

# Service Manual

## Room Air Conditioners

CS-PC9CKV CU-PC9CKV  
CS-PC12CKV CU-PC12CKV



### 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.

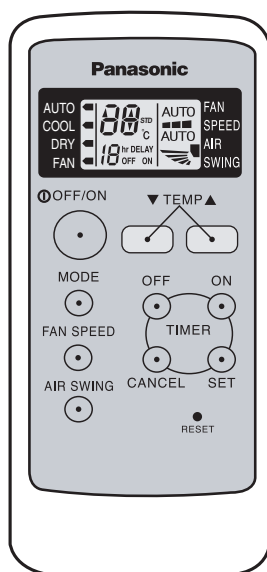
## CONTENTS

	Page		Page
1 Functions .....	2	11 Trouble-shooting guide .....	47
2 Product Specifications .....	5	12 Technical Data .....	49
3 Dimensions .....	9	13 Exploded View .....	51
4 Refrigeration Cycle Diagram .....	12	14 Replacement Parts List .....	52
5 Block Diagram .....	13	15 Exploded View .....	53
6 Wiring Diagram .....	14	16 Replacement Parts List .....	54
7 Operation Details .....	15	17 Exploded View .....	55
8 Installation .....	22	18 Replacement Parts List .....	56
9 2-way, 3-way Valve .....	36	19 ELECTRONIC CIRCUIT DIAGRAM .....	57
10 Disassembly of the parts .....	43		

# Panasonic

© Guangzhou Matsushita Air Conditioner Co., Ltd.  
(GMAC) All rights reserved. Unauthorized copying  
and distribution is a violation of law.

# 1 Functions



## Operation START/STOP

## Operation Mode Selection

- Automatic Mode Operation
- Cooling Operation
- Soft Dry Mode Operation
- Air Circulation Operation

## Indoor Fan Speed Selection

- Low Speed  
■
- Medium Speed  
■■
- High Speed  
■■■
- Automatic Speed

## Airflow Direction Control

- Auto Airflow Direction
- Airflow Direction Manual Control

## Room Temperature Setting

- Temperature Setting(16°C to 30°C)
- Auto Operation

## Timer Operation Selection

- Stop/Start Operation Control  
(set the ON/OFF Timer hourly later)

## Set /Cancel Timer Operation

- Set timer/Cancel the set timer

## Indoor Unit



### Power Switch ON/OFF

### Auto Mode Operation Selection Button

- When the remote control cannot be used, please use this button.

### Signal Receiving Sound Control

- Keep pressing this button for 10sec to turn on or turn off the signal receiving sound.

### Test Run

- Used when testing or repairing

### Operation Indication Lamps

- Operation (green) .....lights up in operation  
Blinks during Test Run operation and determining Auto Operation mode
- Timer(orange) .....Timer in operation

### Operation Mode

- Cooling/Soft Dry/Air Circulation/ Auto Operation

### Anti-freezing Control for the Evaporator

- Cooling or Soft Dry Operation

### Time Delay Safety Control

- The unit will restart operation after 3-4 minutes after each pause.

### Automatic Restarting Control

- 7-minutes automatic restarting at Cooling Operation

### Indoor Fan Speed Control

- High,Med,Low
- Auto Fan Speed

### Airflow Direction Control

- Automatic Airflow Direction Control  
The louver automatically swings up and down
- Airflow Direction Manual Control

### Delayed On-timer Control

- For cooling or soft dry mode, the unit starts 15 minutes before the set time with the remote control.

## Outdoor Unit



CU-PC9CKV



CU-PC12CKV

### Anti-reverse Protection

- To protect the compressor from reverse rotation when power off suddenly.


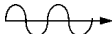
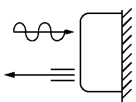
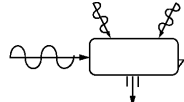
### Overload Protector

- The 2-step Overload Protector is to protect the compressor when  
1/ temperature of compressor reaches 120°C  
2/ high temperature or current enters into the compressor.

### 60-seconds Test Operation Control

- Once the compressor is activated, it does not stop for 60 seconds. It stops immediately with remote controller ON/OFF button.

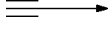
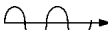
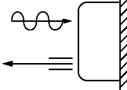
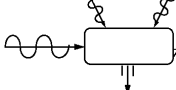
## 2 Product Specifications

		Unit	CS-PC9CKV	CU-PC9CKV
Cooling Capacity		kW	2.50	
Moisture Removal		L/h	1.40	
Power Source		Phase V Cycle	Single 220-230 60	
Airflow Method		OUTLET  INTAKE 	SIDE VIEW 	TOP VIEW 
Air Circulation	Indoor Air (low)	m <sup>3</sup> /min	7.0	—
	Indoor Air (medium)	m <sup>3</sup> /min	7.8	—
	Indoor Air (high)	m <sup>3</sup> /min	8.8	—
	Outdoor Air	m <sup>3</sup> /min	—	—
Noise Level		dB(A)	High36, Low30	High49
Electrical Data	Input	W	830-840	
	Running Current	A	4.0-3.9	
	EER	W/W	3.0-2.98	
	Starting Current	A	19	
Piping Connection Port (Flare piping)		Inch	G: half union 3/8" L: half union 1/4"	G: 3-way valve 3/8" L: 2-way valve 1/4"
Piping Size (Flare piping)		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	0.6	—
Power Supply Cord Length (Number of core-wire)		m	2.2 3 core-wire/1.5mm <sup>2</sup>	— —
Dimensions	Height	mm	250	534
	Width	mm	770	590
	Depth	mm	205	255
Net Weight		kg	8.0	26
Compressor	Type		—	Rotary(1 cylinder) Rolling piston type
	Motor Type		—	Induction(2 pole)
	Rated Output	W	—	650

		Unit	CS-PC9CKV	CU-PC9CKV
Air Circulation	Type		Cross-flow Fan	Propeller fan
	Motor Type		Induction (4 pole)	Induction (4 pole)
	Input	W	38.4	58.2
	Rated Output	W	13	22
	Fan Speed	Low	870±60	—
		Medium	980±60	—
		High	1100±60	880±60
Heat Exchanger	Description		Evaporator	Condenser
	Tube Material		copper	copper
	Fin Type		slot type	Corrugation type
	Rows / Stage		(Plate fin configuration, forced draft)	
	FPI		2 × 12	1 × 20
	Dimensions	mm	18	18
Refrigerant Control Device			610 × 252 × 25.4	568.8 × 508 × 22
Refrigeration Oil		(c.c)	—	Capillary Tube
Refrigerant (R-22)		g	—	SUNISO 4GDID or ATMOS M60 (M56)
Thermostat			—	530*
Protection Device			Electronic Control	—
Capillary			—	O.L.P.(25A/230V)
Capillary	Length	mm	—	630
	Circulation	L/min	—	11.7
	Inner Diameter	mm	—	1.5
Air Filter			P.P Honeycomb	—
Refrigerant Circulation Control Device			Capillary	
Compressor Capacitor		μFV	—	30μF, 370V
Fan Motor Capacitor		μFV	1.5μF, 400V	1.5μF, 440V

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

\* 60g for air purging is not included.

		Unit	CS-PC12CKV	CU-PC12CKV
Cooling Capacity		kW	3.50	
Moisture Removal		L/h	2.1	
Power Source		Phase V Cycle	Single 220-230 60	
Airflow Method		OUTLET  INTAKE 	SIDE VIEW 	TOP VIEW 
Air Circulation	Indoor Air (low)	m <sup>3</sup> /min	8.0	—
	Indoor Air (medium)	m <sup>3</sup> /min	8.7	—
	Indoor Air (high)	m <sup>3</sup> /min	9.9	—
	Outdoor Air	m <sup>3</sup> /min	—	—
Noise Level		dB(A)	High39, Low33	High47
Electrical Data	Input	W	1210-1220	
	Running Current	A	5.70-5.50	
	EER	W/W	2.89-2.87	
	Starting Current	A	25	
Piping Connection Port (Flare piping)		Inch Inch	G: half union 3/8" L: half union 1/4"	G: 3-way valve 3/8" L: 2-way valve 1/4"
Piping 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	0.6	—
Power Supply Cord Length (Number of core-wire)		m	2.2 3 core-wire/1.5mm <sup>2</sup>	— —
Dimensions	Height	mm	250	505
	Width	mm	770	780
	Depth	mm	205	245
Net Weight		kg	8.0	30
Compressor	Type		—	Rotary(1 cylinder) Rolling piston type
	Motor Type		—	Induction(2 pole)
	Rated Output	W	—	850

		Unit	CS-PC12CKV	CU-PC12CKV
Air Circulation	Type		Cross-flow Fan	Propeller fan
	Motor Type		Induction (4 pole)	Induction (4 pole)
	Input	W	43	61
	Rated Output	W	16	20
	Fan Speed	Low	980±60	—
		Medium	1110±60	—
		High	1260±60	740±50
Heat Exchanger	Description		Evaporator	Condenser
	Tube Material		copper	copper
	Fin Type		slot type	Corrugation type
	Rows / Stage		(Plate fin configuration, forced draft)	
	FPI		21	16
	Dimensions	mm	610 × 315 × 25.4	706.2 × 482.6 × 22
Refrigerant Control Device			—	Capillary Tube
Refrigeration Oil		(c.c)	—	SUNISO 4GDID or ATMOS M60 (M56)
Refrigerant (R-22)		g	—	800*
Thermostat			Electronic Control	O.L.P.(25A/230V)
Protection Device			—	—
Capillary	Length	mm	—	720
	Circulation	L/min	—	11.0
	Inner Diameter	mm	—	1.5
Air Filter			P.P Honeycomb	—
Refrigerant Circulation Control Device			Capillary	
Compressor Capacitor		μFV	—	30μF, 370V
Fan Motor Capacitor		μFV	1.5μF, 400V	1.5μF, 400V

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

\* 60g for air purging is not included.

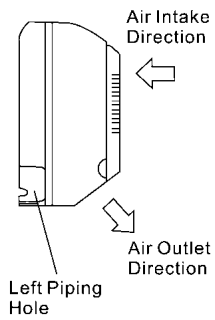


### 3 Dimensions

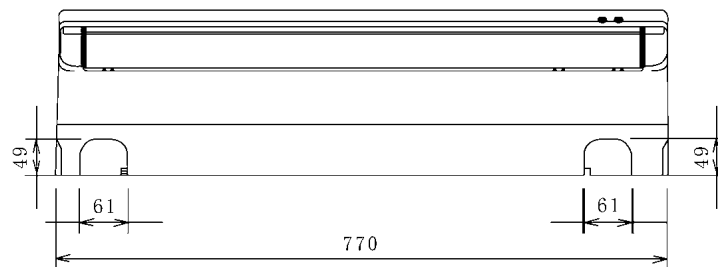
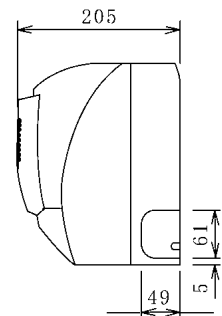
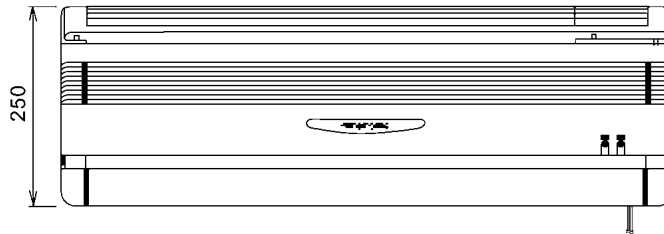
#### Indoor Unit

##### • CS-PC9CKV

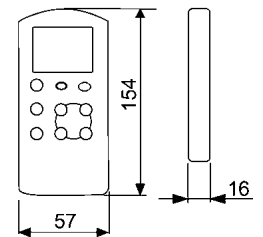
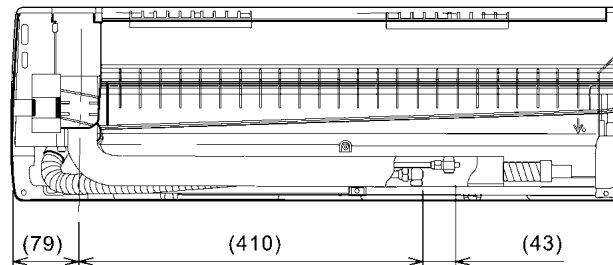
Unit:mm



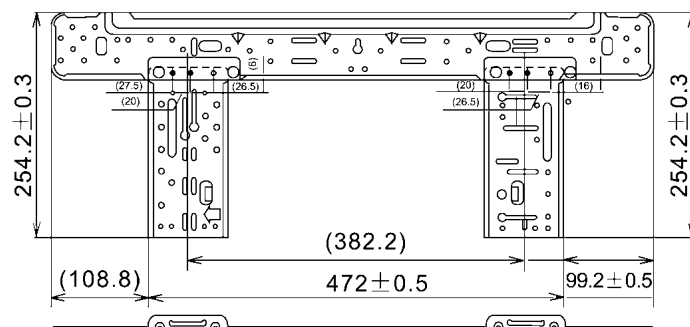
<Front View>



<Back View>



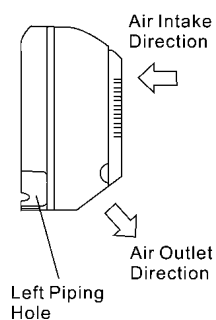
Relative position between the unit and the installation plate<Front View>



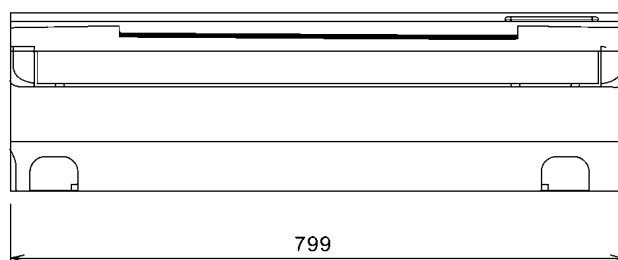
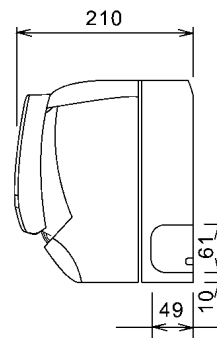
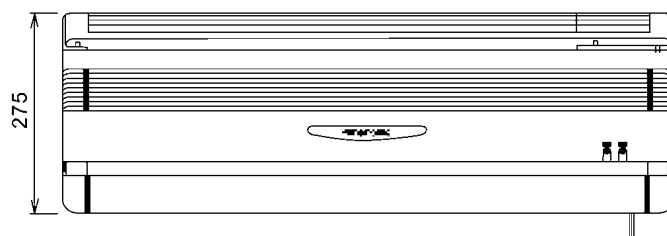
# Indoor Unit

## • CS-PC12CKV

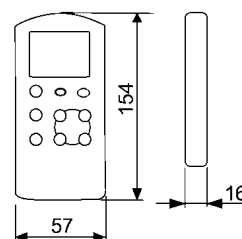
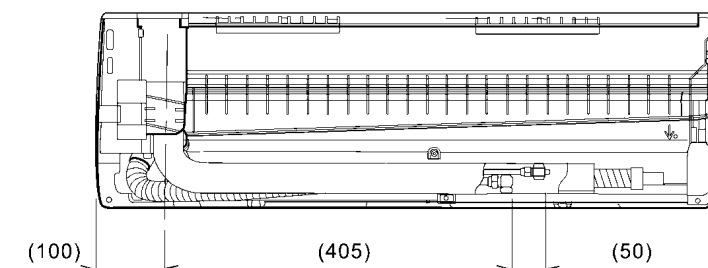
Unit:mm



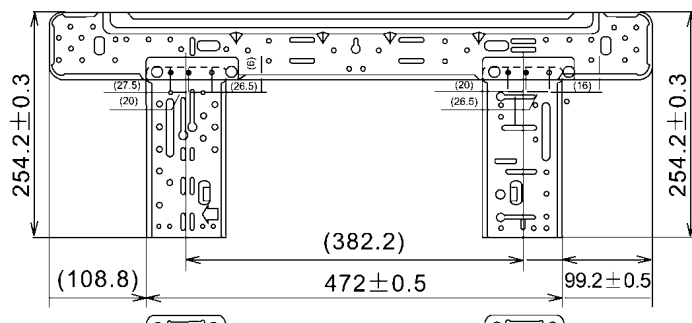
<Front View>



<Back View>

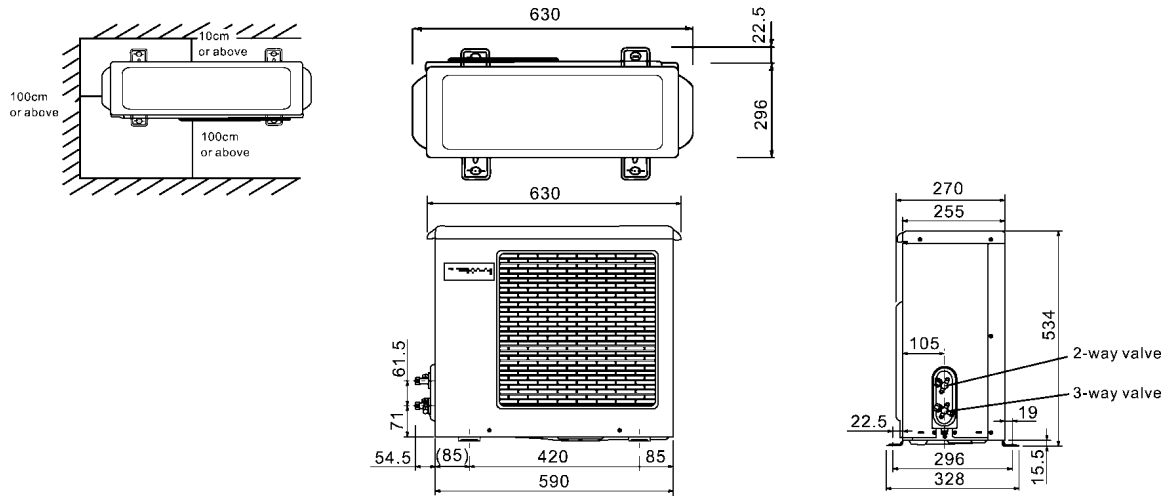


Relative position between the unit and the installation plate<Front View>

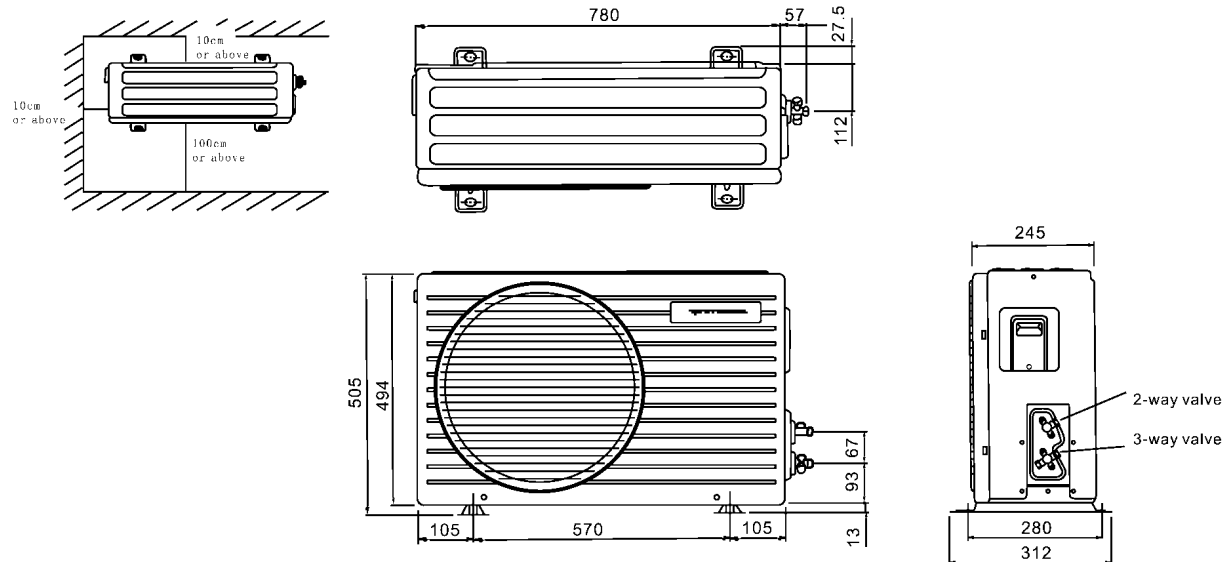


# Outdoor Unit

## ● CU-PC9CKV

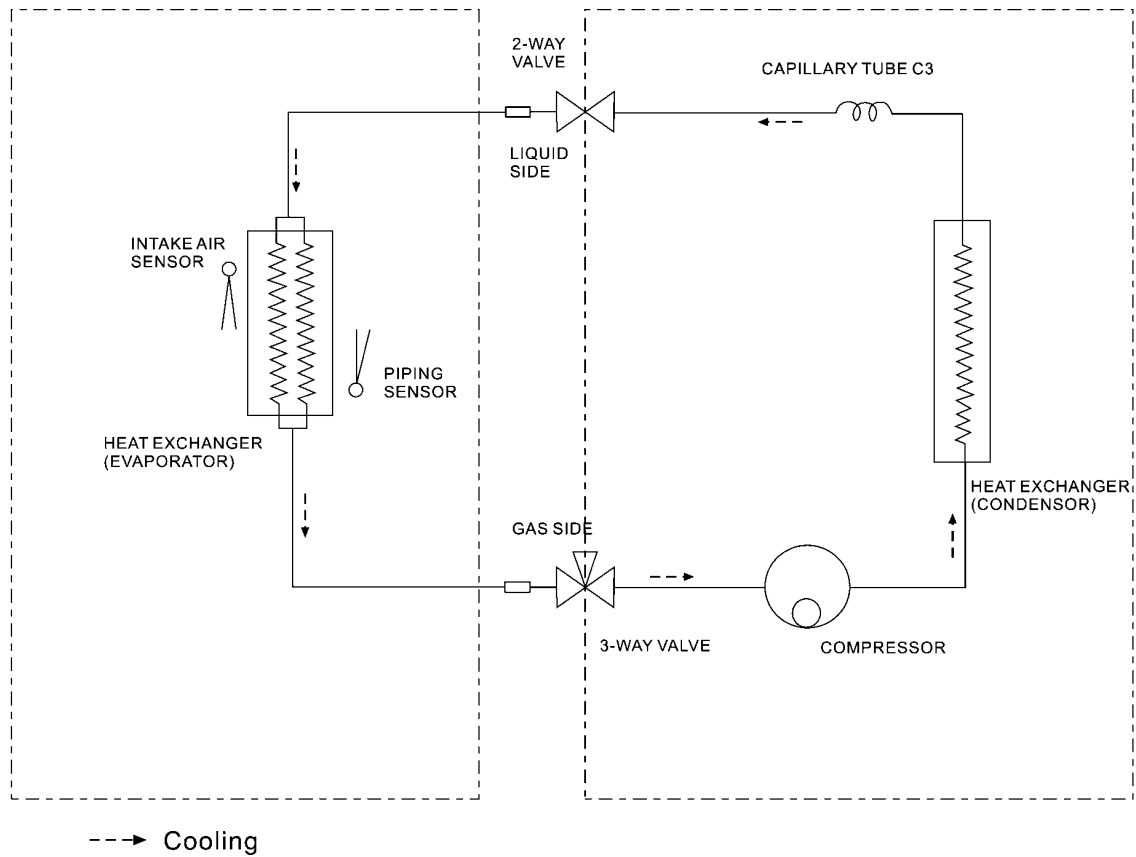


## ● CU-PC12CKV



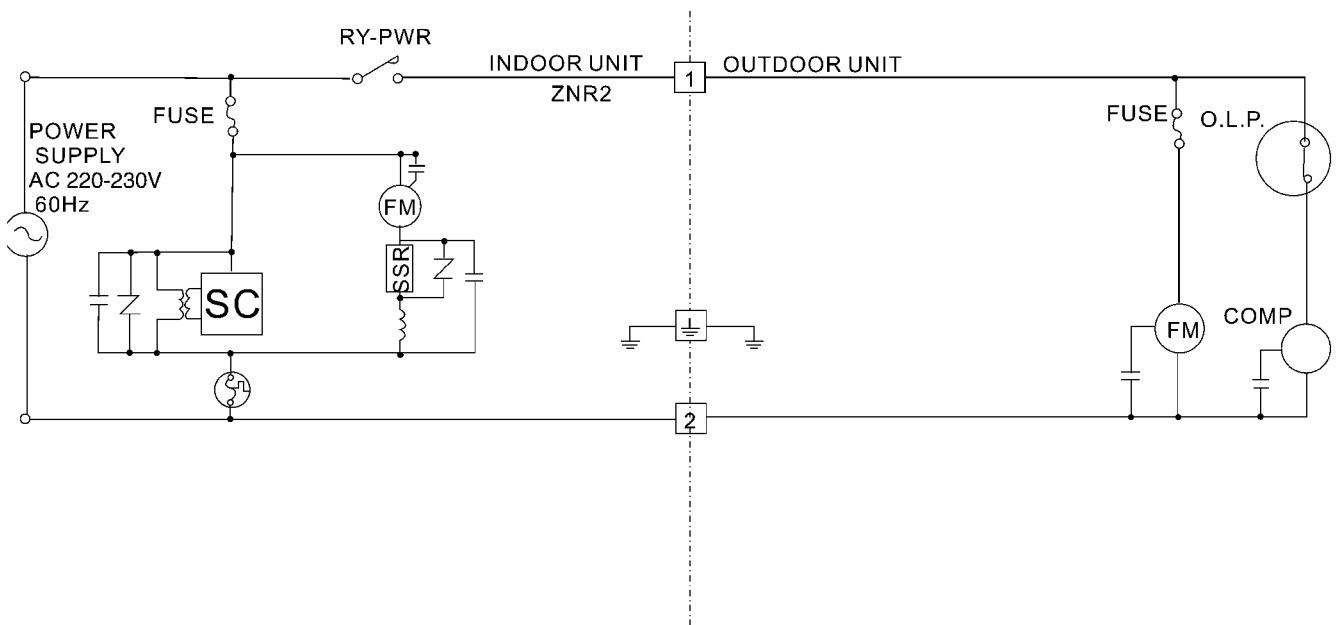
## 4 Refrigeration Cycle Diagram

### 4.1. CS/CU-PC9CKV, CS/CU-PC12CKV



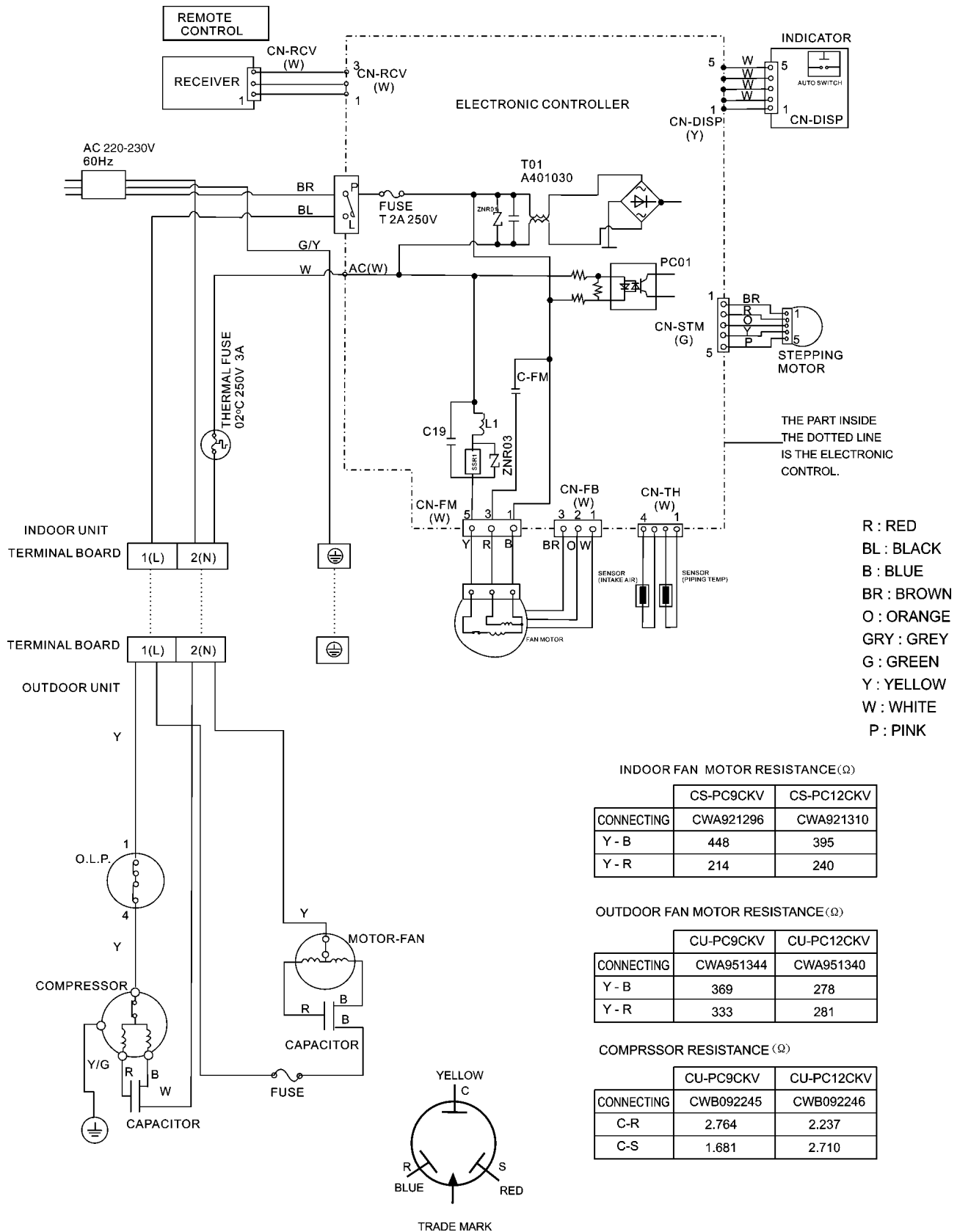
## 5 Block Diagram

### 5.1. CS/CU-PC9CKV,CS/CU-PC12CKV



## 6 Wiring Diagram

### 6.1. CS/CU-PC9CKV, CS/CU-PC12CKV



## 7 Operation Details

### 7.1. Cooling Mode Operation

- When selecting the Cooling Mode Operation, the unit will operate according to the setting by the Remote Control and the operation is as the following.

#### Time Delay Safety Control

- 3 min. ---- The compressor is ceased for 3 minutes to balance the pressure in the refrigeration cycle.
- (Protection of compressor).

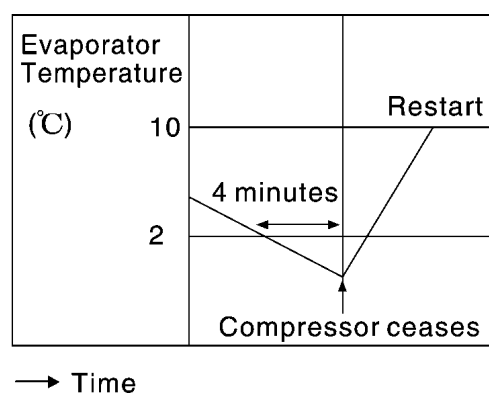
#### Automatic Restarting Control

- 7 min. ---- The unit will automatically operate in 7 minutes even if the room temperature is not reached.  
(Prevention of raising the humidity)

#### Anti-freezing Control

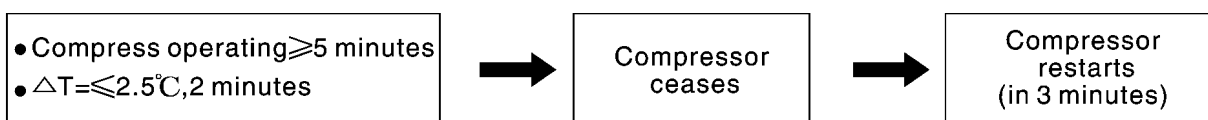
- If temperature of evaporator is lower than 2°C continuously for 4 minutes, the compressor will cease to prevent the evaporator from freezing. Fan speed setting will not be changed.
- When temperature of evaporator reaches 10°C, compressor will restart.

⊗ During Cooling Mode Operation, the Time Delay Safety Control is available.



#### Anti-reversing Control

- If the compressor has been continuously running for 5 minutes, and the difference of temperature between intake air and evaporator is continuously lower than 2.5°C for 2 minutes, the compressor is ceased for 3 minutes then restarts. (Time Delay Protection Control is effective.)

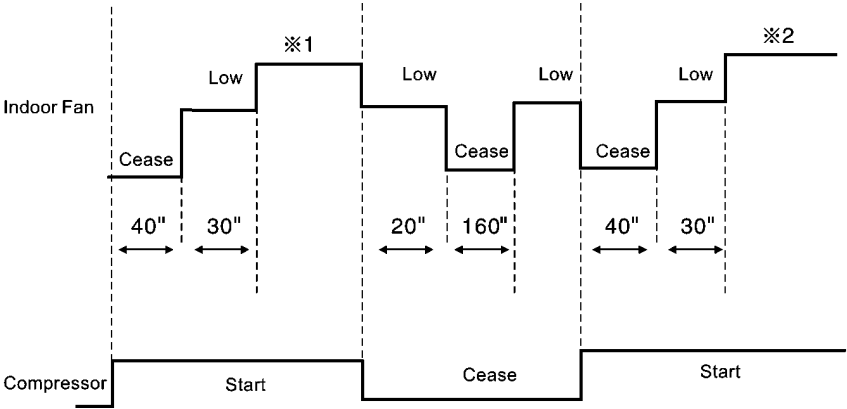


$\Delta T$  = intake air temperature - evaporator temperature

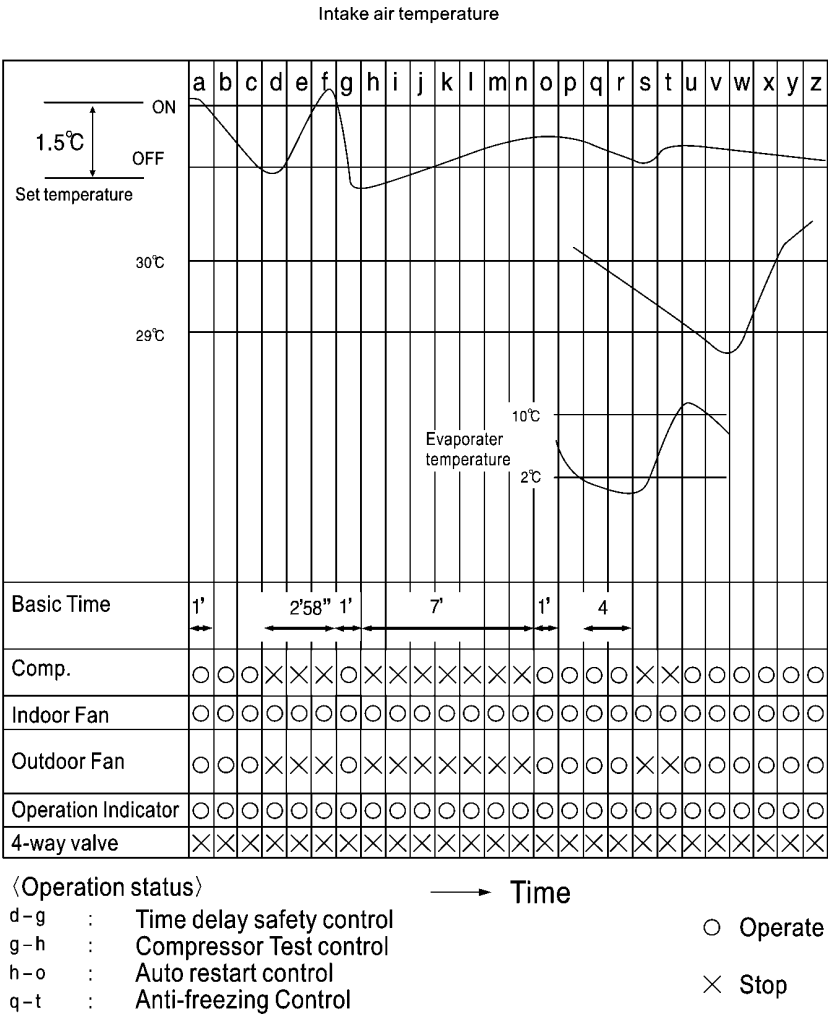
Automatic Fan Speed Mode

During Cooling Mode Operation, use remote control to select Automatic Fan Speed.

- Fan speed will be at the point between "high speed" and "medium speed".
- Deodorization control.



Time Graph for cooling Operation





## 7.2. Soft Dry Mode Operation

- When selecting Soft Dry mode operation, the operation will be cooling until the room temperature reaches the set temp on the remote control, and then Soft Dry will be activated. (During Soft Dry Mode the fan of indoor unit will operate at super low speed.)
- Once soft Dry mode operation is turned off, indoor fan, compressor and outdoor fan will stop for 6 minutes.

### Time Delay Safety Protection

- During cooling mode operation, if the compressor ceased, it will not restart within 3 minutes.

### Anti Freezing Control

- Same as the denotation in Cooling Operation. (P.15)  
(During Soft Dry Mode Operation, compressor will stop for at least 6 min.)

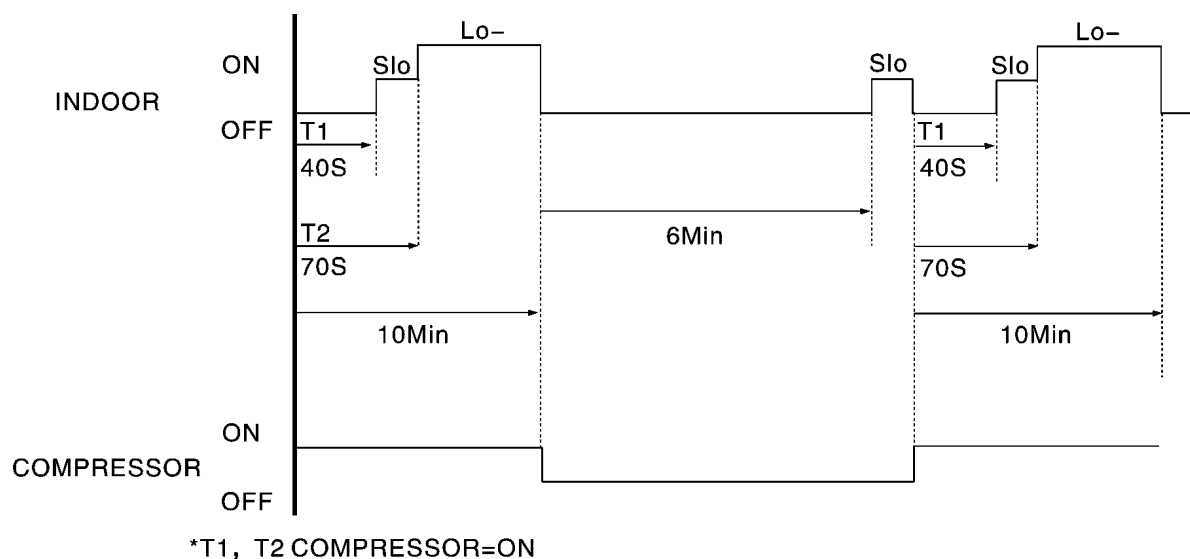
### Anti-reverse Control

- Same as the denotation in Cooling Operation. (P.15)

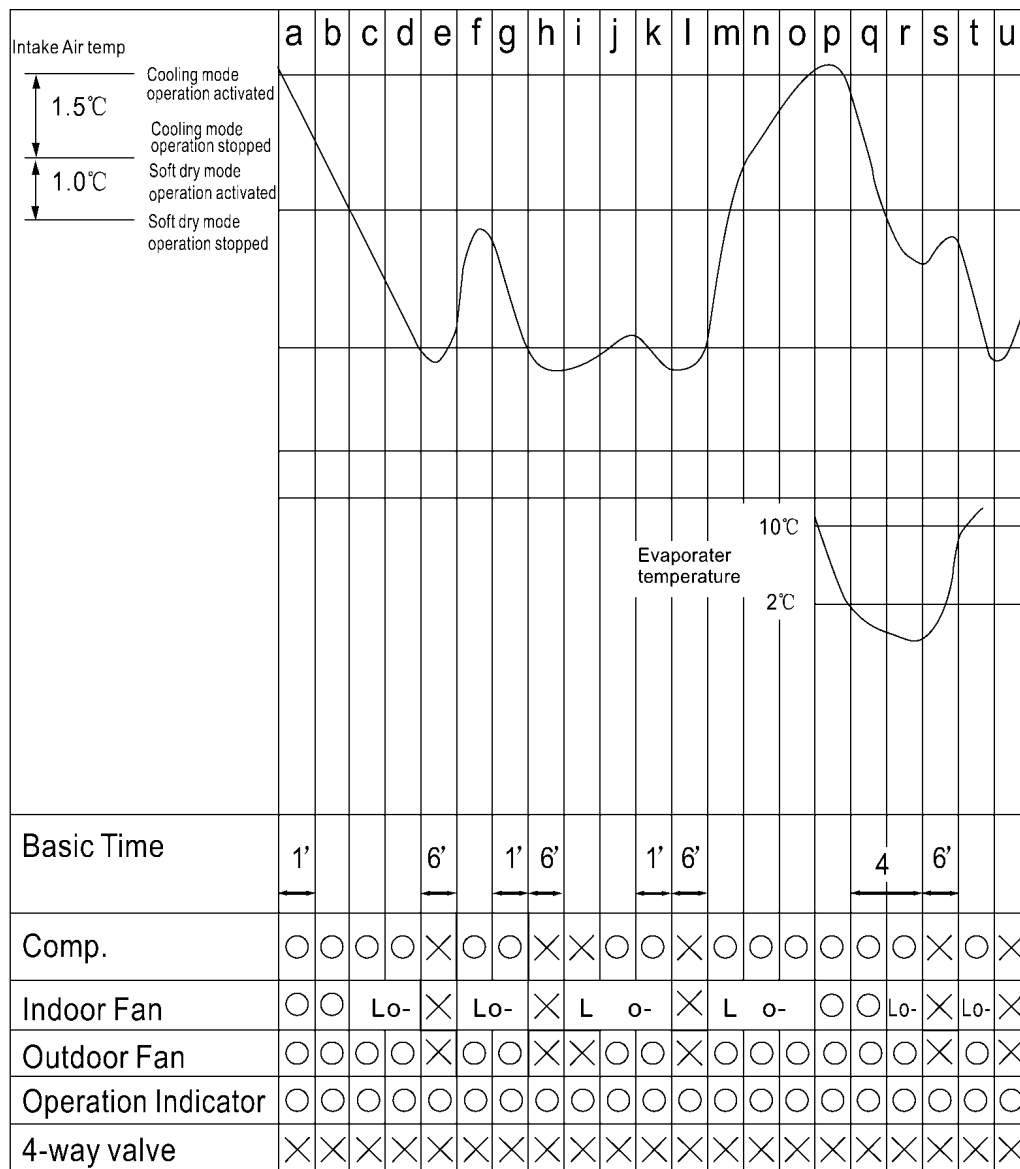
### Automatic Fan Speed

During Soft Dry Operation, use remote control to select Auto Fan Speed mode.

- Indoor Fan Speed is at super low.
- Deodorization control.



## Time Graph for soft dry operation



〈Operation status〉

→ Time

a-c, p-r : Cooling Mode Operation

c-p, r-u : Soft Dry Mode Operation

e-f : Soft Dry Mode Operation stopped

j-l : Compressor Test operation control

q-t : Deice control

— Cooling mode operation

- - - Soft Dry Mode operation

○ Operate

× Stop

## 7.3. Automatic Mode Operation

### Standard for determining operation mode

#### First Determination:

Intake Air temperature 23°C	Cooling mode
	Soft Dry mode

	Setting Temperature (standard)
Cooling mode	25°C
Soft Dry mode	22°C

#### Second Determination:

One hour after the above determination, the unit will operate according to the table below.

		Second Determination		
		Cooling	dry	heating
First Determination	Cooling	23°C or above	——	23°C below
	Dry	——	20°C or above	20°C below

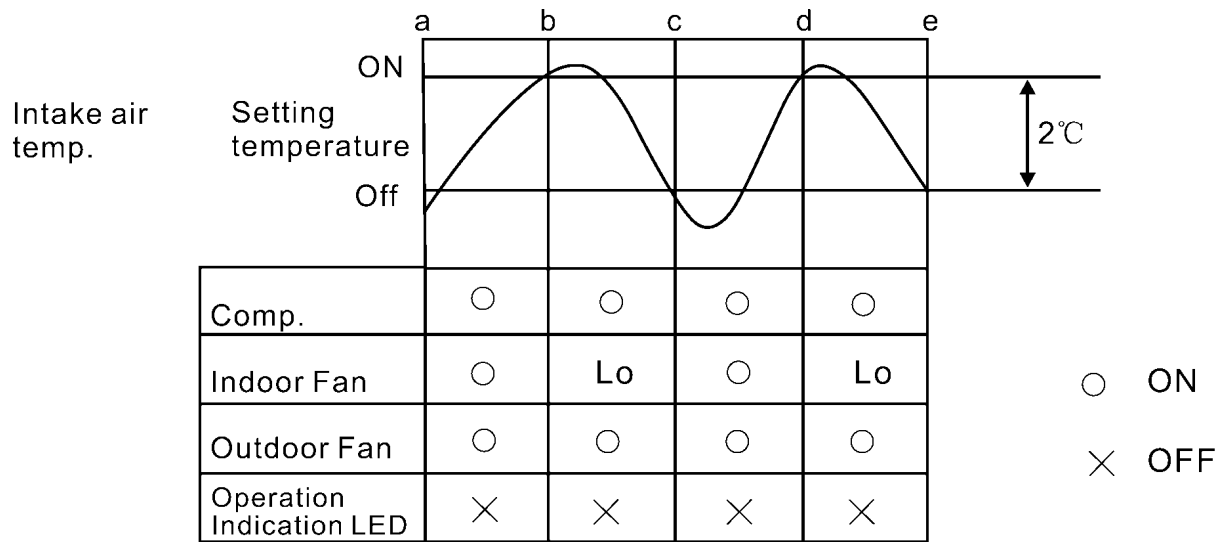
- Indoor fan operates at super low speed for 20 seconds.
- After judging indoor air temperature, the operation is determined and operation continued at the mode determined.
- After the operation mode has been determined, the mode does not change. However, Soft Dry mode operation includes cooling mode operation.
- If automatic mode operation is started while the unit is operating, operation will continue.  
If current operation is in cooling mode (including the cooling mode operation when is a part of Soft Dry mode operation) it will be maintained, and if current operation is not cooling mode, the appropriate operation mode is determined for 20 seconds at super slow fan speed. Then the selected mode will continue.
- Room temperature adjustment

Higher	→	+2°C
Standard	→	±0°C
Lower	→	-2°C

## 7.4. Air Circulation Mode Operation

1. An additional heater may make the warm air evenly covering each corner of the room.
2. When the temperature near the ceiling reaches the setting temperature, Air Circulation Mode Operation commences at low airflow volume. It stops when the temperature drops to 2°C below the setting temperature.
3. The vertical airflow direction louver will not swing.

Time graph for Air Circulation Mode Operation



## 7.5. Indoor Fan Motor Control

- Automatic fan speed control  
When automatic fan speed set, the available range for fan speed is from H to SLo
- Manual Fan Speed Control
- Basic fan speed can be manually adjusted (Lo, Med, Hi) by using the fan speed selection button.

## 7.6. Airflow Direction Control

### Airflow Direction Auto-control

- When set at airflow direction auto-control with remote control, the louver swings up and down as shown in the table below.
- The louver does not swing when the indoor fan stops during operation.
- When stop the unit with remote control, the discharge vent is closed with the louver.
- When temperature of indoor heat exchanger reaches 38°C during heating mode operation, if temperature falls to 35°C, airflow direction will change from the lower limit to horizontal.

✕ The left and right airflow direction louver can be adjusted manually.

### Airflow direction manual control

- When the airflow direction set button is pressed, the automatic airflow is released and the airflow direction louver moves up and down as shown in the table below. The louver can be stopped by releasing the button at the desired position.
- When the remote control is used to stop the operation, the discharge vent is closed with airflow direction louver.

Angles Of Airflow Direction Louver

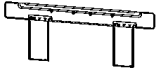


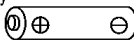
Operating Mode		1	2	3	4	5
Cooling Soft dry	Manual	12°	17°	26°	32°	36°
	Auto	12°~36°				
Heating	Manual	9°	21°	29°	44°	55°
	Auto	Controlled By Piping Temperature: Upward limit 9°, Downward limit 55°				
Determining Operating Mode		9°				

## 8 Installation

### 8.1. Before Installation

#### WARNING

- Engage dealer or specialist for installation. If installation done by the user is defective, it will cause water leakage, electrical shock or fire.
- Use the specified cable(1.5mm<sup>2</sup>) and connect tightly for indoor/outdoor connection.
- Power supply connection to a circuit breaker for the permanent connection. Use an approved 16A circuit breaker for the permanent connection. It must be a double pole switch with a minimum 3 mm contact gap.
- The unit must be earthed, or it will cause fire or electric shock.

No.	Accessories part	Qty.
1	Installation plate 	1
2	Installation plate fixing screw 	5
3	Remote control 	1
4	Battery 	2

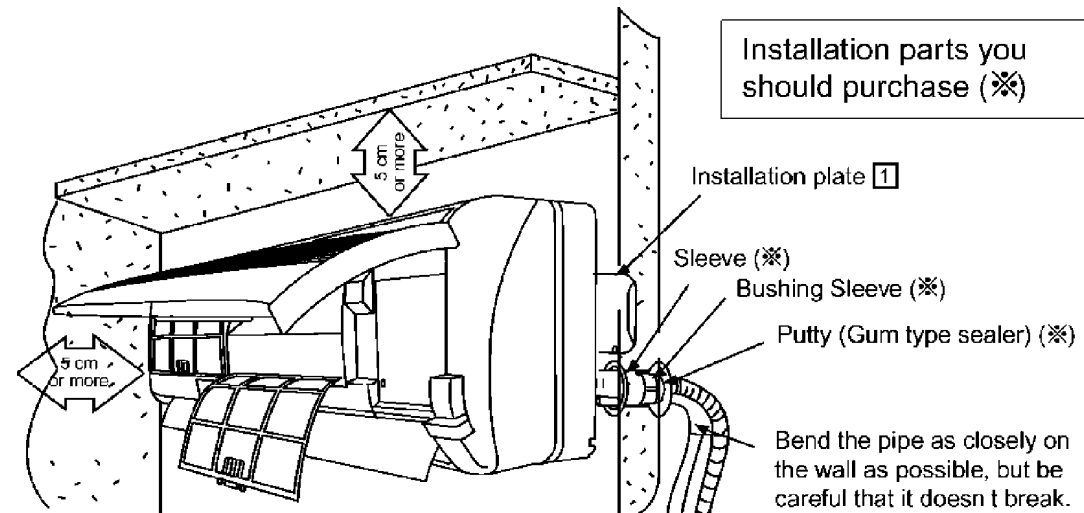
#### SELECT THE BEST LOCATION

##### 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 2.3m.

##### OUTDOOR UNIT

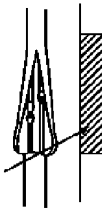
- If an awning is built over the unit to prevent direct sunlight or rain, be careful that heat radiation from the condenser is not obstructed.
- There should not be any animal or plant which could be affected by hot air discharged.
- Keep the spaces indicated by arrows from wall, ceiling, fence or other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



#### Insulation of piping connections

- Carry out insulation after checking for gas leaks and secure with vinyl tape.

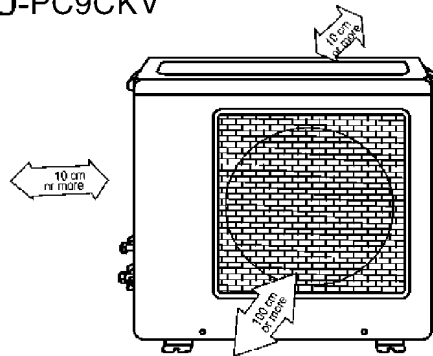
※ Vinyl tape



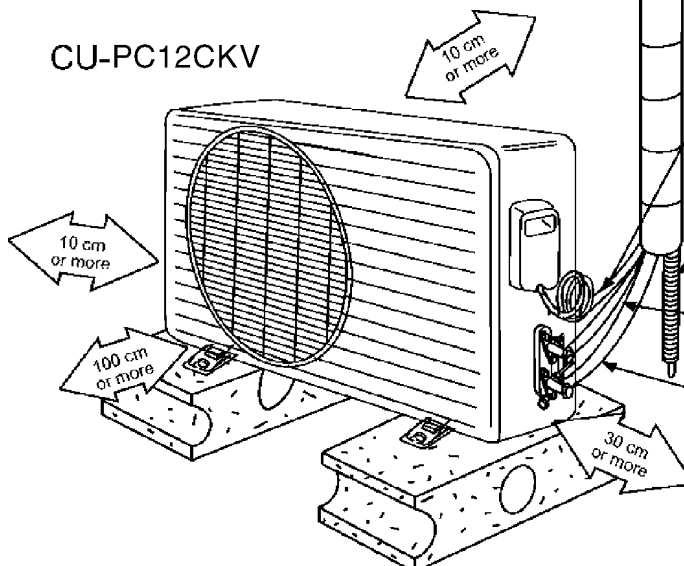
Vinyl tape (Wide) (※)

- Apply after carrying out a drainage test.
- To carry out the drainage test, remove the air filters and pour water into the heat exchanger.

CU-PC9CKV



CU-PC12CKV



Saddle (※)

Connecting cable  
(3-CORE WIRE/1.5 mm<sup>2</sup>)

Type designation 245 IEC 57  
or heavier cord

Additional drain hose (※)

1/4" Liquid side piping (※)

Gas side piping (※) 3/8"  
PC9CKV

Gas side piping (※) 1/2"  
PC12CKV

## 8.2. Outline of installation

Installation works	Installation parts	Required tools
<b>1. Installation of indoor, outdoor unit</b> 1) Select best location.....P.25 2) Indoor unit installation.....P.26	<ul style="list-style-type: none"> <li>● Installation plate</li> <li>● 4 wooden screws</li> <li>● 4 anchor bolts</li> </ul>	<ul style="list-style-type: none"> <li>● A level gauge</li> <li>● Philips screw driver</li> <li>● Electric drill hole-core drill (Ø70mm)</li> <li>● Slide cutter or electrical pliers</li> </ul>
<b>2. Piping and drainage of indoor unit</b> 1) Preparation of piping.....P.27 2) Connection of piping.....P.28 For the right piping.....P.28 For the left side piping.....P.29	<ul style="list-style-type: none"> <li>● Pipes: Gas side.....3/8" Liquid side.....1/4"</li> <li>● Insulated drain hose</li> <li>● Insulation materials</li> </ul>	<ul style="list-style-type: none"> <li>● Flaring tools set</li> <li>● Specified torque wrenches 18N.m.....Liquid side piping 42N.m.....Gas side piping</li> <li>● Spanner.....Half union</li> </ul>
<b>3. In case of Embedded Piping</b> For the embedded piping.....P.31	<ul style="list-style-type: none"> <li>● Pipes: Gas side.....3/8" Liquid side.....1/4"</li> <li>● Insulated drain hose</li> <li>● Insulation materials</li> </ul>	<ul style="list-style-type: none"> <li>● Flaring tools set</li> <li>● Specified torque wrenches 18N.m.....Liquid side piping 42N.m.....Gas side piping</li> <li>● Spanner.....Half union</li> </ul>
<b>4. Connecting piping and cable to the outdoor unit</b> 1) Connecting the piping to outdoor unit.....P.32 2) Connect the cable to the outdoor unit.....P.32	<ul style="list-style-type: none"> <li>● Additional drain hose (Outer diameter.....1.55mm)</li> <li>● Connecting cable Locally approved cable</li> </ul>	<ul style="list-style-type: none"> <li>● Specified torque wrenches 18N.m.....Liquid side 42N.m.....Gas side</li> </ul>
<b>5. Checking the drainage and connecting the cable to indoor unit</b> 1) Checking the drainage.....P.33 2) Connecting the cable to the indoor unit.....P.34	<ul style="list-style-type: none"> <li>● Connecting cable</li> <li>● Locally approved cable</li> </ul>	<ul style="list-style-type: none"> <li>● A glass of water</li> <li>● Phillips screw driver</li> </ul>
<b>6. Test Running</b> 1) Connect the power supply.....P.35 2) Evaluation of the performance.....P.35		<ul style="list-style-type: none"> <li>● Circuit breaker or time delay fuse (consult an electrician)</li> <li>● Operating instructions</li> <li>● Thermometer</li> </ul>

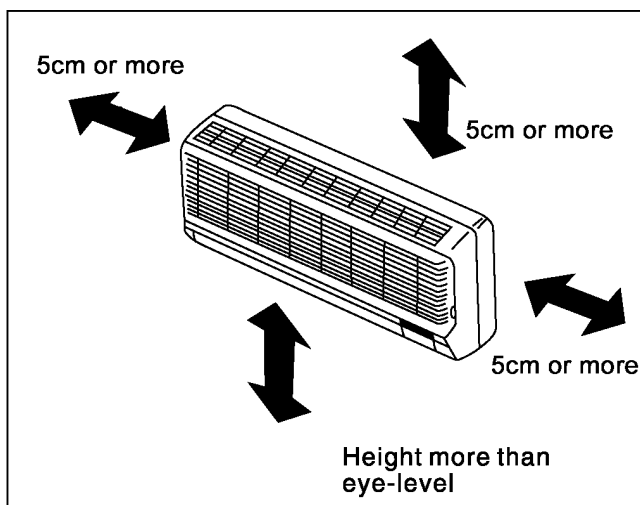


## 8.3. Installation of indoor, outdoor unit

### 8.3.1. Select best location

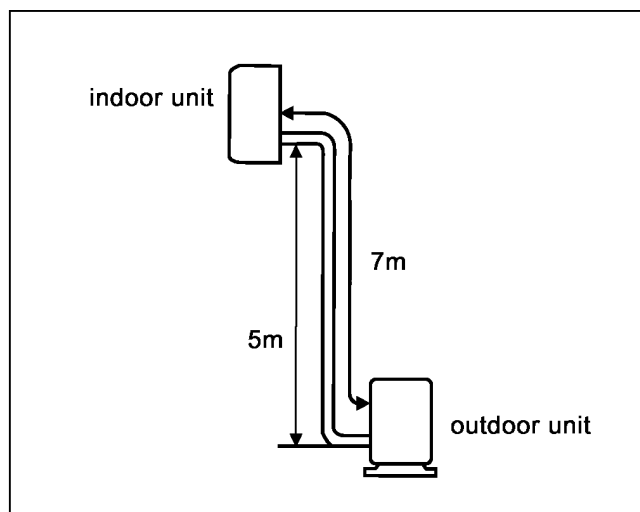
#### 8.3.1.1. Indoor unit

- There should not be any heat source of steam near the unit.
- There should not be any obstacles to prevent the air circulation.
- A place where air circulation will be good.
- A place where drainage can be easily obtained.
- A place where noise prevention is taken into consideration.
- Do not install the unit near the doorway.
- Ensure the spaces indicated by arrows from the wall, ceiling, fence, or other obstacles.
- From the floor, the height should be more than eye-level.



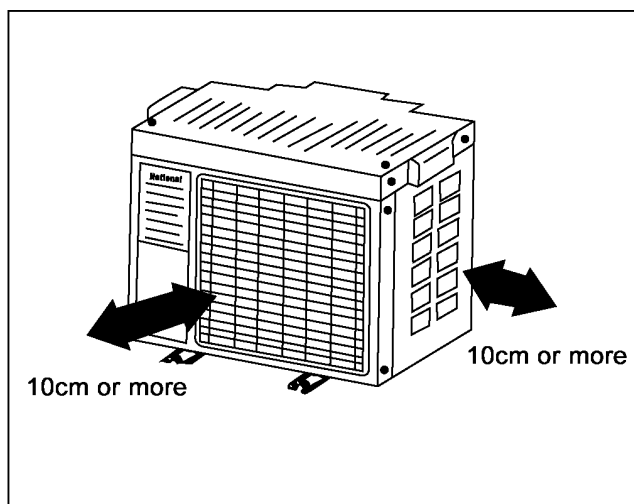
#### 8.3.1.3. Piping length and elevation

Model	Piping size		Max piping length(m)	Max elevation(m)
	Gas	Liquid		
PC9CKV	3/8"	1/4"	7	5
PC12CKV	1/2"	1/4"	7	5



#### 8.3.1.2. Outdoor unit

- If an awning is built over the unit to prevent direct sunlight or rain exposure, be careful that heat radiation from the condenser is not restricted.
- There should not be any animals or plants which could be affected by hot air discharged.
- Ensure the spaces indicated by arrows from the wall, ceiling, fence, or other obstacles.



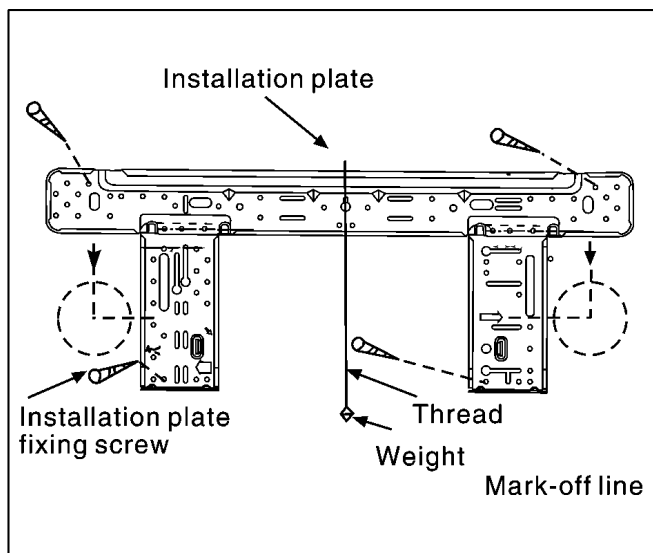
### 8.3.2. Indoor unit installation

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

#### 8.3.2.1. Mount the installation plate on the wall with four installation plate fixing screws.

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

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



#### 8.3.2.2. Drill the piping hole with Ø70mm hole-core drill.

- Line according to the arrows marked on the lower left and right side of the installation plate.

To drill a hole in the wall and install a sleeve for tube ass'y

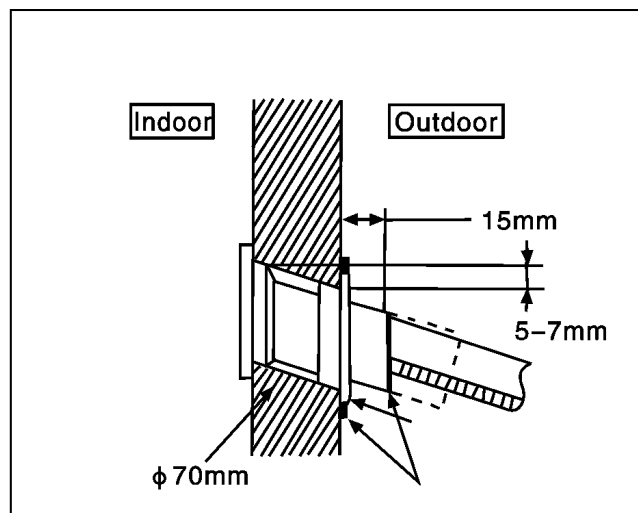
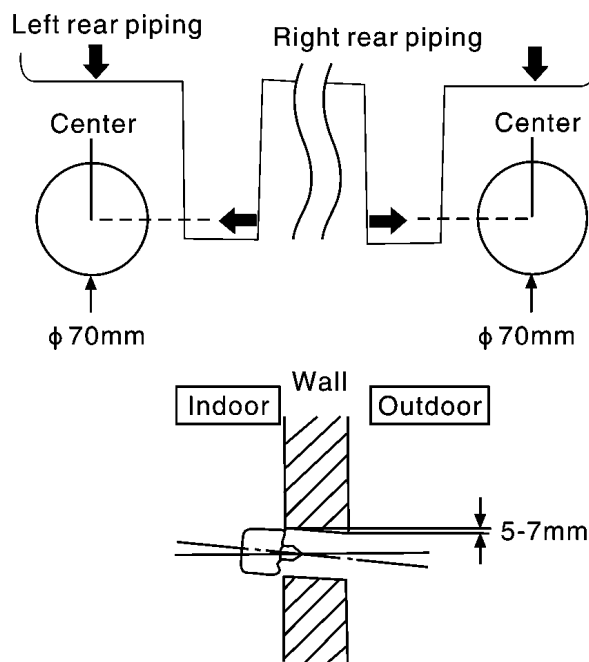
- Drill a Ø70mm hole sloping downward toward the outside of the wall.
- Insert the sleeve for tube ass'y through the hole.
- Fix the bushing to the sleeve.
- Extrude 15mm of the sleeve then cut.

#### 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.

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

The lower left and right side of installation plate

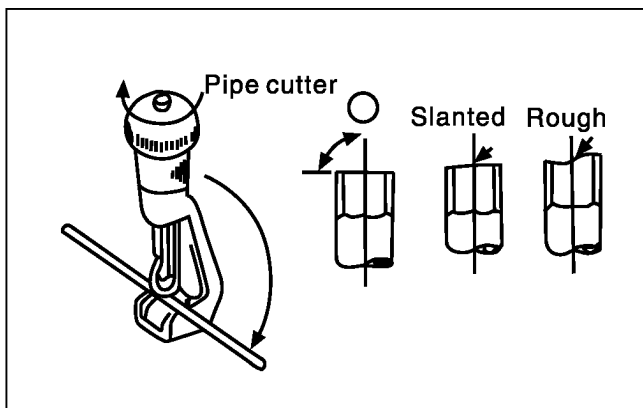


## 8.4. Piping and drainage of indoor unit

### 8.4.1. Preparation of piping

#### 8.4.1.1. Cut the pipes and the cable

- Use the accessory piping kit or pipes purchased locally.
- Measure the distance between the indoor and the outdoor unit.
- Cut the pipes a little longer than measured distance.
- Cut the cable a 1.5m longer than the pipe length.



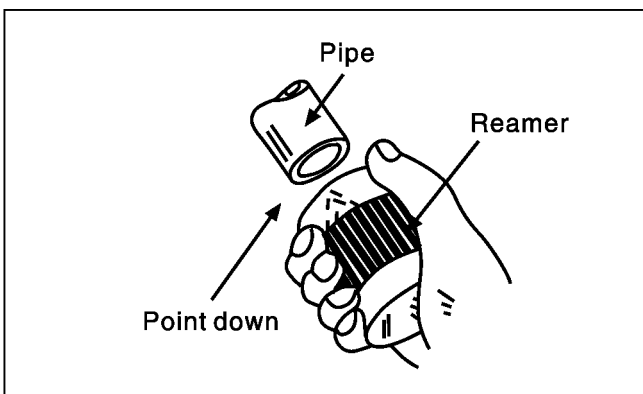
Model	Pipe size	
	Gas side	Liquid side
PC9CKV	3/8"	1/4"
PC12CKV	1/2"	1/4"

#### 8.4.1.2. Remove burrs

- Remove burrs from cut edges of pipes.
- Turn the pipe end down to avoid the metal powder entering the pipe.

#### Caution

If burrs are not removed, they may cause a gas leakage



#### 8.4.1.3. Flaring the pipe

- Insert the flare nuts, mounted on the connection ports of both indoor and outdoor unit, onto the copper pipes.
- Fit the copper pipe end into the bar of flare tool about 0.5-1.5mm higher. (see Fig.A)
- Flare the pipe ends.

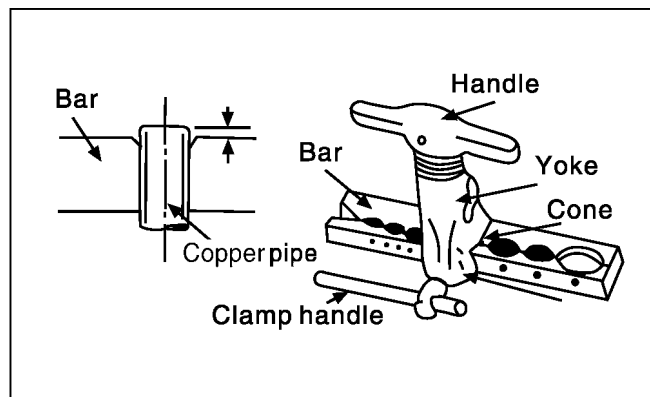
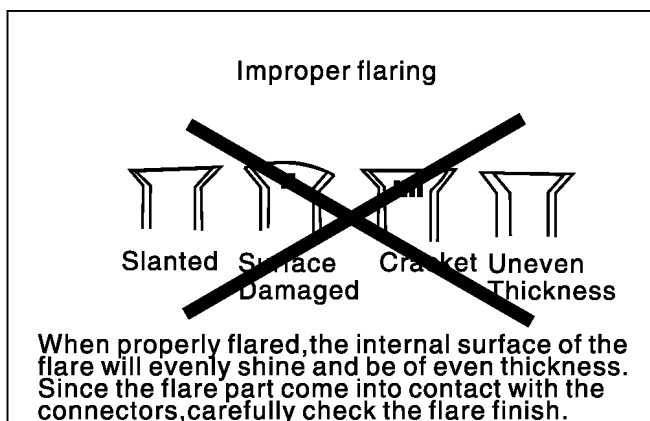


Fig.A

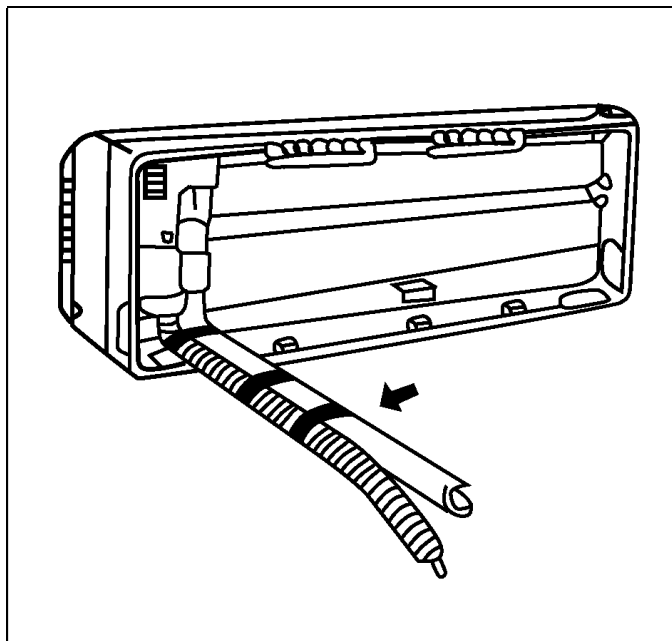
#### 8.4.1.4. Tape the flaring portion to protect it from dust or damage.



## 8.4.2. Connection of piping

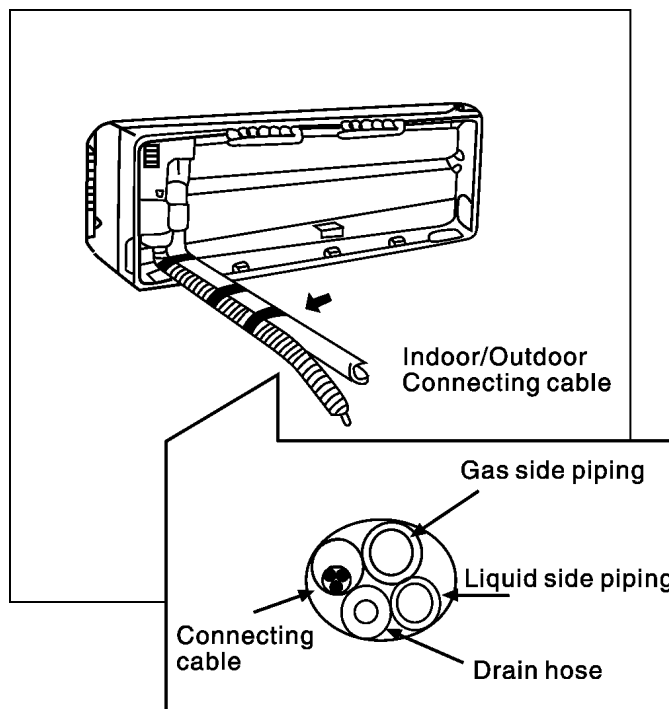
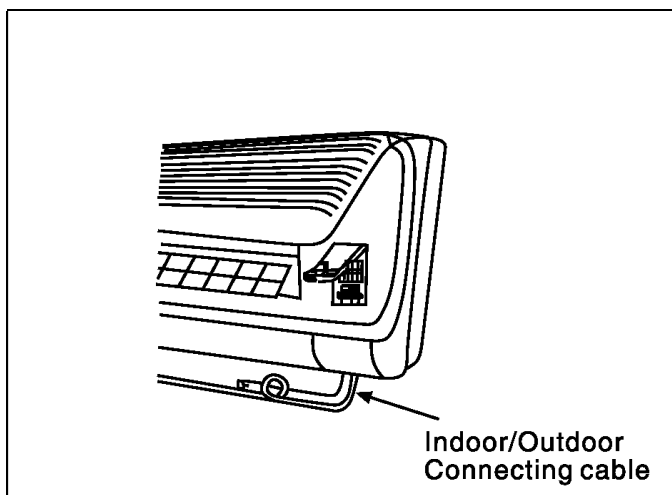
Remove the indoor piping

- Pull the tube out of chassis.



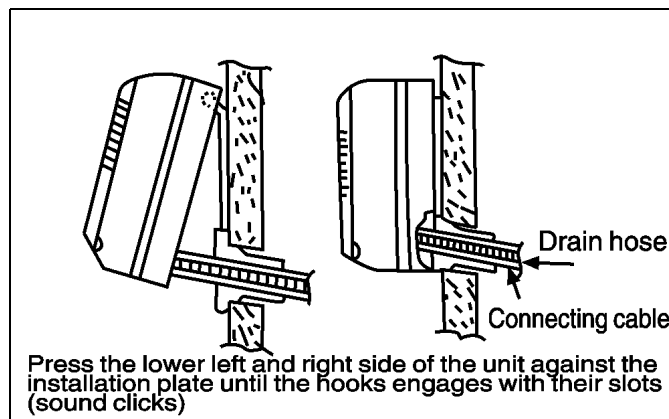
### For the right piping

1. Pull the tube out of chassis.
2. Insert the tube and drain hose into the hole.
3. Insert the connecting cable into the indoor unit through the hole.
  - Do not connect the unit to power supply.
  - Make a small loop with the cable for easy connection later.
4. Tape the tube, drain hose and cable.



### 5. Indoor unit installation

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

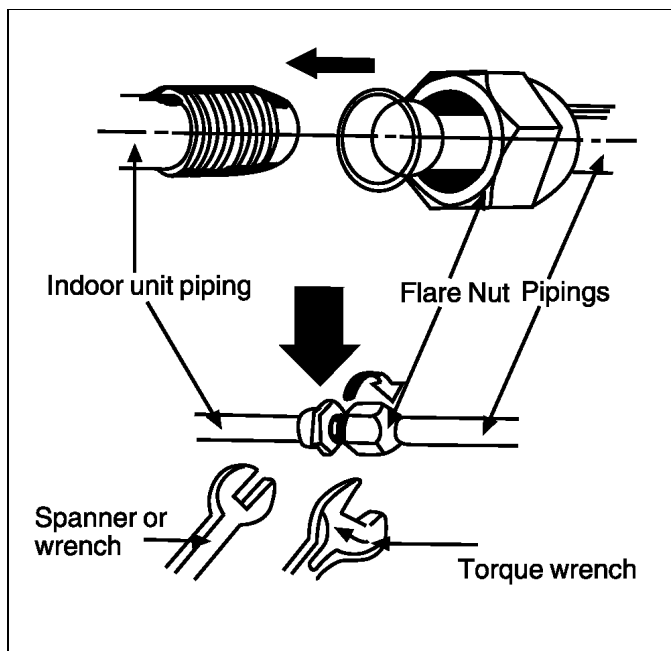


### 6. Connecting the piping to the indoor unit

- 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 arrow on the wrench.

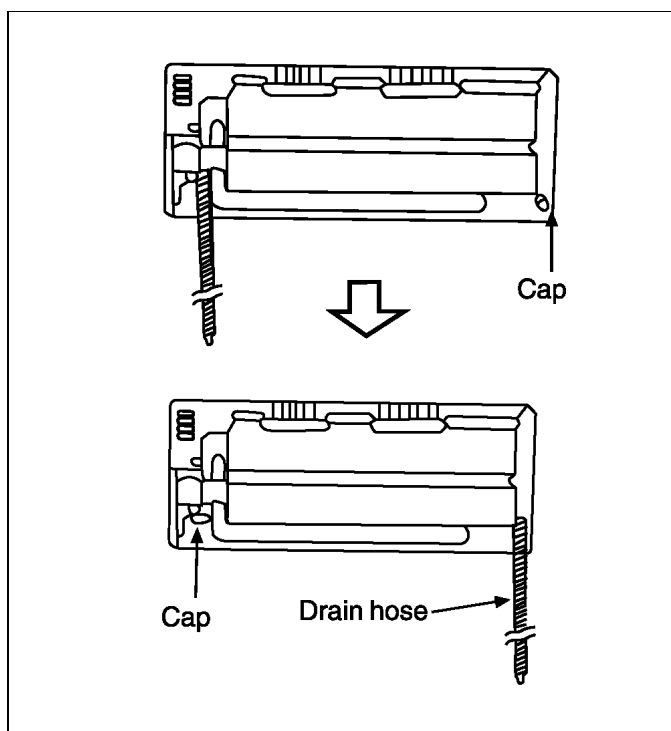
Model	Piping size	Torque
PC9CKV/ PC12CKV	Liquid side 1/4"	18N.m
PC9CKV	Gas side 3/8"	42N.m
PC12CKV	Gas side 1/2"	55N.m



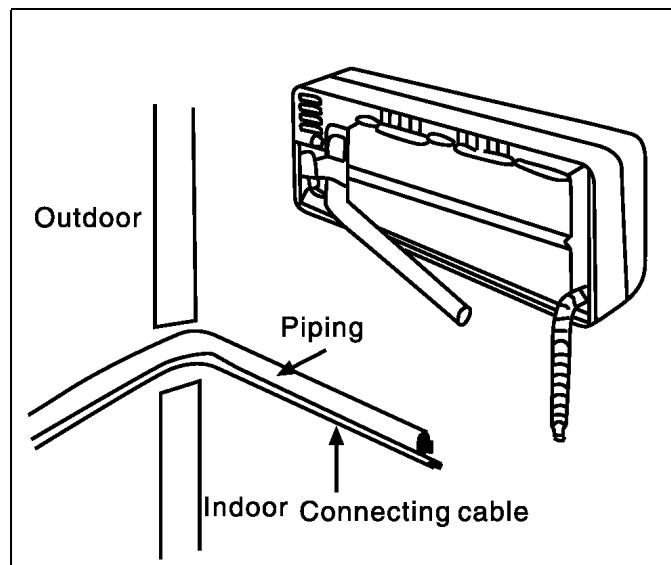
#### For the left side piping

1. Route the indoor tubing with the drain hose to the hole.

- Pull out the drain hose.
- Exchange the hose and cap.

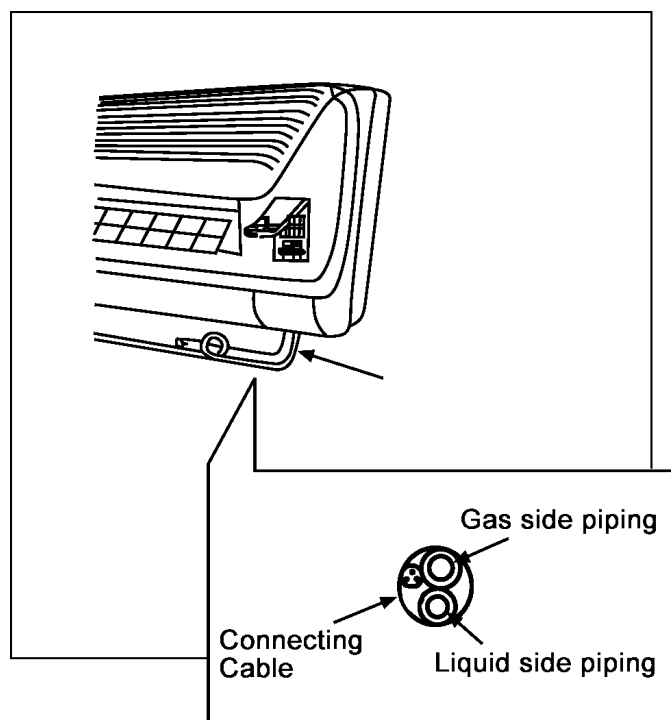


2. Insert the piping and connecting cable to indoor side through the hole.



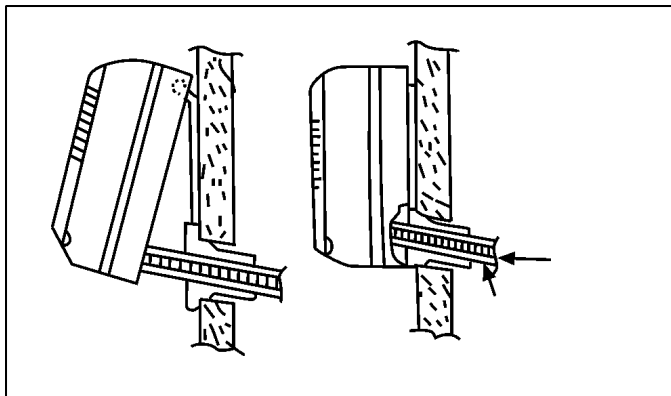
3. Insert the connecting cable into the indoor unit

- Do not connect the cable to the indoor unit.
- Make a small loop with the cable for easy connection.



4. Indoor unit installation

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

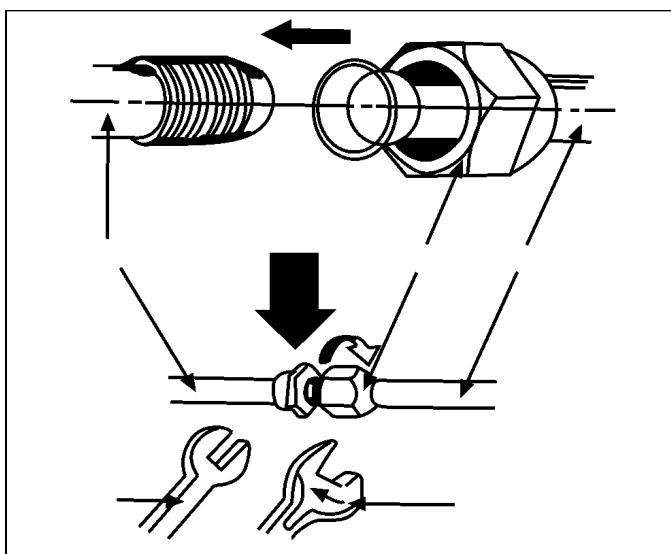


#### 5. Connecting the piping to the indoor unit

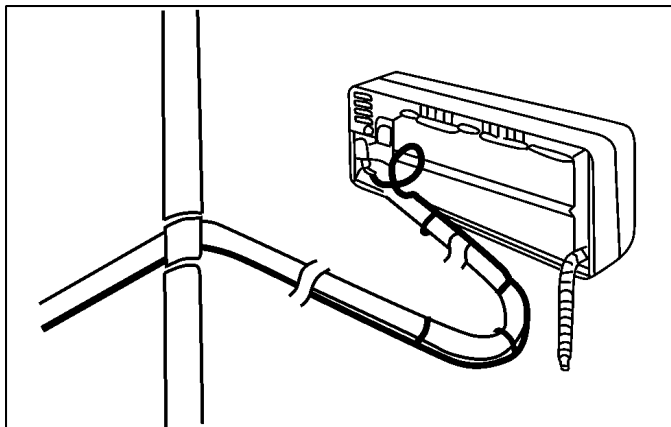
- Align the center of the piping and sufficiently tighten the flare nut with fingers.
- Finally, tighten the flare nut with torque wrench until the wrench clicks.

When tightening the flare nut with torque wrench, ensure the direction for tightening follows arrow on the wrench.

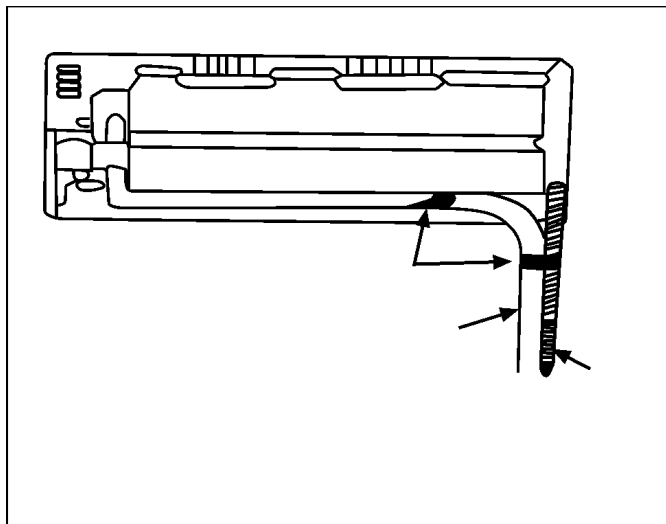
Model	Piping size	Torque
PC9CKV/ PC12CKV	Liquid side 1/4"	18N.m
PC9CKV	Gas side 3/8"	42N.m
PC12CKV	Gas side 1/2"	55N.m



#### 6. Set the piping and the connecting cable to the back of chassis with the clamping cover.



#### 7. Tape the piping, drain hose and connecting cable.



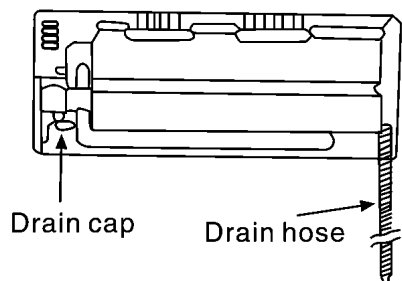
## 8.5. In case of embedded Piping

### For the embedded piping

Follow the same procedure for left rear and left piping.

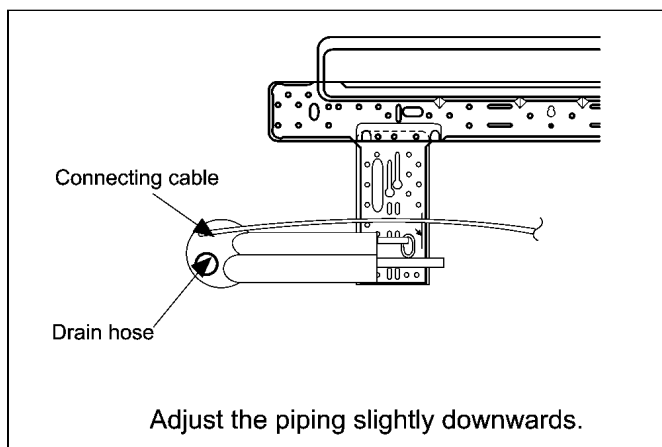
### 8.5.1. Replace the drain hose

Replace the drain hose and drain cap.  
Figure from the back of the indoor unit after installation.  
(For the left and left rear piping)



### 8.5.2. Bend the embedded piping

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



### 8.5.3. Install the indoor unit.

### 8.5.4. Cut and flaring the embedded piping

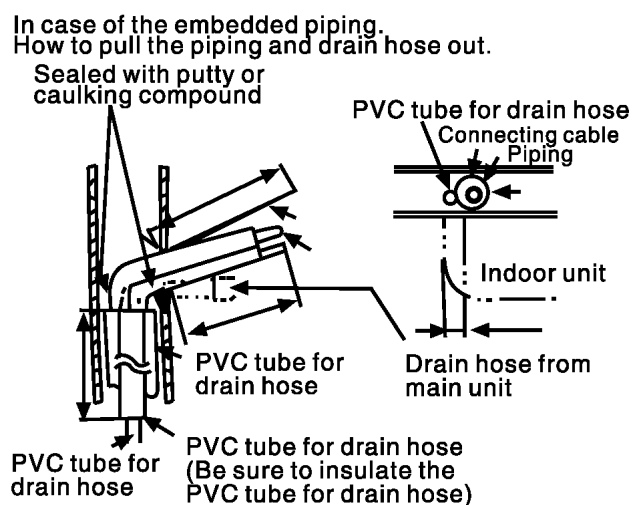
- When determining the dimensions of the piping, slide the unit all the way to the left on the installation plate.
- Refer to the section "cut and flaring the piping" in the directions for the outdoor unit. (see P.27)

### 8.5.5. Pull the connecting cable into the indoor unit.

### 8.5.6. Connecting the piping

- Refer to the section "connecting the piping" in the directions for the indoor unit.

(Connecting the piping to the outdoor unit and checking the gas leakage.)



### 8.5.7. Connecting the cable to the indoor unit

- The cable can be connected without removing the front grille.

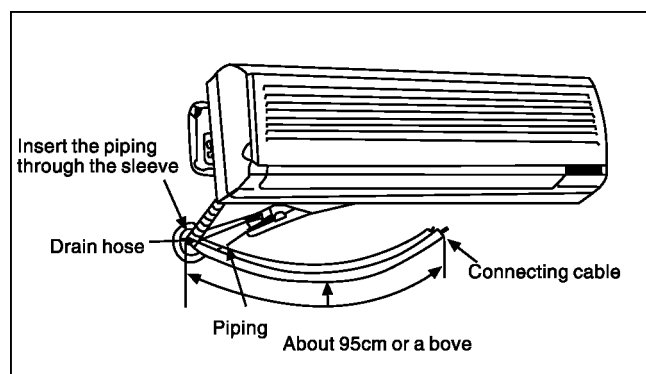


Fig.a

### 8.5.8. Install the indoor unit fixly. [REFERENCE Fig.a, Fig.b]

For left side piping, how to insert the connecting cable and drain hose

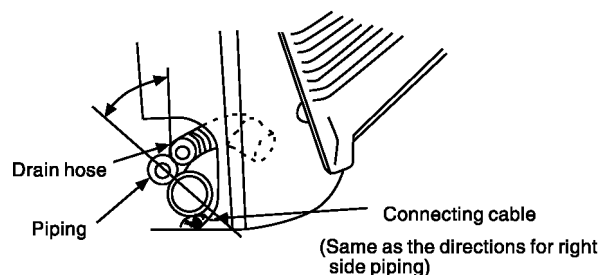


Fig.b

## 8.6. Connecting piping and the cable to outdoor unit

### 8.6.1. Connecting the piping to outdoor unit

1. Align the centre of the piping and sufficiently tighten the flare nut with fingers.
2. 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 of the wrench.



Model	Piping size	Torque
PC9CKV/ PC12CKV	Liquid side 1/4"	18N.m
PC9CKV	Gas side 3/8"	42N.m
PC12CKV	Gas side 1/2"	55N.m

#### Caution

When connecting the piping, always use a torque wrench. Other tools may cause damage to the flare nut because of improper force.

### 8.6.2. Connect the cable to the outdoor unit

1. Remove the control board cover or top plate of the outdoor unit (for PC9CKV only) from the unit by loosening the screw.
2. Connecting cable between indoor unit and outdoor unit shall be approved polychloroprene sheathed 3 x 1.5 mm<sup>2</sup> flexible cord, type designation 245 IEC 57 or heavier cord.

Terminals on the indoor unit	1	2	
Color of wires			
Terminals on the outdoor unit	1	2	

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



## 8.7. Checking the drainage and connecting the cable to indoor unit

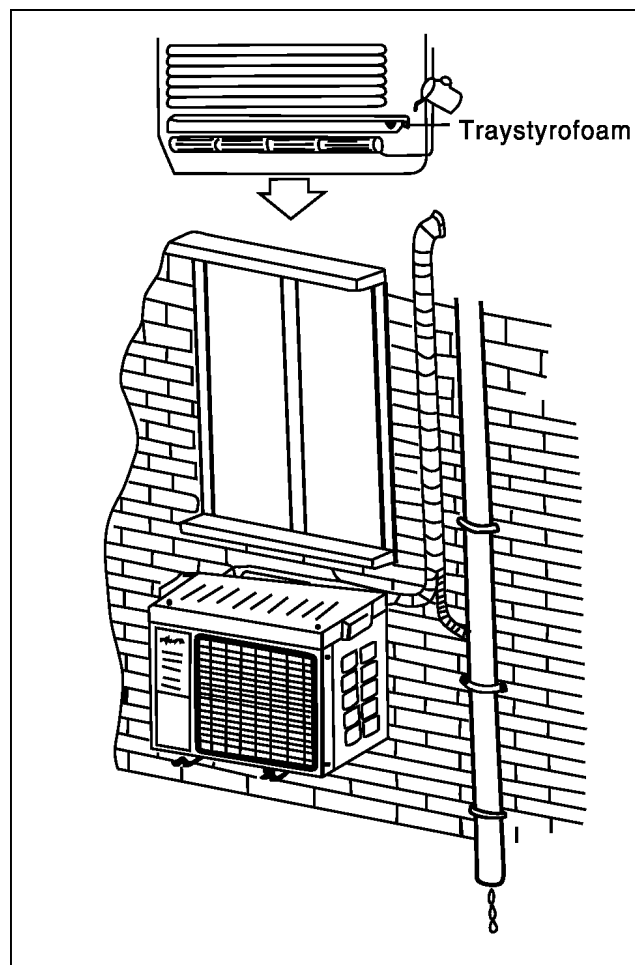
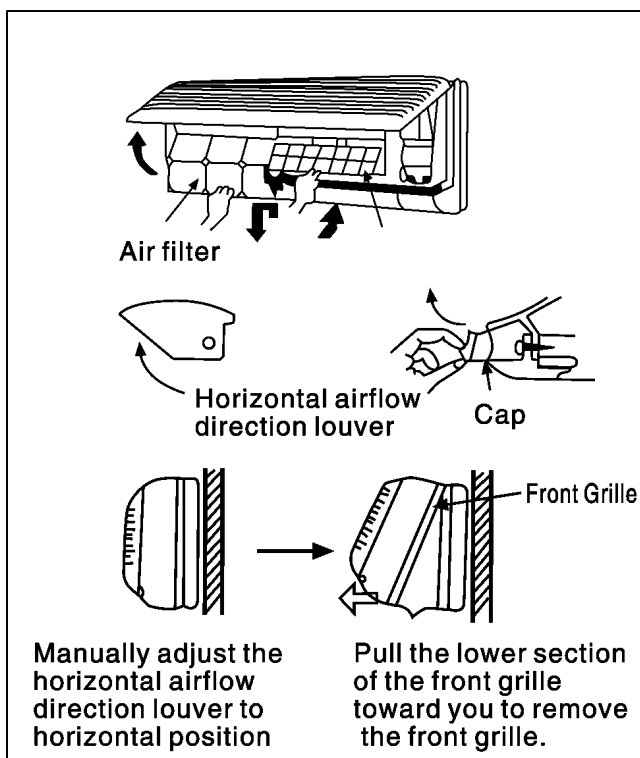
### 8.7.1. Checking the drainage

#### 1. Remove the front grille from the cabinet

When removing the front grille for maintenance purposes, etc, carry out by the following procedures.

- Set the vertical airflow direction louver (1) to the horizontal position.
- Remove the two caps on the front grille as shown in the illustration at right, and then remove the two mounting screws.
- Pull the lower section of the front grille toward you to remove the front grille.

When reinstalling the front grille, first set the vertical airflow direction louver to the horizontal position, and then carry out by steps 3 and 2 in that order. At this time check to sure that the fixing tabs on the top inside edge of the front grille are securely inserted into the respective slots.






#### 2. Checking the drainage

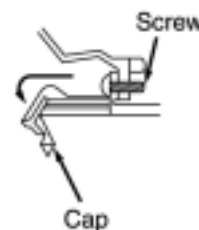
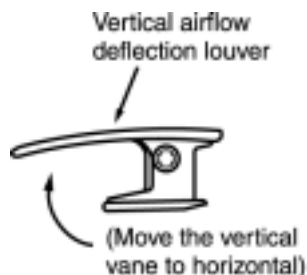
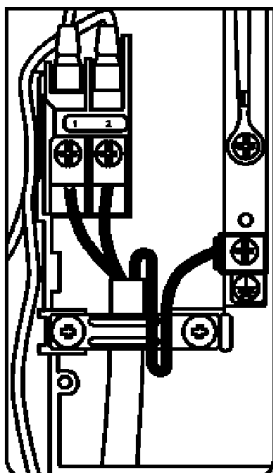
- Pour a glass of water into the drain traystyroform.
- Ensure water flows out from drain hose of indoor unit.

### 8.7.2. Connecting 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 x 1.5mm<sup>2</sup> flexible cord, type designation 245 IEC 57 or heavier cord.
  - Ensure the color 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	
Color of wires			
Terminals on the outdoor unit	1	2	

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



#### AUTO SWITCH OPERATION

The below operations will be performed by pressing the "AUTO" switch.

##### 1. AUTO OPERATION MODE

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

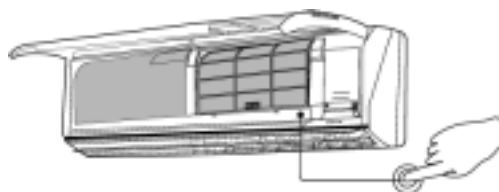
##### 2. TEST RUN OPERATION (FOR PUMP DOWN/SERVICING PURPOSE)

The Test Run operation will be activated if the Auto Switch is pressed continuously for more than 5 sec. to below 10 sec.

A "pep" sound will occur at the fifth sec., in order to identify the starting of Test Run operation

##### 3. REMOTE CONTROLLER RECEIVING SOUND ON/OFF

The ON/OFF of Remote Controller receiving sound can be changed over by pressing the "AUTO" Switch continuously for 10 sec. and above. A "pep", "pep" sound will occur at the tenth sec., in order to indicate the "ON/OFF" changed over of remote control receiving sound.



#### HOW TO TAKE OUT FRONT GRILLE

Please follow the steps below to take out front grille if necessary such as when servicing.

1. Set the vertical airflow direction louver to the horizontal position.
2. Slide down the two caps on the front grille as shown in the illustration at right, and then remove the two mounting screws.
3. Pull the lower section of the front grille towards you to remove the front grille.

When reinstalling the front grille, first set the vertical airflow direction louver to the horizontal position and then carry out above steps 2 - 3 in the reverse order.

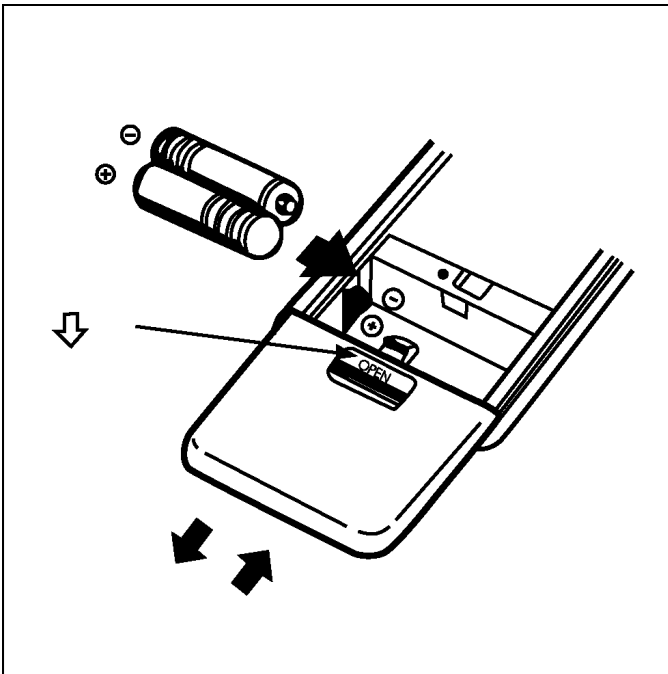
## 8.8. Test Running

### 8.8.1. Connect the power supply

1. Connect the power supply cord to independent power supply.
  - Circuit breaker is necessary.
2. Prepare the remote control
  - Insert two batteries
  - Remove the cover from the back of the remote control.

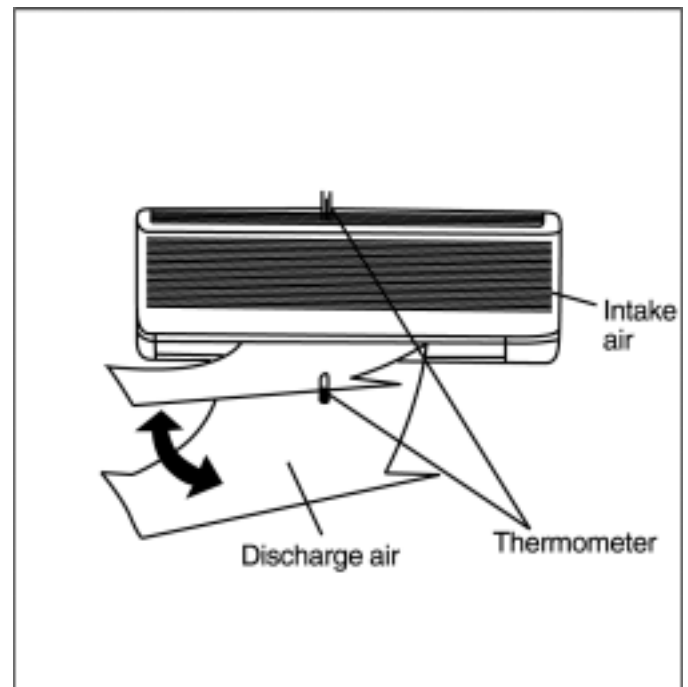
Insert two batteries

- Be sure that the (+) and (-) directions are correct.
  - Be sure that both batteries are new.
  - Re-attach the cover.
  - Slide the cover back into position.
3. Operate the unit at cooling mode operation for 15 minutes or more.



### 8.8.2. Evaluation of the performance

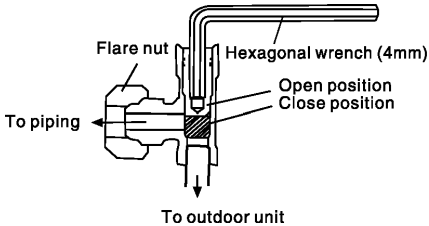
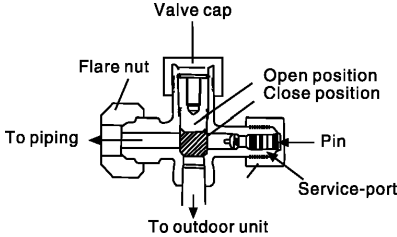
1. Operate the air conditioner for 15 minutes.
2. Measure the temperature of the intake and discharge air.
3. Ensure the difference of temperature between the intake and discharge air is more than 8°C, in cooling operation.



#### CAUTION

Connecting cable between the indoor and outdoor unit shall be approved cable and the size of the conductor shall be 1.5mm<sup>2</sup>.

## 9 2-way, 3-way Valve

	2-way Valve (Liquid Side)	3-way Valve (Gas Side)	
			
Works	Shaft Position	Shaft Position	Service Port
Shipping	Close (With valve cap)	Closed (With valve cap)	Closed (With cap)
Air purging (Installation and Re-installation)	Open (Counter-clockwise)	Closed (clockwise)	Open (Push-pin)
Operation	Open (Counter-clockwise)	Open (With valve cap)	Closed (With cap)
Pumping down (transferring)	Closed (clockwise)	Open (counter-clockwise)	Open (Connected manifold gauge)
Evacuation (Servicing)	Open	Open	Open With vacuum pump
Charging (servicing)	Open	Open	Open (With charging cylinder)
Pressure check (Servicing)	Open	Open	Open (Connected manifold gauge)
Gas releasing (Servicing)	Open	Open	Open (Connected manifold gauge)

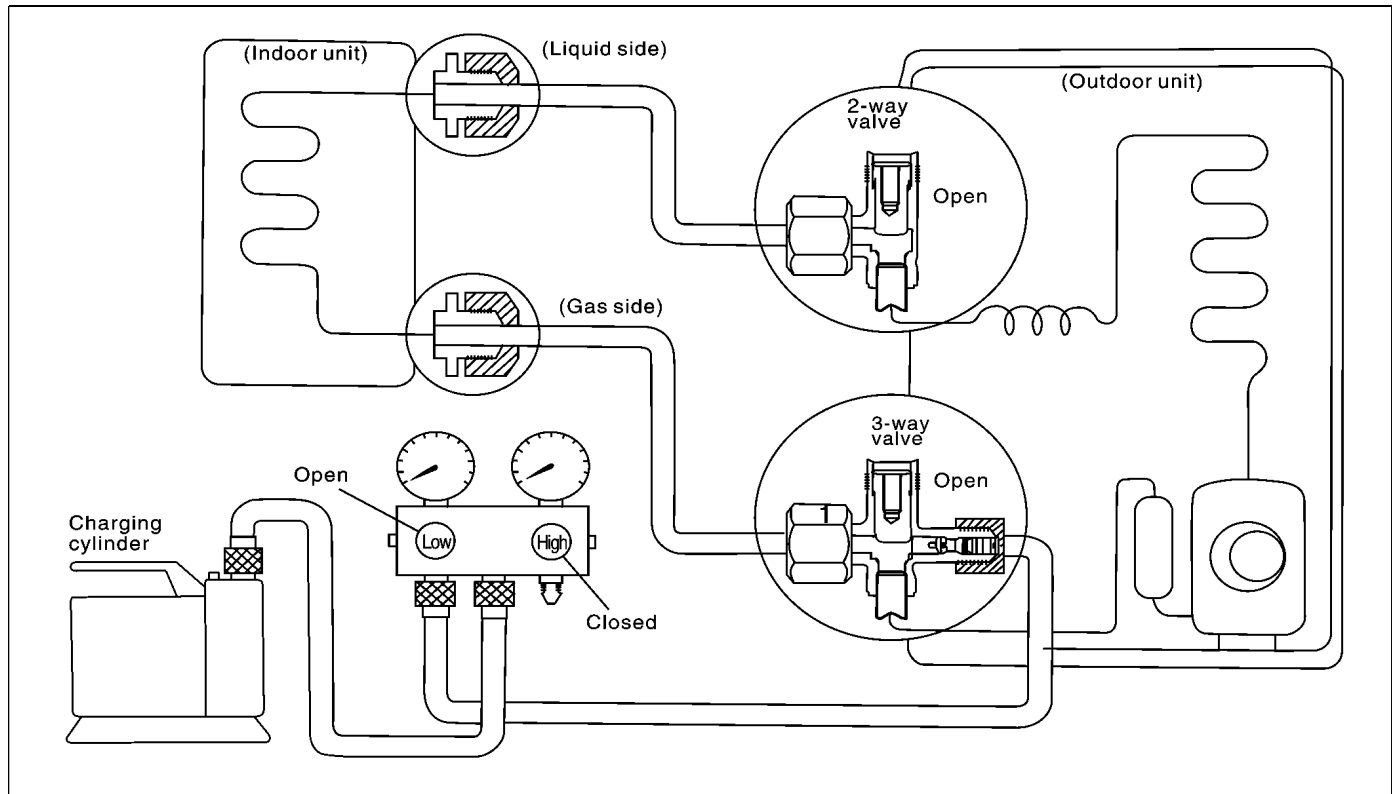
## 9.1. Evacuation of Installation

When installing an air conditioner, be sure to evacuate the air inside the indoor unit and pipes in the following procedure.

### Required tools:

hexagonal wrench, adjustable wrench, torque wrench, wrench to hold the joints, gas leak detector, charging set and vacuum pump

The air in the indoor unit and in the piping must be purged. If air remains in the refrigeration piping, it will affect the compressor, reduce to cooling capacity, and could lead to a malfunction.



### Service port cap

Be sure, using a torque wrench to tighten the service port cap (after using the service port), so that it prevents the gas leakage from the refrigeration cycle.

### 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 centre hose of the charging set to a vacuum pump.
  3. Turn on the power switch of the vacuum pump and make sure that the needle in the gauge moves from 0 cmHg (0 MPa) to -76 cmHg (-0.1 MPa). Then evacuate the air for approximately 10 minutes.
  4. Close the valve of the Low side of the charging set and turn off the vacuum pump. Make sure that the needle in the gauge does not move after approximately 5 minutes.
- BE SURE TO TAKE THIS PROCEDURE IN ORDER TO AVOID GAS REFRIGERANT 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 both the 3-way valve and the 2-way valve and at a torque of 18 N·m with a torque wrench.

7. Remove the valve caps of both the 3-way valves.

Position both of the valves to \*open\* using a hexagonal wrench (4 mm).

8. Mount valve caps onto both of the 3-way valve and the 2-way valve.

Be sure to check for gas leakage.

### Caution

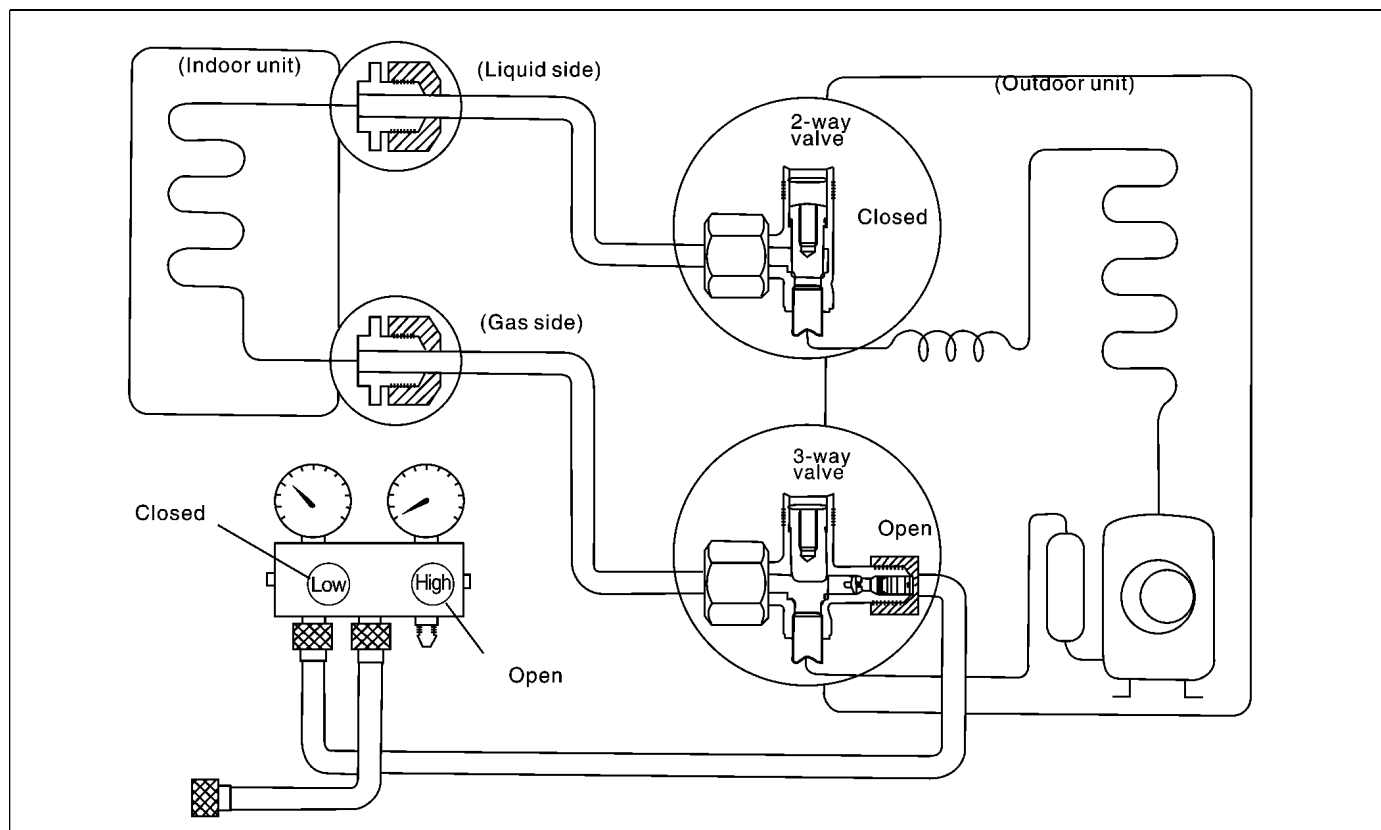
If gauge needle does not move from 0 cmHg (0MPa) to -76 cmHg (-0.1MPa) in step (3) above, take the following measures:

If the leaks stop when the piping connections are tightened further, continue working from step (3).

If the leaks do not stop when the connections are retightened, repair the location of the leak.

## 9.2. Pumping down

(For Re-installation)

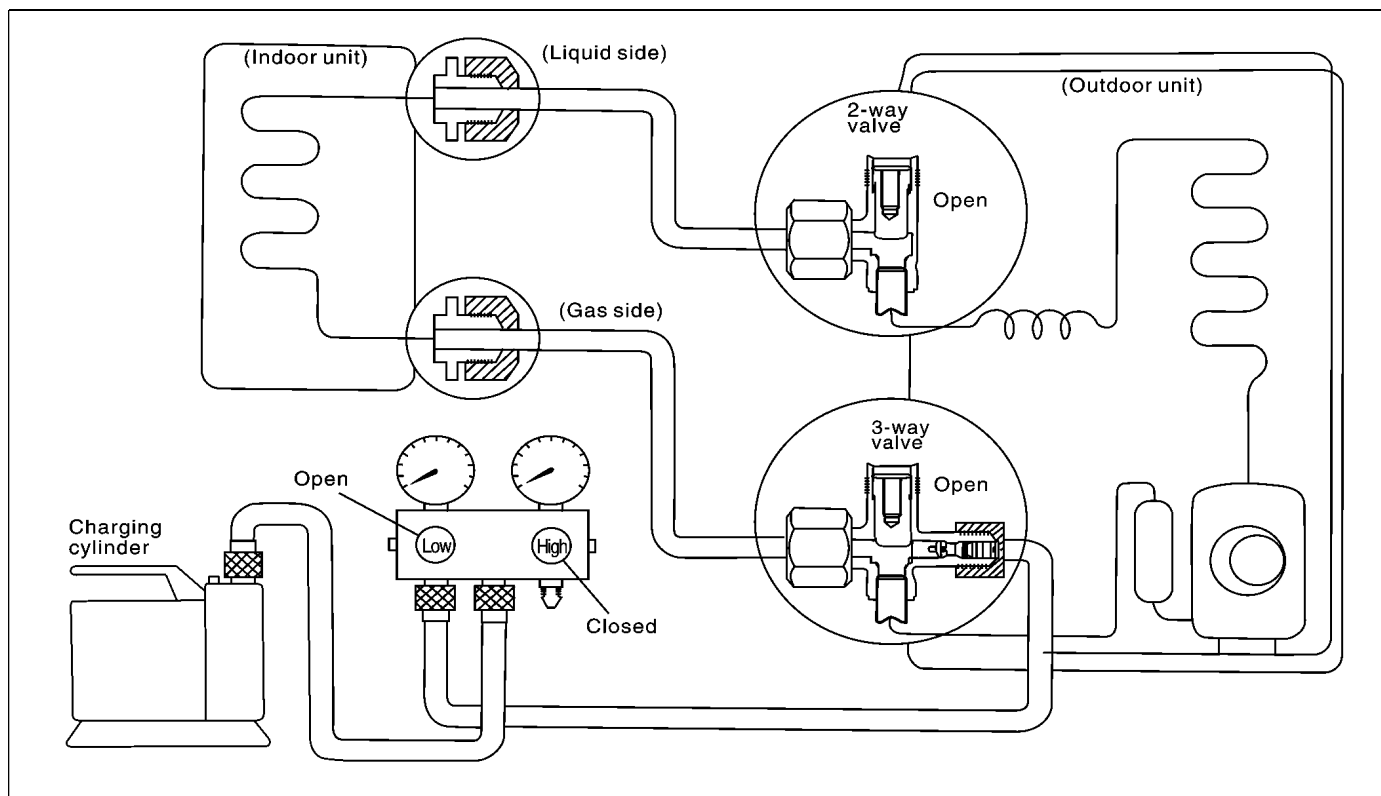


### Procedure

- Confirm that both 2-way and 3-way valves are set to open positions.
  - Remove the valve stem caps and confirm that the valve stems are in the open position.
  - Be sure using a hexagonal wrench to operate the valve stems.
- Operate the unit for 10-15 minutes.
- Stop operation and wait for 3 minutes, then connect the charge set to the service port of the 3-way valves.
  - Connect the charge hose with the push pin to the service port.
- Air purging of the charge hose
  - Open the low-pressure valve or the charge set slightly to purge air from the charge hose.
- Set the 2-way valve to the close position.
- Operate the air conditioner at the cooling cycle and stop it when the gauge indicates 2 kg/cm<sup>2</sup>G (0.1Mpa).
  - If the unit cannot be operate at the cooling mode operation (weather is rather cool), press the **AUTO** switch on the indoor unit, so that the unit can be operated.
- Immediately set 3-way valve to the closed position.
  - Do this quick so that the gauge ends up indicating 1 to 3 kg/cm<sup>2</sup>G. (0.1 to 0.3 Mpa).
- Disconnect the charge set, and mount the 2-way and 3-way valve stem's nuts and service port cap.
  - Use torque wrench to tighten the service port cap to a torque 1.8kg.m (18N.m).
  - Be sure to check for gas leakage.

## 9.3. Re-air purging

(Re-installation)



### Procedure

1. Connect a charging hose with a push pin to the Low side of a charging set and the service port of the 3-way valve.

Be sure to connect the end of the charging hose with the push pin to the service port.

2. Connect the center hose of the charging set to a vacuum pump.
3. Turn on the power switch of the vacuum pump and make sure that the needle in the gauge moves from 0 cmHg (0 MPa) to -76 cmHg (-0.1 MPa). Then evacuate the air for approximately 10 minutes.
4. Close the valve of both Low side of the charging set and turn off the vacuum pump. Make sure that the needle in the gauge does not move after approximately 5 minutes.

**BE SURE TO TAKE THIS PROCEDURE IN ORDER TO AVOID GAS LEAKAGE.**

5. Disconnect the charging hose from the vacuum pump.

#### Caution

If gauge needle does not move from 0 cmHg (0 MPa) to -76 cmHg (-0.1 MPa) in step (3) above, take the following measures:

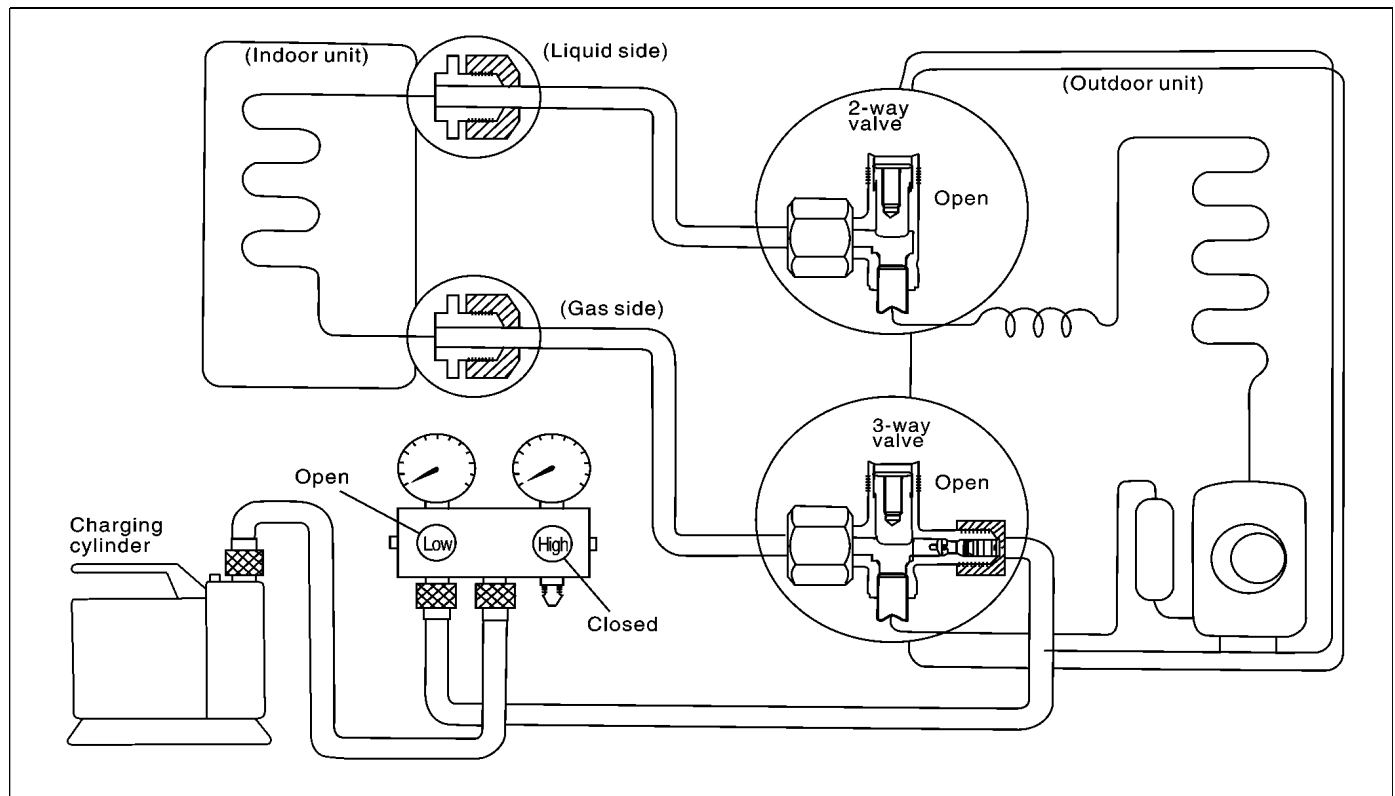
If the leaks stop when the piping connections are tightened further, continue working from step (3).

If the leaks do not stop when the connections are retightened, repair the location of the leak.

6. Tighten the service port caps of both the 3-way valve and 2-way valve at a torque of 18 N·m with a torque wrench.
7. Remove the valve caps of both the valves. Position both of the valves to "open" using a hexagonal wrench (4 mm).
8. Mount valve caps onto both the valves.

## 9.4. Balance refrigerant of the 2-way, 3-way valves

(Gas leakage)



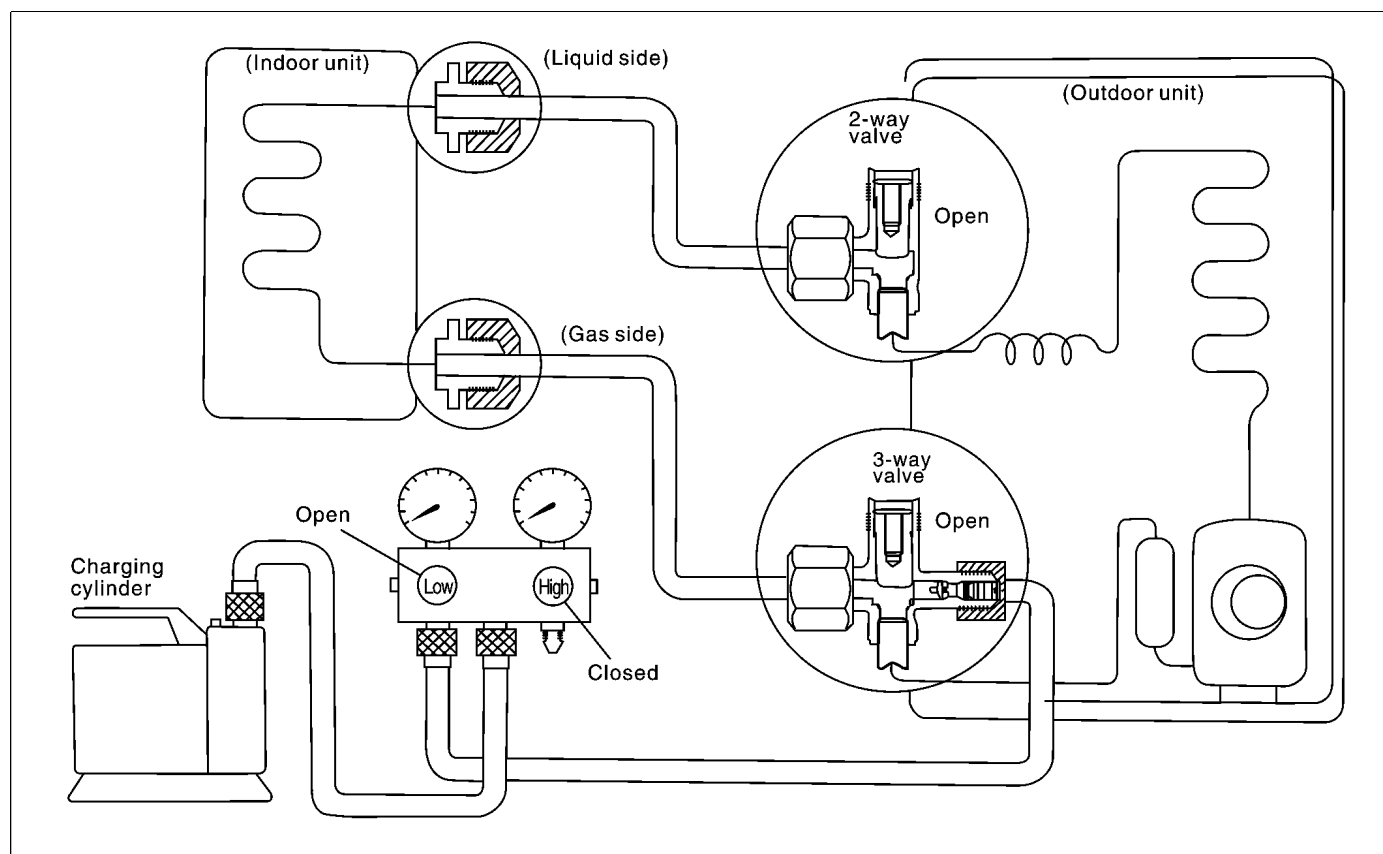
### Procedure

1. Confirm that both 2-way and 3-way valves are set to the open position.
2. Connect the charge set to the service port of the 3-way valve.
  - Leave the valve on the charge set closed.
  - Connect the charge hose with the push pin to the service port.
3. Open the valves (low side) on the charge set and discharge the refrigerant until the gauge indicates 0.5-1kg/cm<sup>2</sup>G (0.05-0.1Mpa).
  - If there is no air in the refrigerant cycle [the pressure when the air conditioner is not running is higher than 1kg/cm<sup>2</sup>G (0.1MPa)], discharge the refrigerant until the gauge indicates 0.5 to 1kg/cm<sup>2</sup>G (0.05 to 0.1MPa). If this is the case, it will not be necessary to apply a evacuation.
  - Discharge the refrigerant gradually, if it is discharged too suddenly, the refrigerant oil will also be discharged.



## 9.5. Evacuation (Installation)

(No refrigerant in the refrigeration cycle)

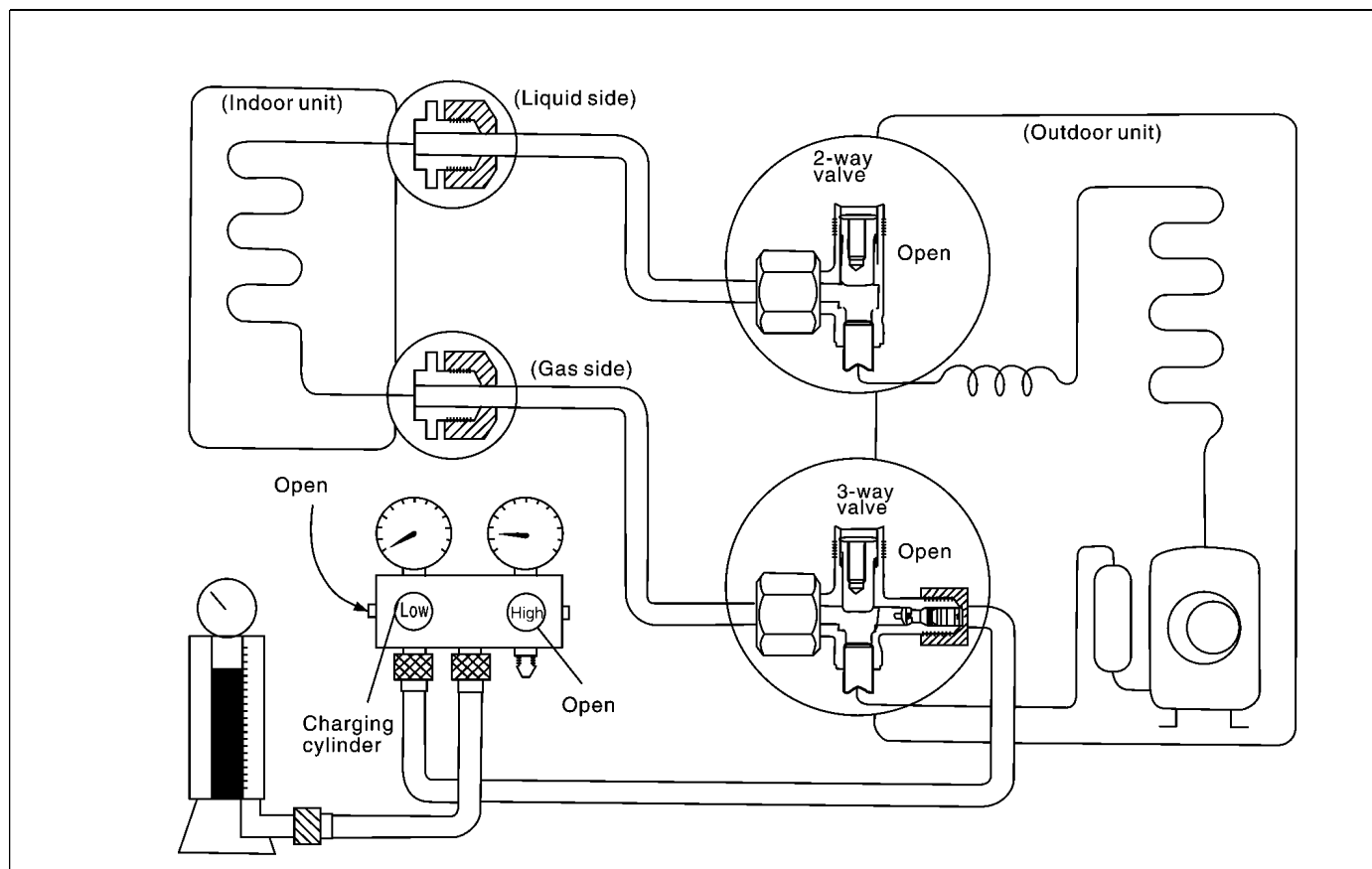


### Procedure

1. Connect the vacuum pump to the charge set's centre hose.
2. Evacuation for approximately 1 hour.
  - Confirm that the gauge needle has moved toward -76cmHg (-0.1Mpa) [vacuum of 4 mmHg or less].
3. Close the valve (low side) on the charge set, turn off the vacuum pump, and confirm that the gauge needle does not move (approximately 5 minutes after turning off the vacuum pump).
4. Disconnect the charge hose from the vacuum.
  - Vacuum oil
    - If the vacuum pump oil becomes dirty or depleted, replenish as needed.

## 9.6. Gas charging

(After evacuation)



### Procedure

#### 1. Connect the charge hose to the charging cylinder

- Connect the charge hose which was disconnected from the vacuum pump to the valve at the bottom of the cylinder.
- If you are using a gas cylinder also use a scale and reverse the cylinder so that the system can be charged with liquid.

#### 2. Purge the air from the charge hose

- Open the valve at the bottom of the cylinder and use a screwdriver to press the check valve on the charge set to purge the air. (Be careful of the liquid refrigerant.)
- The procedure is the same if using a gas cylinder.

#### 3. Open the valve (low side) on the charge set and charge the system with liquid refrigerant.

- If the system cannot be charged with the specified amount of refrigerant, it can be charge with a little at a time (approximately 150g each time) while operating the air conditioner in the cooling cycle.

However, one time is not sufficient, wait approximately 1 minute and then repeat the procedure. (Pumping down pin)

This is different from previous procedures.

Because you are charging with liquid refrigerant from the gas side, absolutely do not attempt to charge with large amounts of liquid refrigerant while operating the air conditioner.

#### 4. Immediately disconnect the charge hose from the 3-way valve's service port.

- Stopping part-way will allow the refrigerant to be discharged.
- If the system has been charged with liquid refrigerant while operating the air conditioner, turn off the air conditioner before disconnecting the hose.

#### 5. Mount the valve stem nuts and the service port.

- Use a torque wrench to tighten the service port cap to a torque of 1.8kg. m (18N.m).
- Be sure to check for gas leakage.

## 10 Disassembly of the parts

### • Indoor Electronic Controller Removal Procedures

1. Remove the intake grille and two caps and screws at the bottom of the front grille. Then remove the front grille by releasing the 2 hooks at the top of the front grille. (See **Fig 1**)

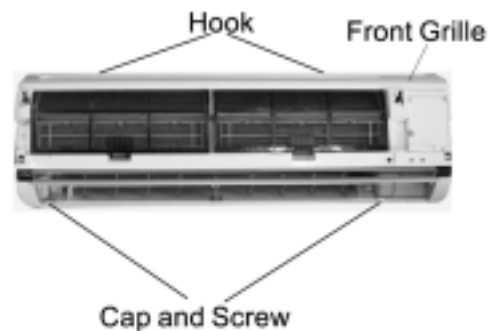


Fig 1

2. Remove the control board cover by releasing the 2 tabs at left and 2 tabs at right side of the control board cover. (Refer to **Fig 2**).

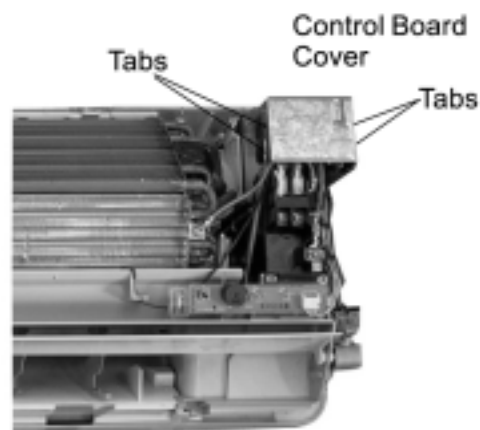


Fig 2

3. Release CN-FB , CN-TH, CN-STM connectors on the electronic controller and CN-DISP on the indicator, CN-RCV on the receiver. (see , **Fig 3**)

4. Pull the electronic controller outward gently by releasing the tab on the right side. ( **Fig 3**)

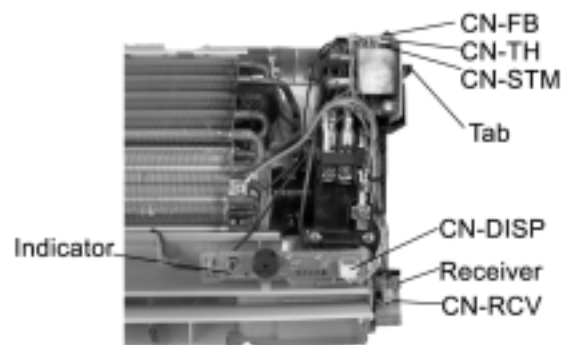


Fig 3

5. Releasing the CN-FM connector and AC(WHT) wire and two connecting wires on RY-PWR and the electronic controller can be replaced. ( **Fig 4**)

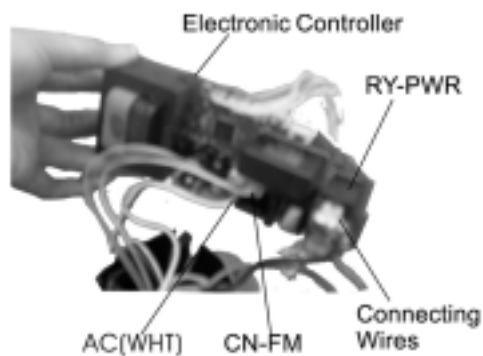
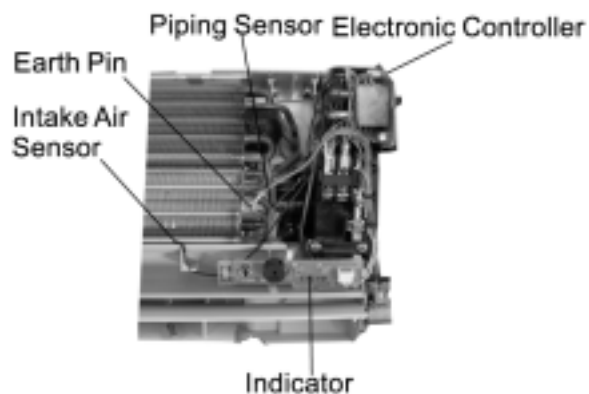


Fig 4

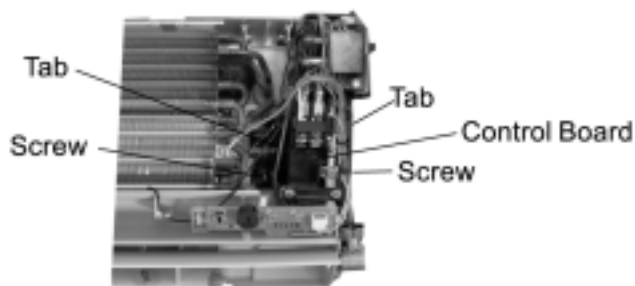
• **Indoor Fan Motor and Cross Flow Fan Removal Procedures**

1. Remove the electronic controller. (See the previous procedure)
2. Release the drain hose and the intake air temperature sensor and piping temperature sensor and remove the discharge grille. Release the earth lead wire on the evaporator. (**Fig 5**)



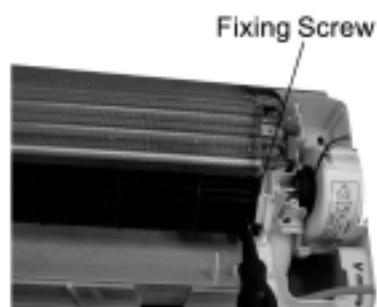
**Fig 5**

3. Release the tabs and screws on the left and right side of the control board to remove the control board. (**Fig 6**)



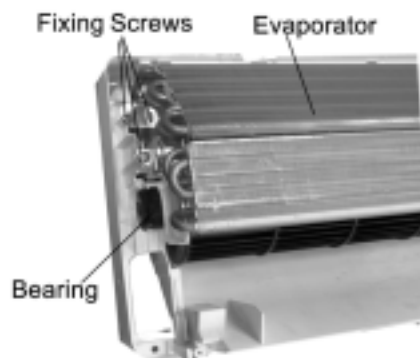
**Fig 6**

4. Release fixing screw of the cross flow fan. (**Fig 7**)



**Fig 7**

5. Release the bearing and the fixing screws on left side of the evaporator. (**Fig 8**)



**Fig 8**

6. Lift up the evaporator and remove the cross flow fan. (Fig 9 )

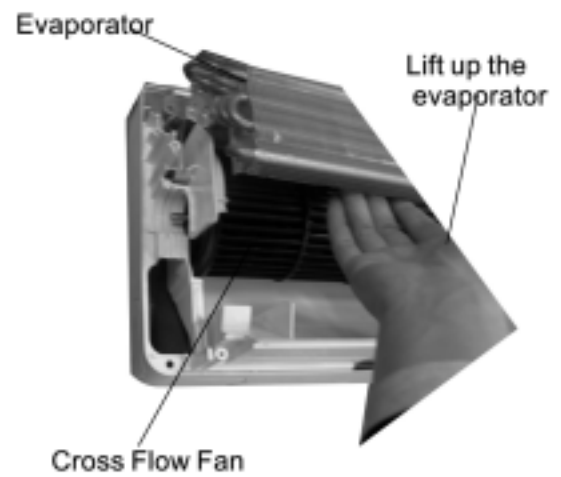


Fig 9

7. Remove the fan motor. (Fig 10)

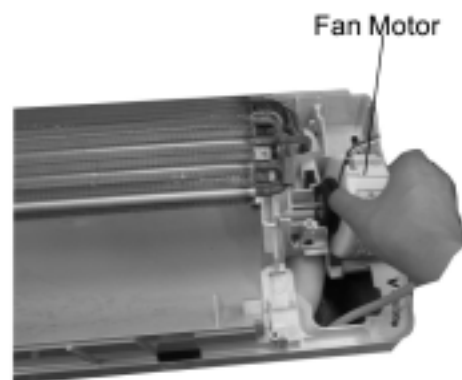


Fig 10

- **Remote control reset**

If the display is chaotic or can not be adjusted, use a pin to gently press reset button to reset the remote control to the original set by manufacturer.(Fig 11 )



Fig 11

# 11 Trouble-shooting guide

## Refrigeration cycle system

In order to diagnose malfunctions, make sure that there are no electrical problems before inspecting the refrigeration cycle.

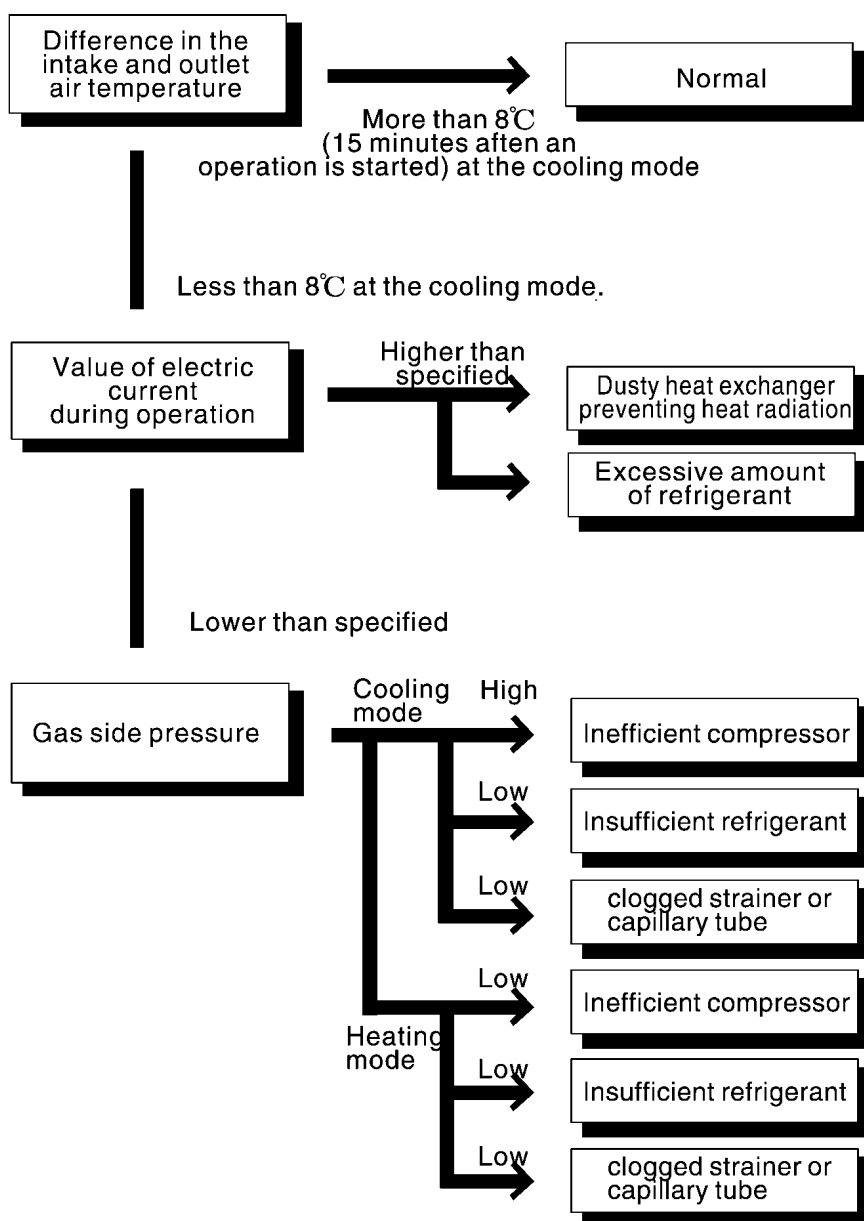
Such problems include insufficient insulation, problem with the power source, malfunction of compressor or fan.

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.

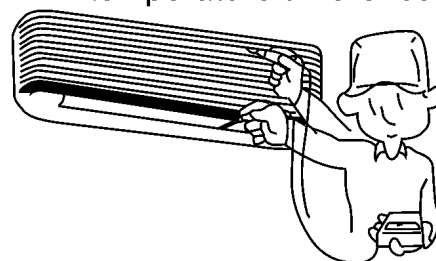
Normal pressure and outlet air temperature (standard)

	Gas side pressure Mpa (kg/cm <sup>2</sup> G)	Outlet air temperature (°C)
Cooling mode	0.4~0.6(4~6)	12~16
Heating mode	1.5~2.1(15~21)	36~45

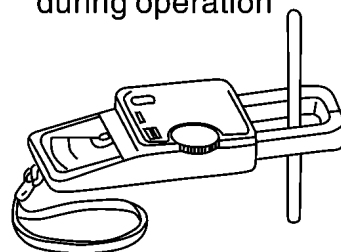
★ Condition: indoor fan speed: high  
outdoor temperature: 35°C  
(cooling mode)  
7°C (heating mode)



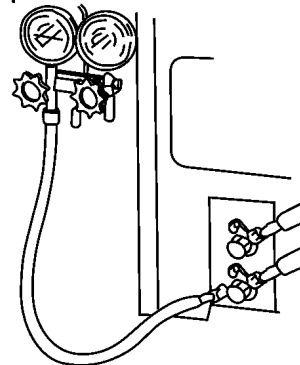
- Measuring the air temperature difference



























- Measuring electric current during operation



- Measuring gas side pressure



## 11.1. Relationship between the condition of 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						
Short circuit in the indoor unit						
Insufficient compression						

## 11.2. Diagnosis methods of a malfunction of a compressor and a 4-way valve

Nature of fault	Symptom
Insufficient compressing of a compressor	<ul style="list-style-type: none"> <li>● Electric current during operation becomes approximately 80% lower than the normal level.</li> <li>● The discharge tube of the compressor becomes abnormally hot (normally 70~90°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>

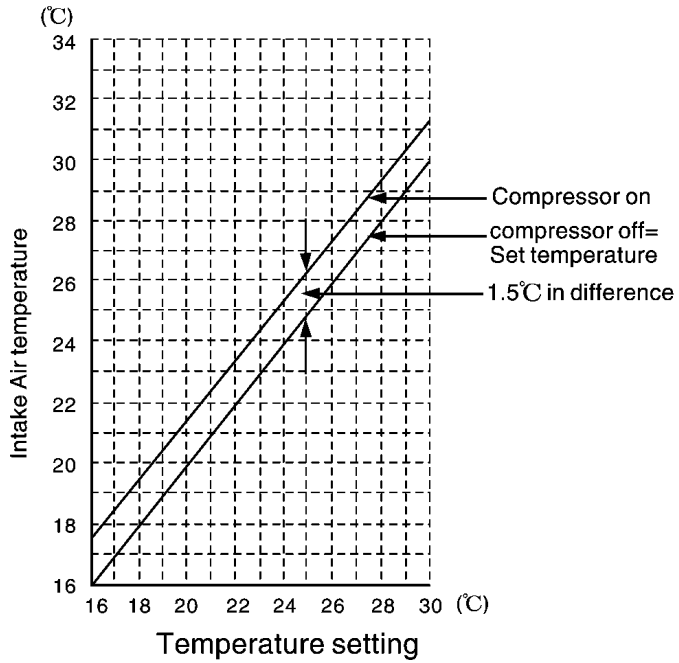


# 12 Technical Data

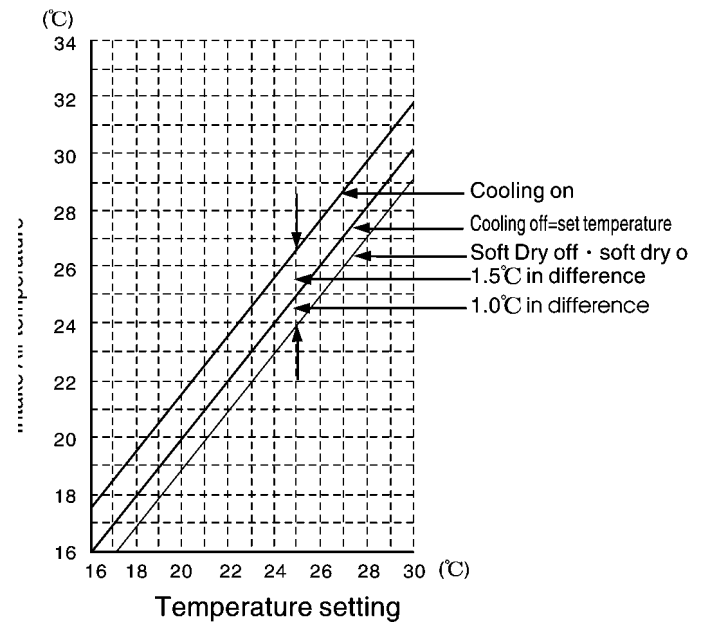
## ■ Thermostat characteristics

CS/CU-PC9CKV, CS/CU-PC12CKV

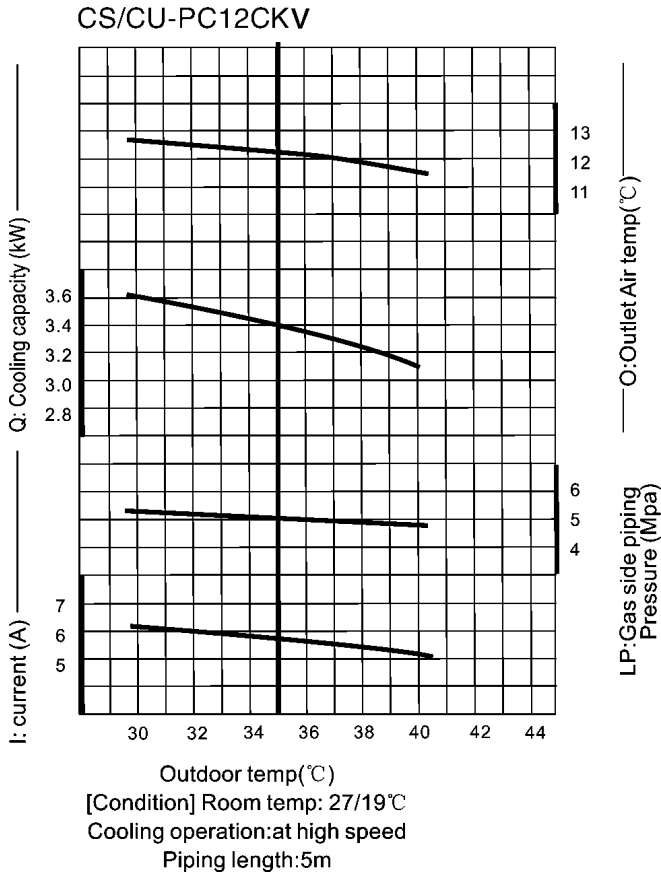
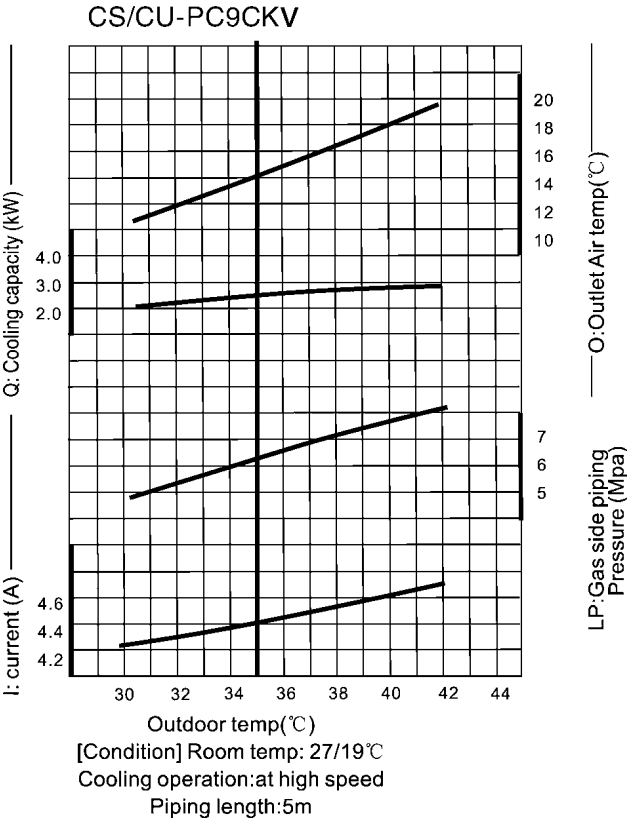
### • Cooling mode



### • Soft dry mode

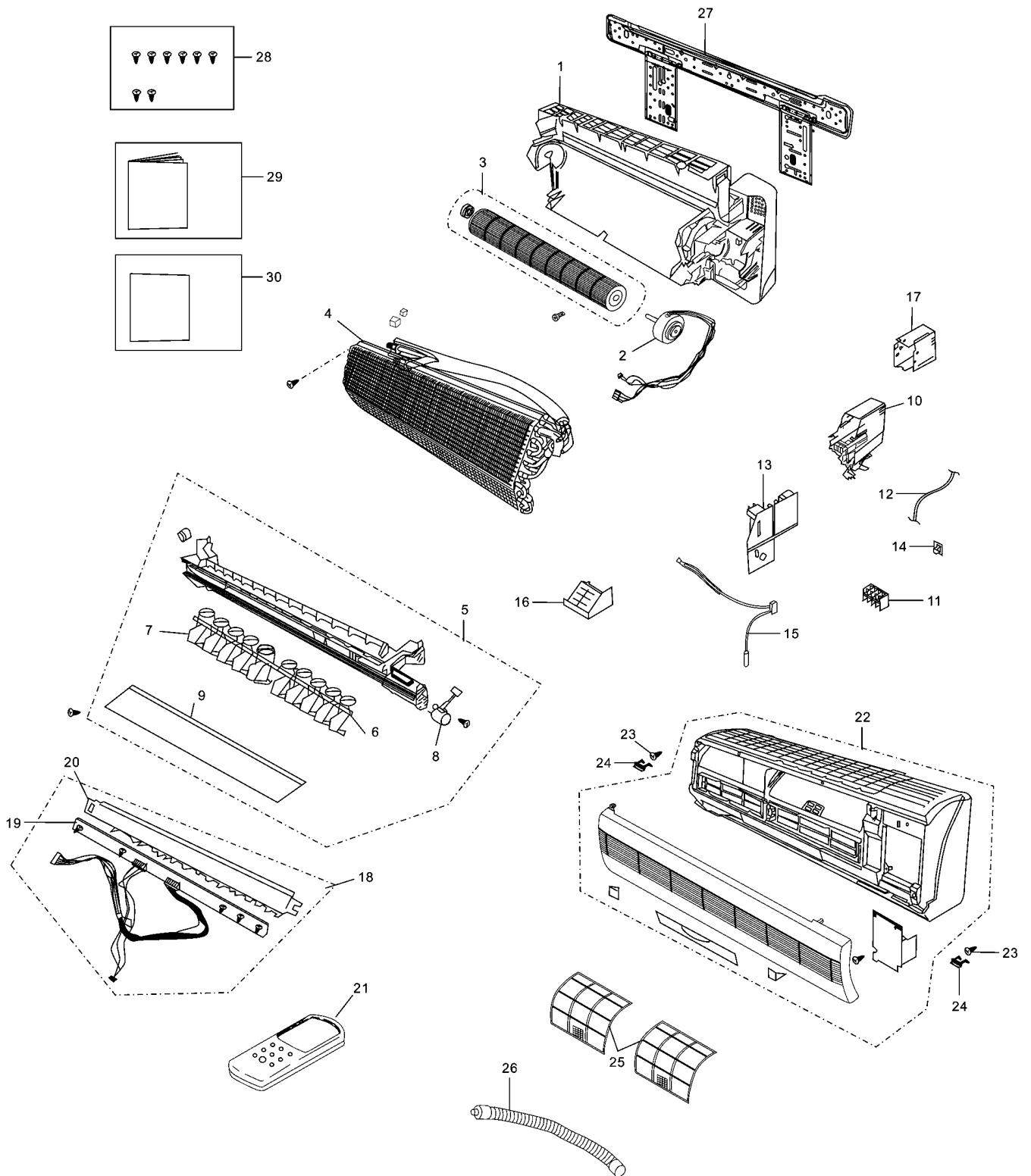


Cooling characteristics



# 13 Exploded View

## CS-PC9CKV/CS-PC12CKV



# 14 Replacement Parts List

## CS-PC9CKV / CS-PC12CKV

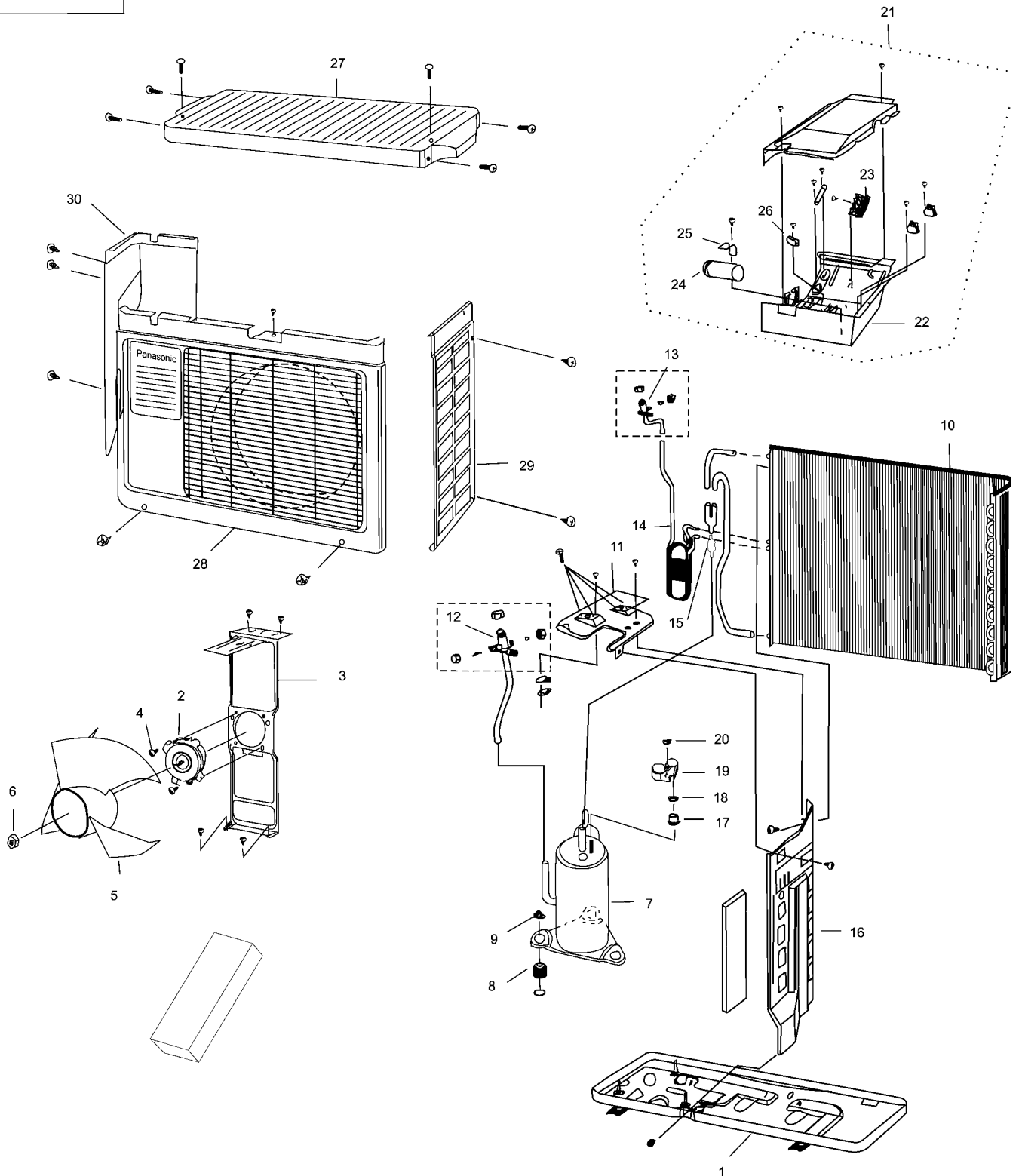
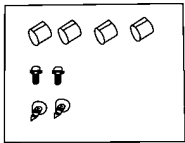
No.	DESCRIPTION&NAME	Q'ty	CS-PC9CKV	CS-PC12CKV	RE
1	CHASSIS COMPLETE	1	CWD50C1348	←	
2	FAN MOTOR	1	CWA921296	CWA921310	*
3	CROSS FLOW FAN COMPLETE	1	CWH02C1030	←	
4	EVAPORATOR	1	CWB30C1448	CWB30C1479	
5	DISCHARGE GRILLE COMPLETE	1	CWE20C2301	←	*
				←	
6	HORIZONTAL VANE	1	CWE24C1059	←	
7	HORIZONTAL VANE	1	CWE24C1058	←	
8	AIR SWING MOTOR	1	CWA98259+C	←	
9	VERTICAL VANE	1	CWE241137	←	*
10	CONTROL BOARD	1	CWH102211	←	
				←	
11	TERMINAL BOARD COMPLETE	1	CWA28C2191	←	
12	POWER SUPPLY CORD	1	CWA20C2362	←	
13	MAIN PCB	1	CWA743360	CWA743430	*
14	RECEIVER	1	CWA743353	←	*
15	SENSOR COMPLETE	1	CWA50C2193	←	*
				←	
16	CONTROL BOARD FRONT COVER	1	CWH131175	←	
17	CONTROL BOARD TOP COVER	1	CWH131176	←	
18	INDICATOR	1	CWE39C1094	←	*
19	INDICATOR PCB	1	CWA743205	←	*
20	INDICATOR HOLDER	1	CWD932332	←	
				←	
21	REMOTE CONTROL COMPLETE	1	CWA75C2559	←	*
22	FRONT GRILLE COMPLETE	1	CWE11C2999	←	
23	SCREW-FRONT GRILLE	2	XTT4+14C	←	
24	CAP-FRONT GRILLE	2	CWH521025F	←	
25	AIR FILTER	1	CWD001110	←	
				←	
26	DRAIN HOSE	1	CWH851074	←	
27	INSTALLATION PLATE	1	CWH36K1019	←	
28	BAG COMPLETE	1	CWH82C1214	←	
29	OPERATION INSTRUCTIONS	1	CWF564242	←	
30	INSTALLATION INSTRUCTIONS	1	CWF612561	←	

### Note:

- 1.All parts are supplied from GMAC, P.R. China.
- 2."\*" marked parts are recommended to be kept in stock.

# 15 Exploded View

## CU-PC9CKV



# 16 Replacement Parts List

## CU-PC9CKV

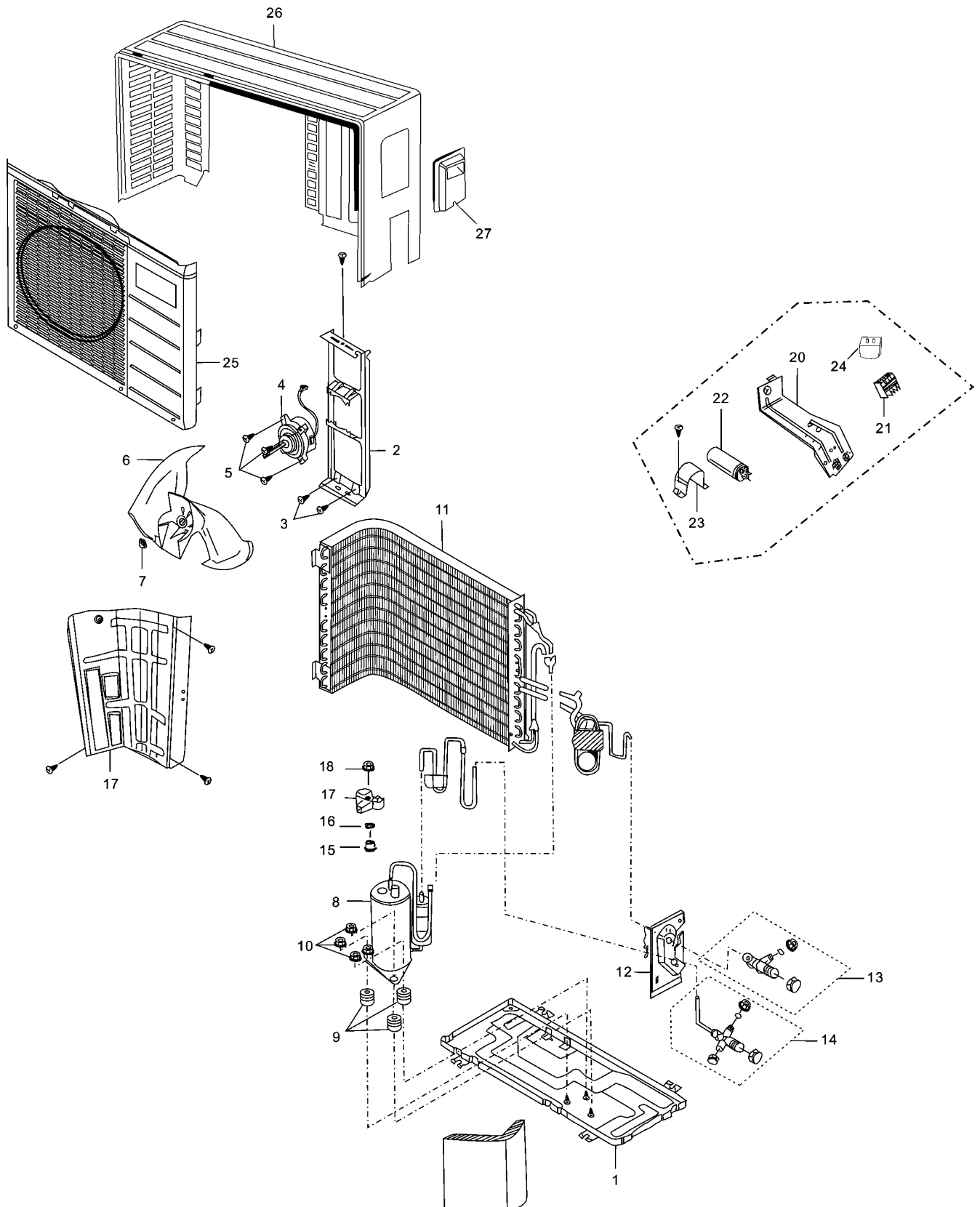
No.	DESCRIPTION&NAME	Q'ty	CU-PC9CKV	RE
1	BASE ASS'Y	1	CWD52K1093A	
2	FAN MOTOR	1	CWA951344	*
3	HOLDER-FAN MOTOR	1	CWD541058	
4	FIXING SCREW-FAN MOTOR	4	CWH55027	
5	PROPELLER FAN	1	CWH03K047	
6	NUT-P.FAN	1	CWH56053	
7	COMPRESSOR	1	CWB092245	*
8	MOUNT RUBBER-COMPRESSOR	3	CWH50055	
9	NUT-COMP.MOUNT	3	4582065	
10	CONDENSER	1	CWB32C1329	
11	HOLDER-COUPLING	1	CWH351039A	
12	3-WAY VALVE	1	CWB011236	
13	2-WAY VALVE	1	CWB021196	
14	TUBE ASS'Y-CAPILLARY	1	CWT01C2979	
15	STRAINER	1	CWB11025	
16	SOUND PROOF PANEL	1	CWH151059	
17	OVER LOAD PROTECTOR	1	CWA121212	*
18	HOLDER-O.L.P.	1	CWH701006	
19	TERMINAL COVER	1	CWH17006	
20	NUT FOR TERMINAL COVER	1	7080300	
21	CONTROL BOX COMPLETE	1	CWH14C4089	
22	CONTROL BOARD	1	CWH102219	
23	TERMINAL BOARD ASS'Y	1	CWA28K1015	
24	CAPACITOR-COMPRESSOR	1	DS371306CPXA	*
25	HOLDER-CAPACITOR	1	CWH301033	
26	CAPACITOR-FAN MOTOR	1	DS441155XPQE	*
27	SURFACE COVER	1	CWE031034A	
28	FRONT PANEL-CABINET	1	CWE06K1044	
29	RIGHT BOARD	1	CWE041090A	
30	LEFT BOARD	1	CWE041089A	

### Note:

- 1.All parts are supplied from GMAC, P.R. China.
- 2."\*" marked parts are recommended to be kept in stock.

# 17 Exploded View

## CU-PC12CKV



# 18 Replacement Parts List

## CU-PC12CKV

No.	DESCRIPTION&NAME	Q'ty	CU-PC12CKV	RE
1	CHASSIS ASS'Y	1	CWD50K2067A	
2	FAN MOTOR BRACKET	1	CWD541041	
3	SCREW-FAN MOTOR BRACKET	2	4580305	
4	FAN MOTOR	1	CWA951340	*
5	SCREW-FAN MOTOR MOUNT	3	CWH55027	
6	PROPELLER FAN ASS'Y	1	CWH00K040	
7	NUT-PROPELLER FAN	1	CWH56032	
8	COMPRESSOR	1	CWB092246	*
9	ANTI-VIBRATION BUSHING	3	CWH50055	
10	NUT-COMPRESSOR MOUNT	3	4582065	
11	CONDENSER	1	CWB32C1222	
12	HOLDER COUPLING ASS'Y	1	CWH351027A	
13	2-WAY VALVE	1	CWB021024	
14	3-WAY VALVE	1	CWB011024	
15	OVER LOAD PROTECTOR	1	CWA121172	*
16	HOLDER-O.L.P.	1	CWH701006	
17	TERMINAL COVER	1	CWH17006	
18	NUT-TERMINAL COVER	1	7080300	
19	SOUND PROOF BOARD	1	CWH151034	
20	CONTROL BOARD	1	CWH102026	
21	TERMINAL BOARD ASS'Y	1	CWA28K1048	
22	CAPACITOR-COMPRESSOR	1	CWA312076	*
23	HOLDER-CAPACITOR	1	CWH30165	
24	CAPACITOR-FAN MOTOR	1	DS441155XPQE	*
25	CABINET FRONT PLATE	1	CWE06C1013A	
26	CABINET COMPLETE	1	CWE00K1051A	
27	CONTROL BOARD COVER	1	CWH13475	

### Note:

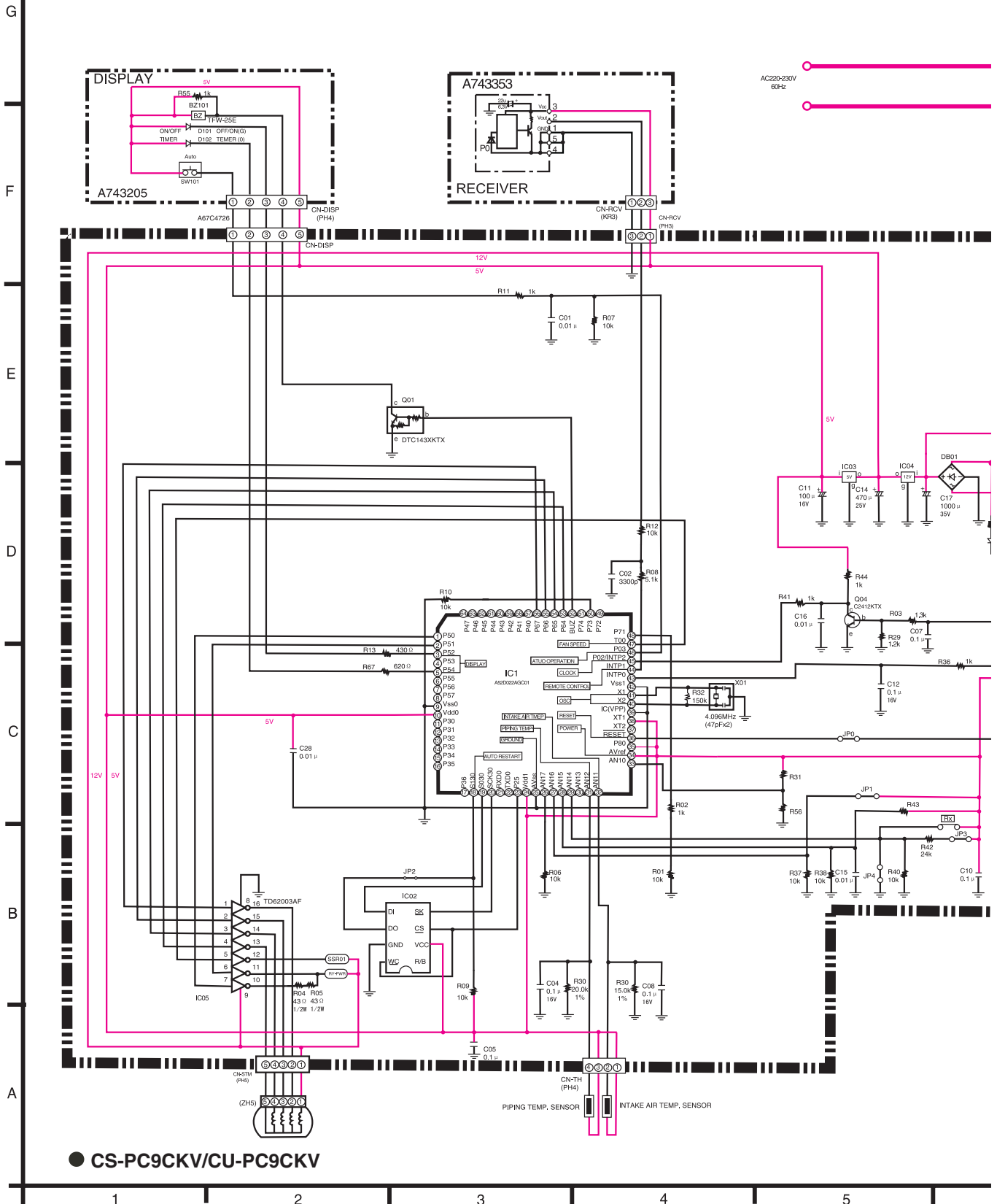
- 1.All parts are supplied from GMAC, P.R. China.
- 2."\*" marked parts are recommended to be kept in stock.



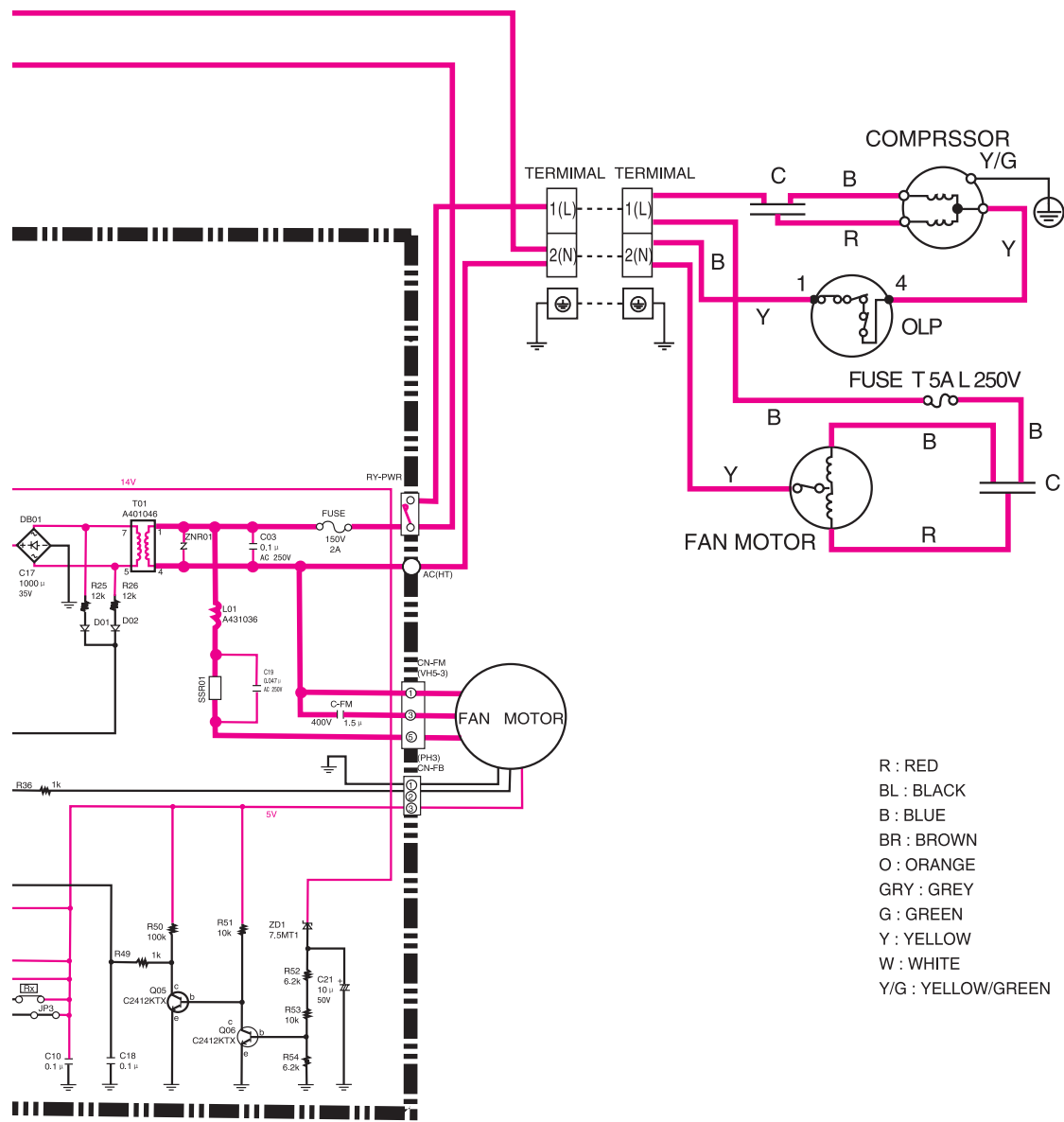
# 19 ELECTRONIC CIRCUIT DIAGRAM

CS/CU-PC9CKV

## ◆ ELECTRONIC CIRCUIT DIAGRAM SCHEMATIC DIAGRAM 1/2



SCHEMATIC DIAGRAM 2/2



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

REMOTE CONTROL No.

REMOTE CONTROL No.	JP3	JP4	FX
0	JUMPER	JUMPER	-
1	JUMPER	NONE	-
2	NONE	NONE	10k
3	JUMPER	NONE	10k

Table

Model	F43
CS-PC9CKV	NONE
CS-PC9CKV	ERJ3GEYJ223V

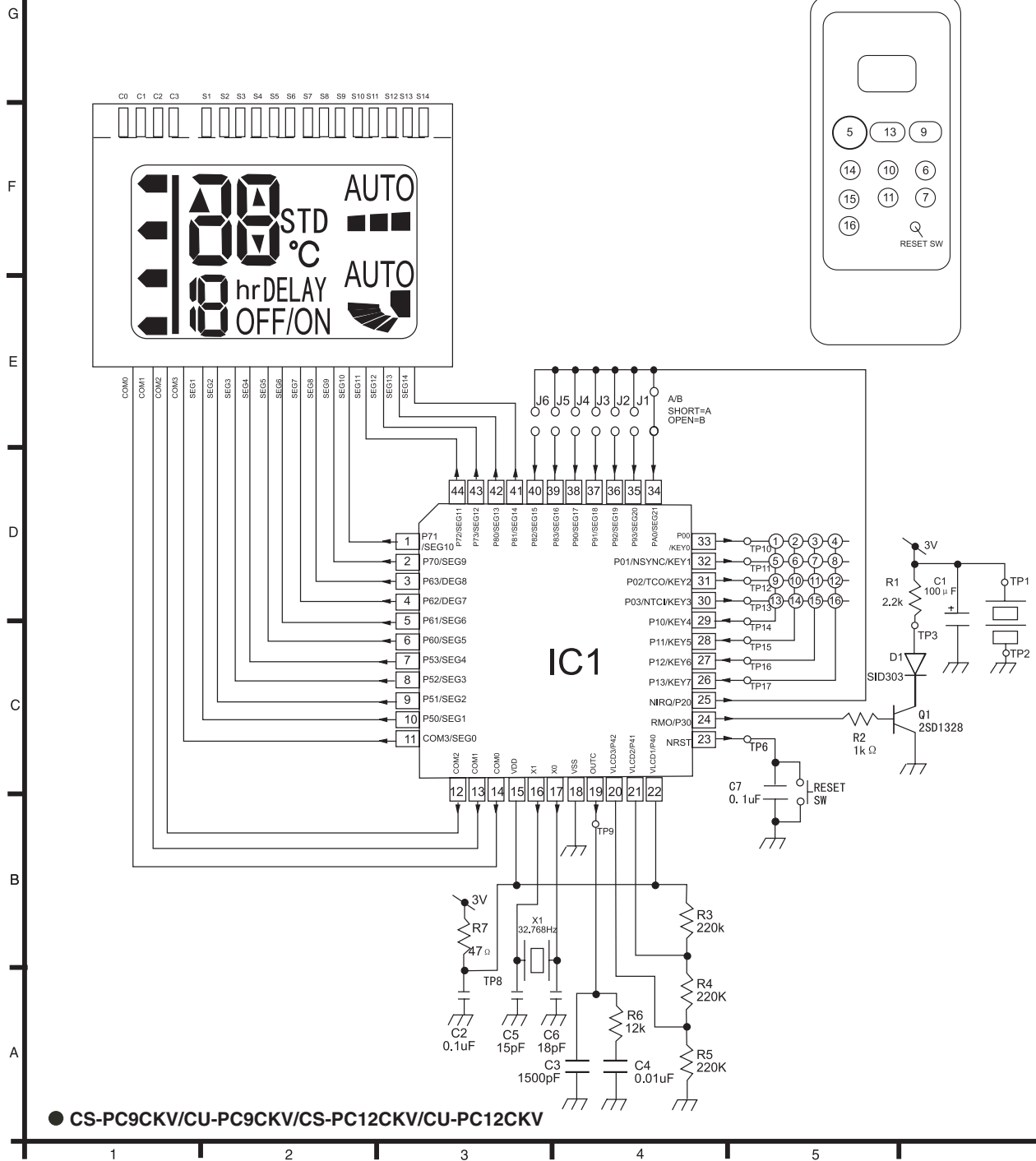
● CS-PC9CKV/CU-PC9CKV

# 19.1. ELECTRONIC CIRCUIT DIAGRAM (REMOTE CONTROL)

CS/CU-PC9CKV CS/CU-PC12CKV

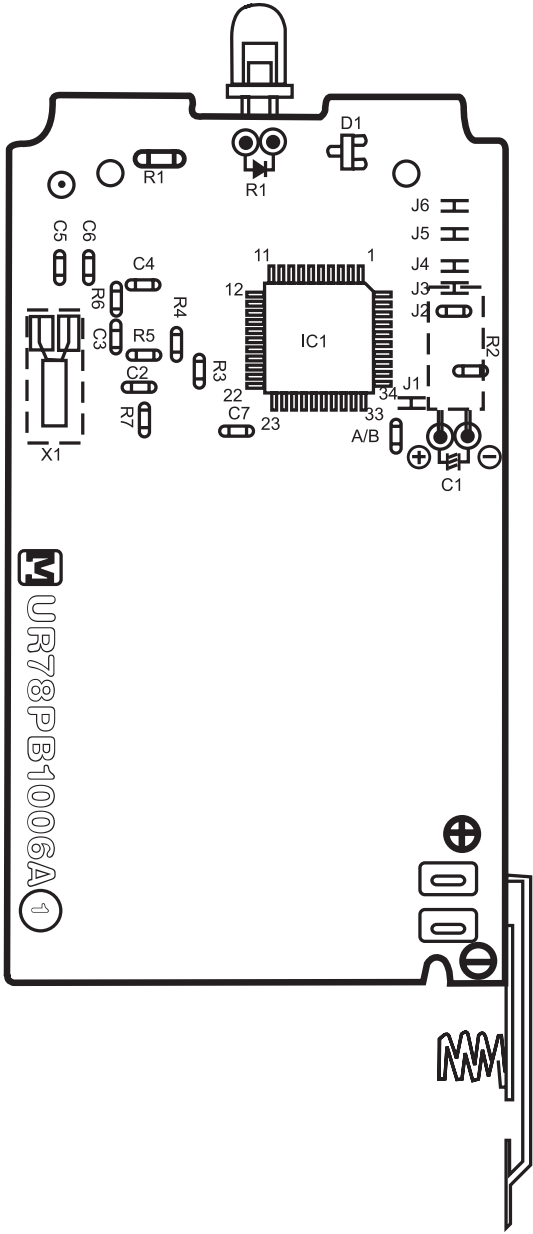
## ◆ ELECTRONIC CIRCUIT DIAGRAM

### ● REMOTE CONTROL



● REMOTE CONTROL

KEY No.	KEY NAME
5	OFF/ON
6	ON-TIMER
7	SET-TIMER
9	TEMP UP
10	OFF-TIMER
11	CANCEL TIMER
13	TEMP DOWN
14	MODE
15	FAN SPEED
16	AIR SWING



● CS-PC9CKV/CU-PC9CKV/CS-PC12CKV/CU-PC12CKV

6 7 8 9 10

## How to use electronic circuit diagram

Before using the circuit diagram, read the following carefully.

**\* Voltage measurement**

Voltage has been measured with a digital tester when the indoor fan is set at high fan speed under the following conditions without setting the timer.

Use them for servicing.

Voltage indication is in Red at all operations.

	Intake air temperature	Temperature setting	Discharge air temperature	Pipe temperature
Cooling	27°C	16°C	17°C	15°C

**\* Indications for resistance**

a. K....kΩ                      M....MΩ  
W...watt                      Not indicated....1/4W

b. Type  
Not indicated.....carbon resister



Tolerance±5%  
.....metal oxide resister  
Tolerance±1%

**\* Indications for capacitor**

a. Unit    μ....μF    P....pF

b. Type    Not indicated....ceramic capacitor

(S).....S series aluminium electrolytic capacitor

(Z).....Z series aluminium electrolytic capacitor

(SU).....SU series aluminium electrolytic capacitor

(P).....P series polyester system

(SXE).....SXE series aluminium electrolytic capacitor

(SRA).....SRA series aluminium electrolytic capacitor

(KME).....KME series aluminium electrolytic capacitor

\* Diode without indication.....MA165

\* Circuit Diagram is subject to change without notice for further development.

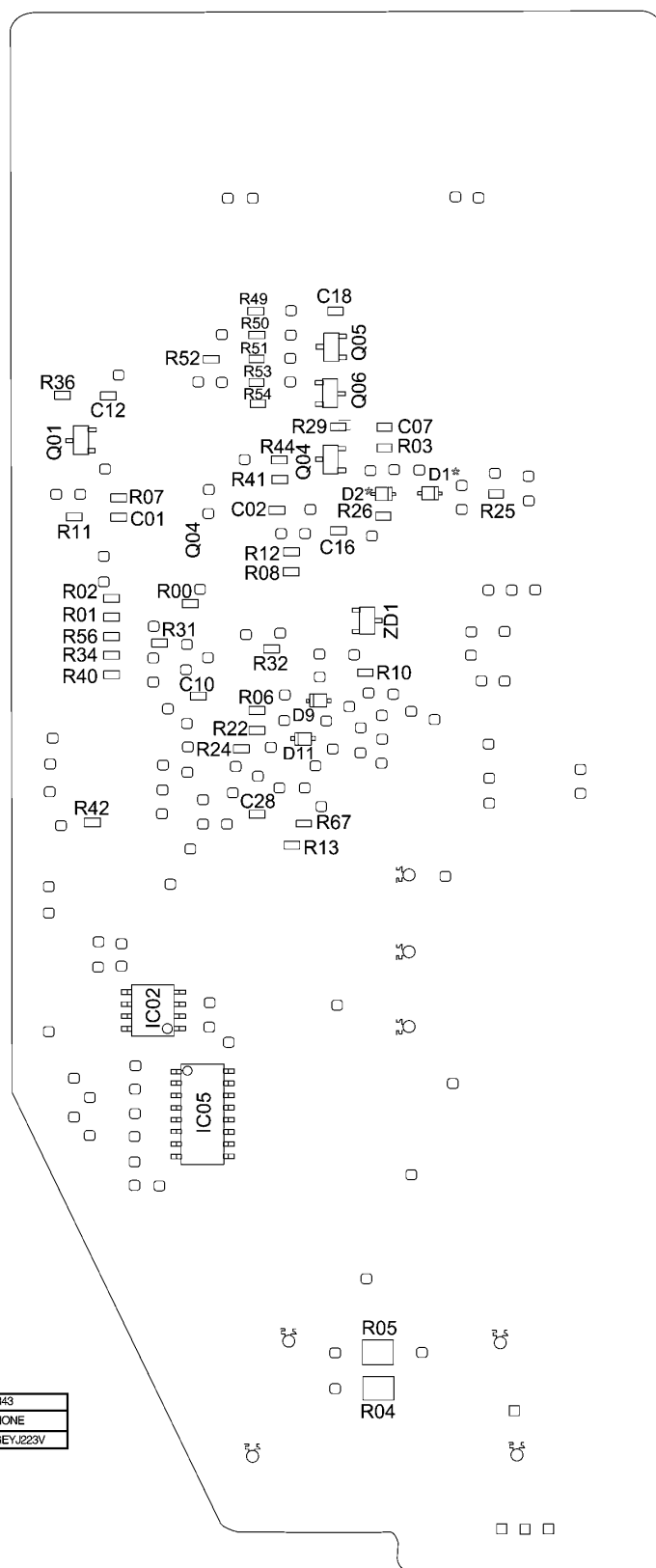
## TIMER TABLE

Name		Time	Test Mode (When test point Short-circuited)	Remarks
Real Timer		1 hr.	1 min.	
		10 min.	10 sec.	
		1 min.	1 sec.	
Time Delay Safety Control		2 min. 58 sec.	0 sec.	
Forced Operation		60 sec.	0 sec.	
Time 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.	Comp. ON 5 min. and above
		2 min	0 sec.	
Comp./ Fan Motor Delay Timer		1.6 sec.	0 sec.	
Random Auto Restart Control		0 ~ 62 sec.	0 ~ 6.2 sec.	

## 19.2. PRINT PATTERN (INDOOR PCB)

**CS-PC9CKV/CS-PC12CKV**

SIDE A



Table

Model	R43
CS-PC9CKV	NONE
CS-PC9CKV	ERJ3GEYJ223V

CS-PC9CKV/CS-PC12CKV

SIDE B

