Order No. GMAC0504039C3

Service Manual

Air Conditioner

CS/CU-PC12DKD
CS/CU-PA12DKD

⚠ 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-techical 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

Panasonic®

1 Features

■ High Efficiency

■ Air Quality Indicator

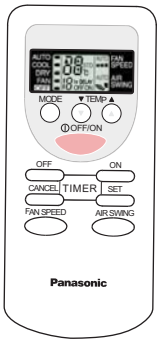
■ Auto Restart Control
Automatically restart after power failure

■ Comfort Environment
Air filter with function to reduce dust and smoke

■ 12-hour Timer Setting

2 Functions

Remote Control



OFF/ON

Operation START/STOP

- Turn on/off the air conditionor
- When stop the operation by pressing OFF/ON button,the cursor key points to OFF.

MODE

Operation Mode Selection

- Automatic Mode Operation
- Heating Mode Operation (For PA12DKD)
- Cooling Mode Operation
- Soft Dry Mode Operation
- Air Circulation Mode Operation (For PC12DKD)

FAN SPEED

Indoor Fan Speed Selection

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

AIR SWING

Airflow Direction Control

- Horizontal Airflow Direction Control
  -Auto Control
  -Manual Control
- Vertical Airflow Direction Manual Control

TEMP

Room Temperature Setting

- Temperature Setting(16℃ to 30℃)
- Auto Operation

TIMER OFF/ON

Timer Operation Selection

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

TIMER SET/ CANCEL

Set /Cancel Timer Operation

- Set timer/Cancel the set timer
- By pressing SET button for 5seconds continuously to switch to set the sensor sensitivity.

Indoor Unit

Auto Switch Button

Power Switch ON/OFF

- When the remote control cannot be used or for repairing and testing ,please use this button.

Demonstration Mode

- Keep pressing this button for 15seconds to start or end the Demonstration Mode.

Signal Receiving Sound Control

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

Operation Indication Lamps

- Power (green) ..... Lights up in operation; Blinks during Test Run operation and determining Auto Operation mode
- Timer(orange) ..... Timer in operation
- Air quality: Green / Orange / Red

Operation Mode

- Cooling/Heating/Soft Dry /Auto Operation / Air circulation

Time Delay Safety Control

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

7-Minutes Time Save Control

- 7-minutes automatic restarting at Cooling Operation

Anti-freezing Control for the Evaporator

- Cooling or Soft Dry Operation

Warm Booting Control

(For PA12DKD only)

- Indoor fan starts running when temperature of evaporator reaches 30℃ or above.
- When temperature of evaporator is between 30℃ and 34℃,indoor fan will run at Super Low or Low speed.
- When temperature of evaporator reaches 34℃, Warm Booting Operation ends.

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, but for heating mode 30 minutes before the set time.

Outdoor Unit

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 145℃
  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 control ON/OFF button.

Deicing Control

- Anti-freezing operation for outdoor unit(during Heating Mode Operation only)
- Temperature of the condenser is tested by TRS. (For PA12DKD only)

Overload Protection Control

(For PA12DKD only)

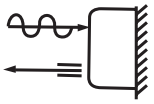
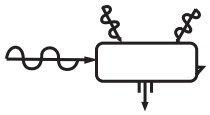
- When the temperature of evaporator reaches 51℃,outdoor fan stops,and will restart when the temperature of evaporator declines to 49℃.
- When the temperature of evaporator reaches 65℃,compressor will stop.

4-way Valve Control

(For PA12DKDonly)

- If the unit is stopped during Heating Operation,the 4-way valve will remain in heating mode operation for 5 minutes.

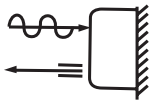
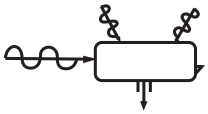
3 Product Specifications

			Unit	CS-PA12DKD	CU-PA12DKD
Cooling Capacity			kW	3.35-3.40	
Heating Capacity			kW	3.80-3.85	
Moisture Removal			L /h	1.80	
Power Source			Phase V Cycle	Single 220/230 50	
Airflow Method			OUTLET INTAKE	SIDE VIEW 	TOP VIEW 
Air Circulation	Indoor Air (low)		m^3/min	7.62	-
	Indoor Air (medium)		m^3/min	8.48	-
	Indoor Air (high)		m^3/min	9.8	-
	Outdoor Air		m^3/min	-	-
Noise Level			dB(A)	Cooling:high39,Low32 Heating:high39,Low31	Cooling:high48 Heating:high49
Electrical Data	Input		W	Cooling:1020-1050 Heating:1000-1030	
	Running Current		A	Cooling:4.80-4.80 Heating:4.80-4.80	
	EER/COP		W/W	Cooling:3.28-3.24 Heating:3.80-3.74	
	Starting Current		A	22	
Piping Connection Port(Flare piping)			Inch Inch	G:half union1/2" L:half union1/4"	G:3-way valve1/2" L:2-way valve1/4"
Piping Size(Flare piping)			Inch Inch	G:gas side1/2" L:liquid side1/4"	G:gas side1/2" L:liquid side1/4"
Drain Hose	Inner Diameter		mm	14	-
	Length		m	0.65	-
Power Supply Cord Length (Number of core-wire)			m	1.3 3 core-wire/1.0mm^2	- -
Dimensions	Height		mm	280	540
	Width		mm	799	780
	Depth		mm	183	289
Net Weight			kg	9	34
Compressor	Type			-	Rotary(1 cylinder) Rolling piston type
	Motor Type			-	Induction(2 pole)
	Rated output		W	-	900
Air Circulation	type			Cross-flow fan	Propeller fan
	Motor type			Induction(4 pole)	Induction(6 pole)
	Input		W	-	-
	Rated Output		W	18	25
	Fan Speed	Low	rpm	980±60	-
		Med	rpm	1090±60	-
		High	rpm	1260±60	760±50

		Unit	CS-PA12DKD	CU-PA12DKD
Heat Exchanger	Description		Evaporator	Condenser
	Tube Material		Copper	Copper
	Fin Type		Slot type	Corrugation type
	Rows/Stage		(Plate fin configuration,forced draft) 2 x 15	2X24
	FPI		21	21
	Dimensions	mm	610x252x25.4	735.8 715.1 X504x36.38
Refrigerant Control Device			-	Capillary Tube
Refrigeration Oil		(c.c)	-	SUNISO 4GDID or ATMOS M60 or ATMOS 56M
Refrigerant (R-22)		g	-	1060(*)
Thermostat			Electronic Control	-
Protection Device			-	O.L.P.(230V,37A)
Capillary	Length	mm	-	545±10 609±10
	Circulation	L/min	-	12.5±0.2 10.0±0.2
	Inner Diameter	mm	-	1.5 1.5
Air Filter			P.P. Honeycomb	
Refrigerant Circulation Control Device			Capillary	
Compressor Capacitor		μF , V	-	30 μF , 370V
Fan Motor Capacitor		μF , V	1.5 μF , 400V	1.8μF , 400V

* 60g for air purging is not included.

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

			Unit	CS-PC12DKD	CU-PC12DKD
Cooling Capacity			kW	3.50-3.55	
Moisture Removal			L/h	1.80	
Power Source			Phase V Cycle	Single 220/230 50	
Airflow Method			OUTLET INTAKE	SIDE VIEW 	TOP VIEW 
Air Circulation	Indoor Air (low)		m^3/min	7.65	-
	Indoor Air (medium)		m^3/min	8.26	-
	Indoor Air (high)		m^3/min	9.7	-
	Outdoor Air		m^3/min	-	-
Noise Level			dB(A)	High39,Low32	High48
Electrical Data	Input		W	1020-1050	
	Running Current		A	4.80-4.80	
	EER		W/W	3.43-3.38	
	Starting Current		A	23	
Piping Connection Port(Flare piping)			Inch inch	G:half union1/2" L:half union1/4"	G:3-way valve1/2" L:2-way valve1/4"
Piping Size(Flare piping)			Inch inch	G:gas side1/2" L:liquid side1/4"	G:gas side1/2" L:liquid side1/4"
Drain Hose	Inner Diameter		mm	14	-
	Length		m	0.5	-
Power Supply Cord Length (Number of core-wire)			m	1.3 3 core-wire/1.0mm^2	- -
Dimensions	Height		mm	280	540
	Width		mm	799	780
	Depth		mm	183	289
Net Weight			kg	9	32
Compressor	Type			-	Rotary(1 cylinder) Rolling piston type
	Motor Type			-	Induction(2 pole)
	Rated Output		W	-	900
Air Circulation	Type			Cross-flow fan	Propeller fan
	Motor Type			Induction(4 pole)	Induction(6pole)
	Input		W	-	-
	Rated Output		W	18	25
	Fan Speed	Low	rpm	1010±60	-
		Med	rpm	1090±60	-
		High	rpm	1280±60	760±60

		Unit	CS-PC12DKD	CU-PC12DKD
Heat Exchanger	Description		Evaporator	Condenser
	Tube Material		copper	copper
	Fin Type		slot type	Corrugation type
	Rows/Stage		(Plate fin configuration,forced draft) 2 x 15	2 x 24
	FPI		21	21
	Dimensions	mm	610x252x25.4	735.8x504x25.4
Refrigerant Control Device			-	Capillary Tube
Refrigeration Oil		(c.c)	-	SUNISO 4GDID or ATMOS M60(M56)
Refrigerant (R-22)		g	-	760(*)
Thermostat			Electronic Control	O.L.P.(37A/230V)
Protection Device			-	
Capillary	Length Circulation Inner Diameter	mm L/min mm	- - -	350±10 15.0±0.2 1.5
Air Filter			P.P Honeycomb	-
Refrigerant Circulation Control Device			Capillary	
Compressor Capacitor		μF , V	-	30μF , 370V
Fan Motor Capacitor		μF , V	1.5μF , 400V	1.8μF , 440V

* 60g for air purging is not included.

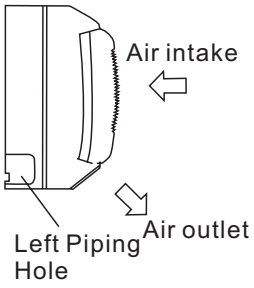
● Specifications are subject to change without notice for further improvement.

4 Dimensions

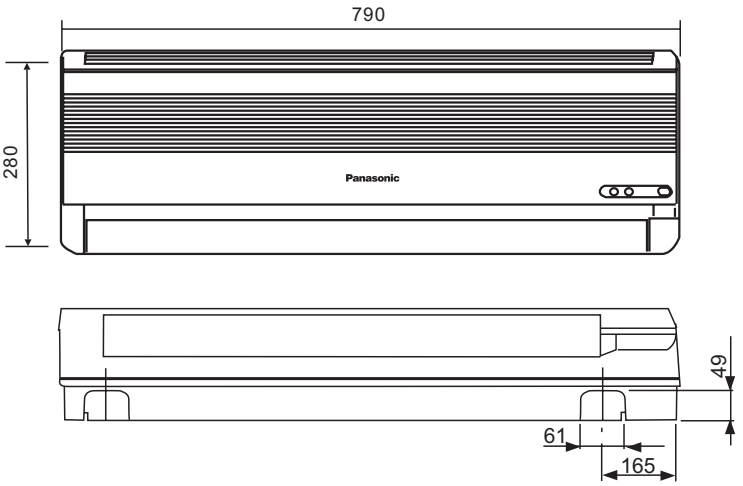
Indoor Unit

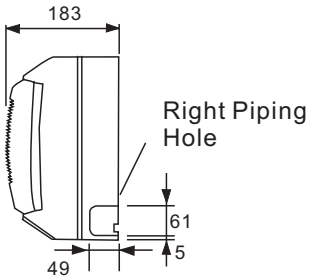
Unit : mm

Side view

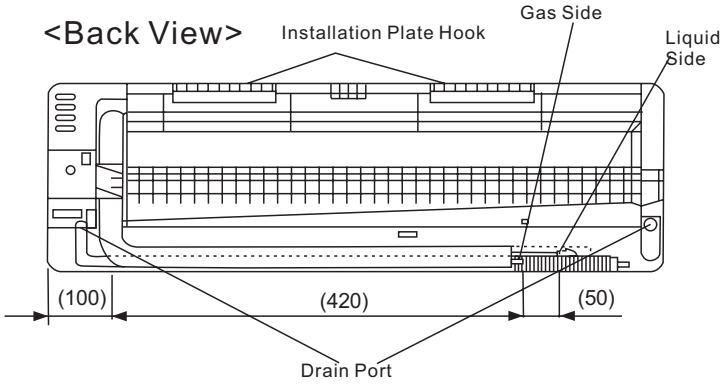


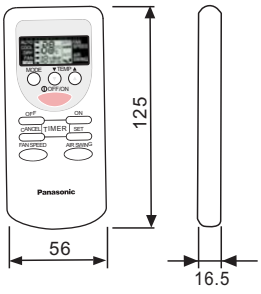
Front View



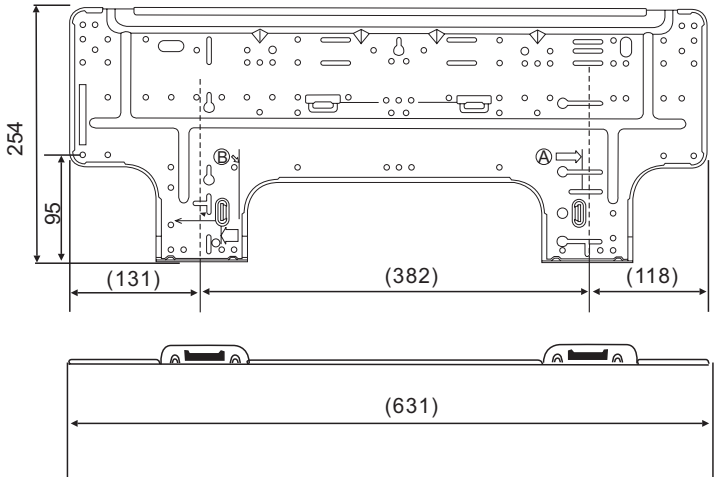


<Back View>



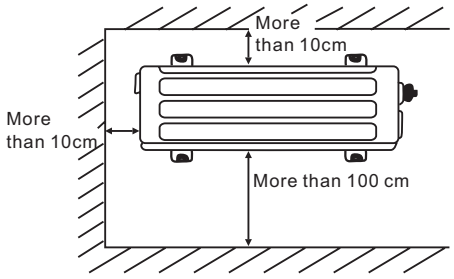


Installation plate (Front View)

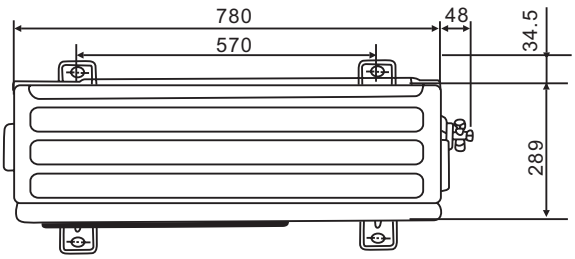


Outdoor Unit

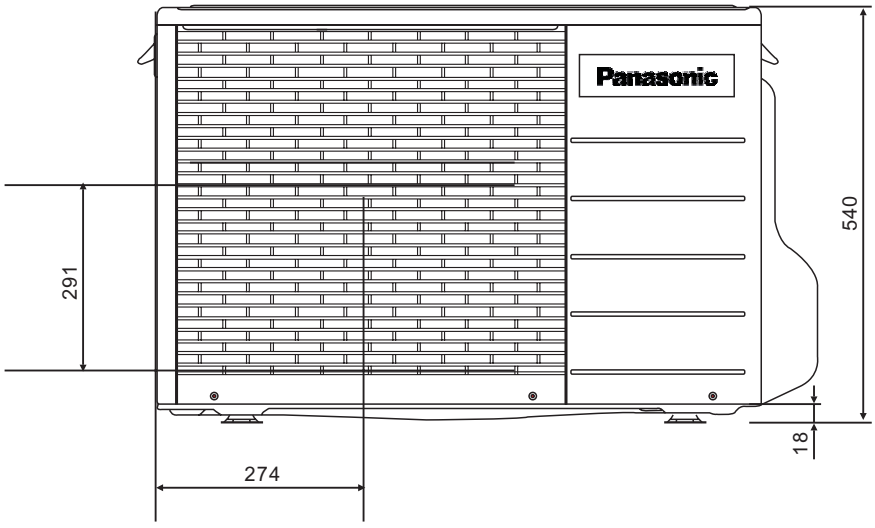
Unit : mm



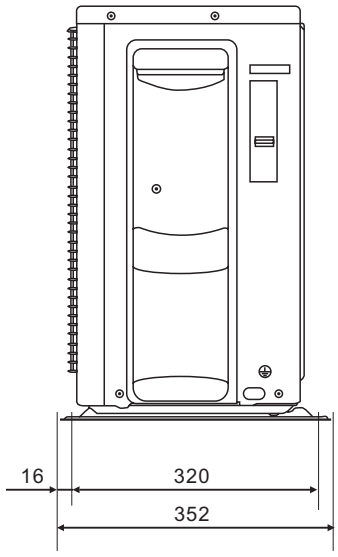
<Top View>



<Front View>

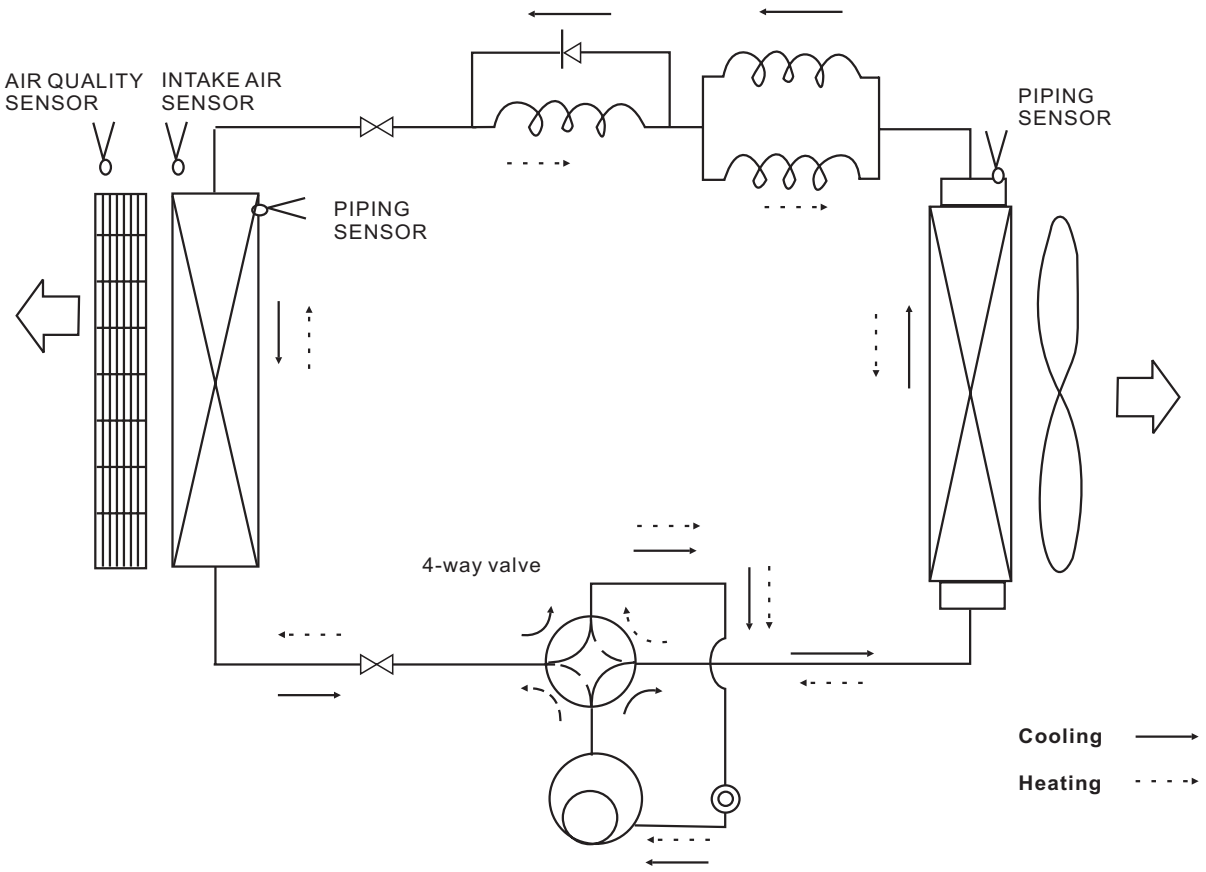


<Side View>

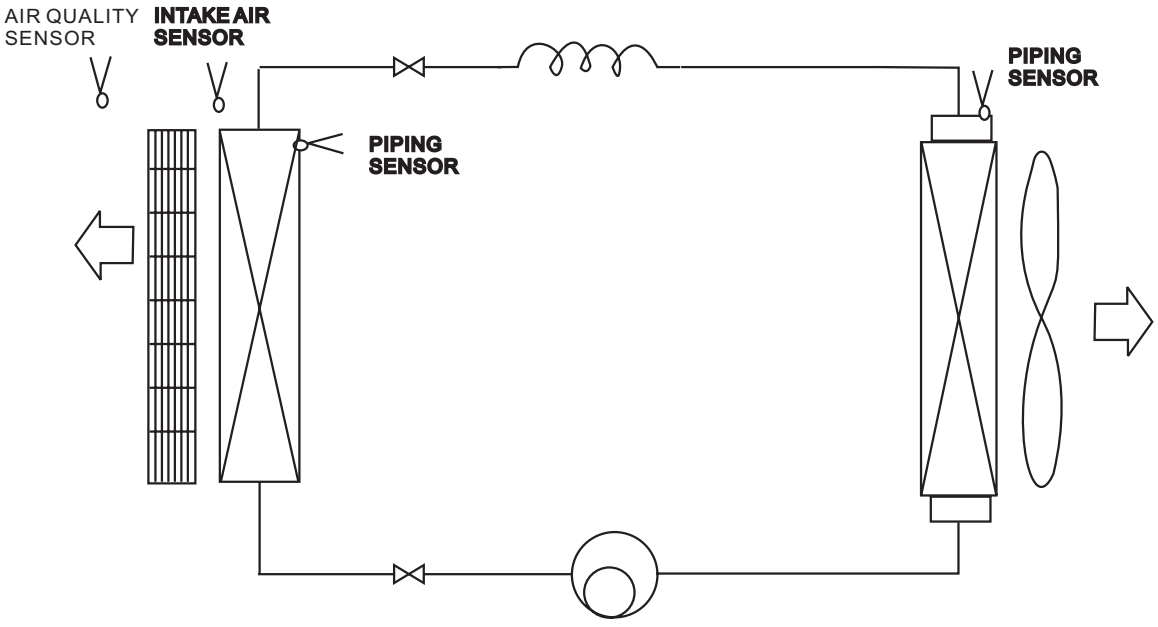


5 Refrigeration Cycle Diagram

CS/CU-PA12DKD

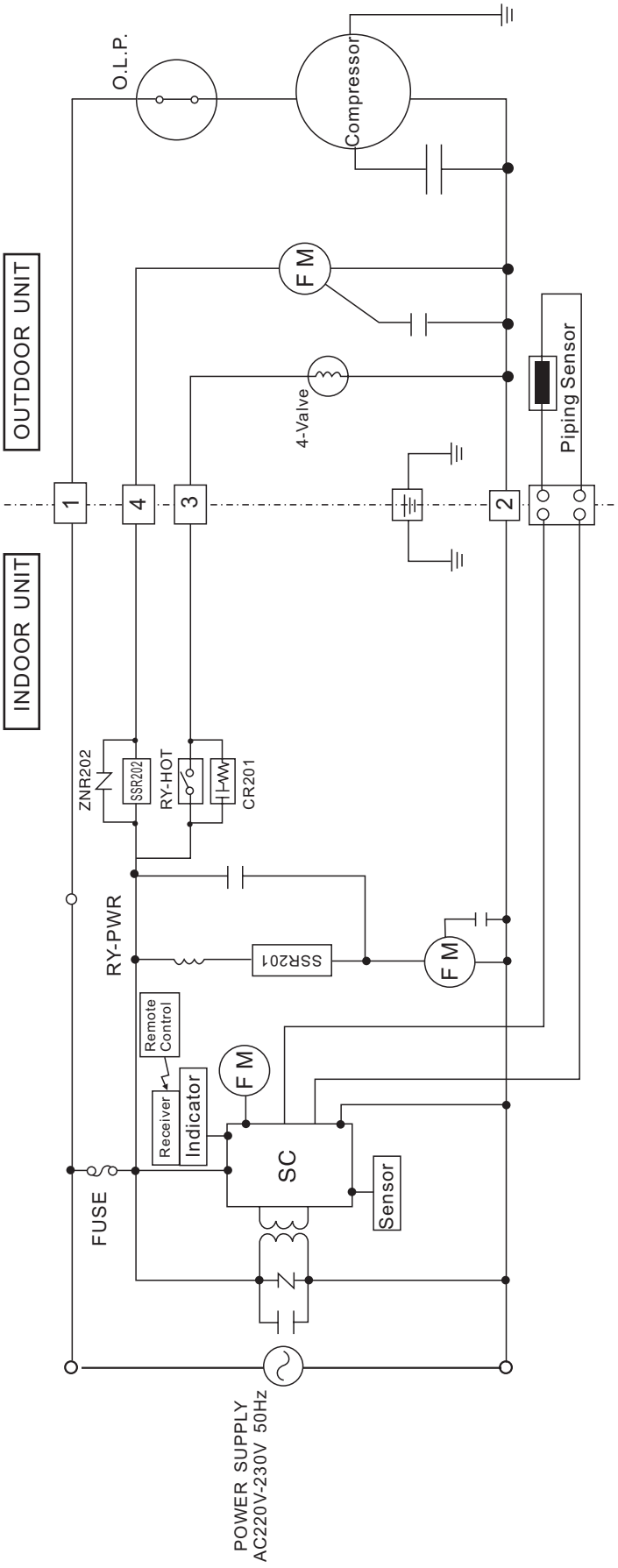


CS/CU-PC12DKD

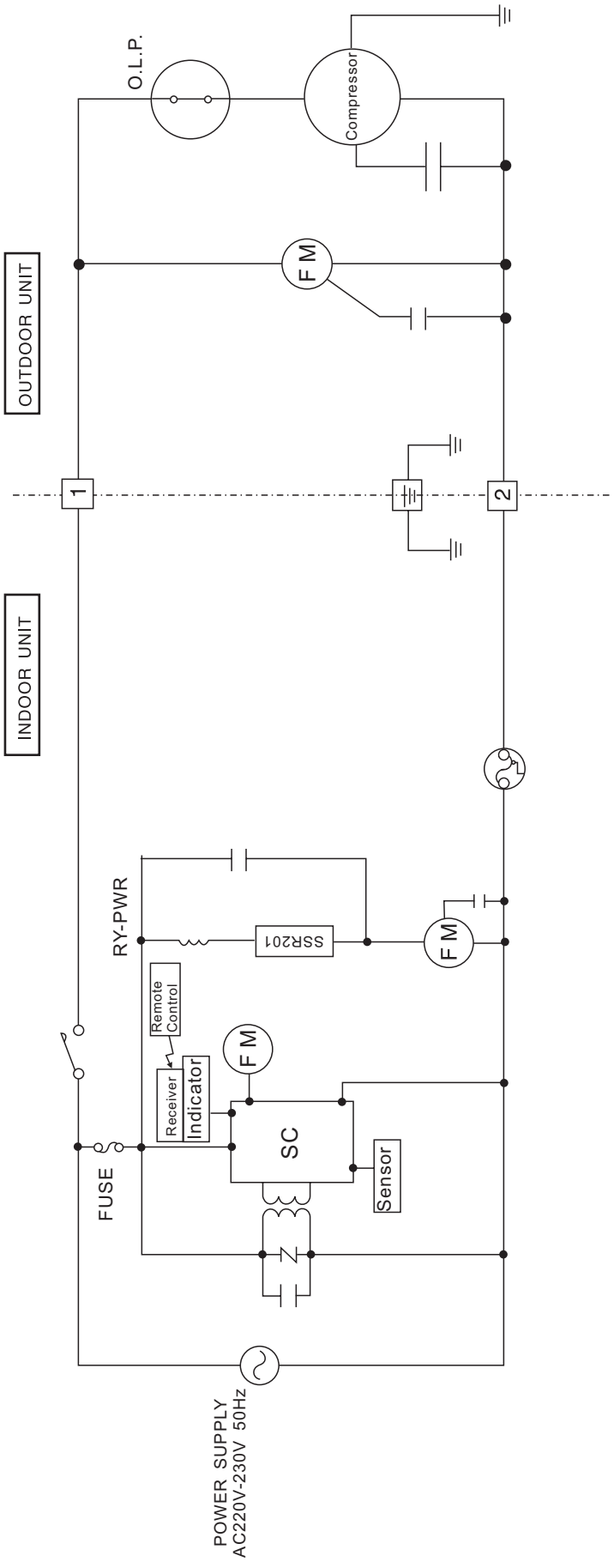


6 Block Diagram

CS-PA12DKD/CU-PA12DKD

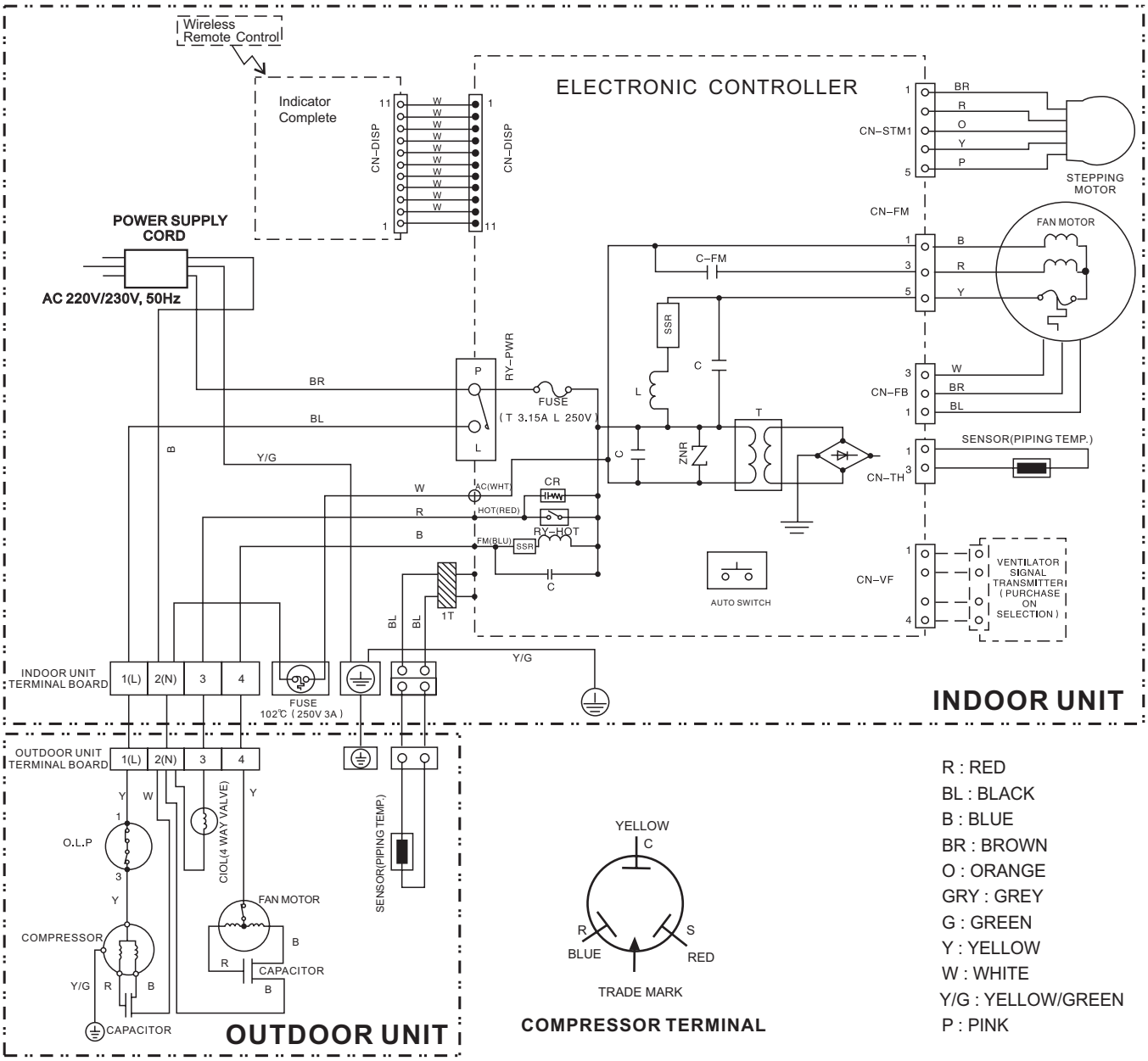


CS-PC127DKD/CU-PC12DKD



7 Wiring Diagram

CS-PA12DKD/CU-PA12DKD



INDOOR FAN MOTOR RESISTANCE(Ω)

	CS-PA12DKD
CONNECTING	CWA921098
Y-B（M）	324
Y-R （A）	290.5

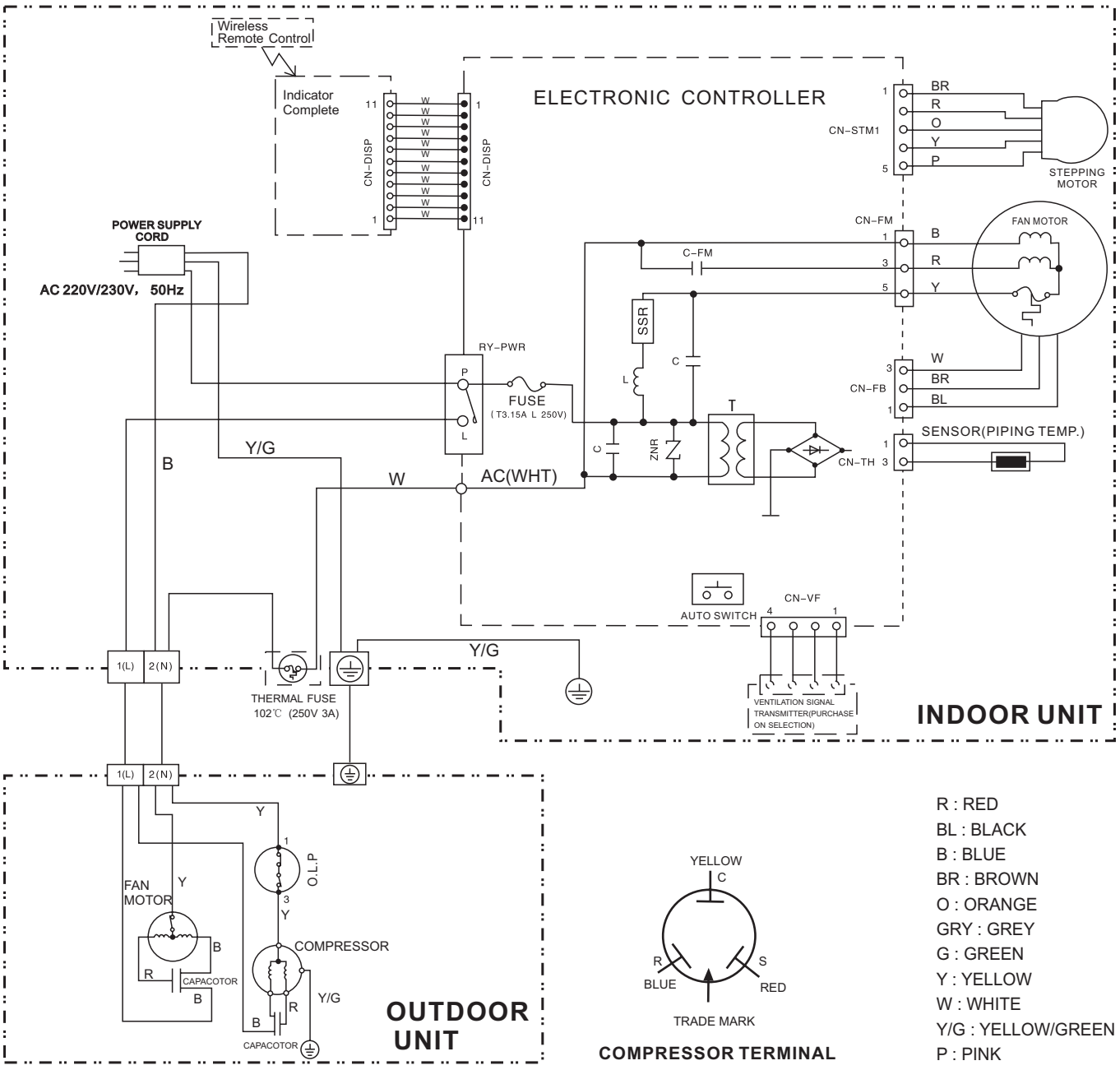
OUTDOOR FAN MOTOR RESISTANCE(Ω)

	CU-PA21DKD
CONNECTING	CWA951440
Y-B	272
Y-R	248

COMPRESSOR RESISTANCE(Ω)

	CU-PA21DKD
CONNECTING	CWB092281
C - R	2.803
C - S	4.420

CS-PC12DKD/CU-PC12DKD



COMPRESSOR TERMINAL

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

INDOOR FAN MOTOR RESISTANCE(Ω)

	CS-PC12DKD
CONNECTING	CWA921098
Y-B (M)	324
Y-R (A)	290.5

OUTDOOR FAN MOTOR RESISTANCE(Ω)

	CU-PC21DKD
CONNECTING	CWA951423
Y-B	272
Y-R	248

COMPRESSOR RESISTANCE(Ω)

	CU-PC21DKD
CONNECTING	CWB092281
C - R	2.803
C - S	4.420

8 Operation Details

8.1 Cooling Mode Operation.

When selecting the Cooling Mode Operation, the unit will operate according to the setting by the Remote Controller or the control panel on the indoor unit and the operation is as the following.

Time Delay Safety Control

- 3 min.----If the compressor stops, it will not restart within 3 minutes.(Protection of compressor).

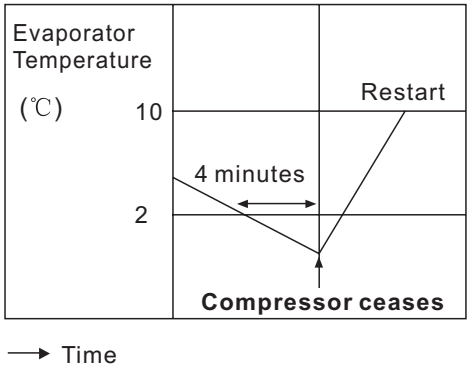
7 Minutes Time Save Control

- 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℃ 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℃,compressor will restart.

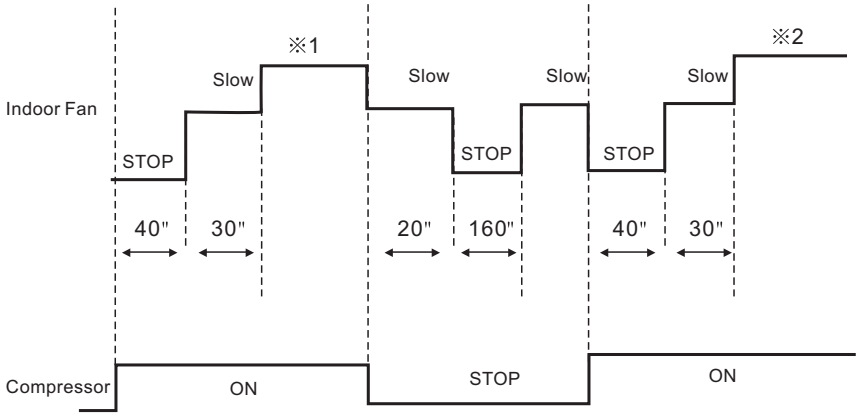
※ During Cooling Mode Operation, the Time Delay Safety Control is available.



Automatic Fan Speed Mode

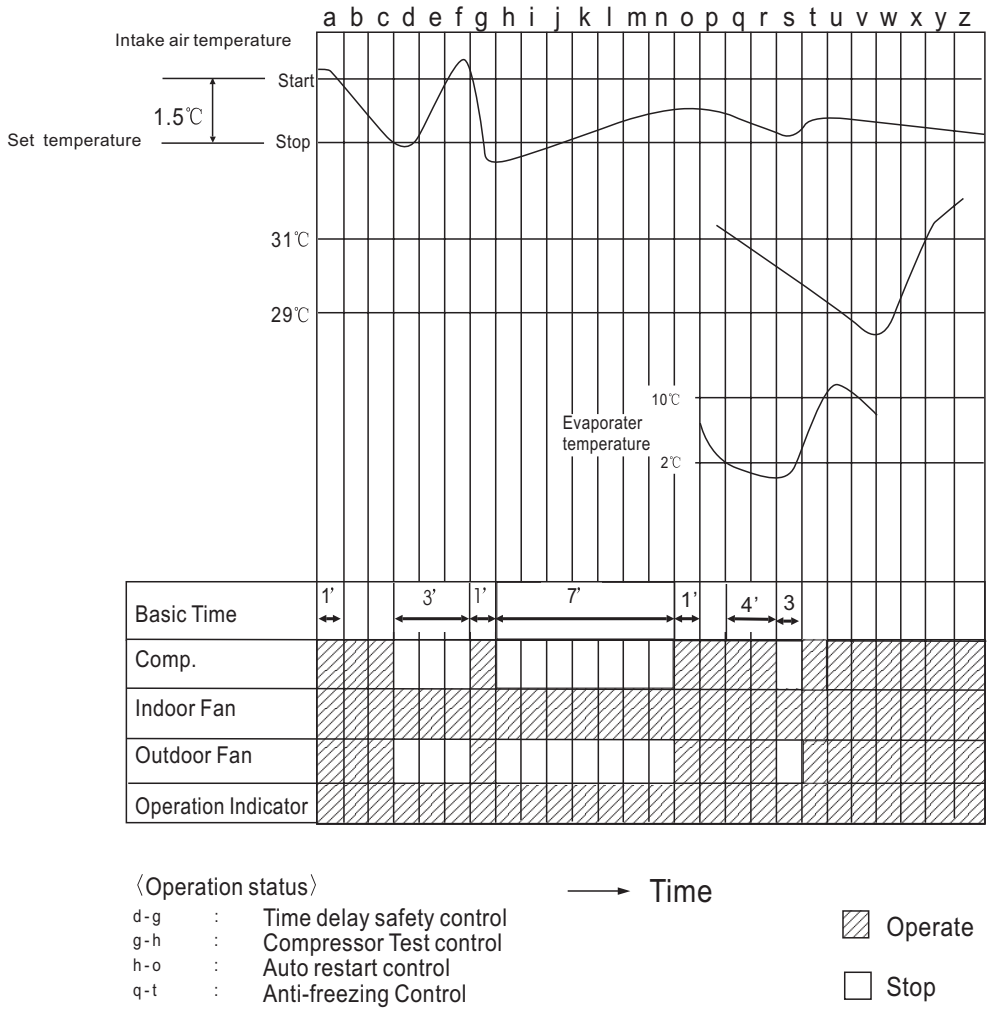
During Cooling Mode Operation, use remote controller to select Automatic Fan Speed.

- Fan speed will be at the point between "High speed" and "Medium speed".
- Deodorization control.



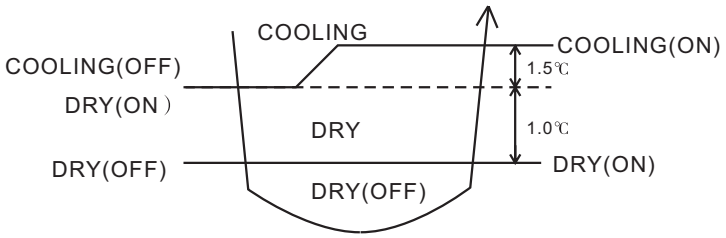
※ 1 Fan speed will be at “Hi” till the compressor ceases (set temperature reached).
※ 2 Fan speed will be at “Me” when the compressor restarts.

Time Graph for Cooling Operation



8.2. Soft Dry Mode Operation

- Operation area



- When selecting Soft Dry mode operation, the operation will be cooling until the room temperature reaches the set temp on remote control, and then Soft Dry will be activated. (During Soft Dry Mode the fan of indoor unit will operate at super low speed. The soft dry mode will run for less than 10 minutes.)
- Once Soft Dry mode operation is turned off, indoor fan, compressor and outdoor fan will stop for 6 minutes.

Time Delay Safety Protection

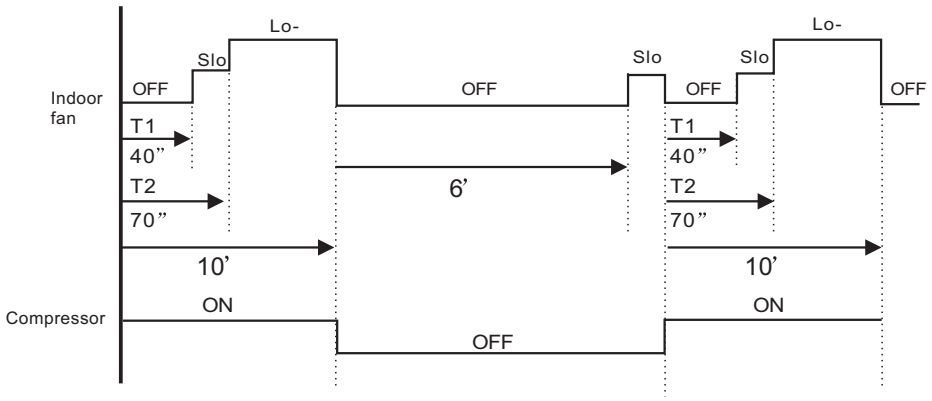
- During cooling mode operation, if the compressor ceased, it will not restart within 3 minutes.

Anti Freezing Control

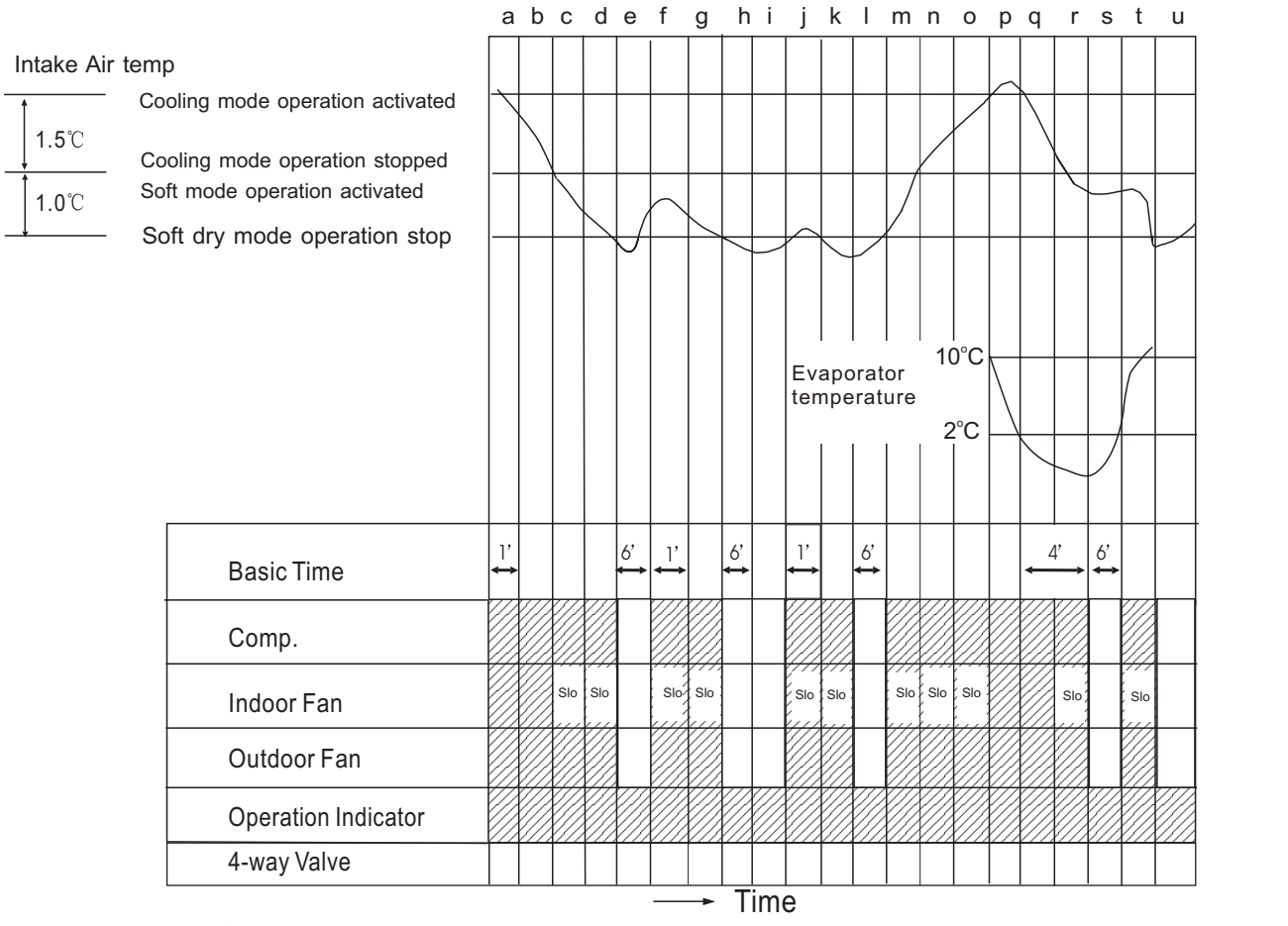
- Same as the denotation in Cooling Operation.(P21)
  (During Soft Dry Mode Operation, compressor will stop for at least 6 min.)

Automatic Fan Speed

- During Soft Dry Operation, use remote controller to select Auto Fan Speed mode. Indoor Fan Speed is at "Lo-"



Time Graph for soft dry operation



〈Operation status〉

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	:	Anti Freezing Control

—— Cooling mode operation

- - - - Soft Dry Mode operation

▨ Operate

□ Stop

8.3. Heating Mode Operation(Only for PA12DKD)

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

Time Delay Safety Control

- If the compressor stopped by switching off, turning off by remote controller, or power off, it will not restart within 3 minutes.
- When room temperature reaches the set temperature on the remote controller, compressor stops and will not restart within 4 minutes.
- 3 minutes after the compressor stopped, indoor fan will stop for 1 minute. Then indoor fan will resume operation with the speed at "super low".

Over Load protection Control

- When temperature of indoor heat exchanger rises to 51℃, outdoor fan will stop when temperature of indoor heat exchanger falls to 49℃, outdoor fan will restart.
- When temperature of indoor heat exchanger rises to 65℃ or above, compressor stops, and will restart 4 minutes later.

Indoor Heat Exchanger ⩾65℃ → Compressor Stops → Compressor Restarts 4 minutes later

Anti-reversing Control

- If the compressor has been continuously running for 5 minutes or longer, and the difference of temperature between intake air and evaporator is continuously lower than 5.0℃ or below for 2 minutes, the compressor will stop , and then restart 3 minutes later.(Time Delay Protection Control is effective.)

Compressor runs ⩾5 min
△T⩽5℃ last for 2 min → Compressor Stops → Compressor Restarts 3 minutes later

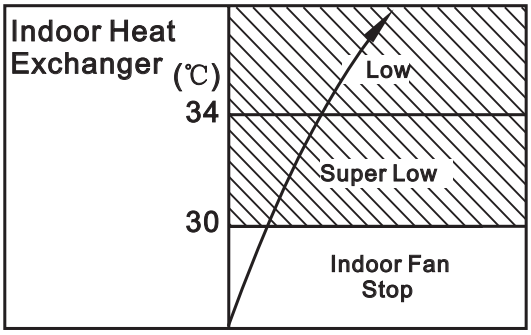
△T= intake air temperature - evaporator temperature

4-way valve control

- During heating mode operation,4-way valve is at "open" mode.
- During heating mode operation,if the unit turned off, the 4-way valve will remain at "open" mode for 5 minutes.

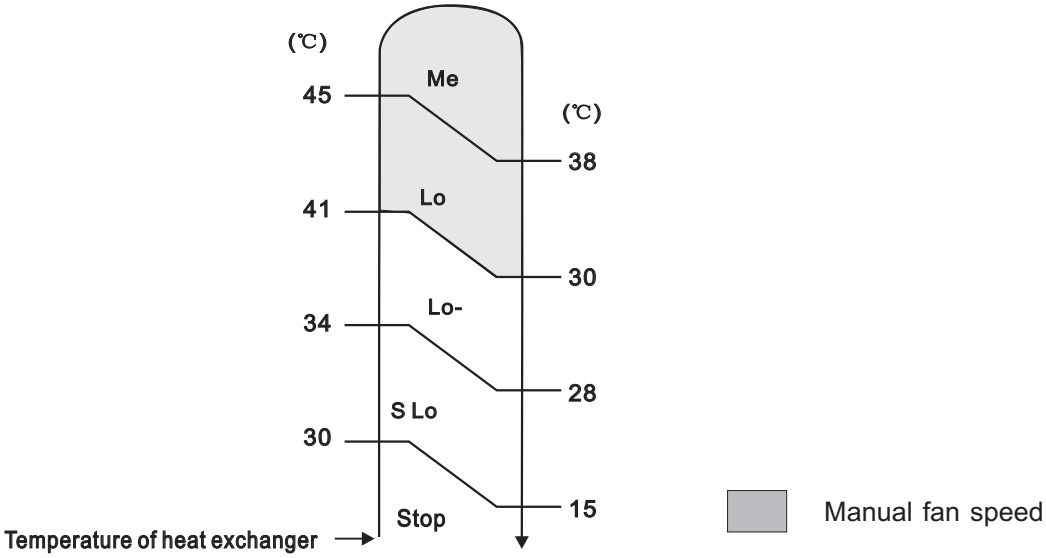
Warm Booting Control

- When turning on the unit by heating mode operation,indoor fan will be activated when temperature of indoor heat exchanger reaches 30℃. (See the figure on the right)
- Warm boot operation ends when temperature of indoor heat exchanger reaches 34℃.

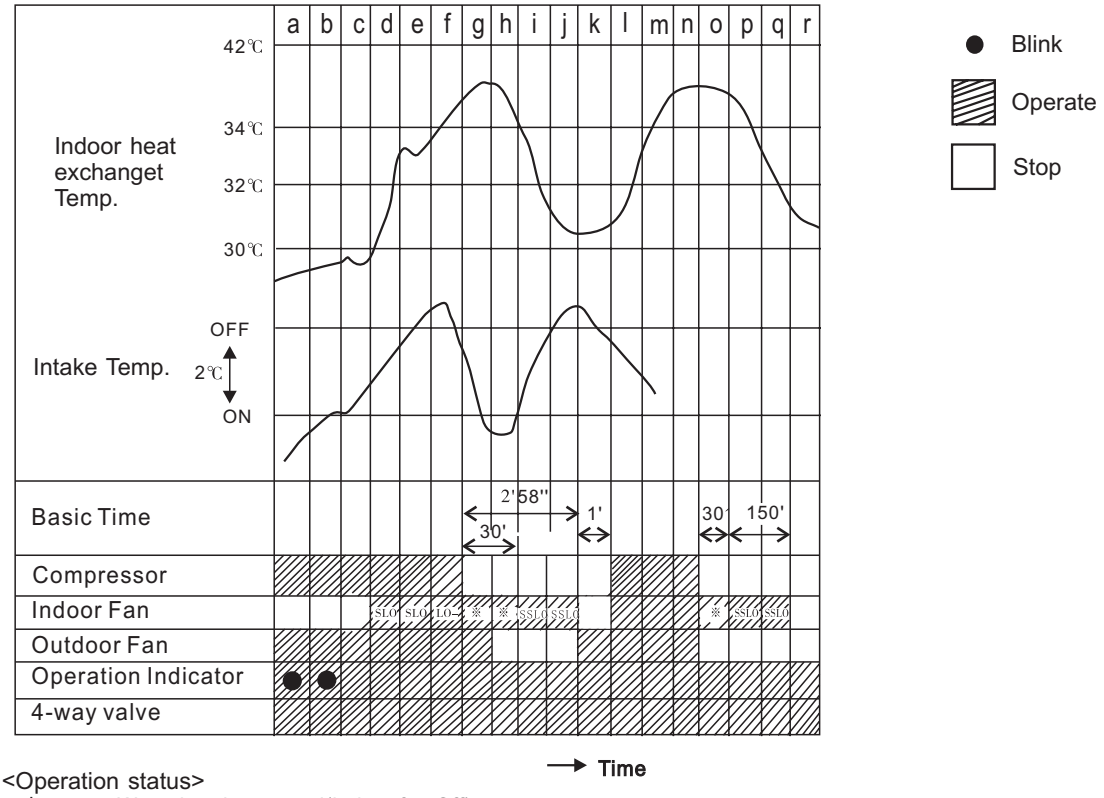


Automatic Fan Speed

During Heating Operation, use remote controller to select Auto Fan Speed mode.
Indoor Fan Speed is between “Me” and “Slo”.



Time Graph for Heating Operation



<Operation status>
a-b : Warm booting control(indoor fan Off)
c-d : Warm booting control(indoor fan Super Slo)
h-k, o-r: Prevent cool air blowing out

Deice Control

Deice operation is to protect the outdoor unit from freezing.

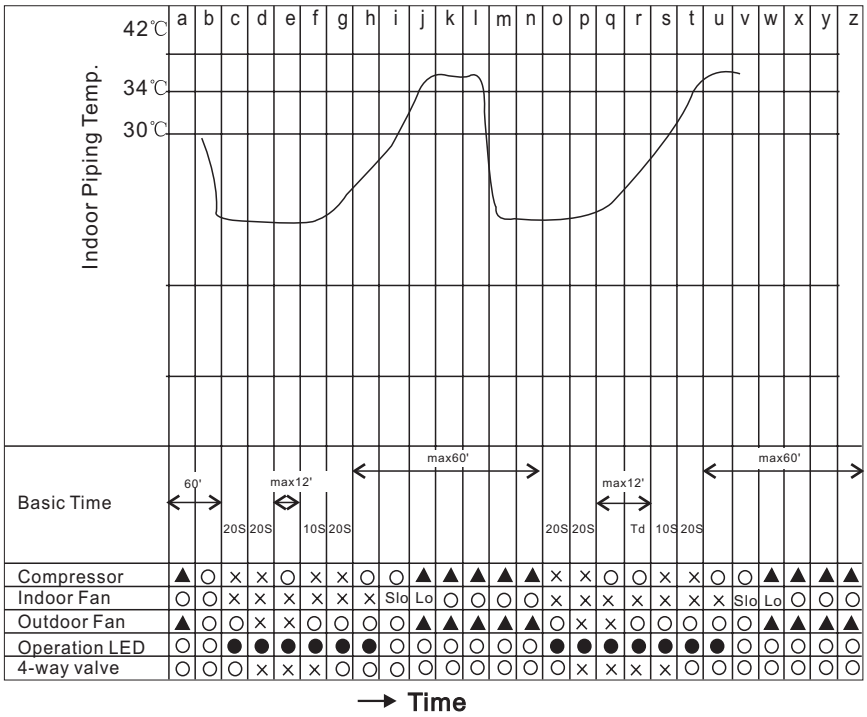
- Normal Deice Operation
  Deicing starts 30 minutes after heating mode operation or 60 minutes after the latest deicing operation. If temperature of outdoor piping, tested by TRS, falls to -3℃ (TRS OFF) or below for continuously 50 seconds, deicing operation starts.
- Overload Deicing Operation
  During heating operation, if the accumulative stopping time of outdoor fan reaches 60 minutes, deicing operation will start 1 minute after compressor starts.
- Deicing operation ends under conditions below

  (a) After 12 minutes.
  (b) Temperature of outdoor unit rises to 4℃.
  (c) As the illustration showed bellow and due to Time Delay (Td), deicing won't ends immediately.

Deicing Operation Time(T)	Td(s)
<3 min	0
3min ≤T<7min	60
7 min≤T<9min	120
T≥9min	180

- Once deicing operation starts, it won't end until 60 seconds later.
- When deicing operation ends, compressor will stop for 30 seconds, and 4-way valve remains at cooling mode operation for 10 seconds.

Time Graph for Normal Deicing Operation

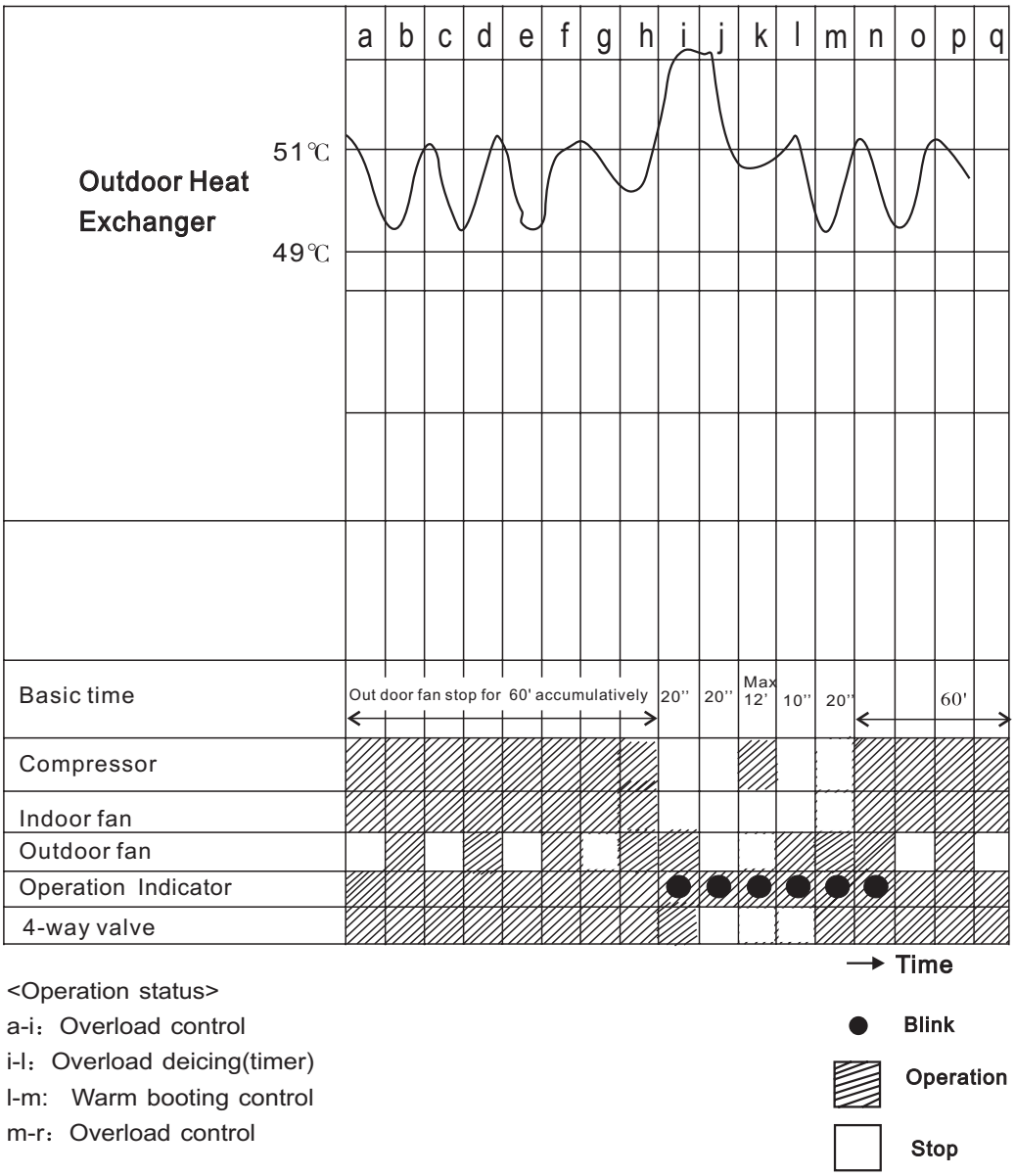


▲ ○ or ×
● Blink
○ Operation
× Stop

<Operation status>

a-c : Deicing confirmation
c-g : Deicing operation(time reset)
h-j,u-w : Warm Booting
o-r : Deicing(TRS)

Time Graph for Overload Deicing



<Operation status>

a-i：Overload control

i-l：Overload deicing(timer)

l-m: Warm booting control

m-r：Overload control

8.4 Automatic Mode Operation

Standard for Determining Operation Mode

- First Determination:

Intake Air temperature	
23℃	Cooling mode
	Soft Dry mode
20℃	Heating mode

	Setting Temperature (Standard)
Cooling mode	25℃
Soft Dry mode	22℃
Heating mode	21℃

- Second Determination:

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

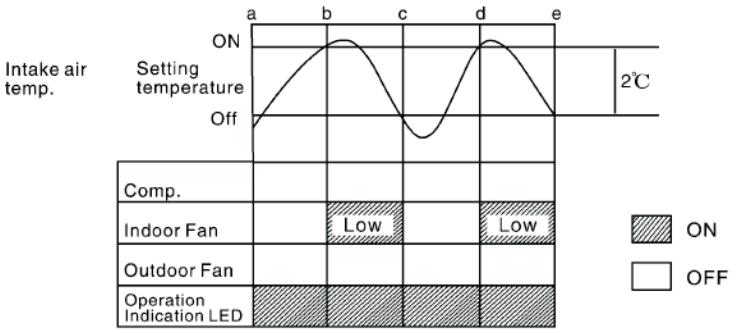
		Second Determination		
		Cooling	Dry	Heating
First determination	Cooling	23℃ or above	———	23℃ below
	Dry	———	20℃ or above	20℃ below
	Heating	25℃ or above	———	25℃ below

A) Indoor fan operates at super low speed for 25 seconds.
B) After judging indoor air temperature, the operation is determined and operation continued at the mode determined.
C) If indoor temperature is less than 16℃, heating operation will immediately operate.
D) After the operation mode has been determined, the mode does not change. However,Soft Dry mode operation includes cooling mode operation.
E) 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 25seconds at super slow fan speed.Then the selected mode will continue.
F) Room temperature adjustment

Higher	→	+2℃
Standard	→	±0℃
Lower	→	−2℃

8.5. Air Circulation Mode Operation(Only for PC12DKD)

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℃ below the setting temperature.
3. The vertical airflow direction louver will not swing.



8.6 Air Quality Sensor Control

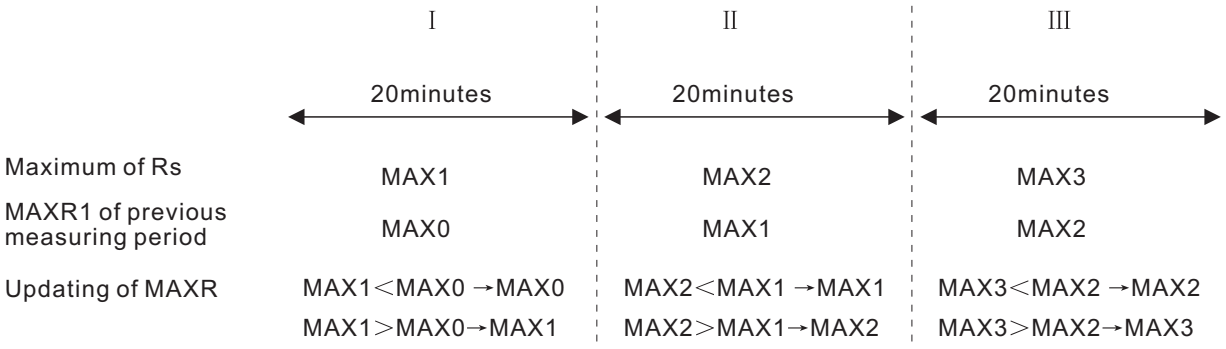
- Resistance of air quality sensor: Rs(air)=10kΩ~50kΩ (The worse the air quality, the smaller the resistance.)

Basic Operation

- Detecting and indicating of the air quality will not stop during the operation of the air conditioner.
- The power of the air quality sensor is always on during the operation of the air conditioner. When the air conditioner stops (The air conditioner is on standby.), the air conditioner will provide power to the air quality sensor intermittently (It will be on for 3 minutes after each 109 minutes.) for the purpose of air quality detecting.
- Within 2 minutes after the air conditioner starts to operate, the air quality sensor is in the process of preheating and the air quality indicator is red.

Resistance Reference

- Detecting of air quality(During the operation of the air conditioner):
  (a) The measuring period is 20 minutes; The air conditioner will measure the resistance (Rs) of the air quality sensor once each 2 seconds and record the data. The maximum Rs within the 20 minutes will be selected as Rs(MAX) for this measuring period.
  (b) Suppose the current Rs(MAX) as MAX and the resistance reference of the previous measuring period is as MAXR1.; If MAX>MAXR1, the resistance reference of the current measuring period is MAXR=MAX; If MAX<MAXR1, MAXR=MAXR1;
  (c) Within 2 minutes after the power of the air quality sensor is turned on, the resistance reference of this measuring period is the maximum resistance of the sensor during this period.



The following conditions should be fulfilled

(d) The initial MAXR after the preheating of the air quality sensor when the air conditioner is turned on:
The air conditioner will compare the maximum value of the current measuring period (MAX) with the resistance reference 109 minutes before (MAXR0) and select the bigger one as the current resistance
(e) reference(MAXR).
When the air conditioner determines the air quality is getting worse: Air quality level 1 Air quality level 2, MAXR will not be updated; When the air quality gets better (air quality level 0), Rs detected at this time will be
(f) MAX and MAXR.
The air conditioner will not detect the air quality during deicing operation. The indication prior to the deicing operation will be held during the deicing operation.

● Detecting of air quality(When the air conditioner is on standby.)

(a) After the air conditioner stops operation, it will provides power to the air quality sensor intermittently to detect the air quality and update the resistance reference (MAXR). The power of the air quality sensor will be on for 3 minutes after each 109 minutes.

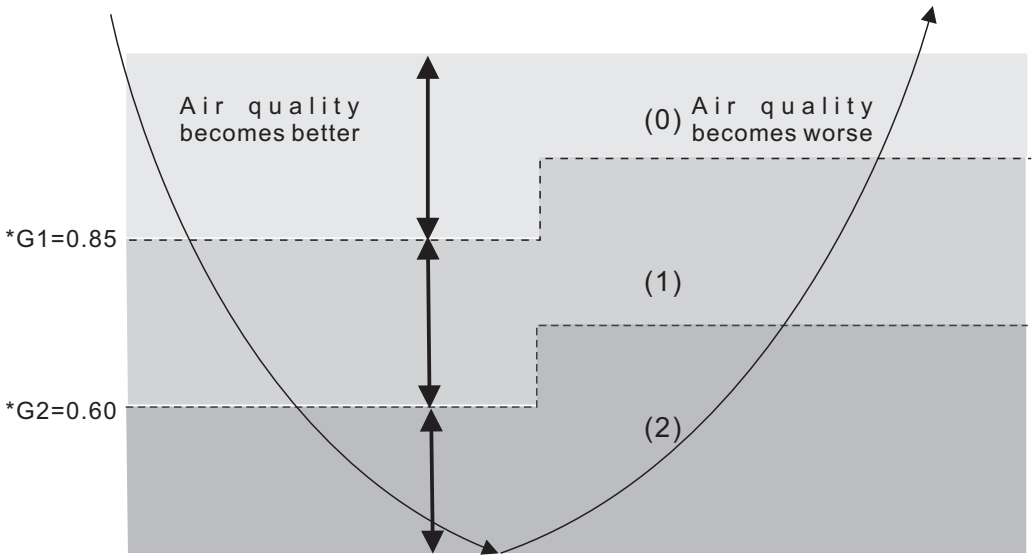
(b) During these 3 minutes, the air quality sensor will be in preheating process for 2 minutes and the other time is for measuring the resistance. The air conditioner will compare the maximum resistance measured in this period with the maximum value in the previous 109 minutes and the bigger one will be selected as resistance

Air Quality Control

● Detecting of air quality(When the air conditioner is on standby.)

Rs/MAXR will be calculated automatically every 2 seconds and the air quality level will be determined in accordance with the value below,

	Signal of Air Quality Sensor	Air Quality Level
Air Quality Getting Worse	Rs/MAXR≤G1	(0)→(1)
	Rs/MAXR≤G2	(1)→(2)
Air Quality Getting Better	Rs/MAXR≥G3	(2)→(1)
	Rs/MAXR≥G4	(1)→(0)



※ Set the sensitivity number of the air quality sensor as 2 (Standard)

Air Quality Level and Indicator

● During preheating of the air quality sensor the air quality indicator is red.

● The color of the air quality indicator varies with the air quality level:

Air Pollution Level 0: Green

Air Pollution Level 1:Orange

Air Pollution Level 2:Red

Forced Resetting

- Forced Resetting Time (The added operation time mentioned later not included.)
  (a) Air Pollution Level 2: Red: 5 minutes Orange: 8 minutes Green
  (B) Air Pollution Level 1: Red: 5 minutes Orange: 8 minutes Green

- Timer Resetting
  When the forced resetting mode is determined and the following conditions are fulfilled, the timer is reset.
  1) The air quality changes which results in the changing of the color of the air quality indicator.
  2) Compare Rs detected in current 2 seconds with R1 detected in previous 2 seconds and Rs/R1<0.95.
  3) Suppose Rs detected in previous 3 minutes is R2 and Rs/R2≤0.87.

Added Operation of Air Quality Sensor

- When the air quality getting worse
  If the air pollution level changes from 0 to 2, the color of the air quality indicator changes as below,
  Green ⟶ Orange (2 Sec.) ⟶ Red

- When the air quality getting better (added operation)
  If the air pollution level changes from 2 to o, the color of the air quality indicator changes as below,
  Red (60 Sec.) ⟶ Orange(60Sec.) ⟶ Green

- Judgment during added operation
  During added operation, if the air quality sensor judges that the air quality is getting worse, the added operation will be stopped immediately and the air quality indicator will shift to normal indication. If the air quality getting better, the air conditioner will judge the air quality until the added operation is finished.

Sensitivity Control of Air Quality Sensor

- The sensitivity number can be changed through the following procedure
  <Setting Sensitivity Number>
  1.Keep the SET button on the remote control depressed continuously for 5 seconds to select sensitivity control m ode.
  2.The previous sensitivity setting will be displayed in the temperature display.
  "0"=Turn off the air quality indicator
  "1"= Low Sensitivity……..G1=0.70, G2=0.45, G3=0.48, G4=0.73
  "2"=Standard Sensitivity……..G1=0.85, G2=0.60, G3=0.63, G4=0.88
  "3"=High Sensitivity……..G1=0.90, G2=0.65, G3=0.68, G4=0.93
  3.Press ▽or △button on the remote control to change the sensitivity

- Within 10 seconds after the sensitivity setting is finished, other settings are not available. The display of the remote control will change back to normal without pressing any button.

8.7Demo Mode (Outdoor unit not needed)

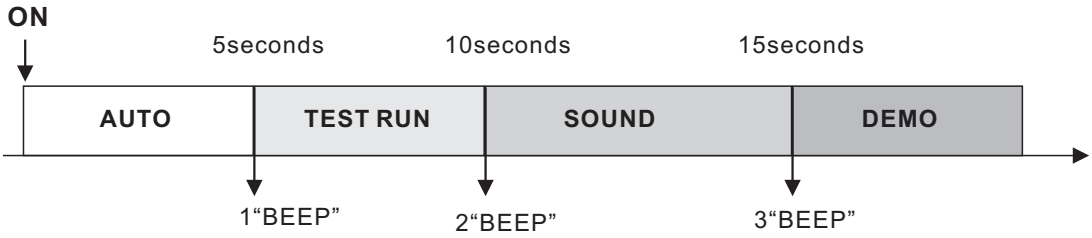
Activate the demo mode:

Keep the AUTO button on the indoor unit depressed continuously for 15 seconds until 3 beeps are heard and the demo mode is activated. → Turn off the air conditioner → Demo mode operation will be restarted automatically in 1 minute.

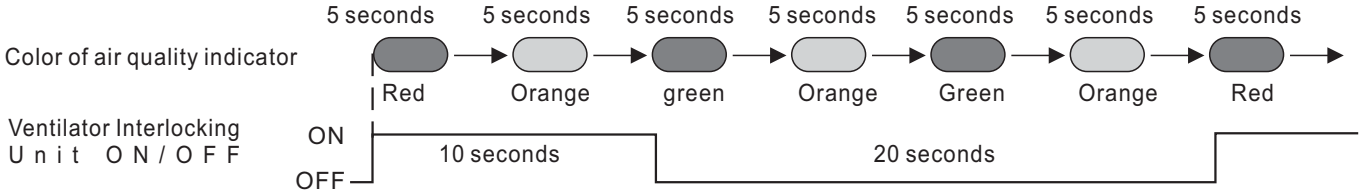
- In demo mode, the air conditioner can be operated(if the outdoor unit is connected to the indoor unit); Whenever you turned off the air conditioner, it will restart automatically into demo mode opertion.

Cancel the demo mode:

- Keep the AUTO button on the indoor unit depressed continuously for 15 seconds until 3 beeps are heard.



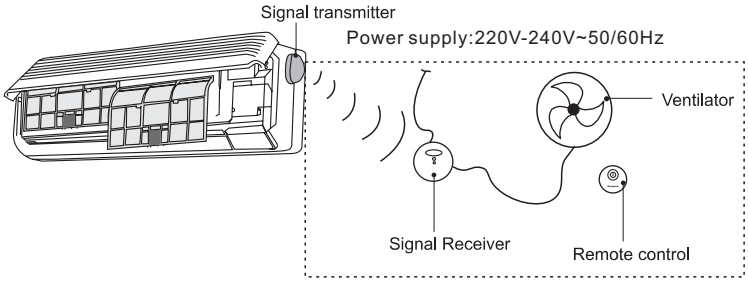
- Demo operation control(Air quality indicator and Ventilator Interlocking Unit signal)



8.8Ventilator Interlocking Unit Control (Optional)

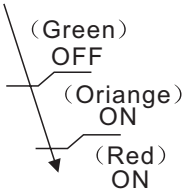
- Purpose: The air conditioner will control the operation of the ventilator (optional) according to the signal of the air quality sensor when displaying the air quality.
- Devices: Ventilator, Ventilator Interlocking Unit (wireless)

※To use this function, a ventilator and a ventilator interlocking unit should be purchased.

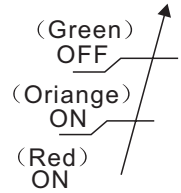


- Control Specification:

Air quality getting worse



Air quality getting better



15 minutes after the air conditioner is Turned on:

- Ventilator ON: Air quality indicator is red or orange.
- Ventilator OFF: Air quality indicator is green or the air conditioner is turned off.

※Within 15 minutes after the air conditioner is turned on, the ventilator will not operate even though the air quality indicator is red.

8.9 About Cursor Key Which Points To "OFF" On Remote Control

- When the ON/OFF button on the remote control is pressed, the cursor key which points to "OFF" will appear or disappear to indicate the ON/OFF status of the air conditioner.

- For some reason (Ex. The signal of the remote control does not reach the signal receiver of the indoor unit.), the display of the remote control will not correspond with the actual ON/OFF status of the indoor unit:

1. The air conditioner is running but the cursor key which points to "OFF" appears. The air conditioner can be stopped with any button (Except for "ON/OFF", "TIMER SET", "TIMER ON") pressed.
2. The air conditioner is on standby, but the cursor key which points to "OFF" disappears. The air conditioner can be started with any button(Except for "ON/OFF", "TIMER SET", "TIMER OFF") pressed.

8.10. Indoor Fan Motor Control

- Automatic fan speed control
  When automatic fan speed set, the available range for fan speed is from Hi to Slo.

- Manual Fan Speed Control
  Basic fan speed can be manually adjusted (Lo, Med, Hi) by using the fan speed selection button.

- Basic Fan Speed

Category		Hi	Me	Lo	Lo-	SLo	SSLo
Cooling Mode Operation	Manual	○	○	○			
	Auto	○	○			○	
Soft Dry Operation	Manual				○	○	
	Auto				○	○	
Heating Mode Operation	Manual	○	○	○	○	○	○
	Auto		○	○	○	○	○

8.11. Auto restart control

- If the operation is stopped due to a power failure under any operation mode, it will restart automatically un der the previous operation mode when the power supply is resumed.

8.12. 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℃ during heating mode operation, if temperature falls to 35℃,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 thetable 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	Manua	9°	21°	29°	44°	55°
	Auto	9° ~55°				
Determining operation mode		9°				

Notes:

- In heating mode operation

1. Airflow direction automatic control:
   Airflow direction is automatically adjusted to horizontal direction when the temperature of indoor heat exchanger is low and it will be automatically adjusted downward while the indoor temperature rises.
2. Airflow direction manual control:
   The airflow direction is automatically adjusted to horizontal direction when temperature of indoor heat exchanger is low .While temperature of indoor heat temperature rises ,the airflow direction is automatically adjusted to the place set by the remote control.

- In cooling or soft dry mode operation

If the compressor continues to operate for 60 minutes ,and the louver direction is at No 5,the fan speed is below Med, the intake air temperature is below 29 ℃ and continues to change between 2 ℃ for 30 minutes ,the louver direction will be at No 2 in order to prevent dew around the discharge vent.

9 Installation Instructions

Required tools for Installation Works			
1. Philips screw driver	5. Spanner	9. Gas leak detector	13. Multimeter
2. Level gauge	6. Pipe cutter	10. Measuring tape	14. Torque wrench 18 N.m (1.8 kgf.m) 42 N.m (4.2 kgf.m) 55 N.m (5.5 kgf.m)
3. Electric drill, hole core drill (ø70 mm)	7. Reamer	11. Thermometer	15. Vacuum pump
4. Hexagonal wrench (4 mm)	8. Knife	12. Megameter	16. Gauge manifold

9.1. Safety Precautions

Read the following "SAFETY PRECAUTIONS" carefully before installation.

Electrical work must be installed by a licensed electrician.

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

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

The items to be followed are classified by the symbols:

⃠	Symbol with background white denotes item that is PROHIBITED from doing.

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

⚠ **WARNING**	
1. Engage dealer or specialist for installation. If installation done by the user is defective, it will cause water leakage, electrical shock or fire.	
2. Install according to this installation instruction 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. 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• sweight. 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 this 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 (1.5 mm^2) 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 carrying out piping connection, take care not to let air substances other than the specified refrigerant go into refrigeration cycle. Otherwise, it will cause lower capacity, abnormal high pressure in the refrigeration cycle, explosion and injury.	
9. When connecting the piping, do not allow air or any substances other than the specified refrigerant (R22) 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.	⃠
10. 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. if the power supply cord is damaged, engage an authorized dealer to replace it.	⃠

⚠ CAUTION

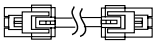
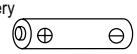
1. The equipment must be earthed. It may cause electrical shock if grounding is not perfect.
2. Do not install the unit at place where leakage of flammable gas may occur. In case gas leaks and accumulates at surrounding of the unit, it may cause fire.
3. Carry out drainage piping as mentioned in installation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

ATTENTION

1. Selection of the installation location.
   Select a 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 room air conditioner.
   Connect the power supply cord of the room air conditioner to the mains using one of the following method.
   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 10A 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 10A circuit breaker for the permanent connection. It must be a double pole switch with a minimum 3 mm contact gap.
3. Do not release refrigerant.
   Do not release refrigerant during piping work for installation, 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.

Attach ed access ories

Attached accessories.

No.	Accessories part	Qty.	No.	Accessories part	Qty.
1	Installation plate 	1	5	Drain elbow (Only for PA12DKD) 	1
2	Installation plate fixing screw 	5			
3	Remote control 	1	6	Connecting Wire (Connector) (Only for PA12DKD) 	1
4	Battery 	2			

SELECT THE BEST LOCATION

INDOOR UNIT

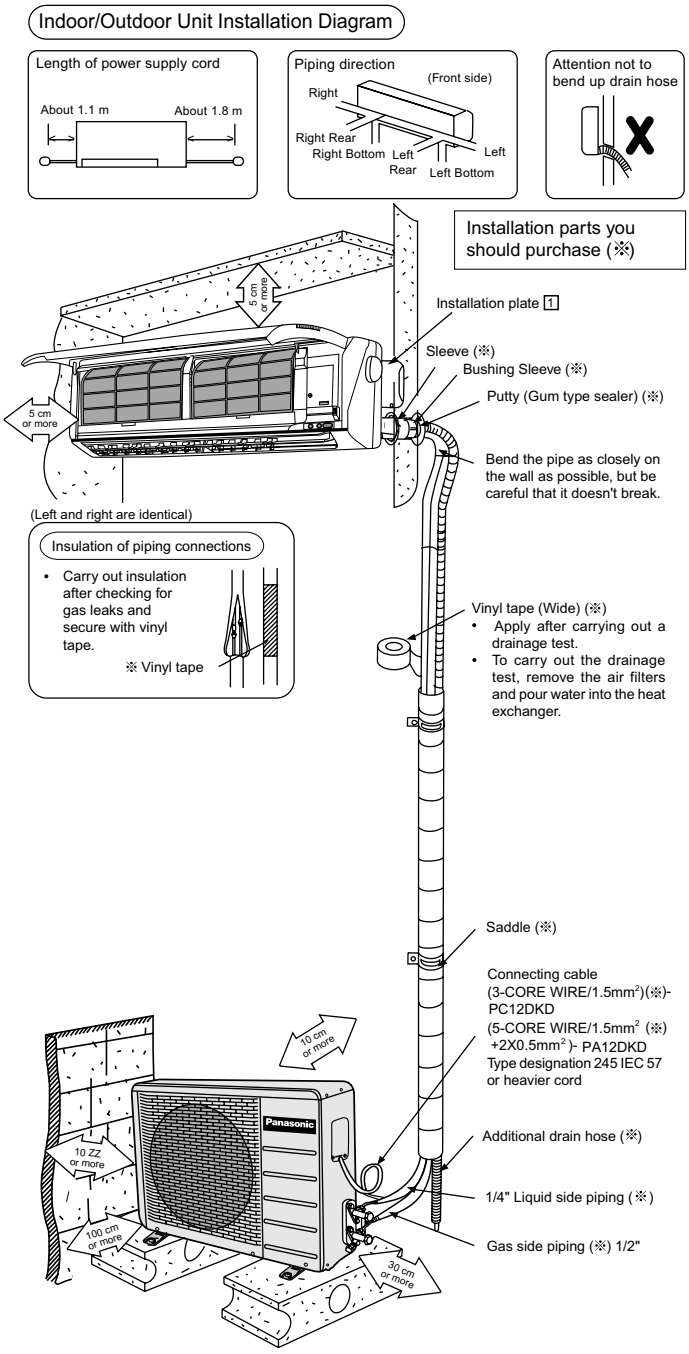
- There should not be any heat source or steam near the unit.
- There should not be any obstacles blocking the air circulation.
- A place where air circulation in the room is good.
- A place where drainage can be easily done.
- A place where noise prevention is taken into consideration.
- Do not install 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 2.5 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 common length, additional refrigerant should be added as shown in the table.

Model	Piping size		Max. Elevation (m)	Max. Piping Length (m)	Additional Refrigerant (g/m)
	Gas	Liquid			
PC12DK	1/2"	1/4"	5	7	-
PA12DKD	1/2"	1/4"	5	7	-

Indoor /Outdo or Unit Installa tion Diagra m



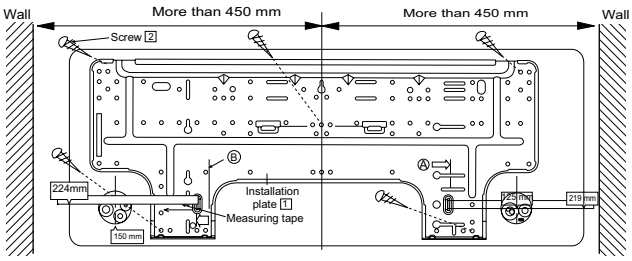
- This illustration is for explanation purposes only. The indoor unit will actually face a different way.

9.2. INDOOR UNIT

9.2.1. SELECT THE BEST LOCATION (Refer to "Select the best location" section)

9.2.2. 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.

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

: For left side piping, piping connecting 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.

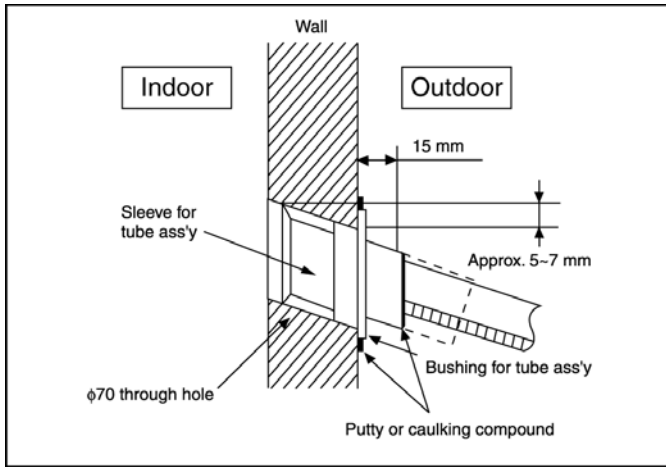
2. Drill the piping plate hole with ø70 mm hole-core drill.
   - Line according to the arrows marked on the lower left and right side of the installation plate. The meeting point of the extended line is the centre of the hole. Another method is by putting measuring tape at position as shown in the diagram above. The hole centre is obtained by measuring the distance namely 105 mm and 145 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.

9.2.3. 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.



9.2.4. 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 embed ded 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 determing the dimension 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

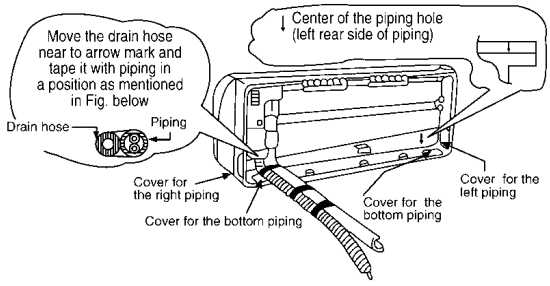
↓ • Please refer to "Connecting the piping" column in outdoor unit section. (Below steps are done after connecting the outdoor piping and gas-leakage confirmation.)

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

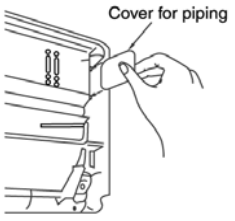
Pull out the piping and drain hose



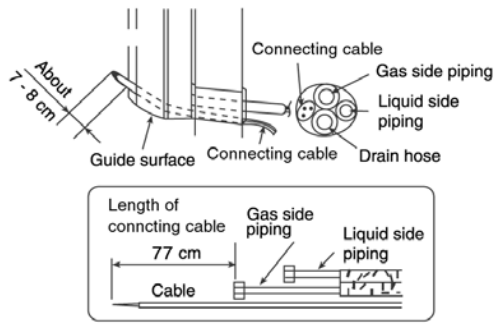
How to keep the cover

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)

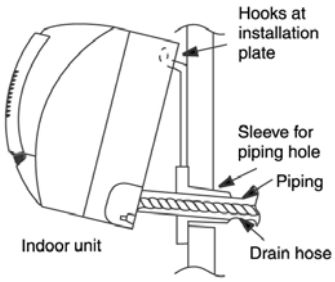


Insert the connecting cable



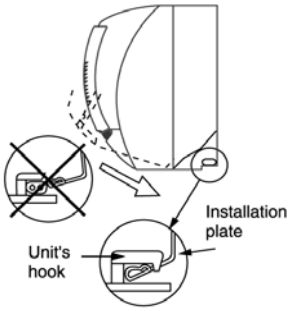
Install the Indoor Unit

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 in left and right.

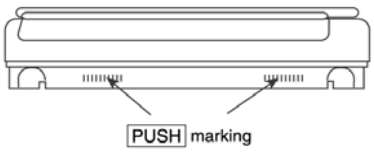


Secure the Indoor Unit

1. Tape the extra power supply cord in a bundle and keep it behind the chassis.
   • Ensure that the power supply cord is not clamped in between the unit's hook (2 positions) and installation plate.
2. Press the lower left and right side of the unit against the installation plate until hooks engages with their slots (sound click).



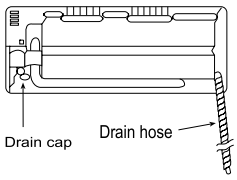
To take out the unit, push the PUSH marking at the bottom unit, and pull it slightly towards you to disengage the hooks from the unit.

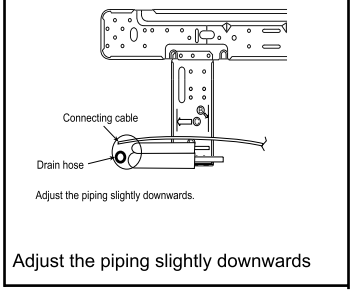


(This can be used for left rear piping & left bottom piping also.)

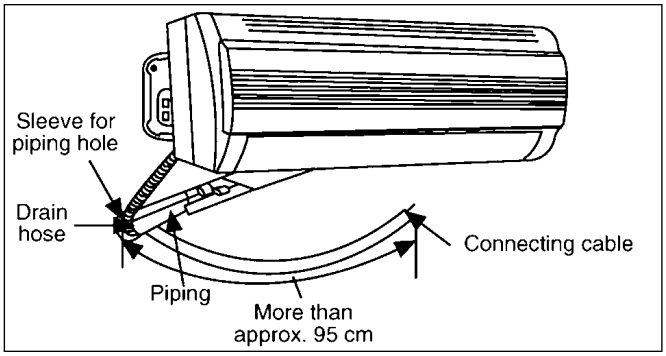
Exchange the drain hose and the cap

Refer view for left piping installation

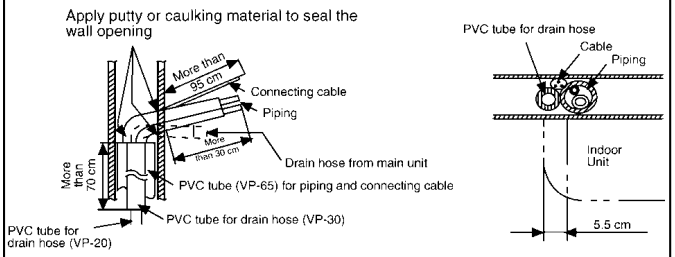




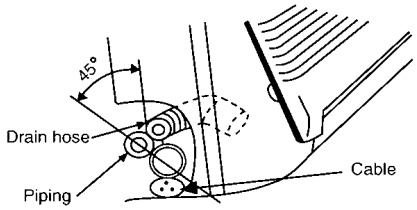
Adjust the piping slightly downwards



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



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



(For the right piping, follow the same procedure)

9.2.5. CONNECT THE CABLE TO THE INDOOR UNIT

1. The inside and outside connecting cable can be connected without removing the front grille.
2. Connecting cable between indoor unit and outdoor unit shall be approved polychloroprene sheathed 5 (PA12DKD) x 1.5 mm^2 flexible cord, 3 (PC12DKD) x 1.5 mm^2, type designation 245 IEC 57 or heavier cord. For PA12DKD, the attached wire [6] with two connectors should be applied.

- 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.

CS-PA12DKD

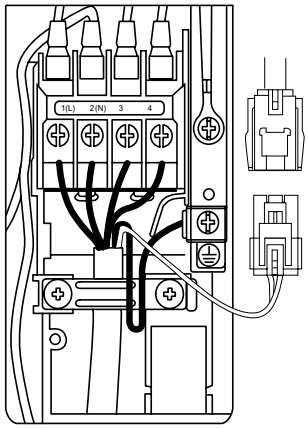
Terminals on the indoor unit	1	2	3	4
Color of wires				
Terminals on the outdoor unit	1	2	3	4

connector

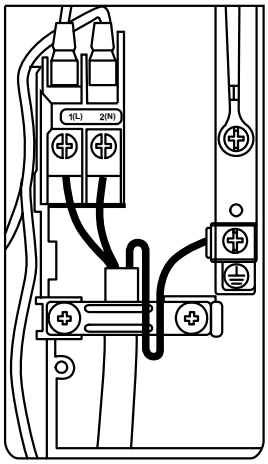
CS-PC12DKD

Terminals on the indoor unit	1(L)	2(N)
Color of wires		
Terminals on the outdoor unit	1(L)	2(N)

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



CS-PA12DKD



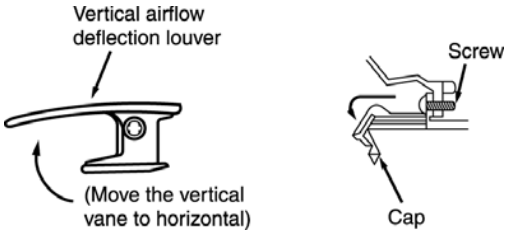
CS-PC12DKD

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 louvre to the horizontal position and then carry out above steps 2 - 3 in the reverse order.



AUTO SWITCH OPERATION

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

1. AUTO OPERATION MODE

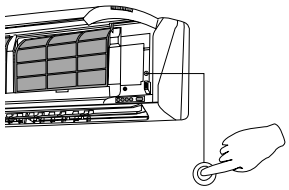
   The Auto operation will be activated immediately once the Auto Switch is pressed.

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.



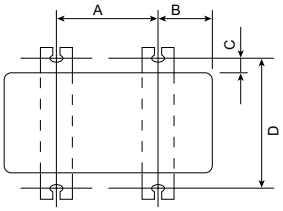
9.3. OUTDOOR UNIT

9.3.1. SELECT THE BEST LOCATION (Refer to "Select the best location" section)

9.3.2. INSTALL THE OUTDOOR UNIT

- After selecting the best location, start installation according to Indoor/Outdoor Unit Installation Diagram.

1. Fix the unit on concrete or rigid frame firmly and horizontally by bolt nut. (ø10 mm).
2. When installing at roof, please consider strong wind and earthquake. Please fasten the installation stand firmly with bolt or nails.



Unit: mm

Model	A	B	C	D
CU-PC12DKD CU-PA12DKD	570	103.9	13.3	320

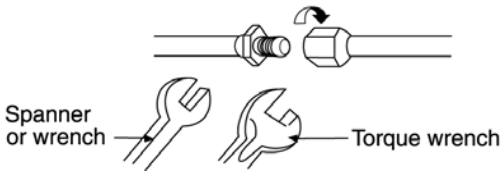
9.3.3. CONNECTING THE PIPING

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.



Piping size (Torque)	
Gas	Liquid
1/2" (55 N.m)	1/4" (18 N.m)

Connecting The Piping To Outdoor Unit

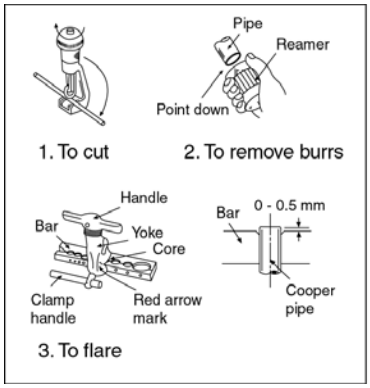
Decide piping length and then cut by using pipe cutter. Remove burrs from cut edge. Make flare after inserting the flare nut (located at valve) onto the copper pipe.

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

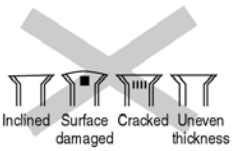
CUTTING AND FLARING THE PIPING

1. Please cut using pipe cutter and then remove the burrs.
2. Remove the burrs by using reamer. If burrs is not removed, gas leakage may be caused.

   Turn the piping end down to avoid the metal powder entering the pipe.
3. Please make flare after inserting the flare nut onto the copper pipes.



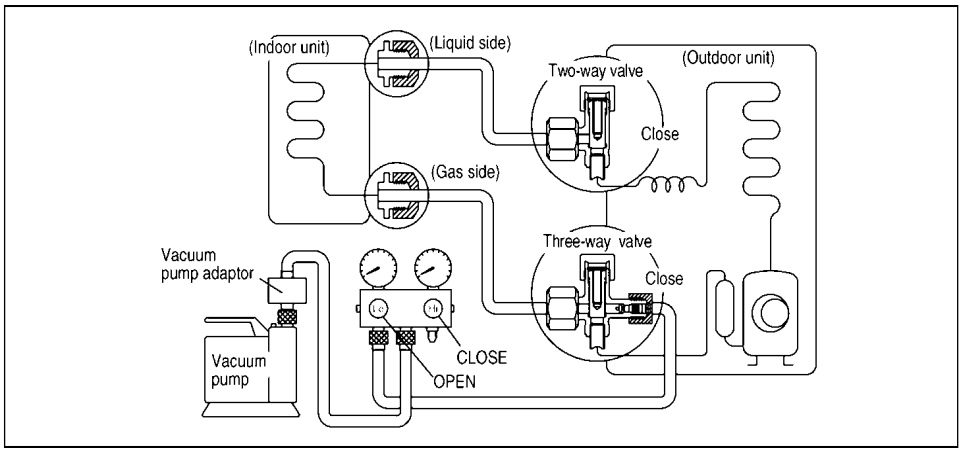
■ Improper flaring ■



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

9.3.4. (a) EVACUATION OF THE EQUIPMENT (FOR EUROPE & OCEANIA DESTINATION)

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



1. Connect a charging hose with a push pin to the Low side of a charging set and the service port of the 3-way valve.
   - Be sure to connect the end of the charging hose with the push pin to the service port.
2. Connect the center hose of the charging set to a vacuum pump with check valve, or vacuum pump and vacuum pump adaptor.
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 approximately ten minutes.
4. Close the Low side valve of the charging set and turn off the vacuum pump. Make sure that the needle in the gauge does not move after approximately five minutes.

   Note: BE SURE TO FOLLOW THIS PROCEDURE IN ORDER TO AVOID REFRIGERANT GAS LEAKAGE.
5. Disconnect the charging hose from the vacuum pump and from the service port of the 3-way valve.
6. Tighten the service port caps of the 3-way valve at torque of 18 N.m with a torque wrench.
7. Remove the valve caps of both of the 2-way valve and 3-way valve. Position both of the valves to • OPEN using a hexagonal wrench (4 mm).
8. Mount valve caps onto the 2-way valve and the 3-way valve.
   - Be sure to check for gas leakage.

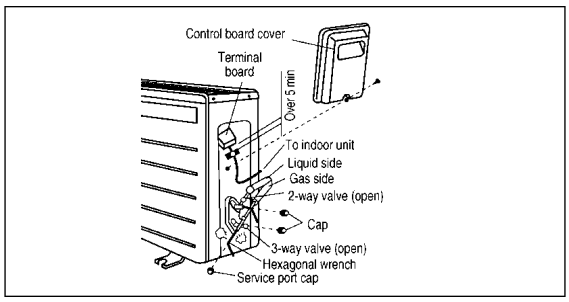
CAUTION

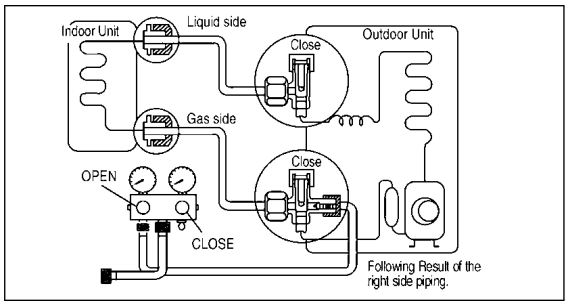
- If gauge needle does not move from 0 cmHg (0 MPa) to -76 cmHg (-0.1 MPa), in step 3 above take the following measure:
- If the leak stops when the piping connections are tightened further, continue working from step 3.
- If the leak does not stop when the connections are retightened, repair the location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

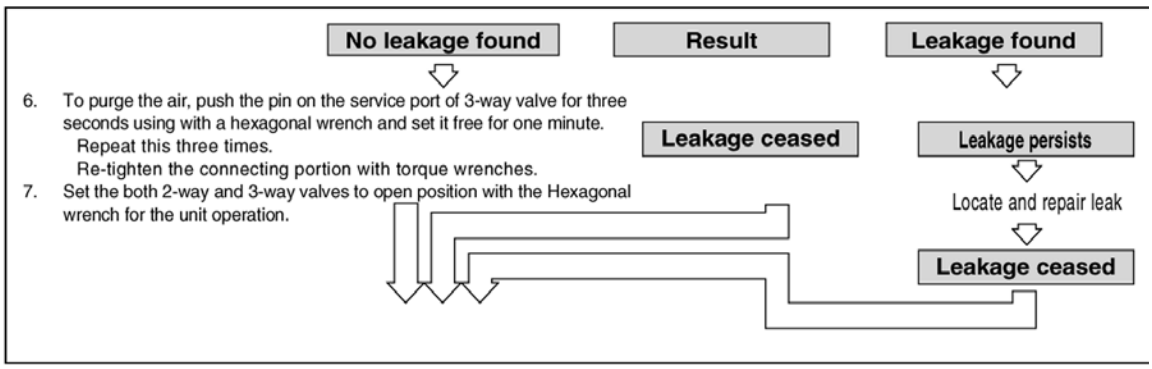
9.3.5. (b) AIR PURGING OF THE PIPING AND INDOOR UNIT

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

1. Remove the caps from the 2-way and 3-way valves.
2. Remove the service-port cap from the 3-way valves.
3. To open the valve, turn the valve stem of 2-way valve counter-clockwise approx. 90° and hold it there for ten seconds, then close it.
4. Check gas-leakage of the connecting portion of the pipings.
   For the left pipings, refer to item 4(A).
5. To open 2-way valve again, turn the valve stem counter-clockwise until it stops.







4(A). Checking gas leakage for the left piping.

(1) * Connect the manifold gauge to the service port of 3-way valve.
Measure the pressure.
*

(2) * Keep it for 5-10 minutes.
Ensure that the pressure indicated on the gauge is the
* same as that of measured during the first time.

9.3.6. CONNECT THE CABLE TO THE OUTDOOR UNIT

1. Remove the control board cover from the unit by loosening the screw.
2. Connecting cable between indoor unit and outdoor unit shall be approved polychloroprene sheathed 3 (PC12DKD) or 5 (PA12DKD) x 1.5 mm^2 flexible cord, type designation 245 IEC 57 or heavier cord. For PA12DKD, the attached wire 6 should be applied.

CS-PC12DKD

Terminals on the indoor unit	1(L)	2(N)	⏚
Color of wires			
Terminals on the outdoor unit	1(L)	2(N)	⏚

CS-PA12DKD

Terminals on the indoor unit	1	2	3	4	⏚	
Color of wires						
Terminals on the outdoor unit	1	2	3	4	⏚	connector

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

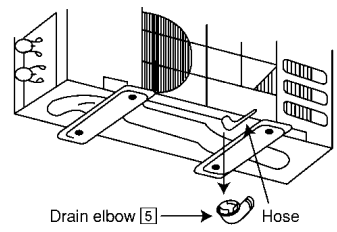
9.3.7. PIPE INSULATION

1. Please carry out insulation at pipe connection portion as mentioned in Indoor/Outdoor Unit Installation Diagram. Please wrap the insulated piping end to prevent water from going inside the piping.
2. If drain hose or connecting piping is in the room (where dew may form), please increase the insulation by using POLY-E FOAM with thickness 6 mm or above.

DISPOSAL OF OUTDOOR UNIT DRAIN WATER

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

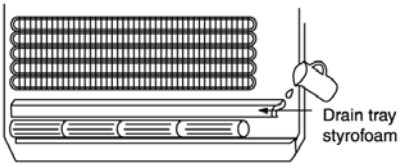
Only for CU-PA12DKD:



Install the hose at an angle so that the water

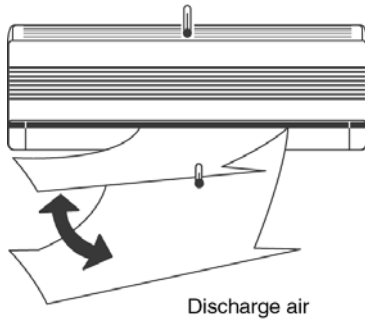
CHECK THE DRAINAGE

- Open front panel and remove air filters.
  (Drainage checking can be carried out without removing the front grille.)
- Pour a glass of water into the drain tray-styrofoam.
- Ensure that water flows out from drain hose of the indoor unit.



EVALUATION OF THE PERFORMANCE

- Operate the unit for fifteen minutes or more.
- Measure the temperature of the intake and discharge air.
- Ensure the difference between the intake temperature and the discharge is more than 8°C during cooling operation or 14°C during heating operation.

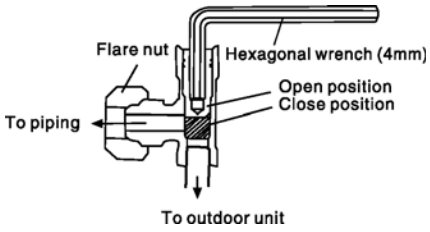
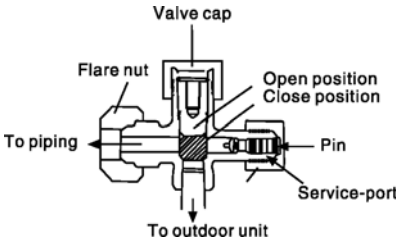


NOTE:
These equipment shall be connected to a suitable mains network with a main impendance less than: 0.27ohm.

CHECK ITEMS

- ☐ Is there any gas leakage at flare nut connections?
- ☐ Has the heat insulation been carried out at flare nut connection?
- ☐ Is the connecting cable being fixed to terminal board firmly?
- ☐ Is the connecting cable being clamped firmly?
- ☐ Is the drainage OK?
  (Refer to “Check the drainage” section)
- ☐ Is the earth wire connection properly done?
- ☐ Is the indoor unit properly hooked to the installation plate?
- ☐ Is the power supply voltage complied with rated value?
- ☐ Is there any abnormal sound?
- ☐ Is the cooling operation normal?
- ☐ Is the thermostat operation normal?
- ☐ Is the remote control’s LCD operation normal?
- ☐ Is the air purifying filter installed?

10 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)

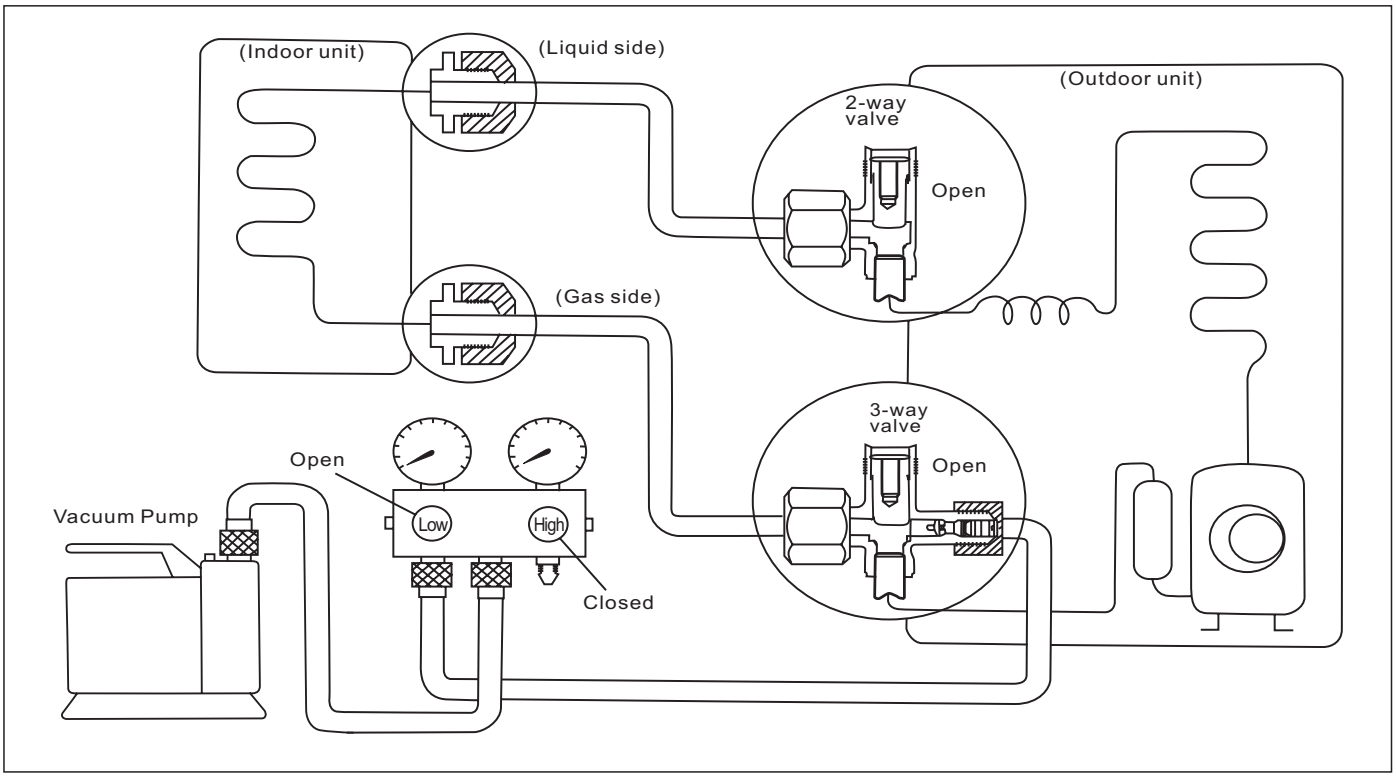
10.1. Evacuation of Installation

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 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 at a torque of18 N.m with a torque wrench.**
7. **Remove the valve caps of both the 3-way and the 2-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.**

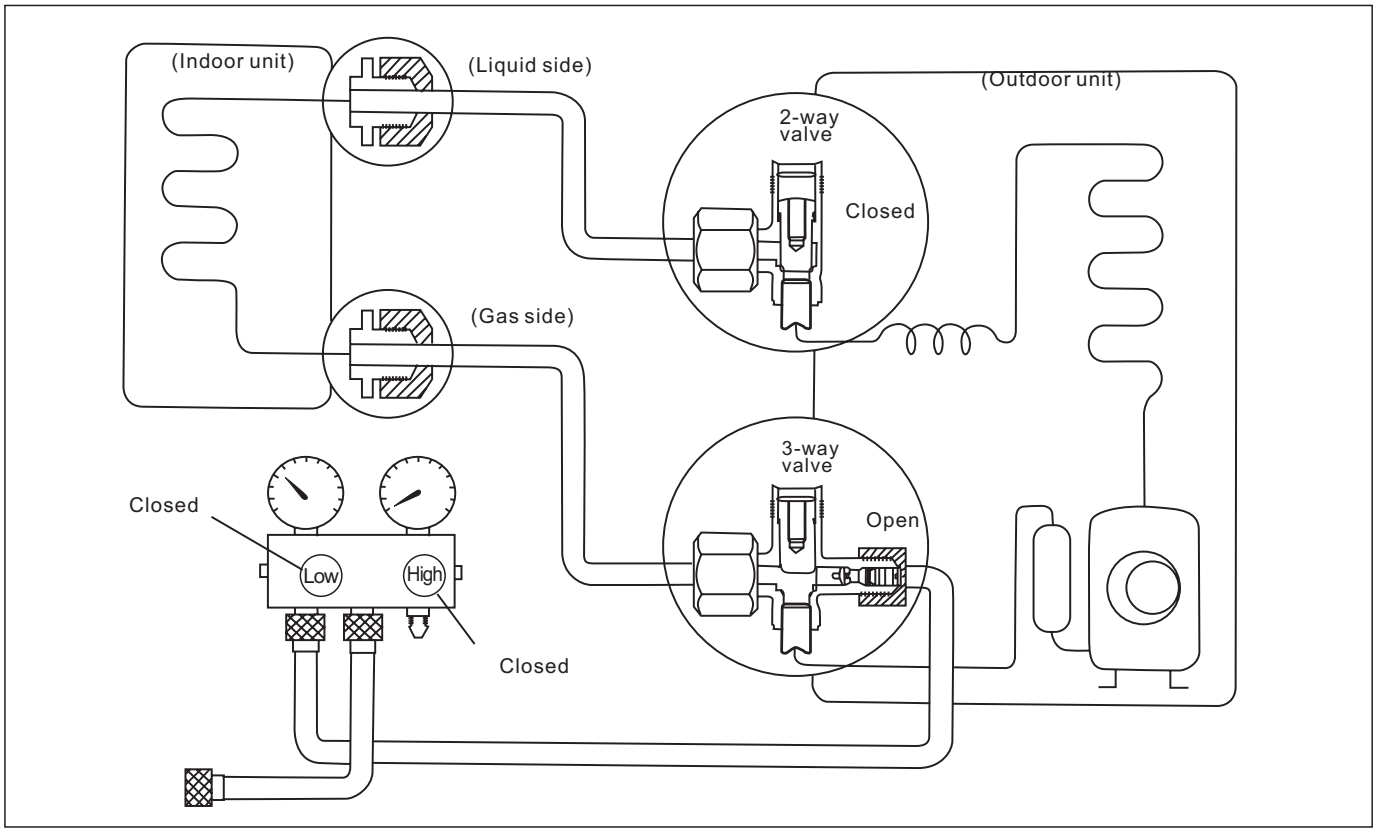
Be sure to check for gas leakage.

Caution

If gauge needle does not move from 0 cmHg(0 Mpa) to -76cmHg (-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.

10.2. Pumping down

(For Re-Installation)



Procedure

1.Confirm that both 2-way and 3-way valves are set to open positions.
- Remove the valve stem cap and confirm that the valve stems are in the open position.
- Be sure using a hexagonal wrench to operate the valve stems.

2.Operate the unit for 10-15 minutes.

3.Stop operation and wait for 3 minutes, then connect the charge set to the service port of the 3-way valve.
- Connect the charge hose with the push pin to the service port.

4.Air purging of the charge hose.
- Open the low-pressure valve of the charge set slightly to purge air from the charge hose.

5.Set the 2-way valve to the close position.

6. Operate the air conditioner at the cooling cycle and stop it when the gauge indicates 2 kg/cm^{2}G (0.1Mpa).
- If the unit cannot be operated at the cooling mode operation (weather is rather cold), short the Pumping Down pins on the Main Control P.C.B.

7. Immediately set 3-way valve to the closed position.
- Do this quickly so that the gauge ends up indicating 1 to 3kg/cm^{2}G (0.1 to 0.3 Mpa).

8. Use refrigerant reclaiming equipment to collect refrigerant from indoor unit and pipes.

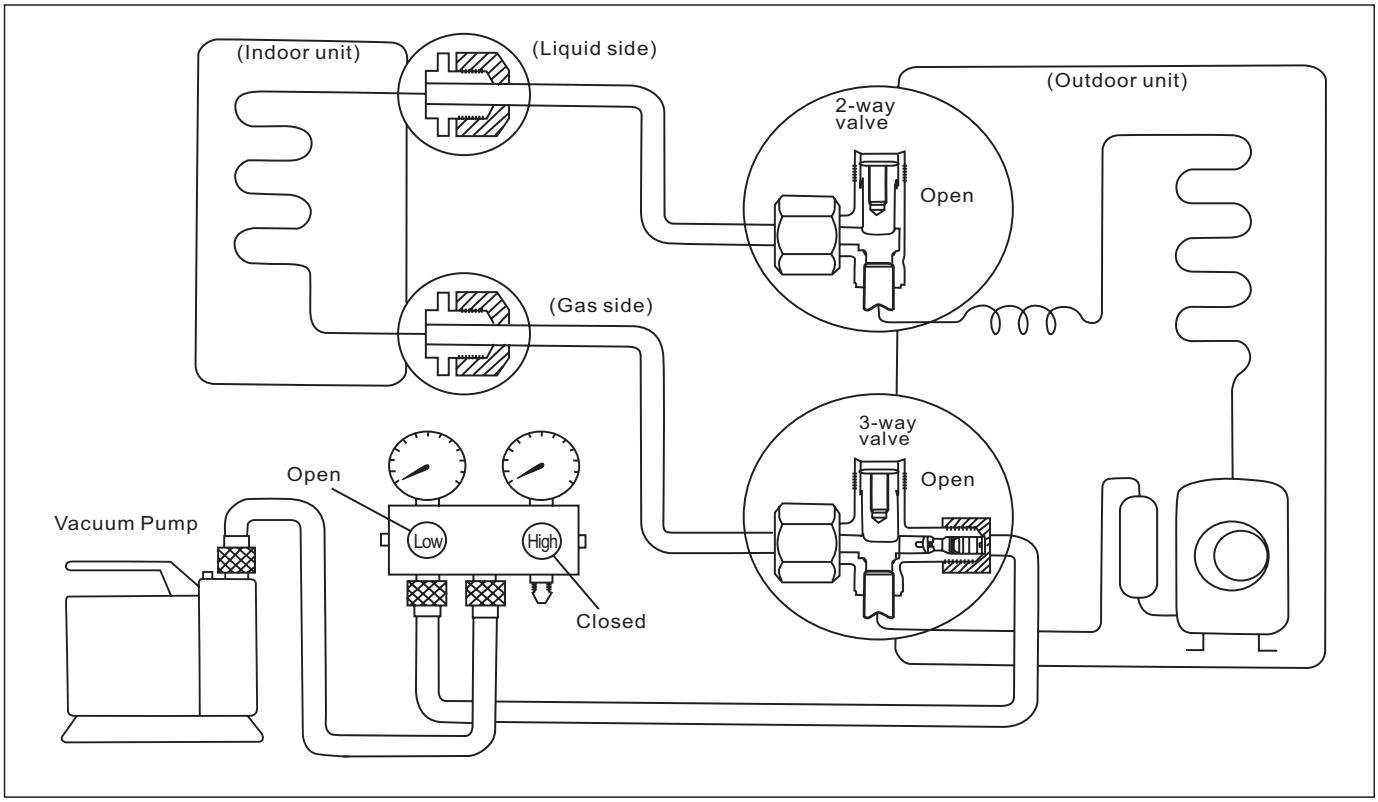
9. Disconnect the charge set, and mount the 2-way and 3-way valve stem's nuts and service port cap.
- Use torque wrench to tighten the service port cap to a torque 1.8kgf.m (18N.m).
- Be sure to check for gas leakage.

10. Disconnect pipes from indoor unit and outdoor unit.

.

10.3.Re-air Purging

(Re-installation)



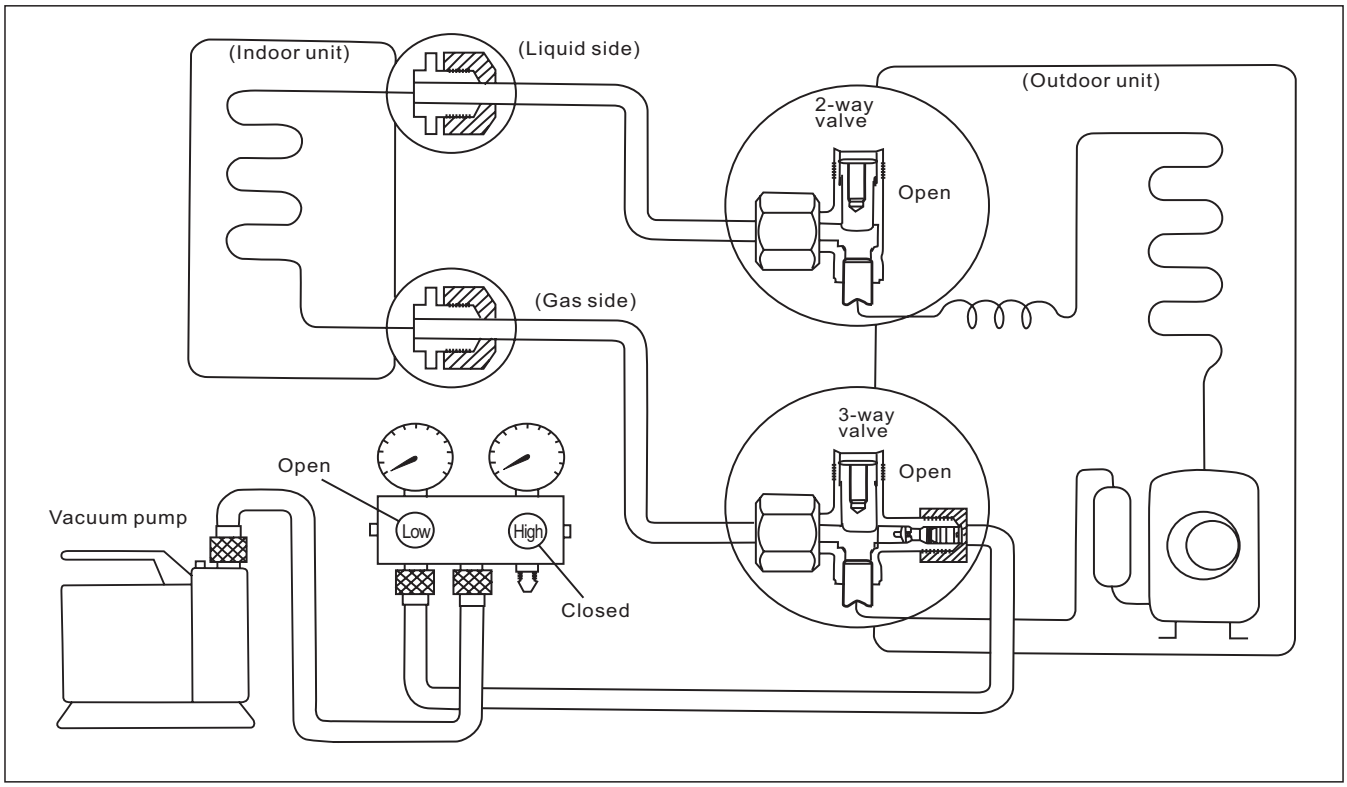
1. **Connect a charging hose with a push pin to the Low side of a charging set and the service port of a 3-way valves.**
   Be sure to connect the end of the charging hose with the push pin to the service port.
2. **Connect the centre hose of the charging set to a vacuum pump.**
3. **Turn on the power 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**
6. **Charge the pipes and indoor unit with gas refrigerant from 3-way valve service port, and then discharge the refrigerant until low side (gas side) gauge needle indicates 0.3 Mpa (3 kg/cm^2).**
7. **Tighten the service port caps of both the 3-way valve and the 2-way valve at a torque of 18 N.m with a torque wrench.**
8. **Remove the valve caps of both the valves. Position both of the valves to "open" using a hexagonal wrench (4 mm).**
9. **Mount valve caps onto both the valves.**
   - BE SURE TO USE REFRIGERANT RECLAIMING EQUIPMENT WHILE DISCHARGING THE REFRIGERANT.
   - Purge the air from charge set's centre hose.
   - Be sure to check for gas leakage.

Caution

If gauge needle does not move from 0 cmHg(0 Mpa) to -76cmHg (-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.

10.4. Balance refrigerant of the 2-way,3-way walves

(Gas leakage)

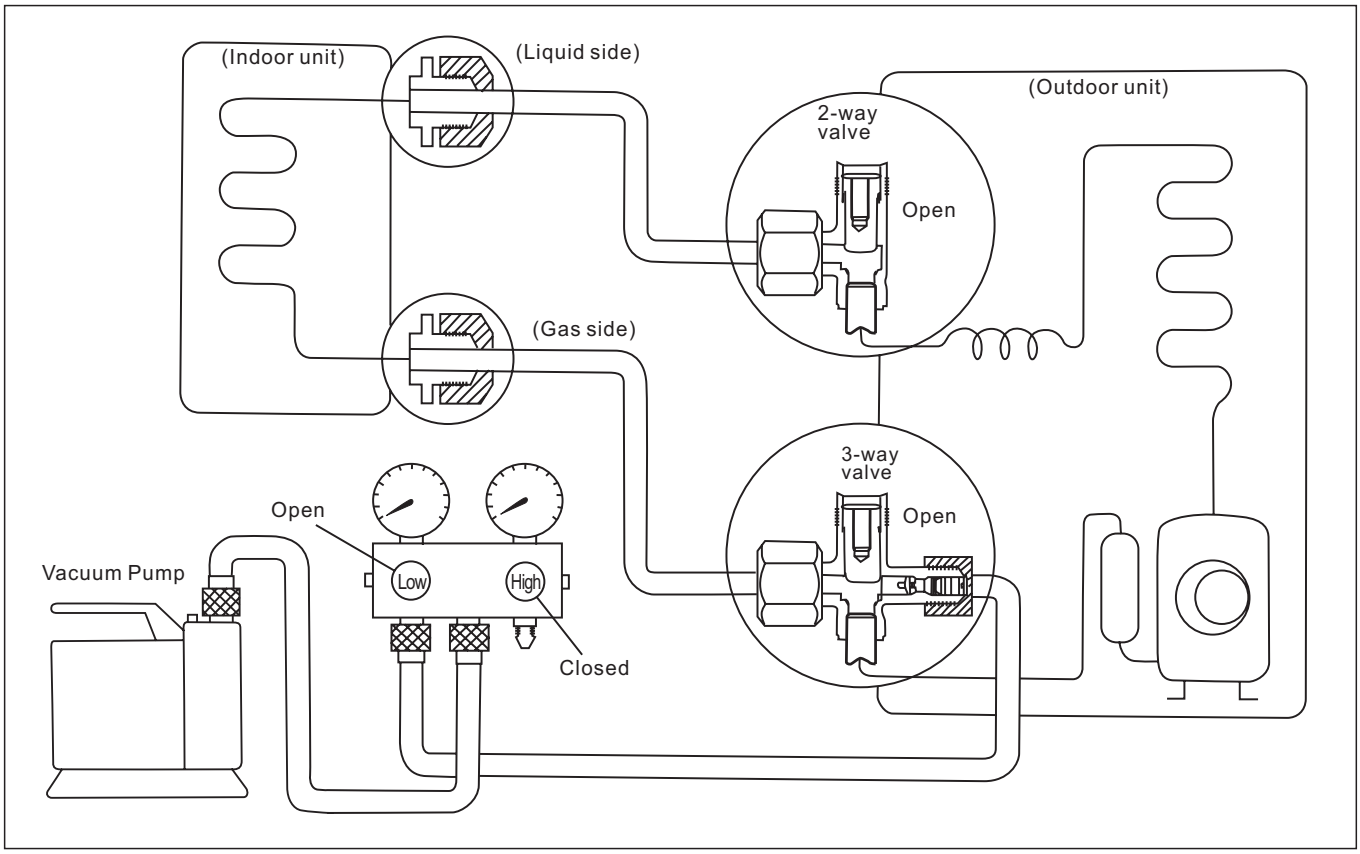


Procedure

1. **Confirm that both the 3-way valve and 2-way valve are set to the open position.**
2. **Connect the charge set to the 3-way valve's service port.**
   - Leave the valve on the charge set closed.
   - Connect the charge hose with the push-pin to the service port.
   - Confirm whether the pressure indicates more than 1 kg/cm^{2}G (0.1MPa).
3. **Connect the charge set's centre hose to refrigerant reclaiming equipment.**
4. **Open the valve (Low side) on the charge set and discharge the refrigerant until the gauge indicates 0.05 MPa (0.5 kg/cm^{2}G) to 0.1 MPa (1 kg/cm^{2}G).**
   - If there is no air in the refrigeration cycle (the pressure when the air conditioner is not running is higher than 0.1 MPa (1 kg/cm^{2}G), discharge the refrigerant until the gauge indicates 0.05 MPa (0.5 km/cm^{2}G) to 0.1 MPa (1 kg/cm^{2}G). 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 refrigeration oil will also be discharged.
5. **Turn on refrigerant reclaiming equipment to collect the refrigerant until the needle indicates 0 (no refrigerant is remaining).**

10.5. 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).**

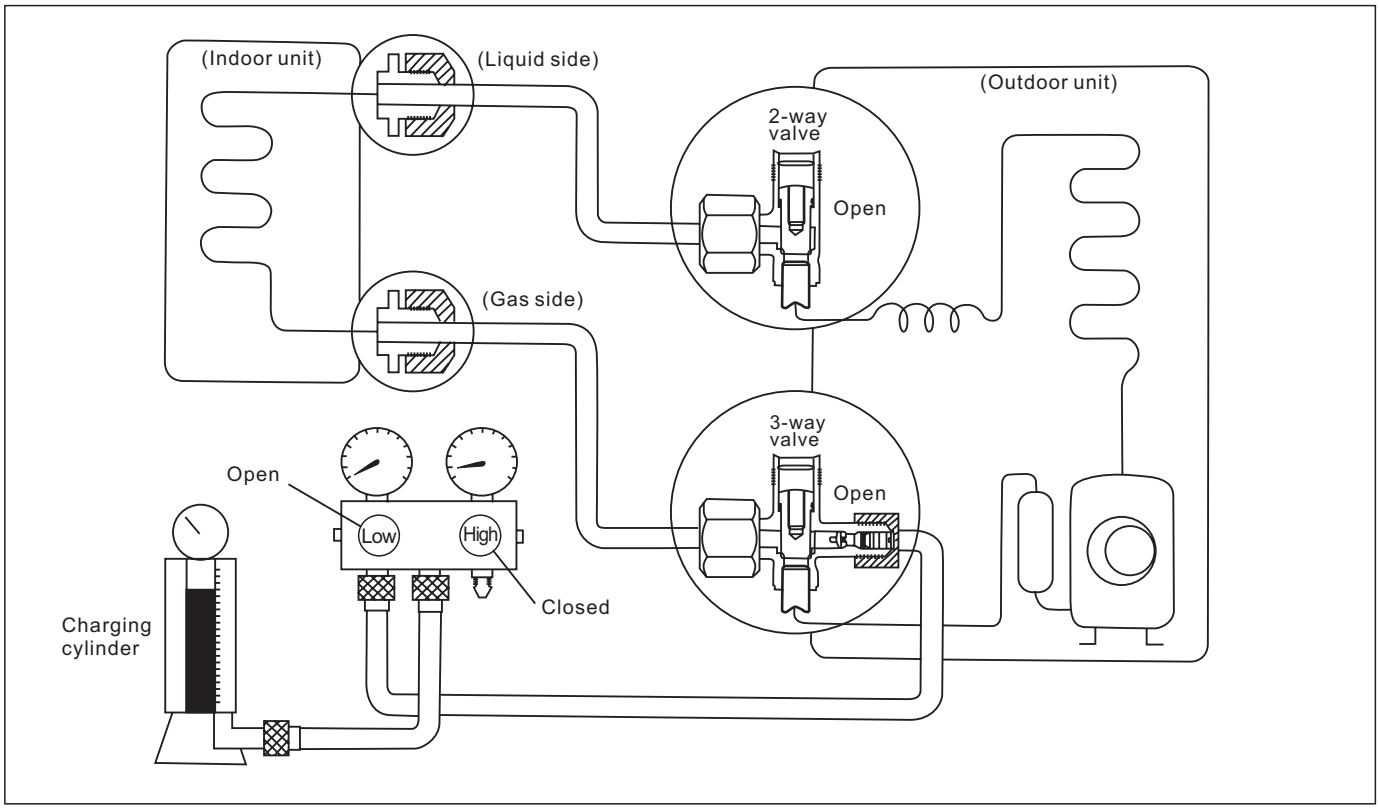
4.**Disconnect the charge hose from the vacuum.**

- Vacuum oil

  If the vacuum pump oil becomes dirty or depleted, replenish as needed.

10.6. 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 no attempt to charge with large amount 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 1.8kgf.m (18 N.m)
- Be sure to check for gas leakage.

11 Disassembly of the parts

Removal Procedure For Intake Grille

1. Open the intake grille and pull it to the horizontal position. (Fig. 1)

Fig. 1

2. Pull up the intake grille until it falls off.(Fig. 2)

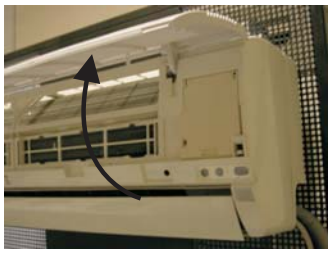


Fig. 2

Removal Procedure For Front Grille

1.Remove the two caps at the discharge port (right and left) (Fig. 3)

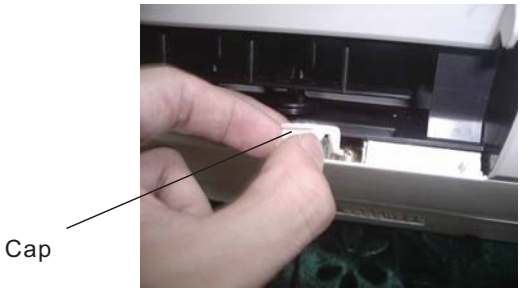


Fig. 3

2.Release the two screws under the both caps. (Fig. 4)

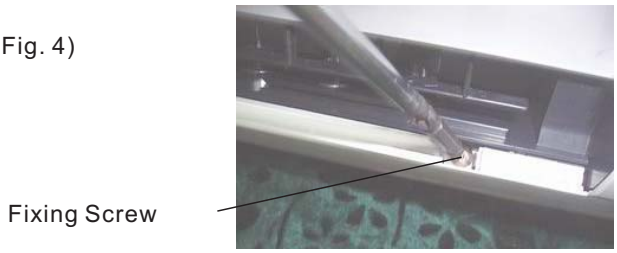


Fig. 4

3.Pull out the front grille from the unit body. (Fig.5)

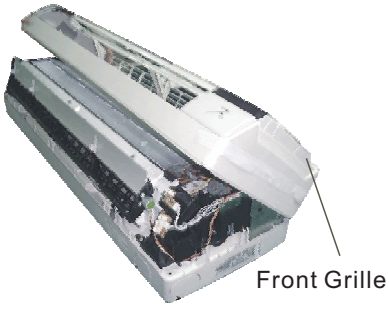


Fig. 5

Removal Procedure For Electronic Controller

1、Remove indicador complete

Afer removing the front grille, loose the screw behind the indicator, the whole indicator can be released.

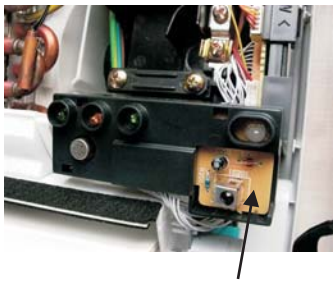


Fig 6

2、Remove the cover of control board and holder

3、Break off the earing ,release the holder slightly.
Be sure to avoid cracking of the holder.

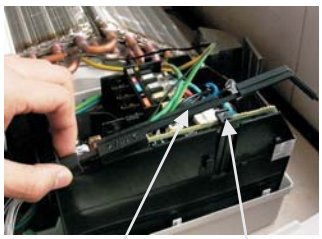


Fig 7

4. Release the lead wire CN-FM, CN-VF, CN-STM, CN-DISP and earth wire(Yellow/Green). Take out the sensor from the socket. Pull out the whole electronic controller.

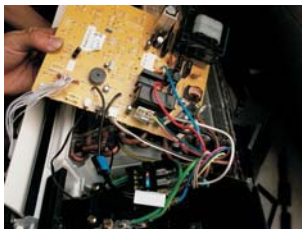


Fig 8

5. Remove the whole control board
Loose the screw s of control board,earings slightly, then the whole control board can be pulled out.

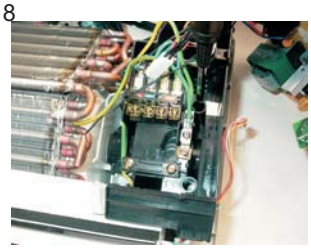


Fig 9

Removal Procedure For the Discharge Grille

1. Separate the drain hose and the drain plate(Fig.10)

Fig 10

2. Pull out the discharge grille slightly (Fig. 11)

Fig. 11

Removal Procedure For Cross Flow Fan

1. Release the two fixing screws,disassembly the fixing board from evaporator on the left side of the evaporator and pull out the whole evaporator. (Fig. 12)

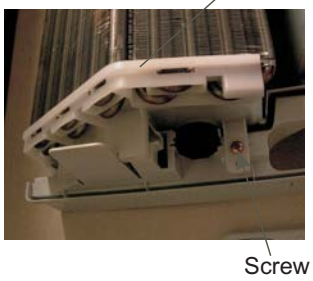


Fig. 12

2.Loose the fixing screw of the cross flow fan. (Fig. 13)

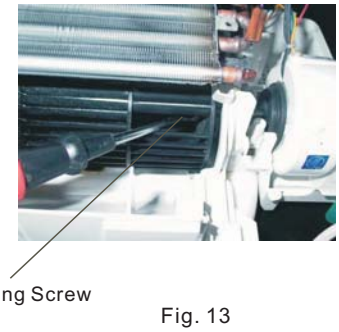


Fig. 13

3.After removing the bearing (refer to fig14) , indoor fan can be taken out from the left side.

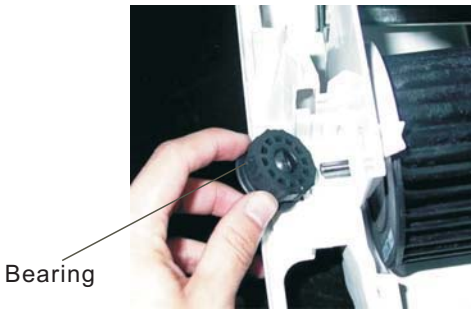


Fig 14

4. Lift up the indoor fan slightly, and then pull the fan motor out.（Fig15）

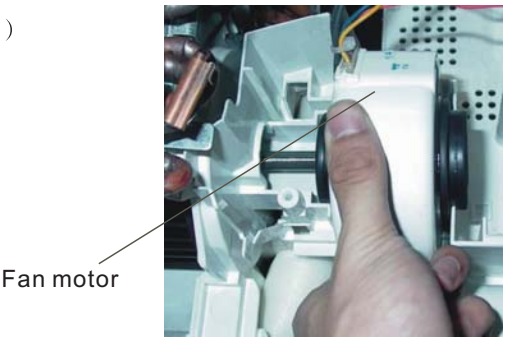


Fig 15

Remote control reset

If the display is chaotic or can not be adjusted, Remove the back lid of the remote control and you will find the resetting terminals and shorten the two terminals using a screw driver to reset.

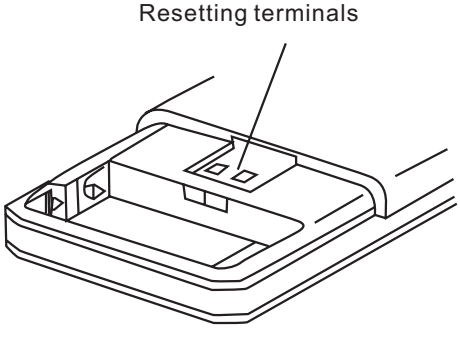


Fig 16

12 Troubleshooting Guide

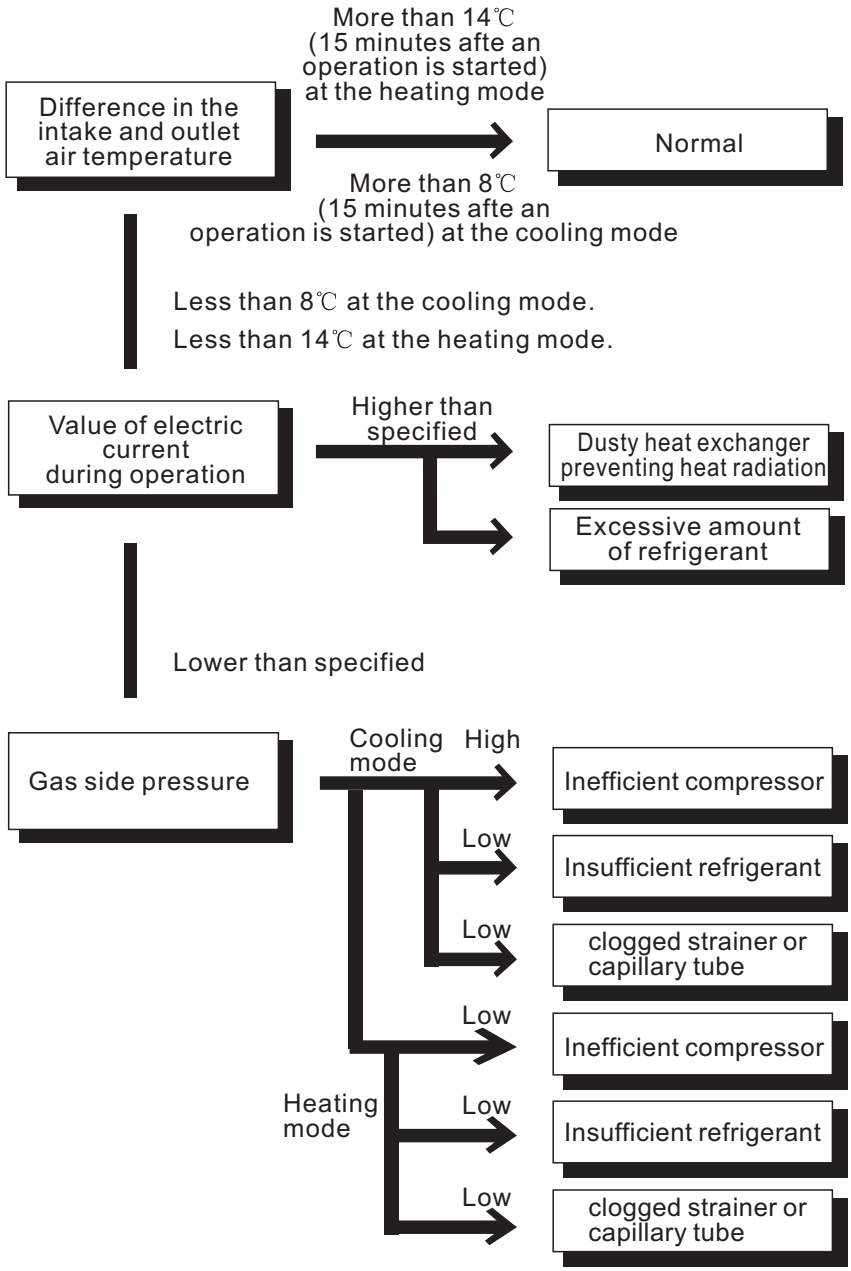
12.1. Refrigeration cycle system

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 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.

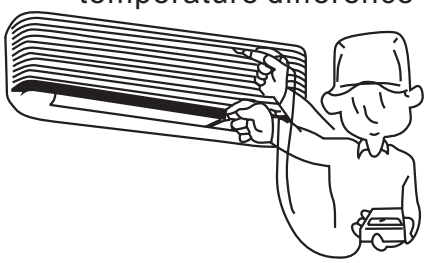
Normal pressure and outlet air temperature(standard)

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

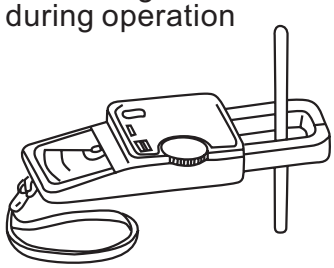
★ Condition: indoor fan speed: high
outdoor temperature:
35℃ (Cooling mode)
7℃ (Heating mode)



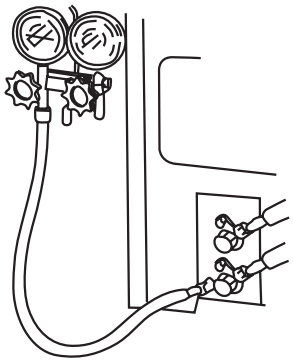
- Measuring the air temperature difference



- Measuring electric current during operation



- Measuring gas side pressure



12.2. Relationship between the condition of air conditioner and pressrue 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	↘	↘	↘	↗	↗	↗
Heat radiation deficiency of the outdoor unit	↗	↗	↗	↘	↘	↘
Insufficient compression	↗	↘	↘	↗	↘	↘

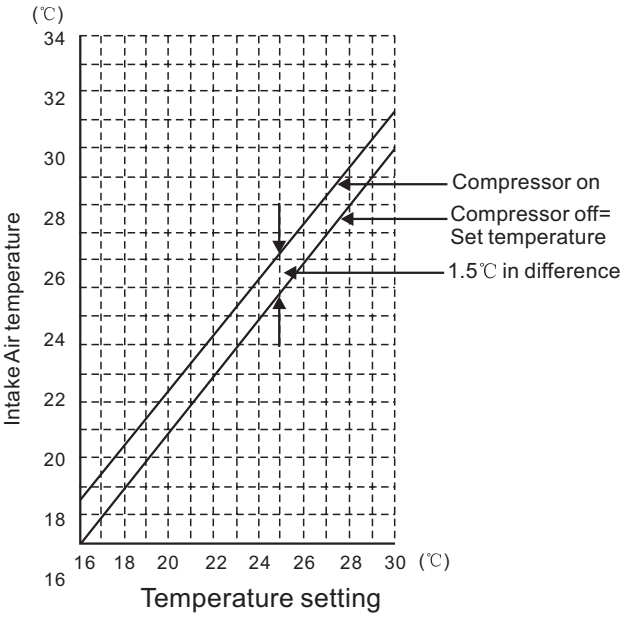
12.3. Diagnosis methods of a malfunction of a compressor .

Nature of fault	Symptom
Insufficient compressing of a compressor	• Electric current during operation becomes approximately 80% lower than the normal level. • The discharge tube of the compressor becomes abnormally hot (normally 70~90℃). • The difference between high pressure and low pressure becomes almost zero.
Locked compressor	• Electric current reaches a high level abnormally, and the value exceeds the limit of an ammeter. In some cases, a breaker turns off. • The compressor has a humming sound.
Inefficient switches of the 4-way valves	• Electric current during operation becomes approximately 20% lower than the normal valve. • The temperature difference between from the discharge tube to the 4-way valve and from suction tube to the 4-way valve becomes almost zero.

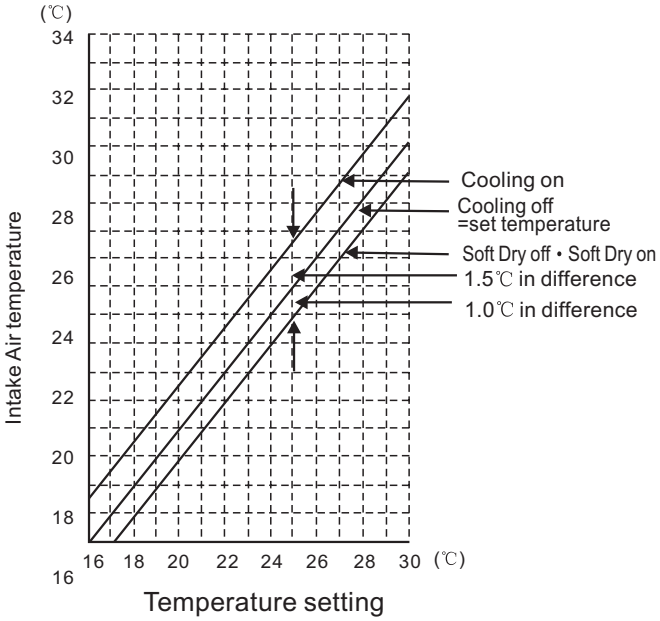
13 Technical Data

■ Thermostat characteristics

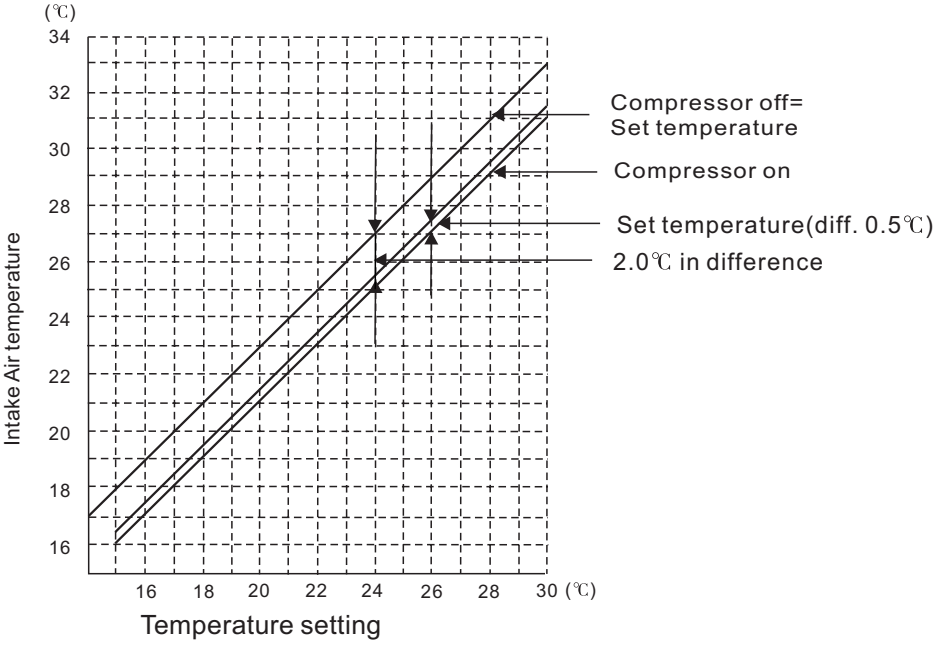
- Cooling mode



- Soft dry mode

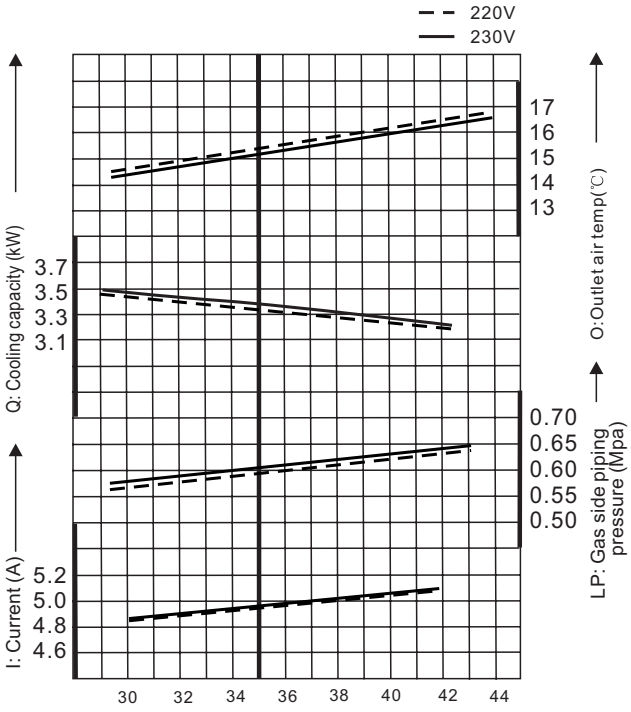


- Heating mode (Only for CS-PA7DKD/CS-PA9DKD)



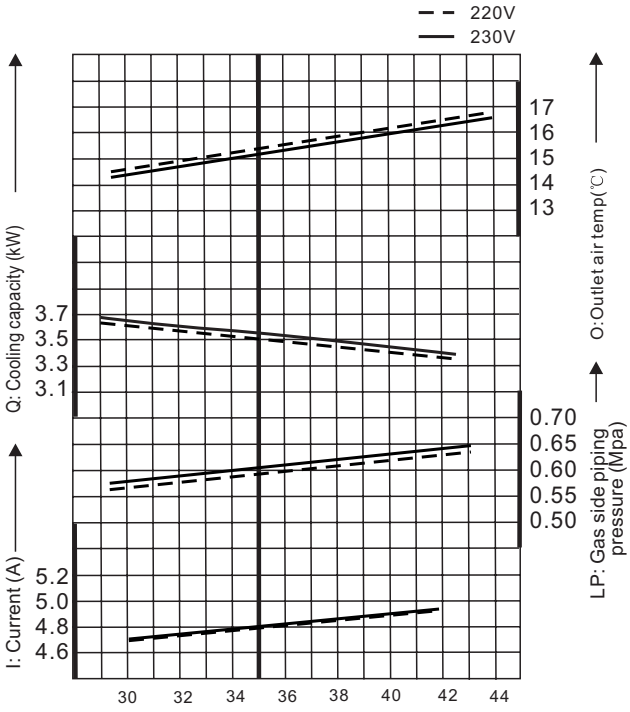
■ Cooling characteristics

● CS/CU-PA12DKD



[Condition] Room temp: 27/19℃
Cooling operation:at high speed
Piping length:5m

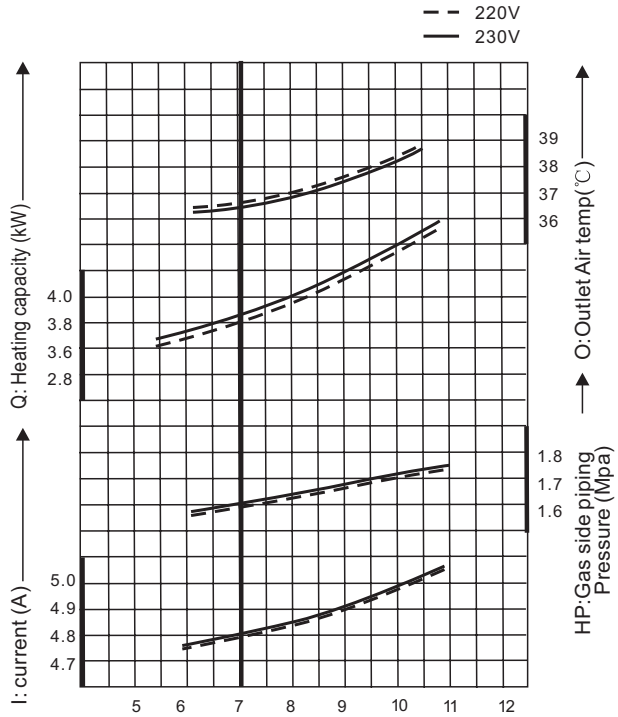
● CS/CU-PC12DKD



[Condition] Room temp: 27/19℃
Cooling operation:at high speed
Piping length:5m

■ Heating characteristics

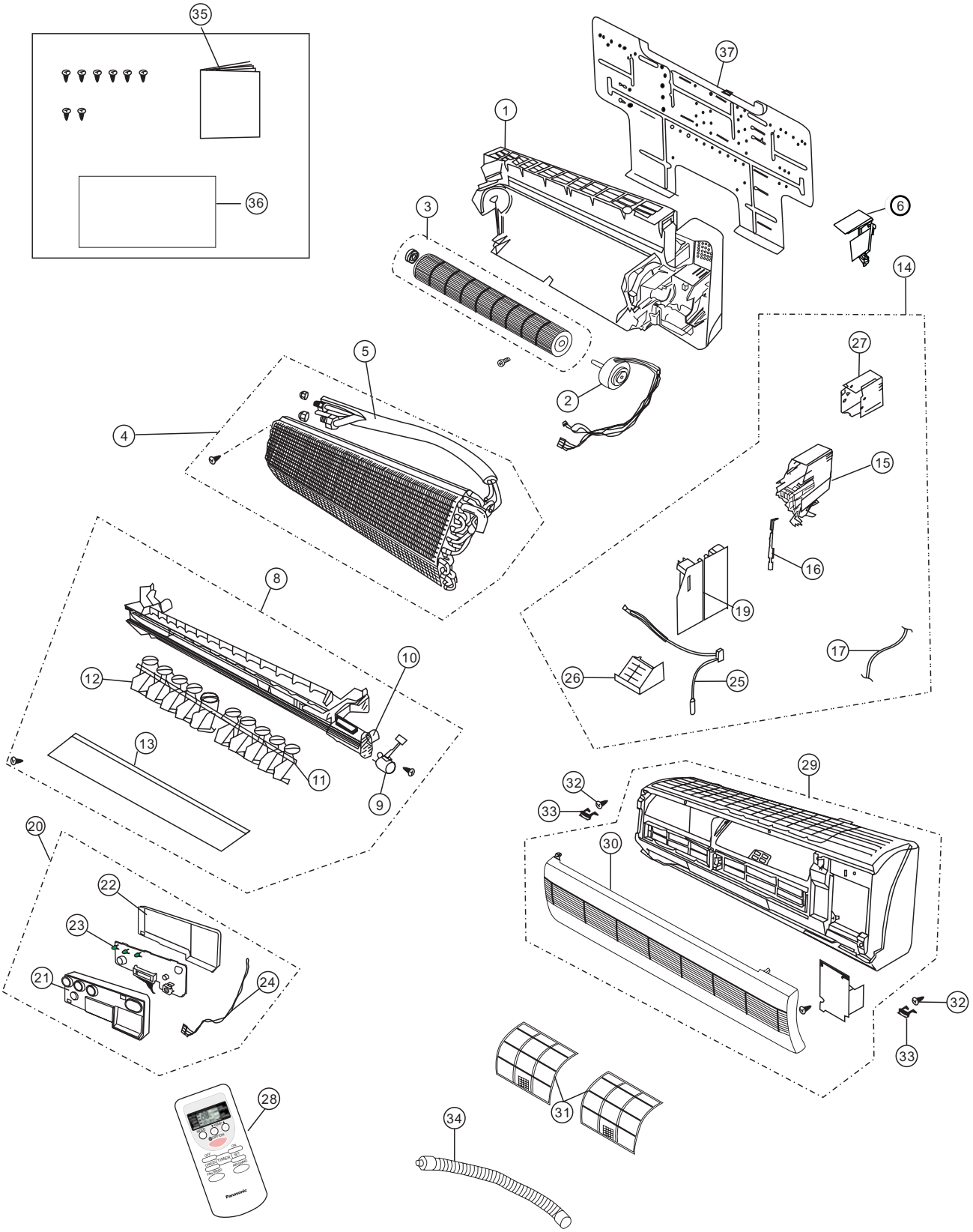
● CS/CU-PA12DKD



[Condition] Room temp: 27/19℃
Heating operation:at high speed
Piping length:5m

14 Exploded View

CS-PA12DKD
CS-PC12DKD



15 Replacement Parts List

CS-PA12DKD
CS-PC12DKD

No.	DESCRIPTION&NAME	Q'ty	CS-PA12DKD	CS-PC12DKD	RE
1	CHASSIS COMPLETE	1	CWD50C1423	CWD50C1423	
2	FAN MOTOR	1	CWA921098	CWA921098	※
3	CROSS FLOW FAN COMPLETE	1	CWH02C1036	CWH02C1036	
4	EVAPORATOR	1	CWB30C1730	CWB30C1694	
5	INTAKE AIR SENSOR HOLDER	1	CWT01C3457	CWT01C3425	
6	PARTICULAR PIECE	1	CWD932454B	CWD932454B	
8	DISCHARGE GRILLE COMPLETE	1	CWE20C2406	CWE20C2406	
9	AIR SWING MOTOR	1	CWA981091	CWA981091	
10	DAIN ELBOW	1	CWH52160C	CWH52160C	
11	HORIZONTAL VANE（RIGHT）	1	CWE24C1081	CWE24C1081	
12	HORIZONTAL VANE（LEFT）	1	CWE24C1082	CWE24C1082	
13	VERTICAL VANE	1	CWE24C1100	CWE24C1100	※
14	C-BOX	1	CWH14C4488	CWH14C4487	
15	CONTROL BOARD	1	CWH102265	CWH102265	
16	PARTICULAR PIECE	1	CWD932493J	CWD932493J	
17	POWER SUPPLY CORD COMPLETE	1	CWA20C2362	CWA20C2362	
19	MAIN PCB	1	CWA743751	CWA743750	※
20	INDICATOR COMPLETE	1	CWE39C1124	CWE39C1124	※
21	INDICATOR HOLDER-FRONT	1	CWD932491	CWD932491	
22	INDICATOR HOLDER-BACK	1	CWD932492	CWD932492	
23	INDICATOR PCB	1	CWA743836	CWA743836	※
24	CONNECTING LEAD (INDICATOR)	1	CWA67C3681	CWA67C3681	
25	SENSOR COMPLETE	1	CWA50C2271J	CWA50C2271J	
26	CONTROL BOARD FRONT COVER	1	CWH131235	CWH131235	
27	CONTROL BOARD TOP COVER	1	CWH131237	CWH131237	
28	REMOTE CONTROL	1	CWA75C2712	CWA75C2710	※
29	FRONT GRILLE COMPLETE	1	CWE11C3210	CWE11C3210	
30	FRONT GRILLE	1	CWE22K1255	CWE22K1255	
31	AIR FILTER	2	CWD001153	CWD001153	
32	SCREW-FRONT GRILLE	2	XTT4+16CFJ	XTT4+16CFJ	
33	CAP-FRONT GRILLE	2	CWH521109	CWH521109	
34	DRAIN HOSE	1	CWH851074	CWH851074	
35	OPERATING INSTRUTIONS	1	CWF564654	CWF564654	
36	INSTALLATION INSTRUCTION	1	CWF612704	CWF612704	
37	INSTALLATION PLATE	1	CWH361069	CWH361069	

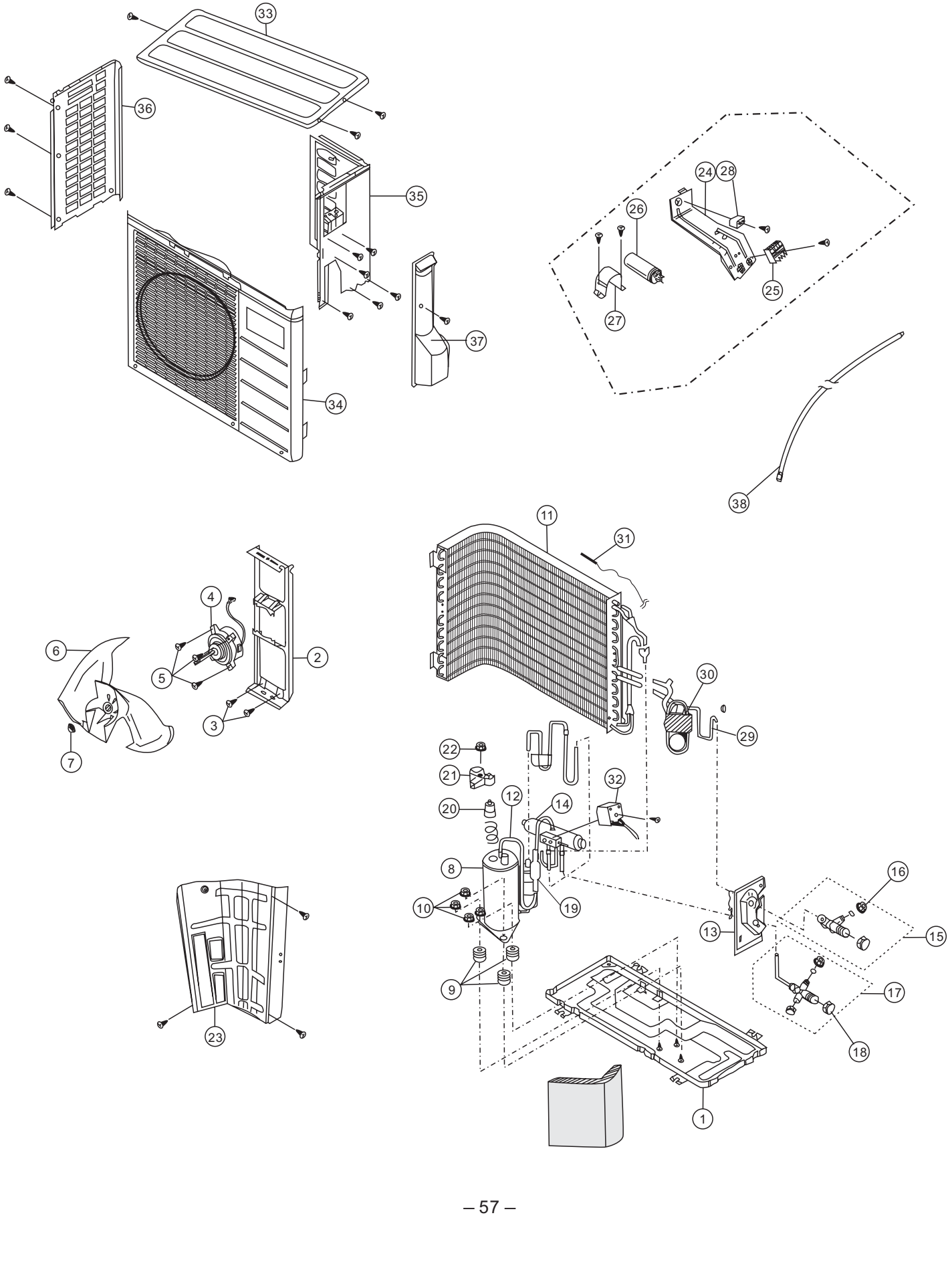
Note:

1.All parts are supplied from GMAC, P.R. China.

2."*" marked parts are recommended to be kept in stock.

16 Exploded View

CU-PA12DKD
CU-PC12DKD



17 Replacement Parts List

CU-PA12DKD
CU-PC12DKD

No.	DESCRIPTION&NAME	Q'ty	CU-PA12DKD	CU-PC12DKD	RE
1	BASE ASS'Y	1	CWD50K2124A	CWD50K2122A	
2	HOLDER-FAN MOTOR	1	CWD541020	CWD541020	
3	SCREW-F.M. HOLDER	2	CWH551060J	CWH551060J	
4	FAN MOTOR	1	CWA951440	CWA951440	※
5	FIXING SCREW-FAN MOTOR	4	CWH55406J	CWH55406J	
6	PROPELLER FAN	1	CWH03K1010	CWH03K1010	
7	NUT-P.FAN	1	CWH561036J	CWH561036J	
8	COMPRESSOR	1	CWB092281	CWB092281	※
9	MOUNT RUBBER(COMP.)	3	CWH50077	CWH50077	
10	NUT-COMP.MOUNT	3	CWH561047A	CWH561047A	
11	CONDENSER	1	CWB32C1567	CWB32C1578	
12	TUBE ASS'Y(RECEIVER)	1	CWT01C3357	CWT023639	
13	HOLDER-COUPLING	1	CWH351017	CWH351017	
14	4-WAY VALVE	1	CWB001048	--------	
15	2-WAY VALVE	1	CWB021247	CWB021260	
17	3-WAY VALVE	1	CWB011312	CWB011323	
19	STRAINER	1	CWB111026	CW'B111026	
20	OVER LOAD PROTECTOR	1	CWA121218	CWA121218	
21	TERMINAL COVER	1	CWH17006	CWH17006	
22	NUT-TERMINAL COVER	1	CW7080300J	CW7080300J	
23	SOUND PROOF PANEL	1	CWH151113	CWH151113	
24	CONTROL BOARD	1	CWH102270	CWH102270	
25	TERMINAL BOARD ASS'Y	1	CWA28K1104	CWA28K1105	
26	CAPACITOR-COMPRESSOR	1	CWA312150	CWA312150	※
27	HOLDER-CAPACITOR	1	CWH30165	CWH30165	
28	CAPACITOR-FAN MOTOR	1	CWF0GAG3060001	CWF0GAG3060001	※
29	TUBE ASS'Y(CAPILLARY)	1	CWT01C3357	CWT01C3409	
30	CAPILLARY	1	CWB15563	CWB15418	
31	SENSOR	1	CWA50C2276	--------	
32	V-COIL COMPLETE	1	CWA43C2176	--------	
33	SURFACE COVER	1	CWE03C1033	CWE03C1033	
34	CABINET FRONT PLATE	1	CWE06C1116	CWE06C1116	
35	CABINET SIDE PLATE(R)	1	CWE041116A	CWE041116A	
36	CABINET SIDE PLATE(L)	1	CWE041118A	CWE041118A	
37	CONTROL BOARD COVER	1	CWH13C1119	CWH13C1119	
38	CONNECT WIRE-SENSOR	1	CWA22C1022	--------	

Note:

1.All parts are supplied from GMAC, P.R. China.

2."*" marked parts are recommended to be kept in stock.

18 Electronic Diagram

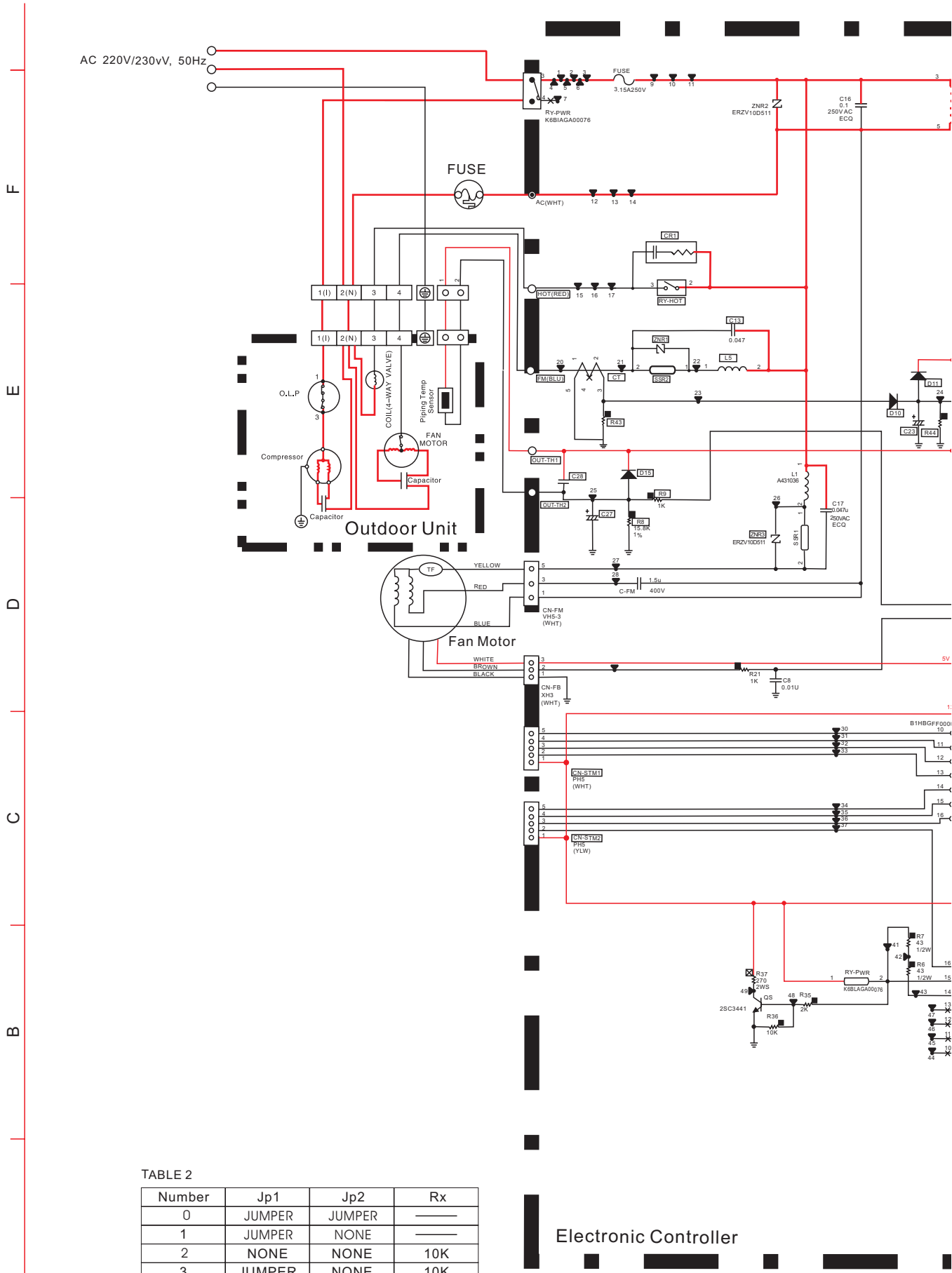
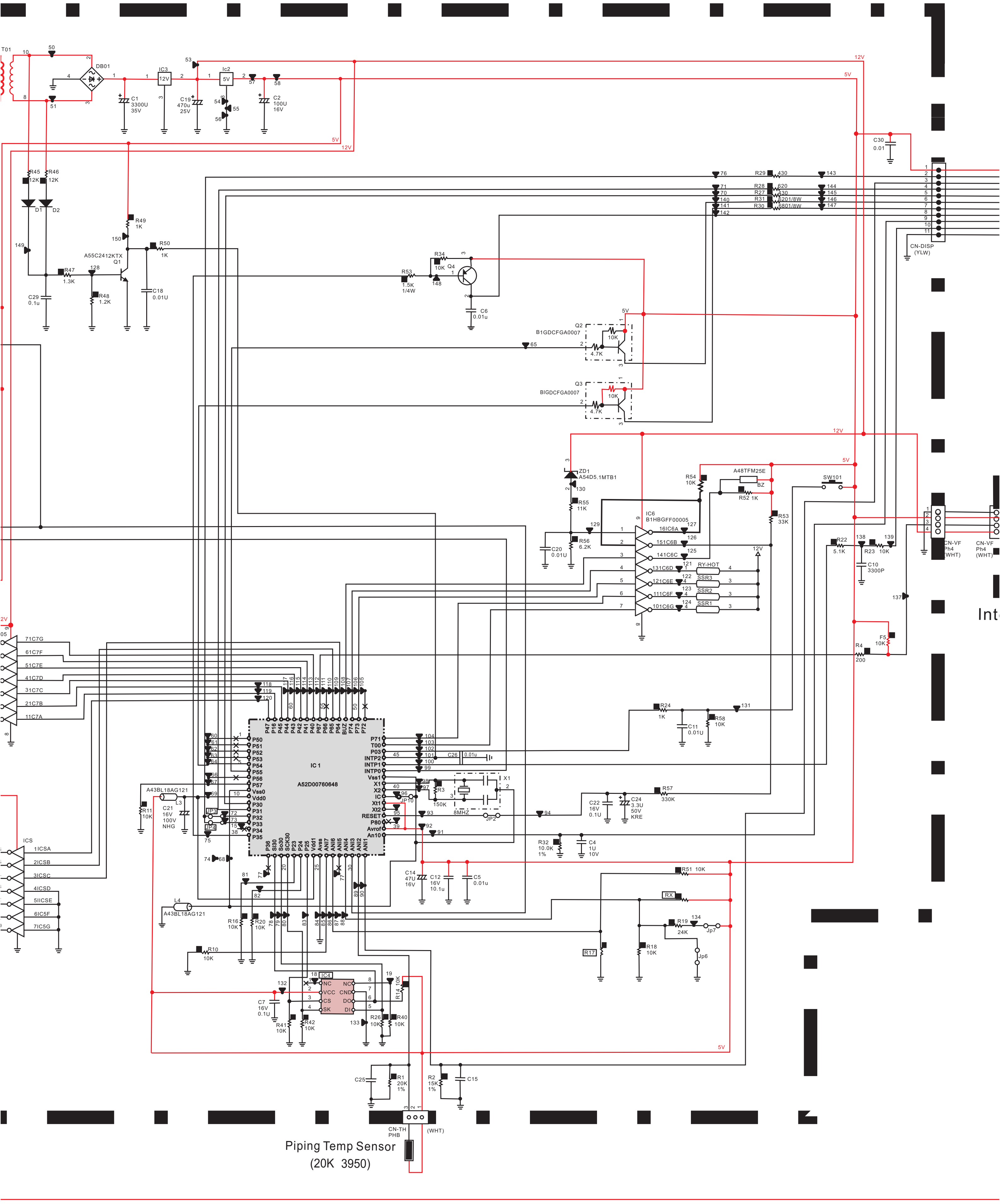
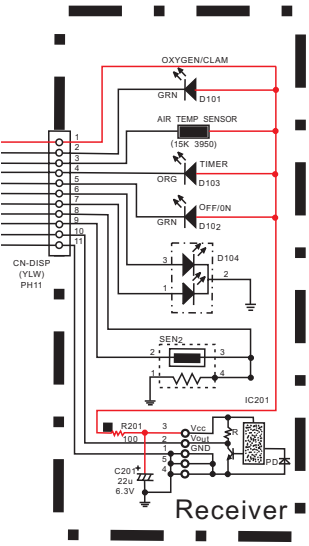
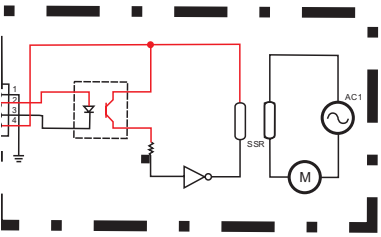


TABLE 2

Number	Jp1	Jp2	Rx
0	JUMPER	JUMPER	———
1	JUMPER	NONE	———
2	NONE	NONE	10K
3	JUMPER	NONE	10K


IC 1
A52D00760648
IC6
B1HBGFF00005
CN-DISP
(YLW)
CN-VF
Ph4
(WHT)
CN-TH
PHB
(WHT)
Piping Temp Sensor
(20K 3950)
5
6
7
8
9
10



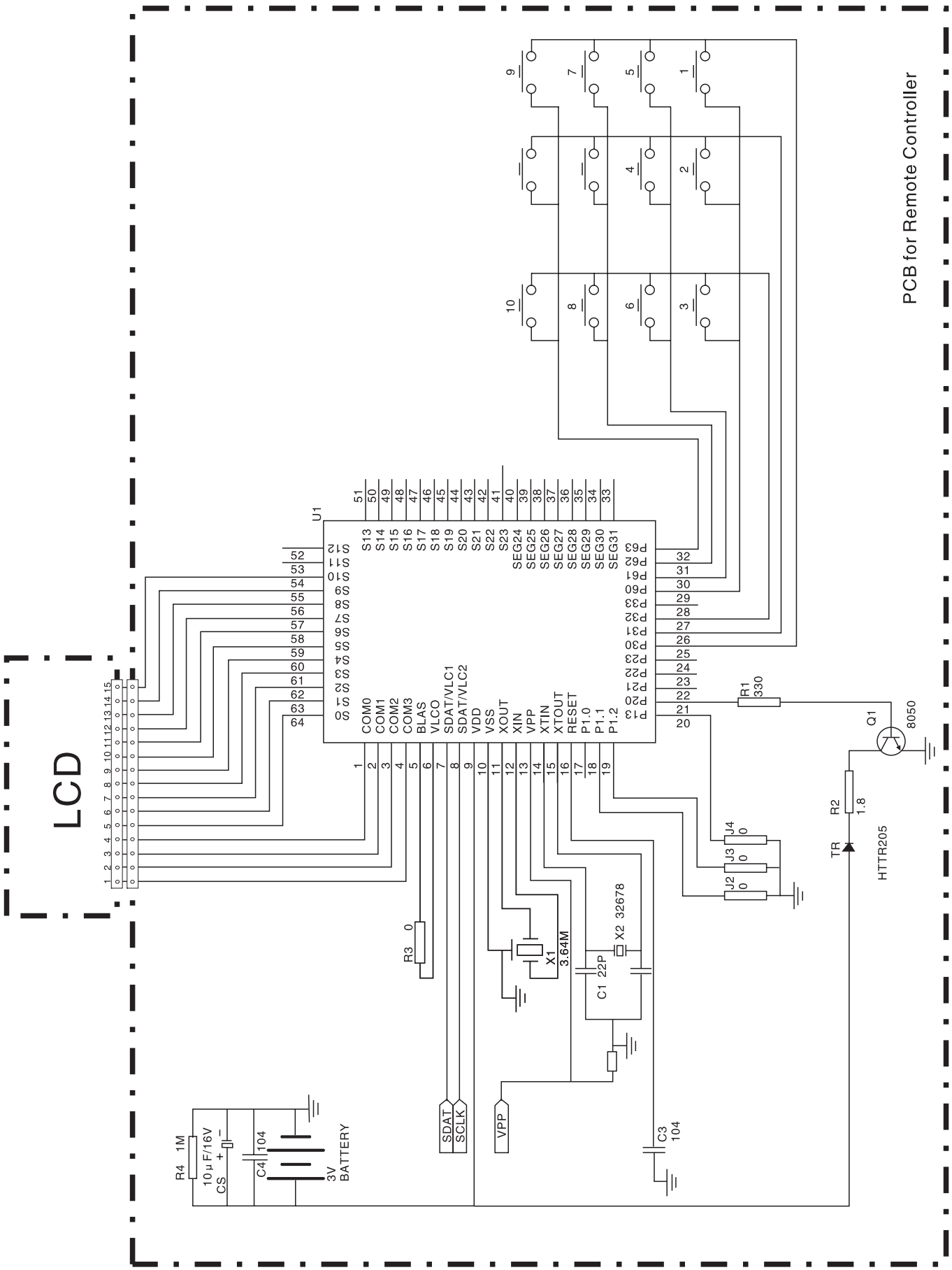


erlocking Ventilator Unit(Optional)

TABLE1

REMARK	CS/CU-PC12DKD	CS/CU-PA12DKD
CODE NO.	A743750	A743751
C13	NONE	ECQU2A473A05
C23	NONE	NONE
C27	NONE	ECA1CHG101B
C28	NONE	ECJIVF1A105Z
CR1	NONE	JOHBJY000004
CN-STM2	NONE	NONE
CT	NONE	NONE
D10	NONE	NONE
D11	NONE	NONE
D15	NONE	BOACCK000005
FM(BLU)	NONE	A67C3830
HOT(RED)	NONE	A67C3843
JP3	NONE	NONE
JP4	NONE	NONE
L5	NONE	A431090
OUT-TH1 OUT-TH2	NONE	A67C5001
R8	NONE	ERJ3EKF1582V
R9	NONE	ERJ3GEYJ102V
R17	NONE	NONE
R43	NONE	NONE
R44	NONE	NONE
RX	NONE	NONE
RY-HOT	NONE	K6B1AGA00073
SSR2	NONE	A56G3MC202PL
SSR3	NONE	NONE
ZNR1	NONE	NONE
ZMR3	NONE	NONE
ZMR4	NONE	NONE
IC4	A53D0878	A53D0877

18.2 Remote Controller(PA12DKD)



18.3 Remote Controller(PC12DKD)