

# Service Manual

## Room Air Conditioners



**CS/CU-PA7GKD**  
**CS/CU-PC7GKD**  
**CS/CU-PA9GKD**  
**CS/CU-PC9GKD**  
**CS/CU - PA12GKD**  
**CS/CU - PC12GKD**  
**CS/CU - PA16GKD**



### WARNING

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

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# Panasonic®

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# 1 Features

## ■ High Efficiency

## ■ Comfort Environment

Air filter with function to reduce dust and smoke

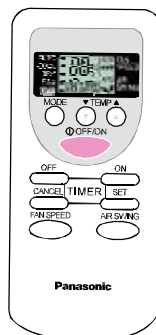
## ■ Auto Restart Control

Automatically restart after power failure

## ■ 12-hour Timer Setting

## 2 Functions

### Remote Control



OFF/ON

#### Operation START/STOP

- Turn on/off the air conditioner
- 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 PA7GKD, PA9GKD, PA12GKD, PA16GKD)
- Cooling Mode Operation
- Soft Dry Mode Operation
- Air Circulation Mode Operation  
(For PC7GKD, PC9GKD, PC12GKD)

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°C to 30°C)
- 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 5 seconds 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.

### Signal Receiving Sound Control

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

### Auto Restart Control

- Keep pressing this button for 15seconds to switch off Auto Restart Control. To resume Auto Restart Control,repeat the above step.

### 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 PA7GKD, PA9GKD ,PA12GKD, PA16GKD 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

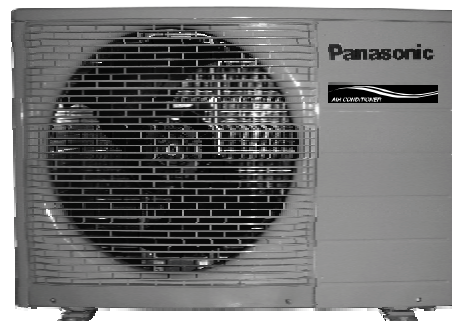
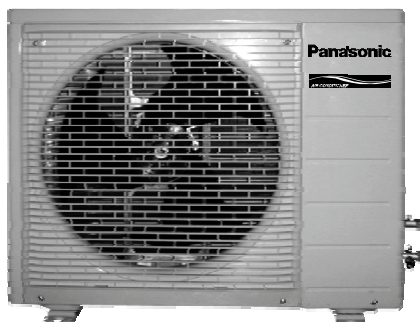
### Airflow Direction Control

- 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

- PA/PC7GKD,PA/PC9GKD  
The 2-step Overload Protector is to protect the compressor when
  - 1)Temperature of compressor reaches 150°C (PA7GKD,PC7GKD,PA9GKD) or 145°C (PC9GKD)
  - 2)High temperature or current enters into the compressor
- PC12GKD,PA12GKD,PA16GKD  
Inner protect

### 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 sensor.  
(For PA7GKD,PA9GKD only)

### Overload Protection Control

(For PA7/9/12/16GKD only)



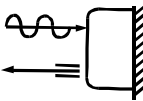
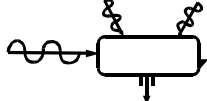
- When the temperature of evaporator reaches 51°C,outdoor fan stops,and will restart when the temperature of evaporator declines to 49°C.
- When the temperature of evaporator reaches 65°C,compressor will stop.

### 4-way Valve Control

(For PA7/9/12/16GKD only)

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


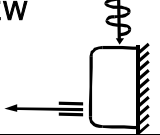
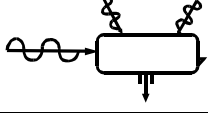
### 3 Product Specifications

		Unit	CS-PA7GKD	CU-PA7GKD	
Cooling Capacity		kW	2.10		
Heating Capacity		kW	2.35		
Moisture Removal		L /h	1.20		
Power Source		Phase V Cycle	Single 220 50		
Airflow Method		OUTLET  INTAKE 	SIDE VIEW 	TOP VIEW 	
Air Circulation	Indoor Air (low)	m³/min	7.24	-	
	Indoor Air (medium)	m³/min	8.48	-	
	Indoor Air (high)	m³/min	9.3	-	
	Outdoor Air	m³/min	-	-	
Noise Level		dB(A)	Cooling:high37,Low29 Heating:high38,Low29	Cooling:high47 Heating:high48	
Electrical Data	Input	W	Cooling:695 Heating:600		
	Running Current	A	Cooling:3.65 Heating:3.20		
	EER/COP	W/W	Cooling:3.02 Heating:3.91		
	Starting Current	A	18		
Piping Connection Port(Flare piping)		Inch Inch	G:half union3/8" L:half union1/4"	G:3-way valve3/8" L:2-way valve1/4"	
Piping Size(Flare piping)		Inch Inch	G:gas side3/8" L:liquid side1/4"	G:gas side3/8" 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/1.0mm²	- -	
Dimensions	Height	mm	250	530	
	Width	mm	770	650	
	Depth	mm	205	230	
Net Weight		kg	7.5	23	
Compressor	Type		-	Rotary(1 cylinder) Rolling piston type	
	Motor Type		-	Induction(2 pole)	
	Rated output	W	-	750	
Air Circulation	type		Cross-flow fan	Propeller fan	
	Motor type		Induction(4 pole)	Induction(6 pole)	
	Input	W	-	-	
	Rated Output	W	13	28	
	Fan Speed	Low	rpm	880±60	-
		Med	rpm	1030±60	-
		High	rpm	1130±60	810±60

		Unit	CS-PA7GKD	CU-PA7GKD
Heat Exchanger	Description		Evaporator	Condenser
	Tube Material		Copper	Copper
	Fin Type		Slot type	Corrugation type
	Rows/Stage		(Plate fin configuration,forced draft) 2 x 12                      1X24	
	FPI		18	21
	Dimensions	mm	610x252x25.4	569.1X504x18.19
Refrigerant Control Device			-	Capillary Tube
Refrigeration Oil		(c.c)	-	SUNISO 4GDID or ATMOS M60 or ATMOS 56M
Refrigerant (R-22)		g	-	530(*)
Thermostat			Electronic Control	-
Protection Device			-	O.L.P.(230V,30A)
Capillary	Length	mm	-	850±10
	Circulation	L/min	-	8.5±0.2
	Inner Diameter	mm	-	1.4
Air Filter			P.P. Honeycomb	
Refrigerant Circulation Control Device			Capillary	
Compressor Capacitor		μF , V	-	20 μF , 370V
Fan Motor Capacitor		μF , V	1.5 μF , 400V	2.0 μF , 400V

\* 60g for air purging is not included.

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


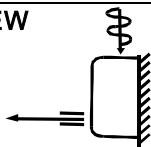
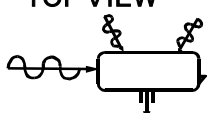
		Unit	CS-PA9GKD	CU-PA9GKD
Cooling Capacity		kW	2.60/2.65	
Heating Capacity		kW	3.0/3.05	
Moisture Removal		L/h	1.40	
Power Source		Phase V Cycle	Single 220/230 50	
Airflow Method		OUTLET  INTAKE	SIDE VIEW 	TOP VIEW 
Air Circulation	Indoor Air (low)	m <sup>3</sup> /min	6.88	-
	Indoor Air (medium)	m <sup>3</sup> /min	7.98	-
	Indoor Air (high)	m <sup>3</sup> /min	9.0	-
	Outdoor Air	m <sup>3</sup> /min	-	-
Noise Level		dB(A)	Cooling:high38,Low30 Heating:high38,Low29	Cooling:high47 Heating:high48
Electrical Data	Input	W	Cooling:990/1010 Heating:790/810	
	Running Current	A	Cooling:4.55/4.45 Heating:3.65/3.60	
	EER/COP	W/W	Cooling:2.62/2.62 Heating:3.79/3.76	
	Starting Current	A	16.5	
Piping Connection Port(Flare piping)		Inch Inch	G:half union3/8" L:half union1/4"	G:3-way valve3/8" L:2-way valve1/4"
Piping Size(Flare piping)		Inch Inch	G:gas side3/8" L:liquid side1/4"	G:gas side3/8" 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 <sup>2</sup>	- -
Dimensions	Height	mm	250	530
	Width	mm	770	650
	Depth	mm	205	230
Net Weight		kg	7.5	24
Compressor	Type		-	Rotary(1 cylinder) Rolling piston type
	Motor Type		-	Induction(2 pole)
	Rated output	W	-	750
Air Circulation	type		Cross-flow fan	Propeller fan
	Motor type		Induction(4 pole)	Induction(6 pole)
	Input	W	-	-
	Rated Output	W	13	28
	Fan Speed	Low	rpm 940±60	-
		Med	rpm 1090±60	-
		High	rpm 1230±60	800±60



		Unit	CS-PA9GKD	CU-PA9GKD
Heat Exchanger	Description		Evaporator	Condenser
	Tube Material		Copper	Copper
	Fin Type		Slot type	Corrugation type
	Rows/Stage		(Plate fin configuration,forced draft) 2 x 12                      1X24	
	FPI		18	18
	Dimensions	mm	610x252x25.4	569.1X504x18.19
Refrigerant Control Device			-	Capillary Tube
Refrigeration Oil		(c.c)	-	SUNISO 4GDID or ATMOS M60 or ATMOS 56M
Refrigerant (R-22)		g	-	680(*)
Thermostat			Electronic Control	-
Protection Device			-	O.L.P.(230V,37A)
Capillary	Length	mm	-	470±10    560±20
	Circulation	L/min	-	13.4±0.2    8.5±0.2
	Inner Diameter	mm	-	1.5          1.3
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	2.0 μF , 400V

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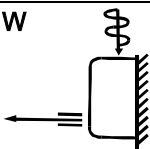
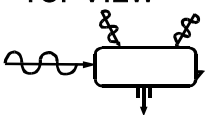
- Specifications are subject to change without notice for further improvement.

		Unit	CS-PA12GKD	CU-PA12GKD	
Cooling Capacity		kW	3.60/365		
Heating Capacity		kW	4.00/4.05		
Moisture Removal		L /h	2.10		
Power Source		Phase V Cycle	Single 220/230 50		
Airflow Method		OUTLET  INTAKE	SIDE VIEW 	TOP VIEW 	
Air Circulation	Indoor Air (low)	m³/min	7.00	-	
	Indoor Air (medium)	m³/min	7.79	-	
	Indoor Air (high)	m³/min	9.0	-	
	Outdoor Air	m³/min	-	-	
Noise Level		dB(A)	Cooling:high39,Low33 Heating:high39,Low31	Cooling:high50 Heating:high51	
Electrical Data	Input	W	Cooling:1290/1330 Heating:1100/1130		
	Running Current	A	Cooling:6.00/5.90 Heating:5.20/5.15		
	EER/COP	W/W	Cooling:2.79/2.74 Heating:3.63/3.58		
	Starting Current	A	25.0		
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/1.0mm²	- -	
Dimensions	Height	mm	280	540	
	Width	mm	799	780	
	Depth	mm	183	289	
Net Weight		kg	9	35	
Compressor	Type		-	Rotary(1 cylinder) Rolling piston type	
	Motor Type		-	Induction(2 pole)	
	Rated output	W	-	1100	
Air Circulation	type		Cross-flow fan	Propeller fan	
	Motor type		Induction(4 pole)	Induction(6 pole)	
	Input	W	37.4	-	
	Rated Output	W	18	28	
	Fan Speed	Low	rpm	980±60	-
		Med	rpm	1090±60	-
		High	rpm	1260±60	880±50

		Unit	CU-PA12GKD	CU-PA12GKD
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	

\* 60g for air purging is not included.

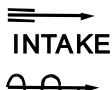
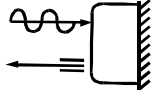
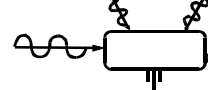
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		Unit	CS-PA16GKD	CU-PA16GKD	
Cooling Capacity		kW	4.60/4.60		
Heating Capacity		kW	5.30/5.35		
Moisture Removal		L /h	2.5		
Power Source		Phase V Cycle	Single 220 / 240 50		
Airflow Method		OUTLET  INTAKE 	SIDE VIEW 	TOP VIEW 	
Air Circulation	Indoor Air (low)	m³/min	10.0	-	
	Indoor Air (medium)	m³/min	10.5	-	
	Indoor Air (high)	m³/min	11.1	-	
	Outdoor Air	m³/min	-	-	
Noise Level		dB(A)	Cooling:high42,Low39 Heating:high40,Low37	Cooling:high51 Heating:high53	
Electrical Data	Input	W	Cooling:1790/1840 Heating:1840-1890		
	Running Current	A	Cooling:8.50/8.20 Heating:8.80/8.50		
	EER/COP	W/W	Cooling:2.56/2.50 Heating:2.88/2.83		
	Starting Current	A	41		
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/1.5mm²	- -	
Dimensions	Height	mm	280	540	
	Width	mm	799	780	
	Depth	mm	183	289	
Net Weight		kg	9	41	
Compressor	Type		-	Rotary(1 cylinder) Rolling piston type	
	Motor Type		-	Induction(2 pole)	
	Rated output	W	-	1600	
Air Circulation	type		Cross-flow fan	Propeller fan	
	Motor type		Induction(4 pole)	Induction(6 pole)	
	Input	W	-	-	
	Rated Output	W	18	35	
	Fan Speed	Low	rpm	1200±60	-
		Med	rpm	1260±60	-
		High	rpm	1330±60	880±60

		Unit	CS-PA16GKD	CU-PA16GKD
Heat Exchanger	Description		Evaporator	Condenser
	Tube Material		copper	copper
	Fin Type		slot type	Corrugation type
	Rows/Stage		(Plate fin configuration,forced draft)	
	FPI		2 x 15	2 x 20
	Dimensions	mm	610x315x25.4	692.3x508x40
Refrigerant Control Device			-	Capillary Tube
Refrigeration Oil		(c.c)	-	SUNISO 4GDID or ATMOS M60(M56)
Refrigerant (R-22)		g	-	860(*)
Thermostat			Electronic Control	-
Protection Device			-	-
Capillary	Length	mm	-	625
	Circulation	L/min	-	13.5
	Inner Diameter	mm	-	1.2
Air Filter			P.P Honeycomb	-
Refrigerant Circulation Control Device			Capillary	
Compressor Capacitor		$\mu\text{F}$ , V	-	50 $\mu\text{F}$ , 370V
Fan Motor Capacitor		$\mu\text{F}$ , V	1.5 $\mu\text{F}$ , 400V	3.0 $\mu\text{F}$ , 400V

\* 60g for air purging is not included.


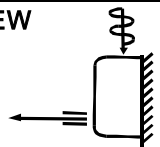
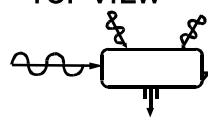
- Specifications are subject to change without notice for further improvement.

		Unit	CS-PC7GKD	CU--PC7GKD	
Cooling Capacity		kW	2.10		
Moisture Removal		L/h	1.20		
Power Source		Phase V Cycle	Single 220 50		
Airflow Method		OUTLET  INTAKE	SIDE VIEW 	TOP VIEW 	
Air Circulation	Indoor Air (low)	m³/min	6.67	-	
	Indoor Air (medium)	m³/min	7.74	-	
	Indoor Air (high)	m³/min	9.30	-	
	Outdoor Air	m³/min	-	-	
Noise Level		dB(A)	High36,Low28	High47	
Electrical Data	Input	W	695		
	Running Current	A	3.40		
	EER	W/W	3.02		
	Starting Current	A	15		
Piping Connection Port(Flare piping)		Inch inch	G:half union3/8" L:half union1/4"	G:3-way valve3/8" L:2-way valve1/4"	
Piping Size(Flare piping)		Inch inch	G:gas side3/8" L:liquid side1/4"	G:gas side3/8" 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/1.0mm²	- -	
Dimensions	Height	mm	250	530	
	Width	mm	770	650	
	Depth	mm	205	230	
Net Weight		kg	7.5	21	
Compressor	Type		-	Rotary(1 cylinder) Rolling piston type	
	Motor Type		-	Induction(2 pole)	
	Rated Output	W	-	600	
Air Circulation	Type		Cross-flow fan	Propeller fan	
	Motor Type		Induction(4 pole)	Induction(6pole)	
	Input	W	-	-	
	Rated Output	W	13	28	
	Fan Speed	Low	rpm	810±60	-
		Med	rpm	940±60	-
		High	rpm	1130±60	830±60

		Unit	CS-PC7GKD	CU-PC7GKD
Heat Exchanger	Description		Evaporator	Condenser
	Tube Material		copper	copper
	Fin Type		slot type	Corrugation type
	Rows/Stage		(Plate fin configuration,forced draft)	
	FPI		2 x 12	1 x 24
	Dimensions	mm	610x252x25.4	575.8x504x12.7
Refrigerant Control Device			-	Capillary Tube
Refrigeration Oil		(c.c)	-	SUNISO 4GDID or ATMOS M60(M56)
Refrigerant (R-22)		g	-	450(*)
Thermostat			Electronic Control	O.L.P.(25A/230V)
Protection Device			-	
Capillary	Length	mm	-	560
	Circulation	L/min	-	8.5
	Inner Diameter	mm	-	1.3
Air Filter			P.P Honeycomb	-
Refrigerant Circulation Control Device			Capillary	
Compressor Capacitor		$\mu\text{F}$ , V	-	20 $\mu\text{F}$ , 370V
Fan Motor Capacitor		$\mu\text{F}$ , V	1.5 $\mu\text{F}$ , 400V	2.0 $\mu\text{F}$ , 400V

\* 60g for air purging is not included.

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


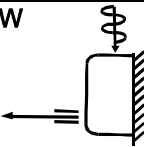
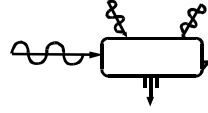
		Unit	CS-PC9GKD	CU-PC9GKD
Cooling Capacity		kW	2.50/2.55	
Moisture Removal		L/h	1.4	
Power Source		Phase V Cycle	Single 220/230 50	
Airflow Method		OUTLET  INTAKE	SIDE VIEW 	TOP VIEW 
Air Circulation	Indoor Air (low)	m³/min	7.16	-
	Indoor Air (medium)	m³/min	8.07	-
	Indoor Air (high)	m³/min	9.3	-
	Outdoor Air	m³/min	-	-
Noise Level		dB(A)	High36,Low30	High47
Electrical Data	Input	W	930/960	
	Running Current	A	4.30/4.40	
	EER	W/W	2.26/2.65	
	Starting Current	A	19.5	
Piping Connection Port(Flare piping)		Inch inch	G:half union3/8" L:half union1/4"	G:3-way valve3/8" L:2-way valve1/4"
Piping Size(Flare piping)		Inch inch	G:gas side3/8" L:liquid side1/4"	G:gas side3/8" L:liquid side1/4"
Drain Hose	Inner Diameter	mm	15	-
	Length	m	0.5	-
Power Supply Cord Length (Number of core-wire)		m	1.3 3 core-wire/1.0mm²	-
Dimensions	Height	mm	250	530
	Width	mm	770	650
	Depth	mm	205	230
Net Weight		kg	7.5	21
Compressor	Type		-	Rotary(1 cylinder) Rolling piston type
	Motor Type		-	Induction(2 pole)
	Rated Output	W	-	750
Air Circulation	Type		Cross-flow fan	Propeller fan
	Motor Type		Induction(4 poles)	Induction(6poles)
	Input	W	-	-
	Rated Output	W	13	27
	Fan Speed	Low	rpm 870±60	-
		Med	rpm 980±60	-
		High	rpm 1130±60	800±60



		Unit	CS-PC9GKD	CU-PC9GKD
Heat Exchanger	Description		Evaporator	Condenser
	Tube Material		copper	copper
	Fin Type		slot type	Corrugation type
	Rows/Stage		(Plate fin configuration,forced draft)	
	FPI		2 x12	1 x 24
	Dimensions	mm	610x252x25.4	575.8x504x12.7
Refrigerant Control Device			-	Capillary Tube
Refrigeration Oil		(c.c)	-	SUNISO 4GDID or ATMOS M60(M56)
Refrigerant (R-22)		g	-	500(*)
Thermostat			Electronic Control	O.L.P.(37A/230V)
Protection Device			-	
Capillary	Length	mm	-	515±20
	Circulation	L/min	-	9.2±0.2
	Inner Diameter	mm	-	1.3
Air Filter			P.P Honeycomb	-
Refrigerant Circulation Control Device			Capillary	
Compressor Capacitor		μF , V	-	25μF , 370V
Fan Motor Capacitor		μF , V	1.5μF , 400V	2.0μF , 400V

\* 60g for air purging is not included.

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

		Unit	CS-PC12GKD	CU-PC12GKD
Cooling Capacity		kW	3.60/3.65	
Moisture Removal		L/h	2.1	
Power Source		Phase V Cycle	Single 220/240 50	
Airflow Method		OUTLET  INTAKE	SIDE VIEW 	TOP VIEW 
Air Circulation	Indoor Air (low)	m³/min	7.00	-
	Indoor Air (medium)	m³/min	7.93	-
	Indoor Air (high)	m³/min	9.0	-
	Outdoor Air	m³/min	-	-
Noise Level		dB(A)	High39,Low33	High48
Electrical Data	Input	W	1290/1320	
	Running Current	A	6.00/5.95	
	EER	W/W	2.79/2.76	
	Starting Current	A	25.0	
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/1.0mm²	-
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	-	1100
Air Circulation	Type		Cross-flow fan	Propeller fan
	Motor Type		Induction(4 pole)	Induction(6pole)
	Input	W	-	-
	Rated Output	W	18	28
	Fan Speed	Low	rpm 980±60	-
		Med	rpm 1110±60	-
		High	rpm 1260±60	880±60

		Unit	CS-PC12GKD	CU-PC12GKD
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	1 x 24
	FPI		20	18
	Dimensions	mm	610x315x25.4	732.1X504x12.7
Refrigerant Control Device			-	Capillary Tube
Refrigeration Oil		(c.c)	-	SUNISO 4GDID or ATMOS M60(M56)
Refrigerant (R-22)		g	-	670(*)
Thermostat			Electronic Control	O.L.P.(37A/230V)
Protection Device			-	
Capillary	Length	mm	-	630±10
	Circulation	L/min	-	6.5±0.2
	Inner Diameter	mm	-	1.2
Air Filter			P.P Honeycomb	-
Refrigerant Circulation Control Device			Capillary	
Compressor Capacitor		μF , V	-	30μF , 370V
Fan Motor Capacitor		μF , V	1.5μF , 400V	2.0μF , 440V

\* 60g for air purging is not included.

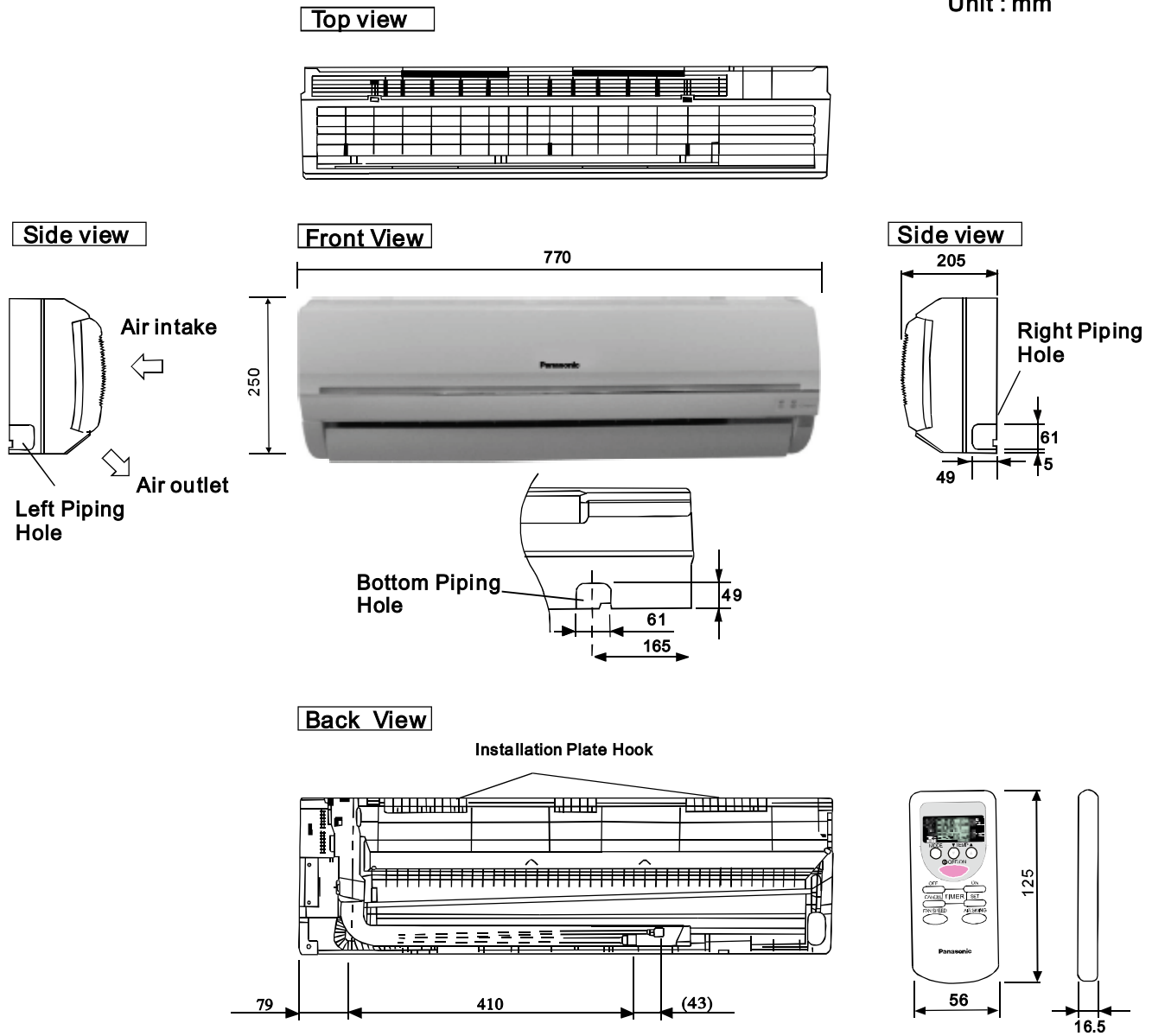
- Specifications are subject to change without notice for further improvement.

## 4 Dimensions

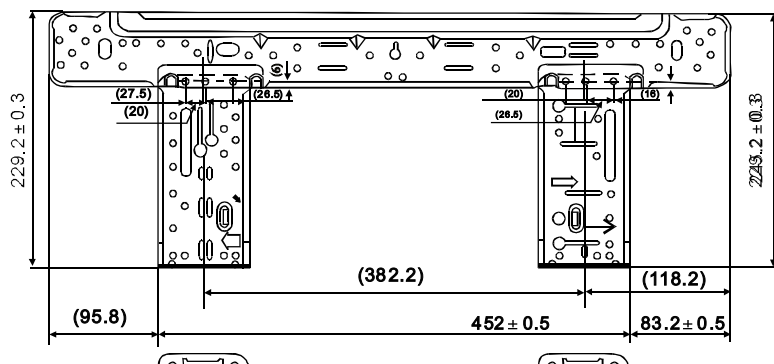
### Indoor Unit

CS-PC7GKD/ CS-PC9GKD / PA7GKD / PA9GKD

Unit : mm



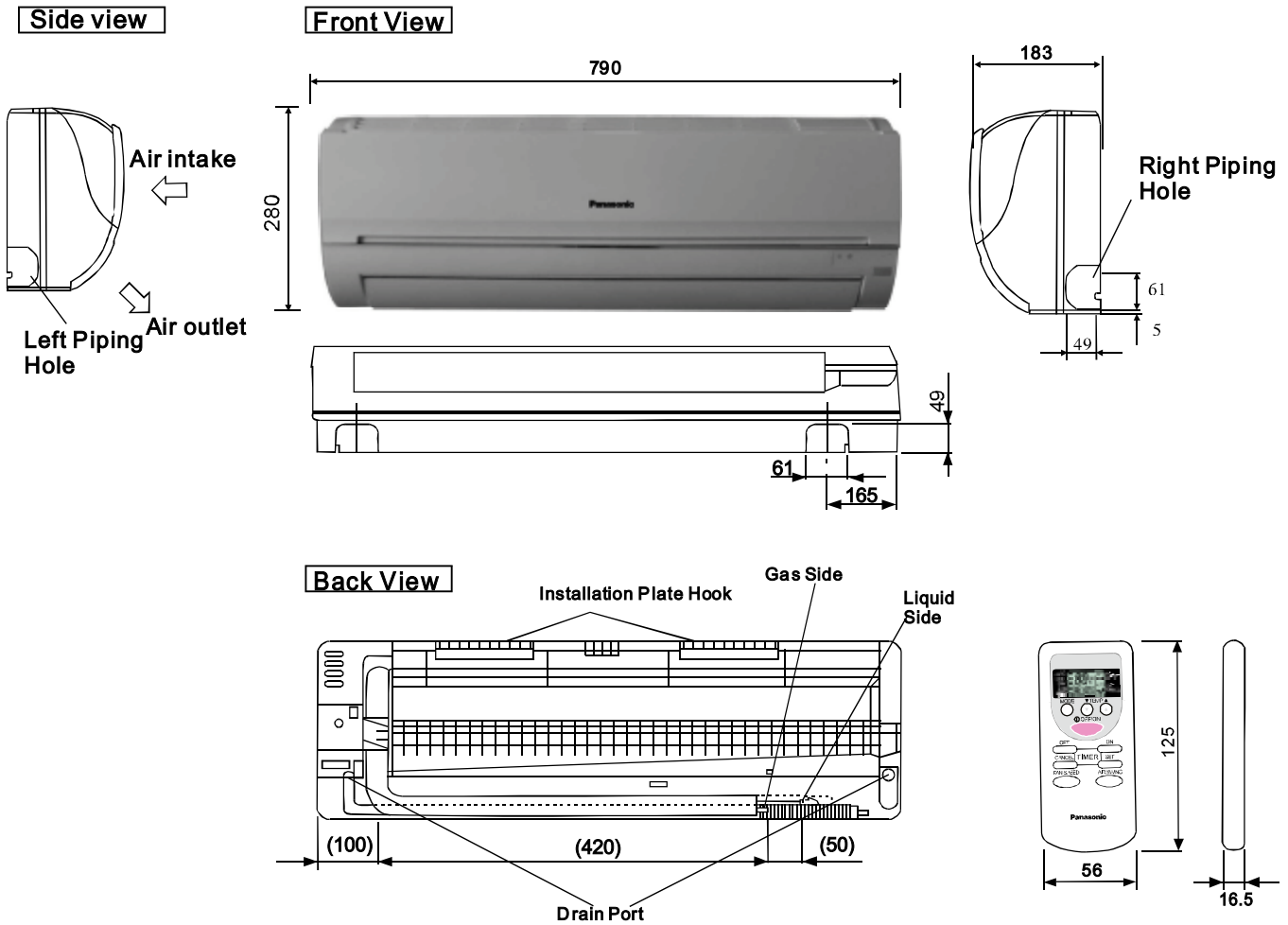
Dimension of installation plate (Front View)



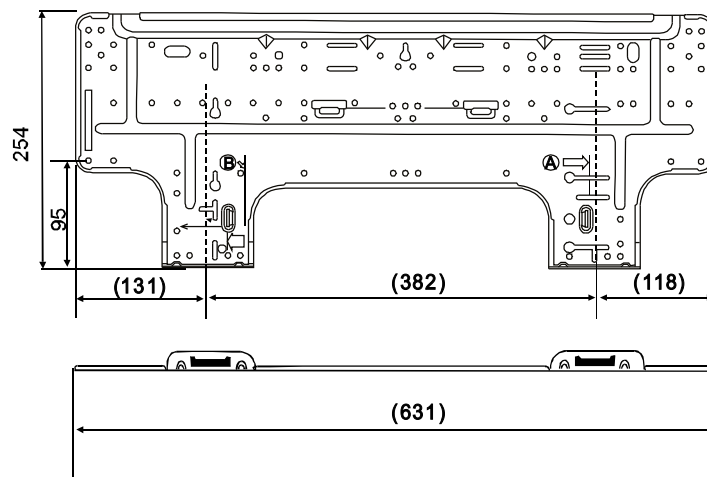
# Indoor Unit

## CS-PC12GKD, CS-PA12GKD, CS-PA16GKD

Unit : mm



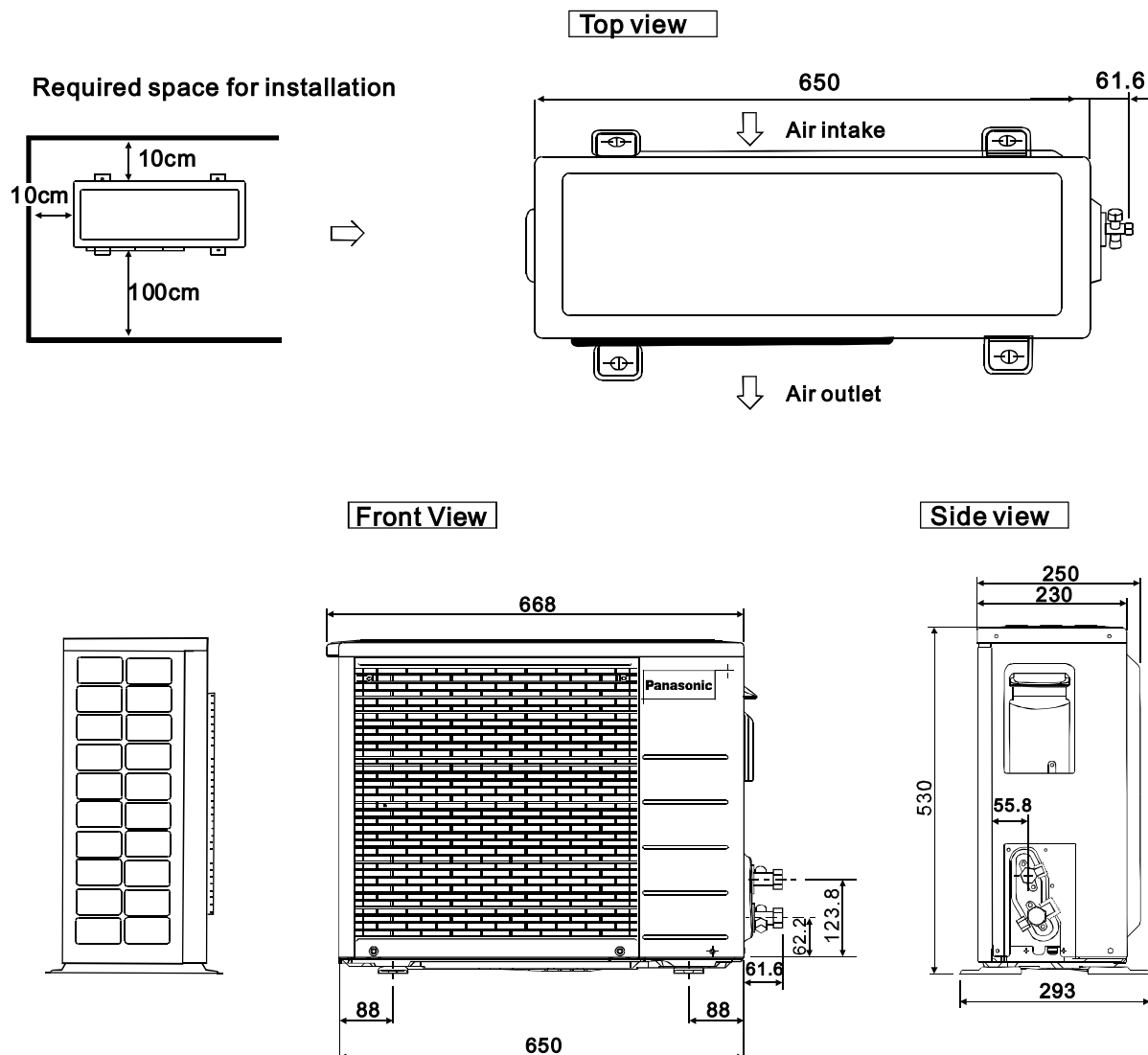
### Installation plate (Front View)



# Outdoor Unit

Unit : mm

CU-PA7GKD    CU-PC7GKD  
CU-PA9GKD    CU-PC9GKD

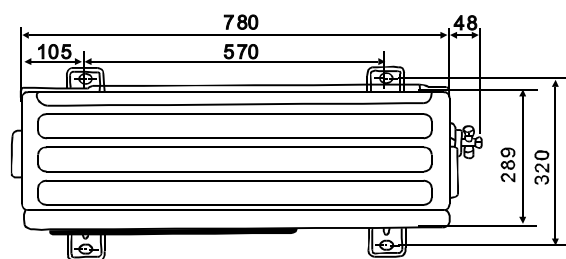
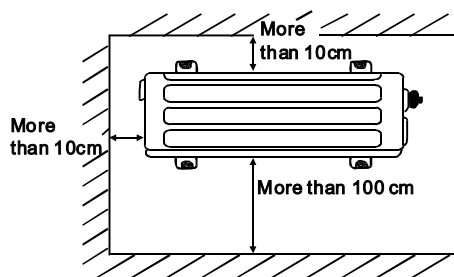


# Outdoor Unit

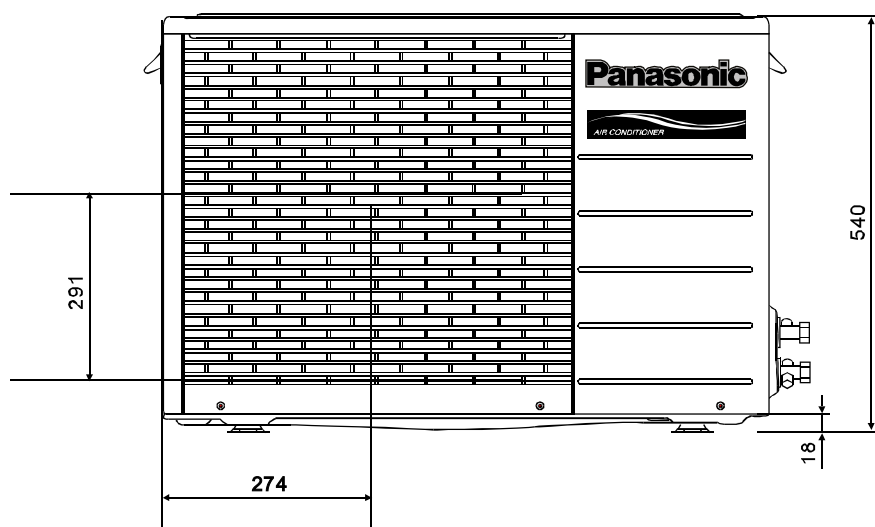
**CU-PC12GKD**  
**CU-PA12GKD**  
**CU-PA16GKD**

Unit : mm

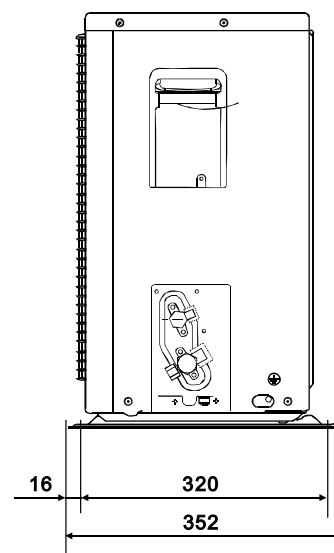
Top view



Front View

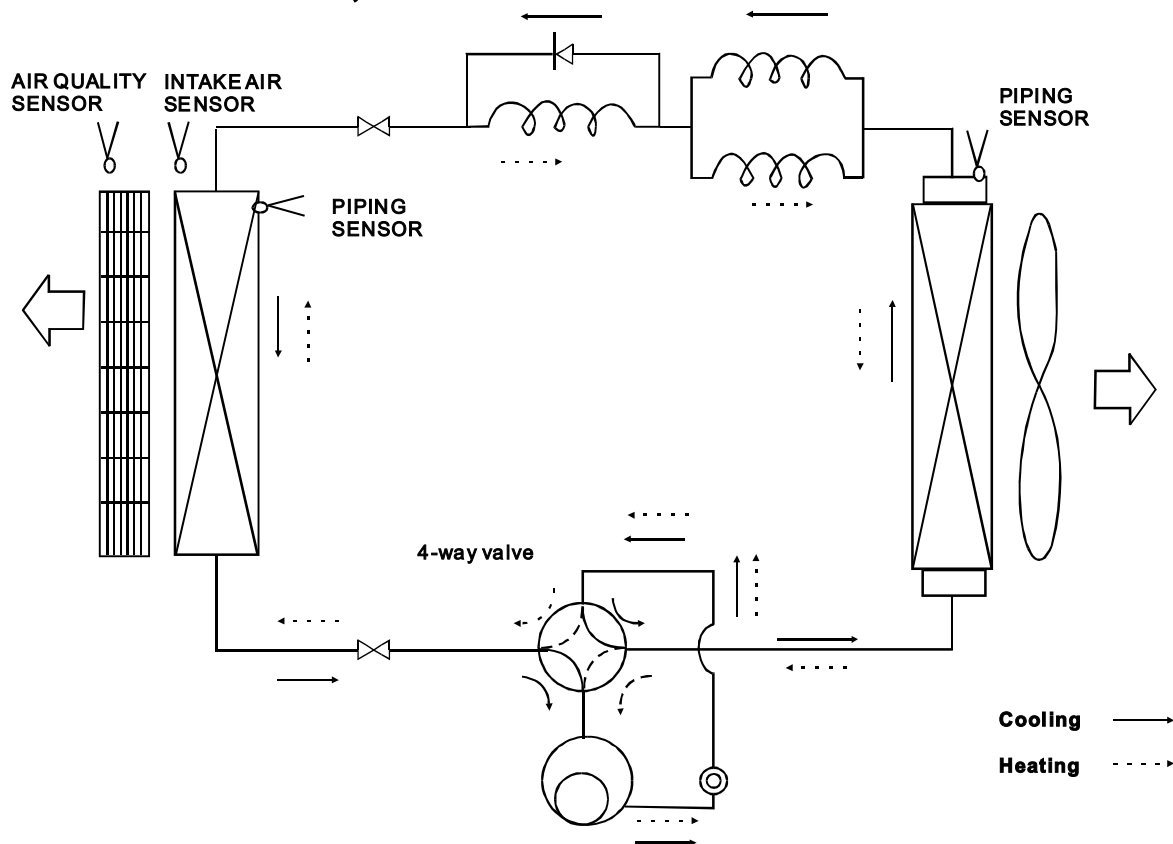


Side view

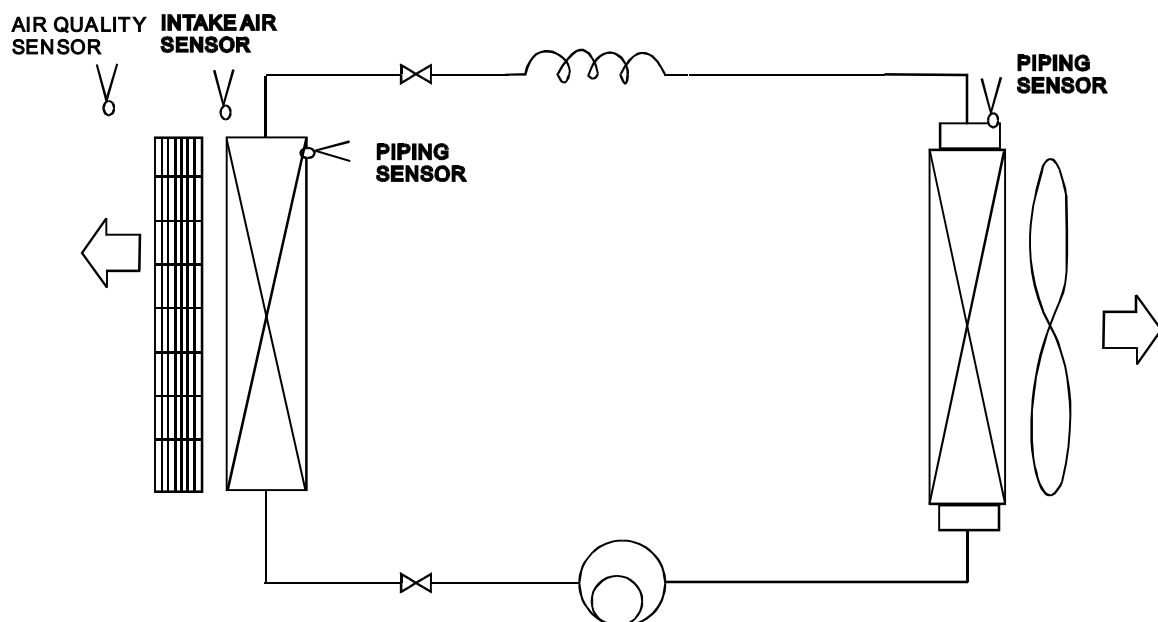


## 5 Refrigeration Cycle Diagram

CS/CU-PA7GKD, CS/CU-PA9GKD  
CS/CU-PA12GKD, CS/CU-PA16GKD



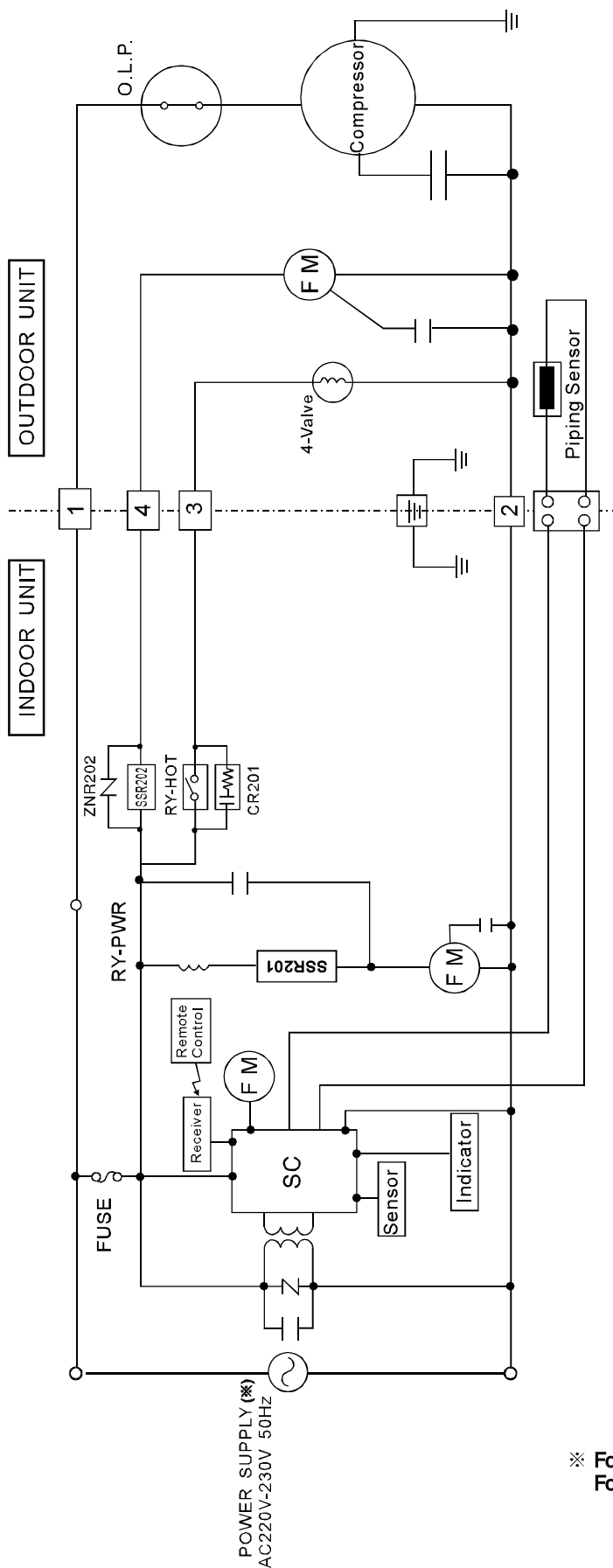
CS/CU-PC7GKD  
CS/CU-PC9GKD  
CS/CU-PC12GKD





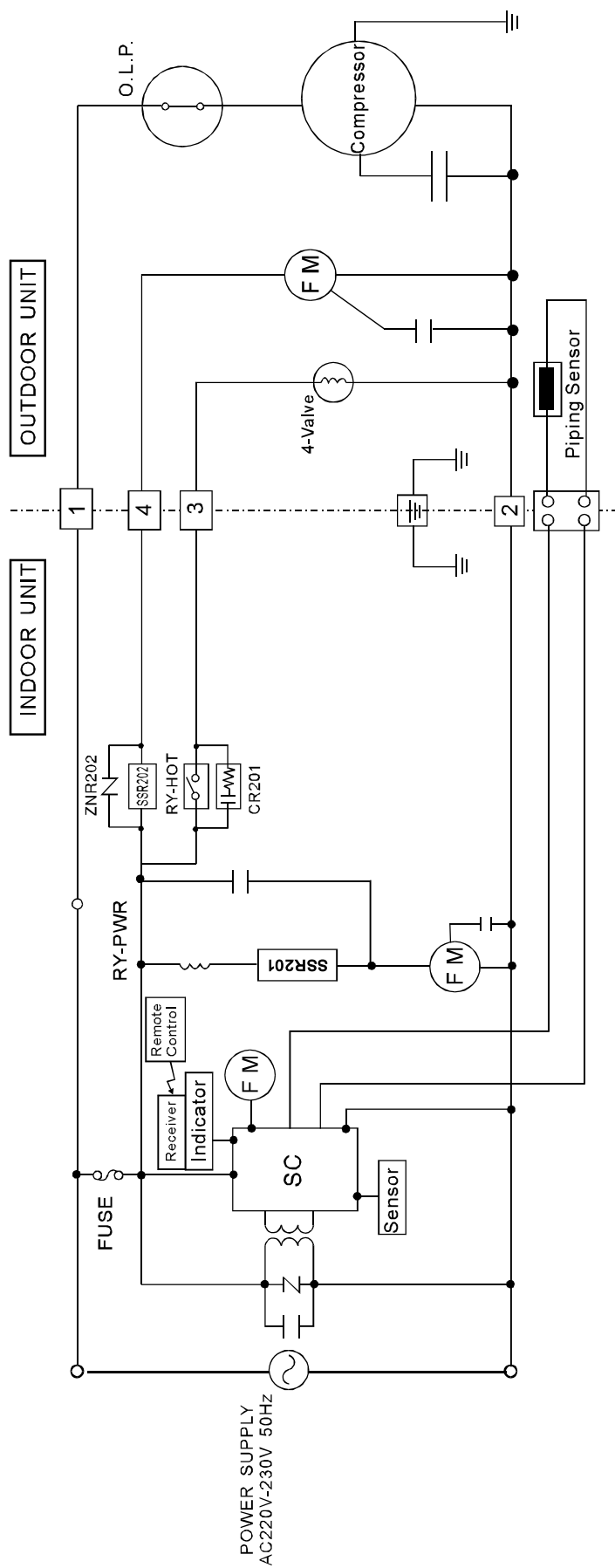
## 6 Block Diagram

### CS-PA7GKD/CU-PA7GKD CS-PA9GKD/CU-PA9GKD

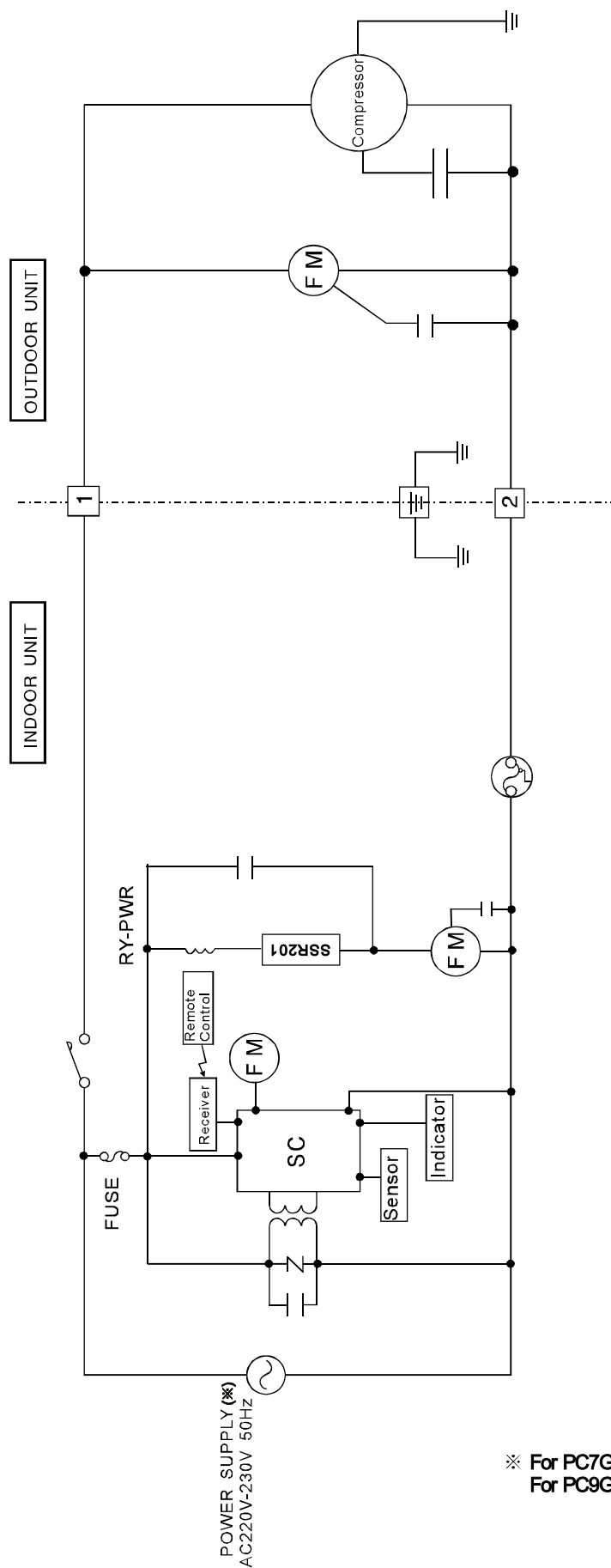


※ For PA7GKD, the power source is 220V.  
For PA9GKD, the power source is 220V-230V.

## CS-PA12GKD/CU-PA16GKD



# CS-PC7GKD/CU-PC7GKD CS-PC9GKD/CU-PC9GKD



※ For PC7GKD, the power source is 220V.  
For PC9GKD, the power source is 220V-230V.

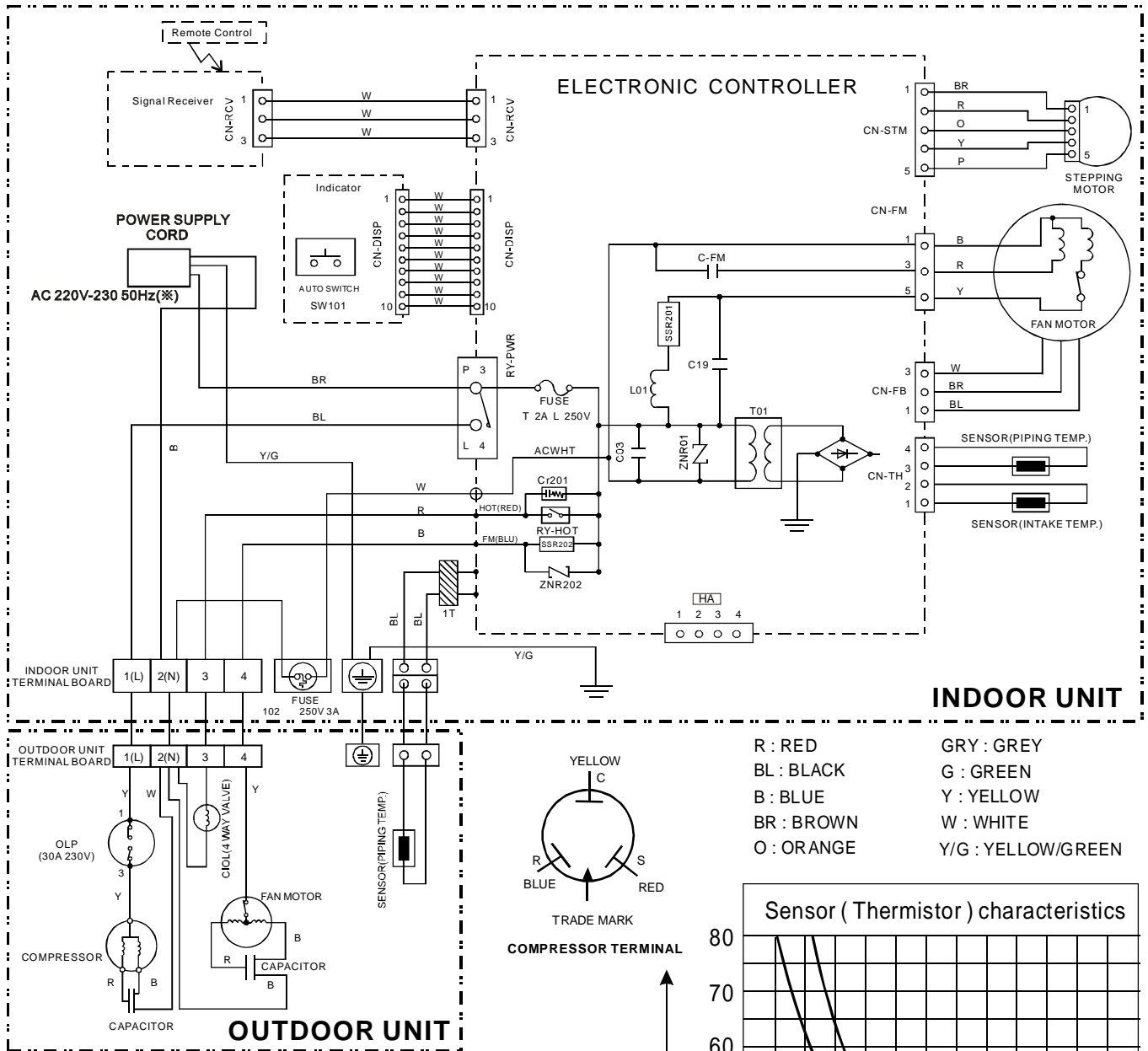


# 7 Wiring Diagram

## CS-PA7GKD/CU-PA7GKD

## CS-PA9GKD/CU-PA9GKD

※ For PA7GKD, the power source is 220V.  
For PA9GKD, the power source is 220V-230V.



INDOOR FAN MOTOR RESISTANCE(Ω)

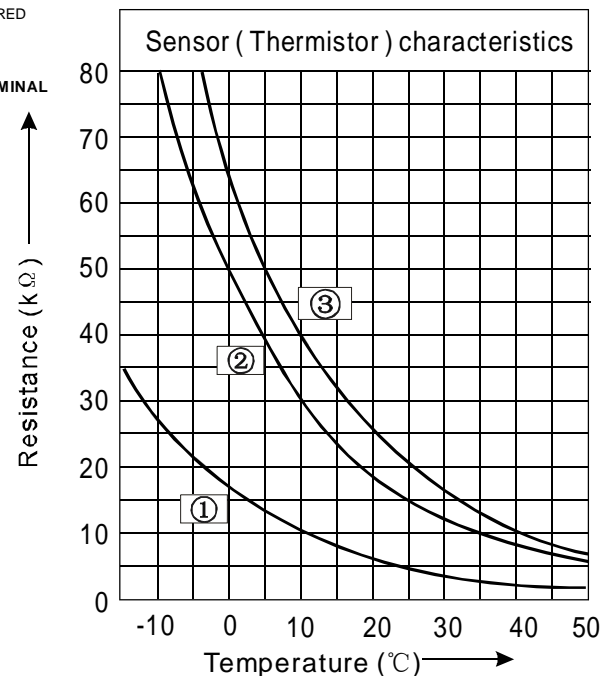
	CS-PA7GKD	CS-PA9GKD
CONNECTING	CWA921372	CWA921372
Y-B (M)	397	397
Y-R (A)	308.1	308.1

OUTDOOR FAN MOTOR RESISTANCE(Ω)

	CU-PA7GKD	CU-PA9GKD
CONNECTING	CWA951427	CWA951427
Y-B	275	275
Y-R	260	260

COMPRESSOR RESISTANCE(Ω)

	CU-PA7GKD	CU-PA9GKD
CONNECTING	CWB092128	CWB092296
C - R	3.678	3.466
C - S	7.240	3.843

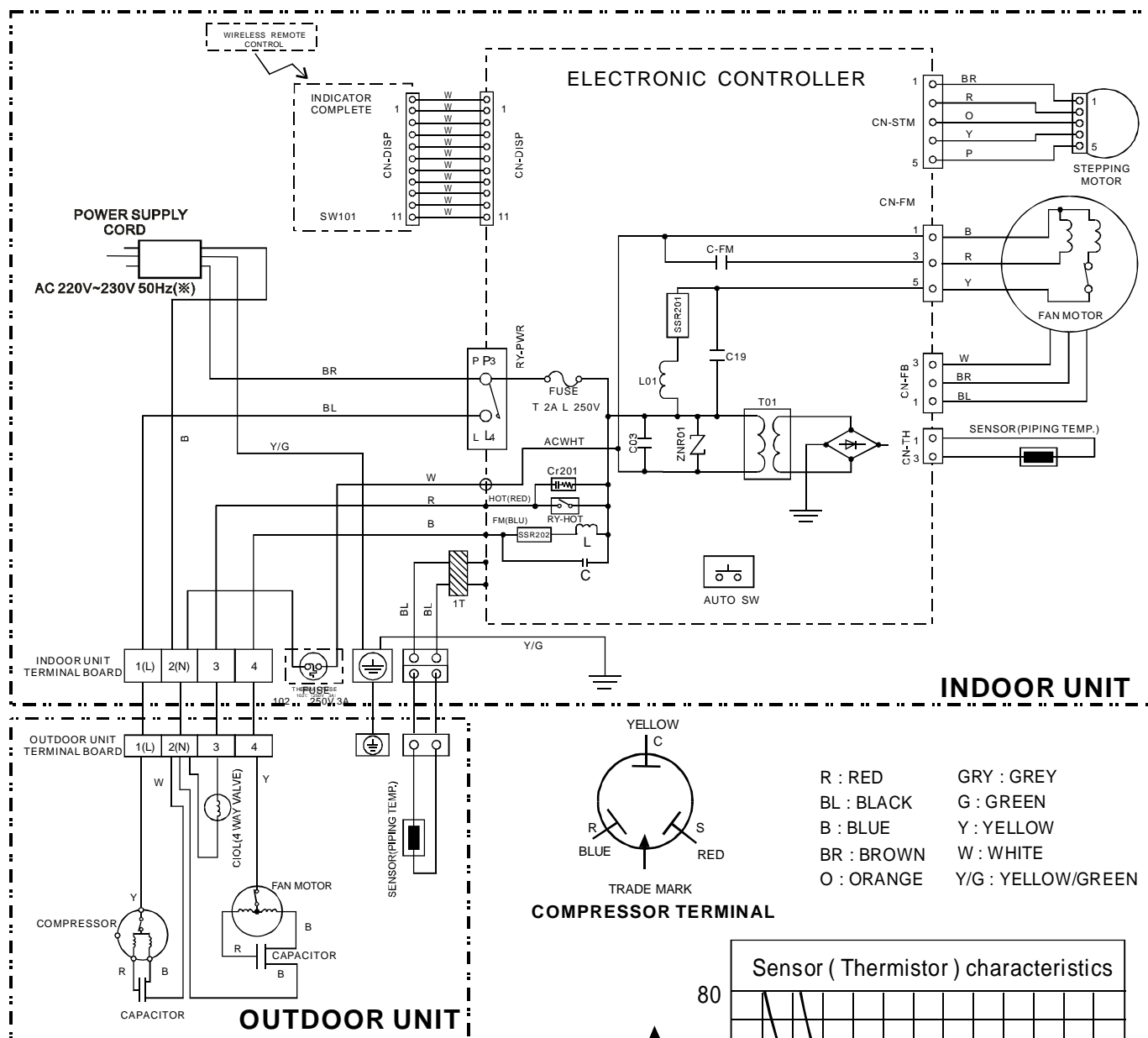


Remark:

- ①: Outdoor Pipe Temp. Sensor
- ②: Indoor intake/ Outdoor air sensor
- ③: Indoor pipe Temp. Sensor

## CS-PA12GKD/CU-PA16GKD

※ For PA12GKD, the power source is 220V-230V  
For PA16GKD, the power source is 220V-240V.



INDOOR FAN MOTOR RESISTANCE(Ω)

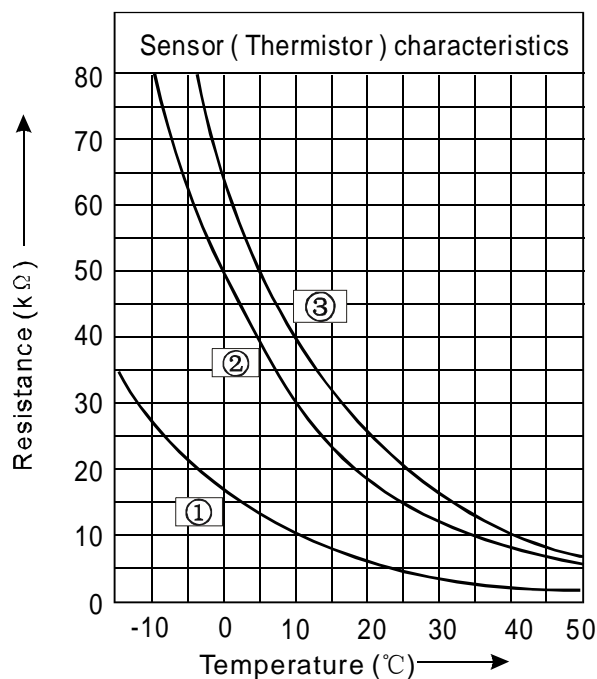
	CS-PA12GKD	CS-PA16GKD
CONNECTING	CWA921378	CWA921378
Y-B (M)	419.8	419.8
Y-R (A)	304.4	304.4

OUTDOOR FAN MOTOR RESISTANCE(Ω)

	CU-PA12GKD	CU-PA16GKD
CONNECTING	CWA951427	CWA951521
Y-B	275	200
Y-R	260	136

COMPRESSOR RESISTANCE(Ω)

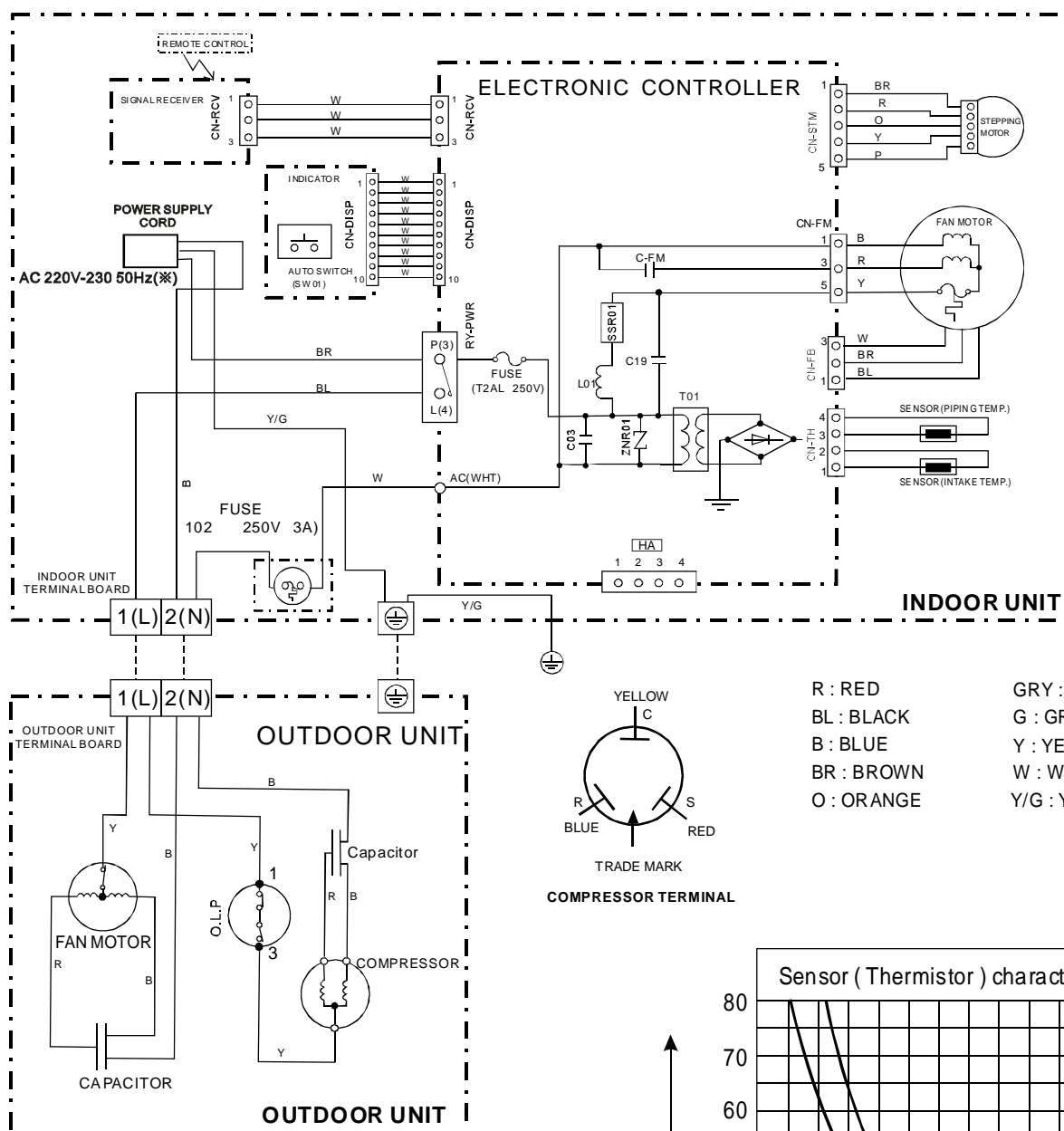
	CU-PA12GKD	CU-PA16GKD
CONNECTING	CWB092117	CWB092236
C - R	2.331	1.572
C - S	3.958	2.637



Remark: ①: Outdoor Pipe Temp. Sensor  
②: Indoor intake/ Outdoor air sensor  
③: Indoor pipe Temp. Sensor

# CS-PC7GKD/CU-PC7GKD CS-PC9GKD/CU-PC9GKD

※ For PC7GKD, the power source is 220V.  
For PC9GKD, the power source is 220V-230V.



INDOOR FAN MOTOR RESISTANCE(Ω)

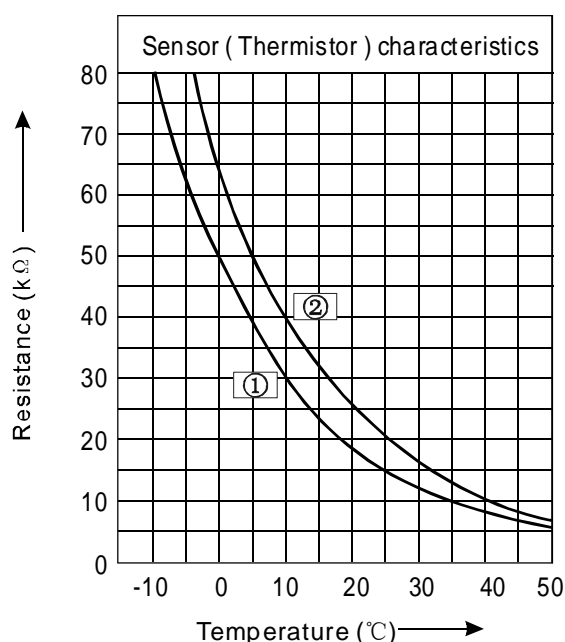
	CS-PC7GKD	CS-PC9GKD
CONNECTING	CWA921372	CWA921372
Y-B (M)	397	397
Y-R (A)	308.1	308.1

OUTDOOR FAN MOTOR RESISTANCE(Ω)

	CU-PC7GKD	CU-PC9GKD
CONNECTING	CWA951427	CWA951427
Y-B	275	275
Y-R	260	260

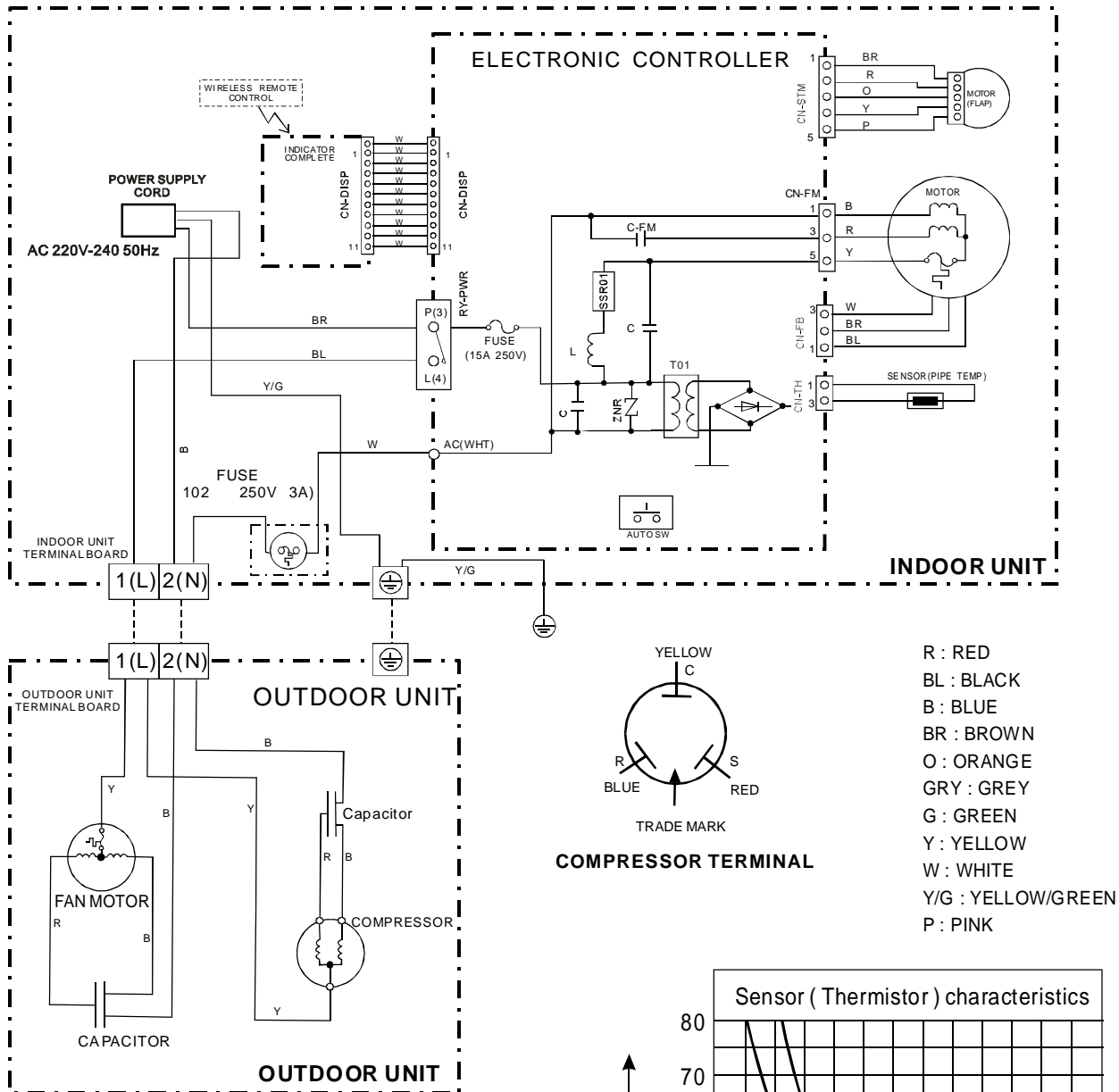
COMPRESSOR RESISTANCE(Ω)

	CU-PC7GKD	CU-PC9GKD
CONNECTING	CWB092129	CWB092279
C - R	4.307	3.072
C - S	7.668	5.216



# CS-PC12GKD

## CS-PC12GKD/CU-PC12GKD



INDOOR FAN MOTOR RESISTANCE(Ω)

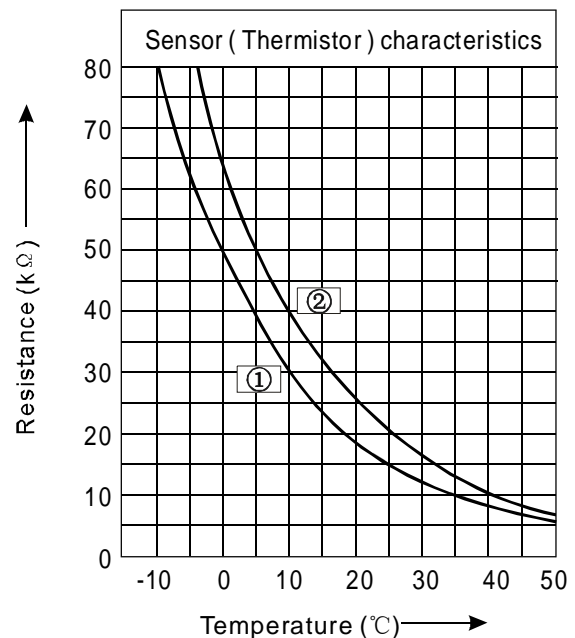
	CS-PC12GKD
CONNECTING	CWA921378
Y-B (M)	419.8
Y-R (A)	304.4

OUTDOOR FAN MOTOR RESISTANCE(Ω)

	CU-PC12GKD
CONNECTING	CWA951427
Y-B	275
Y-R	260

COMPRESSOR RESISTANCE(Ω)

	CU-PC12GKD
CONNECTING	CWB092117
C - R	2.331
C - S	3.958



Remark: ①: Indoor intake air sensor  
②: Indoor pipe Temp. Sensor



## 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).

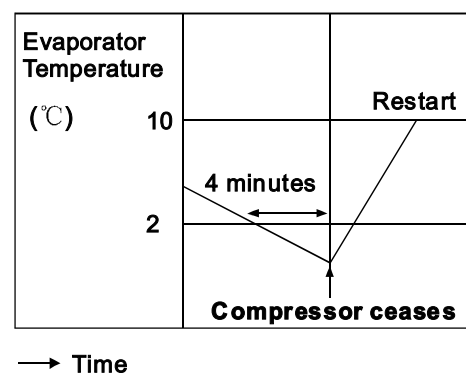
#### 7 Minutes Time Save Control

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

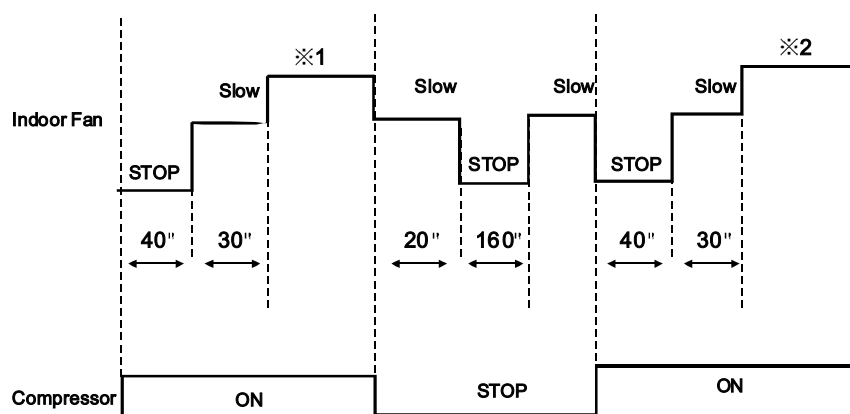
※ During Cooling Mode Operation, the Time Delay Safety Control is available.



#### Automatic Fan Speed Mode

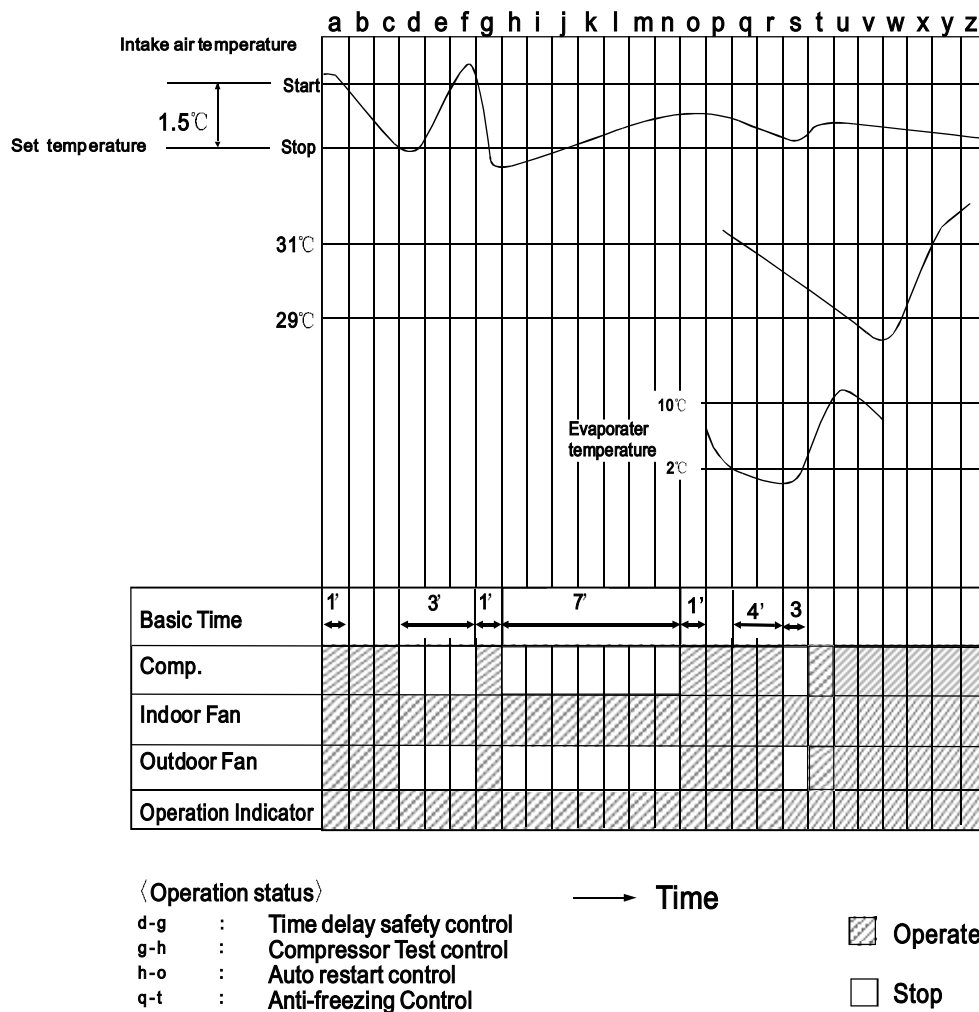
During Cooling Mode Operation, use remote controller to select Automatic Fan Speed.

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



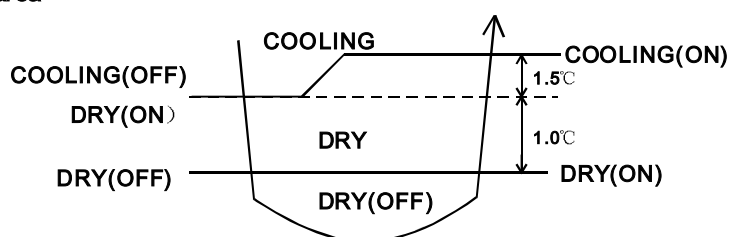
- ※ 1 Fan speed will be at "Hi" till the compressor ceases (set temperature reached).
- ※ 2 Fan speed will be at "Me" when the compressor restarts.

### 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

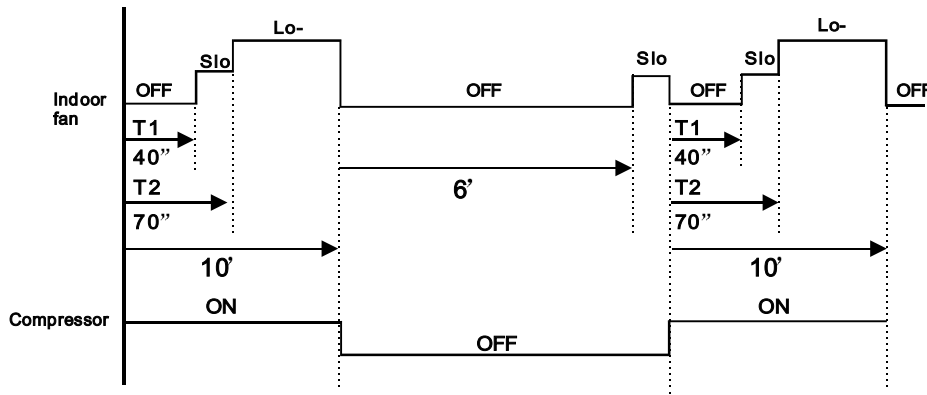
- During cooling mode operation, if the compressor ceased, it will not restart within 3 minutes.

### Anti Freezing Control

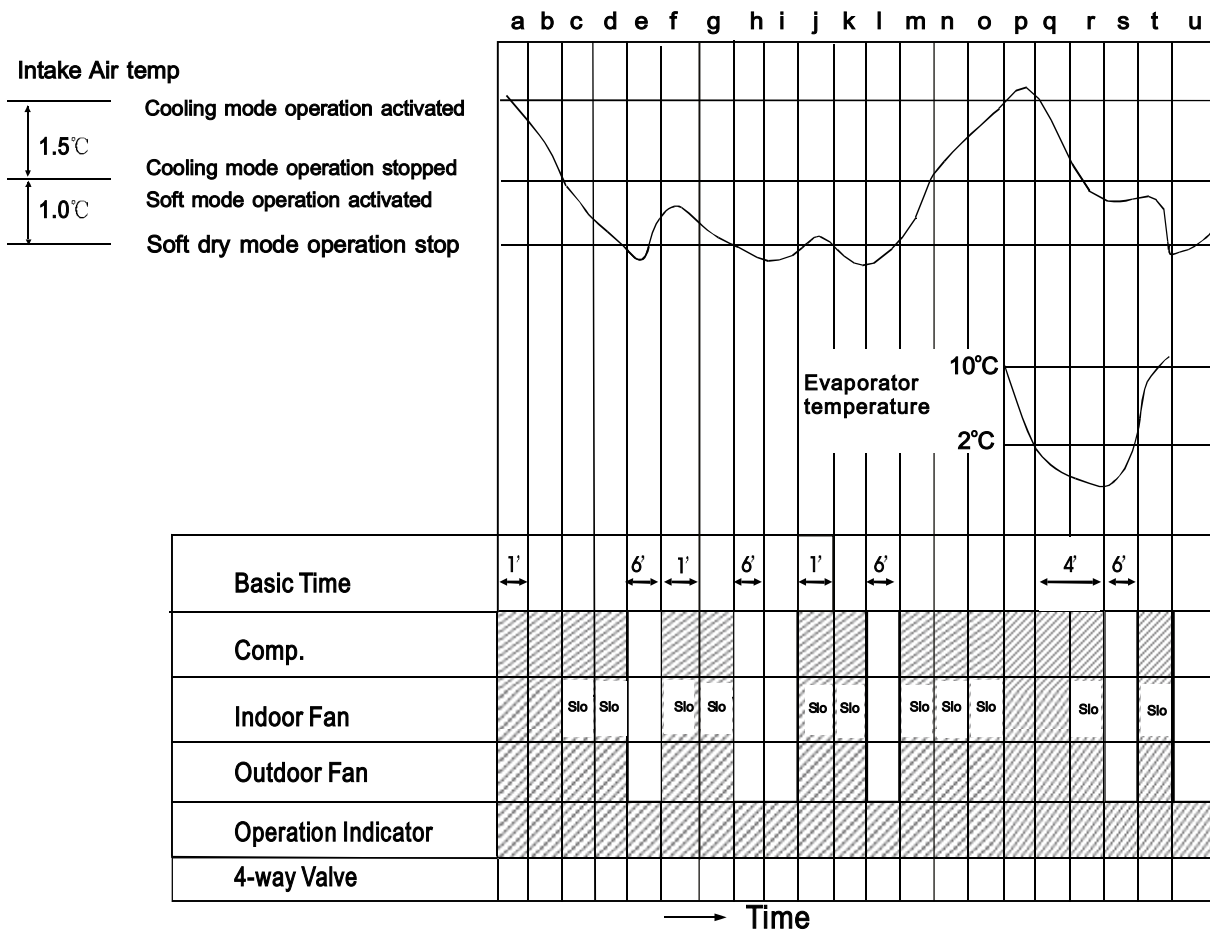
- Same as the denotation in Cooling Operation.(P33)  
(During Soft Dry Mode Operation, compressor will stop for at least 6 min.)

### 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 heat pump models)

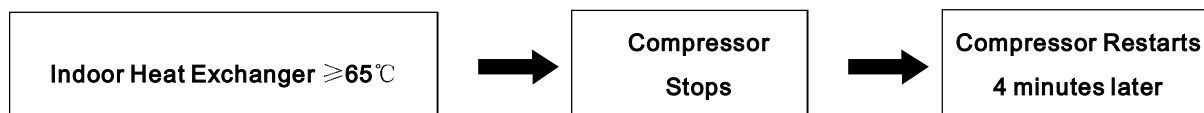
When selecting the Heating Mode Operation, the unit will operate according to the setting by the Remote Controller and the operation is as the following.

#### 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".

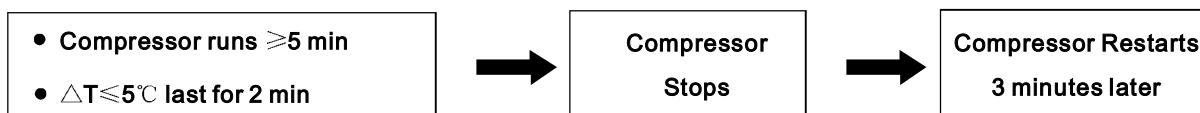
#### Over Load protection Control

- When temperature of indoor heat exchanger rises to 51°C, outdoor fan will stop when temperature of indoor heat exchanger falls to 49°C, outdoor fan will restart.
- When temperature of indoor heat exchanger rises to 65°C or above, compressor stops, and will restart 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°C or below for 2 minutes, the compressor will stop, and then restart 3 minutes later.(Time Delay Protection Control is effective.)



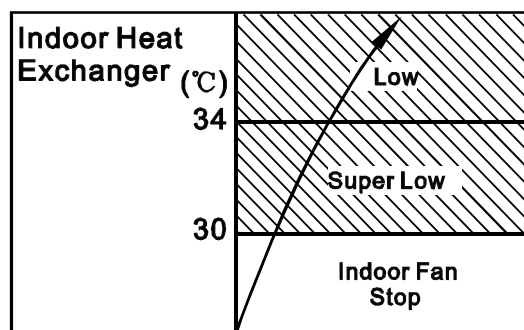
$\Delta T$  = intake air temperature - evaporator temperature

#### 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.

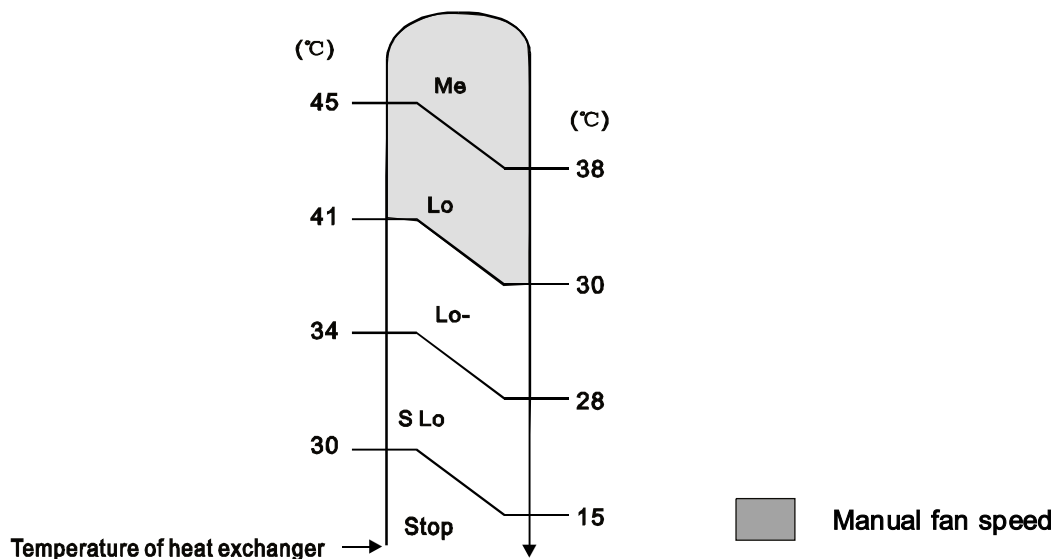
#### Warm Booting Control

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

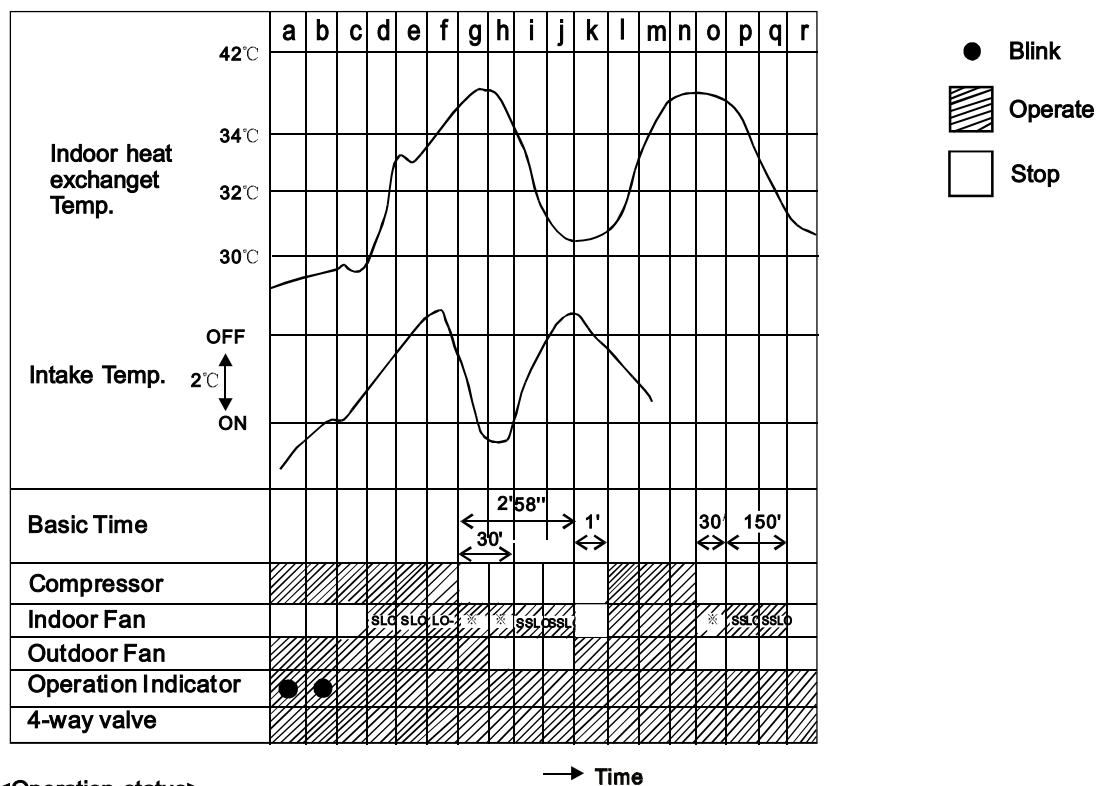


### Automatic Fan Speed

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

## 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  $-3^{\circ}\text{C}$  (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  $4^{\circ}\text{C}$ .

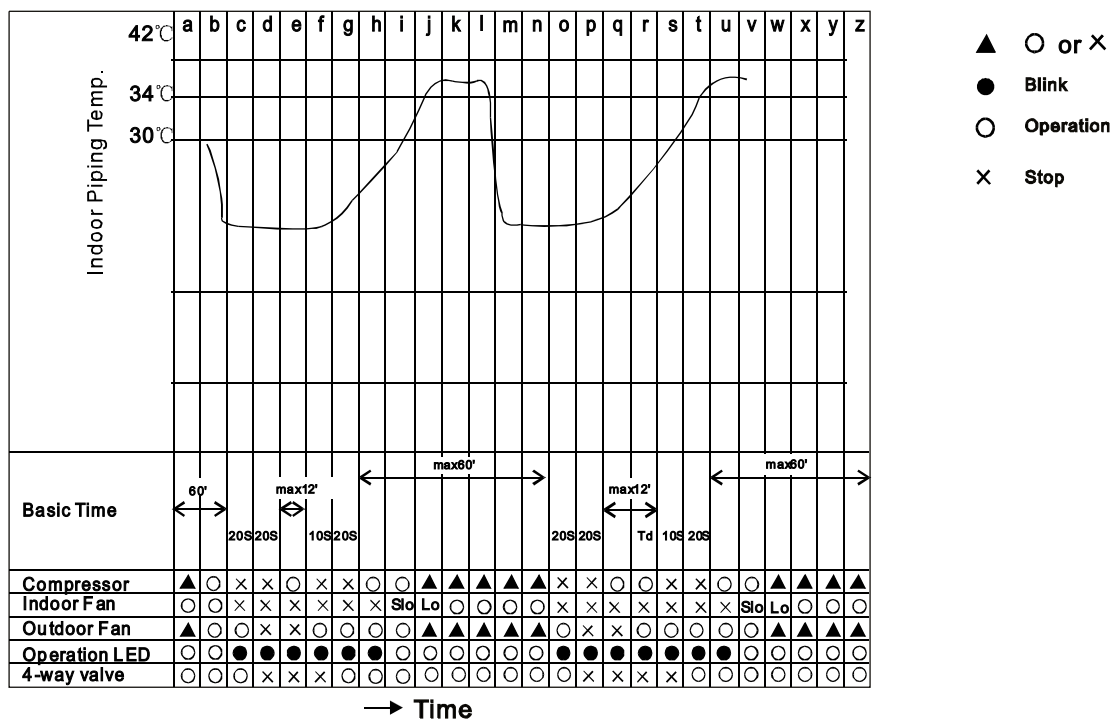
(c) As the illustration showed below and due to Time Delay (Td), deicing won't ends immediately.

Deicing Operation Time(T)	Td(s)
$<3\text{ min}$	0
$3\text{ min} \leq T < 7\text{ min}$	60
$7\text{ min} \leq T < 9\text{ min}$	120
$T \geq 9\text{ min}$	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



### <Operation status>

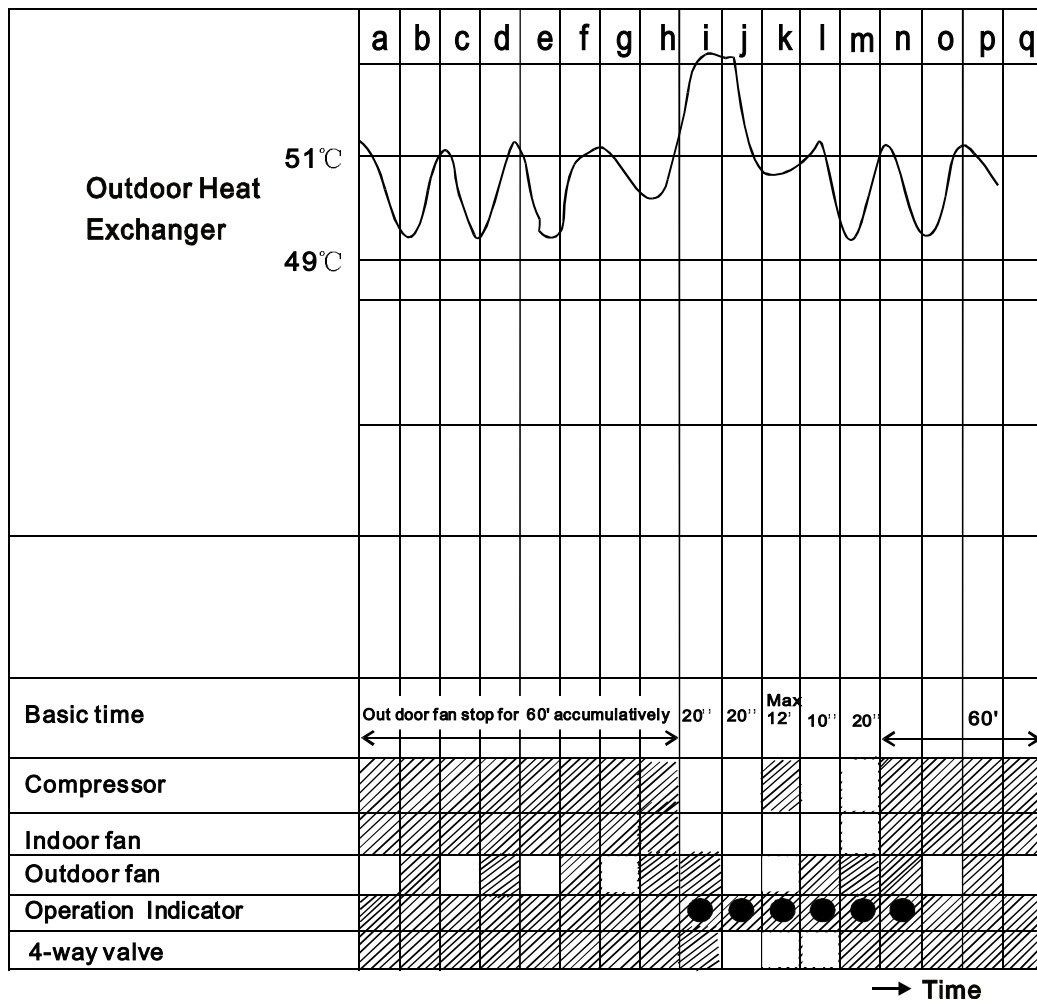
a-c : Deicing confirmation

c-g : Deicing operation(time reset)

h-j, u-w : Warm Booting

o-r : Deicing(TRS)

Time Graph for Overload Deicing



&lt;Operation status&gt;

a-i: Overload control

i-l: Overload deicing(timer)

l-m: Warm booting control

m-r: Overload control

● Blink

Operation

Stop

## 8.4. Automatic Mode Operation

### Standard for Determining Operation Mode

#### ● First Determination:

Intake Air temperature	23℃	Cooling mode		Setting Temperature (Standard)
		Soft Dry mode		
	20℃	Heating mode		
			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.

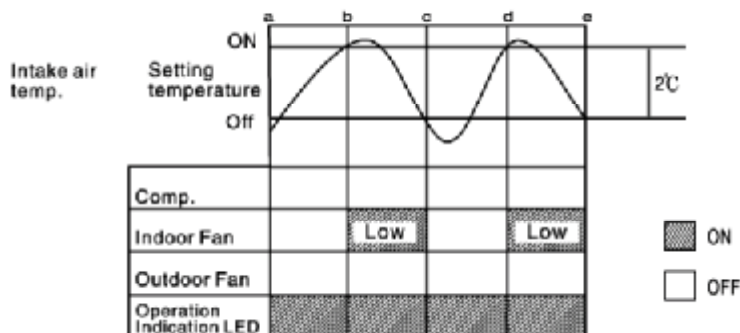
		Second Determination		
		Cooling	Dry	Heating
First determination	Cooling	23℃ or above	————	23℃ below
	Dry	————	20℃ or above	20℃ below
	Heating	25℃ or above	————	25℃ below

- 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 cooling models)

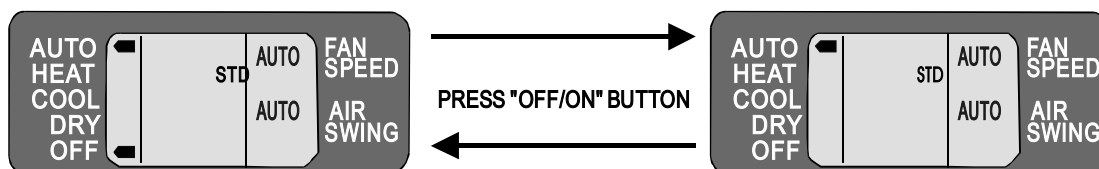
1. An additional heater may make the warm air evenly covering each corner of the room.
2. When the temperature near the ceiling reaches the setting temperature, Air Circulation Mode Operation commences at low airflow volume. It stops when the temperature drops to 2℃ below the setting temperature.
3.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





## 8.9 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:
  - 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.
  - 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 under 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 the table below. The louver can be stopped by releasing the button at the desired position.
- When the remote control is used to stop the operation, the discharge vent is closed with airflow direction louver.

#### Angles Of Airflow Direction Louver

Operating Mode						
Cooling Soft dry	Manual	12°	17°	26°	32°	36°
	Auto	12° ~36°				
Heating	Manual	9°	21°	29°	44°	55°
	Auto	9° ~55°				
Determining operation mode		9°				

#### Notes:

- In heating mode operation
  - 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.
  - 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.






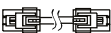
## 9 Installation

### 9.1. Before Installation

#### WARNING

- Engage dealer or specialist for installation. If installation done by the user is defective, it will cause water leakage, electrical shock or fire.
- Use the specified cable (1.5mm<sup>2</sup>) and connect tightly for indoor/outdoor connection.
- Power supply connection to a circuit breaker for the permanent connection. Use an approved 10A circuit breaker for the permanent connection. It must be a double pole switch with a minimum 3 mm contact gap.
- The unit must be earthed, or it will cause fire or electric shock.

#### Attached accessories

No.	Accessories parts	Qty
1	Installation plate 	1
2	Installation plate fixing screw 	5
3	Battery 	2
4	Remote controller 	1
5	Drain elbow (Only for models: heat pump models) 	1
6	Connecting Wire (Connector) (Only for models: heat pump models) 	1

#### SELECT THE BEST LOCATION

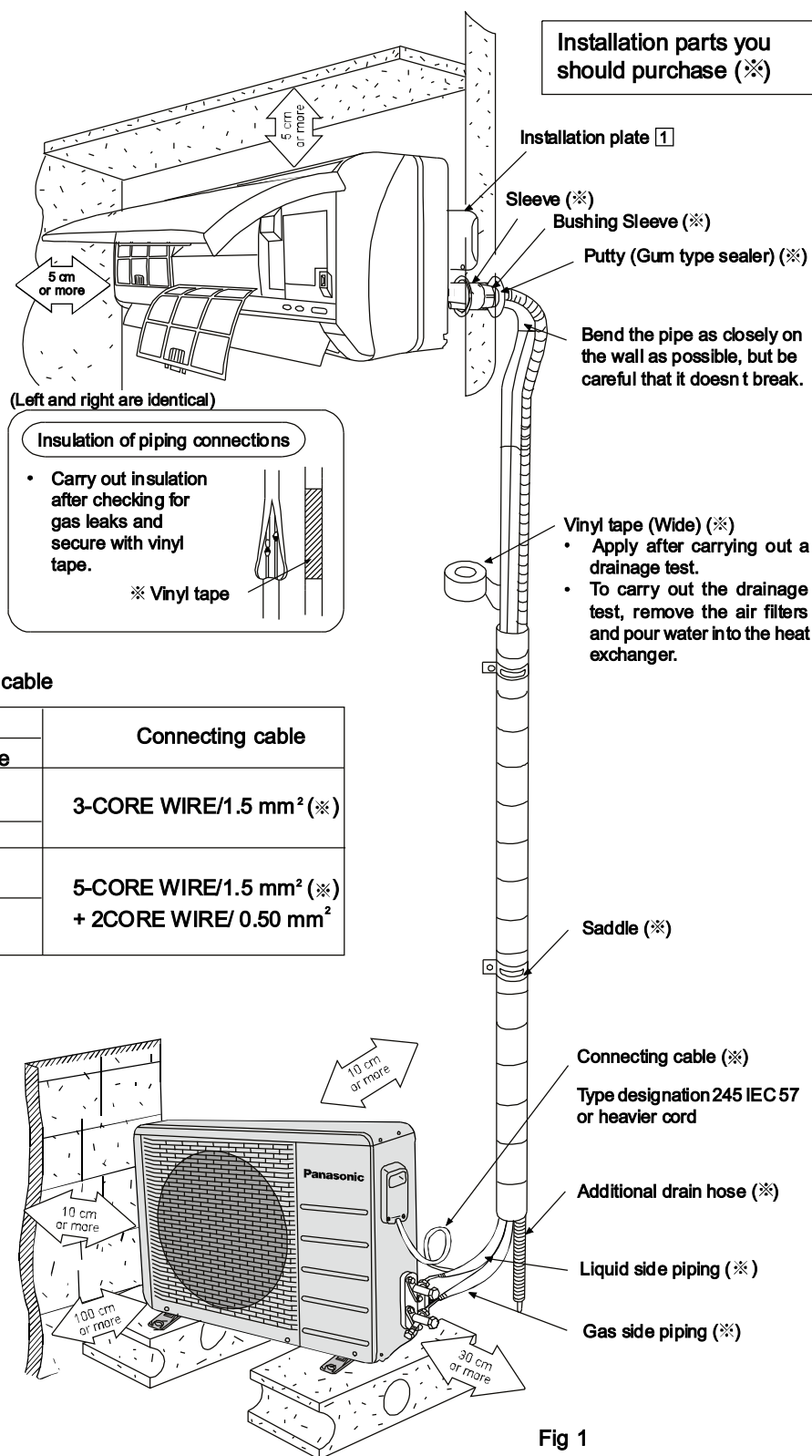
##### INDOOR UNIT

- There should not be any heat source or steam near the unit.
- There should not be any obstacles blocking the air circulation.
- A place where air circulation in the room is good.
- A place where drainage can be easily done.
- A place where noise prevention is taken into consideration.
- Do not install the unit near the door way.
- Ensure the spaces indicated by arrows from the wall, ceiling, fence or other obstacles.
- Recommended installation height for indoor unit shall be at least 2.5m.

##### 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.

## Indoor/Outdoor Unit Installation Diagram



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

## 9.2. Outline of installation

Installation works	Installation parts	Required tools
<b>1. Installation of indoor, outdoor unit</b> 1) Select the best location ..... 46 2) Indoor unit installation ..... 47	<ul style="list-style-type: none"> <li>● Installation plate</li> <li>● 4 wooden screws</li> <li>● 4 anchor bolts</li> </ul>	<ul style="list-style-type: none"> <li>● A level gauge</li> <li>● Phillips screw driver</li> <li>● Electric drill hole-core drill(<math>\Phi</math> 70mm)</li> <li>● Side cutter or electrical pliers</li> </ul>
<b>2. Piping and drainage of indoor unit</b> 1) Prepare of piping ..... 48 2) Connection of piping ..... 49 For the right piping ..... 49 For the left piping ..... 50	<ul style="list-style-type: none"> <li>● Pipes: Gas side PA7/9GKD,PC7/9GKD ..... 3/8"</li> <li>PA12/16GKD,PC12GKD... 1/2 Liquid side ..... 1/4"</li> <li>● Insulated drain hose</li> <li>● Insulation materials</li> </ul>	<ul style="list-style-type: none"> <li>● Flaring tools set</li> <li>Specified torque wrenches 18N·m ..... Liquid side piping</li> <li>42N·m ..... Gas side piping</li> <li>Spanner ..... Half union</li> </ul>
<b>3. In case of Embedded Piping</b> For the embedded piping ..... 52	<ul style="list-style-type: none"> <li>● Pipes: Gas side PA7/9GKD,PC7/9GKD ..... 3/8"</li> <li>PA12/16GKD,PC12GKD... 1/2 Liquid side ..... 1/4"</li> <li>● Insulated drain hose</li> <li>● Insulation materials</li> </ul>	<ul style="list-style-type: none"> <li>● Flaring tools set</li> <li>Specified torque wrenches 18N·m ..... Liquid side piping</li> <li>42N·m ..... Gas side piping</li> <li>Spanner ..... Half union</li> </ul>
<b>4. Connecting piping and cable to the outdoor unit</b> 1) Connecting the piping to the outdoor unit ..... 53 2) Connecting the cable ..... 53	<ul style="list-style-type: none"> <li>● Additional drain hose (Outer diameter ..... 1.5mm)</li> <li>● Connecting cable (3-core wire/1.5mm<sup>2</sup>)..Cooling modles (5-core wire/1.5mm<sup>2</sup>)..Heating pump modles Locally approved cable</li> </ul>	<ul style="list-style-type: none"> <li>● Specified torque wrenches 18N·m ..... Liquid side</li> <li>42N·m ..... Gas side</li> <li>56N·m ..... Gas side</li> </ul>
<b>5. Checking the drainage and connecting the cable to indoor unit</b> 1) Checking the drainage ..... 54 2) Connect the cable to the indoor unit ..... 55	<ul style="list-style-type: none"> <li>● Connecting cable (3-core wire/1.5mm<sup>2</sup>)..Cooling modles (5-core wire/1.5mm<sup>2</sup>)..Heating pump modles</li> <li>● Locally approved cable</li> </ul>	<ul style="list-style-type: none"> <li>● A glass of water</li> <li>● Phillips screw driver</li> </ul>
<b>6. Test Running</b> 1) Connect the power supply ..... 56 2) Evaluation of the performance ..... 56		<ul style="list-style-type: none"> <li>● Circuit breaker or time delay fuse(consult an electrician)</li> <li>● Operating instructions</li> <li>● Thermometer</li> </ul>

## 9.3. Outline of installation

### 9.3.1. Select the best location

#### 1. Indoor unit

- There should not be any heat source of steam near the unit.
- There should not be any obstacles to prevent the air circulation.
- A place where air circulation will be good.
- A place where drainage can be easily obtained.
- A place where noise prevention is taken into consideration.
- Do not install the unit near the doorway.
- Ensure the spaces indicated by arrows from the wall, ceiling, fence, or other obstacles.(Fig 2)
- Recommended installation height for indoor unit shall be at least 2.5m.

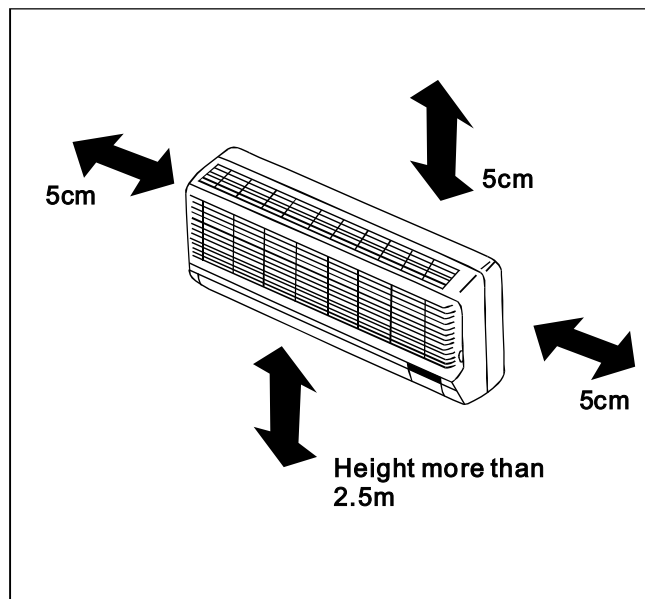


Fig.2

#### 2. Outdoor unit

- If an awning is built over the unit to prevent direct sunlight or rain exposure, be careful that heat radiation from the condenser is not restricted.
- There should not be any animals or plants which could be affected by hot air discharged.
- Ensure the spaces indicated by arrows from the wall, ceiling, fence, or other obstacles.(Fig 3)

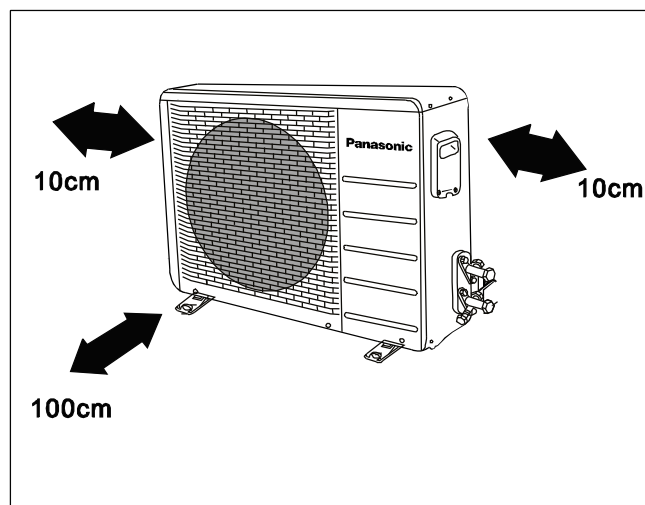


Fig.3

#### 3. Piping length and elevation

Model	Piping size		Max piping length(A)	Max piping elevation(B)
	Gas	Liquid		
PA7GKD/PC7GKD PA9GKD/PC9GKD	3/8"	1/4"	7 m	5 m
PA12GKD/PC12GKD	1/2"	1/4"	10 m	5 m
PA16GKD	1/2"	1/4"	10 m	10 m

- If piping length is over the common length, additional refrigerant should be added as shown in the table.

Model	Common length	Max piping length(m)	Additional Refrigerant (g/m)
PA7GKD/PC7GKD PA9GKD/PC9GKD	7	7	-
PA12GKD/PC12GKD PA16GKD	7	10	20

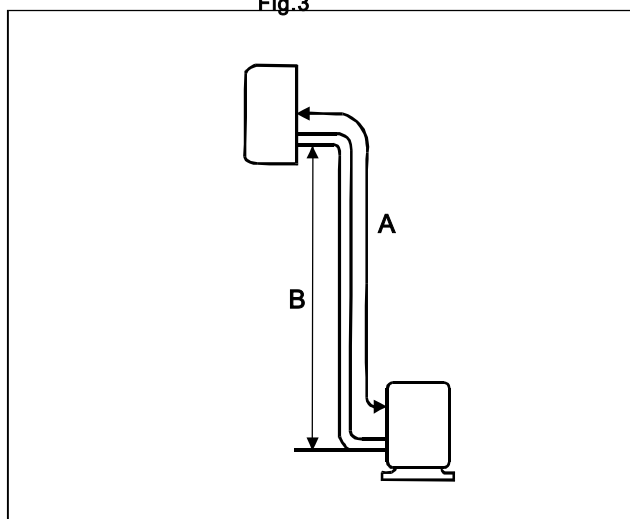


Fig.4

### 9.3.2. Indoor unit Installation

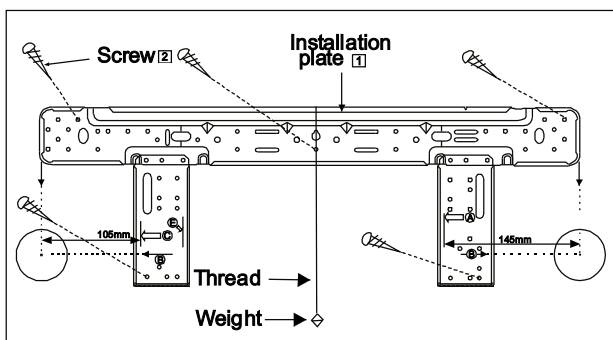
The mounting wall is strong and solid enough to prevent it from vibration.

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

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

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

For CS-PA7/9GKD, CS-PC7/9GKD:



For CS-PA12GKD, CS-PC12GKD, CS-PA16GKD:

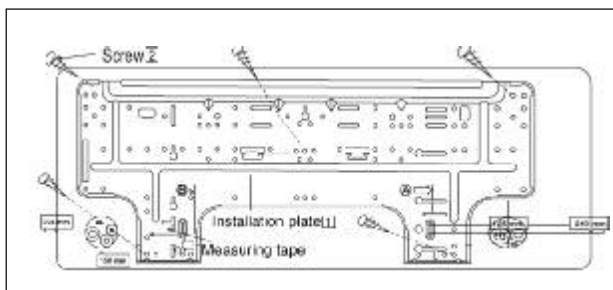


Fig.5

#### 2. Drill the piping hole with $\phi 70\text{mm}$ hole-core drill.

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

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

- Drill a  $\phi 70\text{mm}$  hole sloping downward toward the outside of the wall.
- Insert the sleeve for tube ass'y through the hole.
- Fix the bushing to the sleeve.
- Extrude 15mm of the sleeve then cut

#### Caution

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

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

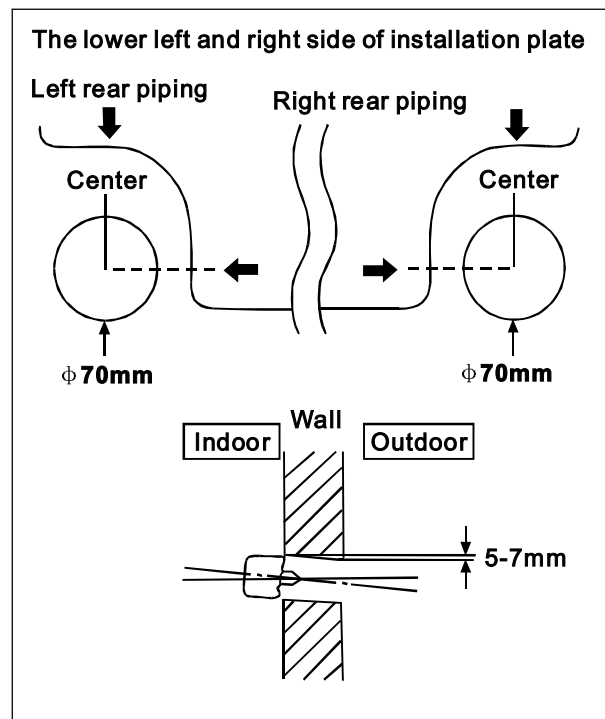


Fig.6

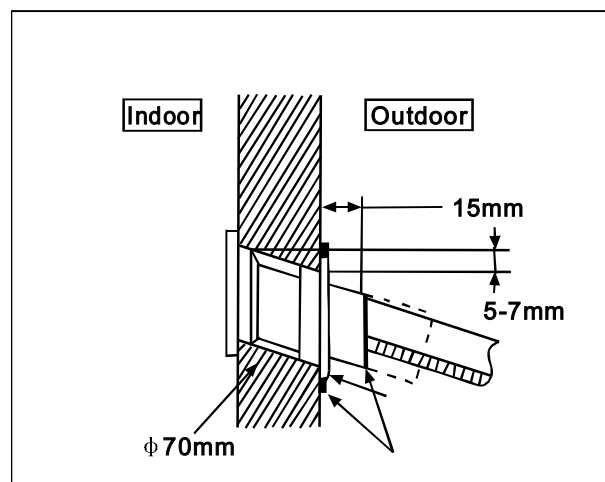


Fig.7

## 9.4. Piping and Drainage of Indoor Unit

### 9.4.1. Preparation of piping

#### 1. Cut the pipes and the cable

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

Model	Pipe size	
	Gas side	Liquid side
PA7GKD/PC7GKD PA9GKD/PC9GKD	3/8"	1/4"
PA12GKD / PC12GKD PA16GKD	1/2"	1/4"

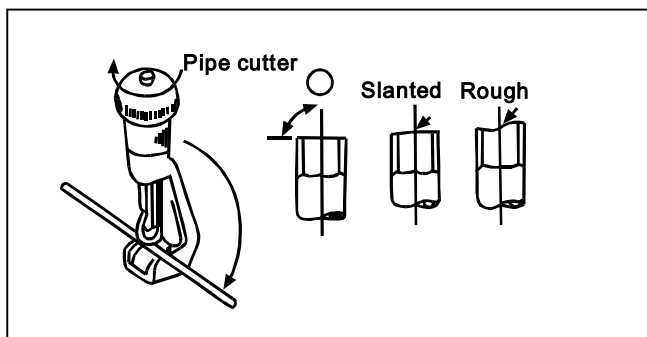


Fig.8

#### 2. Remove burrs

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

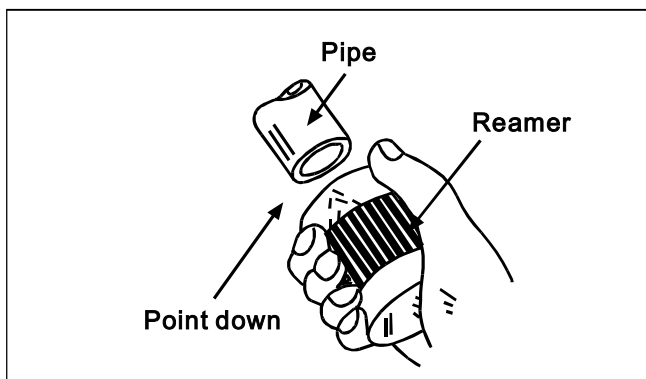


Fig.9

#### Caution

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

#### 3. Flaring the pipe

- Insert the flare nuts, mounted on the connection ports of both indoor and outdoor unit, onto the copper pipes.
- Fit the copper pipe end into the bar of flare tool about 0.5-1.5mm higher. (See Fig.10)
- Flare the pipe ends.

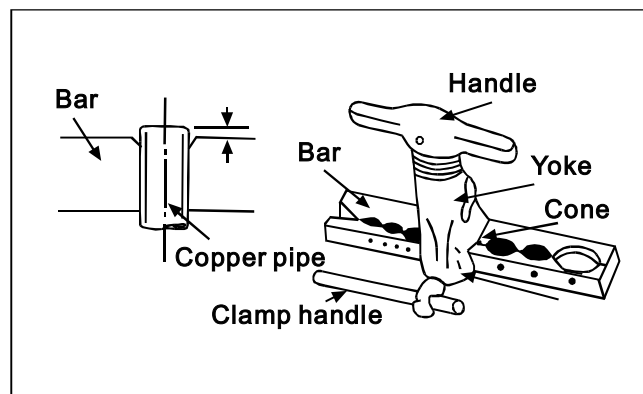


Fig.10

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

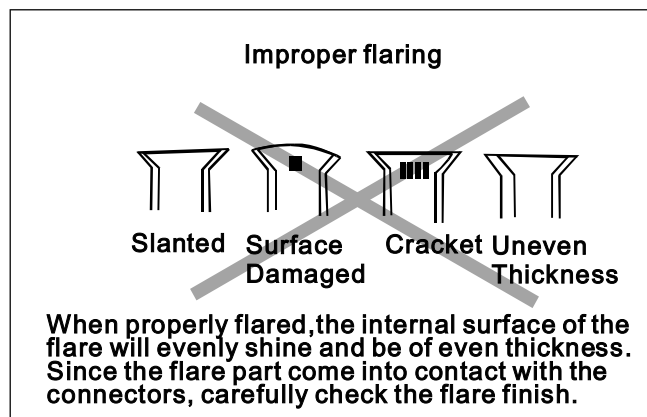


Fig.11



## 9.4.2. Connection of piping

Remove the indoor piping

- Pull the tube out of chassis.

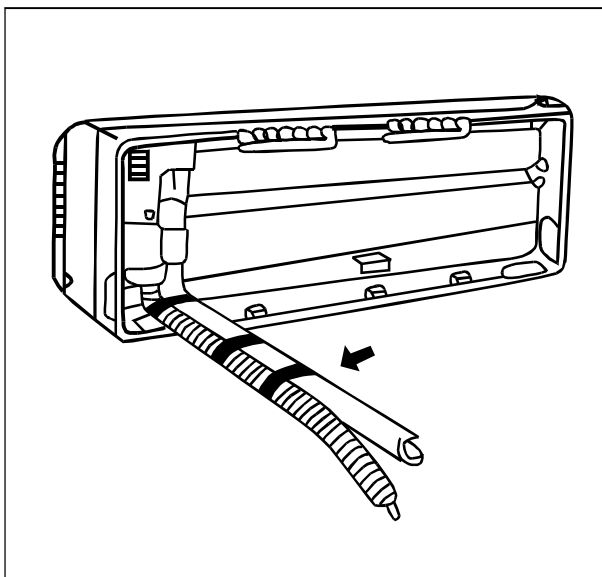


Fig.12

### For the right piping

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

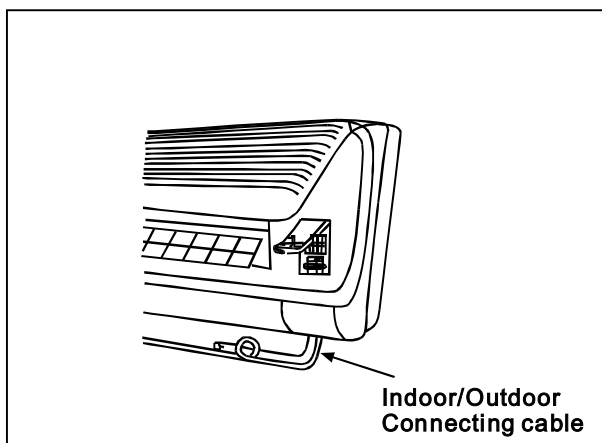


Fig.13

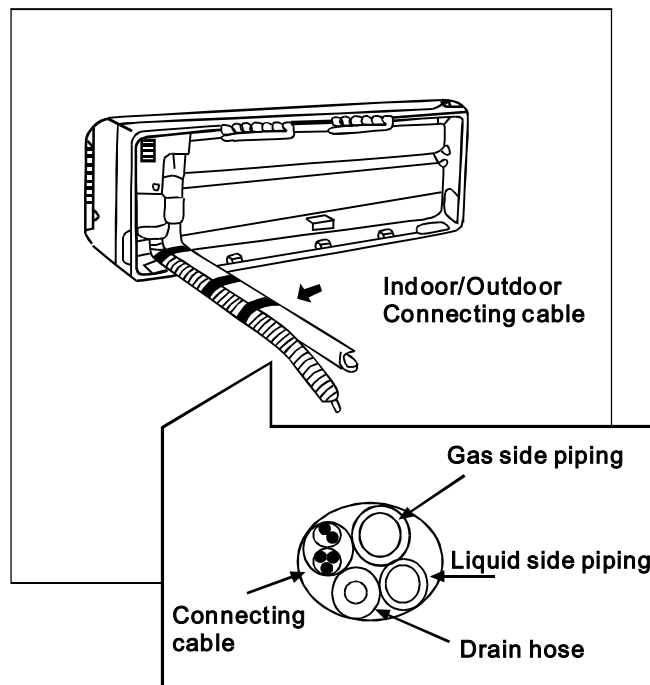


Fig.14

### 5. Indoor unit installation

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

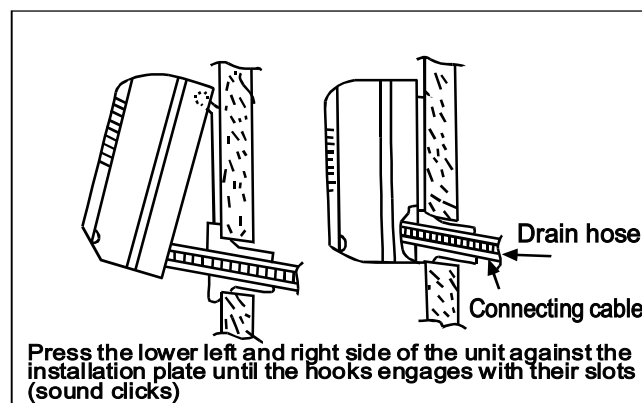


Fig.15

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

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

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

Model	Piping side	Torque
PA7GKD, PA9GKD PC7GKD, PC9GKD	Liquid side 1/4"	18N·m
	Gas side 3/8"	42N·m
PA12GKD, PC12GKD PA16GKD	Liquid side 1/4"	18N·m
	Gas side 1/2"	56N·m

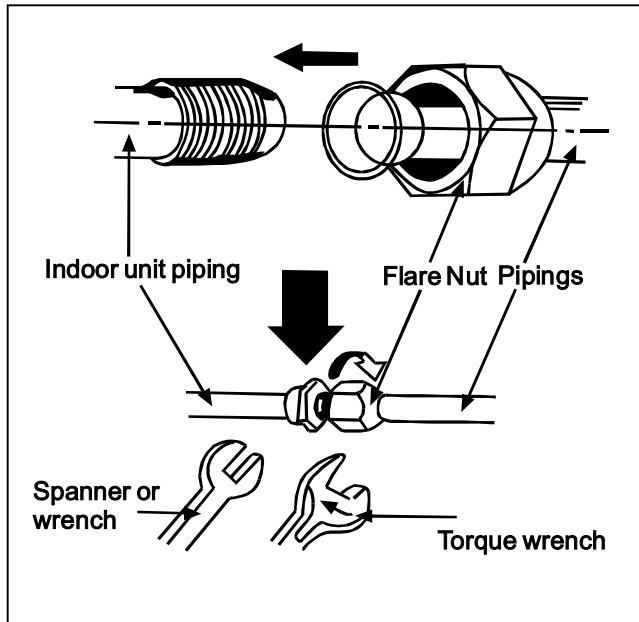


Fig.16

### For the left piping

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

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

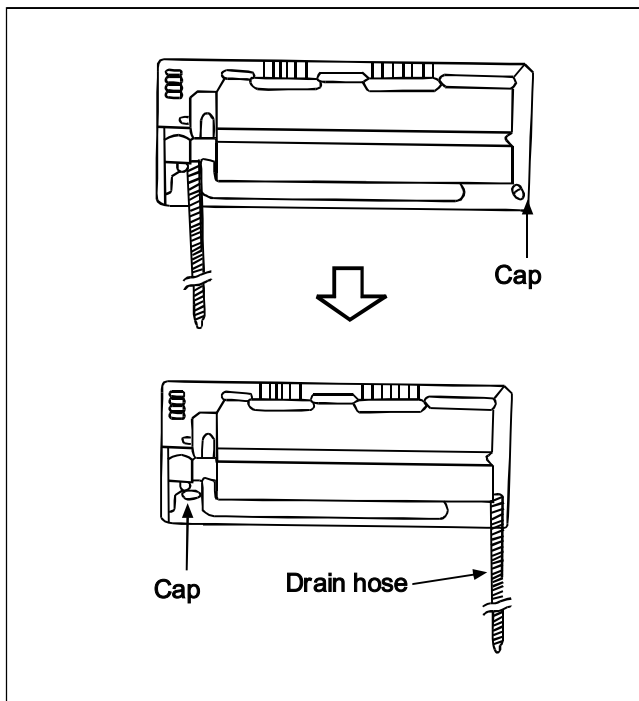


Fig.17

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

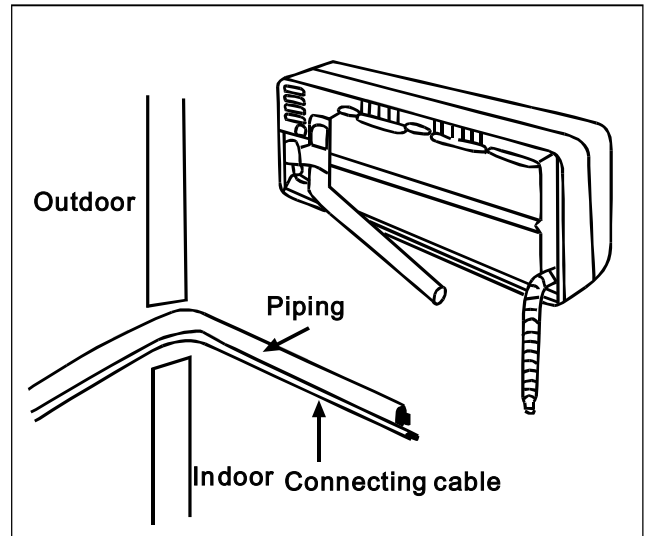


Fig.18

3. Insert the connecting cable into the indoor unit

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

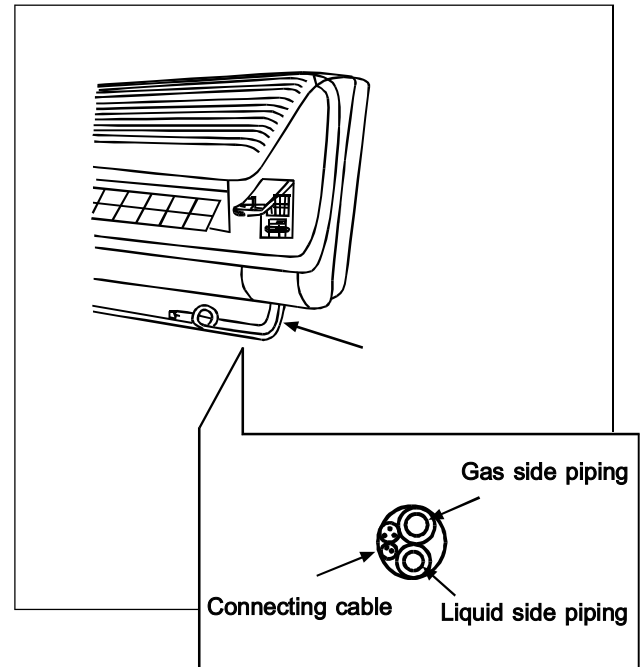


Fig.19

#### 4. Indoor unit installation

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

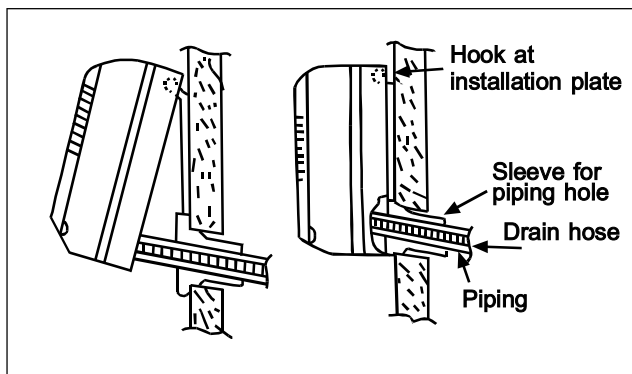


Fig.21

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

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

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

Model	Piping side	Torque
PA7GKD, PA9GKD PC7GKD, PC9GKD	Liquid side 1/4"	18N·m
	Gas side 3/8"	42N·m
PA12GKD, PC12GKD PA16GKD	Liquid side 1/4"	18N·m
	Gas side 1/2"	56N·m

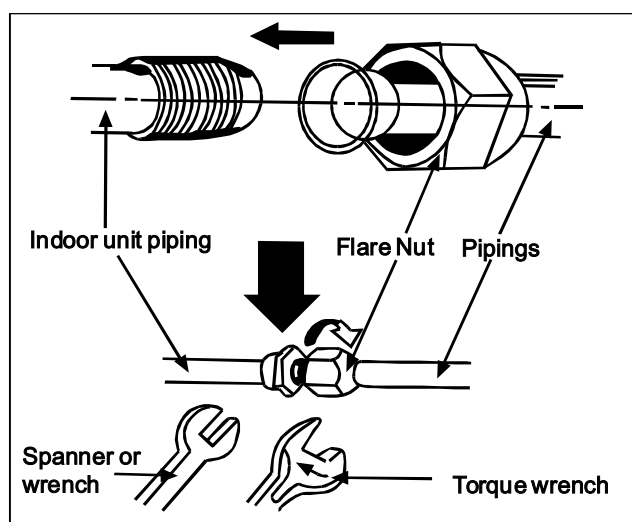


Fig.22

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

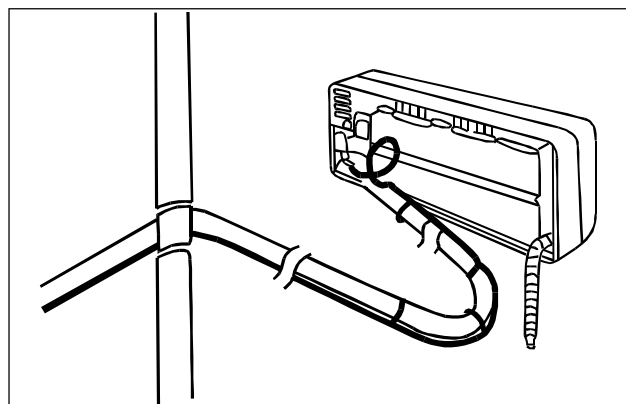


Fig.23

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

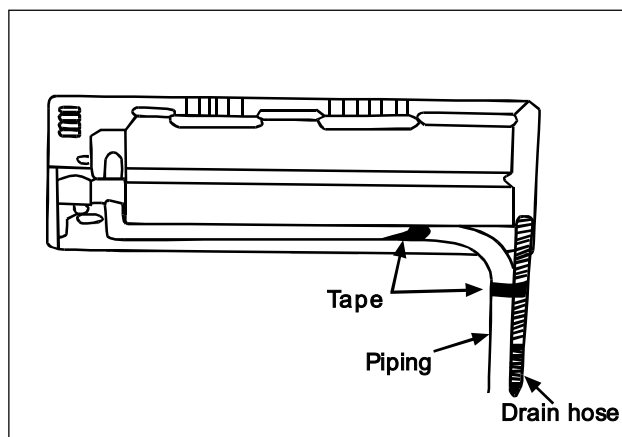


Fig.24

## 9.5. In case of embedded Piping

### For the embedded piping

Follow the same procedure for left rear and left piping.

### 9.5.1. Replace the drain hose

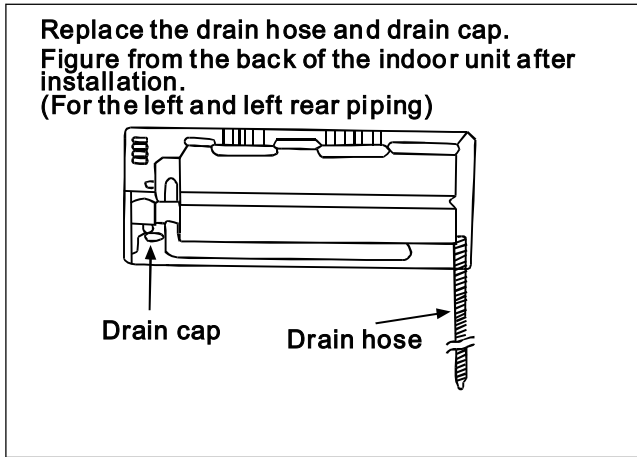


Fig.25

### 9.5.2. Bend the embedded piping

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

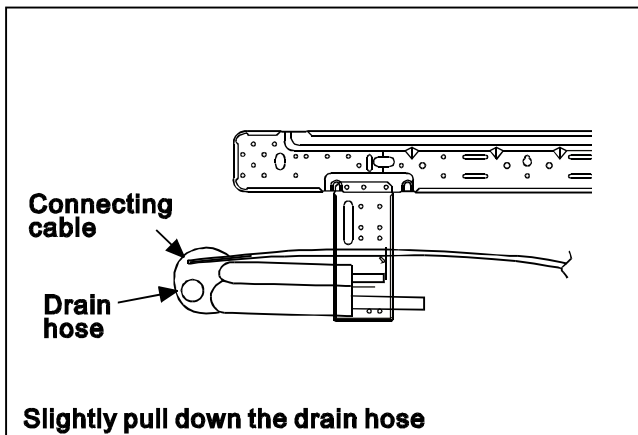


Fig.26

### 9.5.3. Install the indoor unit.

### 9.5.4. Cut and flaring the embedded piping

- When determining the dimensions of the piping, slide the unit all the way to the left on the installation plate.
- Refer to the section "cut and flaring the piping" in the directions for the outdoor unit. (Refer page 40)

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

### 9.5.6. Connecting the piping

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

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

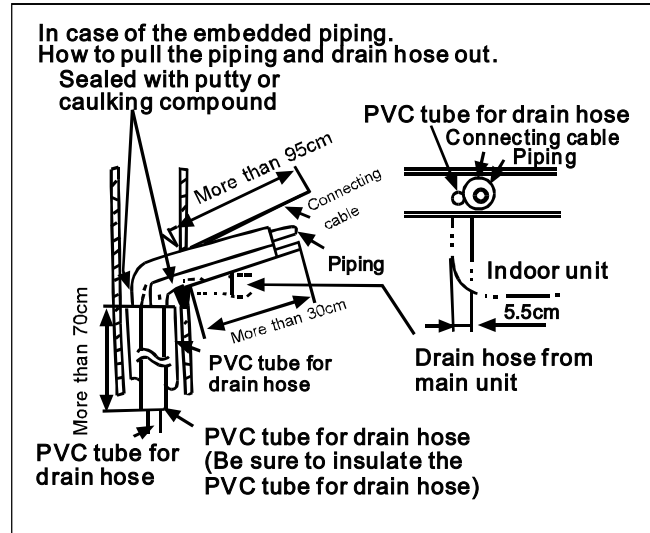


Fig.27

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

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

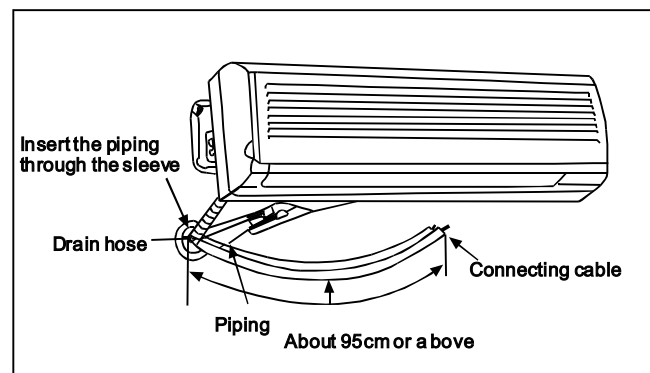


Fig.28

### 9.5.8. Install the indoor unit fixly. [REFERENCE Fig.28, Fig.29]

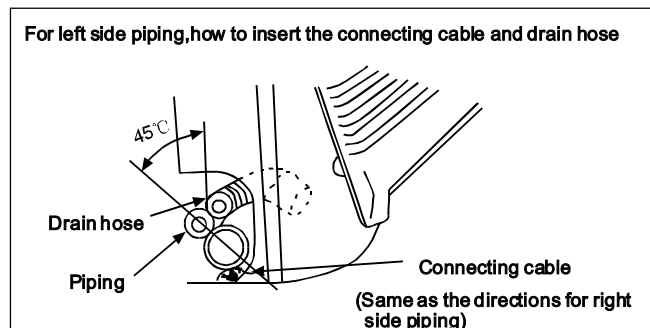


Fig.29

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

### 9.6.1. Connecting the piping to outdoor unit

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


Piping side	Torque
Liquid side 1/4"	18N·m
Gas side 3/8"	42N·m

#### Caution






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

3. Ensure not to let the piping exposed to air.










### 9.6.2. Connecting the cable to the outdoor unit

1. Remove the control board cover of the outdoor unit from the unit by loosening the screw.
2. Connecting cable between indoor unit and outdoor unit shall be approved polychloroprene sheathed 3 (PC7GKD, PC9GKD, PC12GKD) or 5 (PA7GKD, PA9GKD, PA12GKD, PA16GKD) x 1.5 mm<sup>2</sup> flexible cord, type designation 245 IEC 57 or heavier cord. For PA7GKD, PA9GKD, PA12GKD, PA16GKD the attached wire  with two connectors should be applied.

CS/CU-PC7GKD, CS/CU-PC9GKD, CS/CU-PC12GKD

Indoor Connecting Terminal	1(L)	2(N)	
Colours of wires			
Outdoor Connecting Terminal	1(L)	2(N)	

CS/CU-PA7GKD, CS/CU-PA9GKD, CS/CU-PA12GKD, CS/CU-PA16GKD

Indoor Connecting Terminal	1(L)	2(N)	3	4		
Colours of wires						
Outdoor Connecting Terminal	1(L)	2(N)	3	4		Connector

3. Secure the cable onto the control board with the holder ( clamber ).
4. Attach the control board cover to the original position with the screws.

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

### 9.7.1. Checking the drainage

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

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

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

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

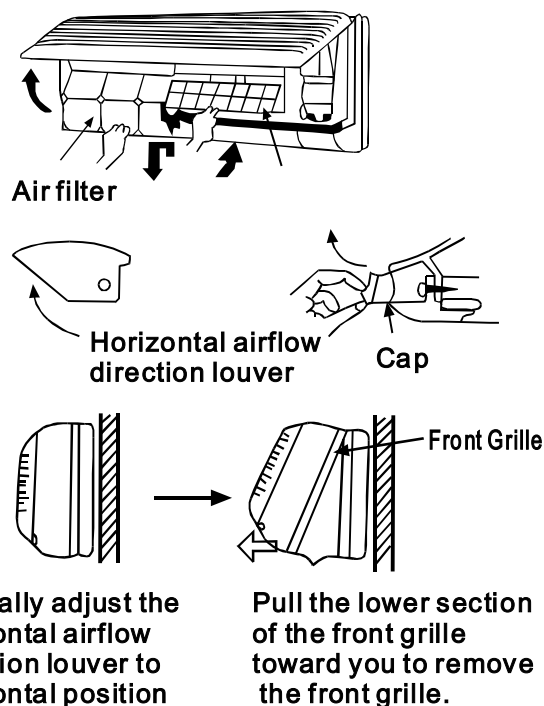


Fig.30

#### 2. Checking the drainage

- Pour a glass of water into the drain train traystyrofoam.
- Ensure water flow out from drain hose of indoor unit.

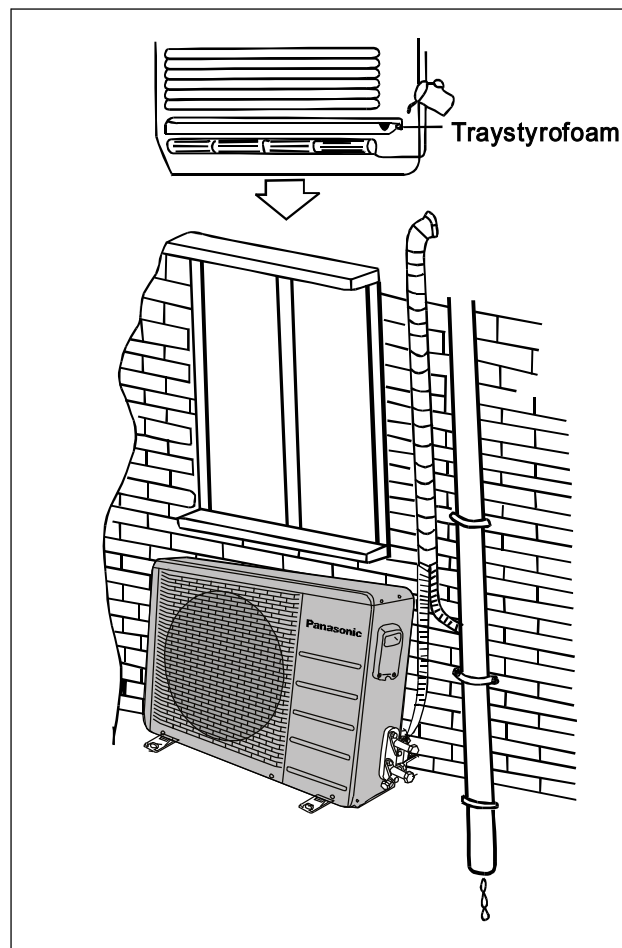
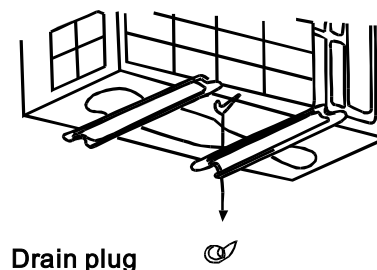


Fig.31

#### 3. Drainage control for outdoor unit (For heating pump models only)

- If a drainage plug is applied, the outdoor unit should at least be 3 centimeters high from the floor.
- If is better not to use the drainage plug if the temperature is lower than 0°C, since icing of the condensed water may block the water flow.



## 9.7.2. Connect the cable to the indoor unit

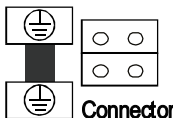
1. The inside and outside connecting cable can be connected without removing the front grille.
2. Connecting cable between indoor unit and outdoor unit shall be approved polychloroprene sheathed 3 (PC7/9/12GKD) or 5 (PA7/9/12/16GKD)  $\times 1.5\text{mm}^2$  flexible cord, type designation 245 IEC 57 or heavier cord. For PA7/9/12/16GKD, the attached wire **6** with two connectors should be applied.
  - Ensure the colour of wires of outdoor unit and the terminal number are the same as the indoor's respectively.
  - Secure the cable onto the board with the holder (clammer).
  - Both the unit and the power supply socket should be properly grounded.

CS/CU-PC7GKD, CS/CU-PC9GKD, CS/CU-PC12GKD

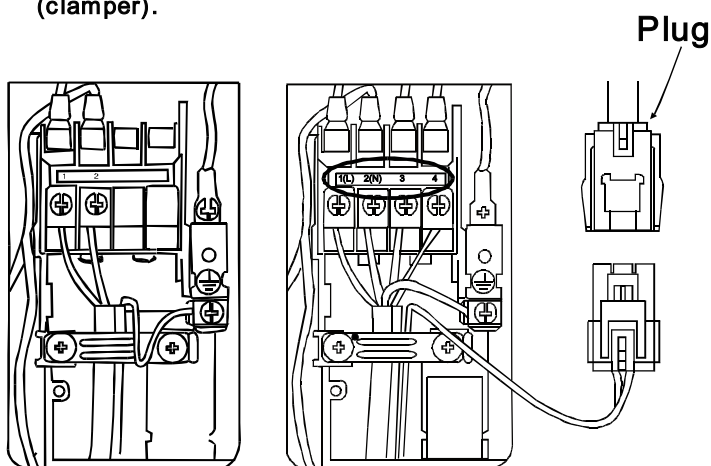
Indoor Connecting Terminal	1(L)	2(N)	
Colours of wires			
Outdoor Connecting Terminal	1(L)	2(N)	

CS/CU-PA7GKD, CS/CU-PA9GKD,  
CS/CU-PA12GKD, CS/CU-PA16GKD

Indoor Connecting Terminal	1(L)	2(N)	3	4	
Colours of wires					
Outdoor Connecting Terminal	1(L)	2(N)	3	4	



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



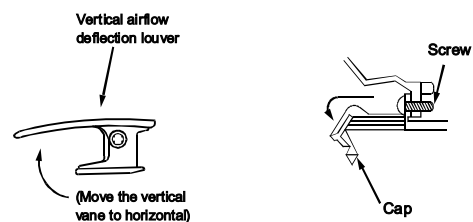
CS-PC7GKD  
CS-PC9GKD  
CS-PC12GKD

CS-PA7GKD  
CS-PA9GKD  
CS-PA12GKD  
CS-PA16GKD

## HOW TO TAKE OUT THE FRONT GRILLE

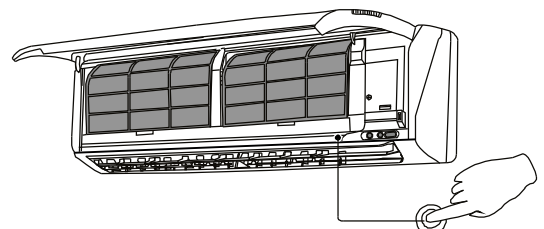
- Please follow the steps below to take out front grille
  1. If necessary such as when servicing.
  2. Set the vertical airflow direction louver to the horizontal position.
  3. Slide down the two caps on the front grille as shown in the illustration below, and then remove the two mounting screw. Pull the lower section of the front grille towards you to remove the front grille.

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



## AUTO SWITCH OPERATION

- The below operation 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.



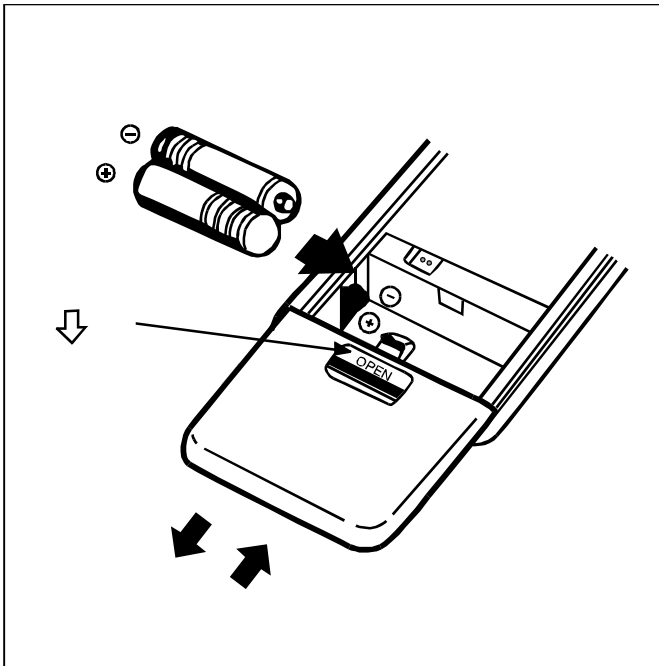
## 9.8. Test Running

### 9.8.1. Connect the power supply

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

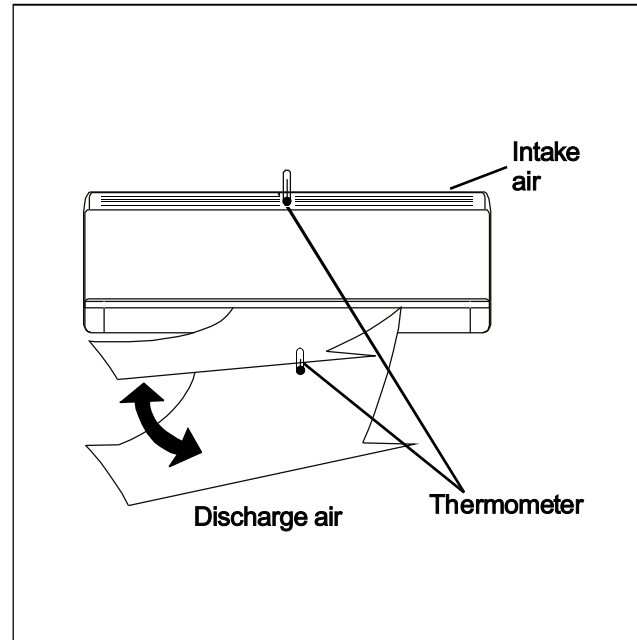
#### Insert two batteries

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



### 9.8.2. Evaluation of the performance

1. Operate the air conditioner for 15 minutes.
2. Measure the temperature of the intake and discharge air.
3. Ensure the difference of temperature between the intake and discharge air is more than 8°C in cooling operation, or more than 14°C in heating operation.

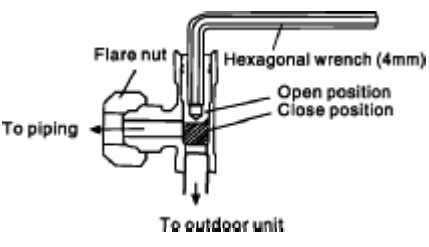
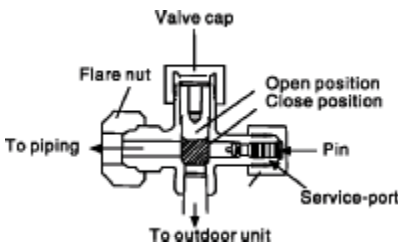


#### CAUTION

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



## 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)

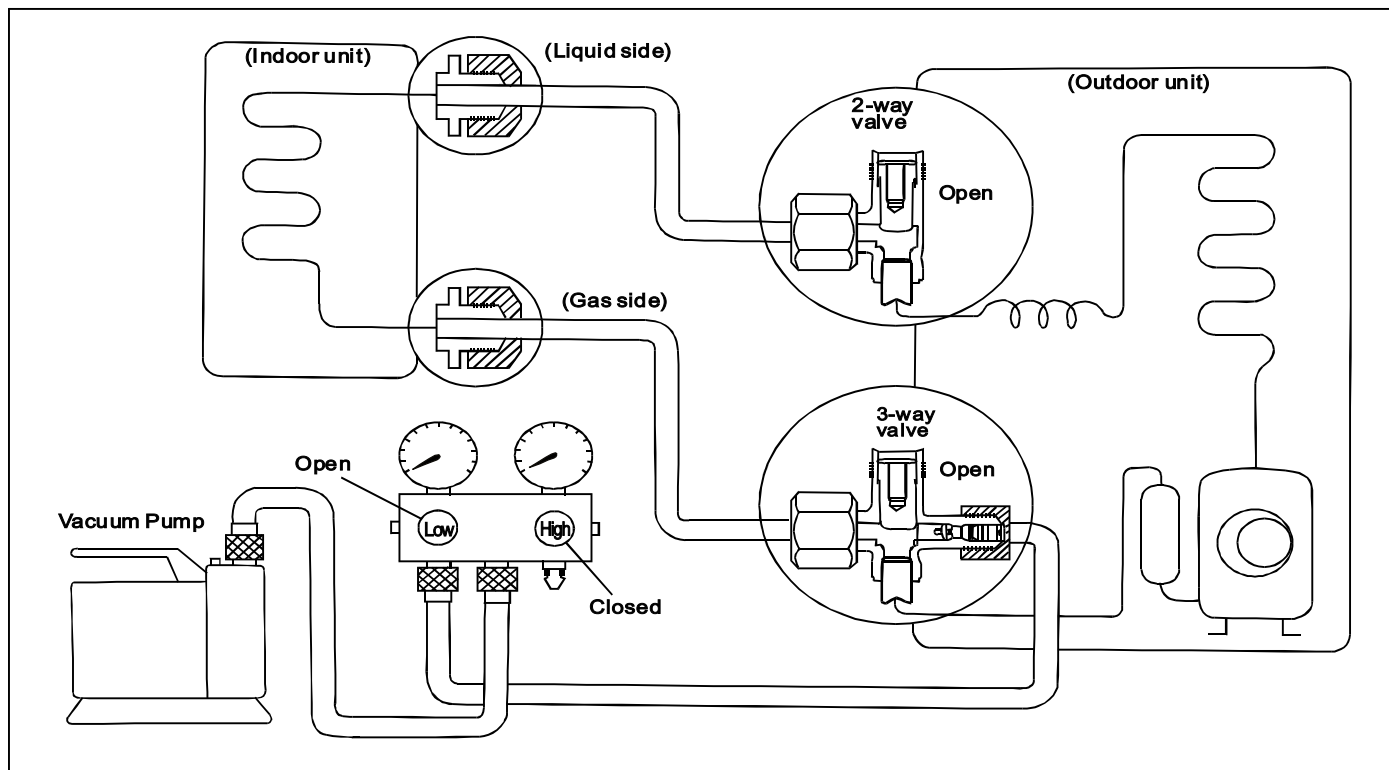
## 10.1. Evacuation of Installation

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 of 18 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.

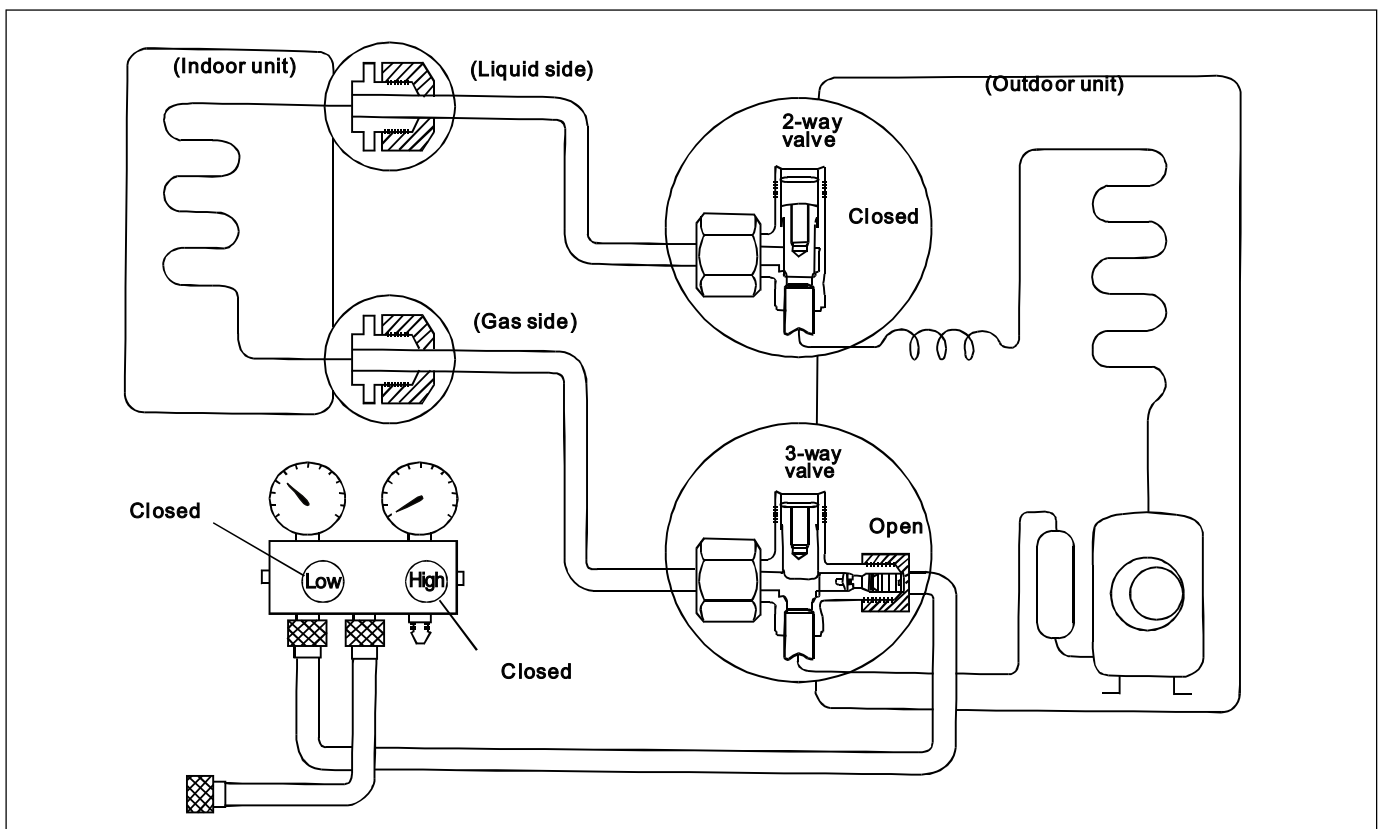
Be sure to check for gas leakage.

### 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)

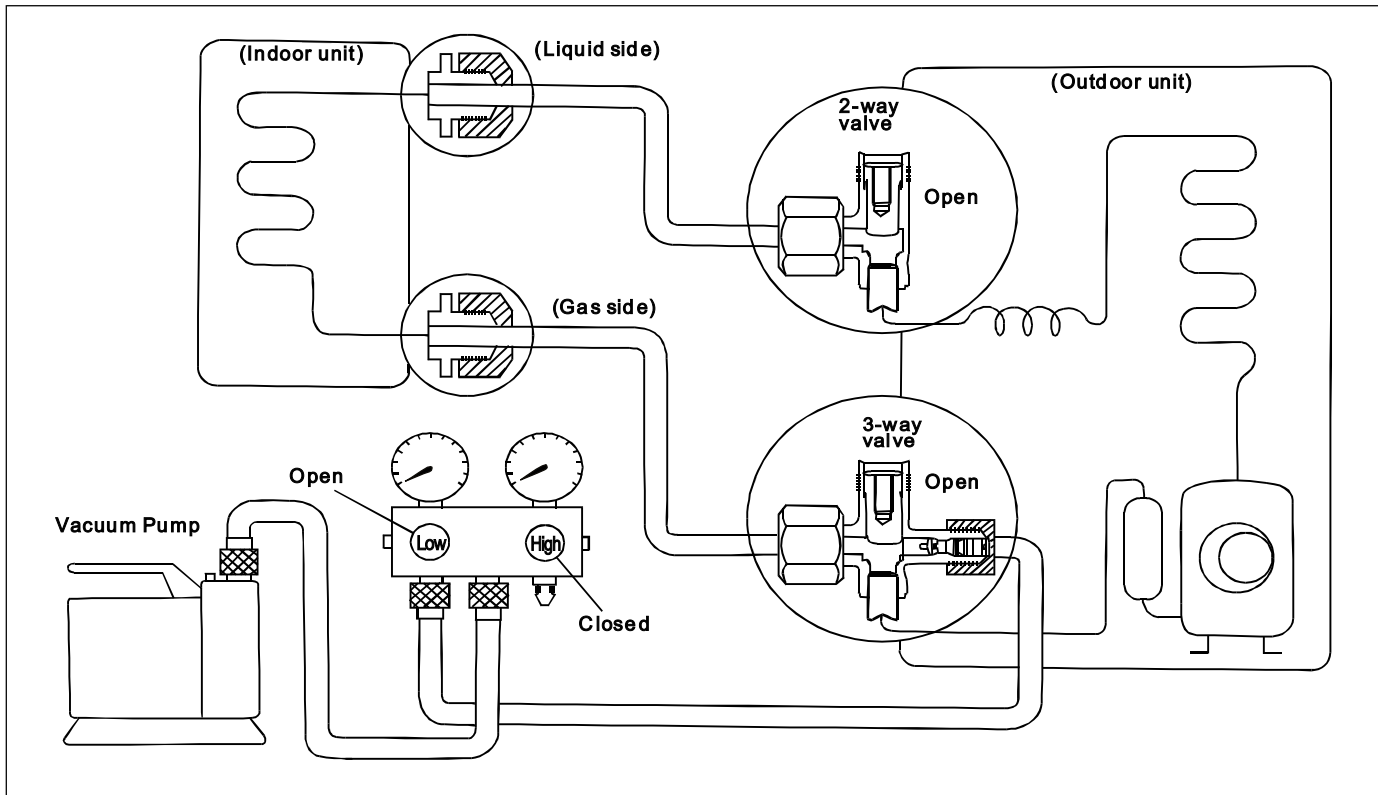


### Procedure

- 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.
- Operate the unit for 10-15 minutes.
- Stop operation and wait for 3 minutes, then connect the charge set to the service port of the 3-way valve.
  - Connect the charge hose with the push pin to the service port.
- Air purging of the charge hose.
  - Open the low-pressure valve of the charge set slightly to purge air from the charge hose.
- Set the 2-way valve to the close position.
- Operate the air conditioner at the cooling cycle and stop it when the gauge indicates 2 kg/cm<sup>2</sup>G (0.1Mpa).
  - If the unit cannot be operated at the cooling mode operation (weather is rather cold), short the Pumping Down pins on the Main Control P.C.B.
- Immediately set 3-way valve to the closed position.
  - Do this quickly so that the gauge ends up indicating 1 to 3kg/cm<sup>2</sup>G (0.1 to 0.3 Mpa).
- Use refrigerant reclaiming equipment to collect refrigerant from indoor unit and pipes.
- 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.
- 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 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
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<sup>2</sup>).

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.

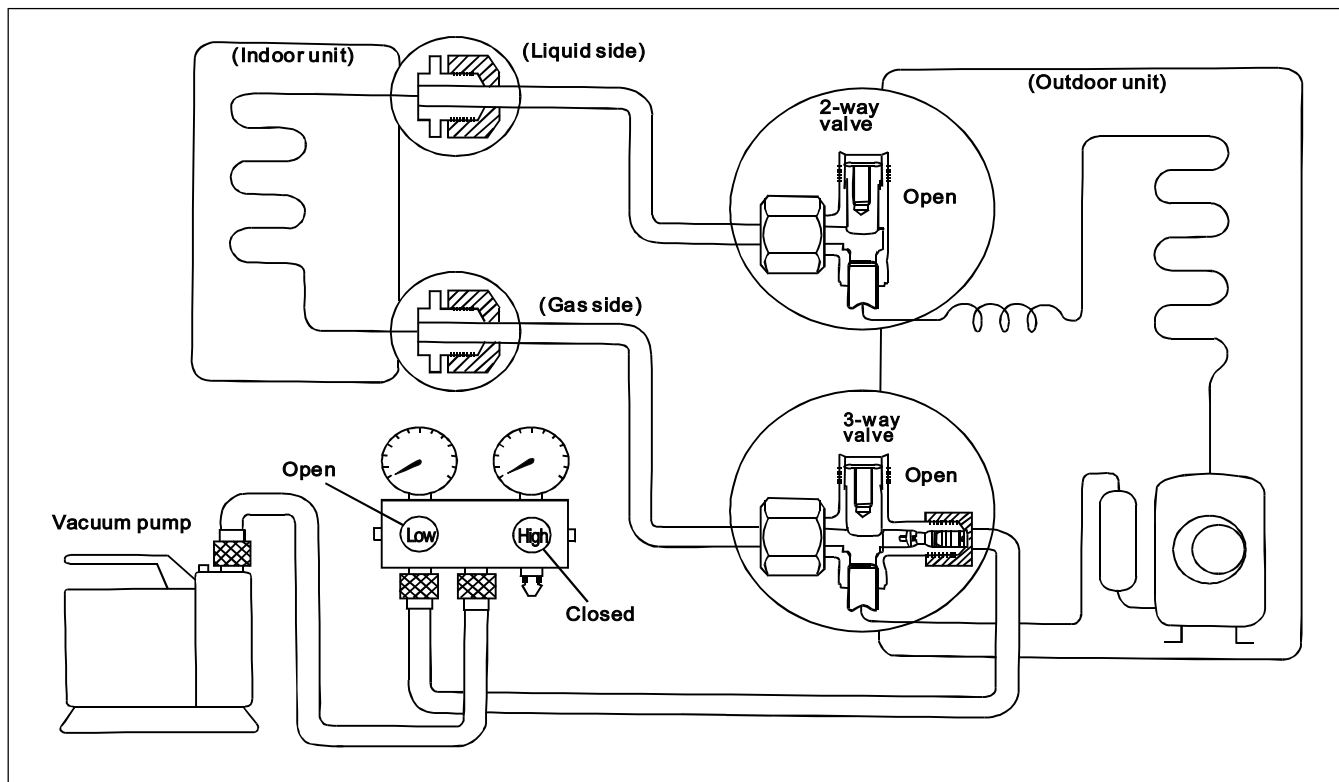
- BE SURE TO USE REFRIGERANT RECLAIMING EQUIPMENT WHILE DISCHARGING THE REFRIGERANT.
- Purge the air from charge set's centre hose.
- Be sure to check for gas leakage.

### 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 valves

(Gas leakage)

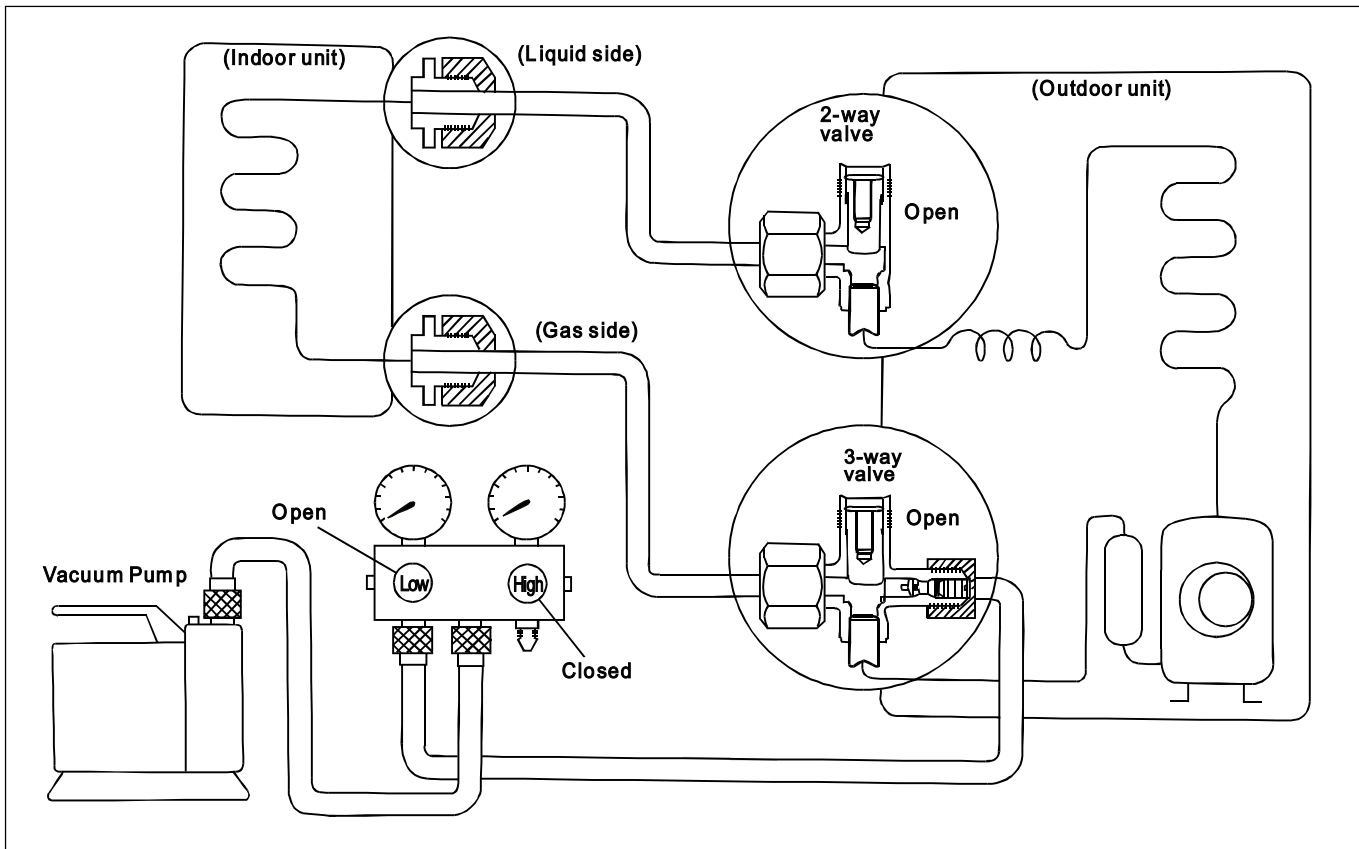


### Procedure

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<sup>2</sup>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<sup>2</sup>G) to 0.1 MPa (1 kg/cm<sup>2</sup>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<sup>2</sup>G), discharge the refrigerant until the gauge indicates 0.05 MPa (0.5 km/cm<sup>2</sup>G) to 0.1 MPa (1 kg/cm<sup>2</sup>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].

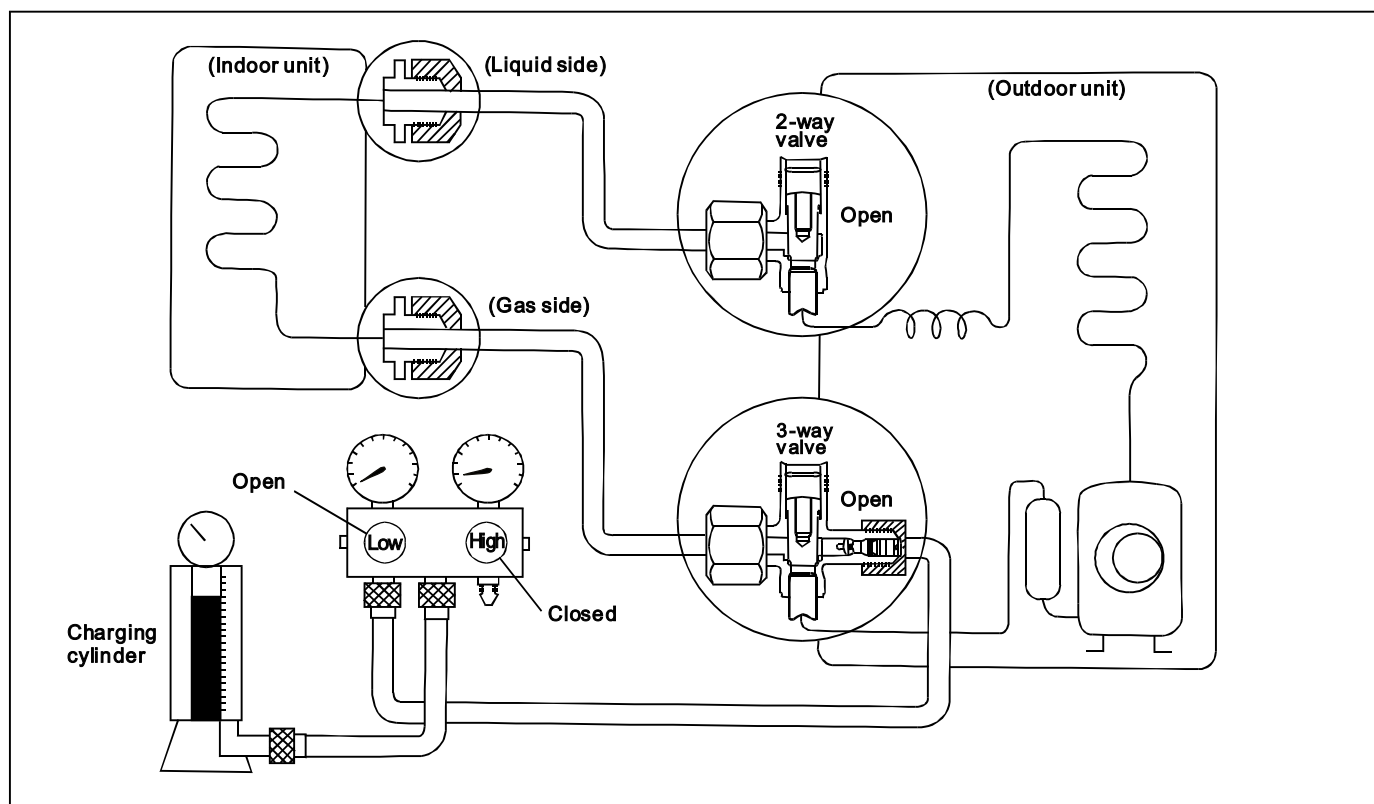
3. Close the valve ( Low side ) on the charge set, turn off the vacuum pump, and confirm that the gauge needle does not move (approximately 5 minutes after turning off the vacuum pump).

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)

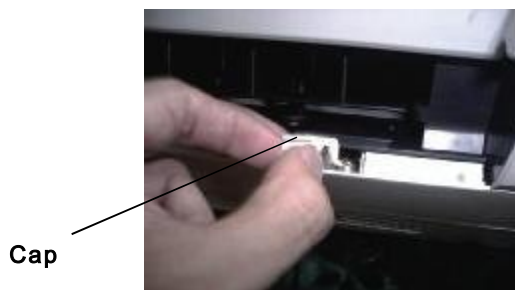


Fig. 3

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)

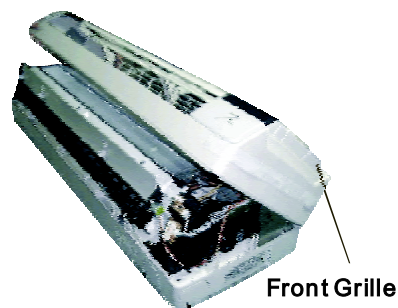


Fig. 5



### Removal Procedure For Electronic Controller

1. Release tabs of the control box cover and detach the control box cover .  
Release the fixing screws of the control box. (Fig. 6)



Fig 6

2. Release the lead wire CN-FM, CN-FB, CN-AIR, CN-STM,CN-RCV ,  
CN-DISP and earth wire(Yellow/Green). Pull out the whole electronic  
controller.



Fig 7

### Removal Procedure For the Discharge Grille

1. Separate the drain hose and the drain plate(Fig. 8)



Fig 8

2. Pull out the discharge grille slightly (Fig. 9)



Fig. 9

### Removal Procedure For Cross Flow Fan

1. Release the two fixing screws on the left side of the evaporator and lift up the evaporator slightly. (Fig. 10)

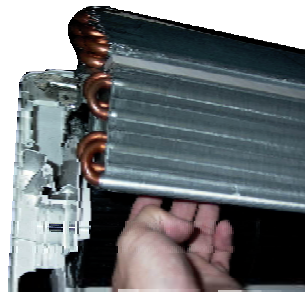


Fig. 10

2. Loose the fixing screw of the cross flow fan. (Fig. 11)



Fixing Screw

Fig. 11

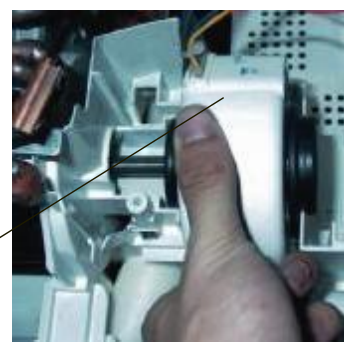
3. After removing the bearing (refer to fig12), indoor fan can be taken out from the left side.



Bearing

Fig 12

4. Lift up the indoor fan slightly, and then pull the fan motor out. ( Fig13 )

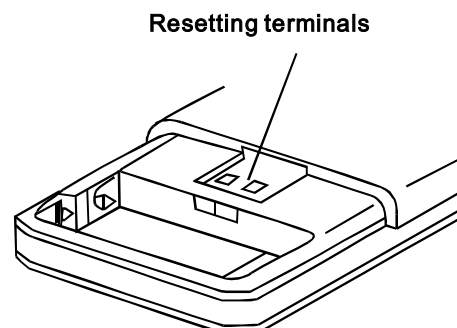


Fan motor

Fig 13

### 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.



Resetting terminals

Fig 14

# 12 Troubleshooting Guide

## 12.1. Refrigeration cycle system

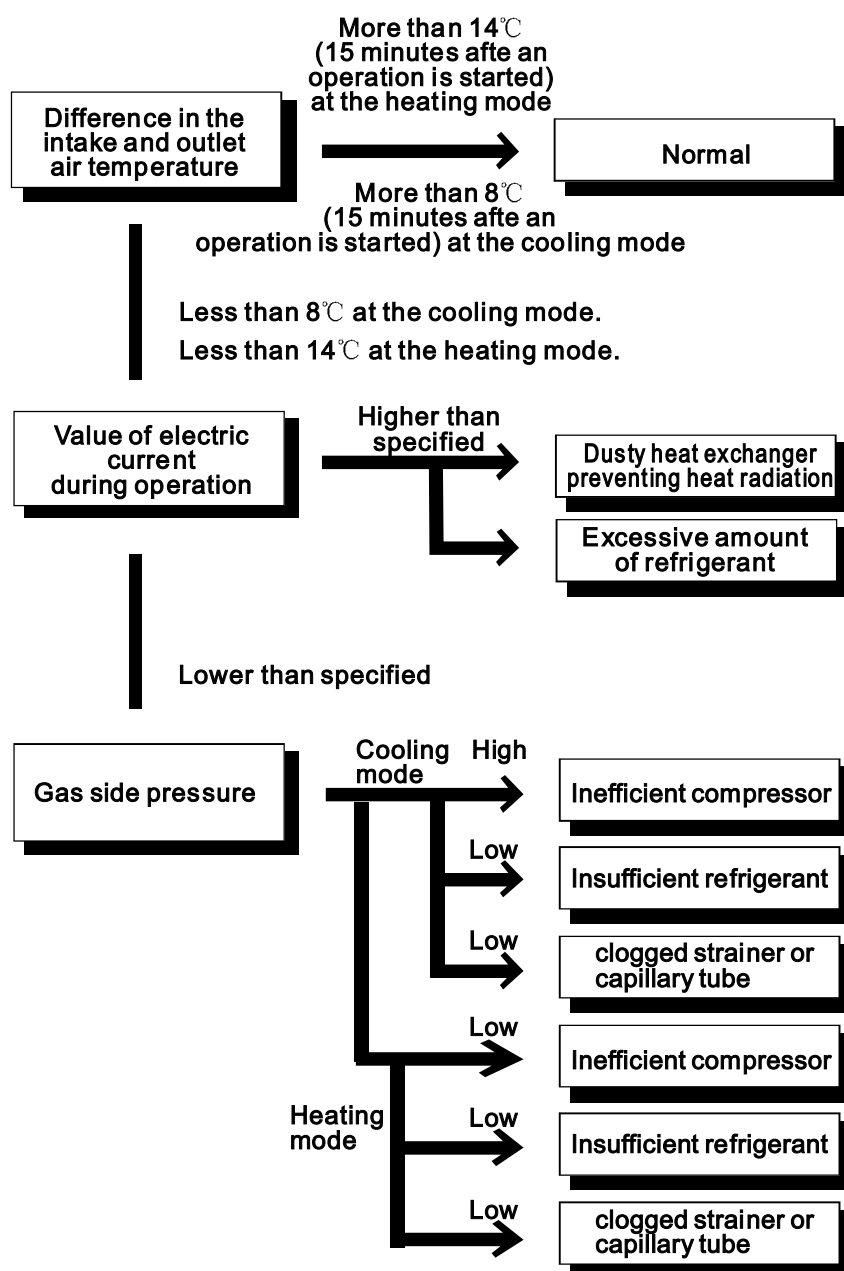
In order to diagnose malfunctions, make sure that there are no electrical problems before inspecting the refrigeration cycle. Such problems include insufficient insulation, problem with the power source, malfunction of compressor or fan.

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.

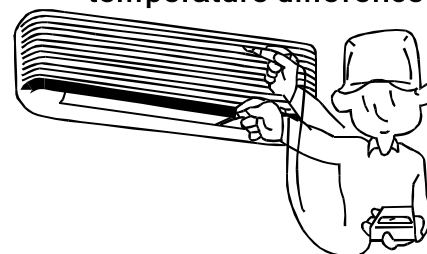
Normal pressure and outlet air temperature(standard)

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

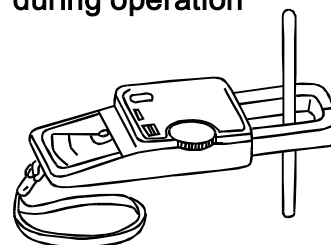
★ Condition: indoor fan speed: high  
outdoor temperature:  
35°C (Cooling mode)  
7°C (Heating mode)



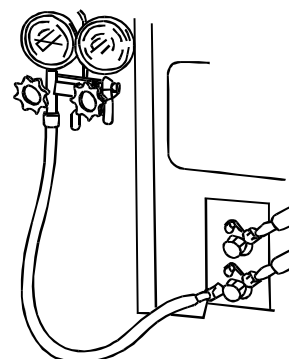
- Measuring the air temperature difference



- Measuring electric current during operation



- Measuring gas side pressure



## 12.2. Relationship between the condition of air conditioner and pressure and electric current

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

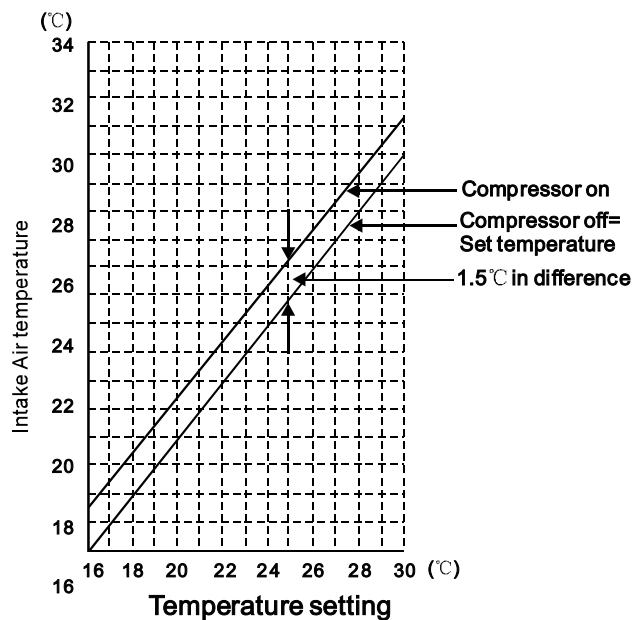
## 12.3. Diagnosis methods of a malfunction of a compressor .

Nature of fault	Symptom
Insufficient compressing of a compressor	<ul style="list-style-type: none"> <li>• Electric current during operation becomes approximately 80% lower than the normal level.</li> <li>• The discharge tube of the compressor becomes abnormally hot (normally 70~90℃).</li> <li>• The difference between high pressure and low pressure becomes almost zero.</li> </ul>
Locked compressor	<ul style="list-style-type: none"> <li>• Electric current reaches a high level abnormally, and the value exceeds the limit of an ammeter. In some cases, a breaker turns off.</li> <li>• The compressor has a humming sound.</li> </ul>
Inefficient switches of the 4-way valves	<ul style="list-style-type: none"> <li>• Electric current during operation becomes approximately 20% lower than the normal value.</li> <li>• 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.</li> </ul>

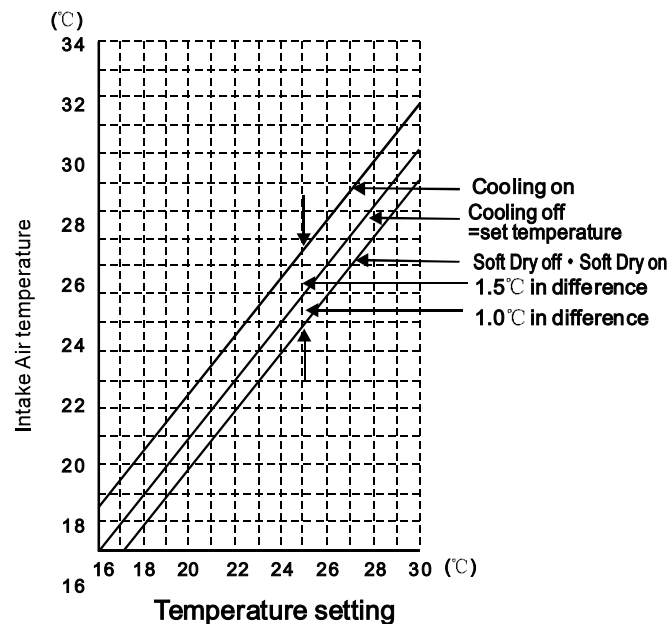
# 13 Technical Data

## ■ Thermostat characteristics

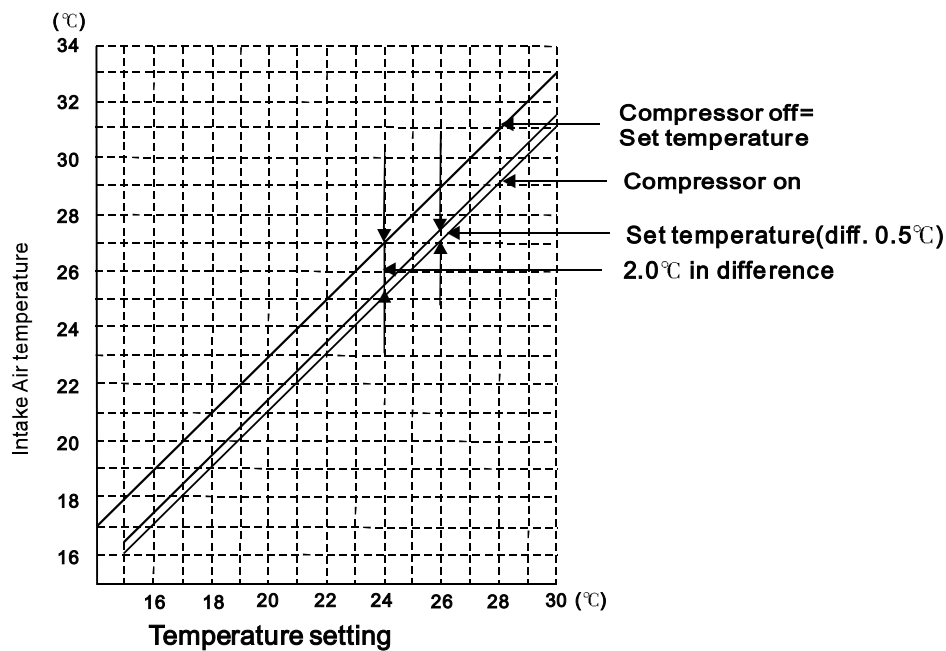
### • Cooling mode



### • Soft dry mode

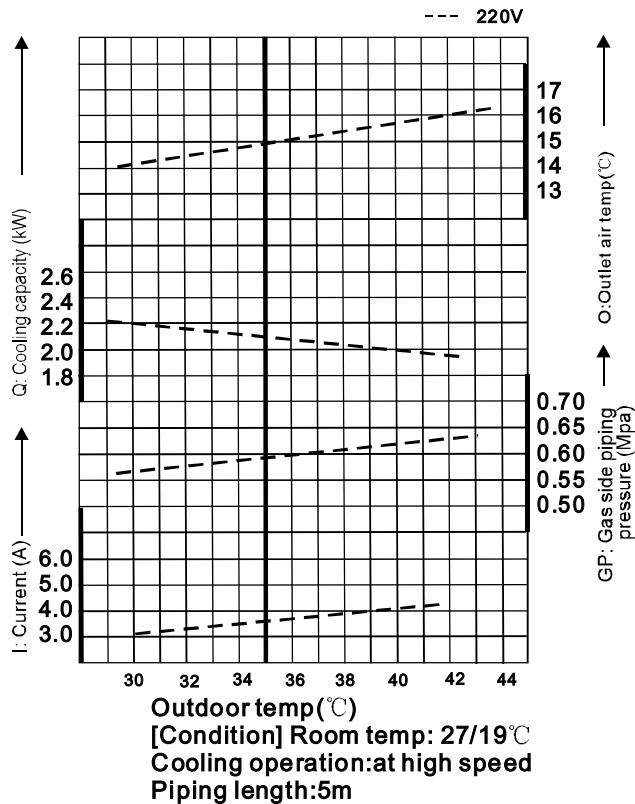


### • Heating mode (Only for CS-PA7GKD/CS-PA9GKD)

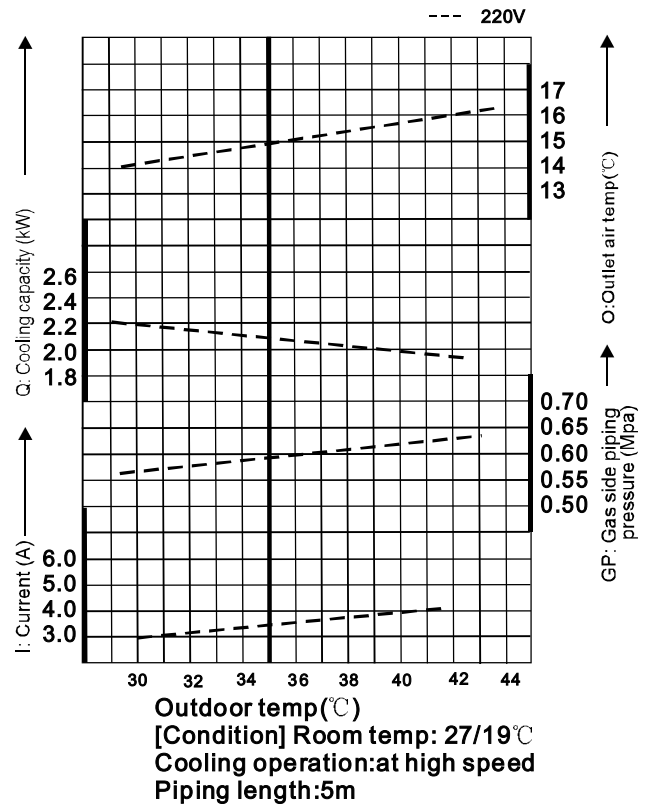


## Cooling characteristics

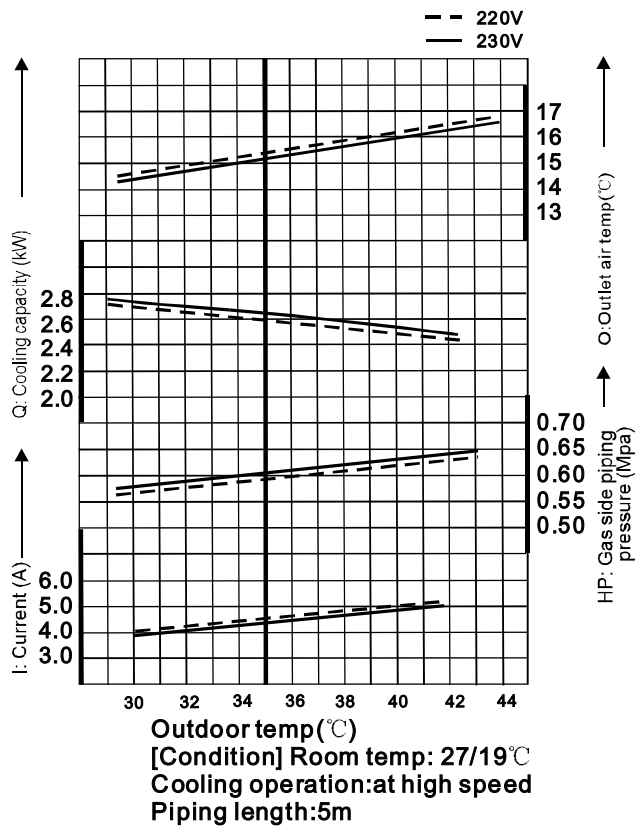
### CS/CU-PA7GKD



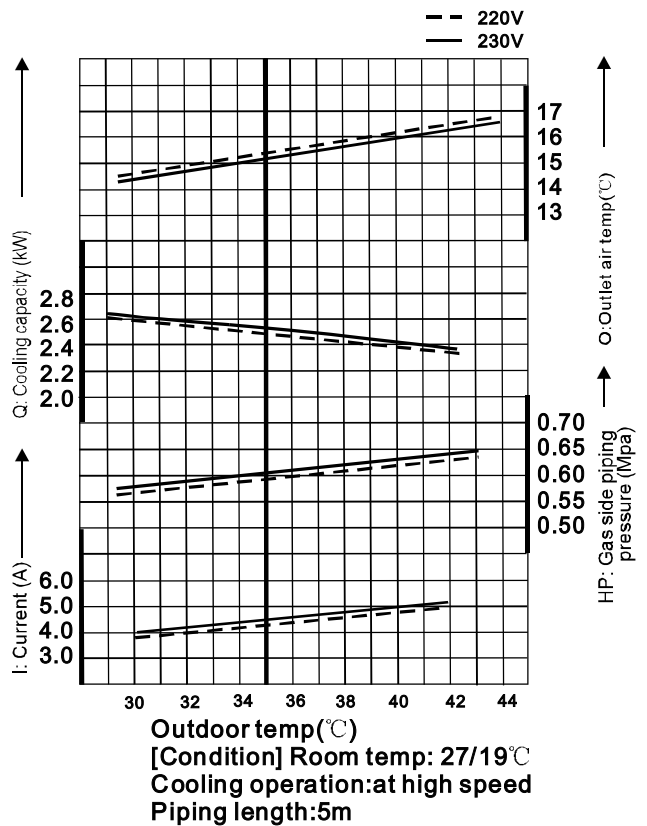
### CS/CU-PC7GKD



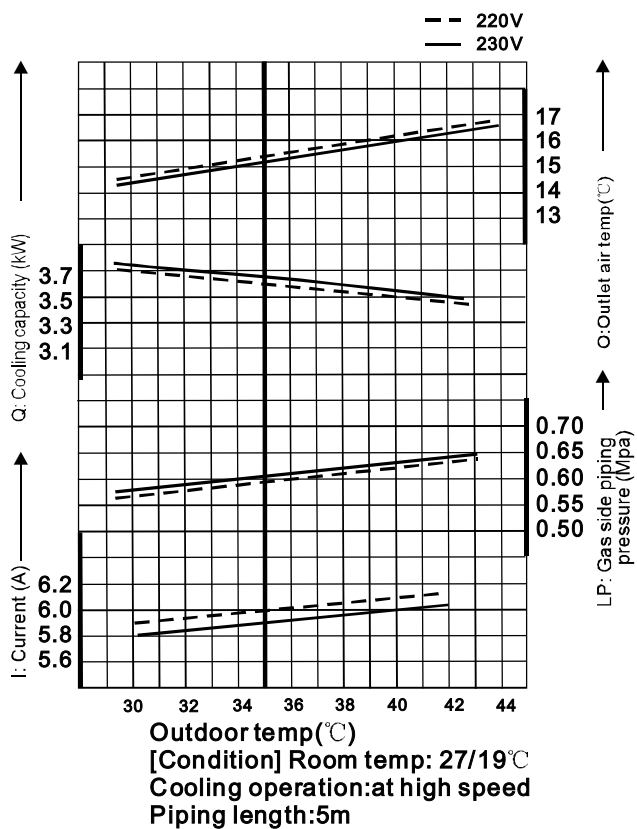
### CS/CU-PA9GKD



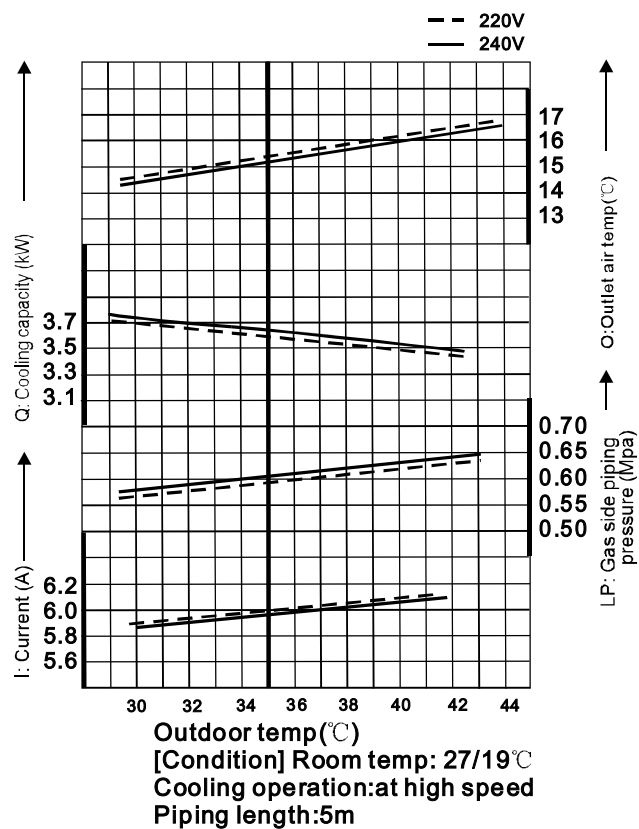
### CS/CU-PC9GKD



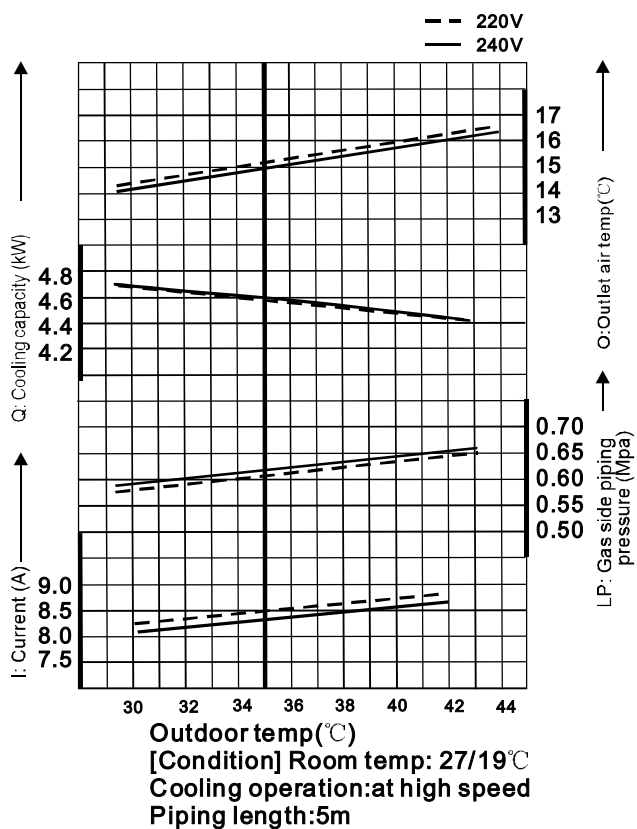
## • CS/CU-PA12GKD



## • CS/CU-PC12GKD

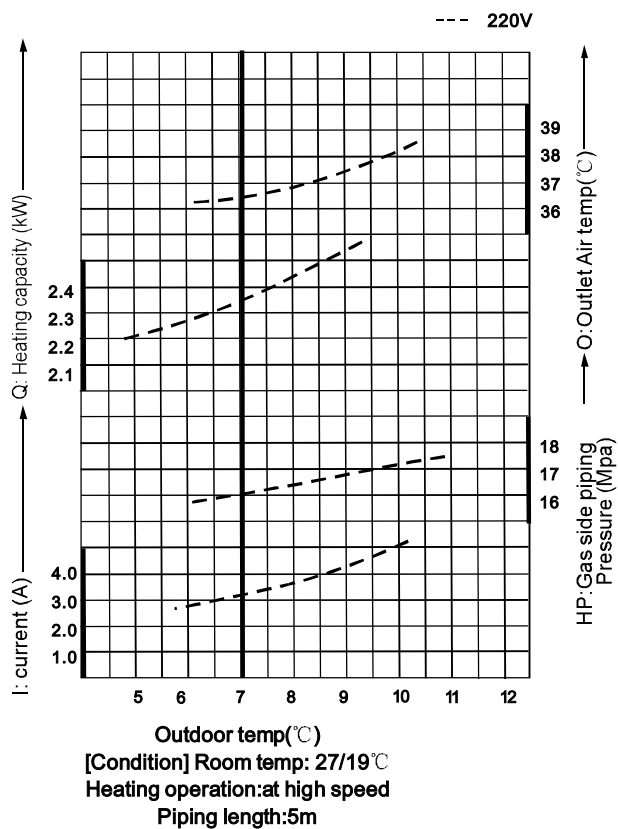


## • CS/CU-PA16GKD

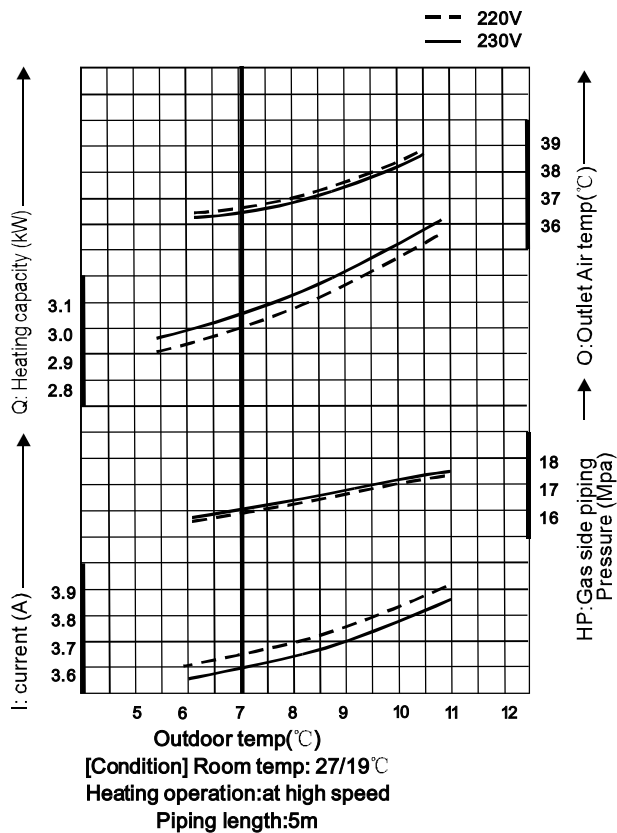


## ■ Heating characteristics

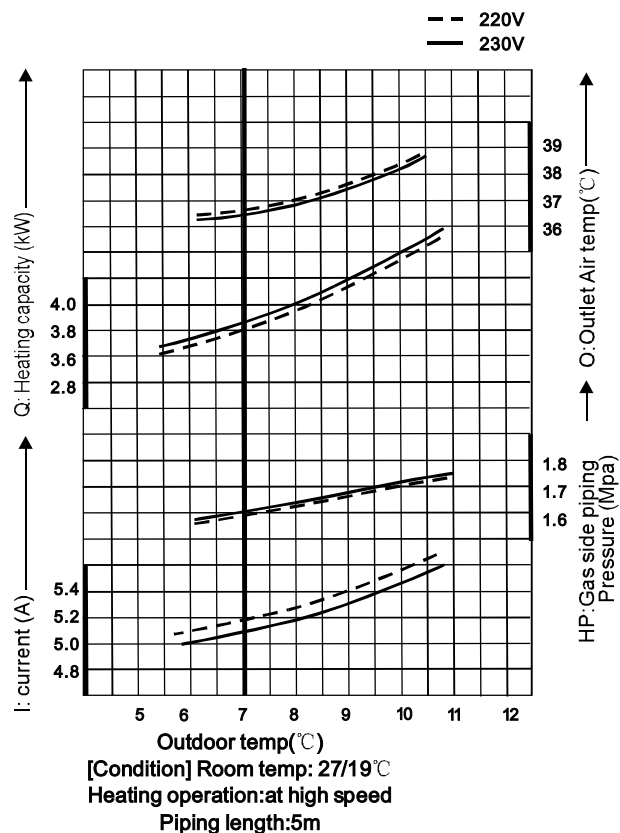
### ● CS/CU-PA7GKD



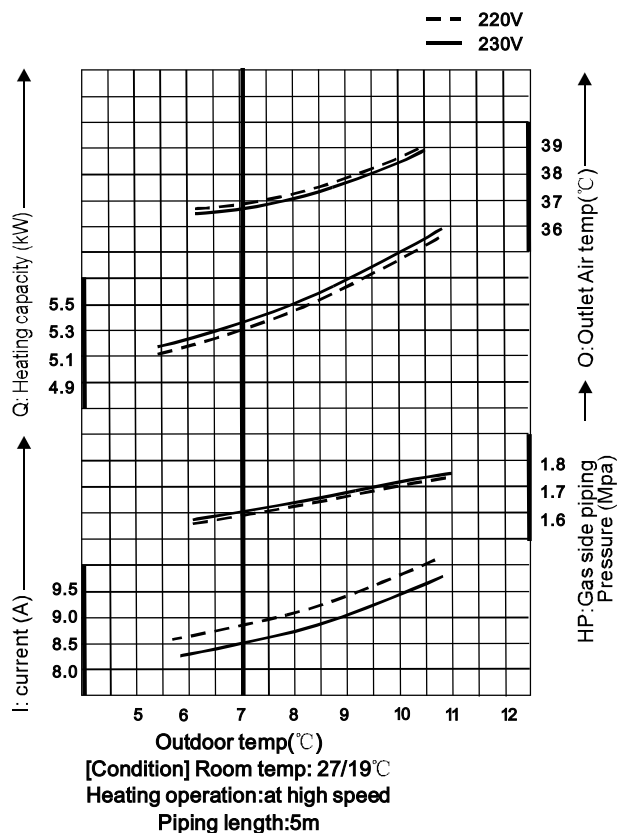
### ● CS/CU-PA9GKD



### ● CS/CU-PA12GKD



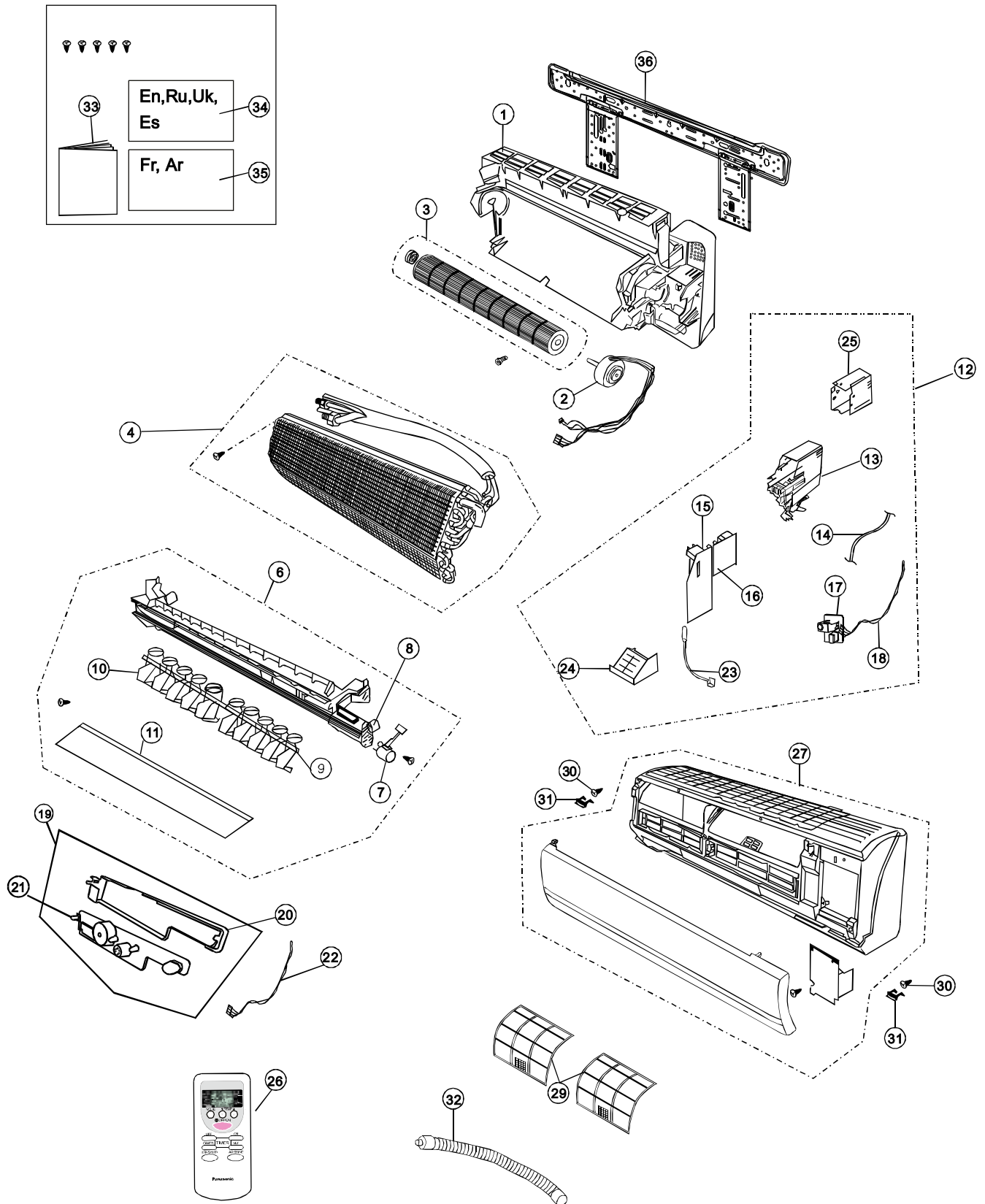
### ● CS/CU-PA16GKD





# 14 Exploded View

CS-PA7GKD/CS-PC7GKD  
CS-PA9GKD/CS-PC9GKD



# 15 Replacement Parts List

**CS-PA7GKD/CS-PC7GKD**  
**CS-PA9GKD/CS-PC9GKD**

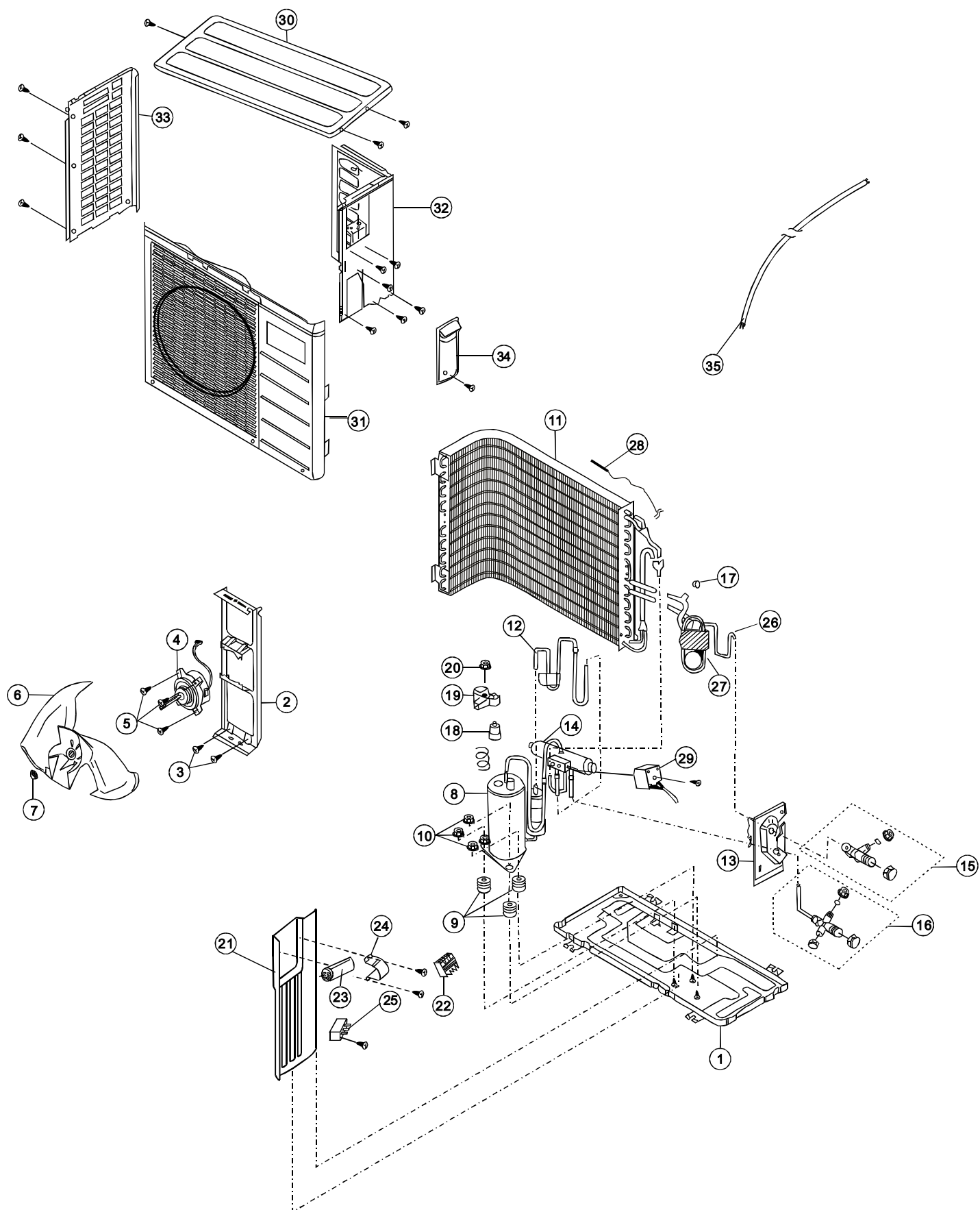
No.	PART NAME & DESCRIPTION	Q'TY	CS-PC7GKD	CS-PA7GKD	CS-PC9GKD	CS-PA9GKD	RE
1	CHASSIS COMPLETE	1	CWD50C1531	CWD50C1531	CWD50C1531	CWD50C1531	
2	FAN MOTOR	1	CWA921372	CWA921372	CWA921372	CWA921372	*
3	CROSS FLOW FAN COMPLETE	1	CWH02C1051	CWH02C1051	CWH02C1051	CWH02C1051	
4	EVAPORATOR	1	CWB30C2146	CWB30C2146	CWB30C2146	CWB30C2146	
6	DISCHARGE GRILLE COMPLETE	1	CWE20C2691	CWE20C2691	CWE20C2691	CWE20C2700	
7	AIR SWING MOTOR	1	CWA981184	CWA981184	CWA981184	CWA981184	
8	DAIN ELBOW	1	CWH52160C	CWH52160C	CWH52160C	CWH52160C	
9	HORIZONTAL VANE	2	CWE24C1184	CWE24C1184	CWE24C1184	CWE24C1184	
11	VERTICAL VANE	1	CWE241144B	CWE241141	CWE241141	CWE241141	
12	C-BOX	1	CWH14C5651	CWH14C5652	CWH14C5653	CWH14C5654	*
13	CONTROL BOARD	1	CWH102261	CWH102261	CWH102261	CWH102261	
14	POWER SUPPLY CORD COMPLETE	1	CWA20C2602	CWA20C2602	CWA20C2602	CWA20C2602	
16	MAIN PCB	1	CWA73C2590	CWA73C2591	CWA73C2592	CWA73C2593	*
17	RECEIVER	1	CWA743353	CWA743353	CWA743353	CWA743353	
19	INDICATOR COMPLETE	1	CWE39C1134	CWE39C1134	CWE39C1134	CWE39C1134	
20	INDICATOR HOLDER-FRONT	1	CWD932447	CWD932447	CWD932447	CWD932447	
21	INDICATOR PCB	1	CWA743929	CWA743929	CWA743929	CWA743929	
22	CONNECTING LEAD-INDICATOR	1	CWA67C5169	CWA67C5252	CWA67C5252	CWA67C5252	
23	SENSOR COMPLETE	1	CWA50C2275	CWA50C2275	CWA50C2275	CWA50C2275	*
24	CONTROL BOARD FRONT COVER	1	CWH131189	CWH131189	CWH131189	CWH131189	
25	CONTROL BOARD TOP COVER	1	CWH131256	CWH131256	CWH131256	CWH131256	
26	REMOTE CONTROL	1	CWA75C2710	CWA75C2712	CWA75C2710	CWA75C2712	*
27	FRONT GRILLE COMPLETE	1	CWE11C3744	CWE11C3744	CWE11C3744	CWE11C3744	
29	AIR FILTER	2	CWD001110	CWD001110	CWD001110	CWD001110	
30	SCREW-FRONT GRILLE	2	XTT4+14CFJ	XTT4+14CFJ	XTT4+14CFJ	XTT4+14CFJ	
31	CAP-FRONT GRILLE	2	CWH521025N	CWH521096	CWH521096	CWH521096	
32	DRAIN HOSE	1	CWH851095	CWH851095	CWH851095	CWH851095	
33	OPERATING INSTRUCTIONS	1	CWF565575	CWF565576	CWF565575	CWF565576	
34	INSTALLATION INSTRUCTION	1	CWF613140	CWF613140	CWF613140	CWF613140	
35	INSTALLATION INSTRUCTION	1	CWF613194	CWF613194	CWF613194	CWF613194	
36	INSTALLATION PLATE	1	CWH36K1025	CWH36K1025	CWH36K1025	CWH36K1025	

**Note:**

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

# 16 Exploded View

CU-PA7GKD/CU-PC7GKD  
CU-PA9GKD/CU-PC9GKD



# 17 Replacement Parts List

CU-PA7GKD/CU-PC7GKD

CU-PA9GKD/CU-PC9GKD

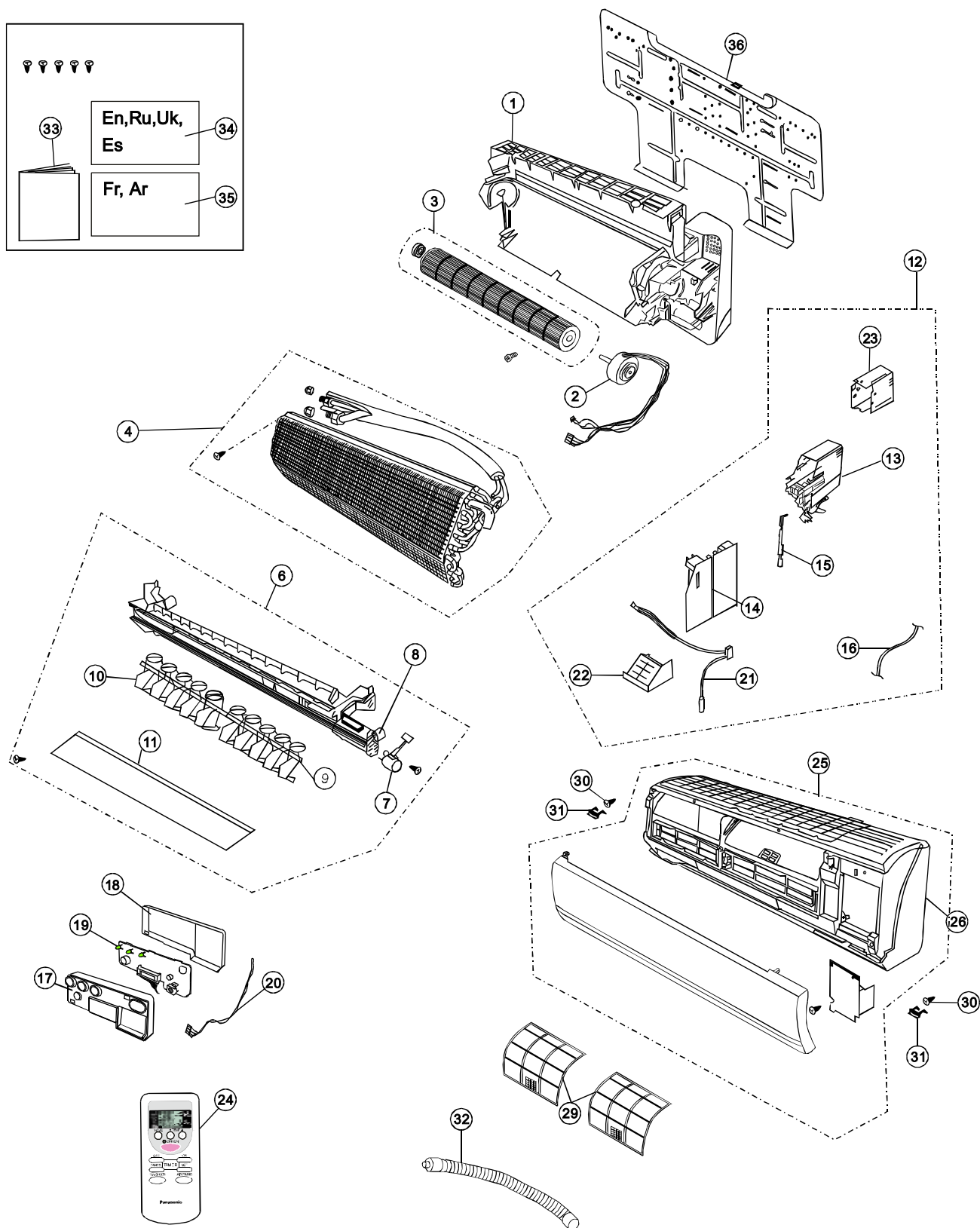
No.	PART NAME & DESCRIPTION	Q'TY	CU-PC7GKD	CU-PA7GKD	CU-PC9GKD	CU-PA9GKD	RE
1	CHASSIS ASS'Y	1	CWD52K1174A	CWD52K1166A	CWD52K1174A	CWD52K1166A	
2	FAN MOTOR BRACKET	1	CWD541094	CWD541095	CWD541094	CWD541095	
3	SCREW-FAN MOTOR BRACKET	2	XTT4+10DFJ	XTT4+10DFJ	XTT4+10DFJ	XTT4+10DFJ	
4	FAN MOTOR	1	CWA951427	CWA951427	CWA951427	CWA951427	*
5	SCREW-FAN MOTOR MOUNT	3	CWH55406J	CWH55406J	CWH55406J	CWH55406J	
6	PROPELLER FAN ASS'Y	1	CWH03K1025	CWH03K1025	CWH03K1025	CWH03K1025	
7	NUT-PROPELLER FAN	1	CWH561036J	CWH561036J	CWH561036J	CWH561036J	
8	COMPRESSOR	1	CWB092129	CWB092128	CWB092279	CWB092296	*
9	ANTI-VIBRATION BUSHING	3	CWH501022	CWH501022	CWH501022	CWH501022	
10	NUT-COMPRESSOR MOUNT	3	CWH561047A	CWH561047A	CWH561047A	CWH561047A	
11	CONDENSER	1	CWB32C2023	CWB32C2137	CWB32C2023	CWB32C2136	
12	TUBE ASSY(3 WAY VALVE)	1	CWT024726	CWT01C4095	CWT024707	CWT01C4097	
13	HOLDER COUPLING ASS'Y	1	CWH351064A	CWH351064A	CWH351064A	CWH351064A	
14	4-WAY VALVE	1	-	CWB001055	-	CWB001045	*
15	2-WAY VALVE	1	CWB021260	CWB021260	CWB021260	CWB021260	
16	3-WAY VALVE	1	CWB011322	CWB011322	CWB011322	CWB011322	
17	STRAINER	1	CWB111026	CWB111026	CWB111026	CWB111026	
18	OLP	1	CWA12146+C	CWA121201	CWA121199	CWA121241	
19	TERMINAL COVER	1	CWH17006	CWH17006	CWH17006	CWH17006	
20	NUT FOR TERMIANL COVER	1	CW7080300J	CW7080300J	CW7080300J	CW7080300J	
21	SOUND PROOF BOARD	1	CWH151144	CWH151144	CWH151144	CWH151144	
22	TERMINAL BOARD ASS'Y	1	CWA28K1105	CWA28K1104	CWA28K1105	CWA28K1104	
23	CAPACITOR-COMPRESSOR	1	DS401206CPXB	DS371206CPXC	DS371256CPXB	DS371306CPXC	*
24	HOLDER-CAPACITOR	1	CWH301037	CWH301037	CWH301037	CWH301037	
25	CAPACITOR-FAN MOTOR	1	F0DAH2050001	F0DAH2050001	F0DAH2050001	F0DAH2050001	*
26	TUBE ASS'Y(CAPILLARY)	1	CWT01C4099	CWT01C4095	CWT01C4100	CWT01C4097	
27	CAPILLARY	1	CWB15433	CWB152605	CWB15471	CWB15433	
28	SENSOR	1	-	CWA50C2393	-	CWA50C2393	
29	V-COIL COMPLETE	1	-	CWA43C2254	-	CWA43C2175	
30	TOP PLATE	1	CWE031044A	CWE031044A	CWE031044A	CWE031044A	
31	CABINET FRONT PLATE	1	CWE061096A	CWE06K1049	CWE06K1049	CWE06K1049	
32	CABINET SIDE PLATE ( R )	1	CWE041125A	CWE041125A	CWE041125A	CWE041125A	
33	CABINET SIDE PLATE (L)	1	CWE041124A	CWE041124A	CWE041124A	CWE041124A	
34	CONTROL BOARD COVER	1	CWH131223	CWH131223	CWH131223	CWH131223	
35	CONNECT WIRE-SENSOR	1	-	CWA22C1022	-	CWA22C1022	

## Note:

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

# 18 Exploded View

CS-PA12GKD/CS-PC12GKD  
CS-PA16GKD



# 19 Replacement Parts List

**CS-PC12GKD/CS-PA12GKD**  
**CS-PA16GKD**

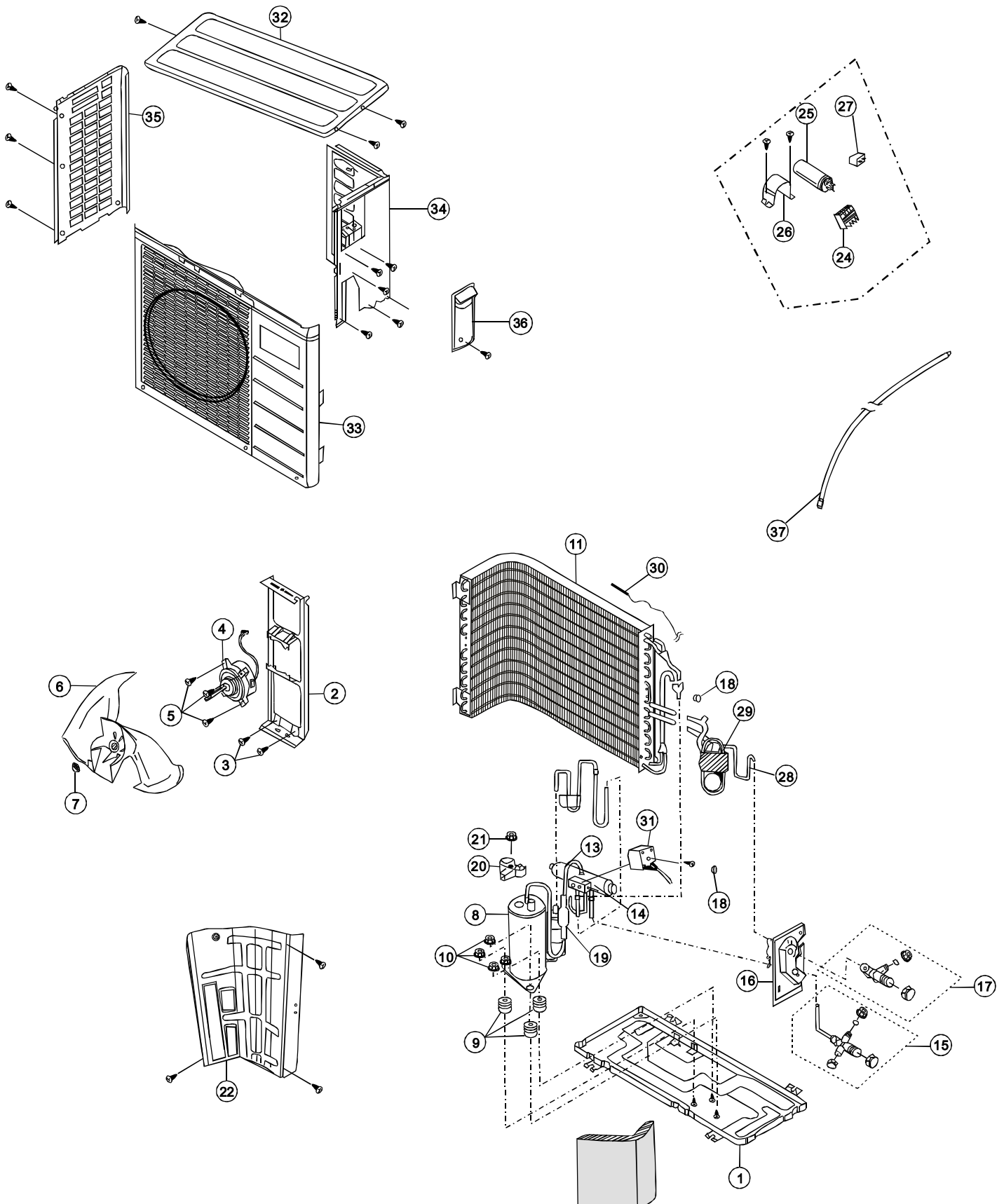
No.	PART NAME & DESCRIPTION	Q'TY	CS-PC12GKD	CS-PA12GKD	CS-PA16GKD	RE
1	CHASSIS COMPLETE	1	CWD50C1530	CWD50C1530	CWD50C1543	
2	FAN MOTOR	1	CWA921378	CWA921378	CWA921378	*
3	CROSS FLOW FAN COMPLETE	1	CWH02C1055	CWH02C1055	CWH02C1055	
4	EVAPORATOR	1	CWB30C2106	CWB30C2106	CWB30C2184	
6	DISCHARGE GRILLE COMPLETE	1	CWE20C2689	CWE20C2689	CWE20C2689	
7	AIR SWING MOTOR	1	CWA981091	CWA981091	CWA981091	
8	DAIN ELBOW	1	CWH52160C	CWH52160C	CWH52160C	
9	HORIZONTAL VANE(RIGHT)	1	CWE24C1189	CWE24C1189	CWE24C1189	
10	HORIZONTAL VANE(LEFT)	1	CWE24C1190	CWE24C1190	CWE24C1190	
11	VERTICAL VANE	1	CWE24C1191	CWE24C1191	CWE24C1191	
12	C-BOX	1	CWH14C5650	CWH14C5649	CWH14C5648	*
13	CONTROL BOARD	1	CWH102337	CWH102337	CWH102337	
14	MAIN PCB	1	CWA73C2589	CWA73C2588	CWA73C2634	*
15	PARTICULAR PIECE	1	CWD932689D	CWD932689D	CWD932689D	
16	POWER SUPPLY CORD COMPLETE	1	CWA20C2602	CWA20C2602	CWA20C2604	
17	INDICATOR HOLDER-FRONT	1	CWD932721	CWD932721	CWD932721	
18	INDICATOR HOLDER-BACK	1	CWD932722	CWD932722	CWD932722	
19	INDICATOR PCB	1	CWA744693	CWA744693	CWA744693	
21	SENSOR COMPLETE	1	CWA50C2271J	CWA50C2271J	CWA50C2271J	*
22	CONTROL BOARD FRONT COVER	1	CWH131235	CWH131235J	CWH131235	
23	CONTROL BOARD TOP COVER	1	CWH131237	CWH131237	CWH131237	
24	REMOTE CONTROL	1	CWA75C2710	CWA75C2712	CWA75C2712	*
25	FRONT GRILLE COMPLETE	1	CWE11C3742	CWE11C3742	CWE11C3742	
29	AIR FILTER	2	CWD001168	CWD001168	CWD001168	
30	SCREW-FRONT GRILLE	2	XTT4+16CFJ	XTT4+16CFJ	CWXTT4+16CFJ	
31	CAP-FRONT GRILLE	2	H521109C	H521109C	CWH521109C	
32	DRAIN HOSE	1	CWH851095	CWH851095	CWH851095	
33	OPERATING INSTRUCTIONS	1	CWF565574	CWF565573	CWF565573	
34	INSTALLATION INSTRUCTION	1	CWF613138	CWF613138	CWF613138	
35	INSTALLATION INSTRUCTION	1	CWF613139	CWF613139	CWF613139	
36	INSTALLATION PLATE	1	CWH361086	CWH361086	CWH361086	

**Note:**

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

## 20 Exploded View

CU-PA12GKD/CU-PC12GKD  
CU-PA16GKD



## 21 Replacement Parts List

### CU-PC12GKD/CU-PA12GKD CU-PA16GKD

No.	PART NAME & DESCRIPTION	Q'TY	CU-PC12GKD	CU-PA12GKD	CU-PA16GKD	RE
1	CHASSIS ASS'Y	1	CWD52K1175A	CWD52K1153A	CWD52K1165A	
2	FAN MOTOR BRACKET	1	CWD541093	CWD541093	CWD541093	
3	SCREW-FAN MOTOR BRACKET	2	CWH551148A	CWH551148A	CWH551148A	
4	FAN MOTOR	1	CWA951427	CWA951427	CWA951521	*
5	SCREW-FAN MOTOR MOUNT	4	CWH55406J	CWH55406J	CWH55406J	
6	PROPELLER FAN ASS'Y	1	CWH03K1034	CWH03K1034	CWH03K1010	
7	NUT-PROPELLER FAN	1	H561036J	H561036J	CWH561036J	
8	COMPRESSOR	1	CWB092117	CWB092117	CWB092236	*
9	ANTI-VIBRATION BUSHING	3	CWH50055	CWH50055	CWH50055	
10	NUT-COMPRESSOR MOUNT	3	CWH561049	CWH561049	CWH561049	
11	CONDENSER	1	CWB32C1985	CWB32C1986	CWB32C1992	
13	TUBE ASS'Y(3 WAY VALVE)	1	CWT024406	CWT01C4085	CWT01C4101	
14	4-WAY VALVE	1	-	CWB001048	CWB001048	*
15	3-WAY VALVE	1	CWB011476	CWB011476	CWB011476	
16	HOLDER COUPLING ASS'Y	1	CWH351064A	CWH351064A	CWH351064A	
17	2-WAY VALVE	1	CWB021359	CWB021359	CWB021359	
18	STRAINER	1	CWB111026	CWB111026	CWB111026	
19	FILTER	1	-	-	CWB11051	
20	TERMINAL COVER	1	CWH171032	CWH171032	CWH171032	
21	NUT FOR TERMIALN COVER	1	CW7080300J	7080300J	7080300J	
22	SOUND PROOF BOARD	1	CWH151139	CWH151139	CWH151139	
24	TERMINAL BOARD ASS'Y	1	CWA28K1105	CWA28K1104	CWA28K1104	
25	CAPACITOR-COMPRESSOR	1	DS371306CPXC	DS371306CPXC	DS371506CPXA	*
26	HOLDER-CAPACITOR	1	CWH30165	CWH30165	CWH30170	
27	CAPACITOR-FAN MOTOR	1	F0DAH2050001	F0DAH2050001	DS401305XPQA	*
28	TUBE ASS'Y(CAPILLARY)	1	CWT01C4084	CWT01C4086	CWT01C4102	
29	CAPILLARY	1	CWB15163	CWB15308	CWB15383	
30	SENSOR	1	-	CWA50C2393	CWA50C2266	*
31	V-COIL COMPLETE	1	-	CWA43C2175	CWA43C2175	
32	TOP PLATE	1	CWE031060A	CWE031060A	CWE031060A	
33	CABINET FRONT PLATE	1	CWE06C1190	CWE06C1190	CWE06C1158	
34	CABINET SIDE PLATE ( L )	1	CWE041187A	CWE041187A	CWE041187A	
35	CABINET SIDE PLATE (R)	1	CWE041188A	CWE041188A	CWE041188A	
36	CONTROL BOARD COVER	1	CWH131223	CWH131223	CWH131223	
37	CONNECT WIRE-SENSOR	1	-	CWA22C1022	CWA22C1044	

**Note:**

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