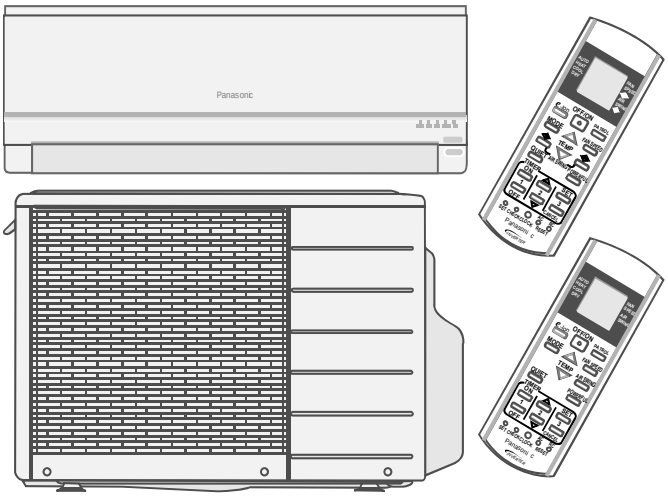
Order No: MAC0704001A2

Service Manual

Air Conditioner

Simplified



INDOOR UNIT

CS-E7GKEW	CS-E7GKDW
CS-E9GKEW	CS-E9GKDW
CS-E12GKEW	CS-E12GKDW
CS-E15GKEW	CS-E15GKDW
CS-E18GKEW	CS-E18GKDW

OUTDOOR UNIT

CU-2E15GBE

Please file and use this manual together with the service manual for Model No. CU-2E18CBPG, CU-3E23CBPG, CU- 4E27CBPG, Order No. RAC0209005C2, Model No. CU-3E18EBE, Order No. RAC0503011C2 and Model No. CS-E9GFEW, CS-E12GFEW, CS-E18GFEW, Order No. RAC0704001C2.

⚠ 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.

⚠ PRECAUTION OF LOW TEMPERATURE

In order to avoid frostbite, be assured of the refrigerant leakage during the installation or repairing of refrigeration circuit.

TABLE OF CONTENTS

Panasonic

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 indication shows the possibility of causing death or serious injury

- 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. 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.	
2. Install according to this installation instructions strictly. If installation is defective, it will cause water leakage, electric shock or fire.	
3. Use the attached accessories parts and specified parts for installation and servicing. Otherwise, it will cause the set to fall, water properly done, the set will drop and cause injury.	
4. 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.	
5. 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.	
6. Use the specified cable and connect tightly for indoor/outdoor connection. Connect tightly and clamp the cable so that no external force will be acted on the terminal. If connection or fixing is not perfect, it will cause heat-up or fire at the connection.	
7. 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.	
8. When connecting the piping, do not allow air or any substances other than the specified refrigerant to enter the refrigeration cycle. Otherwise, this may lower the capacity, cause abnormally high pressure in the refrigeration cycle, and possibly result in explosion and injury.	⃠
9. Thickness of copper pipes used must be more than 0.8 mm. Never use copper thinner than 0.8 mm.	⃠
10. It is desirable that the amount of residual oil is less than 40 mg/10m.	⃠
11. Do not modify the length of the power supply cord or use of the extension cord, and do not share the single outlet with other electrical appliances. Otherwise, it will cause fire or electrical shock.	⃠

⚠ CAUTION
1. The equipment must be earthed. It may cause electrical shock if grounding is not perfect.
2. Do not install the unit at place where leakage of flammable gas may occur. In case gas leaks and accumulates at surrounding of the unit, it may cause fire.
3. Carry out drainage piping as mentioned in installation instructions. If drainage is not perfect, water may enter the room and damage the furniture.
4. 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).

ATTENTION
1. Selection of the installation location. Select an installation location which is rigid and strong enough to support or hold the unit, and select a location for easy maintenance.
2. Power supply connection to the air conditioner. Connect the power supply cord of the air conditioner to the mains using one of the following methods. Power supply point shall be the place where there is ease for access for the power disconnection in case of emergency. In some countries, permanent connection of this room air conditioner to the power supply is prohibited. i. Power supply connection to the receptacle using a power plug. Use an approved power plug with earth pin for the connection to the socket. ii. Power supply connection to a circuit breaker for the permanent component. Use an approved circuit breaker for the permanent connection. It must be a double pole switch with a minimum 3.5 mm contact gap.
3. 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.
4. Installation work: It may need two people to carry out the installation work.
5. Do not install this appliance in a laundry room or other location where water may drip from the ceiling, etc.

2. Specifications

2.1 Indoor unit

Model			CS-E7GKEW CS-E7GKDW	CS-E9GKEW CS-E9GKDW	CS-E12GKEW CS-E12GKDW	CS-E15GKEW CS-E15GKDW	CS-E18GKEW CS-E18GKDW
Item		Unit	Wall Mounted				
Noise Level	Cooling	dB (A)	Hi: 37 Lo: 24	Hi: 39 Lo: 25	Hi: 42 Lo: 28	Hi: 43 Lo: 32	Hi: 44 Lo: 37
		Power level dB	48	50	53	54	57
	Heating	dB (A)	Hi: 38 Lo: 25	Hi: 40 Lo: 27	Hi: 42 Lo: 33	Hi: 43 Lo: 35	Hi: 44 Lo: 37
		dB	49	51	53	54	57
Moisture Removal		l/h	1.3	1.6	2.0	2.4	
		(pt/h)	2.7	3.4	4.2	5.1	
Air Volume	Lo	m^3/m (ft^3/m)	C: 6.3 (220) H: 6.5 (230)	C: 6.6 (230) H: 7.1 (250)	C: 7.0 (250) H: 8.5 (300)	C: 7.4(260) H: 9.0 (320)	C: 12.3 (430) H: 13.0 (460)
	Me	m^3/m (ft^3/m)	C: 8.0 (280) H: 8.4 (300)	C: 8.5 (300) H: 9.1 (320)	C: 9.1 (320) H: 10.1 (360)	C: 9.2 (330) H: 10.8 (380)	C: 13.9 (490) H: 14.6 (520)
	Hi	m^3/m (ft^3/m)	C: 9.8 (350) H: 10.3 (360)	C: 10.4 (370) H: 11.0 (390)	C: 11.2 (400) H: 11.7 (410)	C: 11.0 (390) H: 11.8 (420)	C: 15.2 (540) H: 16.7 (590)
	SHi	m^3/m (ft^3/m)	C: 10.1 (360) H: 10.7 (380)	C: 10.7 (380) H: 11.4 (400)	C: 11.5 (410) H: 12.1 (430)	C: 11.7 (410) H: .11.5 (410)	-
Dimension	Height	mm (inch)	280 (11 – 1/32)				275 (10 – 13/16)
	Width	mm (inch)	799 (31 – 15/32)				998 (39 – 9/32)
	Depth	mm (inch)	183 (7 – 7/32)				230 (9 – 1/16)
Net Weight		kg (lbs)	9 (20)				10 (22)
Pipe Diameter	Gas	mm (inch)	9.52 (3/8)				12.7 (1/2)
	Liquid	mm (inch)	6.35 (1/4)				6.35 (1/4)
Drain Hose	Inner diameter	mm	16				12
	Length	mm	650				650
Fan	Type		Cross-flow fan				
	Material		ASG20K1				
	Motor Type		Transistor (8-pole)				
	Input power	W	-				
	Output power		30				
Heat Exchanger	Fin material		Aluminum (Pre Coat)				
	Fin type		Slit Fin				
	Row x Stage x FPI		2 x 15 x 19			2 x 15 x 21	2 x 15 x 19
	Size (W x H x L)	mm (inch)	610 x 315 x 25.4				810 x 315 x 25.4
Air Filter Type	Material		Polypropelene				
	Style		One-Touch				

1. Cooling capacities are based on indoor temperature of 27°C Dry Bulb (80.6°F Dry Bulb), 19°C Wet Bulb (66.2°F Wet Bulb) and outdoor air temperature of 35°C Dry Bulb (95.0°F Dry Bulb), 24°C Wet Bulb (75.2°F Wet Bulb).
2. Heating capacities are based on indoor temperature of 20°C Dry Bulb (80.6°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).

Item	Unit	
Power Source (Phase, Voltage, Cycle)		Single
	V	230
	Hz	50

2.2 Outdoor Unit

Model Name				CU-2E15GBE
Indoor Unit Combination				2.2kW + 2.2kW
Power Source				1 Phase, 230V, 50Hz (Power supply from outdoor unit)
Cooling Operation	Capacity		kW	4.5 (1.50 – 5.0)
	Electrical Data	Running Current	A	5.75
		Power Input	kW	1.230 (250 -1350)
		EER	W/W	3.66
	Noise	Sound Pressure Level	dB	47
		Sound Power Level	dB	62
Heating Operation	Capacity		kW	5.4 (1.1 – 7.0)
	Electrical Data	Running Current	A	5.20
		Power Input	kW	1.170 (210 – 1670)
		COP	W/W	4.62
	Noise	Sound Pressure Level	dB	49
		Sound Power Level	dB(A)	64
Maximum Current			A	12.0
Starting Current			A	5.75
Circuit Breaker Capacity			A	15
Dimension	Height		mm	540
	Width		mm	780 (+70)
	Depth		mm	289
Net Weight			kg	38
Connection Cable				3 + 1 (Earth) ø1.5 mm^2
Pipe Length Range (1 room)			m	3 – 20
Maximum Pipe Length (Total Room)			m	30
Refrigerant Pipe Diameter	Liquid Side		mm	6.35
	Gas Side		mm	9.52
Compressor	Type			Scroll Type
	Motor Type			DC Brushless (4-poles)
	Rated Output			1200
Air Circulation	Type			Propeller Fan
	Motor Type			DC Brushless (8-poles)
	Rated Output			40
Fan Speed	Low		RPM	690
	High		RPM	860
Heat Exchanger	Type			Plate fin configuration forced draft type
	Tube Material			Copper
	Fin Material			Aluminum
	Row/Stage			2/20
	FPI			19
Air Volume	High Cooling (Heating)			33.3 (28.5)
Refrigerant Control Device				Expansion Valve
Refrigerant Oil				POE (RB-68A)
Refrigerant (R410A)			g	1450

Outdoor Unit	Indoor unit combination		Operation Mode	Capacity		Power Input (kW)		Current (A)
	Operation	Class (kW)		Rating	Min - Max	Rating	Min - Max	
CU-2E15GBE	One-room Operation	2.2	Cooling	2.20	1.1 – 2.9	0.52	0.22 – 0.75	2.45
			Heating	3.20	0.7 – 4.8	0.85	0.17 – 1.41	3.75
		2.8	Cooling	2.80	1.1 – 3.5	0.75	0.22 – 1.00	3.50
			Heating	4.00	0.7 – 5.5	1.15	0.17 – 1.70	5.10
		3.2	Cooling	3.20	1.1 – 4.0	0.92	0.22 – 1.22	4.30
			Heating	4.50	0.7 – 6.2	1.25	0.17 – 1.81	5.55
	Two-room Operation	2.2 + 2.2	Cooling	4.50	1.5 – 5.0	1.23	0.25 – 1.35	5.75
			Heating	5.40	1.1 – 7.0	1.17	0.21 – 1.67	5.20
		2.2 + 2.8	Cooling	4.50	1.5 – 5.2	1.23	0.25 – 1.52	5.75
			Heating	5.40	1.1 – 7.0	1.17	0.21 – 1.67	5.20
		2.2 + 3.2	Cooling	4.50	1.5 – 5.2	1.25	0.25 – 1.53	5.80
			Heating	5.40	1.1 – 7.0	1.23	0.21 – 1.72	5.45

3. Features

- Product
  - o A single outdoor unit enables air conditioning of up to two separate rooms for CU-2E15GBE, CU-2E18CBPG.
  - o A single outdoor unit enables air conditioning of up to three separate rooms for CU-3E18EBE, CU-3E23CBPG.
  - o A single outdoor unit enables air conditioning of up to four separate rooms for CU-4E27CBPG

			Outdoor Unit													
			CU-2E15GBE		CU-2E18CBPG		CU-3E18EBE			CU-3E23CBPG			CU-4E27CBPG			
			A	B	A	B	A	B	C	A	B	C	A	B	C	D
Wall	2.2 kW	CS-E7GKEW CS-E7GKDW	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	2.8 kW	CS-E9GKEW CS-E9GKDW	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	3.2 kW	CS-E12GKEW CS-E12GKDW	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	4.0 kW	CS-E15GKEW CS-E15GKDW	_	_	_	_	●	●	●	●	●	●	●	●	●	●
	5.0 kW	CS-E18GKEW CS-E18GKDW	_	_	_	_	●	●	●	●	●	●	●	●	●	●
Duct	2.8 kW	CS-ME10DD3EG	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	4.0 kW	CS-ME15DD3EG	_	_	_	_	●	●	●	●	●	●	●	●	●	●
	5.0 kW	CS-ME18DD3EG	_	_	_	_	●	●	●	●	●	●	●	●	●	●
Ceiling Floor	2.8 kW	CS-ME10DTEG	_	_	●	●	●	●	●	●	●	●	●	●	●	●
	4.0 kW	CS-E15DTEW	_	_	_	_	●	●	●	●	●	●	●	●	●	●
	5.0 kW	CS-E18DTEW	_	_	_	_	●	●	●	●	●	●	●	●	●	●
Mini-Cassette	4.0 kW	CS-E15DB4EW	_	_	_	_	●	●	●	●	●	●	●	●	●	●
	5.0 kW	CS-E18DB4EW	_	_	_	_	●	●	●	●	●	●	●	●	●	●
Cassette	2.2 kW	CS-ME7EB1E	●	●	_	_	●	●	●	●	●	●	●	●	●	●
	2.8 kW	CS-ME10EB1E	●	●	_	_	●	●	●	●	●	●	●	●	●	●
	3.2 kW	CS-ME12EB1E	_	_	_	_	●	●	●	●	●	●	●	●	●	●
	4.0 kW	CS-ME14EB1E	_	_	_	_	●	●	●	●	●	●	●	●	●	●
Floor Standing	2.8 kW	CS-E9GFEW	●	●	_	_	●	●	●	●	●	●	●	●	●	●
	3.2 kW	CS-E12GFEW	_	_	_	_	●	●	●	●	●	●	●	●	●	●
	5.0 kW	CS-E18GFEW	_	_	_	_	●	●	●	●	●	●	●	●	●	●

Capacity range of connectable indoor units		From 4.4kW to 5.0kW	From 4.4kW to 6.4kW	From 5.0kW to 9.0kW	From 5.0kW to 10kW	From 5.0 to 13.6kW
Piping length	1 room maximum pipe length (m)	20	20	25	25	25
	Allowable elevation (m)	10	10	15	15	15
	Total allowable pipe length (m)	30	30	50	50	70
	Total pip e length for maximum chargeless length (m)	20	20	30	30	40
	Additional gas amount over chargeless length (m)	20	20	20	20	20

Note: "●" : Available

Remarks for CU-2E15GBE / CU-2E18CBPG

1. At least two indoor units must be connected.
2. The total nominal cooling capacity of indoor units that will be connected to outdoor unit must be within connectable capacity range of indoor unit. (as shown in the table above)
   Example: The indoor units' combination below is possible to connect to CU-2E15GBE. (Total nominal capacity of indoor units is between 4.4kW to 5.0kW)
   1) Two CS-E7GKEW only. (Total nominal cooling capacity is 4.4kW)
   2) One CS-E7GKEW and one CS-E9GKEW. (Total nominal cooling capacity is 5.0kW)

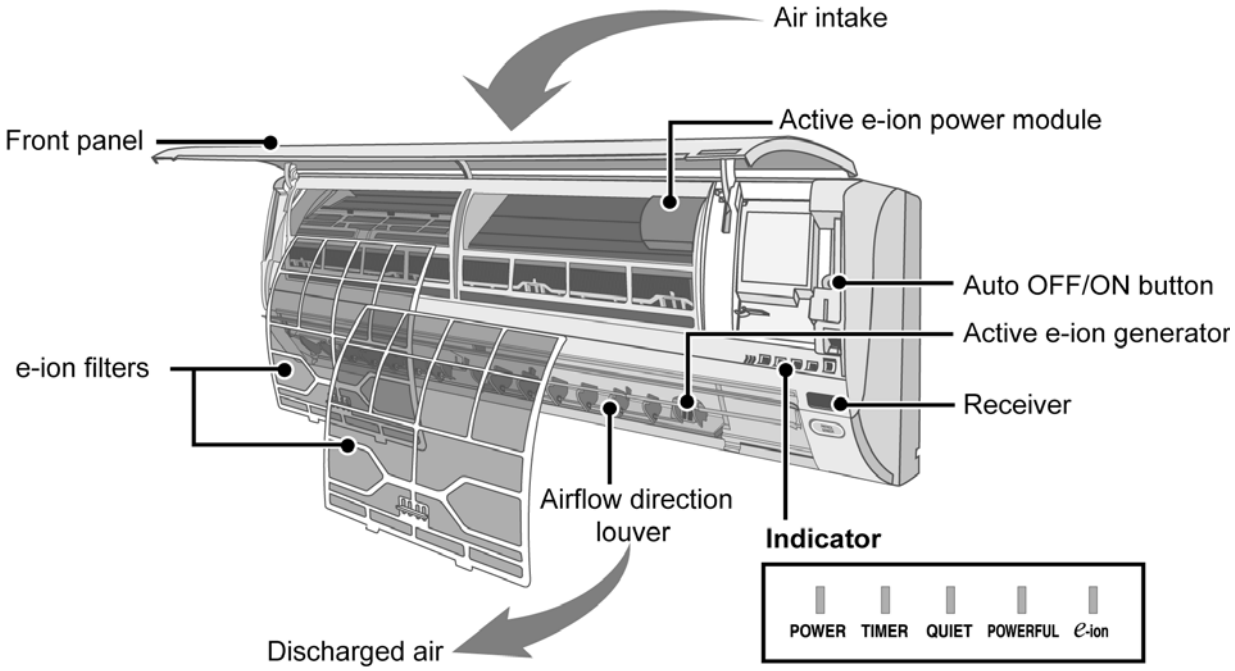
Remarks for CU-3E18EBE / CU-3E23CBPG / CU-4E27CBPG

1. At least two indoor units must be connected.
2. The total nominal cooling capacity of indoor units that will be connected to outdoor unit must be within connectable capacity range of indoor unit. (as shown in the table above)
   Example: The indoor units' combination below is possible to connect to CU-3E23CBPG. (Total nominal capacity of indoor units is between 5.0kW to 10.0kW)
   1) Two CS-E9GKEW only. (Total nominal cooling capacity is 5.6kW)
   2) Three CS-E9GKEW. (Total nominal cooling capacity is 9.6kW)

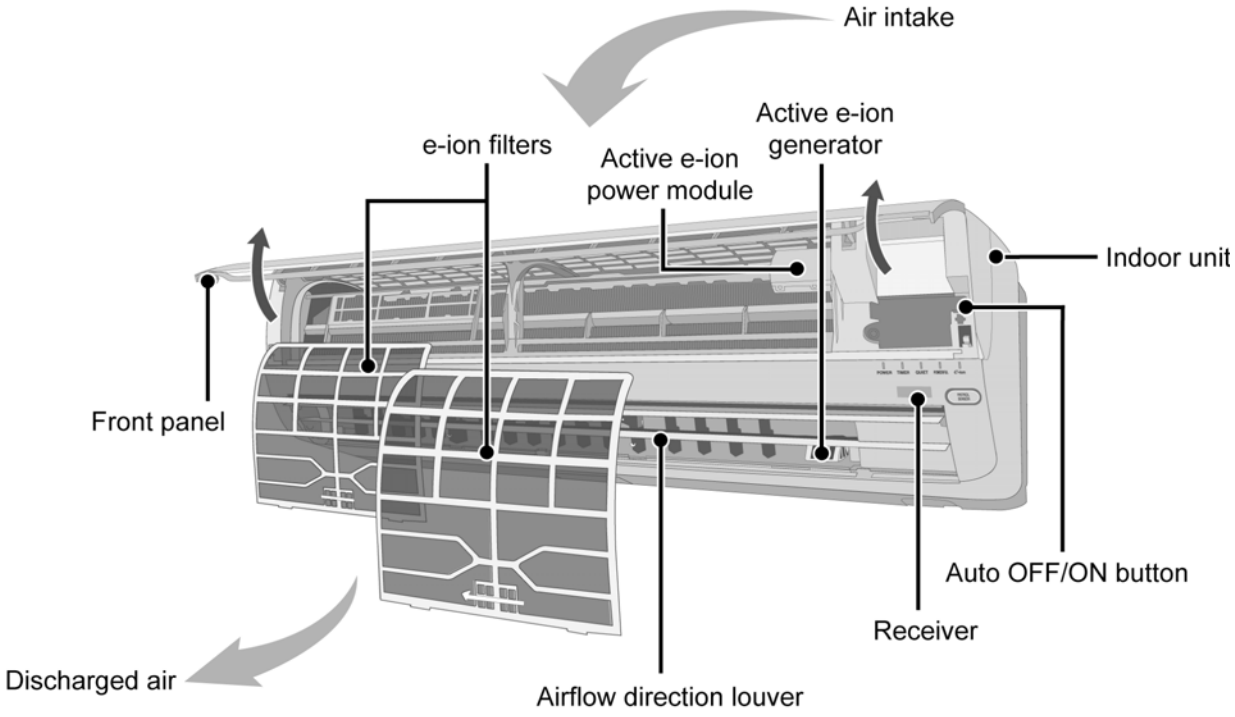
4. Location of Controls and Components

4.1 Indoor Unit

4.1.1 CS-E7GKEW, CS-E9GKEW, CS-E12GKEW, CS-E15GKEW CS-E7GKDW, CS-E9GKDW, CS-E12GKDW, CS-E15GKDW

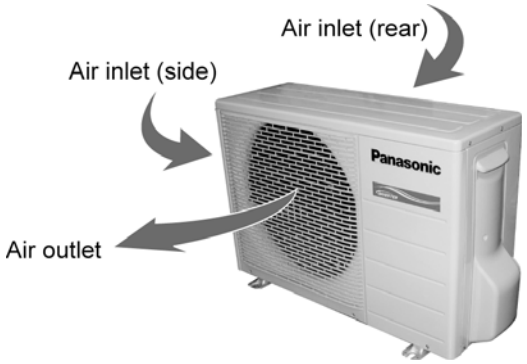


4.1.2 CS-E18GKEW, CS-E18GKDW



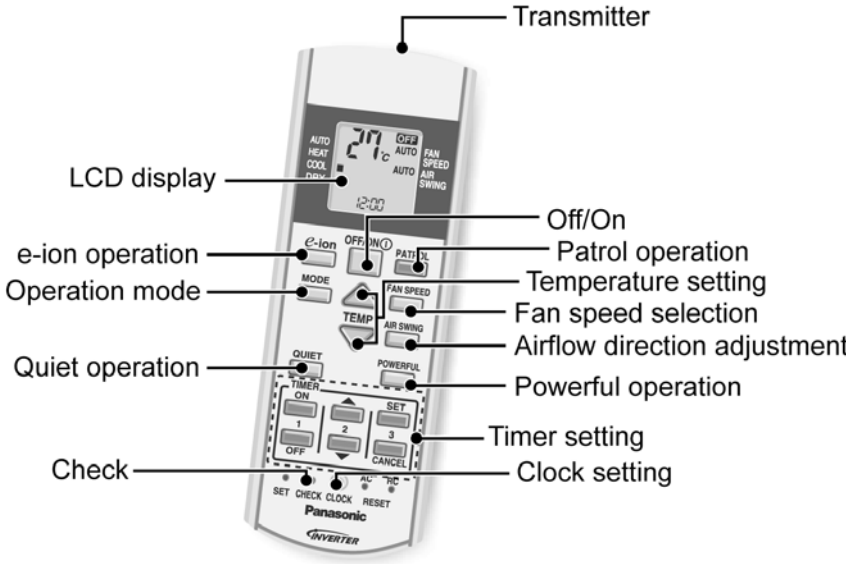
4.2 Outdoor Unit

4.2.1 CU-2E15GBE

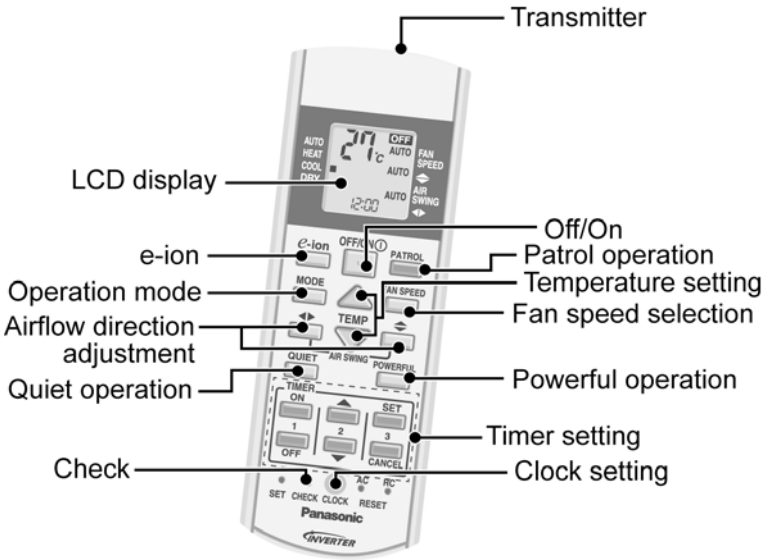


4.3 Remote Control

4.3.1 CS-E7GKEW, CS-E9GKEW, CS-E12GKEW, CS-E15GKEW CS-E7GKDW, CS-E9GKDW, CS-E12GKDW, CS-E15GKDW



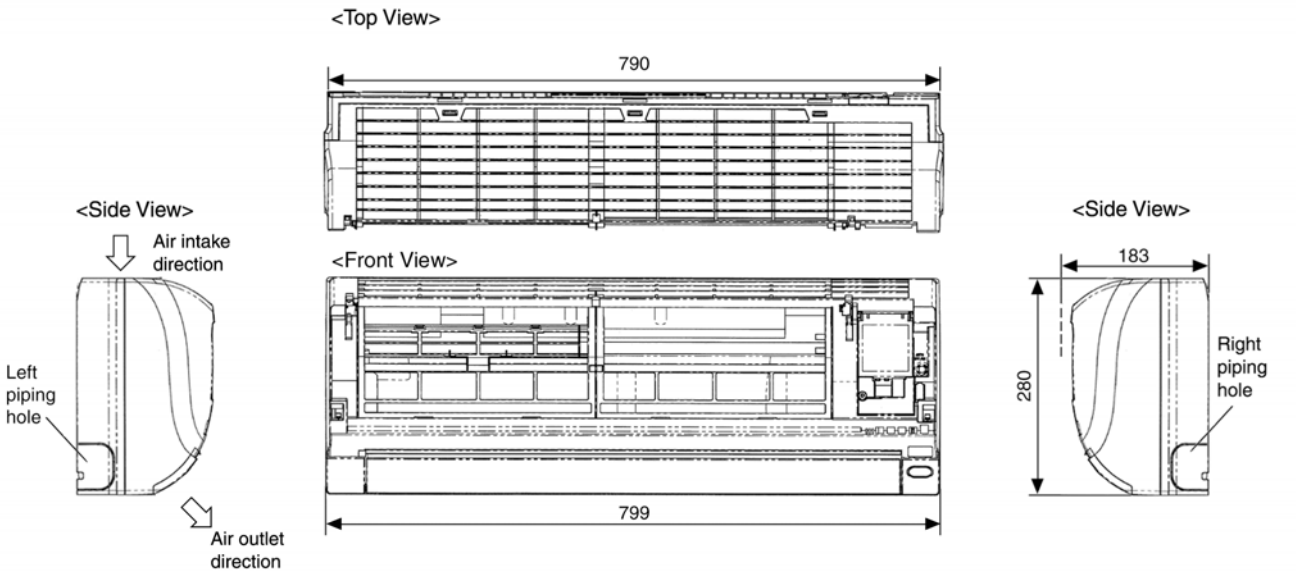
4.3.2 CS-E18GKEW, CS-E18GKDW



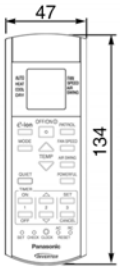
5. Dimensions

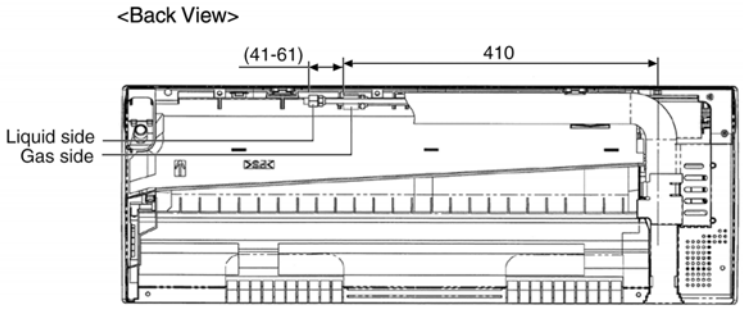
5.1 Indoor Unit & Remote Control

5.1.1 CS-E7GKEW, CS-E9GKEW, CS-E12GKEW, CS-E15GKEW CS-E7GKDW, CS-E9GKDW, CS-E12GKDW, CS-E15GKDW

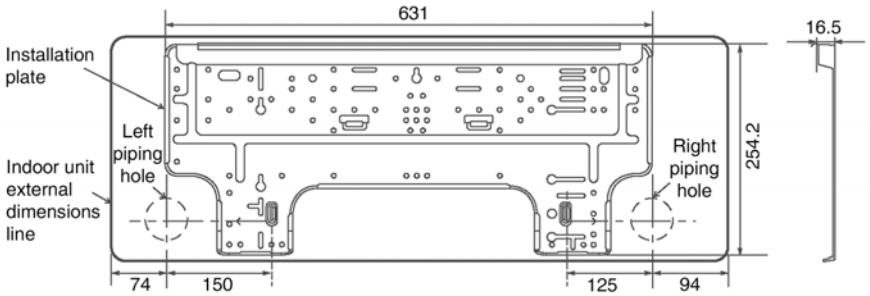


Remote control transmitter



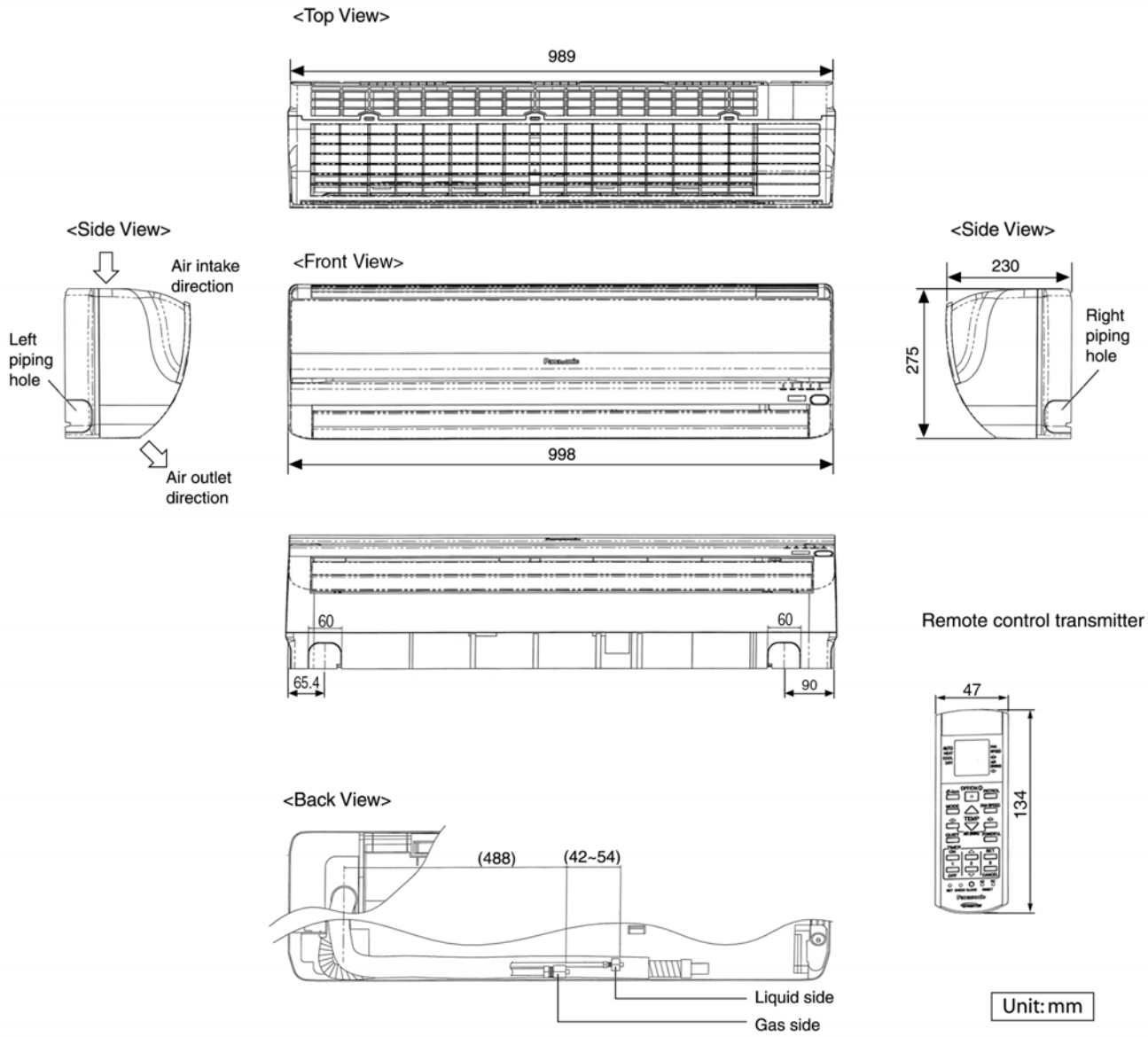


Relative position between the indoor unit and the installation plate <Front View>

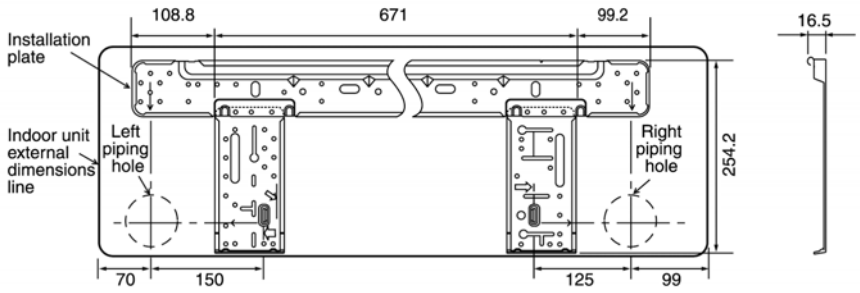


Unit: mm

5.1.2 CS-E18GKEW, CS-E18GKDW

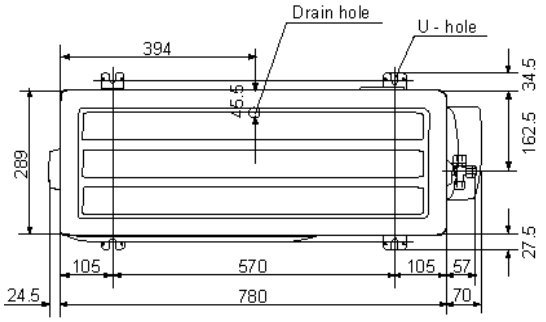


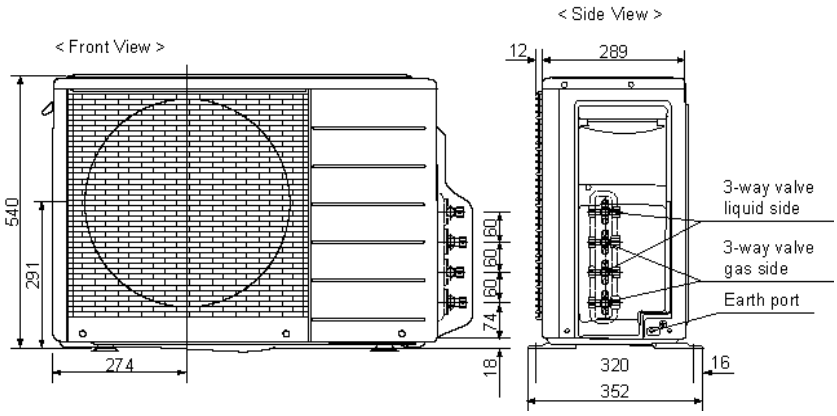
Relative position between the indoor unit and the installation plate <Front View>



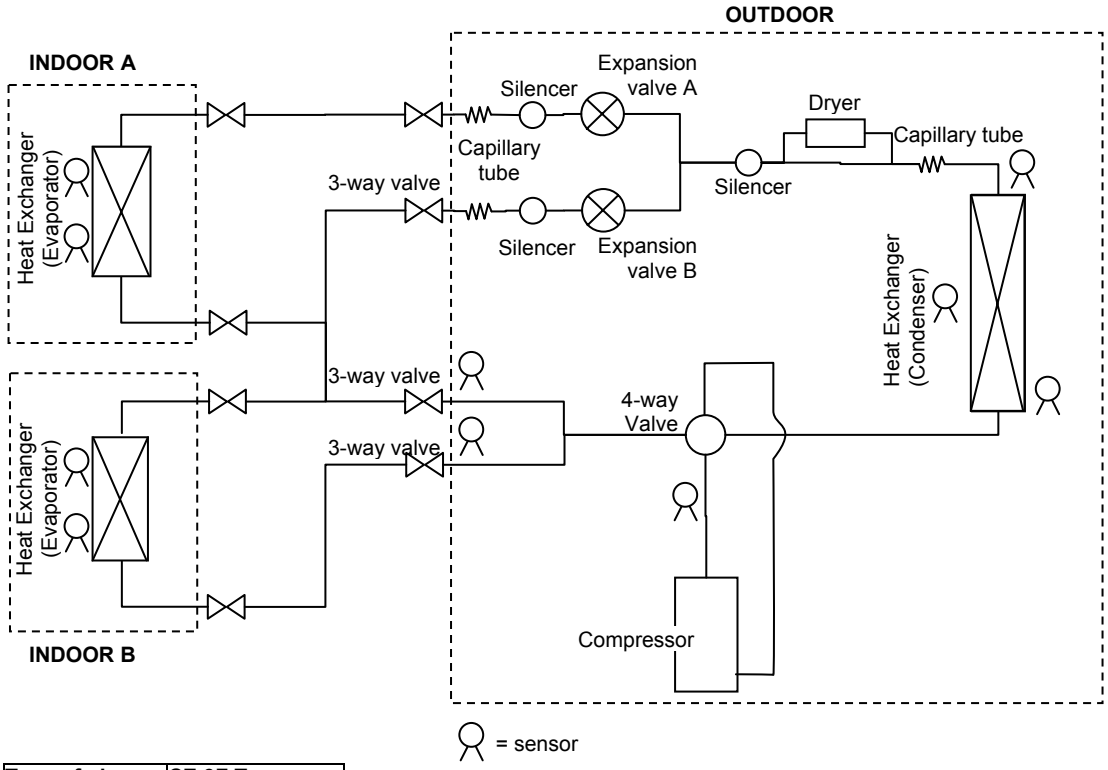
5.2 Outdoor Unit

5.2.1 CU-2E15GBE



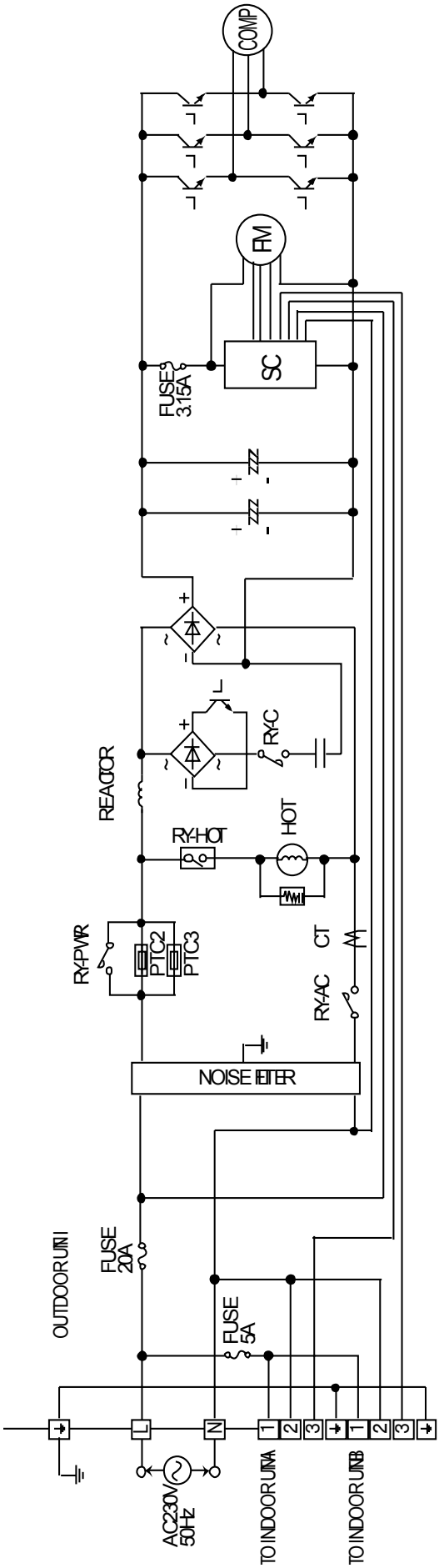


6. Refrigeration Cycle Diagram



Type of pipe	CZ-3F Type
Liquid side pipe	Ø 6.35 mm (1/4“)
Gas side pipe	Ø 9.52 mm (3/8”)

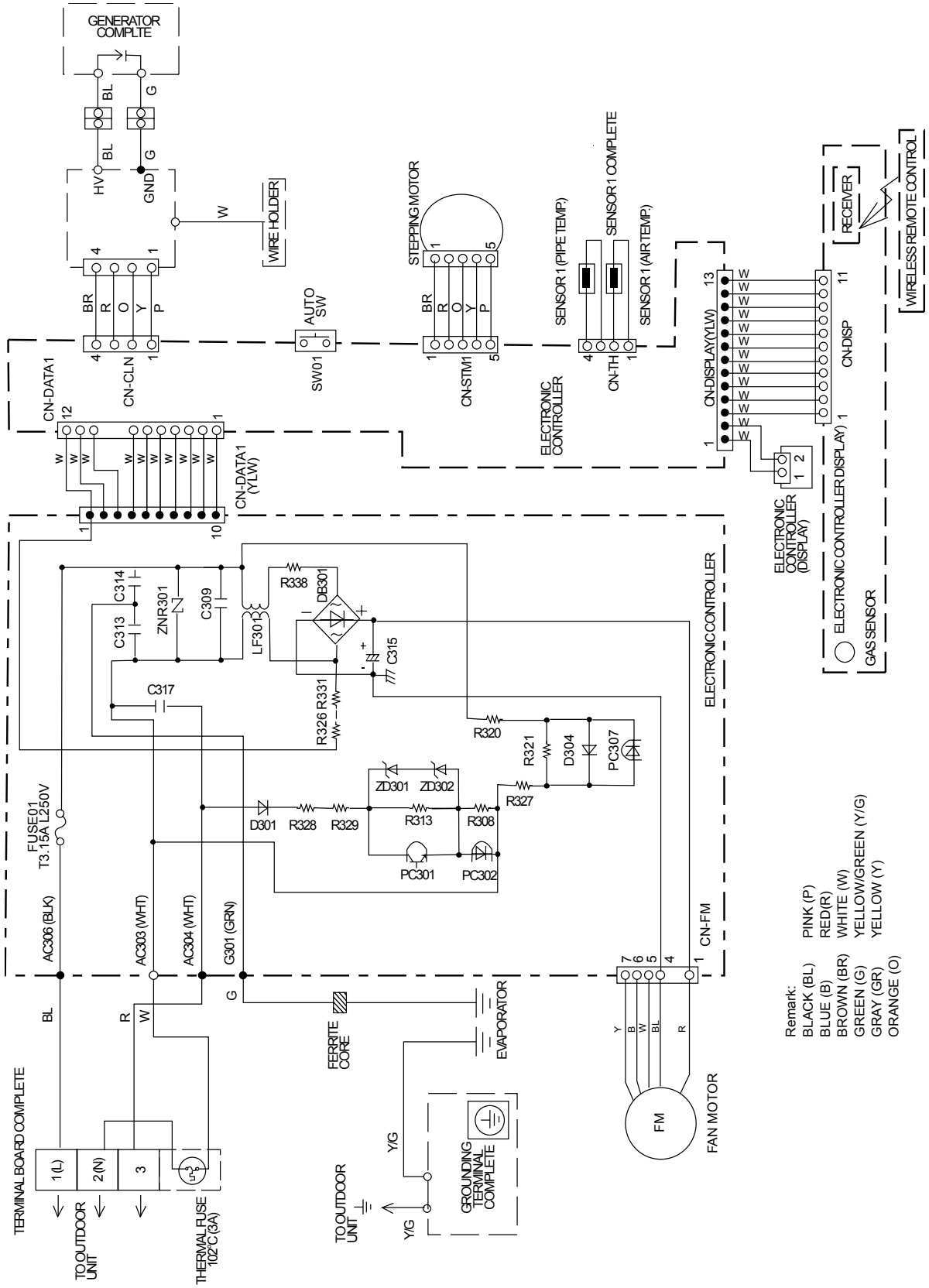
7. Block Diagram



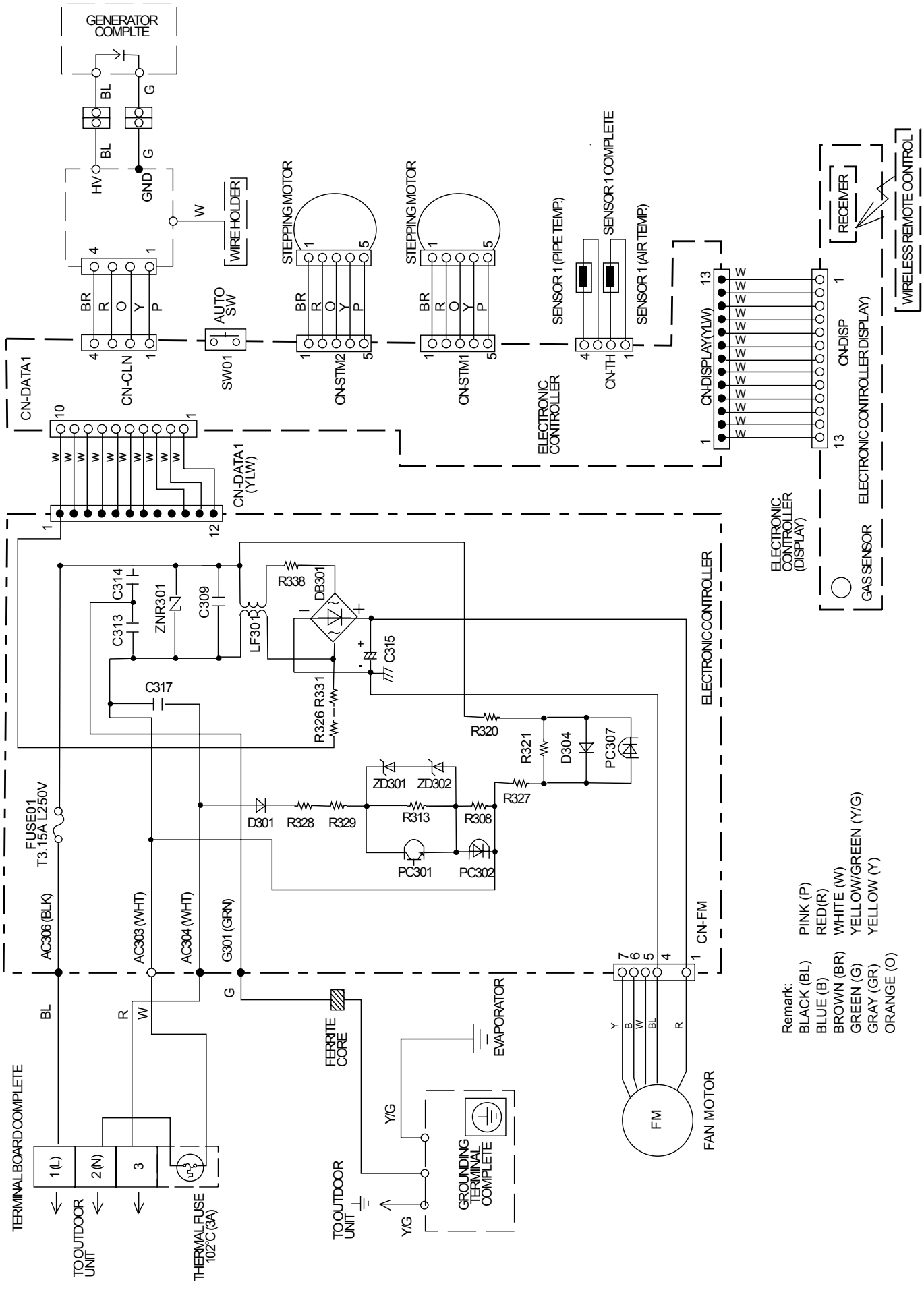
8. Wiring Connection Diagram

8.1 Indoor Unit

8.1.1 CS-E7GKEW, CS-E9GKEW, CS-E12GKEW, CS-E15GKEW CS-E7GKDW, CS-E9GKDW, CS-E12GKEW, CS-E15GKEW

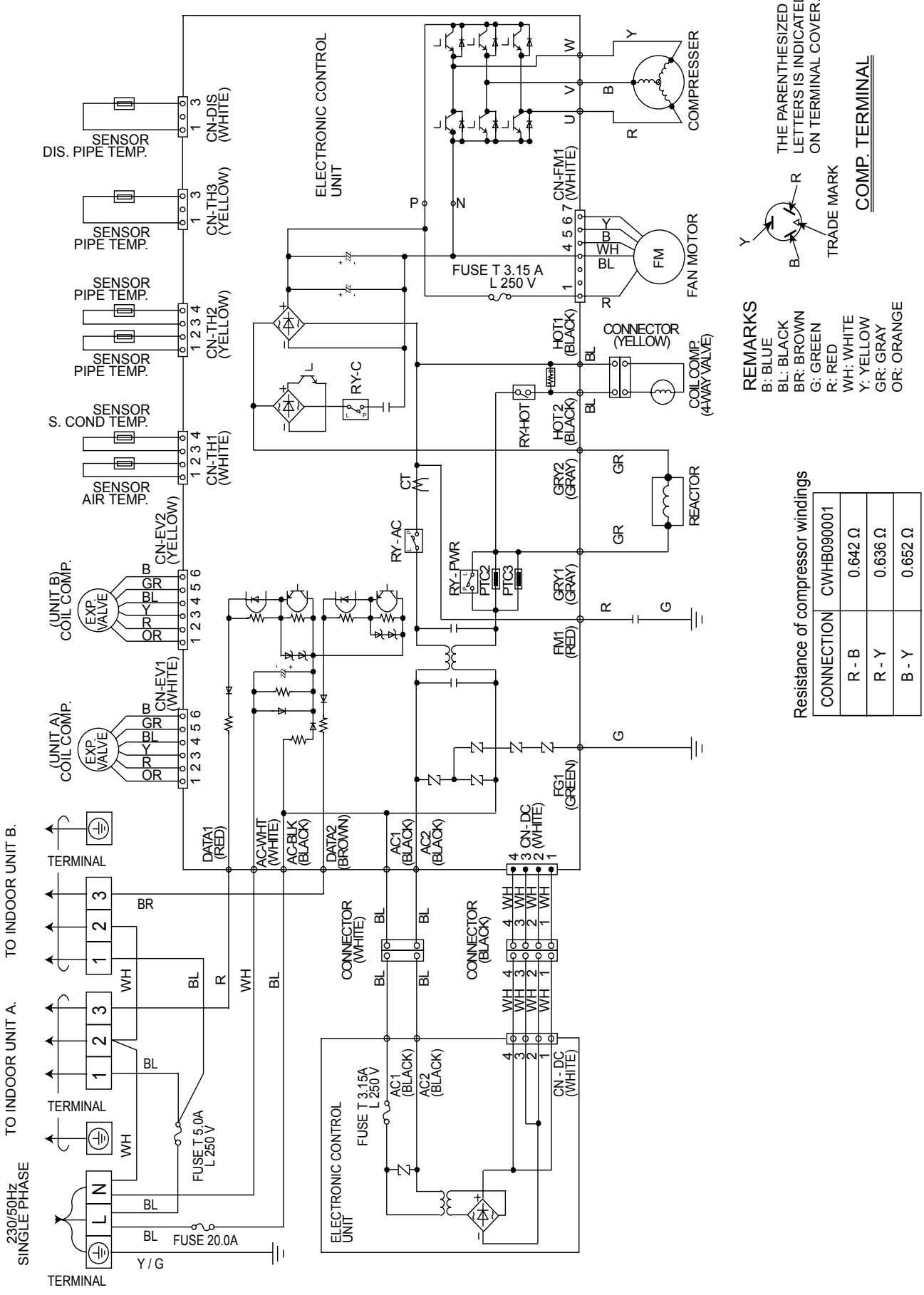


8.1.2 CS-E18GKEW, CS-E18GKDW



8.2 Outdoor Unit

8.2.1 CU-2E15GBE



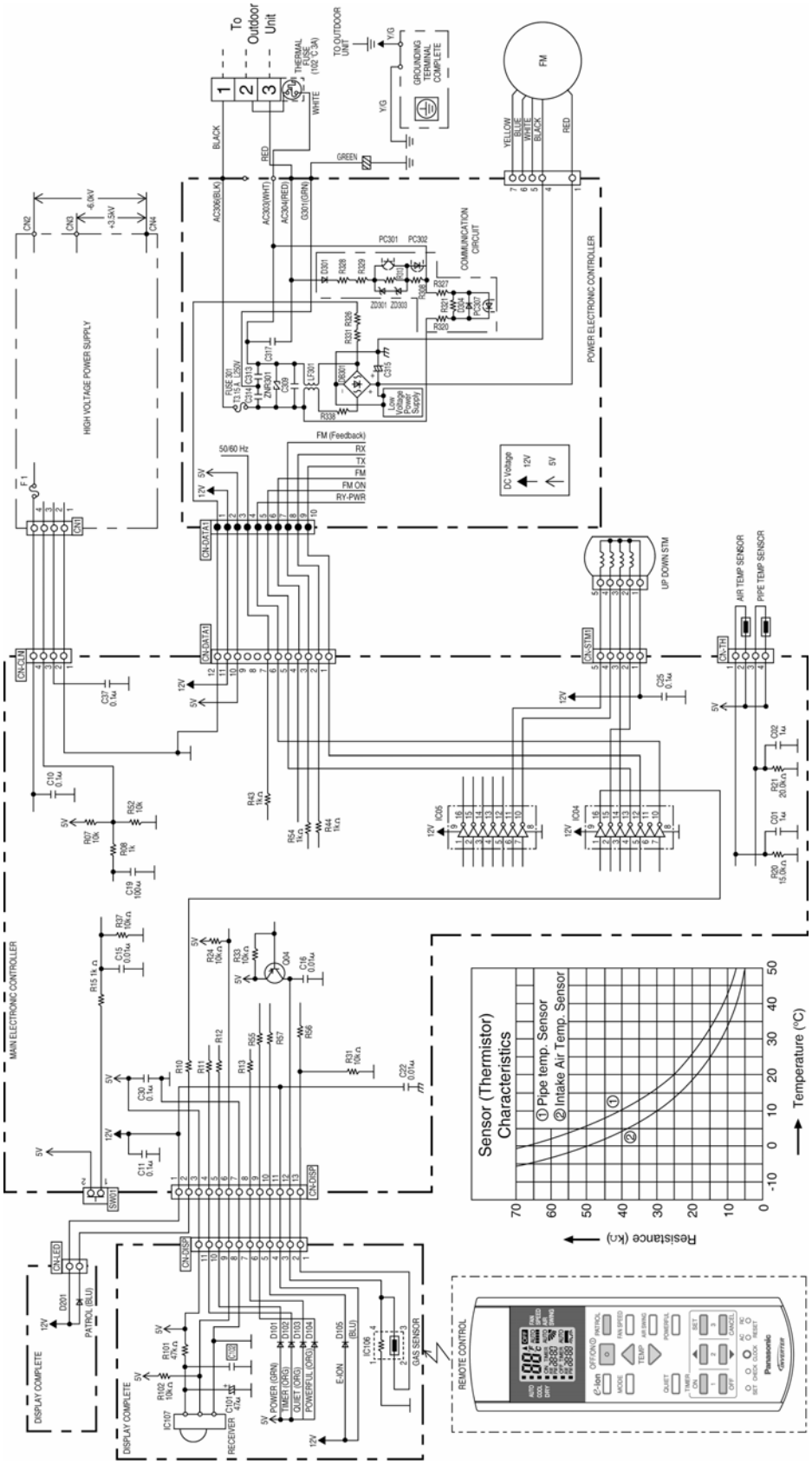
Resistance of compressor windings

CONNECTION	CWHB090001
R - B	0.642 Ω
R - Y	0.636 Ω
B - Y	0.652 Ω

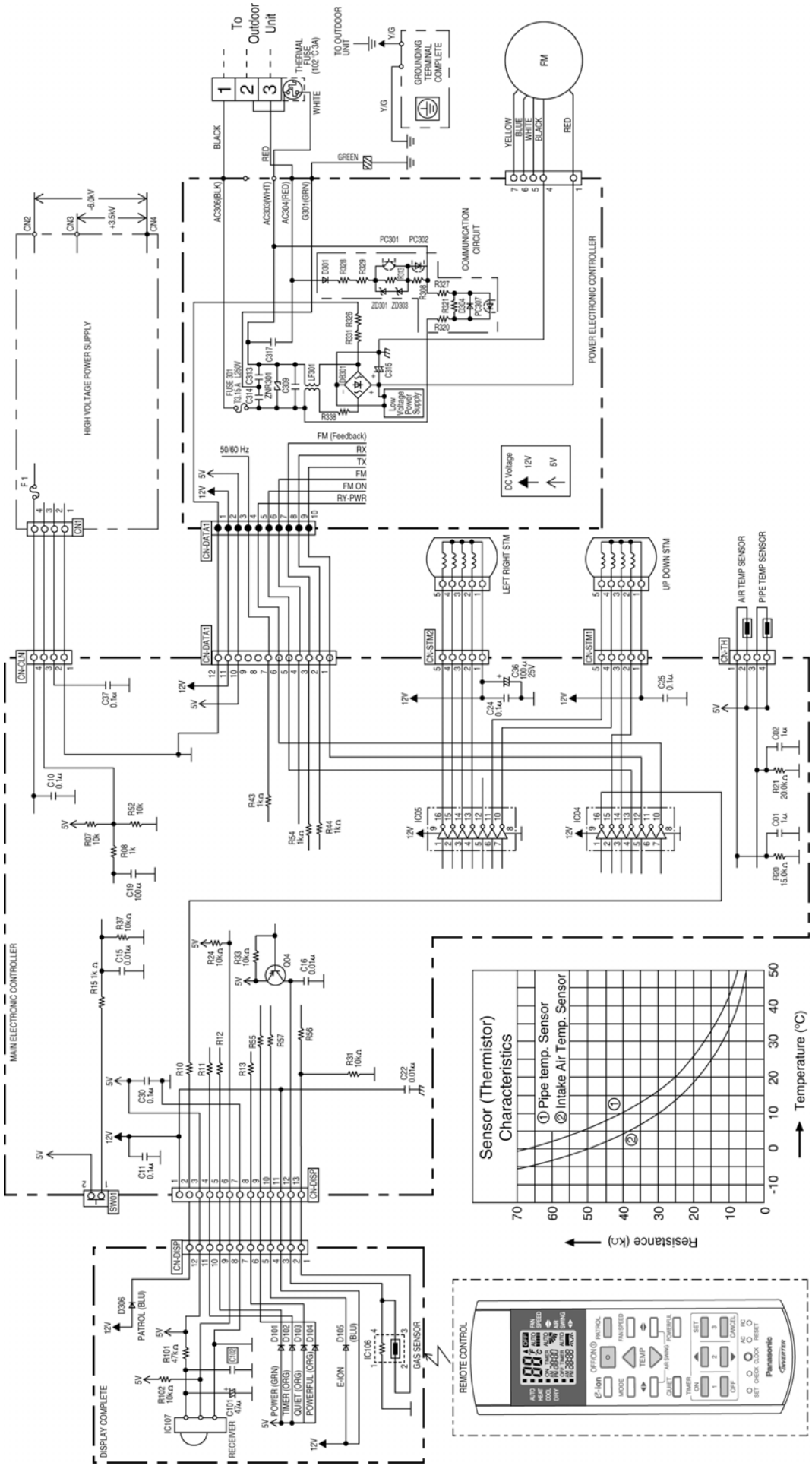
9. Electronic Circuit Diagram

9.1 Indoor Unit

9.1.1 CS-E7GKEW, CS-E9GKEW, CS-E12GKEW, CS-E15GKEW CS-E7GKDW, CS-E9GKDW, CS-E12GKEW, CS-E15GKEW



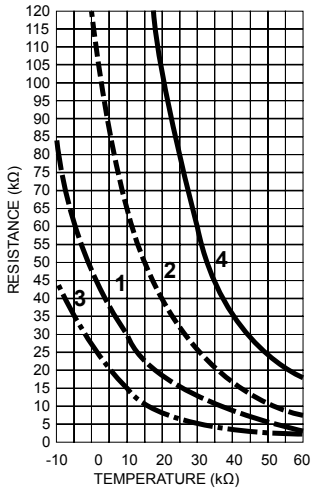
9.1.2 CS-E18GKEW, CS-E18GKDW



9.2 Outdoor Unit

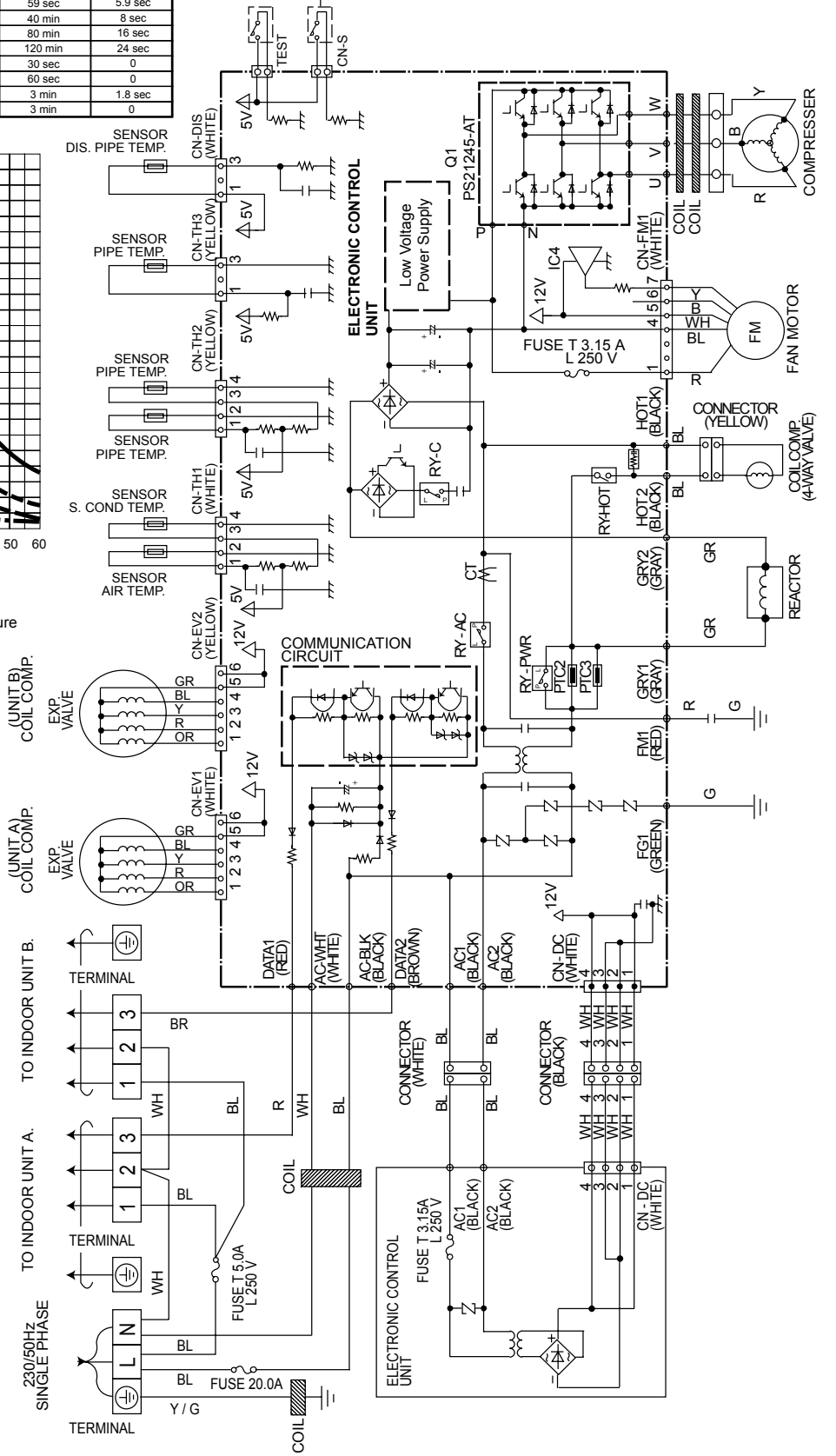
9.2.1 CU-2E15GBE

Outdoor		
Function	Time	Test Mode
First deice operation time	60 min	6 sec
Deice operation starting time	45 sec	4.5 sec
Deice forced completion	10 min 30 sec	63 sec
Deice operation completion	59 sec	5.9 sec
Deice detection	40 min	8 sec
	80 min	16 sec
	120 min	24 sec
Compressor forced operation time	30 sec	0
Compressor operation frequency step up	60 sec	0
Deice operation starting 3°C	3 min	1.8 sec
DC peak detection after compressor restart	3 min	0



1. Outdoor air temp.
2. Pipe temp. A, B
3. Heat exchanger temperature
4. Discharge temperature

- The unit turn to the Rated Frequency Cooling Operation by short-circuiting CN-S after applying power between the terminal 1 and 2.
- Operation of the compressor and the outdoor fan motor can be checked by applying power short-circuiting CN-S.

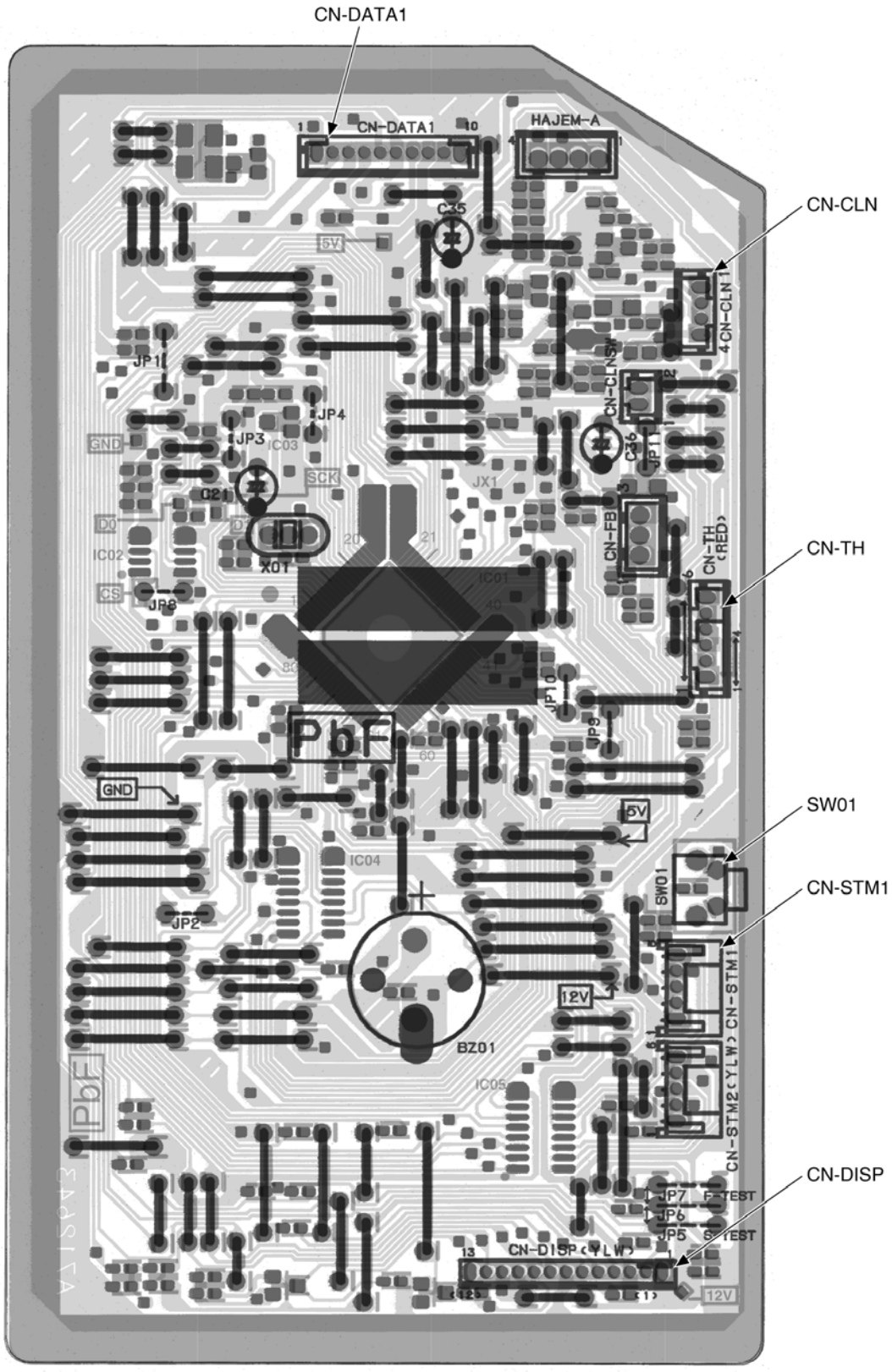


10. Printed Circuit Board

10.1 Indoor Unit

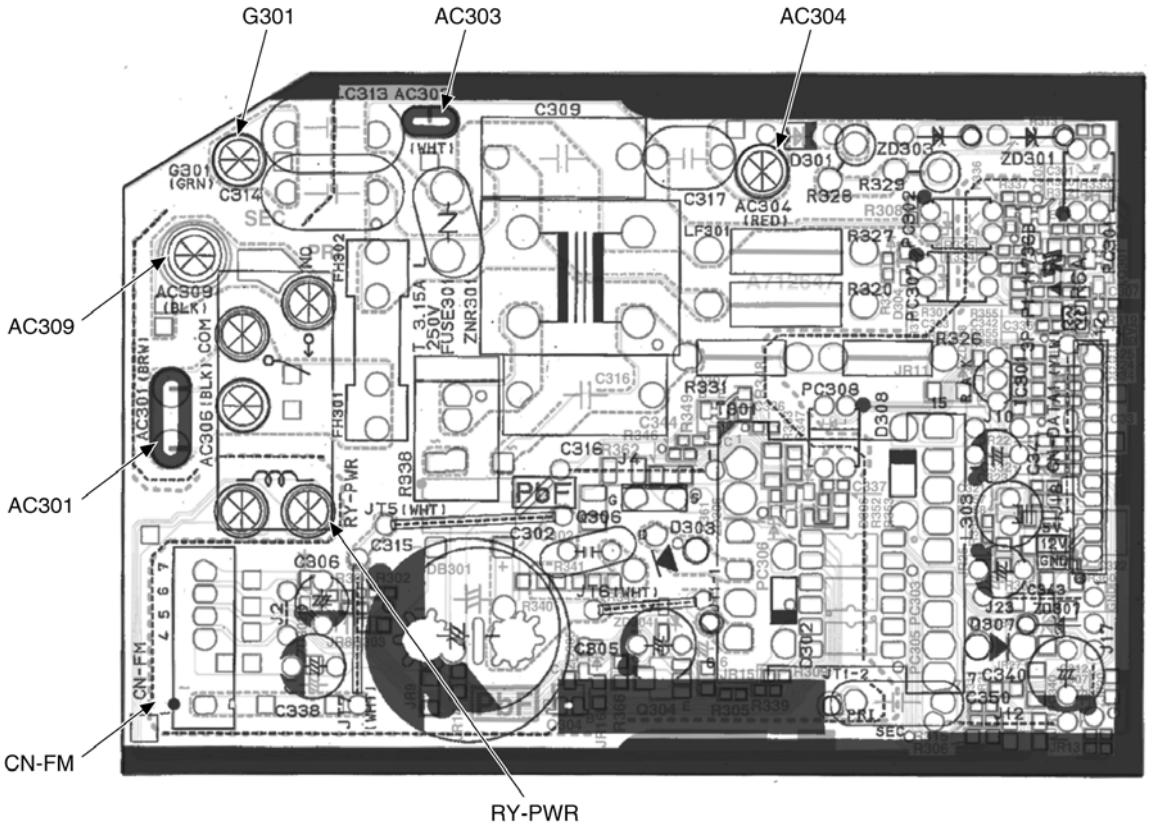
10.1.1 Main Printed Circuit Board

Applicable for the models below:
CS-E7GKEW, CS-E9GKEW, CS-E12GKEW, CS-E15GKEW, CS-E18GKEW
CS-E7GKDW, CS-E9GKDW, CS-E12GKDW, CS-E15GKDW, CS-E18GKDW



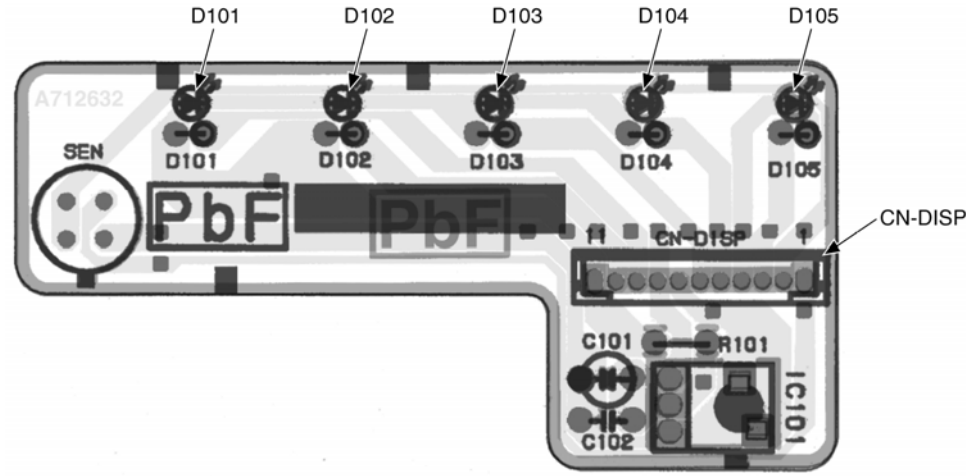
10.1.2 Power Printed Circuit Board

Applicable for the models below:
CS-E7GKEW, CS-E9GKEW, CS-E12GKEW, CS-E15GKEW, CS-E18GKEW
CS-E7GKDW, CS-E9GKDW, CS-E12GKDW, CS-E15GKDW, CS-E18GKDW



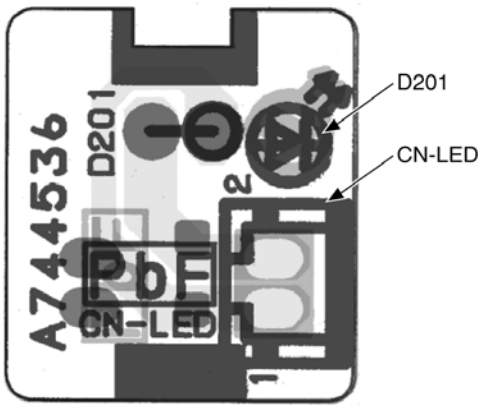
10.1.3 Indicator Printed Circuit Board

Applicable for the models below:
CS-E7GKEW, CS-E9GKEW, CS-E12GKEW, CS-E15GKEW
CS-E7GKDW, CS-E9GKDW, CS-E12GKDW, CS-E15GKDW



10.1.4 Patrol Sensor Printed Circuit Board

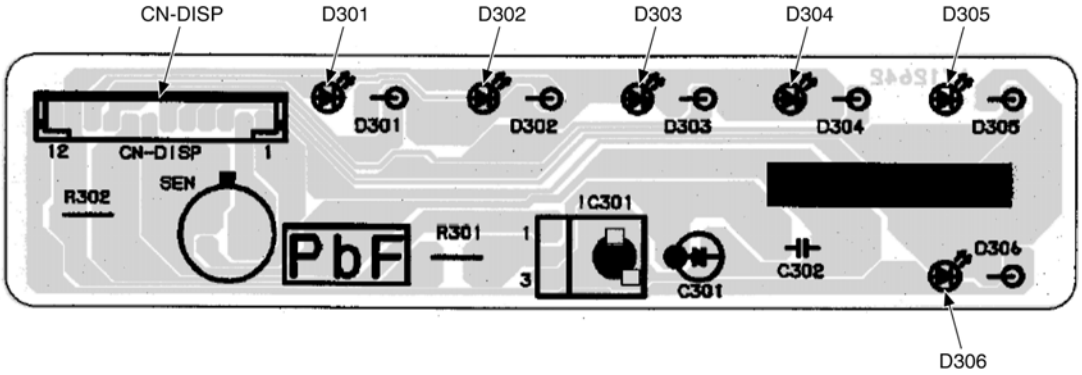
Applicable for the models below:
CS-E7GKEW, CS-E9GKEW, CS-E12GKEW, CS-E15GKEW
CS-E7GKDW, CS-E9GKDW, CS-E12GKDW, CS-E15GKDW



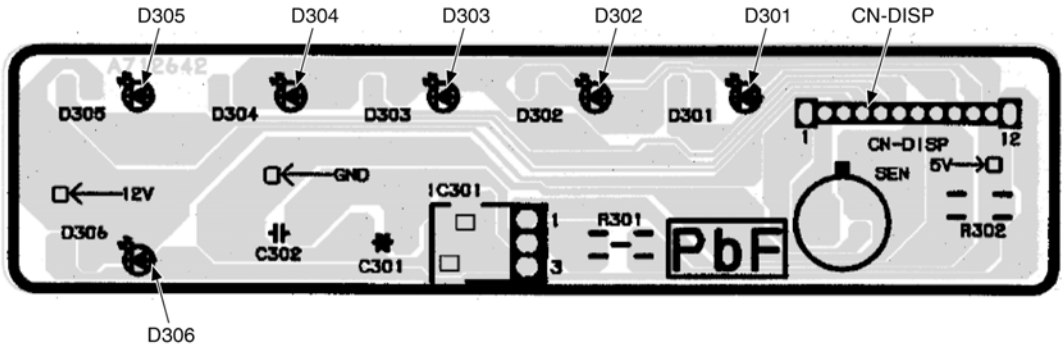
10.1.5 Indicator Printed Circuit Board

Applicable for the models below:
CS-E18GKEW, CS-E18GKDW

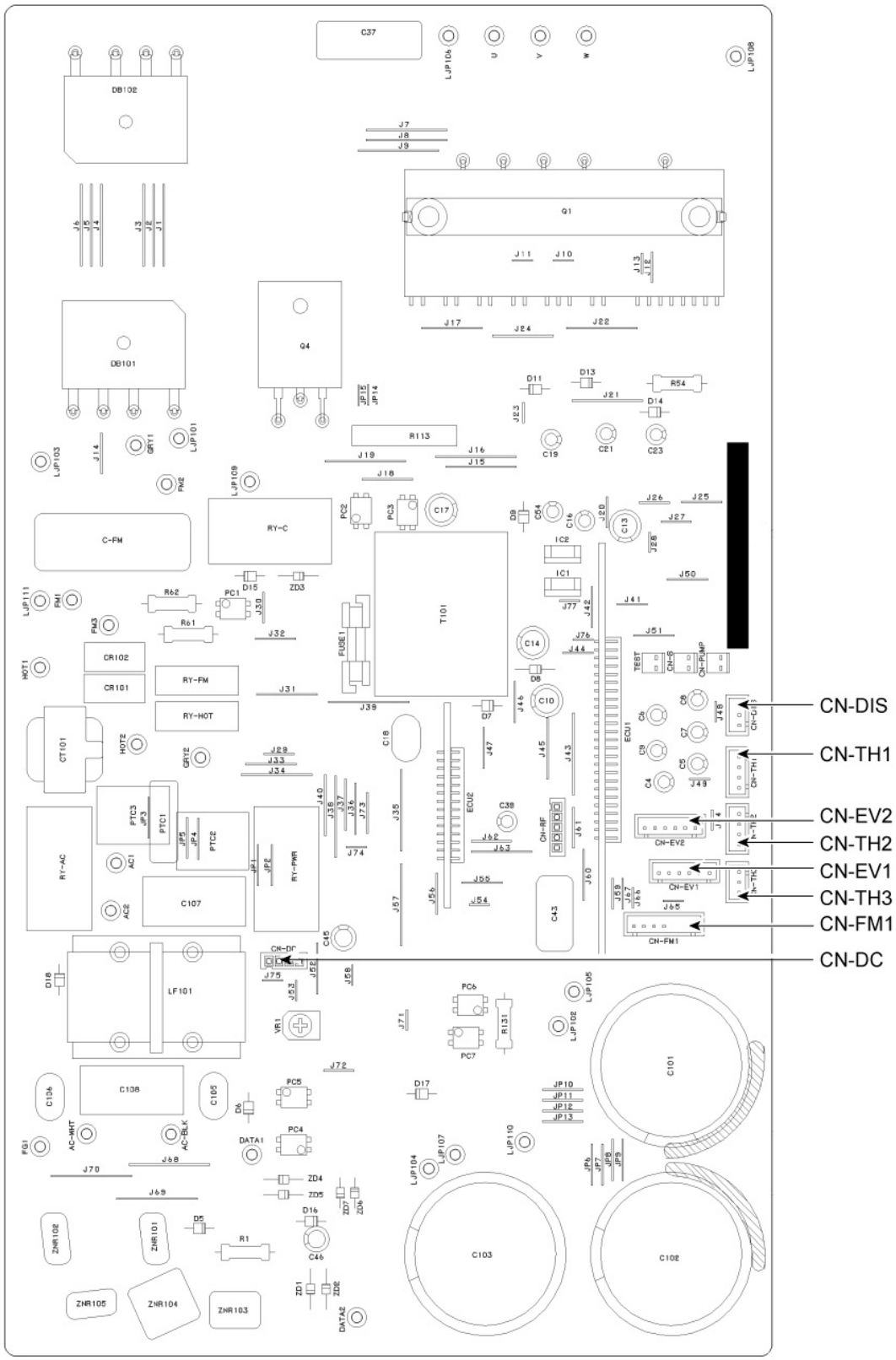
TOP VIEW



BOTTOM VIEW

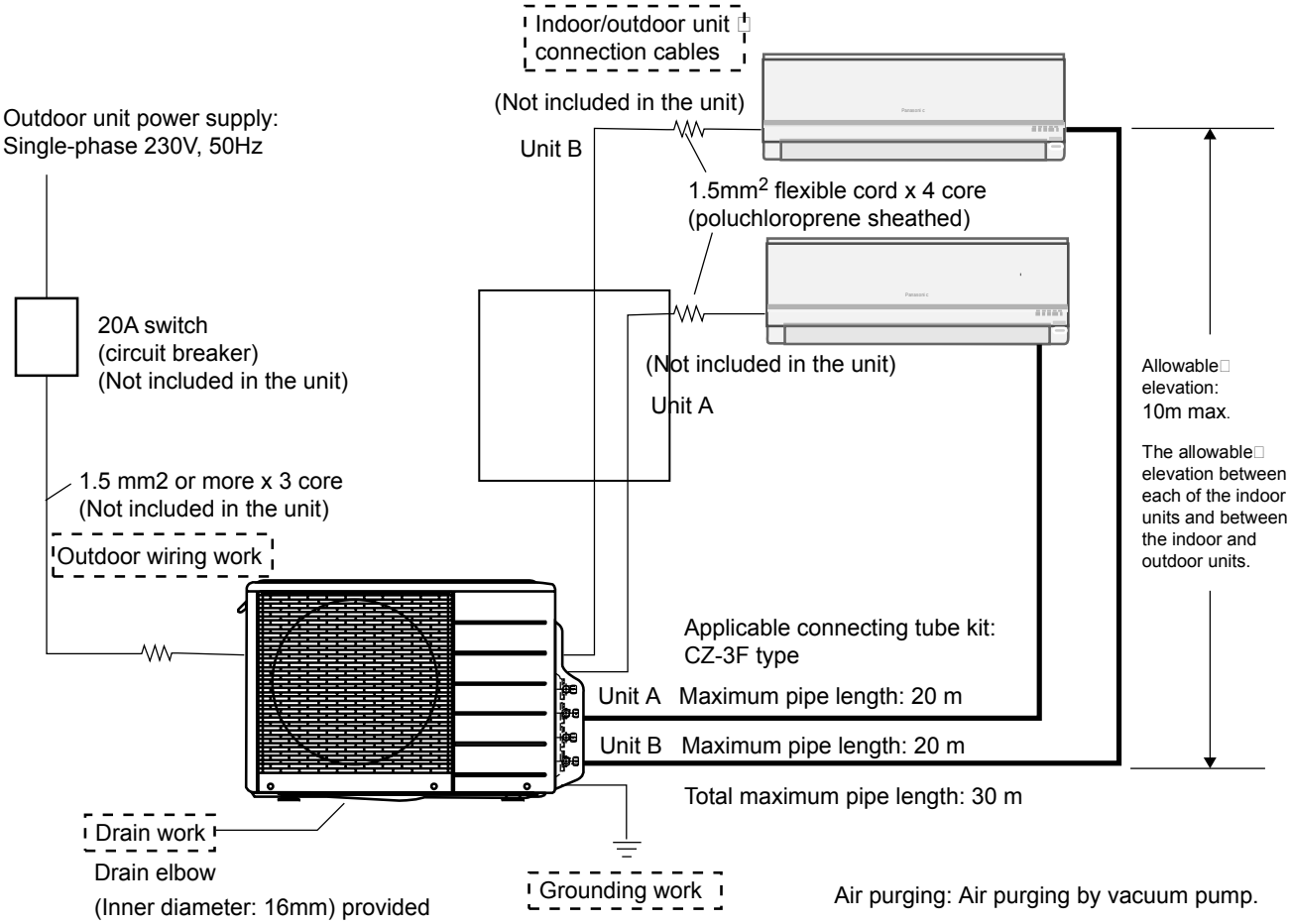


10.2 Outdoor Unit



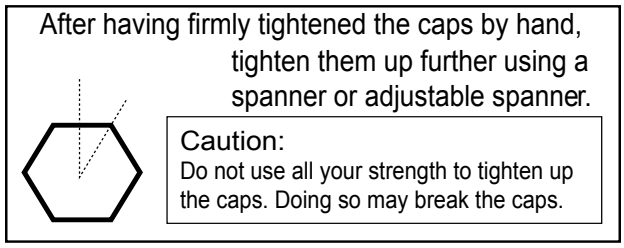
11. Installation Information

11.1 Check Points



11.2 The Shapes of the 3-Way Valve Caps of the Outdoor Unit Have Changed.

- Accompanying the changes in the shapes of the 3-way valve caps, the tightening method has also been changed.
- Firmly tighten the 3-way valve caps by hand and then tighten them up by another 30 degrees or so (one-twelfth of a full turn) using a spanner or adjustable spanner.

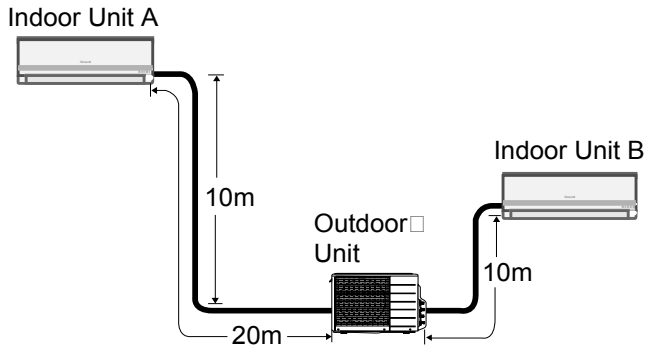


11.3 Piping Length

Piping size		Common Length (m)	Min. Total Length (m)	Max. Total Length (m)	Max. Elevation (m)	Additional gas charge amount (g/m)
Gas	Liquid					
3/8”	1/4"	20	6 (3m / indoor unit)	30 x 1	10	20 x 2

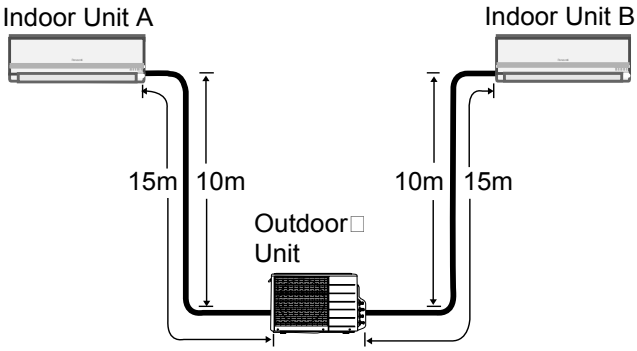
Note:
1. It is possible to extend the piping length of one unit up to 20 meters. However, the total piping length must not exceed 30 meters.
2. If the piping length exceeds 20 meters, refrigerant of 20g per meter must be added.

• Maximum Piping Length



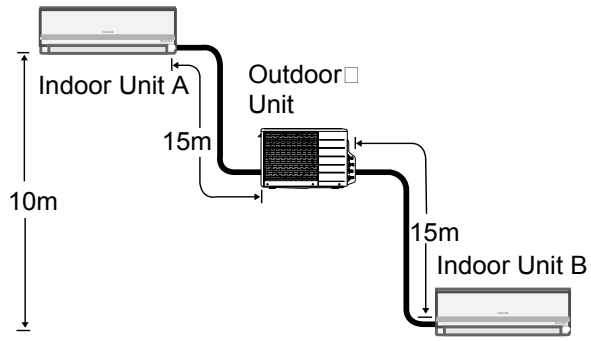
• Additional Gas Charge
(30m - 20m) x 20g = 200g

• Maximum Piping Length



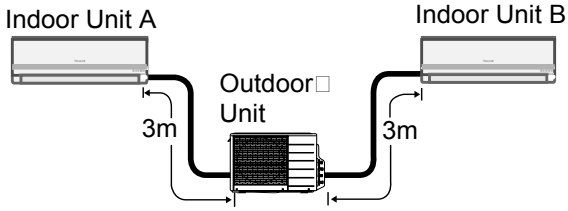
• Additional Gas Charge
(30m - 20m) x 20g = 200g

• Maximum Piping Length



• Additional Gas Charge
(30m - 20m) x 20g = 200g

• Maximum Piping Length



12. Installation Instruction

12.1 Select the Best Location

12.1.1 Indoor Unit

- There should not be any heat source or steam near the unit.
- There should not be any obstacles blocking the air circulation.
- A place where air circulation in the room is good.
- A place where drainage can be easily done.
- A place where noise prevention is taken into consideration.
- Do not install the unit near the door way.
- Ensure the spaces indicated by arrows from the wall, ceiling, fence or other obstacles.
- Recommended installation height for indoor unit shall be at least 2.3m.

12.1.2 Outdoor Unit

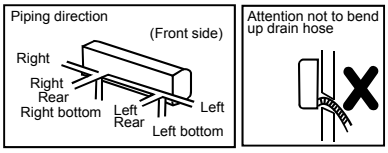
- If an awning is built over the unit to prevent direct sunlight or rain, be careful that heat radiation from the condenser is not obstructed.
- There should not be any animal or plant which could be affected by hot air discharged.
- Keep the spaces indicated by arrows from wall, ceiling, fence or other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

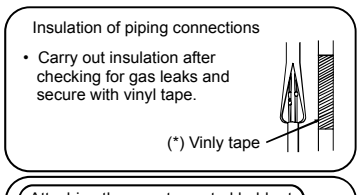
Model	Piping size		Rated Length (m)	Max Elevation (m)	Min Piping Length (m)	Max Total Piping Length (m)	Additional Refrigerant (g/m)
	Gas	Liquid					
CU-2E15GBE	3/8”	1/4”	15	10	3m / Indoor Unit	30	20

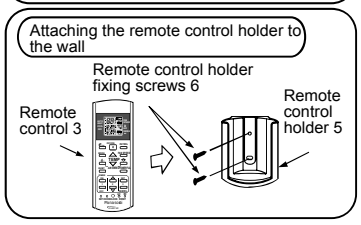
Note:

1. It is possible to extend the piping length of one unit to 20 meters. However, the total piping length must not exceed 30 meters.
2. If the piping length exceeds 20 meters, refrigerant of 20g per meter must be added.

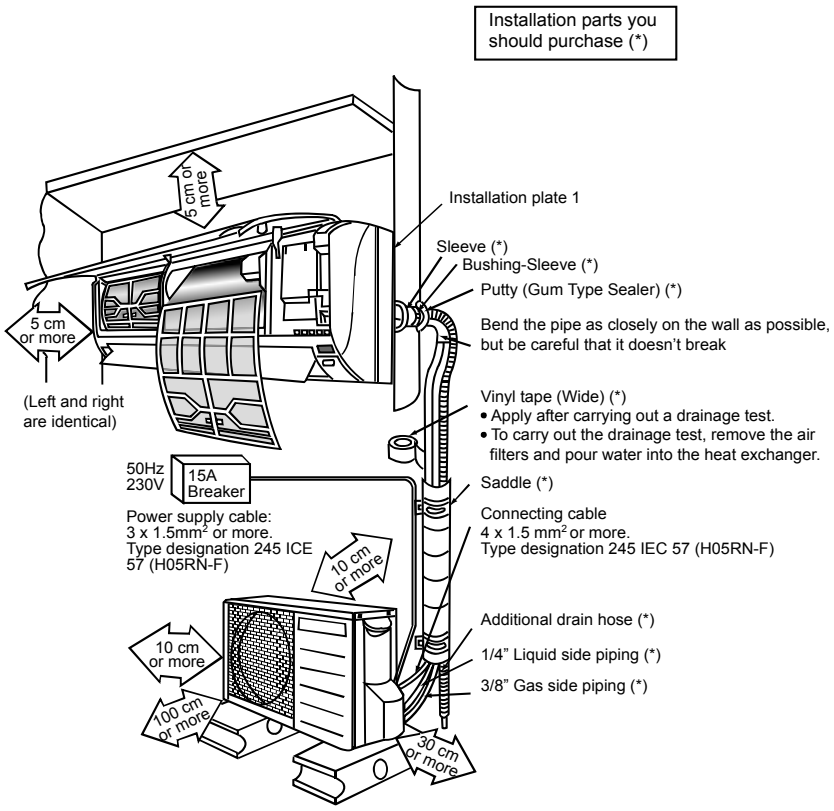
12.1.3 Indoor/Outdoor Unit Installation Diagram







• This illustration is for explanation purposes only. The indoor unit will actually face a different way.



12.2 Indoor Unit

12.2.1 How to Fix Installation Plate

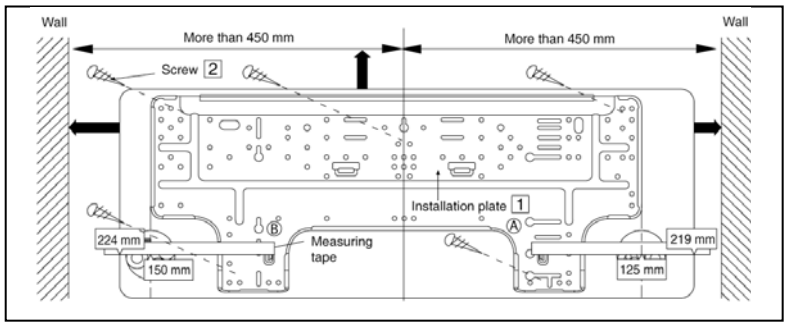
The mounting wall is strong and solid enough to prevent if from the vibration.

The centre of installation plate should be at more than 450 mm at right and left of the wall.

The distance from installation plate edge to ceiling should more than 67mm.

From installation plate left edge to unit's left side is 74mm.

From installation plate right edge to unit's right side is 94mm.



: For left side piping, piping connection for liquid should be about 15mm from this line.

Ⓑ : For left side piping, piping connection for gas should be about 45mm from this line.

: For left side piping, piping connection cable should be about 800mm from this line.

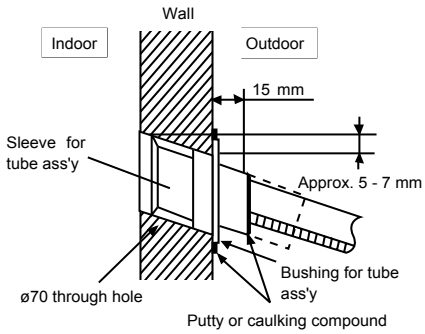
1. Mount the installation plate on the wall with 5 screws or more. (If mounting the unit on the wall, consider using anchor bolts.) Always mount the installation plate horizontally by aligning the marking-off line with the thread and using a level gauge.
2. Drill the piping plate hole with ø70mm hole-core drill.
   - Line according to the left and right side edge of the installation plate. The meeting point of the extended line is the centre of the hole. Another method is by putting measuring tape at position as shown in the diagram above. The hole centre is obtained by measuring the distance namely 150mm and 125mm for left and right hole respectively.
   - Drill the piping plate hole at either the right or left and the hole should be slightly slanted to the outdoor side.

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

1. Insert the piping sleeve to the hole.
2. Fix the busing to the sleeve.
3. Cut the sleeve until it extrudes about 15mm from the wall

Caution
When the wall is hollow, please be sure to use the sleeve for tube ass'y to prevent dangers caused by mice biting the connecting cable.

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



12.2.3 Indoor Unit Installation

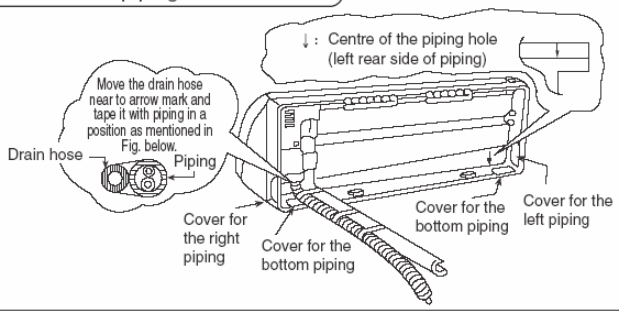
12.2.3.1 For the right rear piping

Pull out the Indoor Piping
↓
Install the Indoor Unit
↓
Secure the Indoor Unit
↓
Insert the connecting cable

12.2.3.2 For the right and right bottom piping

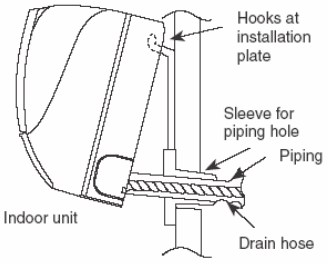
Pull out the Indoor Piping
↓
Install the Indoor Unit
↓
Insert the connecting cable
↓
Secure the indoor unit

Pull out the piping and drain hose



Install the indoor unit

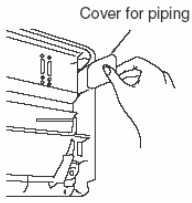
Hook the indoor unit onto the upper portion of installation plate. (Engage the indoor unit with the upper edge of the installation plate). Ensure the hooks are properly seated on the installation plate by moving it in left and right.



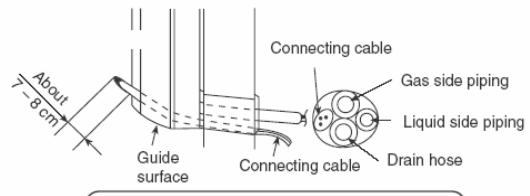
How to keep the cover

In case of the cover is cut, keep the cover at the rear of chassis as shown in the illustration for future reinstallation.

(Left, right and 2 bottom covers for piping.)



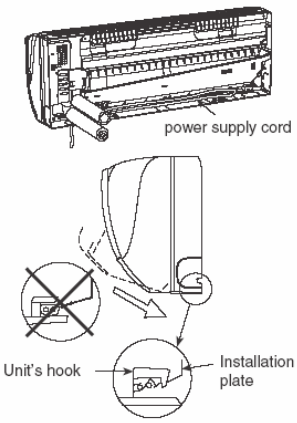
Insert the connecting cable



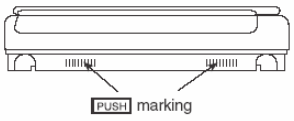
Secure the Indoor Unit

1. Power supply cord arrangement
   Excess length of power supply cord should be arranged behind the chassis at piping keeping area as shown in the diagram without tying up in a bundle. Ensure that the power supply cord is not clamped in between unit's hook (2 position) and installation plate.
   Ensure that the power supply cord is not stretched between chassis back and installation plate. It may create squeak sound.
2. Press the lower left and right side of the unit against the installation plate until hooks engages with their slot (sound click).

Warning: Do not tie up power supply cord into a bundle by band. It may generate heat and cause fire.



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



12.2.3.3 For the embedded piping

Replace the drain hose

↓

Bend the embedded piping

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

↓

Install the Indoor Unit

↓

Cut and flare the embedded piping

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

↓

Pull the connecting cable into indoor unit

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

↓

Connect the piping

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

↓

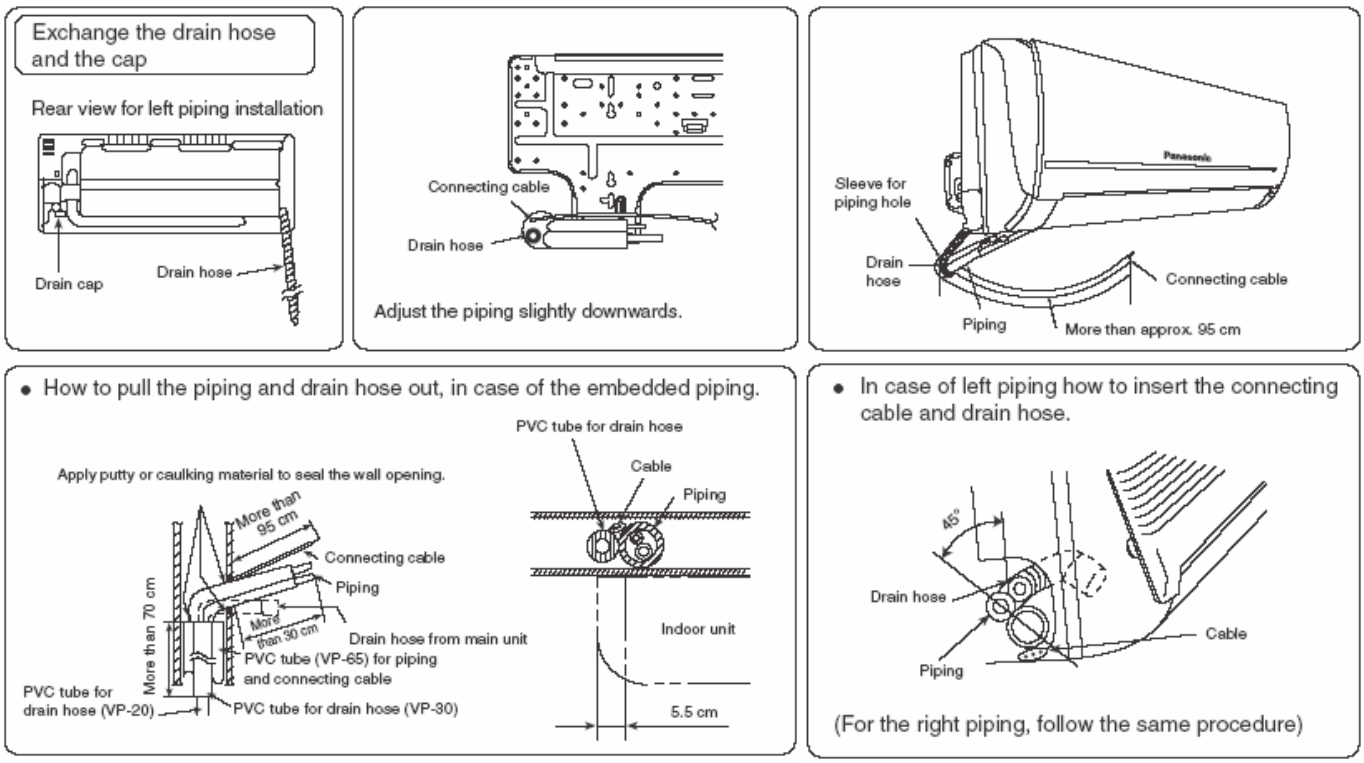
Insulate and finish the piping

- Please refer to “Piping and finishing” column in the outdoor section and “Insulation of piping connections” column as mentioned in Indoor/Outdoor unit installation.

↓

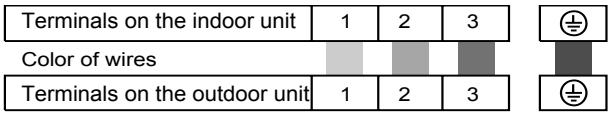
Secure the Indoor Unit

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

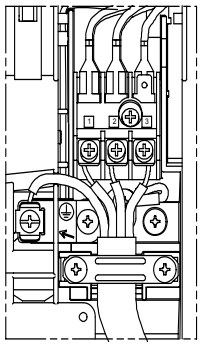


12.2.4 Connect the Cable to the Indoor Unit

1. The inside and outside connecting cable can be connected without removing the front grille.
2. Connecting cable between indoor unit and outdoor unit shall be approved polychloroprene sheathed 3 (C9GK, C12GK) x 1.5mm^2 flexible cord, type designation 245 IEC 57 or heavier cord.
   - o Ensure the color of wires of outdoor unit and the terminal numbers are the same to the indoor's respectively.
   - o Earth lead wire shall be longer than the other lead wires as shown in the figure for the electrical safety in case of the slipping out of the cord from the anchorage.



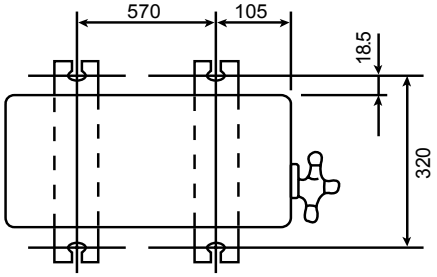
   - o Secure the cable onto the board with the holder (clamper).



12.3 Outdoor Unit

12.3.1 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 (ø10mm).
  2. When installing at roof, please consider strong wind and earthquake. Please fasten the installation stand firmly with bolt or nails.



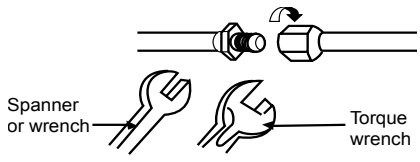
12.3.2 Connecting the Piping

12.3.2.1 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.



Model	Piping size (Torque)	
	Gas	Liquid
E7GK, E9GK, E12GK	3/8" (42 Nm)	1/4 (18 Nm)
E15GK, E18GK	1/2" (55 Nm)	1/4 (18 Nm)

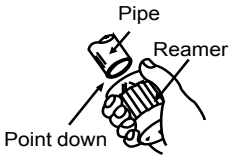
12.3.2.2 Connecting the piping to outdoor unit

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 valves and then tighten with torque wrench to the specified torque as stated in the table.

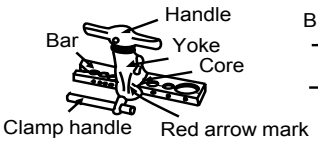
12.3.2.3 Cutting and flaring the piping

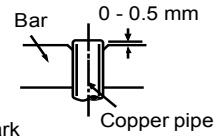
1. Please cut using pipe cutter and then remove the burrs.
2. Remove the burrs by using reamer. If burrs are not removed, gas leakage may be caused. Turn the piping end down to avoid the metal powder entering the pipe.
3. Please make flare after inserting the flare nut onto the copper pipes.

1. To cut



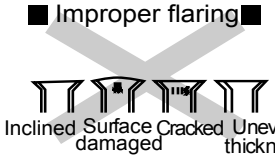
2. To remove burrs





3. To flare

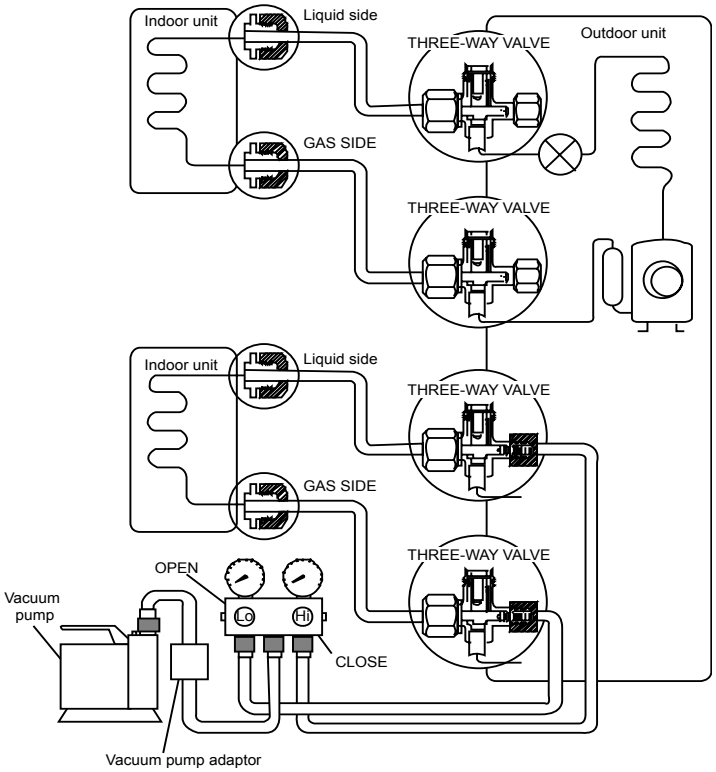
■ Improper flaring■



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

12.3.3 Evacuation of the Equipment

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



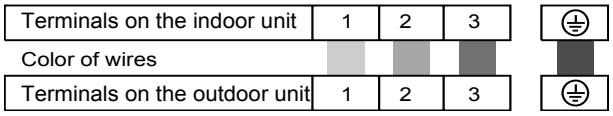
1. Connect a charging hose with a push pin to the Low side of a charging set and the service port of the 3-way valve.
   - Be sure to connect the end of the charging hose with the push pin to the service port.
2. Connect the center hose of the charging hose of the charging set to a vacuum pump.
3. Turn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

CAUTION

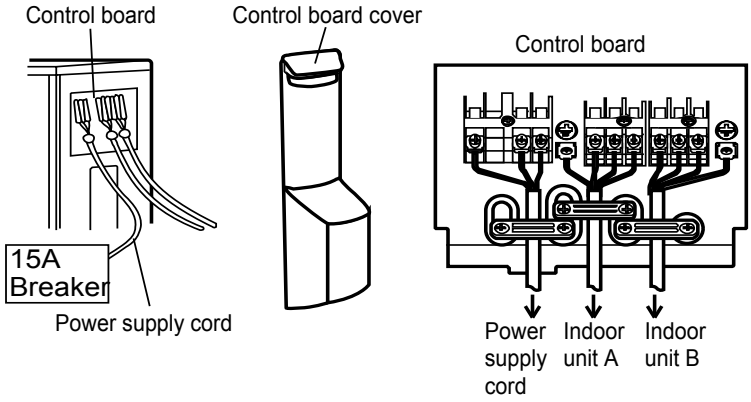
- If gauge needle does not move from 0cmHg (0MPa) to -76cmHg (-0.1MPa), in step 3 above take the following measure:
- If the leak stops when the piping connections are tightened further, continue working from step 3.
- If the leak does not stop when the connections are retightened, repair the location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

12.3.4 Connect the cable to the Outdoor Unit

1. Remove the control board cover from the unit by loosening the screw.
2. Connecting cable between indoor unit and outdoor unit shall be approved polychloroprene sheathed 3 (C9GK, C12GK) x 1.5mm2 flexible cord, type designation 245 IEC 57 or heavier cord.



3. Secure the cable onto the control board with the holder (clamper).
4. Attach the control board cover back to the original position with the screw.



12.3.5 Pipe Insulation

1. Please carry out insulation at pipe connection portion as mentioned in Indoor/Outdoor Unit Installation Diagram. Please warp 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 6mm or above.

13. Operation Control

13.1 Simultaneous Operation Control

- Operation modes which can be selected using the remote control unit:
  - Automatic, Cooling, Dry, Heating and e-ion operation mode.
- Types of operation modes which can be performed simultaneously
  - Cooling operation and Cooling, Dry or e-ion operation
  - Heating operation and Heating operation
- Types of operation modes which cannot be performed simultaneously
  - During cooling operation, heating operation is impossible at another indoor unit in another room.
  - The priority is given to cooling operation if the cooling mode is selected first. In another room where heating mode is selected afterward, the POWER LED blinks to indicate the heating operation is in standby condition, where the fan is stopped hence no discharged air.
  - During heating operation, cooling operation is impossible at another indoor unit in another room.
  - The priority is given to heating operation if the heating mode is selected first. In another room where cooling mode is selected afterward, the POWER LED blinks to indicate the cooling operation is in standby condition, where the fan is stopped hence no discharged air.
- Operation mode priority control
  - The operation mode designated first by the indoor unit has priority.
  - If the priority indoor unit stops operation or initiates the fan operation, the priority is transferred to other indoor units.

"Waiting" denotes the standby status in which the POWER LED blinks (ON for 2.5 seconds and OFF for 0.5 seconds) and the fan is stopped.

ROOM A / ROOM B		Non Priority Unit (2nd ON)			
		Cooling	Dry	Heating	e-ion
Priority Unit (1st ON)	Cooling	C / C	D / C	Waiting / C	E / C
	Dry	C / D	D / D	Waiting / D	E / D
	Heating	Waiting / H	Waiting / H	H / H	Stop / H
	e-ion	C / E	D / E	H / Stop	E / E

In the e-ion mode, priority is transferred to a non-priority unit.

Note

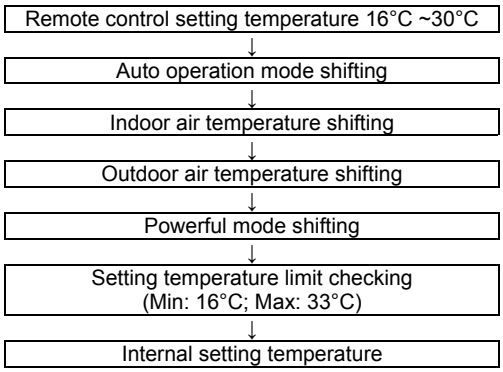
- C: Cooling operation mode
- D: Dry operation mode
- H: Heating operation mode
- F: e-ion operation mode

13.2 Basic function

Inverter control, which 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 model, the microcomputer maintains the set temperature by measuring 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 and intake air temperature.

13.2.1 Internal setting temperature

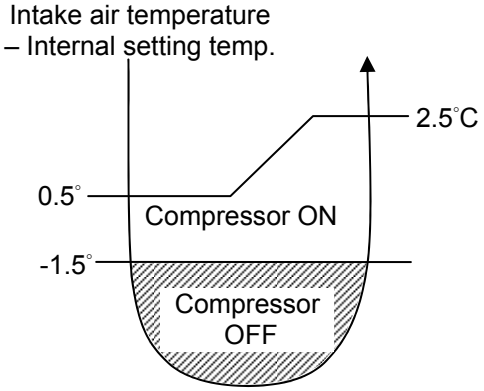
Once the operation starts, remote control temperature will be taken as base vale for temperature shifting processes. These shifting processes are depending on the air conditioner settings and the operation environment. The final shifted value will be used as internal setting temperature and it is updated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



13.2.2 Cooling operation

13.2.2.1 Thermostat control

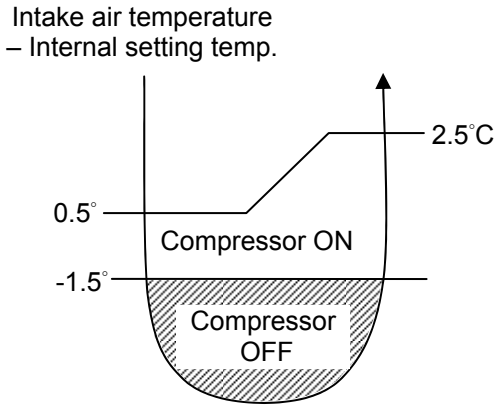
- Compressor is OFF when intake air temperature – Internal setting temperature <-1.5°C.
- Compressor is ON after waiting for 3 minutes, if the intake air temperature – Internal setting temperature > compressor OFF point.



13.2.3 Soft dry operation

13.2.3.1 Thermostat control

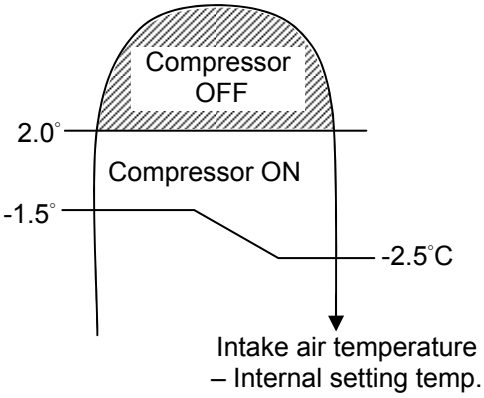
- Compressor is OFF when intake air temperature – Internal setting temperature <-1.5°C.
- Compressor is ON after waiting for 3 minutes, if the intake air temperature – Internal setting temperature > compressor OFF point.



13.2.4 Heating operation

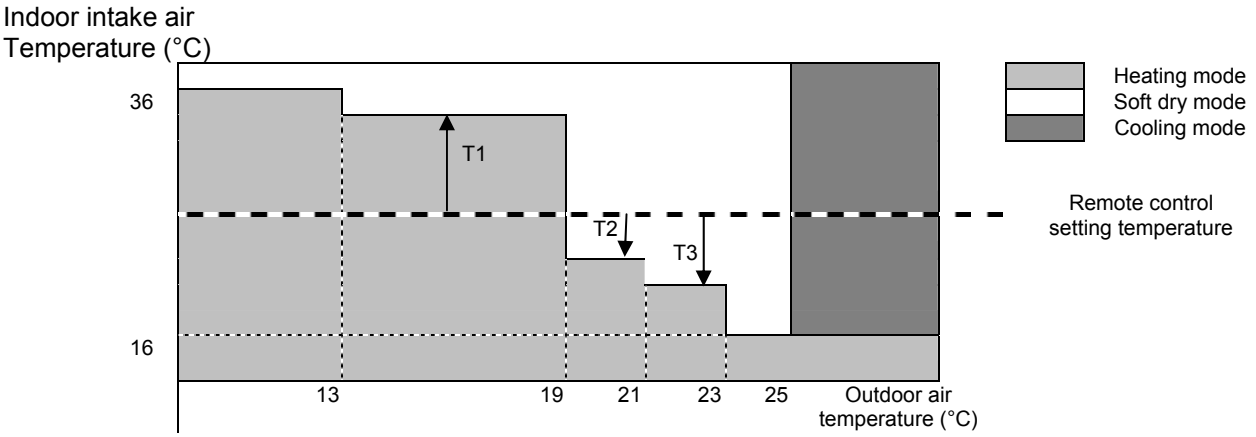
13.2.4.1 Thermostat control

- Compressor is OFF when intake air temperature – Internal setting temperature >+2.0°C.
- Compressor is ON after waiting for 3 minutes, if the intake air temperature – Internal setting temperature < compressor OFF point.



13.2.5 Automatic operation

- This mode can be set using remote control and the operation is decided by remote control setting temperature, remote control operation mode, indoor intake temperature and outdoor air temperature.
- During operation mode judgment, indoor fan motor (with speed of Lo-) and outdoor fan motor are running for 30 seconds to detect the indoor intake and outdoor air temperature. The operation mode is decided based on below chart.



Values of T1, T2, and T3 depend on remote control setting temperature, as shown in below table. After the adjustment of T1, T2 and T3 values, the operation mode for that particular environment and remote control setting is judged and performed, based on the above operation mode chart, every 30 minutes.

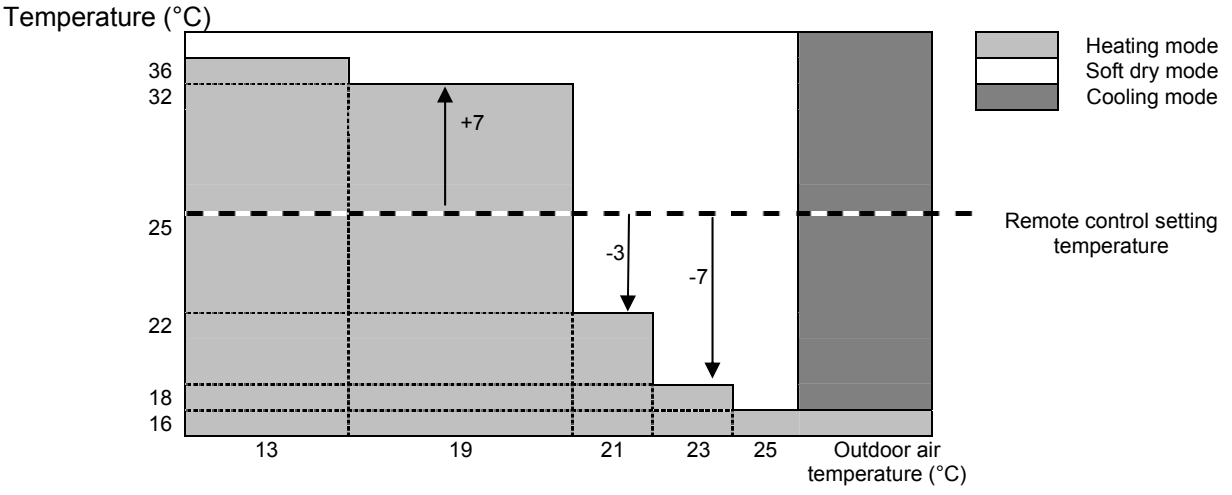
Remote control setting temperature (°C)	T1	T2	T3
16 ~ 18	+10	-2	-5
19 ~ 22	+8	-3	-7
23 ~ 26	+7	-3	-7
27 ~ 30	+6	-3	-8

There is a temperature shifting on T1, T2 and T3 if the operation mode judged is changed from cooling/ soft dry to heating or vice versa.

Operation mode change from	Temperature shifts (°C)
Cooling/ Soft dry → Heating	-2
Heating → Cooling/ Soft dry	+2

Example of operation mode chart adjustment:
From the above table, if remote control setting temperature = 25,
T1 = 25 + 7 = 32; T2 = 25 – 3 = 22; T3 = 25 -7 =18

The operation mode chart for this example is shown in below figure and the operation mode to be performed will depend on indoor intake air temperature and outdoor air temperature at the time when the judgment is made.



13.2.6 Indoor fan motor operation

- Basic Rotation speed (rpm)
  - o Manual fan speed

[Cooling, Dry]

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

Remote control	O	O	O	O	O
Tab (rpm)	SHi	Me+	Me	Me-	Lo

[Heating]

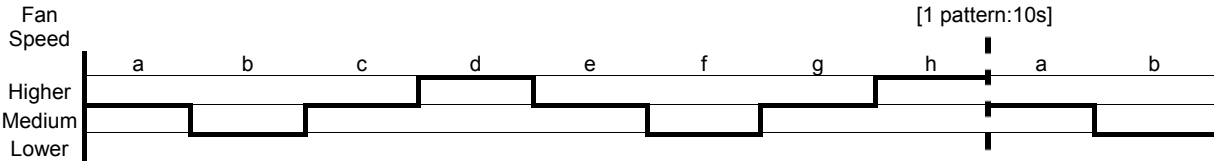
- Fan motor's number of rotation is determined according to remote control setting.

Remote control	O	O	O	O	O
Tab (rpm)	Hi	Me+	Me	Me-	Lo

  - o Auto fan speed

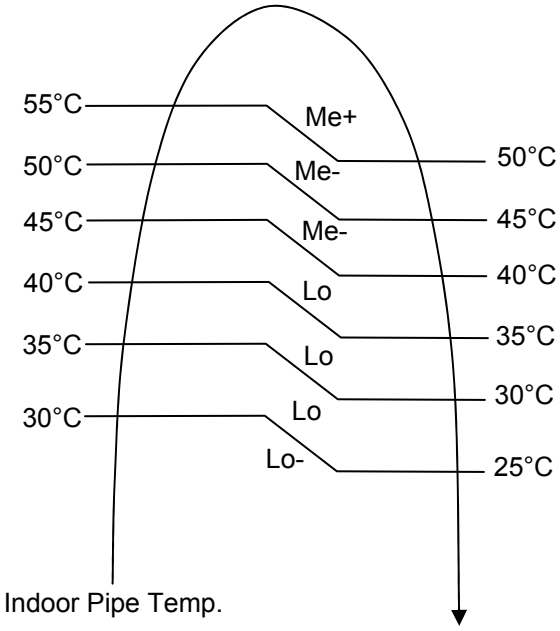
[Cooling, Dry]

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



[Heating]

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



- Feedback control
  - o Immediately after the fan motor started, feedback control is performed once every second.
  - o During fan motor is stop and then restart. If the fan motor counter becomes 7 times, then H19 – fan motor error is detected. Operation stops and cannot on back.

13.2.7 Airflow direction

- There are two types of airflow, vertical airflow (directed by horizontal vane) and horizontal airflow (directed by vertical vanes).
- Control of airflow direction can be automatic (angles off direction is determined by operation mode, heat exchanger temperature and intake air temperature) and manual (angles of direction can be adjusted using remote control).

13.2.7.1 Vertical airflow

Operation mode	Airflow direction				Vane Angle (°)				
					1	2	3	4	5
Heating	Auto with heat exchanger temperature	A	Upward fix	CU-E7,9,12,15GK	0				
				CU-E18GK	16				
		B	Downward fix	CU-E7,9,12,15GK	45				
				CU-E18GK	50				
		C	Upward fix	CU-E7,9,12,15GK	0				
				CU-E18GK	8				
		D	Downward fix	CU-E7,9,12,15GK	0				
				CU-E18GK	8				
	Manual			CU-E7,9,12,15GK	12	25	37	49	60
				CU-E18GK	8	17	33	49	60
Cooling and ion	Auto (Anti-Dew Control)			CU-E7,9,12,15GK	10 ~ 32 (22 ~ 30)				
				CU-E18GK	8 ~ 38				
	Manual (Anti-Dew Control)			CU-E7,9,12,15GK	12 (22)	18	25	31	37 (30)
				CU-E18GK	8	17	33	49	60
Soft Dry	Auto (Anti-Dew Control)			CU-E7,9,12,15GK	10 ~ 32 (22 ~ 30)				
				CU-E18GK	8				
	Manual (Anti-Dew Control)			CU-E7,9,12,15GK	12 (22)	18	25	31	37 (30)
				CU-E18GK	8	17	25	33	38

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

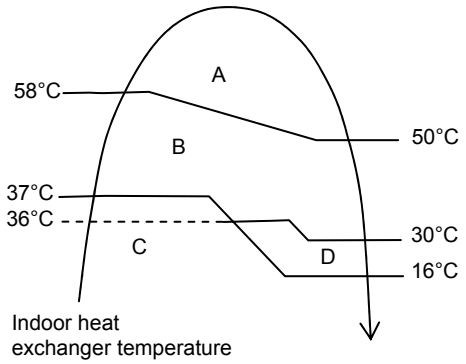


Figure 1

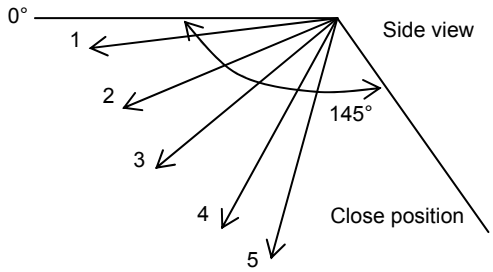


Figure 2

13.2.7.2 Horizontal airflow

- For CS-E7, 9, 12, 15GKD/GKE, the horizontal airflow direction louvers can be adjusted manually by hand.
- For CS-E18GKD/GKE, automatic airflow direction can be set using remote control; the vane swings left and right within the angles as stated below. For heating mode operation, the angle of the vane depends on the indoor heat exchanger temperature as Figure 1 below.

Operation Mode		Vane angle (°)
Heating, with heat exchanger temperature	A	68 ~ 112
	B	90
Cooling and soft dry		68 ~ 112

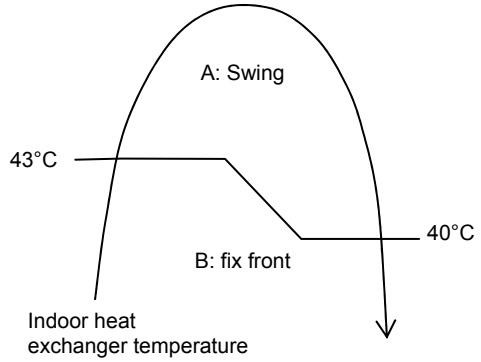


Figure 1

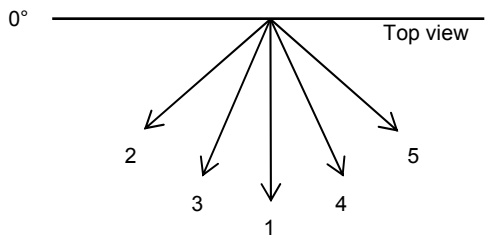


Figure 2

- For CS-E18GKD/GKE, manual vertical airflow direction can be set using remote control; the angles of the vane are as stated below and the positions of the vane are as Figure 2 above.

Pattern	1	2	3	4	5
Airflow direction patterns at remote control					
Vane angle (°)	90	68	79	101	112

13.2.8 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
  1. When “quiet” button at remote control is pressed. Quiet LED illuminates.

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

Control content

- Fan speed is changed from normal setting to quiet setting of respective fan speed. This is to reduce sound of Hi, Me, Lo for 3dB.
- Fan speed for quiet operation is -1 step from setting fan speed.

13.2.9 Quiet operation (Heating)

Purpose

- To provide quiet heating operation compare to normal operation.

Control condition

- Quiet operation start condition
  1. When “quiet” button at remote control is pressed. Quiet LED illuminates.

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

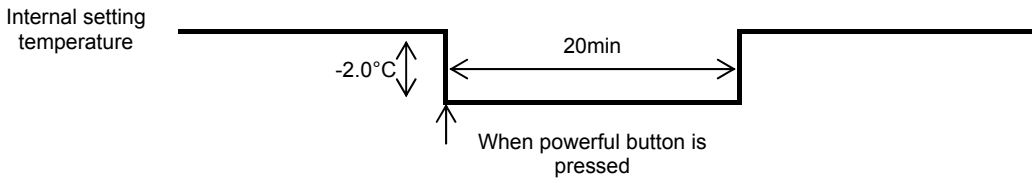
Control content

- Fan speed manual
  1. Fan speed is changed from normal setting to quiet setting of respective fan speed. This is to reduce sound of Hi, Me, Lo for 3dB.
  2. Fan speed for quiet operation is -1 step from setting fan speed.
  3. Fan speed auto. Indoor FM RPM depends on pipe temperature sensor of indoor heat exchanger.

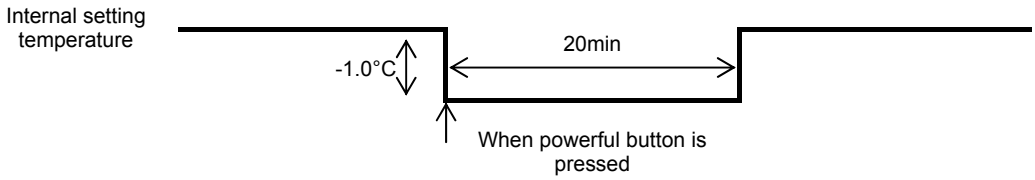
13.2.10 Powerful mode operation

When the powerful mode is selected, the internal setting temperature will shift to achieve the setting temperature quickly.

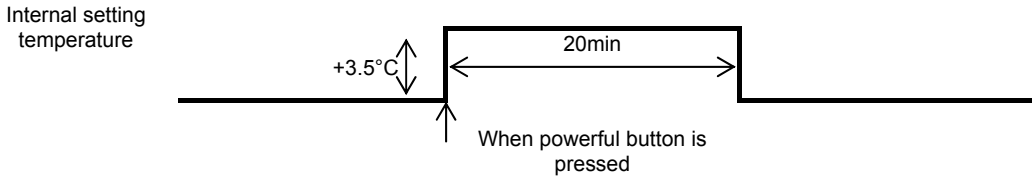
- Cooling operation



- Soft dry operation



- Heating

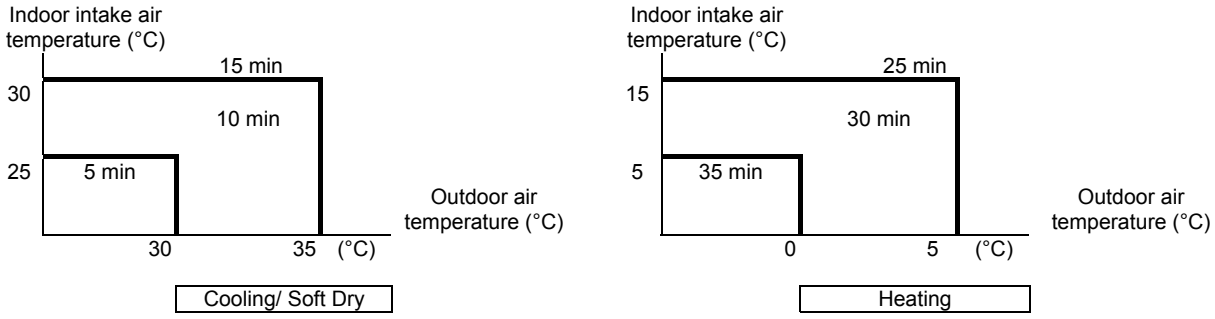


ON timer control

- ON timer 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 timer.
- 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.

13.2.11 OFF timer control

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



13.2.12 Auto restart control

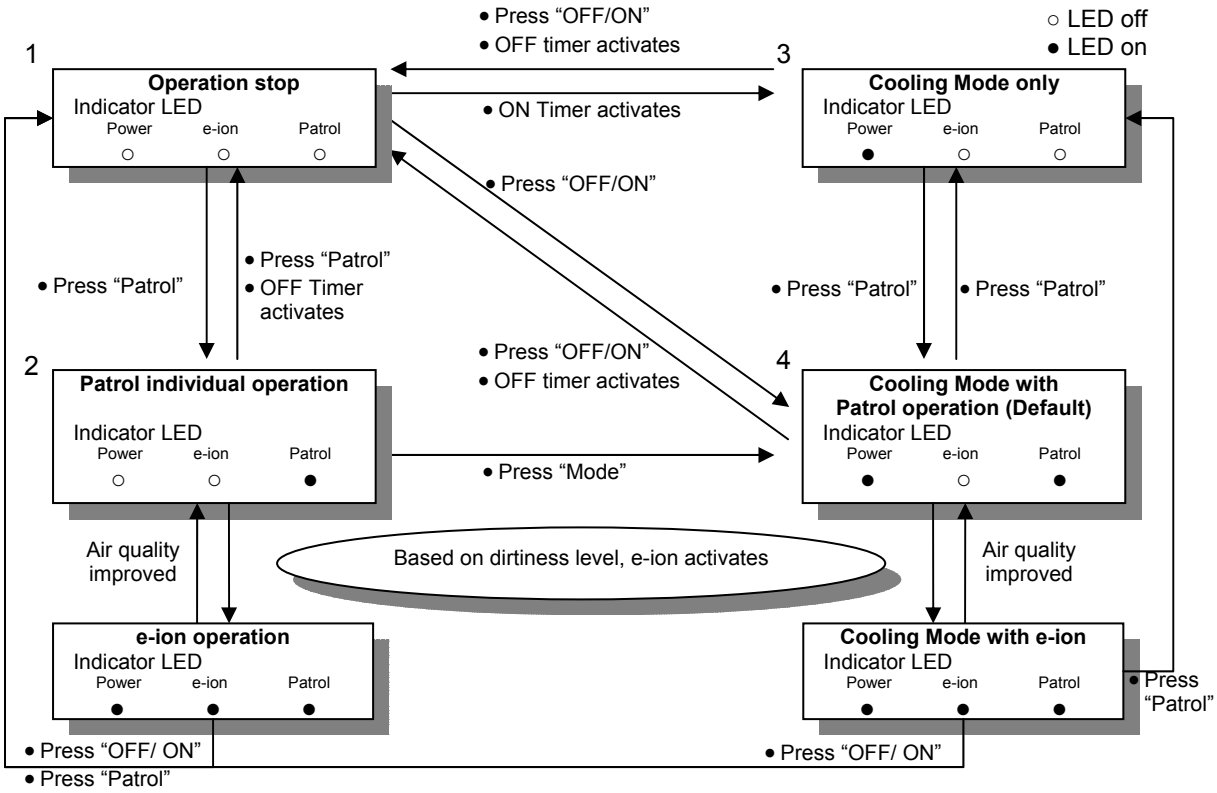
- When the power supply is cut off during the operation of air conditioner, the compressor will re-operate within three to four minutes (there are 10 patterns between 2 minutes 58 seconds and 3 minutes 52 seconds to be selected randomly. After power supply resumes.
- This type of control is not applicable during ON/OFF timer setting.

13.2.13 Indication panel

LED	POWER	TIMER	QUIET	POWERFUL	e-ion	PATROL SENSOR
Color	Green	Orange	Orange	Orange	Blue	Blue
Light ON	Operation ON	Quiet setting ON	Quiet mode ON	Powerful mode ON	e-ion ON	PATROL ON
Light OFF	Operation OFF	Quiet setting OFF	Quiet mode OFF	Powerful mode OFF	e-ion OFF	PATROL 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.
- If e-ion LED is blinking, there is an abnormality e-ion occurs.
- If PATROL LED is blinking, there is gas sensor error detection.

13.2.14 Patrol Operation



A. Patrol operation monitor air dirtiness level by using gas sensor and activates e-ion operation whenever air is dirty.

B. Control Condition

a) Patrol operation start condition
- When the unit operation is started with “OFF/ON” button.
- When the unit stops, “Patrol” button is pressed. Patrol individual operation will start.
- During cooling only operation, “Patrol” button is pressed.

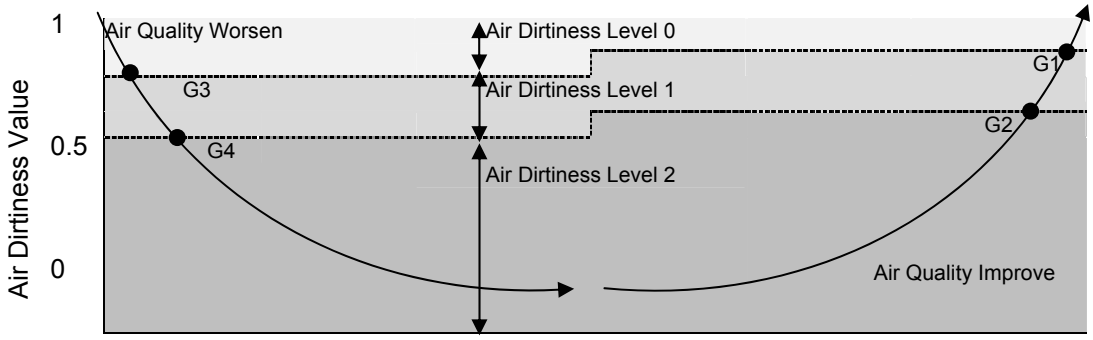
b) Patrol operation stop condition
When any of the following condition is fulfilled:
- When “OFF/ON” button is pressed
- During any operation with Patrol, “Patrol” button is pressed again.
- When “e-ion” button is pressed.
- When OFF Timer activates.

c) Patrol operation disable
- To disable the Patrol Operation during unit start (default) with “OFF/ON” button, press “Patrol” button and hold for 5 seconds, then release.
- To disable the Patrol Operation, press “Patrol” button and hold for 15 seconds, then release.

C. Control Content

a) Gas Sensor Control

- First 2 minutes from Patrol function activates is stabilization time, during stabilization time, no air dirtiness level is monitored. The Air Dirtiness level is set to level 2.
- After that, gas sensor starts to record the resistance value at fixed interval. Higher resistance value indicates cleaner air.
- The air dirtiness level is monitored by comparing the current resistance value with maximum resistance value from time to time to get the Air Dirtiness Value.
- There are 3 air dirtiness levels, based on the Air Dirtiness Value:
  (1) Air Dirtiness level 0: Clean
  (2) Air Dirtiness level 1: Moderate
  (3) Air Dirtiness level 2: Contaminated



- Dirtiness level sensitivity adjustment
  It is possible to change the gas sensor sensitivity, where the Threshold value (G1 ~ G4) will be shifted accordingly:
  (1) Press and release “SET” button.
  (2) Press “Timer increment” / “Timer decrement” button to select sensitivity. (Low ↔ Standard (Default) ↔ High)
  (3) Confirm setting by pressing “Timer Set” button. LCD returned to original display after 2 seconds.
  (4) LCD returned to original display if remote control does not operate for 30 seconds.

b) e-ion Control

- When dirtiness level is 1 or 2, e-ion operation starts.
- If dirtiness level improves from level 2 to level 1, the unit carries out level change after 60 seconds.
- When dirtiness level returns to level 0 continuously for 10 minutes or more, e-ion operation stops.

c) Dirtiness Level Shift

- For Auto Fan Speed, the fan speed increased based on dirtiness level:

	Dirtiness level	rpm shift	
		Patrol individual operation	Combine operation
e-ion ON	Dirtiness level 0	No change	No change
	Dirtiness level 1	+ 20	+ 20
	Dirtiness level 2	+ 40	+ 40

d) Indoor Fan Control

- During any operation mode combines with Patrol operation, fan speed follows respective operation mode.
- During Patrol individual operation if e-ion starts, only Auto Fan Speed and no Powerful operation is allowed. Even if “Fan Speed” button is pressed, no signal is sent to air conditioner, and no change on LCD display.
- During Patrol individual operation if e-ion stops, Indoor Fan stop operation.

e) Airflow direction (Horizontal, Vertical) Control

- During any operation mode combines with Patrol operation, airflow direction follows respective operation mode.
- During Patrol individual operation if e-ion starts, only Auto Air Swing is allowed. Even if “Air Swing” button is pressed, no signal is sent to air conditioner, and no change to LCD display.
- During Patrol individual operation if e-ion stops, Airflow direction louver closed.

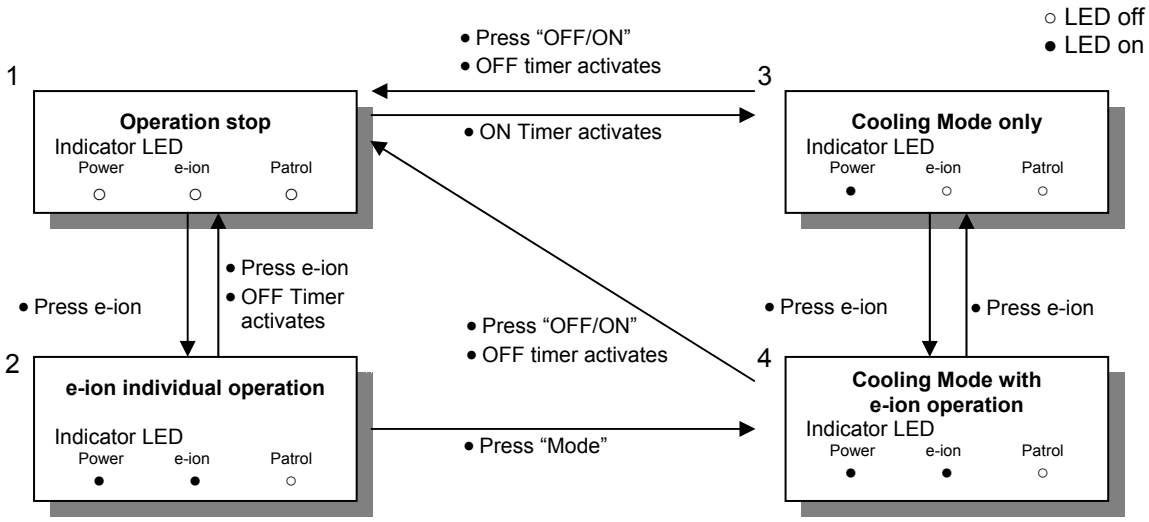
f) Indicator
- When Patrol operation starts, Patrol Sensor indicator ON.
- When e-ion operation starts based on dirtiness level, e-ion indicator ON.

g) Remote Control Receiving Sound
- Normal Operation → Patrol Mode : Beep
- Patrol Mode → Stop : Long Beep
- Patrol Mode → Normal Operation : Beep
- Stop → Patrol : Beep

h) Timer Control
- When ON timer activates when unit stops, previous operation resumes without Patrol operation.
- When ON timer activates during any operation, no change and carry on current operation.
- When OFF timer activates during any operation, all operation stops.

i) Power failure
- During Patrol individual operation, if power failure occurs, after power resumes, Patrol individual operation resumes immediately.
- During combination operation, if power failure occurs, after power resumes combination resume immediately.

13.2.15 e-ion Operation



A. Purpose
This operation provides clean air by producing negative ions to attract dust captured at the positively charged e-ion filters.

B. Control Condition
a) e-ion operation start condition
- During unit running at any operation mode, if "e-ion" button is pressed, combination operation (operation mode + e-ion operation) starts.
- During unit is OFF, if "e-ion" button is pressed, e-ion individual operation starts.

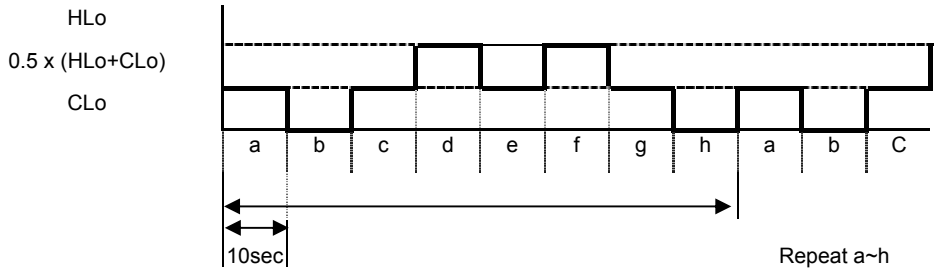
b) e-ion operation stop condition
- When "OFF/ON" button is pressed to stop the operation.
- When "e-ion" button is pressed again.
- When "Patrol" button is pressed.
- When OFF Timer activates.

c) e-ion operation pause condition
- When indoor fan stop (during deice, odor cut control, thermostat off, etc.). e-ion operation resume after indoor fan restarts.
- When indoor intake temperature ≥ 40°C. e-ion operation resume after indoor intake temperature < 40°C continuously for 30 minutes.

C. Control content

a) Indoor fan control
- During any operation mode combines with e-ion operation, fan speed follows respective operation mode.
- During e-ion individual operation – only Auto Fan Speed and no Powerful operation is allowed. Even if Fan Speed button is pressed, no signal is sent to air conditioner, and no change on LCD display.

Auto Fan Speed for e-ion operation switches between HLo and CLo at pattern below:



b) Airflow direction control
- During any operation mode combines with e-ion operation, airflow direction follows respective operation mode.
- During e-ion individual operation, only Auto Air Swing is allowed. Even if Air Swing button is pressed, no signal is sent to air conditioner, and no change on LCD display.

c) Timer Control
- When ON timer activates when unit stops, previous operation resumes without e-ion operation.
- When ON timer activates during any operation, no change and carry on current operation.
- When OFF timer activates during any operation, all operation stops.

d) Indicator
- When e-ion operation starts, e-ion indicator ON.

e) e-ion Check Mode
- To check if e-ion is malfunctioning, during e-ion operation press “e-ion” button for 15 seconds and release to enter e-ion Check Mode and supplies power to the e-ion Air Purifying System.
- If abnormal discharge is detected at filter (short-circuited) due to water or dust adhesion, etc., the e-ion LED blinks immediately.

f) Power failure
- During e-ion individual operation, if power failure occurs, after power resumes, e-ion individual operation resumes immediately.
- During combination operation, if power failure occurs, after power resumes, combination operation resume immediately.

g) Error Detection Control
- When e-ion LED blink, it indicates error listed below:

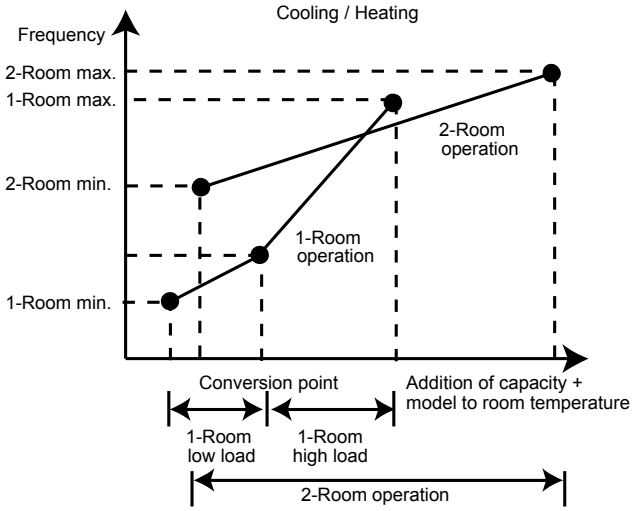
(1) e-ion Air Purifying system main connector to PCB is open:
Judgment Method
(a) During e-ion operation (include during Patrol operation), e-ion Air Purifying system main connector to PCB is opened.

Troubleshooting Methods
(a) Connect the connector or stop operation (include during Patrol operation) to cancel the blinking.

(2) Abnormal Discharge
Judgment Method
(a) During e-ion operation, when feedback voltage is –Lo (at microcontroller) is detected, it is judged abnormal discharge and stops power supplies to the e-ion Air Purifying system.
(b) The unit retries after 30 minutes and repeat for 24 times. (not applicable for e-ion Check Mode)

13.2.16 Compressor Operation Frequency

- The compressor operation frequency is determined by room temperature, capacity, and model type.
  a) When operation is started after the air conditioner has been stopped for more than one hour, the air conditioner operates at a high frequency which lowers the room temperature quickly for cooling (or raises it quickly for heating).
  b) If two or more indoor units are operating simultaneously, the thermostat is set to OFF in one room; the automatic expansion valve is closed to adjust the flow of refrigerant so as to control the room temperature.
  c) When the thermostat is set to OFF during 1-room operation, the compressor and fan of the outdoor unit are stopped. (The outdoor unit fan is stopped 30 seconds after the compressor stops).
  d) It takes about 180 seconds to restart operation when the compressor has been stopped (Time delay safety control)



13.2.17 Deice Operation

- During Heating operation, the deice operation judgment method:
  According to outdoor heat exchanger temperature, operation time and outdoor air temperature.
- Deice operation
  1. The outdoor heat exchanger temperature falls below 3°C continuously for 3 minutes
  2. During deice operation; the 4-way valve is switched to cooling cycle to melt the frost.
  3. Deice operation ends about 12 minutes of operation or the temperature of heat exchanger rises above 25°C.

Deice operation Characteristic

	Deicing start				End
Elapsed time	40 min. (outdoor air temperature below -3°C)	40 min. (outdoor air temperature above -3°C)	80 min. (outdoor air temperature above -1°C)	120 min. (outdoor air temperature above -1°C)	12 min.
Operating time temperature of heat exchanger	-11°C	-9°C	-7°C	-6°C	25°C
Fuzzy control makes it increasingly harder to initiate the deice operation as the outdoor temperature drops.					

Deice operation

4-way valve	Outdoor unit fan	Indoor unit fan
Cooling cycle	Stopped	Stopped

13.3 Protection Control for All Operations

13.3.1.1 Time delay safety control

- The compressor does not restart for 3 minutes after stop of compressor.

13.3.1.2 Total running current control

- When the air conditioner has been operated at the capacity designated by the indoor unit and the total running current exceeds setting I1, the operating frequency of the compressor is reduced. Conversely, when the total current drops below setting I1, it is increased (but only up to the capacity designated by the indoor unit).
- The compressor is stopped as soon as the total current exceeds setting I2.
- If the compressor is stop by the total running current control on 3 occasions in a 20-minutes period, the “F98” error is displayed.

Model	Setting	CU-2E15GBE
Dry-Cooling	I1	9.0A
	I2	15.0A
Heating	I1	12.5A

13.3.1.3 IPM (Power transistor) prevention control

Overheating prevention control

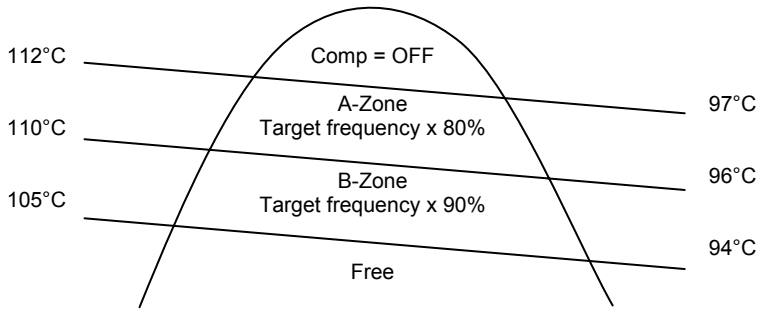
- The compressor is stopped when the overheating protection circuit inside the IPM has been activated. It restarts after 3 minutes.
- Activation temperature: 110°C Reset temperature: 95°C

DC peak current control

- When the inverter load current (DC peak current) exceeds the setting value (22.5A), the compressor is stopped immediately. If this happens within 30 seconds after it started operating, it will restart one minute later; if it happens after 30 seconds have elapsed since it started operating, it will restart 3 minutes later.
- If the DC peak current exceeds the setting value on 7 consecutive occasions within 30 seconds after the compressor started operating, the “F99” error is displayed, and the unit operation is stopped.

13.3.1.4 Compressor Overheating Prevention Control

- When the compressor discharge temperature exceeds 105°C, compressor frequency control (including expansion valve control) is conducted.



- If the compressor stops when compressor discharge temperature exceeds 112°C for 3 occasions within 30 minutes, TIMER LED blinks (F97: Compressor overheat)

13.3.1.5 Low Pressure Prevention Control (Gas Leakage Detection)

- Control start conditions
  - For 5 minutes, the compressor continuously operates and outdoor total current is between 1.5A and 1.88A.
  - During Cooling and Soft Dry operations:
    - Indoor heat exchanger temperature is above 20°C.
  - During heating operations:
    - Indoor heat exchanger temperature is below 25°C.

- Control contents
  - Compressor stops (and restart after 3 minutes).
  - If the conditions above happen 2 times within 20 minutes, the unit will:
    - Stop operation
    - Timer LED blinks and "F91" indicated (Refrigeration cycle abnormality).

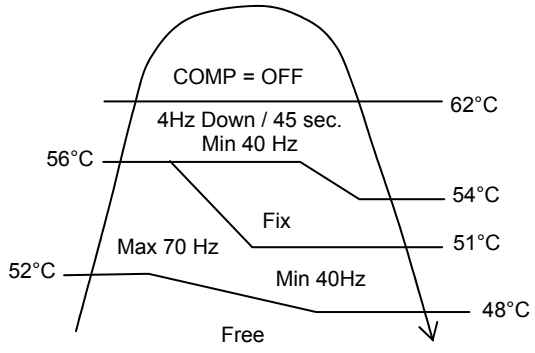
13.3.1.6 4-Way Valve Failure Protection Control

- During Cooling operation
  - 4 minutes after compressor started, if the temperature of the indoor unit heat exchanger exceeds 45°C, the compressor stops (After 3 minutes, Time delay safety control starts).
  - If this situation occurs 4 times within 30 minutes, TIMER LED blinks (F11 error)
- During Heating operation
  - 4 minutes after compressor started, if the temperature of the indoor unit heat exchanger drops below 5°C, the compressor stops (After 3 minutes, Time delay safety control starts).
  - If this situation occurs 4 times within 30 minutes, TIMER LED blinks (F11 error)

13.3.2 Protection Control for Cooling & Soft Dry Operation

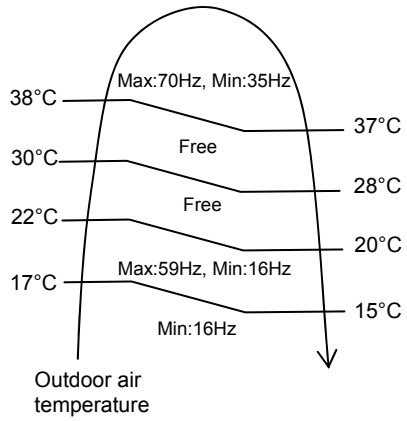
13.3.2.1 Cooling overload control

- Detects the outdoor pipe temperature and carry below restriction/ limitation (limit the compressor operation frequency).
- If the outdoor heat exchanger temperature exceeds 52°C during cooling / dry operation, the compressor frequency is restricted.
- If the compressor if outdoor pipe temperature exceeds 62°C.
- If the compressor stops 4 times within 20 minutes, TIMER LED blinks (F95: outdoor high pressure rise protection)



13.3.2.2 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.



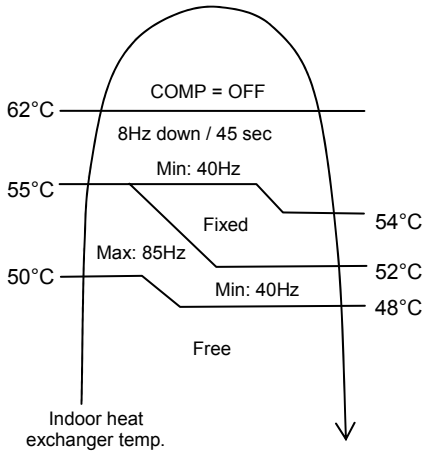
13.3.2.3 Abnormal Wiring or Piping Connection Checking Control

- 3 minutes after forced cooling operation was conducted for one room during the initial operation after power was turned on. The abnormal wiring or piping connection control activates when:
  - o The outdoor gas piping temperature (connected to non operating indoor unit) drops by more than 5°C to 5°C or below 3 minutes after compressor started.
  - o The non operating indoor unit pipe temperature where outdoor air temperature above 5°C has dropped by more than 20°C to 5°C or lower.
  - o When above conditions are satisfied, the Timer LED blinks. (H41 error)

13.3.3 Protection Control for Heating Operation

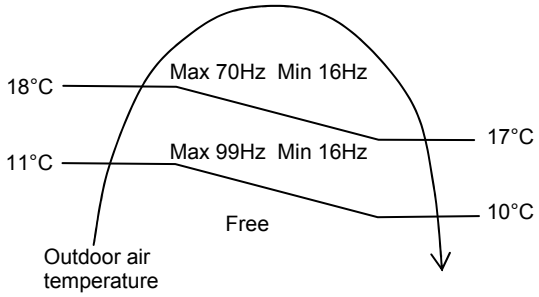
13.3.3.1 Overload Protection Control

- The compressor operating frequency is regulated in accordance to indoor heat exchanger temperature as shown in below figures.



13.3.3.2 Intake Air Temperature Control

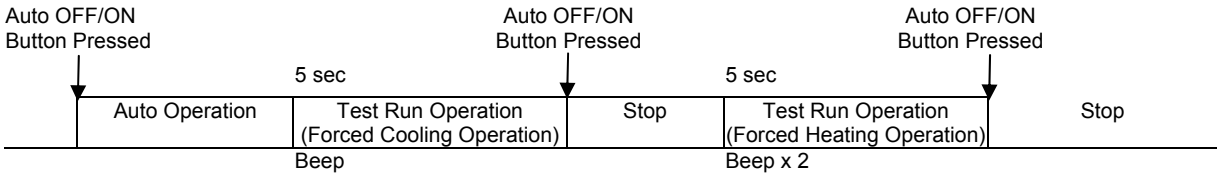
- Compressor operating frequency changes in accordance to the outdoor air temperature.



- This control is not applicable during minimum frequency operation protection control, deice operation, pump down operation.

14. Servicing Mode

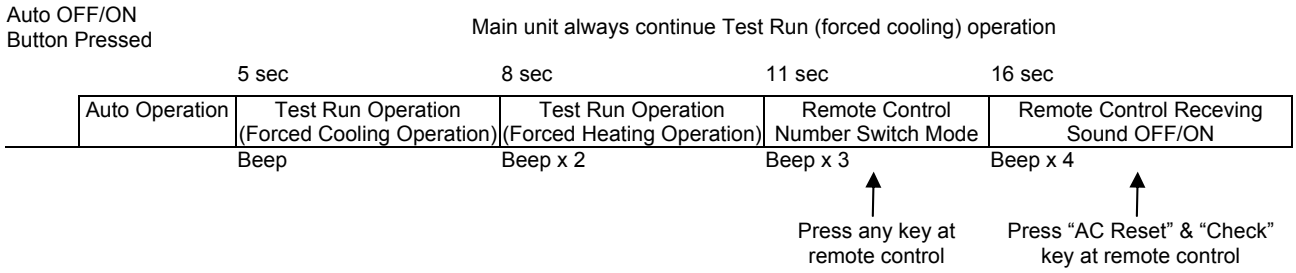
14.1 Auto OFF/ON Button



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 be heard at the fifth seconds, in order to identify the starting of this operation (Forced Cooling Operation). Within 5 minutes after Forced Cooling Operation starts, the Auto OFF/ON button is pressed for more than 5 seconds, 2 “beep” sounds will occurs at 5th 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 any button at remote control to transmit and store the desired transmission code to the EEPROM.

   For transmission code selection explanation, please refer to “Select Remote Control Transmission Code”

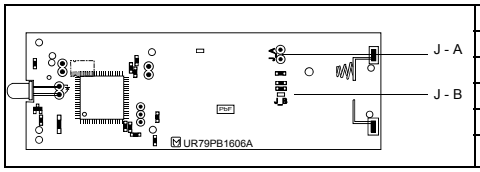
4. REMOTE CONTROL RECEIVING SOUND OFF/ON MODE
   The Remote Control Receiving Sound OFF/ON Mode will be activated if the Auto OFF/ON button is pressed continuously for more than 16 seconds (4 “beep” sounds will occur at 16th seconds to identify the Remote Control Receiving Sound OFF/ON Mode is in standby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

- 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 (J-B)	Remote Control No.
Short	Open	A (Default)
Open	Open	B
Short	Short	C
Open	Short	D

14.3 Remote Control Button

14.3.1 SET Button

- To check remote control transmission code:
  - Press for more than 10 seconds by using pointer
- To change the air quality sensor:
  - Press and release by using pointer
  - Press the Timer Decrement button to select sensitivity:
    1. Low sensitivity
    2. Standard (Default)
    3. Hi sensitivity
  - Confirm setting by pressing Timer Set button, a “beep” sound will be heard. LCD returns to original display after 2 seconds.
  - LCD returns to original display if remote control does not operate for 30 seconds.

14.3.2 CLOCK Button

- To change the remote control time format:
  - Press for more than 10 seconds

14.3.3 RESET (RC) Button

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

14.3.4 RESET (AC) Button

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

14.3.5 TIMER ▲

- To change indoor unit indicators’ intensity:
  - Press continuously for 10 seconds.

14.3.6 TIMER ▼

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

15. Troubleshooting Guide

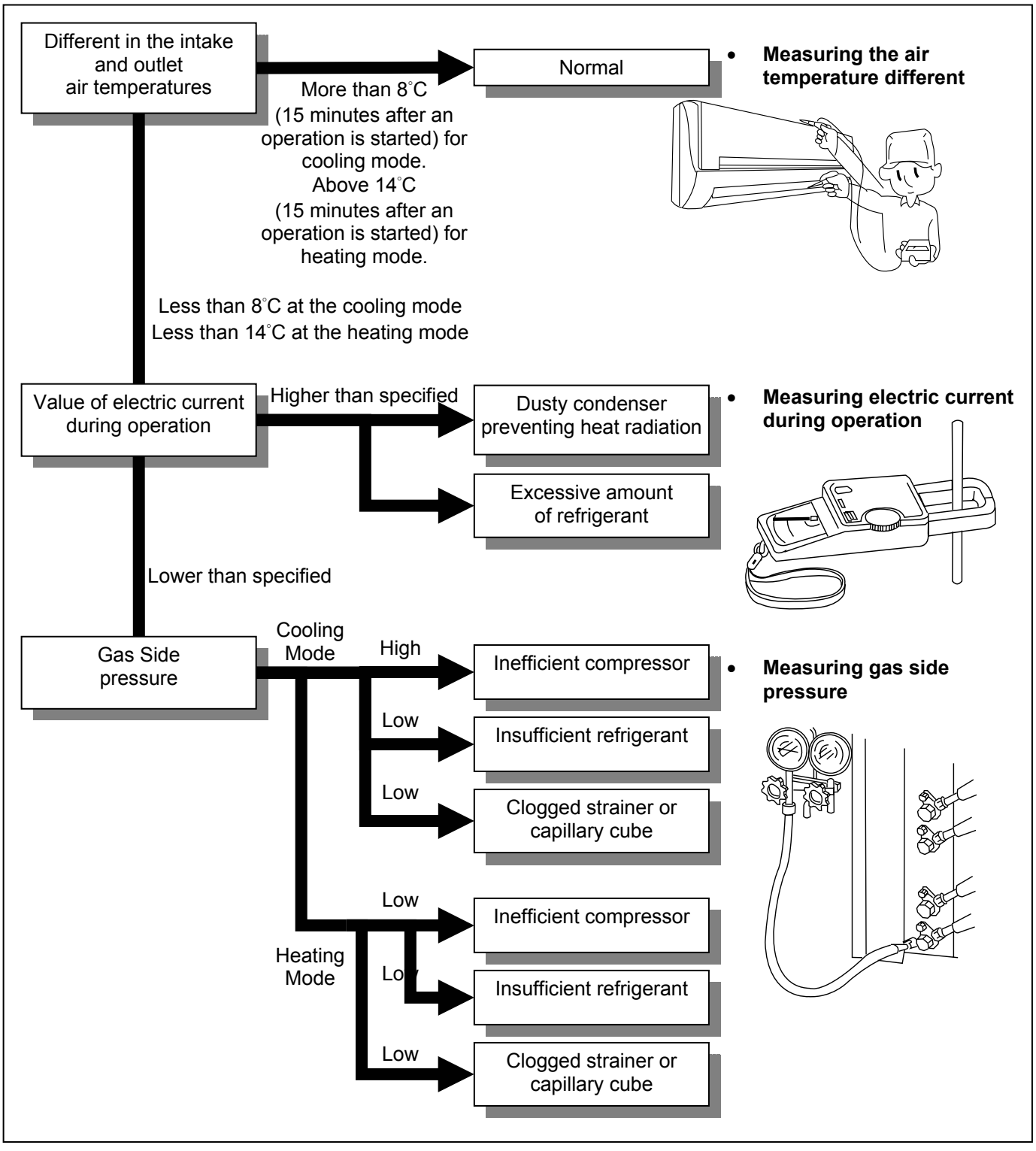
15.1 Refrigeration cycle system

In order to diagnose malfunctions, ensure the air conditioner is free from 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 to the right.

Normal Pressure and Outlet Air Temperature (Standard)

	Gas Pressure Mpa (kg/cm^2G)	Outlet air Temperature (°C)
Cooling Mode	0.9 ~ 1.2 (9 ~ 12)	15 ~ 17
Heating Mode	2.3 ~ 2.8 (23 ~ 28)	35 ~ 41

Condition: - Indoor fan speed = High
- Outdoor temperature = 35°C at cooling mode and 7°C at heating mode.
- Compressor operates at rated frequency



15.1.1 Relationship between the condition of the air conditioner and pressure and electric current

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

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

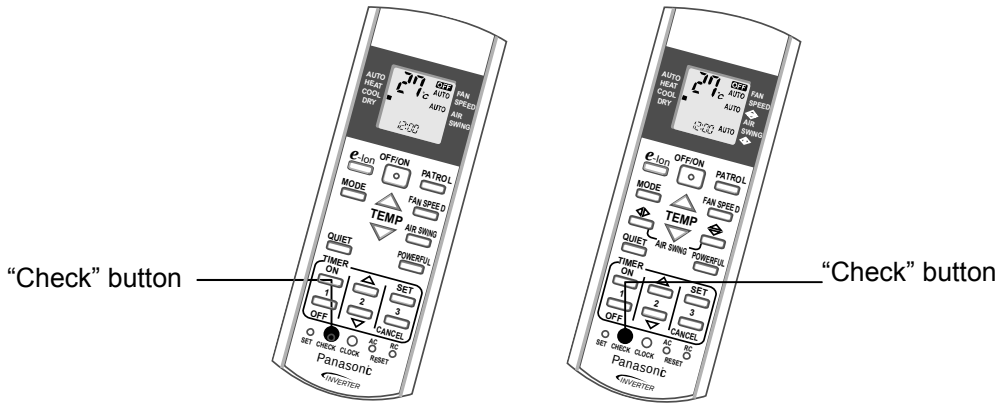
15.2 Breakdown self diagnosis function

15.2.1 Self Diagnosis Function (Three Digits Alphanumeric Code)

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

15.2.1.1 To make a diagnosis

1. Timer LED starts 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.



For CS-E7, 9, 12, 15GKEW
And CS-E7, 9, 12, 15GKDW

For CS-E18GKEW
And CS-E18GKDW

15.2.1.2 To display memorized error (Protective operation) status

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

15.2.1.3 To clear memorized error (Protective operation) status after repair:

1. Turn power on.
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.

15.2.1.4 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.

Error Code	Operation	Temporary items
H27, H28	Cooling, Heating	Emergency operation with limited power

15.2.1.5 Error Code Table

Diagnosis Display	Abnormality / Protection control	Abnormality Judgment	Emergency operation	Primary location to verify	Note
H11	Indoor/Outdoor abnormal communication	> 1 min after starting operation	Indoor fan operation only (single type only)	• Internal/external cable connections • Indoor/outdoor PCB	
H12	Indoor unit capacity unmatched	-	-	• Indoor unit total capacity	Multi only
H14	Intake air temperature unmatched	-	-	• Intake air temperature sensor (defective or disconnected)	
H16	Outdoor Current Transformer	-	-	• Decreased amount of refrigerant • Outdoor PCB	
H19	Indoor fan motor mechanism lock	-	-	• Fan motor • Indoor PCB	
H23	Indoor heat exchanger temperature sensor	Continue for 5 sec	-	• Heat exchanger temperature sensor (defective or disconnected)	
H27	Outdoor air temperature sensor	Continue for 5 sec	○ (Single type only)	• Outdoor air temperature sensor (defective or disconnected)	
H28	Outdoor heat exchanger temperature sensor 1	Continue for 5 sec	○ (Single type only)	• Outdoor heat exchanger temperature sensor (defective or disconnected)	
H30	Outdoor discharge pipe temperature sensor	Continue for 5 sec	-	• Outdoor discharge pipe temperature sensor (defective or disconnected)	
H32	Outdoor heat exchanger temperature sensor 2 (discharge pipe temp)	Continue for 5 sec	-	• Outdoor heat exchanger temperature sensor (defective or disconnected)	Multi only
H34	Outdoor heatsink temperature sensor at Control Board	Continue for 2 sec	-	• Outdoor heatsink temperature sensor at control board (defective or disconnected)	Multi only
H36	Outdoor gas pipe temperature sensor	Continue for 2 sec	-	• Outdoor gas pipe temperature sensor (defective or disconnected)	Multi only
H37	Outdoor liquid pipe temperature sensor	Continue for 2 sec	-	• Outdoor liquid pipe temperature sensor (defective or disconnected)	Multi only
H39	Abnormal indoor operating unit or standby units	-	-	• Piping connection error • Indoor/outdoor connection cable connection error	Multi only
H41	Abnormal wiring or piping connection	-	-	• Wiring or piping connection	CU-2E15GBE
H97	Outdoor fan motor mechanism lock	-	-	• Outdoor Fan Motor	
H98	Indoor high pressure protection	-	-	• Air filter dirty • Air circulation short circuit	
H99	Indoor heat exchanger freeze prevention	-	-	• Insufficient refrigerant • Air filter dirty	
F11	Cooling/heating cycle changeover abnormality	4 times occurrences within 30 minutes	-	• 4-way valve • V-coil	
F17	Indoor standby unit freezing	-	-	• Outdoor expansion valve leakage • Indoor unit pipe temperature sensor	
F90	PFC circuit protection	-	-	• Outdoor PCB • Outdoor fan motor	
F91	Refrigerant cycle abnormality	2 times occurrences within 20 minutes	-	• No refrigerant (3-way valve is closed)	
F93	Outdoor compressor abnormal revolution	4 times occurrences within 20 minutes	-	• Compressor	
F95	Cooling high pressure protection	4 times occurrences within 20 minutes	-	• Outdoor refrigerant cycle	
F96	IPM (power transistor) overheating protection	-	-	• Express refrigerant • Improper heat radiation • Outdoor PCB	
F97	Outdoor compressor overheating protection	4 times occurrences within 10 minutes	-	• Insufficient refrigerant • Compressor	
F98	Total running current protection	3 times occurrences within 20 minutes	-	• Excess refrigerant • Improper heat radiation	
F99	Outdoor Direct Current (DC) peak detection	7 times occurrences	-	• Outdoor PCB • Compressor	

Note:
"○" – Frequency measured and fan speed fixed.

16. Disassembly and Assembly Instructions

⚠WARNING

- When handling electronic controller, be careful of electrostatic discharge.
- Be sure to return the wiring to its original position.
- There are many high voltage components within the heat sink cover, so never touch the interior during operation. Wait at least two minutes after power has been turned off.

16.1 Indoor Unit (CS-E7GKEW, CS-E9GKEW, CS-E12GKEW, CS-E15GKEW CS-E7GKDW, CS-E9GKDW, CS-E12GKDW, CS-E15GKDW)

16.1.1 To Remove the Front Grille

- Lift to open the vertical vent gently. Remove the 2 caps and 2 screws at the bottom of discharge vent. (Fig. 1)
- Remove the Front Grille by releasing the 3 hooks at the top of the Front Grille. Hold both sides of the Front Grille and remove it by pulling up and towards you gently. (Fig. 1)

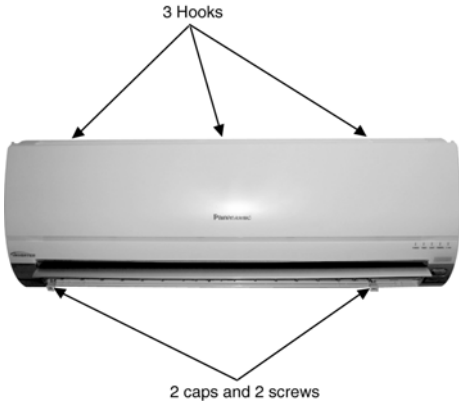


Fig. 1

16.1.2 To Remove the Main Electronic Controller

- Unhook the tabs at the Control Board to remove the Control Board Cover. (Fig. 2)

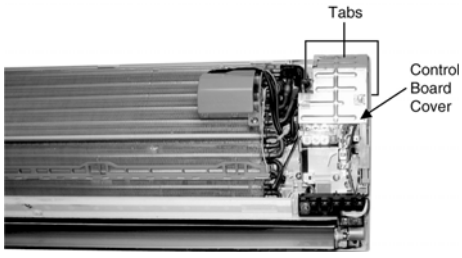


Fig. 2

- Release the Indicator by detaching the CN-DISP and CN-LED, and then remove the Indicator from the 2 tabs. (Fig. 3)

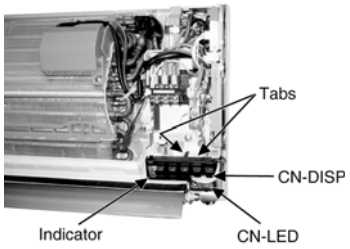


Fig. 3

- Press the Hold to right hand side, remove the Particular Piece and slide out the Main Electronic Controller. (Fig. 4)

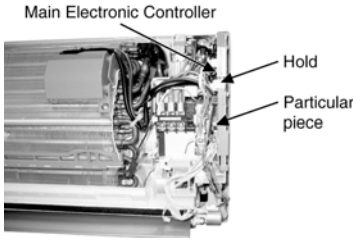


Fig. 4

- Release the CN-DATA1.(Fig. 5)
- Release the CN-CLN.(Fig. 5)
- Release the CN-FB.(Fig. 5)
- Release the CN-TH.(Fig. 5)
- Release the CN-STM1.(Fig. 5)

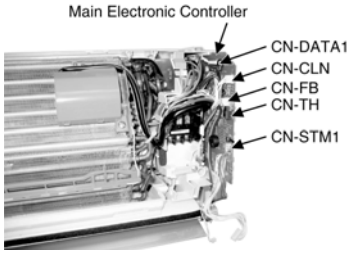


Fig. 5

16.1.3 To Remove the Power Electronic Controller

- Release the screw for the Earth wire. (Fig. 6)
- Pull out 2 terminal wires (Black & Red) from the Terminal Board. (Fig. 6)
- Detach the Terminal Board from the Control Board. (Fig. 6)
- Press the Hold to left hand side, remove the Particular Piece and slide out the Power Electronic Controller. (Fig. 6)

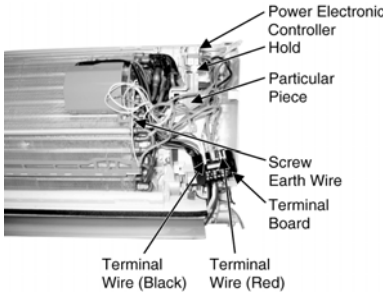


Fig. 6

- Release the AC-301 (BRW) connector.(Fig. 7)
- Release the AC-303 (WHT) connector.(Fig. 7)
- Release the CN-PCFM connector.(Fig. 7)

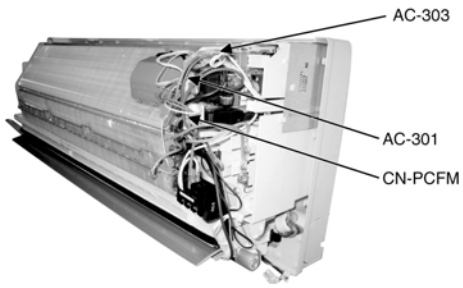


Fig. 7

16.1.4 To Remove the Discharge Grille

- Pull out the Drain Hose (behind the Discharge Grille) from outlet to remove the Discharge Grille. (Fig. 8)

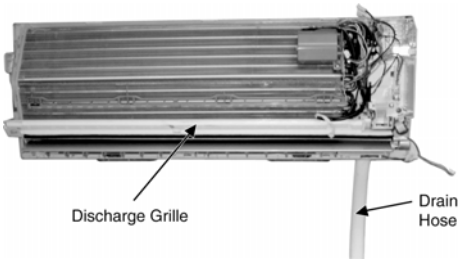


Fig. 8

16.1.5 To Remove Control Board

- Release the 3 screws (Fig. 9)
- By pressing down the hook at left hand side of control board, you will be able to remove the Control Board. (Fig. 9)

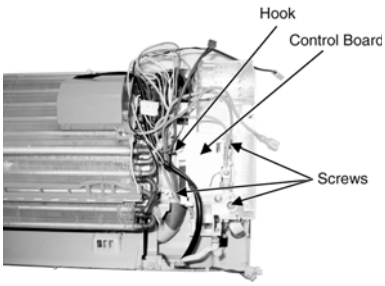


Fig. 9

16.1.6 To Remove the Cross Flow Fan and Indoor Fan Motor

- Remove the screw at the Cross Flow Fan. (Fig. 10)

  Reminder: To reinstall the Fan Motor, please adjust the connector location to 45° with Fan Motor before fixing Control Board. (Fig. 10)

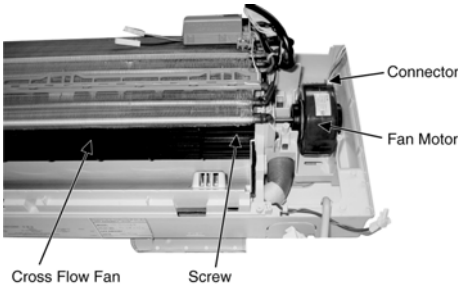


Fig. 10

- Remove the Bearing. (Fig. 11)
- Remove the screw at the left of the Evaporator. (Fig. 11)
- Press the Hold to left hand side then you can release the Evaporator. (Fig. 11)

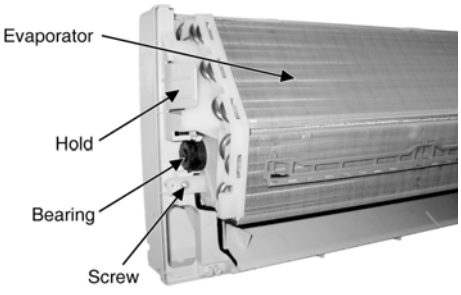


Fig. 11

- Lift up the Evaporator and remove the Cross Flow Fan from the unit by pulling it to the left and downward. Fan Motor can be removed after the removal of the Cross Flow Fan. (Fig. 12)

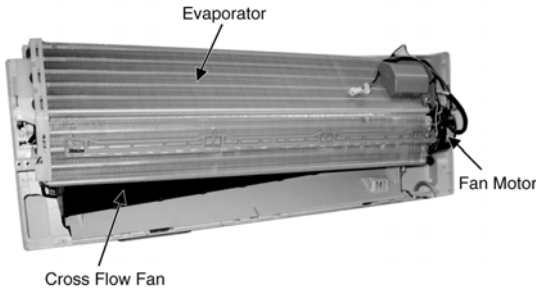


Fig. 12

16.2 Indoor Unit (CS-E18GKEW, CS-E18GKDW)

16.2.1 To Remove the Front Grille

- Lift to open the vertical vent gently. Remove the 3 caps and 3 screws at the bottom of discharge vent. (Fig. 1)
- Remove the Front Grille by releasing the 3 hooks at the top of the Front Grille. Hold both sides of the Front Grille and remove it by pulling up and towards you gently. (Fig. 1)

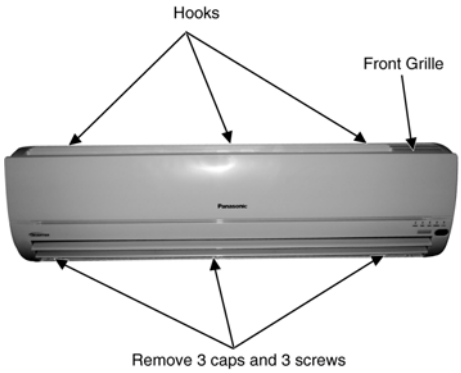


Fig. 1

- Unhook the tabs at the Control Board to remove the Control Board Cover. (Fig 2)
- Release the Particular Piece. (Fig. 2)

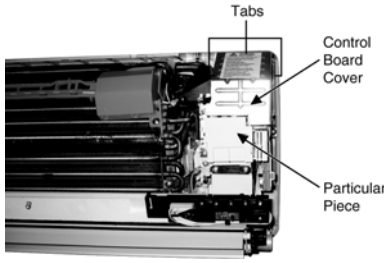


Fig. 2

16.2.2 To Remove the Main Electronic Controller

- Release the 2 screws for the earth wire. (Fig. 3)
- Pull out 2 terminal wires (Red and Black) from the Terminal Board. (Fig. 3)
- Detach the connector Indicator and release the Indicator. (Fig. 3)
- Release the 2 Particular Piece. (Fig. 3)
- Release the screw Holder Terminal Board. (Fig. 3)
- Release the 2 Connector E-Ion. (Fig. 3)

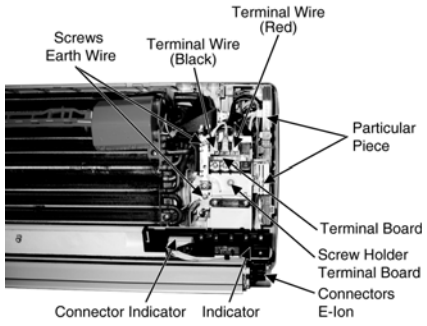


Fig. 3

- Release the hooks that hold the Main Electronic Controller and pull out the Main Electronic Controller. (Fig. 4)

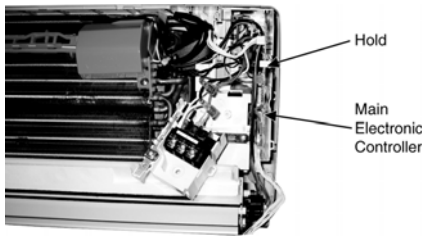


Fig. 4

- Release the CN-DATA1 connector (Fig. 5)
- Release the CN-TH connector (Fig. 5)
- Release the CN-CLN connector (Fig. 5)
- Release the CN-STM1 connector (Fig. 5)
- Release the CN-STM2 connector (Fig. 5)

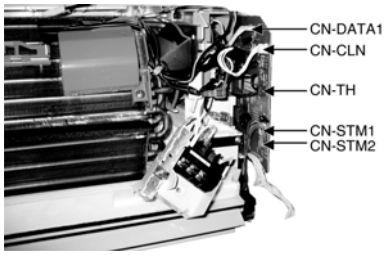


Fig. 5

16.2.3 To Remove the Power Electronic Controller

- Release the hook that hold the Particular Piece and pull out the Power Electronic Controller. (Fig. 6)

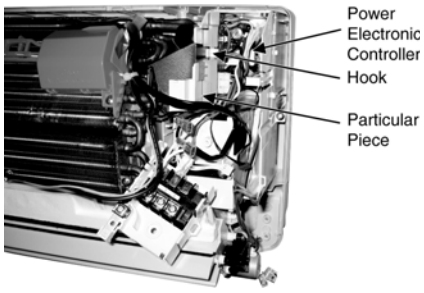


Fig. 6

- Release the AC-303 connector. (Fig. 7)
- Release the CN-FM connector. (Fig. 7)

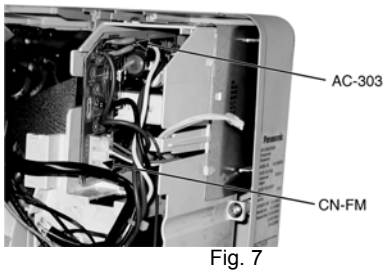


Fig. 7

16.2.4 To Remove the Discharge Grille

- Pull out the Drain Hose (behind the Discharge Grille) from outlet to remove the Discharge Grille. (Fig. 8)

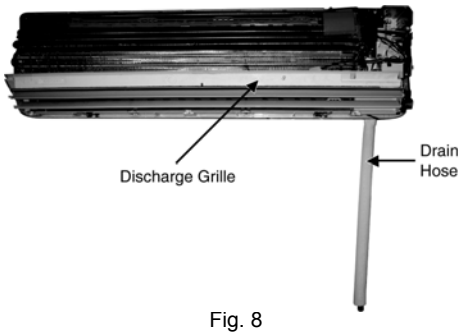


Fig. 8

16.2.5 To Remove the Control Board

- Release the 3 screws (Fig. 9)
- By pressing down the hook at the left hand side, you will be able to remove the Control Board. (Fig. 9)

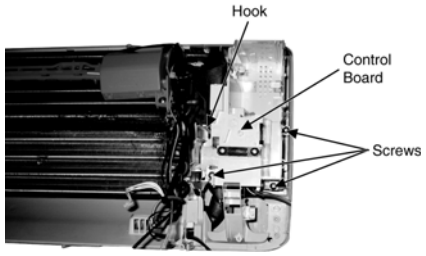


Fig. 9

16.2.6 To Remove the Cross Flow Fan and Indoor Fan Motor

- Remove the screw at the Cross Flow Fan (Fig. 10)

  Reminder: To reinstall the Fan Motor, please adjust the connector location is positioned 90° with Fan Motor before fixing Control Board. (Fig. 10)

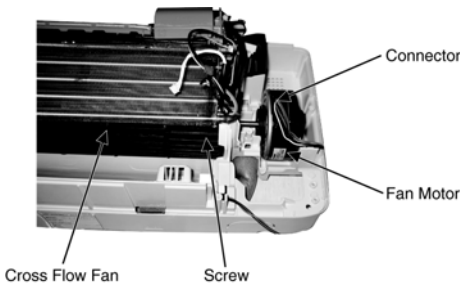


Fig. 10

- Remove the Bearing. (Fig. 11)
- Remove the screws at the left hand side of the Evaporator. (Fig 11)

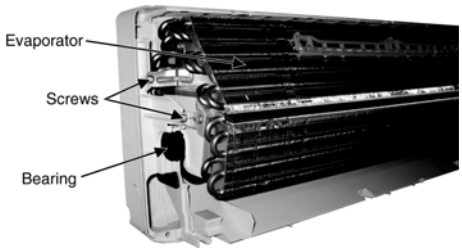


Fig. 11

- Push up the Evaporator and pull out the Cross Flow Fan from shaft. Then take out the Fan Motor. (Fig. 12)

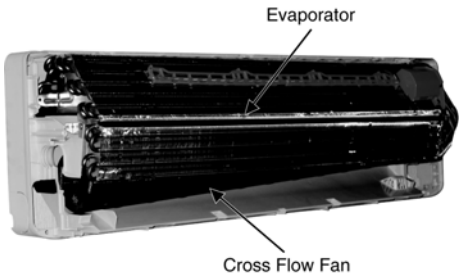
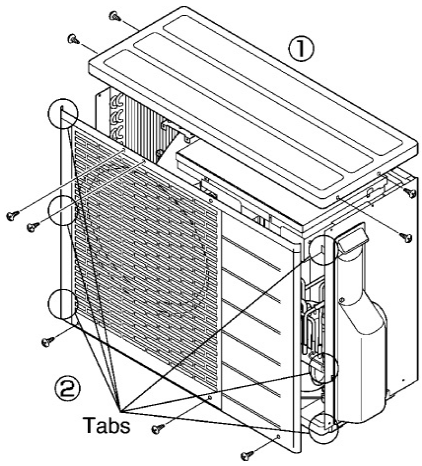


Fig. 12

16.3 Outdoor Unit

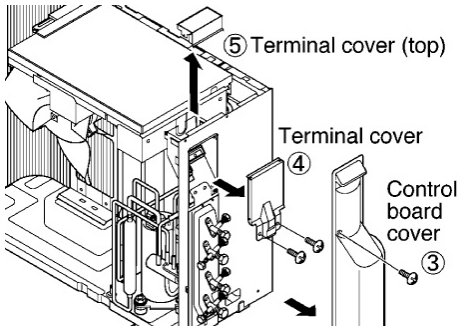
16.3.1 Removing the Cabinet Top Plate and Cabinet Front Plate

1. Remove the cabinet top plate (by removing the 4 screws).
2. Remove the 5 screws fixing the cabinet front plate, release 6 hooks and pull the cabinet front plate toward front side.



16.3.2 Removing the Control Board Cover

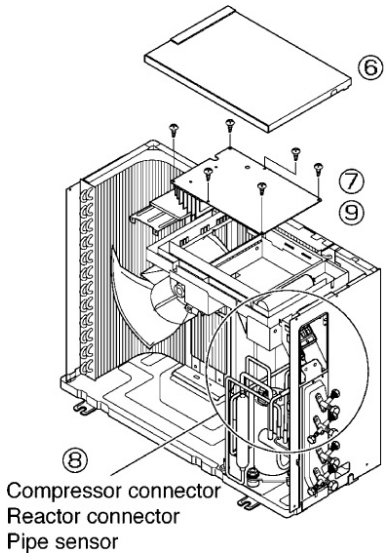
3. Remove the control board cover (remove 1 screw)
4. Remove the terminal cover (remove 2 screws)
5. Remove the terminal cover (top) and disconnect all the lead wires (3 fasten tab) inside.



16.3.3 Removing the Control Board

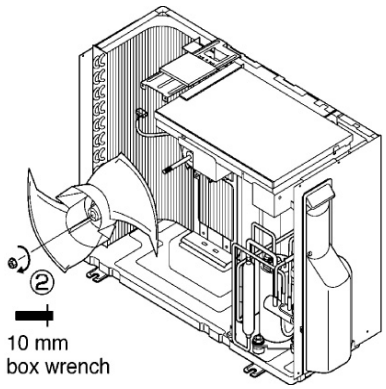
6. Remove the control board cover.
7. Remove the 6 screws at the positions on the control board indicated by arrows
8. Disconnect the connectors and pipe sensor connected to the compressor and reactor.
9. Remove the control board.

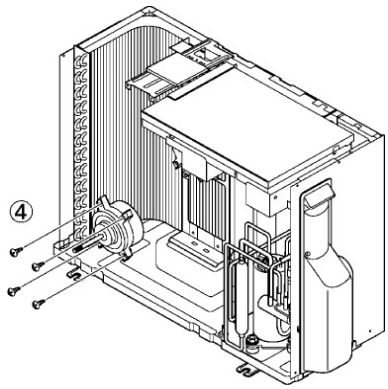
   When pulling the control board upward, it may not be possible to remove it because of the way in which the ground wire and other wires are routed. In this case, it is removed after the control board cover itself has been removed.



16.3.4 Removing the Propeller Fan and Fan Motor

1. Remove the cabinet top plate and cabinet front plate
2. Remove the propeller fan by removing the nut turning clockwise at its center.
3. Disconnect the connector of the fan motor from the control board.
4. Loosen the 4 screws at the fan motor mounting then remove the fan motor.



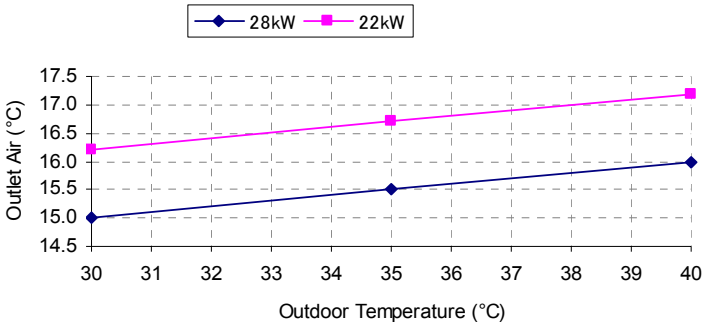


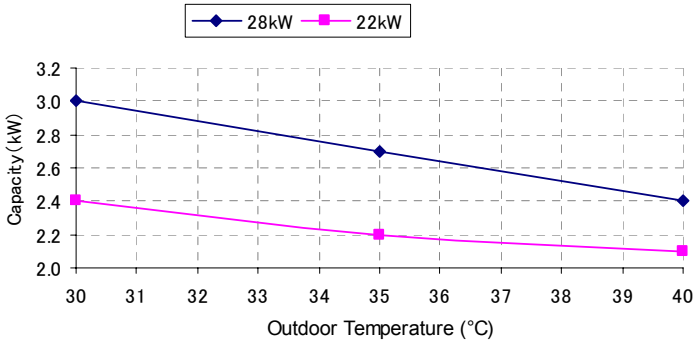
17. Technical Data

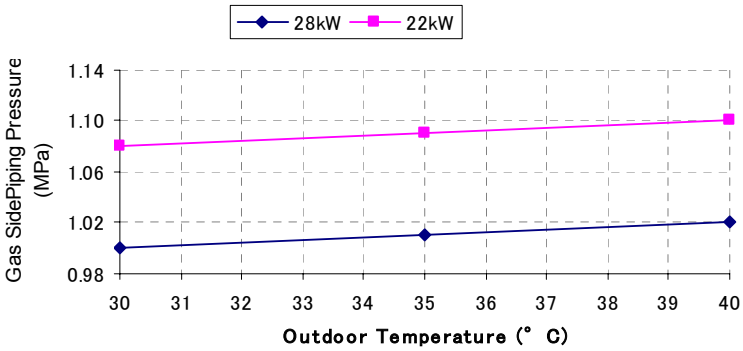
17.1 Operation Characteristics

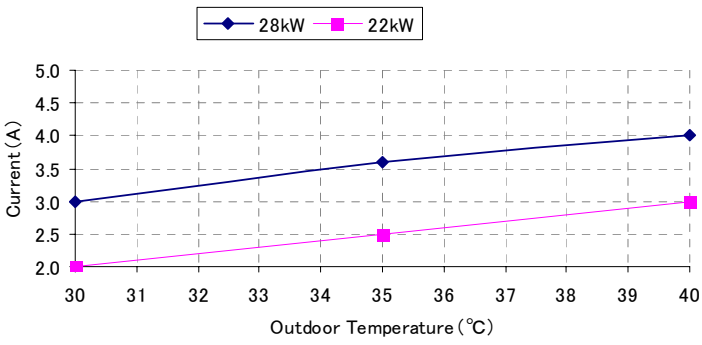
17.1.1 One Indoor Unit Operation

- Cooling Characteristic
  - o Room temperature: 27°C (DBT), 19°C (WBT)
  - o Operation condition: High fan speed
  - o Piping Length: 7.5m

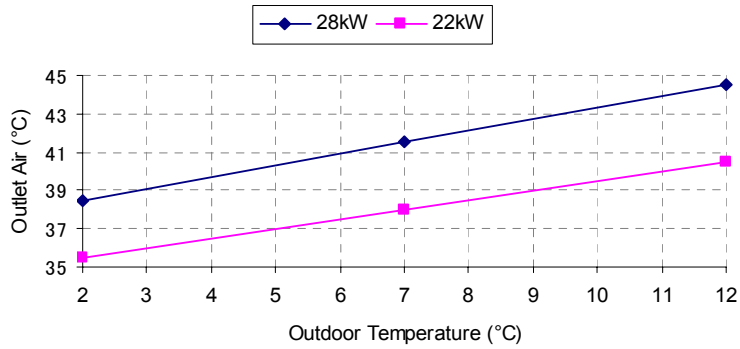


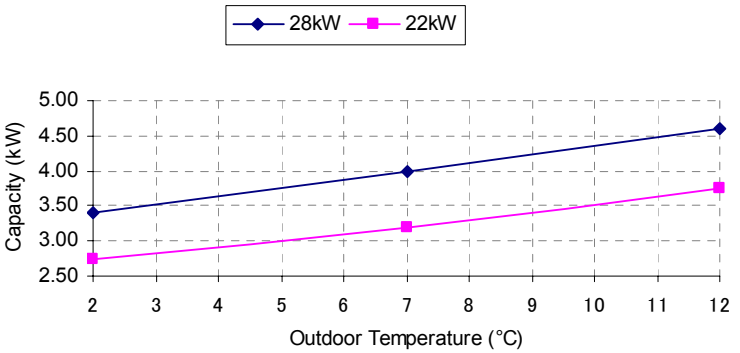


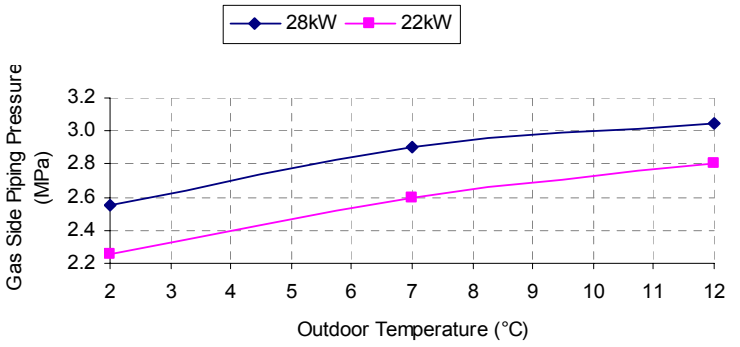


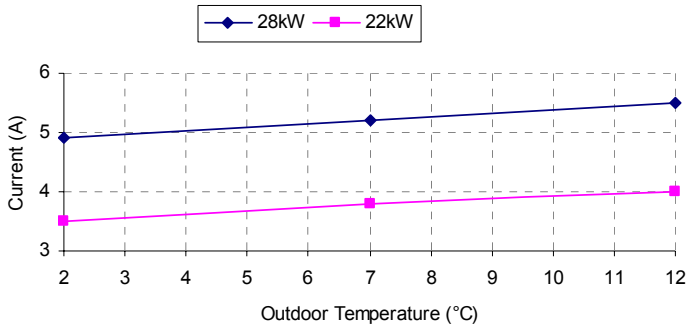


- Heating Characteristic
  - o Room temperature: 27°C (DBT), 19°C (WBT)
  - o Operation condition: High fan speed
  - o Piping Length: 7.5m



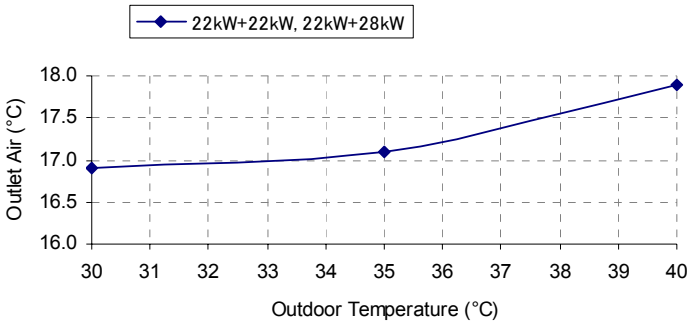


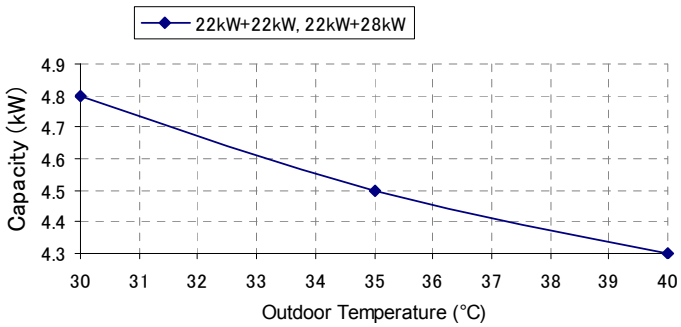


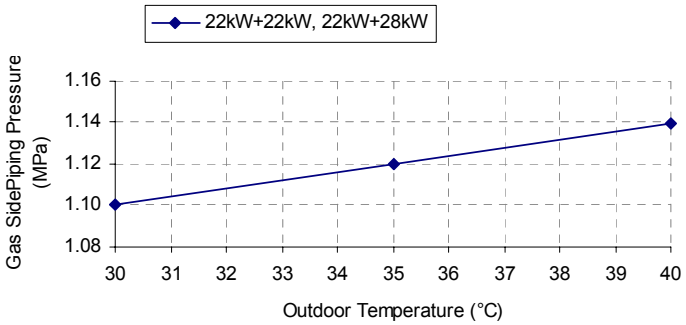


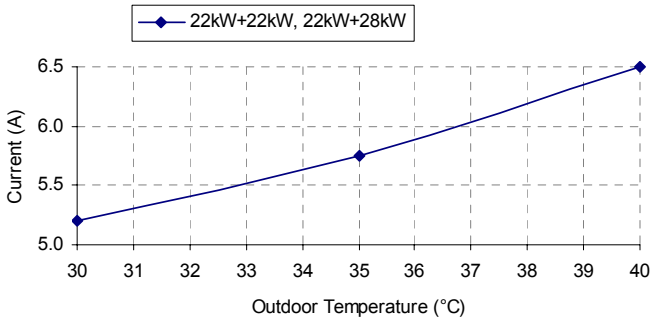
17.1.2 Two Indoor Unit Operation

- Cooling Characteristic
  - o Room temperature: 27°C (DBT), 19°C (WBT)
  - o Operation condition: High fan speed
  - o Outdoor temperature: 7.5m

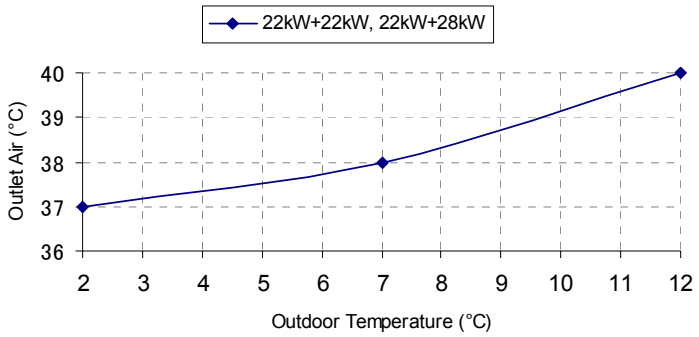


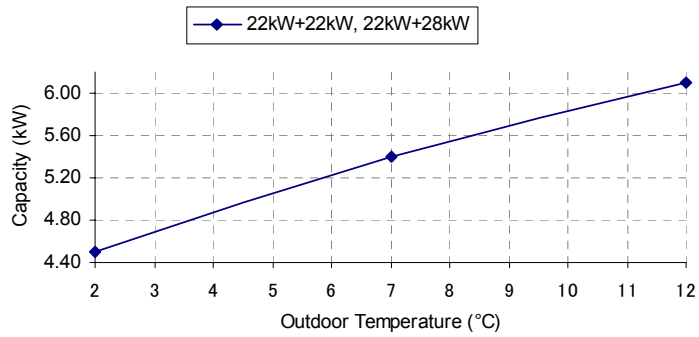


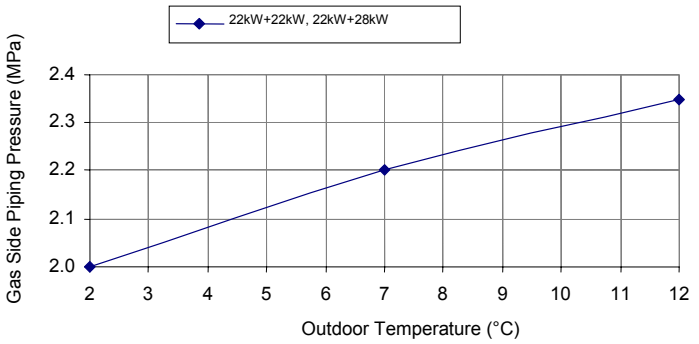


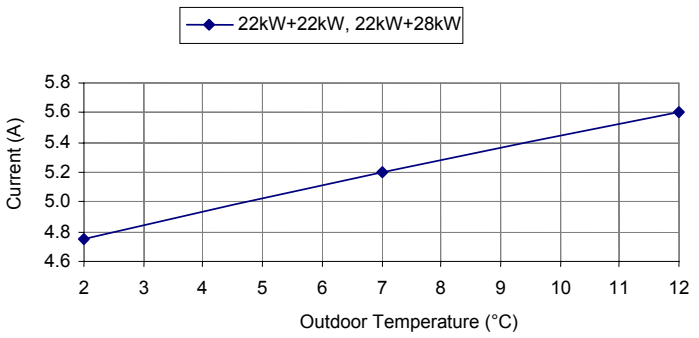


- Heating Characteristic
  - Room temperature: 27°C (DBT), 19°C (WBT)
  - Operation condition: High fan speed
  - Outdoor temperature: 7.5m



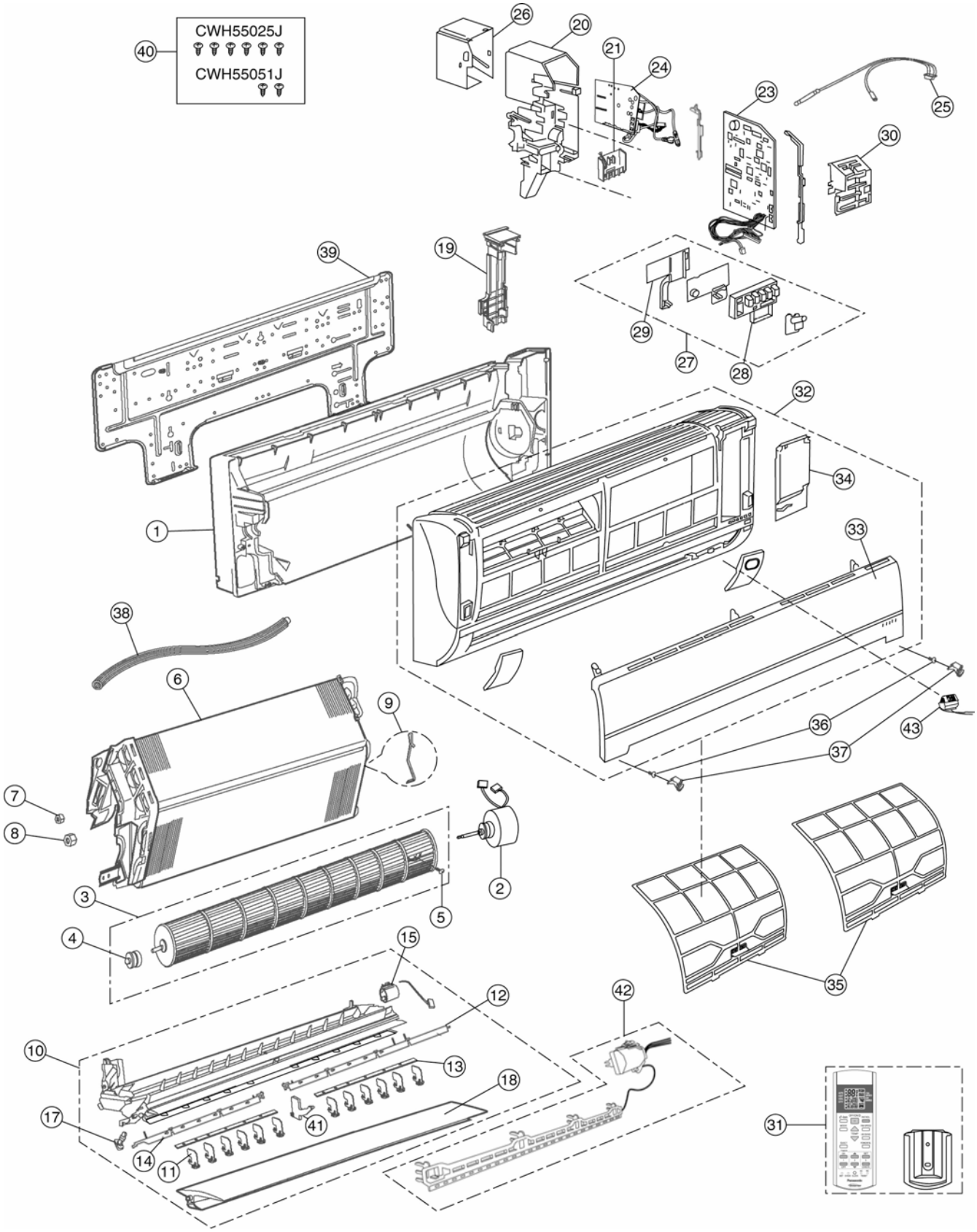






18. Exploded View and Replacement Parts List

18.1 Indoor Unit
(CS-E7GKEW, CS-E9GKEW, CS-E12GKEW, CS-E15GKEW CS-E7GKDW, CS-E9GKDW, CS-E12GKDW, CS-E15GKDW)



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.

REF. NO.	PART NAME & DESCRIPTION	QTY	CS-E7GKEW	CS-E9GKEW	CS-E12GKEW	CS-E15GKEW	REMARKS
1	CHASSY COMPLETE	1	CWD50C1513	←	←	←	
2	FAN MOTOR	1	ARW61F8P30AC (N. Europe) ARW61E8P30AC (Others)	ARW61E8P30AC	←	←	○
3	CROSS FLOW FAN COMPLETE	1	CWH02C1045	←	←	←	
4	BEARING ASSY	1	CWH64K007	←	←	←	
5	SCREW – CROSS FLOW FAN	1	CWH551146	←	←	←	
6	EVAPORATOR	1	CWB30C2099	←	←	CWB30C2100	
7	FLARE NUT (1/4")	1	CWT251030	←	←	←	
8	FLARE NUT (3/8")	1	CWT251031	←	←	CWT251032	
9	CLIP FOR SENSOR	1	CWH32143	←	←	←	
10	DICHARGE GRILLE COMPLETE	1	CWE20C2621	←	←	←	
11	VERTICAL VANE	12	CWE241157	←	←	←	
12	CONNECTING BAR	1	CWE261092	←	←	←	
13	CONNECTING BAR	2	CWE261071	←	←	←	
14	CONNECTING BAR	1	CWE261091	←	←	←	
15	AIR SWING MOTOR	1	CWA981091	←	←	←	○
17	CAP – DRAIN TRAY	1	CWH521096	←	←	←	
18	HORIZONTAL VANE COMPLETE	1	CWE24C1176	←	←	←	
19	BACK COVER CHASIS	1	CWD932454	←	←	←	
20	CONTROL BOARD CASING	1	CWH102321	←	←	←	
21	TERMINAL BOARD COMPLETE	1	CWA28C2128J	←	←	←	○
23	ELECTRONIC CONTROLLER – MAIN	1	CWA73C2532	CWA73C2533	CWA73C2534	CWA73C2535	○
24	ELECTRONIC CONTROLLER – POWER	1	CWA744567	←	←	←	○
25	SENSOR COMPLETE	1	CWA50C2122	←	←	←	○
26	CONTROL BOARD FRONT COVER		CWH131207	←	←	←	
27	INDICATOR COMPLETE	1	CWE39C1168	←	←	←	○
28	INDICATOR HOLDER	1	CWD932744	←	←	←	
29	INDICATOR HOLDER	1	CWD932745	←	←	←	
30	CONTROL BOARD FRONT COVER CO.	1	CWH13C1171	←	←	←	○
31	REMOTE CONTROL COMPLETE	1	CWA75C3006	←	←	←	○
32	FRONT GRILLE COMPLETE	1	CWE11C3676	←	←	←	
33	INTAKE GRILLE COMPLETE	1	CWE22C1344	←	←	←	
34	GRILLE DOOR	1	CWE14C1010	←	←	←	
35	E-ION FILTER	2	CWD00K1001	←	←	←	
36	SCREW – FRONT GRILLE	2	XTT4+16CFJ	←	←	←	
37	CAP – FRONT GRILLE	2	CWH521109	←	←	←	
38	DRAIN HOSE	1	CWH851063	←	←	←	
39	INSTALLATION PLATE	1	CWH361067	←	←	←	
40	BAG COMPLETE – INSTALLATION SCREW	1	CWH82C067	←	←	←	
41	FULCRUM	1	CWH621049	←	←	←	
42	E-ION AIR PURIFYING SYSTEM	1	CWH14C5332	←	←	←	○
43	ION – GENERATOR	1	CWH94C0014	←	←	←	○

(Note)

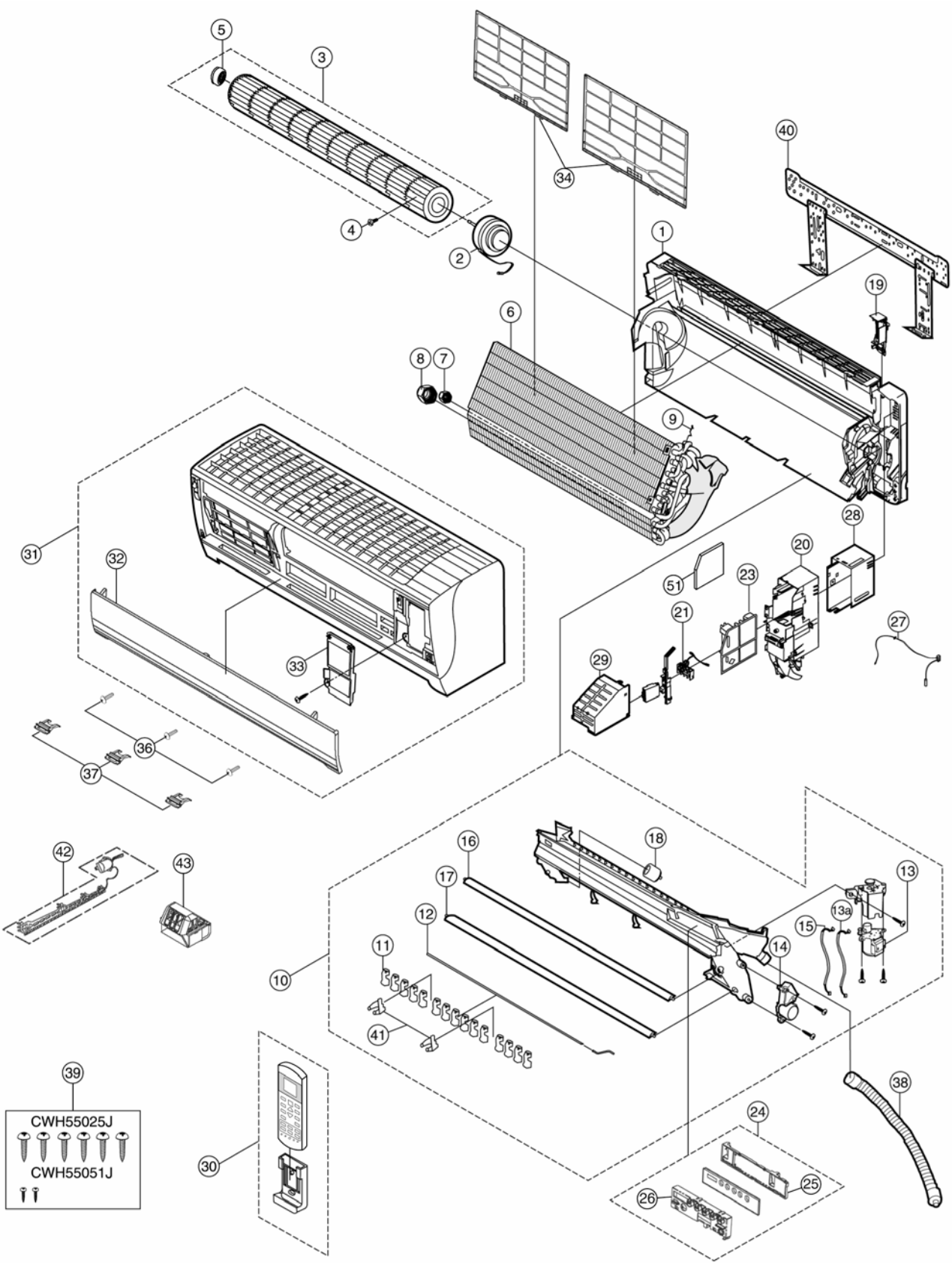
- All parts are supplied from PHAAM, Malaysia (Vendor Code: 061)
- "○" marked parts are recommended to be kept in stock.

REF. NO.	PART NAME & DESCRIPTION	QTY	CS-E7GKDW	CS-E9GKDW	CS-E12GKDW	CS-E15GKDW	REMARKS
1	CHASSY COMPLETE	1	CWD50C1513	←	←	←	
2	FAN MOTOR	1	ARW61E8P30AC	ARW61E8P30AC	←	←	○
3	CROSS FLOW FAN COMPLETE	1	CWH02C1045	←	←	←	
4	BEARING ASSY	1	CWH64K007	←	←	←	
5	SCREW – CROSS FLOW FAN	1	CWH551146	←	←	←	
6	EVAPORATOR	1	CWB30C2099	←	←	CWB30C2100	
7	FLARE NUT (1/4")	1	CWT251030	←	←	←	
8	FLARE NUT (3/8")	1	CWT251031	←	←	CWT251032	
9	CLIP FOR SENSOR	1	CWH32143	←	←	←	
10	DICHARGE GRILLE COMPLETE	1	CWE20C2621	←	←	←	
11	VERTICAL VANE	12	CWE241157	←	←	←	
12	CONNECTING BAR	1	CWE261092	←	←	←	
13	CONNECTING BAR	2	CWE261071	←	←	←	
14	CONNECTING BAR	1	CWE261091	←	←	←	
15	AIR SWING MOTOR	1	CWA981091	←	←	←	○
17	CAP – DRAIN TRAY	1	CWH521096	←	←	←	
18	HORIZONTAL VANE COMPLETE	1	CWE24C1176	←	←	←	
19	BACK COVER CHASIS	1	CWD932454	←	←	←	
20	CONTROL BOARD CASING	1	CWH102321	←	←	←	
21	TERMINAL BOARD COMPLETE	1	CWA28C2128J	←	←	←	○
23	ELECTRONIC CONTROLLER – MAIN	1	CWA73C2532	CWA73C2533	CWA73C2534	CWA73C2535	○
24	ELECTRONIC CONTROLLER – POWER	1	CWA744567	←	←	←	○
25	SENSOR COMPLETE	1	CWA50C2122	←	←	←	○
26	CONTROL BOARD FRONT COVER		CWH131207	←	←	←	
27	INDICATOR COMPLETE	1	CWE39C1168	←	←	←	○
28	INDICATOR HOLDER	1	CWD932744	←	←	←	
29	INDICATOR HOLDER	1	CWD932745	←	←	←	
30	CONTROL BOARD FRONT COVER CO.	1	CWH13C1171	←	←	←	○
31	REMOTE CONTROL COMPLETE	1	CWA75C3006	←	←	←	○
32	FRONT GRILLE COMPLETE	1	CWE11C3676	←	←	←	
33	INTAKE GRILLE COMPLETE	1	CWE22C1344	←	←	←	
34	GRILLE DOOR	1	CWE14C1010	←	←	←	
35	E-ION FILTER	2	CWD00K1001	←	←	←	
36	SCREW – FRONT GRILLE	2	XTT4+16CFJ	←	←	←	
37	CAP – FRONT GRILLE	2	CWH521109	←	←	←	
38	DRAIN HOSE	1	CWH851063	←	←	←	
39	INSTALLATION PLATE	1	CWH361067	←	←	←	
40	BAG COMPLETE – INSTALLATION SCREW	1	CWH82C067	←	←	←	
41	FULCRUM	1	CWH621049	←	←	←	
42	E-ION AIR PURIFYING SYSTEM	1	CWH14C5332	←	←	←	○
43	ION – GENERATOR	1	CWH94C0014	←	←	←	○

(Note)

- All parts are supplied from PHAAM, Malaysia (Vendor Code: 061)
- "○" marked parts are recommended to be kept in stock.

18.2 Indoor Unit (CS-E18GKEW, CS-E18GKDW)



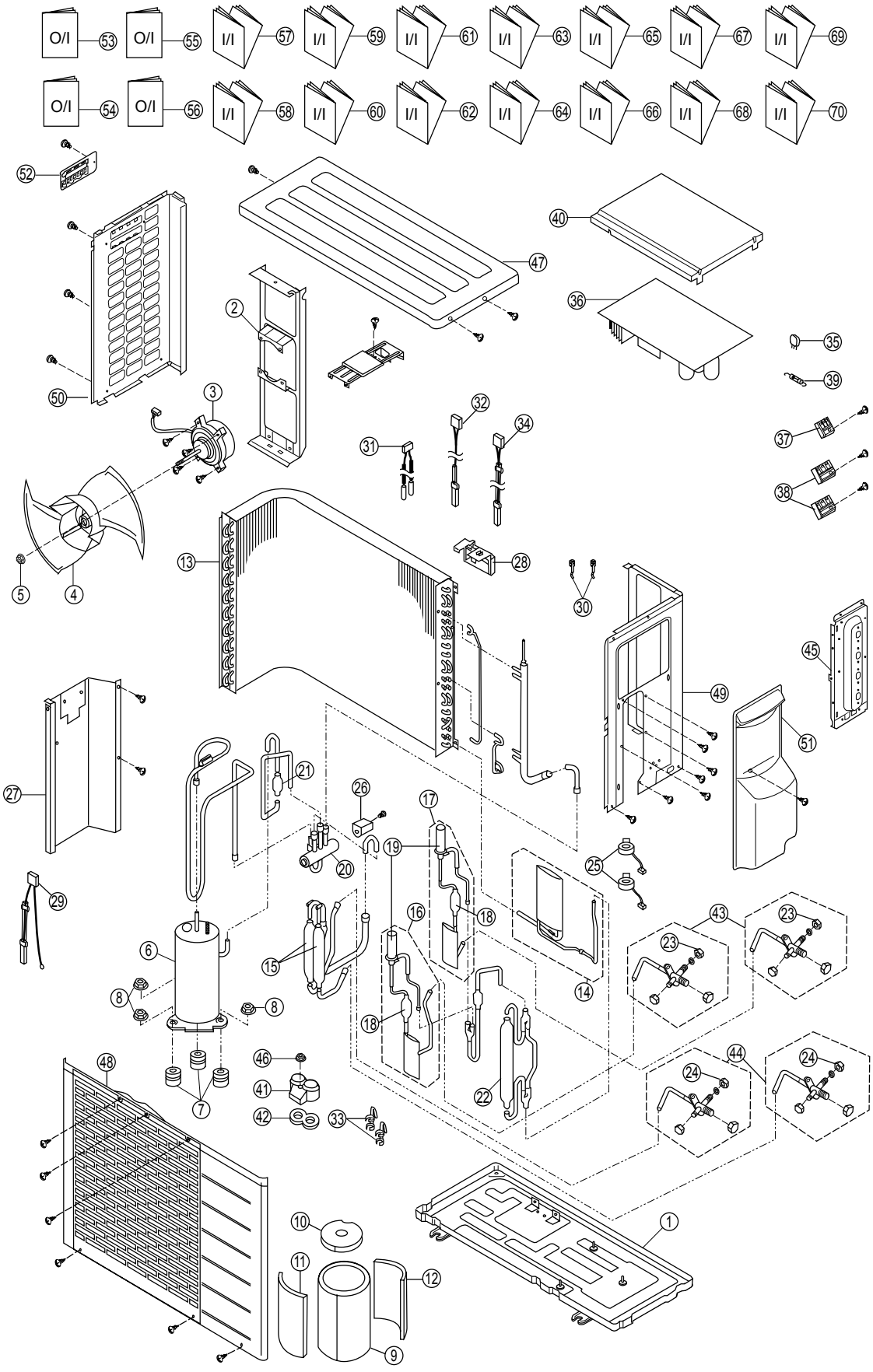
Note
The above exploded view is for the purpose of parts disassembly and replacement.
The non-numbered parts are not kept as standard service parts.

REF. NO.	PART NAME & DESCRIPTION	QTY	CS-E18GKEW	CS-E18GKDW	REMARKS
1	CHASSY COMPLETE	1	CWD50C1520	←	
2	FAN MOTOR	1	ARW51H8P30AC	←	○
3	CROSS FLOW FAN COMPLETE	1	CWH02C1010	←	
4	SCREW – CROSS FLOW FAN	1	CWH551146	←	
5	BEARING ASSY	1	CWH64K007	←	
6	EVAPORATOR	1	CWB30C1533	←	
7	FLARE NUT (1/4")	1	CWT251030	←	
8	FLARE NUT (1/2")	1	CWT251032	←	
9	HOLDER SENSOR	1	CWH32143	←	
10	DICHARGE GRILLE COMPLETE	1	CWE20C2685	←	
11	VERTICAL VANE	12	CWE241088	←	
12	CONNECTING BAR	1	CWE261025	←	
13	AIR SWING MOTOR	2	CWA98260+MJ	←	○
13a	LEAD WIRE AIR SWING MOTOR	1	CWA67C3849	←	
14	AIR SWING MOTOR	1	CWA98K1008	←	○
15	LEAD WIRE AIR SWING MOTOR	1	CWA67C4445	←	
16	HORIZONTAL VANE	1	CWE241228	←	
17	HORIZONTAL VANE	1	CWE241229	←	
18	CAP – DRAIN TRAY	1	CWH521096	←	
19	BACK COVER CHASIS	1	CWD932162B	←	
20	CONTROL BOARD CASING	1	CWH102334	←	
21	TERMINAL BOARD COMPLETE	1	CWA28C2128J	←	○
23	ELECTRONIC CONTROLLER – MAIN	1	CWA73C2536	←	○
24	INDICATOR COMPLETE		CWE39C1174	←	○
25	INDICATOR HOLDER	1	CWD932818	←	
26	INDICATOR HOLDER	1	CWD932817	←	
27	SENSOR COMPLETE	1	CWA50C2122	←	○
28	CONTROL BOARD TOP COVER	1	CWH131209	←	
29	CONTROL BOARD FRONT COVER	1	CWH131210	←	
30	REMOTE CONTROL COMPLETE	1	CWA75C3008	←	○
31	FRONT GRILLE COMPLETE	1	CWE11C3695	←	○
32	INTAKE GRILLE COMPLETE	1	CWE22C1361	←	○
33	GRILLE DOOR	2	CWE141076	←	
34	E-ION FILTER	2	CWD00K1002	←	
36	SCREW – FRONT GRILLE	2	XTT4+16CFJ	←	
37	CAP – FRONT GRILLE	1	CWH521062A	←	
38	DRAIN HOSE	1	CWH851063	←	
39	BAG COMPLETE – INSTALLATION SCREW	1	CWH82C067	←	
40	INSTALLATION PLATE	1	CWH36K1007	←	
41	FULCRUM	1	CWH621073	←	
42	E-ION AIR PURIFYING SYSTEM	1	CWH14C5600	←	
43	ION-GENERATOR	1	CWH94C0014	←	
51	ELECTRONIC CONTROLLER - POWER	1	CWA744758	←	○

(Note)

- All parts are supplied from PHAAM, Malaysia (Vendor Code: 061)
- "○" marked parts are recommended to be kept in stock.

18.3 Outdoor Unit



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

REF. NO.	PART NAME & DESCRIPTION	QTY.	CU-2E15GBE	REMARKS
1	CHASSY ASSY	1	CWD50K2058	
2	FAN MOTOR BRACKET	1	CWD541089	
3	FAN MOTOR,AC 50W SINGLE	1	CWA981072	○
4	PROPELLER FAN	1	CWH03K1013	
5	NUT - PROPELLER FAN	1	CWH561034J	
6	COMPRESSOR	2	5CS102XFC	○
7	ANTI - VIBRATION BUSHING	3	CWH501022	
8	NUT - COMPRESSOR	3	CWH56000J	
9	SOUND PROOF MATERIAL	1	CWG302138	
10	SOUND PROOF MATERIAL	1	CWG302139	
11	SOUND PROOF MATERIAL	1	CWG302404	
12	SOUND PROOF MATERIAL	1	CWG302405	
13	CONDENSER COMPLETE	1	CWB32C1816	
14	TUBE ASS'Y (CAPPILLARY TUBE)	1	CWT01C4066	
15	RECEIVER	2	CWB14013	
16	TUBE ASS'Y (CAP.TUBE,MUFLER,EXP VALVE)	1	CWT01C2499	
17	TUBE ASS'Y (CAP.TUBE,MUFLER,EXP VALVE)	1	CWT01C2500	
18	DISCHARGE MUFFLER	2	CWB121002	
19	EXPANSION VALVE	2	CWB051008J	
20	4-WAYS VALVE	1	CWB001027J	○
21	STRAINER	1	CWB111004	○
22	DRYER	1	CWB101016J	○
23	UNION NUT (1/4")	2	CWT251030	
24	UNION NUT (3/8")	2	CWT251031	
25	V-COIL COMPLETE	2	CWA43C2086J	○
26	V-COIL COMPLETE	1	CWA43C2212	○
27	SOUND-PROOF BOARD	1	CWH151032	
28	HOLDER-SENSOR	1	CWMH320001	
29	SENSOR-COMPLETE	1	CWA50C2088	○
30	HOLDER-SENSOR	2	CWH32138	
31	SENSOR-COMPLETE	1	CWA50C2089	○
32	SENSOR-COMPLETE	1	CWA50C2090	○
33	HOLDER-SENSOR	2	CWH32074	
34	SENSOR-COMPLETE	1	CWA50C2097	○
35	NORMAL-MODE LINE CHOKE COILS	1	G0A193M00001	
36	ELECTRONIC CONTROLLER	1	CWA73C2631R	
37	TERMINAL BOARD ASSY	1	CWA28K1162	○
38	TERMINAL BOARD ASSY	2	CWA28K1045J	○
39	FUSE	1	XBA2C50TR0	
40	CONTROL BOARD COVER	1	CWH131116	○
41	TERMINAL COVER	1	CWH171001	
42	RUBBER GASKET	1	CWH7070603	
43	3-WAY VALVE (1/4")	2	CWB011418	○
44	3-WAY VALVE (3/8")	2	CWB011081J	○
45	HOLDER COUPLING	1	CWH351018	
46	NUT - TERMINAL COVER	2	CWH7080300J	
47	CABINET TOP PLATE	1	CWE031014A	
48	CABINET FRONT PLATE CO.	1	CWE06C1136	
49	CABINET SIDE PLATE COMP	1	CWE04C1085	
50	CABINET SIDE PLATE	1	CWE041074A	
51	CONTROL BOARD COVER COMPLETE	1	CWH13C1073	
52	HANDLE	1	CWE161010	
53	OPERATING INSTRUCTION	1	CWF565585	
54	OPERATING INSTRUCTION	1	CWF565586	
55	OPERATING INSTRUCTION	1	CWF565587	
56	OPERATING INSTRUCTION	1	CWF565627	
57	INSTALLATION INSTRUCTION	1	CWF613168	
58	INSTALLATION INSTRUCTION	1	CWF613169	
59	INSTALLATION INSTRUCTION	1	CWF613170	
60	INSTALLATION INSTRUCTION	1	CWF613171	
61	INSTALLATION INSTRUCTION	1	CWF612980	
62	INSTALLATION INSTRUCTION	1	CWF612981	
63	INSTALLATION INSTRUCTION	1	CWF612982	
64	INSTALLATION INSTRUCTION	1	CWF613173	
65	INSTALLATION INSTRUCTION	1	CWF613174	
66	INSTALLATION INSTRUCTION	1	CWF613175	
67	INSTALLATION INSTRUCTION	1	CWF613176	
68	INSTALLATION INSTRUCTION	1	CWF613179	
69	INSTALLATION INSTRUCTION	1	CWF613180	
70	INSTALLATION INSTRUCTION	1	CWF613181	

(Note)

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SFYF0704 - 00