

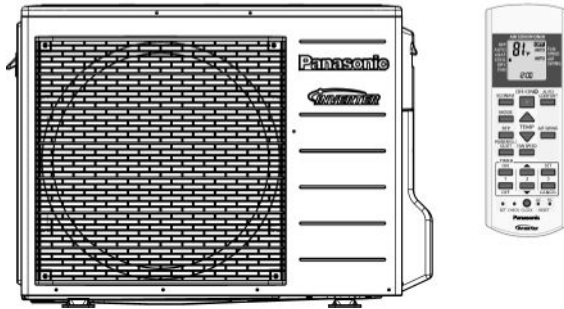
Service Manual

Air Conditioner



Indoor Unit
CS-XE9PKUA
CS-XE12PKUA

Outdoor Unit
CU-XE9PKUA
CU-XE12PKUA




Destination
U.S.A.
Canada

WARNING

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

IMPORTANT SAFETY NOTICE

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

PRECAUTION OF LOW TEMPERATURE

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



Panasonic®

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1. Safety Precautions







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

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

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

	This symbol denotes item that is PROHIBITED from doing.
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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.

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

⚠ WARNING

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

⚠ CAUTION

- | | | |
|-----|---|---|
| 1. | Do not install the unit at place where leakage of flammable gas may occur. In case gas leaks and accumulates at surrounding of the unit, it may cause fire. | ⊘ |
| 2. | Carry out drainage piping as mentioned in installation instructions. If drainage is not perfect, water may enter the room and damage the furniture. | |
| 3. | Tighten the flare nut with torque wrench according to specified method. If the flare nut is over-tightened, after a long period, the flare may break and cause refrigerant gas leakage. | |
| 4. | Do not touch outdoor unit air inlet and aluminium fin. It may cause injury. | ⊘ |
| 5. | Select an installation location which is easy for maintenance. | |
| 6. | Pb free solder has a higher melting point than standard solder; typically the melting point is 50°F – 70°F (30°C – 40°C) higher. Please use a high temperature solder iron. In case of the soldering iron with temperature control, please set it to 700 ± 20°F (370 ± 10°C). Pb free solder will tend to splash when heated too high (about 1100°F / 600°C). | |
| 7. | Power supply connection to the room air conditioner.
Power supply cord shall be UL listed or CSA approved 3 conductor with minimum AWG14 wires.
Power supply point should be in an 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.
Fix power supply connection to a circuit breaker for permanent connection.
Use NRTL approved fuse or circuit breaker (rating refers to name plate) for permanent connection. | |
| 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-XE9PKUA					
		Outdoor	CU-XE9PKUA					
Performance Test Condition			ARI					
Power Supply		Phase, Hz	Single, 60					
		V	208			230		
		Min.	Mid.	Max.	Min.	Mid.	Max.	
Cooling	Capacity	kW	0.83	2.55	3.51	0.83	2.55	3.51
		BTU/h	2800	8700	12000	2800	8700	12000
		kcal/h	–	–	–	–	–	–
	Running Current	A	–	2.80	–	–	2.50	–
	Input Power	W	150	540	850	150	540	850
	Annual Consumption	kWh	–	–	–	–	–	–
	EER	W/W	5.53	4.72	4.13	5.53	4.72	4.13
		BTU/hW	18.65	16.10	14.10	18.65	16.10	14.10
		kcal/hW	–	–	–	–	–	–
	Power Factor	%	–	93	–	–	94	–
	Indoor Noise (H / L / QLo)	dB-A	42 / 25 / 20			42 / 25 / 20		
		Power Level dB	58 / – / –			58 / – / –		
	Outdoor Noise (H / L / QLo)	dB-A	48 / – / –			48 / – / –		
		Power Level dB	63 / – / –			63 / – / –		
Heating	Capacity	kW	0.89	3.51	5.29	0.89	3.51	5.29
		BTU/h	3000	12000	18000	3000	12000	18000
		kcal/h	–	–	–	–	–	–
	Running Current	A	–	4.50	–	–	4.00	–
	Input Power	W	150	860	1.65k	150	860	1.65k
	COP	W/W	5.93	4.08	3.21	5.93	4.08	3.21
		BTU/hW	20.00	13.95	10.90	20.00	13.95	10.90
		kcal/hW	–	–	–	–	–	–
	Power Factor	%	–	92	–	–	93	–
	Indoor Noise (H / L / QLo)	dB-A	42 / 29 / 26			42 / 29 / 26		
		Power Level dB	58 / – / –			58 / – / –		
Outdoor Noise (H / L / QLo)	dB-A	48 / – / –			48 / – / –			
	Power Level dB	63 / – / –			63 / – / –			
17°F: Rated Capacity (BTU/h) / I. Power (W)			8000 / 750					
5°F: Max. Capacity (BTU/h)			11000					
Max Current (A) / Max Input Power (W)			7.8 / 1.71k					
Starting Current (A)			4.50					
Compressor	Type	Hermetic Motor (Rotary)						
	Motor Type	Brushless (4 poles)						
	Output Power	W	700					

Model			Indoor	CS-XE9PKUA		
			Outdoor	CU-XE9PKUA		
Indoor Fan	Type			Cross-Flow Fan		
	Material			ASG33		
	Motor Type			DC / Transistor (8-poles)		
	Input Power		W	47.0		
	Output Power		W	40		
	Speed	QLo	Cool	rpm	570	
			Heat	rpm	740	
		Lo	Cool	rpm	660	
			Heat	rpm	810	
		Me	Cool	rpm	850	
			Heat	rpm	1000	
		Hi	Cool	rpm	1040	
			Heat	rpm	1190	
	SHi	Cool	rpm	1140		
Heat		rpm	1290			
Outdoor Fan	Type			Propeller Fan		
	Material			PP		
	Motor Type			DC (8-poles)		
	Input Power		W	-		
	Output Power		W	40		
	Speed	Hi	Cool	rpm	600	
			Heat	rpm	670	
Min Circuit Ampacity			15.0			
Max. Overcurrent Protection			15.0			
SEER / HSPF			28.50 / 12.50			
Moisture Removal		L/h (Pt/h)	0.5 (1.3)			
Indoor Airflow	QLo	Cool	m ³ /min (ft ³ /min)	5.0 (170)		
		Heat	m ³ /min (ft ³ /min)	7.4 (260)		
	Lo	Cool	m ³ /min (ft ³ /min)	6.3 (220)		
		Heat	m ³ /min (ft ³ /min)	8.3 (290)		
	Me	Cool	m ³ /min (ft ³ /min)	8.9 (310)		
		Heat	m ³ /min (ft ³ /min)	10.9 (380)		
	Hi	Cool	m ³ /min (ft ³ /min)	11.5 (405)		
		Heat	m ³ /min (ft ³ /min)	13.5 (475)		
SHi	Cool	m ³ /min (ft ³ /min)	12.8 (450)			
	Heat	m ³ /min (ft ³ /min)	14.9 (520)			
Outdoor Airflow	Hi	Cool	m ³ /min (ft ³ /min)	34.6 (1220)	34.6 (1220)	
		Heat	m ³ /min (ft ³ /min)	39.1 (1380)	39.1 (1380)	
Refrigeration Cycle	Control Device		Expansion Valve			
	Refrigerant Oil		cm ³	FV50S (320)		
	Refrigerant Type		g (oz)	R410A, 1.15k (40.6)		
Dimension	Height(I/D / O/D)		mm (inch)	295 (11-5/8) / 695 (27-3/8)		
	Width (I/D / O/D)		mm (inch)	870 (34-9/32) / 875 (34-15/32)		
	Depth (I/D / O/D)		mm (inch)	255 (10-1/16) / 320 (12-5/8)		
Weight	Net (I/D / O/D)		kg (lb)	11 (24) / 44 (97)		

Model		Indoor	CS-XE9PKUA	
		Outdoor	CU-XE9PKUA	
Piping	Pipe Diameter (Liquid / Gas)	mm (inch)	6.35 (1/4) / 9.52 (3/8)	
	Standard length	m (ft)	7.5 (24.6)	
	Length range (min – max)	m (ft)	3 (9.8) ~ 20 (65.6)	
	I/D & O/D Height different	m (ft)	15.0 (49.2)	
	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 (inch)	16.7 (5/8)	
	Length	mm(inch)	650 (25-5/8)	
Indoor Heat Exchanger	Fin Material		Aluminium (Pre Coat)	
	Fin Type		Slit Fin	
	Row × Stage × FPI		2 × 17 × 21	
	Size (W × H × L)	mm (inch)	636.5 × 357 × 25.4 (25-1/16 × 14-1/16 × 1)	
Outdoor Heat Exchanger	Fin Material		Aluminium / Blue Coated	
	Fin Type		Corrugated Fin	
	Row × Stage × FPI		2 × 31 × 18	
	Size (W × H × L)	mm (inch)	36.4 × 651 × 854.5:824.5 (1-7/16 × 25-11/16 × 33-11/16:32-15/32)	
Air Filter	Material		Polypropelene	
	Type		One-touch	
Power Supply			Outdoor	
Power Supply Cord		A	Nil	
Thermostat			Electronic Control	
Protection Device			Electronic Control	
			Dry Bulb	Wet Bulb
Indoor Operation Range	Cooling	Maximum °F/°C	89.6/32	73.4/23
		Minimum °F/°C	60.8/16	51.8/11
	Heating	Maximum °F/°C	86.0/30	-/-
		Minimum °F/°C	60.8/16	-/-
Outdoor Operation Range	Cooling	Maximum °F/°C	114.8/46	78.8/26
		Minimum °F/°C	0.0/-18	-/-
	Heating	Maximum °F/°C	75.2/24	64.4/18
		Minimum °F/°C	0.0/-18	-2.2/-19

1. Cooling capacities are based on indoor temperature of 80°F (26.7°C) DRY BULB, 67°F (19.4°C) WET BULB and outdoor air temperature of 95°F (35°C) DRY BULB, 75°F (23.8°C) WET BULB.
2. Heating capacities are based on indoor temperature of 70°F (21.1°C) DRY BULB, 60°F (15.6°C) WET BULB and outdoor air temperature of 47°F (8.3°C) DRY BULB, 43°F (6.1°C) WET BULB.
3. 17°F (-8.3°C) Heating Capacity and Input Power measured at 230V, indoor temperature 70°F (21.1°C), outdoor 17/15°F (-8.3/-9.4°C).
4. 5°F (-15°C) Heating Capacity measured at 230V, indoor temperature 70°F (21.1°C), outdoor 5°F (-15°C/-).
5. Specifications are subjected to change without prior notice for further improvement.

Model		Indoor	CS-XE12PKUA					
		Outdoor	CU-XE12PKUA					
Performance Test Condition			ARI					
Power Supply		Phase, Hz	Single, 60					
		V	208			230		
			Min.	Mid.	Max.	Min.	Mid.	Max.
Cooling	Capacity	kW	0.83	3.36	4.10	0.83	3.36	4.10
		BTU/h	2800	11500	14000	2800	11500	14000
		kcal/h	-	-	-	-	-	-
	Running Current	A	-	4.20	-	-	3.80	-
	Input Power	W	150	800	1.05k	150	800	1.05k
	Annual Consumption	kWh	-	-	-	-	-	-
	EER	W/W	5.53	4.20	3.90	5.53	4.20	3.90
		BTU/hW	18.65	14.35	13.30	18.65	14.35	13.30
		kcal/hW	-	-	-	-	-	-
	Power Factor	%	-	92	-	-	92	-
	Indoor Noise (H / L / QLo)	dB-A	45 / 28 / 20			45 / 28 / 20		
		Power Level dB	61 / - / -			61 / - / -		
	Outdoor Noise (H / L / QLo)	dB-A	49 / - / -			49 / - / -		
Power Level dB		64 / - / -			64 / - / -			
Heating	Capacity	kW	0.89	4.05	6.72	0.89	4.05	6.72
		BTU/h	3000	13800	23000	3000	13800	23000
		kcal/h	-	-	-	-	-	-
	Running Current	A	-	5.80	-	-	5.20	-
	Input Power	W	150	1.15k	2.10k	150	1.15k	2.10k
	COP	W/W	5.93	3.52	3.20	5.93	3.52	3.20
		BTU/hW	20.00	12.00	10.95	20.00	12.00	10.95
		kcal/hW	-	-	-	-	-	-
	Power Factor	%	-	95	-	-	96	-
	Indoor Noise (H / L / QLo)	dB-A	44 / 35 / 32			44 / 35 / 32		
		Power Level dB	60 / - / -			60 / - / -		
	Outdoor Noise (H / L / QLo)	dB-A	49 / - / -			49 / - / -		
		Power Level dB	64 / - / -			64 / - / -		
17°F: Rated Capacity (BTU/h) / I. Power (W)			10400 / 1.05k					
5°F: Max. Capacity (BTU/h)			12500					
Max Current (A) / Max Input Power (W)			9.5 / 2.15k					
Starting Current (A)			5.80					
Compressor	Type	Hermetic Motor (Rotary)						
	Motor Type	Brushless (4 poles)						
	Output Power	700						

Model			Indoor	CS-XE12PKUA		
			Outdoor	CU-XE12PKUA		
Indoor Fan	Type			Cross-Flow Fan		
	Material			ASG33		
	Motor Type			DC / Transistor (8-poles)		
	Input Power		W	47.0		
	Output Power		W	40		
	Speed	QLo	Cool	rpm	570	
			Heat	rpm	890	
		Lo	Cool	rpm	710	
			Heat	rpm	970	
		Me	Cool	rpm	1010	
			Heat	rpm	1110	
		Hi	Cool	rpm	1300	
			Heat	rpm	1250	
	SHi	Cool	rpm	1350		
Heat		rpm	1350			
Outdoor Fan	Type			Propeller Fan		
	Material			PP		
	Motor Type			DC (8-poles)		
	Input Power		W	-		
	Output Power		W	40		
	Speed	Hi	Cool	rpm	600	
			Heat	rpm	750	
Min Circuit Ampacity			15.0			
Max. Overcurrent Protection			20.0			
SEER / HSPF			25.50 / 12.00			
Moisture Removal		L/h (Pt/h)		1.1 (2.3)		
Indoor Airflow	QLo	Cool	m ³ /min (ft ³ /min)	5.0 (170)		
		Heat	m ³ /min (ft ³ /min)	9.4 (330)		
	Lo	Cool	m ³ /min (ft ³ /min)	6.9 (240)		
		Heat	m ³ /min (ft ³ /min)	10.5 (370)		
	Me	Cool	m ³ /min (ft ³ /min)	11.1 (390)		
		Heat	m ³ /min (ft ³ /min)	12.4 (430)		
	Hi	Cool	m ³ /min (ft ³ /min)	15.0 (530)		
		Heat	m ³ /min (ft ³ /min)	14.3 (505)		
SHi	Cool	m ³ /min (ft ³ /min)	15.7 (550)			
	Heat	m ³ /min (ft ³ /min)	15.7 (550)			
Outdoor Airflow	Hi	Cool	m ³ /min (ft ³ /min)	35.9 (1265)	35.9 (1265)	
		Heat	m ³ /min (ft ³ /min)	44.0 (1555)	44.0 (1555)	
Refrigeration Cycle	Control Device			Expansion Valve		
	Refrigerant Oil		cm ³	FV50S (320)		
	Refrigerant Type		g (oz)	R410A, 1.15k (40.6)		
Dimension	Height(I/D / O/D)		mm (inch)	295 (11-5/8) / 695 (27-3/8)		
	Width (I/D / O/D)		mm (inch)	870 (34-9/32) / 875 (34-15/32)		
	Depth (I/D / O/D)		mm (inch)	255 (10-1/16) / 320 (12-5/8)		
Weight	Net (I/D / O/D)		kg (lb)	11 (24) / 44 (97)		

Model		Indoor	CS-XE12PKUA	
		Outdoor	CU-XE12PKUA	
Piping	Pipe Diameter (Liquid / Gas)	mm (inch)	6.35 (1/4) / 12.70 (1/2)	
	Standard length	m (ft)	7.5 (24.6)	
	Length range (min – max)	m (ft)	3 (9.8) ~ 20 (65.6)	
	I/D & O/D Height different	m (ft)	15.0 (49.2)	
	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 (inch)	16.7 (5/8)	
	Length	mm (inch)	650 (25-5/8)	
Indoor Heat Exchanger	Fin Material		Aluminium (Pre Coat)	
	Fin Type		Slit Fin	
	Row × Stage × FPI		2 × 17 × 21	
	Size (W × H × L)	mm (inch)	636.5 × 357 × 25.4 (25-11/16 × 14-1/16 × 1)	
Outdoor Heat Exchanger	Fin Material		Aluminium / Blue Coated	
	Fin Type		Corrugated Fin	
	Row × Stage × FPI		2 × 31 × 18	
	Size (W × H × L)	mm (inch)	36.4 × 651 × 854.5:824.5 (1-7/16 × 25-11/16 × 33-11/16:32-15/32)	
Air Filter	Material		Polypropelene	
	Type		One-touch	
Power Supply			Outdoor	
Power Supply Cord		A	Nil	
Thermostat			Electronic Control	
Protection Device			Electronic Control	
			Dry Bulb	Wet Bulb
Indoor Operation Range	Cooling	Maximum °F/°C	89.6/32	73.4/23
		Minimum °F/°C	60.8/16	51.8/11
	Heating	Maximum °F/°C	86.0/30	-/-
		Minimum °F/°C	60.8/16	-/-
Outdoor Operation Range	Cooling	Maximum °F/°C	114.8/46	78.8/26
		Minimum °F/°C	0.0/-18	-/-
	Heating	Maximum °F/°C	75.2/24	64.4/18
		Minimum °F/°C	0.0/-18	-2.2/-19

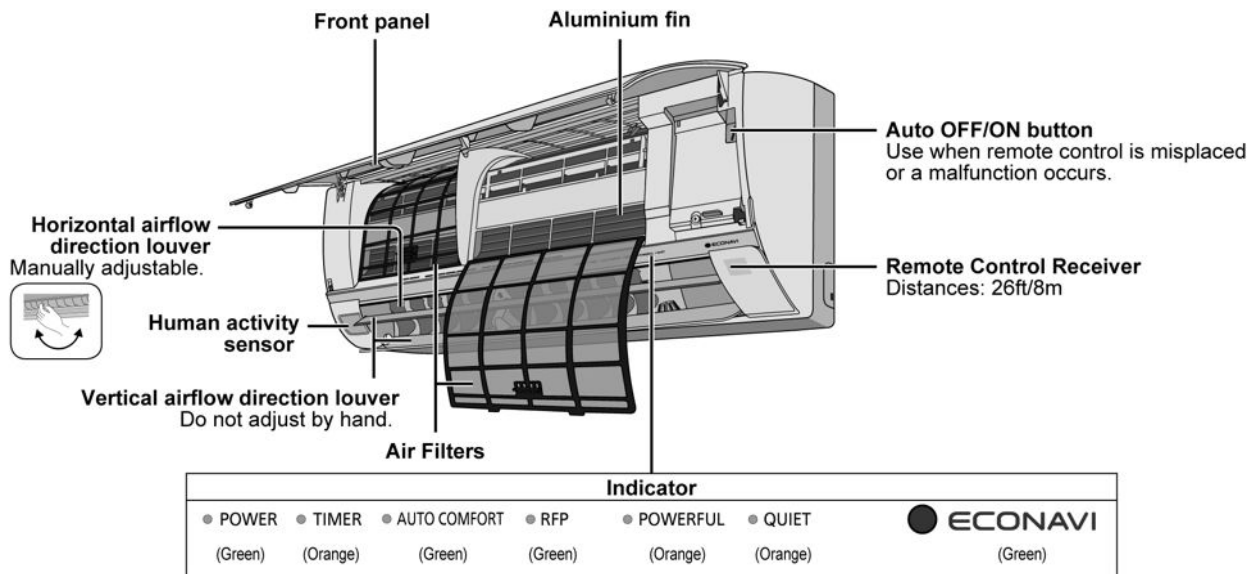
- Cooling capacities are based on indoor temperature of 80°F (26.7°C) DRY BULB, 67°F (19.4°C) WET BULB and outdoor air temperature of 95°F (35°C) DRY BULB, 75°F (23.8°C) WET BULB.
- Heating capacities are based on indoor temperature of 70°F (21.1°C) DRY BULB, 60°F (15.6°C) WET BULB and outdoor air temperature of 47°F (8.3°C) DRY BULB, 43°F (6.1°C) WET BULB.
- 17°F (-8.3°C) Heating Capacity and Input Power measured at 230V, indoor temperature 70°F (21.1°C), outdoor 17/15°F (-8.3/-9.4°C).
- 5°F (-15°C) Heating Capacity measured at 230V, indoor temperature 70°F (21.1°C), outdoor 5°F (-15°C/-).
- Specifications are subjected to change without prior notice for further improvement.

3. Features

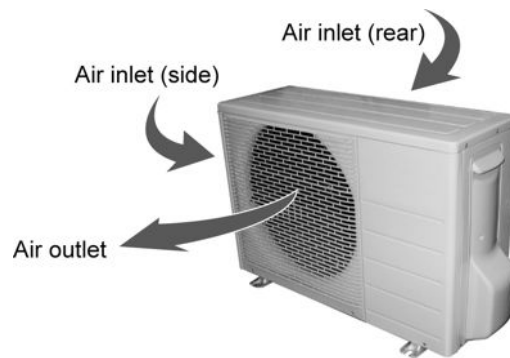
- **Inverter Technology**
 - Wider output power range
 - Energy saving
 - Quick Cooling
 - Quick Heating
 - More precise temperature control
- **Environment Protection**
 - Non-ozone depletion substances refrigerant (R410A)
- **Long Installation Piping**
 - Long piping up to 65.6ft (20 meters) during 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**
 - Quiet mode to reduce the indoor unit operating sound
 - Powerful mode to reach the desired room temperature quickly
 - 24-hour timer setting
 - RFP (Room Freeze Protection) operation is designed to circulate the air in High mode for monitoring the temperature. Used in spaces that are unoccupied during the winter, for the purpose of protecting any equipment or appliances which may be destroyed as a result of freezing temperature.
- **Serviceability Improvement**
 - Breakdown Self Diagnosis function

4. Location of Controls and Components

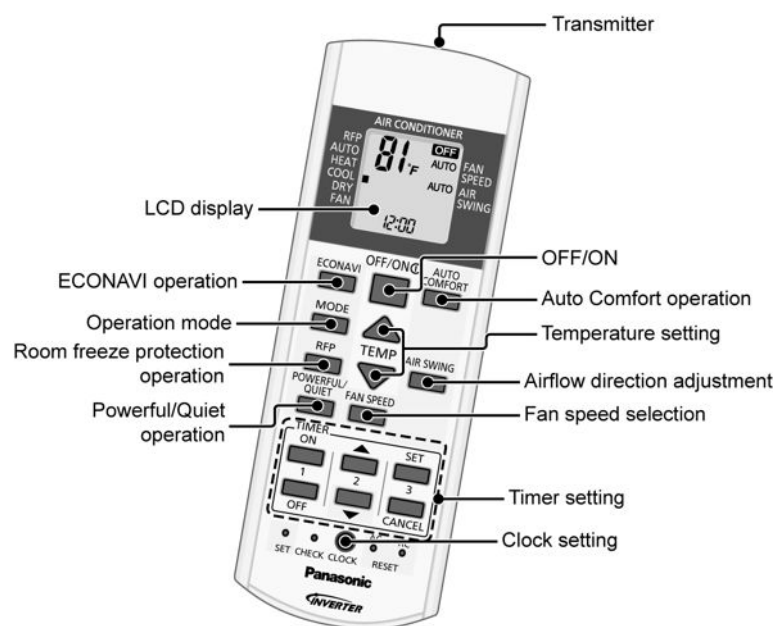
4.1 Indoor Unit



4.2 Outdoor Unit

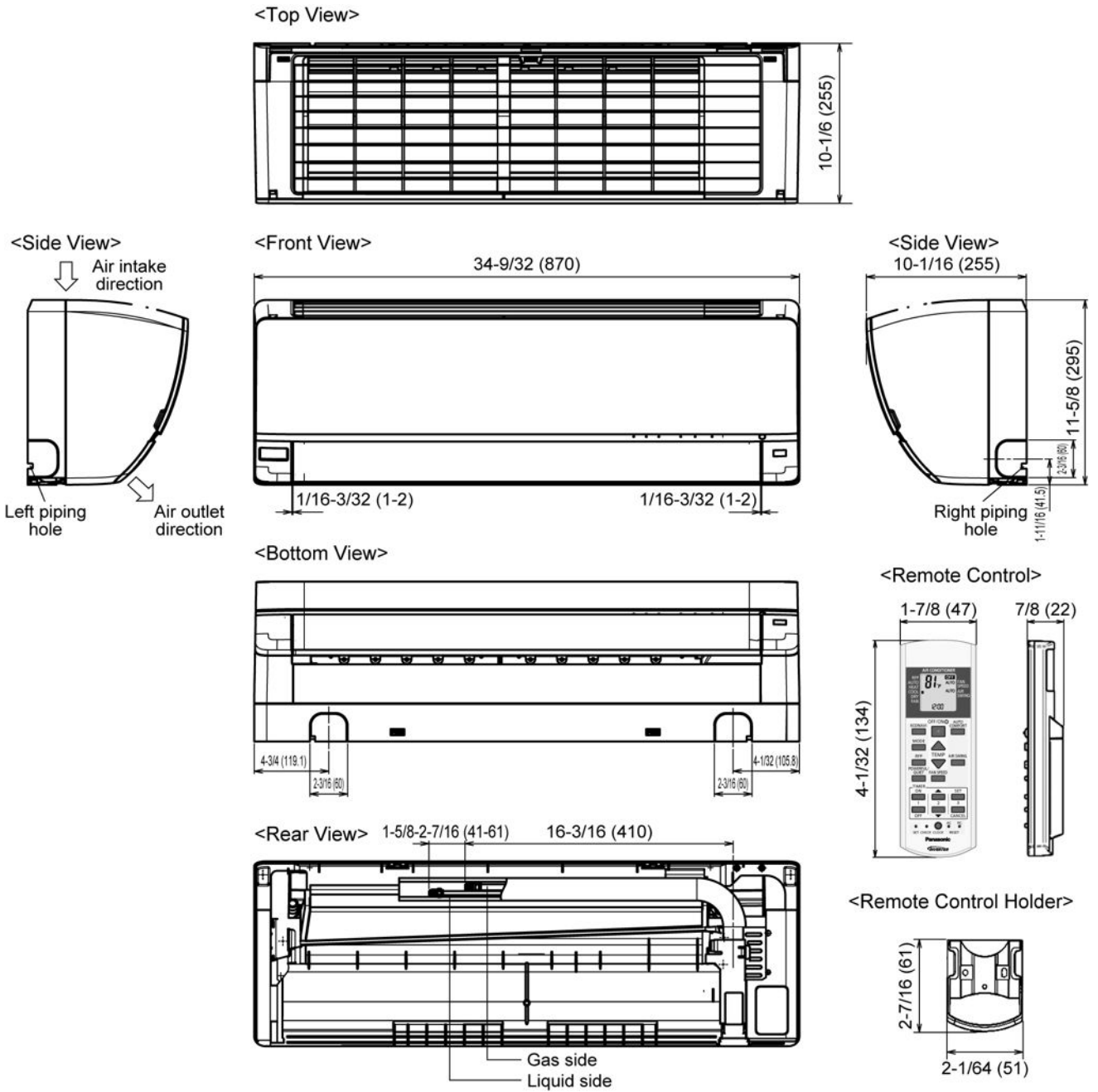


4.3 Remote Control

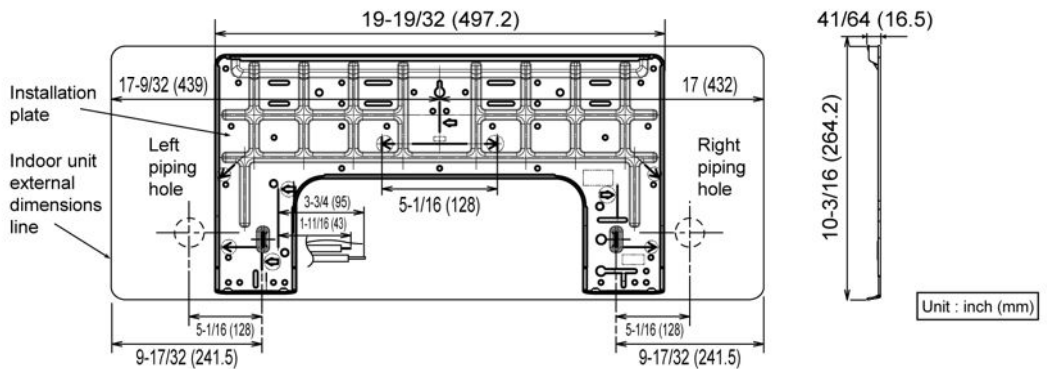


5. Dimensions

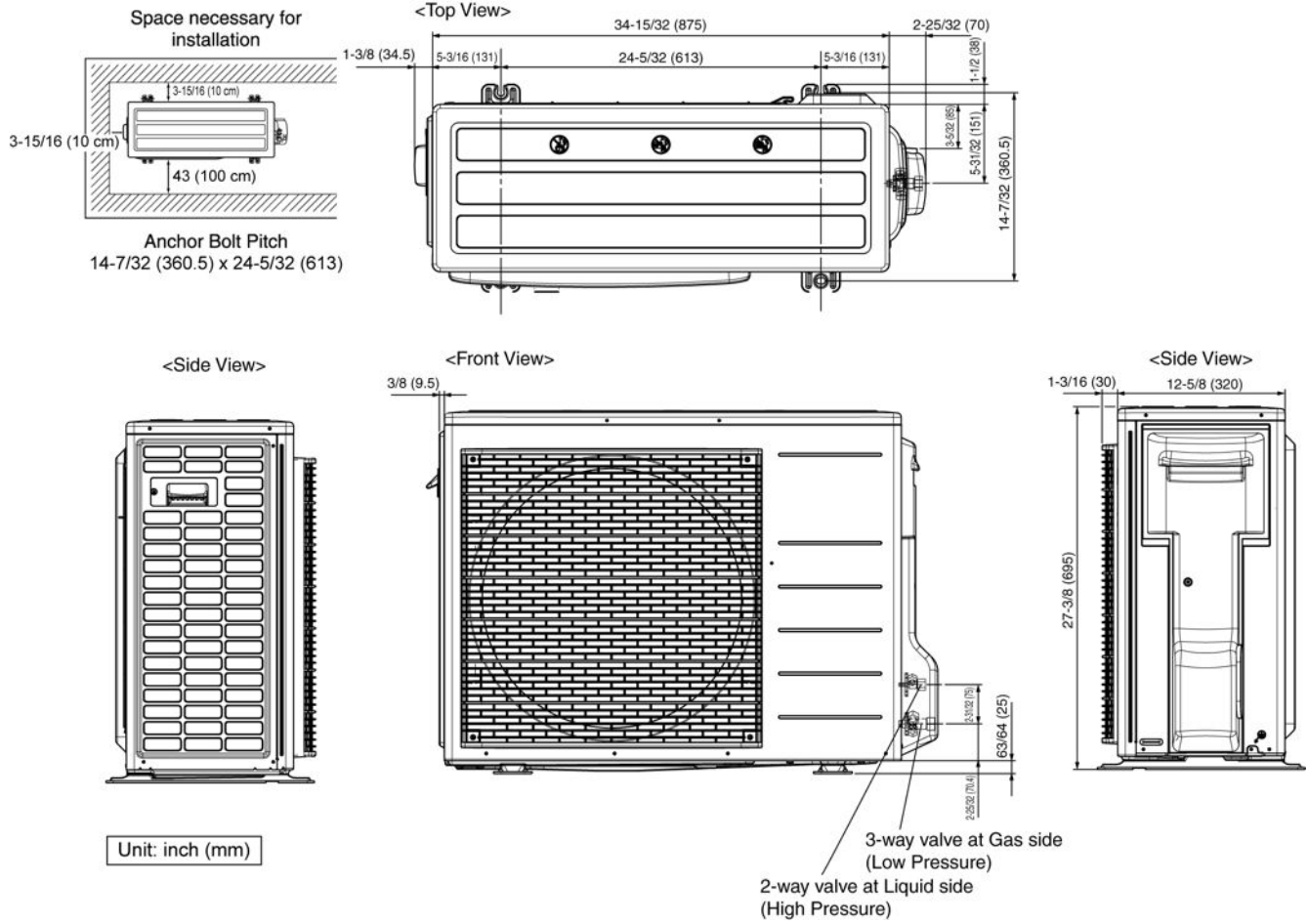
5.1 Indoor Unit



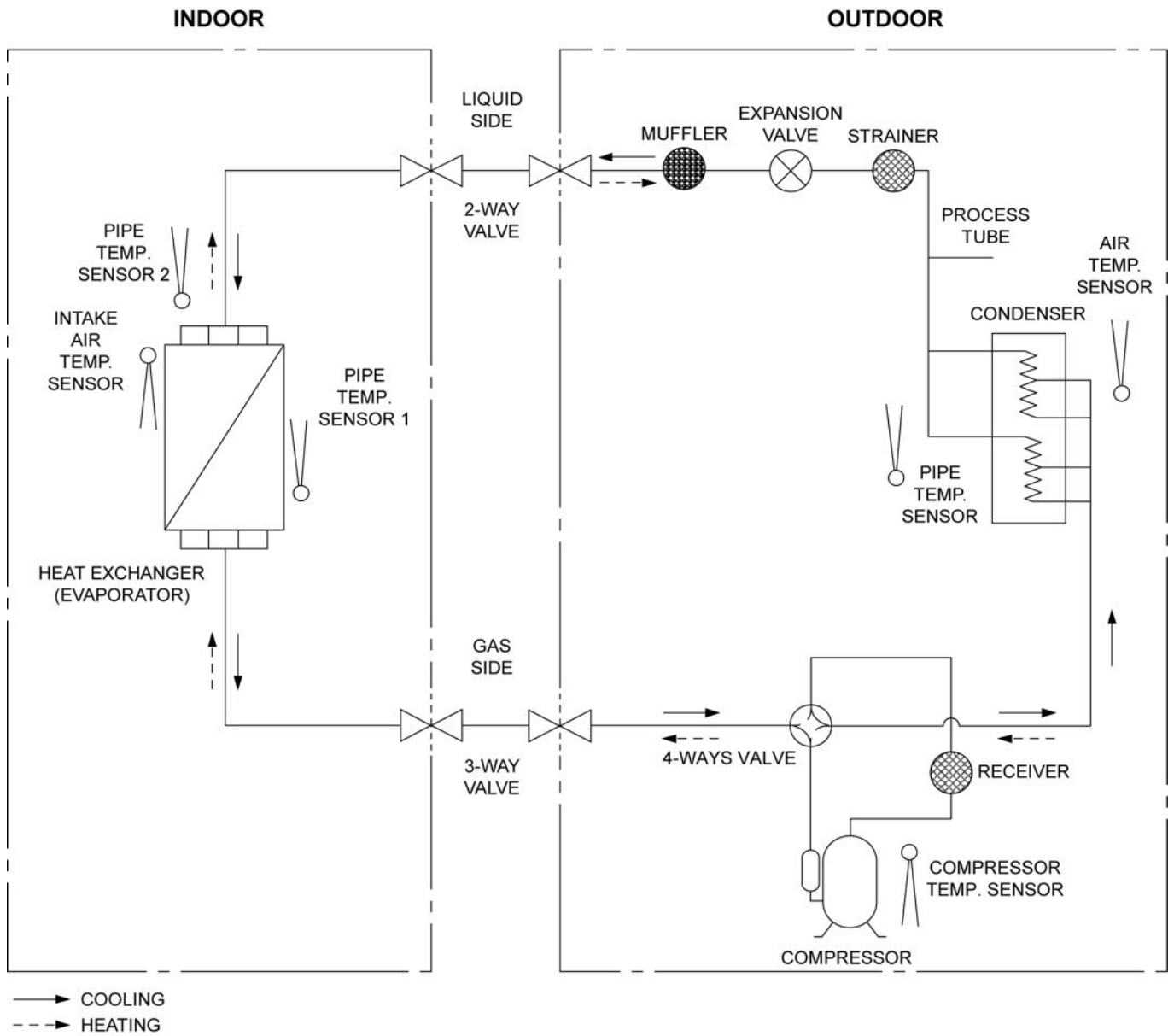
Relative position between the indoor unit and the installation plate <Front View>



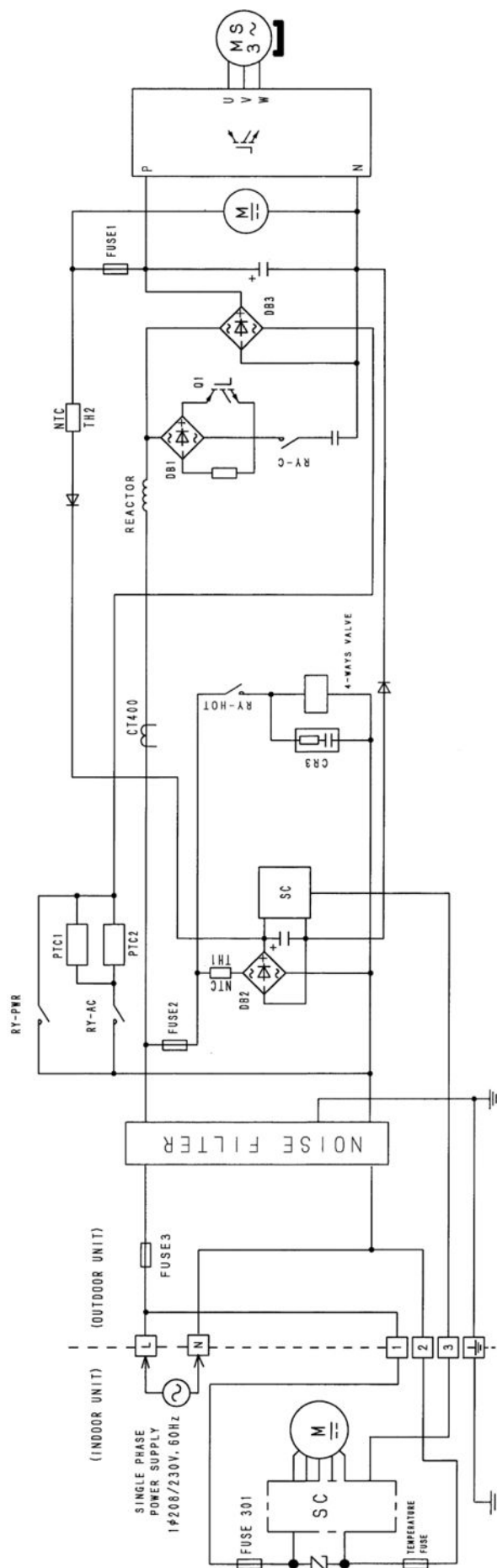
5.2 Outdoor Unit



6. Refrigeration Cycle Diagram

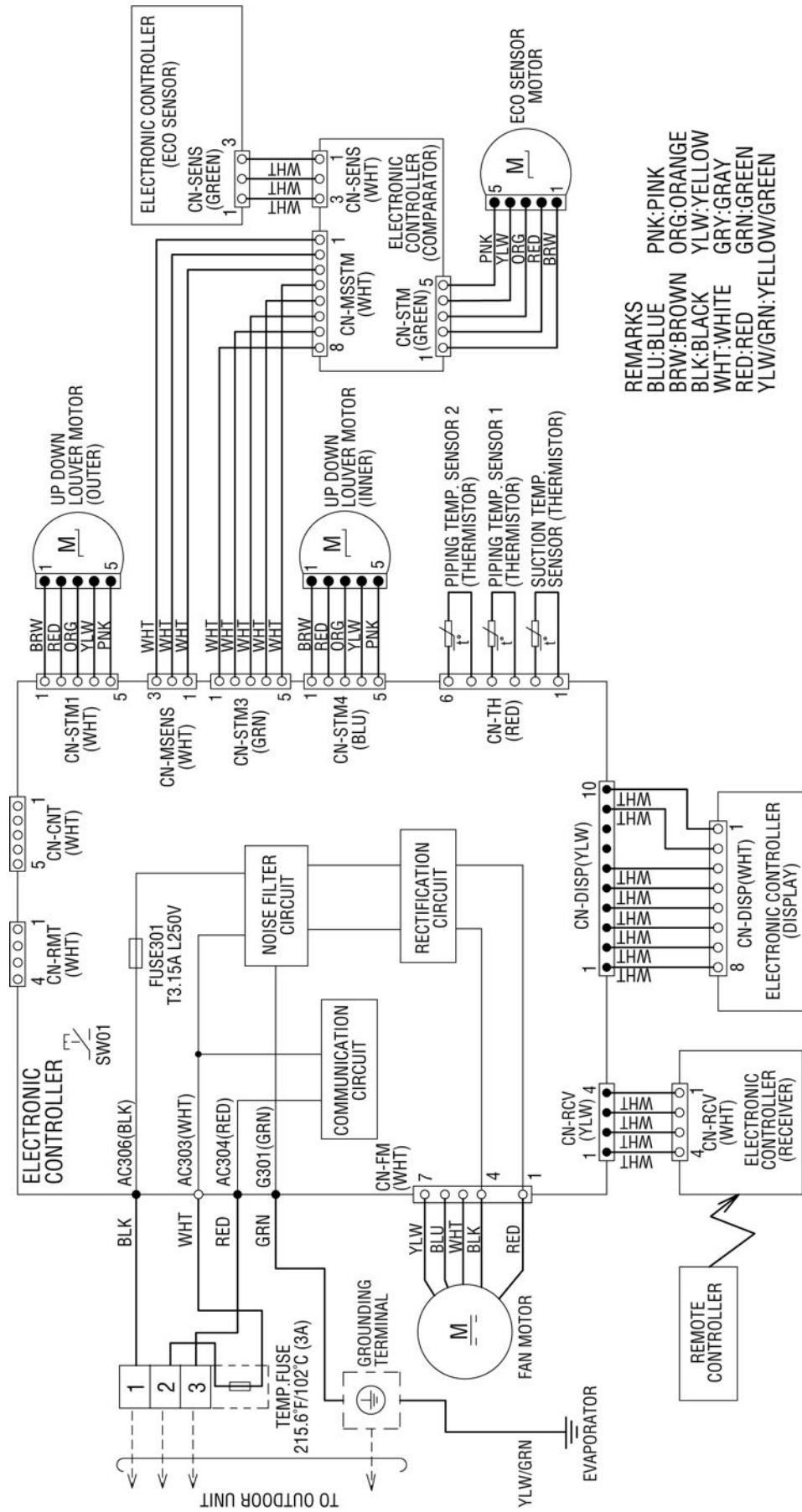


7. Block Diagram



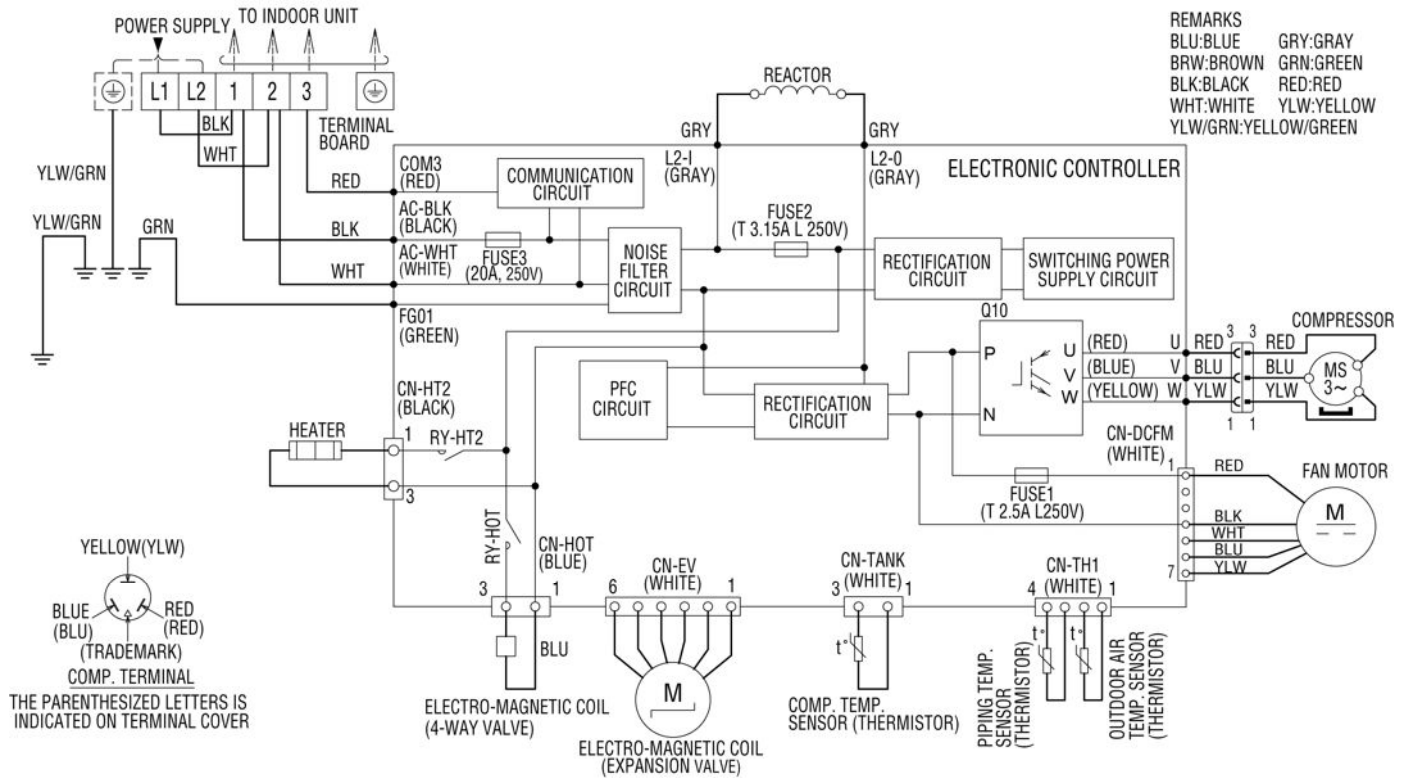
8. Wiring Connection Diagram

8.1 Indoor Unit



REMARKS
 BLU:BLUE
 BRW:BROWN
 BLK:BLACK
 WHT:WHITE
 RED:RED
 YLV/GRN:YELLOW/GREEN
 PNK:PINK
 ORG:ORANGE
 YLV:YELLOW
 GRY:GRAY
 GRN:GREEN
 YLV/GRN:YELLOW/GREEN

8.2 Outdoor Unit



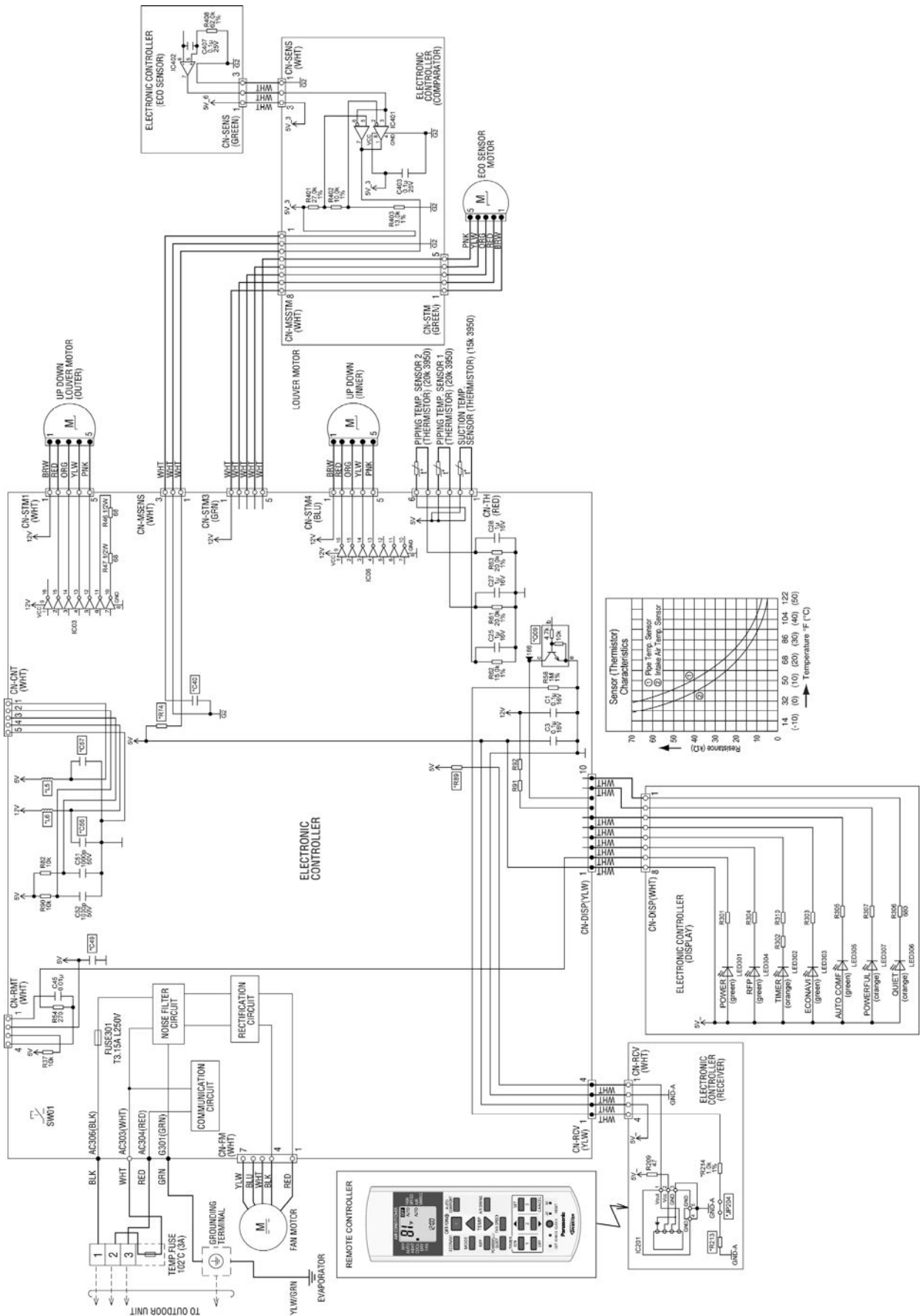
Resistance of Compressor Windings

MODEL	CU-XE9/12PK
CONNECTION	5RS102XHB21 (Ω)
U-V	1.741
U-W	1.765
V-W	1.711

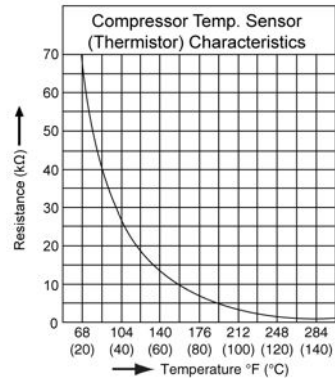
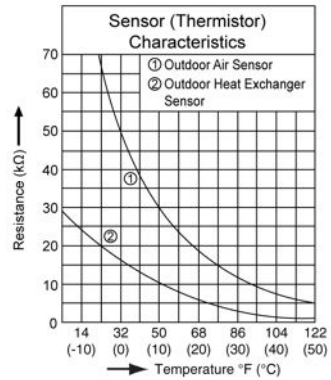
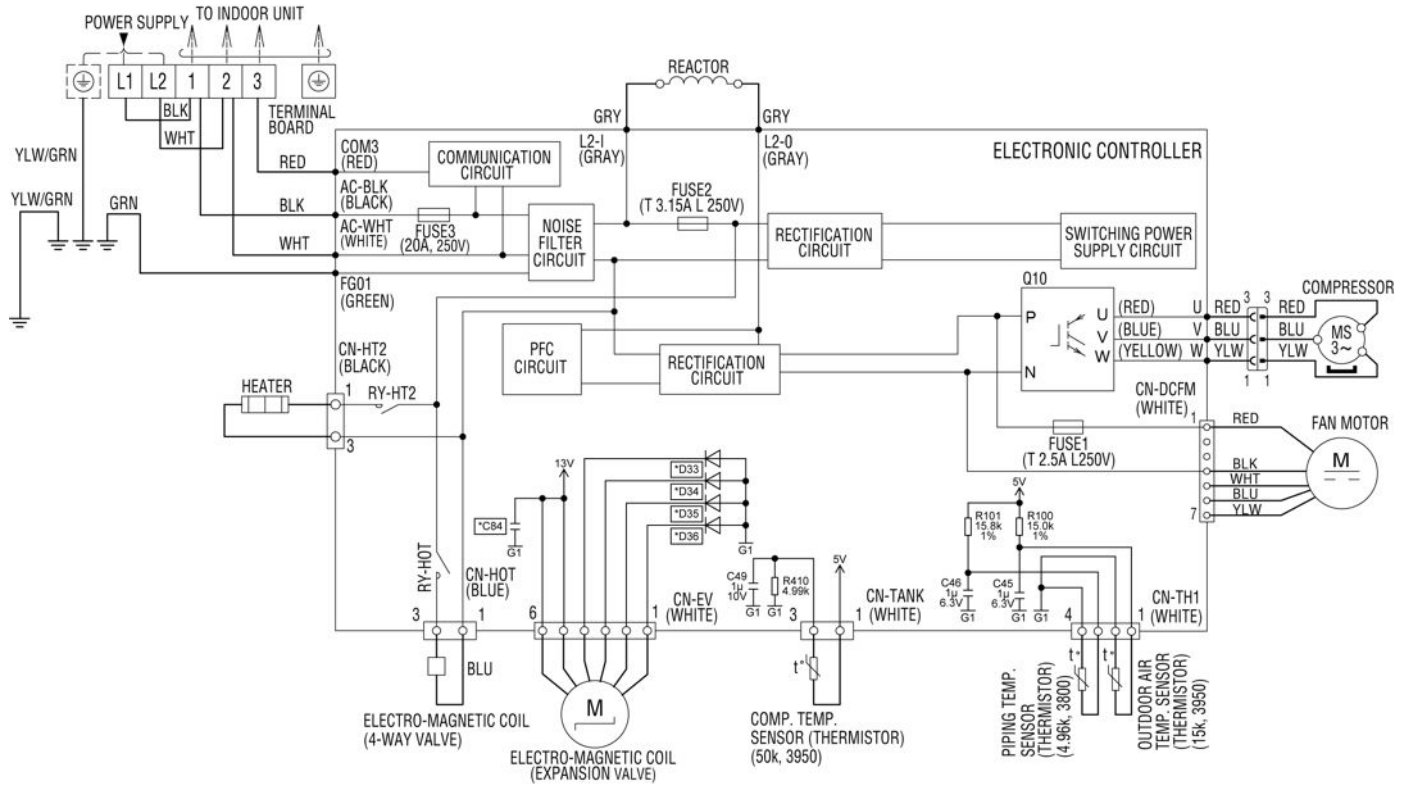
Note: Resistance at 20°C of ambient temperature.

9. Electronic Circuit Diagram

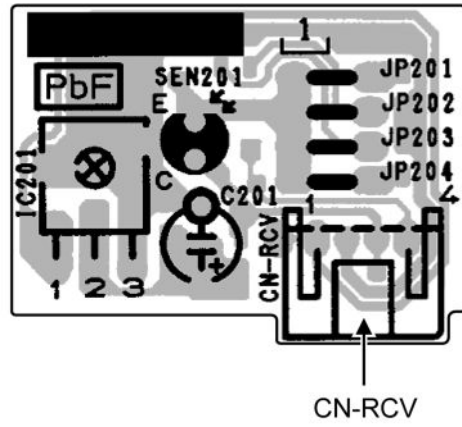
9.1 Indoor Unit



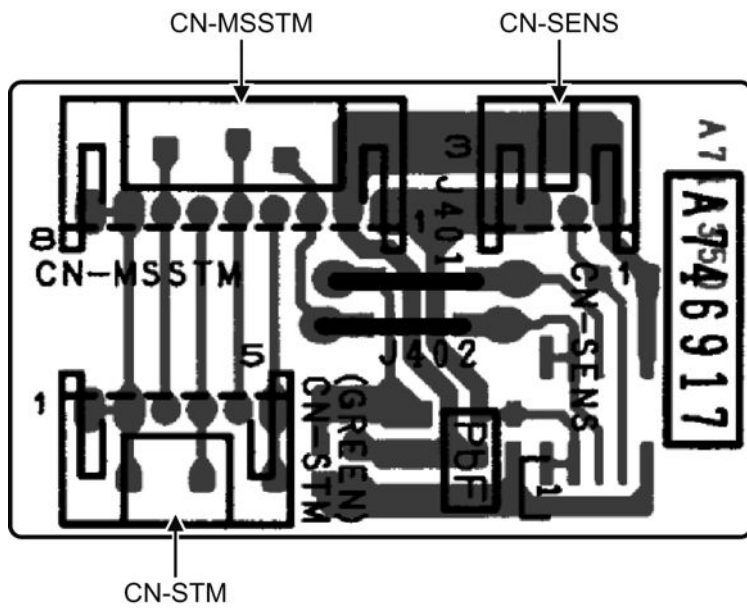
9.2 Outdoor Unit



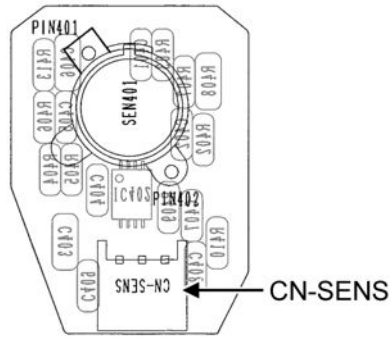
10.1.3 Receiver Printed Circuit Board



10.1.4 Comparator Printed Circuit Board



10.1.5 Human Activity Sensor Printed Circuit Board



11. Installation Instruction

11.1 Select the Best Location

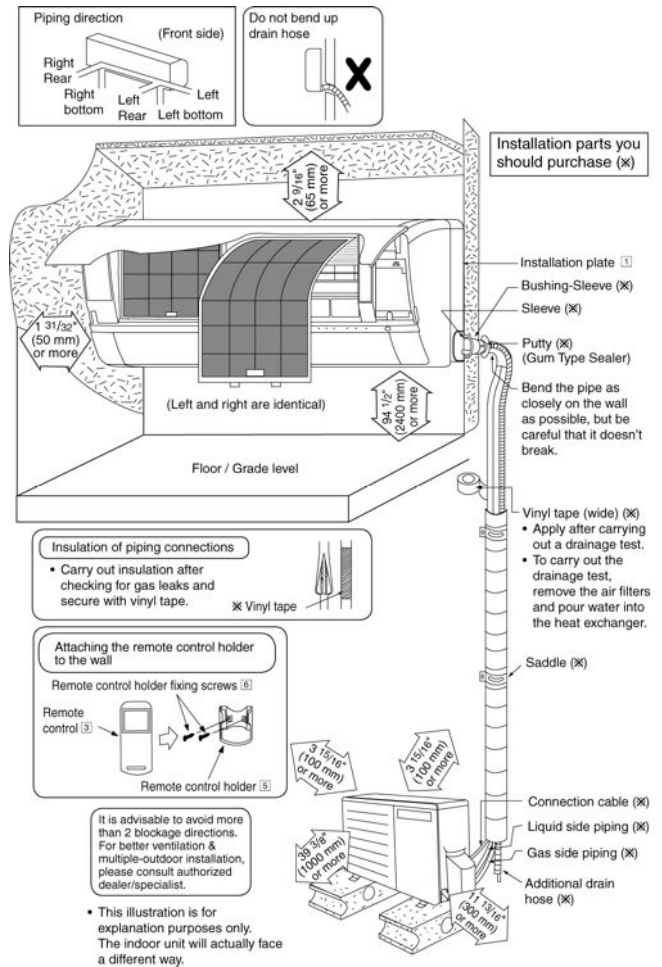
11.1.1 Indoor Unit

- 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.
- Mount with the lowest moving parts at least 8ft (2.4 m) above floor or grade level.

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.
- Recommended installation height for outdoor unit should be above the seasonal snow level.

11.1.3 Indoor/Outdoor Unit Installation Diagram



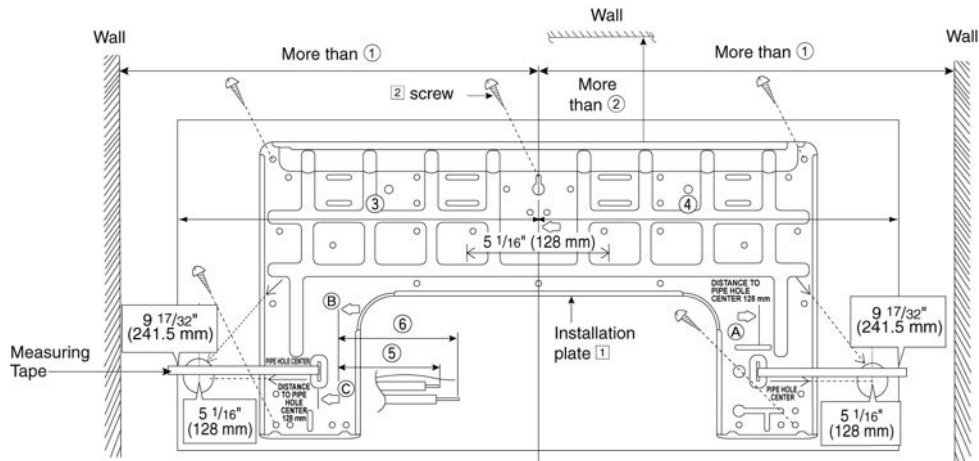
Model	Capacity (Btu/h)	Piping size		Std. Length	Max. Elevation	Min. Piping Length	Max. Piping Length	Additional Refrigerant	Piping Length for add. gas
		Gas	Liquid						
XE9PKUA	8700	3/8\" (9.52 mm)	1/4\"	24.6 ft (7.5 m)	49.2 ft (15 m)	9.8 ft (3 m)	65.6 ft (20 m)	0.2 oz/ft (20 g/m)	24.6 ft (7.5 m)
XE12PKUA	11500	1/2\" (12.7 mm)							

Example: For XE9PKUA

If the unit is installed at 32.8 ft (10 m) distance, the quantity of additional refrigerant should be 1.64 oz (50 g) (32.8 - 24.6) ft x 0.2 oz/ft = 1.64 oz. ((10-7.5) m x 20 g/m = 50 g)

11.2 Indoor Unit

The mounting wall shall be strong and solid enough to prevent it from vibration.



Model	Dimension					
	①	②	③	④	⑤	⑥
XE9PKUA, XE12PKUA	19-9/32" (490 mm)	3-7/32" (82 mm)	17-9/32" (439 mm)	17" (432 mm)	1-11/16" (43 mm)	3-3/4" (95 mm)

The center of installation plate should be at more than ① at right and left of the wall.

The distance from installation plate edge to ceiling should more than ②.

From installation plate left edge to unit's left side is ③.

From installation plate right edge to unit's right is ④.

- Ⓑ : For left side piping, piping connection for liquid should be about ⑤ from this line.
 : For left side piping, piping connection for gas should be about ⑥ from this line.

- Mount the installation plate on the wall with 5 screws or more (at least 5 screws).
(If mounting the unit on the concrete wall, consider using anchor bolts.)
 - Always mount the installation plate horizontally by aligning the marking-off line with the thread and using a level gauge.
- Drill the piping plate hole with $\varnothing 2\text{-}3/4"$ ($\varnothing 70$ mm) hole-core drill.
 - Line according to the left and right side of the installation plate. The meeting point of the extended line is the center of the hole. Another method is by putting measuring tape at position as shown in the diagram above. The hole center is obtained by measuring the distance namely $5\text{-}1/16"$ (128 mm) for left and right hole respectively.
 - Drill the piping hole at either the right or the left and the hole should be slightly slanting to the outdoor side.

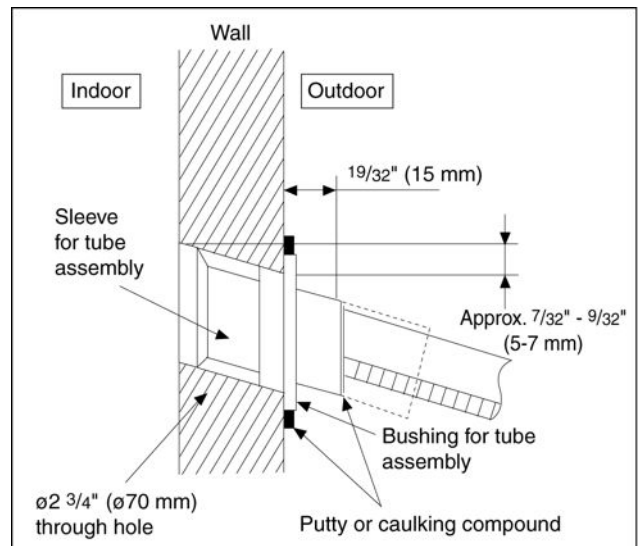
11.2.1 To Drill a Hole in the Wall and Install a Sleeve of Piping

- Insert the piping sleeve to the hole.
- Fix the bushing to the sleeve.
- Cut the sleeve until it extrudes about $19/32"$ (15 mm) from the wall.

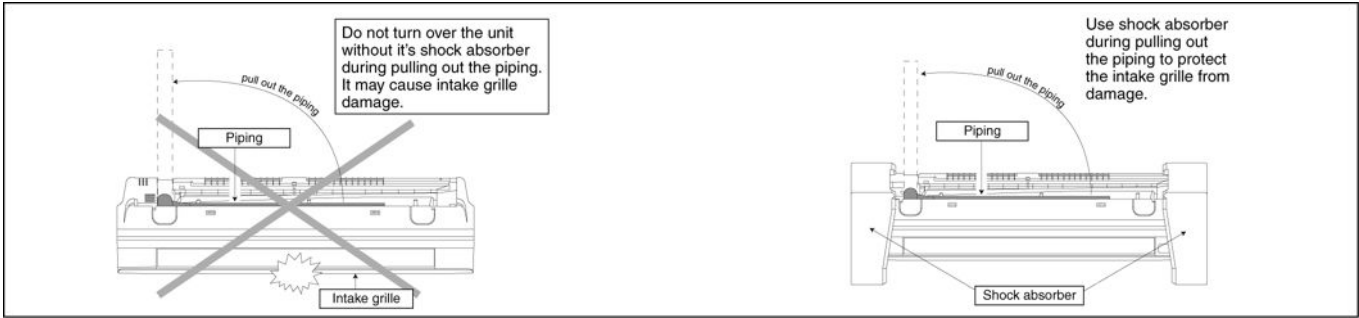
⚠ CAUTION

- ❗ When the wall is hollow, please be sure to use the sleeve for tube assembly to prevent dangers caused by mice biting the connection cable.

- Finish by sealing the sleeve with putty or caulking compound at the final stage.



11.2.2 Indoor Unit Installation



11.2.2.1 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

11.2.2.2 For the 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

11.2.2.3 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 the cover is cut, keep the cover at the rear of chassis as shown in the illustration for future reinstallation. (Left 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).

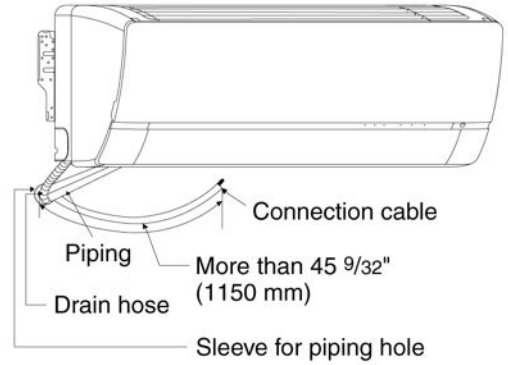
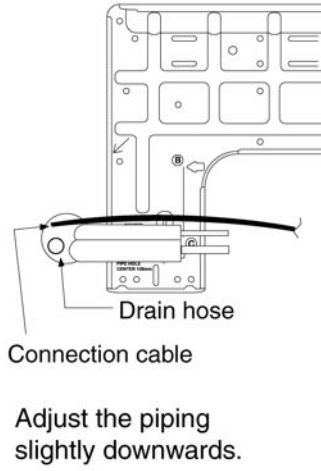
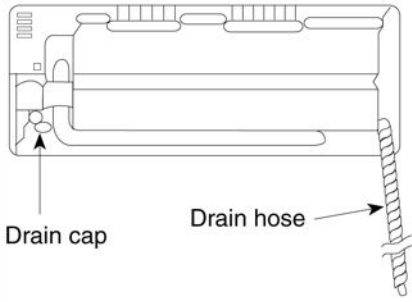
To take out the unit, push the **PUSH** marking at the bottom unit, and pull it slightly towards you to disengage the hooks from the unit.

Insert the connection cable

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

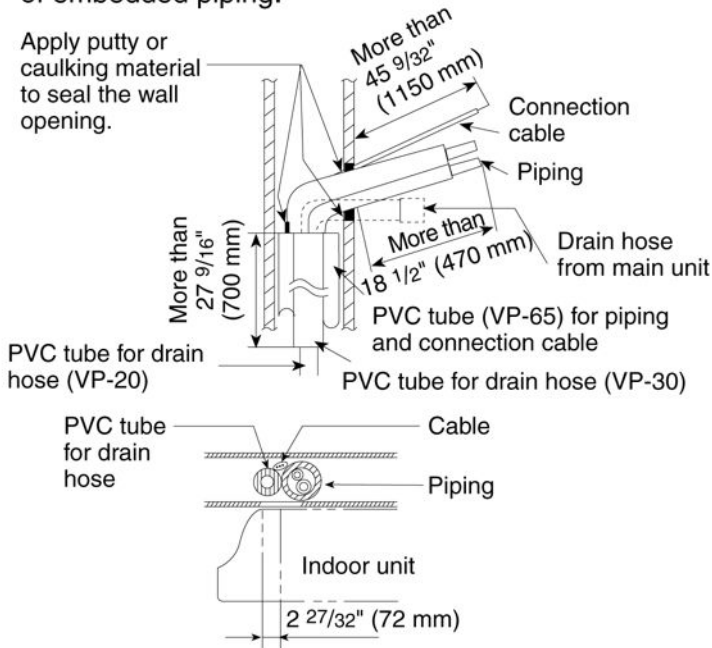
Replace the drain hose

Rear view for left piping installation

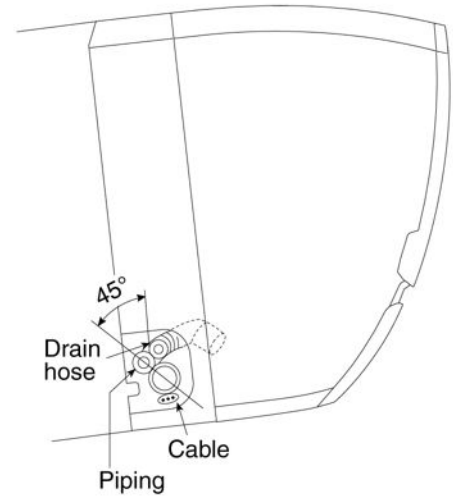


- How to pull the piping and drain hose out, in case of embedded piping.

Apply putty or caulking material to seal the wall opening.



- How to insert the connection cable and drain hose in the case of left piping.



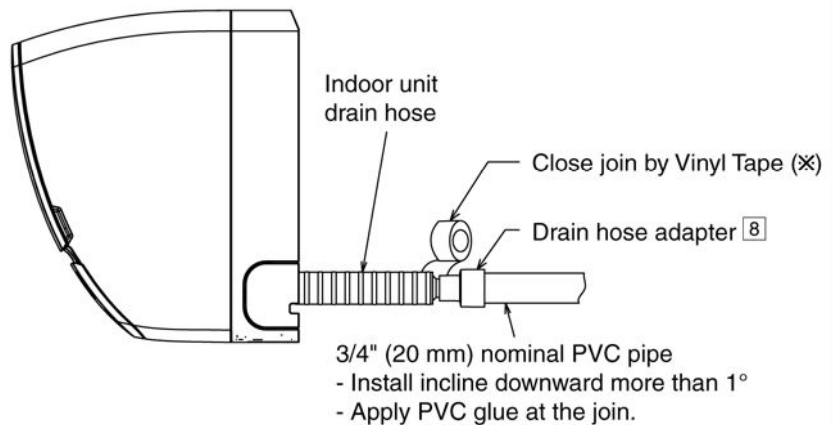
(For right piping, follow the same procedure)

Drain hose adapter [8] usage

- Join indoor drain hose to 3/4" (20 mm) nominal PVC pipe size by using drain hose adapter [8] when necessary.

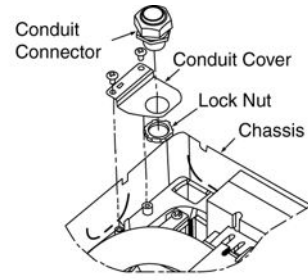
Remarks :

Make sure indoor unit drain hose & 3/4" (20 mm) nominal PVC pipe are fully inserted to drain hose adapter [8].



11.2.3 Connect the Cable to the Indoor Unit

- 1 The inside and outside connection cable can be connected without removing the front grille.
- 2 Unscrew the conduit cover and fix the conduit connector to conduit cover with lock nut, then secure it against chassis.
- 3 Connection cable between indoor unit and outdoor unit should be UL listed or CSA approved 4 conductor wires minimum AWG16 in accordance with local electric codes.
 - o Ensure the colour of wires of outdoor unit and terminal number are the same as the indoor's respectively.

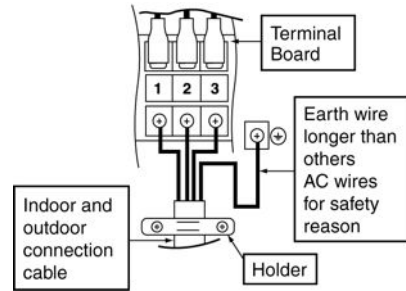


Rear Side of Indoor Unit

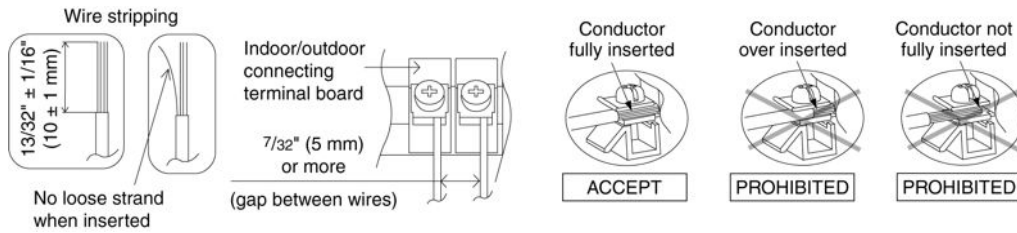
Terminals on the indoor unit	1	2	3	
Colour of wires (connection cable)				
Terminals on the outdoor unit	1	2	3	

⚠ WARNING
 ⚡ This equipment must be properly earthed.

- o Earth lead wire shall be Yellow/Green (Y/G) in colour and shall be longer than other lead wires as shown in the figure for electrical safety in case of slipping.



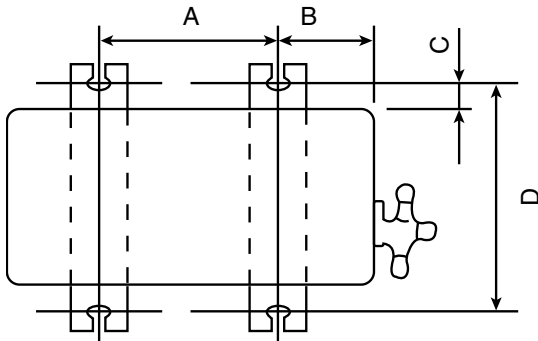
11.2.3.1 Wire Stripping and Connecting Requirement



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 with a bolt nut $\phi 13/32"$ ($\phi 10$ 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
XE9PKUA, XE12PKUA	24-1/8" (613 mm)	5-5/32" (131 mm)	5/8" (16 mm)	14-3/16" (360.5 mm)

11.3.2 Connect the Piping

11.3.2.1 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.

Do not over tighten, over tightening may cause gas leakage

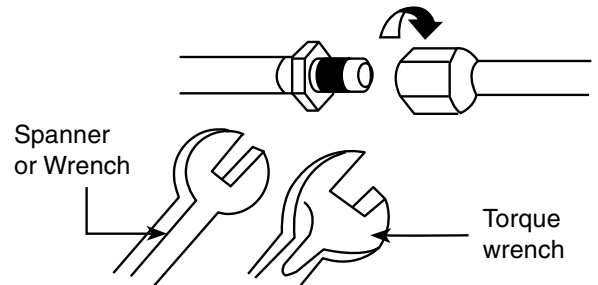
Piping size	Torque
1/4" (6.35 mm)	13.3 lbf.ft [18N•m (1.8 kgf.m)]
3/8" (9.52 mm)	31.0 lbf.ft [42 N•m (4.3 kgf.m)]
1/2" (12.7 mm)	40.6 lbf.ft [55 N•m (5.6 kgf.m)]
5/8" (15.88 mm)	47.9 lbf.ft [65 N•m (6.6 kgf.m)]
3/4" (19.05 mm)	73.8 lbf.ft [100 N•m (10.2 kgf.m)]

11.3.2.2 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 (located at valve) onto the copper pipe.

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

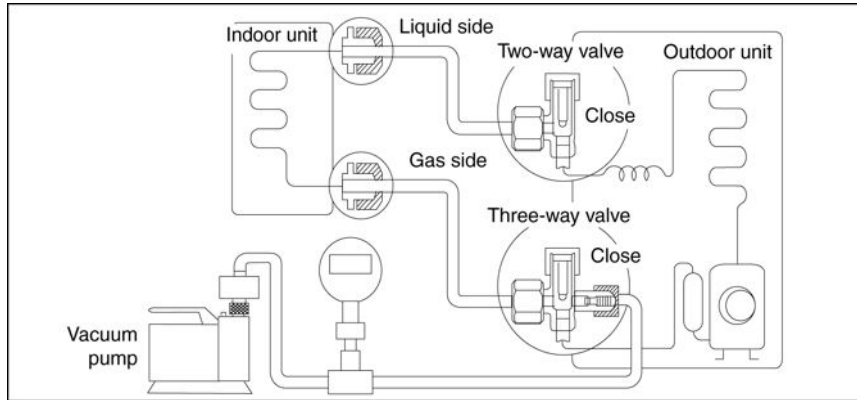


11.3.2.3 Gas leak checking

Pressure test to system to 400 PSIG with dry nitrogen, in stages. Thoroughly leak check the system. If the pressure holds, release the nitrogen and proceed to section 11.3.3.

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.

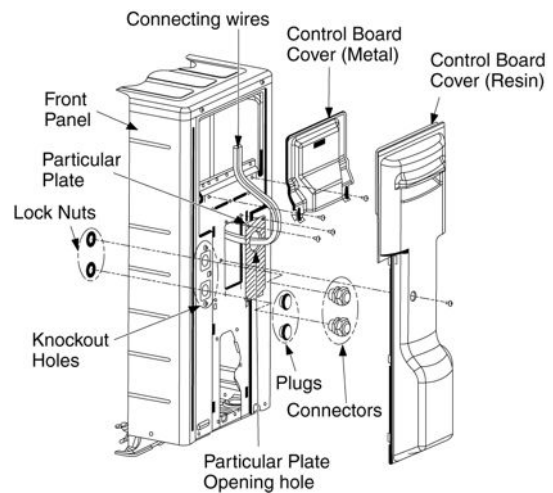


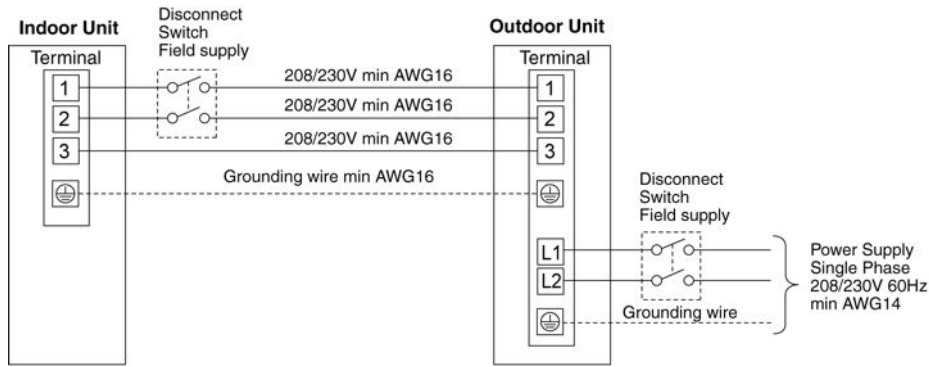
- 1 Connect a charging hose with a push pin to the Low side of a charging set and the service port of the 3-way valve.
- 2 Connect the micron gauge between vacuum pump and service port of outdoor units.
- 3 Turn on the power switch of the vacuum pump and make sure that connect digital micron gauge and to pull down to a value of 500 microns.
- 4 To make sure micron gauge a value 500 microns and close the low side valve of the charging set and turn off the vacuum pump.
- 5 Disconnect the vacuum pump house from the service port of the 3-way valve.
- 6 Tighten the service port caps of the 3-way valve at a torque of 13.3 lbf.ft (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 (5/32" (4 mm)).
- 8 Mount valve caps onto the 2-way valve and the 3-way valve.
 - o Be sure to check for gas leakage.

- If micron gauge value does not descend 500 microns, take the following measures:
 - 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.
 - Be careful with the liquid refrigerant, it may cause frostbite.

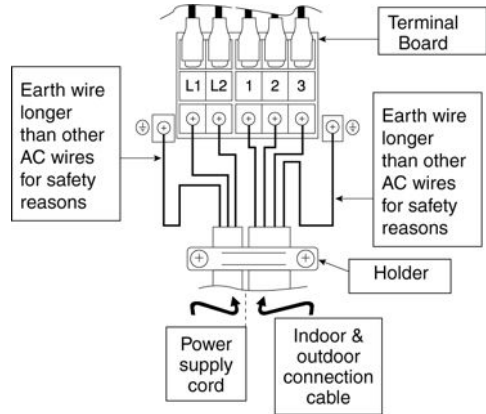
11.3.4 Connect the Cable to the Outdoor Unit

- 1 Remove control board cover (Resin and Metal).
- 2 Remove particular plate.
- 3 Remove plugs.
- 4 Fix the conduit connectors to the knockout holes with lock-nuts, then secure them against the side panel.
- 5 All wires pass through conduits & particular plate's opening hole.
- 6 Connecting wire between indoor unit and outdoor unit should be UL listed or CSA approved 4 conductor wires minimum AWG16 in accordance with local electric codes.
- 7 Wire connection to the power supply (208/230V 60Hz) through circuit breaker.
 - o Connect the UL listed or CSA approved wires minimum AWG14 to the terminal board, and connect the other end of the wires to ELCB/ GFCI.
- 8 Connect the power supply cord and connecting wire between indoor unit and outdoor unit according to the diagram below.





- 9 Secure the wire onto the control board with the holder (clammer).
- 10 After completing wiring connections, reattach the particular plate and control board cover (metal and resin) to the original position with the screws.
- 11 For wire stripping and connection requirement, refer to instruction 11.2.3 of indoor unit.



⚠ WARNING

⚡ This equipment must be properly earthed.

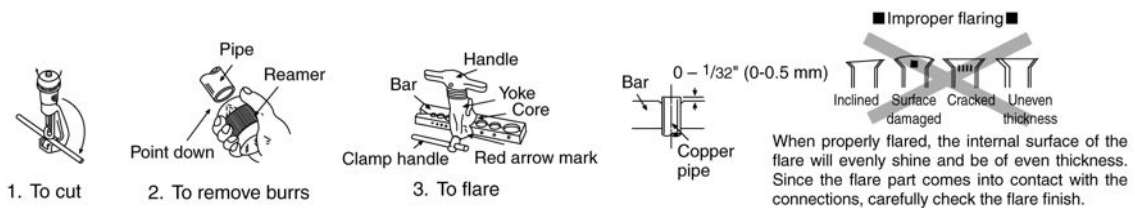
- Earth lead wire shall be Yellow/Green (Y/G) in colour and should be longer than other lead wires as shown in the figure for electrical safety in case of slipping.

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 1/4" (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.



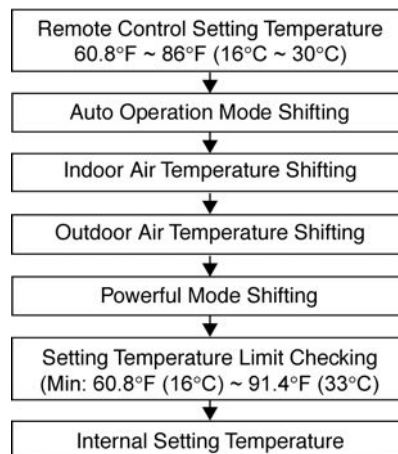
12. Operation Control

12.1 Basic Function

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

12.1.1 Internal Setting Temperature

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



12.1.2 Cooling Operation

12.1.2.1 Thermostat control

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

12.1.3 Soft Dry Operation

12.1.3.1 Thermostat control

- Compressor is OFF when Intake Air Temperature - Internal Setting Temperature < -3.6°F (-2.0°C) continue for 3 minutes.
- When compressor is OFF (Thermostat OFF) and AUTO FAN is set, the fan will stop periodically.
- Compressor is ON after waiting for 3 minutes, if the Intake Air Temperature - Internal Setting Temperature > Compressor OFF point.

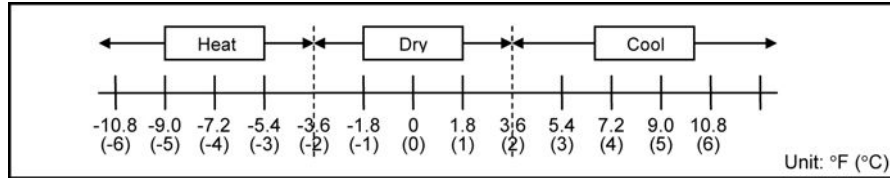
12.1.4 Heating Operation

12.1.4.1 Thermostat control

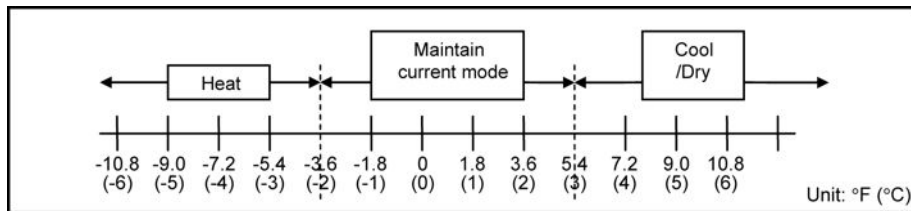
- Compressor is OFF when Intake Air Temperature - Internal Setting Temperature > +3.6°F (+2.0°C) continue for 3 minutes.
- Compressor is ON after waiting for 3 minutes, if the Intake Air Temperature - Internal Setting Temperature < Compressor OFF point.

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 $\geq 3.6^{\circ}\text{F}$ (2°C), COOL mode is decided.
 - If -3.6°F (-2°C) \leq indoor intake temperature - remote control setting temperature $< 3.6^{\circ}\text{F}$ (2°C), DRY mode is decided.
 - If indoor intake temperature - remote control setting temperature $< -3.6^{\circ}\text{F}$ (-2°C), HEAT mode is decided.



- For the 2nd judgment onwards
 - If indoor intake temperature - remote control setting temperature $\geq 5.4^{\circ}\text{F}$ (3°C), if previous operate in DRY mode, then continue in DRY mode. otherwise COOL mode is decided.
 - If -3.6°F (-2°C) \leq indoor intake temperature - remote control setting temperature $< 5.4^{\circ}\text{F}$ (3°C), maintain with previous mode.
 - If indoor intake temperature - remote control setting temperature $< -3.6^{\circ}\text{F}$ (-2°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

12.2.1 Basic Rotation Speed (rpm)

A. Basic Rotation Speed (rpm)

i. Manual Fan Speed

[Cooling, Dry]

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

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

[Heating]

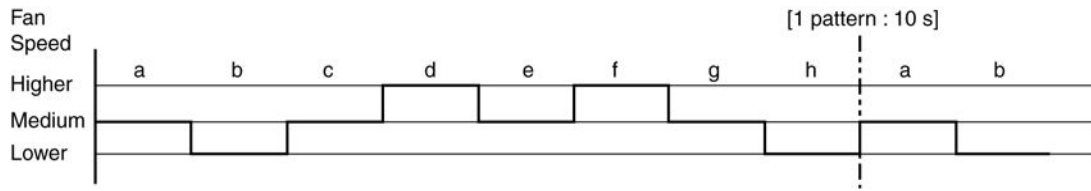
- Fan motor's number of rotation is determined according to remote control setting.

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

ii. Auto Fan Speed

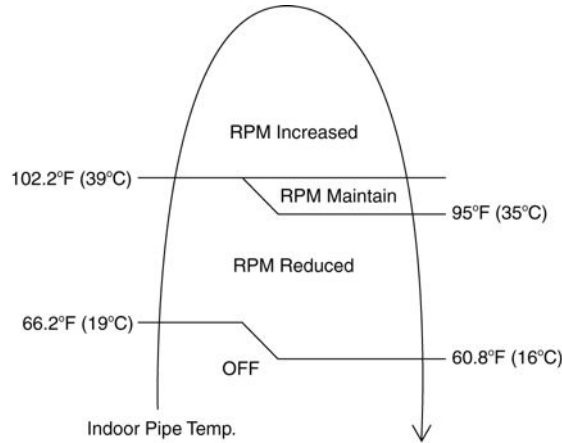
[Cooling, Dry]

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



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

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

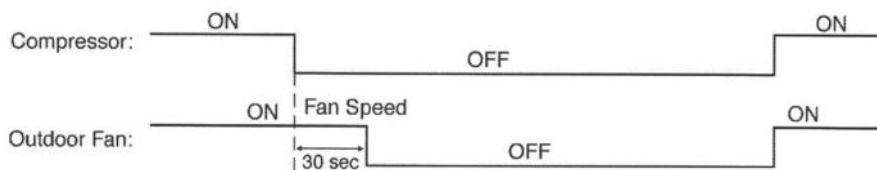


B. Feedback control

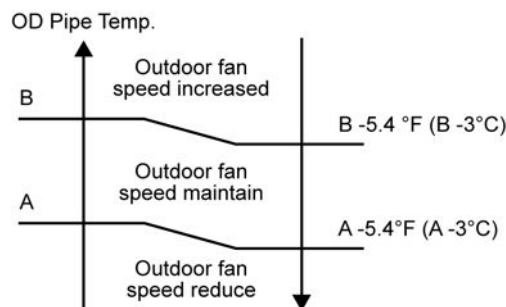
- Immediately after the fan motor started, feedback control is performed once every second.
- During fan motor on, if fan motor feedback ≥ 2550 rpm or < 50 rpm continue for 10 seconds, then fan motor error counter increase, fan motor is then stop and restart. If the fan motor counter becomes 7 times,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

12.3 Outdoor Fan Motor Operation

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

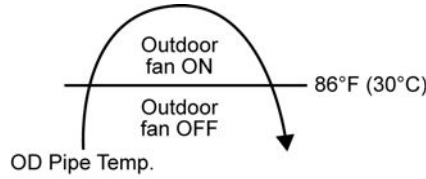


- During cooling operation, and outdoor ambient temperature is below 46.4°F (8°C), outdoor fan speed will be controlled according to outdoor piping temperature as following:



	OD Pipe Temperature
A	78.8°F (26°C)
B	91.4°F (33°C)

- During above condition, when indoor heat exchanger temperature is below 41°F (5°C), the outdoor fan will stop according to outdoor piping temperature as following:



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		Upper Vane Angle (°)					Lower Vane Angle (°)				
			1	2	3	4	5	1	2	3	4	5
Heating	Auto with Heat Exchanger Temperature	A	25					17				
		B	55					37				
		C	25					17				
	Summer House		55					37				
	Manual		20	45	55	65	70	17	27	37	47	56
Cooling	Auto		45 ~ 70					2 ~ 39				
	Manual		20	25	50	55	70	2	7	17	27	39
Soft Dry	Auto		45 ~ 70					2 ~ 39				
	Manual		20	25	50	55	70	2	7	17	27	39

- 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.
- Manual vertical airflow direction can be set using remote control; the angles of the vane are as stated above and the positions of the vane are as Figure 2 below. When the air conditioner is stopped using remote control, the vane will shift to close position.

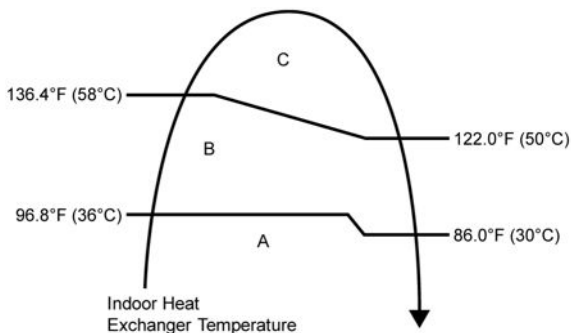


Figure 1

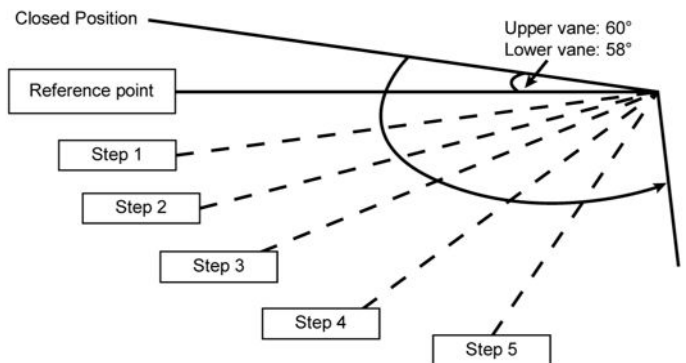


Figure 2

12.4.2 Horizontal Airflow

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

12.5 Quiet operation (Cooling Mode/Cooling area of Dry Mode)

- Purpose
 - To provide quiet cooling operation compare to normal operation.
- Control condition
 - Quiet operation start condition
 - When “POWERFUL/QUIET” button at remote control is pressed twice. POWERFUL/QUIET LED illuminates.
 - Quiet operation stop condition
 - When one of the following conditions is satisfied, quiet operation stops:
 - POWERFUL/QUIET button is pressed again.
 - Stop by OFF/ON switch.
 - Timer “off” activates.
 - AUTO COMFORT button is pressed.
 - ECONAVI button is pressed.
 - When quiet operation is stopped, operation is shifted to normal operation with previous setting.
 - When fan speed is changed, quiet operation is shifted to quiet operation of the new fan speed.
 - When operation mode is changed, quiet operation is shifted to quiet operation of the new mode.
 - During quiet operation, if timer “on” activates, quiet operation maintains.
 - After off, when on back, quiet operation is not memorised.
- Control contents
 - Fan speed is changed from normal setting to quiet setting of respective fan speed. Fan speed for quiet operation is reduced from setting fan speed.

12.6 Quiet Operation (Heating)

- Purpose
 - To provide quiet heating operation compare to normal operation.
- Control condition
 - Quiet operation start condition
 - When “POWERFUL/QUIET” button at remote control is pressed. POWERFUL/QUIET LED illuminates.
 - Quiet operation stop condition
 - When one of the following conditions is satisfied, quiet operation stops:
 - POWERFUL/QUIET button is pressed again.
 - Stop by OFF/ON switch.
 - Timer “off” activates.
 - AUTO COMFORT button is pressed.
 - ECONAVI button is pressed.
 - When quiet operation is stopped, operation is shifted to normal operation with previous setting.
 - When fan speed is changed, quiet operation is shifted to quiet operation of the new fan speed.
 - When operation mode is changed, quiet operation is shifted to quiet operation of the new mode, except fan mode only.
 - During quiet operation, if timer “on” activates, quiet operation maintains.
 - After off, when on back, quiet operation is not memorised.
- Control contents
 - Fan speed manual
 - Fan speed is changed from normal setting to quiet setting of respective fan speed.
 - Fan speed for quiet operation is reduced from setting fan speed.
 - Fan Speed Auto
 - Indoor FM RPM depends on pipe temp sensor of indoor heat exchanger.

12.7 Powerful Mode Operation

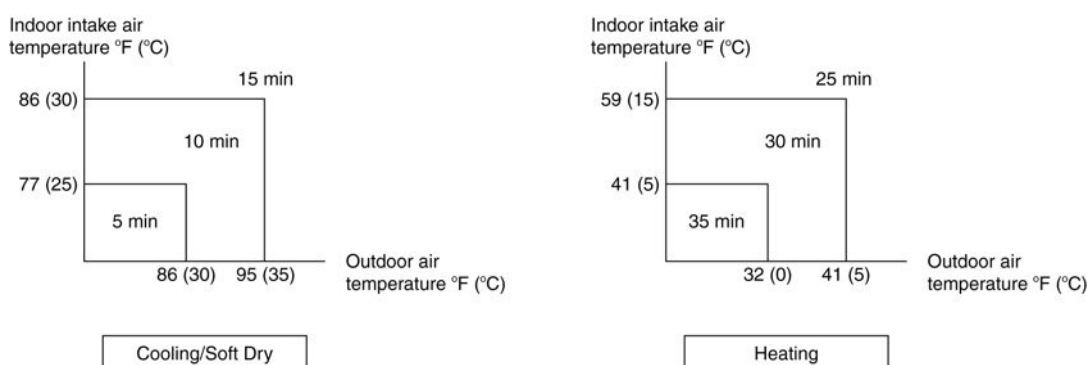
- When the powerful mode is selected, the internal setting temperature will shift lower up to 3.6°F (2°C) (for Cooling/Soft Dry) or higher up to 6.3°F (3.5°C) (for Heating) than remote control setting temperature for 20 minutes to achieve the setting temperature quickly.

12.8 Timer Control

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

12.8.1 ON Timer Control

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



12.8.2 OFF Timer Control

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

12.9 Auto Restart Control

- When the power supply is cut off during the operation of air conditioner, the compressor will re-operate within three to four minutes (there are 10 patterns between 2 minutes 58 seconds and 3 minutes 52 seconds to be selected randomly) after power supply resumes.
- This type of control is not applicable during ON/OFF Timer setting.
- This control can be omitted by open the circuit of JP1 at indoor unit printed circuit board.

12.10 Indication Panel

LED	POWER	TIMER	POWERFUL/QUIET	RFP	ECONAVI	AUTO COMFORT
Color	Green	Orange	Orange	Green	Green	Green
Light ON	Operation ON	Timer Setting ON	POWERFUL/QUIET Mode ON	RFP ON	ECONAVI ON	AUTO COMFORT ON
Light OFF	Operation OFF	Timer Setting OFF	POWERFUL/QUIET Mode OFF	RFP OFF	ECONAVI OFF	AUTO COMFORT OFF

Note:

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

12.11 Room Freeze Protection Function (RFP) Operation

- When the RFP is selected, the unit will operate the fan at high speed for proper room temperature monitoring. When the sensor detects that the room temperature has dropped below 46°F / 8°C, the compressor/heat pump operation begins.
- When the room temperature reaches 50°F / 10°C, the unit shuts off, then will repeat continuously if the temperature drops below 46°F / 8°C again.

<Disclaimer>

This function may not be performed if the unit is not energized, or under a certain condition that unit is unable to operate such as in protection mode. Please consult with the HVAC installers or professional for details.

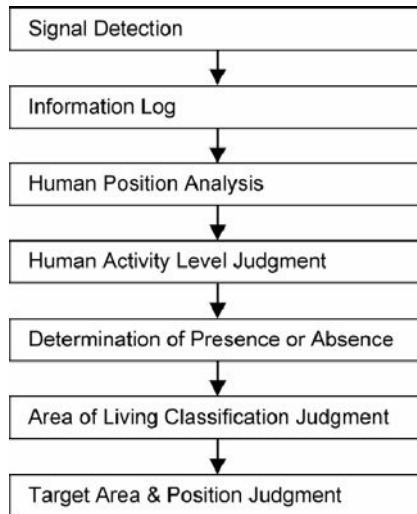
- The Room Freeze Protection function (RFP) cannot be used unless the unit is energized and set into the RFP mode.
- In the advent of a power failure this mode will not function. During the RFP mode, POWERFUL OPERATION, QUIET OPERATION and FAN SPEED selection are all disabled. Please consult with your HVAC installer or professional for more details.

12.12 AUTO COMFORT and ECONAVI Operation

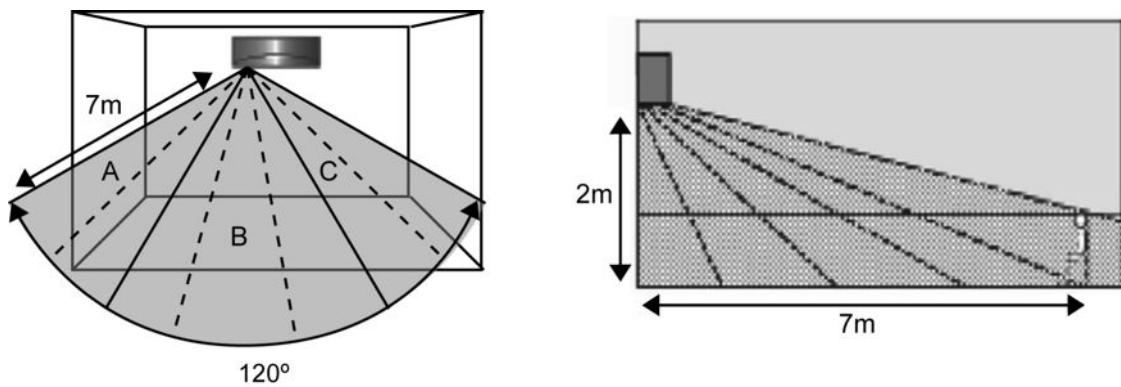
- Area of human availability, activity level and absent is judged based on pulses by using 2 infrared sensors. The internal setting temperature shift, fan speed and horizontal airflow direction are adjusted in order to provide comfort environment while maintain the energy saving level.
- AUTO COMFORT start condition:
 - When AUTO COMFORT button is pressed.
- AUTO COMFORT stop conditions:
 - When AUTO COMFORT button is pressed again.
 - When unit is OFF by OFF/ON button.
 - When unit is OFF when OFF TIMER activates.
 - When unit is OFF by AUTO OFF/ON button at indoor unit.
 - When POWERFUL, QUIET operation activates.
- ECONAVI start condition:
 - When ECONAVI button is pressed.
- ECONAVI stop conditions:
 - When ECONAVI button is pressed again.
 - When unit is OFF by OFF/ON button.
 - When unit is OFF when OFF TIMER activates.
 - When unit is OFF by AUTO OFF/ON button at indoor unit.
 - When POWERFUL, QUIET operation activates.

12.12.1 Human Activity Sensor

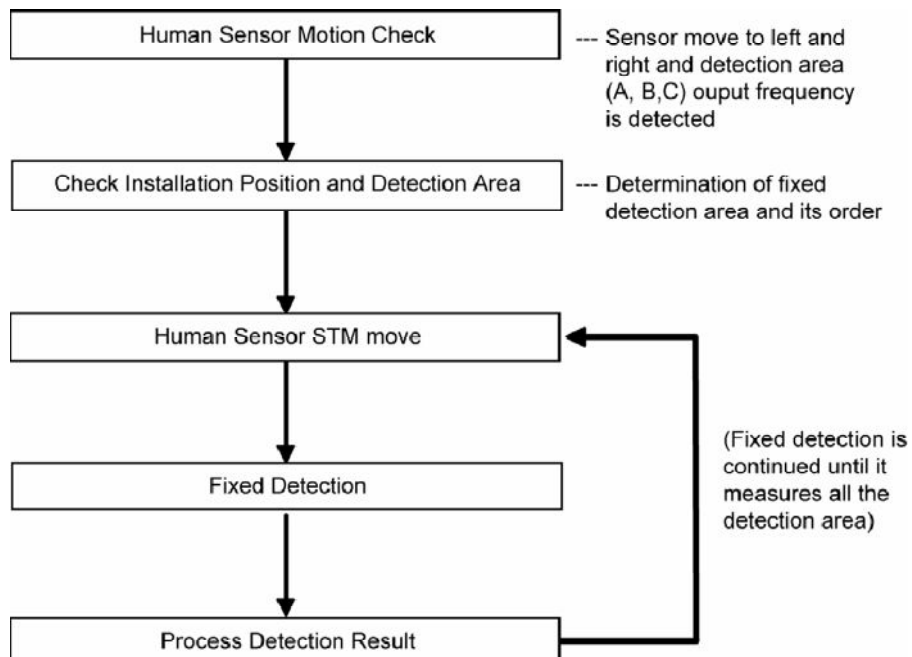
- Area of human availability, activity level and absent is judged based on pulses by using infrared sensor. The internal setting temperature shift, fan speed and horizontal airflow direction are adjusted in order to provide comfort environment while maintain the energy saving level.
- Human activity judgment is as following:



12.12.1.1 Signal Detection



- Presumption flow of human position.
 - Detection outline.



12.12.1.2 Information Log

- The signal from Infrared sensors will be log to human activity database for further analysis.

12.12.1.3 Human Position Analysis

- According to Area of Living, frequency of activity, the system will analyze the human position away from the indoor unit.

12.12.1.4 Human Activity Level Judgment

- Human Activity Level is judged based on the frequency of pulses detected by the infrared sensors within a timeframe. The activity level will be categorized into High, Normal, Low level.
- When a pulse is detected within this timeframe, the status of human presence is judged.
- When there is no signal detection continues for 40 minutes or more, the status of human absence is judged.

12.12.1.5 Determination of Presence or Absence

- Human presence status shall be determined based on the human presence status of each area.
- When all area has been detected absent for more than 40 minutes then it will judge as absence.

12.12.1.6 Area of Living Classification Judgment

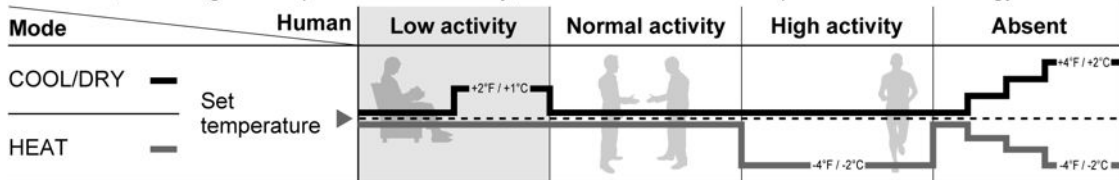
- The system is able to judge area of living according to human activity database, classified as following:
 - (Zone I) Living Area – In front of television, dining table, etc.
 - (Zone II) Walkway – Human detection is relatively less.
 - (Zone III) Non-Living Area – Near windows, wall, etc.

12.12.1.7 Target Area and Position Judgment

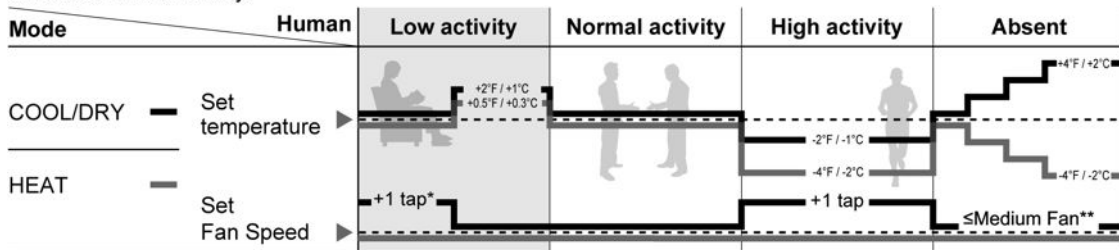
- By default, the system will judge the indoor unit installation position according to human activities and will reset the louver center position:
 - Non-Living Area at Position A – Indoor unit installed at left side of the room.
 - Non-Living Area at Position C – Indoor unit installed at right side of the room.
 - Other than above – Indoor unit installed at center of the room.
- Every 4 hours, the Judgment will restart.
- Target area is judged according to human position analysis result.

12.12.1.8 Setting Temperature and Fan Speed Shift

ECONAVI ; Detecting human presence and activity, the unit controls room temperature to save energy.



AUTO COMFORT ; Detecting human presence and activity, the unit controls room temperature to keep human comfortable consistently.



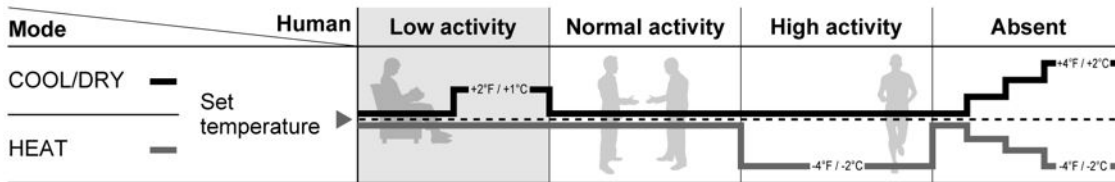
* During low activity, fan speed 1 tap up for first 15 minutes or until set temperature is reached.

** During human absence, maximum fan speed for COOL/DRY mode is medium fan.

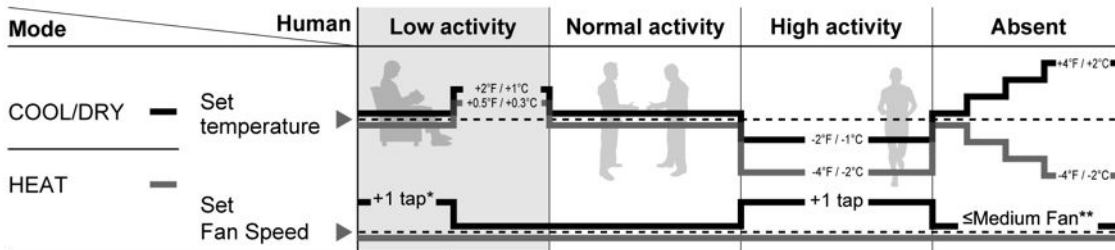
12.12.1.9 Rhythmic Temperature Wave Operation

- To further maximize the energy saving during ECONAVI or AUTO COMFORT operates at low activity level.
- Start condition
 - The unit is operates in Cool or Dry mode under ECONAVI or AUTO COMFORT operation, and
 - Human activity sensor detects low activity level, and
 - Neuro stable zone continuously for 60 minutes.
- Stop condition
 - Unit is off, or
 - ECONAVI or AUTO COMFORT is off, or
 - Human activity sensor detects high activity level or absent, or
- Control contents
 - When all start conditions complied, set temperature will shift accordingly as following:

ECONAVI

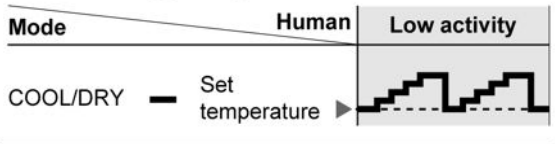


AUTO COMFORT



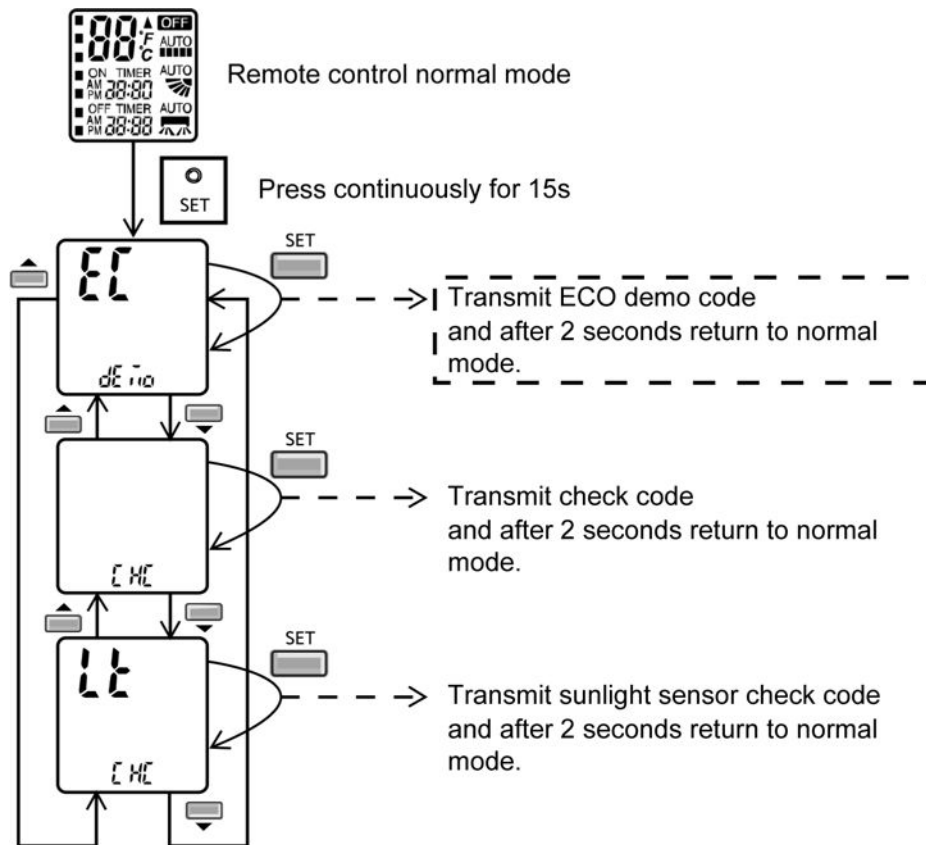
ECONAVI and AUTO COMFORT

Precise control of temperature during low activity to maximize energy saving.



12.12.1.10 ECONAVI and AUTO COMFORT Demo Mode

- To enable ECO DEMO mode:



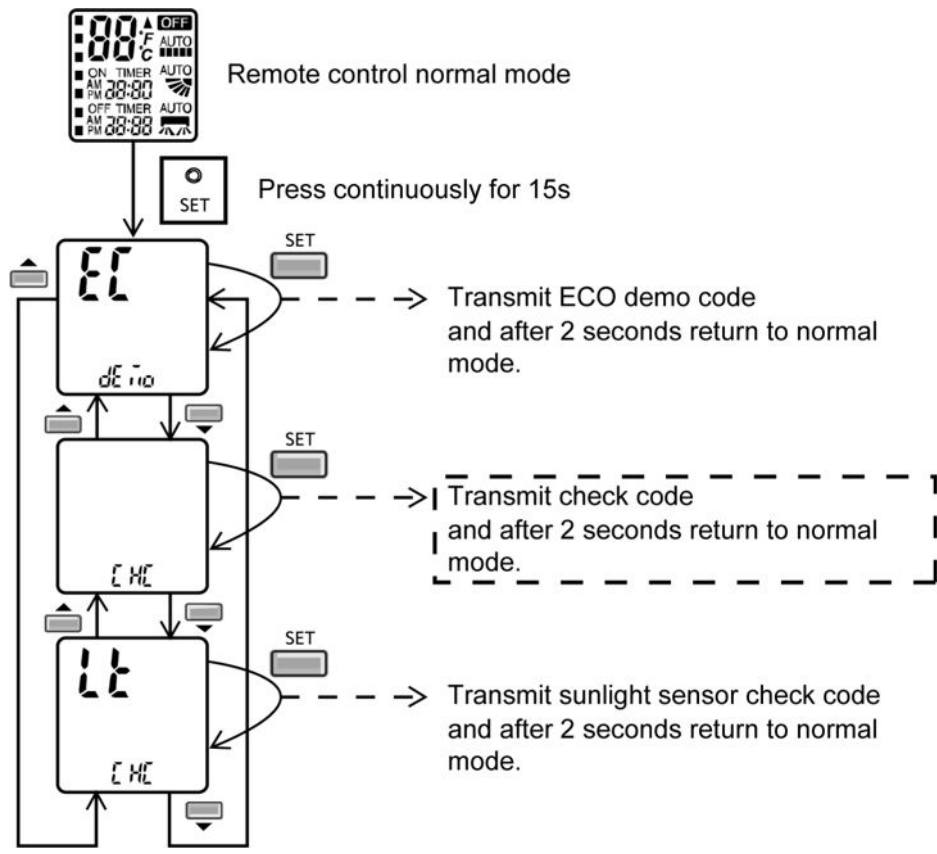
- To disable ECO Demo MODE:
 - Transmit ECO Demo signal again.

12.12.1.11 Human Activity Sensor Abnormality

- Abnormality detection:
 - Connector disconnection / Wire cut abnormality
 - Sensor judge Hi level continuously for 25 seconds
 - Circuit abnormality
 - 70 seconds after power ON, if human activity sensor judge Lo level continuously for 25 seconds
- Error Code judgment
 - When abnormality happened, internal counter increase by 1 time.
 - Human activity sensor power OFF, retry after 5 seconds.
 - When the human activity sensor maintains normal condition for 120 seconds, the counter reset or AC reset.
 - When abnormality counter reached 4 times, H59 occurred – No TIMER indicator blinking.
- When error code happened, the unit is able to operate without AUTO COMFORT / ECONAVI.

12.12.1.12 Human Activity Sensor Check Mode

- To enable human activity sensor abnormality check mode:



- During ECONAVI is ON, when CHECK signal received, if either sensors has abnormality, the 4 times abnormality counter is ignored, ECONAVI Indicator will blink immediately and error code is memorized.
- The unit could operate without ECONAVI or AUTO COMFORT.
- The ECONAVI indicator blinking could be cancelled by pressing ECONAVI button again.
- If the human activity sensor has no abnormality, the CHECK process will end and continue with normal operation.

13. Protection Control

13.1 Protection Control For All Operations

13.1.1 Restart Control (Time Delay Safety Control)

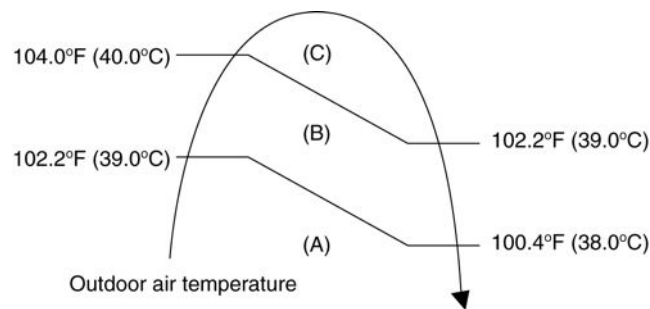
- The Compressor will not turn on within 3 minutes from the moment operation stops, although the unit is turned on again by pressing OFF/ON button at remote control within this period.
- This control is not applicable if the power supply is cut off and on again.
- This phenomenon is to balance the pressure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

13.1.2 Total Running Current

- 1 When the outdoor unit total running current (AC) exceeds X value, the frequency instructed for compressor operation will be decreased.
- 2 If the running current does not exceed X value for 5 seconds, the frequency instructed will be increased.
- 3 However, if total outdoor unit running current exceeds Y value, compressor will be stopped immediately for 3 minutes.

Model	XE9PKUA		XE12PKUA	
	X (A)	Y (A)	X (A)	Y (A)
Cooling / Soft Dry (A)	6.48	15.00	7.70	15.00
Cooling / Soft Dry (B)	6.48	15.00	7.70	15.00
Heating	7.48	15.00	9.20	15.00
Cooling / Soft Dry (C)	6.48	15.00	7.70	15.00

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

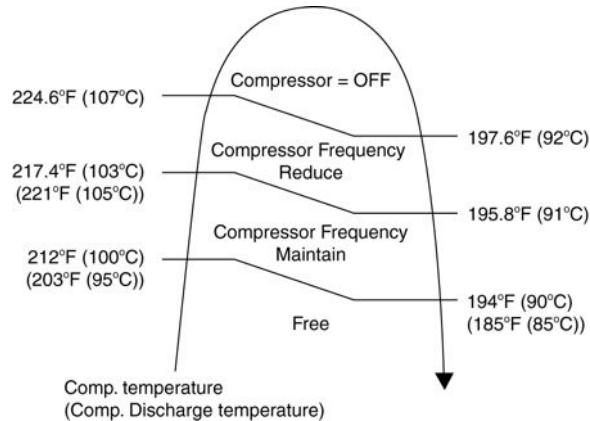


13.1.3 IPM (Power transistor) Prevention Control

- Overheating Prevention Control
 - 1 When the IPM temperature rises to 248°F (120°C), compressor operation will stop immediately.
 - 2 Compressor operation restarts after 3 minutes the temperature decreases to 230°F (110°C).
 - 3 If this condition repeats continuously 4 times within 20 minutes, timer LED will be blinking ("F96" is indicated).
- DC Peak Current Control
 - 1 When electric current to IPM exceeds set value of 16.0 ±2.0A, the compressor will stop operate. Then, operation will restart after 3 minutes.
 - 2 If the set value is exceeded again more than 30 seconds after the compressor starts, the operation will restart after 1 minute.
 - 3 If the set value exceeded again within 30 seconds after the compressor starts, the operation will restart after 1 minute. 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 224.6°F (107°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 0.75A and 0.95A.
 - During Cooling and Soft Dry operations:
Indoor suction temperature - indoor piping temperature is below 7.2°F (4°C).
 - During Heating operations :
Indoor piping temperature - indoor suction is under 9°F (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 20 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.

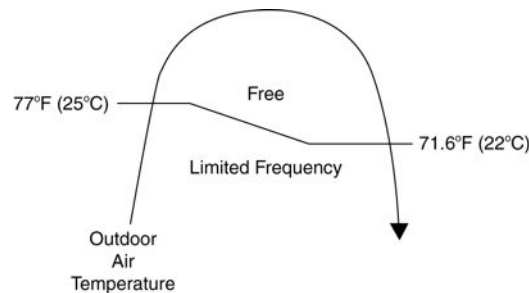
Temperature, T, for:	Cooling/Soft Dry	Heating
Indoor intake air (°C)	T < 14 or T ≥ 30	T < 14 or T ≥ 28
Outdoor air (°C)	T < 13 or T ≥ 38	T < 4 or T ≥ 24
Indoor heat exchanger (°C)	T < 30	T ≥ 0

Temperature, T, for:	Cooling/Soft Dry	Heating
Indoor intake air (°F)	T < 57.2 or T ≥ 86.0	T < 57.2 or T ≥ 82.4
Outdoor air (°F)	T < 55.4 or T ≥ 100.4	T < 39.2 or T ≥ 75.2
Indoor heat exchanger (°F)	T < 86.0	T ≥ 32.0

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 141.8°F (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 32°F (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 41°F (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 41°F (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 50°F (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 will be adjusted accordingly in this control.

13.2.6 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:
 1. Compressor OFF → Compressor ON.
The indoor unit fan stops temporarily and then starts to blow at minimum airflow for 30 seconds.
 2. Compressor ON → Compressor OFF.
The indoor unit fan stops for 90 seconds and then blows at minimum airflow for 20 seconds.

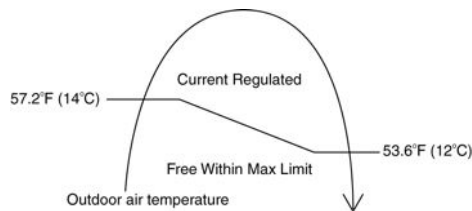
13.3 Protection Control For Heating Operation

13.3.1 Intake Air Temperature Control

Compressor will operate at limited freq., if indoor intake air temperature is 86°F (30°C) or above.

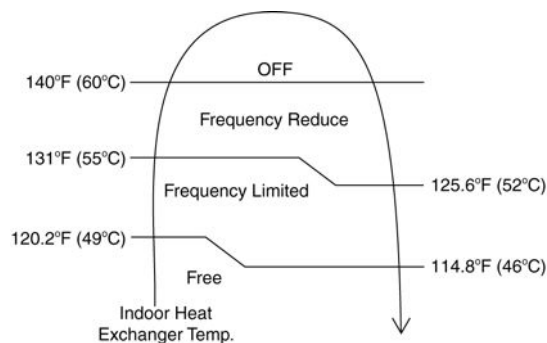
13.3.2 Outdoor Air Temperature Control

- The Max current value is regulated when the outdoor air temperature rise above 57.2°F (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 140°F (60°C), compressor will stop.



13.3.4 Low Temperature Compressor Oil Return Control

- In heating operation, if the outdoor temperature falls below 14°F (-10°C) when compressor starts, the compressor frequency will be regulated up to 600 seconds.

13.3.5 Cold Draught Prevention Control

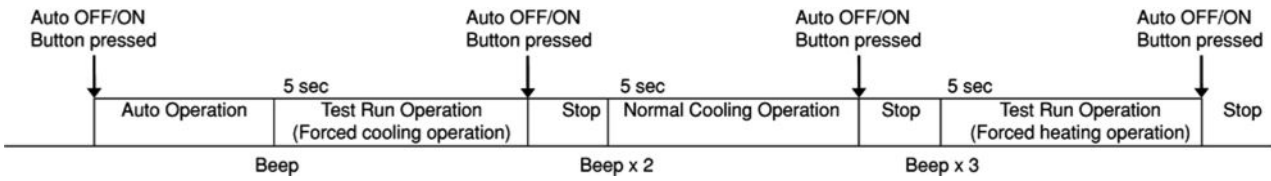
- When indoor pipe temperature is low, cold draught operation starts where indoor fan speed will be reduced.

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 operation LED blinks.

14. Servicing Mode

14.1 Auto OFF/ON Button



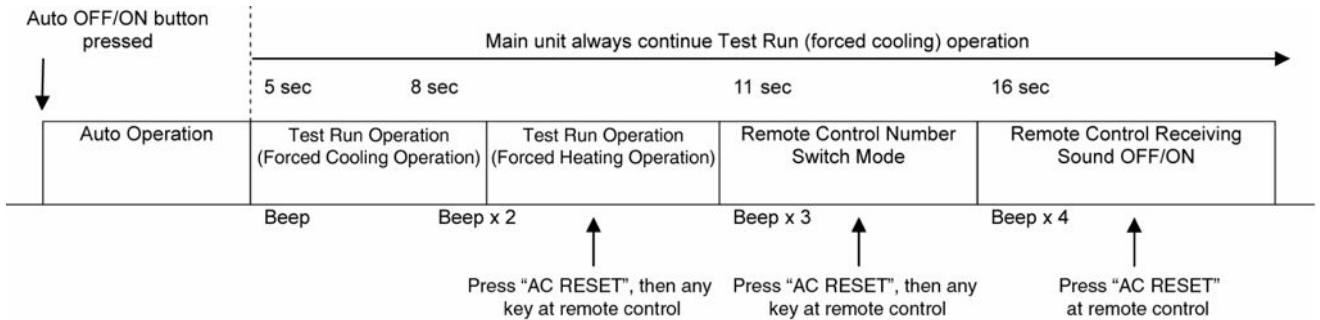
1 AUTO OPERATION MODE

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 Normal cooling operation. Within 5 minutes after Normal cooling operation start, the Auto OFF/ON button is pressed for more than 5 seconds. A 3 “beep” sounds will be heard at the fifth seconds, in order to identify the starting of Forced heating operation.

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



3 REMOTE CONTROL NUMBER SWITCH MODE

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

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

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

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

4 REMOTE CONTROL RECEIVING SOUND OFF/ON MODE

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

Press “Auto OFF/ON button” to toggle remote control receiving sound.

- Short “beep”: Turn OFF remote control receiving sound.
- Long “beep”: Turn ON remote control receiving sound.

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

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 continuously for 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

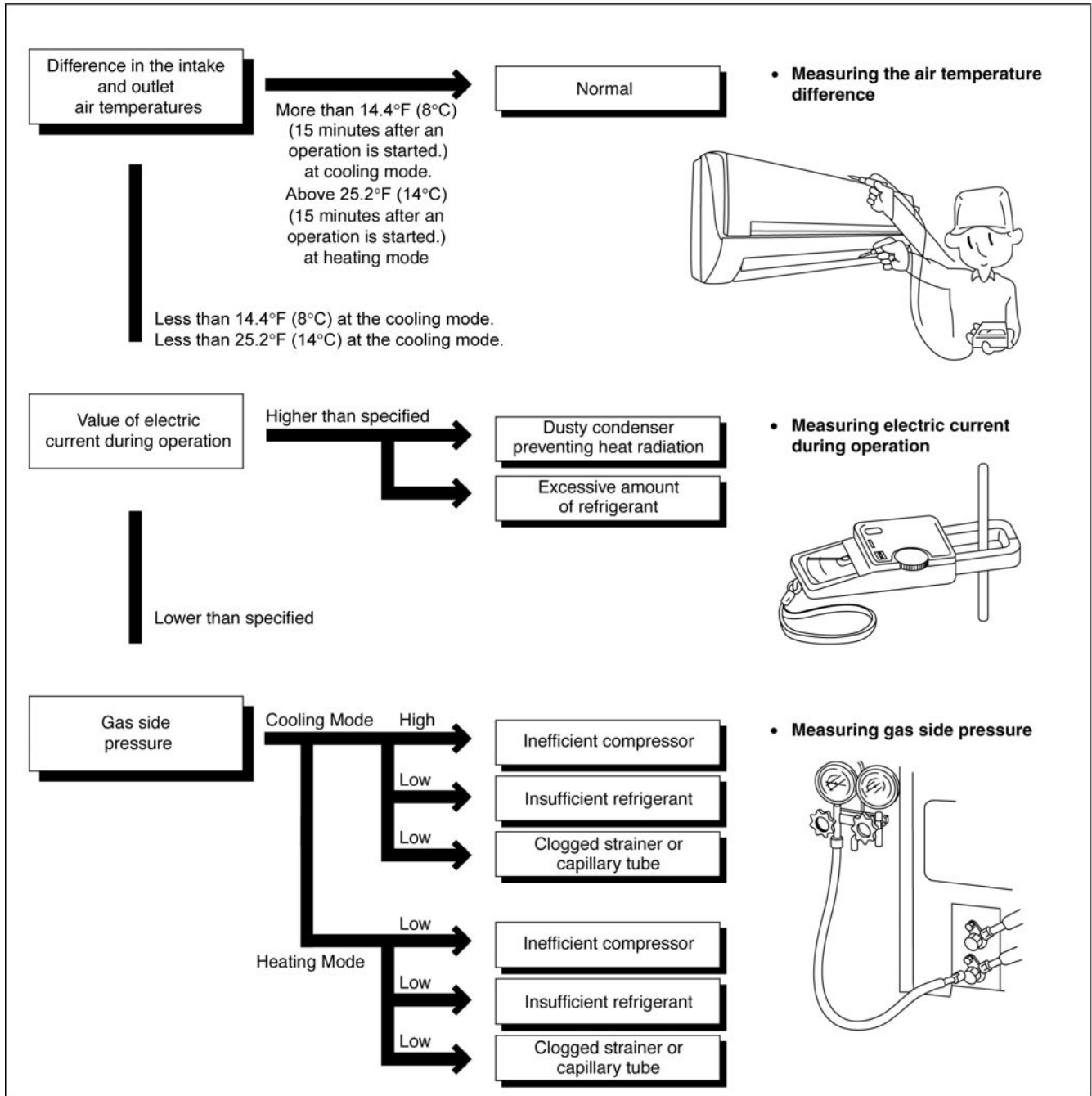
15.1 Refrigeration Cycle System

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

- *Condition:
- Indoor fan speed = High
 - Outdoor temperature 95°F (35°C) at the Cooling mode and 44.6°F (7°C) at the 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)

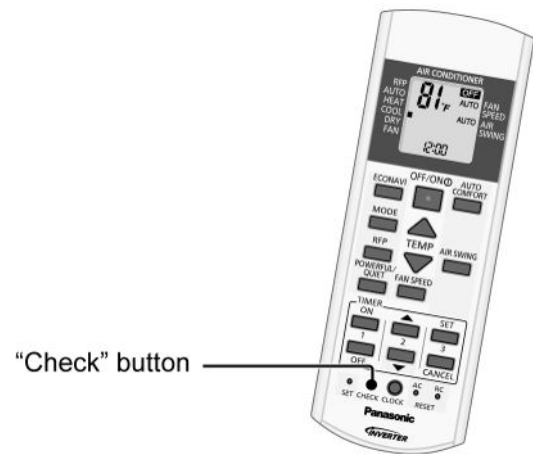
- Once abnormality has occurred during operation, the unit will stop its operation, and Timer LED blinks.
 - Although Timer LED goes off when power supply is turned off, if the unit is operated under a breakdown condition, the LED will light up again.
 - In operation after breakdown repair, the Timer LED will no more blink. The last error code (abnormality) will be stored in IC memory.
- 6 When the latest abnormality code on the main unit and code transmitted from the remote controller are matched, power LED will light up for 30 seconds and a beep sound (continuously for 4 seconds) will be heard. If no codes are matched, power LED will light up for 0.5 seconds and no sound will be heard.
 - 7 The breakdown diagnosis mode will be canceled unless pressing the CHECK button continuously for 5 seconds or operating the unit for 30 seconds.
 - 8 The same diagnosis can be repeated by turning power on again.

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 Code (Protective Operation)

- 1 Turn power on.
- 2 Press the CHECK button on the remote controller continuously for 5 seconds.
- 3 “- -” will be displayed on the remote controller display.
Note: Display only for “- -”. (No transmitting signal, no receiving sound and no Power LED blinking.)
- 4 Press the “TIMER” ▲ or ▼ button on the remote controller. The code “H00” (no abnormality) will be displayed and signal will be transmitted to the main unit. The power LED lights up. If no abnormality is stored in the memory, three beeps sound will be heard.
- 5 Every press of the button (up or down) will increase abnormality numbers and transmit abnormality code signal to the main unit.



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

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

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 Codes Table

Diagnosis display	Abnormality / Protection control	Abnormality Judgment	Protection Operation	Problem	Check location
H00	No memory of failure	—	Normal operation	—	—
H11	Indoor/outdoor abnormal communication	After operation for 1 minute	Indoor fan only operation can start by entering into force cooling operation	Indoor/outdoor communication not establish	<ul style="list-style-type: none"> Indoor/outdoor wire terminal Indoor/outdoor PCB Indoor/outdoor connection wire
H12	Indoor unit capacity unmatched	90s after power supply	—	Total indoor capability more than maximum limit or less than minimum limit, or number of indoor unit less than two	<ul style="list-style-type: none"> Indoor/outdoor connection wire Indoor/outdoor PCB Specification and combination table in catalogue
H14	Indoor intake air temperature sensor abnormality	Continuous for 5s	—	Indoor intake air temperature sensor open or short circuit	<ul style="list-style-type: none"> Indoor intake air temperature sensor lead wire and connector
H15	Compressor temperature sensor abnormality	Continuous for 5s	—	Compressor temperature sensor open or short circuit	<ul style="list-style-type: none"> Compressor temperature sensor lead wire and connector
H16	Outdoor current transformer (CT) abnormality	—	—	Current transformer faulty or compressor faulty	<ul style="list-style-type: none"> Outdoor PCB faulty or compressor faulty
H19	Indoor fan motor mechanism lock	Continuous happen for 7 times	—	Indoor fan motor lock or feedback abnormal	<ul style="list-style-type: none"> Fan motor lead wire and connector Fan motor lock or block
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"> Indoor heat exchanger temperature sensor lead wire and connector
H24	Indoor heat exchanger temperature sensor 2 abnormality	Continuous for 5s	—	Indoor heat exchanger temperature sensor 2 open or short circuit	<ul style="list-style-type: none"> Indoor heat exchanger temperature sensor 2 lead wire and connector
H27	Outdoor air temperature sensor abnormality	Continuous for 5s	—	Outdoor air temperature sensor open or short circuit	<ul style="list-style-type: none"> Outdoor air temperature sensor lead wire and connector
H28	Outdoor heat exchanger temperature sensor 1 abnormality	Continuous for 5s	—	Outdoor heat exchanger temperature sensor 1 open or short circuit	<ul style="list-style-type: none"> Outdoor heat exchanger temperature sensor 1 lead wire and connector
H30	Outdoor discharge pipe temperature sensor abnormality	Continuous for 5s	—	Outdoor discharge pipe temperature sensor open or short circuit	<ul style="list-style-type: none"> Outdoor discharge pipe temperature sensor lead wire and connector
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"> Outdoor heat exchanger temperature sensor 2 lead wire and connector
H33	Indoor / outdoor misconnection abnormality	—	—	Indoor and outdoor rated voltage different	<ul style="list-style-type: none"> Indoor and outdoor units check
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"> Outdoor gas pipe temperature sensor lead wire and connector
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"> Outdoor liquid pipe temperature sensor lead wire and connector
H38	Indoor/Outdoor mismatch (brand code)	—	—	Brand code not match	<ul style="list-style-type: none"> Check indoor unit and outdoor unit
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"> Check indoor/outdoor connection wire and connection pipe Indoor heat exchanger sensor lead wire and connector Expansion valve and lead wire and connector
H59	ECONAVI sensor abnormality	Continuous for 25s	—	ECONAVI sensor open or short circuit	<ul style="list-style-type: none"> ECONAVI sensor (defective or disconnected) ECONAVI PCB
H64	Outdoor high pressure sensor abnormality	Continuous for 1 minute	—	High pressure sensor open circuit during compressor stop	<ul style="list-style-type: none"> High pressure sensor Lead wire and connector
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"> Outdoor fan motor lead wire and connector Fan motor lock or block

Diagnosis display	Abnormality / Protection control	Abnormality Judgment	Protection Operation	Problem	Check location
H98	Indoor high pressure protection	—	—	Indoor high pressure protection (Heating)	<ul style="list-style-type: none"> • Check indoor heat exchanger • Air filter dirty • Air circulation short circuit
H99	Indoor operating unit freeze protection	—	—	Indoor freeze protection (Cooling)	<ul style="list-style-type: none"> • Check indoor heat exchanger • Air filter dirty • Air circulation short circuit
F11	4-way valve switching abnormality	4 times happen within 30 minutes	—	4-way valve switching abnormal	<ul style="list-style-type: none"> • 4-way valve • Lead wire and connector
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"> • Check indoor/outdoor connection wire and pipe • Indoor heat exchanger sensor lead wire and connector • Expansion valve lead wire and connector
F90	Power factor correction (PFC) circuit protection	4 times happen within 10 minutes	—	Power factor correction circuit abnormal	<ul style="list-style-type: none"> • Outdoor PCB faulty
F91	Refrigeration cycle abnormality	2 times happen within 20 minutes	—	Refrigeration cycle abnormal	<ul style="list-style-type: none"> • Insufficient refrigerant or valve close
F93	Compressor abnormal revolution	4 times happen within 20 minutes	—	Compressor abnormal revolution	<ul style="list-style-type: none"> • Power transistor module faulty or compressor lock
F94	Compressor discharge overshoot protection	4 times happen within 30 minutes	—	Compressor discharge pressure overshoot	<ul style="list-style-type: none"> • Check refrigeration system
F95	Outdoor cooling high pressure protection	4 times happen within 20 minutes	—	Cooling high pressure protection	<ul style="list-style-type: none"> • Check refrigeration system • Outdoor air circuit
F96	Power transistor module overheating protection	4 times happen within 30 minutes	—	Power transistor module overheat	<ul style="list-style-type: none"> • PCB faulty • Outdoor air circuit (fan motor)
F97	Compressor overheating protection	3 times happen within 30 minutes	—	Compressor overheat	<ul style="list-style-type: none"> • Insufficient refrigerant
F98	Total running current protection	3 times happen within 20 minutes	—	Total current protection	<ul style="list-style-type: none"> • Check refrigeration system • Power source or compressor lock
F99	Outdoor direct current (DC) peak detection	Continuous happen for 7 times	—	Power transistor module current protection	<ul style="list-style-type: none"> • Power transistor module faulty or compressor lock

15.4 Self-diagnosis Method

15.4.1 H11 (Indoor/Outdoor Abnormal Communication)

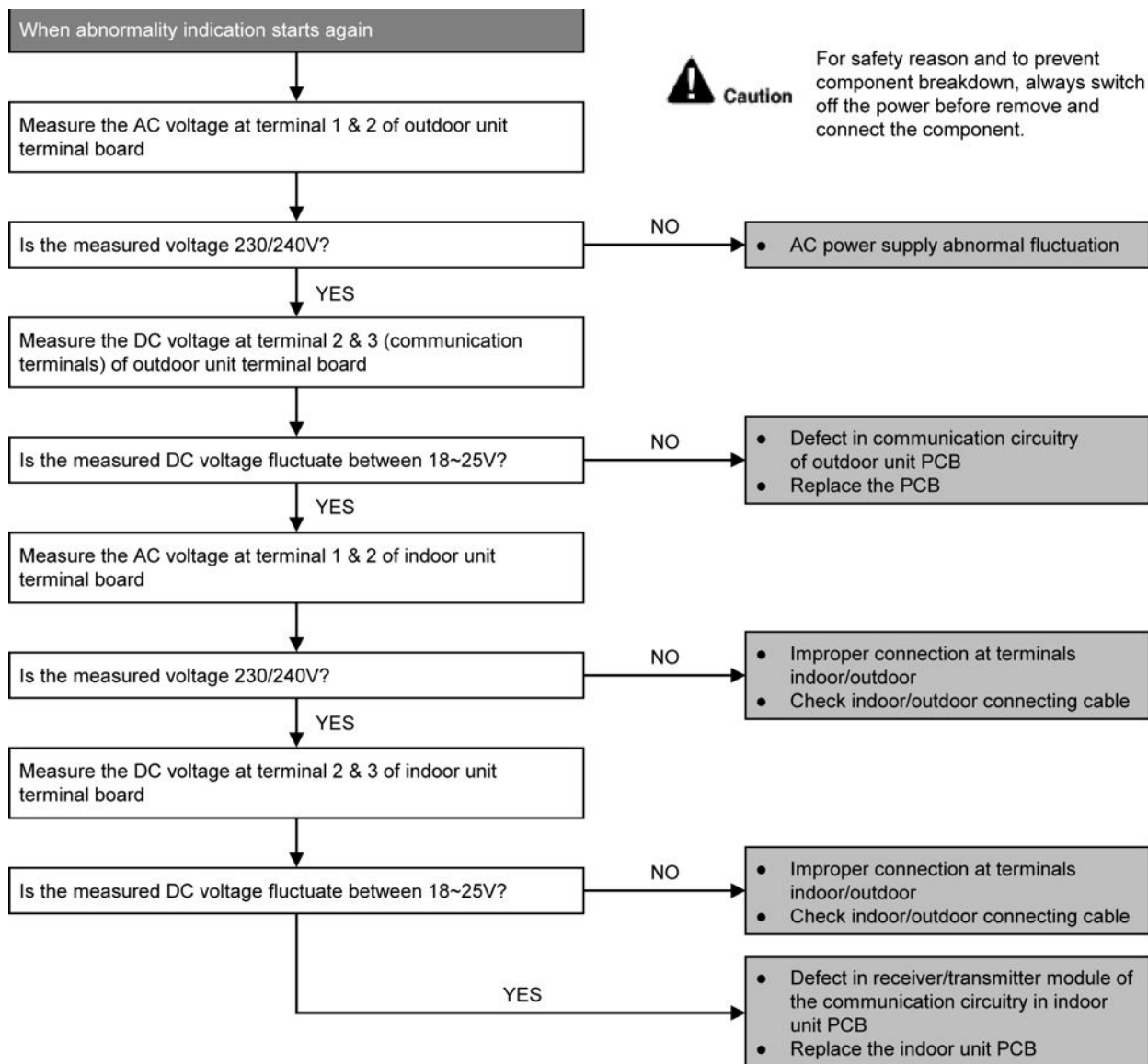
Malfunction Decision Conditions

- 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)

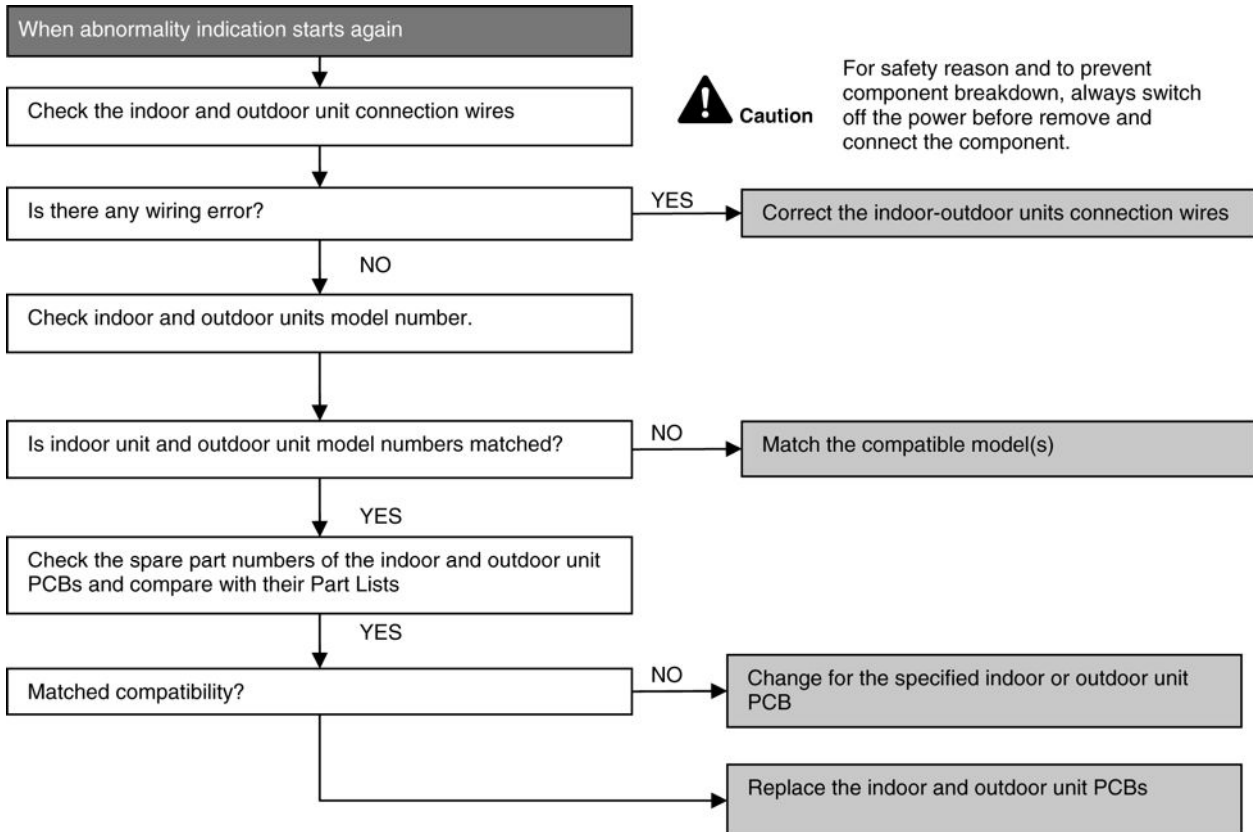
Malfunction Decision Conditions

- 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)

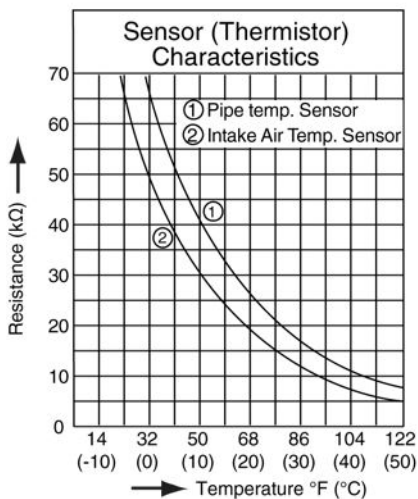
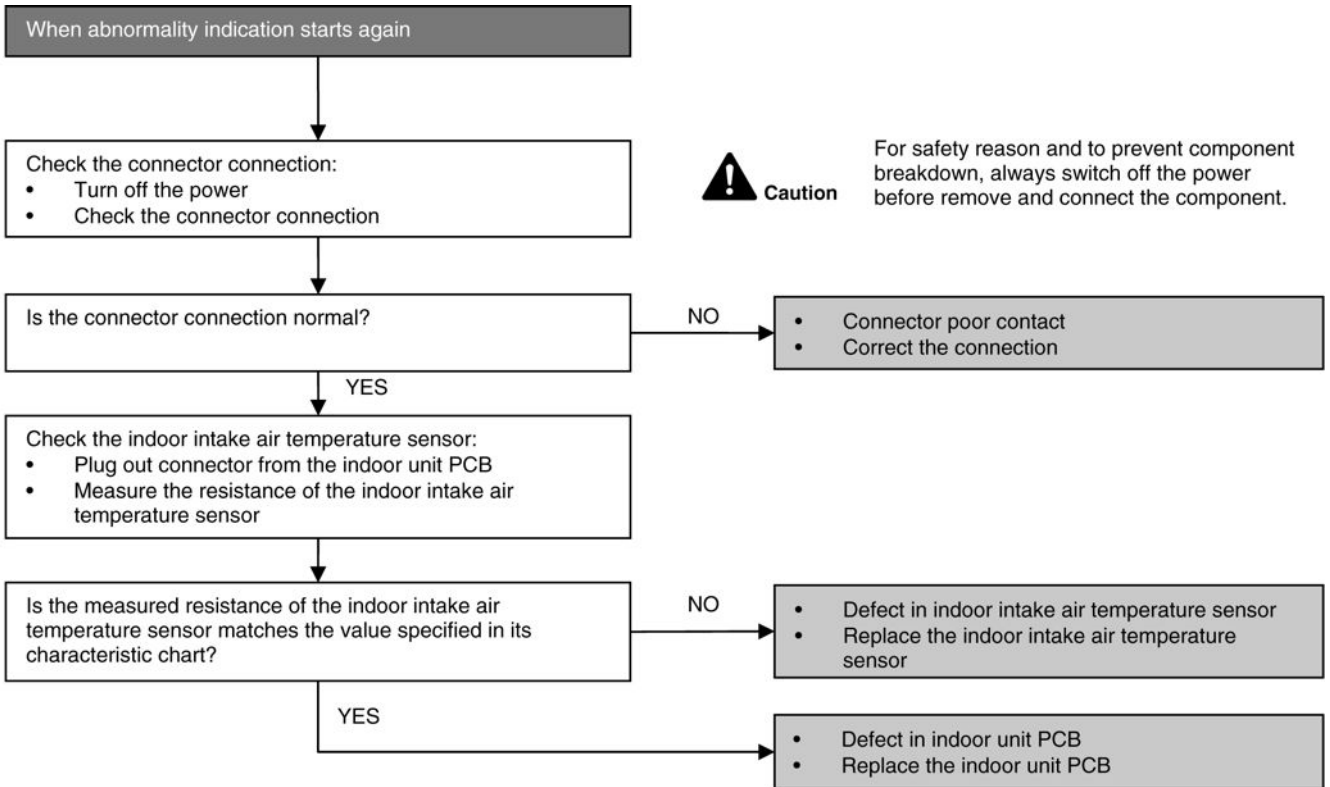
Malfunction Decision Conditions

- 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)

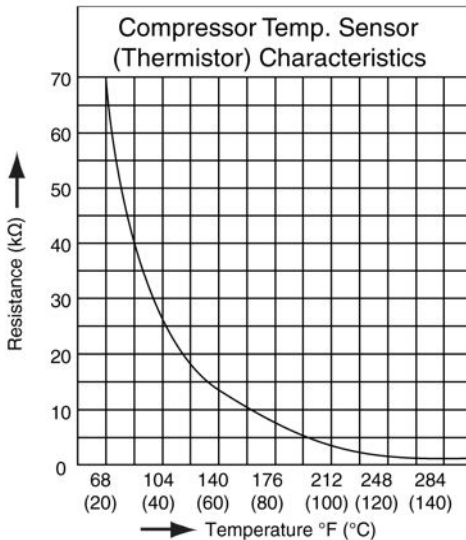
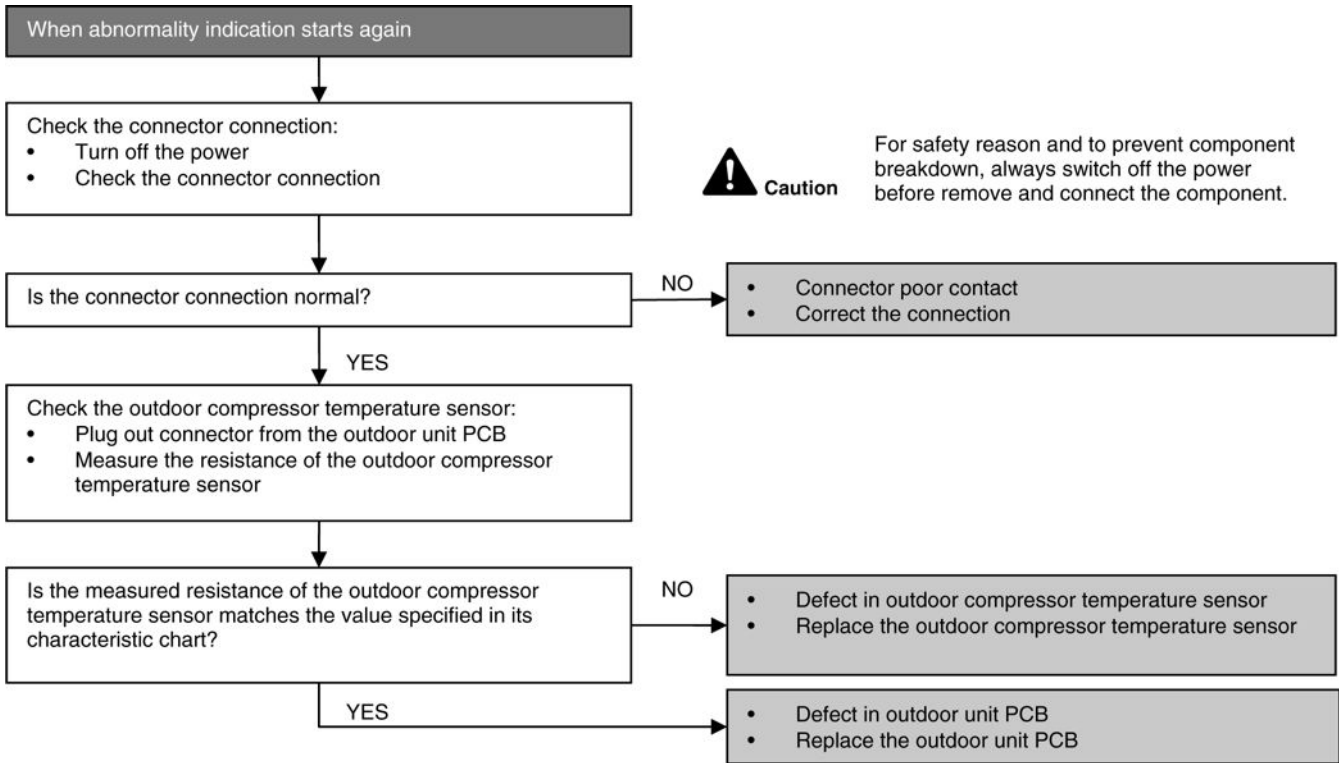
Malfunction Decision Conditions

- 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)

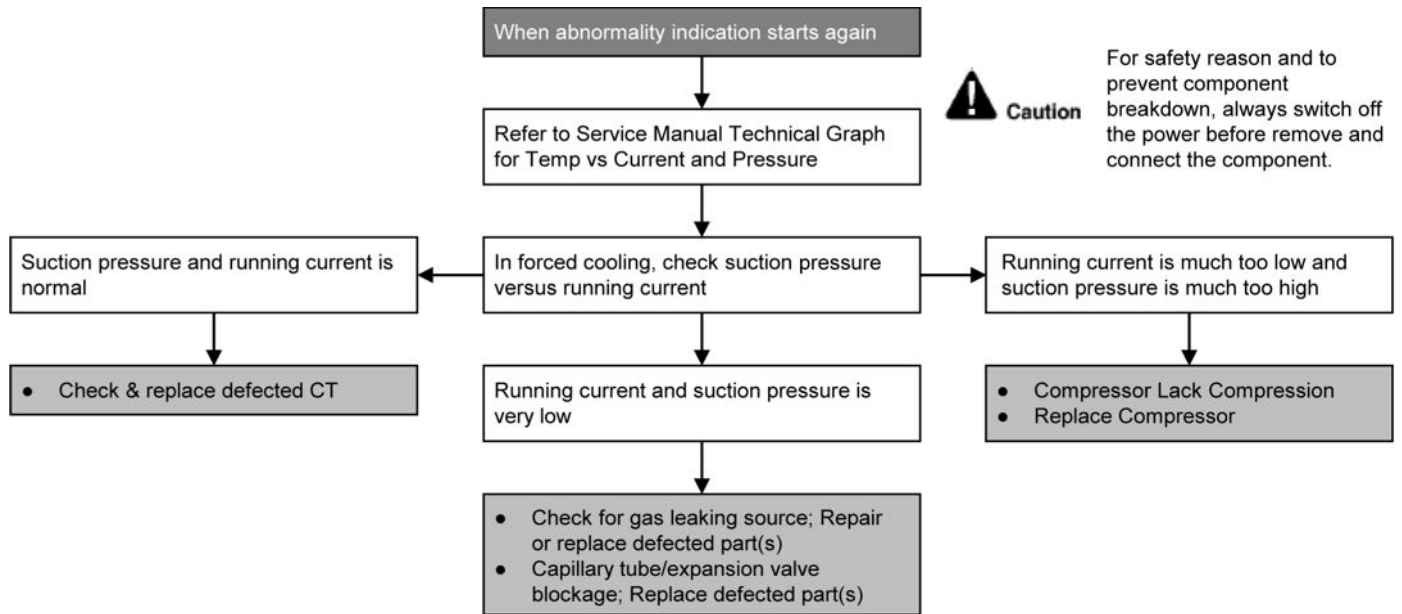
Malfunction Decision Conditions

- 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)

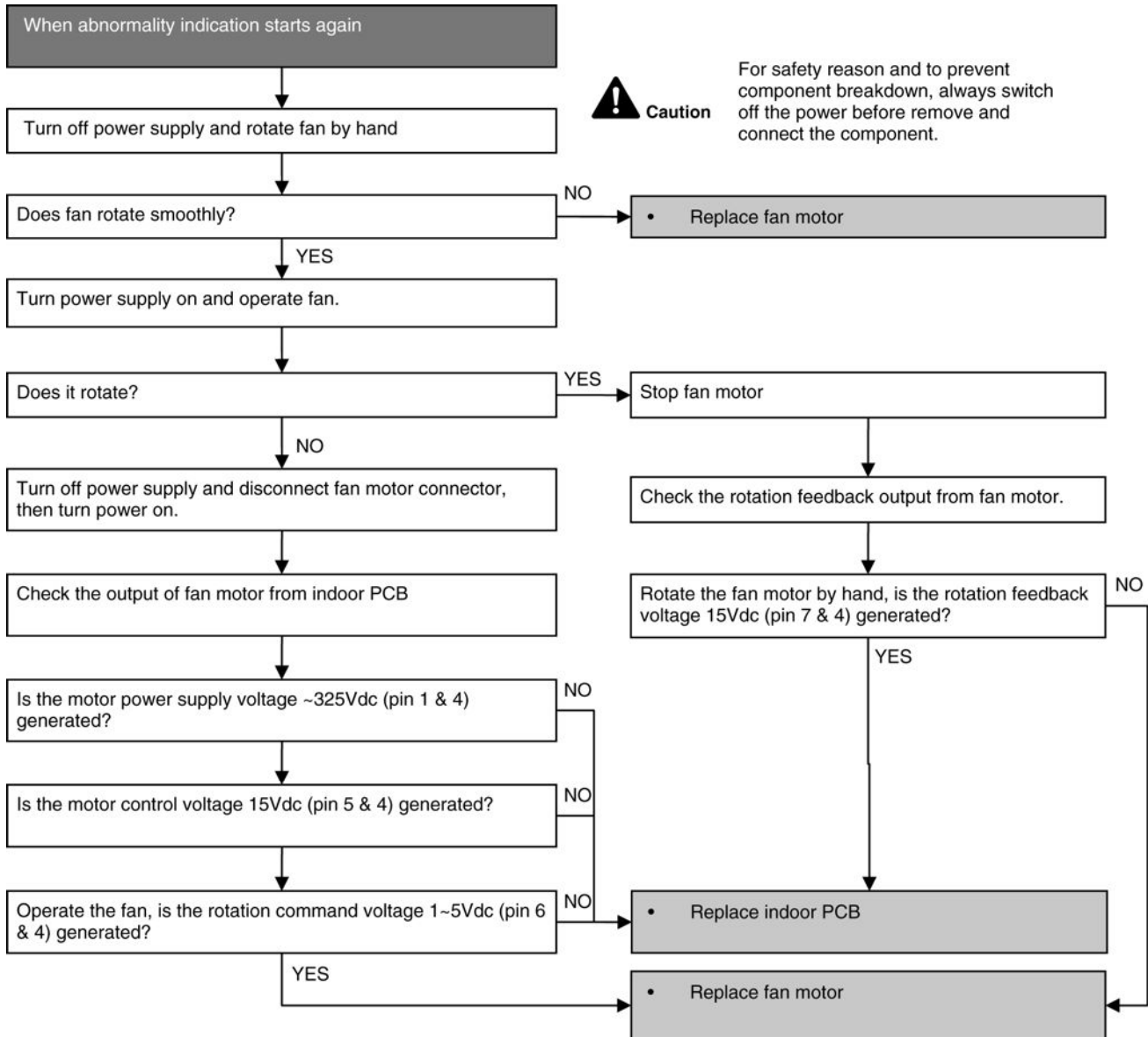
Malfunction Decision Conditions

- 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 / H24 (Indoor Pipe Temperature Sensor Abnormality)

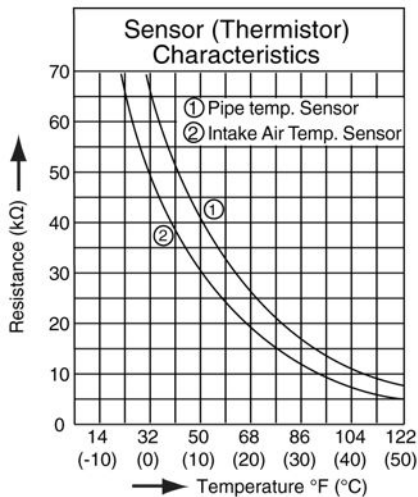
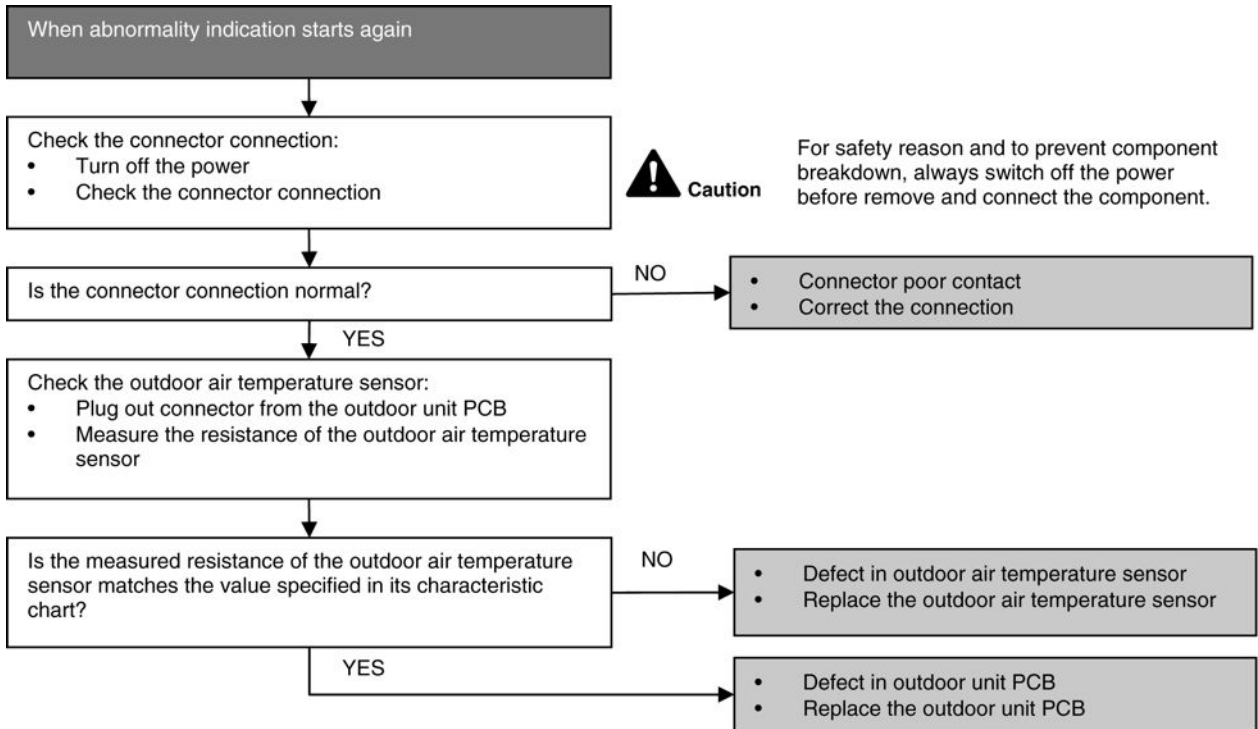
Malfunction Decision Conditions

- 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)

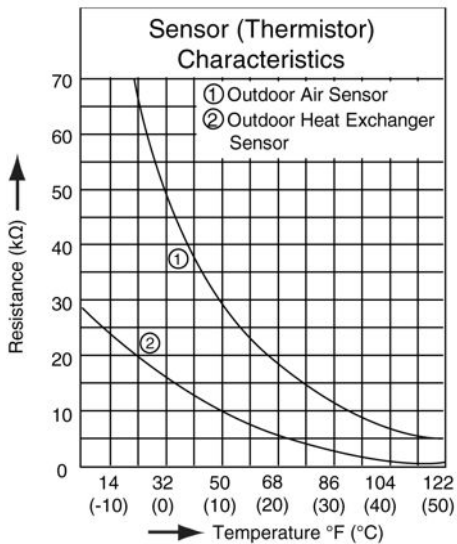
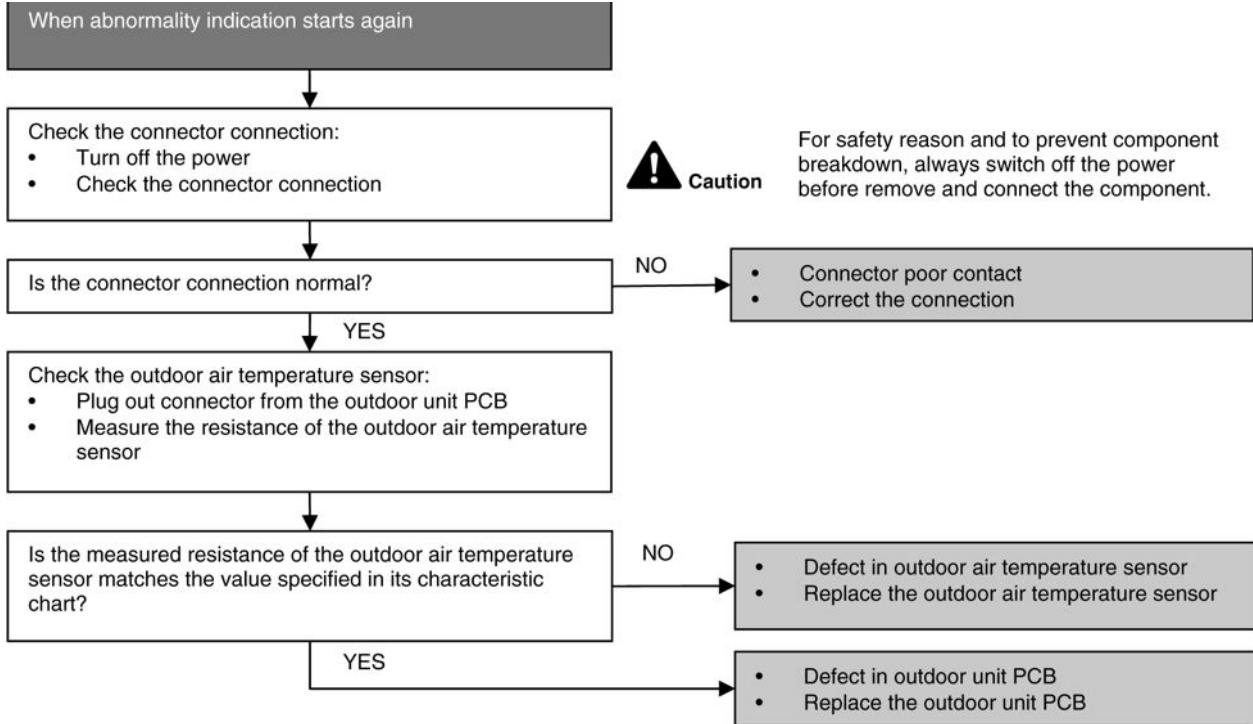
Malfunction Decision Conditions

- 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)

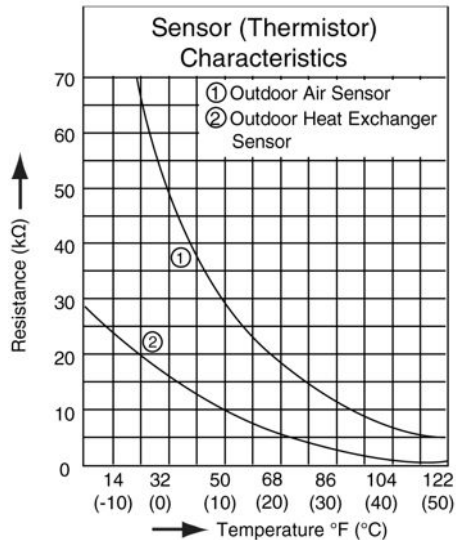
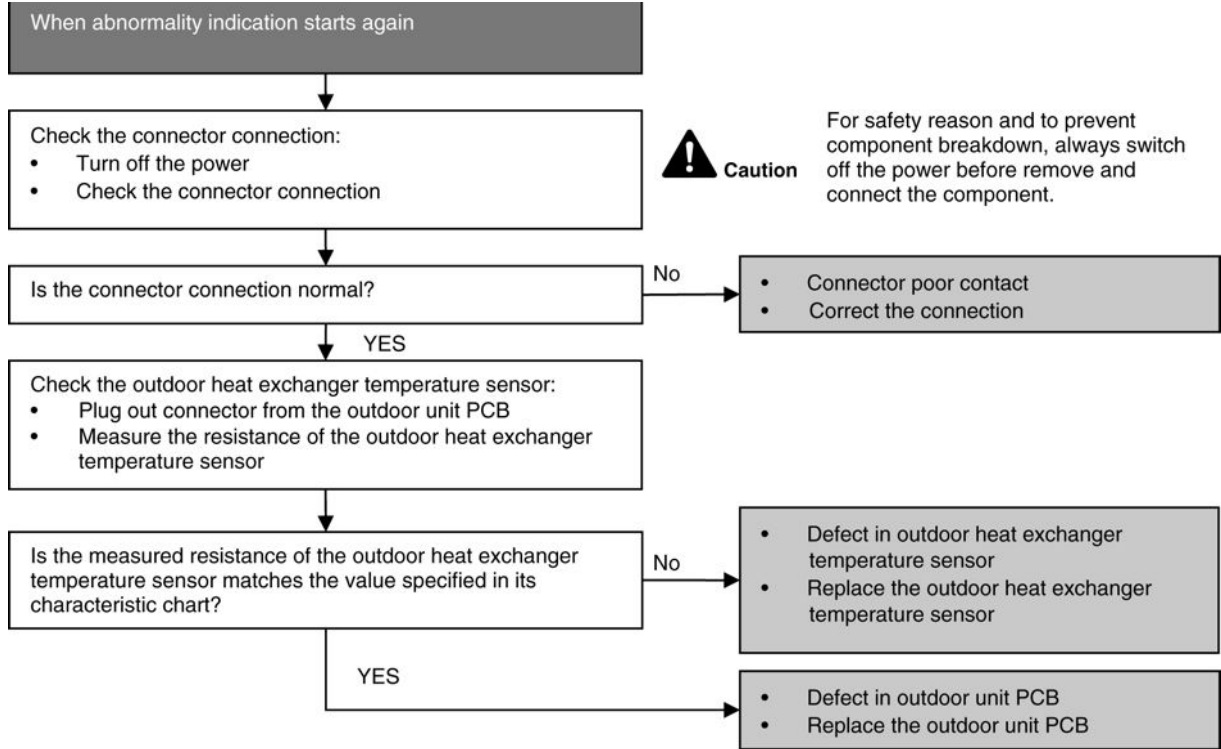
Malfunction Decision Conditions

- 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)

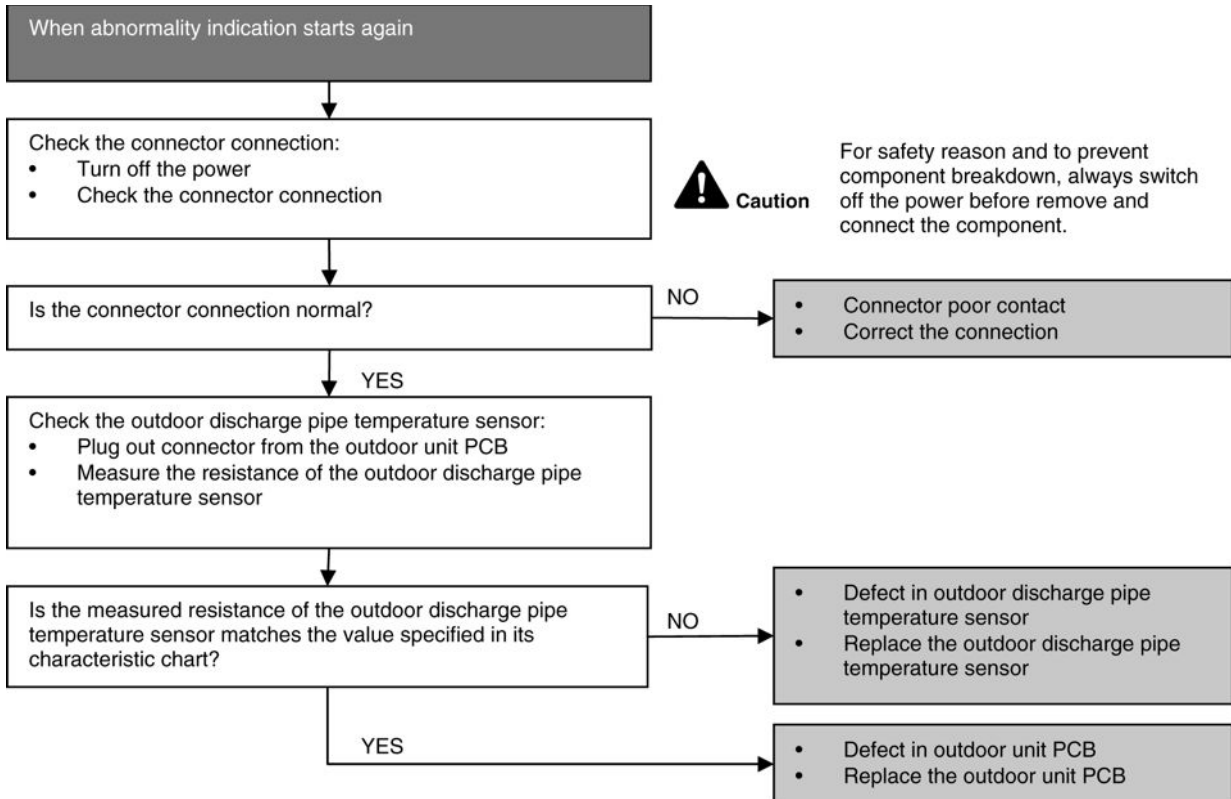
Malfunction Decision Conditions

- 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)

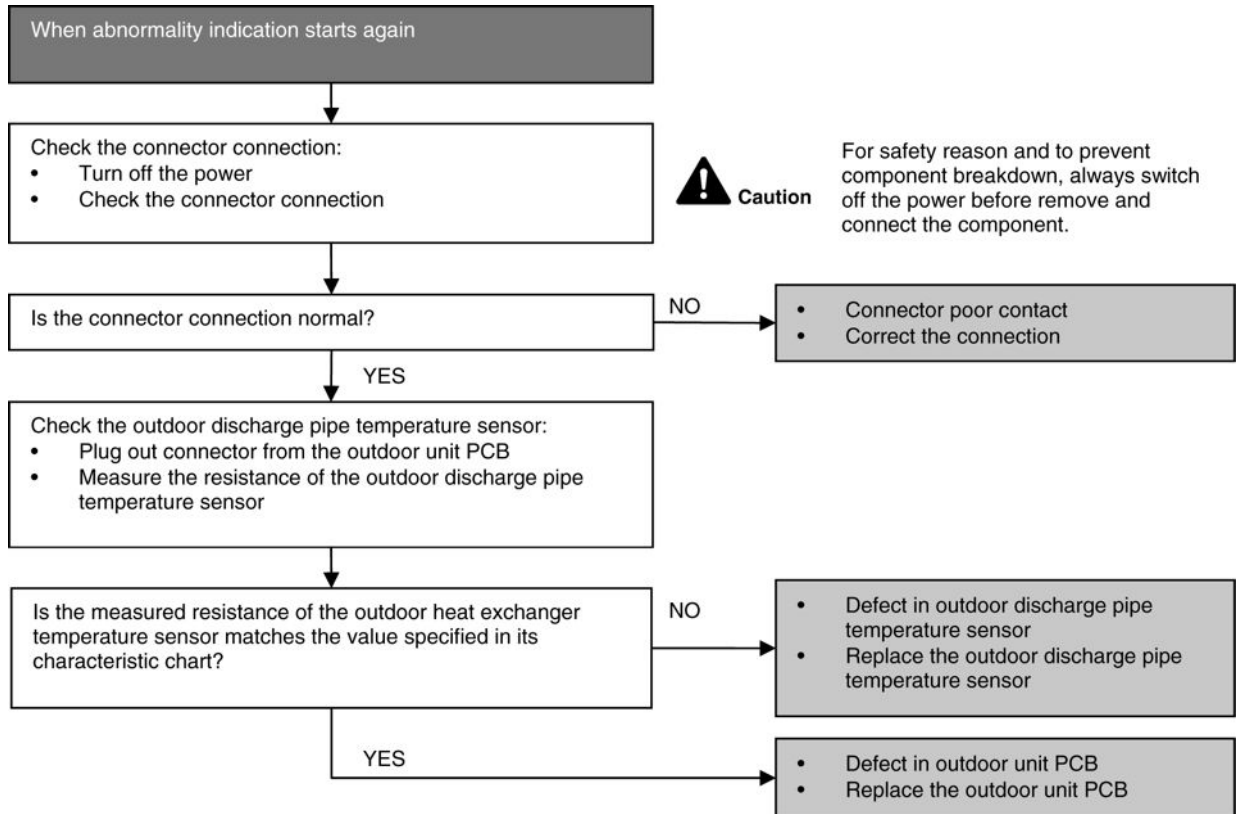
Malfunction Decision Conditions

- 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)

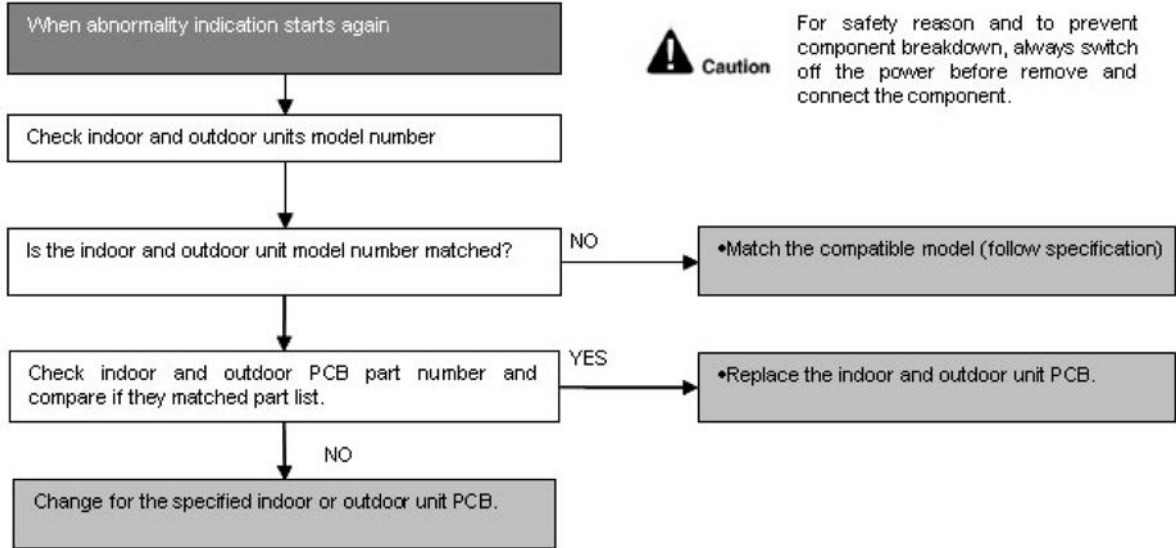
Malfunction Decision Conditions

- 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 H36 (Outdoor Gas Pipe Sensor Abnormality)

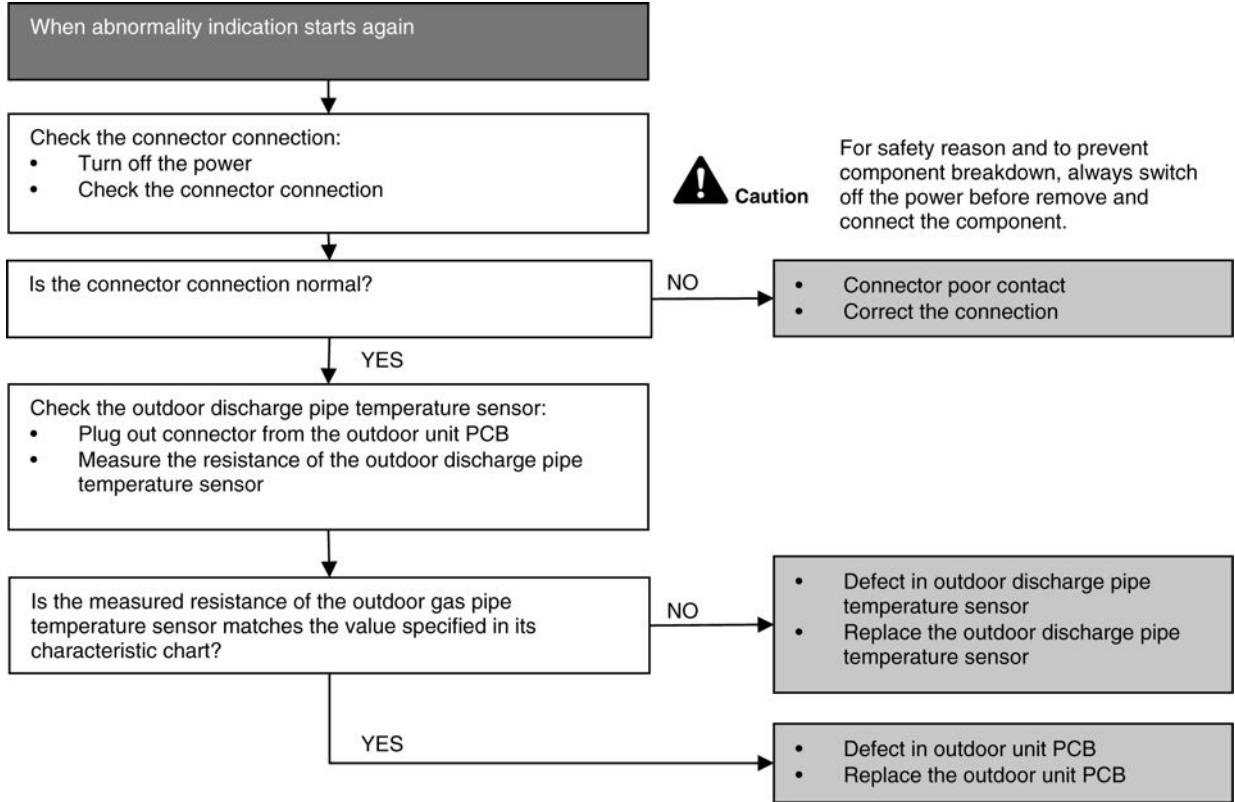
Malfunction Decision Conditions

- 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



15.4.14 H37 (Outdoor Liquid Pipe Temperature Sensor Abnormality)

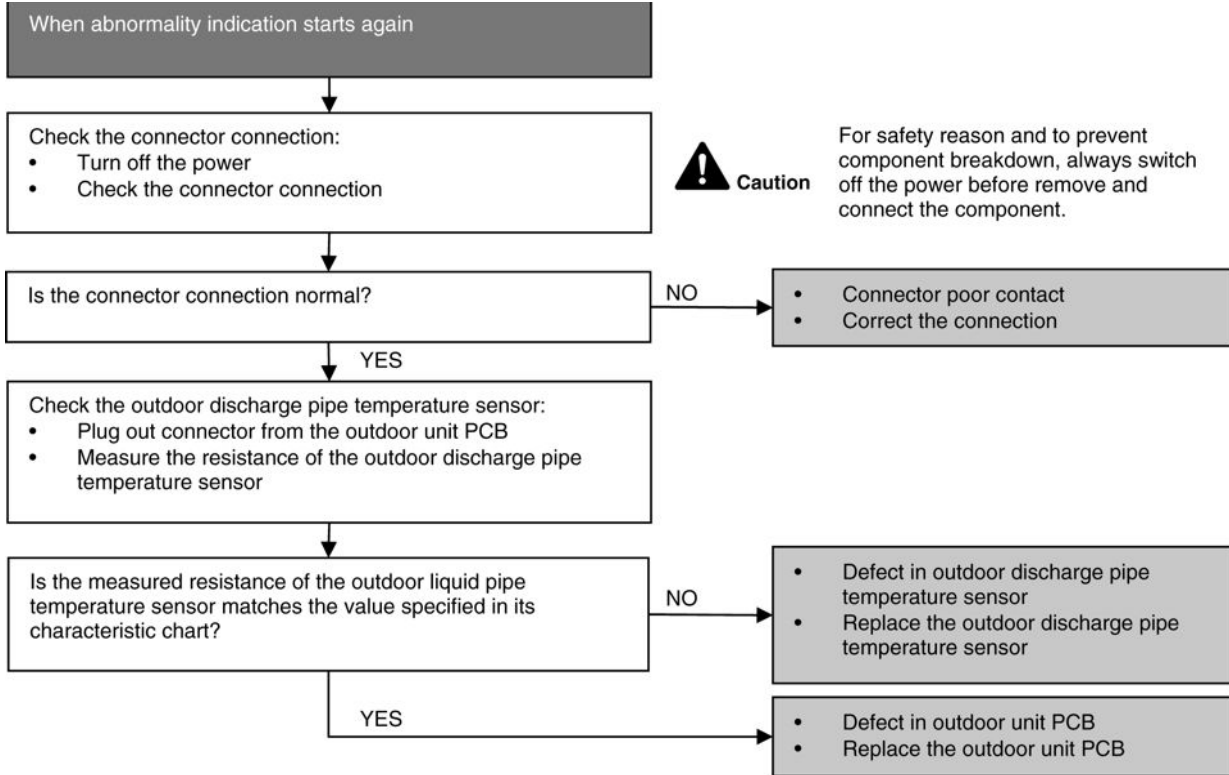
Malfunction Decision Conditions

- 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



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

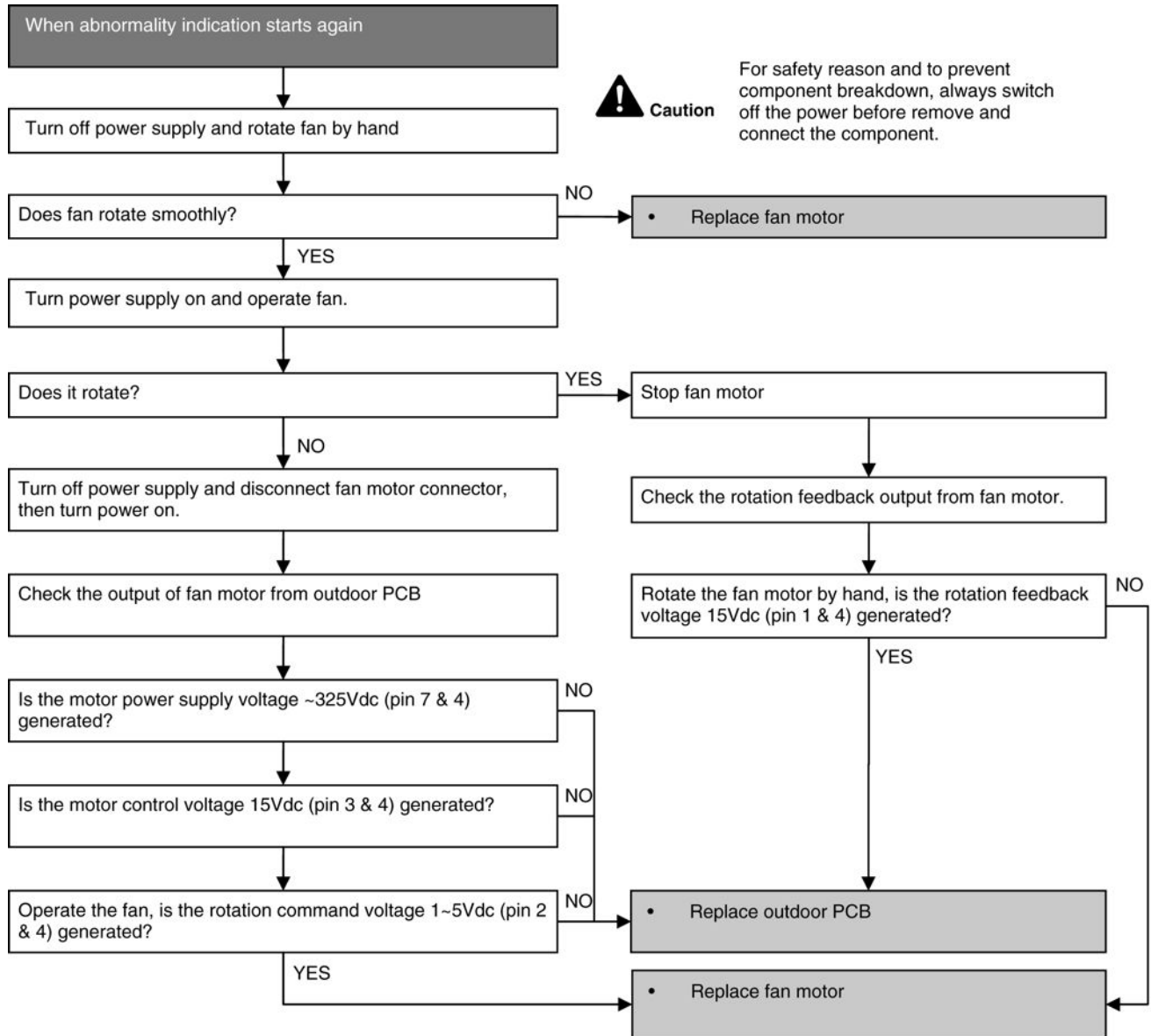
Malfunction Decision Conditions

- 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



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

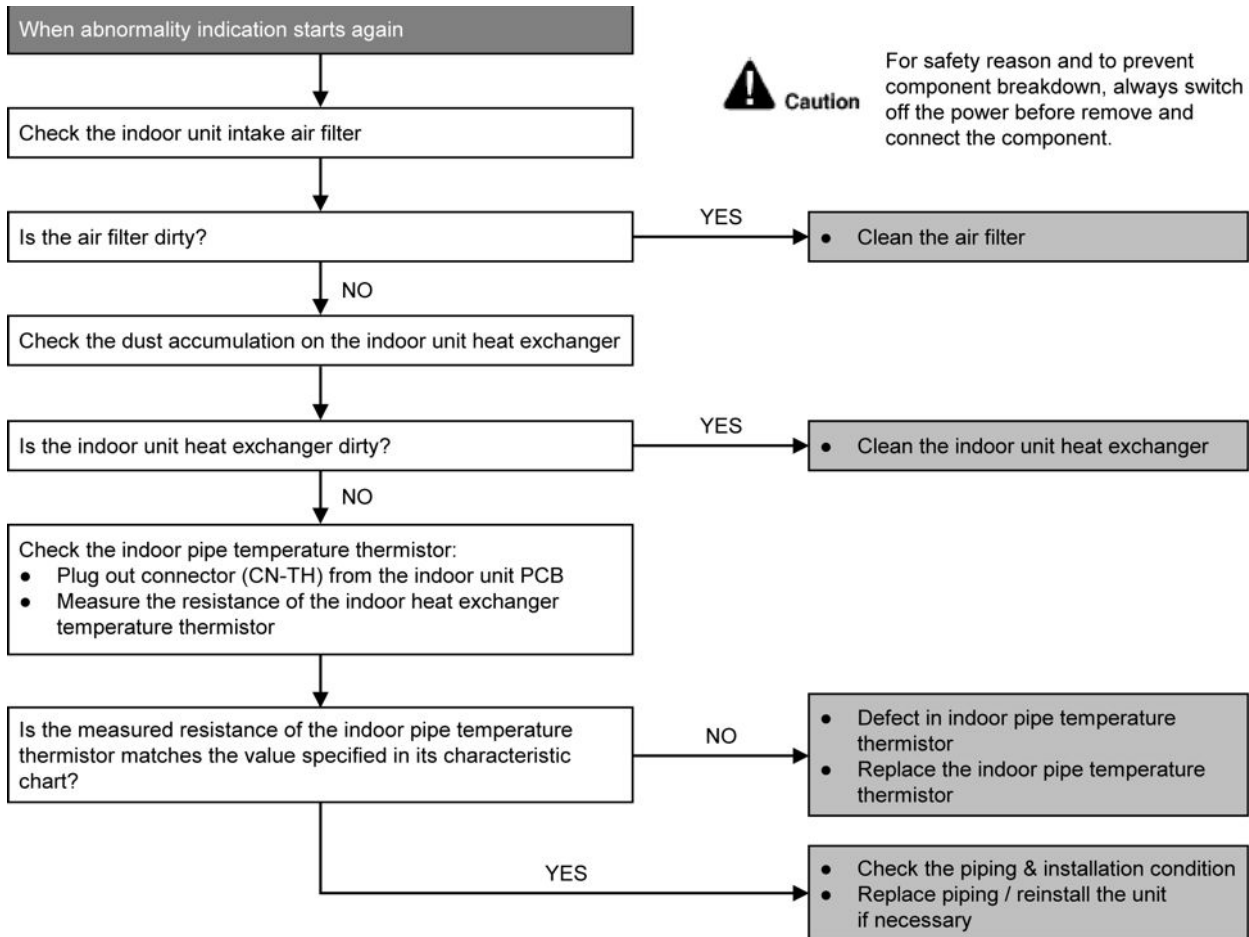
Malfunction Decision Conditions

- 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



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

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

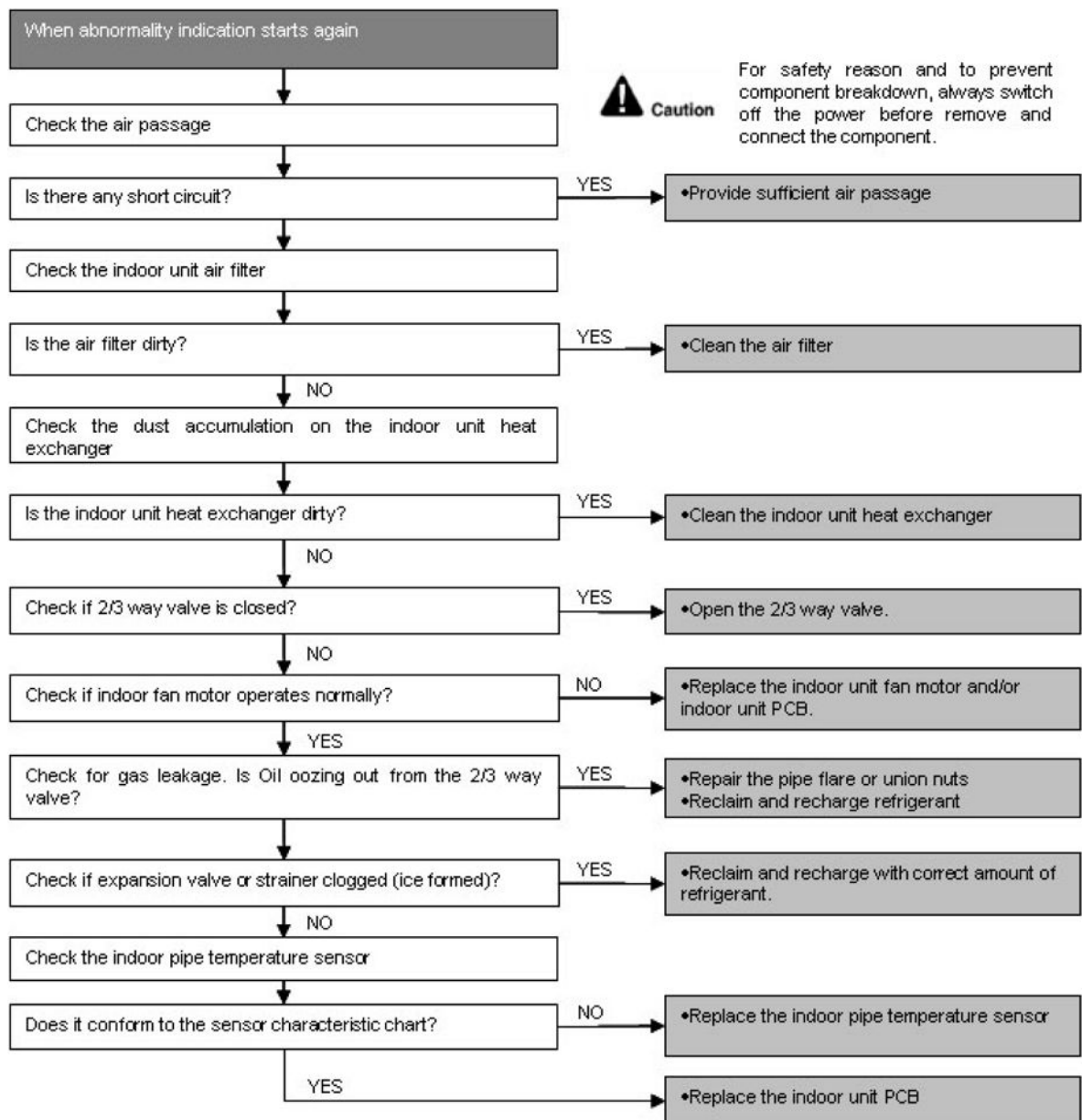
Malfunction Decision Conditions

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



15.4.18 F11 (4-way Valve Switching Failure)

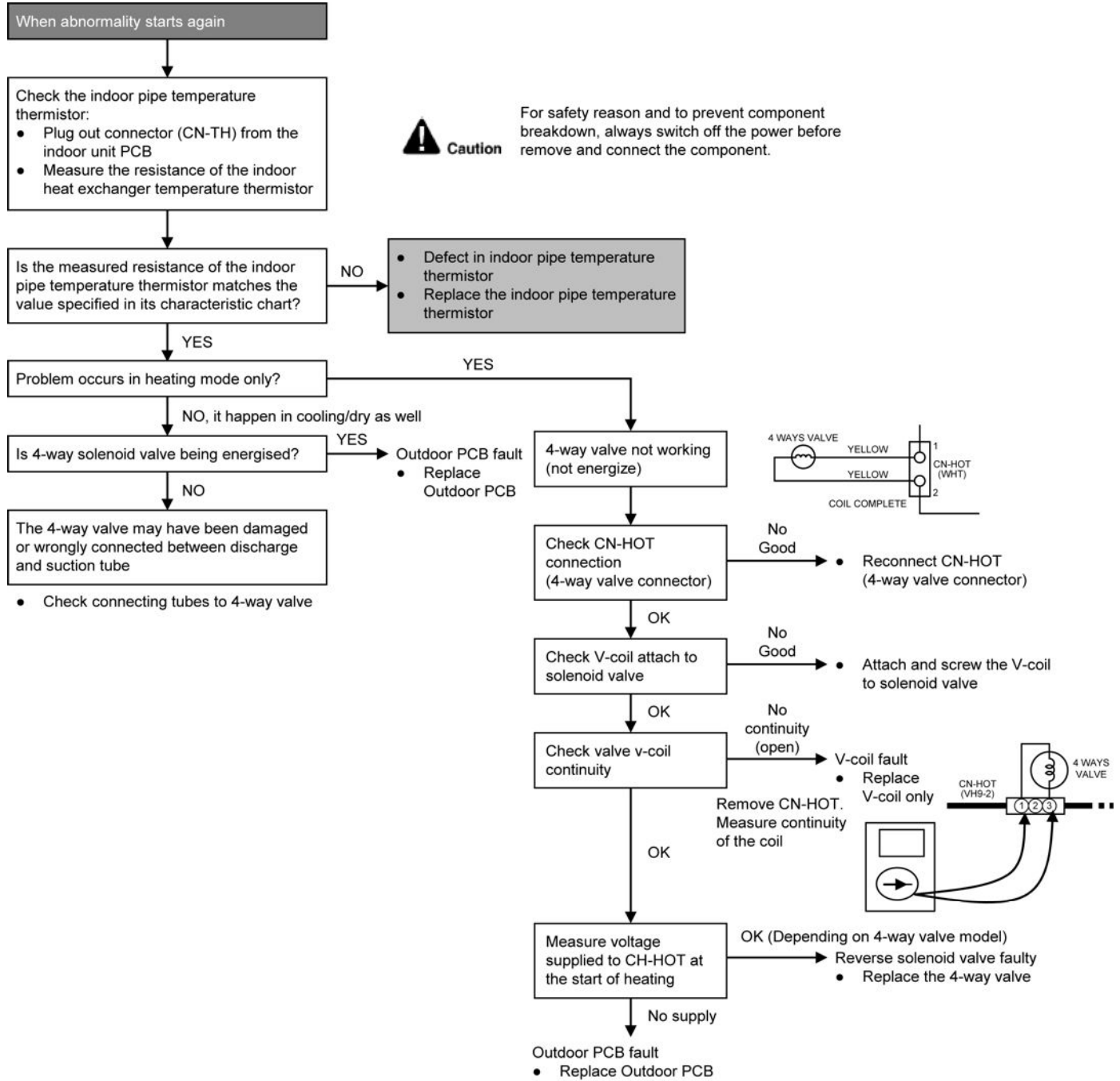
Malfunction Decision Conditions

- 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

15.4.19 F17 (Indoor Standby Units Freezing Abnormality)

Malfunction Decision Conditions

- When the different between indoor intake air temperature and indoor pipe temperature is above 50°F (10°C) or indoor pipe temperature is below 30.2°F (-1.0°C).

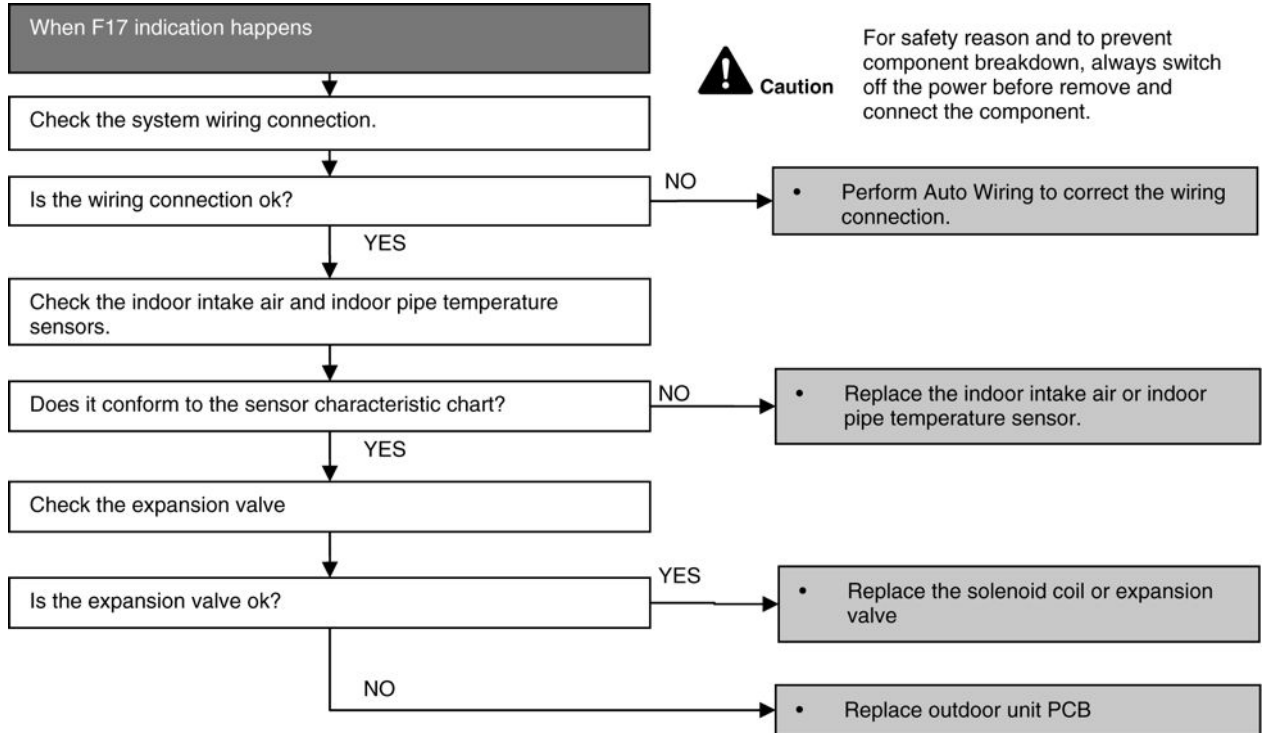
Remark:

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



15.4.20 F90 (Power Factor Correction Protection)

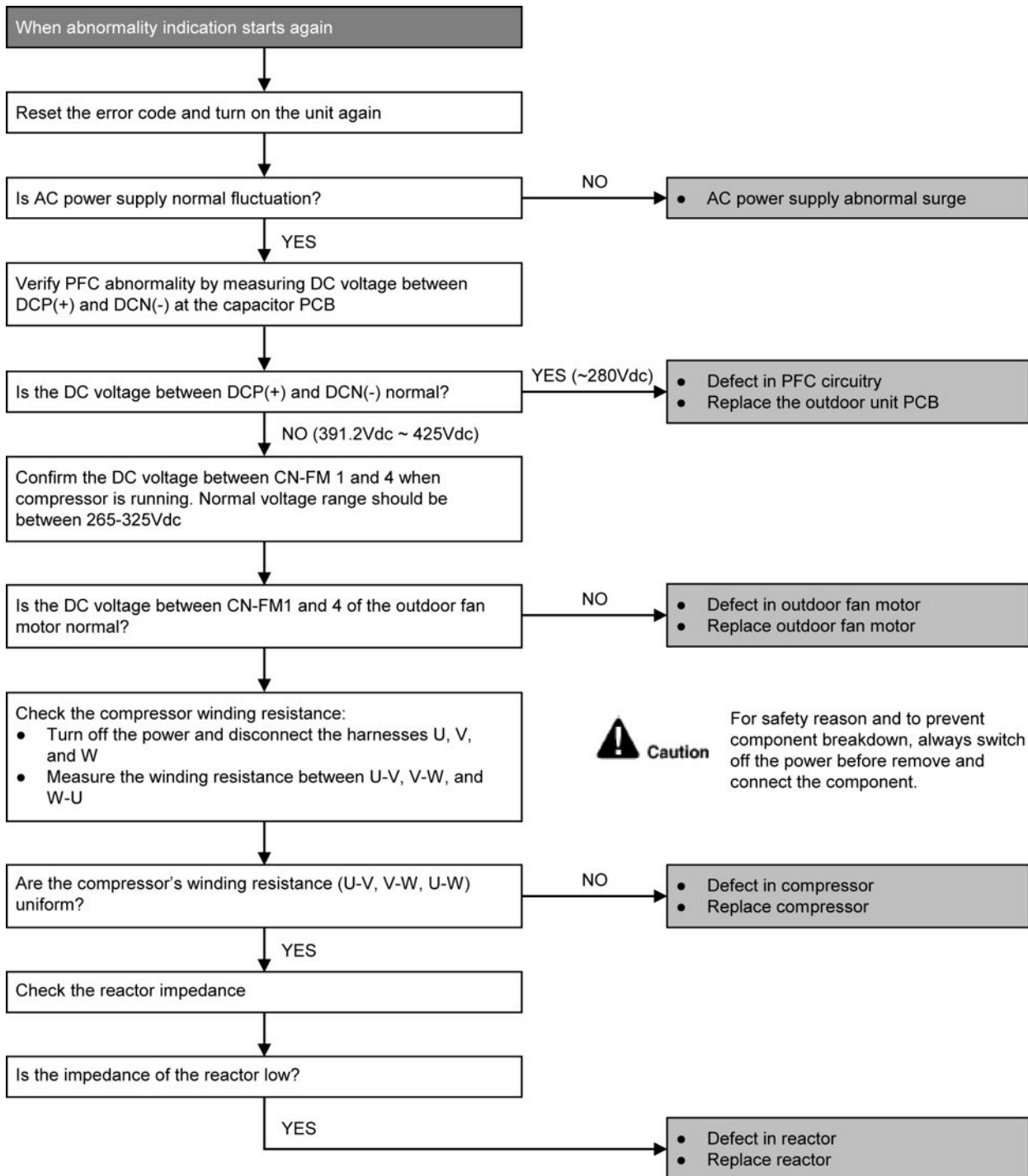
Malfunction Decision Conditions

- 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



15.4.21 F91 (Refrigeration Cycle Abnormality)

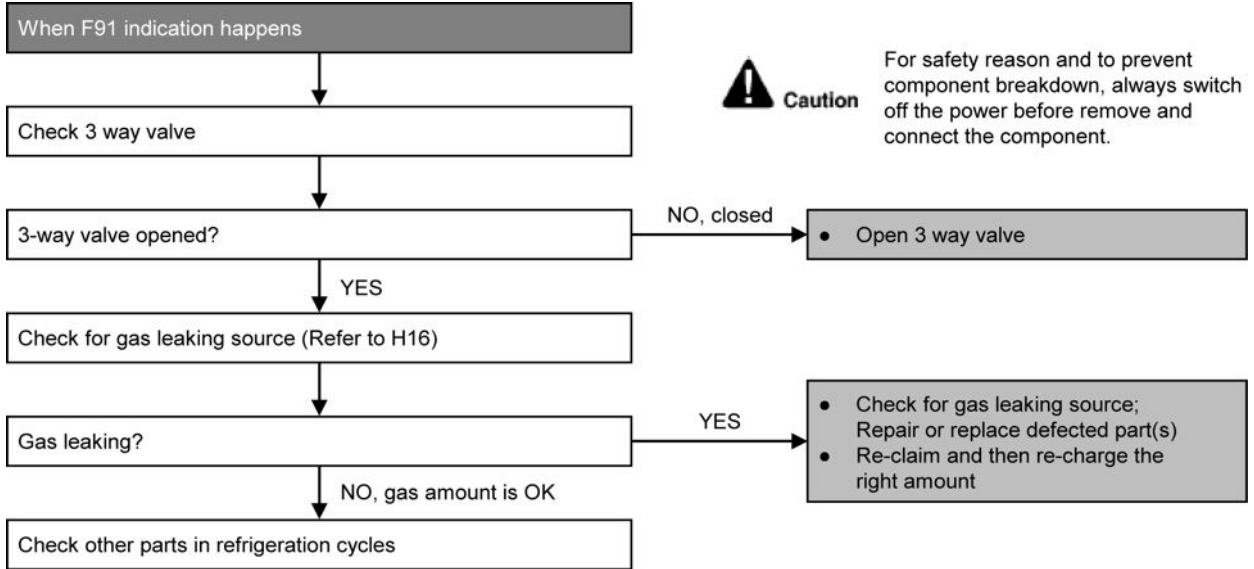
Malfunction Decision Conditions

- 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



15.4.22 F93 (Compressor Rotation Failure)

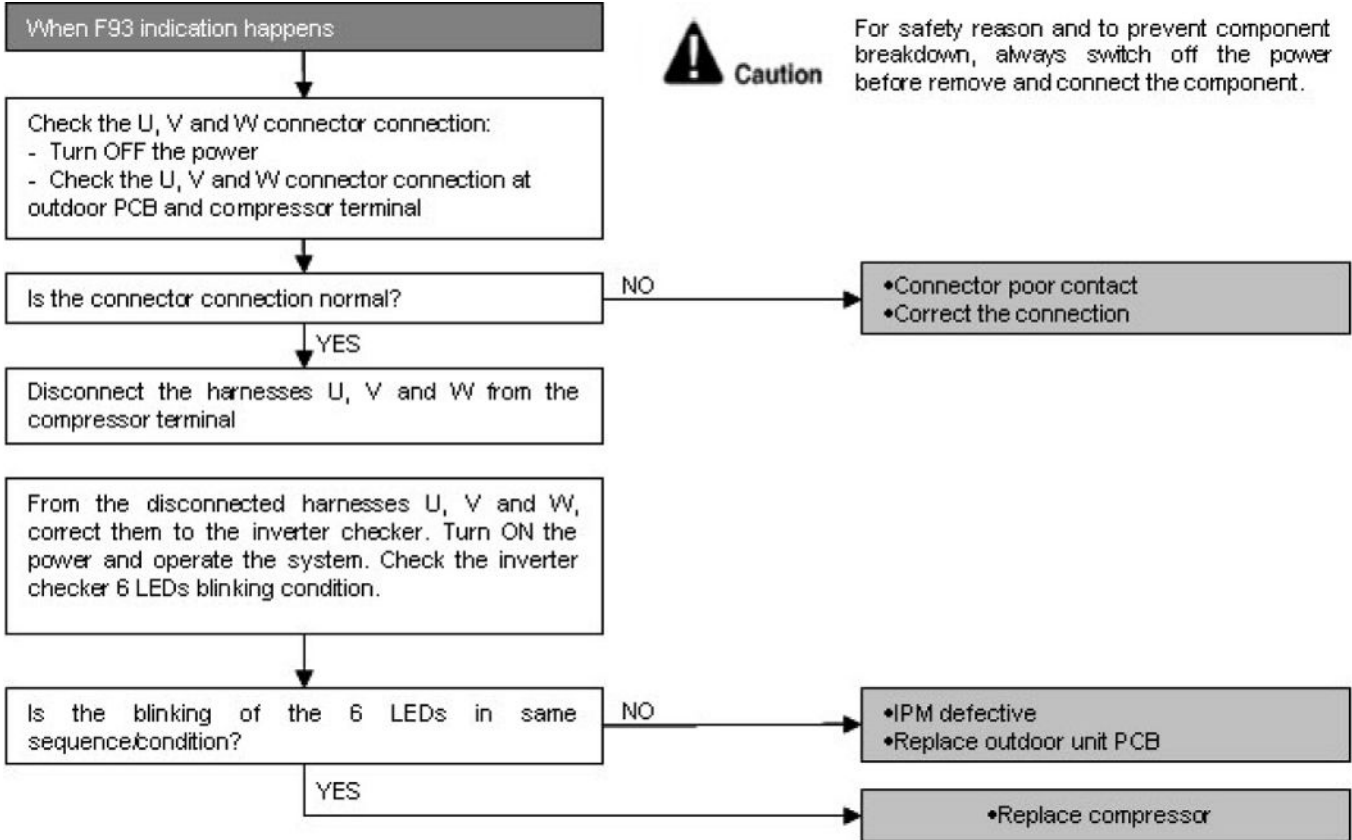
Malfunction Decision Conditions

- 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



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

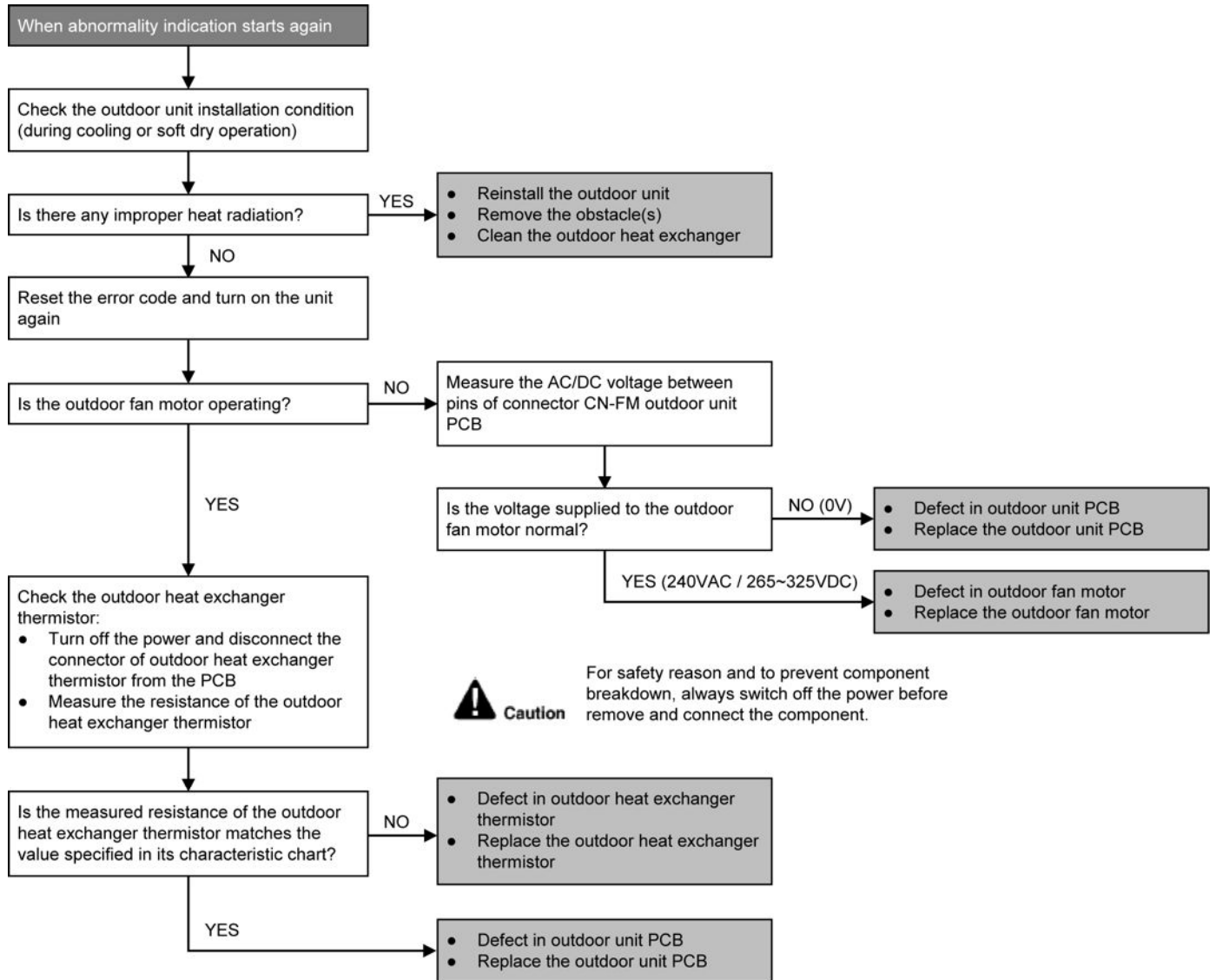
Malfunction Decision Conditions

- 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 exchanger temperature rise due to defective outdoor heat exchanger thermistor.
- Outdoor heat exchanger temperature rise due to defective of outdoor unit PCB.

Troubleshooting



15.4.24 F96 (IPM Overheating)

Malfunction Decision Conditions

- During operating of cooling and heating, when IPM temperature data 212°F (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 194°F (90°C) is detected by the heat sink temperature sensor.

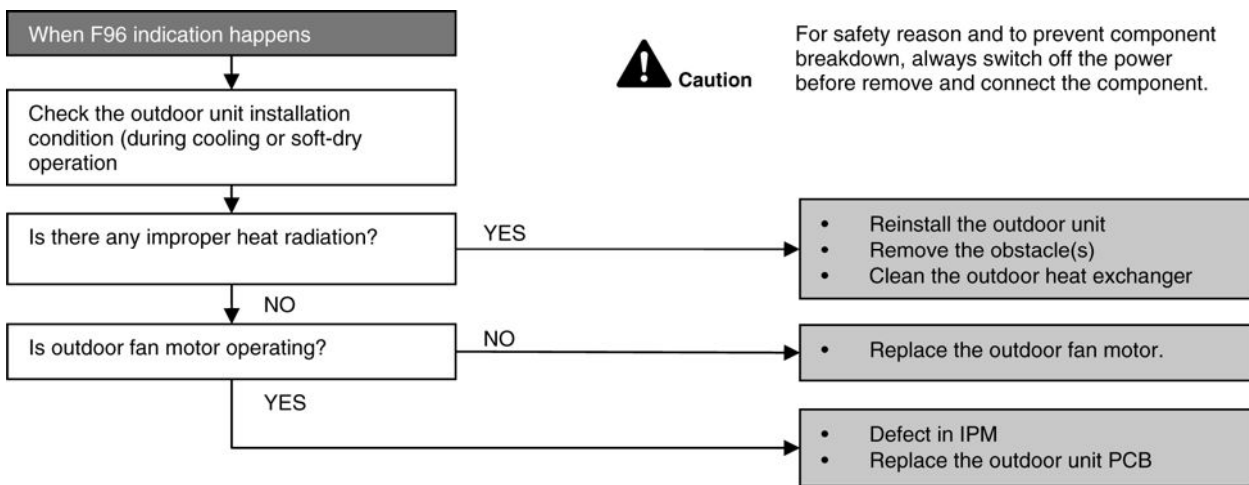
Malfunction Caused

- 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



15.4.25 F97 (Compressor Overheating)

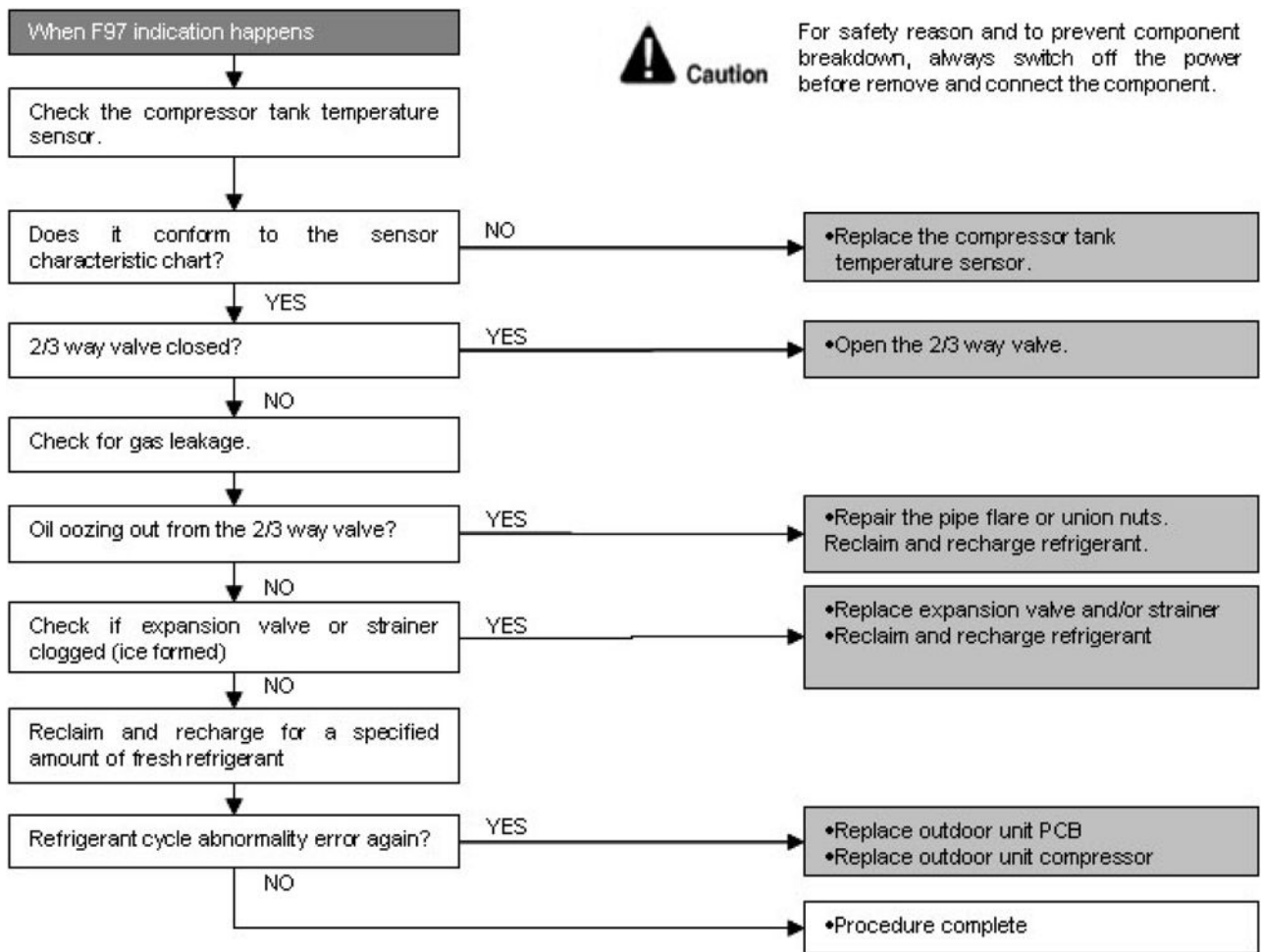
Malfunction Decision Conditions

- During operation of cooling and heating, when compressor tank temperature data 233.6°F (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



15.4.26 F98 (Input Over Current Detection)

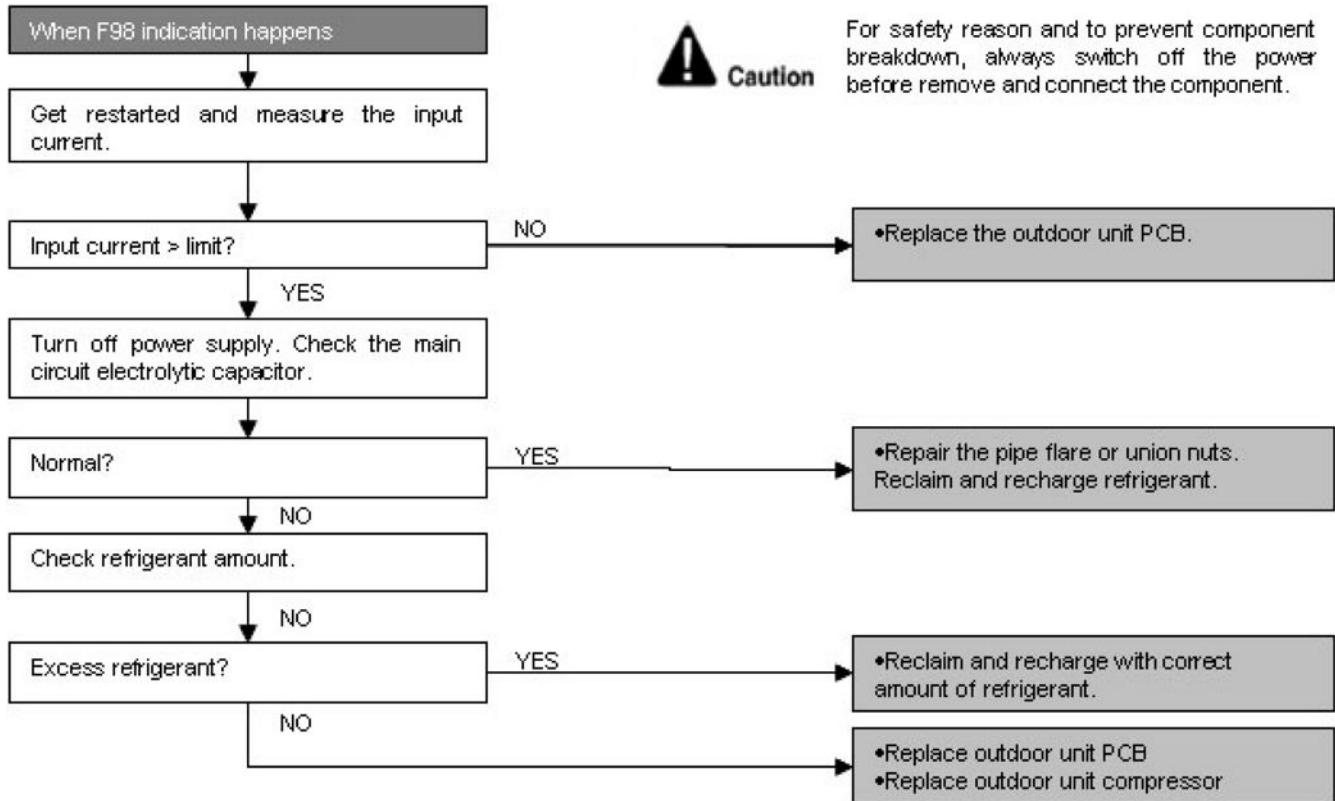
Malfunction Decision Conditions

- 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



15.4.27 F99 (DC Peak Detection)

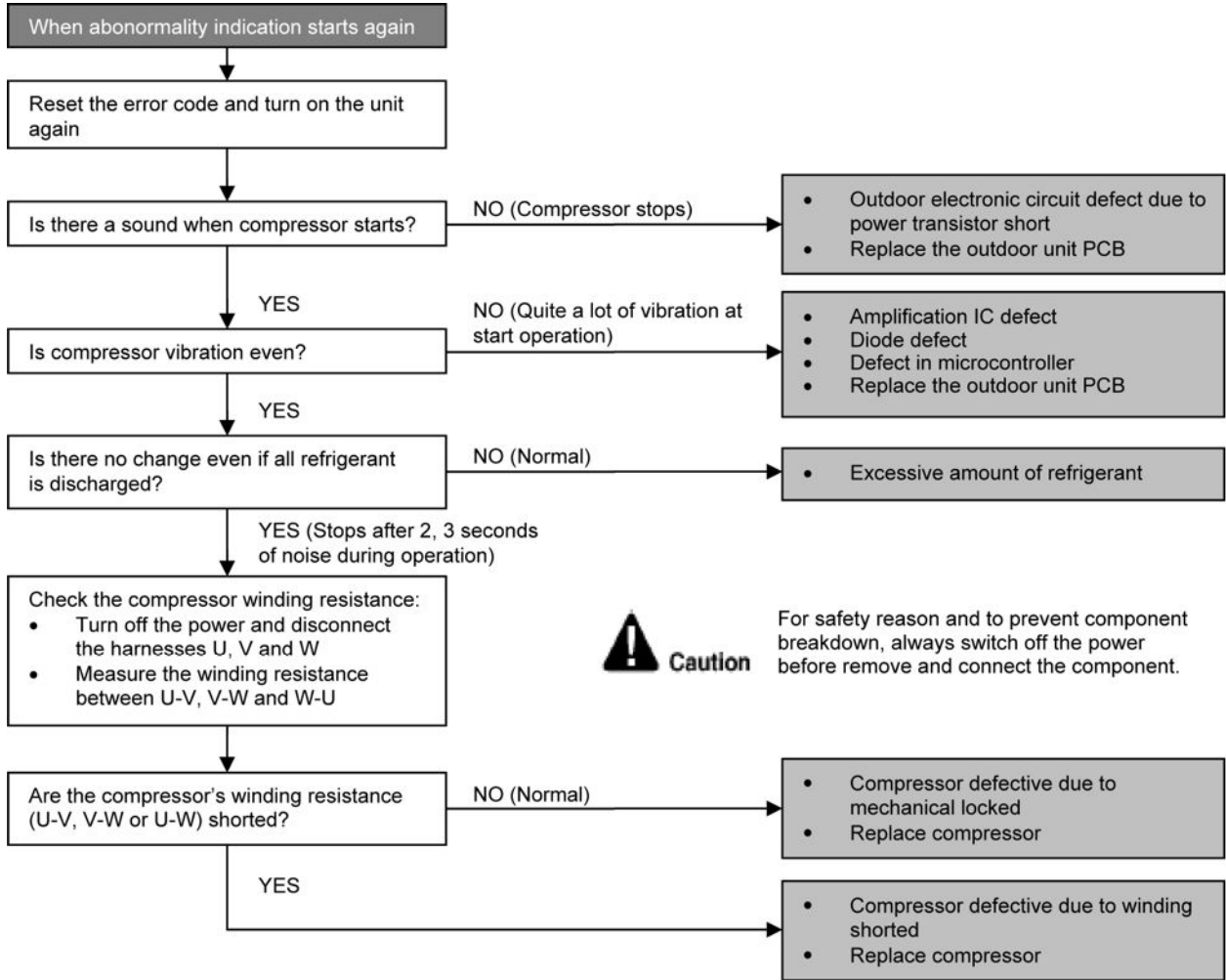
Malfunction Decision Conditions

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



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

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

16.1.1 To remove front grille

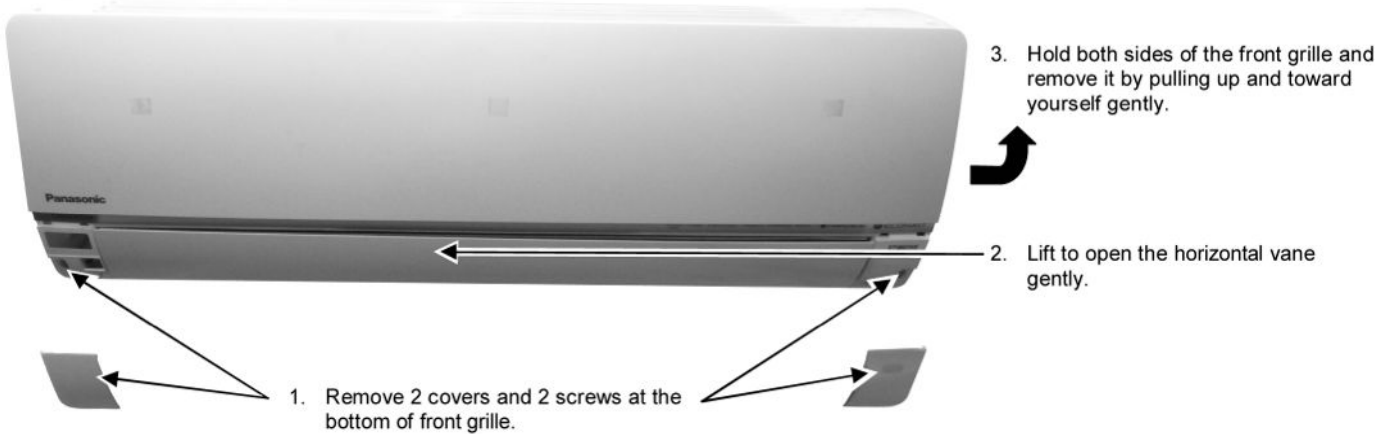


Figure 1

16.1.2 To remove electronic controller

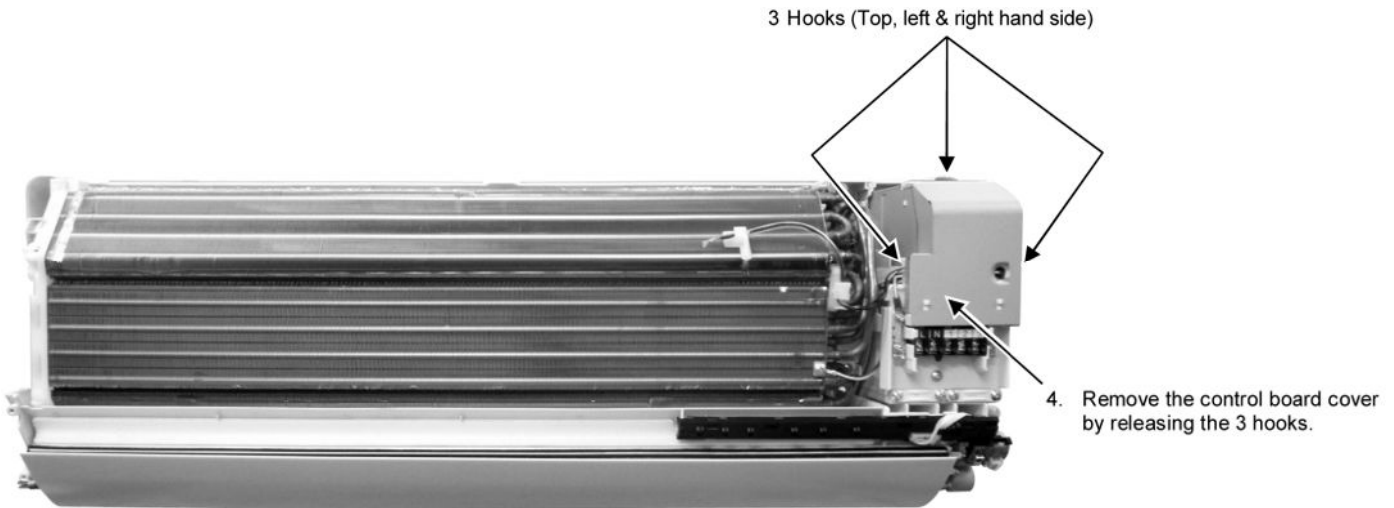


Figure 2

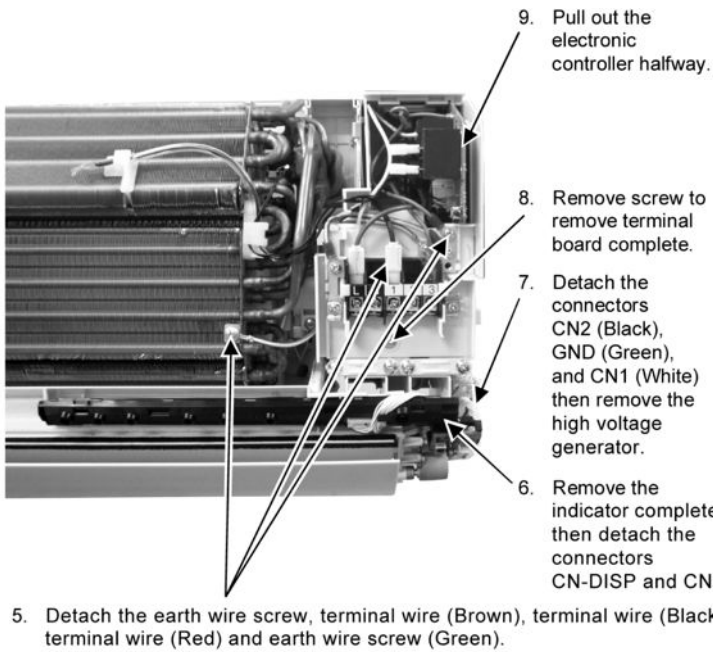


Figure 3

Figure 3

10. Detach 7 connectors as labeled from the electronic controller. Then pull out electronic controller gently.

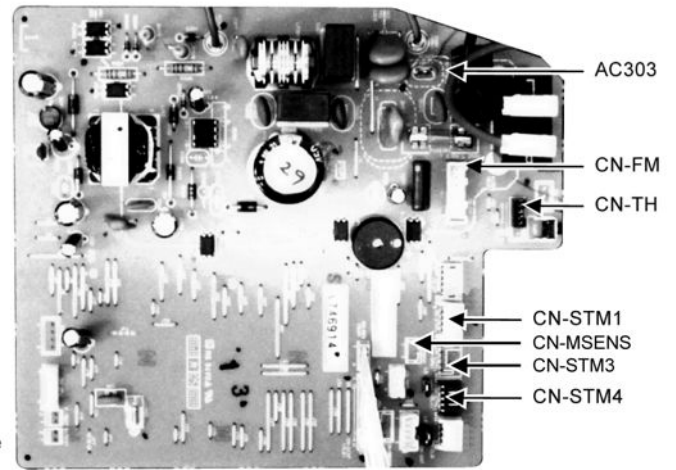


Figure 4

Figure 4

16.1.3 To remove discharge grille

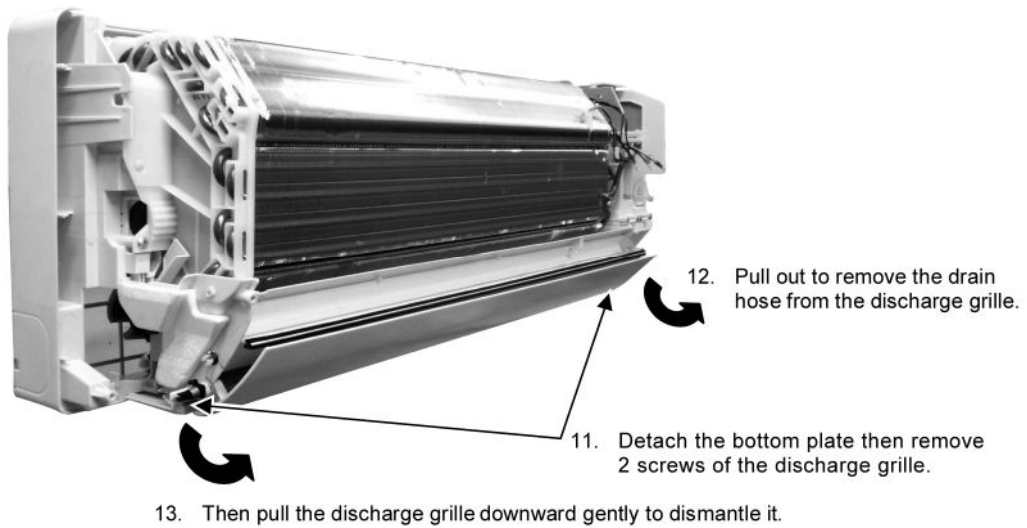


Figure 5

16.1.4 To remove control board

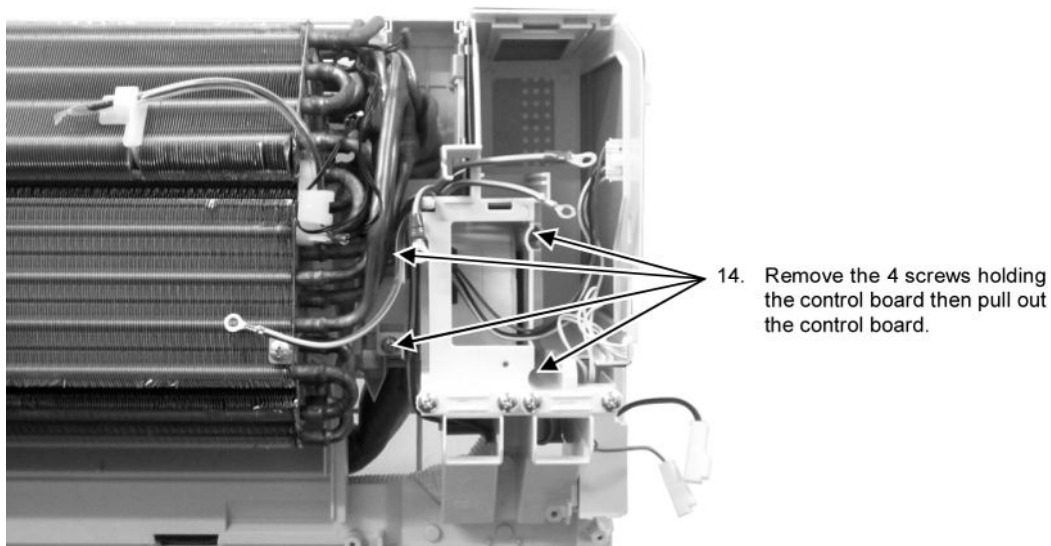


Figure 6

16.1.5 To remove cross flow fan and indoor fan motor

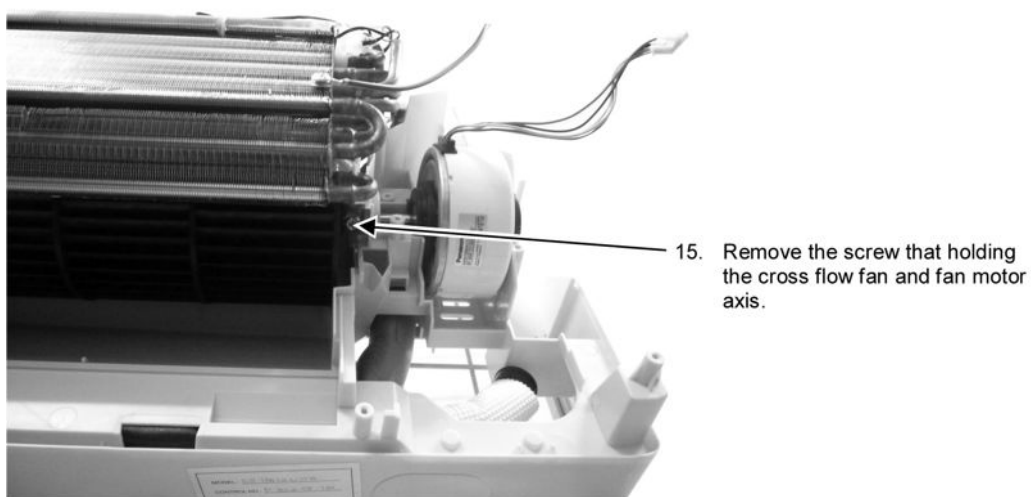


Figure 7

17. Remove the bearing by pulling it out gently.

16. Remove the screw from the evaporator.

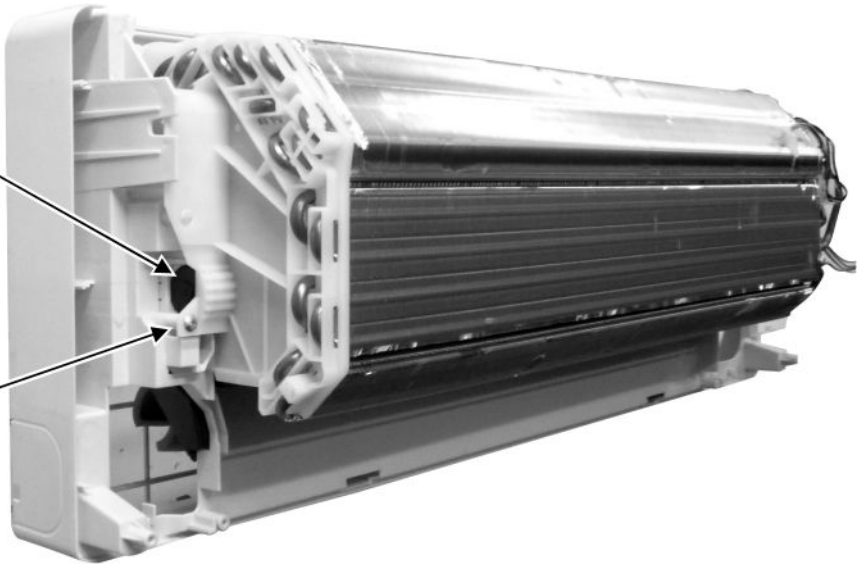
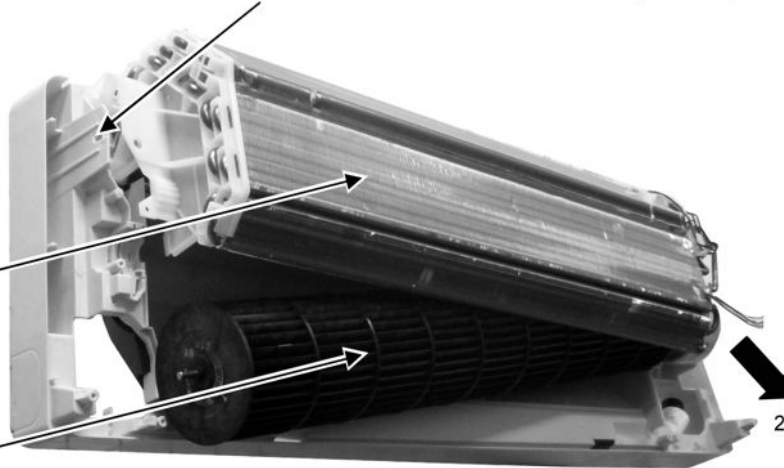


Figure 8

18. Push the holdfast to the left and lift up the evaporator.

Evaporator

Cross flow fan



20. Fan motor can be removed after the removal of the cross flow fan.

Reminder: To reinstall the fan motor, adjust the fan motor connector to 90° towards you before fixing control board.

19. Remove the cross flow fan from the unit by pulling it to the left and downward.

Figure 9

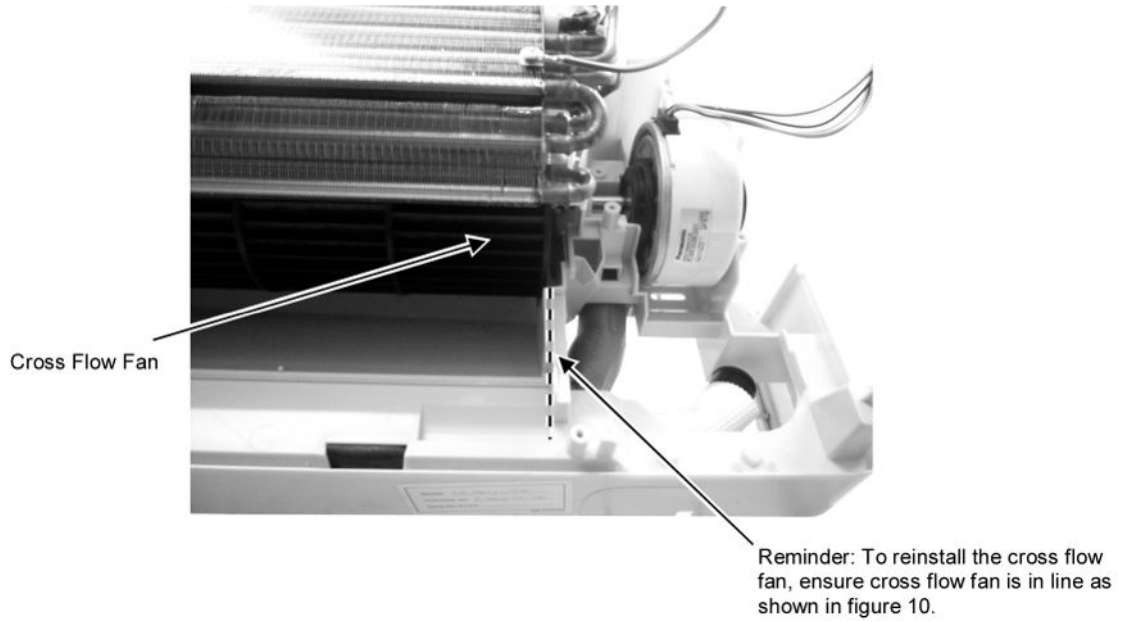


Figure 10

16.2 Outdoor Electronic Controller Removal Procedure

- 1 Remove the 4 screws of the Top Panel.

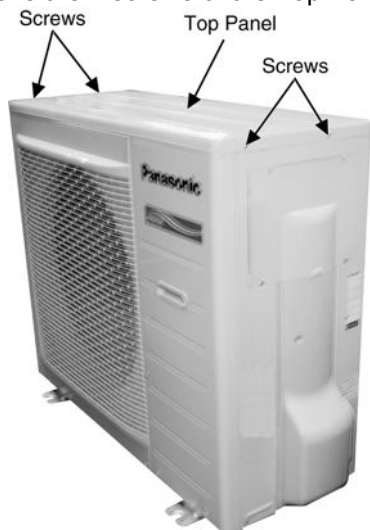


Fig.1

- 2 Remove the 10 screws of the Front Panel.

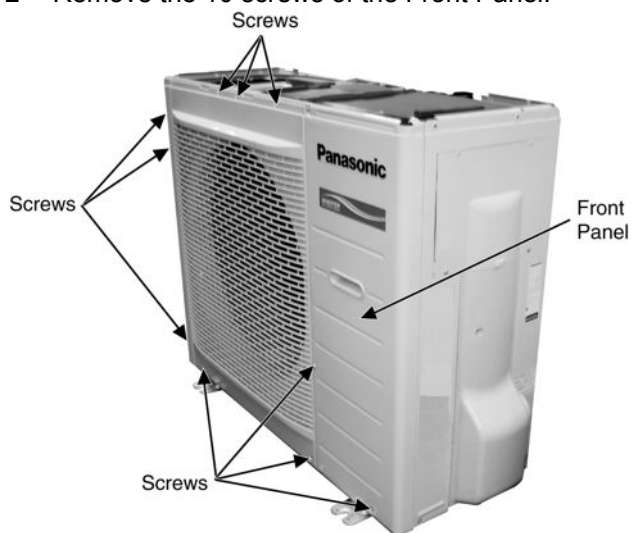


Fig.2

- 3 Remove the Top Cover of the Electronic Controller.



Fig.3

- 4 Remove the Control Board.

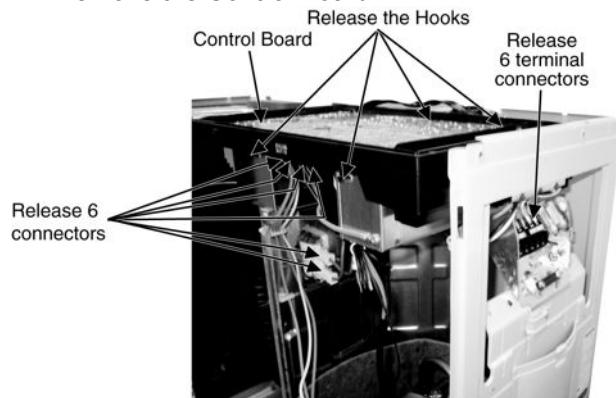


Fig.4

- 5 Remove the 8 screws of the Electronic Controller.

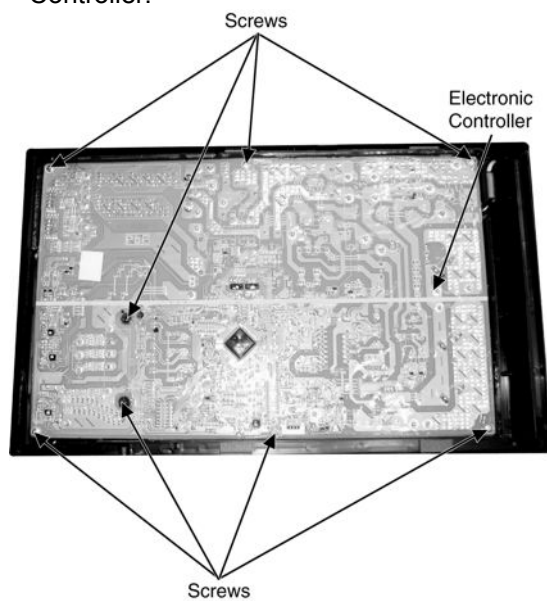


Fig.5

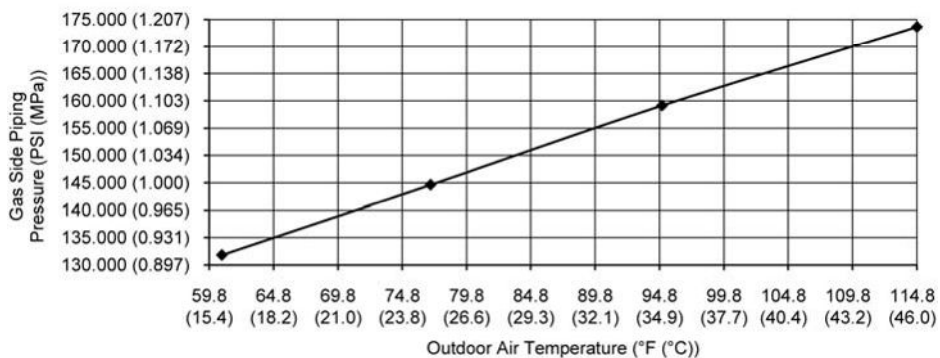
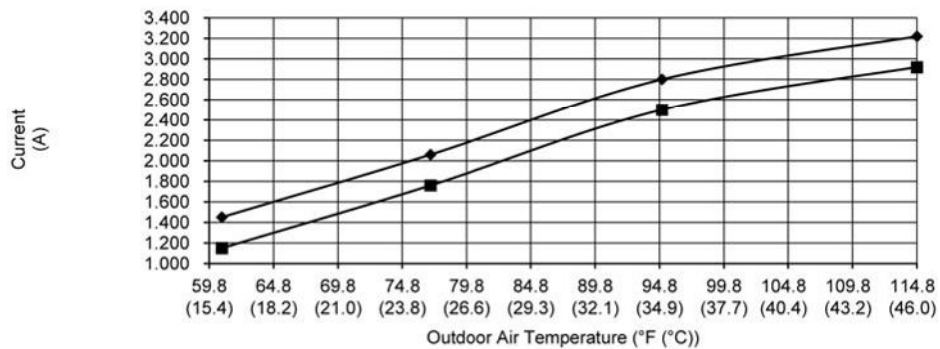
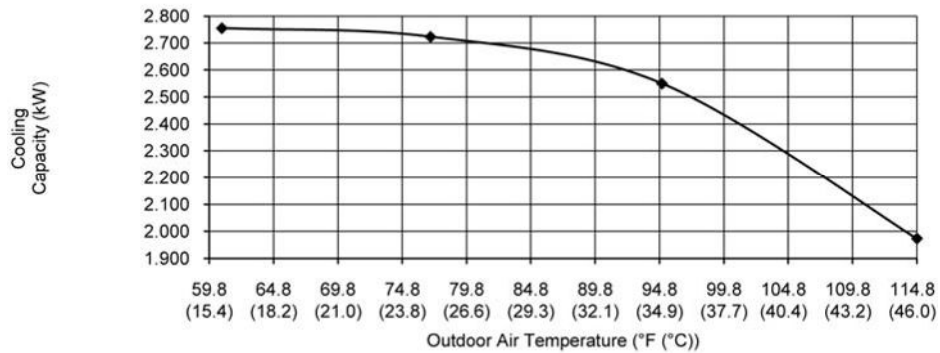
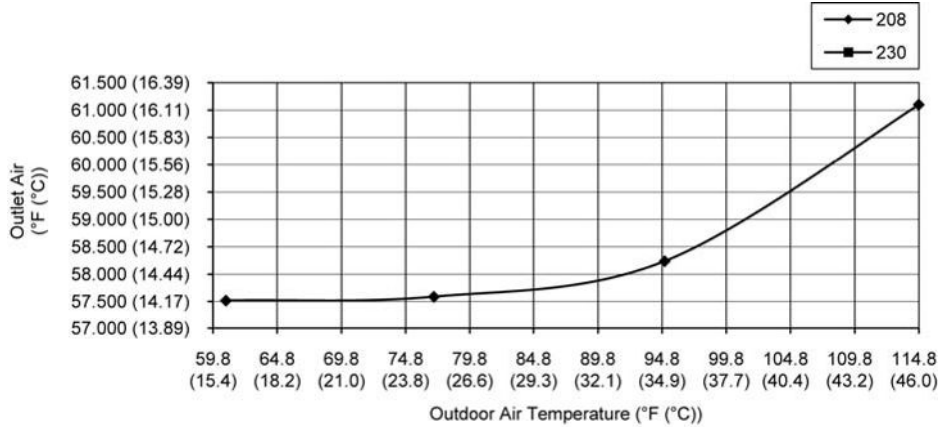
⚠ Caution! When handling electronic controller, be careful of electrostatic discharge.

17. Technical Data

17.1 Operation Characteristics

17.1.1 CS-XE9PKUA CU-XE9PKUA

- Cooling Characteristic
- [Condition] Indoor temperature: 81°F (27°C) (DBT), 66°F (19°C) (WBT)
 Piping Length: 24.6ft (7.5 m)
 Remote condition: High fan speed
 Comp. Hz: F_c



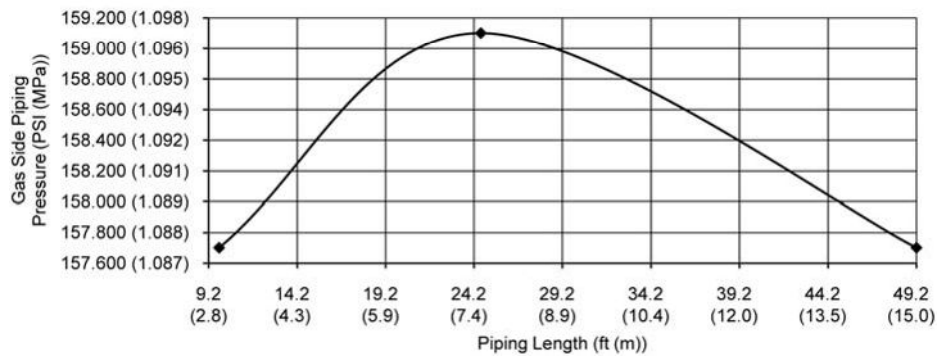
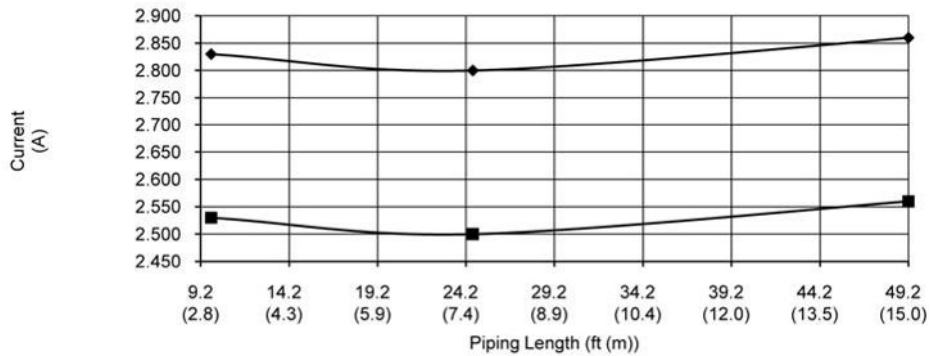
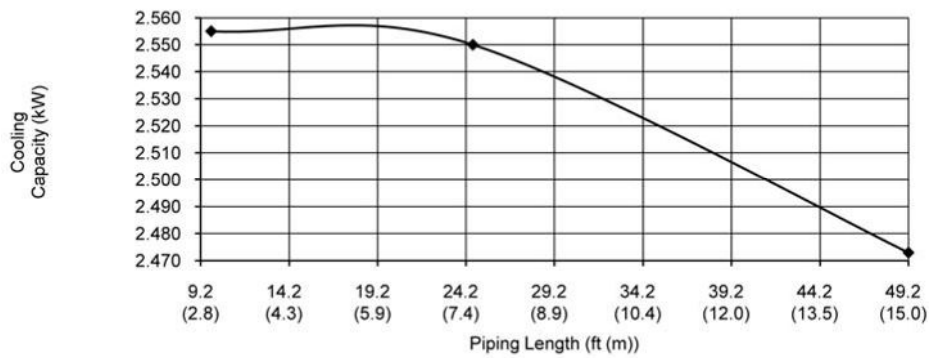
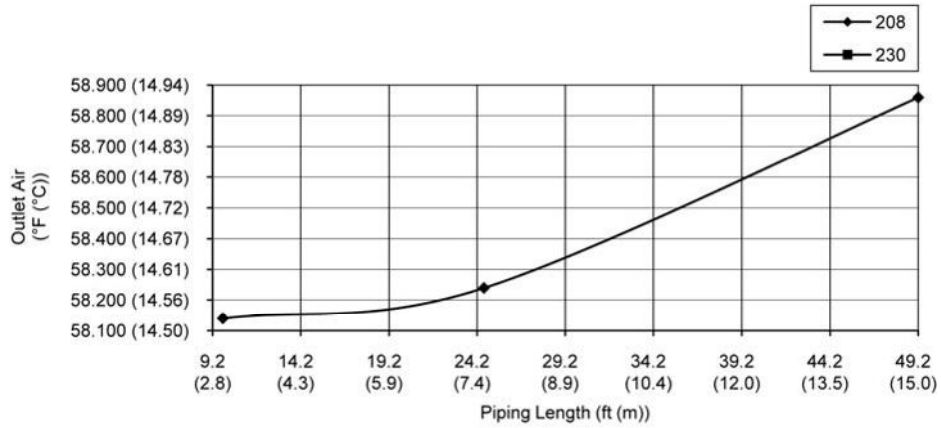
- Piping Length Characteristic

[Condition] Indoor temperature: 81°F (27°C) (DBT), 66°F (19°C) (WBT)

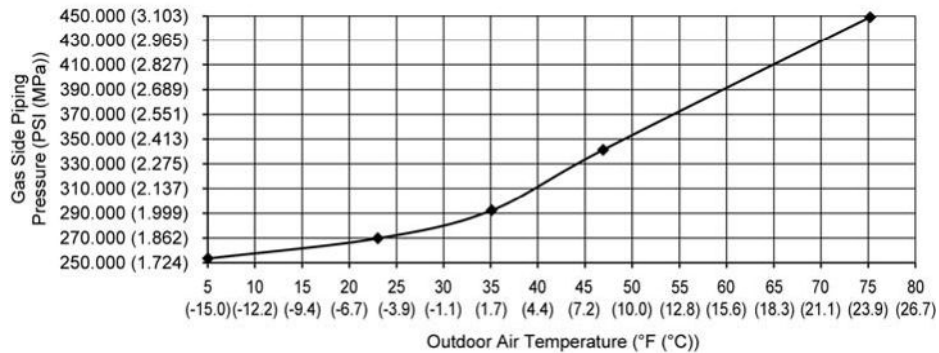
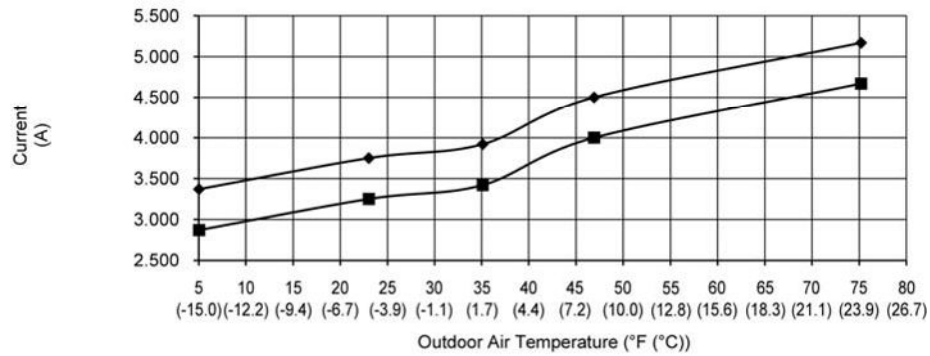
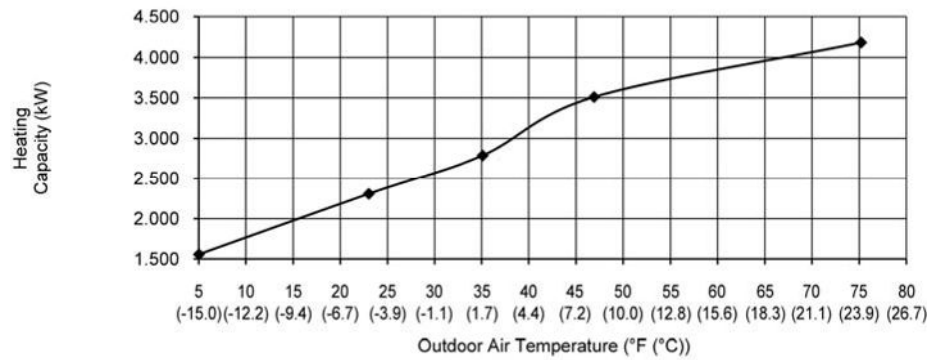
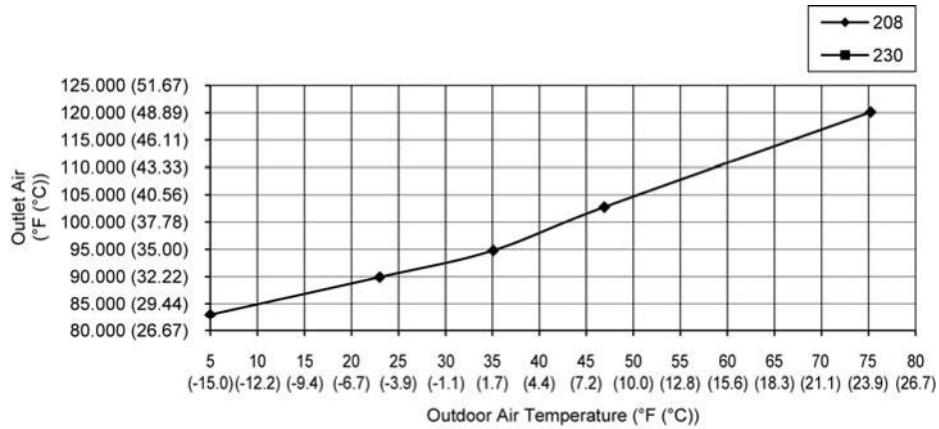
Outdoor temperature: 95°F (35°C) (DBT)

Remote condition: High fan speed

Comp. Hz: F_c

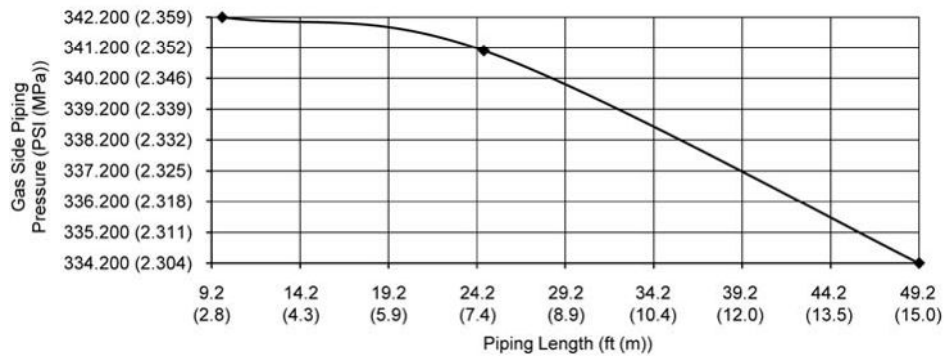
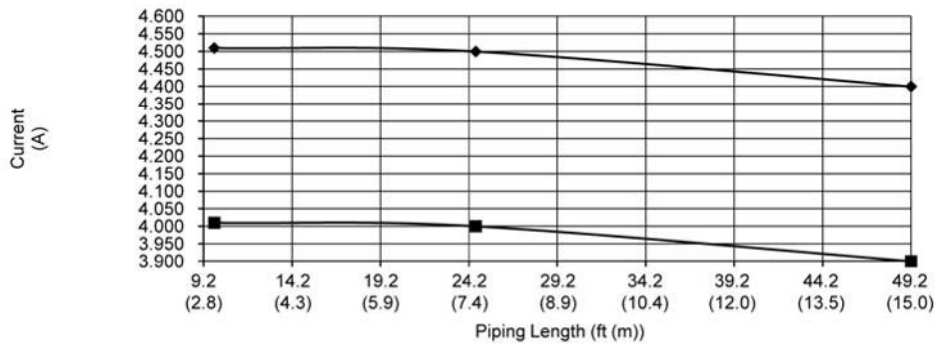
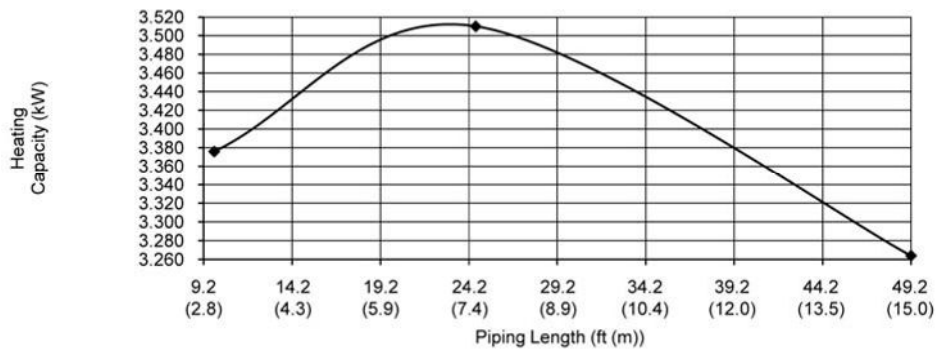
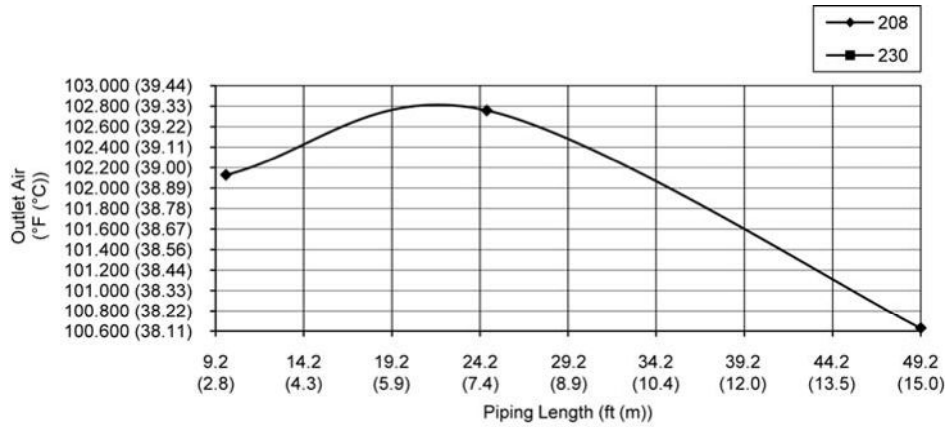


- Heating Characteristic
 [Condition] Indoor temperature: 68°F (20°C) (DBT)
 Piping Length: 24.6ft (7.5 m)
 Remote condition: High fan speed
 Comp. Hz: F_n



- Piping Length Characteristic

[Condition] Indoor temperature: 68°F (20°C) (DBT)
 Outdoor temperature: 47°F (8°C) (DBT), 43°F (6°C) (WBT)
 Remote condition: High fan speed
 Comp. Hz: F_h



17.1.2 CS-XE12PKUA CU-XE12PKUA

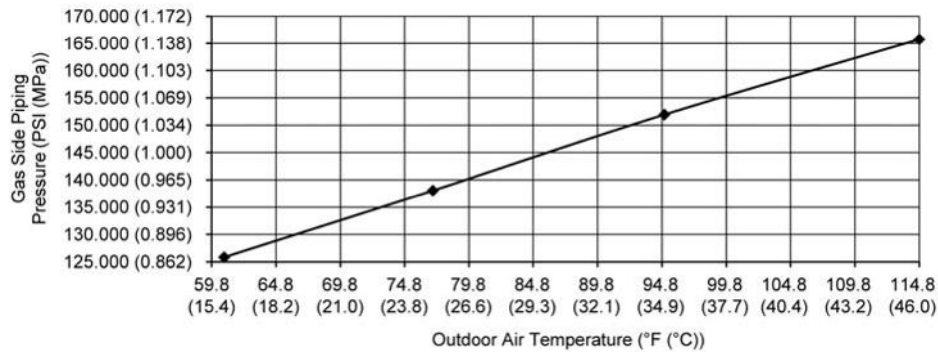
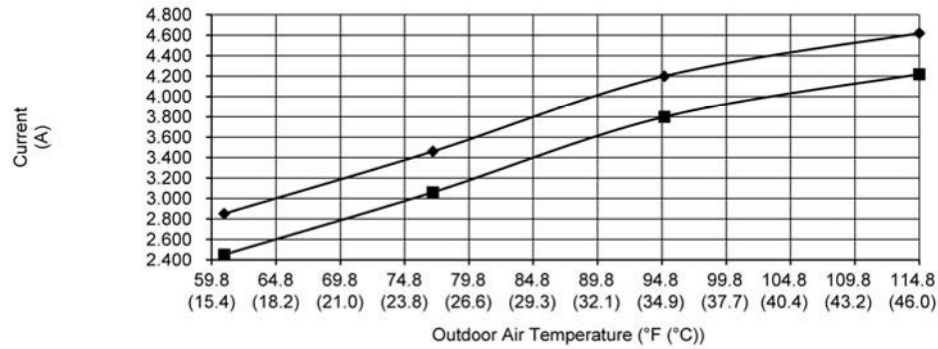
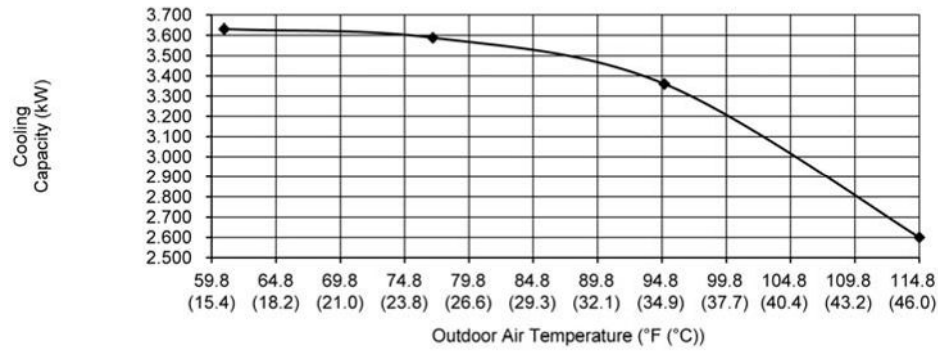
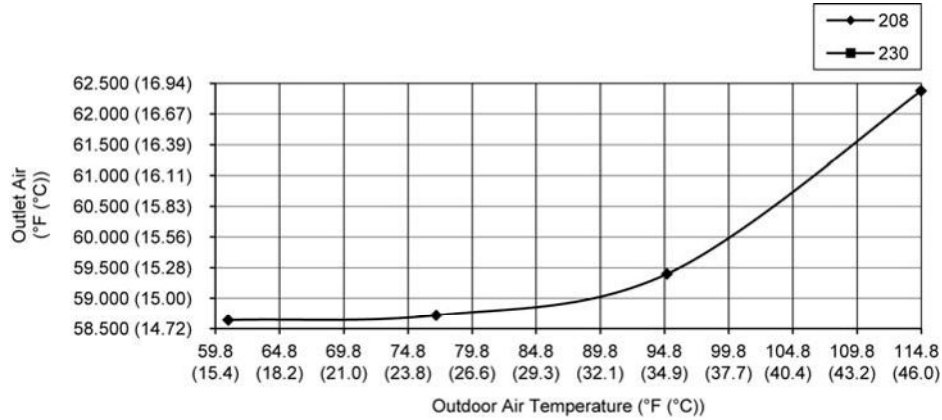
- Cooling Characteristic

[Condition] Indoor temperature: 81°F (27°C) (DBT), 66°F (19°C) (WBT)

Piping Length: 24.6ft (7.5 m)

Remote condition: High fan speed

Comp. Hz: F_c



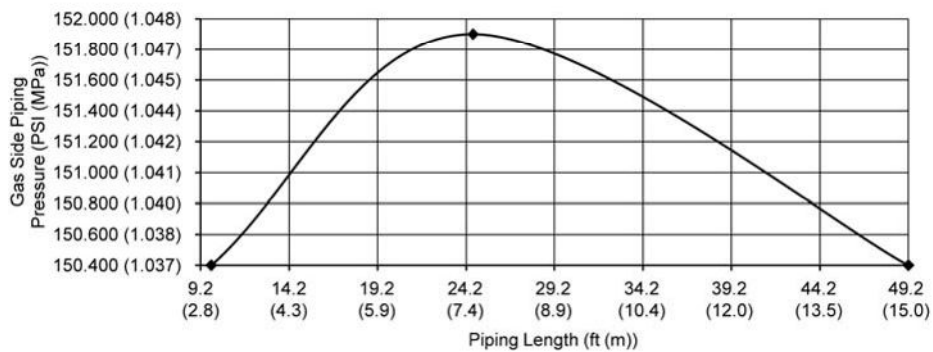
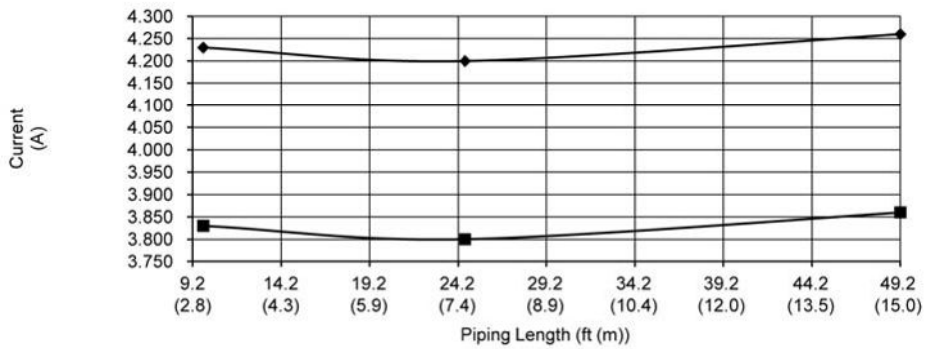
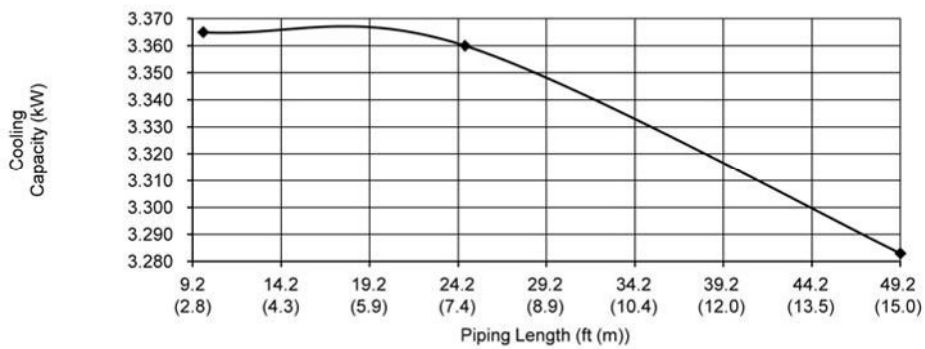
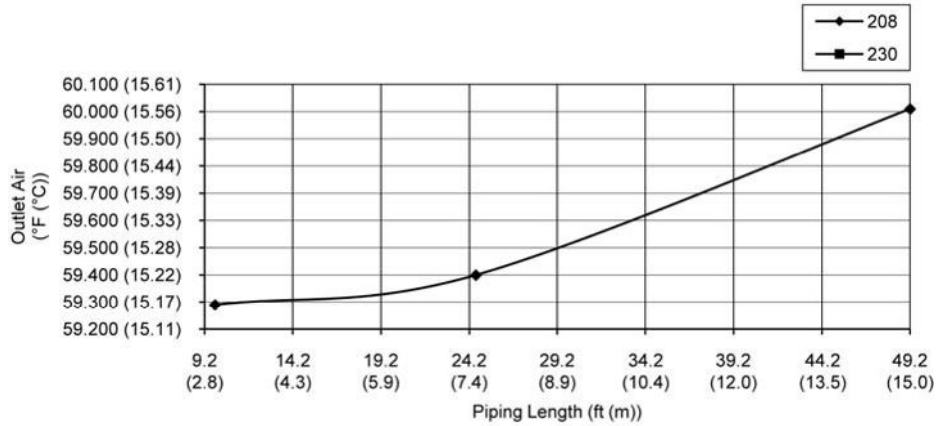
- Piping Length Characteristic

[Condition] Indoor temperature: 81°F (27°C) (DBT), 66°F (19°C) (WBT)

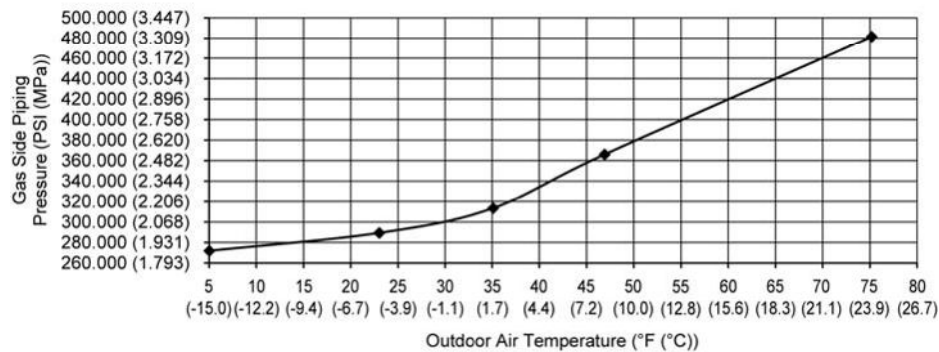
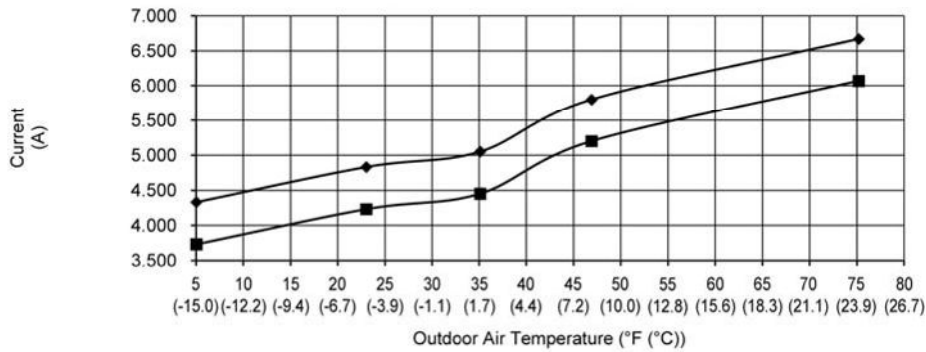
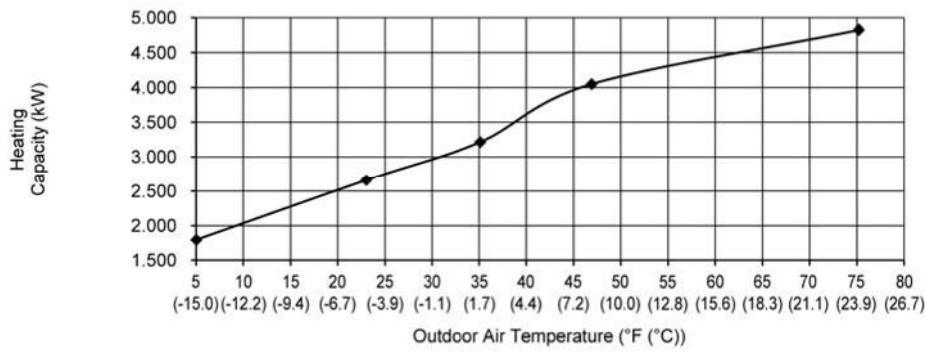
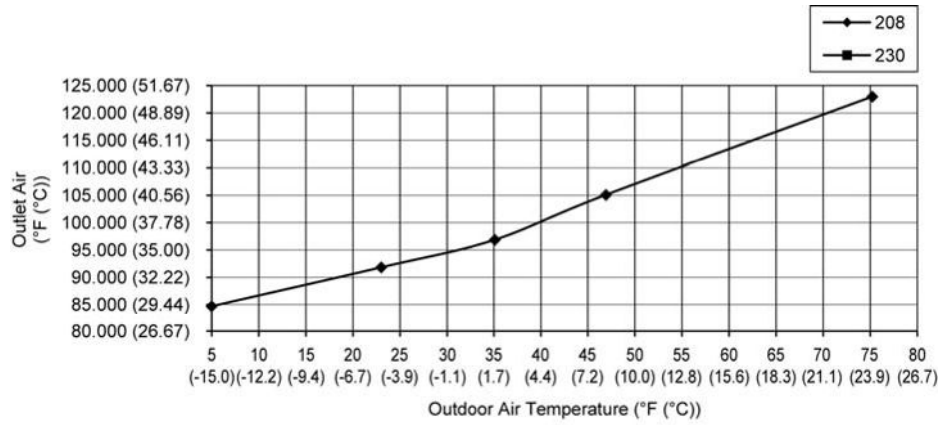
Outdoor temperature: 95°F (35°C) (DBT)

Remote condition: High fan speed

Comp. Hz: F_c

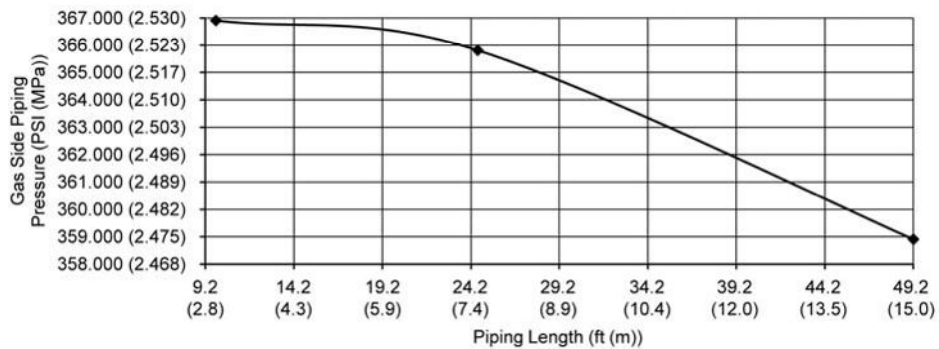
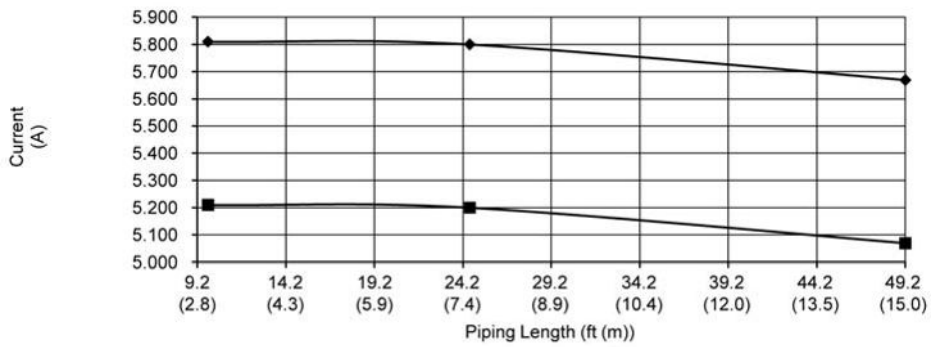
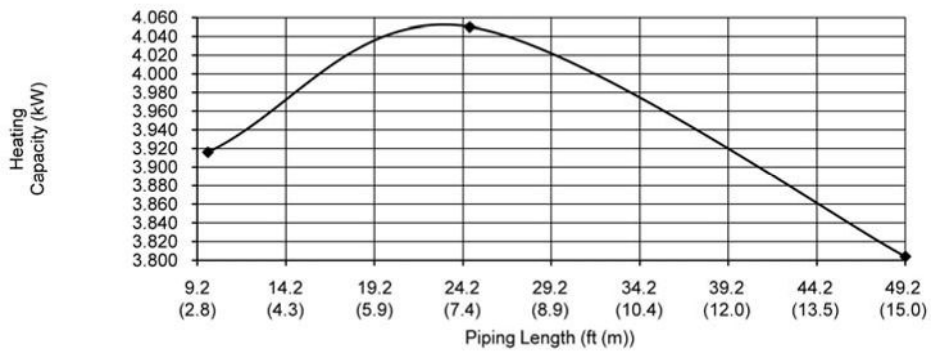
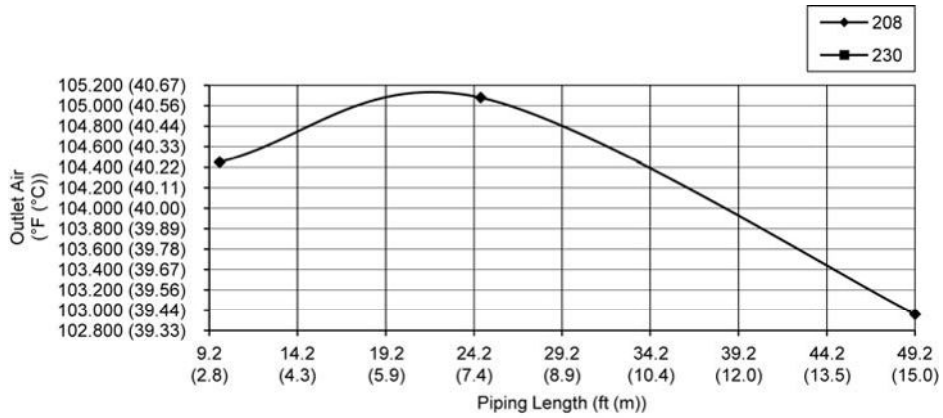


- Heating Characteristic
 [Condition] Indoor temperature: 68°F (20°C) (DBT)
 Piping Length: 24.6ft (7.5 m)
 Remote condition: High fan speed
 Comp. Hz: F_h



- Piping Length Characteristic

[Condition] Indoor temperature: 68°F (20°C) (DBT)
 Outdoor temperature: 47°F (8°C) (DBT), 43°F (6°C) (WBT)
 Remote condition: High fan speed
 Comp. Hz: F_h



17.2 Sensible Capacity Chart

- **CU-XE9PKUA**

208-230V Indoor wet bulb	Outdoor Temperature											
	86 °F (30 °C)			95 °F (35 °C)			104 °F (40 °C)			114.8 °F (46 °C)		
	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP
62.6°F (17.0 °C)	2.53	1.92	0.49	2.36	1.84	0.53	2.20	1.77	0.57	2.00	1.68	0.61
66.2°F (19.0 °C)				2.55		0.54						
67.1°F (19.5 °C)	2.78	2.01	0.50	2.60	1.93	0.54	2.41	1.86	0.58	2.20	1.77	0.63
71.6°F (22.0 °C)	3.03	2.08	0.51	2.83	2.00	0.55	2.63	1.93	0.59	2.39	1.84	0.64

- **CU-XE12PKUA**

208-230V Indoor wet bulb	Outdoor Temperature											
	86 °F (30 °C)			95 °F (35 °C)			104 °F (40 °C)			114.8 °F (46 °C)		
	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP
62.6°F (17.0 °C)	3.33	2.53	0.73	3.11	2.42	0.79	2.90	2.33	0.84	2.63	2.21	0.91
66.2°F (19.0 °C)				3.36		0.80						
67.1°F (19.5 °C)	3.66	2.65	0.75	3.42	2.54	0.80	3.18	2.45	0.86	2.89	2.33	0.93
71.6°F (22.0 °C)	3.99	2.74	0.76	3.73	2.64	0.82	3.47	2.55	0.87	3.15	2.43	0.94

TC - Total Cooling Capacity (kW)

SHC - Sensible Heat Capacity (kW)

IP - Input Power (kW)

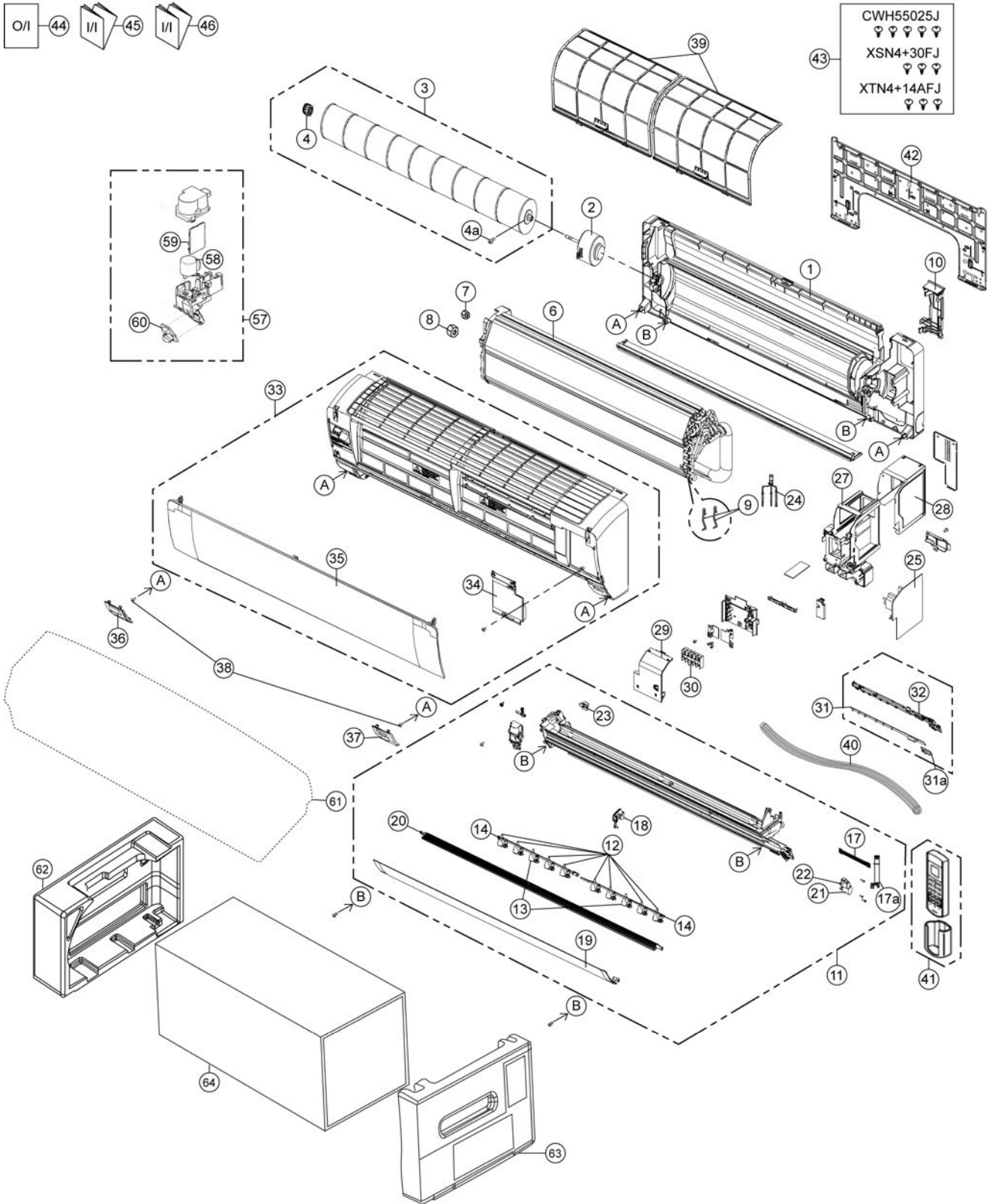
Indoor 80.6°F/66.2°F (27°C/19°C)

Outdoor 95.0°F/75.2°F (35°C/24°C)

18. Exploded View and Replacement Parts List

18.1 Indoor Unit

18.1.1 CS-XE9PKUA CS-XE12PKUA



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.

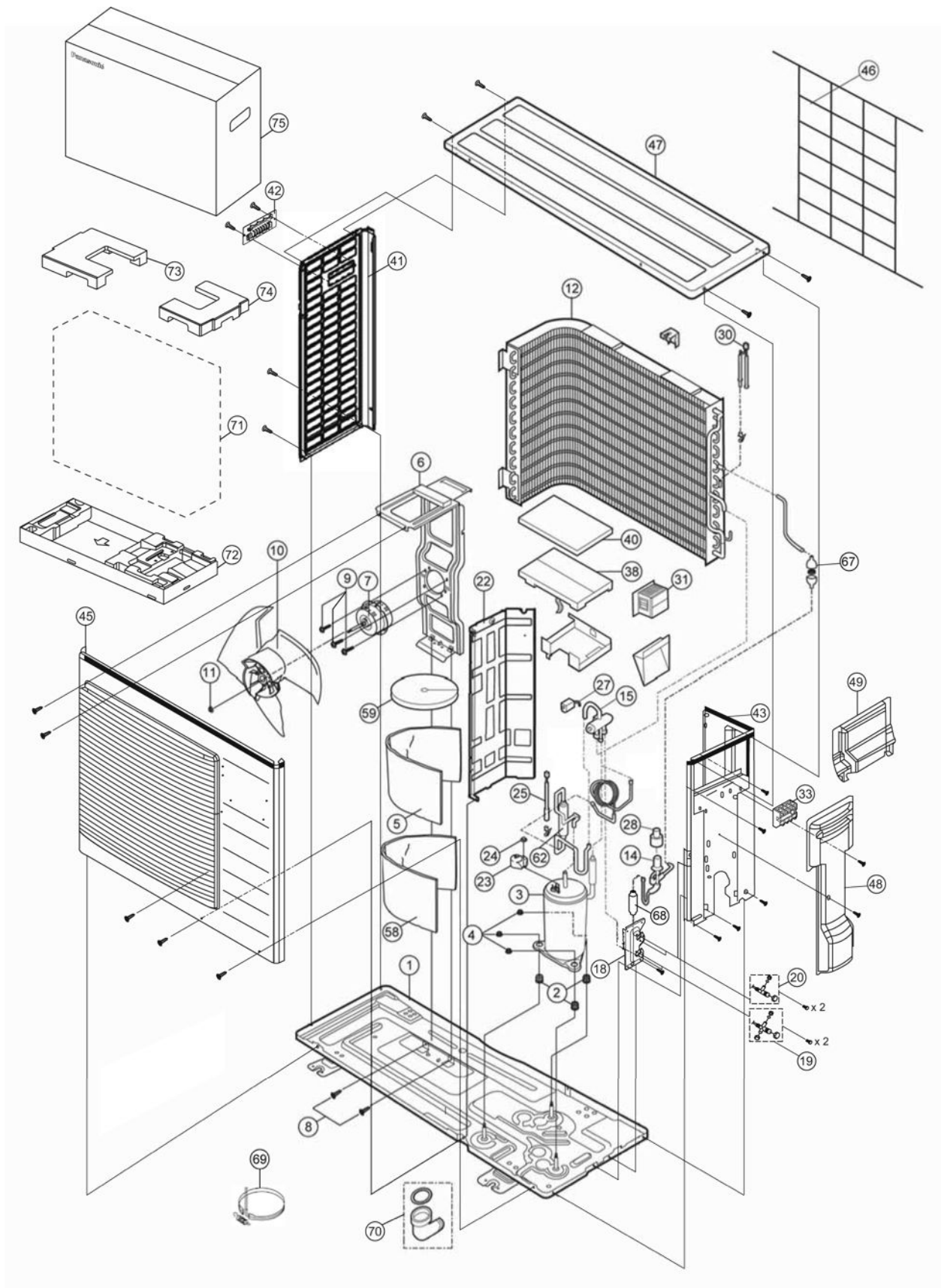
SAFETY	REF. NO.	PART NAME & DESCRIPTION	QTY.	CS-XE9PKUA	CS-XE12PKUA	REMARK
	1	CHASSIS COMPLETE	1	CWD50C1730	←	
⚠	2	FAN MOTOR	1	ARW7715AC	←	O
	3	CROSS - FLOW FAN COMPLETE	1	CWH02C1137	←	
	4	BEARING ASSY	1	CWH64K1010	←	O
	4a	SCREW – CROSS - FLOW FAN	1	CWH551146	←	
	6	EVAPORATOR	1	CWB30C4585	CWB30C4588	
	7	FLARE NUT (LIQUID)	1	CWT251030	←	
	8	FLARE NUT (GAS)	1	CWT251031	CWT251032	
	9	CLIP FOR SENSOR	2	CWH711019	←	
	10	BACK COVER CHASSIS	1	CWD933463	←	
	11	DISCHARGE GRILLE COMPLETE	1	CWE20C3419	←	
	12	VERTICAL VANE	8	CWE241389	←	
	13	VERTICAL VANE	2	CWE241409	←	
	14	CONNECTING BAR	2	CWE261272	←	
	17	LEAD WIRE - COMPLETE	1	CWA68C0784	←	O
	17a	LEAD WIRE - COMPLETE	1	CWA68C0786	←	O
	18	FULCRUM	1	CWH621157	←	
	19	HORIZONTAL VANE COMPLETE	1	CWE24C1422	←	
	20	HORIZONTAL VANE COMPLETE	1	CWE24C1421	←	
⚠	21	AIR SWING MOTOR	1	CWA981241	←	O
⚠	22	AIR SWING MOTOR	1	CWA981299	←	O
	23	CAP - DRAIN TRAY	1	CWH521259	←	
	24	SENSOR COMPLETE	1	CWA50C2800	←	
⚠	25	ELECTRONIC CONTROLLER - MAIN	1	CWA73C7809	CWA73C7810	O
	27	CONTROL BOARD CASING	1	CWH102564A	←	
	28	CONTROL BOARD TOP COVER	1	CWH131531	←	
	29	CONTROL BOARD FRONT COVER CO.	1	CWH13C1309	←	
⚠	30	TERMINAL BOARD COMPLETE	1	CWA28C2616	←	
⚠	31	ELECTRONIC CONTROLLER - INDICATOR	1	CWA747457	←	O
⚠	31a	ELECTRONIC CONTROLLER - RECEIVER	1	CWA747456	←	O
	32	INDICATOR HOLDER	1	CWD933466	←	
	33	FRONT GRILLE COMPLETE	1	CWE11C5689	←	O
	34	GRILLE DOOR COMPLETE	1	CWE14C1099	←	
	35	INTAKE GRILLE COMPLETE	1	CWE22K1610	←	
	36	DECORATION BASE (LEFT)	1	CWE35K1166	←	
	37	DECORATION BASE (RIGHT)	1	CWE351326	←	
	38	SCREW - FRONT GRILLE	2	XTT4+16CFJ	←	
	39	AIR FILTER	2	CWD001326	←	O
	40	DRAIN HOSE	1	CWH851173	←	
	41	REMOTE CONTROL COMPLETE	1	CWA75C4246	←	O
	42	INSTALLATION PLATE	1	CWH361134	←	
	43	BAG COMPLETE - INSTALLATION SCREW	1	CWH82C1705	←	
	44	OPERATING INSTRUCTION	1	CWF569182	←	
	45	INSTALLATION INSTRUCTION	1	CWF615968	←	
	46	INSTALLATION INSTRUCTION	1	CWF615977	←	
	57	SENSOR COMPLETE (ECO)	1	CWA50C3005	←	
⚠	58	AIR SWING MOTOR (ECO)	1	CWA981298	←	O
⚠	59	ELECTRONIC CONTROLLER	1	CWA746917	←	O
⚠	60	ELECTRONIC CONTROLLER	1	CWA747279	←	O

SAFETY	REF. NO.	PART NAME & DESCRIPTION	QTY.	CS-XE9PKUA	CS-XE12PKUA	REMARK
	61	BAG	1	CWG861515	←	
	62	SHOCK ABSORBER (L)	1	CWG713484	←	
	63	SHOCK ABSORBER (R)	1	CWG713485	←	
	64	C.C.CASE	1	CWG568509	←	

(NOTE)

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

18.2 Outdoor 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.	CU-XE9PKUA	CU-XE12PKUA	REMARK
	1	CHASSIS COMPLETE	1	CWD52K1347A	←	
	2	ANTI - VIBRATION BUSHING	3	CWH50077	←	
⚠	3	COMPRESSOR	1	5RS102XHB21	←	O
	4	NUT - COMPRESSOR MOUNT	3	CWH56000J	←	
	5	SOUND PROOF MATERIAL	1	CWG302850	←	
	6	FAN MOTOR BRACKET	1	CWD541153	←	
⚠	7	FAN MOTOR	1	ARW8407AC	←	O
	8	SCREW - FAN MOTOR BRACKET	2	CWH551217	←	
	9	SCREW - FAN MOTOR MOUNT	4	CWH551106J	←	
	10	PROPELLER FAN ASSY	1	CWH03K1065	←	
	11	NUT - PROPELLER FAN	1	CWH56053J	←	
	12	CONDENSER	1	CWB32C3796	←	
	14	EXPANSION VALVE	1	CWB051016J	←	O
	15	4-WAYS VALVE	1	CWB001057	←	O
	18	HOLDER COUPLING	1	CWH351228A	←	
	19	3-WAY VALVE (GAS)	1	CWB011784	CWB011785	O
	20	2-WAYS VALVE (LIQUID)	1	CWB021180J	←	O
	22	SOUND PROOF BOARD	1	CWH151236	←	
	23	TERMINAL COVER	1	CWH171039A	←	
	24	NUT - TERMINAL COVER	1	CWH7080300J	←	
	25	SENSOR CO	1	CWA50C2343	←	O
⚠	27	V-COIL COMPLETE (4-WAY VALVE)	1	CWA43C2392	←	O
⚠	28	V-COIL COMPLETE (EXP. VALVE)	1	CWA43C2393	←	O
	30	SENSOR – COMPLETE (AIR TEMP AND PIPE TEMP)	1	CWA50C2710	←	
⚠	31	REACTOR	1	G0C193J00004	←	O
⚠	33	TERMINAL BOARD ASSY	1	CWA28K1154	←	O
⚠	38	ELECTRONIC CONTROLLER - MAIN	1	CWA73C7718R	CWA73C7719R	O
	40	CONTROL BOARD COVER-TOP	1	CWH131333	←	O
	41	CABINET SIDE PLATE (LEFT)	1	CWE041733A	←	
	42	HANDLE	1	CWE161010	←	
	43	CABINET SIDE PLATE (RIGHT)	1	CWE041732A	←	
	45	CABINET FRONT PLATE CO.	1	CWE06K1101	←	
	46	WIRE NET	1	CWD041155A	←	
	47	CABINET TOP PLATE	1	CWE031131A	←	
	48	CONTROL BOARD COVER - COMPLETE	1	CWH13C1308	←	
	49	CONTROL BOARD COVER	1	CWH131409A	←	
	58	SOUND PROOF MATERIAL	1	CWG302851	←	
	59	SOUND PROOF MATERIAL	1	CWG302630	←	
	62	DISCHARGE MUFFLER (4-WAYS VALVE)	1	CWB121047	←	
	67	STRAINER	1	CWB111076	←	
	68	DISCHARGE MUFFLER (EXP. VALVE)	1	CWB121021	←	
	69	HEATER	1	CWA341094	←	
	70	BAG - COMPLETE	1	CWG87C900	←	
	71	BAG	1	CWG861461	←	
	72	BASE BOARD - COMPLETE	1	CWG62C1131	←	
	73	SHOCK ABSORBER (LEFT)	1	CWG713217	←	

SAFETY	REF. NO.	PART NAME & DESCRIPTION	QTY.	CU-XE9PKUA	CU-XE12PKUA	REMARK
	74	SHOCK ABSORBER (RIGHT)	1	CWG713218	←	
	75	C.C.CASE	1	CWG568360	←	

(NOTE)

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