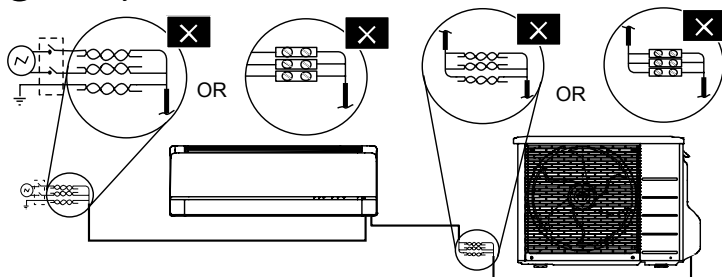


**WARNING**

**RISK OF FIRE**  
 JOINING  
 OF WIRES  
 MAY CAUSE  
 OVERHEATING  
 AND FIRE.



⊘ Do not joint wires

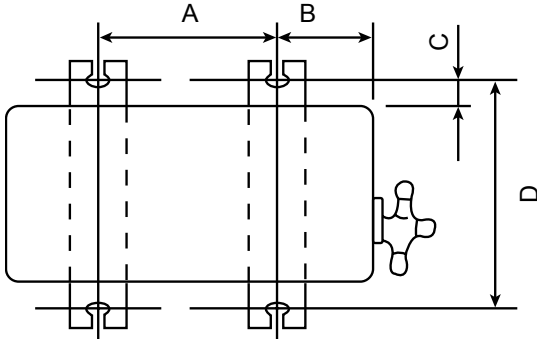


- ❗ Use complete wire without joining.
- ❗ Use approved socket and plug with earth pin.
- ❗ Wire connection in this area must follow to national wiring rules.

## 11.3 Outdoor Unit

### 11.3.1 Install the Outdoor Unit

- After selecting the best location, start installation according to Indoor/Outdoor Unit Installation Diagram.
  - Fix the unit on concrete or rigid frame firmly and horizontally by bolt nut ( $\phi 10$  mm).
  - When installing at roof, please consider strong wind and earthquake. Please fasten the installation stand firmly with bolt or nails.



Model	A	B	C	D
CE9***, CE12***	540 mm	160 mm	18.5 mm	330 mm

### 11.3.2 Connect the Piping

#### Connecting the Piping to Indoor

Please make flare after inserting flare nut (locate at joint portion, of tube assembly) onto the copper pipe. (In case of using long piping)

Connect the piping

- Align the center of piping and sufficiently tighten the flare nut with fingers.
- Further tighten the flare nut with torque wrench in specified torque as stated in the table.

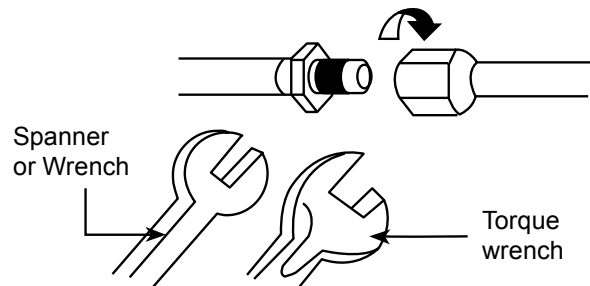
#### Connecting the Piping to Outdoor

Decide piping length and then cut by using pipe cutter. Remove burrs from cut edge.

Make flare after inserting the flare nut (locate at valve) onto the copper pipe.

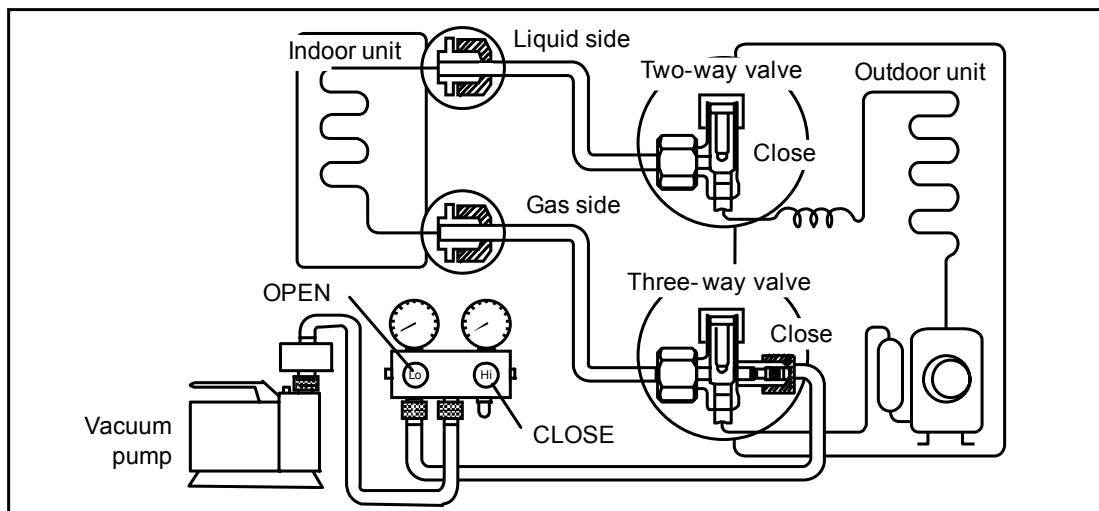
Align center of piping to valves and then tighten with torque wrench to the specified torque as stated in the table.

Do not over tighten, over tightening may cause gas leakage.	
Piping Size	Torque
6.35 mm (1/4")	[18 N•m (1.8 kgf.m)]
9.52 mm (3/8")	[42 N•m (4.3 kgf.m)]
12.7 mm (1/2")	[55 N•m (5.6 kgf.m)]
15.88 mm (5/8")	[65 N•m (6.6 kgf.m)]
19.05 mm (3/4")	[100 N•m (10.2 kgf.m)]



### 11.3.3 Evacuation of the Equipment

WHEN INSTALLING AN AIR CONDITIONER, BE SURE TO EVACUATE THE AIR INSIDE THE INDOOR UNIT AND PIPES in the following procedure.









- 1 Connect a charging hose with a push pin to the Low side of a charging set and the service port of the 3-way valve.
  - Be sure to connect the end of the charging hose with the push pin to the service port.
- 2 Connect the center hose of the charging set to a vacuum pump.
- 3 Turn on the power switch of the vacuum pump and make sure that the needle in the gauge moves from 0 cmHg (0 MPa) to -76 cmHg (-0.1 MPa). Then evacuate the air approximately ten minutes.
- 4 Close the Low side valve of the charging set and turn off the vacuum pump. Make sure that the needle in the gauge does not move after approximately five minutes.  
Note: BE SURE TO TAKE THIS PROCEDURE IN ORDER TO AVOID REFRIGERENT GAS LEAKAGE.
- 5 Disconnect the charging hose from the vacuum pump and from the service port of the 3-way valve.
- 6 Tighten the service port caps of the 3-way valve at a torque of 18 N•m with a torque wrench.
- 7 Remove the valve caps of both of the 2-way valve and 3-way valve. Position both of the valves to "OPEN" using a hexagonal wrench (4 mm).
- 8 Mount valve caps onto the 2-way valve and the 3-way valve.
  - Be sure to check for gas leakage.

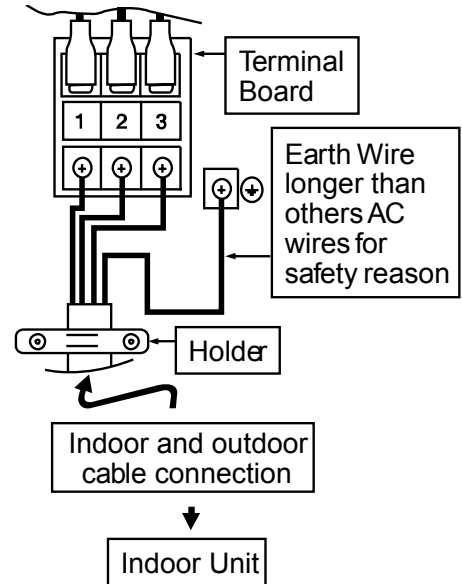
- If gauge needle does not move from 0 cmHg (0 MPa) to -76 cmHg (-0.1 MPa), in the step ③ above take the following measure:
  - If the leak stops when the piping connections are tightened further, continue working from step ③.
  - If the leak does not stop when the connections are retightened, repair location of leak.
  - Do not release refrigerant during piping work for installation and reinstallation.
  - Take care of the liquid refrigerant, it may cause frostbite.

### 11.3.4 Connect the cable to the Outdoor Unit

- 1 Remove the control board cover from the unit by loosening the screw.
- 2 **Connection cable** between indoor unit and outdoor unit shall be approved polychloroprene sheathed  $4 \times 1.5 \text{ mm}^2$  flexible cord, type designation 245 IEC 57 or heavier cord. Do not use joint connection cable. Replace the wire if the existing wire (from concealed wiring, or otherwise) is too short.

Terminals on the outdoor unit	1	2	3	
Colour of wires				
Terminals on the indoor unit	1	2	3	

- 3 Secure the cable onto the control board with the holder (clammer).
- 4 Attach the control board cover back to the original position with screw.
- 5 For wire stripping and connection requirement, refer to instruction 11.2.4 of indoor unit.



#### ⚠ WARNING

⚡ This equipment must be properly earthed.

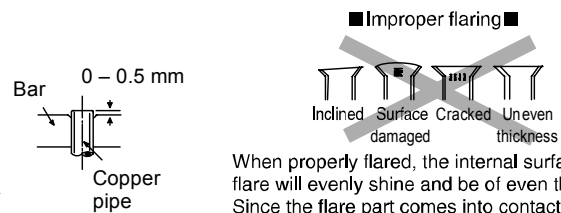
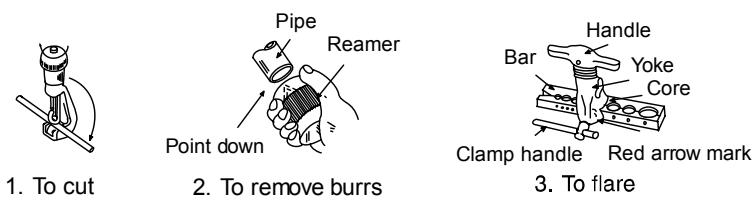
- Earth wire shall be Yellow/Green (Y/G) in colour and longer than the other AC wires for safety reason.

### 11.3.5 Piping Insulation

- 1 Please carry out insulation at pipe connection portion as mentioned in Indoor/Outdoor Unit Installation Diagram. Please wrap the insulated piping end to prevent water from going inside the piping.
- 2 If drain hose or connecting piping is in the room (where dew may form), please increase the insulation by using POLY-E FOAM with thickness 6 mm or above.

#### 11.3.5.1 Cutting and flaring the piping

- 1 Please cut using pipe cutter and then remove the burrs.
- 2 Remove the burrs by using reamer. If burrs are not removed, gas leakage may be caused. Turn the piping end down to avoid the metal powder entering the pipe.
- 3 Please make flare after inserting the flare nut onto the copper pipes.



When properly flared, the internal surface of the flare will evenly shine and be of even thickness. Since the flare part comes into contact with the connections, carefully check the flare finish.

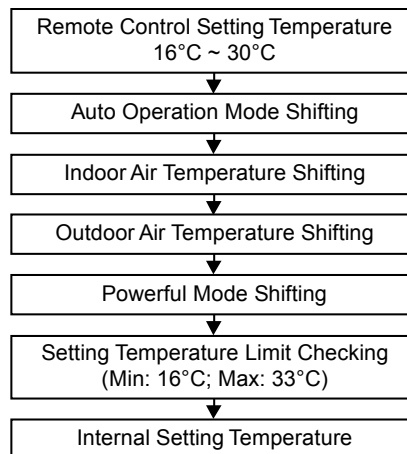
## 12. Operation and Control

### 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 continue for 3 minutes.
- Compressor is ON after waiting for 3 minutes, if the Intake Air Temperature - Internal Setting Temperature > Compressor OFF point.

#### 12.1.3 Soft Dry Operation

##### 12.1.3.1 Thermostat control

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

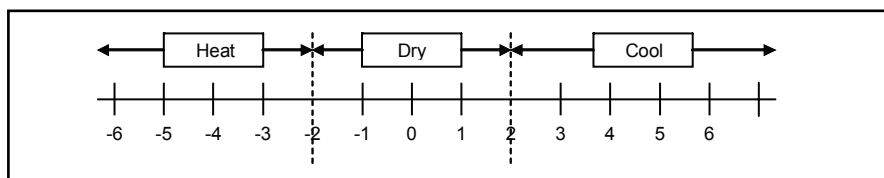
#### 12.1.4 Heating Operation

##### 12.1.4.1 Thermostat control

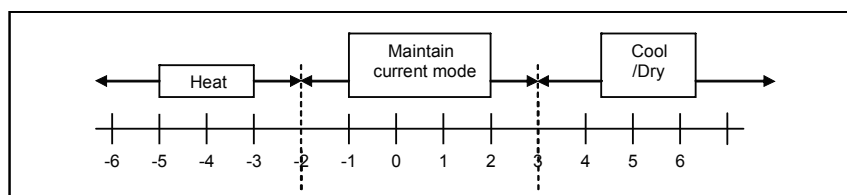
- Compressor is OFF when Intake Air Temperature - Internal Setting Temperature > +2.0°C continue for 3 minutes.
- Compressor is ON after waiting for 3 minutes, if the Intake Air Temperature - Internal Setting Temperature < Compressor OFF point.

### 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  $\geq 2^{\circ}\text{C}$ , COOL mode is decided.
  - If  $-2^{\circ}\text{C} \leq$  indoor intake temperature - remote control setting temperature  $< 2^{\circ}\text{C}$ , DRY mode is decided.
  - If indoor intake temperature - remote control setting temperature  $< -2^{\circ}\text{C}$ , HEAT mode is decided.



- For the 2nd judgment onwards
  - If indoor intake temperature - remote control setting temperature  $\geq 3^{\circ}\text{C}$ , if previous operate in DRY mode, then continue in DRY mode. otherwise COOL mode is decided.
  - If  $-2^{\circ}\text{C} \leq$  indoor intake temperature - remote control setting temperature  $< 3^{\circ}\text{C}$ , maintain with previous mode.
  - If indoor intake temperature - remote control setting temperature  $< -2^{\circ}\text{C}$ , HEAT mode is decided.



### 12.1.6 Fan Operation

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

## 12.2 Indoor Fan Motor Operation

### A. Basic Rotation Speed (rpm)

#### i. Manual Fan Speed

[Cooling, Dry, Fan]

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

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

[Heating]

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

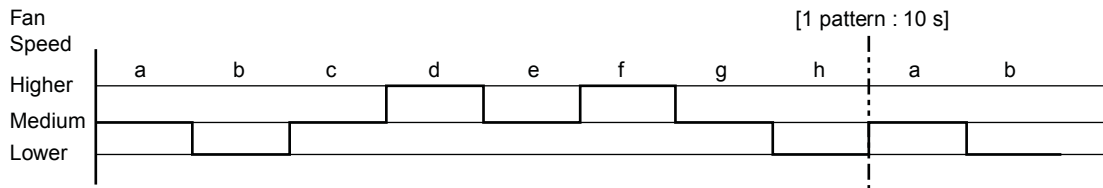
Remote control	O	O	O	O	O
Tab	SHi	Me+	Me	Me-	Lo



## ii. Auto Fan Speed

### [Cooling, Dry]

- According to room temperature and setting temperature, indoor fan speed is determined automatically.
- The indoor fan will operate according to pattern below.

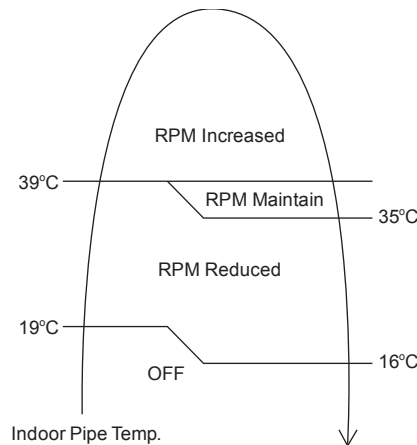


### [Fan]

- Indoor fan speed is fixed at predetermined speed.

### [Heating]

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

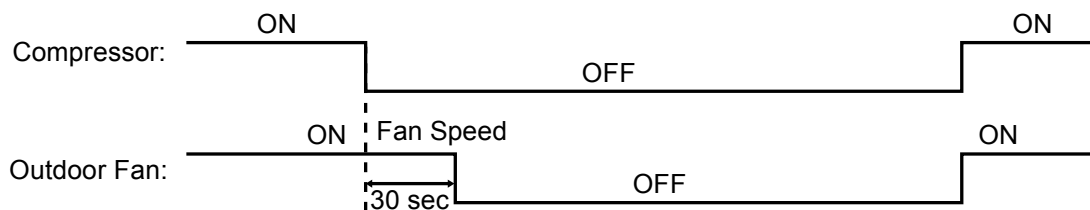


## B. Feedback control

- Immediately after the fan motor started, feedback control is performed once every second.
- During fan motor on, if fan motor feedback  $\geq 2550$  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

Outdoor fan motor is operated with one fan speed only. It starts when compressor starts operation and it stops 30 seconds after compressor stops operation.



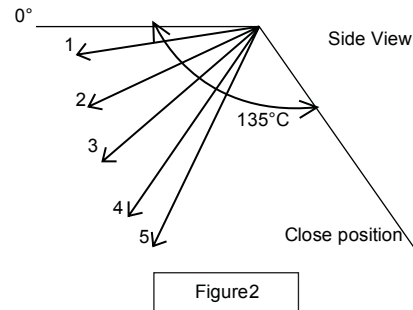
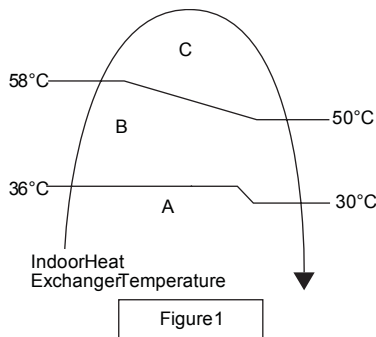
## 12.4 Airflow Direction

- There are two types of airflow, vertical airflow (directed by horizontal vane) and horizontal airflow (directed by vertical vanes).
- 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	Vane Angle (°)				
		1	2	3	4	5
Heating	Auto Heat Exchanger Temperature	A				
		10				
		B				
		43.8				
		C				
		21.2				
	Manual	10	21.2	32.5	43.8	55
Cooling and Fan	Auto	10 ~ 40				
	Manual	10	17.5	25	32.5	40
Soft Dry	Auto	10 ~ 40				
	Manual	10	17.5	25	32.5	40

- 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. It does not swing during fan motor stop. 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.



### 12.4.2 Horizontal Airflow

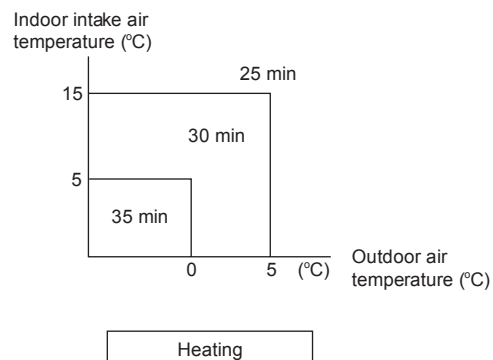
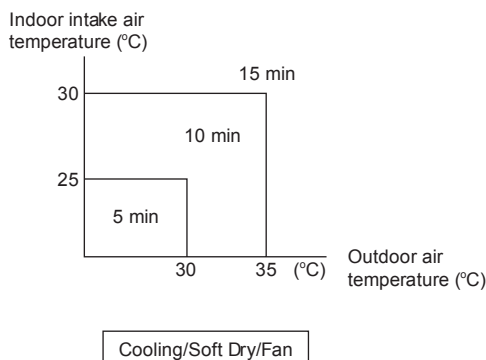
- The horizontal airflow direction louvers can be adjusted manually by hand.

## 12.5 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.

### 12.5.1 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.



### 12.5.2 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.

### 12.6 Auto Restart Control

- 1 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.
- 2 This type of control is not applicable during ON/OFF Timer setting.
- 3 This control can be omitted by open the circuit of JP1 at indoor unit printed circuit board.

### 12.7 Indication Panel

LED	POWER/DEICE		TIMER
Color	Green	Blue	Orange
Light ON	Operation ON	Deice Operation	Time Setting ON
Light OFF	Operation OFF		Time Setting OFF

Note:

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

## 13. Protection Control

### 13.1 Protection Control For All Operations

#### 13.1.1 Restart Control (Time Delay Safety Control)

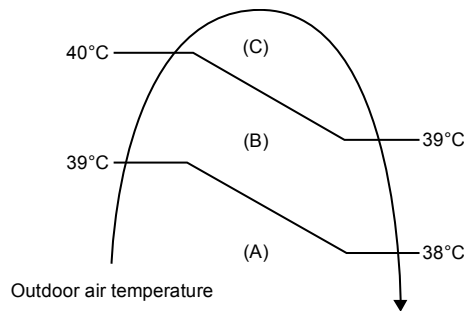
- The Compressor will not turn on within 3 minutes from the moment operation stops, although the unit is turned on again by pressing OFF/ON button at remote control within this period.
- This control is not applicable if the power supply is cut off and on again.
- This phenomenon is to balance the pressure inside the refrigerant cycle.

#### 13.1.2 Total Running Current Control

- When the outdoor unit total running current (AC) exceeds X value, the frequency instructed for compressor operation will be decreased.
- If the running current does not exceed X value for 10 seconds, the frequency instructed will be increased.
- However, if total outdoor unit running current exceeds Y value, compressor will be stopped immediately for 3 minutes.

Model	CE9PK		CE12PK	
Operation Mode	X (A)	Y (A)	X (A)	Y (A)
Cooling/Soft Dry (A)	4.54	14.76	6.20	14.76
Cooling/Soft Dry (B)	3.95	14.76	5.64	14.76
Cooling/Soft Dry (C)	3.95	14.76	5.64	14.76
Heating	5.34	14.76	8.18	14.76

- The first 30 minutes of cooling operation, (A) will be applied.

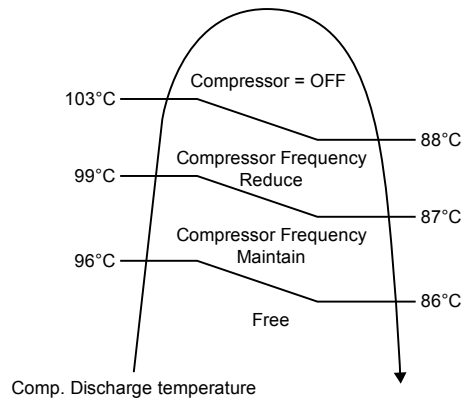


#### 13.1.3 IPM (Power transistor) Prevention Control

- Overheating Prevention Control
  - When the IPM temperature rises to 100°C, compressor operation will stop immediately.
  - Compressor operation restarts after 3 minutes the temperature decreases to 95°C.
  - If this condition repeats continuously 4 times within 20 minutes, timer LED will be blinking ("F96" is indicated).
- DC Peak Current Control
  - When electric current to IPM exceeds set value of 20.2 A, the compressor will stop operate. Then, operation will restart after 3 minutes.
  - If the set value is exceeded again more than 30 seconds after the compressor starts, the operation will restart after 1 minute.
  - If the set value exceeded again within 30 seconds after the compressor starts, the operation will restart after 2 minutes. If this condition repeats continuously for 7 times, all indoor and outdoor relays will be cut off, timer LED will be blinking ("F99" is indicated).

### 13.1.4 Compressor Overheating Prevention Control

- Instructed frequency for compressor operation will be regulated by compressor discharge temperature. The changes of frequency are as below.
- If compressor discharge temperature exceeds 103°C, compressor will be stopped, occurs 4 times per 20 minutes, timer LED will be blinking. ("F97" is indicated.)



### 13.1.5 Low Pressure Prevention Control (Gas Leakage Detection)

- Control start conditions
  - For 5 minutes, the compressor continuously operates and outdoor total current is between 0.6A and 1.15A.
  - During Cooling and Soft Dry operations:  
Indoor suction temperature - indoor piping temperature is below 4°C.
  - During Heating operations :  
Indoor piping temperature - indoor suction is under 5°C.
- Control contents
  - Compressor stops (and restart after 3 minutes).
  - If the conditions above happen 2 times within 20 minutes, the unit will:
    - Stop operation.
    - Timer LED blinks and "F91" indicated.

### 13.1.6 Low Frequency Protection Control 1

- When the compressor operate at frequency lower than 24 Hz continued for 240 minutes, the operation frequency will be changed to 23 Hz for 2 minutes.

### 13.1.7 Low Frequency Protection Control 2

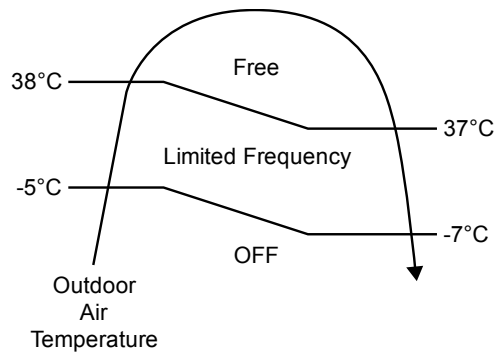
- When all the below conditions comply, the compressor frequency will change to lower frequency.

Temperature, T, for:	Cooling/Soft Dry	Heating
Indoor intake air (°C)	$T < 14$ or $T \geq 30$	$T < 14$ or $T \geq 28$
Outdoor air (°C)	$T < 13$ or $T \geq 38$	$T < 4$ or $T \geq 24$
Indoor heat exchanger (°C)	$T < 30$	$T < 0$

## 13.2 Protection Control For Cooling & Soft Dry Operation

### 13.2.1 Outdoor Air Temperature Control

- The compressor operating frequency is regulated in accordance to the outdoor air temperature as shown in the diagram below.
- This control will begin 1 minute after the compressor starts.
- Compressor frequency will adjust base on outdoor air temperature.



### 13.2.2 Cooling Overload Control

- Detects the Outdoor pipe temperature and carry out below restriction/limitation (Limit the compressor Operation frequency).
- The compressor stop if outdoor pipe temperature exceeds 61°C.
- If the compressor stops 4 times in 20 minutes, Timer LED blinking (F95 indicated: outdoor high pressure rise protection).

### 13.2.3 Freeze Prevention Control 1

- When indoor heat exchanger temperature is lower than 0°C continuously for 6 minutes, compressor will stop operating.
- Compressor will resume its operation 3 minutes after the indoor heat exchanger is higher than 5°C.
- At the same time, indoor fan speed will be higher than during its normal operation.
- If indoor heat exchanger temperature is higher than 5°C for 5 minutes, the fan speed will return to its normal operation.

### 13.2.4 Freeze Prevention Control 2

- Control start conditions
  - During Cooling operation and soft dry operation
    - During thermo OFF condition, indoor intake temperature is less than 10°C or
    - Compressor stops for freeze prevention control
  - Either one of the conditions above occurs 5 times in 60 minutes.
- Control contents
  - Operation stops
  - Timer LED blinks and “H99” indicated

### 13.2.5 Dew Prevention Control 1

- To prevent dew formation at indoor unit discharge area.
- This control will be activated if:
  - Outdoor air temperature and Indoor pipe temperature judgment by microcontroller is fulfilled.
  - When Cooling or Dry mode is operated more than 20 minutes or more.
- This control stopped if:
  - Compressor stopped.
  - Remote control setting changed (fan speed / temperature).
  - Outdoor air temperature and indoor intake temperature changed.
- Fan speed, angle of louver (vertical airflow angle) will be adjusted accordingly in this control.

### 13.2.6 Dew Prevention Control 2

- To prevent dew formation at indoor unit discharge area.
- This control starts if all conditions continue for 20 minutes:
  - Operated with Cooling or Soft Dry Mode.
  - Indoor intake temperature is between 25°C and 29°C.
  - Outdoor air temperature is less than 30°C.
- This control stopped if:
  - When receive air swing change signal from Remote Control.
- The vertical airflow angle will be fixed at 17.5°.

### 13.2.7 Odor Cut Control

- To reduce the odor released from the unit.
  - Start Condition
    - AUTO FAN Speed is selected during COOL or DRY operation.
    - During freeze prevention control and timer preliminary operation, this control is not applicable.
  - Control content
    - Depends on compressor conditions:
      - Compressor OFF → Compressor ON.  
The indoor unit fan stops temporarily and then starts to blow at minimum airflow for 30 seconds.
      - Compressor ON → Compressor OFF.  
The indoor unit fan stops for 90 seconds and then blows at minimum airflow for 20 seconds.

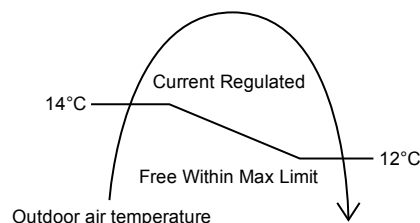
## 13.3 Protection Control For Heating Operation

### 13.3.1 Intake Air Temperature Control

Compressor will operate at limited freq., if indoor intake air temperature is 30°C or above.

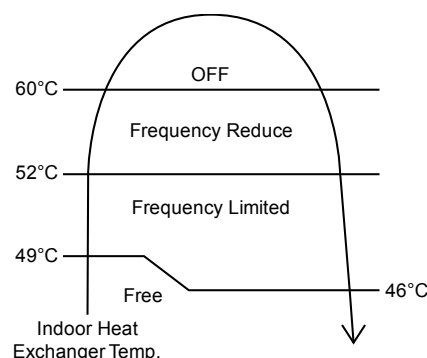
### 13.3.2 Outdoor Air Temperature Control

- The Max current value is regulated when the outdoor air temperature rise above 14°C in order to avoid compressor overloading.



### 13.3.3 Overload Protection Control

- The compressor operating frequency is regulated in accordance to indoor heat exchanger temperature as shown below.
- If the heat exchanger temperature exceeds 60°C, compressor will stop.



#### **13.3.4 Compressor Oil Return Control**

- When compressor starts, the compressor will be regulated for 240 seconds.

#### **13.3.5 Cold Draught Prevention Control**

- When indoor pipe temperature is low, cold draught operation starts where indoor fan speed will be reduced.

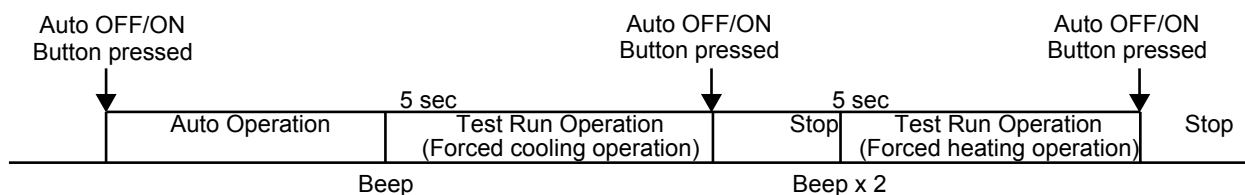
#### **13.3.6 Deice Operation**

- When outdoor pipe temperature and outdoor air temperature is low, deice operation start where indoor fan motor and outdoor fan motor stop and the operation LED deice indicator ON during this operation.



## 14. Servicing Mode

### 14.1 Auto OFF/ON Button



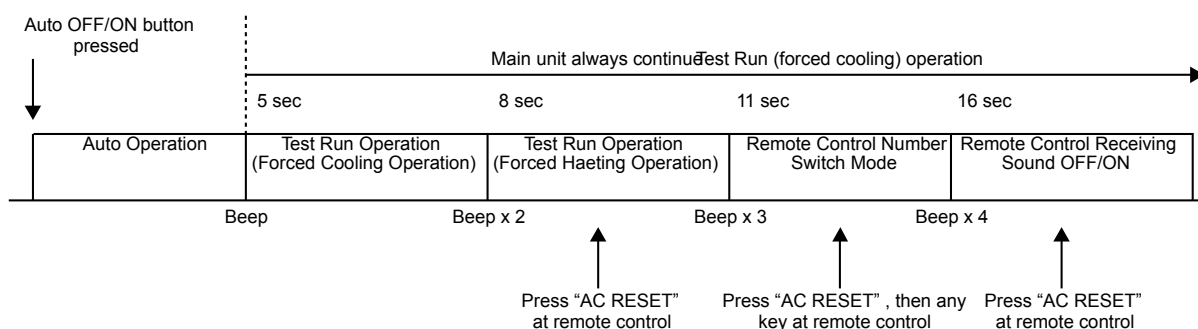
#### 1 AUTO OPERATION MODE

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 Forced heating operation.

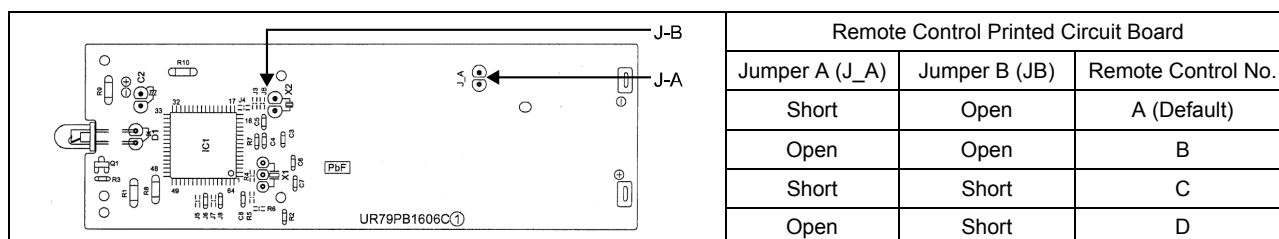
The Auto OFF/ON button may be used together with remote control to set / change the advance setting of air conditioner operation.



#### 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.



- 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.

## 14.2 Remote Control Button

### 14.2.1 SET BUTTON

- To check remote control transmission code and store the transmission code to EEPROM
  - Press “SET” button for more than 10 seconds by using pointer.
  - Press “TIMER SET” button until a “beep” sound is heard as confirmation of transmission code changed.

### 14.2.2 RESET (RC)

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

### 14.2.3 RESET (AC)

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

### 14.2.4 TIMER ▲

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

### 14.2.5 TIMER ▼

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

# 15. Troubleshooting Guide

## 15.1 Refrigeration Cycle System

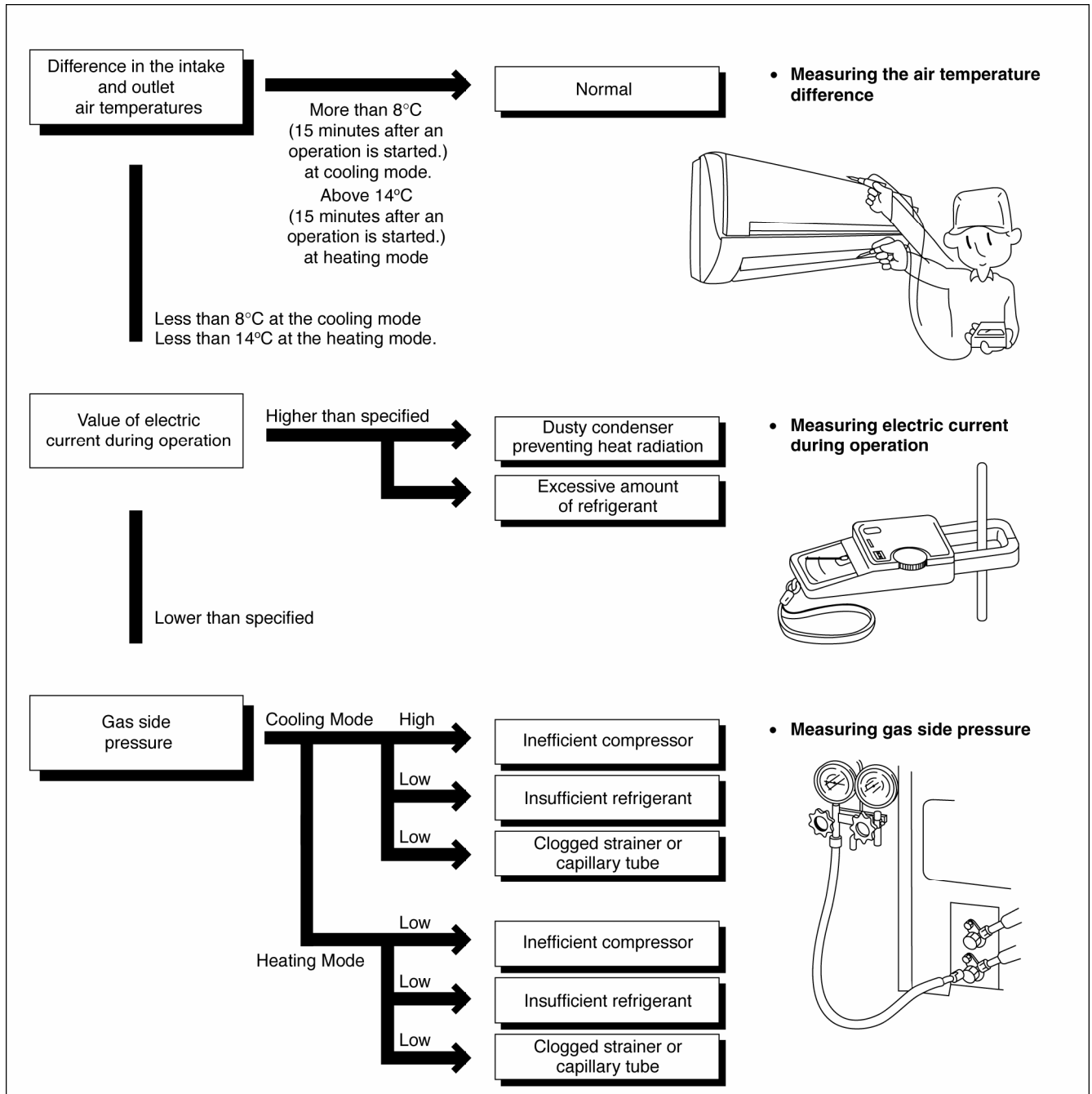
In order to diagnose malfunctions, make sure that there are no electrical problems before inspecting the refrigeration cycle. Such problems include insufficient insulation, problem with the power source, malfunction of a compressor and a fan.

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 MPa (kg/cm <sup>2</sup> G)	Outlet air temperature (°C)
Cooling Mode	0.9 ~ 1.2 (9 ~ 12)	12 ~ 16
Heating Mode	2.3 ~ 2.9 (23 ~ 29)	36 ~ 45

\*Condition: • Indoor fan speed; High  
• Outdoor temperature 35°C at cooling mode and 7°C at heating mode  
• Compressor operates at rated frequency



### 15.1.1 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.

## 15.2 Breakdown Self Diagnosis Function

### 15.2.1 Self Diagnosis Function (Three Digits Alphanumeric Code)

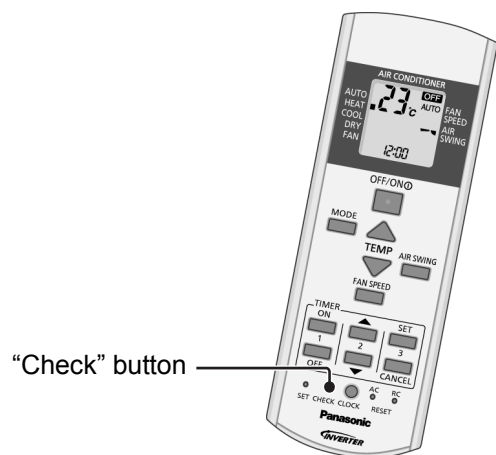
- Once abnormality has occurred during operation, the unit will stop its operation, and Timer LED blinks.
  - Although Timer LED goes off when power supply is turned off, if the unit is operated under a breakdown condition, the LED will light up again.
  - In operation after breakdown repair, the Timer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

### 15.2.2 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.

### 15.2.3 To Display Memorized Error (Protective Operation) status

- 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.



### 15.2.4 To Clear Memorized Error (Protective Operation) status after Repair

- 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.

### 15.2.5 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.

## 15.3 Error Code 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	<ul style="list-style-type: none"> <li>Indoor/outdoor wire terminal</li> <li>Indoor/outdoor PCB</li> <li>Indoor/outdoor connection wire</li> </ul>
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	<ul style="list-style-type: none"> <li>Indoor/outdoor connection wire</li> <li>Indoor/outdoor PCB</li> <li>Specification and combination table in catalogue</li> </ul>
H14	Indoor intake air temperature sensor abnormality	Continuous for 5s	—	Indoor intake air temperature sensor open or short circuit	<ul style="list-style-type: none"> <li>Indoor intake air temperature sensor lead wire and connector</li> </ul>
H15	Compressor temperature sensor abnormality	Continuous for 5s	—	Compressor temperature sensor open or short circuit	<ul style="list-style-type: none"> <li>Compressor temperature sensor lead wire and connector</li> </ul>
H16	Outdoor current transformer (CT) abnormality	—	—	Current transformer faulty or compressor faulty	<ul style="list-style-type: none"> <li>Outdoor PCB faulty or compressor faulty</li> </ul>
H19	Indoor fan motor mechanism lock	Continuous happen for 7 times	—	Indoor fan motor lock or feedback abnormal	<ul style="list-style-type: none"> <li>Fan motor lead wire and connector</li> <li>Fan motor lock or block</li> </ul>
H23	Indoor heat exchanger temperature sensor abnormality	Continuous for 5s	—	Indoor heat exchanger temperature sensor open or short circuit	<ul style="list-style-type: none"> <li>Indoor heat exchanger temperature sensor lead wire and connector</li> </ul>
H24	Indoor heat exchanger temperature sensor 2 abnormality	Continuous for 5s	—	Indoor heat exchanger temperature sensor 2 open or short circuit	<ul style="list-style-type: none"> <li>Indoor heat exchanger temperature sensor 2 lead wire and connector</li> </ul>
H25	Indoor ion device abnormality	Port is ON for 10s during ion device off	—	—	<ul style="list-style-type: none"> <li>ion device PCB</li> </ul>
H27	Outdoor air temperature sensor abnormality	Continuous for 5s	—	Outdoor air temperature sensor open or short circuit	<ul style="list-style-type: none"> <li>Outdoor air temperature sensor lead wire and connector</li> </ul>
H28	Outdoor heat exchanger temperature sensor 1 abnormality	Continuous for 5s	—	Outdoor heat exchanger temperature sensor 1 open or short circuit	<ul style="list-style-type: none"> <li>Outdoor heat exchanger temperature sensor 1 lead wire and connector</li> </ul>
H30	Outdoor discharge pipe temperature sensor abnormality	Continuous for 5s	—	Outdoor discharge pipe temperature sensor open or short circuit	<ul style="list-style-type: none"> <li>Outdoor discharge pipe temperature sensor lead wire and connector</li> </ul>
H32	Outdoor heat exchanger temperature sensor 2 abnormality	Continuous for 5s	—	Outdoor heat exchanger temperature sensor 2 open or short circuit	<ul style="list-style-type: none"> <li>Outdoor heat exchanger temperature sensor 2 lead wire and connector</li> </ul>
H33	Indoor / outdoor misconnection abnormality	—	—	Indoor and outdoor rated voltage different	<ul style="list-style-type: none"> <li>Indoor and outdoor units check</li> </ul>
H34	Outdoor heat sink temperature sensor abnormality	Continuous for 2s	—	Outdoor heat sink temperature sensor open or short circuit	<ul style="list-style-type: none"> <li>Outdoor heat sink sensor</li> </ul>
H36	Outdoor gas pipe temperature sensor abnormality	Continuous for 5s	Heating protection operation only	Outdoor gas pipe temperature sensor open or short circuit	<ul style="list-style-type: none"> <li>Outdoor gas pipe temperature sensor lead wire and connector</li> </ul>
H37	Outdoor liquid pipe temperature sensor abnormality	Continuous for 5s	Cooling protection operation only	Outdoor liquid pipe temperature sensor open or short circuit	<ul style="list-style-type: none"> <li>Outdoor liquid pipe temperature sensor lead wire and connector</li> </ul>
H38	Indoor/Outdoor mismatch (brand code)	—	—	Brand code not match	<ul style="list-style-type: none"> <li>Check indoor unit and outdoor unit</li> </ul>
H39	Abnormal indoor operating unit or standby units	3 times happen within 40 minutes	—	Wrong wiring and connecting pipe, expansion valve abnormality, indoor heat exchanger sensor open circuit	<ul style="list-style-type: none"> <li>Check indoor/outdoor connection wire and connection pipe</li> <li>Indoor heat exchanger sensor lead wire and connector</li> <li>Expansion valve and lead wire and connector</li> </ul>

H41	Abnormal wiring or piping connection	—	—	Wrong wiring and connecting pipe, expansion valve abnormality	<ul style="list-style-type: none"> <li>• Check indoor/outdoor connection wire and connection pipe</li> <li>• Expansion valve and lead wire and connector</li> </ul>
H59	ECO sensor abnormality	Continuous for 70s	—	ECO sensor open or short circuit	<ul style="list-style-type: none"> <li>• ECO sensor</li> <li>• ECO and Indoor PCB</li> </ul>
H64	Outdoor high pressure sensor abnormality	Continuous for 1 minutes	—	High pressure sensor open circuit during compressor stop	<ul style="list-style-type: none"> <li>• High pressure sensor</li> <li>• Lead wire and connector</li> </ul>
H70	Light sensor abnormality	Continuous for 24 hours	—	Light sensor open or short circuit	<ul style="list-style-type: none"> <li>• Light sensor</li> <li>• Indoor PCB</li> </ul>
H97	Outdoor fan motor mechanism lock	2 times happen within 30 minutes	—	Outdoor fan motor lock or feedback abnormal	<ul style="list-style-type: none"> <li>• Outdoor fan motor lead wire and connector</li> <li>• Fan motor lock or block</li> </ul>
H98	Indoor high pressure protection	—	—	Indoor high pressure protection (Heating)	<ul style="list-style-type: none"> <li>• Check indoor heat exchanger</li> <li>• Air filter dirty</li> <li>• Air circulation short circuit</li> </ul>
H99	Indoor operating unit freeze protection	—	—	Indoor freeze protection (Cooling)	<ul style="list-style-type: none"> <li>• Check indoor heat exchanger</li> <li>• Air filter dirty</li> <li>• Air circulation short circuit</li> </ul>
F11	4-way valve switching abnormality	4 times happen within 30 minutes	—	4-way valve switching abnormal	<ul style="list-style-type: none"> <li>• 4-way valve</li> <li>• Lead wire and connector</li> </ul>
F17	Indoor standby units freezing abnormality	3 times happen within 40 minutes	—	Wrong wiring and connecting pipe, expansion valve leakage, indoor heat exchanger sensor open circuit	<ul style="list-style-type: none"> <li>• Check indoor/outdoor connection wire and pipe</li> <li>• Indoor heat exchanger sensor lead wire and connector</li> <li>• Expansion valve lead wire and connector</li> </ul>
F90	Power factor correction (PFC) circuit protection	4 times happen within 10 minutes	—	Power factor correction circuit abnormal	<ul style="list-style-type: none"> <li>• Outdoor PCB faulty</li> </ul>
F91	Refrigeration cycle abnormality	2 times happen within 20 minutes	—	Refrigeration cycle abnormal	<ul style="list-style-type: none"> <li>• Insufficient refrigerant or valve close</li> </ul>
F93	Compressor abnormal revolution	4 times happen within 20 minutes	—	Compressor abnormal revolution	<ul style="list-style-type: none"> <li>• Power transistor module faulty or compressor lock</li> </ul>
F94	Compressor discharge overshoot protection	4 times happen within 30 minutes	—	Compressor discharge pressure overshoot	<ul style="list-style-type: none"> <li>• Check refrigeration system</li> </ul>
F95	Outdoor cooling high pressure protection	4 times happen within 20 minutes	—	Cooling high pressure protection	<ul style="list-style-type: none"> <li>• Check refrigeration system</li> <li>• Outdoor air circuit</li> </ul>
F96	Power transistor module overheating protection	4 times happen within 30 minutes	—	Power transistor module overheat	<ul style="list-style-type: none"> <li>• PCB faulty</li> <li>• Outdoor air circuit (fan motor)</li> </ul>
F97	Compressor overheating protection	3 times happen within 30 minutes	—	Compressor overheat	<ul style="list-style-type: none"> <li>• Insufficient refrigerant</li> </ul>
F98	Total running current protection	3 times happen within 20 minutes	—	Total current protection	<ul style="list-style-type: none"> <li>• Check refrigeration system</li> <li>• Power source or compressor lock</li> </ul>
F99	Outdoor direct current (DC) peak detection	Continuous happen for 7 times	—	Power transistor module current protection	<ul style="list-style-type: none"> <li>• Power transistor module faulty or compressor lock</li> </ul>

## 15.4 Self-diagnosis Method

### 15.4.1 H11 (Indoor/Outdoor Abnormal Communication)

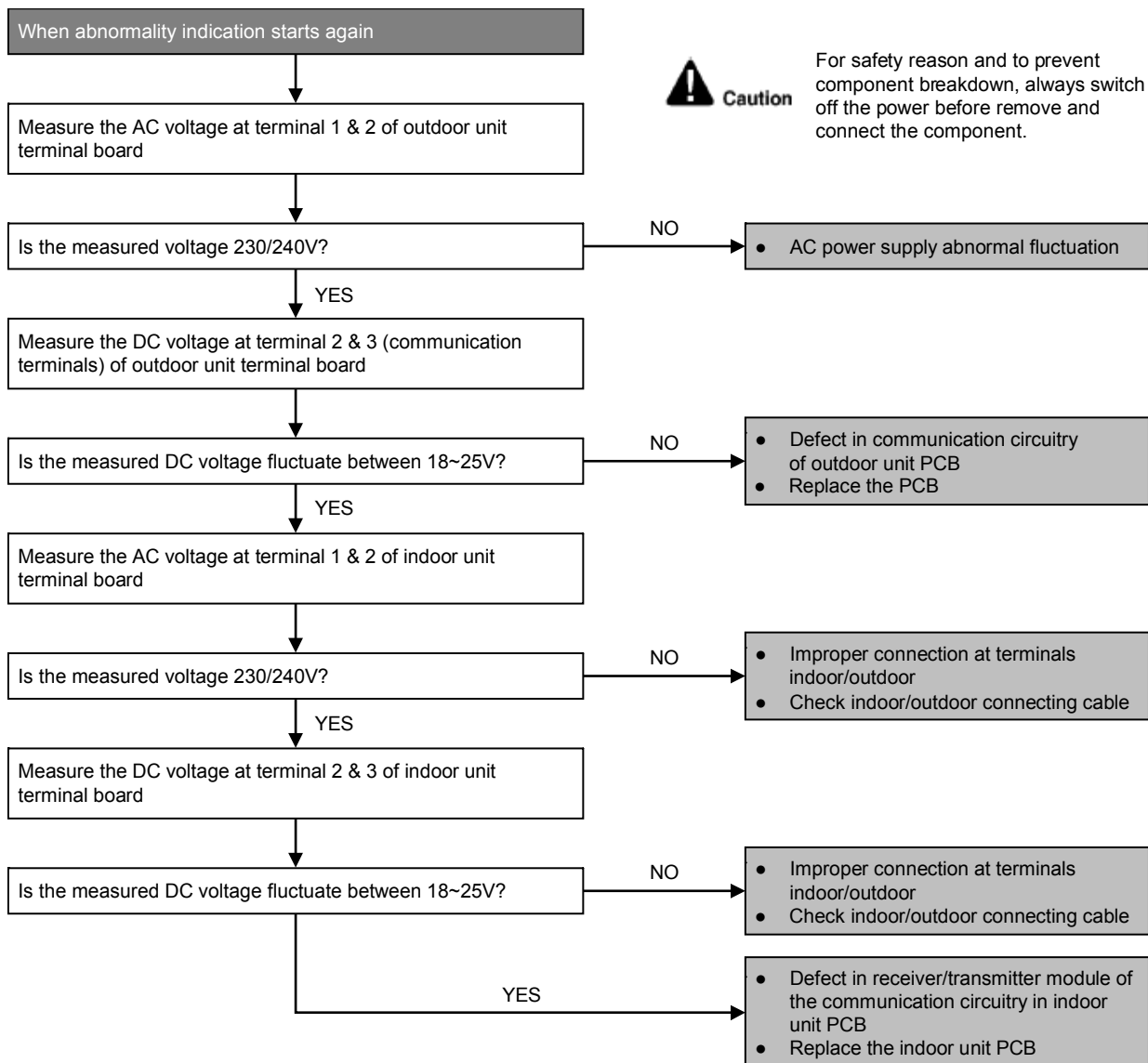
#### Malfunction Decision Conditions

- 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





## 15.4.2 H12 (Indoor/Outdoor Capacity Rank Mismatched)

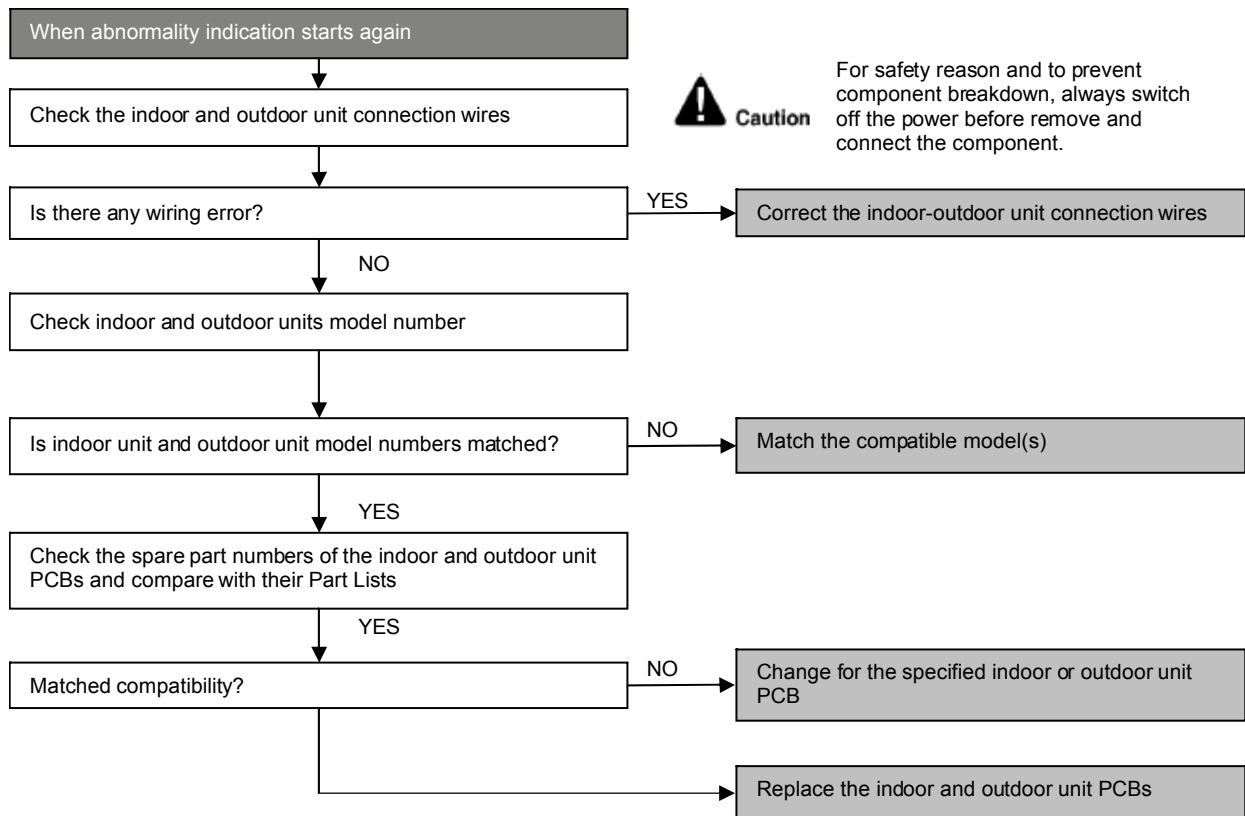
### Malfunction Decision Conditions

- 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



15.4.3 H14 (Indoor Intake Air Temperature Sensor Abnormality)

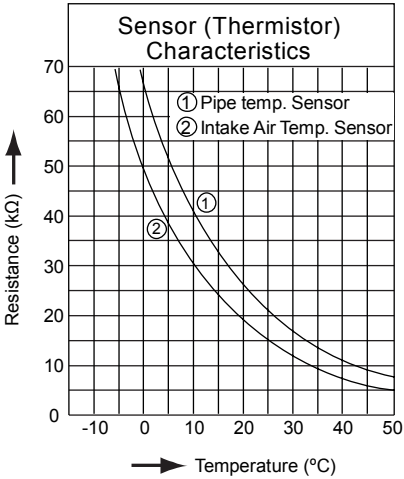
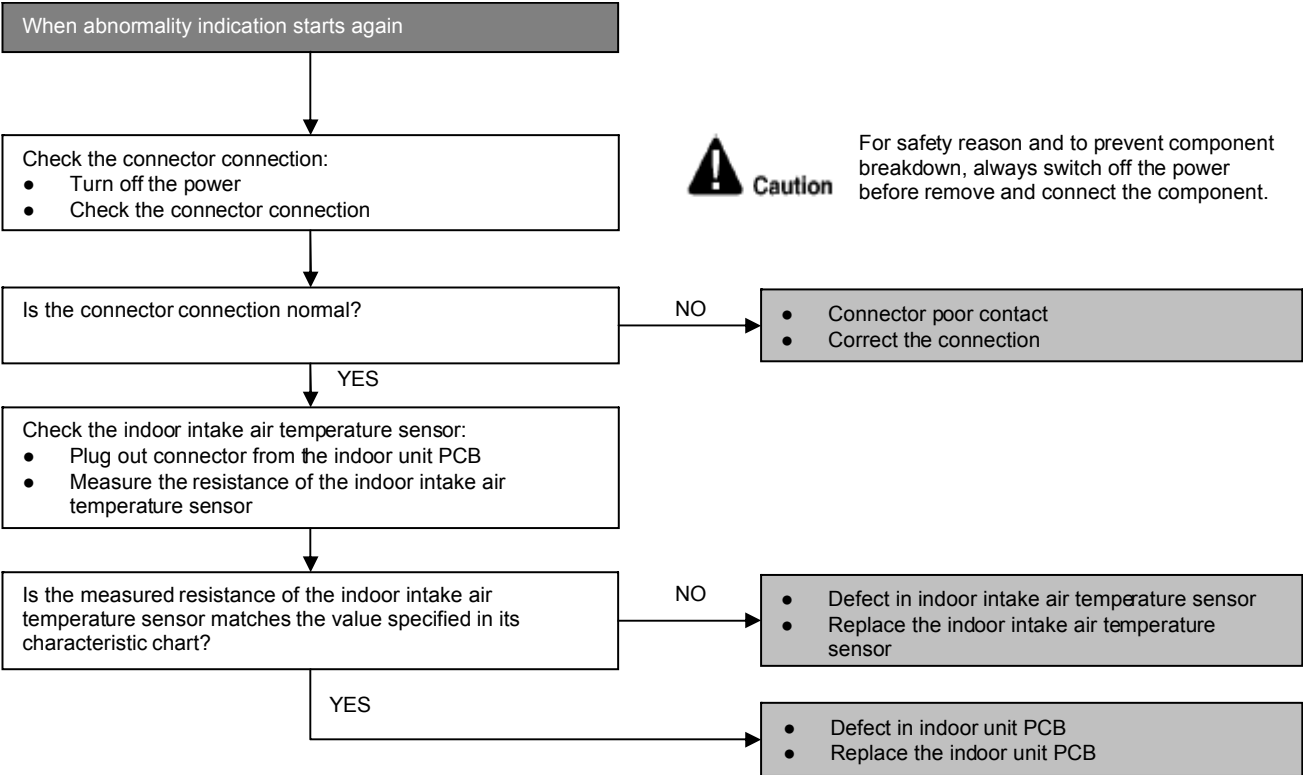
Malfunction Decision Conditions

- 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



## 15.4.4 H15 (Compressor Temperature Sensor Abnormality)

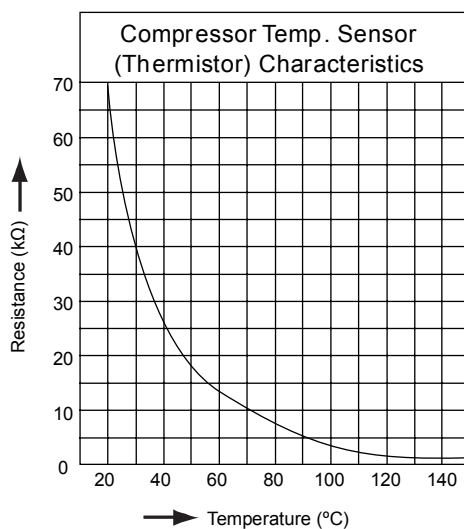
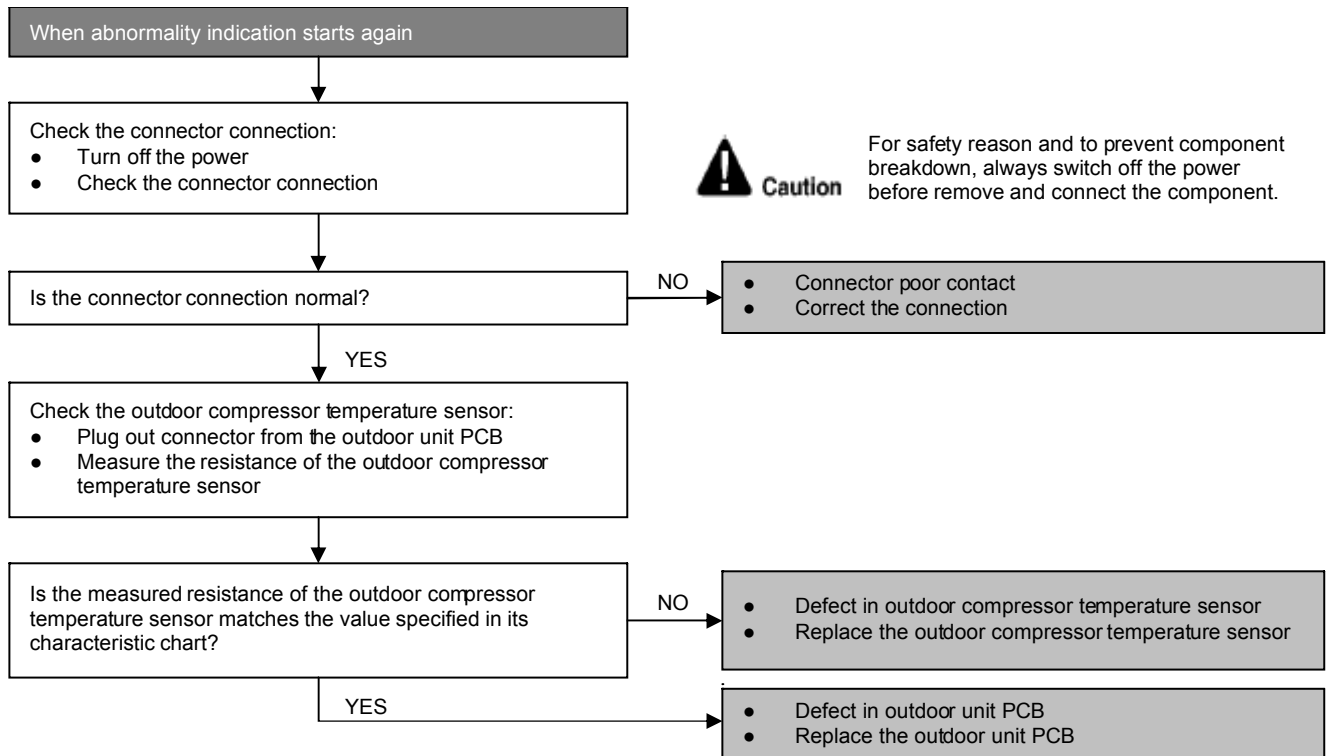
### Malfunction Decision Conditions

- 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



## 15.4.5 H16 (Outdoor Current Transformer)

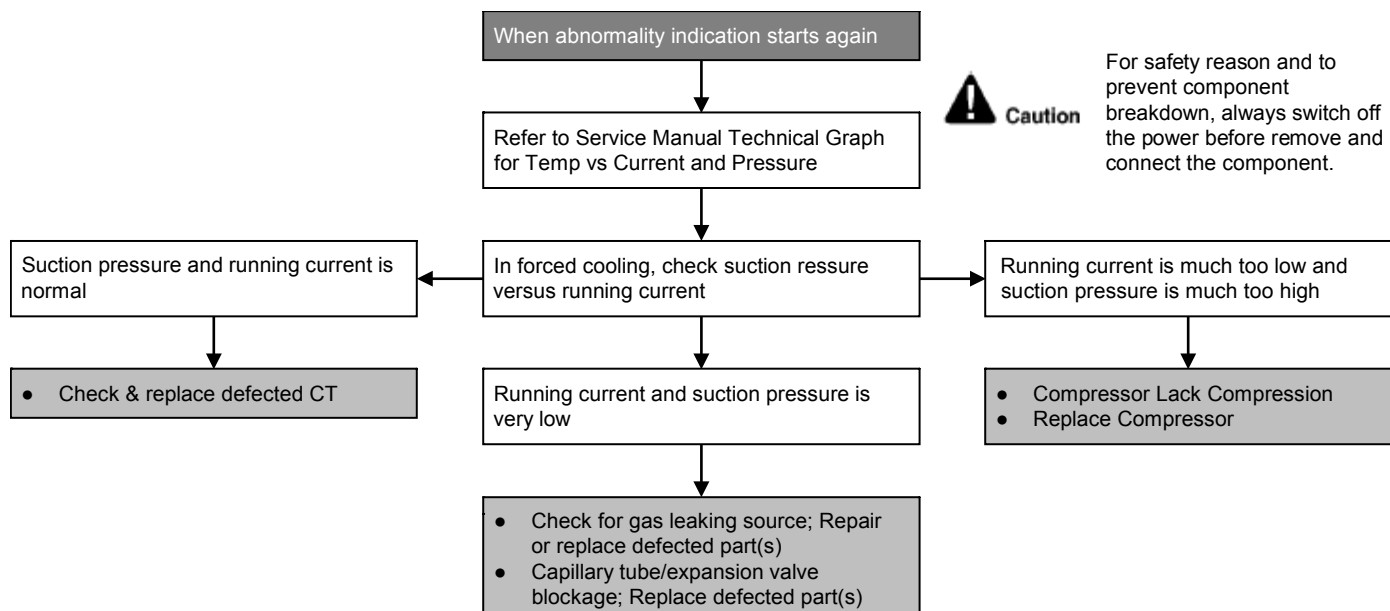
### Malfunction Decision Conditions

- 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



### 15.4.6 H19 (Indoor Fan Motor – DC Motor Mechanism Locked)

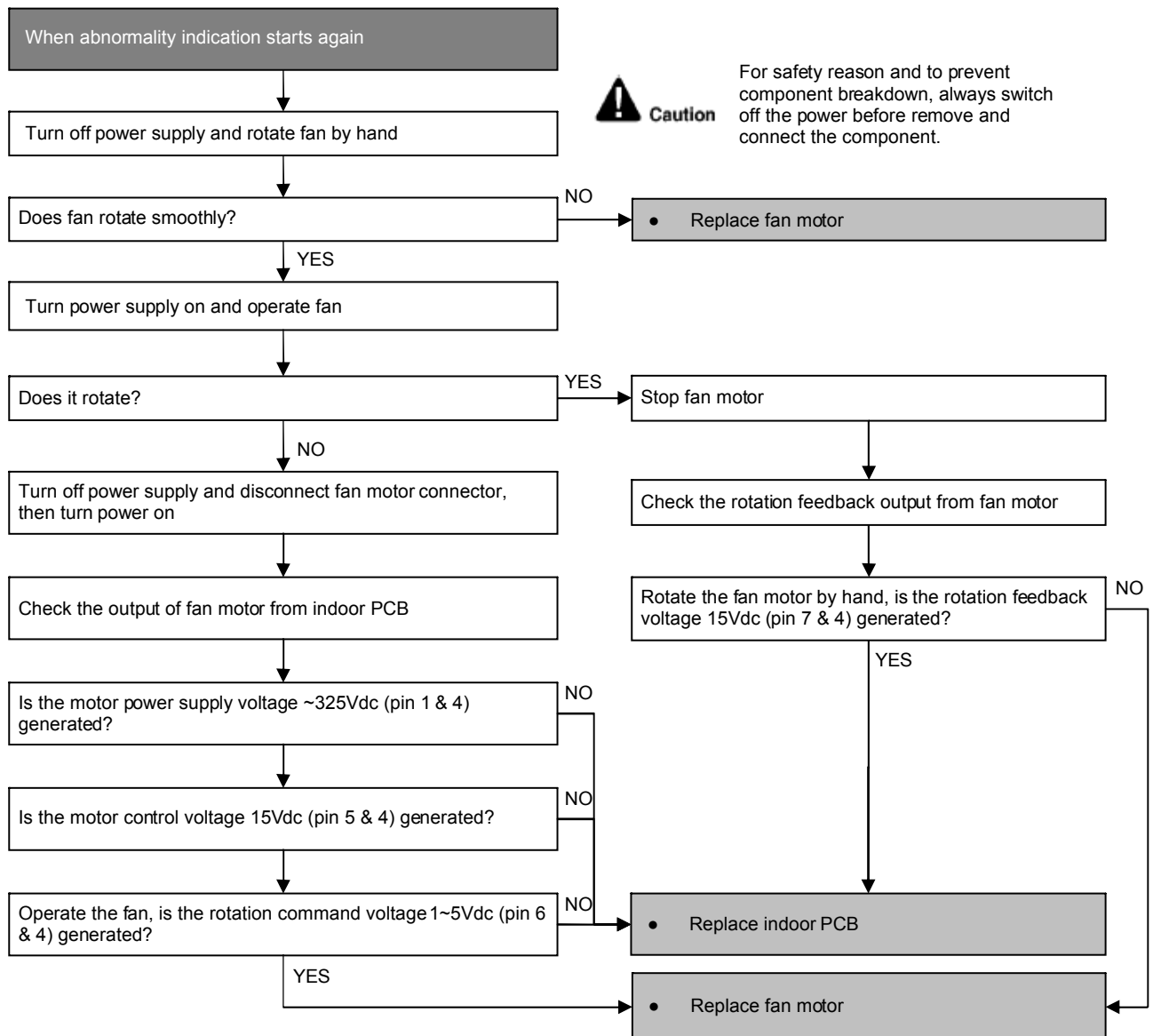
#### Malfunction Decision Conditions

- 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



## 15.4.7 H23 (Indoor Pipe Temperature Sensor Abnormality)

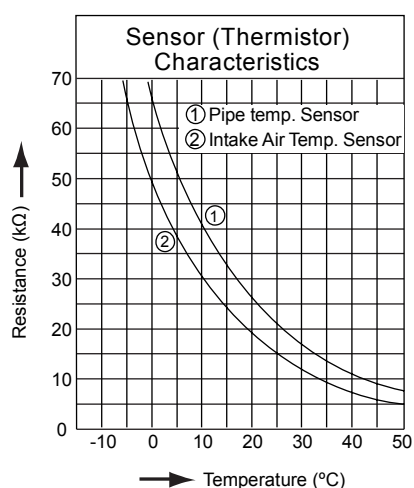
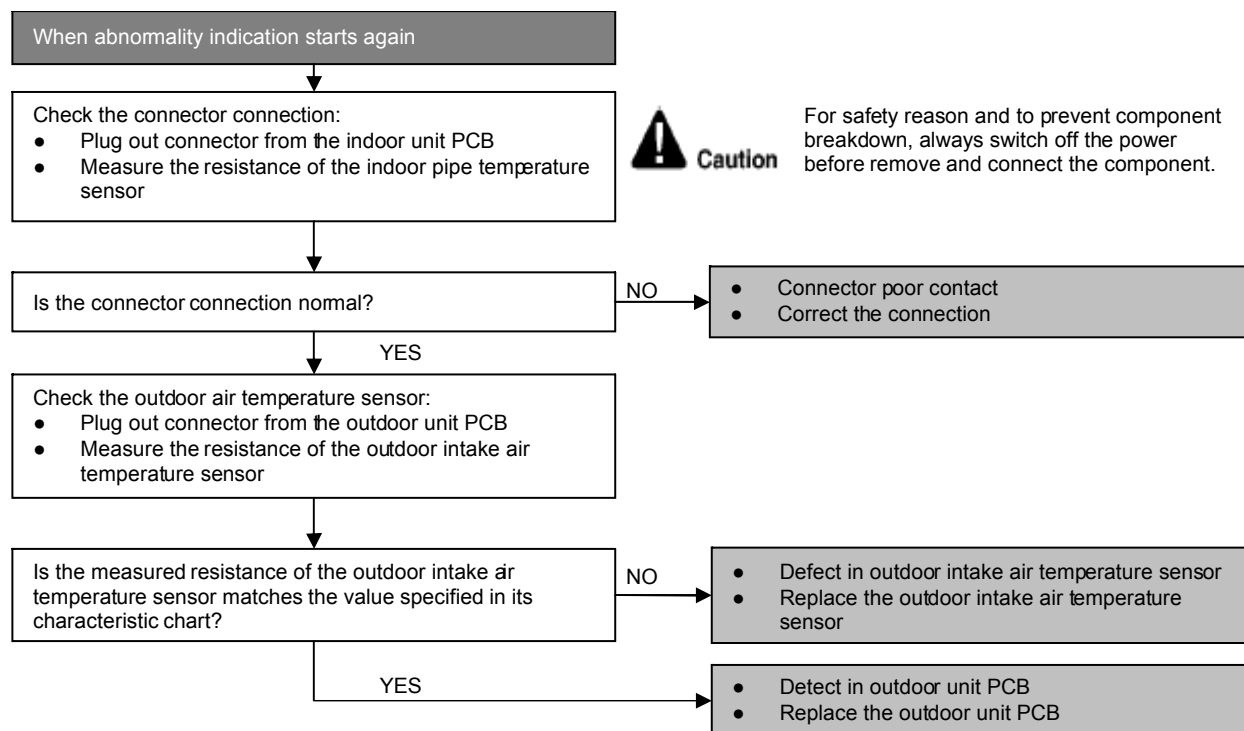
### Malfunction Decision Conditions

- 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



## 15.4.8 H27 (Outdoor Air Temperature Sensor Abnormality)

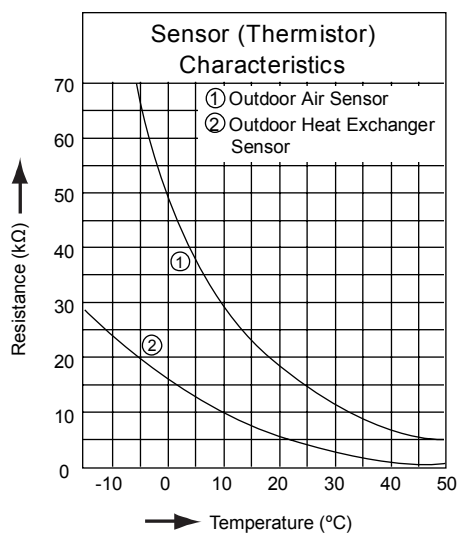
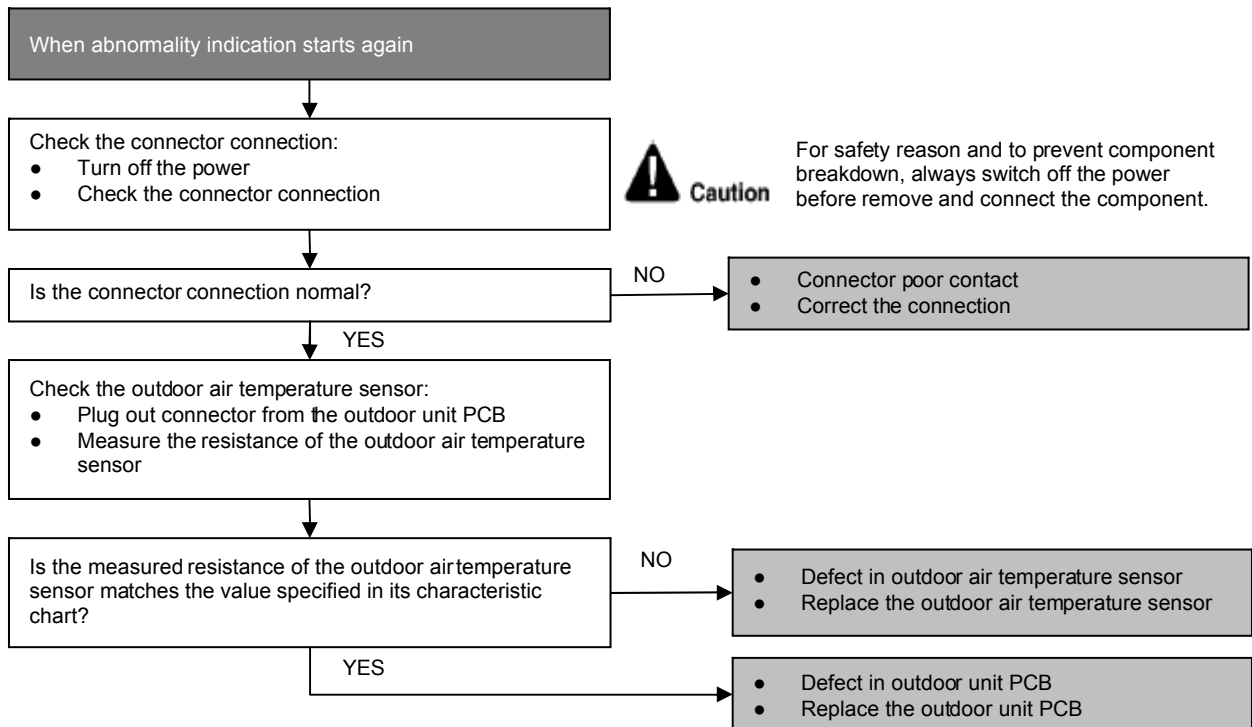
### Malfunction Decision Conditions

- 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



## 15.4.9 H28 (Outdoor Pipe Temperature Sensor Abnormality)

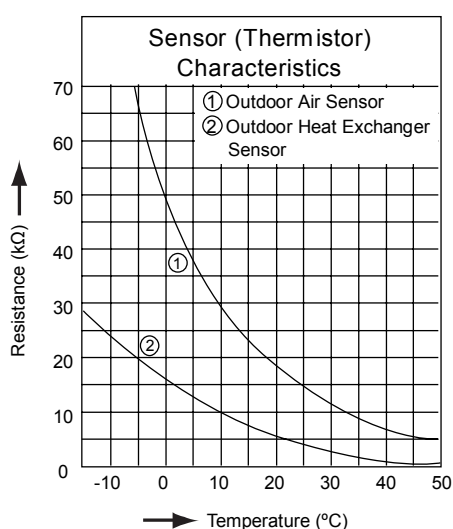
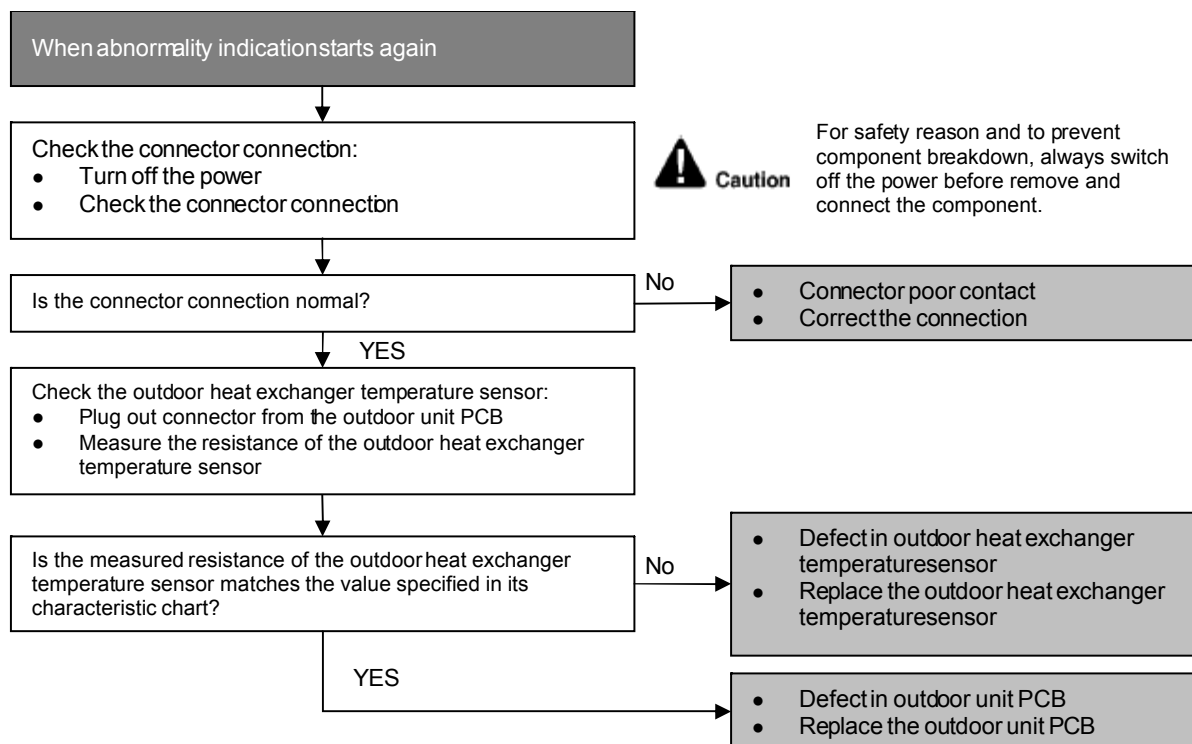
### Malfunction Decision Conditions

- 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





## 15.4.10 H30 (Compressor Discharge Temperature Sensor Abnormality)

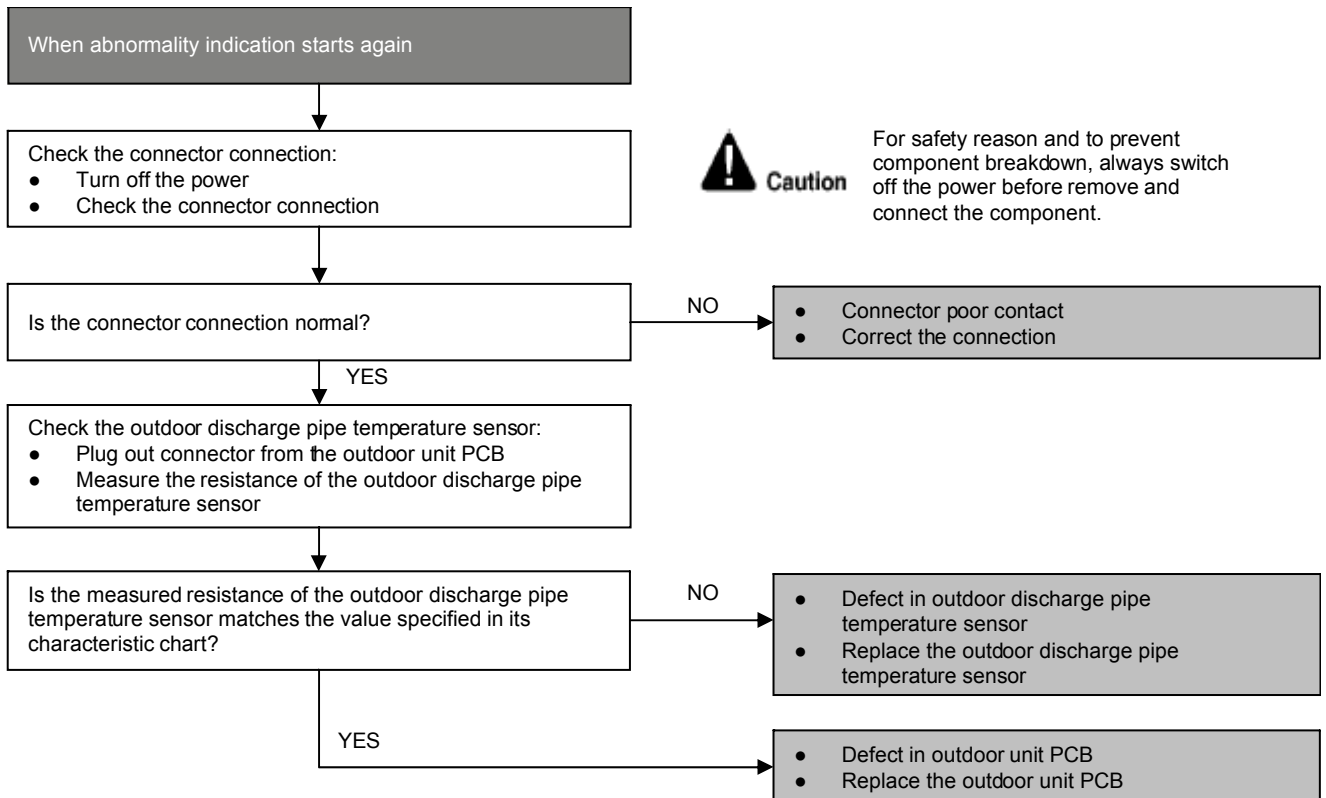
### Malfunction Decision Conditions

- 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



## 15.4.11 H32 (Outdoor Heat Exchanger Temperature Sensor 2 Abnormality)

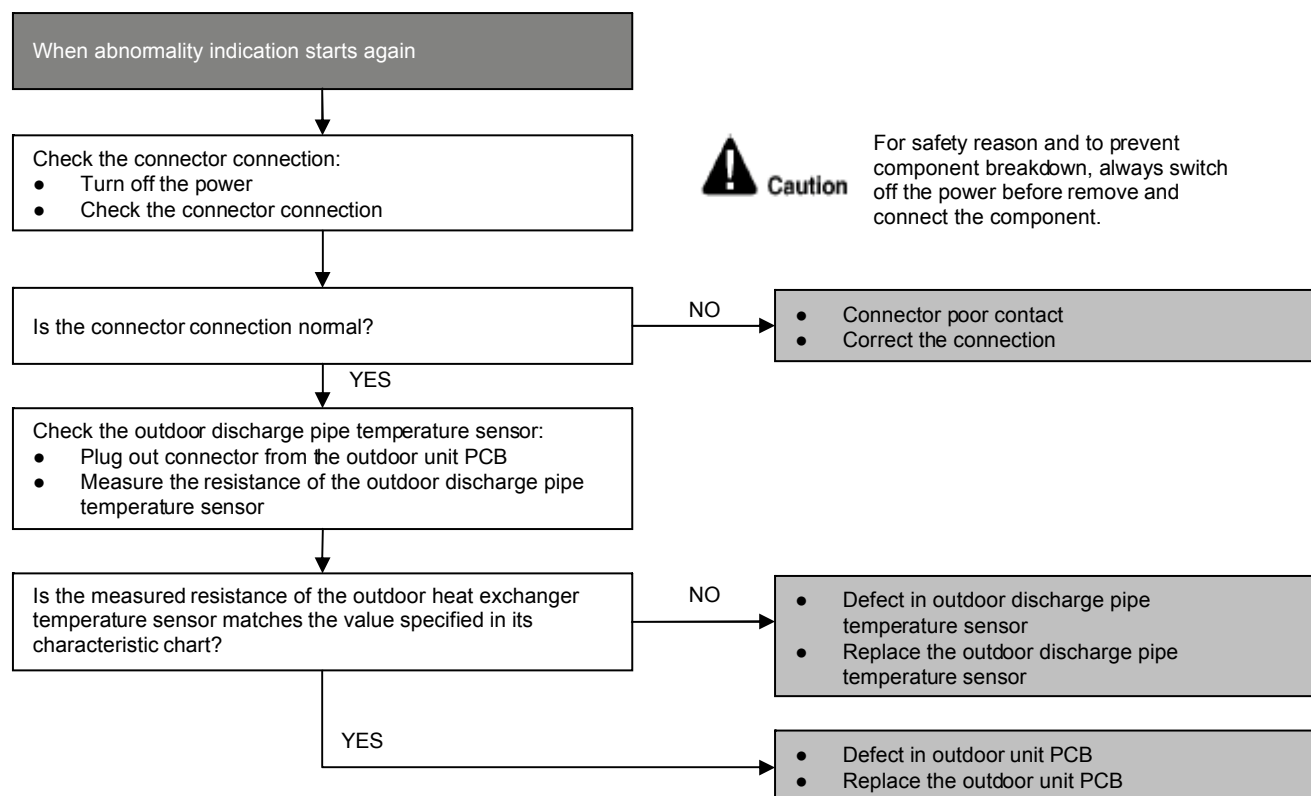
### Malfunction Decision Conditions

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

### Malfunction Caused

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

### Troubleshooting



### 15.4.12 H33 (Unspecified Voltage between Indoor and Outdoor)

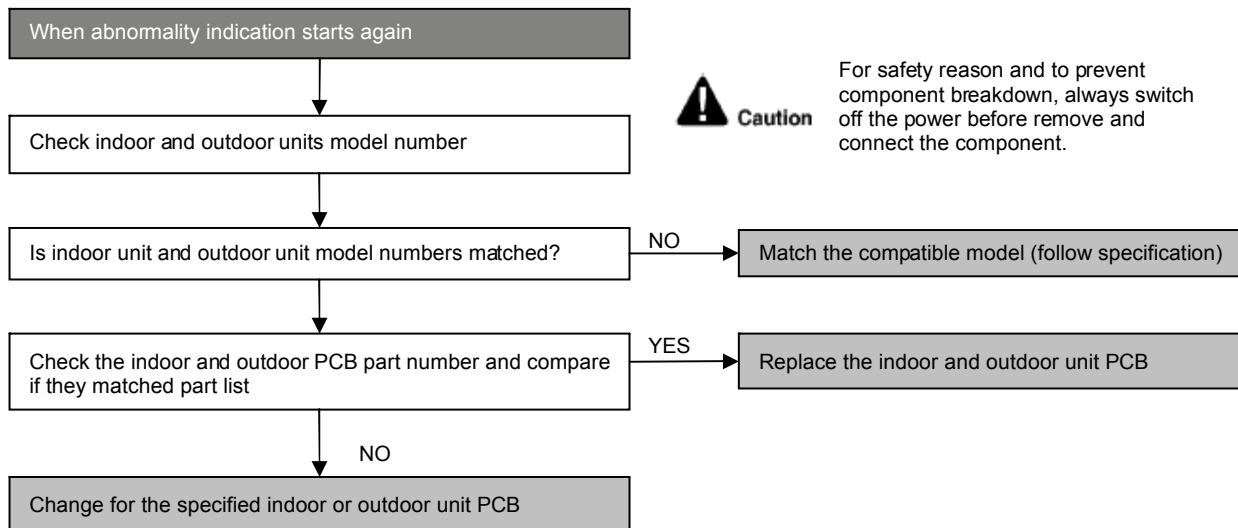
#### Malfunction Decision Conditions

- 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



### 15.4.13 H34 (Outdoor Heat Sink Temperature Sensor Abnormality)

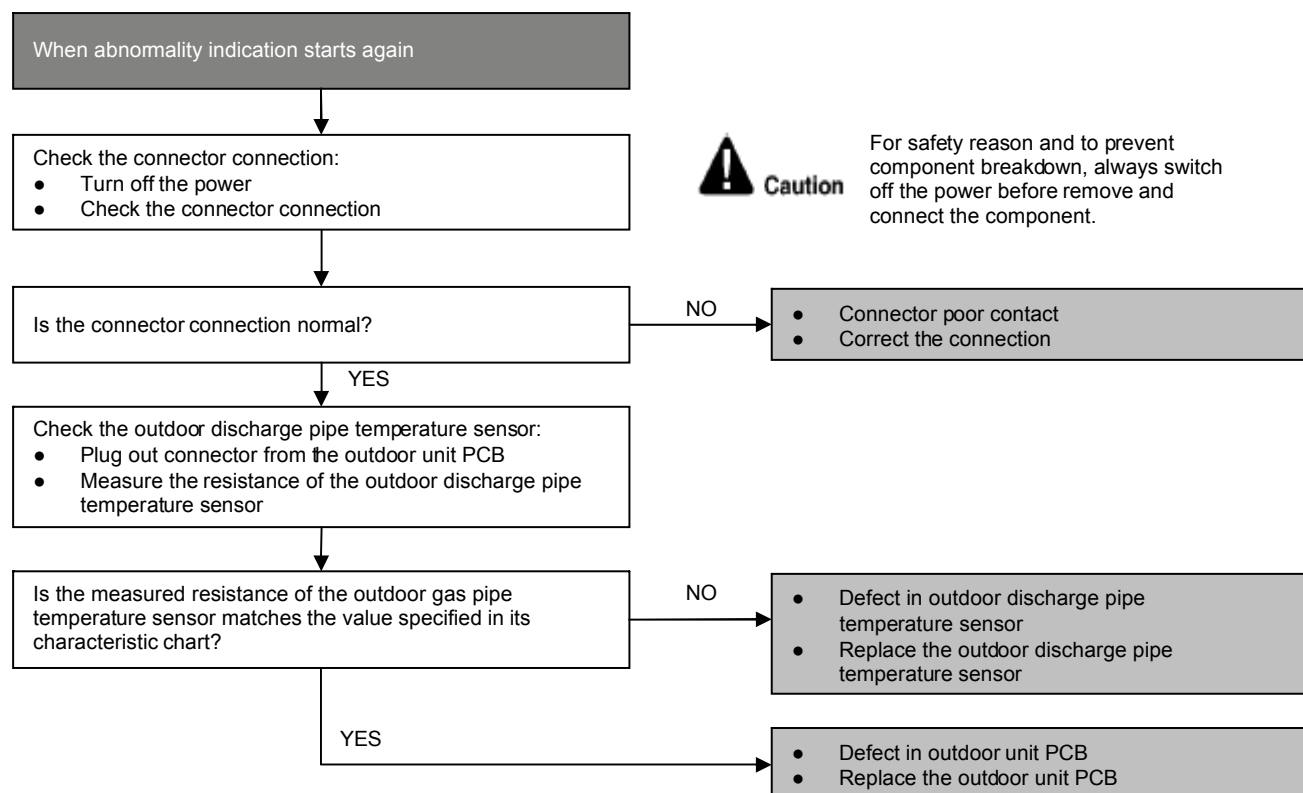
#### Malfunction Decision Conditions

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

#### Malfunction Caused

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

#### Troubleshooting



### 15.4.14 H36 (Outdoor Gas Pipe Sensor Abnormality)

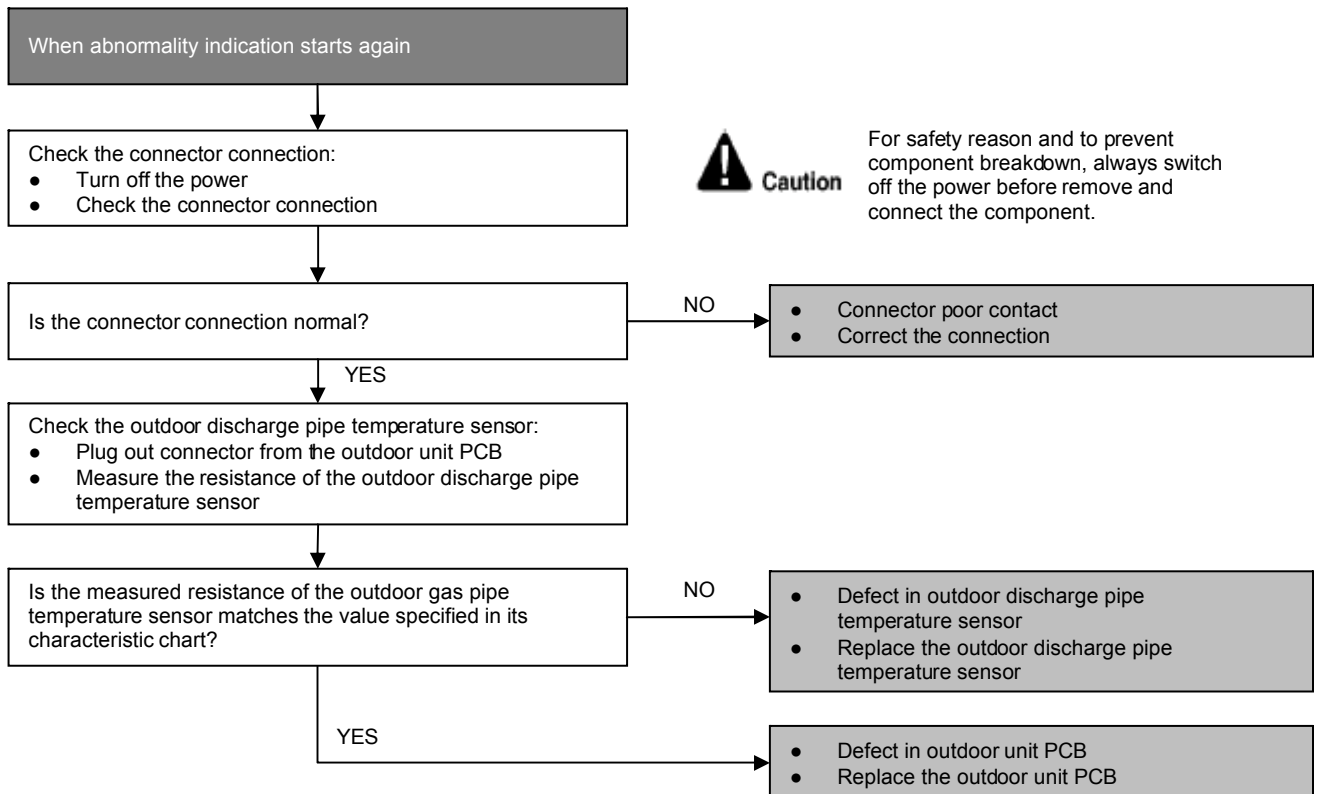
#### Malfunction Decision Conditions

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

#### Malfunction Caused

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

#### Troubleshooting



## 15.4.15 H37 (Outdoor Liquid Pipe Temperature Sensor Abnormality)

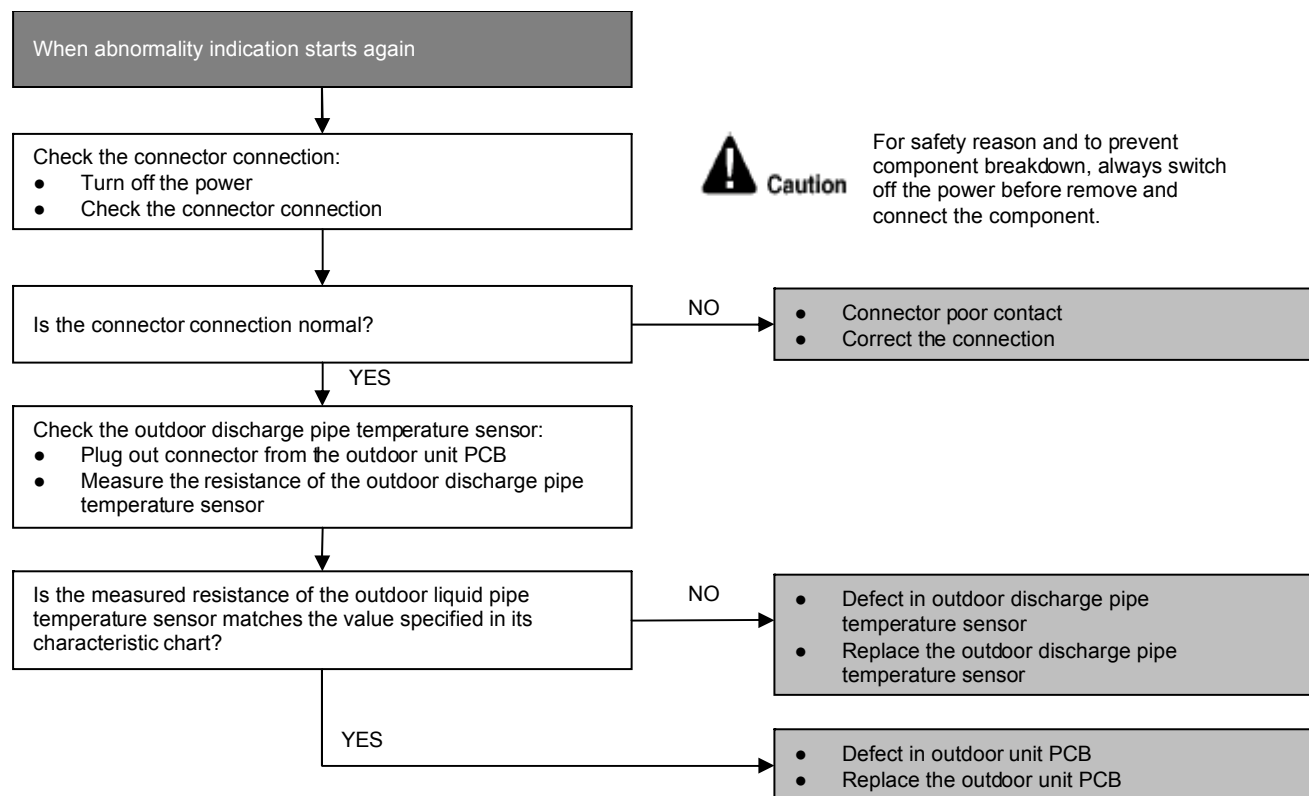
### Malfunction Decision Conditions

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

### Malfunction Caused

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

### Troubleshooting



## 15.4.16 H97 (Outdoor Fan Motor – DC Motor Mechanism Locked)

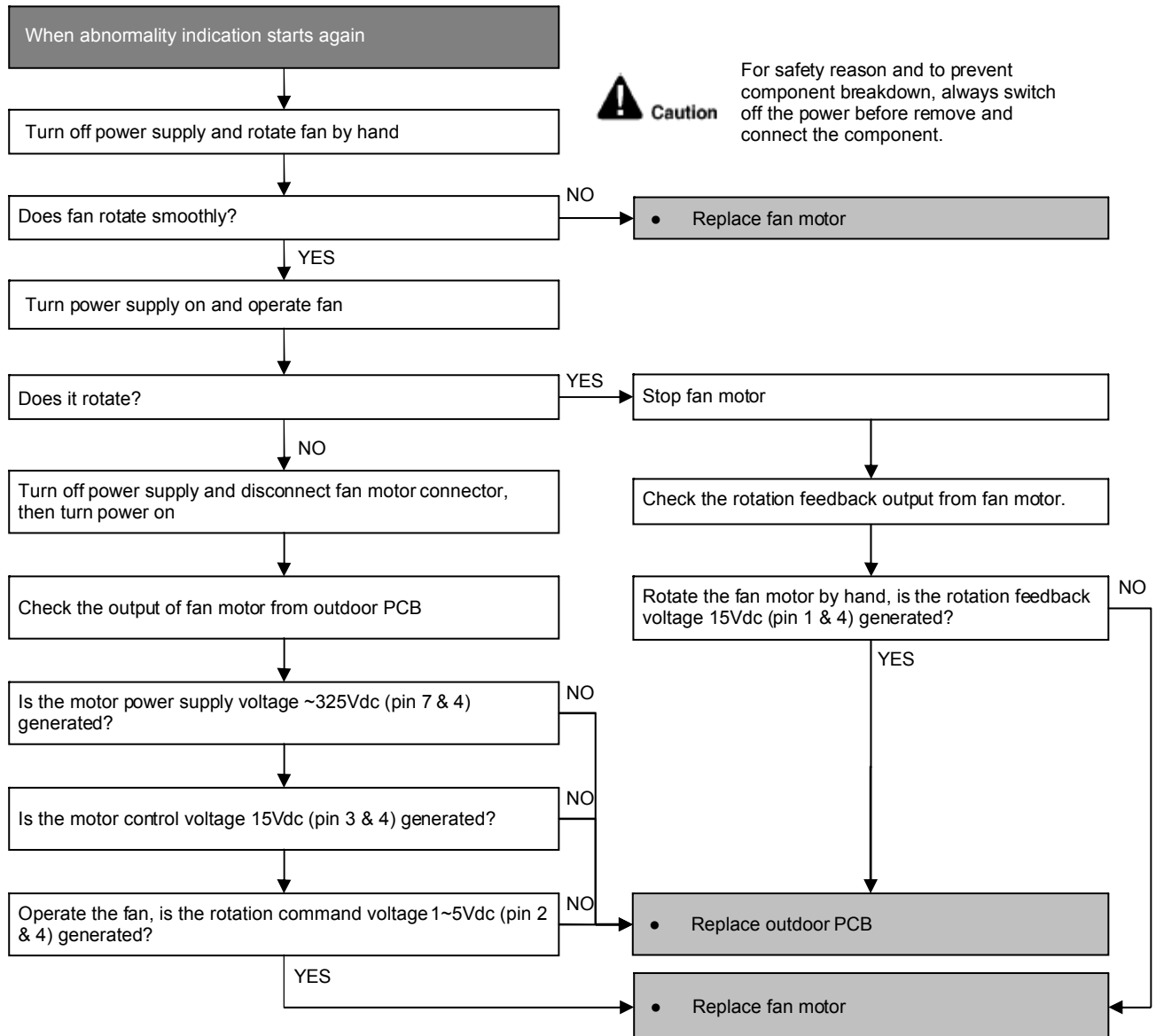
### Malfunction Decision Conditions

- 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



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

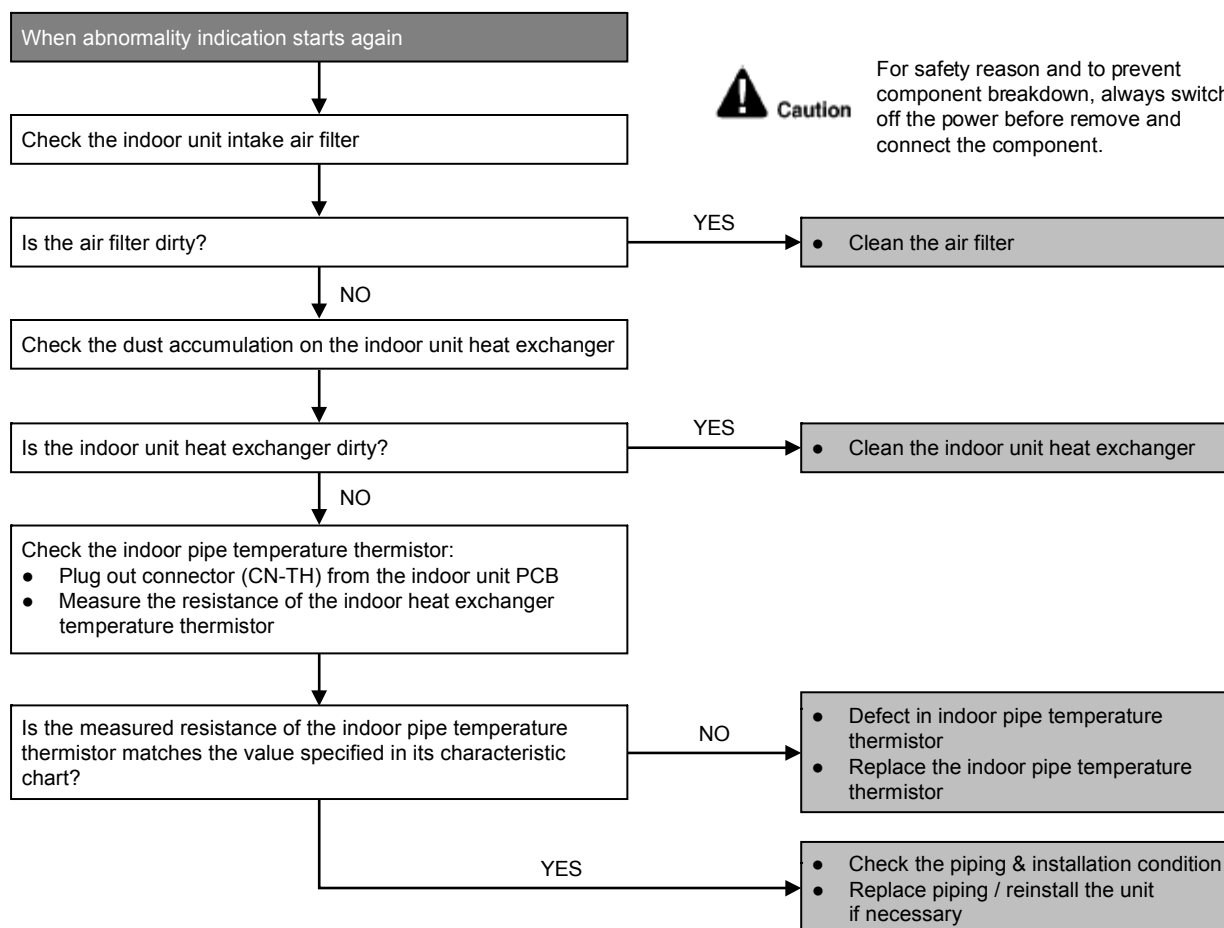
### Malfunction Decision Conditions

- 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





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

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

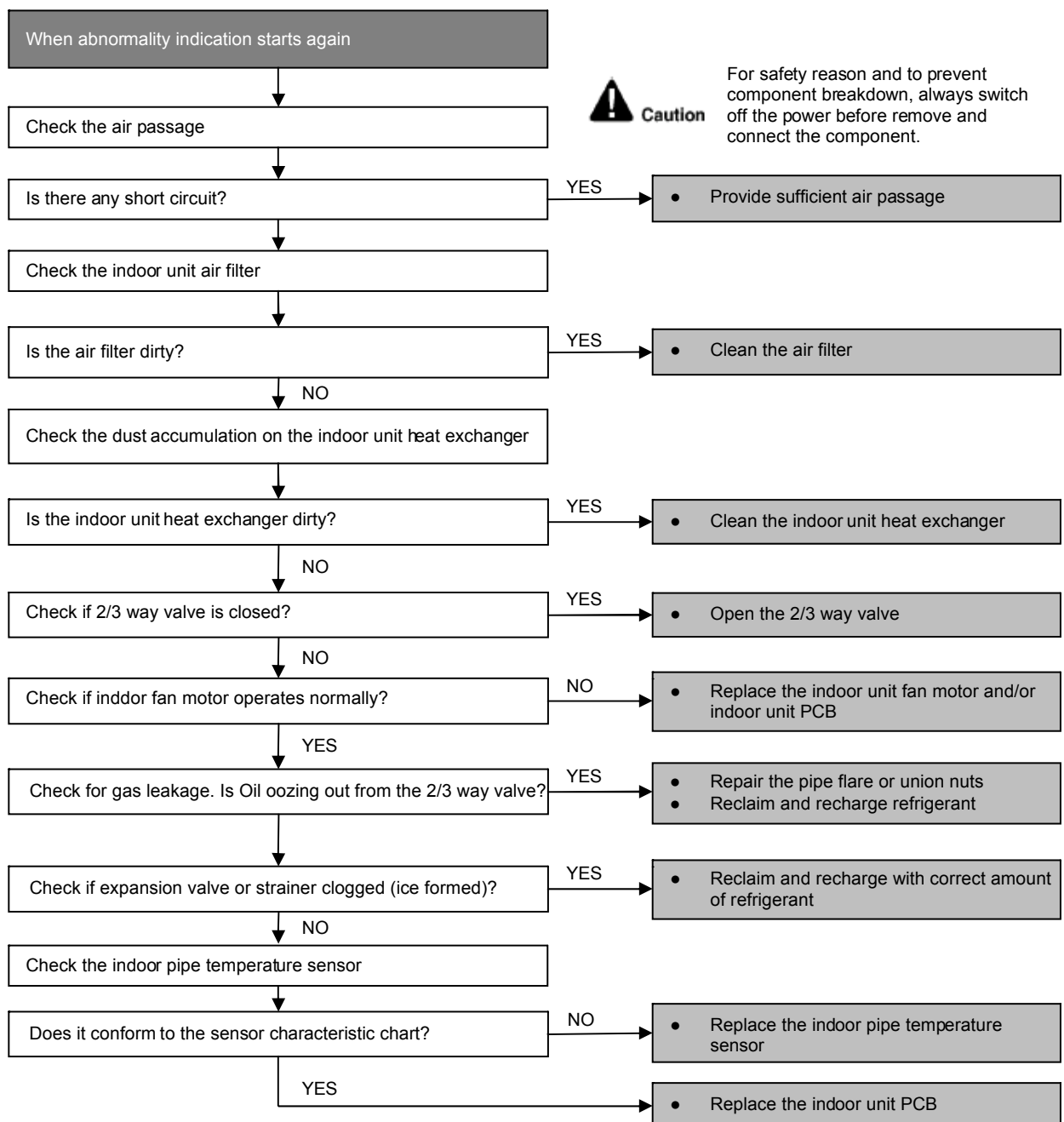
### Malfunction Decision Conditions

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

### 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



## 15.4.19 F11 (4-way Valve Switching Failure)

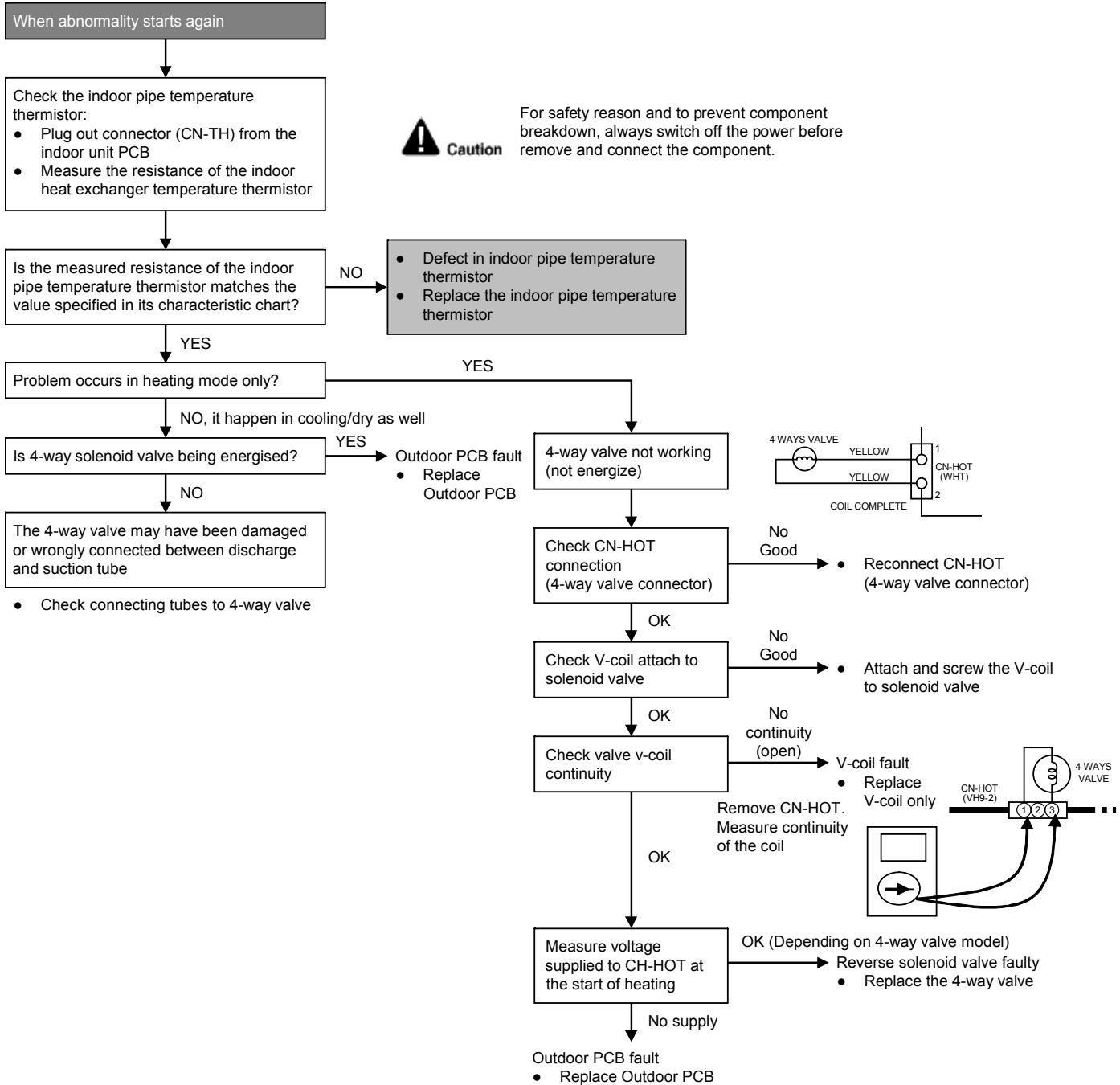
### Malfunction Decision Conditions

- 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

## 15.4.20 F17 (Indoor Standby Units Freezing Abnormality)

### Malfunction Decision Conditions

- When the different between indoor intake air temperature and indoor pipe temperature is above 10°C or indoor pipe temperature is below -1.0°C.

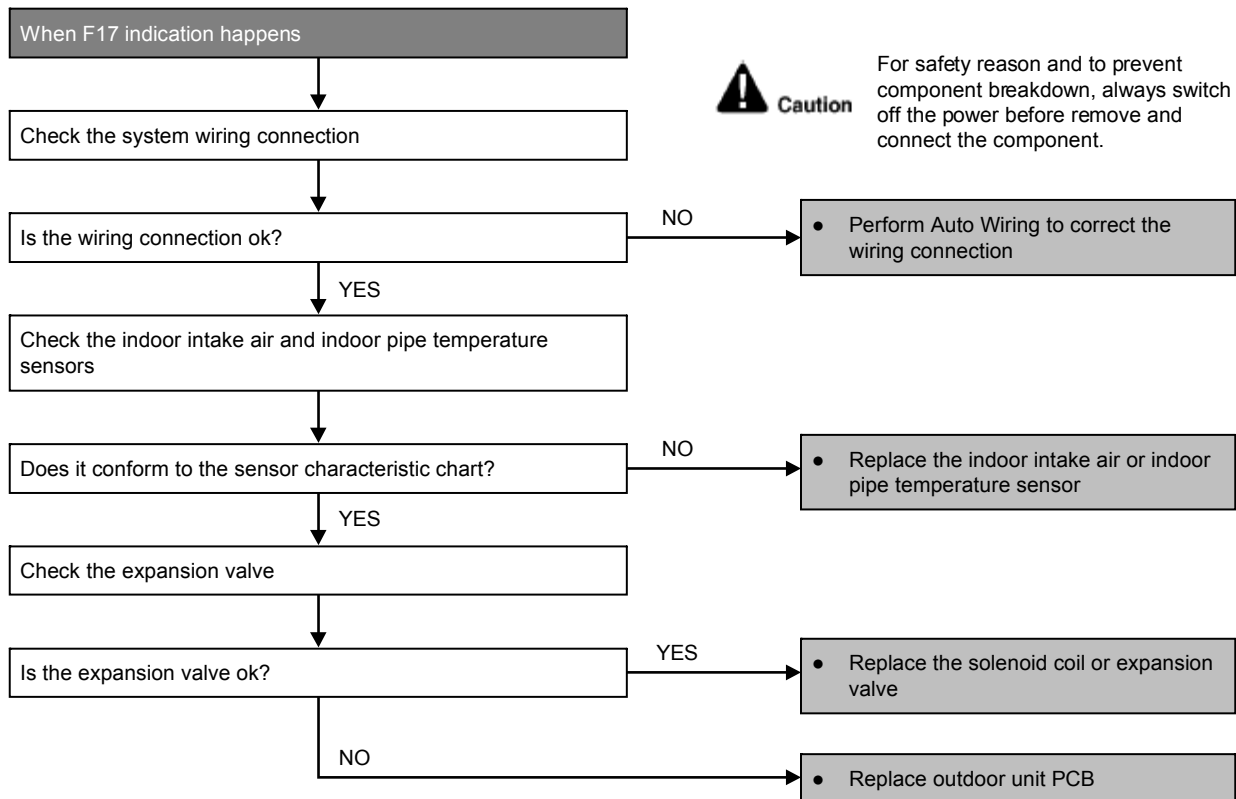
#### Remark:

When the indoor standby unit is freezing, the outdoor unit transfers F17 error code to the corresponding indoor unit and H39 to other indoor unit(s).

### Malfunction Caused

- Wrong wiring connection
- Faulty sensor
- Faulty expansion valve

### Troubleshooting



## 15.4.21 F90 (Power Factor Correction Protection)

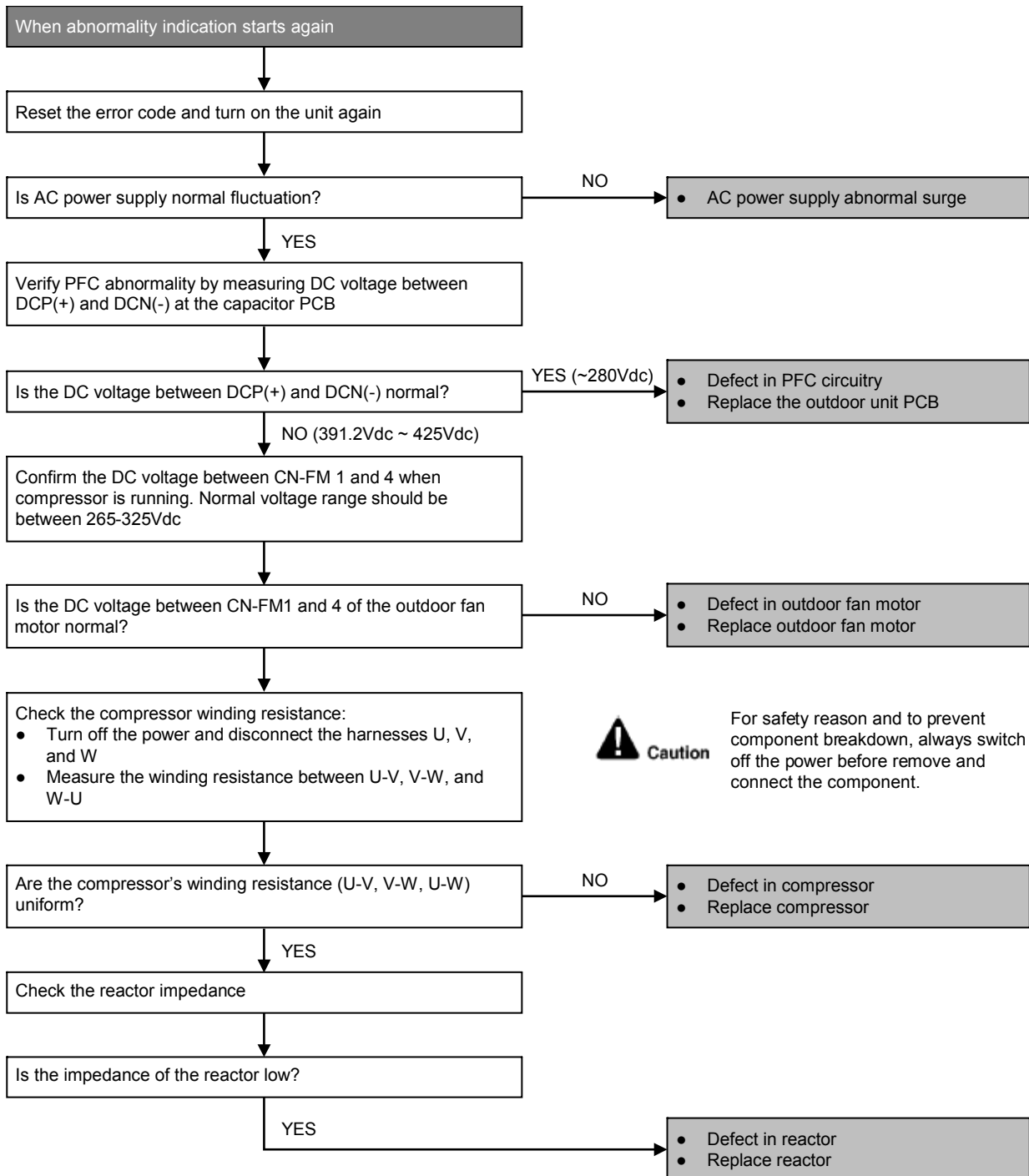
### Malfunction Decision Conditions

- 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



## 15.4.22 F91 (Refrigeration Cycle Abnormality)

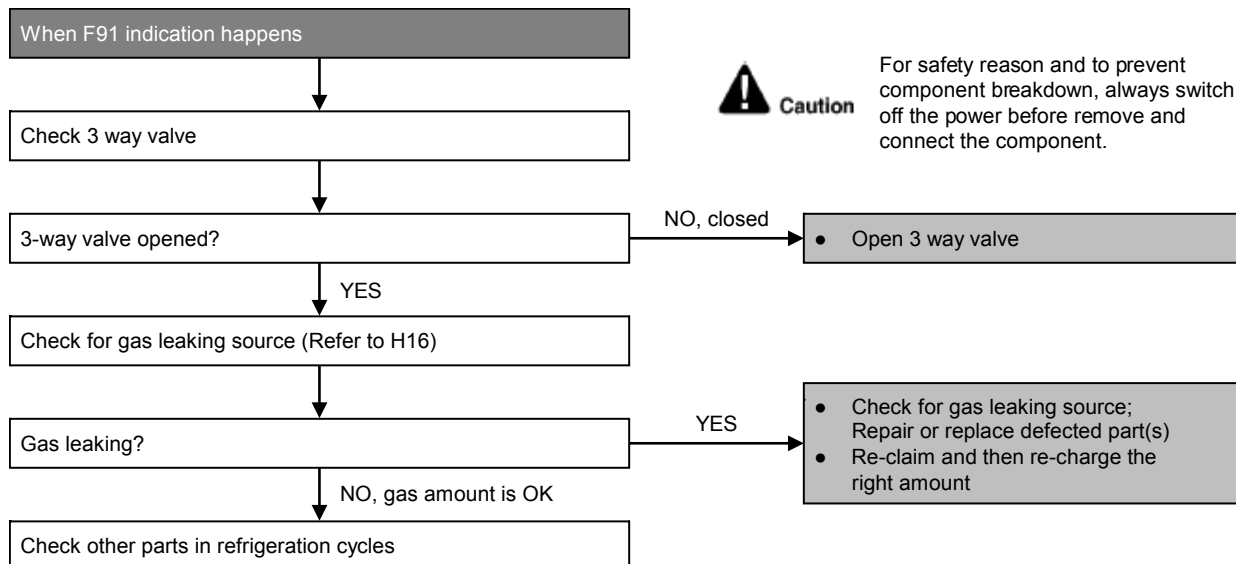
### Malfunction Decision Conditions

- 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



15.4.23 F93 (Compressor Rotation Failure)

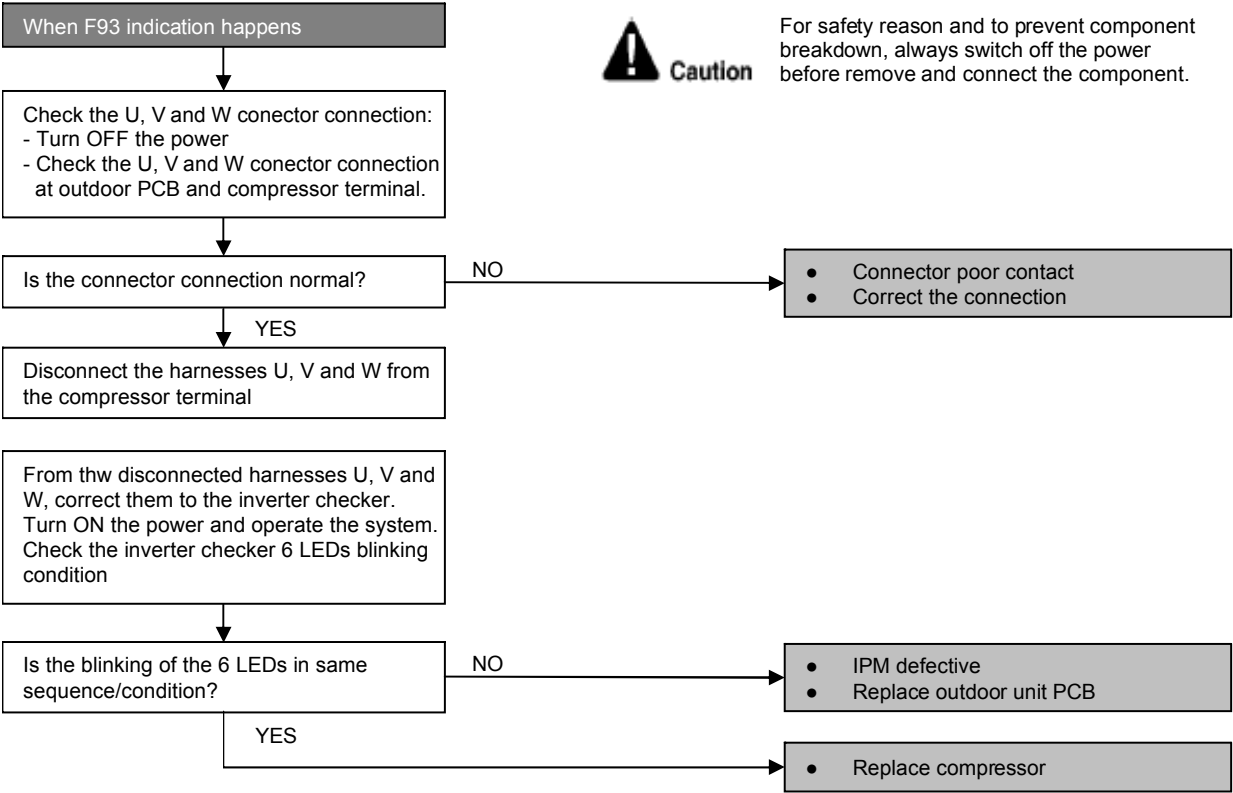
Malfunction Decision Conditions

- 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



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

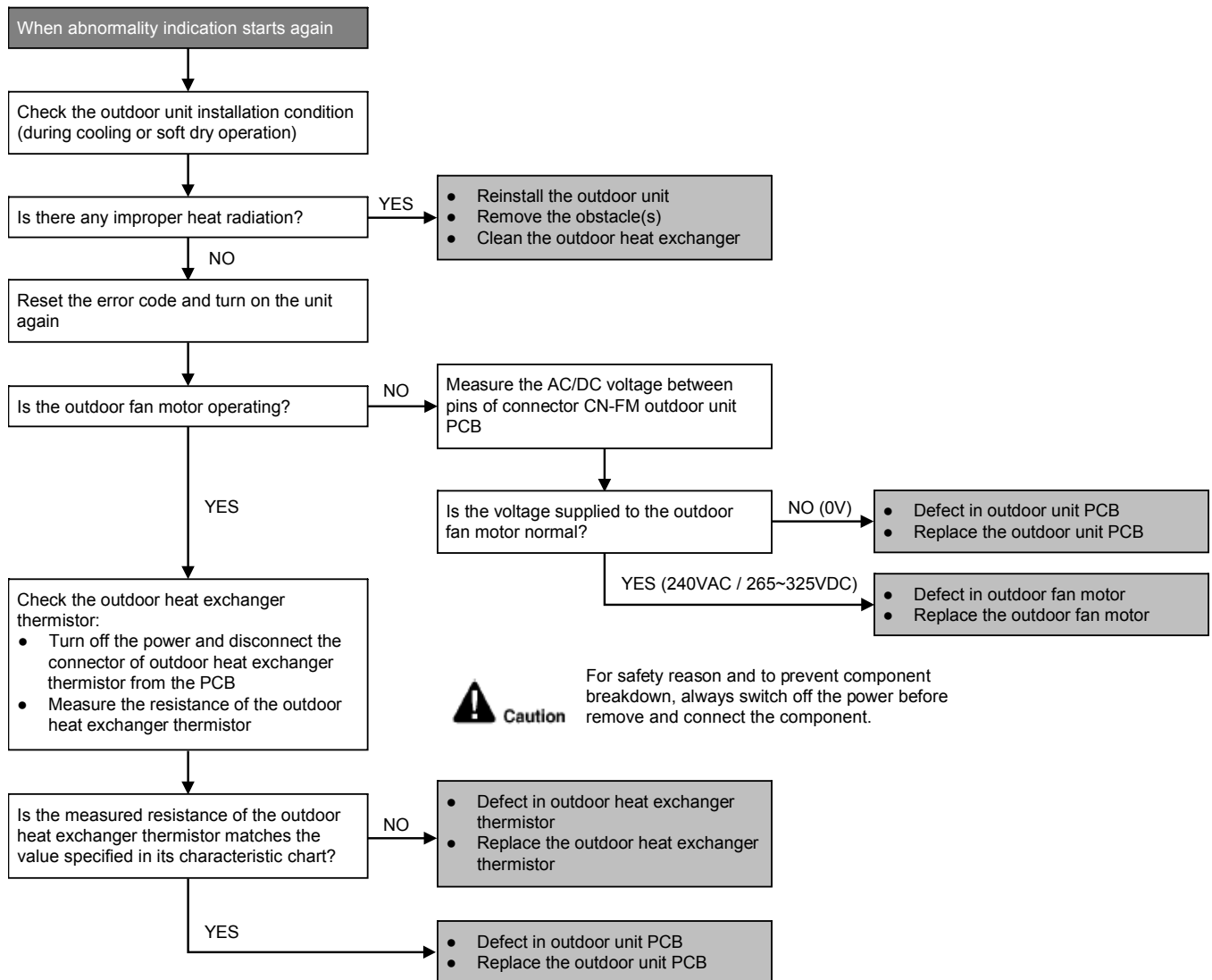
### Malfunction Decision Conditions

- 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



15.4.25 F96 (IPM Overheating)

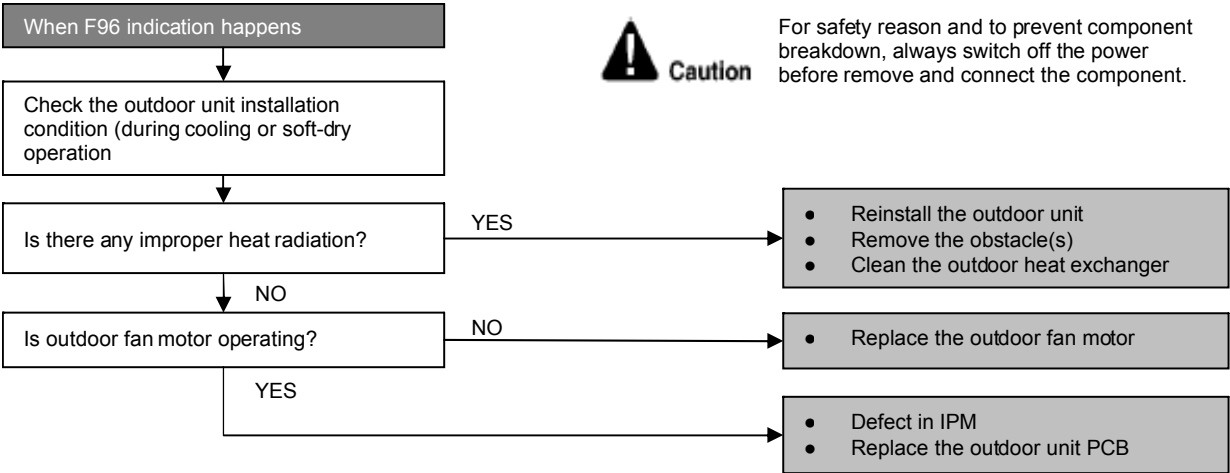
Malfunction Decision Conditions

- During operating of cooling and heating, when IPM temperature data (100°C) 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) 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





## 15.4.26 F97 (Compressor Overheating)

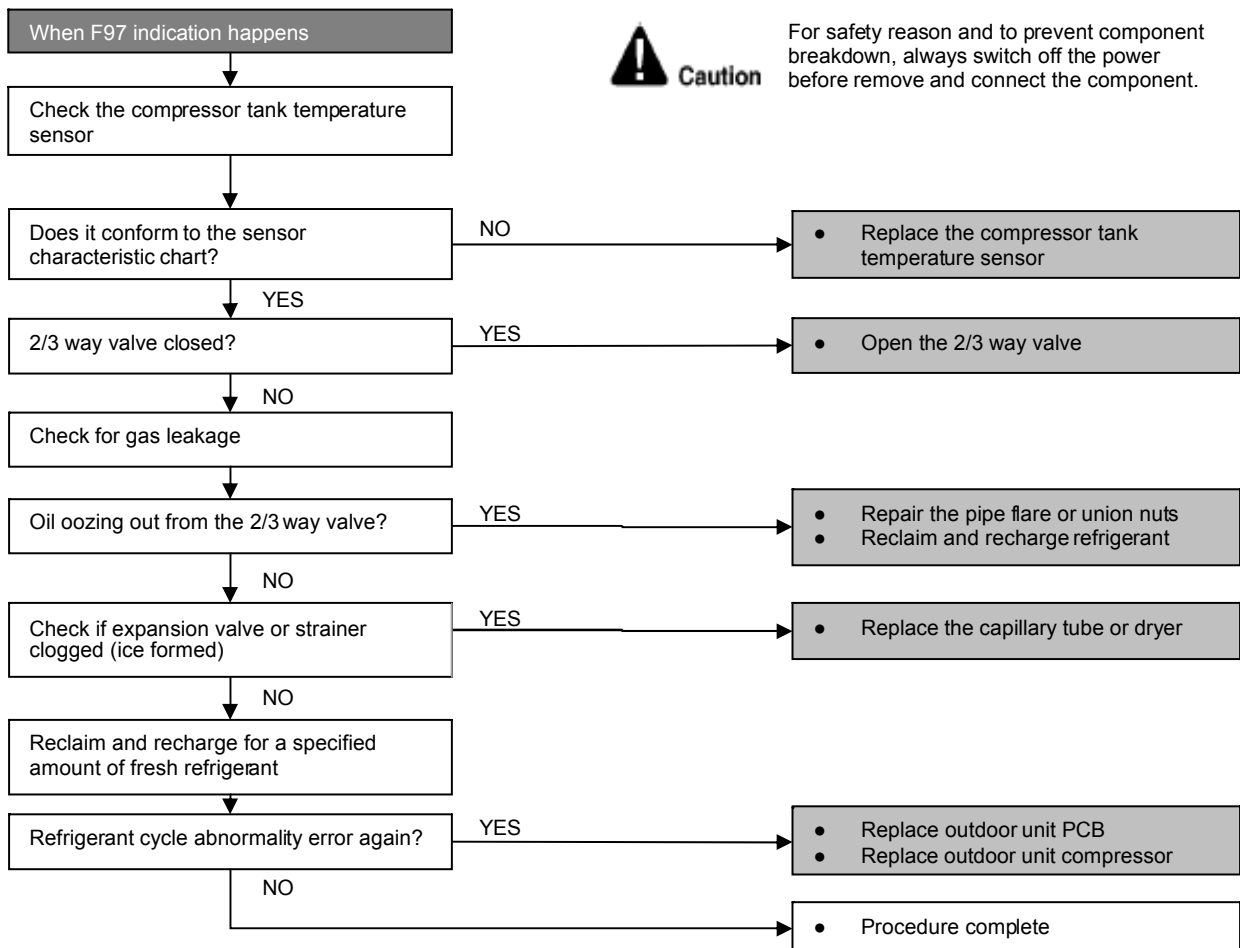
### Malfunction Decision Conditions

- During operation of cooling and heating, when compressor tank temperature data (112°C) 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



15.4.27 F98 (Input Over Current Detection)

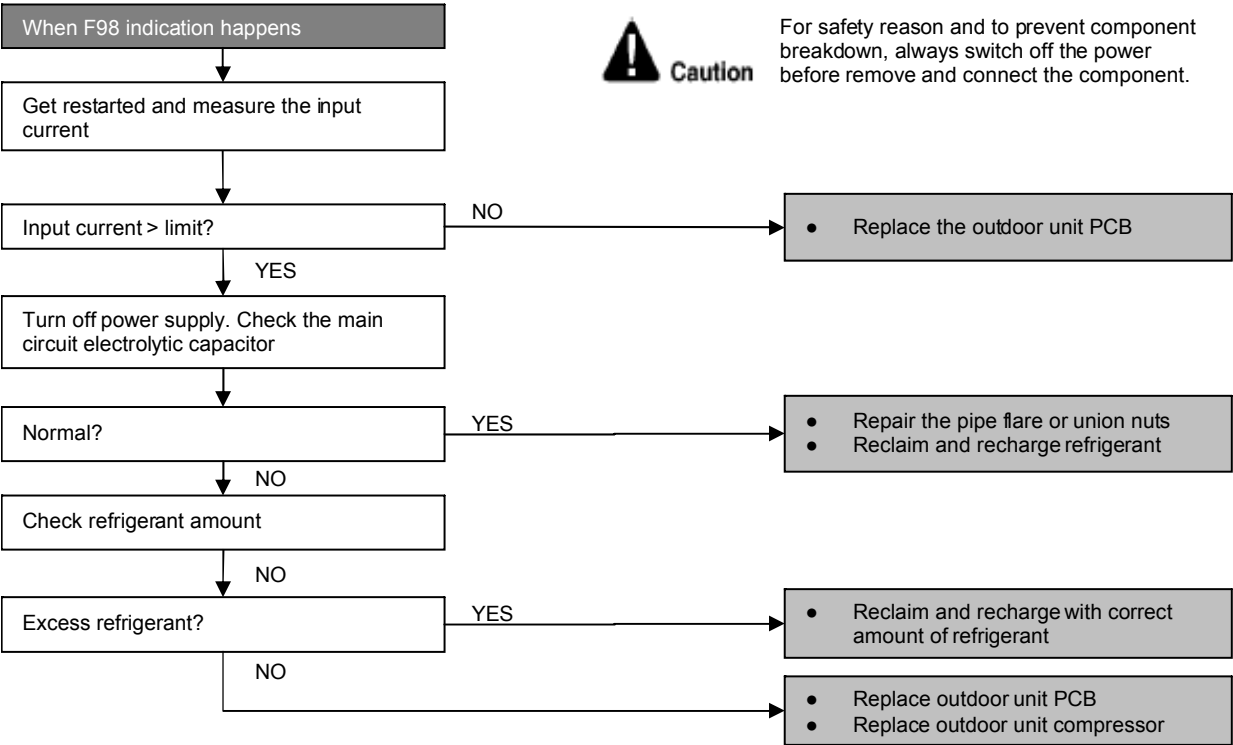
Malfunction Decision Conditions

- 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



## 15.4.28 F99 (DC Peak Detection)

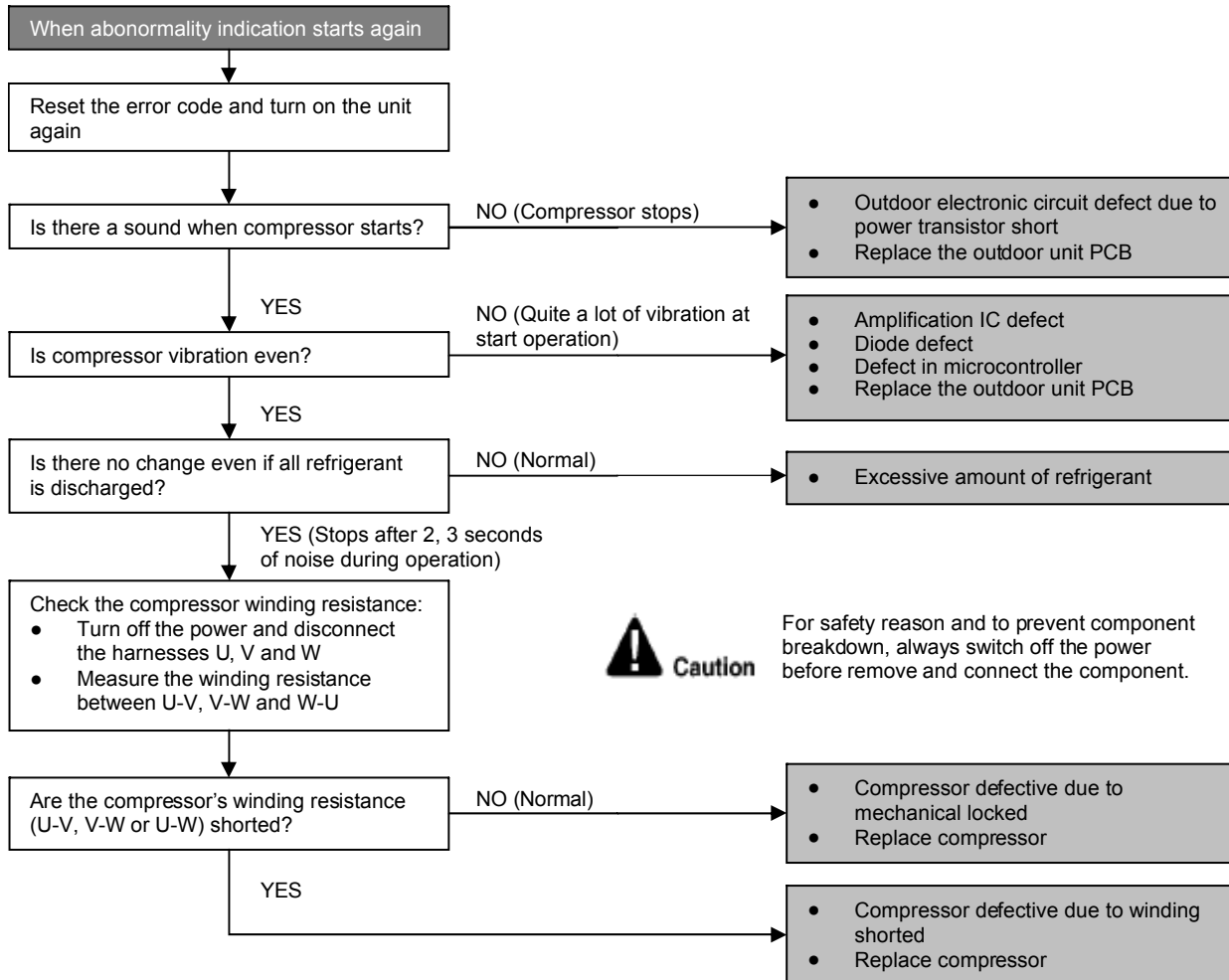
### Malfunction Decision Conditions

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



## 16. Disassembly and Assembly Instructions



### WARNING

High voltages are 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.

### 16.1 Indoor Electronic Controllers, Cross Flow Fan and Indoor Fan Motor Removal Procedures

#### 16.1.1 To remove front grille

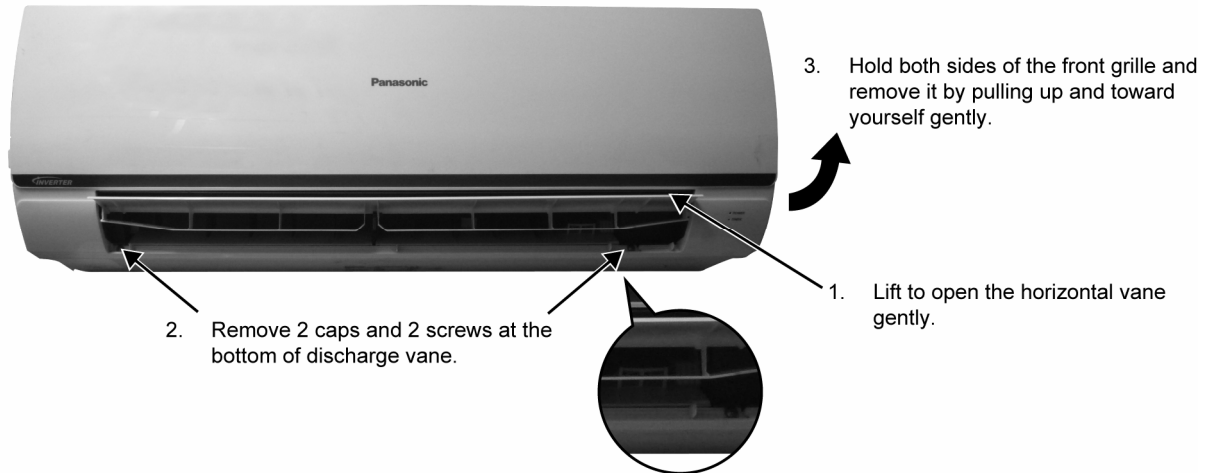


Figure 1

#### 16.1.2 To remove electronic controller



Figure 2

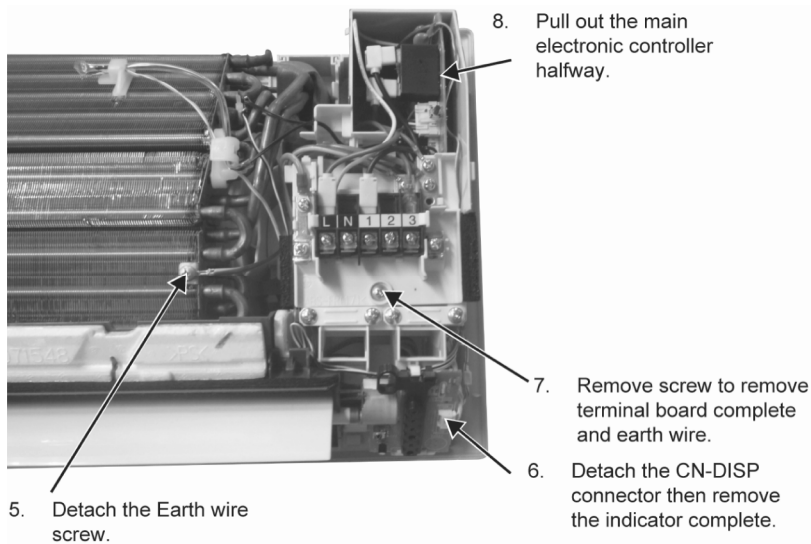


Figure 3

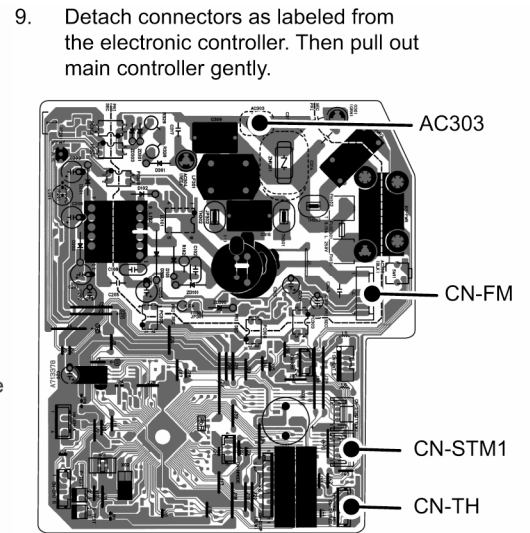


Figure 4

### 16.1.3 To remove discharge grille

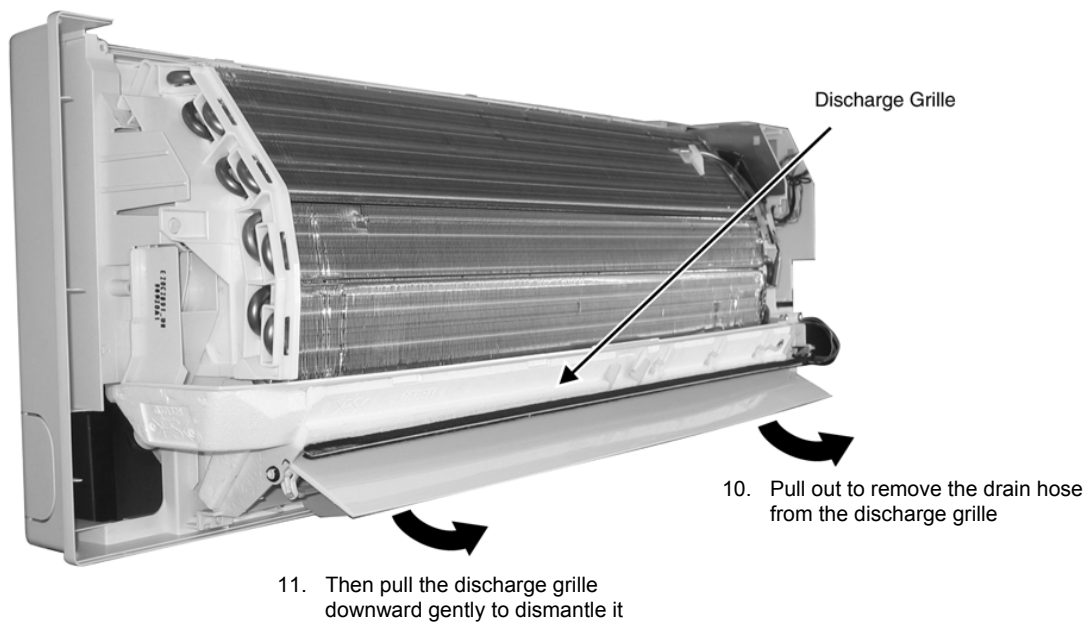


Figure 5

#### 16.1.4 To remove control board

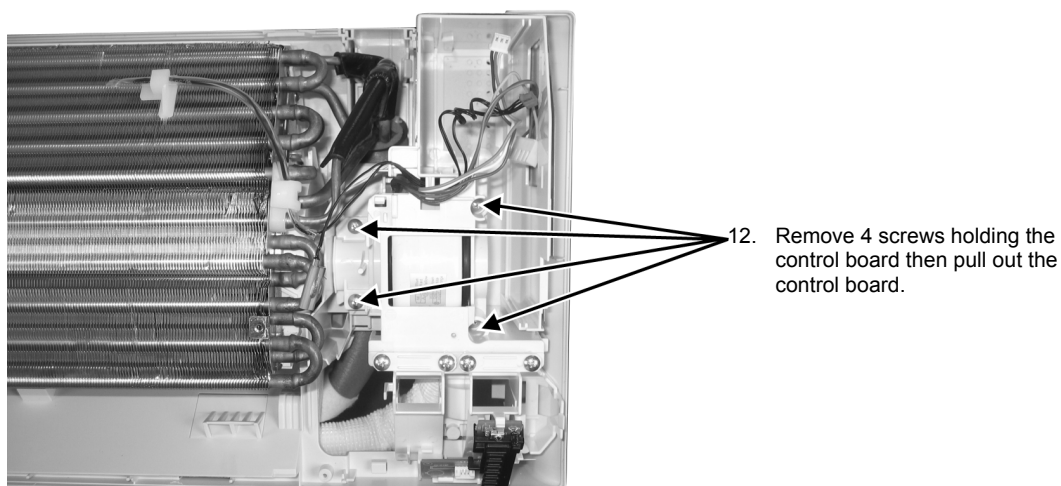


Figure 6

#### 16.1.5 To remove cross flow fan and indoor fan motor

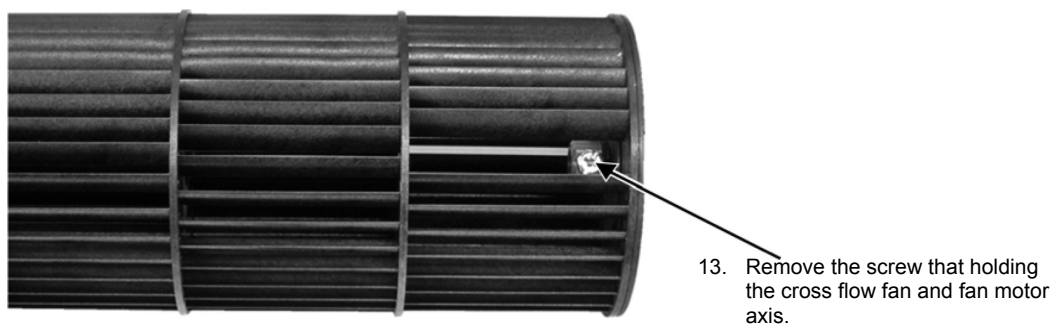


Figure 7

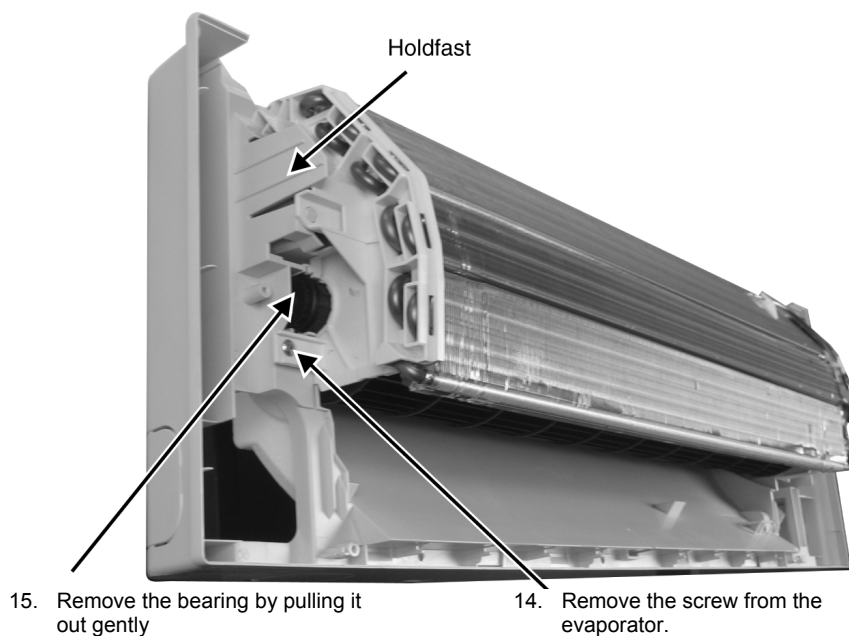
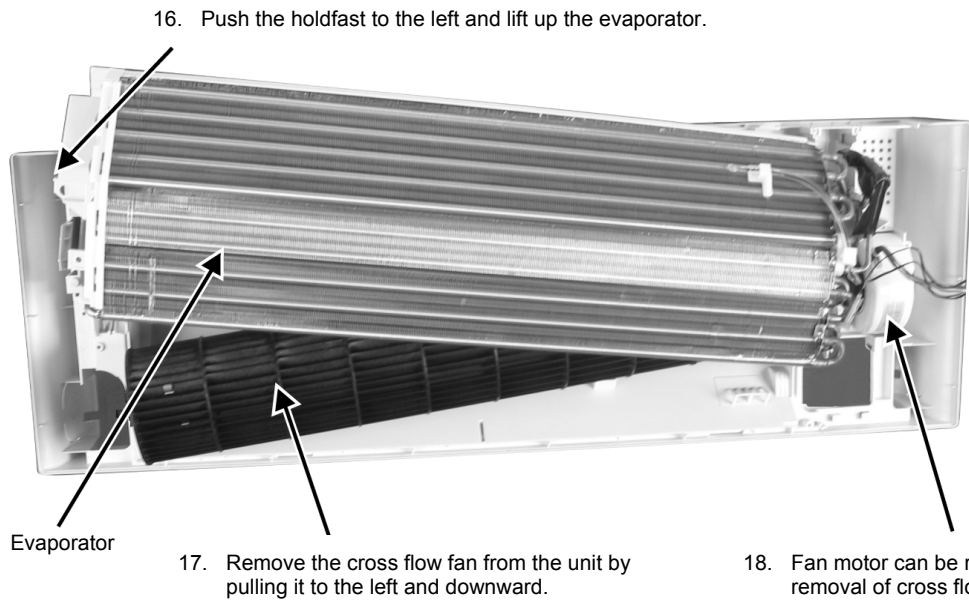
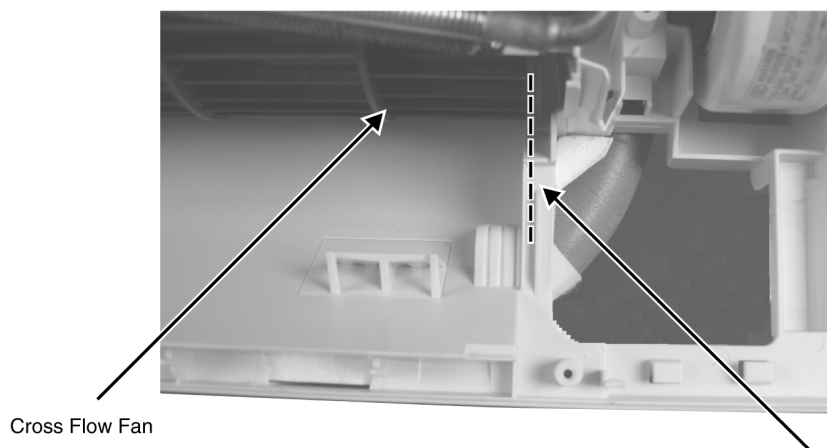


Figure 8



**Figure 9**



**Figure 10**

## 16.2 Outdoor Electronic Controller Removal Procedure

**⚠ Caution!** When handling electronic controller, be careful of electrostatic discharge.

- 1 Remove the 5 screws of the Top Panel.

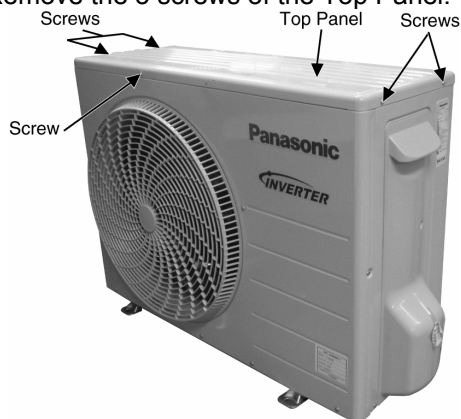


Fig.1

- 2 Remove the 8 screws of the Front Panel.

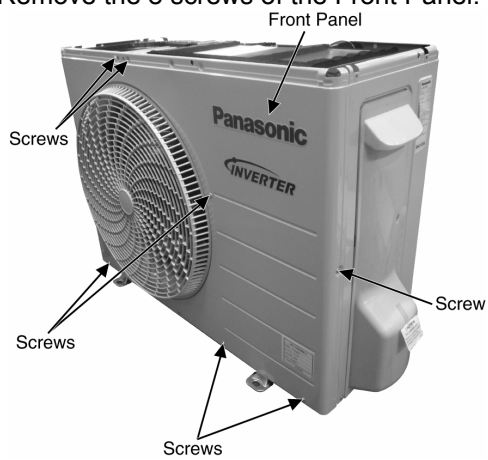


Fig.2

- 3 Remove the screw of the Terminal Board Cover.

- 4 Remove the Top Cover of the Control Board by 4 hooks.

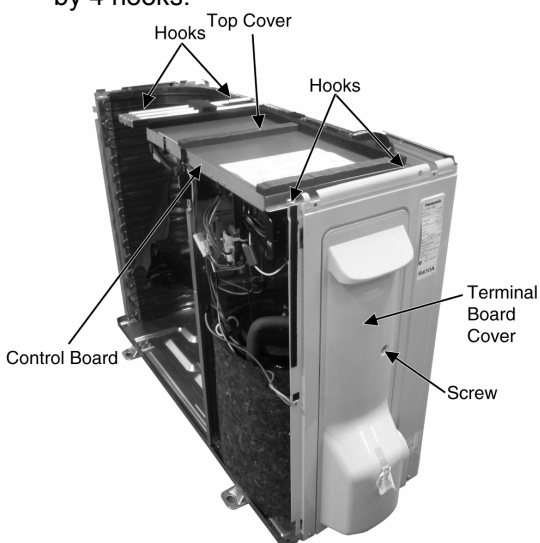


Fig.3

- 5 Remove the Control Board as follows:

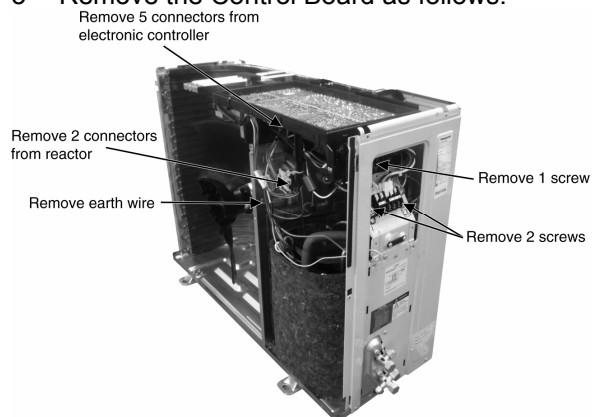


Fig.4

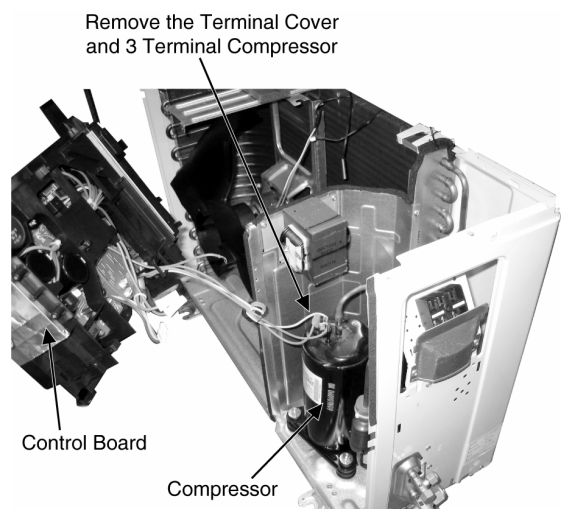


Fig.5

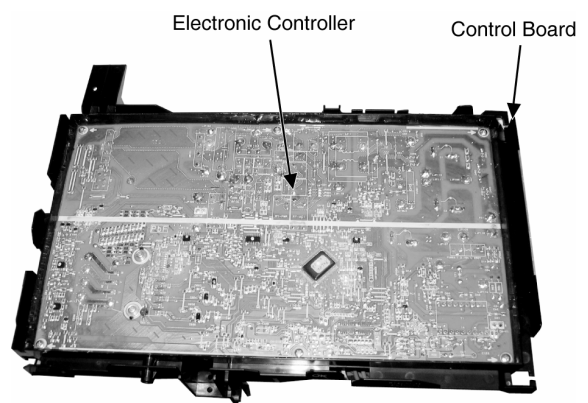


Fig.6



## 17. Technical Data

Technical data provided are based on the air conditioner running under free frequency.

### 17.1 Cool Mode Performance Data

Unit setting: Standard piping length, Hi Fan, Cool mode at 16°C

Voltage: 230V

#### 17.1.1 CS-CE9PKE / CU-CE9PKE

Indoor (°C)		Outdoor DB (°C)								
DB	WB	16			25			35		
		TC	SHC	IP	TC	SHC	IP	TC	SHC	IP
27	19.0	3037	2366	329	2648	2169	425	2500	2006	545
	22.0	3257	1820	318	2887	1995	427	2675	1653	548
23	15.7	2783	2321	337	2349	2128	425	2264	2090	544
	18.4	2901	1781	331	2647	1570	427	2330	1569	539
20	13.3	2533	2229	342	2234	2011	432	1976	1872	535
	15.8	2655	1723	337	2373	1594	429	2066	1523	544

(Dry bulb value based on 46% humidity)

#### 17.1.2 CS-CE12PKE / CU-CE12PKE

Indoor (°C)		Outdoor DB (°C)								
DB	WB	16			25			35		
		TC	SHC	IP	TC	SHC	IP	TC	SHC	IP
27	19.0	4252	3312	574	3707	3036	741	3500	2892	950
	22.0	4559	2548	555	4042	2793	745	3745	2314	955
23	15.7	3896	3249	588	3288	2979	741	3170	2926	948
	18.4	4062	2494	578	3706	2198	744	3263	2196	940
20	13.3	3546	3121	596	3128	2815	752	2767	2621	932
	15.8	3717	2413	587	3322	2232	748	2893	2132	948

(Dry bulb value based on 46% humidity)

### 17.2 Heat Mode Performance Data

Unit setting: Standard piping length, Hi Fan, Heat mode at 30°C

Voltage: 230V

#### 17.2.1 CS-CE9PKE / CU-CE9PKE

Indoor (°C)		Outdoor WB (°C)									
DB	-15/-16		-7/-8		2/1		7/6		12/11		
	TC	IP	TC	IP	TC	IP	TC	IP	TC	IP	
24	2355	1160	3175	1294	3607	1236	3356	790	3630	828	
20	2388	1103	3220	1230	3700	1190	3400	740	3773	770	
16	2459	1046	3316	1166	3729	1125	3658	742	4029	768	

#### 17.2.2 CS-CE12PKE / CU-CE12PKE

Indoor (°C)		Outdoor WB (°C)									
DB	-15/-16		-7/-8		2/1		7/6		12/11		
	TC	IP	TC	IP	TC	IP	TC	IP	TC	IP	
24	3173	1618	3944	1946	4660	1828	3948	1057	4271	1108	
20	3218	1538	4000	1850	4780	1760	4000	990	4439	1030	
16	3314	1458	4120	1754	4818	1664	4304	992	4740	1027	

TC - Total Cooling Capacity (kW)

SHC - Sensible Heat Capacity (kW)

IP - Input Power (kW)

# 18. Service Data

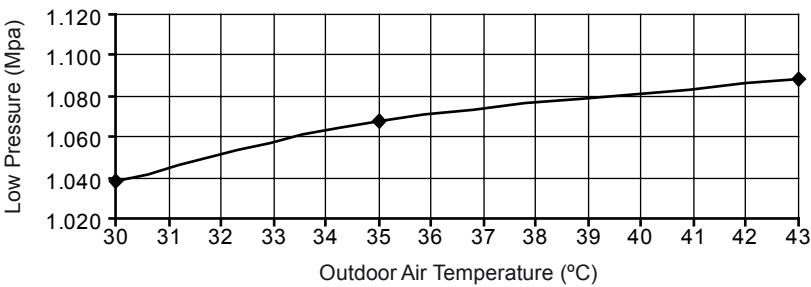
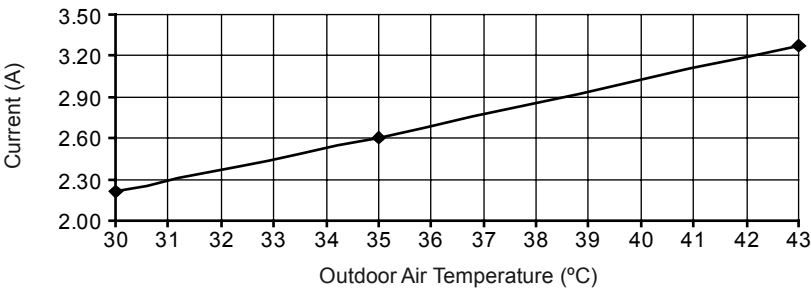
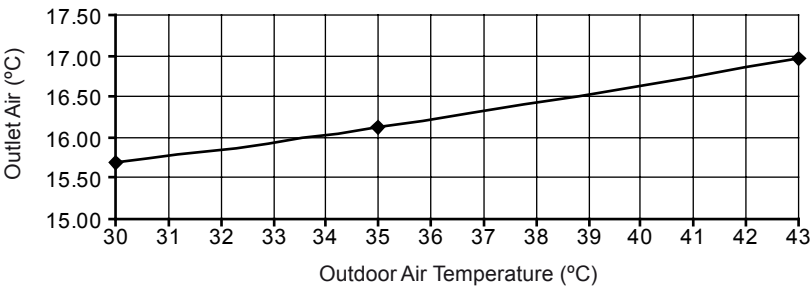
Service data provided are based on the air conditioner running under rated frequency during forced cooling / forced heating mode.

## 18.1 Cool Mode Outdoor Air Temperature Characteristic

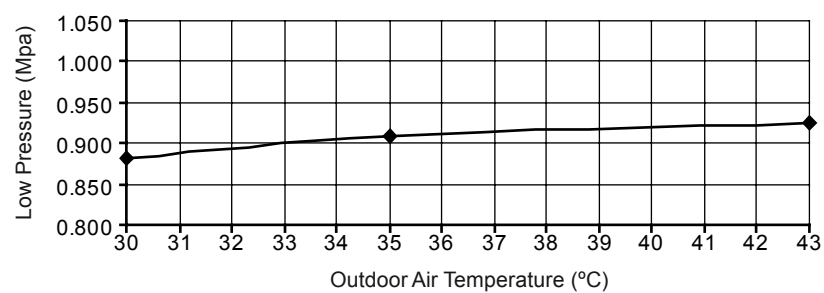
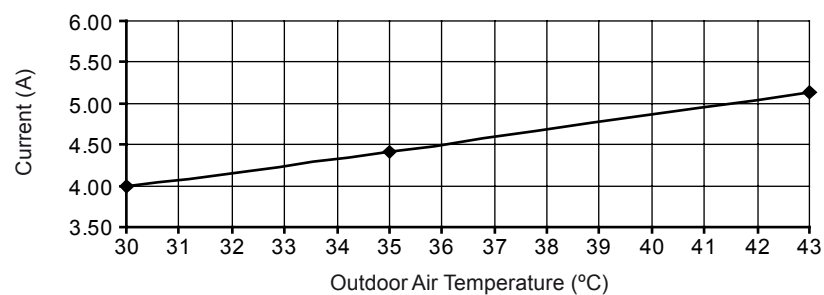
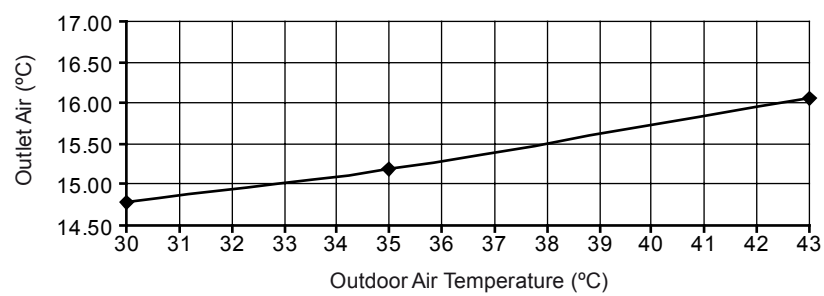
Condition

- Indoor room temperature: 27°C DryBulb/19°C Wet Bulb
- Unit setting: Standard piping length, forced cooling at 16°C, Hi fan
- Compressor frequency: Rated for cooling operation
- Voltage: 230V

### 18.1.1 CS-CE9PKE / CU-CE9PKE



## 18.1.2 CS-CE12PKE / CU-CE12PKE

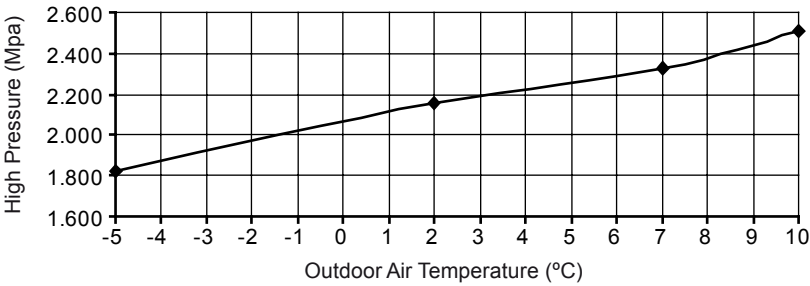
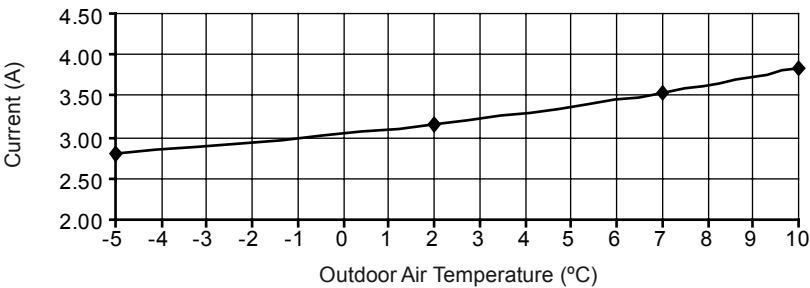
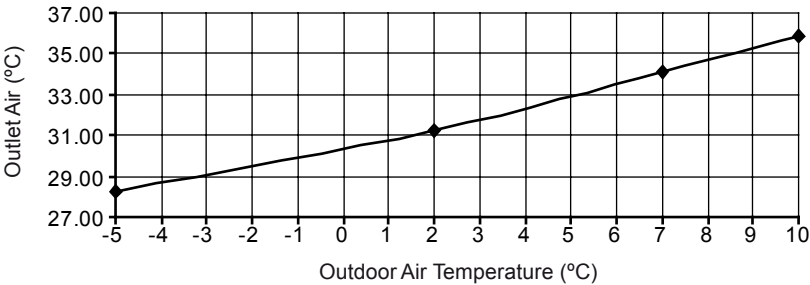


18.2 Heat Mode Outdoor Air Temperature Characteristic

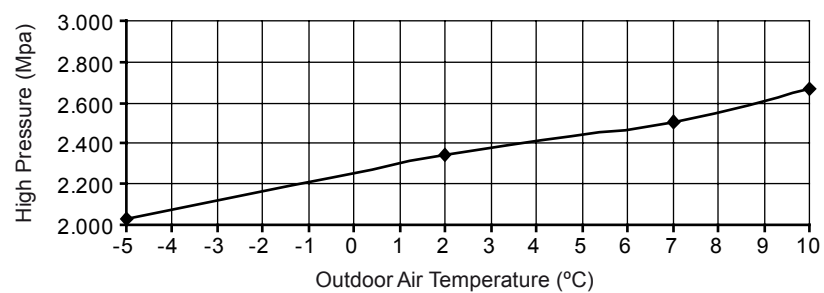
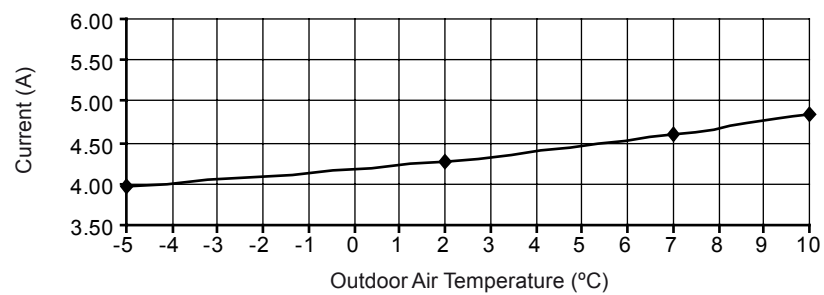
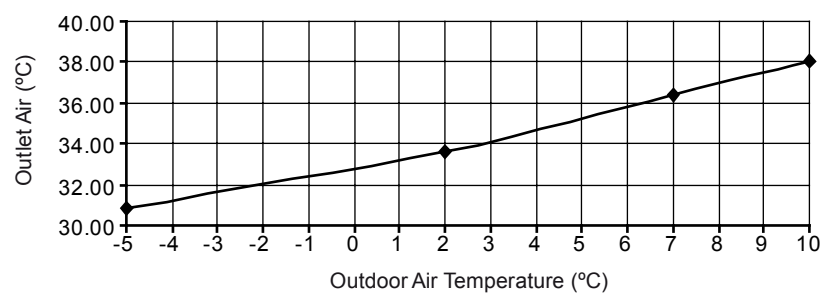
Condition

- Indoor room temperature: 20°C DryBulb/ -°C Wet Bulb
- Unit setting: Standard piping length, forced heating at 30°C, Hi fan
- Compressor frequency: Rated for Heating operation
- Voltage: 230V

18.2.1 CS-CE9PKE / CU-CE9PKE



## 18.2.2 CS-CE12PKE / CU-CE12PKE

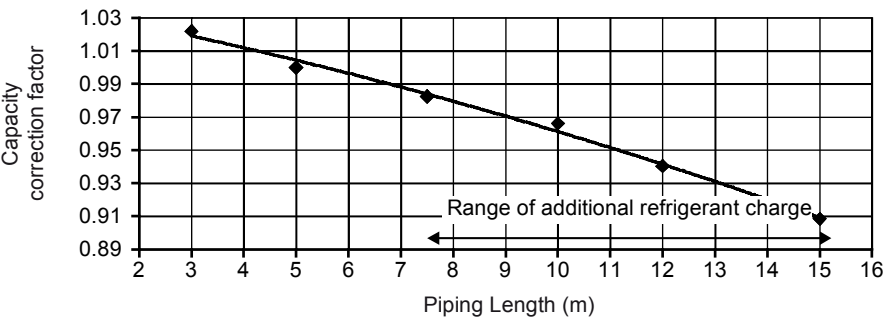


18.3 Piping Length Correction Factor

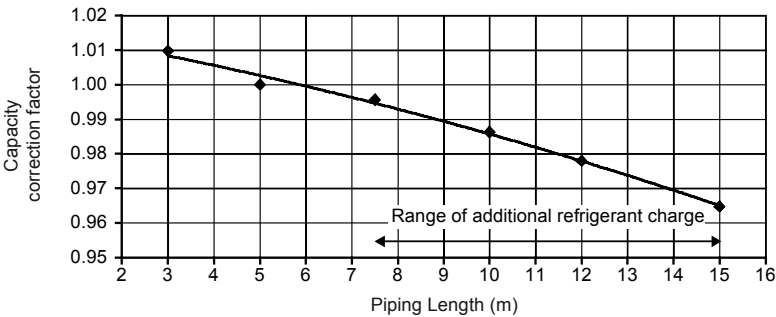
The characteristic of the unit has to be corrected in accordance with the piping length.

18.3.1 CS-CE9PKE / CU-CE9PKE

18.3.1.1 Cooling Capacity



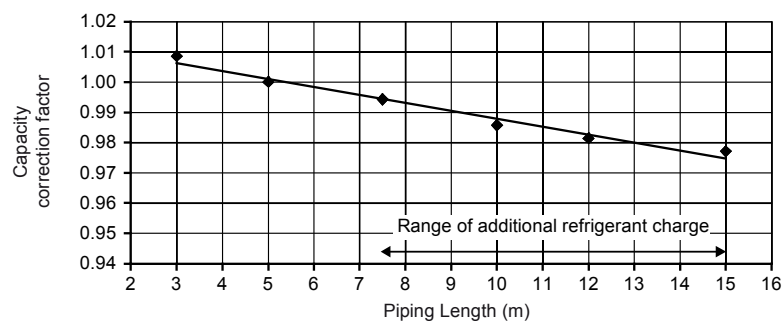
18.3.1.2 Heating Capacity



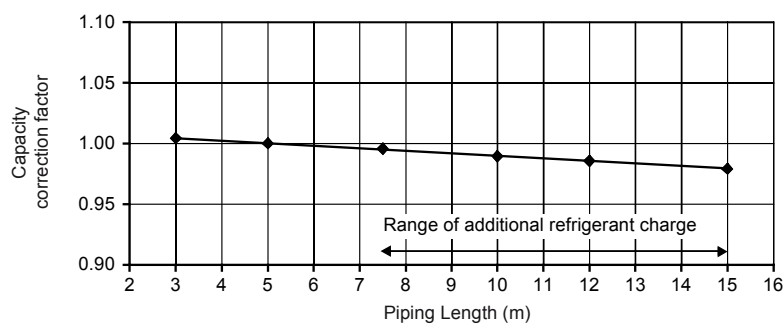
Note: The graphs show the factor after added right amount of additional refrigerant.

## 18.3.2 CS-CE12PKE / CU-CE12PKE

### 18.3.2.1 Cooling Capacity



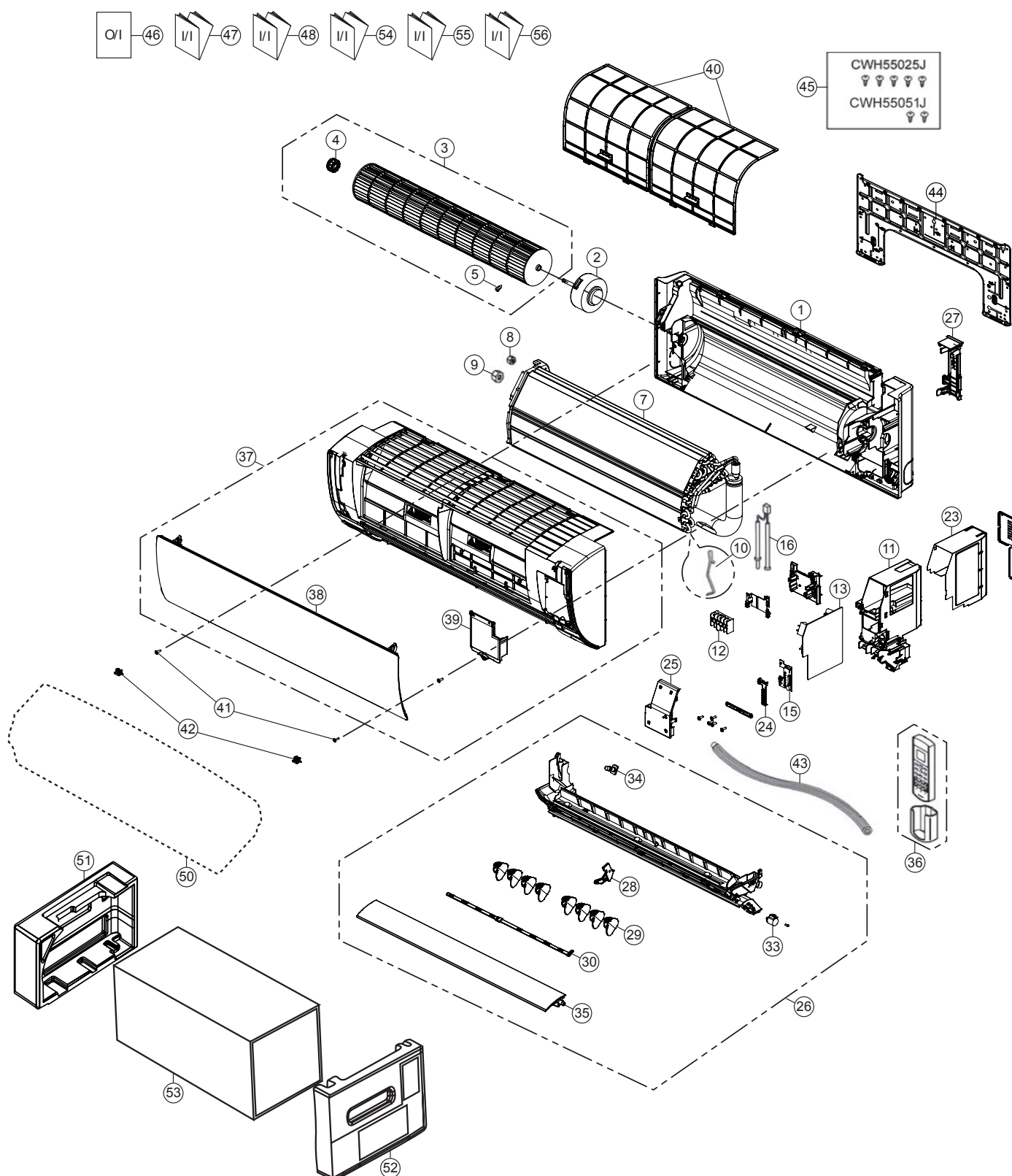
### 18.3.2.2 Heating Capacity



Note: The graphs show the factor after added right amount of additional refrigerant.

# 19. Exploded View and Replacement Parts List

## 19.1 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.



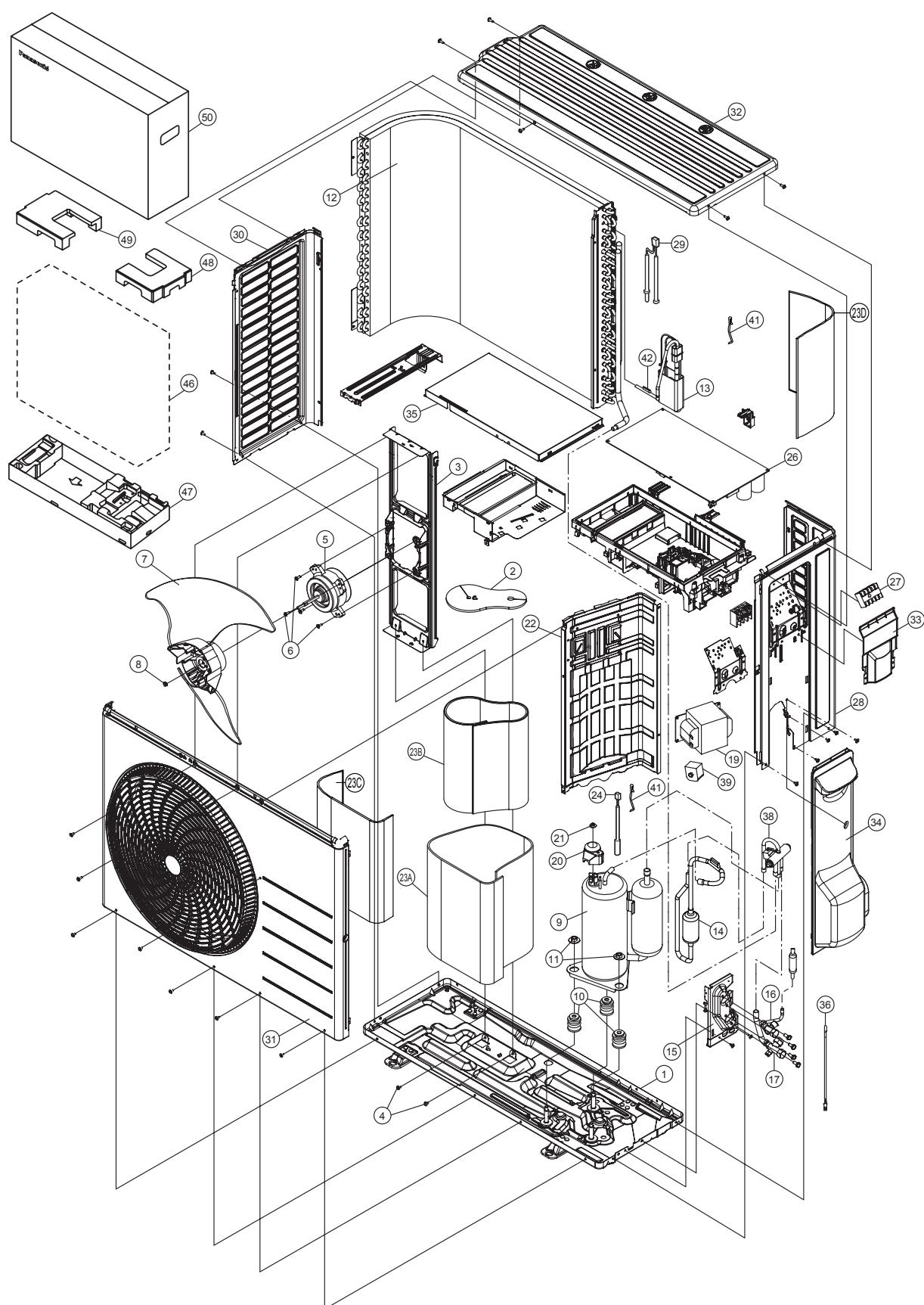
SAFETY	REF. NO.	PART NAME & DESCRIPTION	QTY.	CS-CE9PKE	CS-CE12PKE	REMARK
	1	CHASSY COMPLETE	1	CWD50C1653	←	
⚠	2	FAN MOTOR	1	ARW7628ACCB	←	O
	3	CROSS FLOW FAN COMPLETE	1	CWH02C1076	←	
	4	BEARING ASS'Y	1	CWH64K007	←	O
	5	SCREW - CROSS FLOW FAN	1	CWH551146	←	
	7	EVAPORATOR	1	CWB30C4575	CWB30C4576	
	8	FLARE NUT (LIQUID)	1	CWT251030	←	
	9	FLARE NUT (GAS)	1	CWT251031	←	
	10	HOLDER SENSOR	1	CWH32143	←	
	11	CONTROL BOARD CASING	1	CWH102449	←	
⚠	12	TERMINAL BOARD COMPLETE	1	CWA28C2364	←	O
⚠	13	ELECTRONIC CONTROLLER - MAIN	1	CWA73C7896	CWA73C7897	O
⚠	15	ELECTRONIC CONTROLLER - INDICATOR	1	CWA746963	←	O
	16	SENSOR COMPLETE	1	CWA50C2401	←	O
	23	CONTROL BOARD TOP COVER	1	CWH131467	←	
	24	INDICATOR HOLDER	1	CWD933406	←	
	25	CONTROL BOARD FRONT COVER	1	CWH13C1247	←	
	26	DISCHARGE GRILLE COMPLETE	1	CWE20C3236	←	
	27	BACK COVER CHASSIS	1	CWD933233	←	
	28	FULCRUM	1	CWH621131	←	
	29	VERTICAL VANE	8	CWE241374	←	
	30	CONNECTING BAR	2	CWE261251	←	
⚠	33	A.S.MOTOR, DC SINGLE 12V 300OHM	1	CWA981264	←	O
	34	CAP - DRAIN TRAY	1	CWH521259	←	
	35	HORIZONTAL VANE	1	CWE24C1385	←	
	36	REMOTE CONTROL COMPLETE	1	CWA75C4412	←	O
	37	FRONT GRILLE COMPLETE	1	CWE11C5439	CWE11C5759	O
	38	INTAKE GRILLE COMPLETE	1	CWE22C1723	CWE22C1861	
	39	GRILLE DOOR	1	CWE14C1090	←	
	40	AIR FILTER	2	CWD001279	←	O
	41	SCREW - FRONT GRILLE	2	XTT4+16CFJ	←	
	42	CAP - FRONT GRILLE	2	CWH521227	←	
	43	DRAIN HOSE	1	CWH851173	←	
	44	INSTALLATION PLATE	1	CWH361134	←	
	45	BAG COMPLETE - INSTALLATION SCREW	1	CWH82C1705	←	
	46	OPERATING INSTRUCTION	1	CWF569257	←	
	47	INSTALLATION INSTRUCTION	1	CWF615526	←	
	48	INSTALLATION INSTRUCTION	1	CWF615527	←	
	50	BAG	1	CWG861497	←	
	51	SHOCK ABSORBER (L)	1	CWG713386	←	
	52	SHOCK ABSORBER (R)	1	CWG713387	←	
	53	C.C.CASE	1	CWG567354	←	
	54	INSTALLATION INSTRUCTION	1	CWF615528	←	
	55	INSTALLATION INSTRUCTION	1	CWF615529	←	
	56	INSTALLATION INSTRUCTION	1	CWF615530	←	

(Note)

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

## 19.2 Outdoor Unit

### 19.2.1 CU-CE9PKE



#### Note

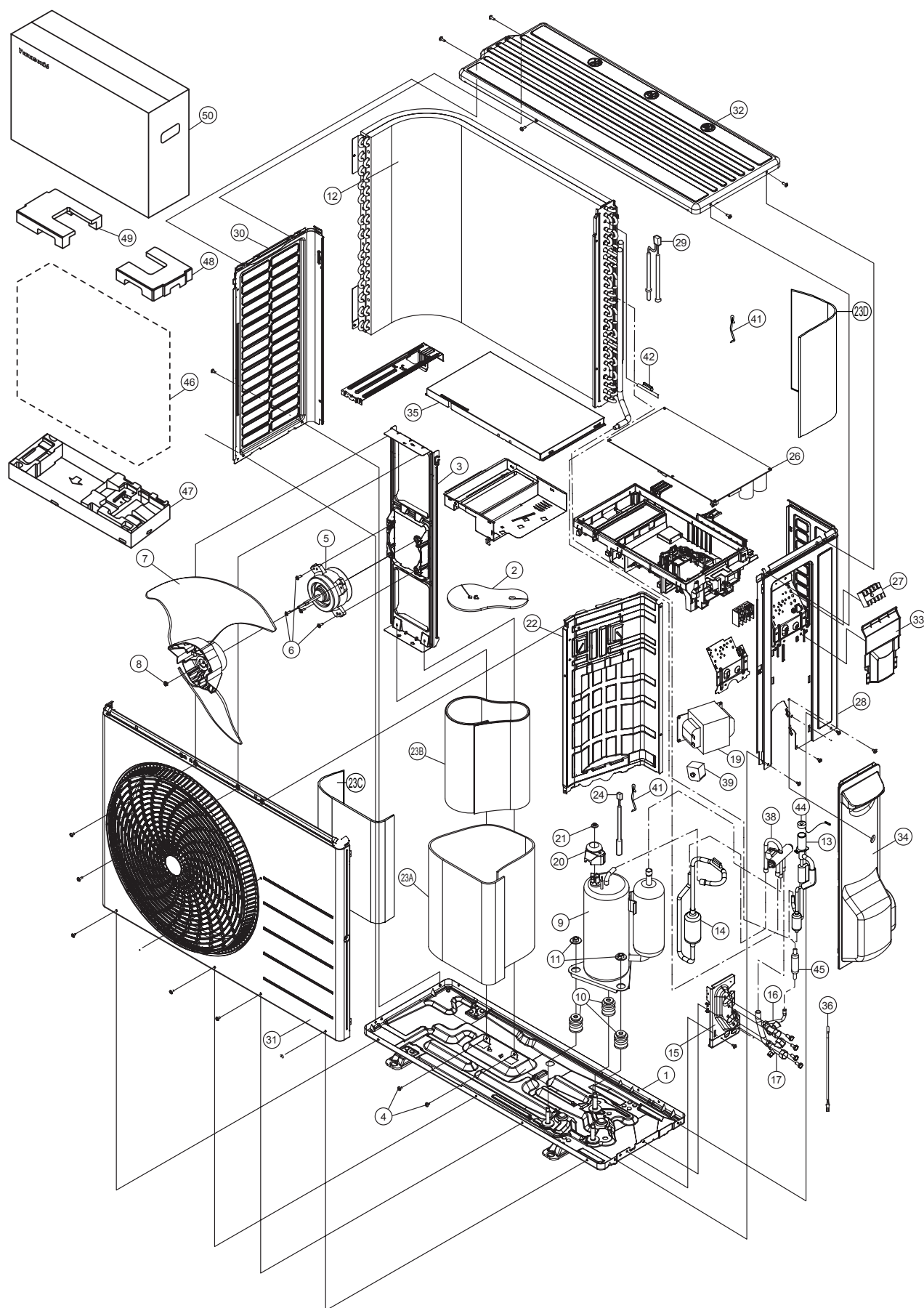
The above exploded view is for the purpose of parts disassembly and replacement.  
The non-numbered parts are not kept as standard service parts.

SAFETY	REF. NO.	PART NAME & DESCRIPTION	QTY.	CU-CE9PKE	REMARK
	1	CHASSY ASS'Y	1	CWD52K1310	
	2	SOUND PROOF MATERIAL	1	CWG302742	
	3	FAN MOTOR BRACKET	1	CWD541167	
	4	SCREW	2	CWH551217	
⚠	5	FAN MOTOR	1	CWA951853	O
	6	SCREW - FAN MOTOR MOUNT	4	CWH55252J	
	7	PROPELLER FAN ASSY	1	CWH03K1066	
	8	NUT - PROPELLER FAN	1	CWH56053J	
⚠	9	COMPRESSOR	1	5RD132XFD21	O
	10	ANTI - VIBRATION BUSHING	3	CWH50077	
	11	NUT - COMPRESSOR MOUNT	3	CWH561096	
	12	CONDENSER COMPLETE	1	CWB32C3560	
	13	TUBE ASS'Y CO. (CAP. TUBE& CHK VALVE)	1	CWT01C6150	
	14	DISCHARGE MUFFLER	1	CWB121010	
	15	HOLDER - COUPLING	1	CWH351233	
	16	2-WAYS VALVE (LIQUID)	1	CWB021400	O
	17	3-WAYS VALVE (GAS)	1	CWB011374	O
⚠	19	REACTOR	1	G0C193J00016	O
	20	TERMINAL COVER	1	CWH171039A	
	21	NUT - TERMINAL COVER	1	CWH7080300J	
	22	SOUND - PROOF BOARD	1	CWH151364	
	23A	SOUND PROOF MATERIAL	1	CWG302856	
	23B	SOUND PROOF MATERIAL	1	CWG302858	
	23C	SOUND PROOF MATERIAL	1	CWG302857	
	23D	SOUND PROOF MATERIAL	1	CWG302855	
	24	SENSOR - COMPLETE	1	CWA50C2894	O
⚠	26	ELECTRONIC CONTROLLER - MAIN	1	CWA73C7966R	O
⚠	27	TERMINAL BOARD ASS'Y	1	CWA28K1036J	
	28	CABINET SIDE PLATE CO.	1	CWE04C1482	
	29	SENSOR - COMPLETE	1	CWA50C2893	O
	30	CABINET SIDE PLATE (L)	1	CWE041617A	
	31	CABINET FRONT PLATE - CO.	1	CWE06C1441	
	32	CABINET TOP PLATE	1	CWE031148A	
	33	PLATE - C.B.COVER	1	CWH131470A	
	34	CONTROL BOARD COVER - COMPLETE	1	CWH13C1253	
	35	CONTROL BOARD COVER	1	CWH131473	
	36	BASE PAN HEATER	1	CWA341072	
	38	4-WAYS VALVE	1	CWB001063	O
⚠	39	V-COIL COMPLETE	1	CWA43C2431	O
	41	HOLDER - SENSOR	2	CWH32143	
	42	HOLDER - SENSOR	1	CWH32075	
	46	BAG	1	CWG861078	
	47	BASE BOARD / CC CASE - COMPLETE	1	CWG62C1162	
	48	SHOCK ABSORBER (RIGHT)	1	CWG713415	
	49	SHOCK ABSORBER (LEFT)	1	CWG713416	
	50	C.C.CASE	1	CWG566848	

(Note)

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

## 19.2.2 CU-CE12PKE



### 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.	CU-CE12PKE	REMARK
	1	CHASSY ASS'Y	1	CWD52K1310	
	2	SOUND PROOF MATERIAL	1	CWG302742	
	3	FAN MOTOR BRACKET	1	CWD541167	
	4	SCREW - FAN MOTOR BRACKET	2	CWH551217	
⚠	5	FAN MOTOR	1	CWA951854	O
	6	SCREW - FAN MOTOR MOUNT	4	CWH55252J	
	7	PROPELLER FAN ASSY	1	CWH03K1066	
	8	NUT - PROPELLER FAN	1	CWH56053J	
⚠	9	COMPRESSOR	1	5RD132XFD21	O
	10	ANTI - VIBRATION BUSHING	3	CWH50077	
	11	NUT - COMPRESSOR MOUNT	3	CWH56000J	
	12	CONDENSER COMPLETE	1	CWB32C3559	
	13	TUBE ASS'Y CO. (EXPAN. VALVE & STRAINER)	1	CWT01C6626	
	14	DISCHARGE MUFFLER	1	CWB121010	
	15	HOLDER - COUPLING	1	CWH351233	
	16	2-WAYS VALVE	1	CWB021590	O
	17	3-WAYS VALVE	1	CWB011374	O
⚠	19	REACTOR	1	G0C193J00016	O
	20	TERMINAL COVER	1	CWH171039A	
	21	NUT - TERMINAL COVER	1	CWH7080300J	
	22	SOUND - PROOF BOARD	1	CWH151364	
	23A	SOUND PROOF MATERIAL	1	CWG302856	
	23B	SOUND PROOF MATERIAL	1	CWG302858	
	23C	SOUND PROOF MATERIAL	1	CWG302857	
	23D	SOUND PROOF MATERIAL	1	CWG302855	
	24	SENSOR - COMPLETE	1	CWA50C2894	O
⚠	26	ELECTRONIC CONTROLLER - MAIN	1	CWA73C7961R	O
⚠	27	TERMINAL BOARD ASS'Y	1	CWA28K1036J	
	28	CABINET SIDE PLATE CO.	1	CWE04C1482	
	29	SENSOR - COMPLETE	1	CWA50C2893	O
	30	CABINET SIDE PLATE (L)	1	CWE041617A	
	31	CABINET FRONT PLATE - CO.	1	CWE06C1441	
	32	CABINET TOP PLATE	1	CWE031148A	
	33	PLATE - C.B.COVER	1	CWH131470A	
	34	CONTROL BOARD COVER - COMPLETE	1	CWH13C1253	
	35	CONTROL BOARD COVER	1	CWH131473	
	36	BASE PAN HEATER	1	CWA341072	
	38	4-WAYS VALVE	1	CWB001063	O
⚠	39	V-COIL COMPLETE (4-WAYS VALVE)	1	CWA43C2431	O
	41	HOLDER - SENSOR	2	CWH32143	
	42	HOLDER - SENSOR	1	CWH32075	
⚠	44	V-COIL COMPLETE (EXP. VALVE)	1	CWA43C2257	
	45	DISCHARGE MUFFLER	1	CWB121058	
	46	BAG	1	CWG861078	
	47	BASE BOARD / CC CASE - COMPLETE	1	CWG62C1162	

SAFETY	REF. NO.	PART NAME & DESCRIPTION	QTY.	CU-CE12PKE	REMARK
	48	SHOCK ABSORBER (RIGHT)	1	CWG713415	
	49	SHOCK ABSORBER (LEFT)	1	CWG713416	
	50	C.C.CASE	1	CWG566848	

(Note)

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