

Service Manual

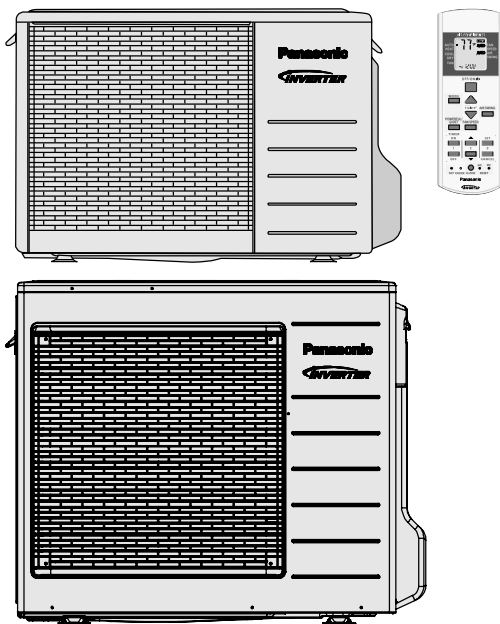
Air Conditioner



Indoor Unit
CS-E12RB4UW
CS-E18RB4UW

Outdoor Unit
CU-E12RB4U
CU-E18RB4U


Destination
USA
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.



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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 is strongly recommended to install with Earth Leakage Circuit Breaker (ELCB) or Residual Current Device (RCD). Otherwise, it may cause electrical shock and fire in case equipment breakdown or insulation breakdown.
10.	Do not use joint cable for indoor / outdoor connection cable. Use the specified Indoor/Outdoor connection cable, refer to installation instruction CONNECT THE CABLE TO THE INDOOR UNIT and connect tightly for indoor / outdoor connection. Clamp the cable so that no external force will be acted on the terminal. If connecting or fixing is not perfect, it will cause heat up or fire at the connection.
11.	Wire routing must be properly arranged so that control board cover is fixed properly. If control board cover is not fixed perfectly, it will cause heat-up or fire at the connection point of terminal, fire or electrical shock.
12.	When install or relocate air conditioner, do not let any substance other than the specified refrigerant, eg. air etc. mix into refrigeration cycle (piping). (Mixing of air etc. will cause abnormal high pressure in refrigeration cycle and result in explosion, injury etc.).
13.	Do not install outdoor unit near handrail of veranda. When installing air-conditioner unit at veranda of high rise building, child may climb up to outdoor unit and cross over the handrail and causing accident.
14.	This equipment must be properly earthed. Earth line must not be connected to gas pipe, water pipe, earth of lightning rod and telephone. Otherwise, it may cause electric shock in case equipment breakdown or insulation breakdown. 
15.	Keep away from small children, the thin film may cling to nose and mouth and prevent breathing. 
16.	Do not use unspecified cord, modified cord, joint cord or extension cord for power supply cord. Do not share the single outlet with other electrical appliances. Poor contact, poor insulation or over current will cause electrical shock or fire. 
17.	Tighten the flare nut with torque wrench according to specified method. If the flare nut is over-tightened, after a long period, the flare may break and cause refrigerant gas leakage. 
18.	For R410A model, use piping, flare nut and tools which is specified for R410A refrigerant. Using of existing (R22) piping, flare nut and tools may cause abnormally high pressure in the refrigerant cycle (piping), and possibly result in explosion and injury. Thickness 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 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 (for E12***) and AWG12 (for E18***) 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-E12RB4UW						
			Outdoor	CU-E12RB4U						
Performance Test Condition				ARI						
Power Supply			Phase, Hz	Single, 60						
			V	208			230			
				Min.	Mid.	Max.	Min.	Mid.	Max.	
Cooling	Capacity		kW	1.20	3.48	3.90	1.20	3.48	3.90	
			BTU/h	4100	11900	13300	4100	11900	13300	
			kcal/h (Frig./h)	—	—	—	—	—	—	
	Running Current		A	—	6.0	—	—	5.2	—	
	Input Power		W	250	1.15k	1.32k	250	1.15k	1.32k	
	Annual Consumption		kWh	—	—	—	—	—	—	
	EER		W/W	4.80	3.03	2.95	4.80	3.03	2.95	
			BTU/hW	16.40	10.30	10.05	16.40	10.30	10.05	
			kcal/hW	—	—	—	—	—	—	
	Power Factor		%	—	92	—	—	96	—	
	Indoor Noise (H / L / QLo)		dB-A	34 / 28 / 25			34 / 28 / 25			
			Power Level dB	50 / — / —			50 / — / —			
	Outdoor Noise (H / L / QLo)		dB-A	51 / — / —			51 / — / —			
			Power Level dB	66 / — / —			66 / — / —			
	Heating	Capacity		kW	1.20	3.99	4.77	1.20	3.99	4.77
				BTU/h	4100	13600	16300	4100	13600	16300
kcal/h (Frig./h)				—	—	—	—	—	—	
Running Current		A	—	6.9	—	—	6.1	—		
Input Power		W	230	1.36k	1.71k	230	1.36k	1.71k		
COP		W/W	5.22	2.93	2.79	5.22	2.93	2.79		
		BTU/hW	17.80	10.00	9.50	17.80	10.00	9.50		
		kcal/hW	—	—	—	—	—	—		
Power Factor		%	—	95	—	—	97	—		
Indoor Noise (H / L / QLo)		dB-A	34 / 30 / 27			34 / 30 / 27				
		Power Level dB	50/ — / —			50 / — / —				
Outdoor Noise (H / L / QLo)		dB-A	51 / — / —			51 / — / —				
		Power Level dB	66 / — / —			66 / — / —				
Max Current (A) / Max Input Power (W)				7.80 / 1.71k						
Starting Current (A)				6.9						
Compressor	Type		Hermetic Motor (Rotary)							
	Motor Type		Brushless (4-poles)							
	Output Power	W	700							

Model				Indoor	CS-E12RB4UW	
				Outdoor	CU-E12RB4U	
Indoor Fan	Type				BACKWARD FAN	
	Material				ABS	
	Motor Type				DC / Transistor (8-poles)	
	Input Power			W	—	
	Output Power			W	40	
	Speed	QLo	Cool	rpm	330	
			Heat	rpm	410	
		Lo	Cool	rpm	370	
			Heat	rpm	460	
		Me	Cool	rpm	460	
			Heat	rpm	540	
		Hi	Cool	rpm	560	
			Heat	rpm	620	
		SHi	Cool	rpm	600	
			Heat	rpm	650	
Outdoor Fan	Type				Propeller Fan	
	Material				PP	
	Motor Type				DC (8-poles)	
	Input Power			W	—	
	Output Power			W	40	
	Speed	Hi	Cool	rpm	830	
			Heat	rpm	820	
Min Circuit Ampacity				15.0		
Max. Overcurrent Protection				15.0		
SEER / HSPF				18.00 / 9.00		
Moisture Removal			L/h (Pt/h)	1.9 (4.0)		
Indoor Airflow	QLo	Cool	m³/min (ft³/min)	6.7 (240)		
		Heat	m³/min (ft³/min)	7.7 (270)		
	Lo	Cool	m³/min (ft³/min)	7.3 (260)		
		Heat	m³/min (ft³/min)	8.5 (300)		
	Me	Cool	m³/min (ft³/min)	8.8 (310)		
		Heat	m³/min (ft³/min)	9.8 (350)		
	Hi	Cool	m³/min (ft³/min)	10.5 (370)		
		Heat	m³/min (ft³/min)	11.1 (390)		
	SHi	Cool	m³/min (ft³/min)	11.2 (400)		
		Heat	m³/min (ft³/min)	11.6 (410)		
Outdoor Airflow	Hi	Cool	m³/min (ft³/min)	31.0 (1095)	31.0 (1095)	
		Heat	m³/min (ft³/min)	31.0 (1095)	31.0 (1095)	
Refrigeration Cycle	Control Device			Expansion Valve		
	Refrigerant Oil		cm³	FV50S (320)		
	Refrigerant Type		g (oz)	R410A, 980 (34.6)		
Dimension	Height (I/D / O/D / PANEL)		mm (inch)	260 (10-1/4) / 540 (21-9/32) / 51 (2-1/32)		
	Width (I/D / O/D / PANEL)		mm (inch)	575 (22-21/32) / 780 (30-23/32) / 700 (27-9/16)		
	Depth (I/D / O/D / PANEL)		mm (inch)	575 (22-21/32) / 289 (11-13/32) / 700 (27-9/16)		
Weight	Net (I/D / O/D / PANEL)		kg (lb)	18 (40) / 37 (82) / 2.5 (6)		

Model		Indoor	CS-E12RB4UW	
		Outdoor	CU-E12RB4U	
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 (ft)	30 (0.098)	
	Length	mm (ft)	193 (0.633)	
Indoor Heat Exchanger	Fin Material		Aluminium (Pre Coat)	
	Fin Type		Slit Fin	
	Row × Stage × FPI		2 × 10 × 18	
	Size (W × H × L)	mm (ft)	1330:1270 × 210 × 25.4 (4.363:4.166 × 0.689 × 0.083)	
Outdoor Heat Exchanger	Fin Material		Aluminium (Blue Coated)	
	Fin Type		Corrugated Fin	
	Row × Stage × FPI		2 × 24 × 17	
	Size (W × H × L)	mm (ft)	36.4 × 504 × 713:684 (0.119 × 1.653 × 2.339:2.244)	
Air Filter	Material		–	
	Type		–	
Power Supply			Outdoor	
Power Supply Cord		A	Nil	
Thermostat			Electronic Control	
Protection Device			Electronic Control	
			Dry Bulb	Wet Bulb
Indoor Operation Range	Cooling	Maximum (°F/°C)	89.6/32	73.4/23
		Minimum (°F/°C)	60.8/16	51.8/11
	Heating	Maximum (°F/°C)	86.0/30	–/–
		Minimum (°F/°C)	60.8/16	–/–
Outdoor Operation Range	Cooling	Maximum (°F/°C)	114.8/46	78.8/26
		Minimum (°F/°C)	0/-17.8	–/–
	Heating	Maximum (°F/°C)	75.2/24	64.4/18
		Minimum (°F/°C)	5.0/-15	3.2/-16

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

Model		Indoor	CS-E18RB4UW					
		Outdoor	CU-E18RB4U					
Performance Test Condition			ARI					
Power Supply		Phase, Hz	Single, 60					
		V	208			230		
			Min.	Mid.	Max.	Min.	Mid.	Max.
Cooling	Capacity	kW	1.17	5.13	5.47	1.17	5.13	5.47
		BTU/h	4000	17500	18700	4000	17500	18700
		kcal/h (Frig./h)	—	—	—	—	—	—
	Running Current	A	—	9.1	—	—	7.7	—
	Input Power	W	250	1.70k	1.85k	250	1.70k	1.85k
	Annual Consumption	kWh	—	—	—	—	—	—
	EER	W/W	4.68	3.02	2.96	4.68	3.02	2.96
		BTU/hW	16.00	10.25	10.10	16.00	10.25	10.10
		kcal/hW	—	—	—	—	—	—
	Power Factor	%	—	90	—	—	96	—
	Indoor Noise (H / L / QLo)	dB-A	44 / 30 / 27			44 / 30 / 27		
		Power Level dB	60 / — / —			60 / — / —		
	Outdoor Noise (H / L / QLo)	dB-A	51 / — / —			51 / — / —		
		Power Level dB	65 / — / —			65 / — / —		
Heating	Capacity	kW	1.29	5.97	6.15	1.29	5.97	6.15
		BTU/h	4400	20400	21000	4400	20400	21000
		kcal/h (Frig./h)	—	—	—	—	—	—
	Running Current	A	—	12.5	—	—	10.7	—
	Input Power	W	270	2.34k	2.50k	270	2.34k	2.50k
	COP	W/W	4.78	2.55	2.46	4.78	2.55	2.46
		BTU/hW	16.25	8.70	8.40	16.25	8.70	8.40
		kcal/hW	—	—	—	—	—	—
	Power Factor	%	—	90	—	—	95	—
	Indoor Noise (H / L / QLo)	dB-A	44 / 31 / 28			44 / 31 / 28		
		Power Level dB	60 / — / —			60 / — / —		
	Outdoor Noise (H / L / QLo)	dB-A	52 / — / —			52 / — / —		
		Power Level dB	66 / — / —			66 / — / —		
Max Current (A) / Max Input Power (W)			13.7 / 3.06k					
Starting Current (A)			12.5					
Compressor	Type		Hermetic Motor (Rotary)					
	Motor Type		Brushless (4-poles)					
	Output Power	W	1.7k					

Model			Indoor	CS-E18RB4UW		
			Outdoor	CU-E18RB4U		
Indoor Fan	Type			BACKWARD FAN		
	Material			ABS		
	Motor Type			DC / Transistor (8-poles)		
	Input Power		W	—		
	Output Power		W	40		
	Speed	QLo	Cool	rpm	360	
			Heat	rpm	430	
		Lo	Cool	rpm	390	
			Heat	rpm	450	
		Me	Cool	rpm	540	
			Heat	rpm	610	
		Hi	Cool	rpm	700	
			Heat	rpm	770	
		SHi	Cool	rpm	750	
			Heat	rpm	820	
Outdoor Fan	Type			Propeller Fan		
	Material			PP		
	Motor Type			DC (8-poles)		
	Input Power		W	—		
	Output Power		W	60		
	Speed	Hi	Cool	rpm	700	
			Heat	rpm	700	
Min Circuit Ampacity			20.0			
Max. Overcurrent Protection			25.0			
SEER / HSPF			17.50 / 8.50			
Moisture Removal		L/h (Pt/h)	2.9 (6.1)			
Indoor Airflow	QLo	Cool	m ³ /min (ft ³ /min)	7.1 (250)		
		Heat	m ³ /min (ft ³ /min)	8.3 (290)		
	Lo	Cool	m ³ /min (ft ³ /min)	7.6 (270)		
		Heat	m ³ /min (ft ³ /min)	8.7 (310)		
	Me	Cool	m ³ /min (ft ³ /min)	10.1 (355)		
		Heat	m ³ /min (ft ³ /min)	11.3 (400)		
	Hi	Cool	m ³ /min (ft ³ /min)	12.8 (450)		
		Heat	m ³ /min (ft ³ /min)	14.0 (495)		
	SHi	Cool	m ³ /min (ft ³ /min)	13.6 (480)		
		Heat	m ³ /min (ft ³ /min)	14.8 (520)		
Outdoor Airflow	Hi	Cool	m ³ /min (ft ³ /min)	54.5 (1925)	54.5 (1925)	
		Heat	m ³ /min (ft ³ /min)	54.5 (1925)	54.5 (1925)	
Refrigeration Cycle	Control Device			Expansion Valve		
	Refrigerant Oil		cm ³	FV50S (800)		
	Refrigerant Type		g (oz)	R410A, 1.60k (56.5)		
Dimension	Height (I/D / O/D / PANEL)		mm (inch)	260 (10-1/4) / 795 (31-5/16) / 51 (2-1/32)		
	Width (I/D / O/D / PANEL)		mm (inch)	575 (22-21/32) / 875 (34-15/32) / 700 (27-9/16)		
	Depth (I/D / O/D / PANEL)		mm (inch)	575 (22-21/32) / 320 (12-5/8) / 700 (27-9/16)		
Weight	Net (I/D / O/D) / PANEL		kg (lb)	18 (40) / 60 (132) / 2.5 (6)		

Model		Indoor	CS-E18RB4UW	
		Outdoor	CU-E18RB4U	
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) ~ 30.5 (100.0)	
	I/D & O/D Height different	m (ft)	15.0 (49.2)	
	Additional Gas Amount	g/m (oz/ft)	25 (0.3)	
	Length for Additional Gas	m (ft)	10.0 (32.8)	
Drain Hose	Inner Diameter	mm (ft)	30 (0.098)	
	Length	mm (ft)	193 (0.633)	
Indoor Heat Exchanger	Fin Material		Aluminium (Pre Coat)	
	Fin Type		Slit Fin	
	Row × Stage × FPI		2 × 10 × 18	
	Size (W × H × L)	mm (ft)	1330:1270 × 210 × 25.4 (4.363:4.166 × 0.689 × 0.083)	
Outdoor Heat Exchanger	Fin Material		Aluminium (Blue Coated)	
	Fin Type		Corrugated Fin	
	Row × Stage × FPI		2 × 36 × 19	
	Size (W × H × L)	mm (ft)	36.4 × 756 × 868.6:897 (0.119 × 2.480 × 2.849:2.942)	
Air Filter	Material		–	
	Type		–	
Power Supply			Outdoor	
Power Supply Cord		A	Nil	
Thermostat			Electronic Control	
Protection Device			Electronic Control	
			Dry Bulb	Wet Bulb
Indoor Operation Range	Cooling	Maximum (°F/°C)	89.6/32	73.4/23
		Minimum (°F/°C)	60.8/16	51.8/11
	Heating	Maximum (°F/°C)	86.0/30	–/–
		Minimum (°F/°C)	60.8/16	–/–
Outdoor Operation Range	Cooling	Maximum (°F/°C)	114.8/46	78.8/26
		Minimum (°F/°C)	0/-17.8	–/–
	Heating	Maximum (°F/°C)	75.2/24	64.4/18
		Minimum (°F/°C)	5.0/-15	3.2/-16

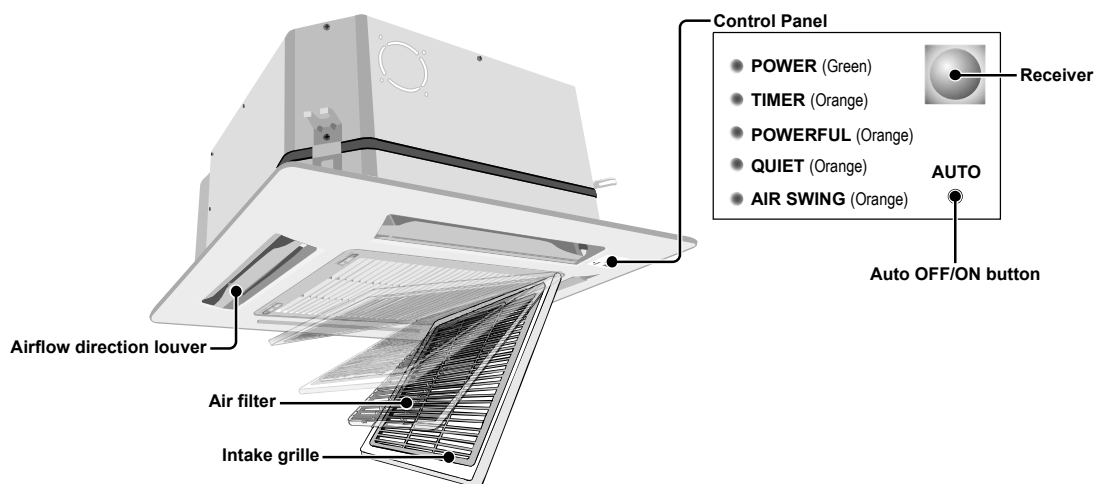
- Cooling capacities are based on indoor temperature of 27°C Dry Bulb (80.6°F Dry Bulb), 19.0°C Wet Bulb (66.2°F Wet Bulb) and outdoor air temperature of 35°C DRY BULB (95°F Dry Bulb), 24°C Wet Bulb (75.2°F Wet Bulb).
- Heating capacities are based on indoor temperature of 20°C Dry Bulb (68°F Dry Bulb)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

3. Features

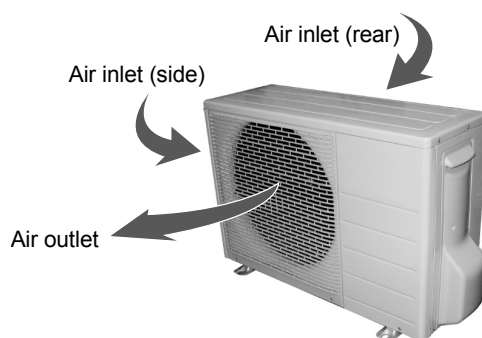
- **Inverter Technology**
 - Wider output power range
 - Energy saving
 - Quick Cooling
 - Quick Heating
 - More precise temperature control
- **Environment Protection**
 - Non-ozone depletion substances refrigerant (R410A)
- **Long Installation Piping**
 - CS-E12RB4UW, CU-E12RB4U long piping up to 20 meters (65.6 ft)
 - CS-E18RB4UW, CU-E18RB4U long piping up to 30.5 meters (100.0 ft)
- **Easy to use remote control**
- **Quality Improvement**
 - Random auto restart after power failure for safety restart operation
 - Gas leakage protection
 - Prevent compressor reverse cycle
 - Inner protector to protect compressor
 - Noise prevention during soft dry operation
 - Blue coated condenser for high resistance to corrosion
- **Operation Improvement**
 - Quiet mode to reduce the indoor unit operating sound
 - Powerful mode to reach the desired room temperature quickly
 - 24-hour timer setting
- **Serviceability Improvement**
 - Breakdown Self Diagnosis function

4. Location of Controls and Components

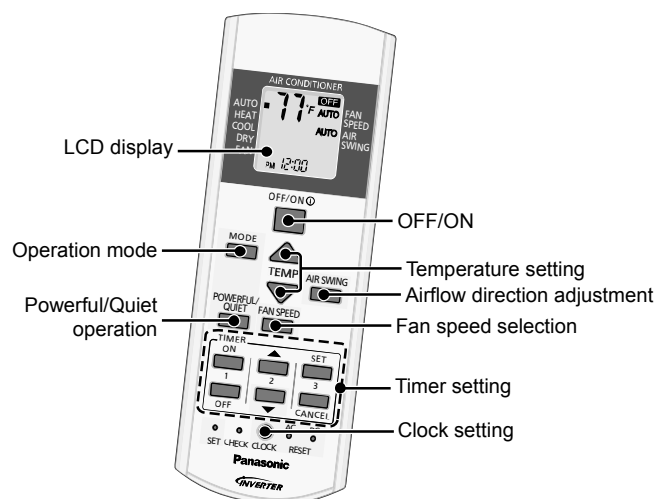
4.1 Indoor Unit



4.2 Outdoor Unit

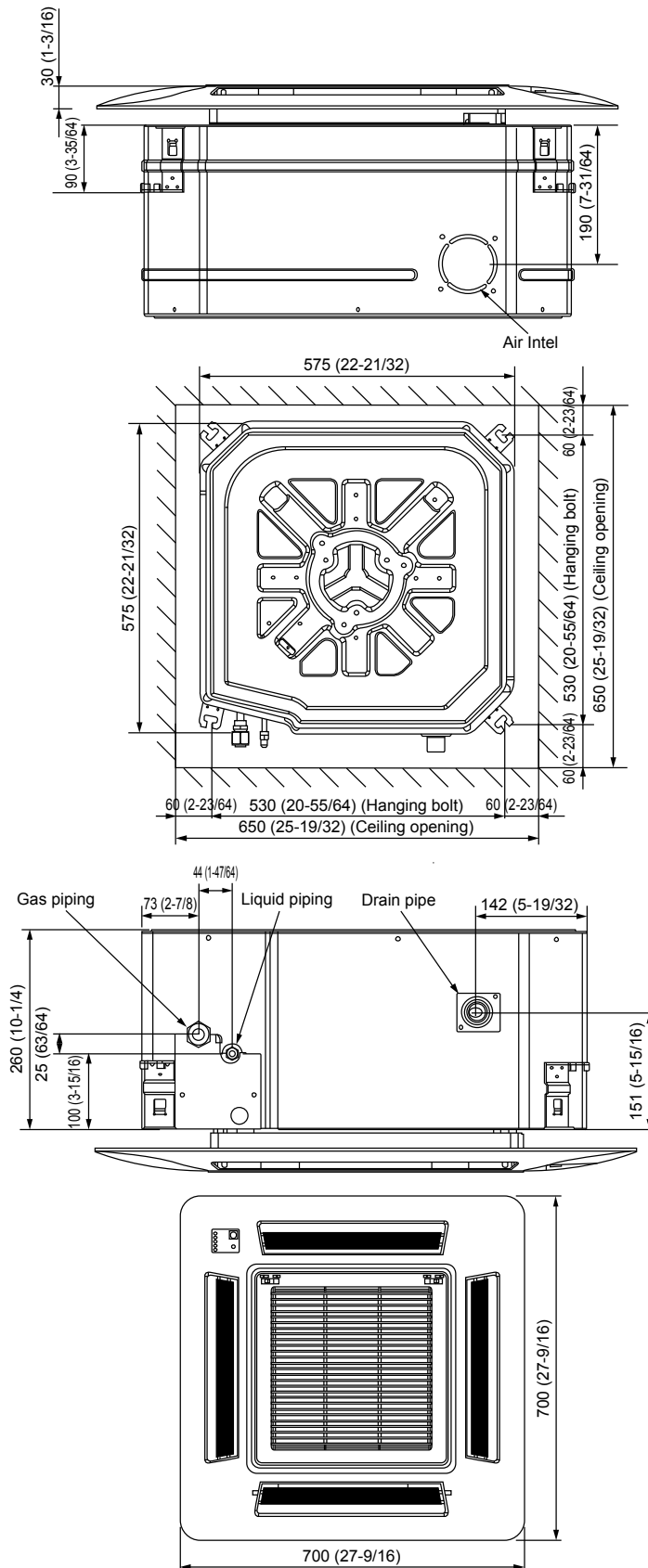


4.3 Remote Control

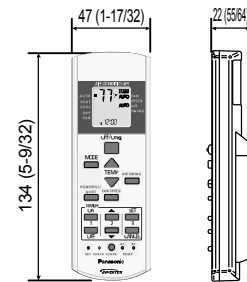


5. Dimensions

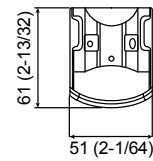
5.1 Indoor Unit



<Remote Control>

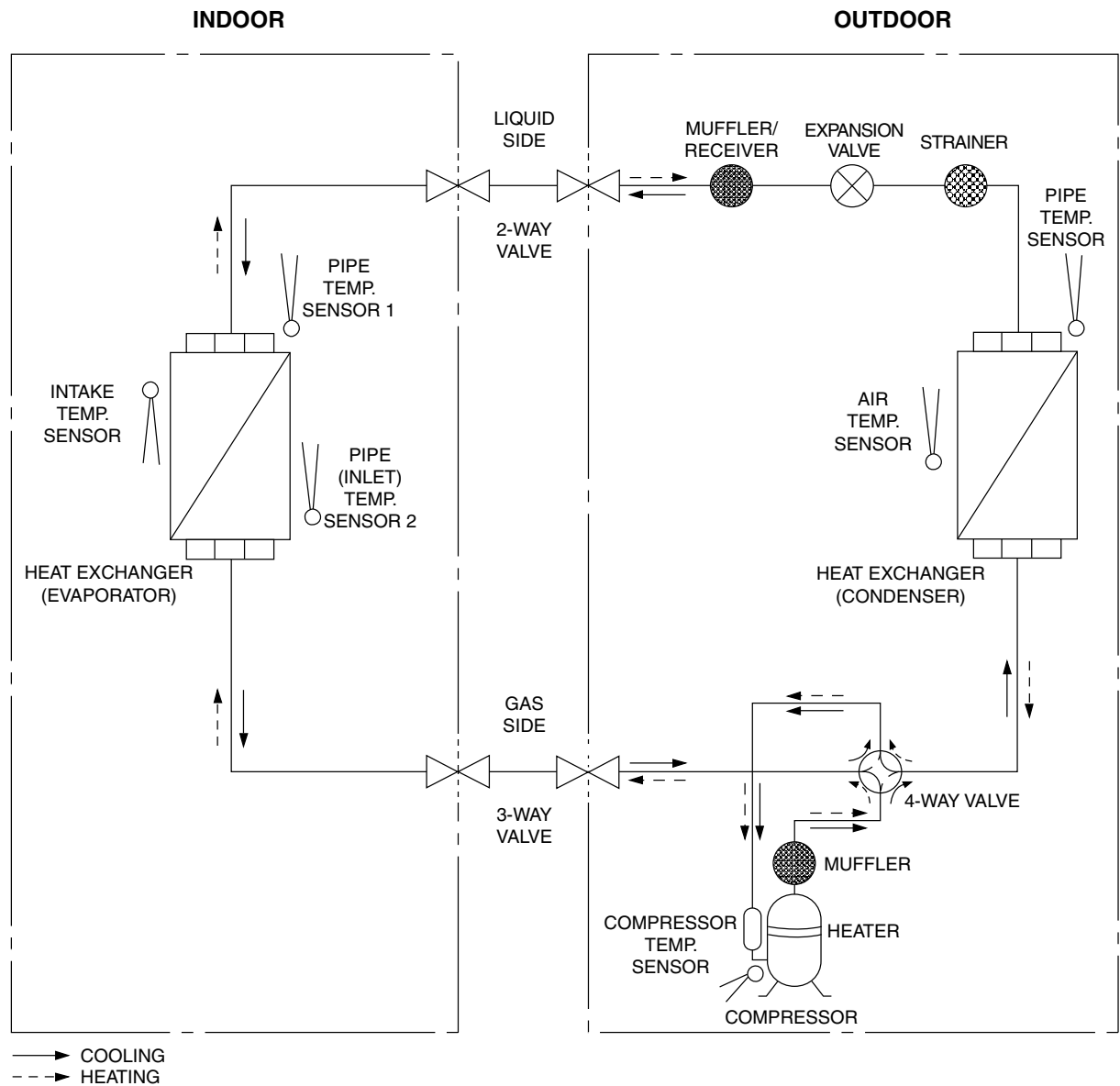


<Remote Control Holder>



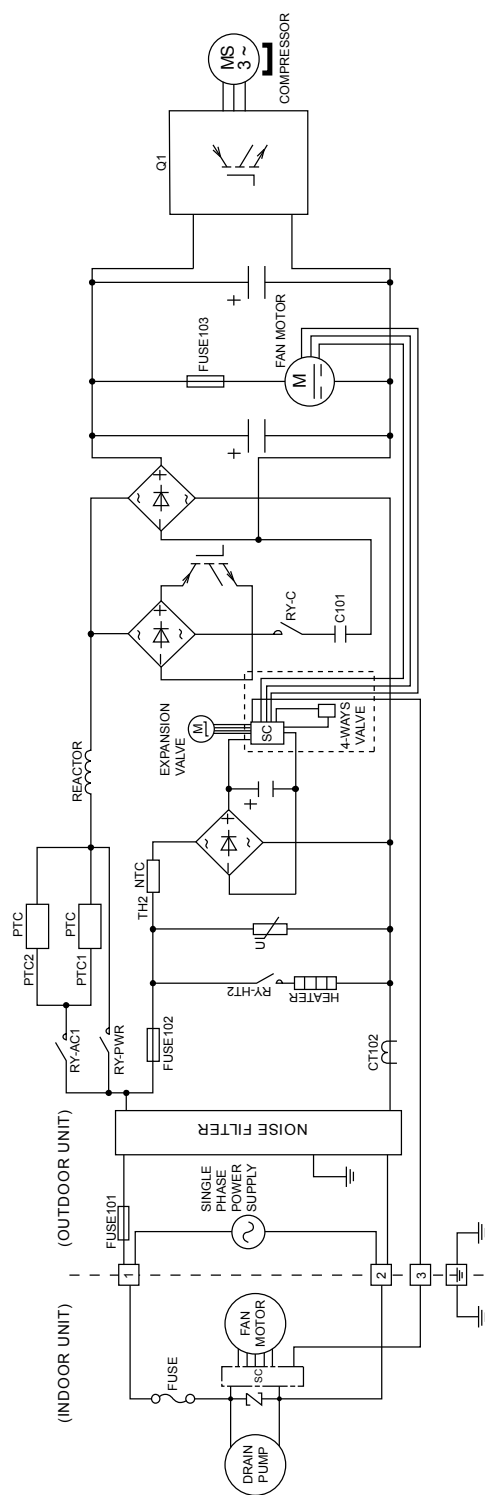
Unit : mm (inch)

6. Refrigeration Cycle Diagram

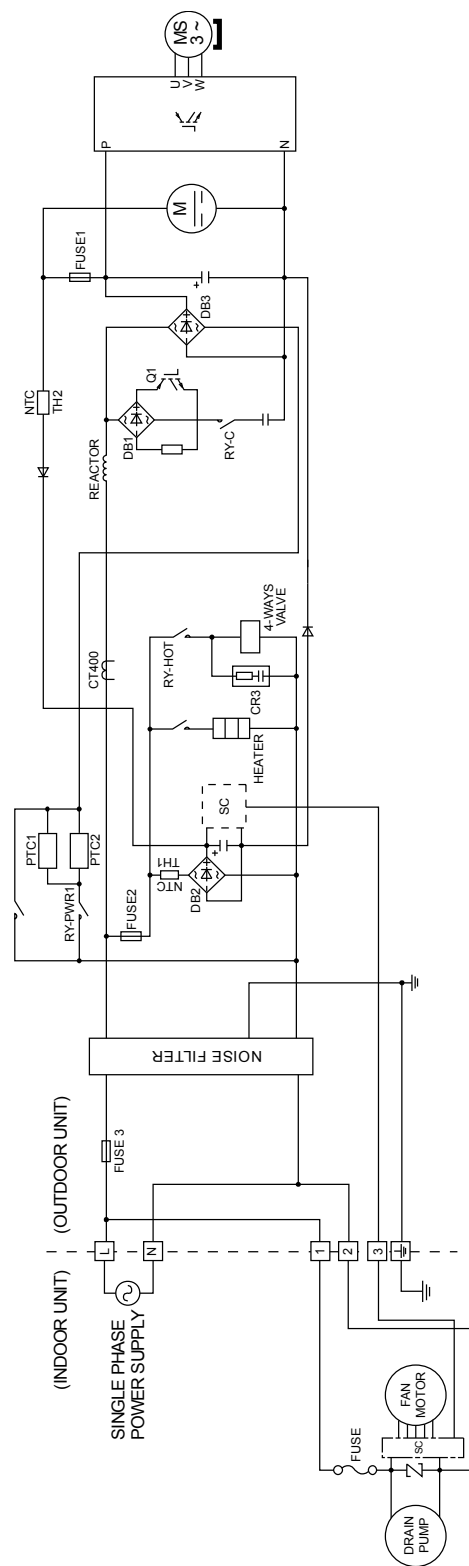


7. Block Diagram

7.1 CS-E12RB4UW CU-E12RB4U

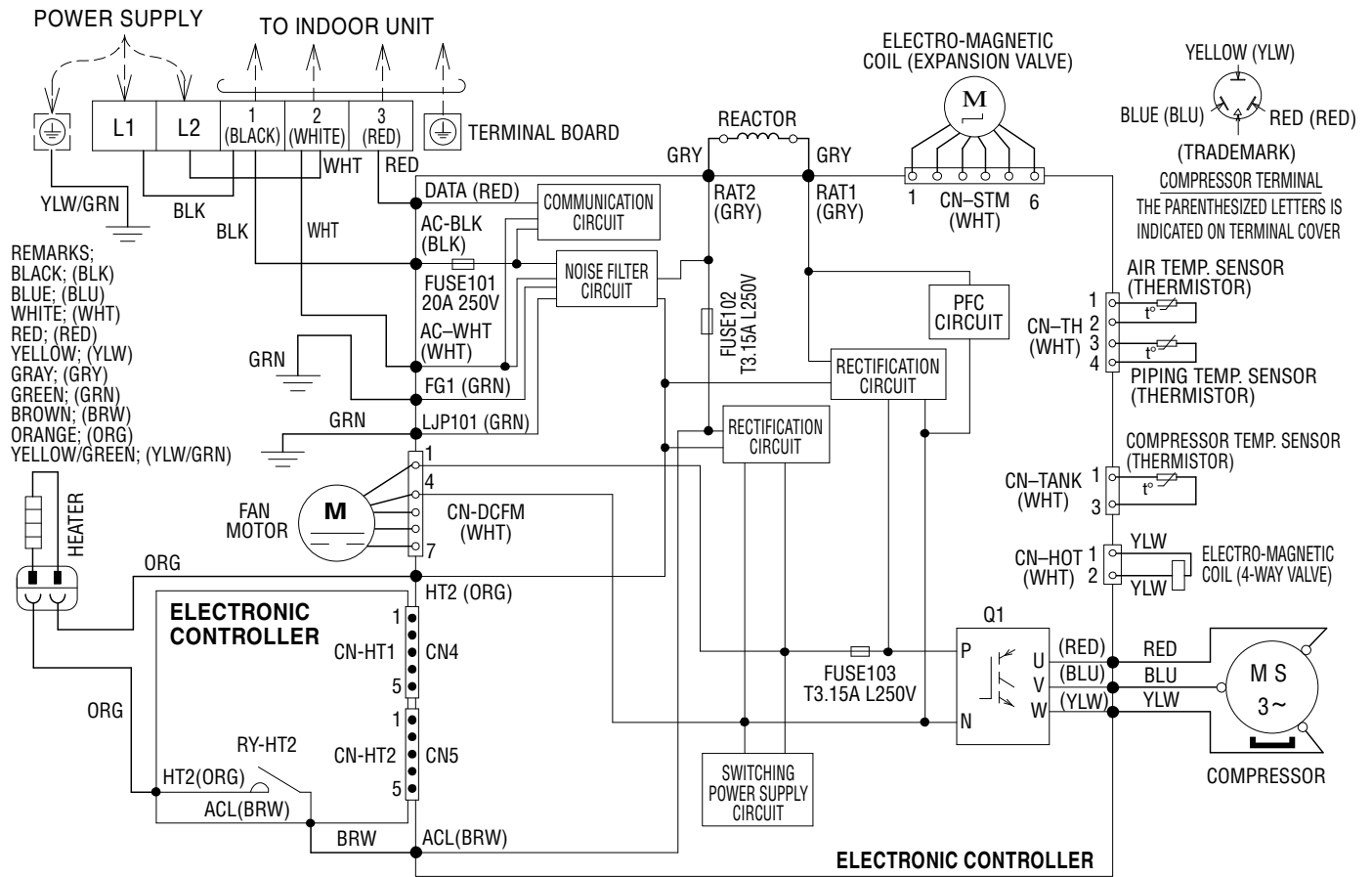


7.2 CS-E18RB4UW CU-E18RB4U



8.2 Outdoor Unit

8.2.1 CU-E12RB4U

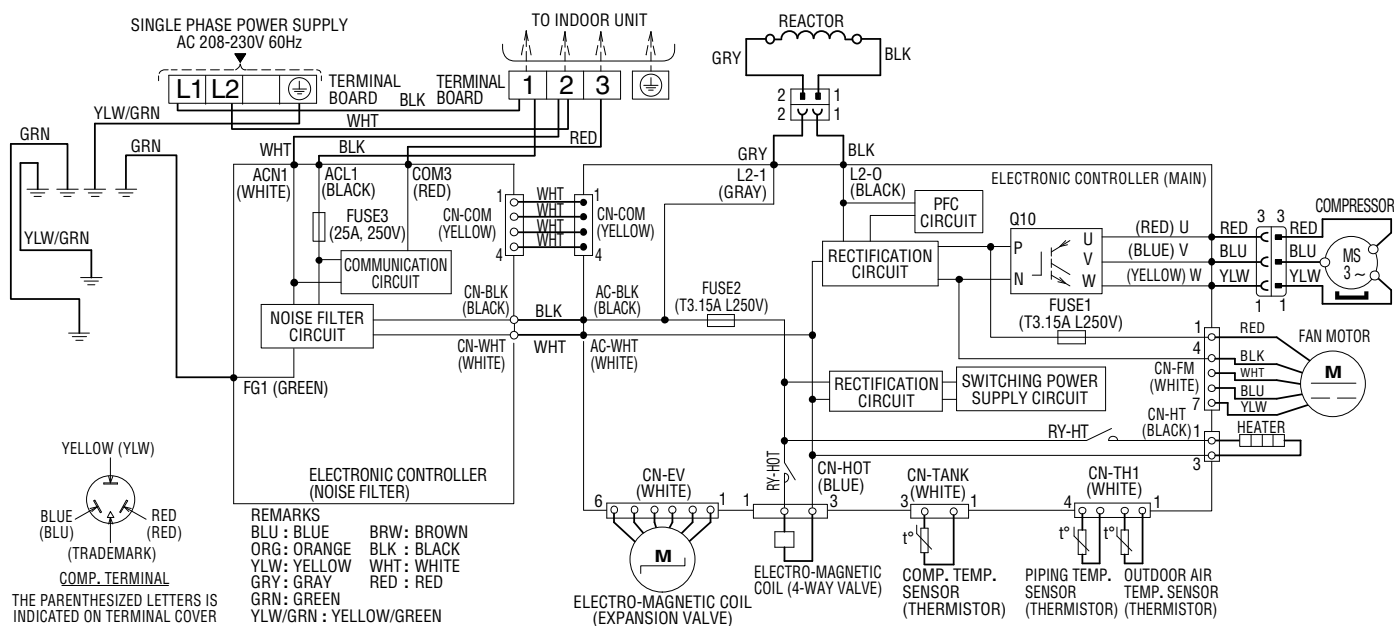


Resistance of Compressor Windings

MODEL	CU-E12RB4U
CONNECTION	5RS102XHA21
U-V	1.741 Ω
U-W	1.711 Ω
V-W	1.765 Ω

Note: Resistance at 20°C of ambient temperature.

8.2.2 CU-E18RB4U



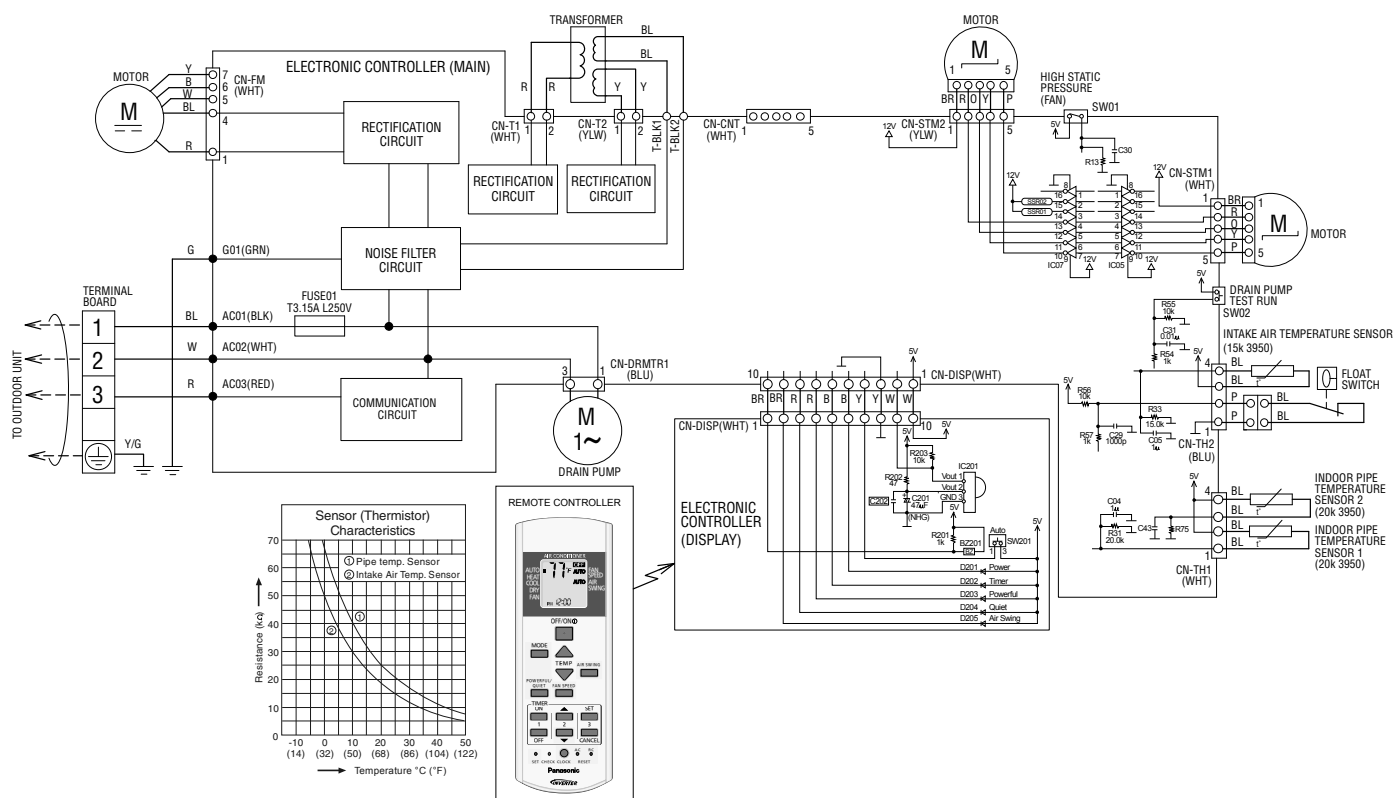
Resistance of Compressor Windings

MODEL	CU-E18RB4U
CONNECTION	5KD240XAF21
U-V	0.720 Ω
U-W	0.726 Ω
V-W	0.708 Ω

Note: Resistance at 20°C of ambient temperature.

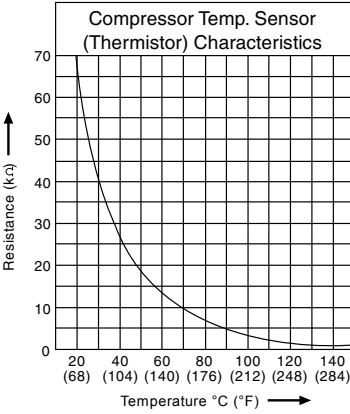
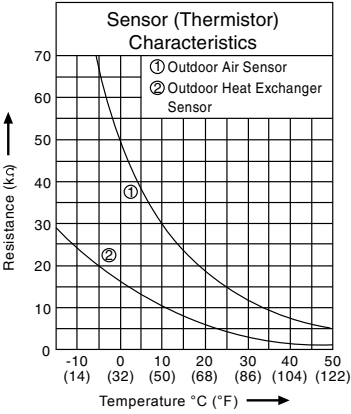
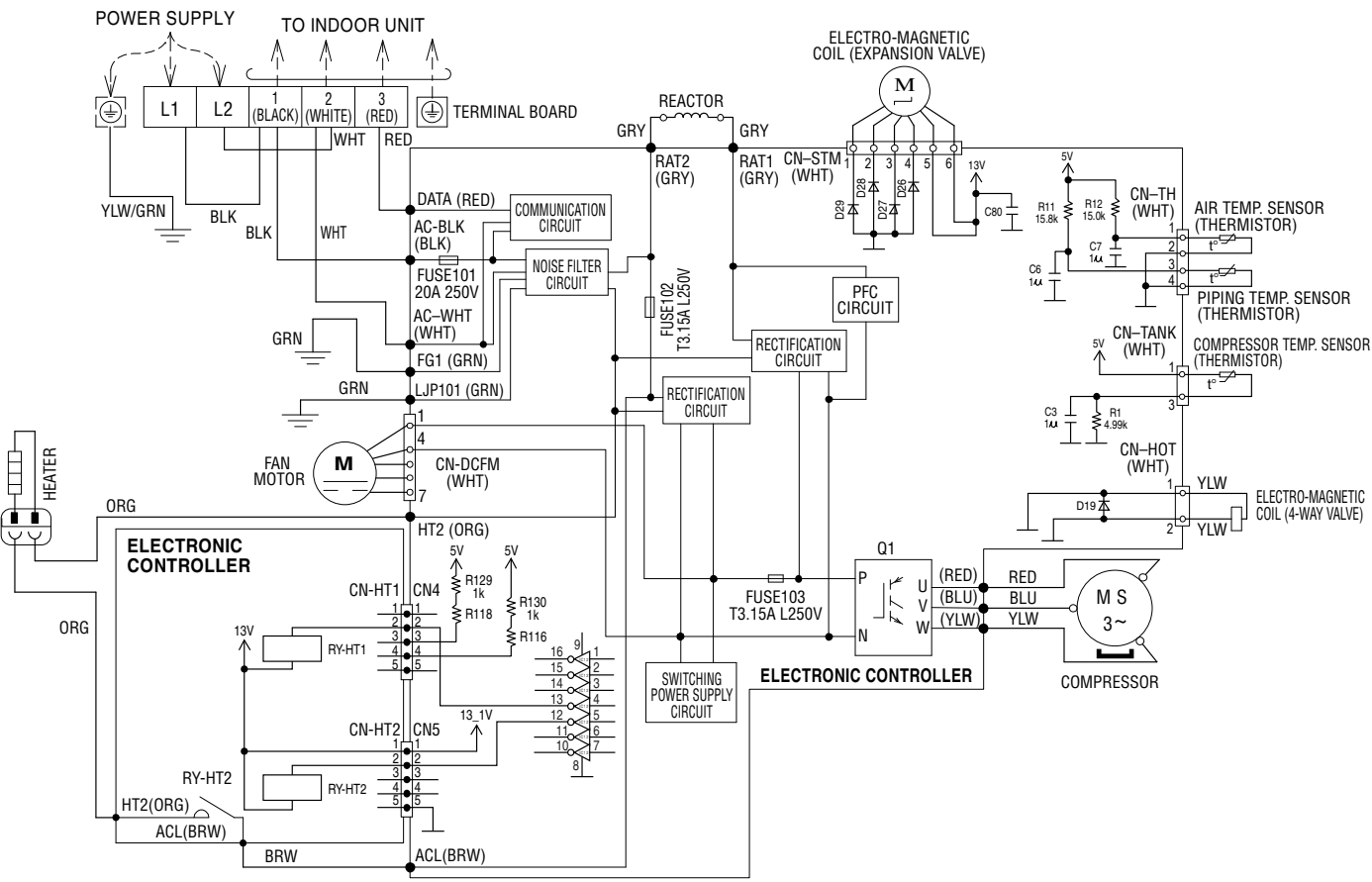
9. Electronic Circuit Diagram

9.1 Indoor Unit

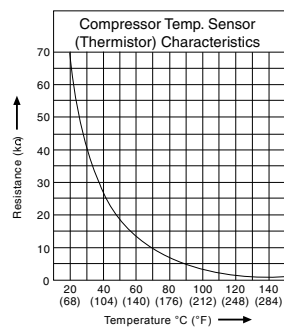
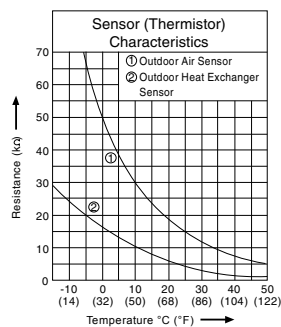
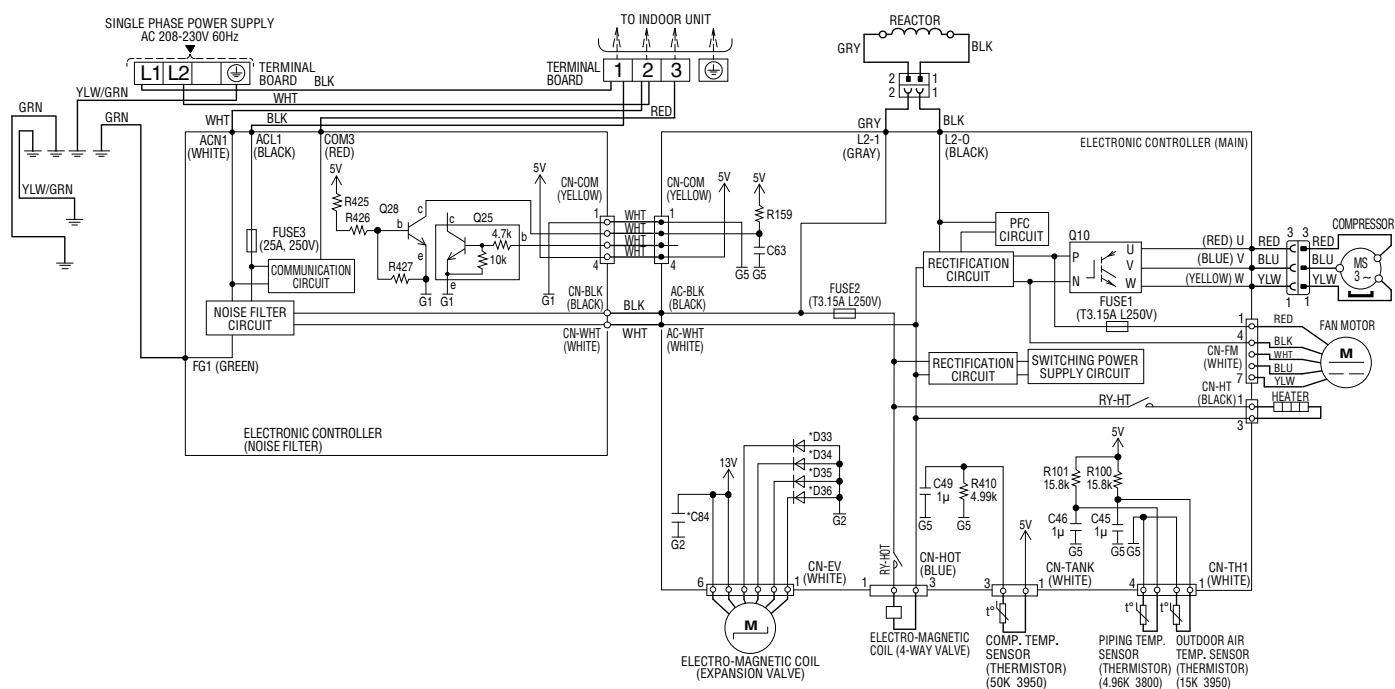


9.2 Outdoor Unit

9.2.1 CU-E12RB4U



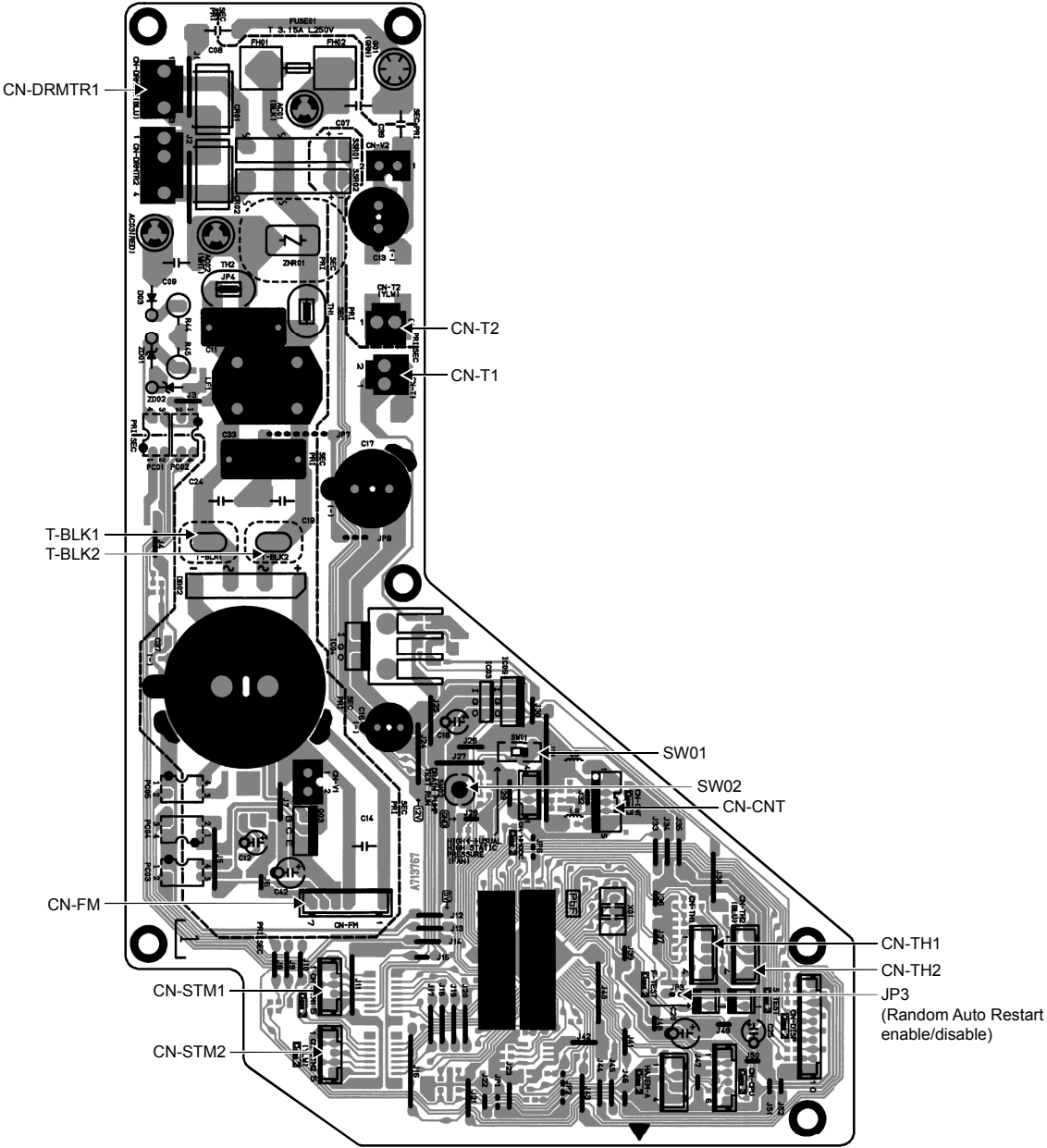
9.2.2 CU-E18RB4U



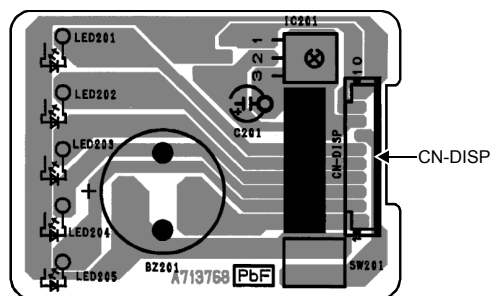
10. Printed Circuit Board

10.1 Indoor Unit

10.1.1 Main Printed Circuit Board



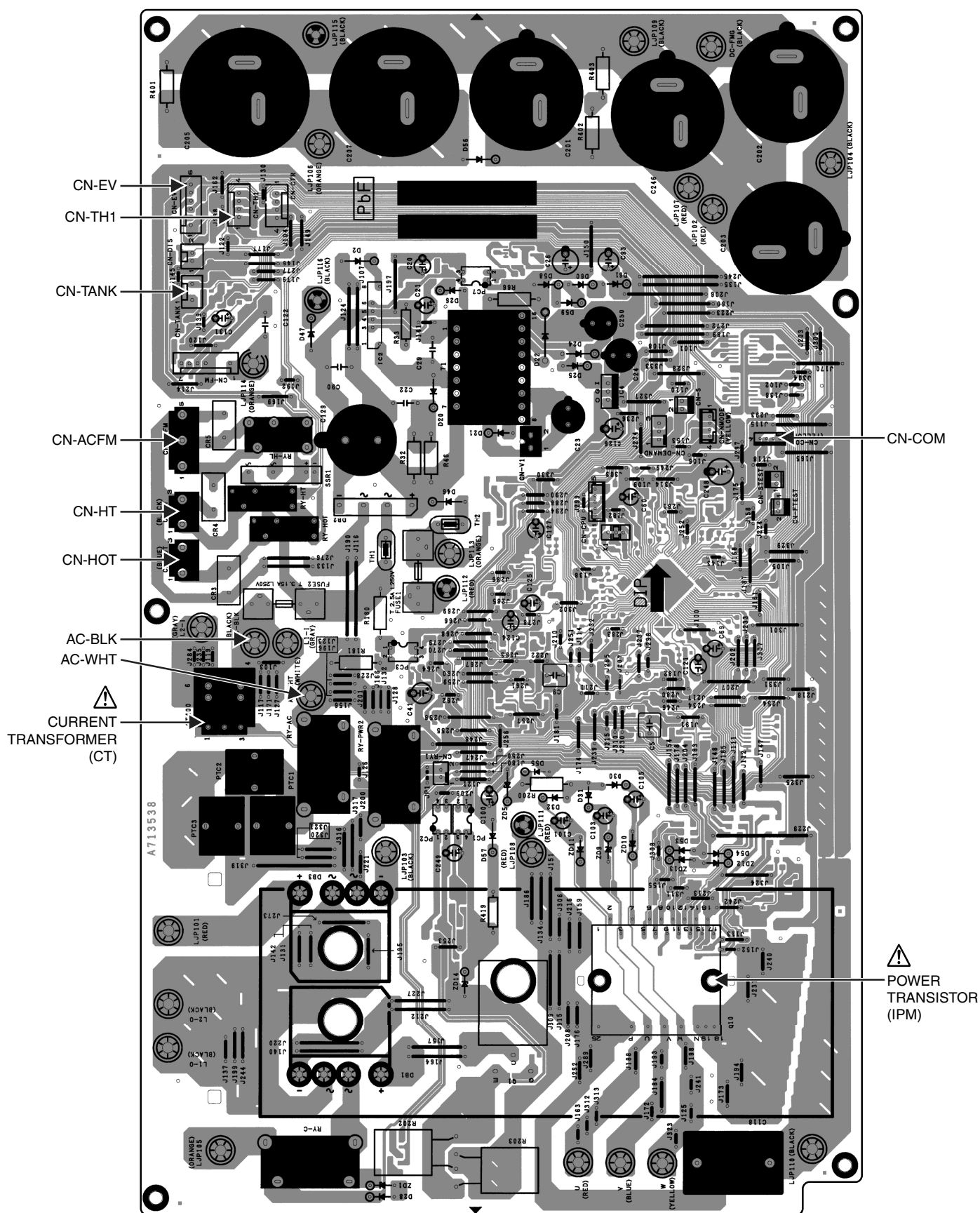
10.1.2 Display Printed Circuit Board



10.2.1.1 CU-E12RB4U

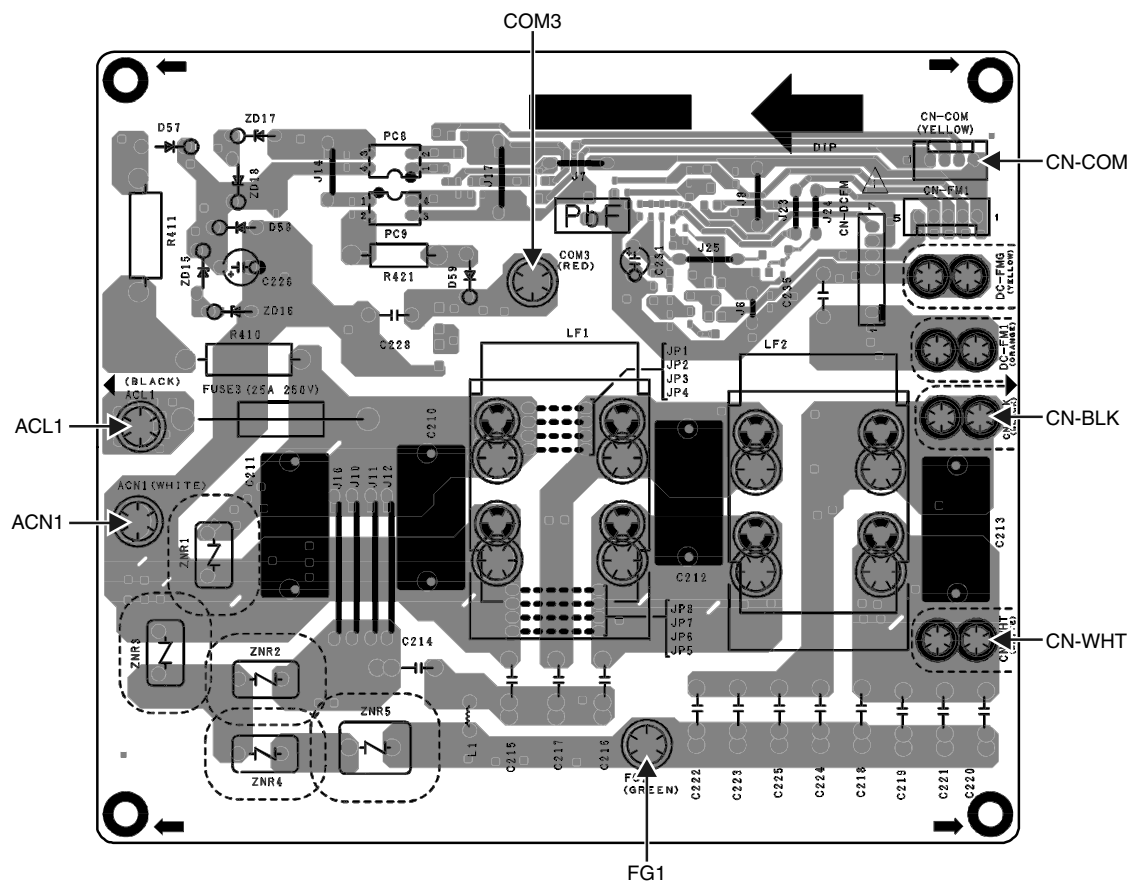


10.2.1.2 CU-E18RB4U



10.2.2 Noise Filter Printed Circuit Board

10.2.2.1 CU-E18RB4U



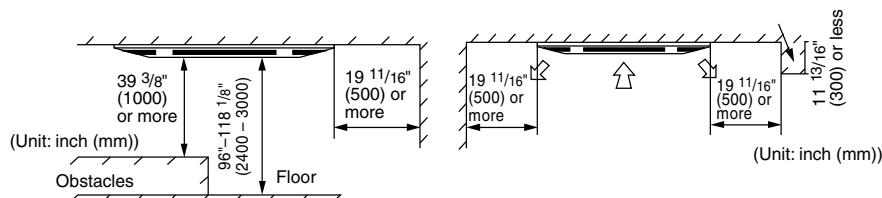
11. Installation Instruction

11.1 Indoor Unit

11.1.1 Selecting the Location for the Indoor Unit

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

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

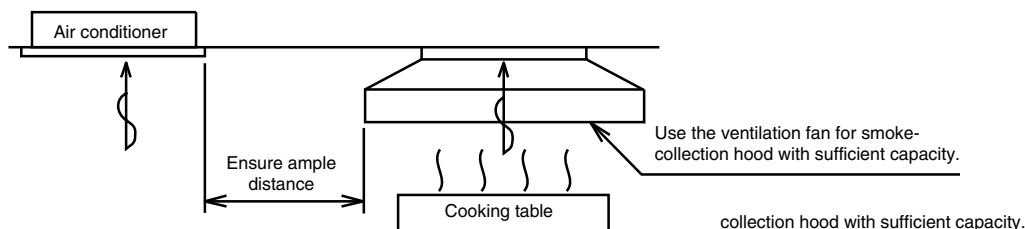


* If the height from the floor to ceiling exceeds three meters, air flow distribution deteriorates and the effect is decreased.

⚠ WARNING	
4	The installation position must be able to support a load four times the indoor unit weight.
5	The indoor unit must be away from heat and steam sources, but avoid installing it near an entrance.
6	The indoor unit must allow easy draining.
7	The indoor unit must allow easy connection to the outdoor unit.
8	Place the indoor unit according to the height from the ceiling shown in the illustration below.
9	The indoor unit must be from at least 9.8 ft (3 m) away from any noise-generating equipment. The electrical wiring must be shielded with a steel conduit.
10	If the power supply is subject to noise generation, add a suppressor.
11	Do not install the indoor unit in a laundry. Electric shocks may result.

Note • Thoroughly study the following installation locations

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



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

Model Name	Height in the ceiling
E12*** E18***	11" (280 mm) or more

11.1.2 Installation of Indoor Unit

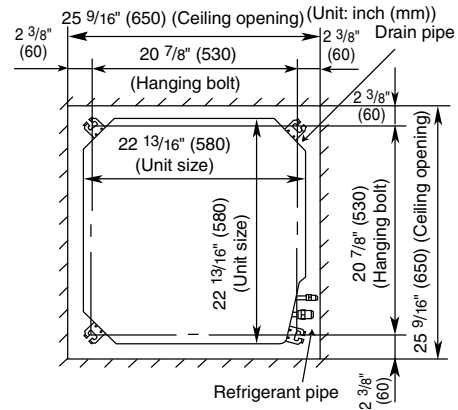
This air conditioner uses a drain up motor.
Horizontally install the unit using a level gauge.

CEILING OPENING DIMENSIONS AND HANGING BOLT LOCATION

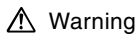
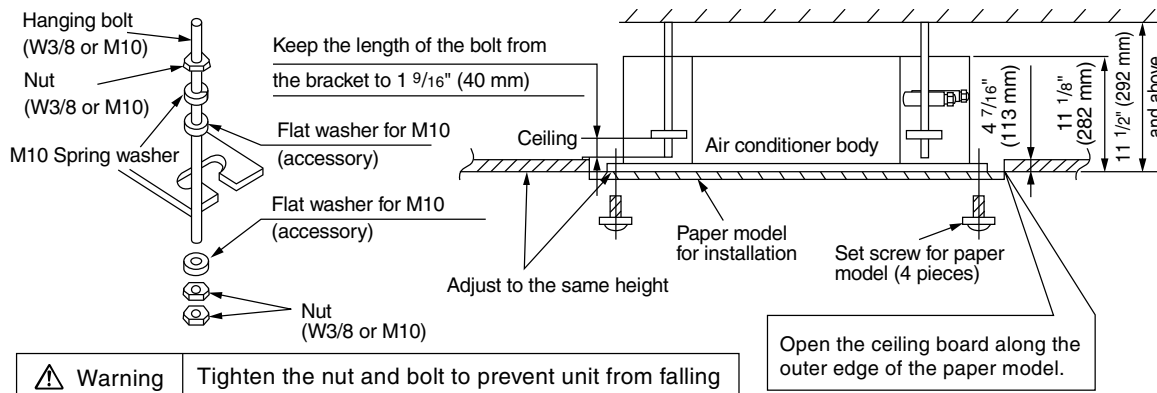
The paper model for installation expand or shrink according to temperature and humidity.
Check on dimensions before using it.

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

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



POSITIONS OF AIR CONDITIONER BODY AND CEILING SURFACE



Warning

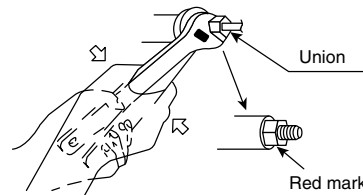
Tighten the nut and bolt to prevent unit from falling

Open the ceiling board along the outer edge of the paper model.

11.1.3 Refrigerant Piping

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

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



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

Vacuum drying

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

CAUTION Use two wrenches and tighten with regular torque.

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

11.1.4 Indoor Unit Drain Piping

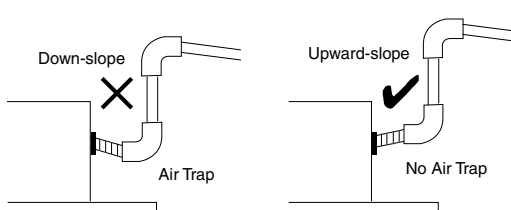
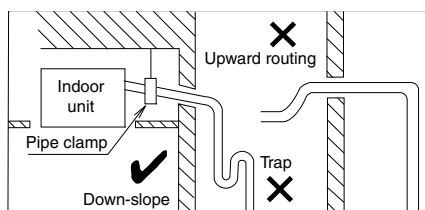
- During drain piping connection, be careful not to exert extra force on the drain port at the indoor unit.
- The outside diameter of the drain connection at the indoor unit is 1-1/4" (32 mm).

Piping material: Polyvinyl chloride pipe VP-25 and pipe fittings.

- Be sure to perform heat insulation on the drain piping.

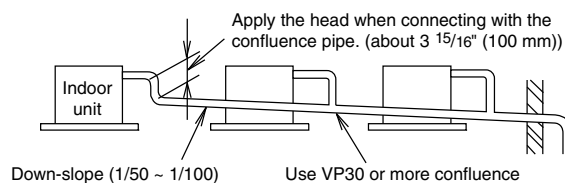
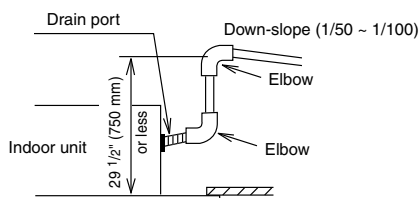
Heat insulation material: Polyethylene foam with thickness more than 5/16" (8 mm) (local supply).

- Drain piping must have down-slope (1/50 to 1/100); be sure not to provide up-and-down slope to prevent reversal flow.
- Be sure to check no air trap on drain hose and to ensure smooth water flow and no abnormal sound.



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

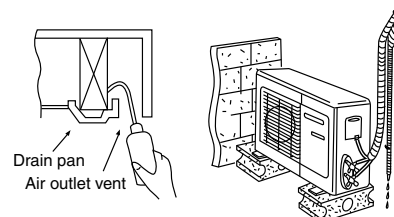
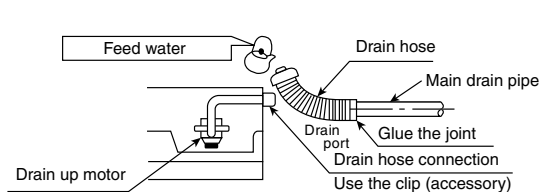
- When drain set piping, install as shown in the figure below.



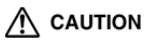
Drain Test

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

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

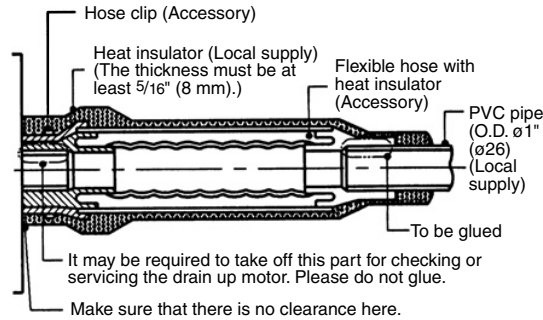
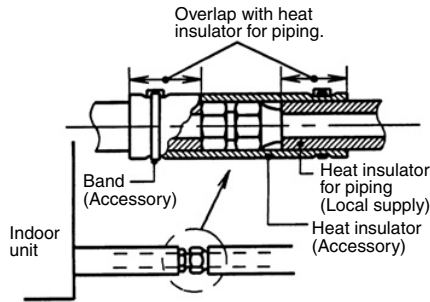


11.1.5 Heat Insulation



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

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



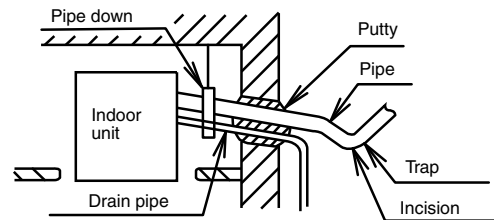
- 2 Precautions in high humidity circumstance.

This air conditioner has been tested according to the "JIS Standard Conditions with Mist" and have been confirmed that there are no faults. However, if it is operated for a long time in high humid atmosphere (dew point temperature: more than 73.4°F (23°C)), water drops are liable to fall. In this case, add heat insulation material according to the following procedure:

- Heat insulation material to be prepared... Adiabatic glass wool with thickness 3/8" to 1 3/16" (10 to 20 mm).
- Stick glass wool on all air conditioners that are located in ceiling atmosphere.
- In addition to the normal heat insulation (thickness: more than 5/16" (8 mm) for refrigerant piping (gas piping: thick piping) and drain piping, add a further of 3/8" (10 mm) to 1 3/16" (30 mm) thickness material.

Wall seal

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

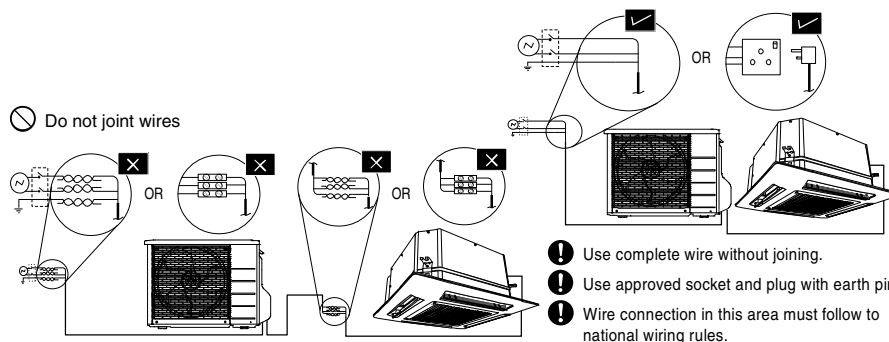
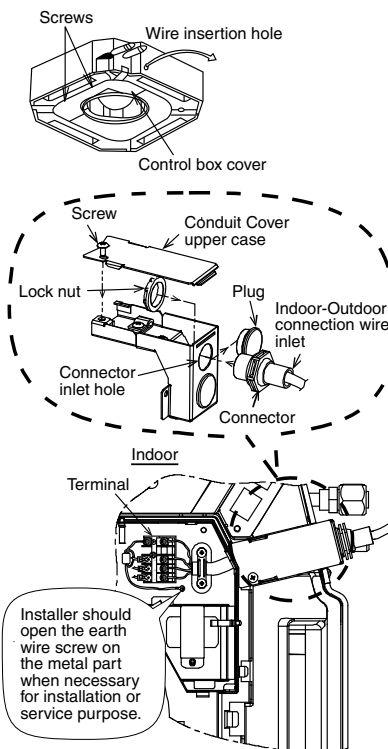
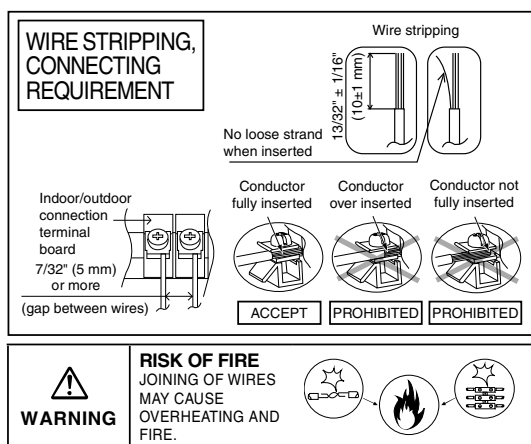
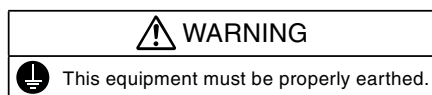


* Put the incision at the trap part of the heat insulator (for water drain)

11.1.6 Connecting the Cable to the Indoor

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

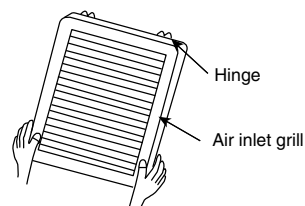
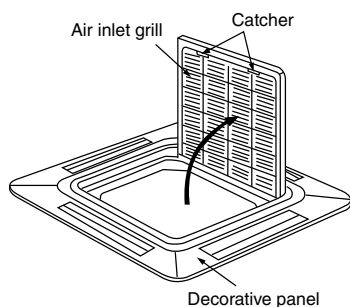
Terminals on the indoor unit	1	2	3	
Colour of wires				
Terminals on the outdoor unit	1	2	3	



11.1.7 Installation of Decorative Panel

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

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

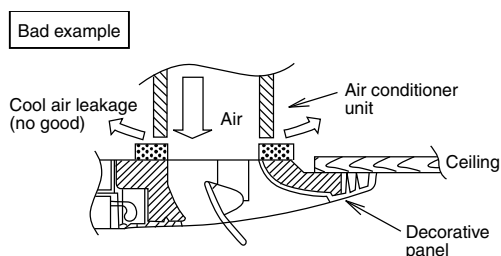
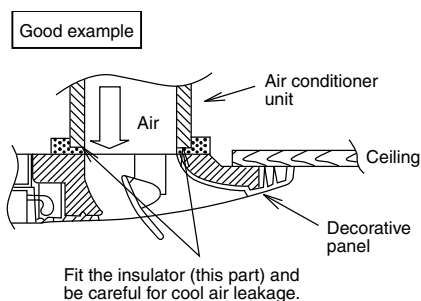
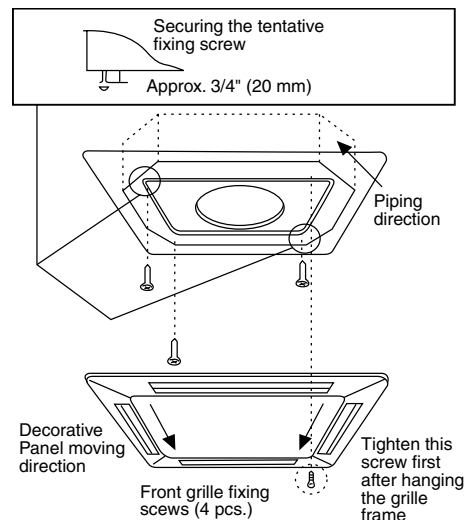


* Hang the hinge on the hole of decorative panel. (The direction of the installation is free.)

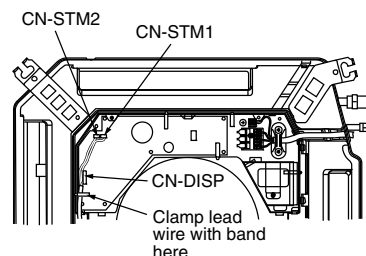
- 2 Fitting the decorative panel
 - Temporarily secure the fixing screws (3 pcs.) before fitting the decorative panel. (For temporarily securing the front grille.)
 - Place decorative panel on the screws (3 pcs.) before fitting, move decorative panel as illustrated and tighten all the screws (4 pcs.).

CAUTION

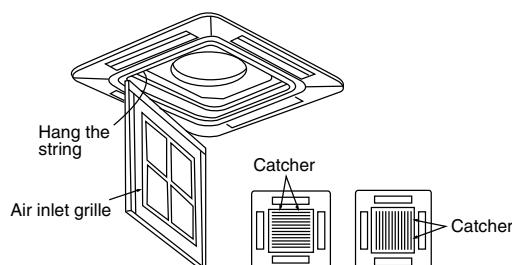
- Check beforehand the height from the ceiling to the unit.
 - The front grille fitting direction is determined by the unit direction.
 - Only use the screws with the length of 1-3/8" (35 mm) which is provided, to fix the decorative panel.
 - Do not use other screw which is longer it may cause damage to the drain-pan and other components.
- 3 Fit the decorative panel and ceiling wall together and confirm no gap in between. Readjust indoor unit height, if there is a gap between ceiling wall and decorative panel.



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



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



11.2 Outdoor Unit

11.2.1 Select the Best Location

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

Model	Capacity (Btu/h)	Piping size		Std. Length	Max. Elevation	Min. Piping Length	Max. Piping Length	Additional Refrigerant	Piping Length for add. gas
		Gas	Liquid						
E12***	11900	1/2"	1/4"	24.6 ft	49.2 ft	9.8 ft	65.6 ft	0.2 oz/ft	24.6 ft
		(12.7mm)	(6.35mm)	(7.5 m)	(15 m)	(3 m)	(20 m)	(20 g/m)	(7.5 m)
E18***	17500				49.2 ft	9.8 ft	100 ft	0.3 oz/ft	32.8 ft
					(15 m)	(3 m)	(30.5 m)	(25 g/m)	(10 m)

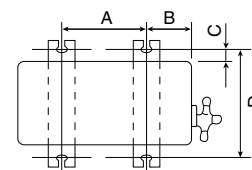
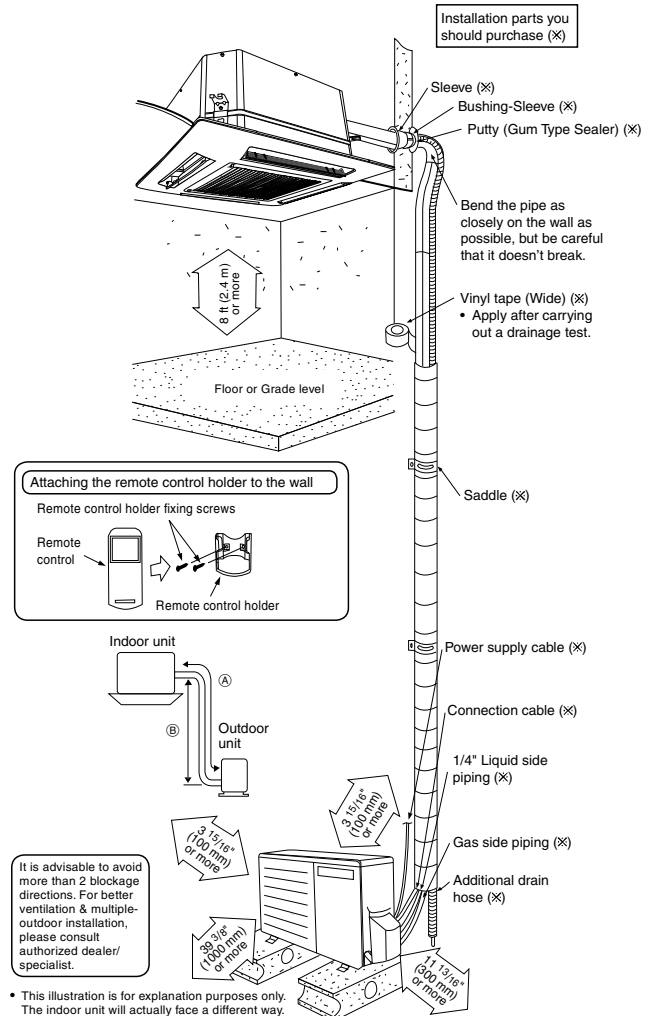
Example: For E12***

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

11.2.2 Install the Outdoor Unit

- After selecting the best location, start installation according to Indoor/Outdoor Unit Installation Diagram.
 - 1 Fix the unit on concrete or rigid frame firmly and horizontally by bolt nut (ø10 mm).
 - 2 When installing at roof, please consider strong wind and earthquake.
Please fasten the installation stand firmly with bolt or nails.

11.2.1.1 Indoor/Outdoor Installation Diagram



Model	A	B	C	D
E12***	22-7/16" (570 mm)	4-1/8" (105 mm)	23/32" (18.5 mm)	12-19/32" (320 mm)
E18***	24-1/8" (613 mm)	5-5/32" (131 mm)	5/8" (16 mm)	14-3/16" (360.5 mm)

11.2.3 Connect the Piping

11.2.3.1 Connecting the Piping to Indoor Unit

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

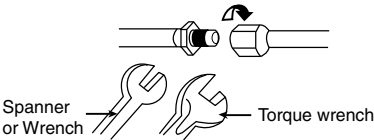
Connect the piping

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

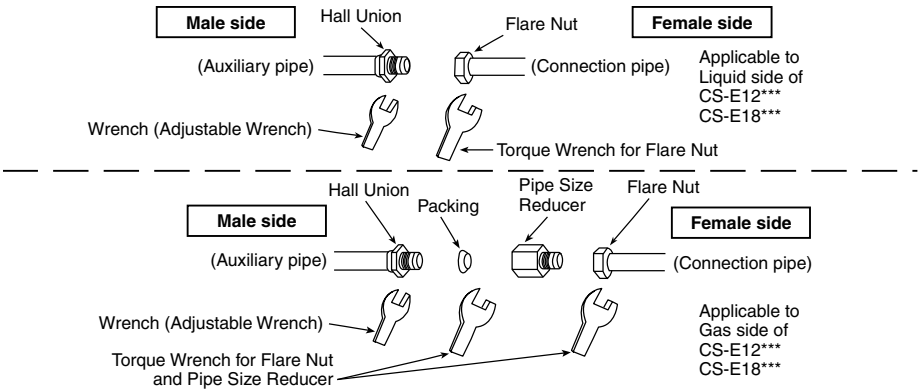
11.2.3.2 Connecting the Piping to Outdoor Unit

Decide piping length and then cut by using pipe cutter. Remove burrs from cut edge. Make flare after inserting the flare nut (locate at valve) onto the copper pipe. Align center of piping to valve and then tighten with torque wrench to the specified torque as stated in the table.



11.2.3.3 Connecting the Piping to Outdoor Multi

Decide piping length and then cut by using pipe cutter. Remove burrs from cut edge. Make flare after inserting the flare nut (locate at valve) onto the copper pipe. Align center of piping to valve and then tighten with torque wrench to the specified torque as stated in the table.

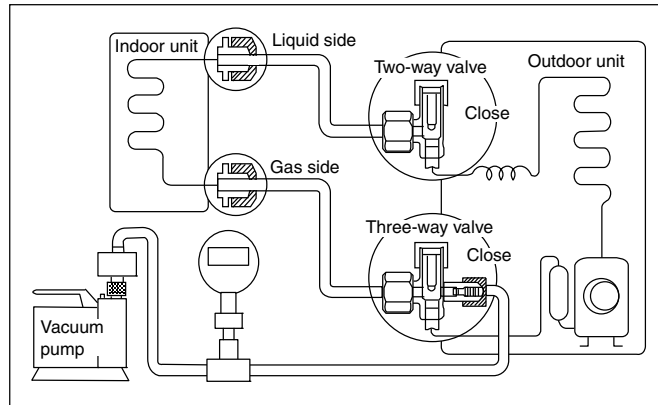


11.2.3.4 Gas Leak Checking

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 11.2.4.

11.2.4 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.

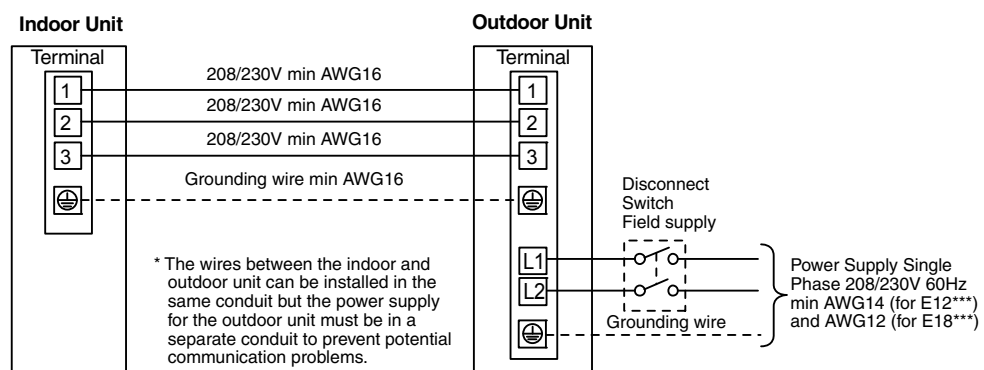


- 1 Connect a charging hose with a push pin to the Low side of a charging set and the service port of the 3-way valve.
- 2 Connect the micron gauge between vacuum pump and service port of outdoor units.
- 3 Turn on the power switch of the vacuum pump and make sure that connect digital micron gauge and 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 hose 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.
 - Be sure to check for gas leakage.

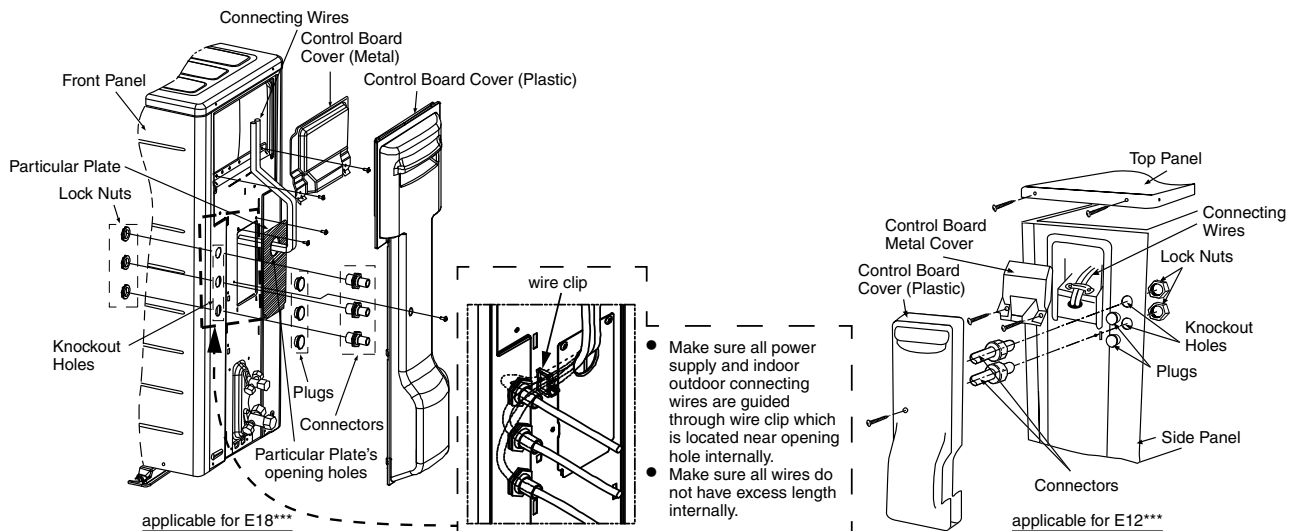
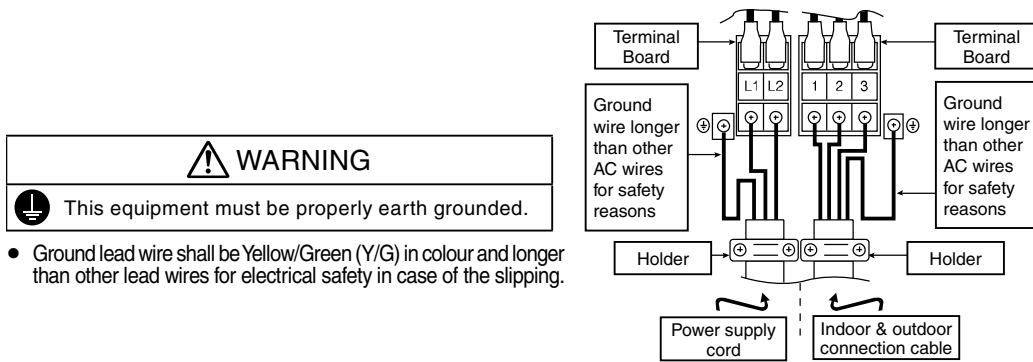
- If micron gauge value does not descend 500 microns, take the following measures:
 - If the leak stops when the piping connections are tightened further, continue working from step ③.
 - If the leak does not stop when the connections are retightened, repair location of leak.
 - Do not release refrigerant during piping work for installation and reinstallation.
 - Be careful with the liquid refrigerant, it may cause frostbite.

11.2.5 Connect the Cable to the Outdoor Unit

- 1 Remove control board cover (Plastic and Metal), follow by particular plate (for E18*** model).
- 2 Remove top panel, follow by Control Board Cover (Plastic and Metal) (for E12*** model).
- 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.
 - Connect the UL listed or CSA approved wires minimum AWG14 (for E12***) and AWG12 (for E18***) 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 (clamp).
- 10 After completing wiring connections, reattach the particular plate and control board cover (metal and plastic) to the original position with the screws.
- 11 For wire stripping and connection requirement, refer to instruction 11.1.6 of indoor unit.

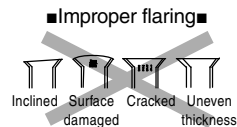
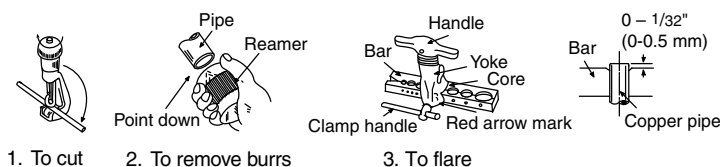


11.2.6 Pipe Insulation

- 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.

11.2.6.1 Cutting and Flaring the Piping

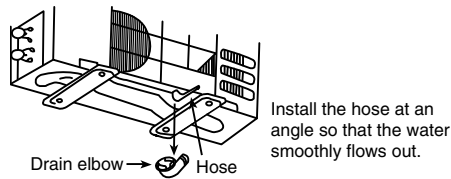
- 1 Please cut using pipe cutter and then remove the burrs.
- 2 Remove the burrs by using reamer. If burrs is not removed, gas leakage may be caused. Turn the piping end down to avoid the metal powder entering the pipe.
- 3 Please make flare after inserting the flare nut onto the copper pipes.



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

11.2.7 Disposal of Outdoor Unit Drain Water

- If a drain elbow is used, the unit should be placed on a stand which is taller than 1-3/16" (3 cm).
- If the unit is used in an area where temperature falls below 32°F (0°C) for 2 or 3 days in succession, it is recommended not to use a drain elbow, for the drain water freezes and the fan will not rotate.



11.2.8 Auto Switch Operation

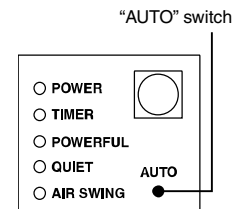
The following operations can be performed by pressing the "AUTO" switch.

1 AUTO OPERATION MODE

The Auto operation will be activated immediately once the Auto Switch is pressed.

2 TEST RUN OPERATION (FOR PUMP DOWN/SERVICING PURPOSE)

The Test Run operation will be activated if the Auto Switch is pressed continuously for more than 5 sec. to below 8 sec. A "pep" sound will occur at the fifth sec., in order to identify the starting of Test Run operation.



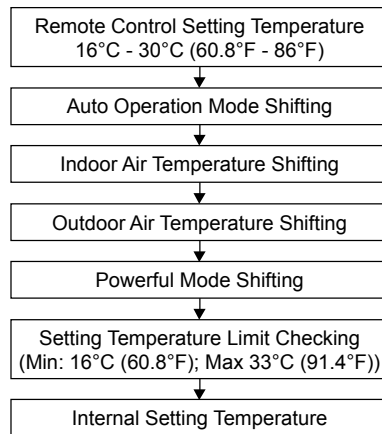
12. Operation Control

12.1 Basic Function

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

12.1.1 Internal Setting Temperature

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



12.1.2 Cooling Operation

12.1.2.1 Thermostat control

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

12.1.3 Soft Dry Operation

12.1.3.1 Thermostat control

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

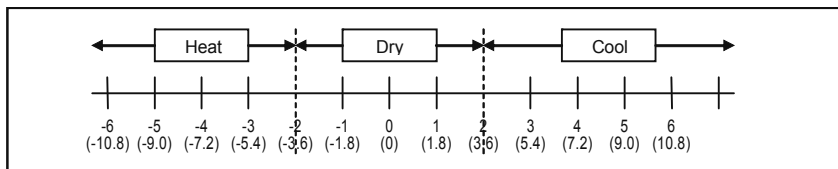
12.1.4 Heating Operation

12.1.4.1 Thermostat control

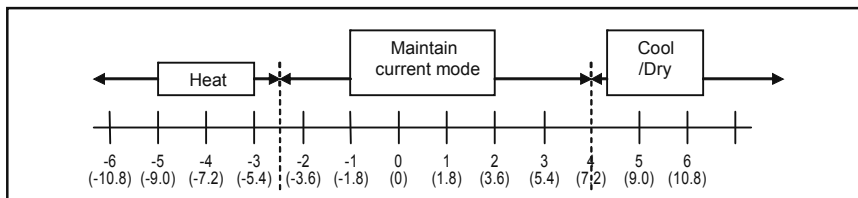
- Compressor is OFF when Intake Air Temperature - Internal Setting Temperature > +2.0°C (3.6°F) continue for 3 minutes.
- Compressor is ON after waiting for 3 minutes, if the Intake Air Temperature - Internal Setting Temperature < Compressor OFF point.

12.1.5 Automatic Operation

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



- For the 2nd judgment onwards
 - If indoor intake temperature - remote control setting temperature $\geq 4^{\circ}\text{C}$ (7.2°F), if previous operate in DRY mode, then continue in DRY mode. otherwise COOL mode is decided.
 - If -2.5°C (-4.5°F) \leq indoor intake temperature - remote control setting temperature $< 4^{\circ}\text{C}$ (7.2°F), maintain with previous mode.
 - If indoor intake temperature - remote control setting temperature $< -2.5^{\circ}\text{C}$ (-4.5°F), HEAT mode is decided.



12.1.6 Fan Operation

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

12.2 Indoor Fan Motor Operation

12.2.1 Basic Rotation Speed (rpm)

A. Basic Rotation Speed (rpm)

i. Manual Fan Speed

[Cooling, Dry]

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

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

[Heating]

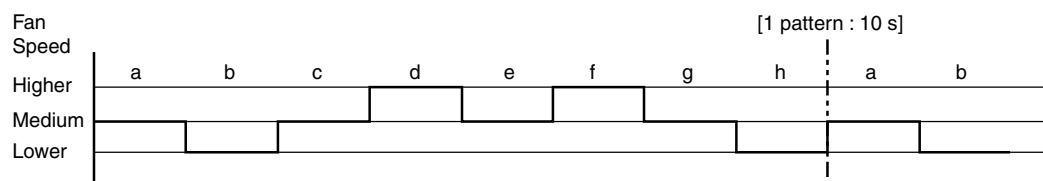
- Fan motor's number of rotation is determined according to remote control setting.

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

ii Auto Fan Speed

[Cooling, Dry]

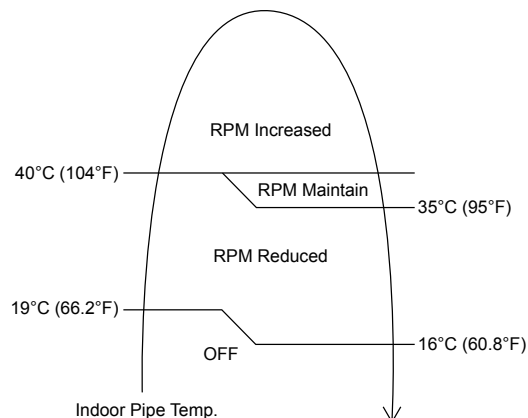
- According to room temperature and setting temperature, indoor fan speed is determined automatically.
- When set temperature is not achieved, the indoor fan will operate according to pattern below.



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

[Heating]

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

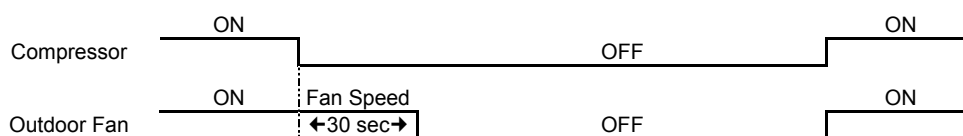


B. Feedback control

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

12.3 Outdoor Fan Motor Operation

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



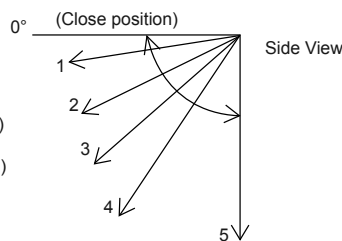
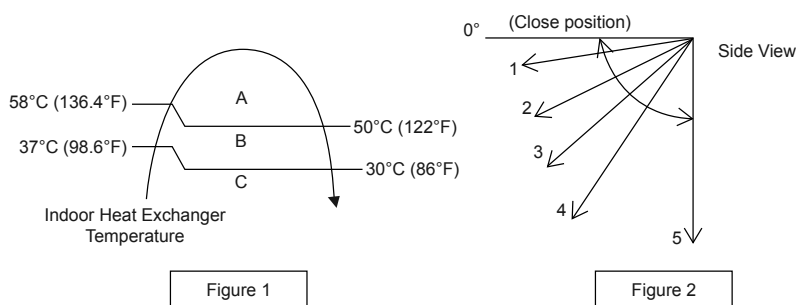
12.4 Airflow Direction

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

12.4.1 Vertical Airflow

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

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



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

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

12.6 Quiet Operation (Heating)

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

12.7 Powerful Mode Operation

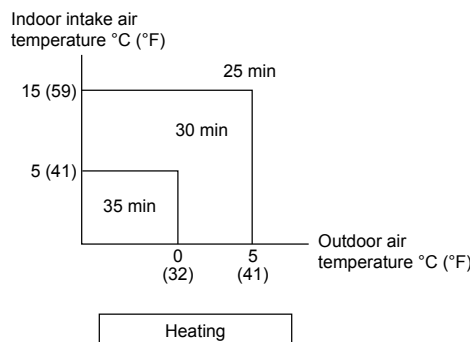
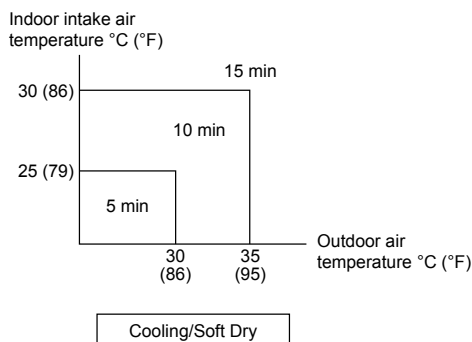
- When the powerful mode is selected, the internal setting temperature will shift lower up to 2°C (3.6°F) (for Cooling/Soft Dry) or higher up to 3.5°C (6.3°F) (for Heating) than remote control setting temperature for 20 minutes to achieve the setting temperature quickly.

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 JP3 at indoor unit printed circuit board.

12.10 Indication Panel

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

Note:

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

12.11 Drain Pump Control Operation

Drain pump control

- This unit has built-in with drain pump.

Control content

- During COOL/DRY mode.
 - During COOL/DRY mode, drain pump starts 10 seconds after indoor fan motor starts.
 - The drain pump is always ON.
- After COOL/DRY mode, when unit turns OFF (power standby) or changes to HEAT mode.
 - The drain pump turns ON for 90 seconds immediately.
- Error judgment
 - When float switch detects ON signal continuously for 2 minutes 30 seconds, error code H21 are shown.
 - When float switch ON has operated 2 times within 20 minutes, error code H35 are shown.

13. Protection Control

13.1 Protection Control For All Operations

13.1.1 Restart Control (Time Delay Safety Control)

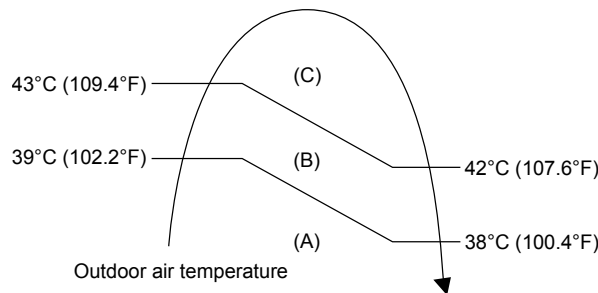
- The Compressor will not turn on within 3 minutes from the moment operation stops, although the unit is turned on again by pressing OFF/ON button at remote control within this period.
- This control is not applicable if the power supply is cut off and on again.
- This phenomenon is to balance the pressure 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	E12RB4U		E18RB4U	
Operation Mode	X (A)	Y (A)	X (A)	Y (A)
Cooling / Soft Dry (A)	6.55	15.01	12.39	19.10
Cooling / Soft Dry (B)	6.10		11.43	
Cooling / Soft Dry (C)	6.10		10.05	
Heating	6.98		13.18	

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

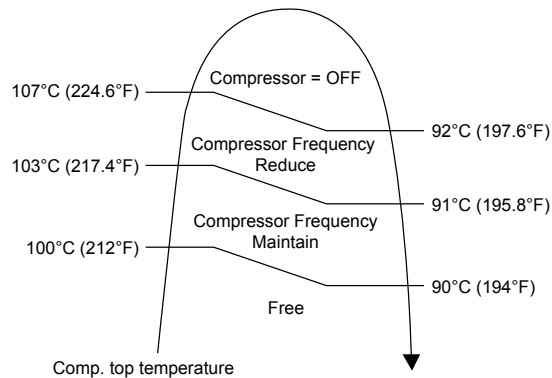


13.1.3 IPM (Power transistor) Prevention Control

- Overheating Prevention Control
 - 1 When the IPM temperature rises to 120°C (248°F), compressor operation will stop immediately.
 - 2 Compressor operation restarts after 3 minutes the temperature decreases to 110°C (230°F).
 - 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 20.23 (E12RB4U), 30.0 (E18RB4U) ± 5.0A, 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 top temperature. The changes of frequency are as below.
- If compressor top temperature exceeds 107°C (224.6°F), 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 4°C (7.2°F).
 - During Heating operations:
Indoor piping temperature - indoor suction is under 5°C (9°F).
- 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

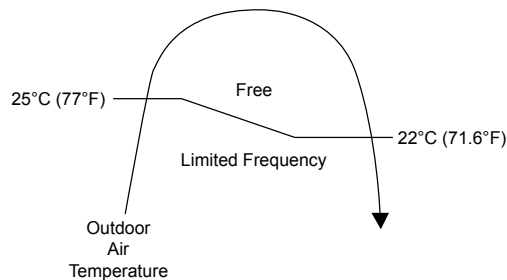
- When all the below conditions comply, the compressor frequency will change to lower frequency.

Temperature, T, for:	Cooling/Soft Dry	Heating
Indoor intake air °C (°F)	T < 14 (57.2) or T ≥ 30 (86)	T < 14 (57.2) or T ≥ 28 (82.4)
Outdoor air °C (°F)	T < 13 (55.4) or T ≥ 38 (100.4)	T < 4 (39.2) or T ≥ 24 (75.2)
Indoor heat exchanger °C (°F)	T < 30 (86)	T ≥ 0 (32)

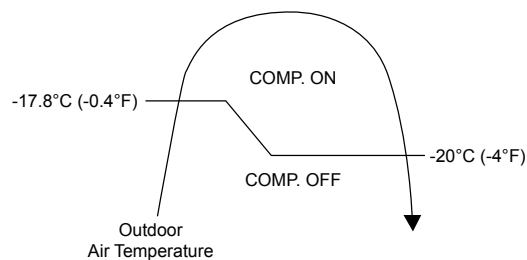
13.2 Protection Control For Cooling & Soft Dry Operation

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.



- The compressor will be stopped to avoid compressor overloading.



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 63°C (145.4°F).
- If the compressor stops 4 times in 20 minutes, Timer LED blinking (F95 indicated: outdoor high pressure rise protection).

13.2.3 Freeze Prevention Control 1

- When indoor heat exchanger temperature is lower than 0°C (32°F) continuously for 6 minutes, compressor will stop operating.
- Compressor will resume its operation after stop for 3 minutes and the indoor heat exchanger is higher than 5°C (41°F).
- At the same time, indoor fan speed will be higher than during its normal operation.
- If indoor heat exchanger temperature is higher than 13°C (55.4°F), the fan speed will return to its normal operation.

13.2.4 Freeze Prevention Control 2

- Control start conditions
 - During Cooling operation and soft dry operation
 - During thermo OFF condition, indoor intake temperature is less than 10°C (50°F) or
 - Compressor stops for freeze prevention control
 - Either one of the conditions above occurs 5 times in 40 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.

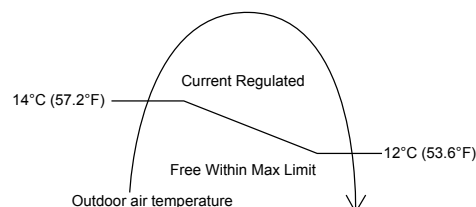
13.3 Protection Control For Heating Operation

13.3.1 Intake Air Temperature Control

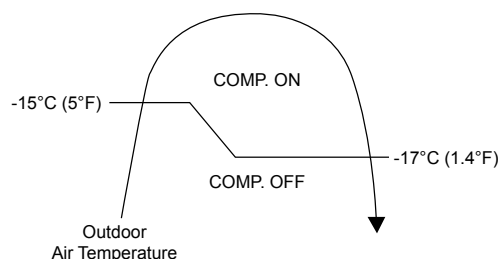
Compressor will operate at limited freq., if indoor intake air temperature is 30°C (86°F) or above.

13.3.2 Outdoor Air Temperature Control

- The Max current value is regulated when the outdoor air temperature rise above 14°C (57.2°F) in order to avoid compressor overloading.

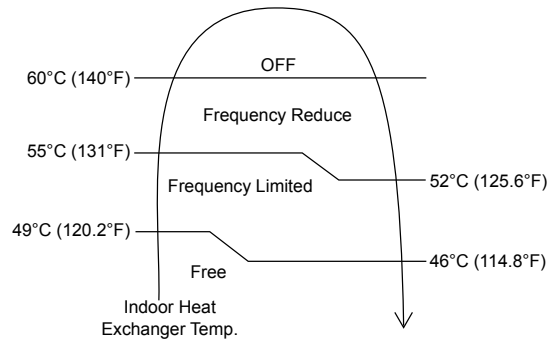


- The compressor will be stopped to avoid compressor overloading.



13.3.3 Overload Protection Control

- The compressor operating frequency is regulated in accordance to indoor heat exchanger temperature as shown below.
- If the heat exchanger temperature exceeds 60°C (140°F), compressor will stop.



13.3.4 Low Temperature Compressor Oil Return Control

- In heating operation, if the outdoor temperature falls below -10°C (14°F) 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

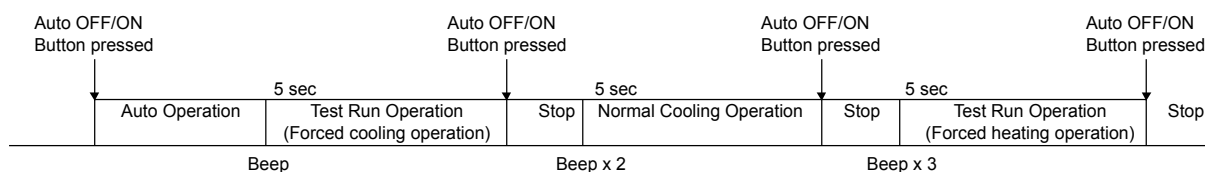
- When outdoor pipe temperature and outdoor air temperature is low, deice operation start where indoor fan motor and outdoor fan motor stop and operation LED blinks.

13.3.7 Pump down Operation by CN-S

- A convenience method to activate pump down operation.
- Control start condition:
 - During power standby condition, short CN-S continuously between 1 second and 10 seconds.
- Control stop condition:
 - 480 seconds after pump down operation starts.
 - CN-S is shorted again during pump down operation.

14. Servicing Mode

14.1 Auto OFF/ON Button



1 AUTO OPERATION MODE

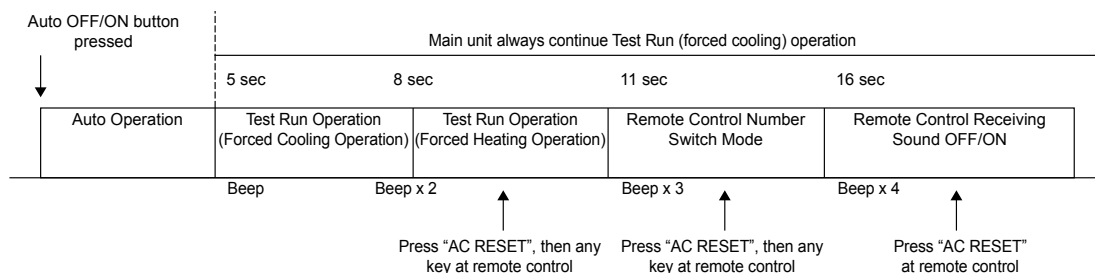
The Auto operation will be activated immediately once the Auto OFF/ON button is pressed. This operation can be used to operate air conditioner with limited function if remote control is misplaced or malfunction.

2 TEST RUN OPERATION (FOR PUMP DOWN/SERVICING PURPOSE)

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

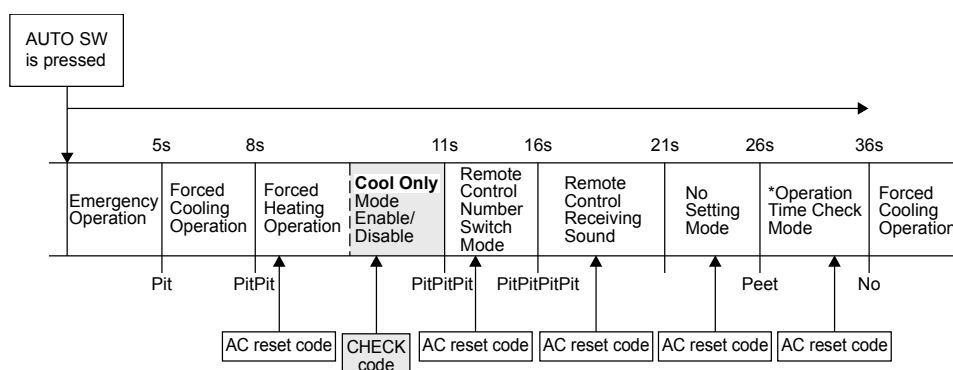
Press “Auto OFF/ON button” to toggle remote control receiving sound.

- 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 Cooling Only Operation (Single connection Only, Multi connection please refer to Multi outdoor manual)

14.2.1 How to activate and deactivate Cooling Only Operation



The default setting is “Cool Only” mode disable.

- To enable the "Cool Only" mode, press the AUTO OFF/ON SW for more than 8s and less than 11s, “Pit Pit” sound will be heard, then release the AUTO OFF/ON SW and press remote controller CHECK button. A short “Pit” sound will be heard. “Cool Only” mode is now enable.
- To disable the "Cool Only" mode, press the AUTO OFF/ON SW for more than 8s and less than 11s, “Pit Pit” sound will be heard, then release the AUTO OFF/ON SW and press remote controller CHECK button. A long “Pit” sound will be heard. “Cool Only” mode is now disable.

14.2.2 Operation mode during Cooling Only Operation

The table below shows the operation mode comparison when cooling only operation mode activated and deactivated.

Operation mode	Cooling Only Operation Mode Activated	Cooling Only Operation Mode Deactivated
AUTO	After 30s sampling, regardless of indoor intake or outdoor intake temperature judgement, the unit will run Cooling or DRY operation.	After 30s sampling, the unit will judge the operation mode base on remote controller temperature setting and Indoor Intake Sensor (New Auto Mode) or Outdoor Intake Sensor (Old Auto Mode)
HEAT	The unit will stop and Power LED blinking.	The unit will run Heating operation.
COOL	The unit will run Cooling operation.	The unit will run Cooling operation.
DRY	The unit will run DRY operation.	The unit will run Dry operation.
Force Heating	The unit will run Force Cooling operation.	The unit will run Force Heating operation.
AUTO (with Timer)	The unit will turn ON by the timer and run Auto Operation. After 30s sampling, regardless of indoor intake or outdoor intake temperature judgement, the unit will run Cooling or DRY operation.	The unit will turn ON by the timer and run Auto Operation. After 30s sampling, the unit will judge the operation mode base on remote controller temperature setting and Indoor Intake Sensor (New Auto Mode) or Outdoor Intake Sensor (Old Auto Mode)
HEAT (with Timer)	The unit will not turn ON by the Timer. Power LED blinking.	The unit will turn ON by the timer and run Heating Operation.
COOL (with Timer)	The unit will turn ON by the Timer and run Cooling operation.	The unit will turn ON by the timer and run Cooling Operation.
DRY (with Timer)	The unit will turn ON by the Timer and run DRY operation.	The unit will turn ON by the timer and run Cooling Dry Operation.

** Power LED blinking = 2.5s ON, 0.5s OFF

14.3 Remote Control Button

14.3.1 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.

14.3.2 RESET (RC)

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

14.3.3 RESET (AC)

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

14.3.4 TIMER ▲

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

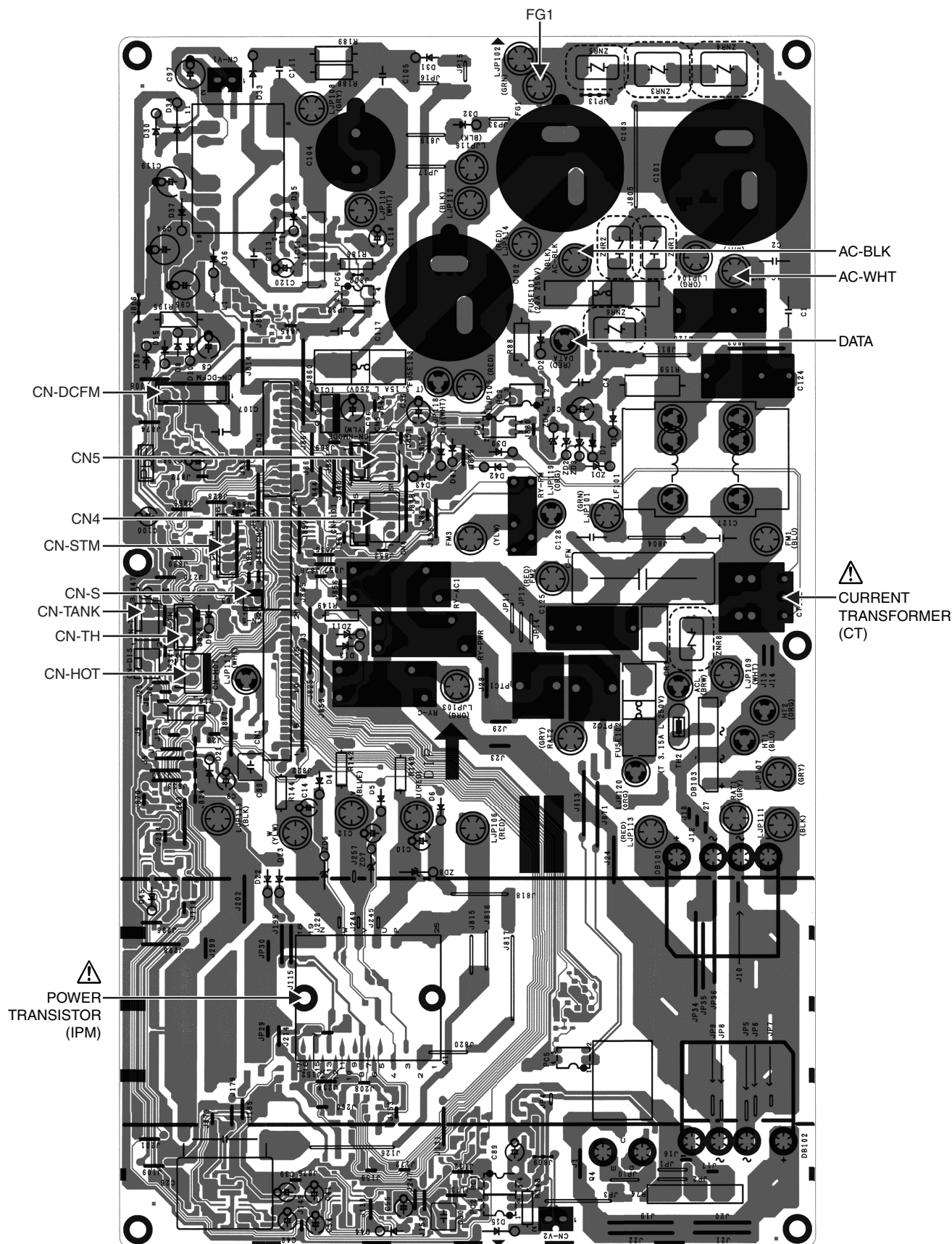
14.3.5 TIMER ▼

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

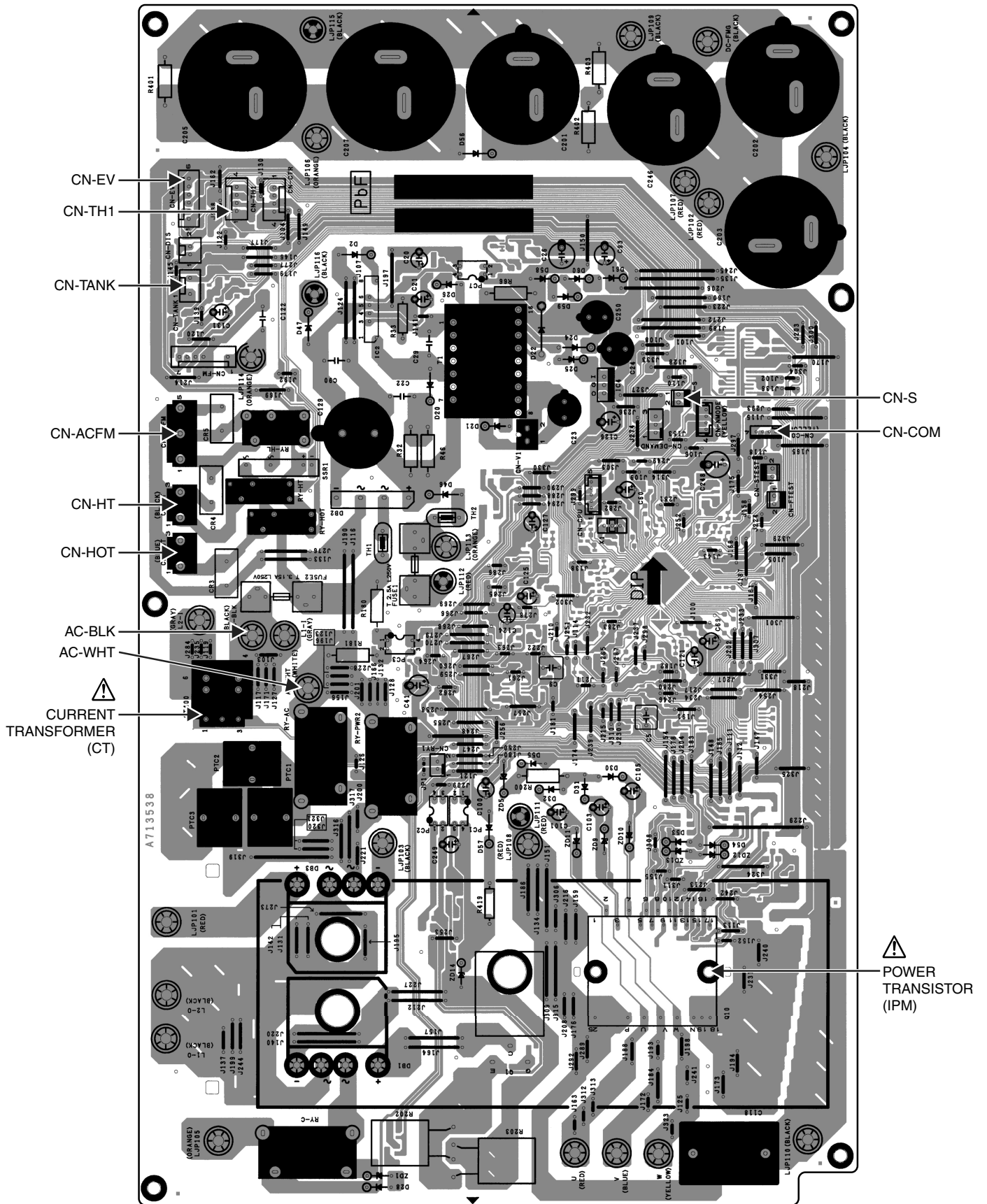
14.4 Outdoor PCB Test Run Operation (For Pump Down/Servicing Purpose)

- The Test Run operation will be activated by short-circuiting CN-S (Pin 1 and 2) at outdoor unit PCB after power supplied to outdoor unit terminal 1 and 2. The unit forced to run rated frequency cooling operation mode.

CU-E12RB4U



■ CU-E18RB4U



15. Troubleshooting Guide

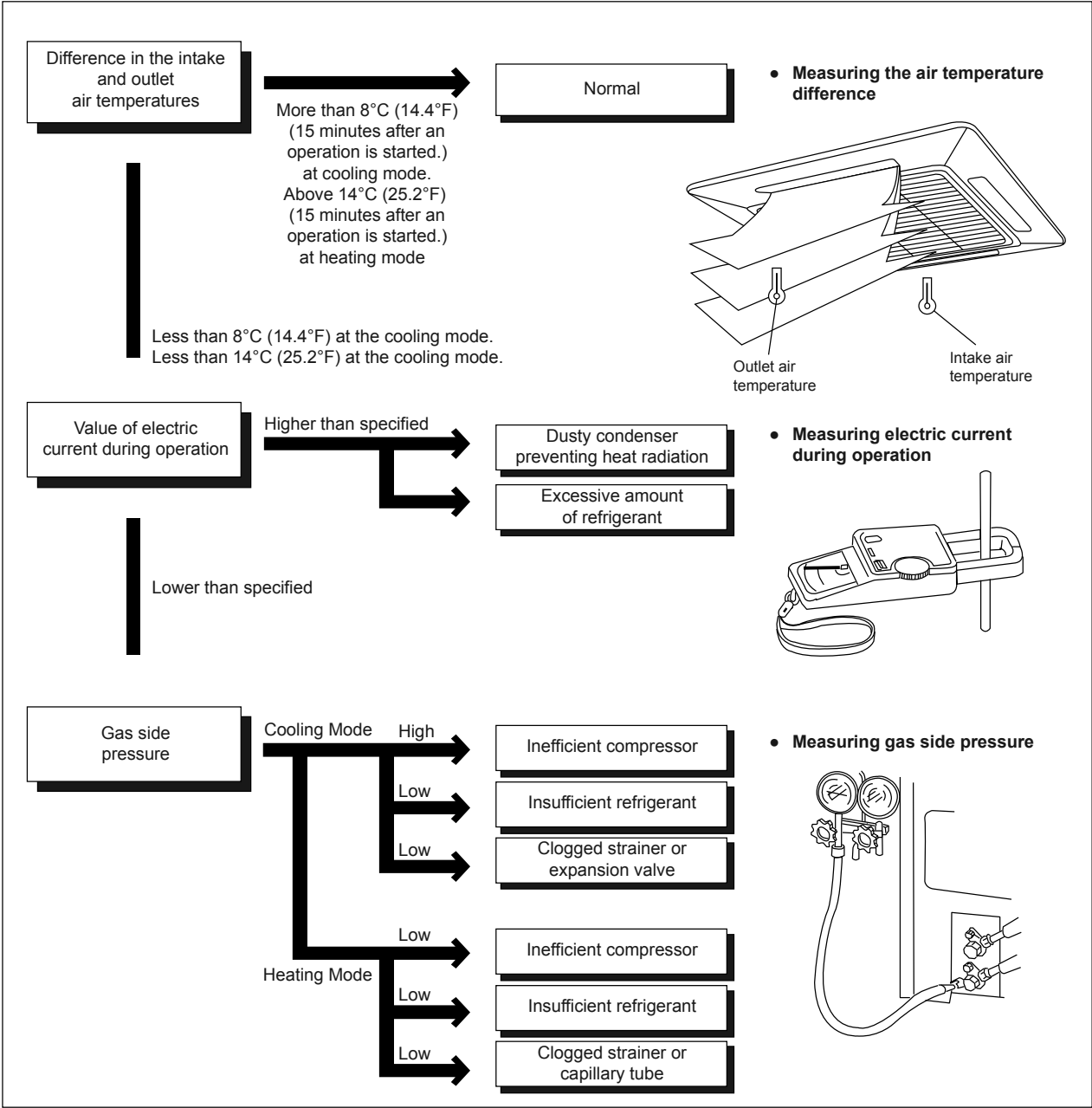
15.1 Refrigeration Cycle System

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 °C (°F)
Cooling Mode	130.53 ~ 174.04 (9 ~ 12)	12 ~ 16 (53.6 ~ 60.8)
Heating Mode	333.58 ~ 420.60 (23 ~ 29)	36 ~ 45 (96.8 ~ 113)

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



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)

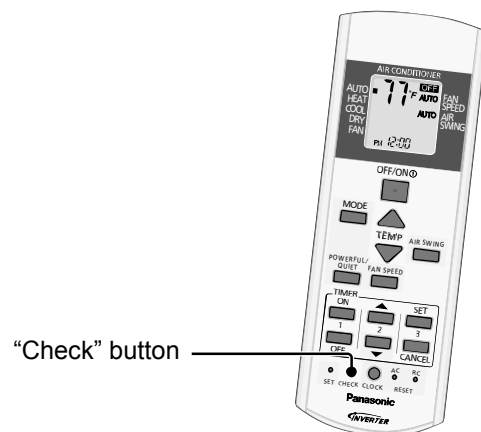
- 1 Turn power on.
- 2 Press the CHECK button on the remote controller continuously for 5 seconds.
- 3 “- -” will be displayed on the remote controller display.
Note: Display only for “- -”. (No transmitting signal, no receiving sound and no Power LED blinking.)
- 4 Press the “TIMER” ▲ or ▼ button on 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
H21	Indoor float switch operation abnormal	—	—	—	—
H23	Indoor heat exchanger temperature sensor abnormality	Continuous for 5s	—	Indoor heat exchanger temperature sensor open or short circuit	<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
H33	Indoor / outdoor misconnection abnormality	—	—	Indoor and outdoor rated voltage different	<ul style="list-style-type: none"> Indoor and outdoor units check
H35	Indoor drain water adverse current abnormal	—	—	—	—
H38	Indoor/Outdoor mismatch (brand code)	—	—	Brand code not match	<ul style="list-style-type: none"> Check indoor unit and outdoor unit
H97	Outdoor fan motor mechanism lock	2 times happen within 30 minutes	—	Outdoor fan motor lock or feedback abnormal	<ul style="list-style-type: none"> Outdoor fan motor lead wire and connector Fan motor lock or block
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
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

Diagnosis display	Abnormality / Protection control	Abnormality Judgment	Protection Operation	Problem	Check location
F95	Outdoor cooling high pressure protection	4 times happen within 20 minutes	—	Cooling high pressure protection	<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)

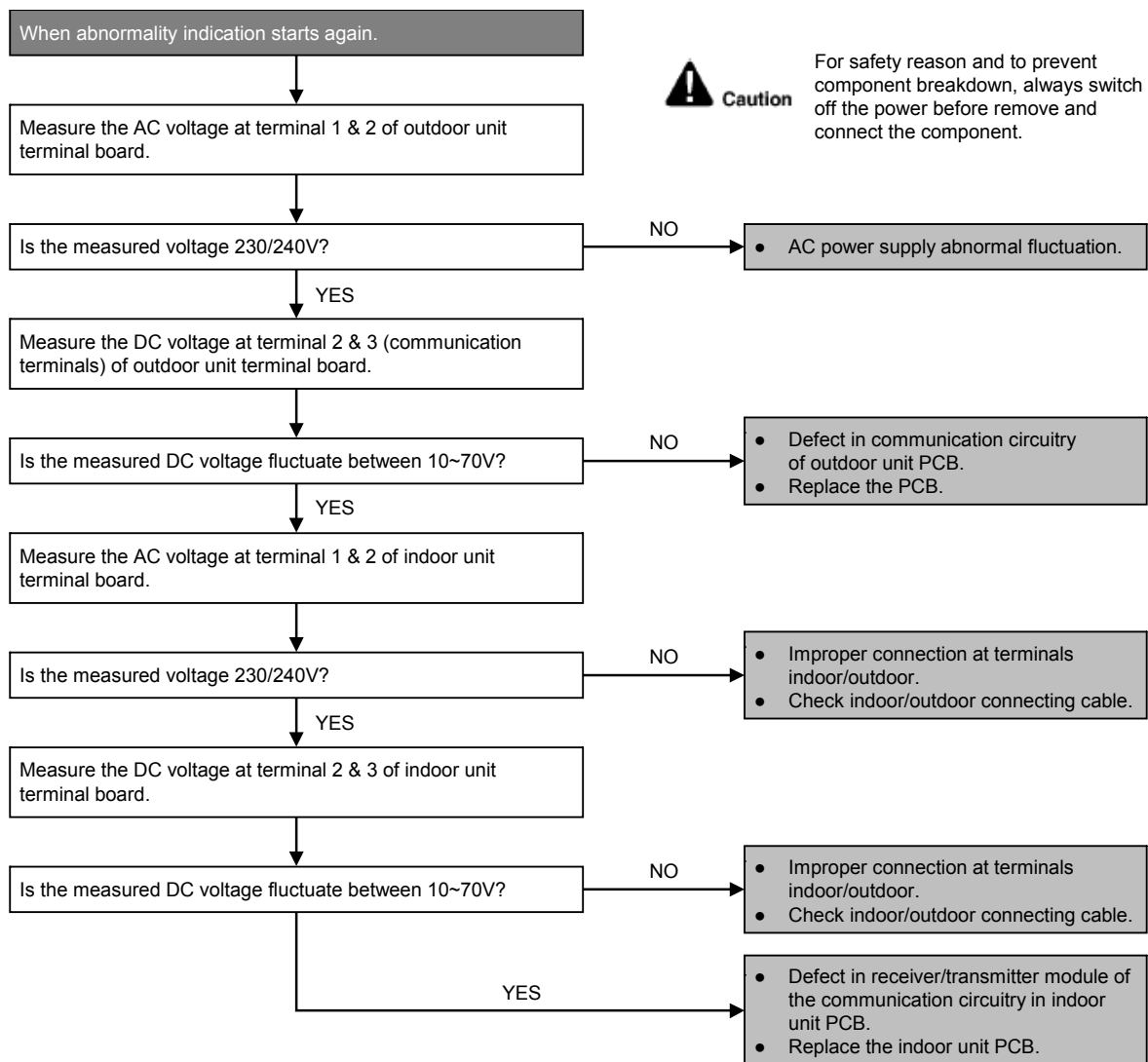
Malfunction Decision Conditions

- 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)

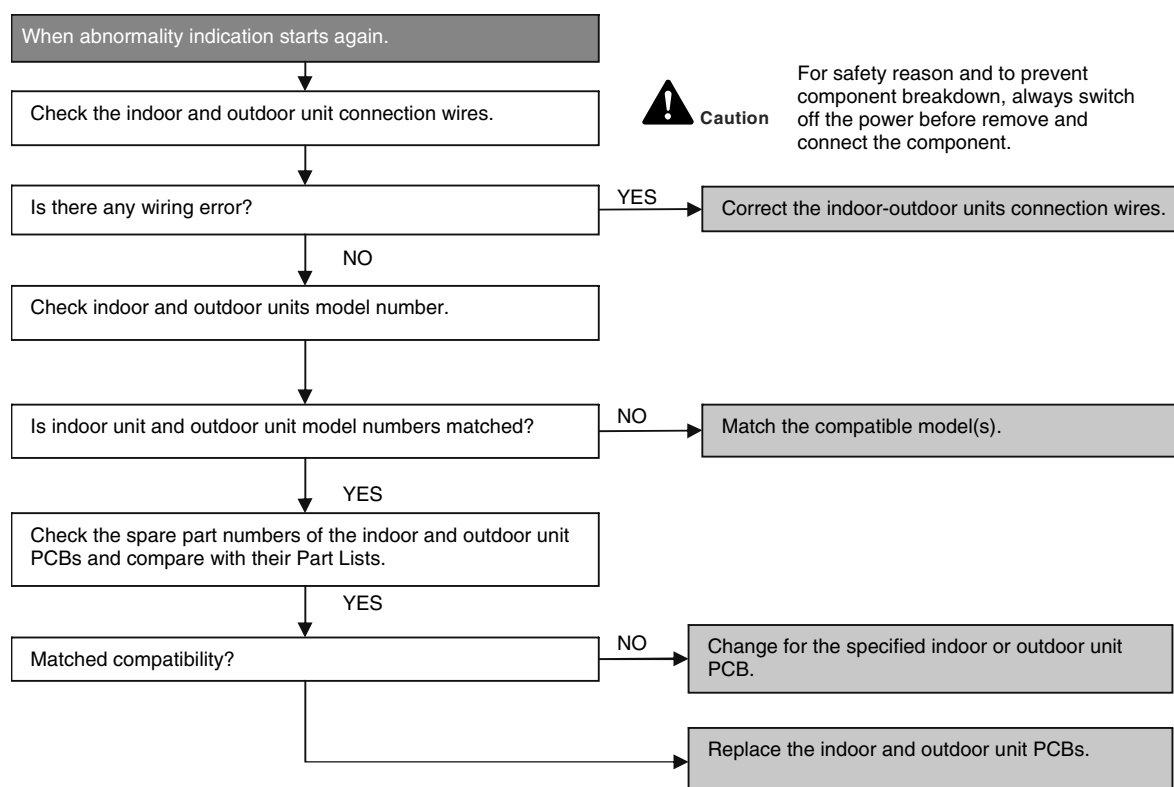
Malfunction Decision Conditions

- 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)

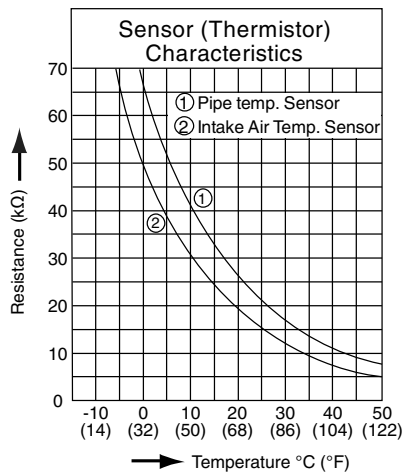
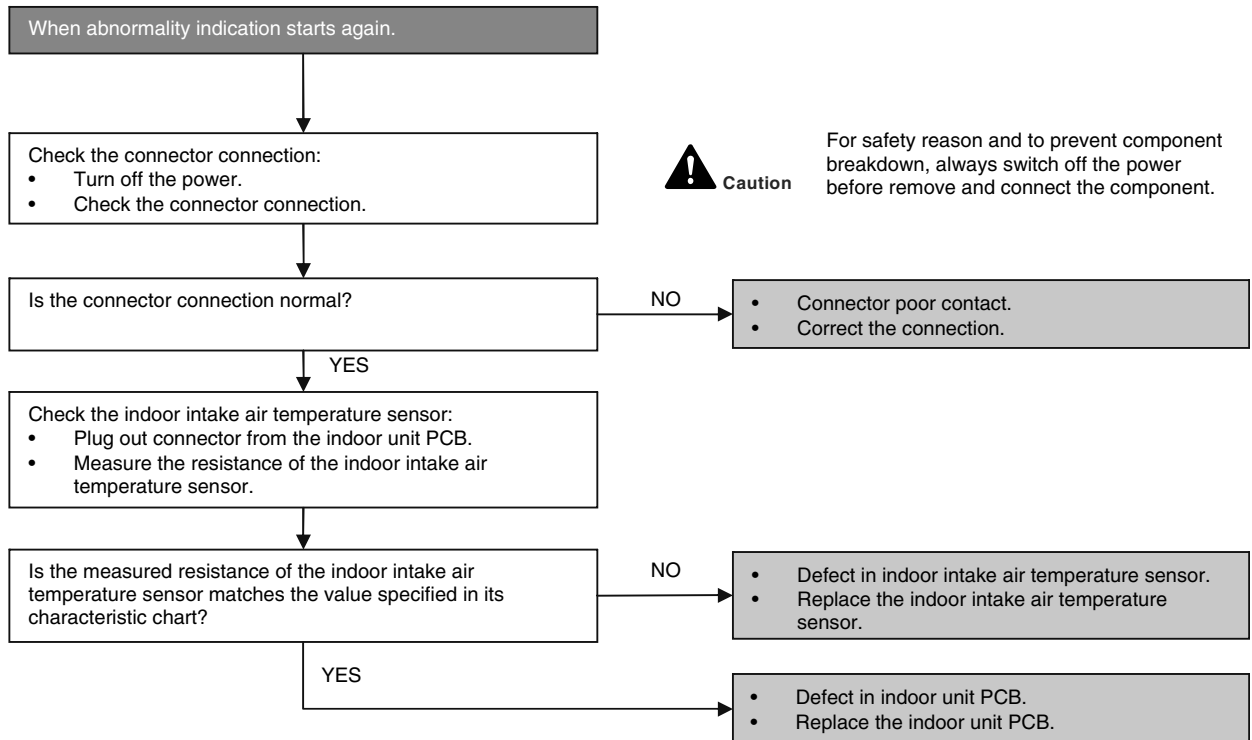
Malfunction Decision Conditions

- 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)

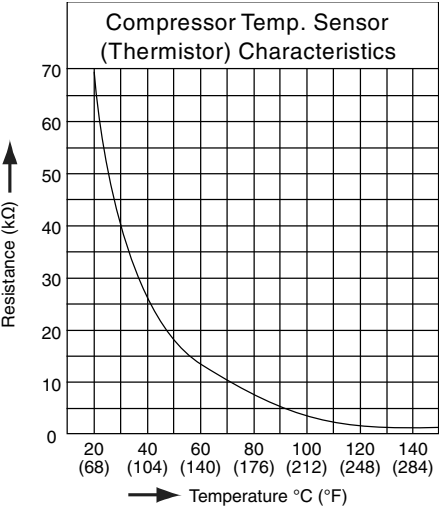
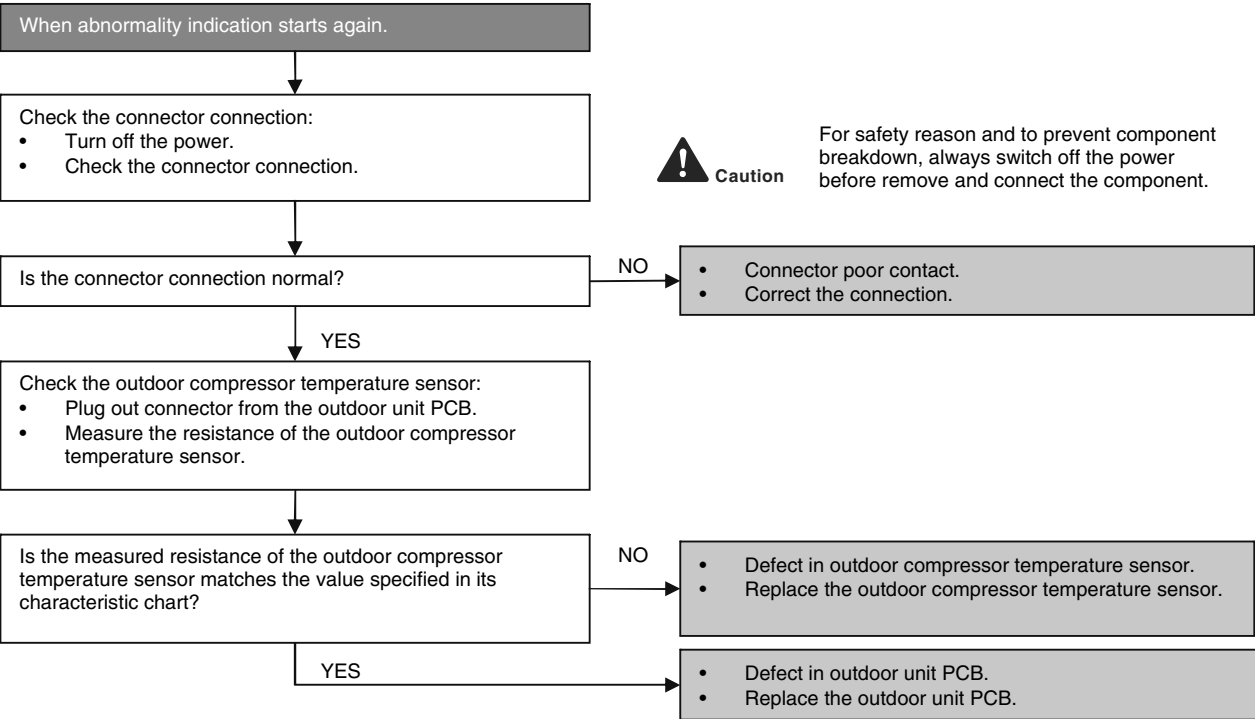
Malfunction Decision Conditions

- 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)

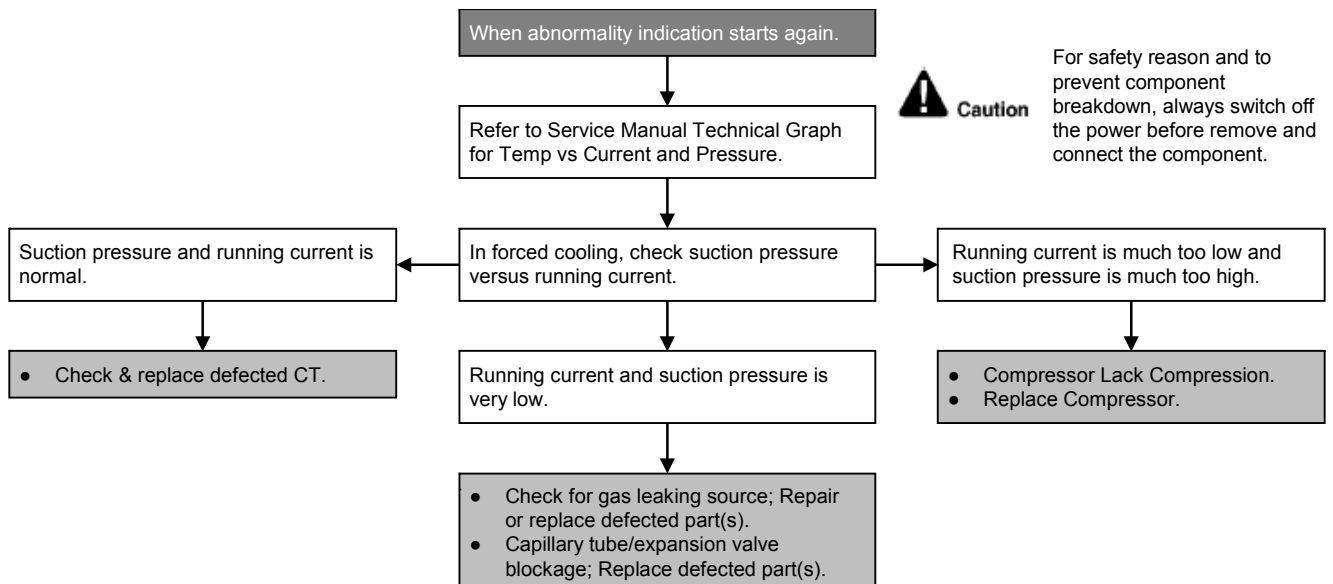
Malfunction Decision Conditions

- 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)

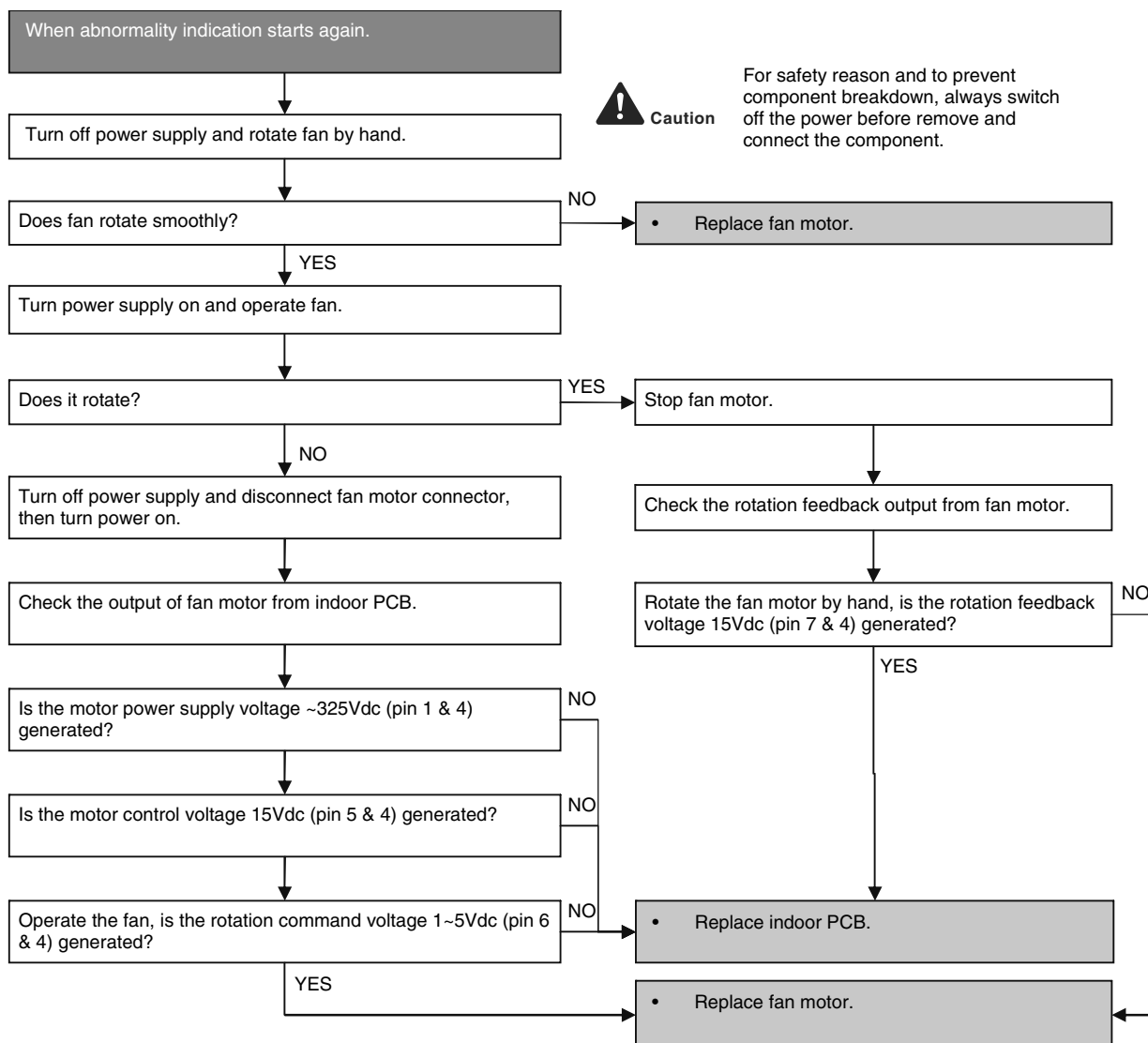
Malfunction Decision Conditions

- 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



Caution

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

15.4.7 H23 (Indoor Pipe Temperature Sensor Abnormality)

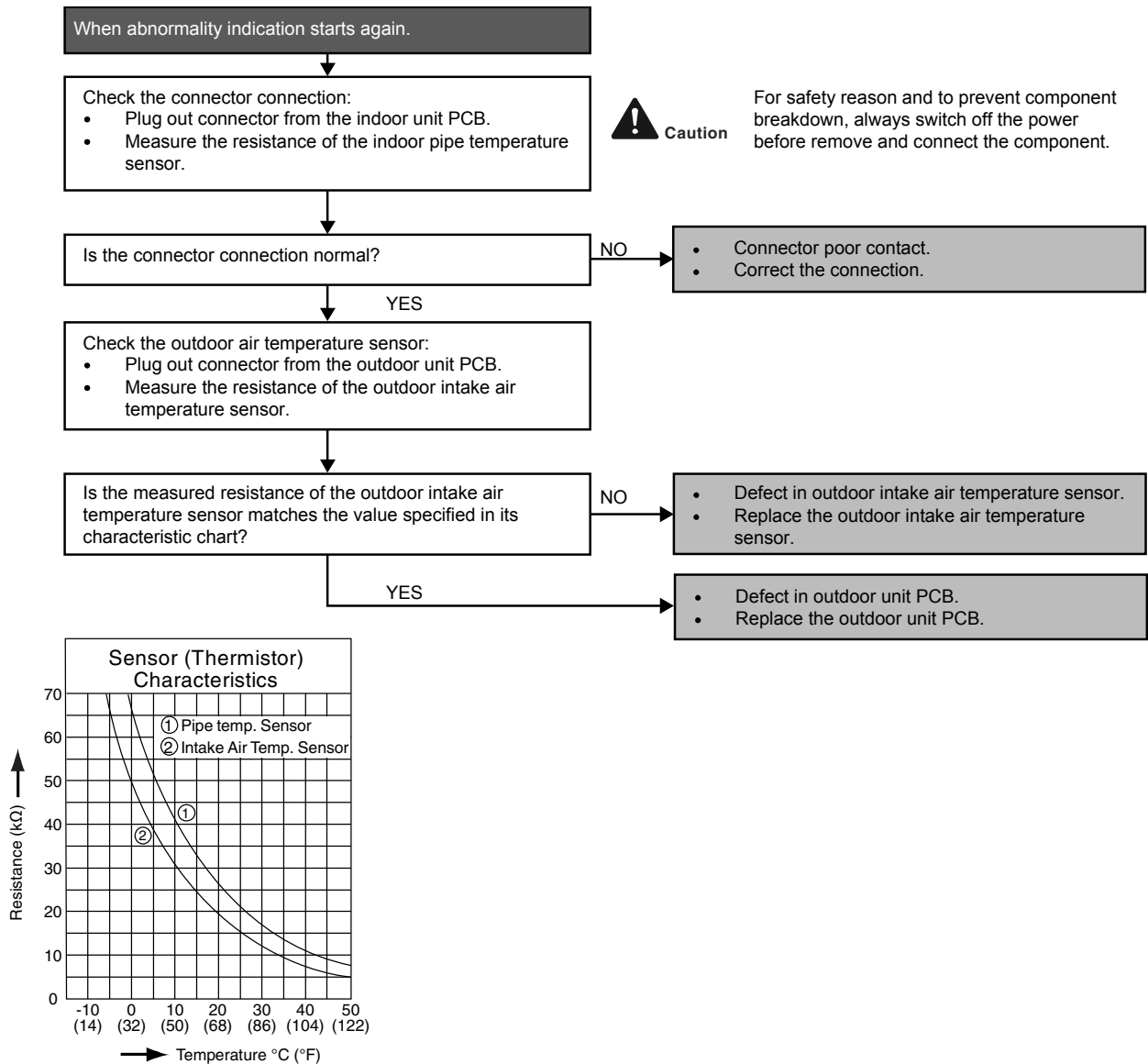
Malfunction Decision Conditions

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

Malfunction Caused

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

Troubleshooting



15.4.8 H24 (Indoor Pipe Temperature Sensor 2 Abnormality)

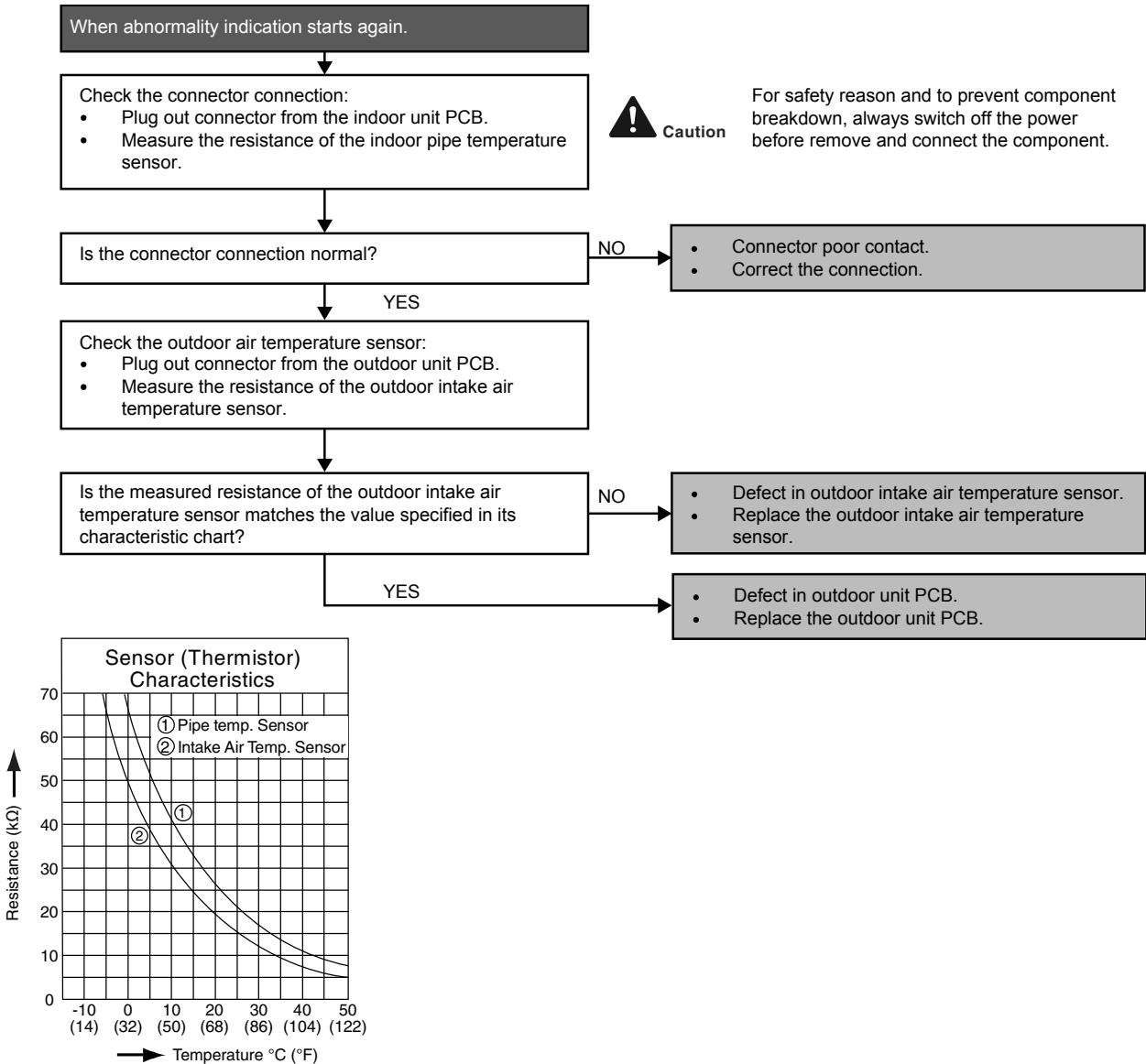
Malfunction Decision Conditions

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

Malfunction Caused

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

Troubleshooting



15.4.9 H27 (Outdoor Air Temperature Sensor Abnormality)

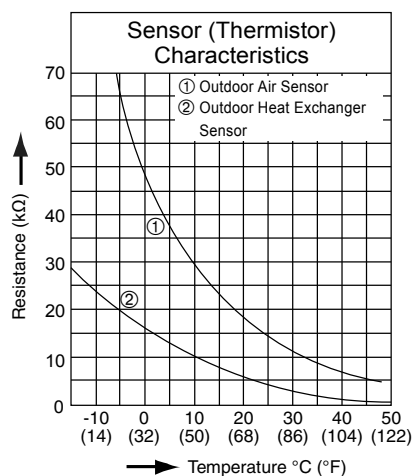
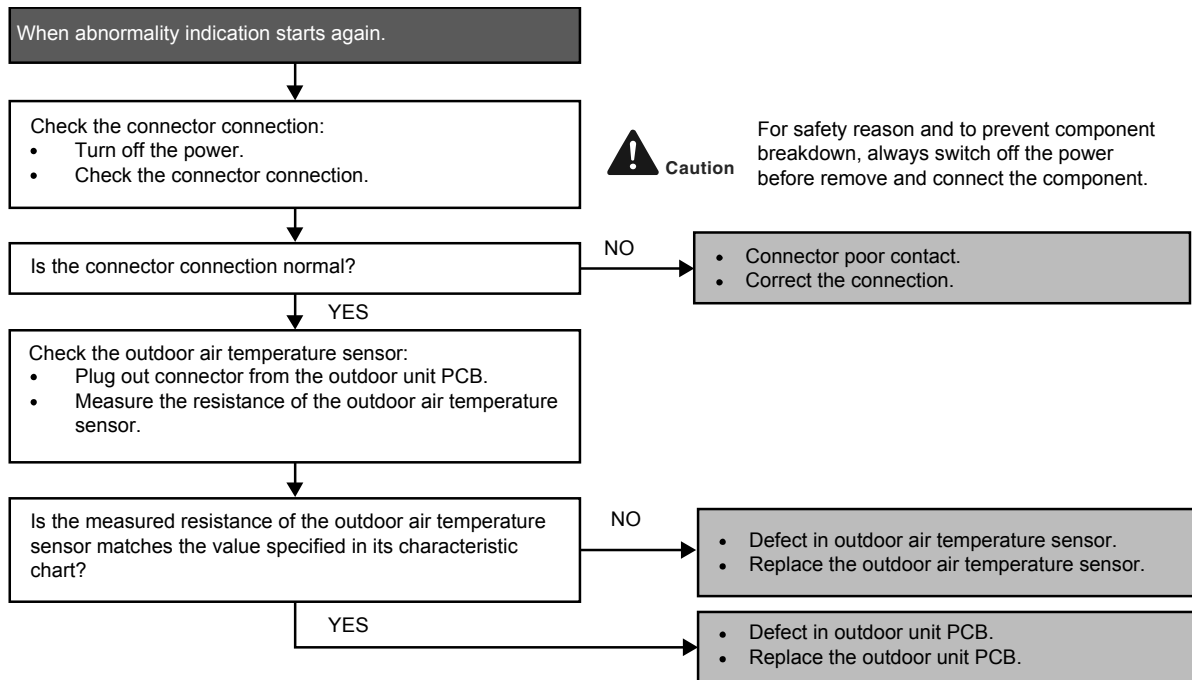
Malfunction Decision Conditions

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

Malfunction Caused

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

Troubleshooting



15.4.10 H28 (Outdoor Pipe Temperature Sensor Abnormality)

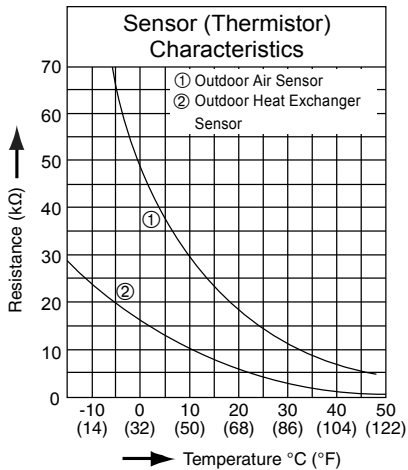
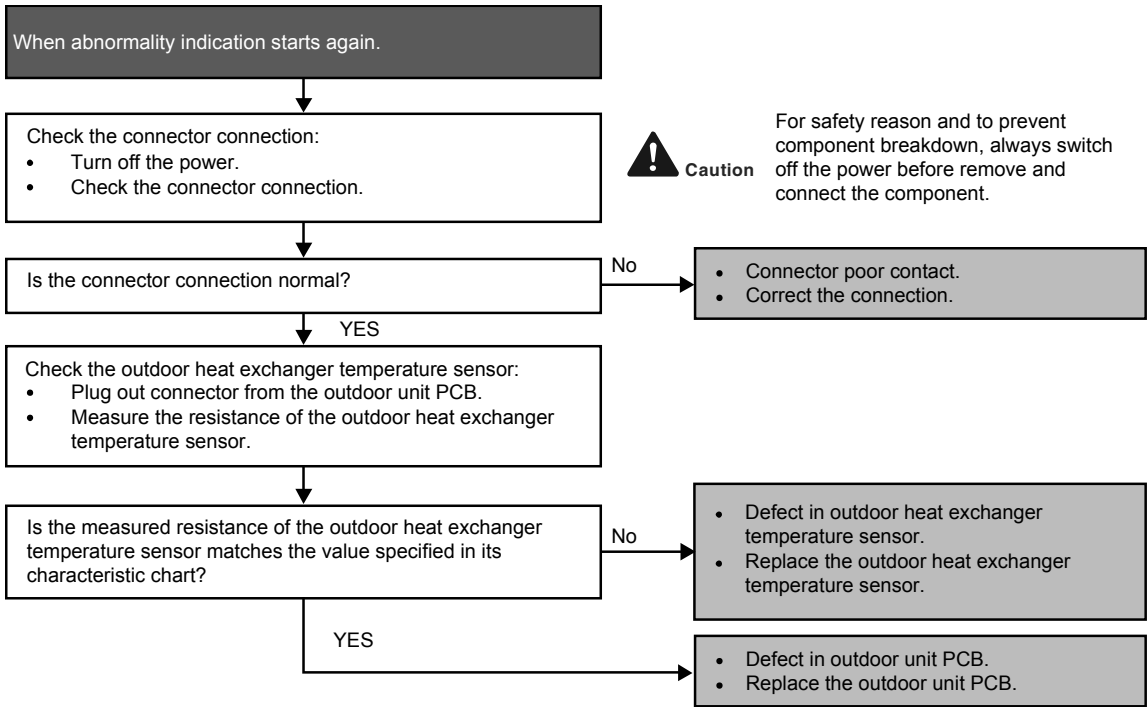
Malfunction Decision Conditions

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

Malfunction Caused

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

Troubleshooting



15.4.11 H30 (Compressor Discharge Temperature Sensor Abnormality)

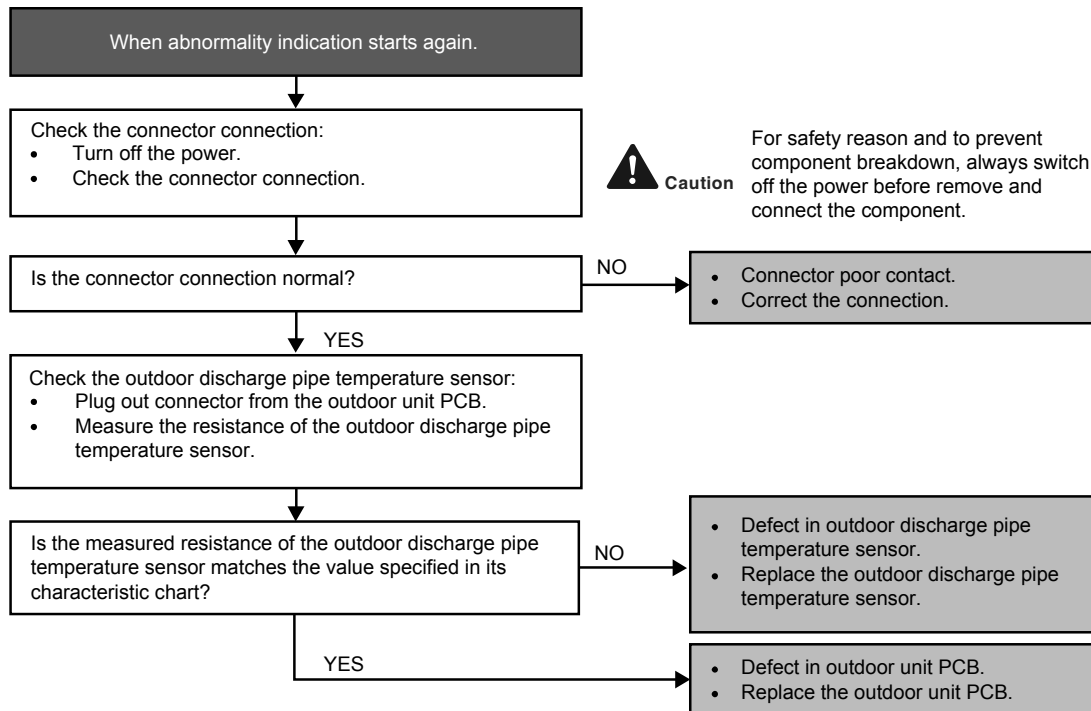
Malfunction Decision Conditions

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

Malfunction Caused

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

Troubleshooting



15.4.12 H33 (Unspecified Voltage between Indoor and Outdoor)

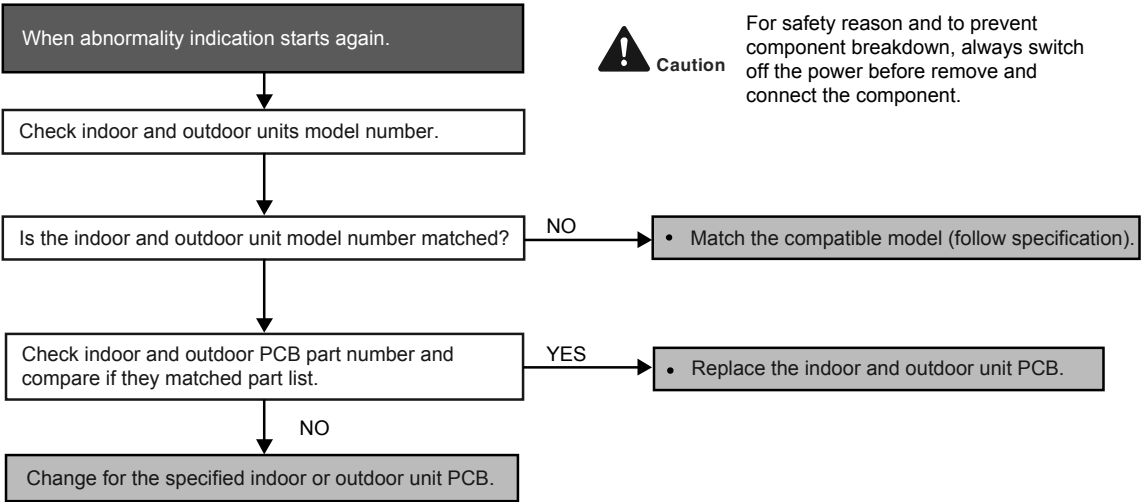
Malfunction Decision Conditions

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

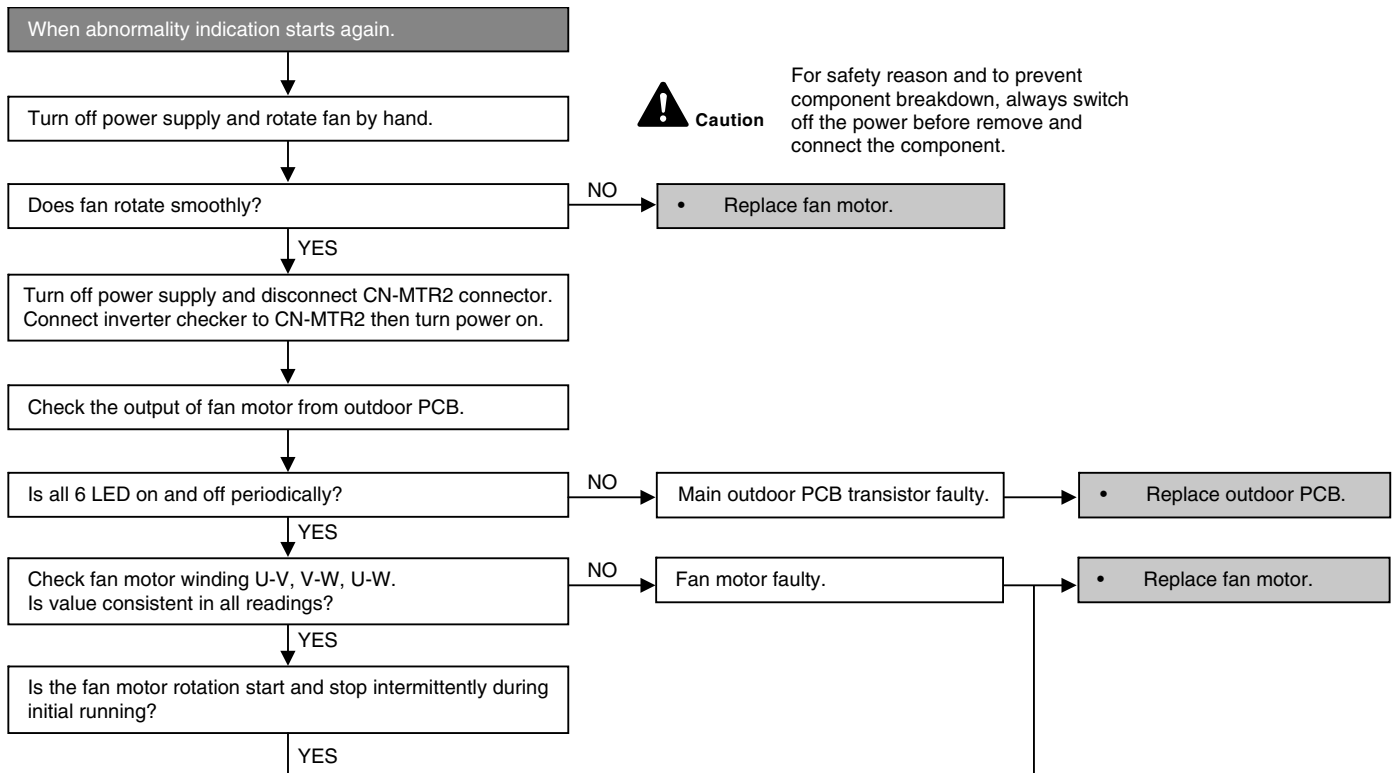
Malfunction Decision Conditions

- 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



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

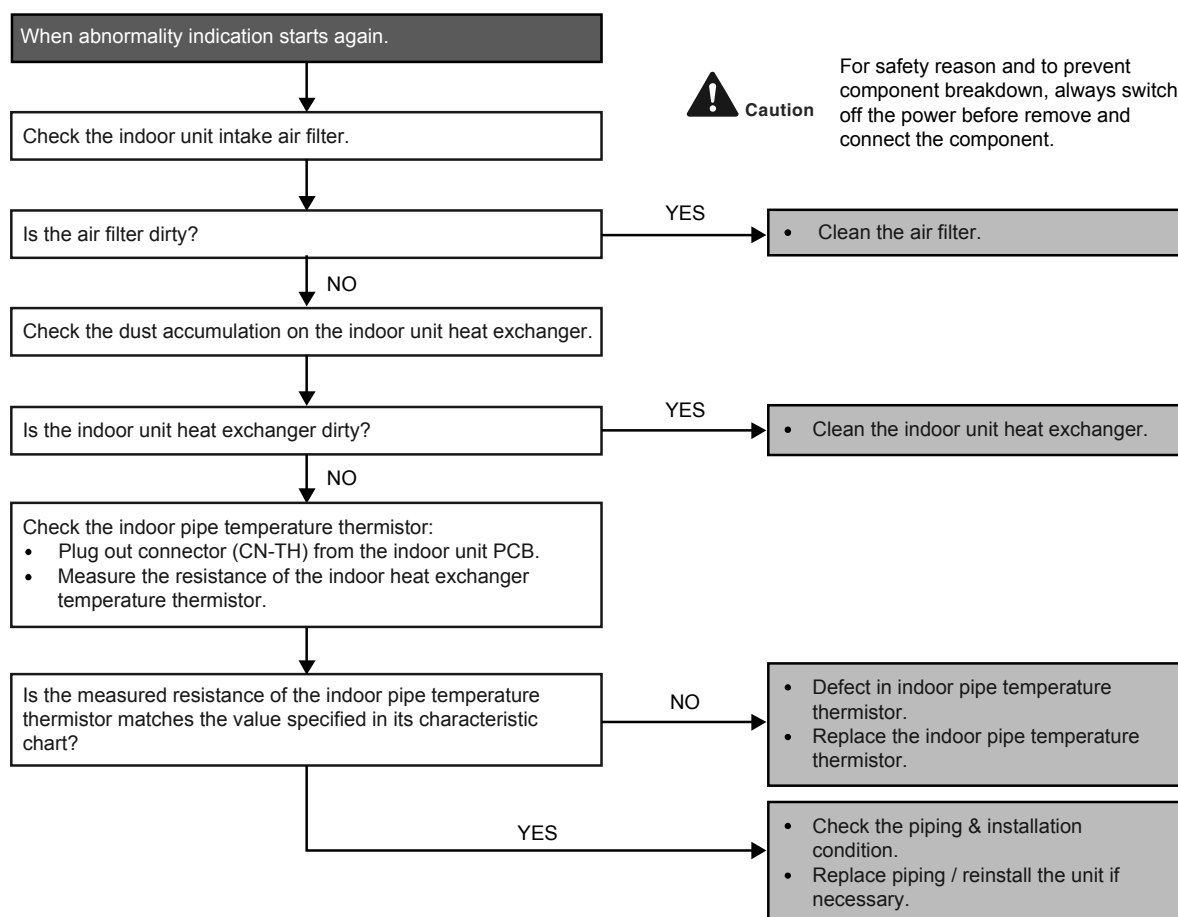
Malfunction Decision Conditions

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

Malfunction Caused

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

Troubleshooting



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

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

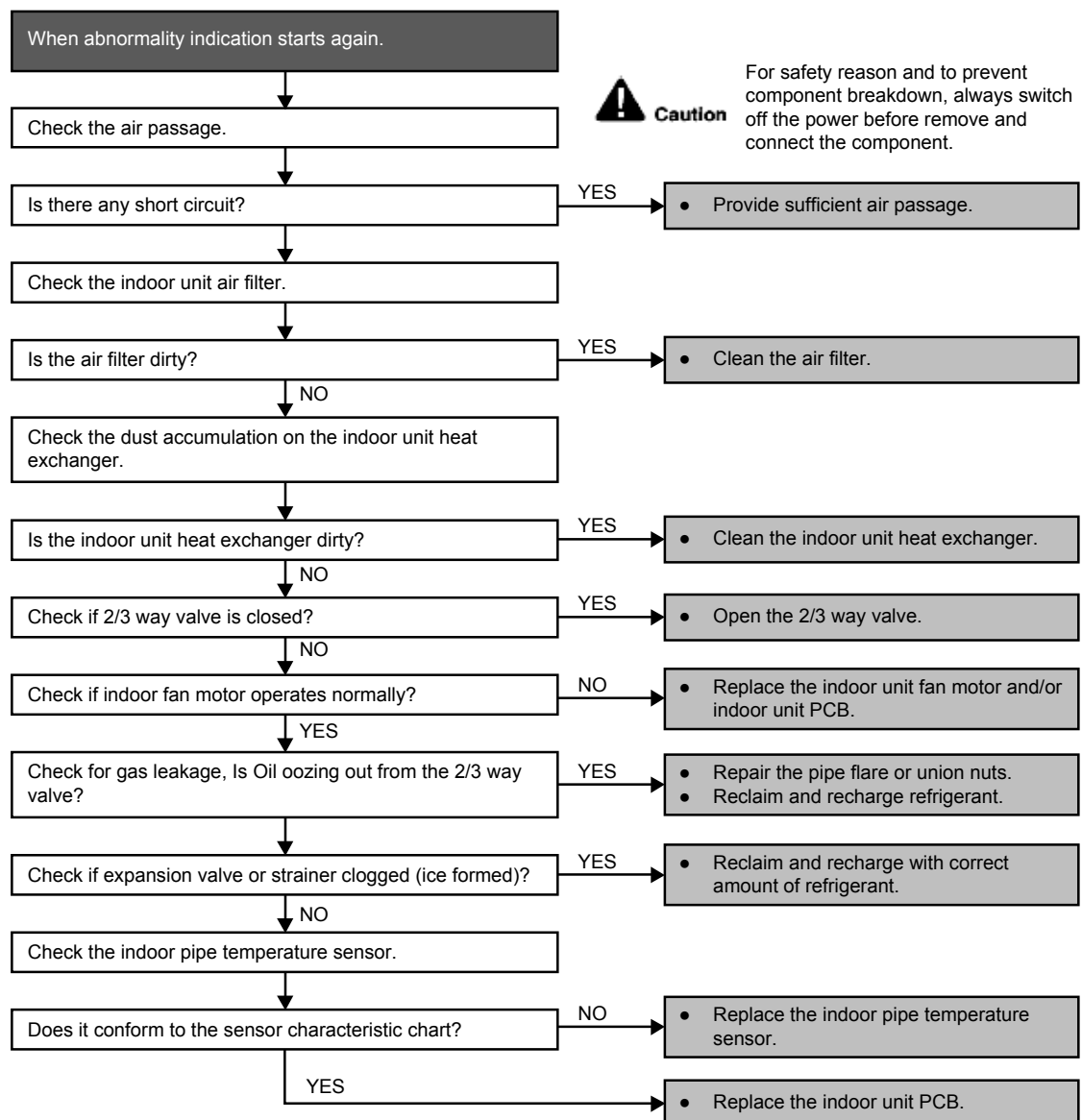
Malfunction Decision Conditions

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

Malfunction Caused

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

Troubleshooting



15.4.16 F11 (4-way Valve Switching Failure)

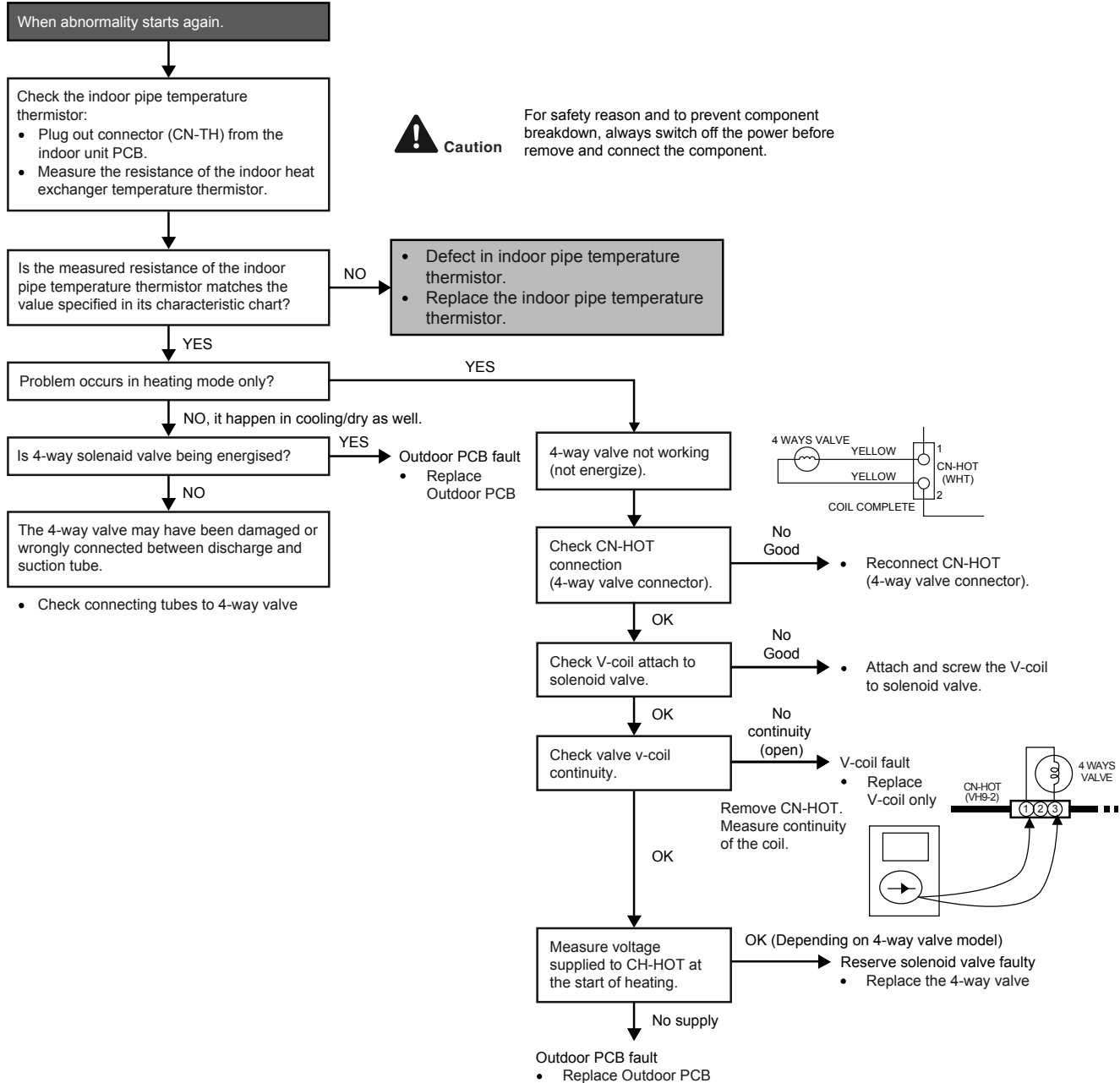
Malfunction Decision Conditions

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

Malfunction Caused

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

Troubleshooting



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

15.4.17 F90 (Power Factor Correction Protection)

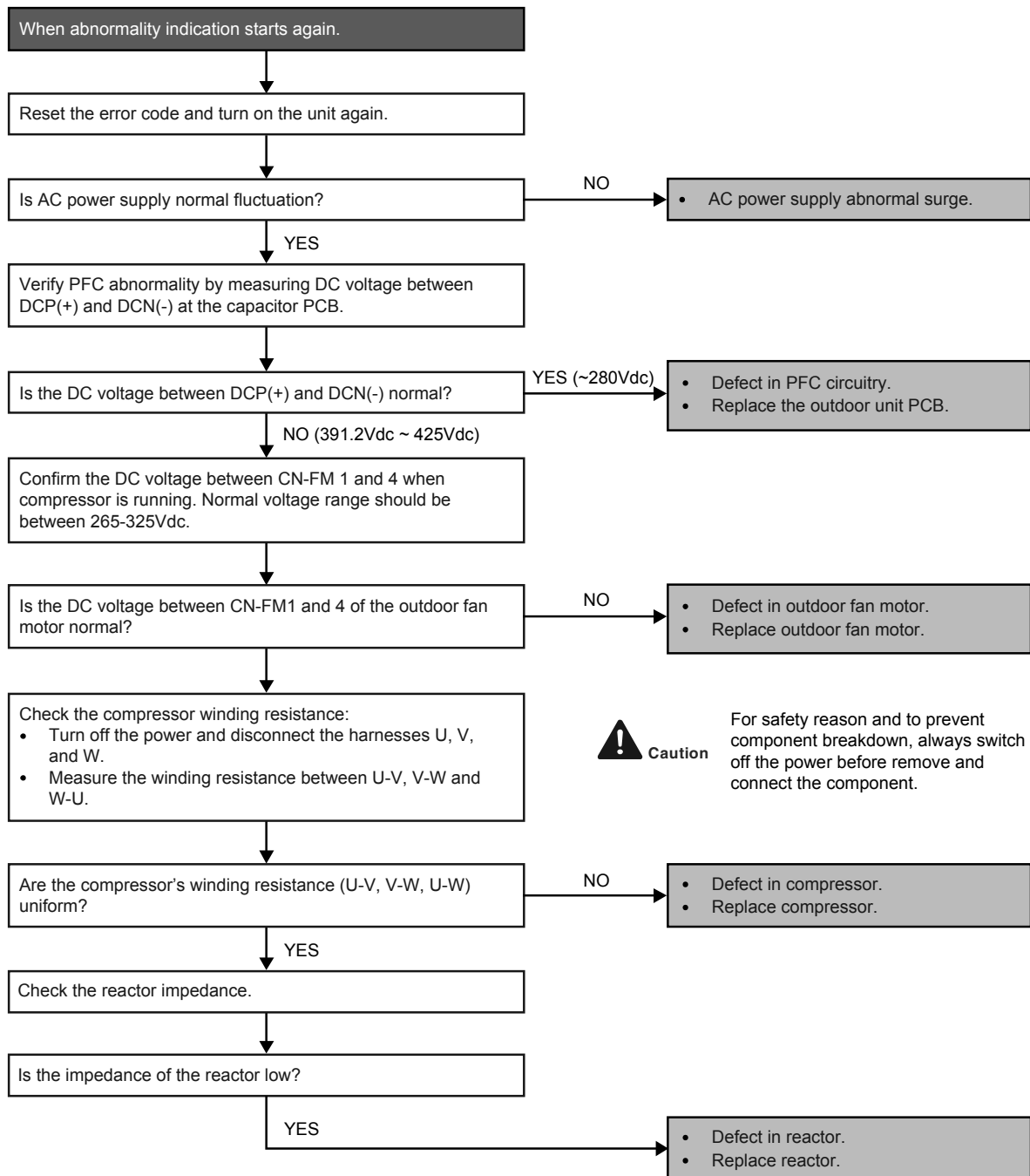
Malfunction Decision Conditions

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

Malfunction Caused

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

Troubleshooting



15.4.18 F91 (Refrigeration Cycle Abnormality)

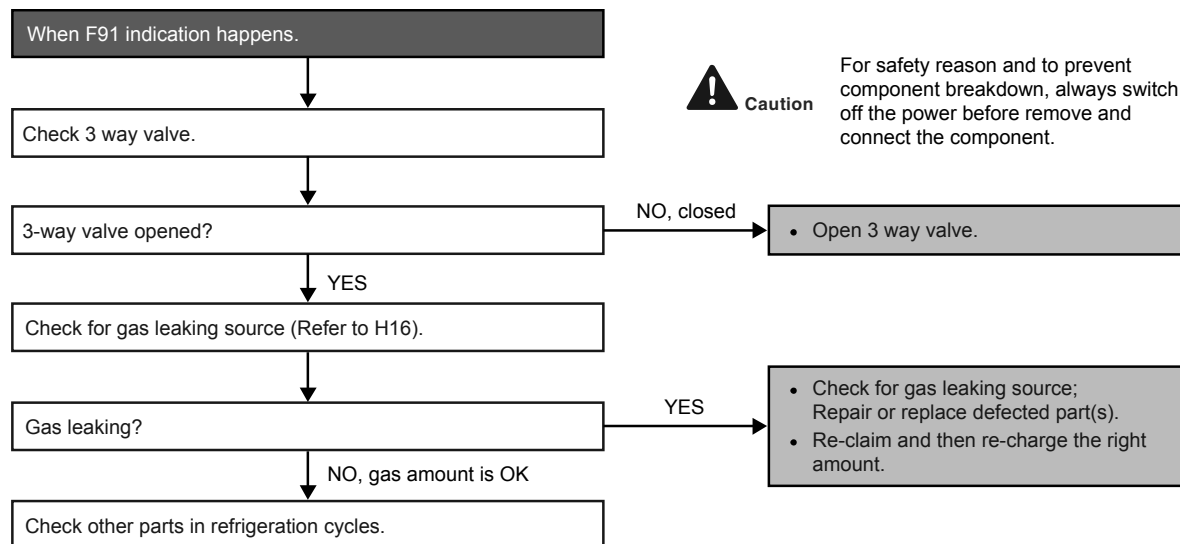
Malfunction Decision Conditions

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

Malfunction Caused

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

Troubleshooting



15.4.19 F93 (Compressor Rotation Failure)

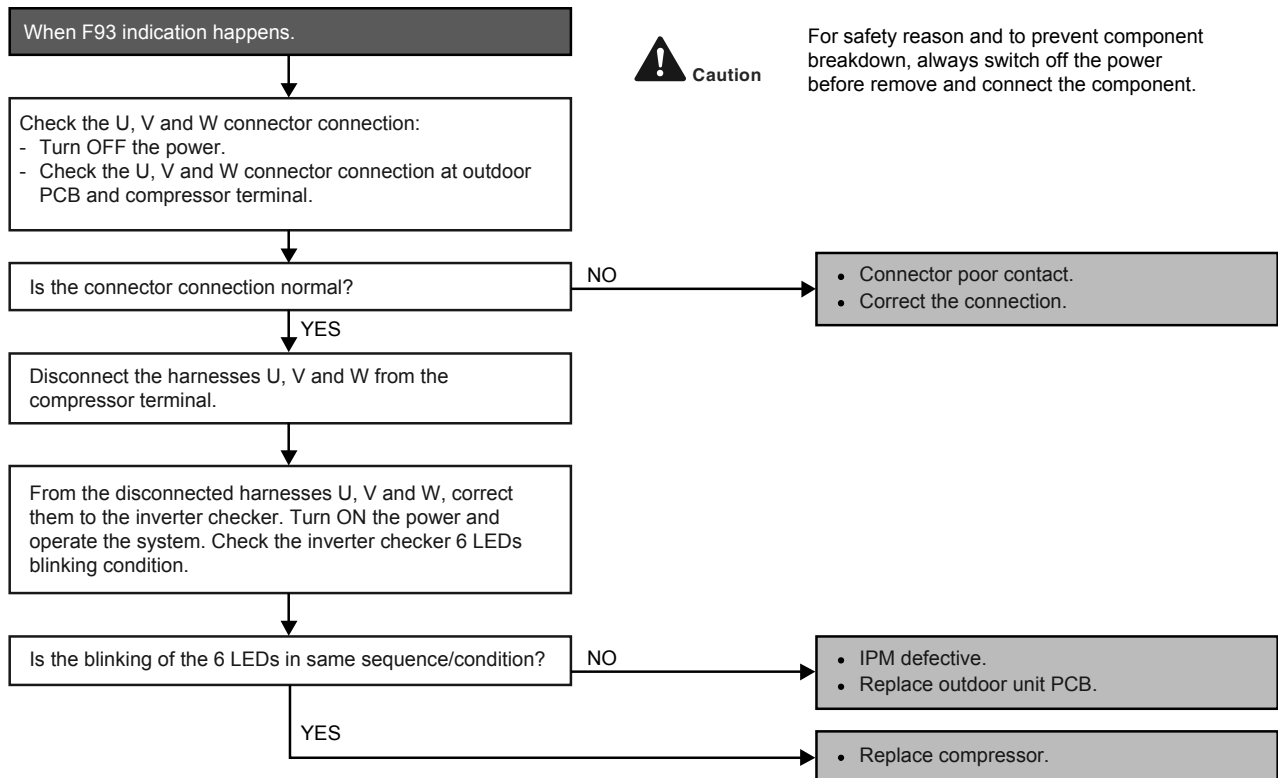
Malfunction Decision Conditions

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

Malfunction Caused

- Compressor terminal disconnect
- Faulty Outdoor PCB
- Faulty compressor

Troubleshooting



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

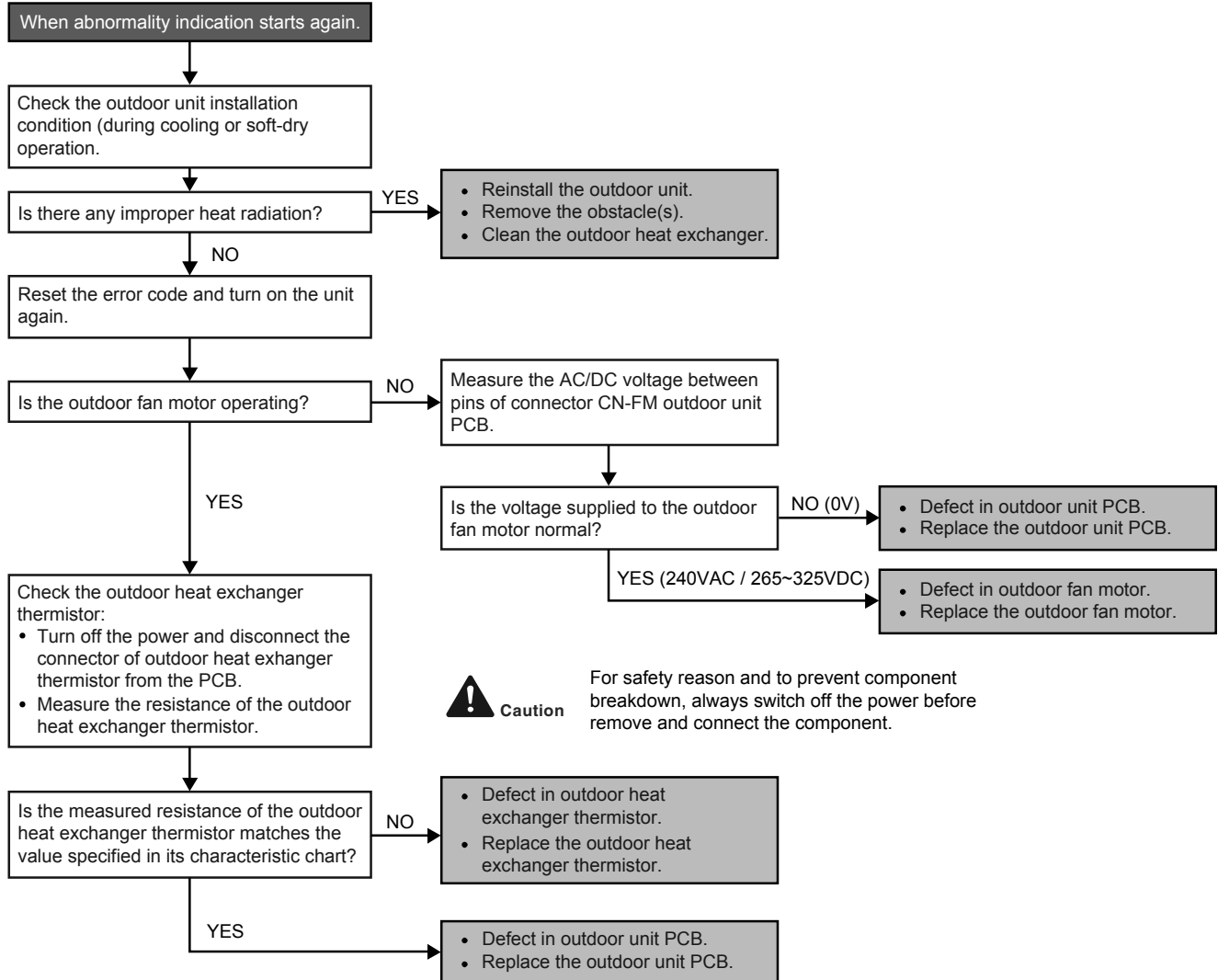
Malfunction Decision Conditions

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

Malfunction Caused

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

Troubleshooting



15.4.21 F96 (IPM Overheating)

Malfunction Decision Conditions

- During operating of cooling and heating, when IPM temperature data (100°C (202°F)) is detected by the IPM temperature sensor.

Multi Models only

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

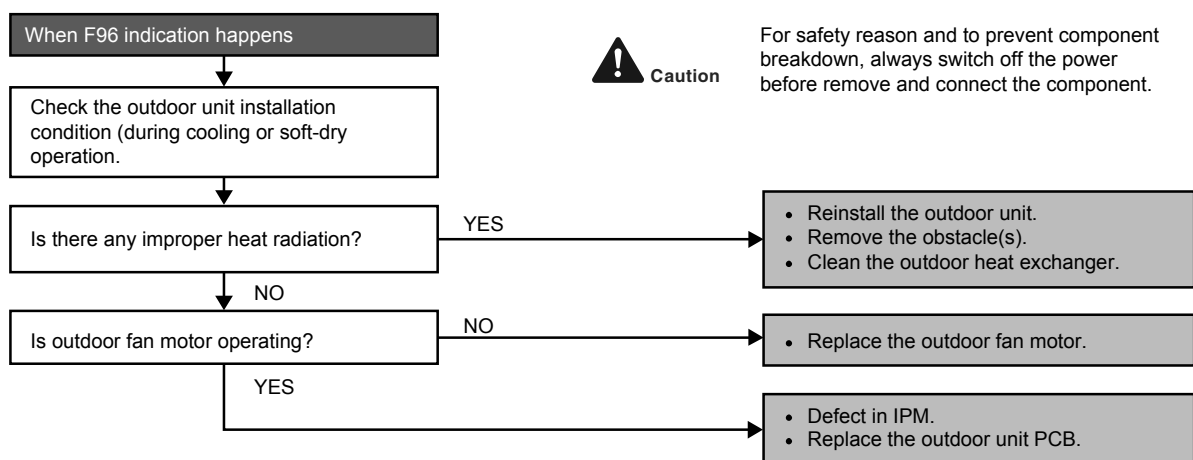
Malfunction Caused

- IPM overheats due to short circuit of hot discharge air flow.
- IPM overheats due to defective of outdoor fan motor.
- IPM overheats due to defective of internal circuitry of IPM.
- IPM overheats due to defective IPM temperature sensor.

Multi Models Only

- Compressor OL connector poor contact.
- Compressor OL faulty.

Troubleshooting



15.4.22 F97 (Compressor Overheating)

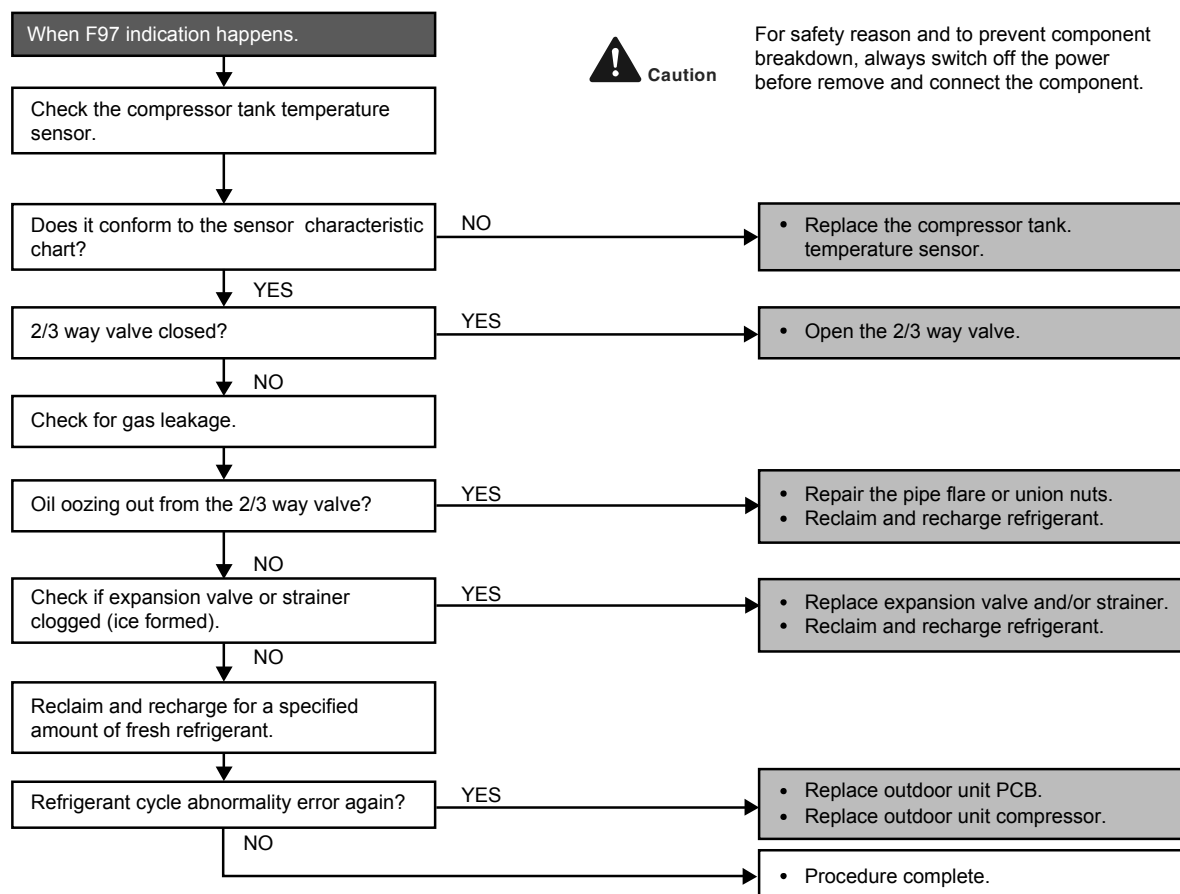
Malfunction Decision Conditions

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

Malfunction Caused

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

Troubleshooting



15.4.23 F98 (Input Over Current Detection)

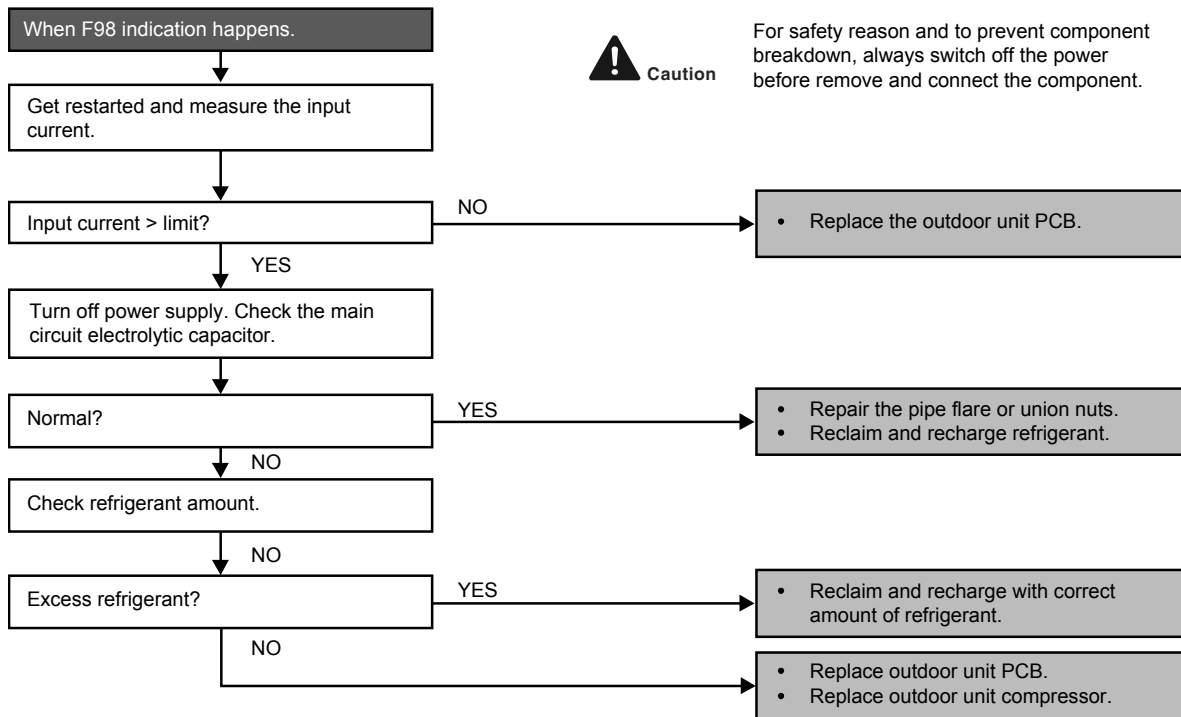
Malfunction Decision Conditions

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

Malfunction Caused

- Excessive refrigerant.
- Faulty outdoor unit PCB.

Troubleshooting



15.4.24 F99 (DC Peak Detection)

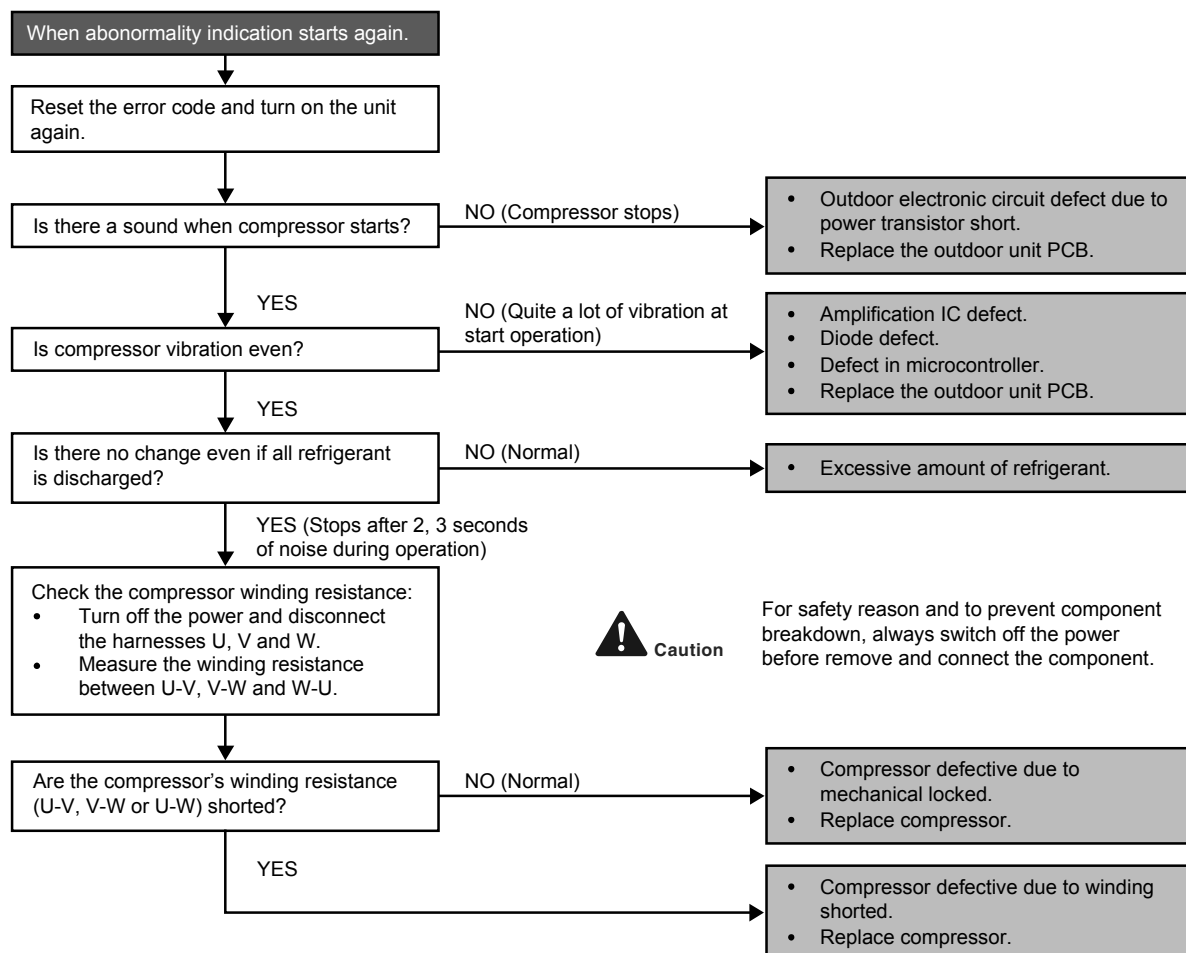
Malfunction Decision Conditions

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

Malfunction Caused

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

Troubleshooting



16. Disassembly and Assembly Instructions



WARNING

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

16.1 Disassembly of Parts

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

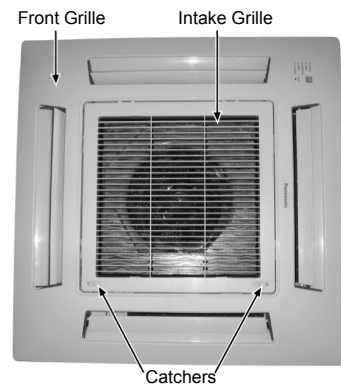


Fig. 1

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

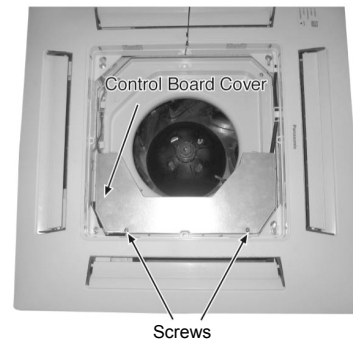


Fig. 2

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

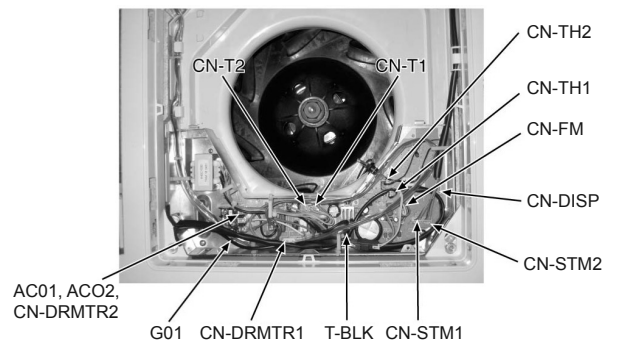


Fig. 3

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

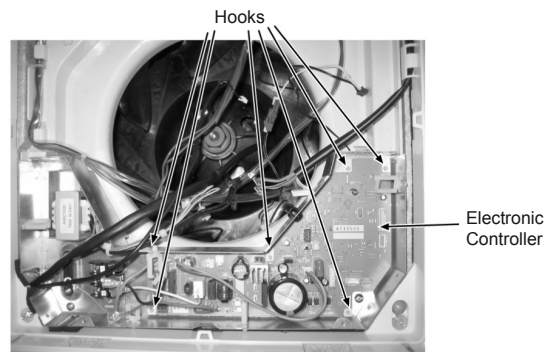


Fig. 4

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

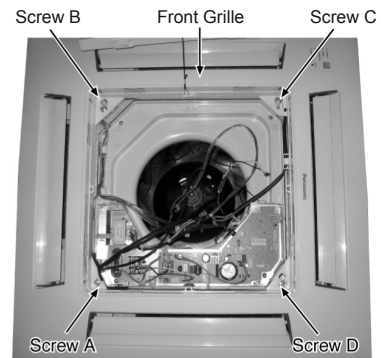


Fig. 5

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

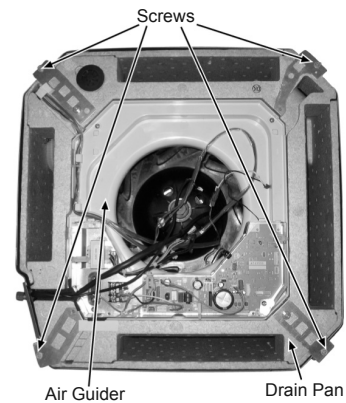


Fig. 6

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

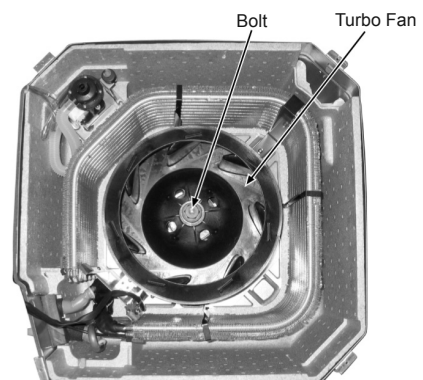


Fig. 7

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

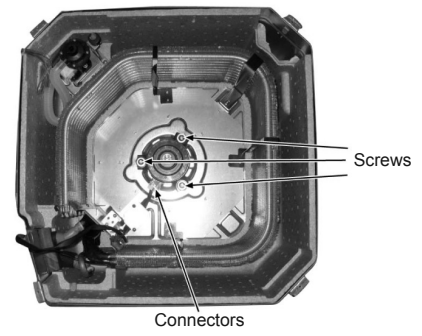


Fig. 8

16.2 Outdoor Electronic Controller Removal Procedure

16.2.1 CU-E12RB4U

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

- 1 Remove the 3 screws of the Top Panel.

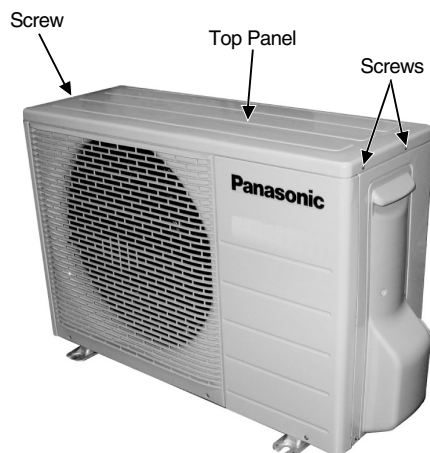


Fig. 1

- 2 Remove the 6 screws of the Front Panel.

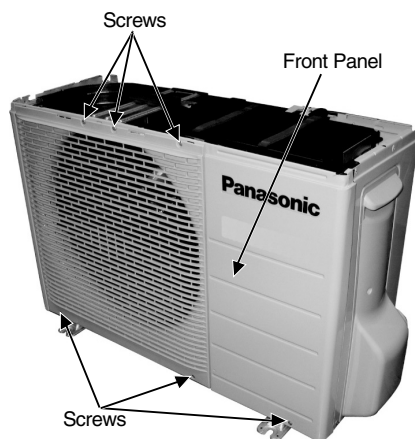


Fig. 2

- 3 Remove the screw of the Terminal Board Cover.

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

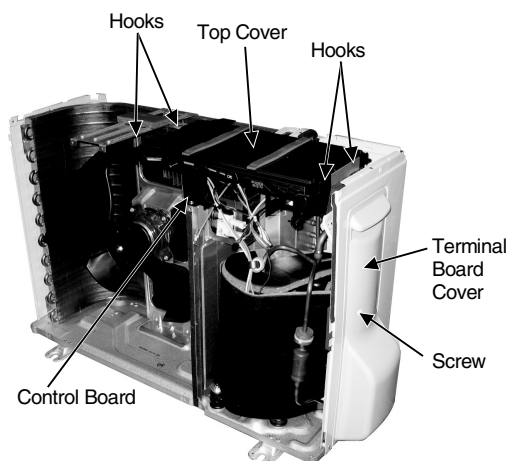


Fig. 3

- 5 Remove the Control Board as follows:

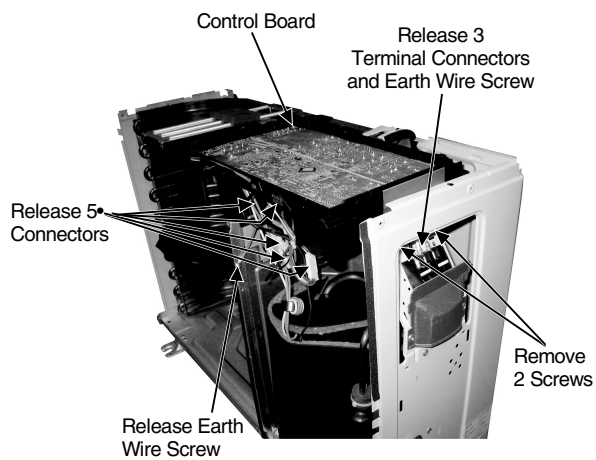


Fig. 4

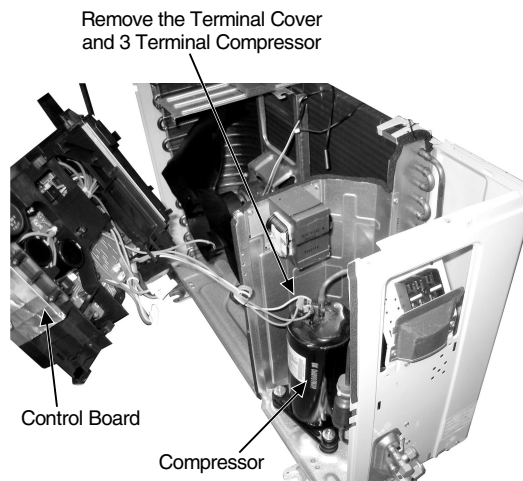


Fig. 5

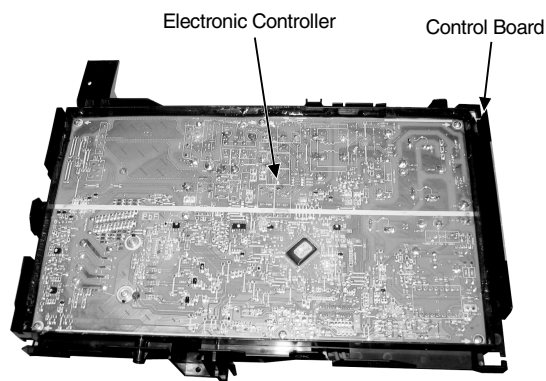


Fig. 6

16.2.2 CU-E18RB4U

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

- 1 Remove the 4 screws of the Top Panel.

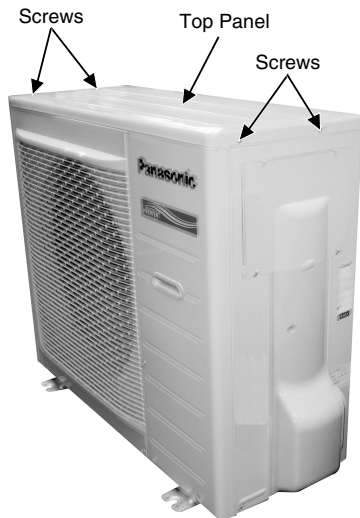


Fig. 1

- 2 Remove the 10 screws of the Front Panel.

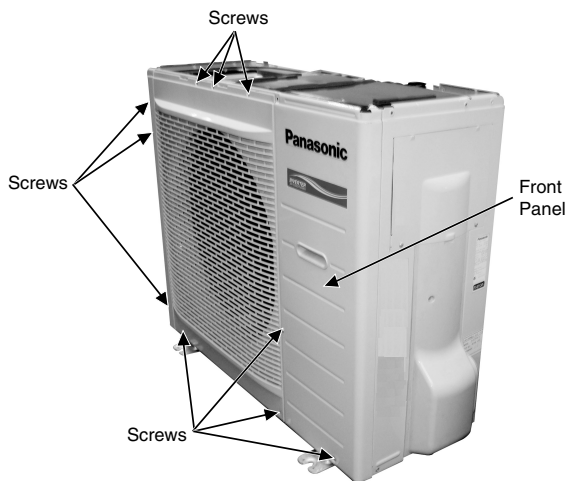


Fig. 2

- 3 Remove the Top Cover of the Electronic Controller.



Fig. 3

- 4 Remove the Control Board.

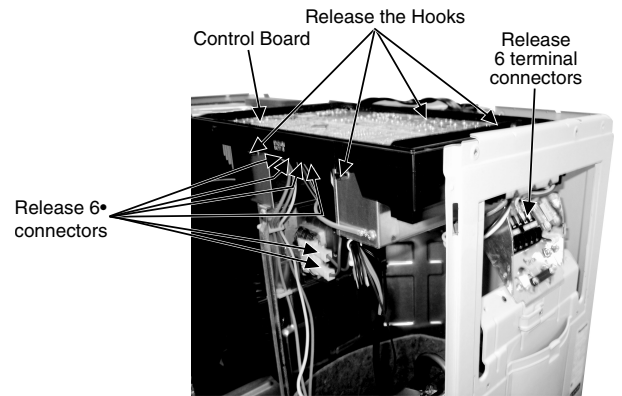


Fig. 4

- 5 Remove the 8 screws of the Electronic Controller.

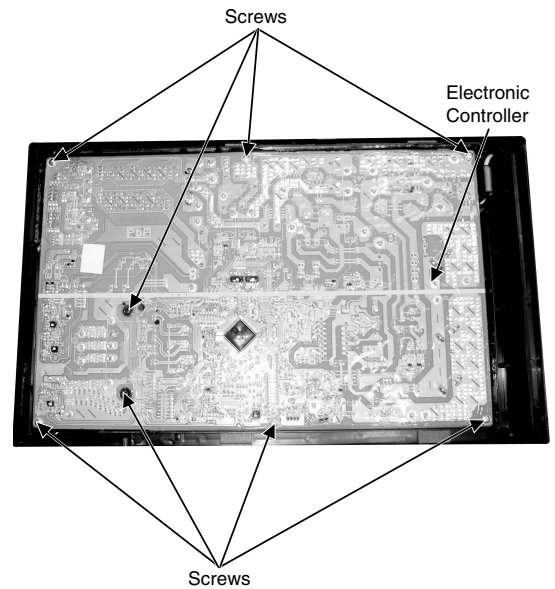


Fig. 5

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

17. Technical Data

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

17.1 Cool Mode Performance Data

Unit setting: Standard piping length, Hi Fan, Cool mode at 16°C (60.8°F)

Voltage: 208V/230V

17.1.1 CS-E12RB4UW CU-E12RB4U

Rated frequency (compressor speed is fixed during forced heating or cooling for capacity measurement and diagnosis purpose)

Indoor (°C / °F)		Outdoor (°C / °F)											
DB	WB	-17.8 (0)			-10 (14)			0 (32)			5 (41)		
		TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP
27 (80.6)	19.0 (66.20)	13351	11952	847	13351	11952	861	13287	12058	839	13563	12308	793
	22.0 (71.60)	14108	8496	901	14108	8496	915	14195	8620	861	15326	9157	643
23 (73.4)	15.7 (60.26)	12494	12369	809	12494	12369	822	12076	11955	879	13679	13542	706
	18.4 (65.12)	13142	8464	830	13142	8464	843	12728	8319	883	13447	8754	745
20 (68.0)	13.3 (55.94)	11872	11753	875	11872	11753	889	11450	11335	911	10493	10388	625
	15.8 (60.44)	12234	8416	892	12234	8416	906	12267	8355	875	11045	7881	592

Indoor (°C / °F)		Outdoor (°C / °F)											
DB	WB	16 (60.8)			25 (77)			35 (95)			46 (114.8)		
		TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP
27 (80.6)	19.0 (66.20)	14114	11997	704	12467	11052	1028	11900	11171	1150	9751	9166	1381
	22.0 (71.60)	14575	8575	701	13606	7761	983	12653	7756	1130	10382	6364	1357
23 (73.4)	15.7 (60.26)	12517	12392	788	11293	11180	1055	10952	10842	1165	8986	8896	1399
	18.4 (65.12)	13239	8489	760	12409	7825	1026	11234	8006	1149	9218	6569	1380
20 (68.0)	13.3 (55.94)	9276	9183	348	9194	9102	797	10064	9963	1169	8257	8175	1404
	15.8 (60.44)	10636	7480	671	11052	7657	1051	10228	7684	1158	8392	6305	1391

17.1.2 CS-E18RB4UW CU-E18RB4U

Rated frequency (compressor speed is fixed during forced heating or cooling for capacity measurement and diagnosis purpose)

Indoor (°C / °F)		Outdoor (°C / °F)											
DB	WB	-17.8 (0)			-10 (14)			0 (32)			5 (41)		
		TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP
27 (80.6)	19.0 (66.20)	21585	18070	1223	21563	18051	1208	21536	18375	1172	21477	17969	1162
	22.0 (71.60)	24761	14770	1069	24736	14755	1056	23579	14434	1224	21993	13533	1221
23 (73.4)	15.7 (60.26)	18995	18805	1350	18976	18787	1333	20174	19972	1110	19232	19040	1230
	18.4 (65.12)	21236	13901	1235	21215	13887	1220	23638	14975	966	22023	13104	1284
20 (68.0)	13.3 (55.94)	16722	16554	1339	16705	16538	1322	16597	16431	878	15998	15838	1050
	15.8 (60.44)	16679	12254	1546	16662	12242	1527	17460	12654	914	18874	13512	902

Indoor (°C / °F)		Outdoor (°C / °F)											
DB	WB	16 (60.8)			25 (77)			35 (95)			46 (114.8)		
		TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP
27 (80.6)	19.0 (66.20)	21393	18203	1146	18720	16185	1562	17500	16117	1700	12025	11063	1528
	22.0 (71.60)	22132	14479	1150	20357	12809	1579	19332	10069	1722	13269	6911	1548
23 (73.4)	15.7 (60.26)	19837	19638	1146	17320	17147	1533	16032	15871	1795	11004	10894	1614
	18.4 (65.12)	21651	13832	1149	19039	12328	1549	17649	11957	1828	12114	8207	1643
20 (68.0)	13.3 (55.94)	17342	17168	959	16223	16060	1531	14783	14635	1764	10147	10045	1586
	15.8 (60.44)	19740	15389	1555	19440	13413	1966	16513	6641	1921	11334	4559	1727

17.1.3 CS-E12RB4UW CU-E12RB4U

Maximum Capacity

Indoor (°C / °F)		Outdoor (°C / °F)											
DB	WB	-17.8 (0)			-10 (14)			0 (32)			5 (41)		
		TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP
27 (80.6)	19.0 (66.20)	13493	11821	880	13499	11827	892	13424	11923	871	13643	12118	823
	22.0 (71.60)	14251	8400	931	14237	8392	942	14285	8490	891	15374	8991	673
23 (73.4)	15.7 (60.26)	12571	12445	838	12584	12458	842	12195	12073	901	13803	13665	741
	18.4 (65.12)	13254	8354	861	13264	8360	872	12857	8225	912	13629	8684	778
20 (68.0)	13.3 (55.94)	11956	11836	902	11980	11860	912	11584	11468	945	10665	10558	658
	15.8 (60.44)	12366	8325	926	12366	8325	941	12410	8272	903	11184	7811	631

Indoor (°C / °F)		Outdoor (°C / °F)											
DB	WB	16 (60.8)			25 (77)			35 (95)			46 (114.8)		
		TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP
27 (80.6)	19.0 (66.20)	14213	11825	732	13489	11703	1151	13319	12253	1320	10088	9281	1453
	22.0 (71.60)	14681	8453	731	14510	8101	1057	14180	8508	1297	10419	6251	1362
23 (73.4)	15.7 (60.26)	12707	12580	812	11731	11613	1102	11614	11498	1338	9087	8996	1412
	18.4 (65.12)	13291	8341	791	12813	7908	1068	12024	8387	1319	9309	6493	1395
20 (68.0)	13.3 (55.94)	9442	9348	372	9340	9247	831	10938	10829	1342	8497	8412	1449
	15.8 (60.44)	10771	7414	705	11242	7622	1075	11119	8176	1329	8510	6258	1421

17.1.4 CS-E18RB4UW CU-E18RB4U

Maximum Capacity

Indoor (°C / °F)		Outdoor (°C / °F)											
DB	WB	-17.8 (0)			-10 (14)			0 (32)			5 (41)		
		TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP
27 (80.6)	19.0 (66.20)	21692	17962	1262	21668	17942	1235	21658	18278	1201	21518	17807	1192
	22.0 (71.60)	24844	14659	1098	24813	14640	1082	23717	14360	1258	22112	13458	1251
23 (73.4)	15.7 (60.26)	19117	18926	1382	19093	18902	1368	20302	20099	1152	19336	19142	1262
	18.4 (65.12)	21354	13826	1262	21330	13811	1258	23748	14881	998	22129	13800	1310
20 (68.0)	13.3 (55.94)	16839	16671	1369	16819	16651	1345	16706	16539	901	16085	15924	1082
	15.8 (60.44)	16768	12186	1572	16737	12163	1553	17597	12615	945	18991	13448	942

Indoor (°C / °F)		Outdoor (°C / °F)											
DB	WB	16 (60.8)			25 (77)			35 (95)			46 (114.8)		
		TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP
27 (80.6)	19.0 (66.20)	21511	18105	1172	20063	17157	1613	18680	16999	1850	12130	11038	1542
	22.0 (71.60)	22238	13803	1286	21231	13214	1646	20613	10619	1874	13322	6863	1558
23 (73.4)	15.7 (60.26)	19950	19751	1180	17817	17639	1570	17094	16923	1953	11106	10995	1632
	18.4 (65.12)	21788	13768	1181	19886	12736	1710	18819	12610	1989	12164	8151	1663
20 (68.0)	13.3 (55.94)	17423	17249	992	16802	16634	1721	15763	15605	1919	10286	10183	1601
	15.8 (60.44)	19858	13046	1582	19619	13390	1999	17607	7004	2090	11444	4552	1745

TC - Total Cooling Capacity (Btu/h)

SHC - Sensible Heat Capacity (Btu/h)

IP - Input Power (W)

17.2 Heat Mode Performance Data

Unit setting: Standard piping length, Hi Fan, Heat mode at 30°C (86°F)

Voltage: 208V/230V

17.2.1 CS-E12RB4UW CU-E12RB4U

Rated frequency (compressor speed is fixed during forced heating or cooling for capacity measurement and diagnosis purpose)

Indoor (°C / °F)	Outdoor (°C / °F)											
DB	-15 (5)		-8.3 (17.06)		1.7 (35.06)		8.3 (46.94)		12 (53.6)		23.9 (75.02)	
	TC	IP	TC	IP	TC	IP	TC	IP	TC	IP	TC	IP
24 (75.2)	7417	1084	9884	1261	12503	1370	13681	1371	13151	1395	15282	1352
20 (68.0)	7892	1075	10567	1256	12860	1344	13600	1360	13901	1364	16153	1323
16 (60.8)	7534	1058	10858	1243	13911	1355	14623	1396	13561	1341	15759	1300

17.2.2 CS-E18RB4UW CU-E18RB4U

Rated frequency (compressor speed is fixed during forced heating or cooling for capacity measurement and diagnosis purpose)

Indoor (°C / °F)	Outdoor (°C / °F)											
DB	-15 (5)		-8.3 (17.06)		1.7 (35.06)		8.3 (46.94)		12 (53.6)		23.9 (75.02)	
	TC	IP	TC	IP	TC	IP	TC	IP	TC	IP	TC	IP
24 (75.2)	9103	1891	11867	2160	15151	2177	19861	2474	20737	2460	22347	2362
20 (68.0)	9214	1821	11903	2078	15371	2087	20400	2340	21563	2360	23237	2267
16 (60.8)	9050	1740	12006	1986	15536	1999	20894	2212	22141	2235	23861	2146

17.2.3 CS-E12RB4UW CU-E12RB4U

Maximum Capacity

Indoor (°C / °F)	Outdoor (°C / °F)											
DB	-15 (5)		-8.3 (17.06)		1.7 (35.06)		8.3 (46.94)		12 (53.6)		23.9 (75.02)	
	TC	IP	TC	IP	TC	IP	TC	IP	TC	IP	TC	IP
24 (75.2)	9472	1433	10805	1505	14107	1663	16355	1724	15698	1738	17556	1623
20 (68.0)	10062	1420	11553	1499	14510	1631	16290	1710	16593	1700	18557	1588
16 (60.8)	9395	1396	11871	1484	15695	1645	17482	1755	16188	1671	18104	1561

17.2.4 CS-E18RB4UW CU-E18RB4U

Maximum Capacity

Indoor (°C / °F)	Outdoor (°C / °F)											
DB	-15 (5)		-8.3 (17.06)		1.7 (35.06)		8.3 (46.94)		12 (53.6)		23.9 (75.02)	
	TC	IP	TC	IP	TC	IP	TC	IP	TC	IP	TC	IP
24 (75.2)	11788	2684	14163	2756	17533	2711	20460	2643	21354	2628	23029	2477
20 (68.0)	11949	2594	14206	2653	17788	2560	21002	2500	22204	2522	23946	2377
16 (60.8)	11689	2485	14329	2540	17979	2474	21524	2363	22800	2388	24589	2251

TC - Total Cooling Capacity (Btu/h)

IP - Input Power (W)

18. Service Data

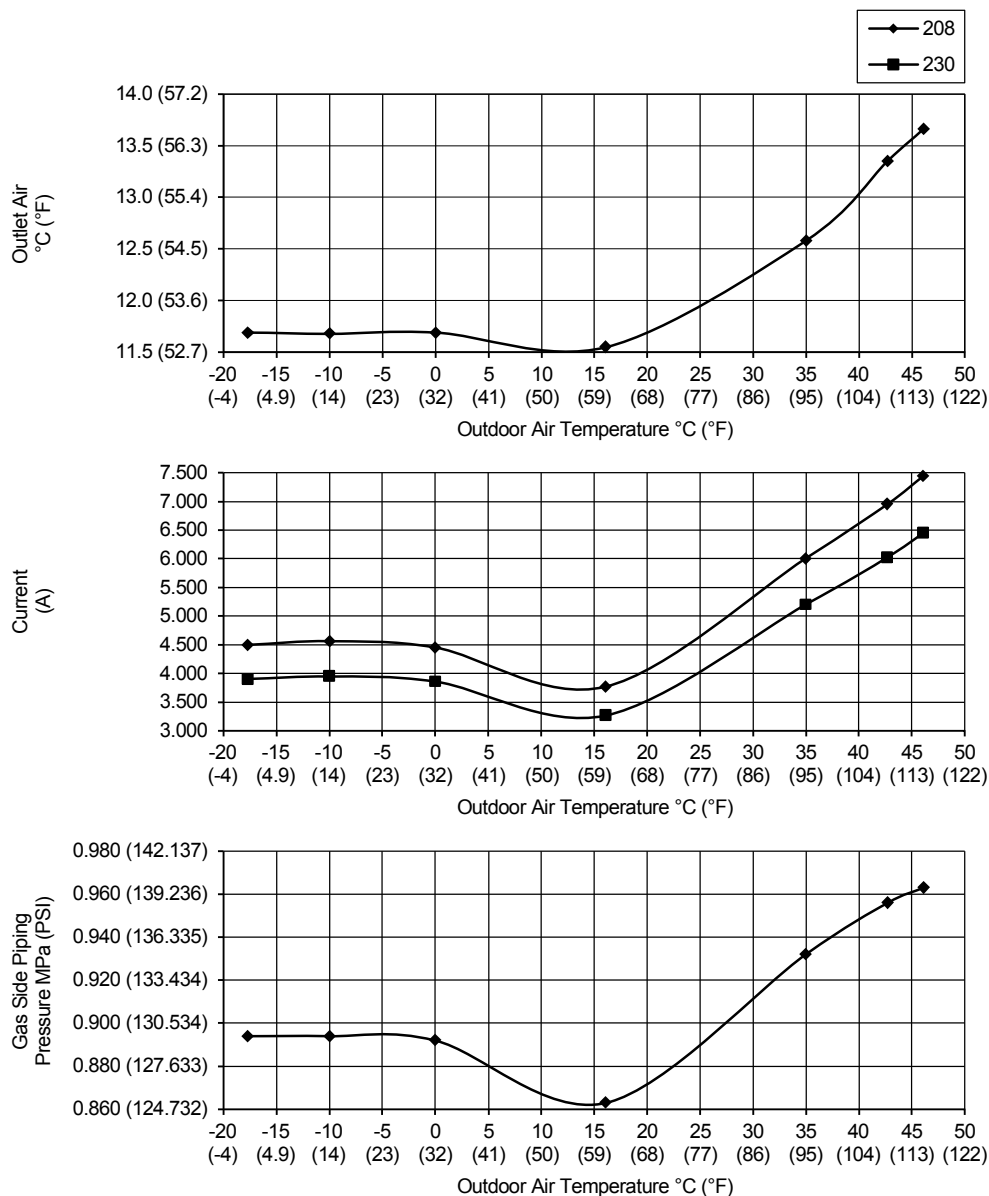
Service data provided are based on the air conditioner running under rated frequency during forced cooling / forced heating mode.

18.1 Cool Mode Outdoor Air Temperature Characteristic

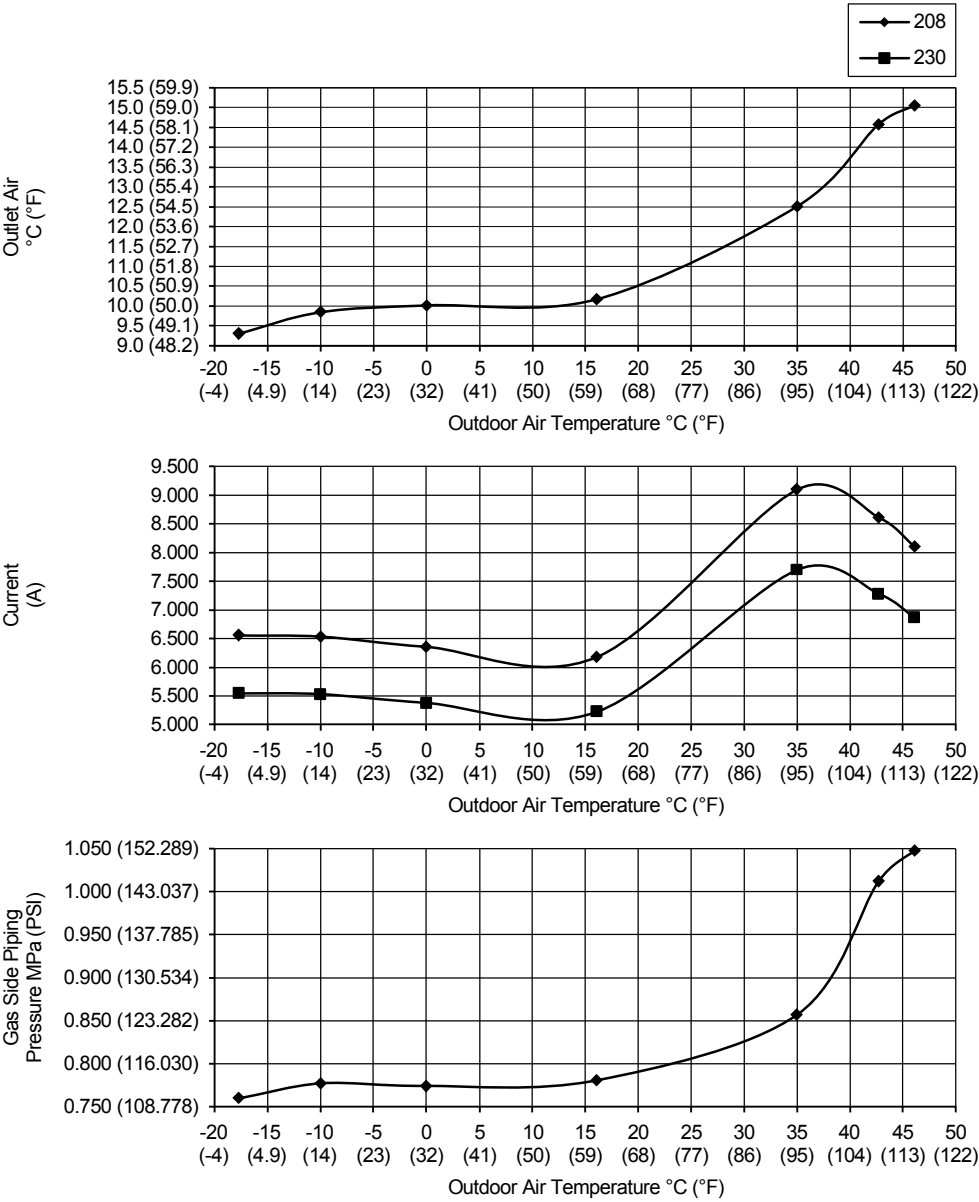
Condition

- Indoor room temperature: 27°C (80.6°F) Dry Bulb/19°C (66.2°F) Wet Bulb
- Unit setting: Standard piping length, forced cooling at 16°C (60.8°F), Hi fan
- Compressor frequency: Rated for cooling operation
- Piping Length: 7.5 m (24.6 ft)
- Voltage: 208V/230V

18.1.1 CS-E12RB4UW CU-E12RB4U



18.1.2 CS-E18RB4UW CU-E18RB4U

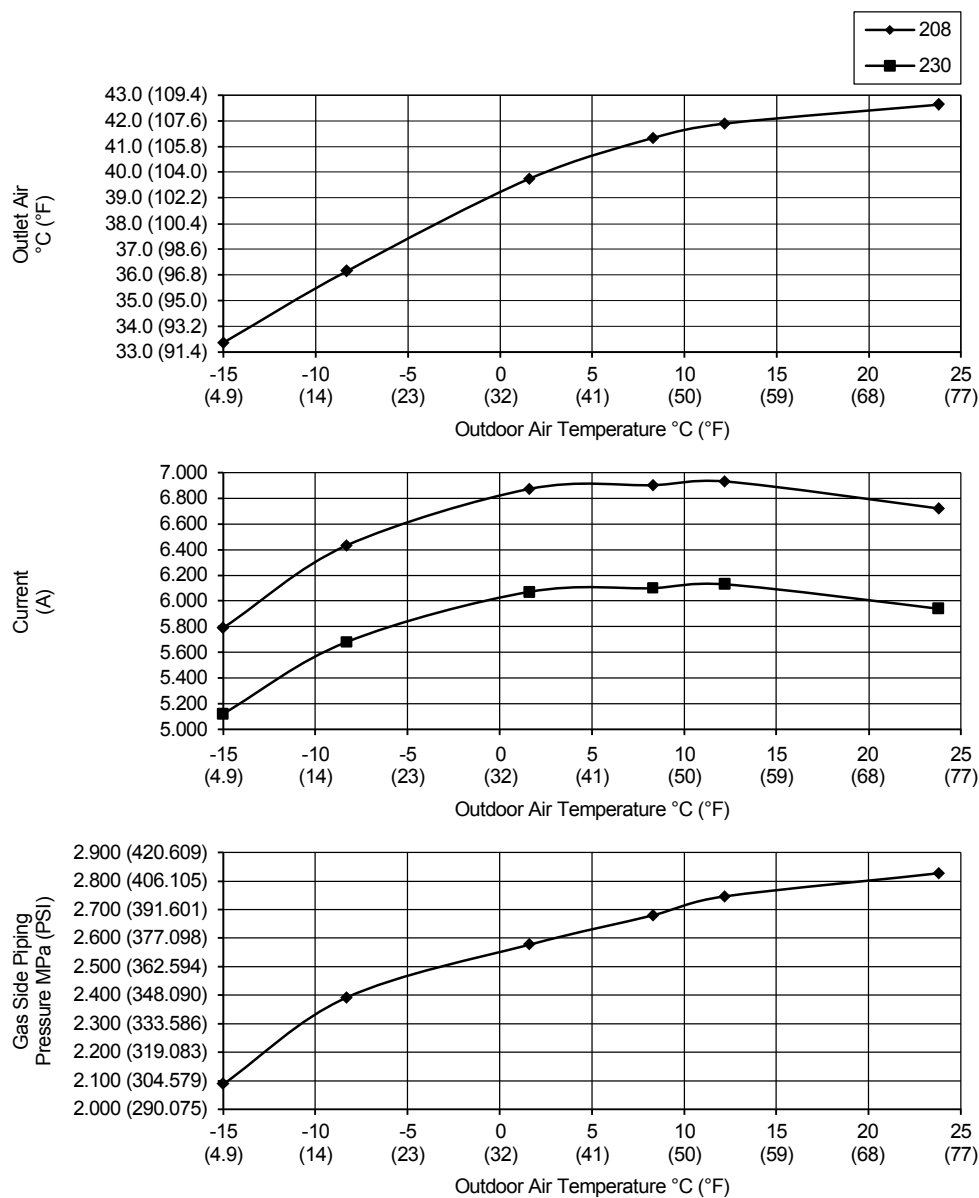


18.2 Heat Mode Outdoor Air Temperature Characteristic

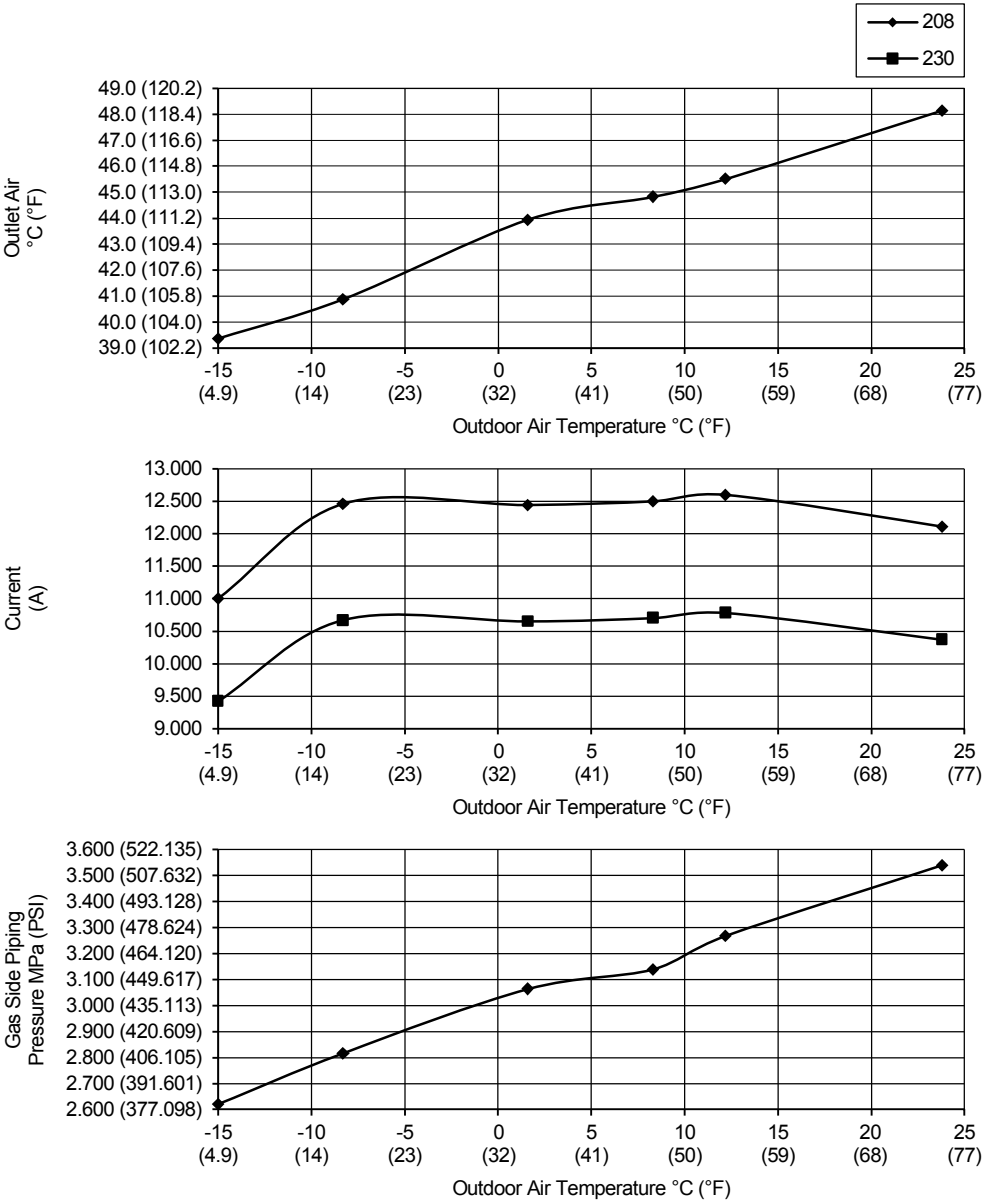
Condition

- Indoor room temperature: 20°C (68°F) Dry Bulb/ -°C Wet Bulb
- Unit setting: Standard piping length, forced heating at 30°C (86°F), Hi fan
- Compressor frequency: Rated for Heating operation
- Piping Length: 7.5 m (24.6 ft)
- Voltage: 208V/230V

18.2.1 CS-E12RB4UW CU-E12RB4U



18.2.2 CS-E18RB4UW CU-E18RB4U

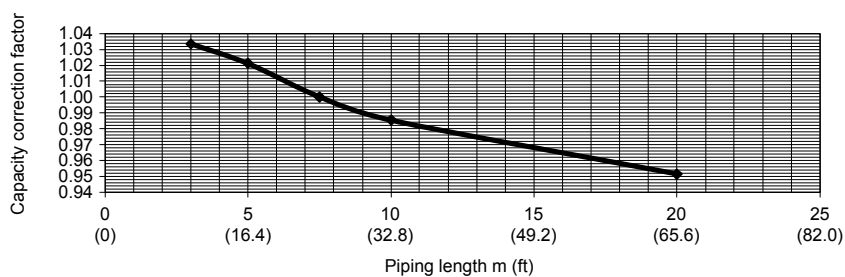


18.3 Piping Length Correction Factor

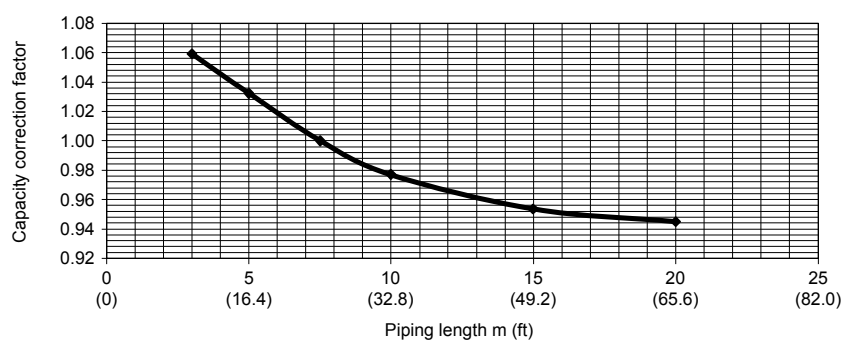
The characteristic of the unit has to be corrected in accordance with the piping length.

18.3.1 CS-E12RB4UW CU-E12RB4U

18.3.1.1 Cooling Capacity



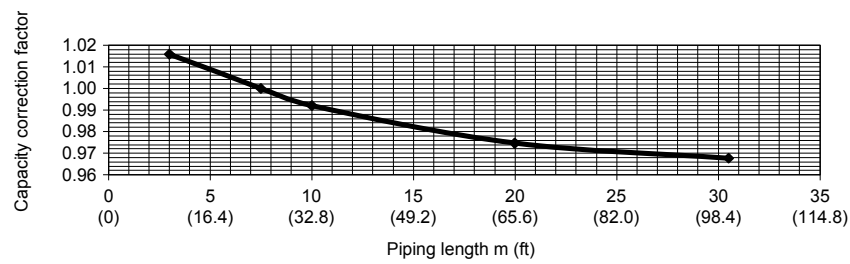
18.3.1.2 Heating Capacity



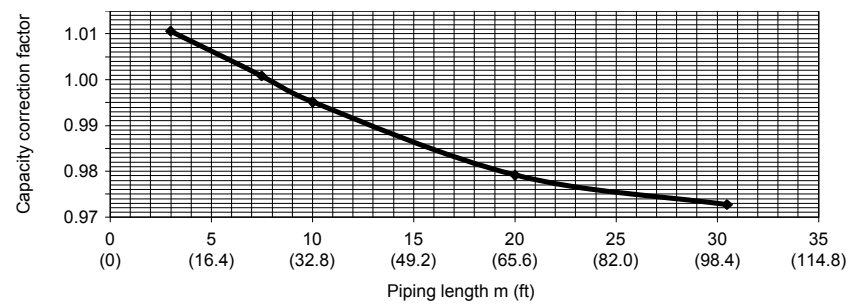
Note: The graphs show the factor after added right amount of additional refrigerant.

18.3.2 CS-E18RB4UW CU-E18RB4U

18.3.2.1 Cooling Capacity



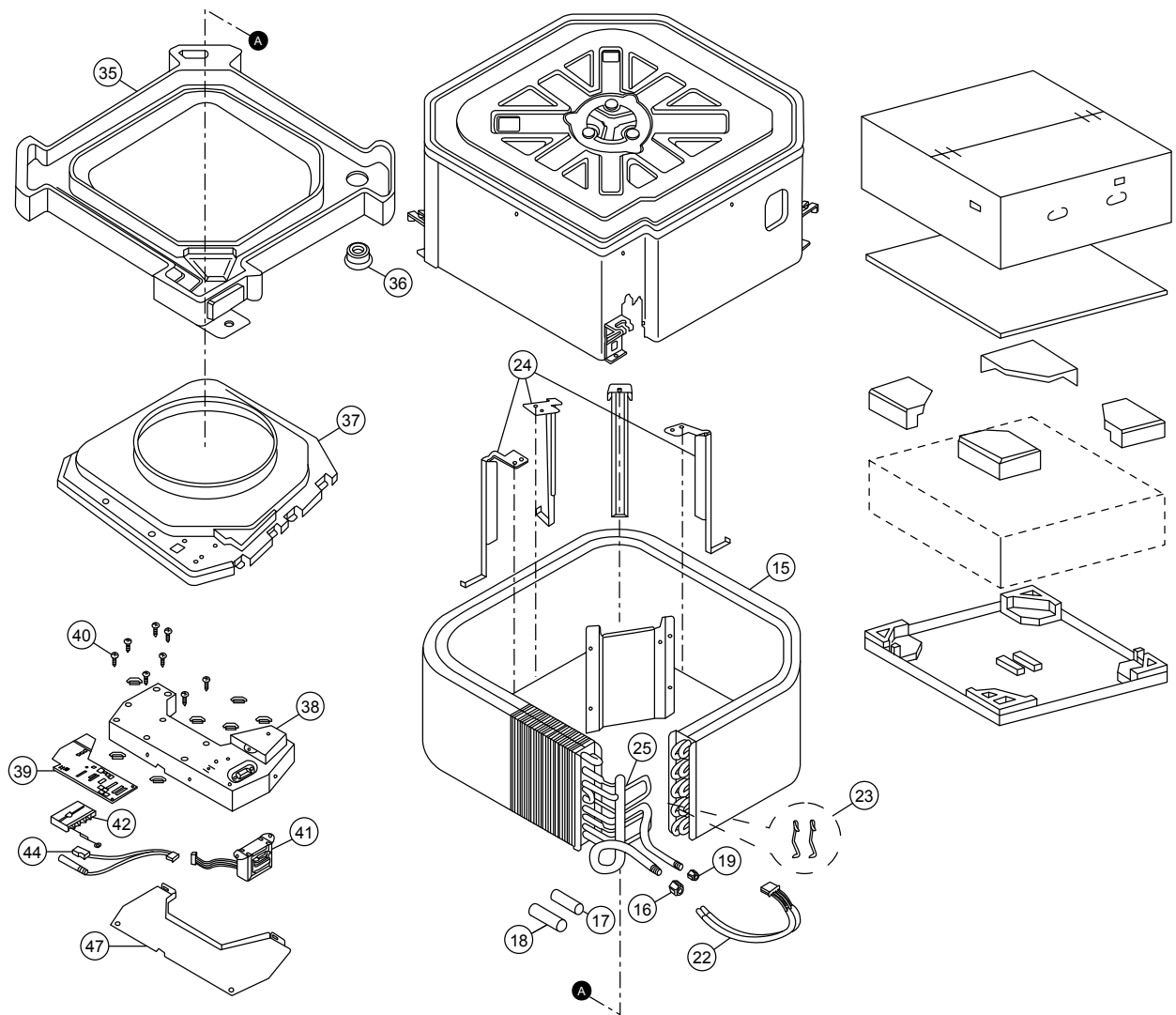
18.3.2.2 Heating Capacity

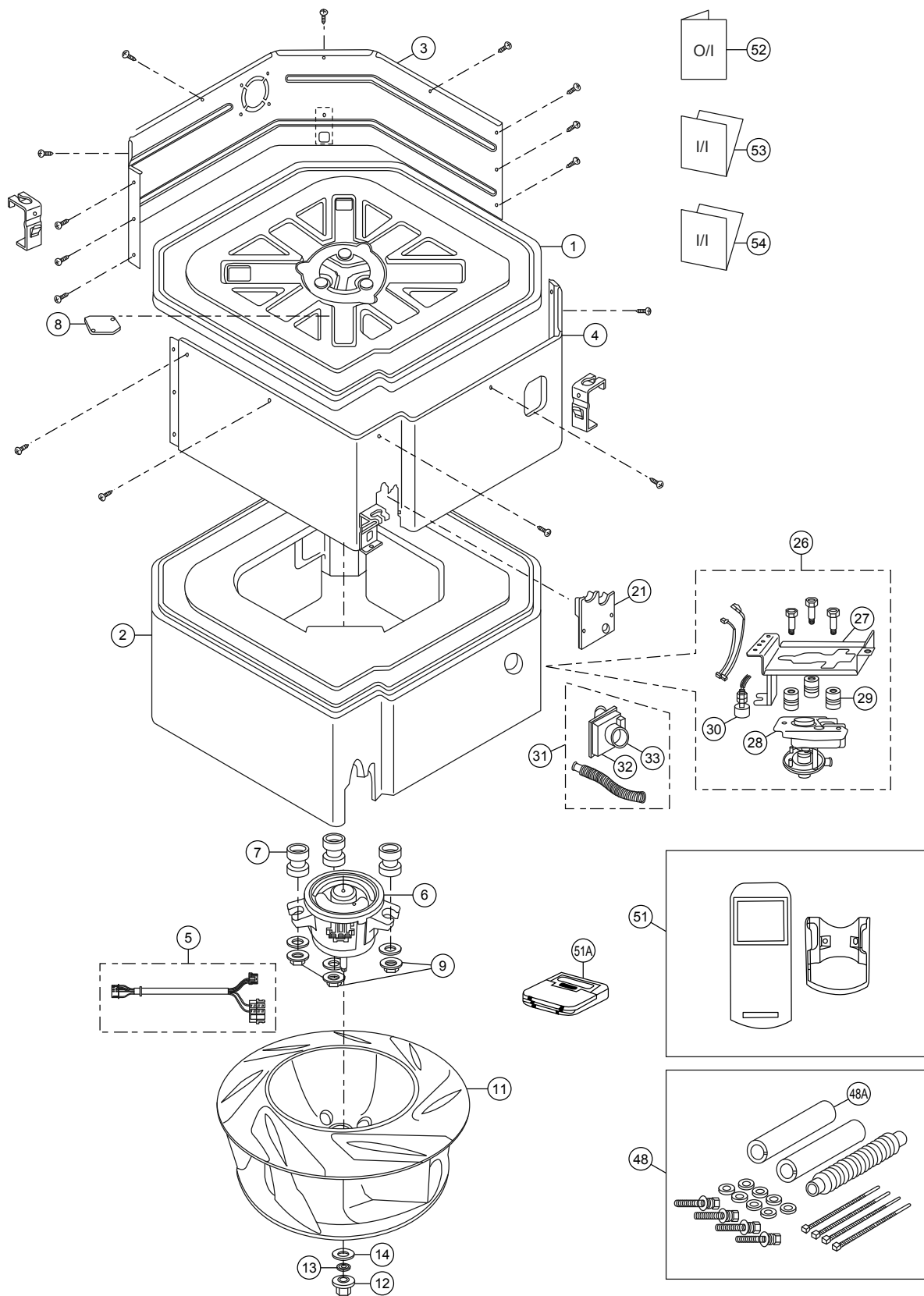


Note: The graphs show the factor after added right amount of additional refrigerant.

19. Exploded View and Replacement Parts List

19.1 Indoor Unit





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

<Model: CS-E12RB4UW CS-E18RB4UW>

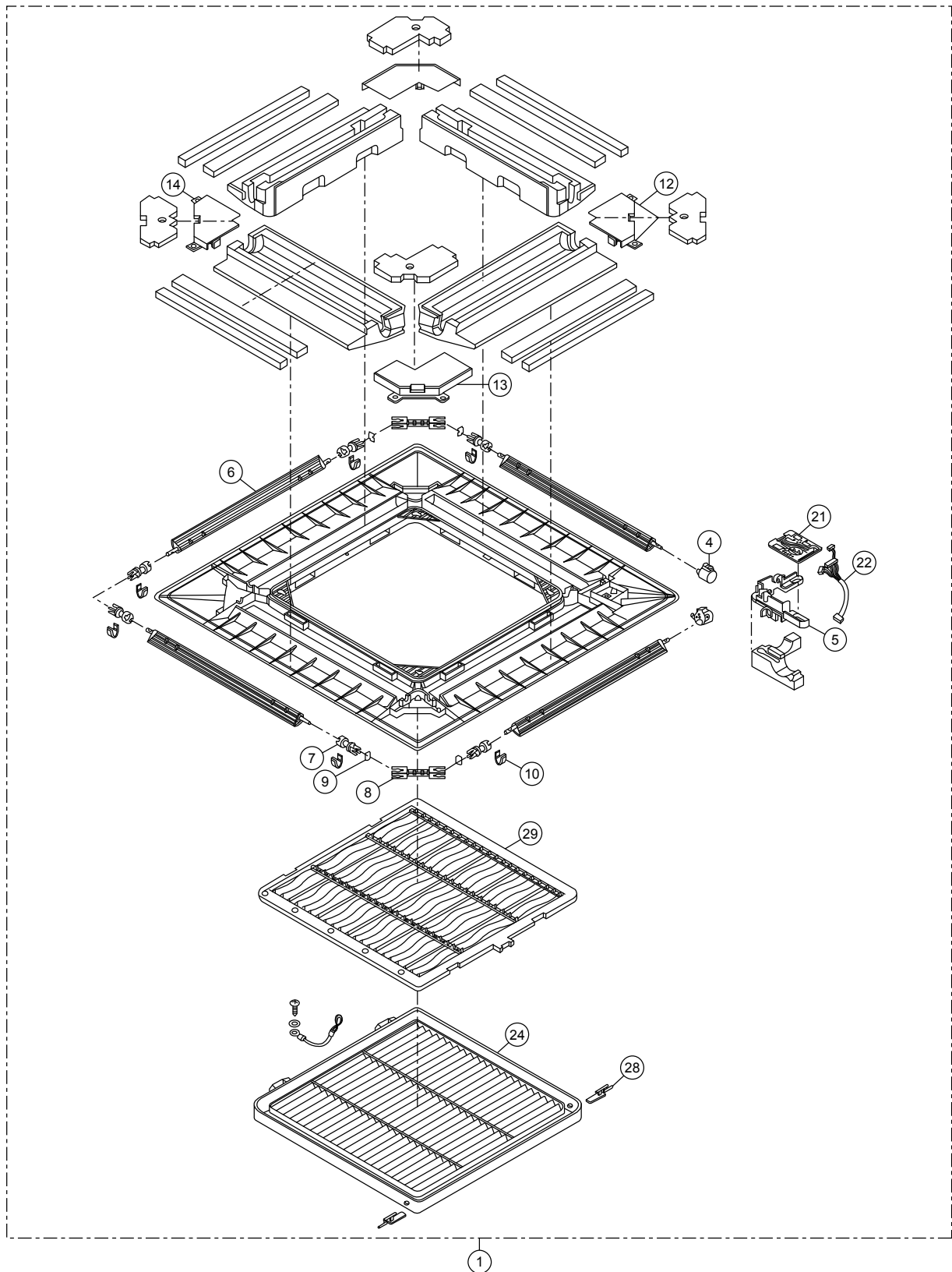
SAFETY	REF. NO.	PART NAME & DESCRIPTION	QTY	CS-E12RB4UW	CS-E18RB4UW	REMARK
	1	BASE PAN ASS'Y	1	CWD52K1100	←	
	2	INNER POLYSTYRENE COMPLETE	1	CWG07C1047A	←	
	3	CABINET SIDE PLATE ASS'Y	1	CWE041121	←	
	4	CABINET SIDE PLATE ASS'Y	1	CWE041122	←	
	5	LEAD WIRE - FAN MOTOR	1	CWA67C5136	←	O
⚠	6	FAN MOTOR	1	EHDS50A40AC	←	O
	7	ANTI - VIBRATION BUSHING	3	CWH501065	←	
	8	CORD HOLDER	1	CWD741024	←	
	9	SCREW - FAN MOTOR	3	CWH561058	←	
⚠	11	TURBO FAN	1	CWH03K1022	←	
	12	NUT for TURBO FAN	1	CWH561042	←	
	13	SP WASHER	1	XWA8BFJ	←	
	14	WASHER	1	XWG8H22FJ	←	
	15	EVAPORATOR COMPLETE	1	CWB30C5022	←	
	16	FLARE NUT (1/2")	1	CWT251032	←	
	17	HEATPROOF TUBE	1	CWG021024	←	
	18	HEATPROOF TUBE	1	CWG021064	←	
	19	FLARE NUT (1/4")	1	CWT251030	←	
	21	PIPE COVER	1	CWD93C1163	←	
	22	SENSOR - EVAPORATOR	1	CWA50C2549	←	
	23	HOLDER SENSOR	2	CWH32143	←	
	24	EVAPORATOR SUPPORTER	3	CWD911529A	←	
	25	TUBE ASS'Y (CAPIL. TUBE)	1	CWT07K1188	←	
	26	DRAIN PUMP COMPLETE	1	CWB53C1055	←	O
	27	PANEL DRAIN PUMP ASS'Y	1	CWD93K1021	←	
	28	DRAIN PUMP	1	CWB532122	←	
	29	ANTI - VIBRATION BUSHING	3	CWH501080	←	
⚠	30	FLOAT SWITCH - DRAIN PUMP	1	CWA121233	←	O
	31	FLEXIBLE PIPE	1	CWH85C1115	←	
	32	DRAIN NOZZLE	1	CWH411011	←	
	33	DRAIN HOSE HEAT INSULATION	1	CWG321116	←	
	35	DRAIN PAN - COMPLETE	1	CWH40C1116	←	
	36	DRAIN PLUG	1	CWB821008	←	
	37	AIR GUIDER BLOWER WHEEL	1	CWD321058	←	
	38	CONTROL BOARD CASING	1	CWH10K1102	←	
⚠	39	ELECTRONIC CONTROLLER (MAIN)	1	CWA73C9226	CWA73C9227	O
	40	SPACER	6	CWH541026	←	
⚠	41	TRANSFORMER	1	CWA40C1030	←	O
⚠	42	TERMINAL BOARD ASS'Y	1	CWA28K1321	←	O
	44	LEADWIRE-AIR TEMP. SENSOR	1	CWA68C2214	←	O
	47	CONTROL BOARD COVER COM.	1	CWH13C1344	←	
	48	ACCESSORY COMPLETE	1	CWH82C2108	←	
	48A	HEATPROOF TUBE	1	CWG021116	←	
	51	WIRELESS REMOTE CONTROL COMPLETE	1	CWA75C4643	←	O
	51A	WIRED REMOTE CONTROL	1	CWA75C4516	←	

SAFETY	REF. NO.	PART NAME & DESCRIPTION	QTY	CS-E12RB4UW	CS-E18RB4UW	REMARK
	52	OPERATING INSTRUCTION	1	CWF569879	←	
	53	INSTALLATION INSTRUCTION	1	CWF616670	←	
	54	INSTALLATION INSTRUCTION	1	CWF616671	←	

(Note)

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

19.2 CZ-BT20U (Front Grille Complete)



Note:

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

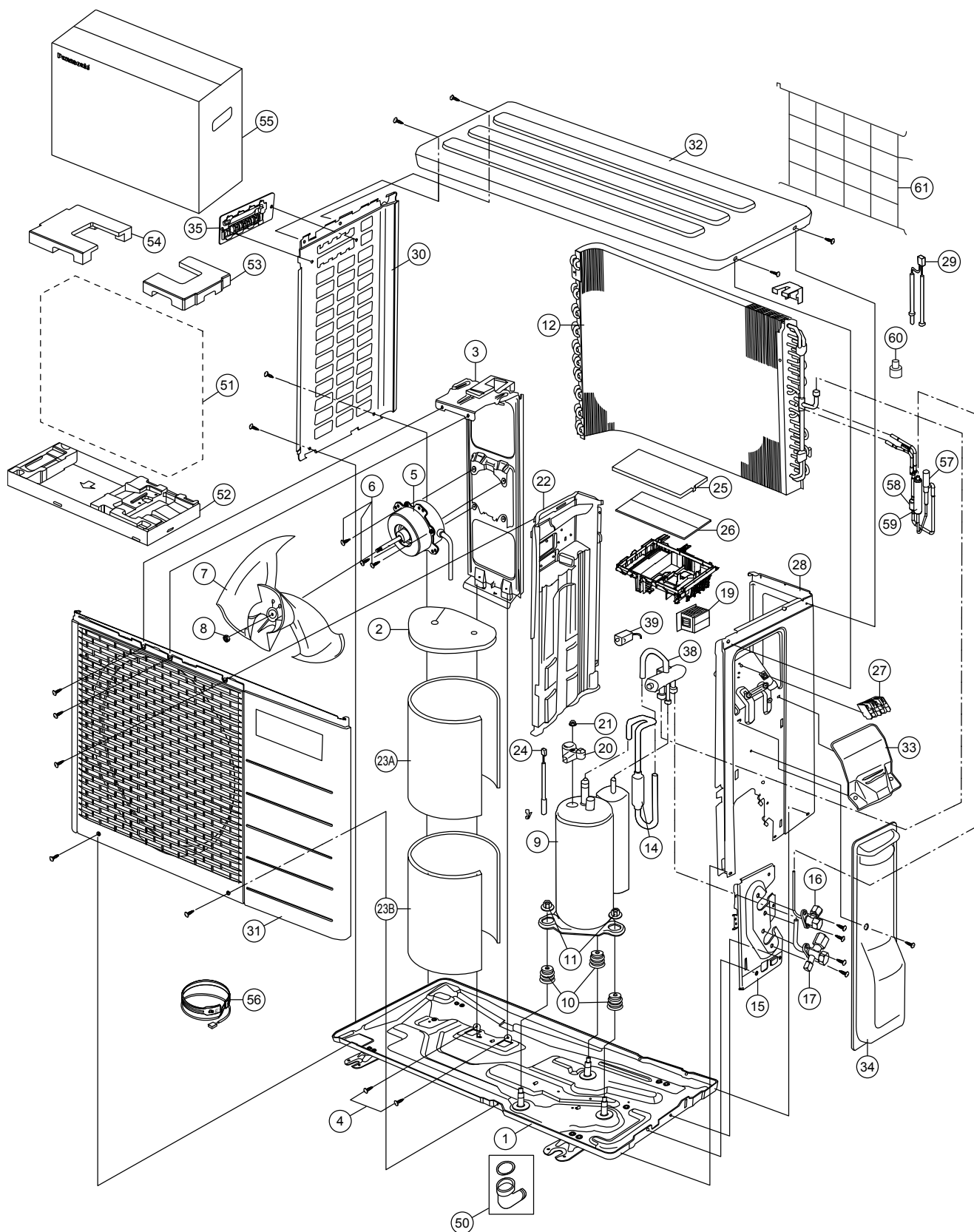
SAFETY	REF. NO.	PART NAME & DESCRIPTION	QTY	CZ-BT20U	REMARK
	1	FRONT GRILLE - COMPLETE	1	CWE11C6074	
⚠	4	A.S MOTOR DC SINGLE 12V 250 OHM	2	CWA981105J	O
	5	BRACKET - A.S.MOTOR	1	CWD932522	
	6	VANE	4	CWE241159	
	7	SHAFT	6	CWH631038	
	8	SHAFT	2	CWH631045	
	9	CONNECTOR - SHAFT	4	CWH081007	
	10	BEARING	6	CWH641008	O
	12	PLATE COVER FOR A.S.MOTOR	1	CWD911459	
	13	PLATE COVER FOR CONNECTING SHAFT	2	CWD911460	
	14	PLATE COVER FOR END SHAFT	1	CWD911461	
⚠	21	ELECTRONIC CONT. (RECEIVER & INDICATOR)	1	CWA748302	
	22	LEAD WIRE - COMPLETE	1	CWA67C5576	
	24	INTAKE GRILLE	1	CWE221131	
	28	LEVER ARM	2	CWH651029	
	29	AIR FILTER	1	CWD001142	O

(Note)

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

19.3 Outdoor Unit

19.3.1 CU-E12RB4U



Note:

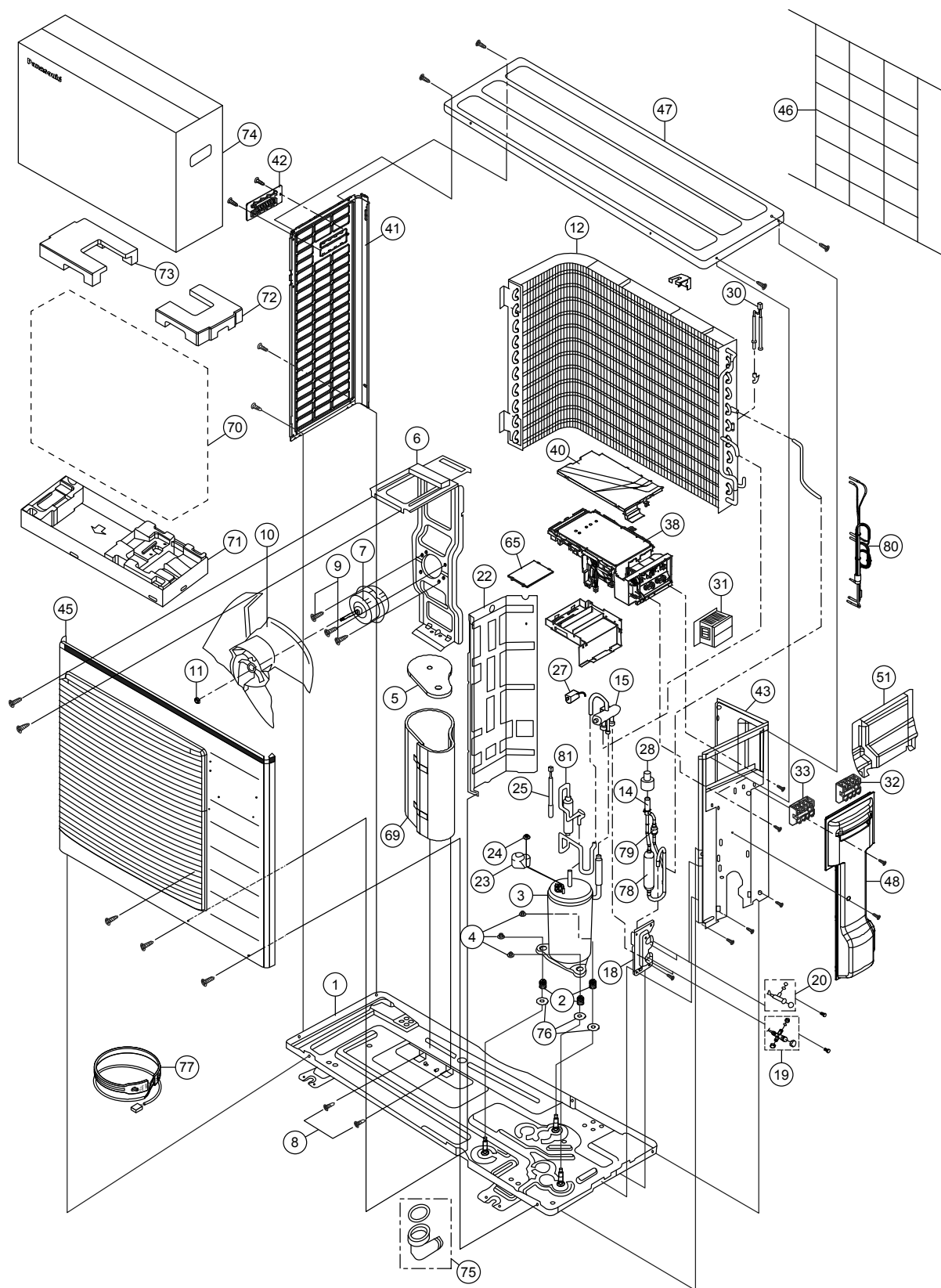
The above exploded view is for the purpose of parts disassembly and replacement.
The non-numbered parts are not kept as standard service parts.

SAFETY	REF. NO.	PART NAME & DESCRIPTION	QTY.	CU-E12RB4U	REMARK
	1	CHASSIS COMPLETE	1	CWD50K2081A	
	2	SOUND PROOF MATERIAL	1	CWG302570	
	3	FAN MOTOR BRACKET	1	CWD541089	
	4	SCREW - FAN MOTOR BRACKET	2	CWH551217	
⚠	5	FAN MOTOR	1	ARW6404AC	O
	6	SCREW - FAN MOTOR MOUNT	4	CWH55252J	
	7	PROPELLER FAN ASSY	1	CWH03K1014	
	8	NUT - PROPELLER FAN	1	CWH56053J	
⚠	9	COMPRESSOR	1	5RS102XHA21	O
	10	ANTI - VIBRATION BUSHING	3	CWH50077	
	11	NUT - COMPRESSOR MOUNT	3	CWH561096	
	12	CONDENSER	1	CWB32C3394	
	14	DISCHARGE MUFFLER (4 W. VALVE)	1	CWB121047	O
	15	HOLDER COUPLING	1	CWH351231A	
	16	2-WAYS VALVE (LIQUID)	1	CWB021180J	O
	17	3-WAY VALVE (GAS)	1	CWB011367	O
⚠	19	REACTOR	1	G0C193J00004	O
	20	TERMINAL COVER	1	CWH171039A	
	21	NUT - TERMINAL COVER	1	CWH7080300J	
	22	SOUND PROOF BOARD	1	CWH151172A	
	23A	SOUND PROOF MATERIAL	1	CWG302292	
	23B	SOUND PROOF MATERIAL	1	CWG302569	
	24	SENSOR CO-COMP TEMP	1	CWA50C2340	O
	25	CONTROL BOARD COVER - TOP	1	CWH131264	
⚠	26	ELECTRONIC CONTROLLER - MAIN	1	CWA73C9228R	O
⚠	27	TERMINAL BOARD ASSY	1	CWA28K1154	O
	28	CABINET SIDE PLATE CO.	1	CWE04C1226	
	29	SENSOR CO-AIR TEMP AND PIPE TEMP	1	CWA50C2793	O
	30	CABINET SIDE PLATE	1	CWE041492A	
	31	CABINET FRONT PLATE CO.	1	CWE06C1142	
	32	CABINET TOP PLATE	1	CWE031018A	
	33	PLATE - C. B. COVER TERMINAL	1	CWH131301	
	34	CONTROL BOARD COVER CO.	1	CWH13C1208	
	35	HANDLE	1	CWE161010	
	38	4-WAYS VALVE	1	CWB001058	O
⚠	39	V-COIL COMPLETE (4 W. VALVE)	1	CWA43C2432	O
	50	BAG-COMplete	1	CWG87C900	
	51	BAG	1	CWG861078	
	52	BASE BOARD-COMplete	1	CWG50C2388	
	53	SHOCK ABSORBER (R)	1	CWG712209	
	54	SHOCK ABSORBER (L)	1	CWG712210	
	55	C.C.CASE	1	CWG565107	
	56	HEATER	1	CWA341065	O
	57	EXPANSION VALVE	1	CWB051016J	O
	58	STRAINER	1	CWB111061	O
	59	DISCHARGE MUFFLER (EXPANSION VALVE)	1	CWB121021	O
⚠	60	V-COIL COMPLETE (EXPANSION VALVE)	1	CWA43C2393	O
	61	WIRE NET	1	CWD041161A	

(NOTE)

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

19.3.2 CU-E18RB4U



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.	DESCRIPTION & NAME	QTY.	CU-E18RB4U	REMARK
	1	CHASSIS COMPLETE	1	CWD52K1228A	
	2	ANTI - VIBRATION BUSHING	3	CWH50055	
⚠	3	COMPRESSOR	1	5KD240XAF21	O
	4	NUT - COMPRESSOR MOUNT	3	CWH561049	
	5	SOUND PROOF MATERIAL	1	CWG302246	
	6	FAN MOTOR BRACKET	1	CWD541127	
⚠	7	FAN MOTOR	1	EHDS80CAC	O
	8	SCREW - FAN MOTOR BRACKET	3	CWH551217	
	9	SCREW - FAN MOTOR MOUNT	4	CWH551323	
	10	PROPELLER FAN ASSY	1	CWH00K1006	
	11	NUT - PROPELLER FAN	1	CWH561092	
	12	CONDENSER	1	CWB32C3516	
	14	EXPANSION VALVE	1	CWB051018J	O
	15	4 WAYS VALVE	1	CWB001057	O
	18	HOLDER - COUPLING	1	CWH351228A	
	19	3 WAYS VALVE (GAS)	1	CWB011672	O
	20	2 WAYS VALVE (LIQUID)	1	CWB021464	O
	22	SOUND PROOF BOARD	1	CWH151197	
	23	TERMINAL COVER	1	CWH171039A	
	24	NUT - TERMINAL COVER	1	CWH7080300J	
	25	SENSOR CO. (COMP TEMP.)	1	CWA50C2689	O
⚠	27	V-COIL COMPLETE (4 W. VALVE)	1	CWA43C2392	O
⚠	28	V-COIL COMPLETE (EXPAND VALVE)	1	CWA43C2393	O
	30	SENSOR CO. (AIR AND PIPE TEMP.)	1	CWA50C2710	O
⚠	31	REACTOR	1	G0C452J00002	O
⚠	32	TERMINAL BOARD ASSY	1	CWA28K1076J	O
⚠	33	TERMINAL BOARD ASSY	1	CWA28K1277	O
⚠	38	ELECTRONIC CONTROLLER - MAIN	1	CWA73C9229R	O
	40	CONTROL BOARD COVER (TOP)	1	CWH131333	
	41	CABINET SIDE PLATE	1	CWE041490A	
	42	HANDLE	1	CWE161010	
	43	CABINET SIDE PLATE	1	CWE041488A	
	45	CABINET FRONT PLATE CO.	1	CWE06K1070	
	46	WIRE NET	1	CWD041128A	
	47	CABINET TOP PLATE	1	CWE031131A	
	48	CONTROL BOARD COVER COMPLETE	1	CWH13C1210	
	51	CONTROL BOARD COVER	1	CWH131332	
⚠	65	ELECTRONIC CONT. - NOISE FILTER	1	CWA748363	O
	69	SOUND PROOF MATERIAL	1	CWG302245	
	70	BAG	1	CWG861154	
	71	BASE BOARD - COMPLETE	1	CWG62C1082	
	72	SHOCK ABSORBER	1	CWG712879	
	73	SHOCK ABSORBER	1	CWG712880	
	74	C.C. CASE	1	CWG565614	
	75	BAG-COMplete	1	CWG87C900	
	76	PACKING	3	CWB81043	
	77	HEATER	1	CWA341067	
	78	RECEIVER	1	CWB14030	
	79	STRAINER	1	CWB111076	

SAFETY	REF NO.	DESCRIPTION & NAME	QTY.	CU-E18RB4U	REMARK
	80	TUBE ASSY CO. (CAP. TUBE)	1	CWT01C6093	
	81	DISCHARGE MUFFLER (4 W. VALVE)	1	CWB121055	

(NOTE)

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