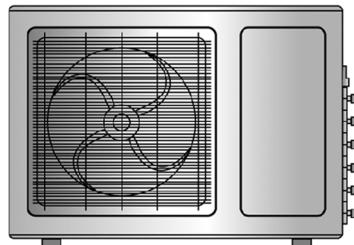
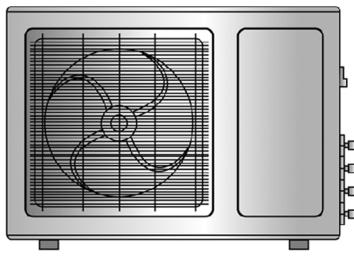
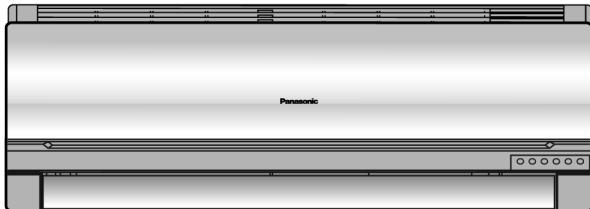


# Service Manual

## Air Conditioner



**CS-C9EKZW CU-2C18EKH**

**CS-C9EKZW CU-3C20EKH**

### ⚠ WARNING

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

## TABLE OF CONTENTS

	PAGE
<b>1 Safety Precautions</b>	3
<b>2 Specifications</b>	5
2.1. CS-C9EKZW CU-2C18EKH	5
2.2. CS-C9EKZW CU-3C20EKH	7
<b>3 Features</b>	9
<b>4 Location of Controls and Components</b>	10
4.1. Indoor Unit	10
4.2. Outdoor Unit	10
4.3. Remote Control	10
<b>5 Dimensions</b>	11
5.1. Indoor Unit & Remote Control	11
5.2. Outdoor Unit	12
<b>6 Refrigeration Cycle Diagram</b>	13
<b>7 Block Diagram</b>	14
<b>8 Wiring Connection Diagram</b>	16
8.1. CS-C9EKZW CU-2C18EKH	16
8.2. CS-C9EKZW CU-3C20EKH	17
<b>9 Printed Circuit Board</b>	18
9.1. Indoor Unit	18
9.2. Indicator	20
9.3. Outdoor Unit	21
<b>10 Installation Instruction</b>	22
10.1. Select The Best Location	22
10.2. Indoor/Outdoor Unit Installation Diagram	22
10.3. Indoor Unit	23
10.4. Outdoor Unit	26
<b>11 Operation And Control</b>	29
11.1. Cooling Operation	29

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11.2. Soft Dry Operation -----	30
11.3. Automatic Operation-----	31
11.4. Operation Control -----	32
11.5. Indoor Fan Speed Control -----	34
11.6. Outdoor Fan Speed Control -----	35
11.7. Vertical Airflow Direction Control -----	36
11.8. Horizontal Airflow Direction Control -----	36
11.9. Powerful Operation -----	36
11.10. Quiet Operation-----	37
11.11. Timer Control-----	38
11.12. Random Auto Restart Control -----	38
11.13. Remote Control Signal Receiving Sound -----	38
<b>12 Servicing Mode -----</b>	<b>39</b>
12.1. Auto OFF/ON Button -----	39
12.2. Remote Control Button -----	39
12.3. Test Mode Timer Table-----	40
<b>13 Troubleshooting Guide-----</b>	<b>41</b>
13.1. Refrigeration Cycle System -----	41
13.2. Relationship Between The Condition Of The Air Conditioner And Pressure And Electric Current-----	42
13.3. Diagnosis Methods Of A Malfunction Of A Compressor-----	42
<b>14 Disassembly and Assembly Instructions-----</b>	<b>43</b>
14.1. Indoor Electronic Controllers Removal Procedures-----	43
14.2. Indoor Fan Motor and Cross Flow Fan Removal Procedures-----	45
<b>15 Technical Data -----</b>	<b>46</b>
15.1. Thermostat Characteristics -----	46
15.2. Operation Characteristics -----	47
<b>16 Exploded View and Replacement Parts List -----</b>	<b>52</b>
16.1. CS-C9EKZW -----	52
16.2. CU-2C18EKH -----	54
16.3. CU-3C20EKH -----	56

# 1 Safety Precautions

- Read the following "SAFETY PRECAUTIONS" carefully before performing any servicing.
- Electrical work must be installed or serviced by a licensed electrician. Be sure to use the correct rating of the power plug and main circuit for the model installed.
- The caution items stated here must be followed because these important contents are related to safety. The meaning of each indication used is as below.

Incorrect installation or servicing due to ignoring of the instruction will cause harm or damage, and the seriousness is classified by the following indications.

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

 <b>CAUTION</b>	This indication shows the possibility of causing injury or damage to properties.
--	--

The items to be followed are classified by the symbols:

	This symbol denotes item that is PROHIBITED from doing.
---	---

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

 <b>WARNING</b>	
1. Engage dealer or specialist for installation and servicing. If installation or servicing done by the user is defective, it will cause water leakage, electrical shock or fire.	
2. Install according to this installation instructions strictly. If installation is defective, it will cause water leakage, electrical 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 leakage, fire or electrical shock.	
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 at 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 pipes thinner than 0.8 mm.	
10. It is desirable that the amount of residual oil is less than 40 mg/10 m.	
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.	

 <b>CAUTION</b>	
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.	



## CAUTION

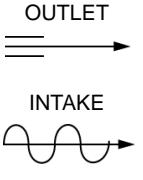
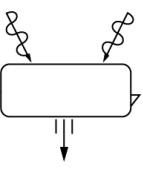
3. Carry out drainage piping as mentioned in installation instructions. If drainage is not perfect, water may enter the room and damage the furniture.
4. Pb free solder has a higher melting point than standard solder; typically the melting point is 50 - 70°F (30 - 40°C) higher. Please use a high temperature soldering iron. In case of the soldering iron with temperature control, please set it to  $700 \pm 20^{\circ}\text{F}$  ( $370 \pm 10^{\circ}\text{C}$ ). Pb free solder will tend to splash when heated too high (about  $1100^{\circ}\text{F}/600^{\circ}\text{C}$ ).

## 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 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.
  1. Power supply connection to the receptacle using a power plug. Use an approved power plug with earth pin for the connection to the socket.
  2. Power supply connection to a circuit breaker for the permanent connection. Use an approved 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 refrigeration 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

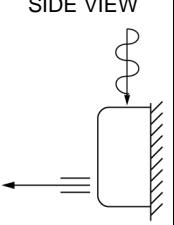
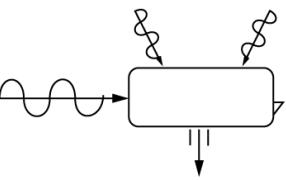
### 2.1. CS-C9EKZW CU-2C18EKH

		Unit	Indoor unit	Outdoor unit
Performance Test Condition			ISO 5151	
Power Source (Phase, Voltage, Cycle)	Ø V Hz		Single 240 - 220 50	
Cooling Capacity	kW (BTU/h)	(1 unit) 2.44 - 2.40 (8,320 - 8,180)	(2 units) 4.88 - 4.80 (16,600 - 16,400)	
Moisture Removal	l/h (Pint/h)	(1 unit) 1.5 (3.2)	(2 units) 2.6 (5.5)	
Airflow Method	OUTLET INTAKE	SIDE VIEW 	TOP VIEW 	
Air Volume	Lo	m³/min (cfm)	5.7 (200) - 5.7 (200)	—
	Me	m³/min (cfm)	7.8 (274) - 7.8 (274)	—
	Hi	m³/min (cfm)	9.4 (332) - 9.4 (332)	32.6 (1,150) - 31.1 (1,100)
	SHi	m³/min (cfm)	10.1 (357) - 10.1 (357)	—
Noise Level	dB (A)	High 36 - 36, Low 26 - 26	High 55 - 53	
Electrical Data	Input Power	W	(1 unit) 770 - 730	(2 units) 1,540 - 1,460
	Running Current	A	(1 unit) 3.3 - 3.5	(2 units) 6.6 - 7.0
	EER	W/W (BTU/hW)	(1 unit) 3.17 - 3.29 (10.8 - 11.2)	(2 units) 3.17 - 3.29 (10.8 - 11.2)
	Starting Current	A	15.0	
Piping Connection Port (Flare piping)	inch inch	G ; Half Union 3/8" L ; Half Union 1/4"	G ; 3-way valve 3/8" L ; 3-way valve 1/4"	
Pipe Size (Flare piping)	inch inch	G (gas side) ; 3/8" L (liquid side) ; 1/4"	G (gas side) ; 3/8" L (liquid side) ; 1/4"	
Drain Hose	Inner diameter	mm	12	—
	Length	m	0.7	—
Dimensions	Height	inch (mm)	11 - 1/32 (280)	25 - 21/32 (651)
	Width	inch (mm)	31 - 15/32 (799)	35 - 3/16 (893)
	Depth	inch (mm)	7 - 7/32 (183)	13 - 19/32 (345)
Net Weight	lb (kg)	18 (8.0)	137 (62)	
Compressor	Description		—	Rotary (1 cylinder) rolling piston type
	Motor	Type	—	Induction (2-poles)
	Rated Output	W	—	650
Fan Motor	Description		Cross-flow Fan	Propeller Fan
	Material		AS + Glass Fiber 20%	AS + Glass Fiber 20%
	Type		Induction (4-poles)	Induction (6-poles)
	Input		29.3 - 26.3	134.6 - 118.8
	Rated Output		15	50
	Fan Speed	Low	rpm	730 - 730
		Medium	rpm	1,000 - 1,000
		High	rpm	1,210 - 1,210
		SuperHigh	rpm	1,300 - 1,300

		Unit	Indoor unit	Outdoor unit
Heat Exchanger	Description		Evaporator	Condenser
	Tube material		Copper	Copper
	Fin material		Aluminium	Aluminium (Blue Coat)
	Fin Type		Slit Fin	Louver Fin
	Row / Stage		(Plate fin configuration, forced draft) 2 x 15	2 x 24
	FPI		19	16
	Size (W x H x L)	mm	610 x 315 x 25.4	560 x 609.6 x 44
Refrigerant Control Device			—	Capillary Tube
Refrigeration Oil		(c.c)	—	SUNISO 4GDID or ATMOS M60 or ATMOS 56M
Refrigerant (R-22)		g (oz)	—	700 x 2 (24.7 x 2)
Thermostat			—	—
Protection Device			—	Overload protector
Capillary	Length	mm	—	680
	Flow Rate	l/min	—	11.5
	Inner Diameter	mm	—	1.5
Air Filter	Material Style		P.P. Honeycomb	—
Capacity Control			Capillary Tube	
Compressor Capacitor		μF, VAC	—	25 μF, 370/400 VAC
Fan Motor Capacitor		μF, VAC	1.5 μF, 440 VAC	3.0 μF, 450 VAC

- Specifications are subject to change without notice for further improvement.

## 2.2. CS-C9EKZW CU-3C20EKH

		Indoor unit	Outdoor unit				
Performance Test Condition		ISO 5151					
		Unit	Single Operation (A, B1, B2)	Single Operation (A)	Double Operation (B1 + B2)	Triple Operation (A + B1 or B2)	Triple Operation (A + B1 + B2)
Power Source (Phase, Voltage, Cycle)			Ø V	240 - 220	50		
Power Source (Phase, Voltage, Cycle)		Hz	2.40-2.34 (8,180-7,980)	2.82-2.78 (9,620-9,480)	3.60-3.52 (12,300-12,000)	5.22-5.12 (17,800-17,500)	6.00-5.86 (20,500-20,000)
Cooling Capacity Per Unit			kW (BTU/h)	—	1.5 (3.2)	1.6 (3.4)	2.1 (4.4)
Moisture Removal		l/h (Pint/h)	—	—	—	2.8 (5.9)	3.2 (6.8)
Airflow Method		OUTLET =====→	SIDE VIEW 	TOP VIEW 			
Air Volume	Lo	m³/min (cfm)	5.7 - 5.7 (200 - 200)	—	—	—	
	Me	m³/min (cfm)	7.8 - 7.8 (274 - 274)	—	—	—	
	Hi	m³/min (cfm)	9.4 - 9.4 (332 - 332)	—	36.8 (1,300) - 35.1 (1,240)	—	
	SHi	m³/min (cfm)	10.1 - 10.1 (357 - 357)	—	—	—	
Noise Level		dB (A)	High 36 - 36, Low 26 - 26	High 56 - 54			
Electrical Data	Input Power	W	55 - 50	820 - 770	1,120 - 1,070	1,210 - 1,150	1,850 - 1,750
	Running Current	A	0.25 - 0.23	3.6 - 3.7	4.9 - 5.1	5.3 - 5.5	8.1 - 8.3
	EER	W/W (BTU/hW)	—	2.93 - 3.04 (10.0 - 10.4)	2.52 - 2.60 (8.6 - 8.9)	2.98 - 3.06 (10.2 - 10.5)	2.82 - 2.93 (9.6 - 10.0)
	Starting Current	A	(A unit) 15.0 - 15.0	(B unit) 21.0 - 21.0			
Piping Connection Port (Flare piping)		inch inch	G ; Half Union 3/8" L ; Half Union 1/4"	G ; 3-way valve 3/8" L ; 3-way valve 1/4"			
Pipe Size (Flare piping)		inch inch	G (gas side) ; 3/8" L (liquid side) ; 1/4"	G (gas side) ; 3/8" L (liquid side) ; 1/4"			
Drain Hose	Inner diameter	mm	12	—			
	Length	m	0.7	—			
Dimensions	Height	inch (mm)	11 - 1/32 (280)	25 - 21/32 (651)			
	Width	inch (mm)	31 - 15/32 (799)	35 - 3/16 (893)			
	Depth	inch (mm)	7 - 7/32 (183)	13 - 19/32 (345)			
Net Weight		lb (kg)	18 (8.0)	146 (66)			
Compressor	Description		—	Rotary (1 cylinder) rolling piston type			
	Motor Type		—	Induction (2-poles)			
	Rated Output	W	—	(A unit) 650			
				(B unit) 900			

		Indoor unit		Outdoor unit
Fan Motor	Description		Cross-flow Fan	Propeller Fan
	Material		AS + Glass Fiber 20%	AS + Glass Fiber 20%
	Type		Induction (4-poles)	Induction (6-poles)
	Input	W	29.3 - 26.3	134.0 - 118.7
	Rated Output	W	15	50
	Fan Speed	Low rpm	730 - 730	—
	Medium rpm	1,000 - 1,000		—
	High rpm	1,210 - 1,210		765 - 725
	SuperHigh rpm	1,300 - 1,300		—
Heat Exchanger	Description		Evaporator	Condenser
	Tube material		Copper	Copper
	Fin material		Aluminium	Aluminium (Blue Coat)
	Fin Type		Slit Fin	Louver Fin
	Row / Stage		2 x 15	(Plate fin configuration, forced draft) 2 x 24
	FPI		19	16
	Size (W x H x L)	mm	610 x 315 x 25.4	756.0 x 609.6 x 44 719.5
Refrigerant Control Device			—	Capillary Tube
Refrigeration Oil		(c.c)	—	SUNISO 4GDID or ATMOS M60 or ATMOS 56M
Refrigerant (R-22)		g (oz)	—	(A unit) 770 (27.2) (B unit) 990 (34.9)
Thermostat			—	—
Protection Device			—	Overload protector
Capillary Tube	Length	mm	—	935, 842, 1,170
	Flow Rate	l/min	—	20.0, 15.5, 10.0
	Inner Diameter	mm	—	2.0, 1.8, 1.6
Air Filter	Material Style		P.P. Honeycomb	—
Capacity Control			Capillary Tube	
Compressor Capacitor		μF, VAC	—	25 μF, 440 VAC
Fan Motor Capacitor		μF, VAC	1.5 μF, 440 VAC	3.0 μF, 450 VAC

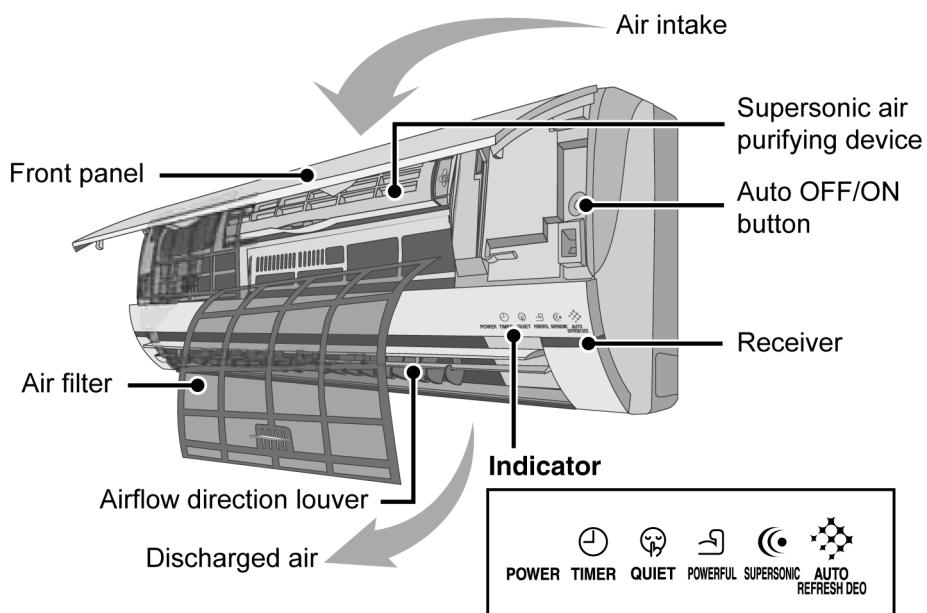
- Specifications are subject to change without notice for further improvement.

### 3 Features

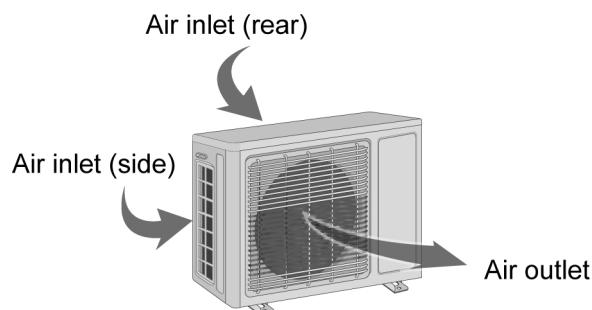
- **High Efficiency**
- **Compact Design**
- **Wider range of horizontal discharge air**
- **Air Filter with function to reduce dust and smoke**
- **Automatic air swing and manual adjusted by Remote Control for vertical airflow**
- **Long Installation Piping**
  - Long piping up to 15 meter
- **Supersonic Air Purifying Device with SUPER alleru-buster**
  - Inactivate various harmful airborne elements including allergens, viruses and bacteria
  - Generated supersonic waves enhance the ability to collect dust and dirt in the air
- **Auto Refresh Deo**
  - Regenerated the deodorizing performance so it stays the same as when it was first used
- **Quality Improvement**
  - Random auto restart after power failure for safety restart operation
  - Gas leakage protection
  - Prevent compressor reverse cycle
  - Inner protector to protect Compressor
  - Noise prevention during soft dry operation
  - Blue Coated Condenser for high resistance to corrosion
- **Operation Improvement**
  - Quiet mode to provide quiet operation
  - Powerful mode to reach the desired room temperature quickly
  - 24-hour timer setting
- **Serviceability Improvement**
  - Removable and washable front panel

## 4 Location of Controls and Components

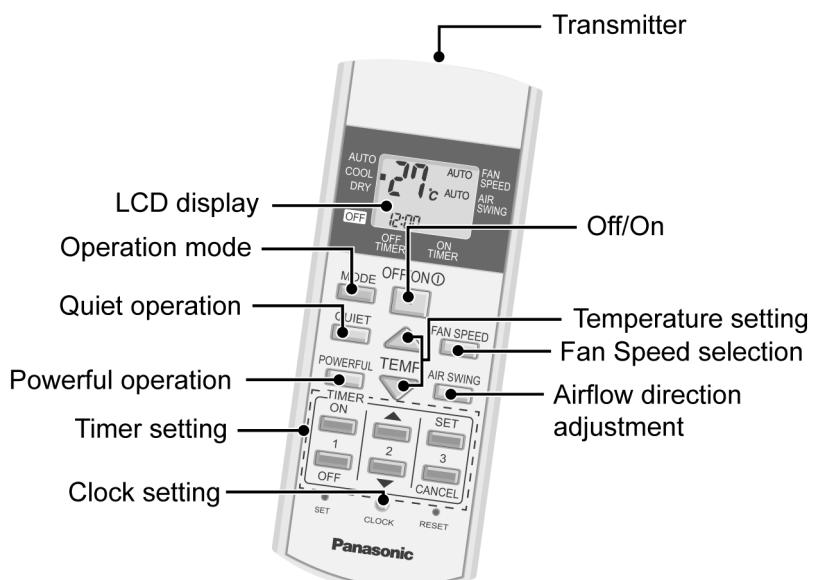
### 4.1. Indoor Unit



### 4.2. Outdoor Unit



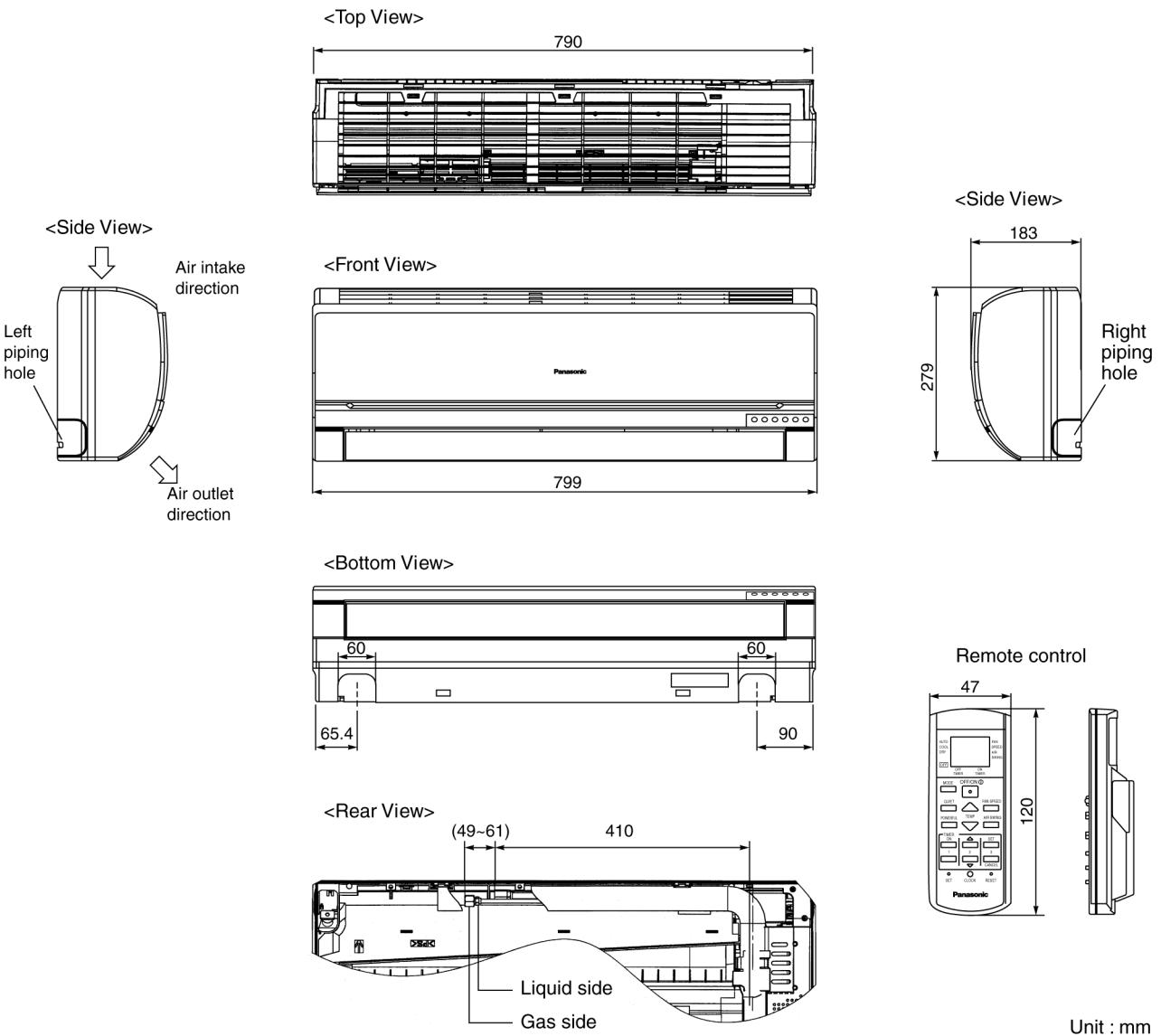
### 4.3. Remote Control



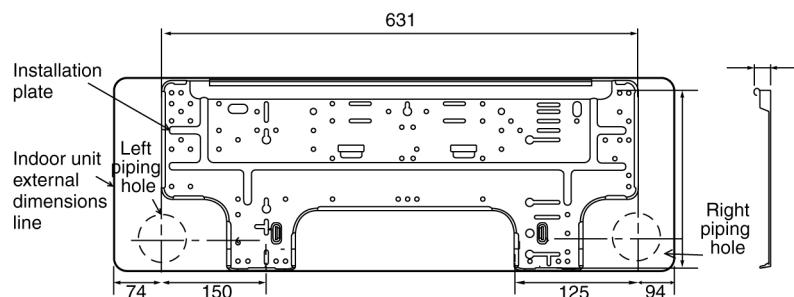
# 5 Dimensions

## 5.1. Indoor Unit & Remote Control

### 5.1.1. CS-C9EKZW



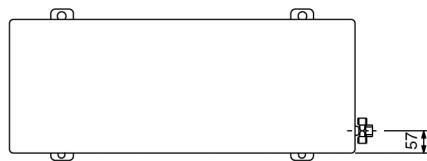
Relative position between the indoor unit and the installation plate <Front View>



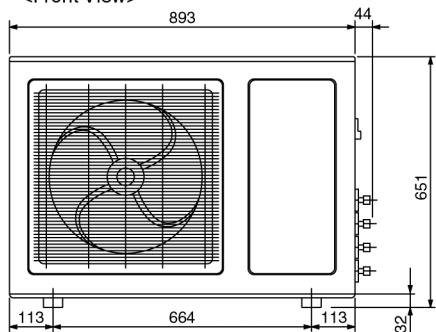
## 5.2. Outdoor Unit

**CU-2C18EKH**

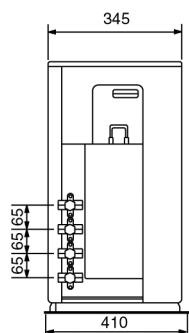
<Top View>



<Front View>

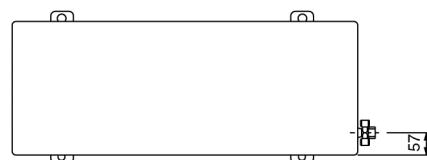


<Side View>

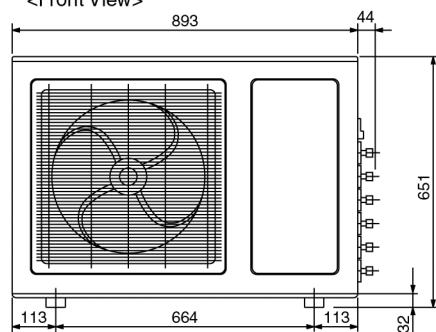


**CU-3C20EKH**

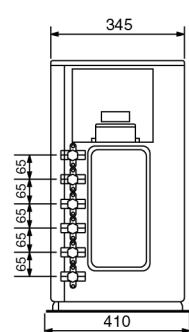
<Top View>



<Front View>



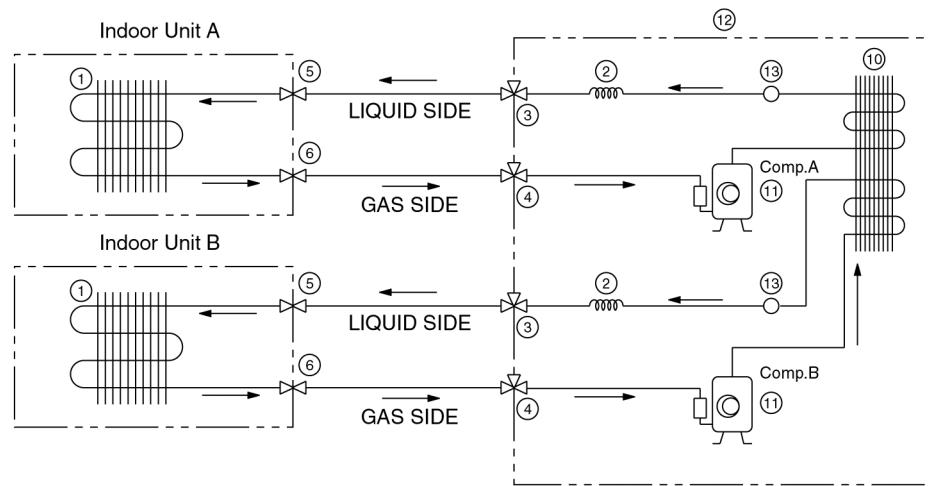
<Side View>



## 6 Refrigeration Cycle Diagram

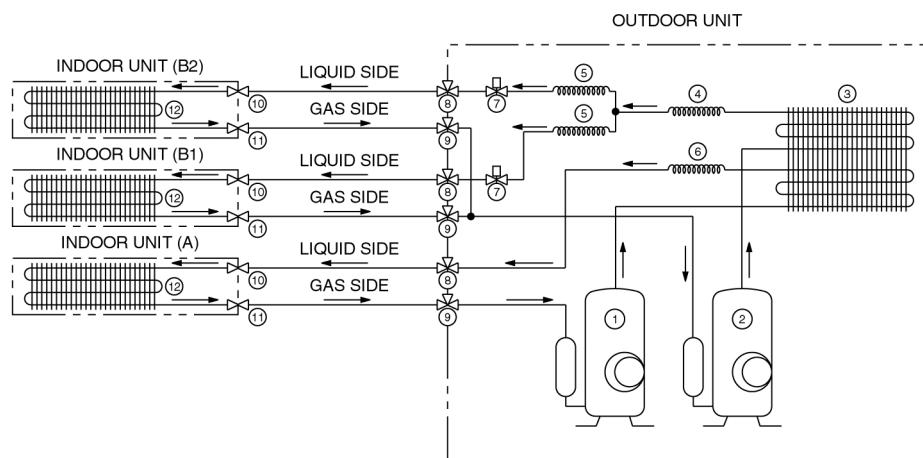
### CS-C9EKZW CU-2C18EKH

- ① Evaporator
- ② Capillary tube (2)
- ③ 3 way valve (1/4")
- ④ 3 way valve (3/8")
- ⑤ Half union (1/4")
- ⑥ Half union (3/8")
- ⑩ Condensor
- ⑪ Compressor
- ⑫ Outdoor unit
- ⑬ Strainer



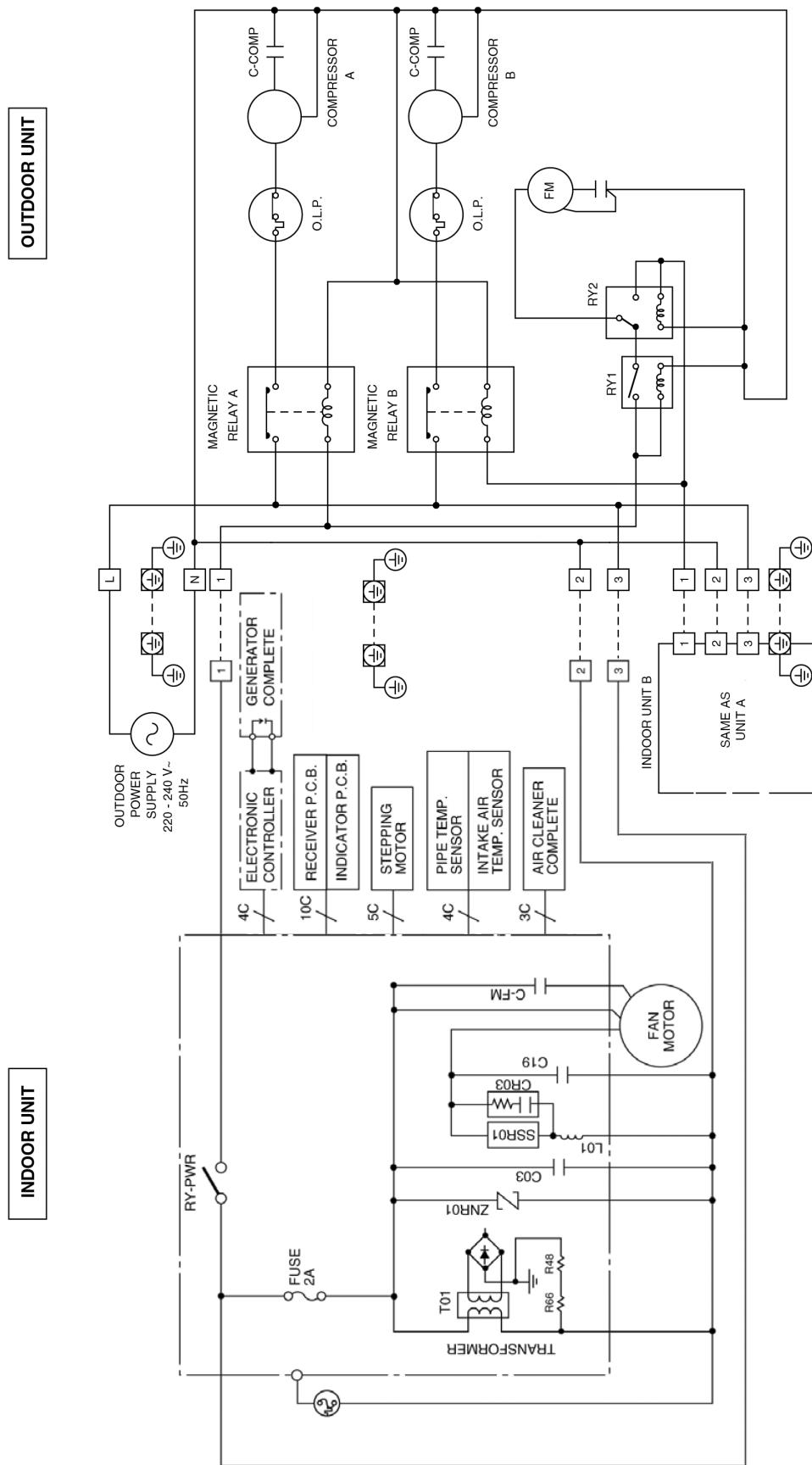
### CS-C9EKZW CU-3C20EKH

- ① Compressor (1)
- ② Compressor (2)
- ③ Condensor
- ④ Capillary tube (1)
- ⑤ Capillary tube (2)
- ⑥ Capillary tube (3)
- ⑦ Switching solenoid valve
- ⑧ 3 way valve (1/4")
- ⑨ 3 way valve (3/8")
- ⑩ Half union (1/4")
- ⑪ Half union (3/8")
- ⑫ Evaporator



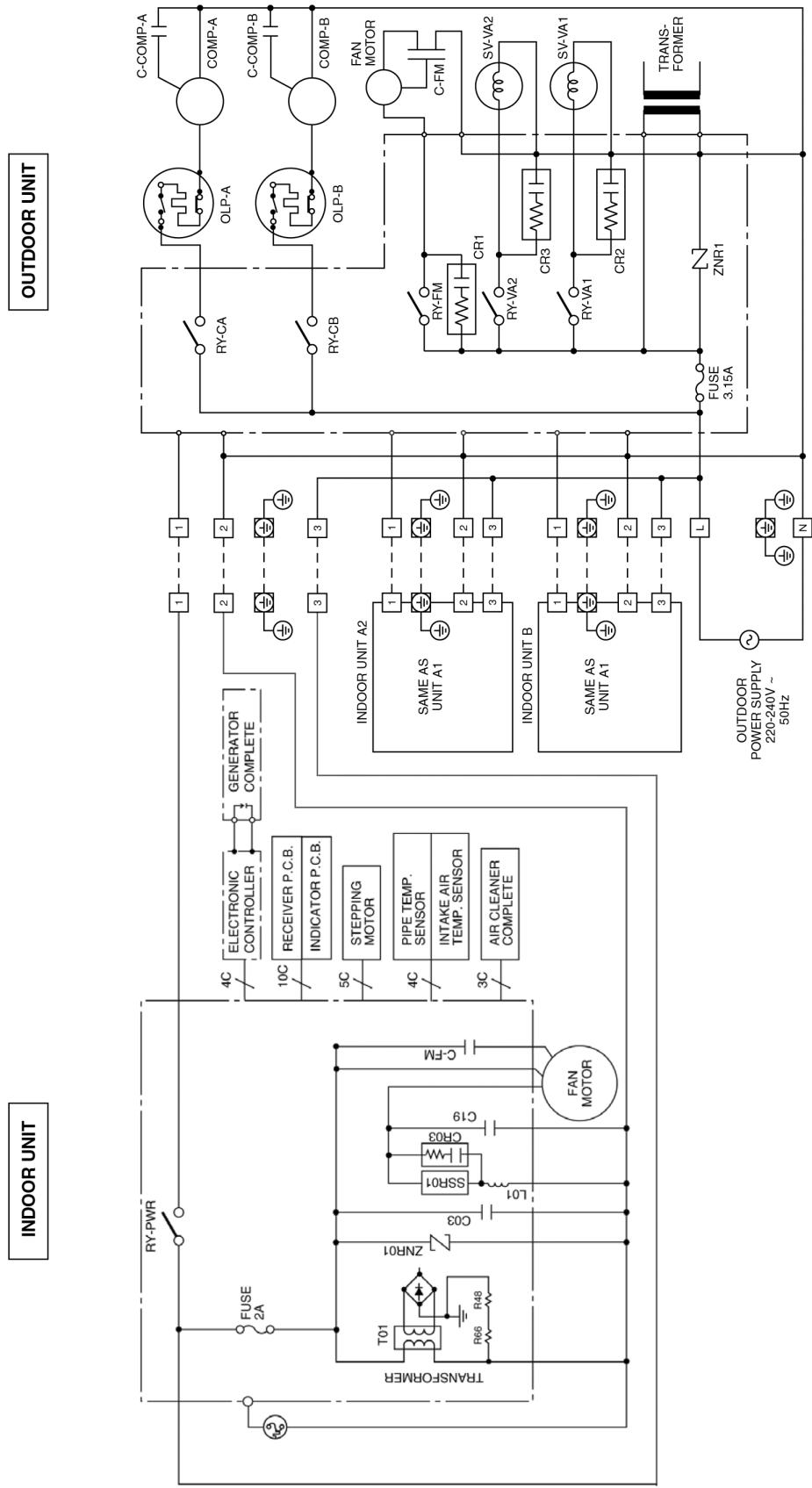
## 7 Block Diagram

CS-C9EKZW CU-2C18EKH



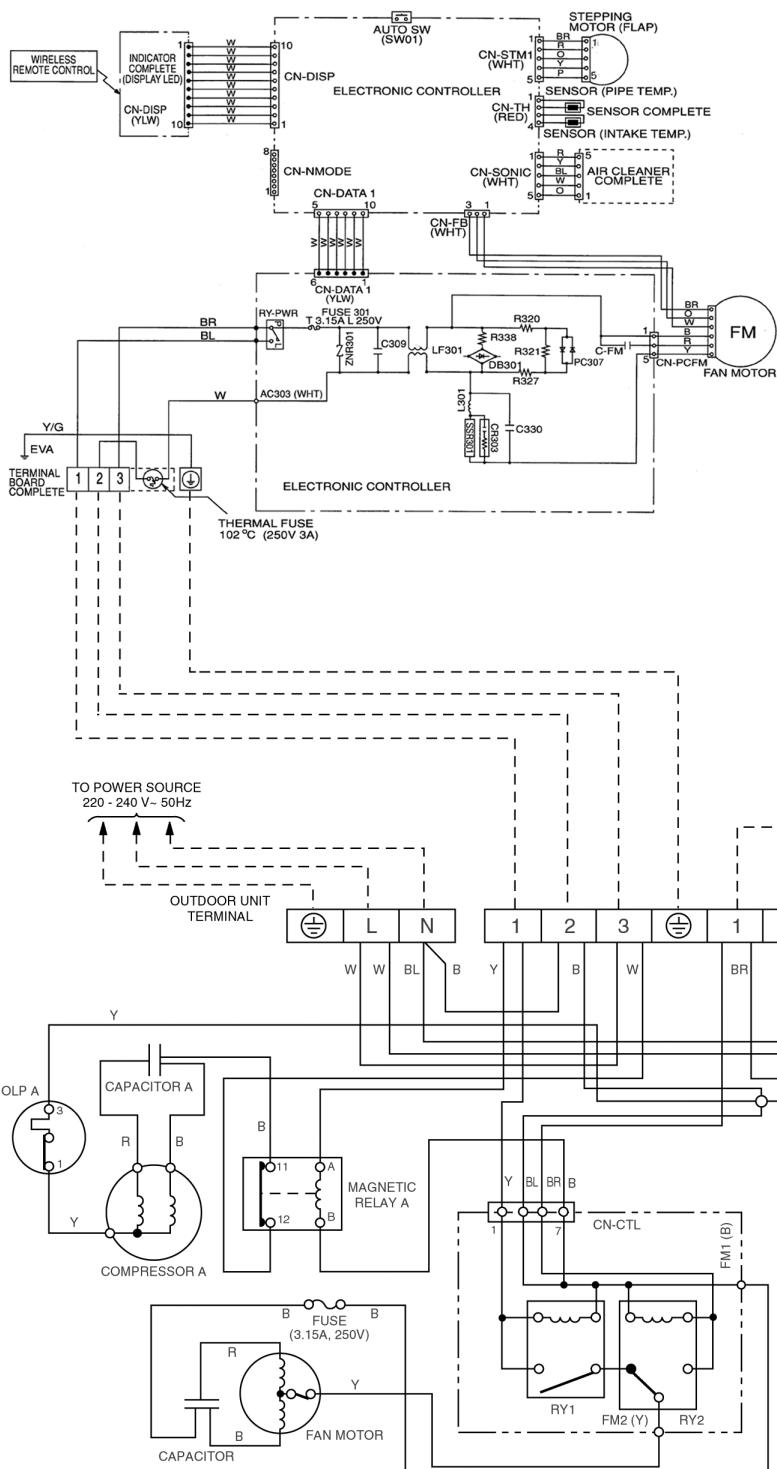
※ [ ] Indicates the electronic control unit.  
 ※ "C" Indicates the number of core wires. (Example: 6C=6 core wires)

## CS-C9EKZW CU-3C20EKH



# 8 Wiring Connection Diagram

## 8.1. CS-C9EKZW CU-2C18EKH



### Remarks:

B	: BLUE
BR	: BROWN
BL	: BLACK
W	: WHITE
R	: RED
O	: ORANGE
P	: PINK
Y/G	: YELLOW / GREEN
GRY	: GRAY

### Resistance of Indoor Fan Motor Windings

CONNECTION	CWA921181 (Ω)	CWA921324 (Ω)
YELLOW - BLUE	390	371
YELLOW - RED	394	387

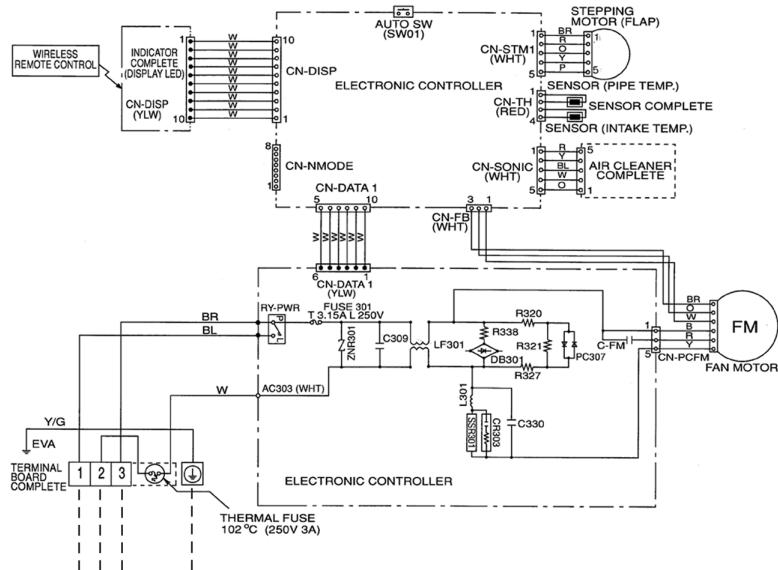
### Resistance of Outdoor Fan Motor Windings

CONNECTION	CWA951402 (Ω)
BLUE - YELLOW	88
YELLOW - RED	100

### Resistance of Compressor Windings

CONNECTION	2PS132D2AC02 (Ω)
C - R	4.2
C - S	4.954

## 8.2. CS-C9EKZW CU-3C20EKH



**Remarks:**

B : BLUE  
BR : BROWN  
BL : BLACK  
W : WHITE  
R : RED  
O : ORANGE  
P : PINK  
Y/G : YELLOW / GREEN  
GRY : GRAY

## Resistance of Indoor Fan Motor Windings

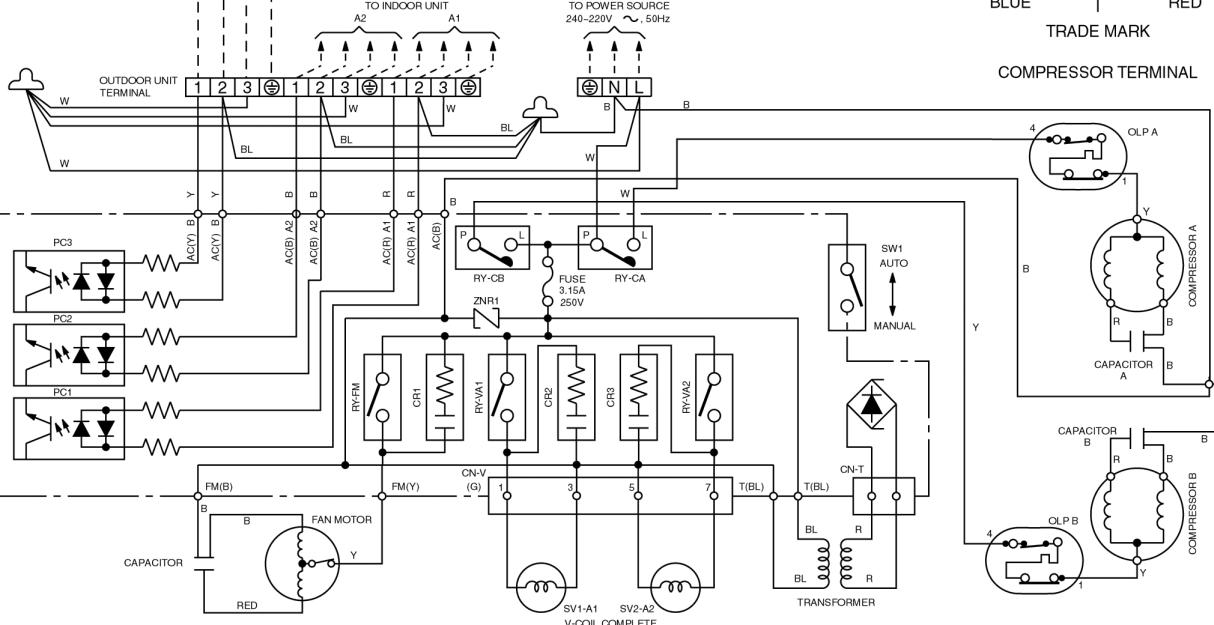
CONNECTION	CWA921181 (Ω)	CWA921324 (Ω)
YELLOW - BLUE	390	371
YELLOW - RED	394	387

## Resistance of Outdoor Fan Motor Windings

CONNECTION	CWA951402 ( $\Omega$ )
BLUE - YELLOW	88
YELLOW - RED	100

## Resistance of Compressor Windings

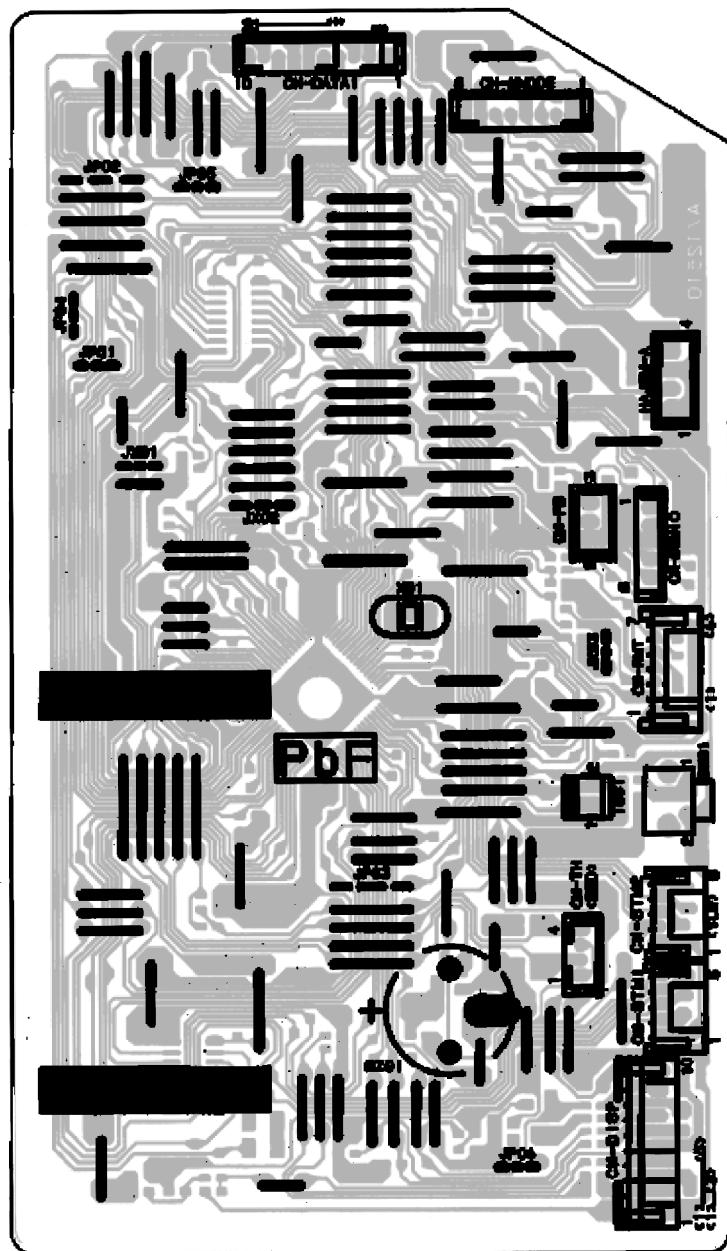
CONNECTION	2PS132D2AC02 ( $\Omega$ )
C - R	4.2
C - S	4.954
CONNECTION	2PS192D2AC02 ( $\Omega$ )
C - R	3.187
C - S	5.297



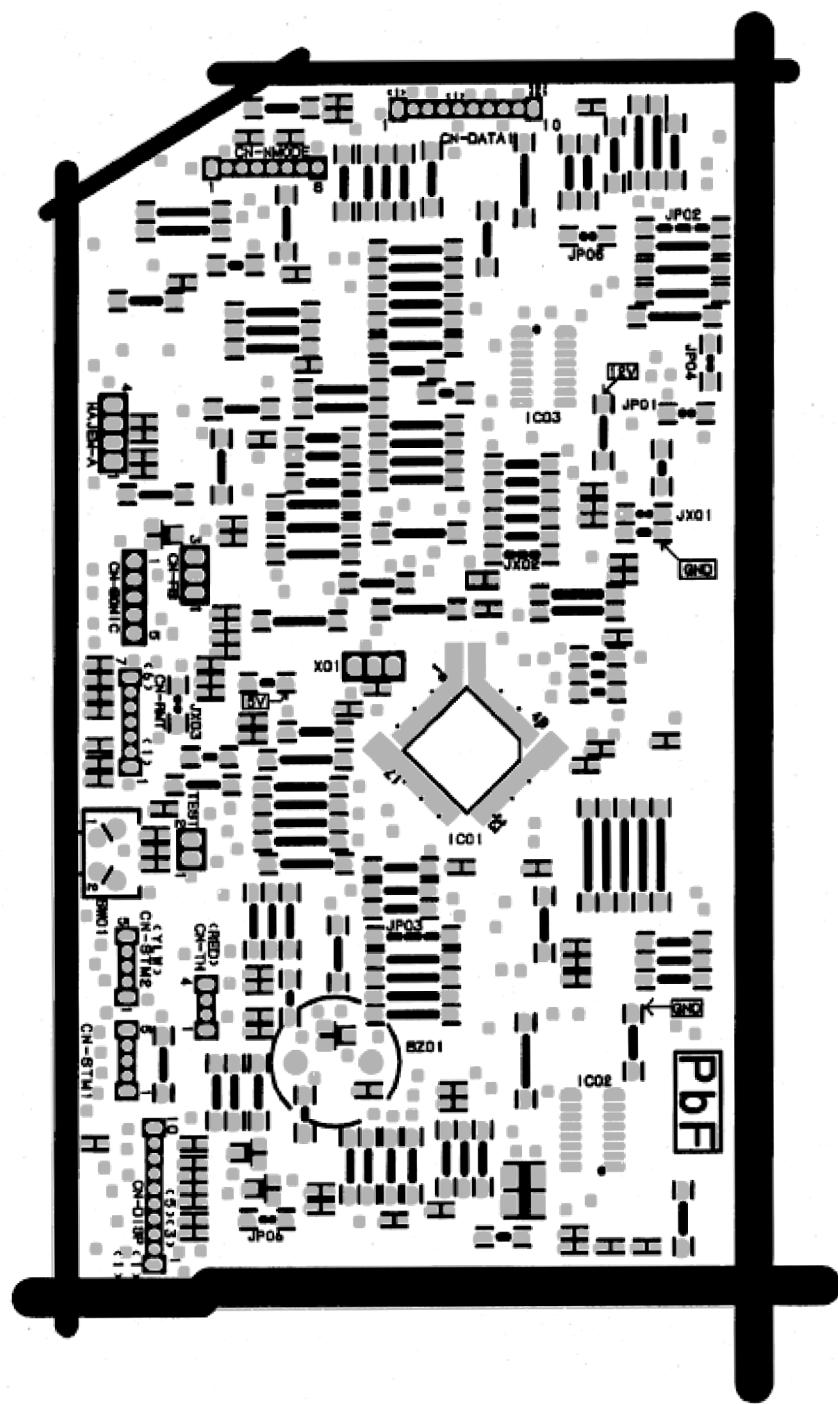
## 9 Printed Circuit Board

### 9.1. Indoor Unit

TOP VIEW

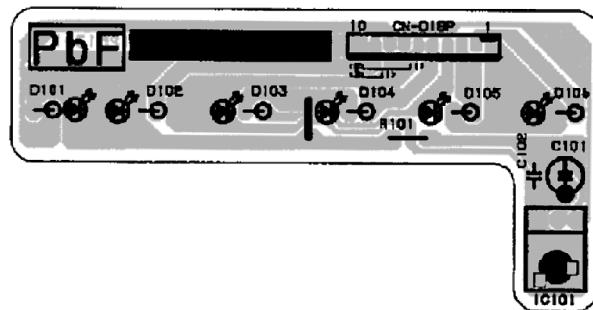


## **BOTTOM VIEW**

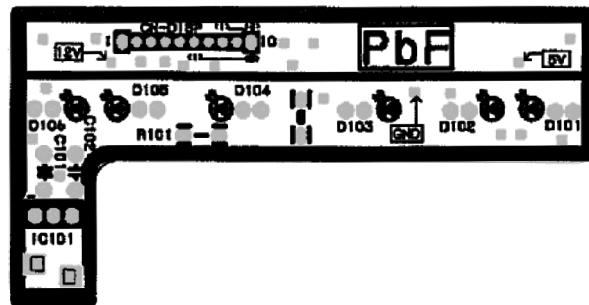


## 9.2. Indicator

### TOP VIEW

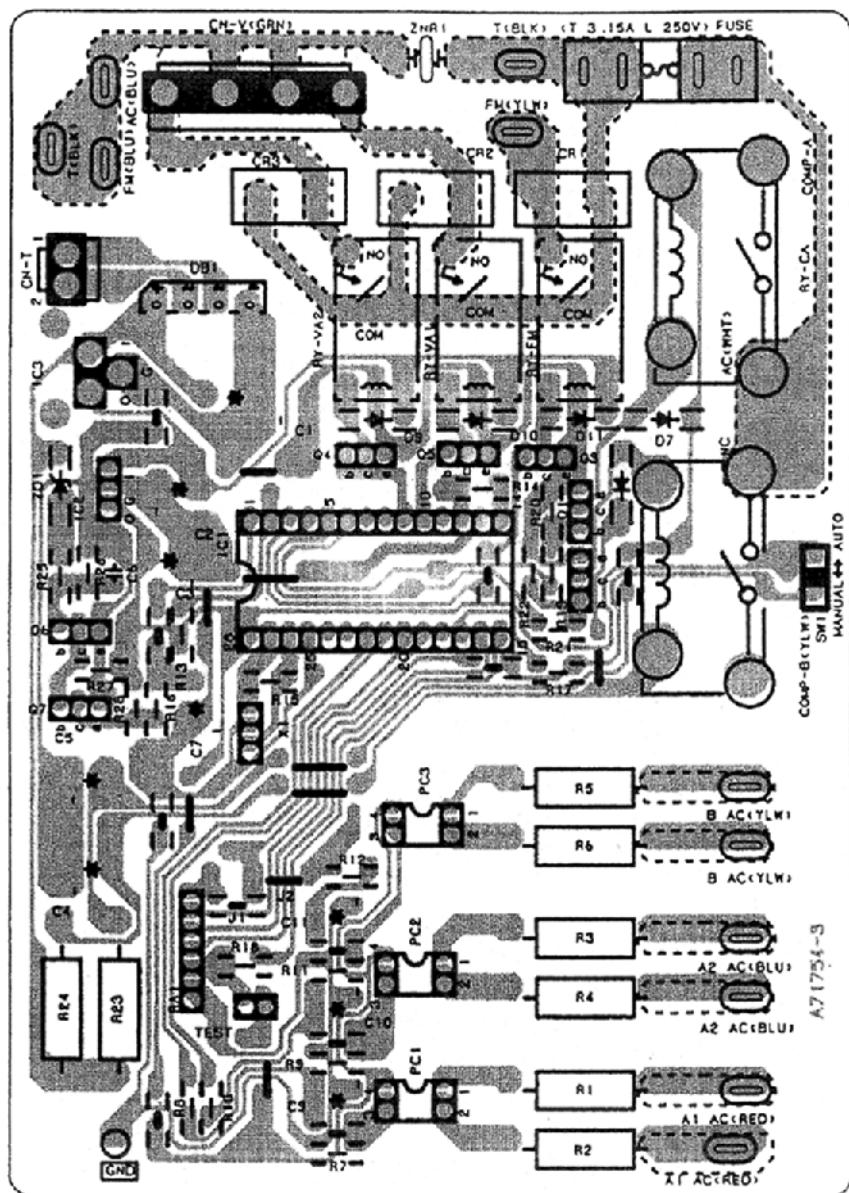


### BOTTOM VIEW



### 9.3. Outdoor Unit

**CU-3C20EKH**



# 10 Installation Instruction

## 10.1. Select The Best Location

### 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 2.5 m.

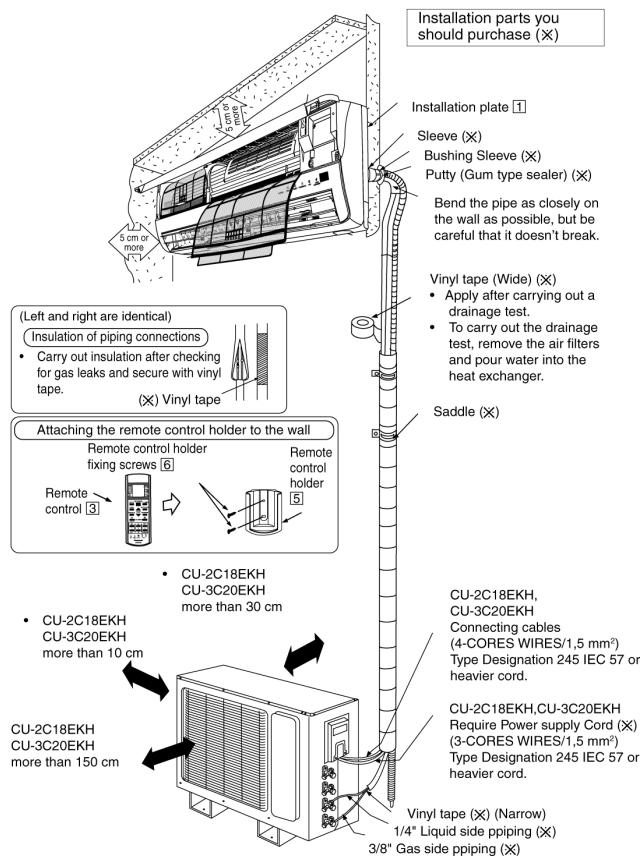
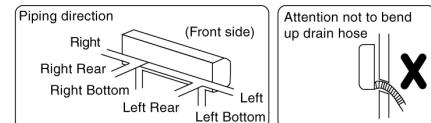
### OUTDOOR UNIT

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

Model	Piping size		Rated Length (m)	Max Elevation (m)	Max. piping Length (m)	Additional Refrigerant (g/m)
	Gas	Liquid				
CS-C9EKZW x 2 CU-2C18EKH	3/8"	1/4"	7.5	5	15	10
CS-C9EKZW x 3 CU-3C20EKH	3/8"	1/4"	7.5	5	15	10

- The above models will be installed at a 15 m (max) distance. The refrigerant should be added 75 g. (15-7.5) x 10 g=75 g

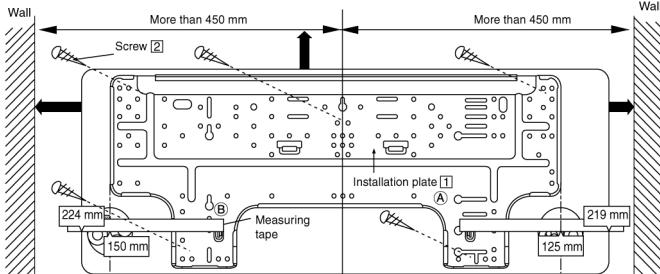
## 10.2. Indoor/Outdoor Unit Installation Diagram



## 10.3. Indoor Unit

### 10.3.1. HOW TO FIX INSTALLATION PLATE

The mounting wall is strong and solid enough to prevent it 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 67 mm.

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

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

- (B) : For left side piping, piping connection for liquid should be about 15 mm from this line.
- : For left side piping, piping connection for gas should be about 45 mm from this line.
- : For left side piping, piping connection cable should be about 800 mm from this line.

1. Mount the installation plate on the wall with 5 screws or more.

(If mounting the unit on the concrete wall consider using anchor bolts.)

- Always mount the installation plate horizontally by aligning the marking-off line with the thread and using a level gauge.

2. Drill the piping plate hole with  $\phi 70$  mm hole-core drill.

- Line according to the left and right side of the installation plate. The meeting point of the extended line is the 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 150 mm and 125 mm for left and right hole respectively.

- Drill the piping hole at either the right or the left and the hole should be slightly slanted to the outdoor side.

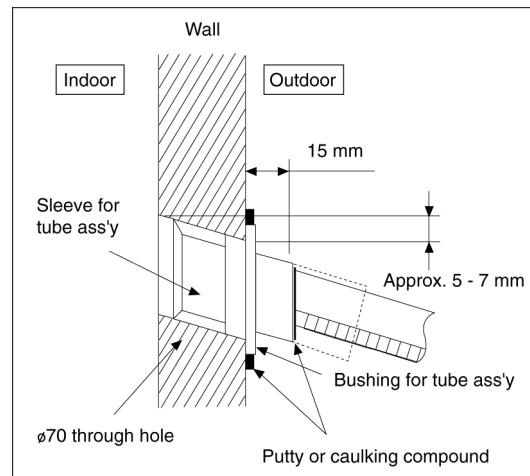
### 10.3.2. TO DRILL A HOLE IN THE WALL AND INSTALL A SLEEVE OF PIPING

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



### 10.3.3. INDOOR UNIT INSTALLATION

#### 1. For the right rear piping

```
Pull out the Indoor piping
↓
Install the Indoor Unit
↓
Secure the Indoor Unit
↓
Insert the connecting cable
```

#### 2. For the right and right bottom piping

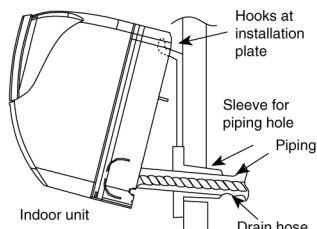
```
Pull out the Indoor piping
↓
Install the Indoor Unit
↓
Insert the connecting cable
↓
Secure the Indoor Unit
```

### 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 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 of outdoor section and "Insulation of piping connections" column as mentioned in Indoor/Outdoor Unit Installation.
- Secure the Indoor Unit

#### Install the indoor unit

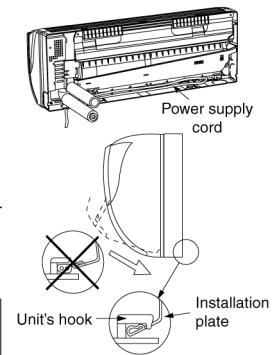
Hook the indoor unit onto the upper portion of installation plate. (Engage the indoor unit with the upper edge of the installation plate). Ensure the hooks are properly seated on the installation plate by moving it in left and right.



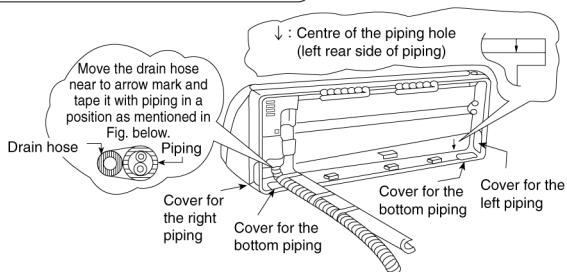
#### Secure the Indoor Unit

- 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.
- 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.



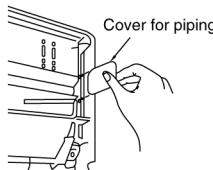
#### Pull out the piping and drain hose



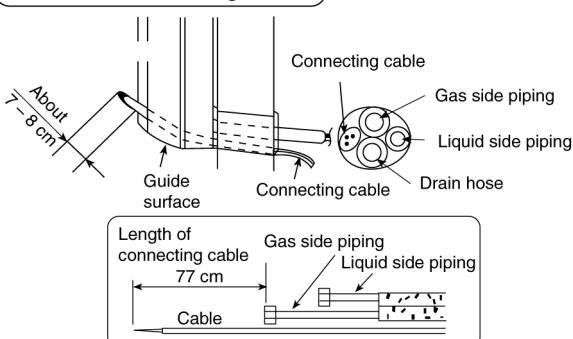
#### How to keep the cover

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

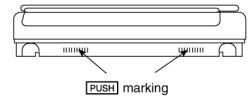
(Left, right and 2 bottom covers for piping.)



#### Insert the connecting cable



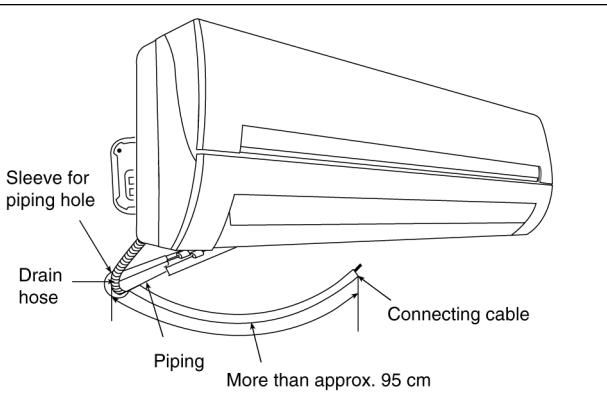
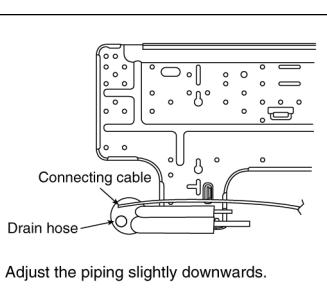
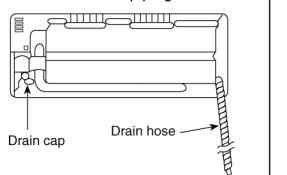
To take out the unit, push the **PUSH** marking at the bottom unit, and pull it slightly towards you to disengage the hooks from the unit.

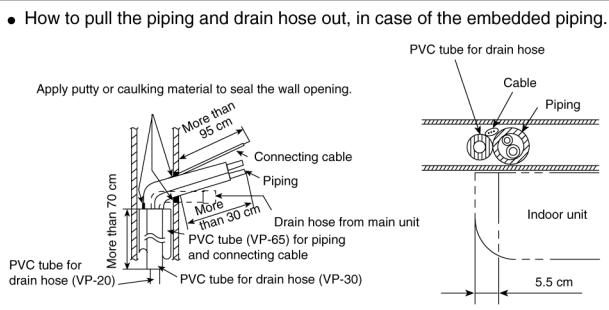


(This can be used for left rear piping and left bottom piping also.)

#### Exchange the drain hose and the cap

##### Rear view for left piping installation



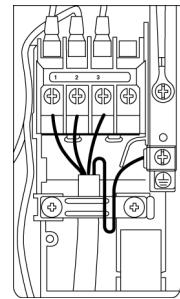


#### 10.3.4. CONNECT THE CABLE TO THE INDOOR UNIT

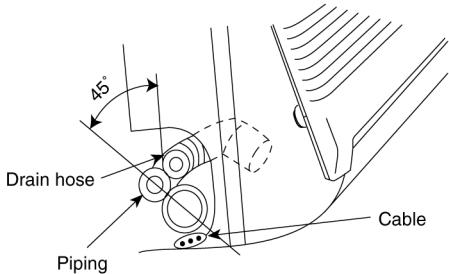
- The inside and outside connecting cable can be connected without removing the front grille.
- Connecting cable between indoor unit and outdoor unit shall be approved polychloroprene sheathed  $4 \times 1.5 \text{ mm}^2$  flexible cord, type designation 245 IEC 57 or heavier cord.
- Ensure the colour of wires of outdoor unit and the terminal Nos. are the same to the indoor's respectively.
- 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.

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

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



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

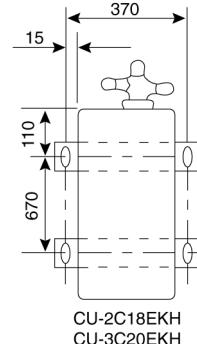


(For the right piping, follow the same procedure)

## 10.4. Outdoor Unit

### 10.4.1. INSTALL THE OUTDOOR UNIT

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



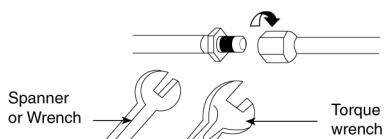
### 10.4.2. CONNECTING THE PIPING

#### 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
CS-C9EKZW	3/8" [42 N·m]	1/4" [18 N·m]

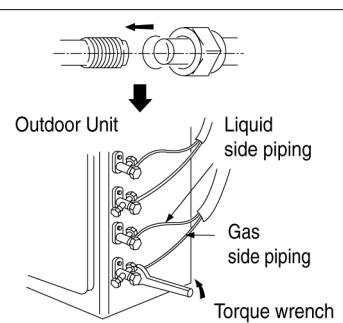
#### Connecting The Piping To Outdoor Unit

- Align the center of the piping and sufficiently tighten the flare nut with fingers.
- Finally, tighten the flare nut with torque wrench until the wrench clicks.
- When tightening the flare nut with torque wrench, ensure the direction for tightening follows the arrow on the wrench.

**CAUTION :** The CU-3C20EKH/C9EKH have different cooling capacities depending on the connection to A<sub>1</sub> A<sub>2</sub> and/or B on CU-3C20EKH individually.

(Refer to SPECIFICATIONS on CATALOG)

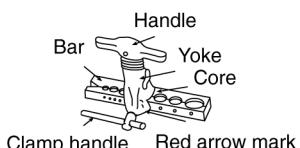
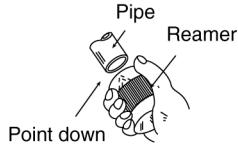
- The Cooling Capacity of Indoor Unit connecting "B" on CU-3C20EKH (Called B unit) is different from that of A<sub>1</sub> and A<sub>2</sub> Units.
- A<sub>1</sub> and A<sub>2</sub> Units share the same compressor, their cooling capacities thus change depending on whether one, the other, or both of the units is in use.
- Reflect the B or A (A<sub>1</sub> and/or A<sub>2</sub>) on the Indoor Unit for later reference.



#### CUTTING AND FLARING THE PIPING

- Please cut using pipe cutter and then remove the burrs.
- Remove the burrs by using reamer. If burrs is not removed, gas leakage may be caused.
- Turn the piping end down to avoid the metal powder entering the pipe.

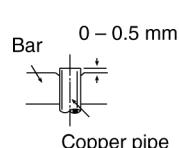
3. Please make flare after inserting the flare nut onto the copper pipes.



1. To cut

2. To remove burrs

3. To flare



#### ■ Improper flaring ■

Inclined Surface Cracked Uneven damaged thickness

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.

### 10.4.3. AIR PURGING OF THE PIPINGS AND INDOOR UNIT

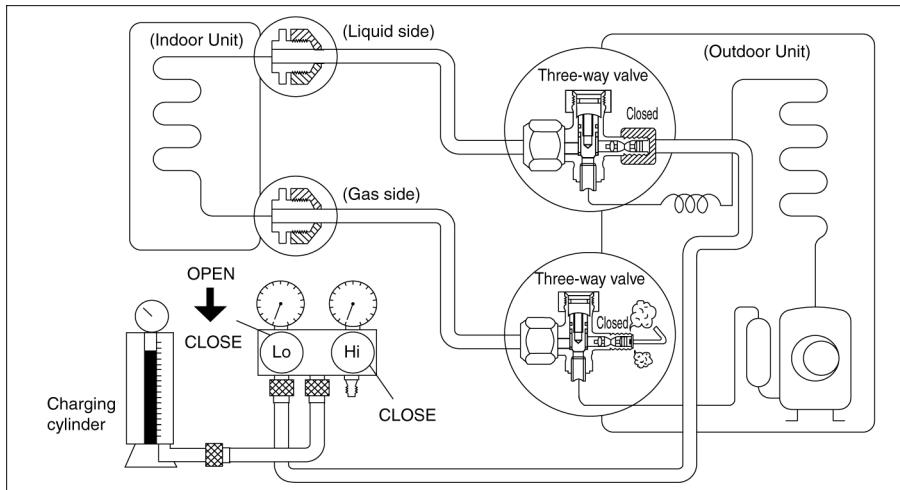
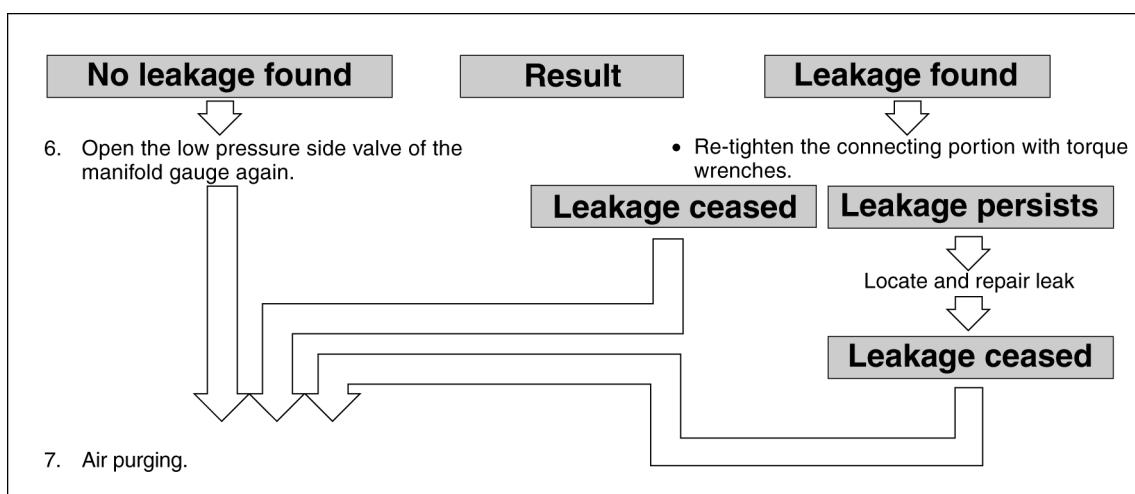
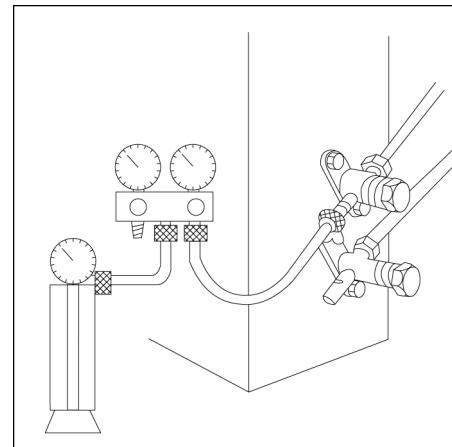
#### 1) Checking a gas leakage

1. Remove the service port cap from 3-way valves.
2. Connect the Manifold gauge set to the service port of liquid side 3-way valve.
3. Connect the Charging Cylinder to the Manifold gauge set and open the valve of the Cylinder.
4. Open the low pressure side valve of the Manifold gauge for approx.10 seconds and then close.
5. Check gas-leakage of the connecting portion of pipings with the gas-leak detector.

<For the left pipings>

- 1) Measure the pressure.
- 2) Keep it for 5-10 minutes.

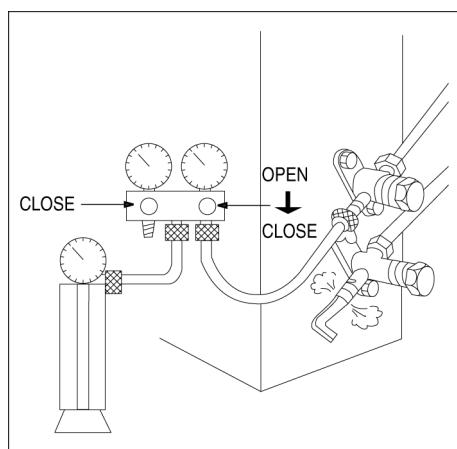
- Ensure if the pressure indicated on the gauge is as same as that of measured at first time.



#### 2) Air Purging

The air remaining in the Refrigeration cycle which contains moisture may cause malfunction on the Compressor.

1. To purge the air, push the pin on the Gas side 3-way valve for three seconds with a Hexagonal wrench and set it free for one minute.
- Repeat this for three times.
2. To balance the refrigerant, close the low pressure side valve on the Manifold gauge and release refrigerant from the piping through service port until the gauge indicates 0.49 -0.294MPa.
3. Set both 3-way valves to open position with the Hexagonal wrench for the unit operation.

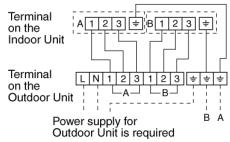


#### 10.4.4. CONNECT THE CABLE TO THE OUTDOOR UNIT

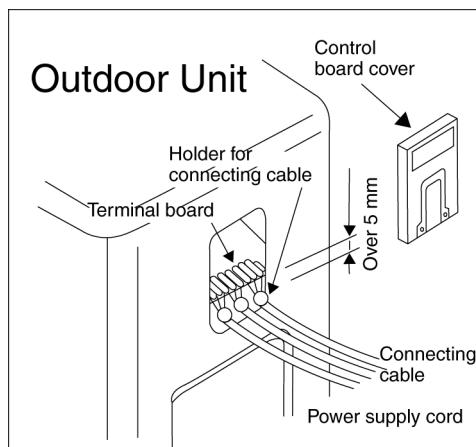
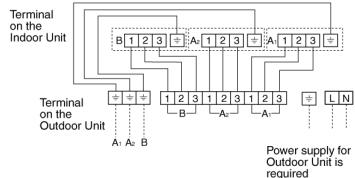
1. Remove the control board cover from the unit by loosening the screw.
2. Connecting cable between indoor unit and outdoor unit shall be approved polychloroprene sheathed flexible cord, type designation 245 IEC 57 or heavier cord (4 x 1.5 mm<sup>2</sup>).

Power supply cord cable use 3 x 1.5 mm<sup>2</sup> flexible cord, type designation 245 IEC 57 or heavier cord.

• CU-2C18EKH/CS-C9EKZW



• CU-3C20EKH/CS-C9EKZW

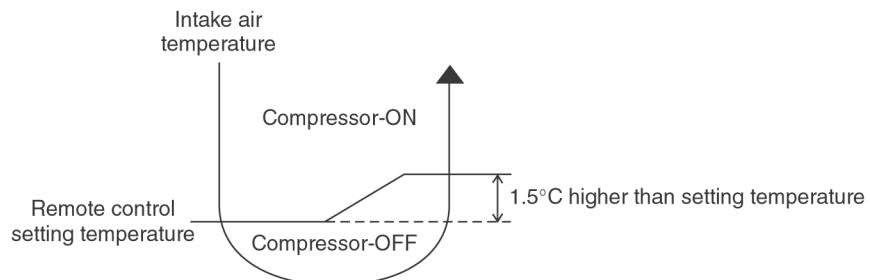


3. Secure the cable onto the control board with the holder (clamper).
4. Confirm the SW1 Switch at AUTO position. (CU-3C20EKH)
5. Attach the control cover back to the original position with the screw.

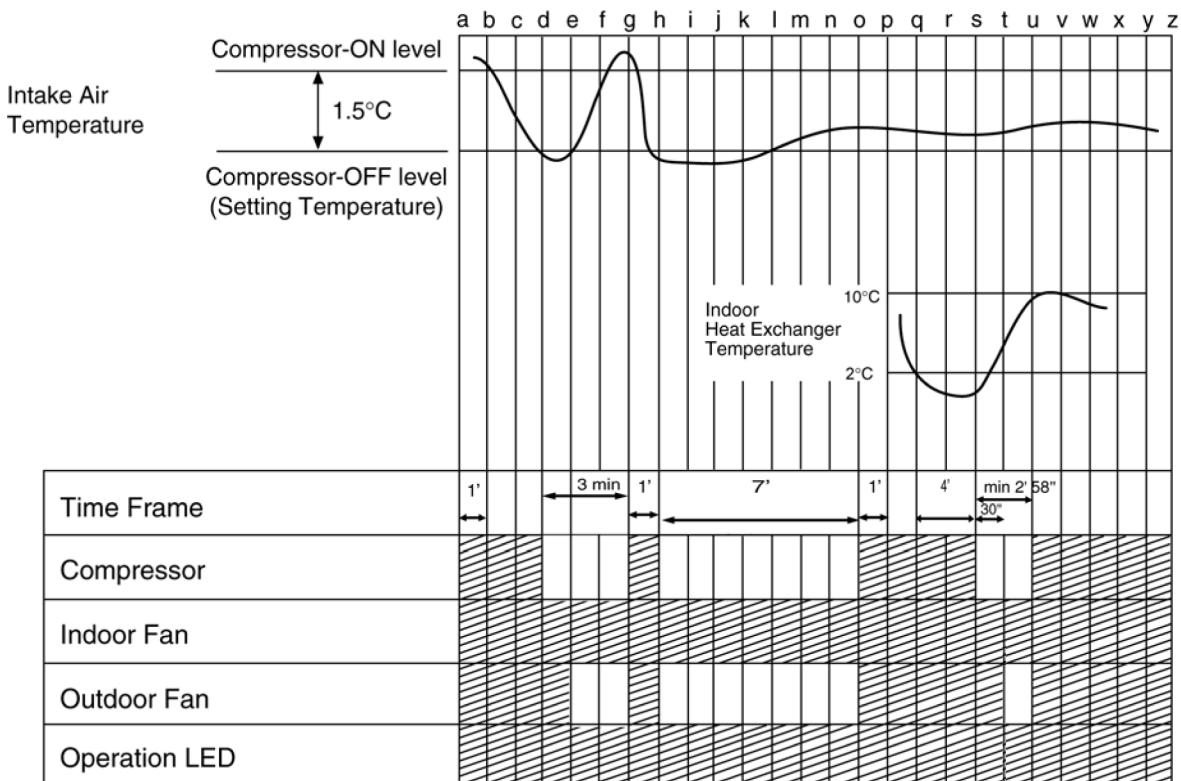
# 11 Operation And Control

## 11.1. Cooling Operation

- Cooling operation can be set using remote control.
- This operation is applied to cool down the room temperature reaches the setting temperature set on the remote control.
- The remote control setting temperature, which takes the reading of intake air temperature sensor, can be adjusted from 16°C to 30°C.
- During cooling operation, the compressor will stop running and restart as shown in below figure.



### 11.1.1. Cooling Operation Time Diagram



#### <Description of operation>

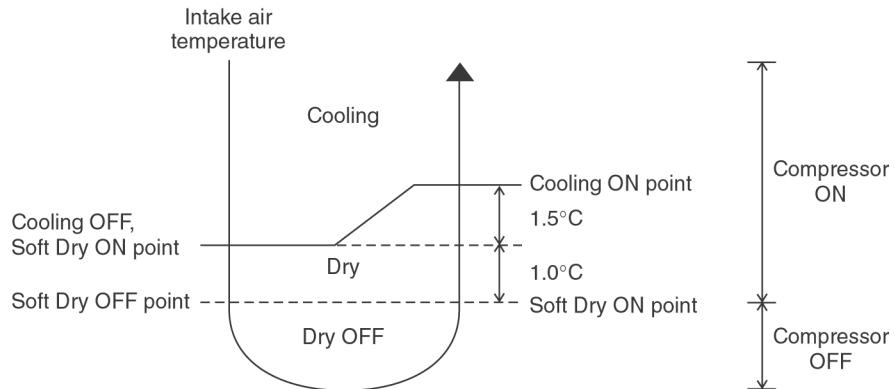
a - b, g - h	: Minimum 60 seconds forced operation
d - g, s - u	: Minimum 3 minutes restart control (Time Delay Safety Control)
h - o	: Maximum 7 minutes time save control
q - u	: Anti-Freezing Control

Operation

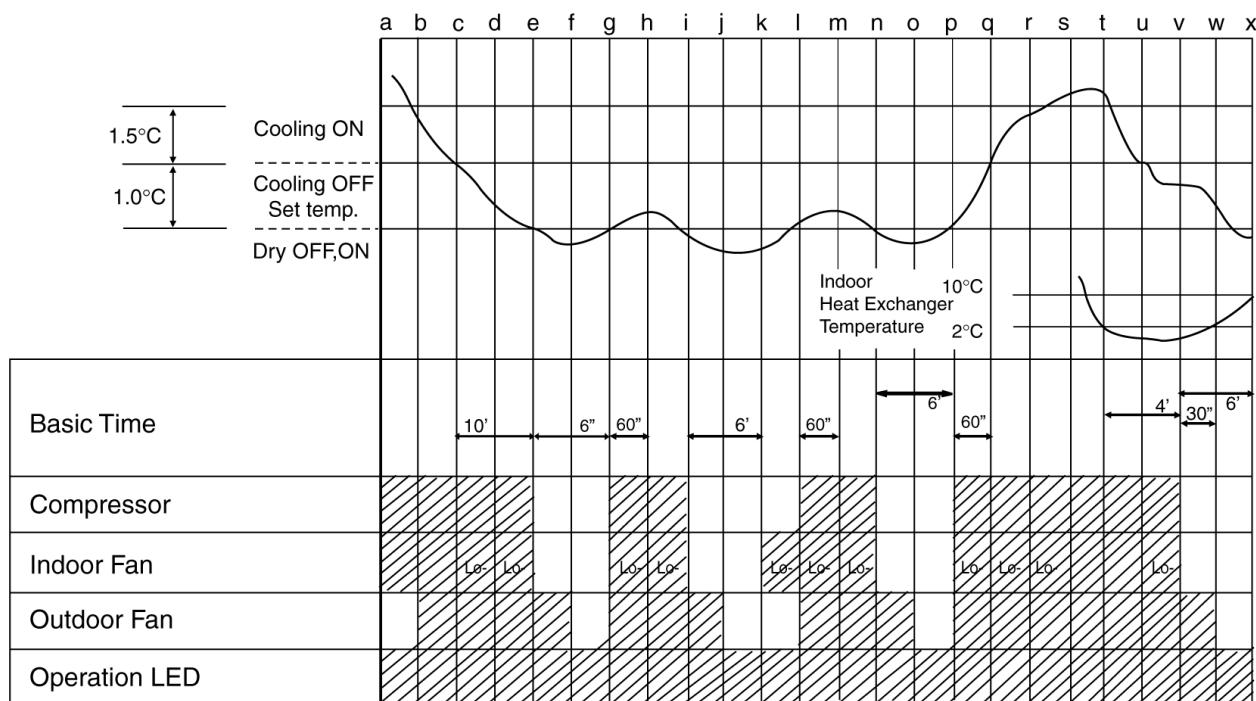
Stop

## 11.2. Soft Dry Operation

- Soft Dry operation can be set using remote control.
- Soft Dry operation is applied to dehumidify and to perform a gentle cooling to the room.
- This operation starts when the intake air temperature sensor reaches the setting temperature on the remote control.
- When operation begins, Soft Dry will be switched “ON” for a maximum 10 minutes, then Soft Dry operation will be turned “OFF” for a minimum 6 minutes. After that, the Soft Dry operation will be “ON” and “OFF” based on the setting temperature as shown in below figure.
- However after 3 minutes of compressor off, during Soft Dry “OFF” (within 6 minutes Soft Dry restart control), the indoor unit will start to operate at normal Cooling mode if the intake temperature is higher than Cooling “ON” point.



### 11.2.1. Soft Dry Operation Time Diagram



<Description of operation>

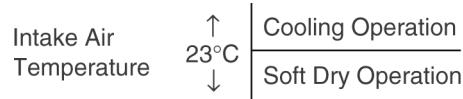
g – h, l – m, p – q,	: Minimum 60 seconds forced operation
a – c	: Minimum 3 minutes restart control (Time Delay Safety Control) - Cooling operation
e – g, n – o	: Minimum 6 minutes restart control (Time Delay Safety Control) - Soft dry operation
t – x	: Anti-Freezing Control

Operation

Stop

### 11.3. Automatic Operation

- Automatic operation can be set using remote control.
- This operation starts to operate with indoor fan at SLo speed for 20 seconds to judge the intake air temperature.
- After judged the temperature, the operation mode is determined by referring to the below standard.



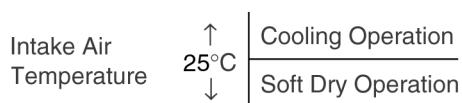
- Then, the unit start to operate at determined operation mode, until it is switched off using remote control, with the setting temperature as shown in below table.

	Setting Temperature (Standard)
Cooling Operation	25°C
Soft Dry Operation	22°C

- The setting temperature for all the operations can be changed one level up or one level down from the standard temperature as shown in below table by pressing on the temperature up or temperature down button at remote control.

			Cooling	Soft Dry
Higher	→	+2°C	27°C	24°C
Standard	→	±0°C	25°C	22°C
Lower	→	-2°C	23°C	20°C

- The operation mode judging temperature and standard setting temperature can be increased by 2°C permanently, by open the circuit of JX1 at indoor electronic controller.



	Setting Temperature (Standard)
Cooling Operation	27°C
Soft Dry Operation	24°C

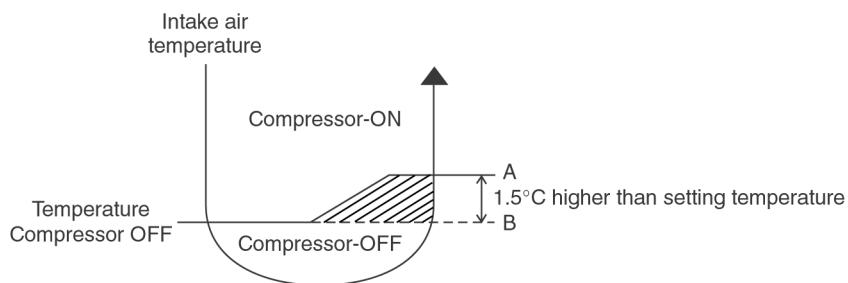
## 11.4. Operation Control

### 11.4.1. Restart Control (Time Delay Safety Control)

- When the thermo-off temperature (temperature which compressor stops to operate) is reached during:-
  - Cooling operation - the compressor stops for 3 minutes (minimum) before resume operation.
  - Soft Dry operation - the compressor stops for 6 minutes (minimum) before resume operation.
- If the operation is stopped by the remote control, the compressor will not turn on within 3 minutes from the moment operation stop, although the unit is turn on again within the period.
- This phenomenon is to balance the pressure inside the refrigerant cycle.

### 11.4.2. 7 Minutes Time Save Control

- The compressor will start automatically if it has stopped for 7 minutes and the intake air temperature falls between the compressor ON temperature (A) and compressor OFF temperature (B) during the period.
- This phenomenon is to reduce the built up humidity inside a room.



### 11.4.3. 60 Seconds Forced Operation

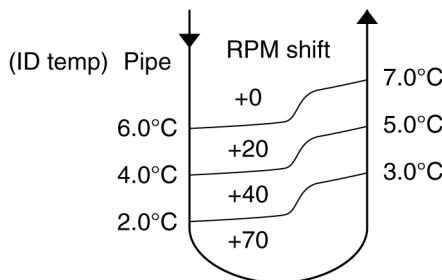
- Once the air conditioner is turned on, the compressor will not stop within 60 seconds in a normal operation although the intake air temperature has reached the thermo-off temperature. However, force stop by pressing the OFF/ON operation button at the remote control is permitted.
- The reason for the compressor to force operate at minimum 60 seconds is to allow the refrigerant oil run in a full cycle and return back to the outdoor unit.

### 11.4.4. Starting Current Control

- When the compressor, outdoor fan motor and indoor fan motor are simultaneously started, the indoor fan motor will start to operate at 1.6 second later.
- The reason of the difference is to reduce the starting current flow.

### 11.4.5. Freeze Prevention Control

- To protect indoor heat exchanger from freezing and to prevent higher volume of refrigerant in liquid form return to compressor.
- This control will activate when the temperature of indoor heat exchanger falls below 2°C continuously for more than 4 minutes.
- The current fan speed will change to freeze prevention speed after 70 seconds compressor on. When indoor pipe temperature reaches certain temperature for 5 sec. the speed will be increased as in below figure.



- Compressor will turn off when indoor temperature falls below 2°C for more than 4 minutes. It will restart again when indoor heat exchanger temperature rises to 10°C.
- Restart control (Time Delay Safety Control) will be applied in this control.

#### 11.4.6. Compressor Reverse Rotation Protection Control

- If the compressor is operating continuously for 5 minutes or longer and the temperature difference between intake air and indoor heat exchanger is  $2.5^{\circ}\text{C}$  or less for continuous 2 minutes, compressor will stop and restart automatically.
- Time Delay Safety Control is activated before the compressor restart.



▲  $\Delta T$  = Intake air temperature - Indoor heat exchanger temperature

- This is to prevent compressor from rotate reversely when there is an instantaneous power failure.

#### 11.4.7. Dew Prevention control

- To prevent dew formation at indoor unit discharge area.
- This control will be activated if:-
  - Cooling mode or Quiet mode.
  - Remote Control setting temperature is less than  $25^{\circ}\text{C}$ .
  - Fan speed is at Low or QLo.
  - Room temperature is constant ( $\pm 1^{\circ}\text{C}$ ) for 30 minutes.
  - Compressor is continuously running.
- Fan speed and angle of horizontal louver (vertical airflow angle) will be adjusted accordingly in this control.
  - Fan speed will be increased slowly if the unit is in quiet mode but no change in normal cooling mode.
  - The angle of horizontal louver will be changed as below figure.

Operation mode		Airflow direction auto-control	Airflow direction manual control
Cooling, Soft Dry	A	$12^{\circ} \sim 32^{\circ}$	$12^{\circ}, 15^{\circ}, 20^{\circ}, 26^{\circ}, 32^{\circ}$
	B	$20^{\circ} \sim 30^{\circ}$	$22^{\circ}, 24^{\circ}, 26^{\circ}, 28^{\circ}, 30^{\circ}$

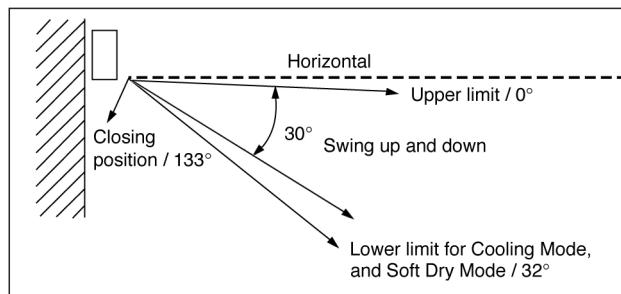
**Note:**

A = Normal operation angle of rotation

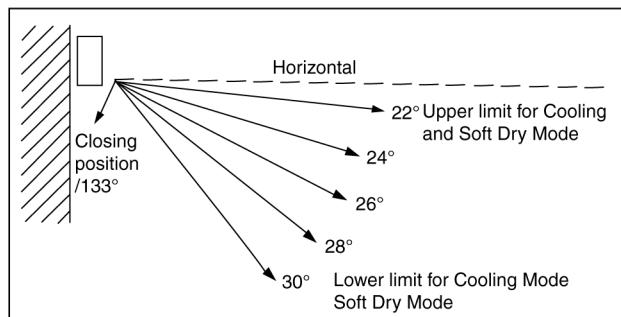
B = Dew prevention angle of rotation

##### Horizontal Louver Angle

During Anti-Dew condensation prevention, the horizontal louver angle in Auto-control are as below figure.



During Anti-Dew condensation prevention, the horizontal louver angle in Manual control are as below figure.



## 11.5. Indoor Fan Speed Control

- Indoor Fan Speed can be set using remote control.

### 11.5.1. Fan Speed Rotation Chart

Speed	Fan Speed (rpm)
CS-C9EKZW	
S Hi	1300
Hi	1210
Me	1000
H Lo	790
C Lo	730
Lo-	680
S Lo	630
Q Hi	1110
Q Me	900
Q Lo	630

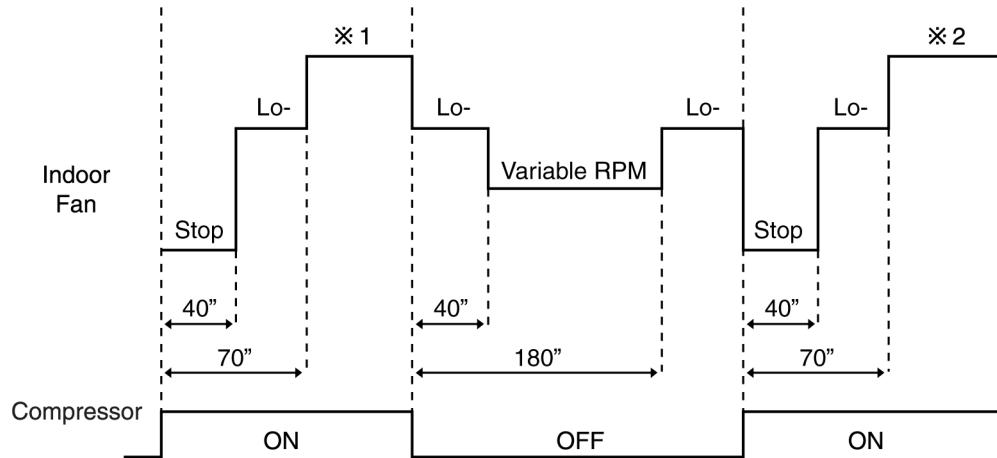
### 11.5.2. Automatic Fan Speed Control

- When set to Auto Fan Speed, the fan speed is adjusted between maximum and minimum setting as shown in the table.
  - Fan speed rotates in the range of Hi and Me.
  - Deodorizing Control will be activated.

Speed Mode			SHi	Hi	Me	HLo	CLo	Lo-	SLo	Stop
Cooling	Quiet	Manual	Hi	○						
			Me		○					
			Lo		○		○			
	Powerful	Auto		○	○			○		○
		Manual		○						
	Soft Dry	Auto		○						
		Manual						○		
		Auto						○		
Cooling	Quiet	Manual	QHi		Hi-100					
			QMe			Me-100				
			QLo					CLo-100		
	Auto				Hi-100	Me-100				
Soft Dry	Quiet	Manual								
Soft Dry	Quiet	Auto								
Mode Jugdement									○	

- Auto Fan Speed during cooling operation:

1. Indoor fan will rotate alternately between off and on as shown in below diagram.
2. At the beginning of each compressor start operation, indoor fan will increase fan speed gradually for deodorizing purpose.
3. For the first time the compressor operate, indoor fan will be switched to Hi fan speed from Lo- after 70 seconds from the start of compressor. This cause the room temperature to achieve the setting temperature quickly.
4. During compressor stop, indoor fan will operate at Lo for the beginning 3 minutes to prevent higher volume of refrigerant in liquid form returning to the compressor.
5. For the resume of compressor operation, indoor fan will operate at Me fan speed to provide comfort and lesser noise environment, after 70 seconds from the restart of compressor.

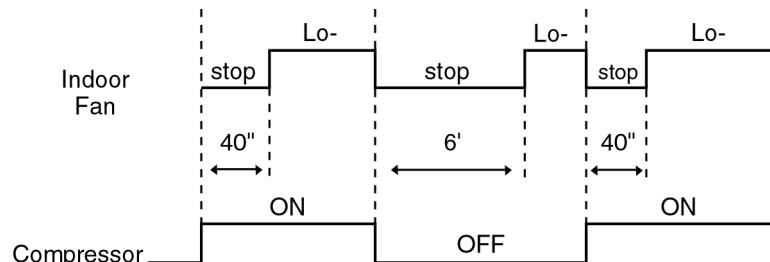


※ 1 Fan Speed is Hi until the compressor stops (when the room temperature reaches setting temperature).

※ 2 Fan Speed is Me after the compressor restarts.

- Auto Fan Speed during Soft Dry operation:

1. Indoor fan will rotate alternately between off and Lo-.
2. At the beginning of each compressor start operation, indoor fan will increase fan speed gradually for deodorizing purpose.
3. When compressor at turn off condition for 6 minutes, indoor fan will start fan speed at Lo- to circulate the air in the room. This is to obtain the actual reading of intake air temperature.



### 11.5.3. Manual Fan Speed Control

- Manual fan speed adjustment can be carried out by using the Fan Speed selection button at the remote control.
- There are 3 types of fan speed settings: Lo, Me, Hi.

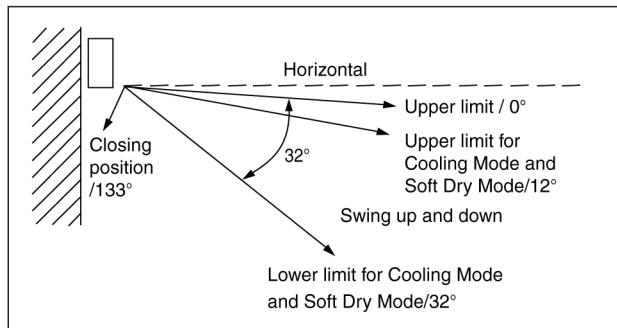
## 11.6. Outdoor Fan Speed Control

- There is only one speed for outdoor fan motor.
- When the air conditioner is turned on, the compressor and the outdoor fan will operate simultaneously.
- Likewise, both compressor and outdoor fan will stop at the same time if the unit is turned off.

## 11.7. Vertical Airflow Direction Control

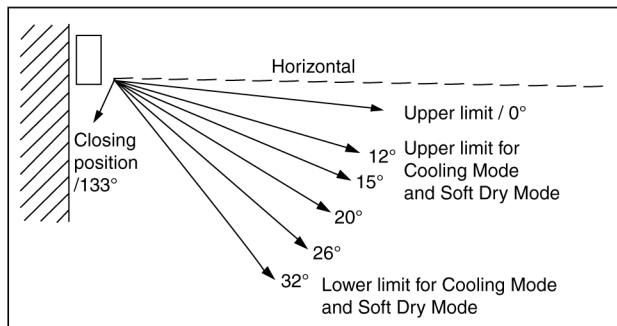
### 11.7.1. Auto Control

- When the vertical airflow direction is set to Auto using the remote control, the louver swings up and down as shown in the diagram.
- When stop operation using the remote control, the discharge vent is reset, and stop at the closing position.
- During Cooling operation or Soft Dry operation, indoor fan motor may stop to rotate at certain periods. At that condition, the louver will stop swinging and rest at the upper limit.



### 11.7.2. Manual Control

- When the vertical airflow direction is set to Manual using the remote control, the automatic airflow is released and the airflow direction louver move up and down in the range shown in the diagram.
- The louver can be adjusted by pressing the button to the desired louver position.
- When stop operation using the remote control, the discharge vent is reset, and stop at the closing position.



## 11.8. Horizontal Airflow Direction Control

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

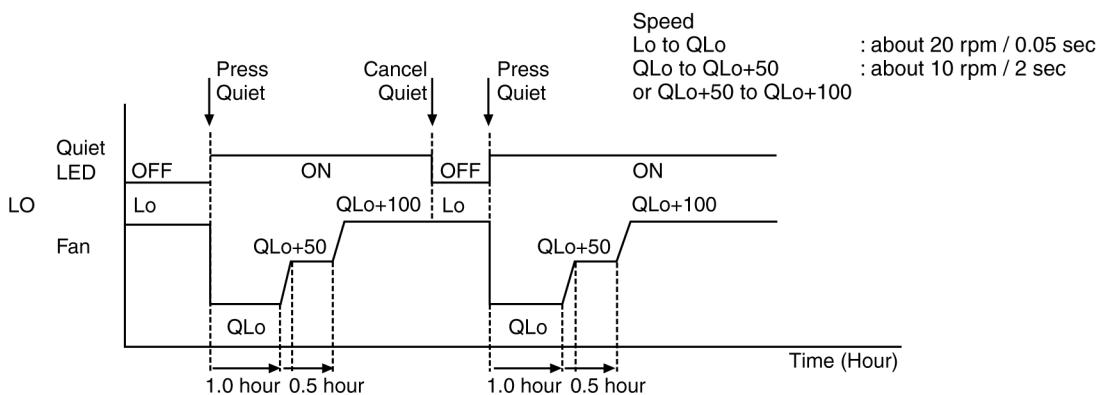
## 11.9. Powerful Operation

- To achieve the setting temperature quickly.
- When Powerful operation is set, the setting temperature will be automatically decreased 3°C internally against the present setting temperature (Lower temperature limit: 16°C).
- This operation automatically will be running under SHi fan Speed (Cooling), Lo- Fan Speed (Soft Dry).
- Vertical Airflow Direction:-
  - In "Manual" setting, the vane will automatically shift down 10° lower than previous setting.
  - In "Auto" setting, the vane will automatically swing up and down. However the lower limit will be shifted 10° downward.
- Powerful operation stops when:-
  - Powerful mode button is pressed again.
  - Powerful operation has operate for 15 minutes.
  - Stopped by OFF/ON operation button.
  - Timer OFF activates.
  - Quiet mode button is pressed.
  - Operation mode is changed.

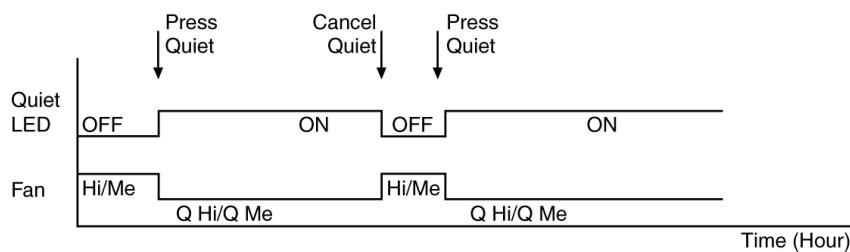
## 11.10. Quiet Operation

### (For Cooling Operation or cooling region of Soft Dry Operation)

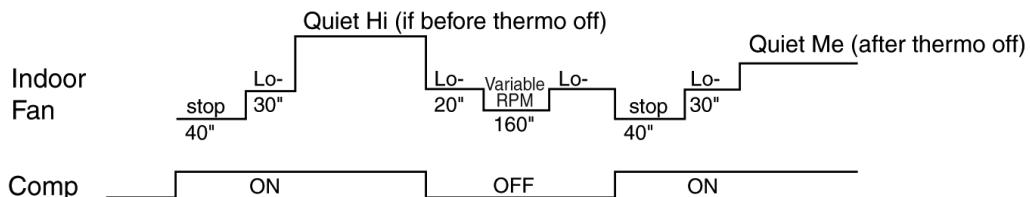
- To provide quiet/cooling operation condition compare to normal operation.
- Once the Quiet Mode is set at the remote control, the Quiet Mode LED illuminated. The sound level will reduce around 2 dB(A) for Lo fan speed or 3 dB(A) for Hi/Me fan speed against the present operation sound level.
- Dew formation become severe at Quiet Lo cool, therefore Quiet Lo cool is operated only 1hr 30 min (1hr QLo, 30 min QLo + 50 rpm). After that, it goes back to Lo cool (However Quiet LED remains on).
- Manual Airflow Direction:-
  - RPM control during Lo cool



- RPM control during Hi & Me cool



- Auto Fan Speed:-



- Quiet operation stops when:-
  - Quiet button is pressed again.
  - Stopped by OFF/ON operation button.
  - Timer OFF activates.
  - Powerful button is pressed.
  - Operation mode button is changed.

## 11.11. Timer Control

### 11.11.1. ON Timer

- When the ON Timer is set by using the remote control, the unit will start to operate slightly before the set time, so that the room will reach nearly to the set temperature by the set time.
- For Cooling and Soft Dry operation, the operation will start 15 minutes before the set time.
- For Automatic operation, the indoor fan will operate at SLo speed for 20 seconds, 30 minutes before the set time to detect the intake air temperature to determine the operation mode. The operation indication lamp will blink at this time.

### 11.11.2. OFF Timer

- When the OFF Timer is set by using the remote control, the unit will stop operate according to the desired setting.

Notes:

1. By pressing ON/OFF operation button, the ON Timer or OFF Timer setting will not be cancelled.
2. To cancel the previous timer setting, press CANCEL button.
3. To activate the previous timer setting, press SET button.
4. If main power supply is switched off, the Timer setting will be cancelled.

## 11.12. Random Auto Restart Control

- If there is a power failure during operation, the air conditioner will automatically restart after 3 to 4 minutes when the power is resumed.
- It will start with previous operation mode and airflow direction.
- If there are more than one air conditioner unit in operation and power failure occur, restart time for each unit to operate will be decided randomly using 4 parameters:- intake air temperature, setting temperature, fan speed and air swing louver position.
- This Random Auto Restart Control is not available when Timer is set.
- This control can be omitted by open the circuit of JX2. (Indoor PCB)

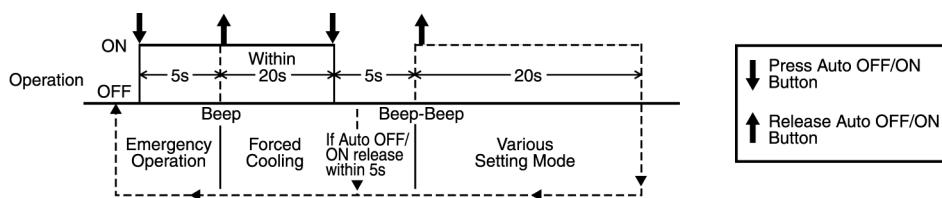
## 11.13. Remote Control Signal Receiving Sound

- Long beep sound will be heard when:-
  - Stopping the air conditioner using ON/OFF switch.
  - Stopping the Quiet Mode.
  - Stopping the Powerful Mode.
- Short beep sound will be heard for others setting.

# 12 Servicing Mode

## 12.1. Auto OFF/ON Button

- The “Auto OFF/ON Button” (behind the front grille) is used to operate the air conditioner if remote control is misplaced or malfunctioning.
- Forced cooling operation is possible by pressing the “Auto OFF/ON Button” for more than 5s where “beep” sound is heard then release the button.
- User able to select remote control transmission code and toggle remote control signal receiving sound under various setting mode.
- To enter various setting mode:
  - Press the “Auto OFF/ON Button” continuously for 5s (“beep” sound is heard) and release.
  - Within 20s, press the “Auto OFF/ON Button” continuously for 5s again (2 “beep” sound is heard) and release.
  - Various setting mode has limit up to 20s. Then return to normal operation.



### 12.1.1. Toggle Remote Control Signal Receiving Sound

- Under various setting mode, press the “Auto OFF/ON Button” to toggle the remote control sound.
  - Short “beep”: Turn ON remote control signal receiving sound.
  - Long “beep”: Turn OFF remote control signal receiving sound.
- After “Auto OFF/ON Button” is pressed, the 20s counter for various setting mode is restarted.

### 12.1.2. 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 unit 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	Transmission Code Combination		
	J - A	J - B	Remote Control No.
	Short	Open	A (Default)
	Open	Open	B
	Short	Short	C
	Open	Short	D

- Under various setting mode, after select the transmission code combination of remote control, press any button of remote control to transmit a signal to indoor unit. The transmission code will be stored in EEPROM.
- After signal is received, the various setting mode is cancelled and return to normal operation.

## 12.2. Remote Control Button

### 12.2.1. SET

- To change the type of remote control transmission signal (there are totally four types of transmission codes).
  - Modify the jumper (back of PCB) & connector (front of PCB) at remote control PCB.
  - Press with pointer for more than 10 seconds.
  - Face the transmitter towards indoor unit receiver and press the timer SET button (to send the signal) or if the timer SET button is not pressed for 30 seconds, the setting mode is cancelled.
  - Press timer CANCEL button to exit the setting mode.

## 12.2.2. CLOCK

- To change the remote control's clock-hour and minute.
  - Press once to enter the clock setting mode.
  - Use timer increment button timer decrement button to change the time.
  - Press once again to exit the setting mode.
- To change the time format (24 hours & 12 hours timer display).
  - Press for more than 5 seconds.

## 12.2.3. RESET

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

## 12.2.4. TIMER “▲”

- Press continuously for 5 seconds, LED intensity for Remote Control dimmer code is transmitted.
- Above condition will not happen when Timer is set.

## 12.2.5. TIMER “▼”

- Press continuously for 10 seconds, set the operation and display changes as Celsius or Fahrenheit.
- Above condition will not happen when Timer is set.

## 12.3. Test Mode Timer Table

Name	Time	Test Mode (When test point Short-circuited)	Remarks	
Real Timer	1 hr.	1 min.		
	10 min.	10 sec.		
	1 min.	1 sec.		
Timer Delay Safety Control	2 min. 58 sec.	0 sec.		
Forced Operation	60 sec.	0 sec.		
Timer Save Control	7 min.	4.2 sec.		
Anti-Freezing	4 min.	0 sec.		
Auto Mode Judgement	20 sec.	0 sec.		
Soft Dry	OFF	6 min.	36 sec.	
	ON	10 min.	60 sec. Soft Dry: 10 min. operation	
Deodorizing Control	Cooling	40 sec.	4 sec.	
		70 sec.	7 sec.	
		20 sec.	2 sec.	
		180 sec.	18 sec.	
	Soft Dry	40 sec.	4 sec.	
		360 sec.	36 sec.	
Comp. Reverse Rotation Detection		5 min.	30 sec. Com. ON 5 min. and above	
		2 min.	0 sec.	
Comp./ Fan Motor Delay Timer		1.6 sec.	0 sec.	
Powerful Mode Operation		15 min.	15 sec.	
Random Auto Restart Control		0 ~ 62 sec.	0 ~ 6.2 sec.	
Quiet Operation Timer		1 hr. 30 min.	9 sec.	

# 13 Troubleshooting Guide

## 13.1. Refrigeration Cycle System

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

The normal outlet air temperature and pressure of the refrigeration cycle depends on various conditions, the standard values for them are shown in the table on the right.

Normal Pressure and Outlet Air Temperature (Standard)

	Gas pressure Mpa (kg/cm <sup>2</sup> G)	Outlet air temperature (°C)
Cooling Mode	0.4 ~ 0.6 (4 ~ 6)	12 ~ 16

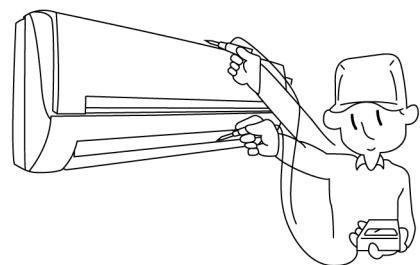
\* Condition: Indoor fan speed; High  
Outdoor temperature: 35°C

Difference in the intake  
and outlet  
air temperatures

More than 8°C  
(15 minutes after an  
operation is started.)

Normal

- Measuring the air temperature difference



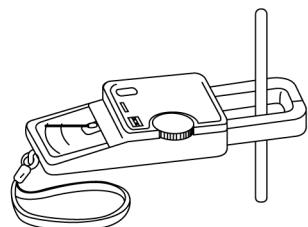
Less than 8°C at the cooling mode

Value of electric  
current during operation

Higher than specified

Dusty condenser  
preventing heat radiation

- Measuring electric current  
during operation



Lower than specified

Gas side  
pressure

Cooling Mode High

Inefficient compressor

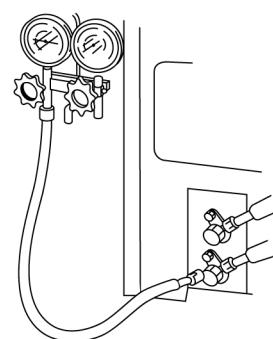
Low

Insufficient refrigerant

Low

Clogged strainer or  
capillary tube

- Measuring gas side pressure



## 13.2. Relationship Between The Condition Of The Air Conditioner And Pressure And Electric Current

Condition of the air conditioner	Cooling Mode		
	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 measurements of pressure, electric current, and temperature fifteen minutes after an operation is started.

## 13.3. Diagnosis Methods Of A Malfunction Of A Compressor

Nature of fault	Symptom
Insufficient compressing of a compressor	<ul style="list-style-type: none"> <li>• Electric current during operation becomes approximately 20% lower than the normal value.</li> <li>• The discharge tube of the compressor becomes abnormally hot (normally 70 to 90°C).</li> <li>• The difference between high pressure and low pressure becomes almost zero.</li> </ul>
Locked compressor	<ul style="list-style-type: none"> <li>• Electric current reaches a high level abnormally, and the value exceeds the limit of an ammeter. In some cases, a breaker turns off.</li> <li>• The compressor has a humming sound.</li> </ul>

# 14 Disassembly and Assembly Instructions



## WARNING

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

### 14.1. Indoor Electronic Controllers Removal Procedures

- Remove the 2 caps and 2 screws at the bottom of the Front Grille. (Fig. 1)

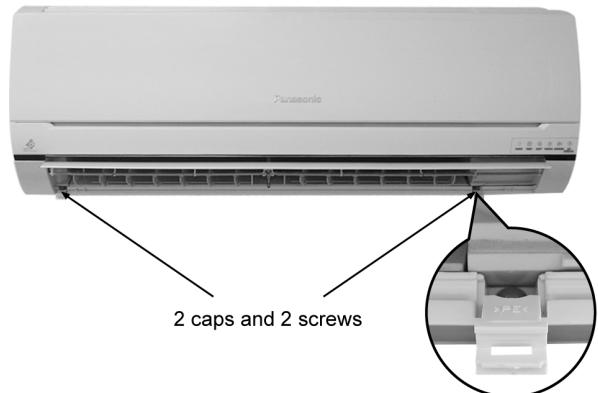


Fig. 1

- Remove the Front Grille Complete. (Fig. 2)

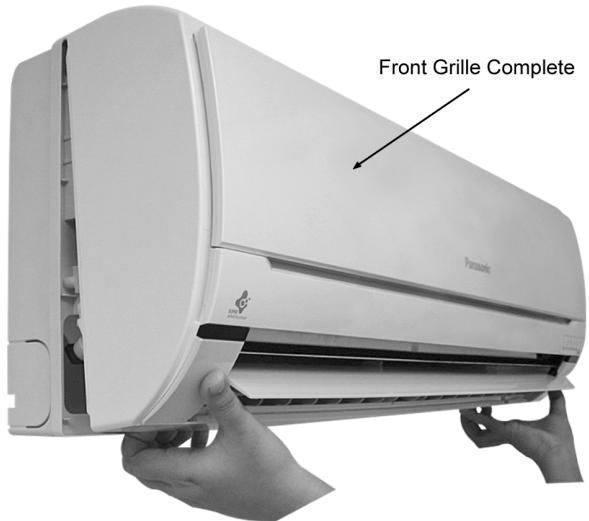


Fig. 2

- Release the taps on the top and on the right side of Control Board Front Cover. (Fig. 3)
- Then remove the Control Board Front Cover. (Fig. 3)
- Remove the Indicator Complete. (Fig. 3)

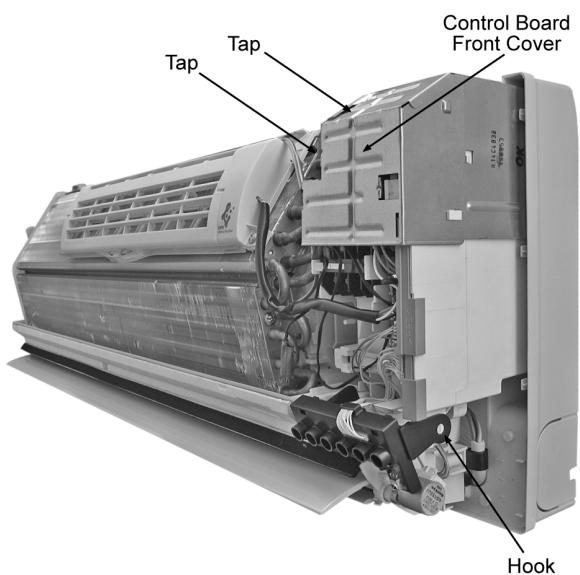


Fig. 3

- How to remove PCBs from the control board

- Pull the hook then remove the particular piece. (Fig. 4)
- Release CN-DISP. (Fig. 4)
- Release CN-STM. (Fig. 4)
- Release CN-TH. (Fig. 4)
- Release CN-SONIC. (Fig. 4)
- Release CN-FB. (Fig. 4)
- Release CN-DATA. (Fig. 4)
- Release CN-FM. (Fig. 4)
- Remove RY-PWR connector (black and brown) and AC-WHT connector from power PCB.
- Pull the hooks and remove the PCBs.

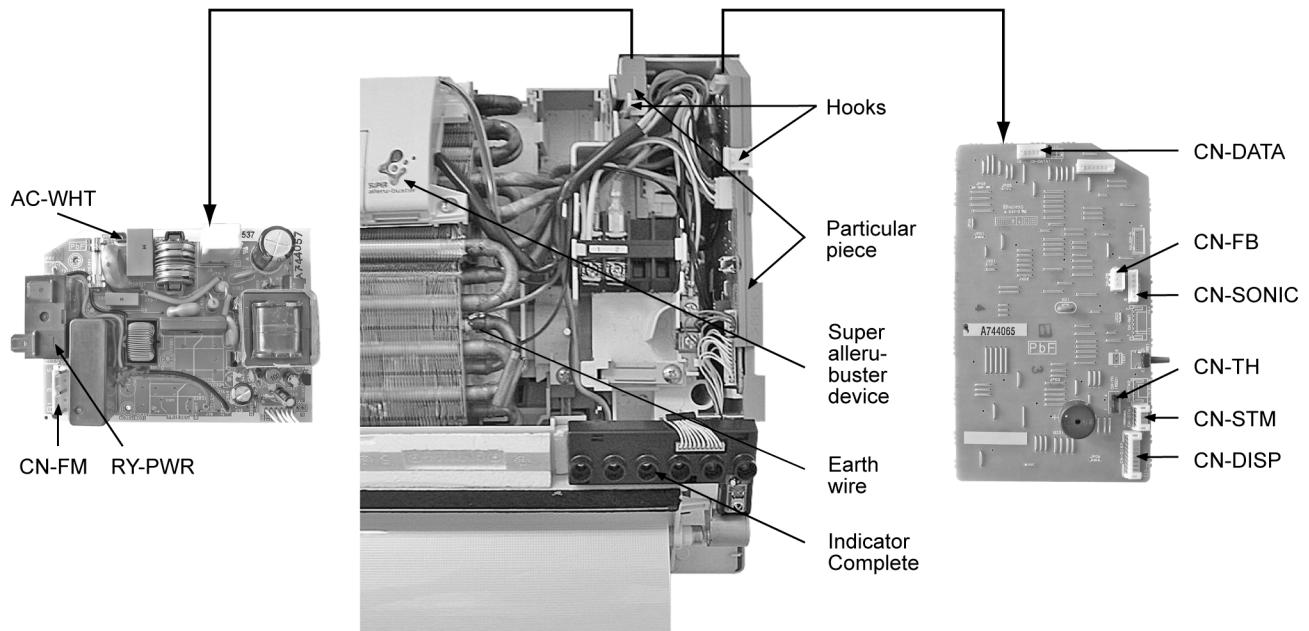


Fig. 4

## 14.2. Indoor Fan Motor and Cross Flow Fan Removal Procedures

- Pull down the Discharge Grille Complete. (Fig. 5)

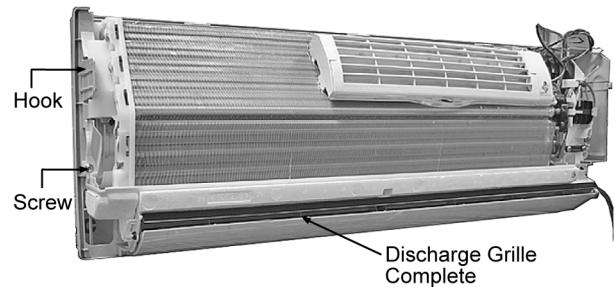


Fig. 5

- Remove the earth wire from the evaporator. (Fig. 6)
- Remove 2 screws on the right and 1 screw at the left side of control board. (Fig. 6)
- Then pull out the control board from the unit. (Fig. 6)

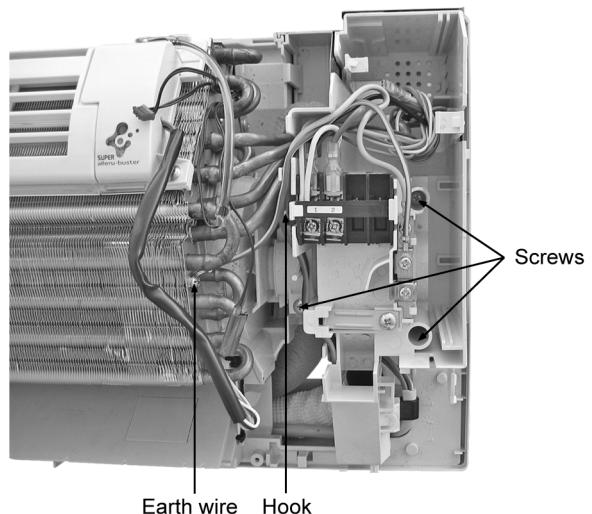


Fig. 6

- Remove the cross flow fan bushing from the chassis. (Fig. 7)
- Loosen the fan boss screw at the cross flow fan.
- Pull the hook at the left side of evaporator. (Fig. 7)

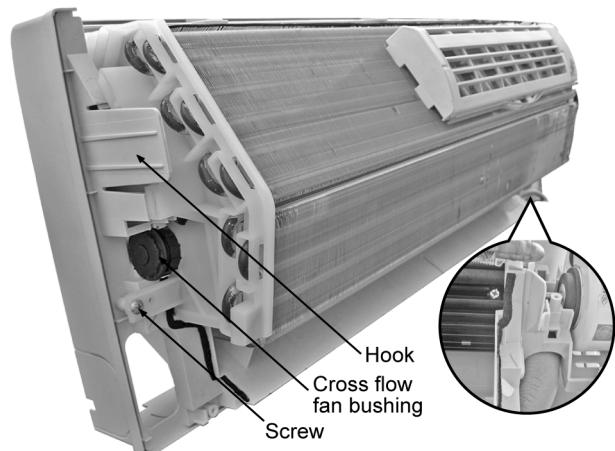


Fig. 7

- Then push up the evaporator and remove cross flow fan by pulling both cross flow fan and fan motor. (Fig. 8)

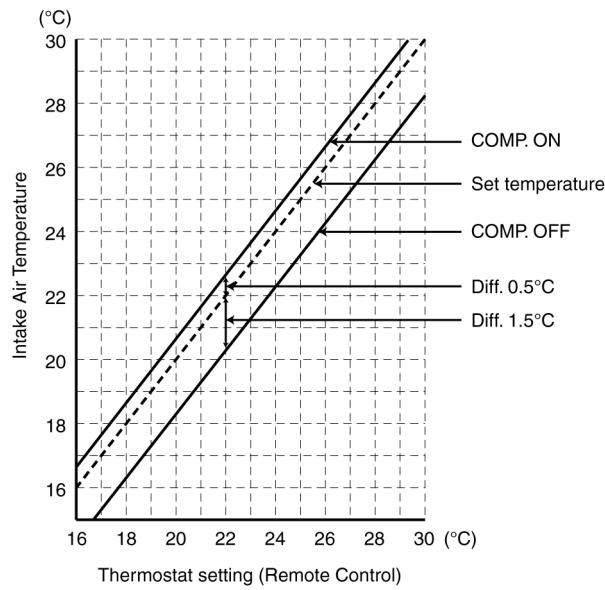


Fig. 8

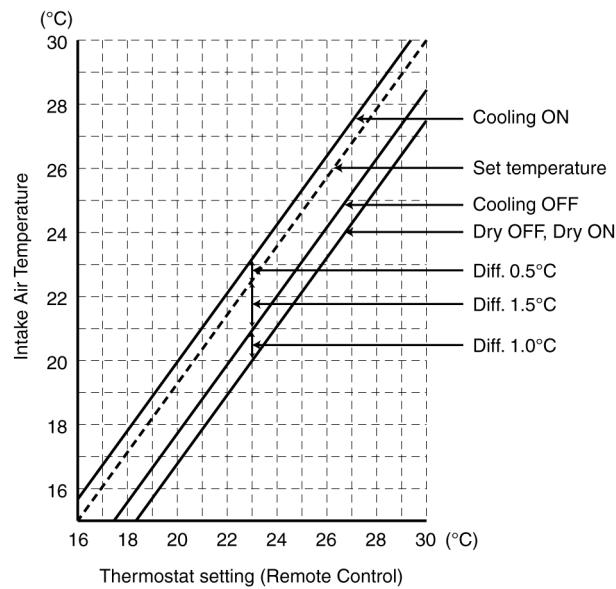
# 15 Technical Data

## 15.1. Thermostat Characteristics

### Cooling



### Soft Dry



## 15.2. Operation Characteristics

### 15.2.1. CS-C9EKZW CU-2C18EKH

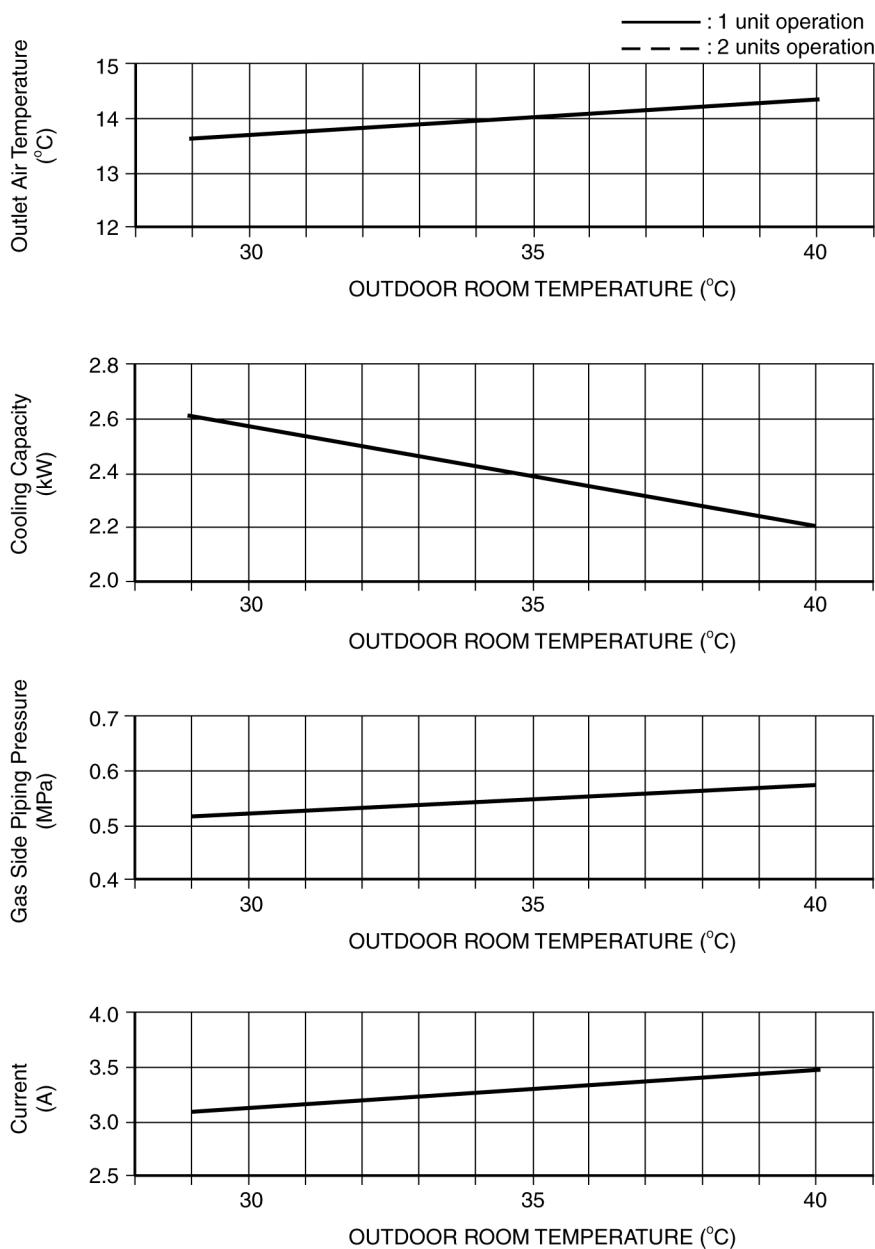
The capability value shown is the value for one unit.  
For a total for two units, multiply by 2.

[Condition] Room temperature: 27/19°C

Cooling operation: At High fan

Piping length: 5 m

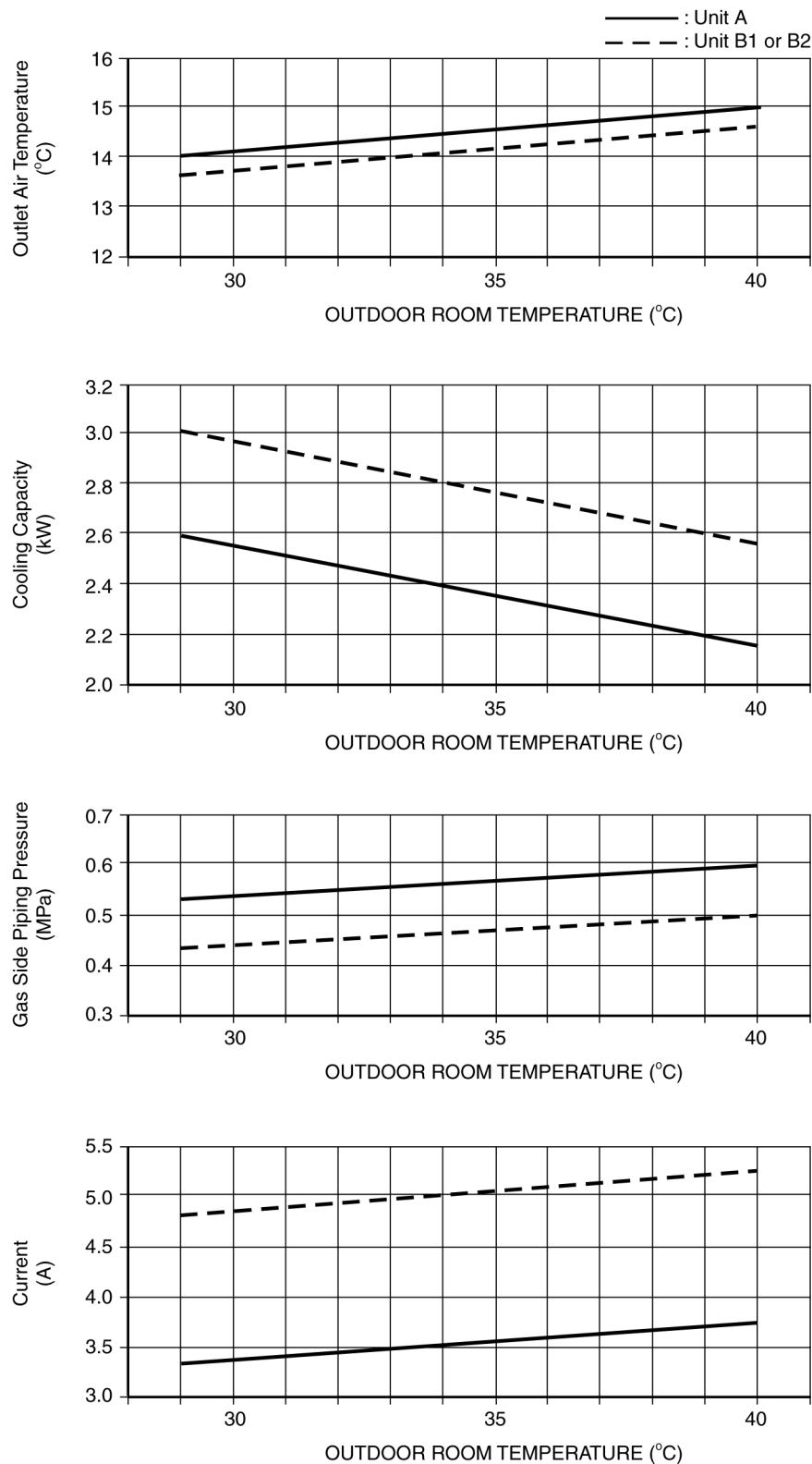
At 220V



## 15.2.2. CS-C9EKZW CU-3C20EKH

### • 1 Unit Operation

[Condition] Room temperature: 27/19°C  
Cooling operation: At High fan  
Piping length: 5 m  
At 220V



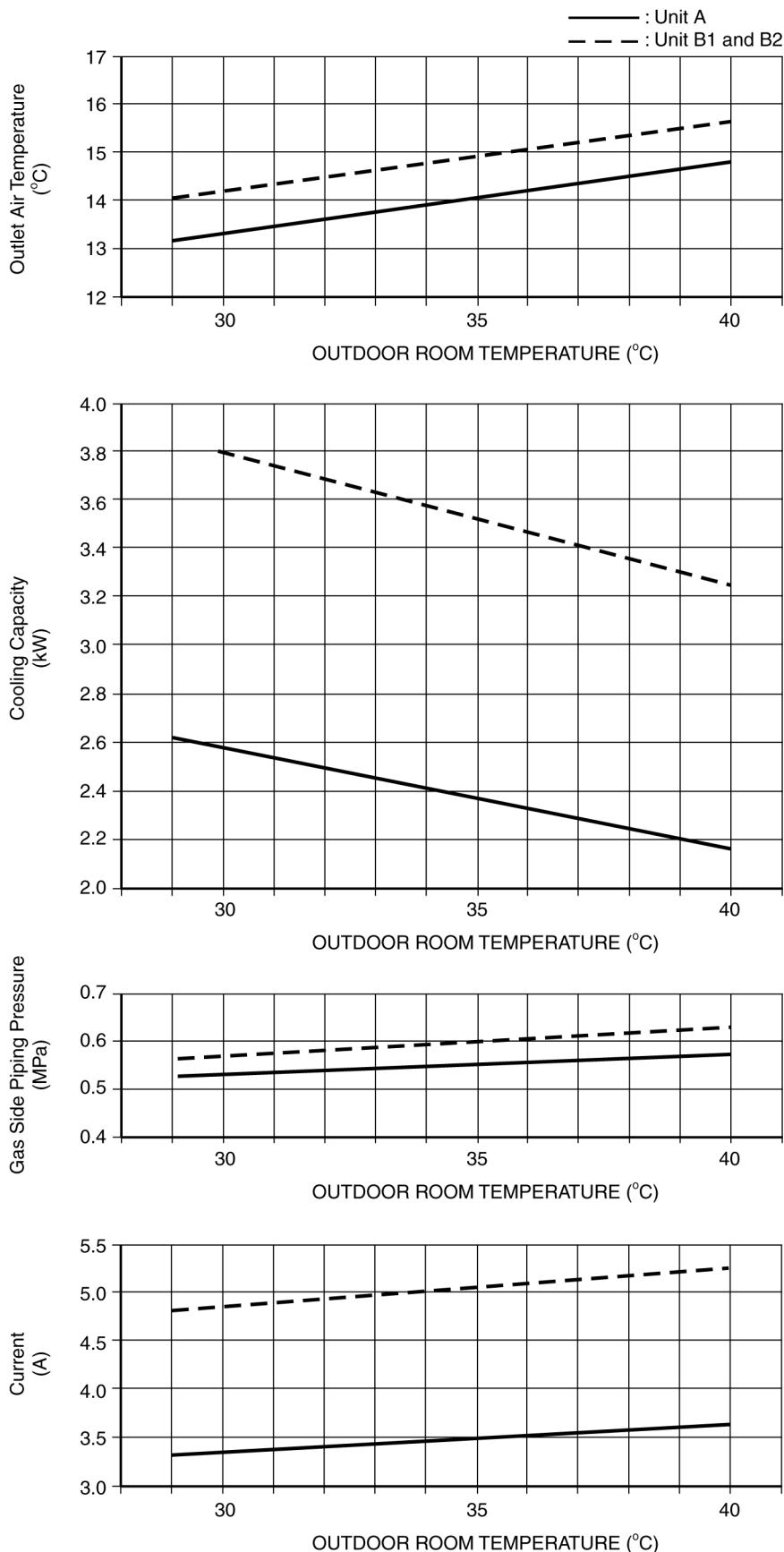
### • 3 Units Operation

[Condition] Room temperature: 27/19°C

Cooling operation: At High fan

Piping length: 5 m

At 220V



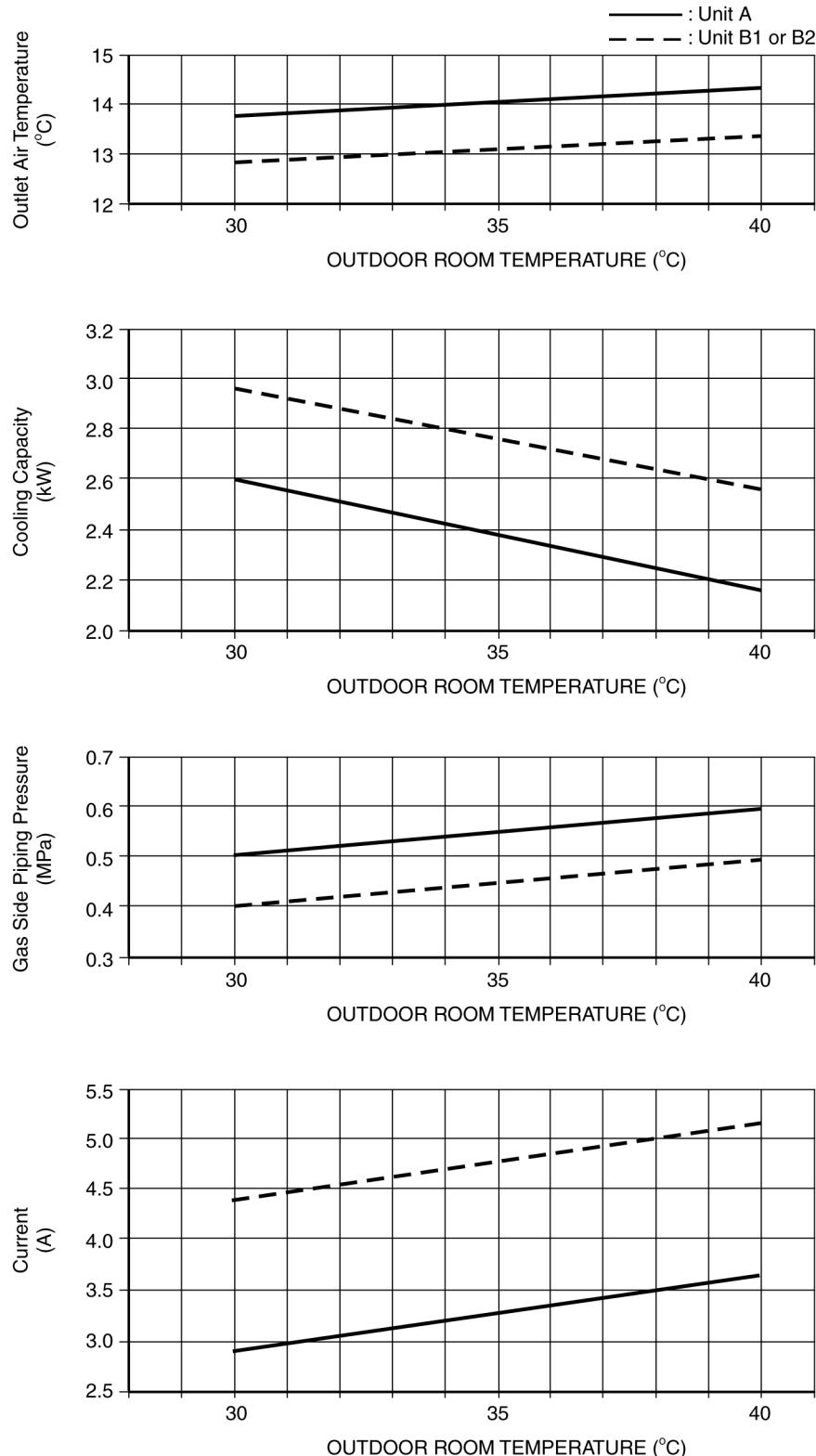
## • 2 Units Operation (A + B1 or B2)

[Condition] Room temperature: 27/19°C

Cooling operation: At High fan

Piping length: 5 m

At 220V



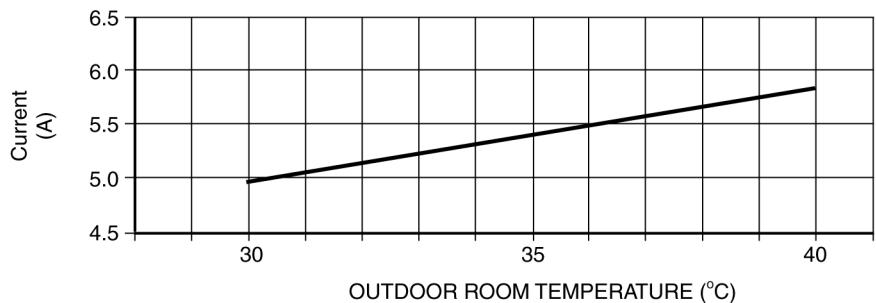
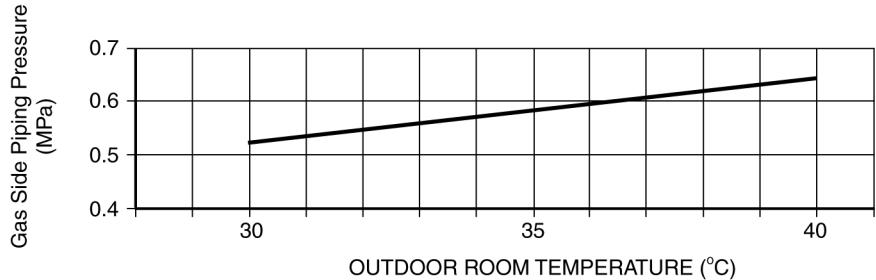
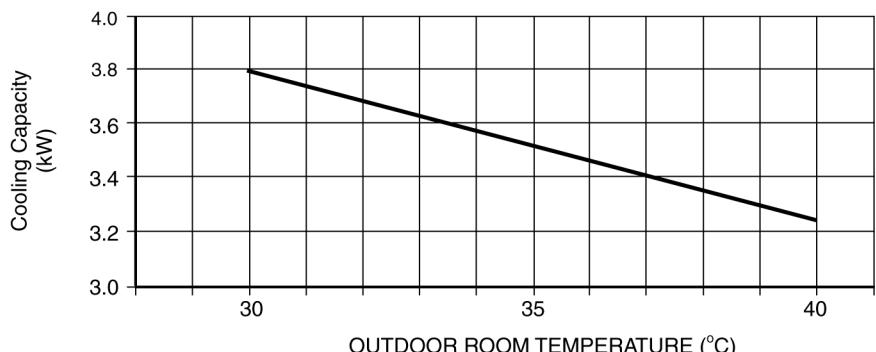
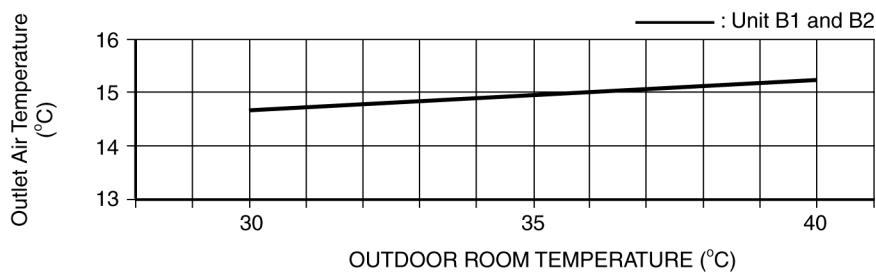
## • 2 Units Operation (B1 + B2)

[Condition] Room temperature: 27/19°C

Cooling operation: At High fan

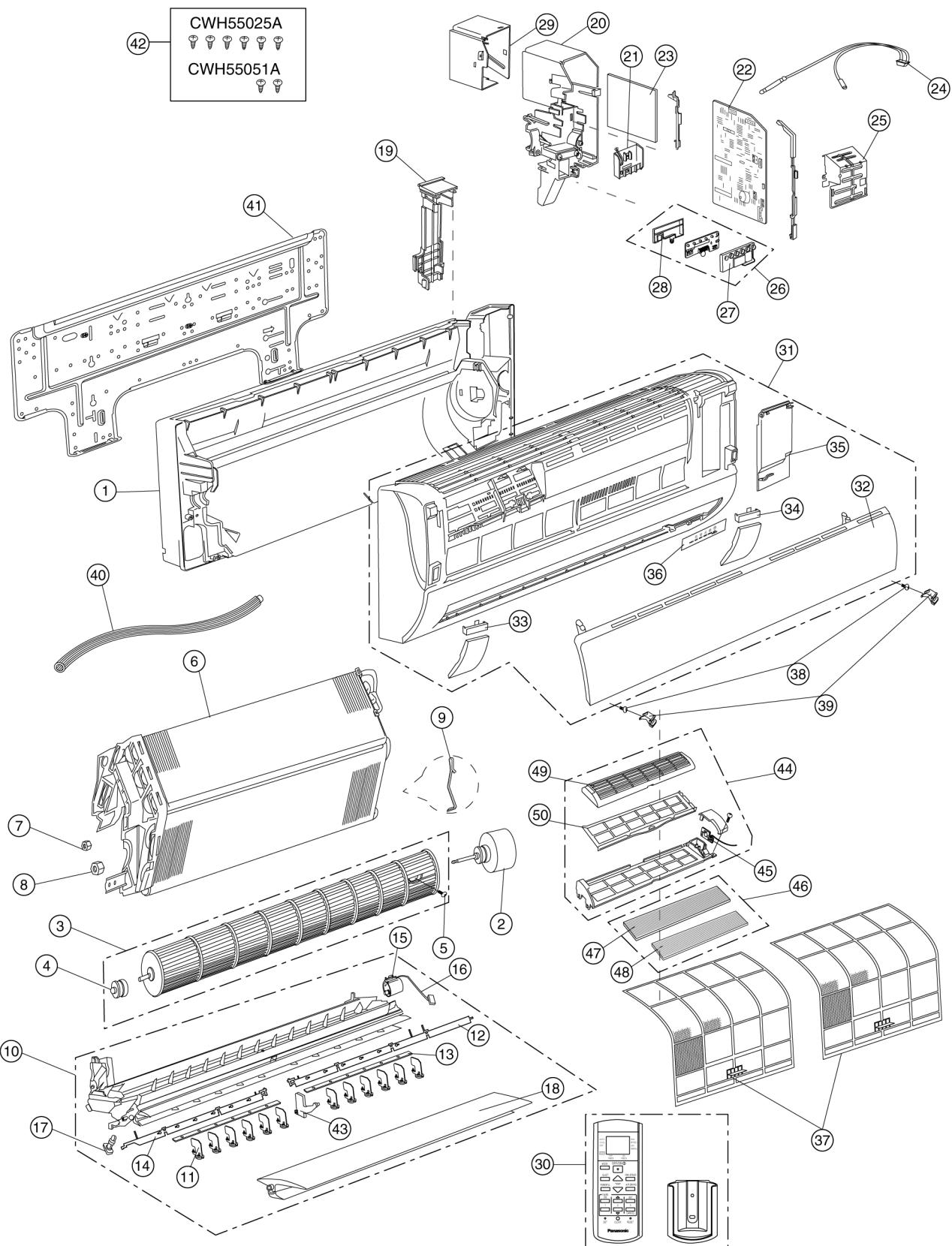
Piping length: 5 m

At 220V



# 16 Exploded View and Replacement Parts List

## 16.1. CS-C9EKZW



### Note:

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

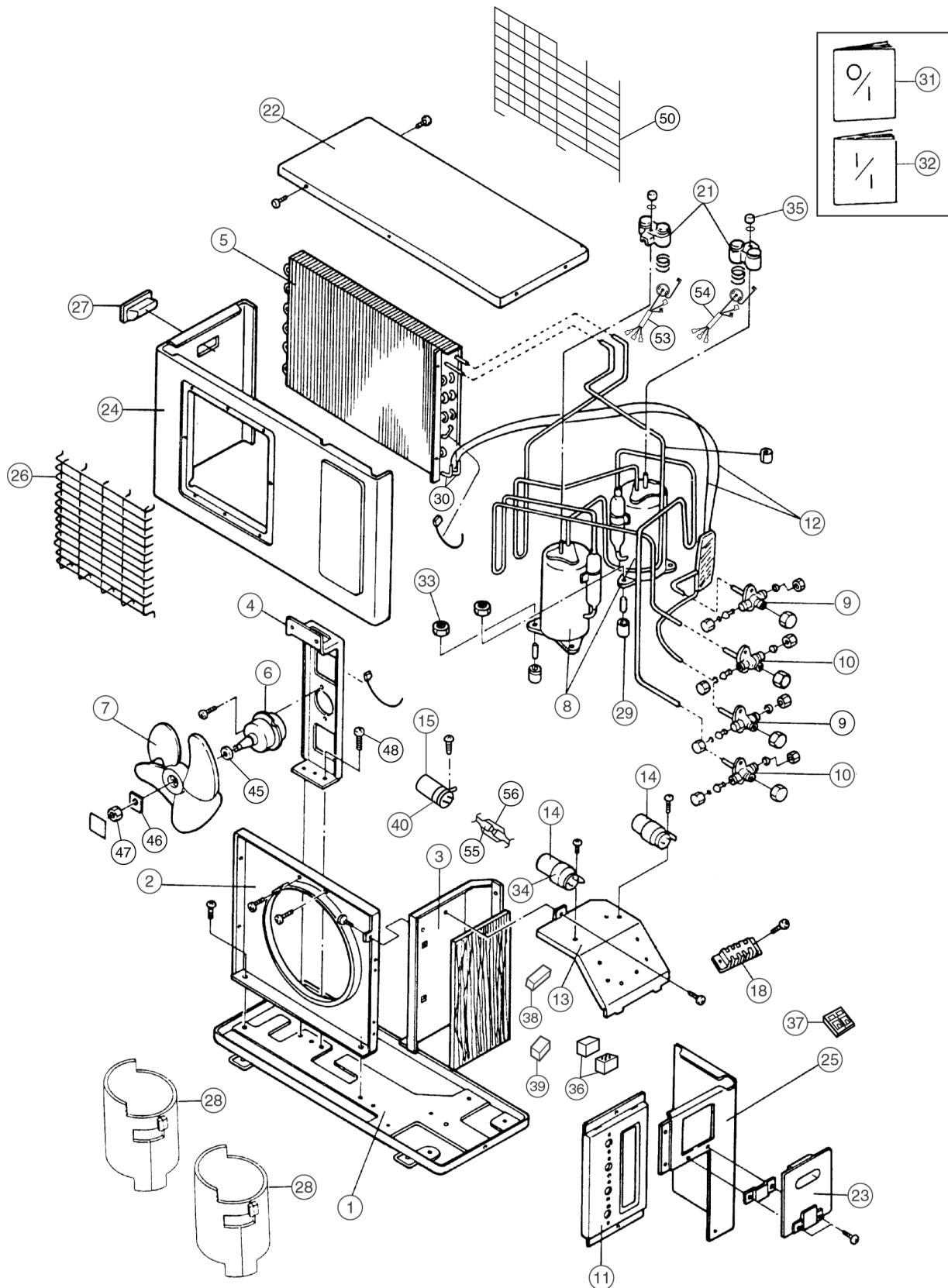
<Model: CS-C9EKZW>

REF. NO.	PART NAME & DESCRIPTION	QTY.	CS-C9EKZW	REMARKS
1	CHASSY COMPLETE	1	CWD50C1492	
2	FAN MOTOR	1	CWA921181J (S.E.Asia) CWA921324 (MALAYSIA)	O
3	CROSS FLOW FAN COMPLETE	1	CWH02C1045	
4	BEARING ASS'Y	1	CWH64K007	
5	SCREW - CROSS FLOW FAN	1	CWH551146	
6	EVAPORATOR	1	CWB30C1741	
7	FLARE NUT (1/4)	1	CWT251026	
8	FLARE NUT (3/8) (1/2)	1	CWT251027	
9	CLIP FOR SENSOR	1	CWH32143	
10	DISCHARGE GRILLE COMPLETE	1	CWE20C2491	
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	CWA98260+MJ	
16	LEAD WIRE - AIR SWING MOTOR	1	CWA67C4445	
17	CAP - DRAIN TRAY	1	CWH521096	
18	HORIZONTAL VANE COMPLETE	1	CWE24C1134	
19	BACK COVER CHASSIS	1	CWD932454	
20	CONTROL BOARD CASING	1	CWH102289	
21	TERMINAL BOARD COMPLETE	1	CWA28C2128J	O
22	ELECTRONIC CONTROLLER - MAIN	1	CWA73C2036	O
23	ELECTRONIC CONTROLLER - POWER	1	CWA744059	O
24	SENSOR COMPLETE	1	CWA50C2122	O
25	CONTROL BOARD FRONT COVER	1	CWH131207	
26	INDICATOR COMPLETE	1	CWE39C1149	
27	INDICATOR HOLDER	1	CWD932609	
28	INDICATOR HOLDER	1	CWD932610	
29	CONTROL BOARD TOP COVER	1	CWH13C1120	
30	REMOTE CONTROL COMPLETE	1	CWA75C2815	O
31	FRONT GRILLE COMPLETE	1	CWE11C3401	
32	INTAKE GRILLE COMPLETE	1	CWE22C1237	
33	DECORATION BASE (L)	1	CWE351141	
34	DECORATION BASE (R)	1	CWE351142	
35	GRILLE DOOR	1	CWE141073	
36	CONTROL PANEL	1	CWE312627	
37	AIR FILTER	2	CWD001144	
38	SCREW - FRONT GRILLE	2	XTT4+16CFJ	
39	CAP - FRONT GRILLE	2	CWH521109	
40	DRAIN HOSE	1	CWH851063	
41	INSTALLATION PLATE	1	CWH361067	
42	BAG COMPLETE - INSTALLATION SCREW	1	CWH82C067	
43	FULCRUM	1	CWH621049	
44	SUPersonic AIR PURIFYING DEVICE	1	CWH91C1016	
45	ELECTRONIC CONTROLLER - SUPersonic	1	CWA744249	O
46	SUPER ALLERU & DEO FILTER COMPLETE	1	CWD00C1161	
47	AIR FILTER - SUPersonic	1	CWD001147	
48	DEODORIZING FILTER	1	CWD001192	
49	FRAME FOR AIR FILTER SUPersonic	1	CWD011035	
50	FRAME FOR AIR FILTER SUPersonic	1	CWD011027	

(Note)

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

## 16.2. CU-2C18EKH



Note:

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

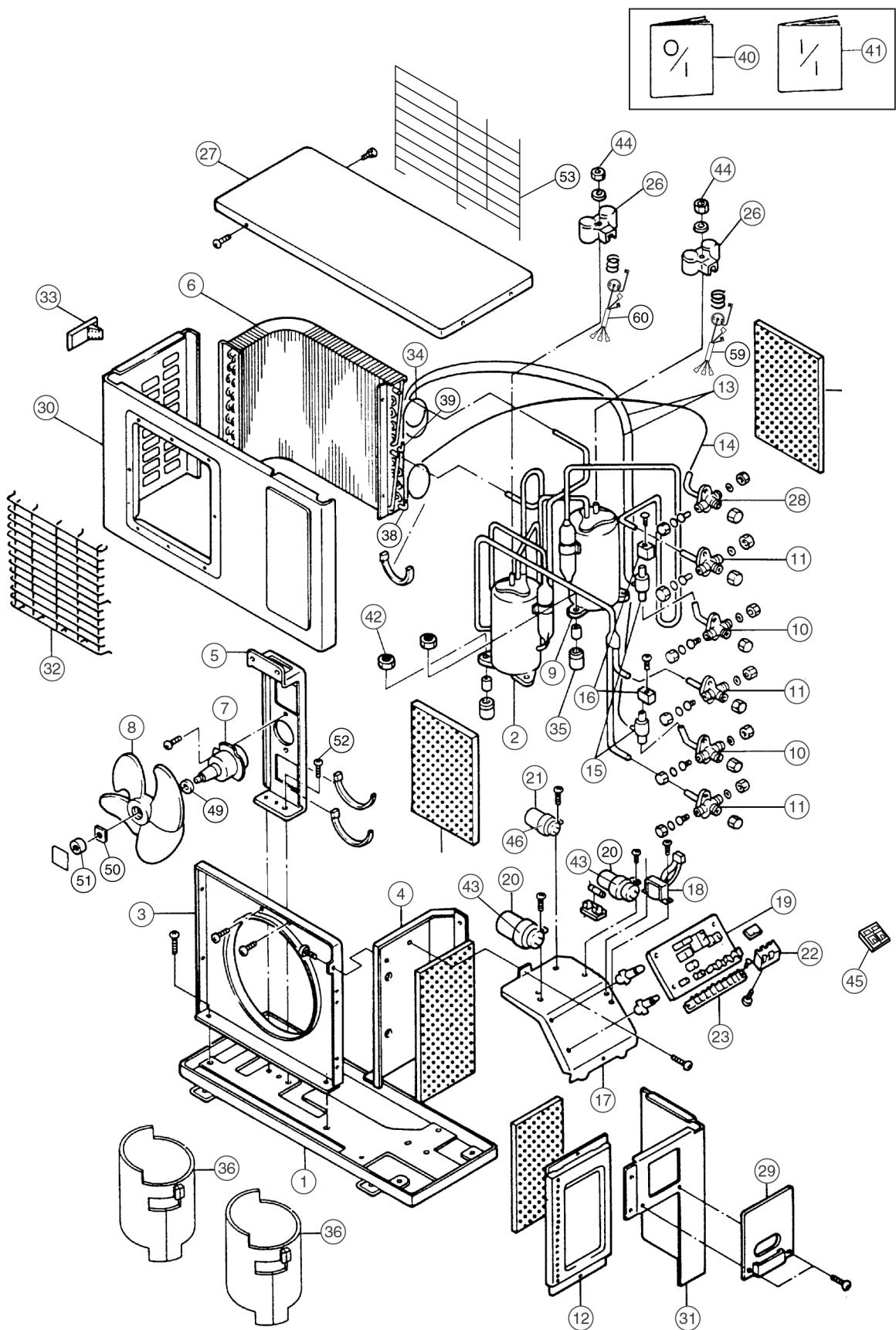
<Model: CU-2C18EKH>

REF. NO.	PART NAME & DESCRIPTION	QTY.	CU-2C18EKH	REMARKS
1	CHASSY ASS'Y	1	CWD50K664A	
2	AIR GUIDER FOR PROPELLER FAN	1	CWD31094A	
3	SOUND PROOF BOARD	1	CWH15071	
4	FAN MOTOR BRACKET	1	CWD54179	
5	CONDENSER	1	CWB32C1028R	
6	FAN MOTOR	1	CWA951402J	O
7	PROPELLER FAN	1	CWH00023	
8	COMPRESSOR	2	2PS132D2AC02	O
9	3-WAY VALVE (LIQUID SIDE)	2	CWB011194	O
10	3-WAY VALVE (GAS SIDE)	2	CWB011195	O
11	HOLDER COUPLING	1	CWH35083A	
12	CAPILLARY TUBE	2	CWB15302	
13	CONTROL BOARD CASING	1	CWH102151	
14	CAPACITOR - COMP.	2	DS371256CPNA	O
15	CAPACITOR - F.M	1	F0GAH305A002	O
18	TERMINAL BOARD	1	K4AA06H00085	O
21	TERMINAL COVER - COMPRESSOR	2	CWH7070220U	
22	CABINET TOP PLATE COMPLETE	1	CWE03C026	
23	CONTROL BOARD COVER	1	CWH13244	
24	CABINET FRONT PLATE	1	CWE06C110A	
25	CABINET SIDE PLATE	1	CWE04069A	
26	FAN GUARD	1	CWD04183	
27	HANDLE	1	CWE16000E	
28	SOUND - PROOF MATERIAL	2	CWG30267	
29	ANTI - VIBRATION BUSHING	6	CWH50049	
30	STRAINER	2	CWB11002	
31	OPERATING INSTRUCTION	1	CWF565222	
32	INSTALLATION INSTRUCTION	1	CWF612961	
33	NUT - COMPRESSOR	6	CWH56000J	
34	HOLDER CAPACITOR - COMP.	2	CWH30078	
35	NUT TERMINAL COVER	2	CWH7080300J	
36	MAGNETIC RELAY	2	CWA4000088	
37	TERMINAL BOARD ASS'Y	1	CWA28K234J	
38	TERMINAL BOARD	1	CWA28K1144	
39	ELECTRONIC CONTROLLER	1	CWA742811	
40	HOLDER CAPACITOR - FAN	1	CWH301005	
45	WASHER - PROPELLER FAN	1	CWH57066	
46	WASHER - PROPELLER FAN	1	CWH57067	
47	NUT - PROPELLER FAN	1	CWH56033J	
48	SCREW - BRACKET FAN MOTOR	4	CWH55027J	
50	WIRE NET	1	CWD04186A	
53	OVERLOAD PROTECTOR COMPLETE	1	CWA67C4716	
54	OVERLOAD PROTECTOR COMPLETE	1	CWA67C4717	
55	FUSE	1	XBA2C31TR0	
56	FUSE HOLDER	1	K3GB1BH00006	

(Note)

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

### 16.3. CU-3C20EKH



Note:

The above exploded view is for the purpose of parts disassembly and replacement.

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

<Model: CU-3C20EKH>

REF. NO.	PART NAME & DESCRIPTION	QTY.	CU-3C20EKH	REMARKS
1	CHASSY ASS'Y	1	CWD50K664A	
2	COMPRESSOR	1	2PS192D2AC02	O
3	AIR GUIDER	1	CWD31094A	
4	SOUND PROOF BOARD	1	CWH15071	
5	FAN MOTOR BRACKET	1	CWD54179	
6	CONDENSER	1	CWB32C1029R	
7	FAN MOTOR	1	CWA951402J	
8	PROPELLER FAN	1	CWH00023	
9	COMPRESSOR	1	2PS132D2AC02	
10	3-WAY VALVE (LIQUID SIDE)	2	CWB011196	O
11	3-WAY VALVE (GAS SIDE)	3	CWB011195	O
12	HOLDER COUPLING	1	CWH35127A	
13	CAPILLARY TUBE	2	CWB15315	
14	CAPILLARY TUBE	1	CWB15199	
15	2-WAY VALVE	2	CWB02306	
16	V - COIL COMPLETE	1	CWA43C680	O
17	CONTROL BOARD CASING	1	CWH102151	O
18	TRANSFORMER	1	CWA40C1033	O
19	ELECTRONIC CONTROLLER	1	CWA741165	O
20	CAPACITOR - COM.	2	DS441256CPNA	O
21	CAPACITOR - F. M	1	F0GAH305A002	O
22	TERMINAL BOARD	1	CWA28K1144	
23	TERMINAL BOARD	1	CWA28064J	
26	TERMINAL COVER - COMPRESSOR	2	CWH171011	
27	CABINET TOP PLATE	1	CWE03C026	
28	3-WAY VALVE (LIQUID SIDE)	1	CWB011194	O
29	CONTROL BOARD COVER	1	CWH13322	
30	CABINET FRONT PLATE	1	CWE06C111A	
31	CABINET SIDE PLATE	1	CWE04131A	
32	FAN GUARD	1	CWD04183	
33	HANDLE	1	CWE16037C	
34	CAPILLARY TUBE	1	CWB152585	
35	ANTI - VIBRATION BUSHING	6	CWH50049	
36	SOUND - PROOF MATERIAL	2	CWG30267	
38	STRAINER	1	CWB11002	
39	STRAINER	1	CWB11004	
40	OPERATING INSTRUCTION	1	CWF565222	
41	INSTALLATION INSTRUCTION	1	CWF612961	
42	NUT - COMPRESSOR	6	CWH56000J	
43	HOLDER CAPACITOR	2	CWH30078	
44	NUT - TERMINAL COVER	2	CWH7080300J	
45	TERMINAL BOARD ASS'Y	1	CWA28K234J	
46	HOLDER CAPACITOR - FAN	1	CWH301005	
49	WASHER - PROPELLER FAN	1	CWH57066	
50	WASHER - PROPELLER FAN	1	CWH57067	
51	NUT - PROPELLER FAN	1	CWH56033J	
52	SCREW - BRACKET FAN MOTOR	4	CWH55027J	
53	WIRE NET	1	CWD04186A	
59	OVERLOAD PROTECTOR COMPLETE	1	CWA67C4145	
60	OVERLOAD PROTECTOR COMPLETE	1	CWA67C4146	

(Note)

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