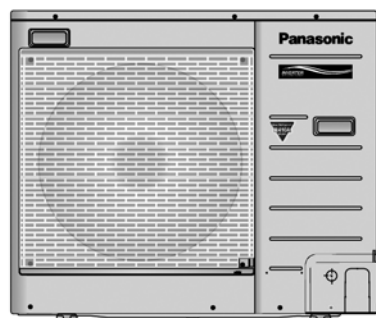
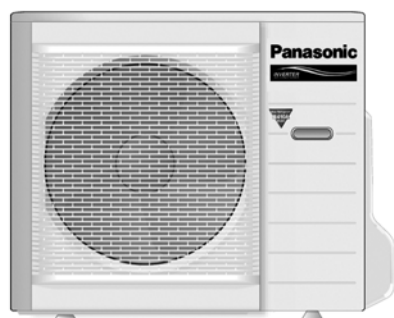


# Service Manual

**Air Conditioner**

**Indoor Unit      Outdoor Unit**  
**CS-RE18HKE    CU-RE18HKE**  
**CS-RE24HKE    CU-RE24HKE**



## **⚠ 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.

## **⚠ PRECAUTION OF LOW TEMPERATURE**

In order to avoid frostbite, be assured of no refrigerant leakage during the installation or repairing of refrigeration circuit.

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# 1 Safety Precautions







- Read the following "SAFETY PRECAUTIONS" carefully before perform any servicing.
- Electrical work must be installed or serviced by a licensed electrician. Be sure to use the correct rating of the power plug and main circuit for the model installed.
- The caution items stated here must be followed because these important contents are related to safety. The meaning of each indication used is as below. Incorrect installation or servicing due to ignoring of the instruction will cause harm or damage, and the seriousness is classified by the following indications.

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





- The items to be followed are classified by the symbols:

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

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

 <b>WARNING</b>	
1. Engage dealer or specialist for installation and servicing. If installation of servicing done by the user is defective, it will cause water leakage, electrical shock or fire.	
2. Install according to this installation instructions strictly. If installation is defective, it will cause water leakage, electric shock or fire.	
3. Use the attached accessories parts and specified parts for installation and servicing. Otherwise, it will cause the set to fall, water leakage, fire or electrical shock.	
4. Install at a strong and firm location which is able to withstand the set's weight. If the strength is not enough or installation is not properly done, the set will drop and cause injury.	
5. For electrical work, follow the local national wiring standard, regulation and the installation instruction. An independent circuit and single outlet must be used. If electrical circuit capacity is not enough or defect found in electrical work, it will cause electrical shock or fire.	
6. This equipment is strongly recommended to install with Earth Leakage Circuit Breaker (ELCB) or Residual Current Device (RCD). Otherwise, it may cause electrical shock and fire in case equipment breakdown or insulation breakdown.	
7. Use the specified cable and connect tightly for indoor/outdoor connection. Connect tightly and clamp the cable so that no external force will be acted on the terminal. If connection or fixing is not perfect, it will cause heat-up or fire at the connection.	
8. Wire routing must be properly arranged so that control board cover is fixed properly. If control board cover is not fixed perfectly, it will cause heat-up or fire at the connection point of terminal, fire or electrical shock.	
9. When carrying out piping connection, take care not to let air substances other than the specified refrigerant go into refrigeration cycle. Otherwise, it will cause lower capacity, abnormal high pressure in the refrigeration cycle, explosive and injury.	
10. Do not install outdoor unit near handrail of veranda. When installing air-conditioner unit at veranda of high rise building, child may climb up to outdoor unit and cross over the handrail and causing accident.	
11. This equipment must be properly earthed. Earth line must not be connected to gas pipe, water pipe, earth of lightning rod and telephone. Otherwise, it may cause electric shock in case equipment breakdown or insulation breakdown.	
12. When connecting the piping, do not allow air or any substances other than the specified refrigerant to enter the refrigeration cycle. Otherwise, this may lower the capacity, cause abnormally high pressure in the refrigeration cycle, and possibly result in explosion and injury.	
13. Do not damage or use unspecified power supply cord. Otherwise it will cause fire or electric shock.	
14. Do not modify the length of the power supply cord or use of the extension cord, and do not share the single outlet with other electrical appliances. Otherwise, it will cause fire or electrical shock.	
15. It is desirable that the amount of residual oil is less than 40 mg/10m. Thickness of copper pipes used with R410A must be more than 0.8 mm. Never use copper pipes thinner than 0.8 mm.	
16. During installation, before run the compressor, confirm the refrigerant pipes are fixed. Operation of compressor without fixing the piping, setting the valves at open condition, a burst may occur and cause injury.	
17. After completion of the installation servicing confirm there is no leakage of refrigerant gas. It may generate toxic gas when the refrigerant contacts with fire.	
18. Ventilate if there is refrigerant gas leakage during operation. It may cause toxic gas when the refrigerant contacts with fire.	

 **CAUTION**

1. Do not install the unit at place where leakage of flammable gas may occur. In case gas leaks and accumulates at surrounding of the unit, it may cause fire.	
2. Carry out drainage piping as mentioned in installation instructions. If drainage is not perfect, water may enter the room and damage the furniture.	
3. Tighten the flare nut with torque wrench according to specified method. If the flare nut is over-tightened, after a long period, the flare may break and cause refrigerant gas leakage.	
4. Do not touch outdoor unit air inlet and aluminium fin. It may cause injury.	
5. Select an installation location which is easy for maintenance.	
6. Pb free solder has a higher melting point than standard solder; typically the melting point is 50°F - 70°F (30°C - 40°C) higher. Please use a high temperature solder iron. In case of the soldering iron with temperature control, please set it to 700 ± 20°F (370 ± 10°C). Pb free solder will tend to splash when heated too high (about 1100°F / 600°C).	
7. Power supply connection to the conditioner. Connect the power supply cord of the air conditioner to the mains using one of the following methods. Power supply point shall be the place where there is ease for access for the power disconnection in case of emergency. In some countries, permanent connection of this room air conditioner to the power supply is prohibited. 1. Power supply connection to the receptacle using a power plug. Use an approved power plug with earth pin for the connection to the socket. 2. Power supply connection to a circuit breaker for the permanent component. Use an approved circuit breaker for the permanent connection. It must be a double pole switch with a minimum 3.5 mm contact gap.	
8. Do not release refrigerant during piping work for installation, servicing, reinstallation and during repairing a refrigeration parts. Take care of the liquid refrigerant, it may cause frostbite.	
9. Installation work. It may need two people to carry out the installation work.	
10. Do not install this appliance in a laundry room or other location where water may drip from the ceiling, etc.	

## 2 Specifications

### 2.1. CS-RE18HKE CU-RE18HKE

ITEM			UNIT	INDOOR UNIT	OUTDOOR UNIT	
Performance Test Condition			EUROVENT			
C O O L I N G	Capacity		kW	5.30 (0.90 ~ 6.00)		
			BTU/h	18100 (3070 ~ 20500)		
			*kCal/h	4560 (770 ~ 5160)		
	EER		W/W (Class)	3.21 (4.19 ~ 2.93)		
			BTU/hW	11.0 (14.3 ~ 10.0)		
	Noise Level		dB (A)	High: 44, Low: 37	High: 47/-	
Power level dB			High: 57/-	High: 60/-		
H E A T I N G	Capacity		kW	6.60 (0.90 ~ 8.00)		
			BTU/h	22500 (3070 ~ 27300)		
			*kCal/h	5680 (770 ~ 6880)		
	COP		W/W (Class)	3.69 (3.67 ~ 3.02)		
			BTU/hW	12.6 (12.5 ~ 10.3)		
	Noise Level		dB (A)	High: 44, Low: 37	High: 47/-	
Power level dB			High: 57/-	High: 60/-		
Moisture Removal			l/h	2.9		
			pt/h	6.1		
Air Volume	Lo	Cooling	m <sup>3</sup> /min (ft <sup>3</sup> /min)	12.3 (433)	—	
		Heating		13.1 (463)	—	
	Hi	Cooling	m <sup>3</sup> /min (ft <sup>3</sup> /min)	15.2 (540)	40.0 (1410)	
		Heating		16.7 (590)	38.6 (1360)	
Refrigeration Control Device			—	Expansion Valve		
Refrigeration Oil (Charged)			cm <sup>3</sup>	—	RB68A or FREOL ALPHA68M (400)	
Refrigerant (Charged) R410A			kg (oz)	—	1.18 (41.7)	
Dimension	Height		mm (inch)	275 (10-27/32)	750 (29-17/32)	
	Width		mm (inch)	998 (39-5/16)	875 (34-15/32)	
	Depth		mm (inch)	230 (9-1/16)	345 (13-19/32)	
Net Weight			kg (lbs)	10 (22)	48 (106)	
Pipe Diameter	Gas		mm (inch)	12.7 (1/2")		
	Liquid		mm (inch)	6.35 (1/4")		
Height Difference			m (ft)	15.0 (49.2)		
Pipe Length Range			m (ft)	3 (9.8) ~ 20 (65.6)		
Additional Gas Amount			g/m (oz/ft)	20 (0.2)		
Refrigeration Charge Less			m (ft)	10.0 (32.8)		
Drain Hose	Inner Diameter		mm	16	—	
	Length		mm	650	—	
Compressor	Type		—	Hermetic		
	Motor Type		—	Brushless (4-pole)		
	Rated Output		W	—	900	
Fan	Type		—	Cross-Flow Fan	Propeller Fan	
	Material		—	ASHT-18	PP Resin	
	Motor Type		—	Transistor (8-poles)	PWM (8-poles)	
	Input Power		W	68	62.1	
	Output Power		W	30	40	
	Fan Speed	Lo (Cool/Heat)		rpm	1160 / 1240	—
		Me (Cool/Heat)		rpm	—	—
		Hi (Cool/Heat)		rpm	1430 / 1580	660 / 640
SHi (Cool/Heat)		rpm	—	—		

ITEM		UNIT	INDOOR UNIT	OUTDOOR UNIT
Heat Exchanger	Fin Material		Aluminium (Pre coat)	Aluminium (Blue coat)
	Fin Type		Slit Fin	Corrugated Fin
	Row x Stage x FPI		2 x 15 x 19	2 x 34 x 16
	Size (W x H x L)	mm	810 x 315 x 25.4	36.4 x 714 x 803.2:831.9
Air Filter Type	Material		P. P. Honey Comb	—
	Style		One-Touch	—

1. Cooling capacities are based on indoor temperature of 27°C D.B. (80.6°F D.B.), 19.0°C W.B. (66.2°F W.B.) and outdoor air temperature of 35°C D.B. (95°F D.B.), 24°C W.B. (75.2°F W.B.)
2. Heating capacities are based on indoor temperature of 20°C D.B. (80.6°F D.B.) and outdoor air temperature of 7°C D.B. (44.6°F D.B.), 6°C W.B. (42.8°F W.B.)

Item		Unit	
Power Source (Phase, Voltage, Cycle)		∅	Single
		V	230
		Hz	50
Input Power	Cooling	W	1.65k (215 ~ 2.05k)
	Heating	W	1.79k (245 ~ 2.65k)
*Annual consumption		W	825
Starting Current		A	8.3
Running Current	Cooling	A	7.5
	Heating	A	8.1
Maximum Current	Cooling	A	11.9
Power Factor	Cooling	%	96
	Heating	%	96
Power factor means total figure of compressor, indoor fan motor and outdoor fan motor.			
Power Cord	Number of core		—
	Length	m (ft)	—
Thermostat			—
Protection Device			—

Note

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

## 2.2. CS-RE24HKE CU-RE24HKE

ITEM			UNIT	INDOOR UNIT	OUTDOOR UNIT	
Performance Test Condition				EUROVENT		
C O O L I N G	Capacity		kW	6.8 (0.90 ~ 8.10)		
			BTU/h	23200 (3070 ~ 27600)		
			*kCal/h	5850 (770 ~ 6970)		
	EER		W/W (Class)	3.21 (2.57 ~ 3.00)		
			BTU/hW	10.9 (8.8 ~ 10.2)		
	Noise Level		dB (A)	High: 47, Low: 38	High: 52	
		Power level dB	High: 60	High: 66		
H E A T I N G	Capacity		kW	8.60 (0.90 ~ 9.90)		
			BTU/h	29300 (3070 ~ 33800)		
			*kCal/h	7400 (770 ~ 8510)		
	COP		W/W (Class)	3.23 (2.50 ~ 3.09)		
			BTU/hW	11.0 (8.5 ~ 10.6)		
	Noise Level		dB (A)	High: 47, Low: 38	High: 52	
		Power level dB	High: 60	High: 66		
Moisture Removal			l/h	3.9		
			pt/h	8.2		
Air Volume	Lo	Cooling	m <sup>3</sup> /min (ft <sup>3</sup> /min)	16.9 (600)	—	
		Heating		18.3 (650)	—	
	Hi	Cooling	m <sup>3</sup> /min (ft <sup>3</sup> /min)	16.9 (600)	54.5 (1925)	
		Heating		18.3 (650)	54.5 (1925)	
Refrigeration Control Device				—	Expansion Valve	
Refrigeration Oil (Charged)			cm <sup>3</sup>	—	FV50S (800)	
Refrigerant (Charged) R410A			kg (oz)	—	1.65 (58.2)	
Dimension	Height		mm (inch)	275 (10-27/32)	795 (31-5/16)	
	Width		mm (inch)	998 (39-5/16)	900 (35-7/16)	
	Depth		mm (inch)	230 (9-1/16)	320 (12-5/8)	
Net Weight			kg (lbs)	11 (24)	67 (148)	
Pipe Diameter	Gas		mm (inch)	15.88 (5/8")		
	Liquid		mm (inch)	6.35 (1/4")		
Height Difference			m (ft)	20.0 (65.6)		
Pipe Length Range			m (ft)	3 (9.8) ~ 30 (98.4)		
Additional Gas Amount			g/m (oz/ft)	30 (0.3)		
Refrigeration Charge Less			m (ft)	10.0 (32.8)		
Drain Hose	Inner Diameter		mm	16	—	
	Length		mm	650	—	
Compressor	Type			—	Hermetic	
	Motor Type			—	Brushless (4-pole)	
	Rated Output		W	—	1.70k	
Fan	Type			Cross-Flow Fan	Propeller Fan	
	Material			ASHT-18	PP (MICA 30% + GF 10%)	
	Motor Type			Transistor (8-poles)	Induction (6-poles)	
	Input Power		W	—	97.8	
	Output Power		W	30	76	
	Fan Speed	Lo (Cool/Heat)		rpm	1180 / 1280	—
		Me (Cool/Heat)		rpm	—	—
		Hi (Cool/Heat)		rpm	1550 / 1680	700
SHi (Cool/Heat)			rpm	—	—	
Heat Exchanger	Fin Material			Aluminium (Pre coat)	Aluminium	
	Fin Type			Slit Fin	Corrugated Fin	
	Row x Stage x FPI			2 x 15 x 21	2 x 30 x 19	
	Size (W x H x L)		mm	810 x 315 x 25.4	38.1 x 762 x 873.8:903.8	

ITEM		UNIT	INDOOR UNIT	OUTDOOR UNIT
Air Filter Type	Material		P. P. Honey Comb	—
	Style		One-Touch	—

1. Cooling capacities are based on indoor temperature of 27°C D.B. (80.6°F D.B.), 19.0°C W.B. (66.2°F W.B.) and outdoor air temperature of 35°C D.B. (95°F D.B.), 24°C W.B. (75.2°F W.B.)
2. Heating capacities are based on indoor temperature of 20°C D.B. (80.6°F D.B.) and outdoor air temperature of 7°C D.B. (44.6°F D.B.), 6°C W.B. (42.8°F W.B.)

Item		Unit	
Power Source (Phase, Voltage, Cycle)		∅	Single
		V	230
		Hz	50
Input Power	Cooling	W	2.12k (350 - 2.70k)
	Heating	W	2.66 (360 - 3.20k)
*Annual consumption		W	1060
Starting Current		A	12.1
Running Current	Cooling	A	9.7
	Heating	A	12.1
Maximum Current	Cooling	A	14.6
Power Factor	Cooling	%	93
	Heating	%	96
Power factor means total figure of compressor, indoor fan motor and outdoor fan motor.			
Power Cord	Number of core		—
	Length	m (ft)	—
Thermostat			—
Protection Device			—

Note

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

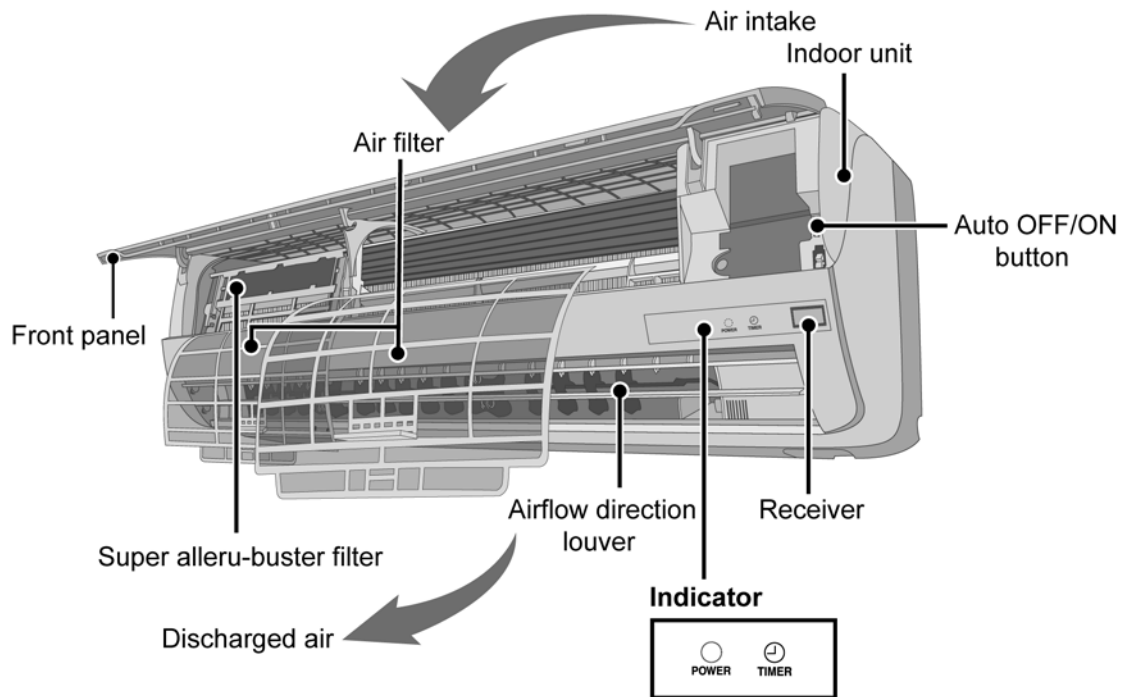


# 3 Features

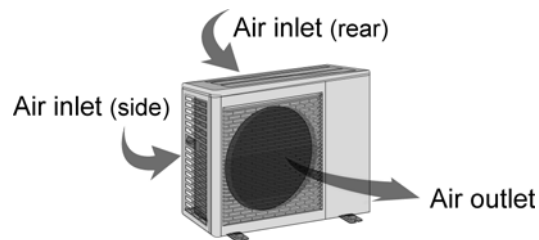
- **Inverter Technology**
  - Wider output range
  - Energy saving
  - Quick Cooling
  - More precise temperature control
- **Environment Protection**
  - Non-ozone depletion substances refrigerant (R410A)
- **Long Installation Piping**
  - CS/CU-RE18HKE, long piping up to 20 meter
  - CS/CU-RE24HKE, long piping up to 30 meter
- **Easy to use remote control**
- **Quality Improvement**
  - Random auto restart after power failure for safety restart operation
  - Gas leakage protection
  - Prevent compressor reverse cycle
  - Inner protector to protect compressor
  - Noise prevention during soft dry operation
- **Serviceability Improvement**
  - Breakdown Self Diagnosis function

## 4 Location of Controls and Components

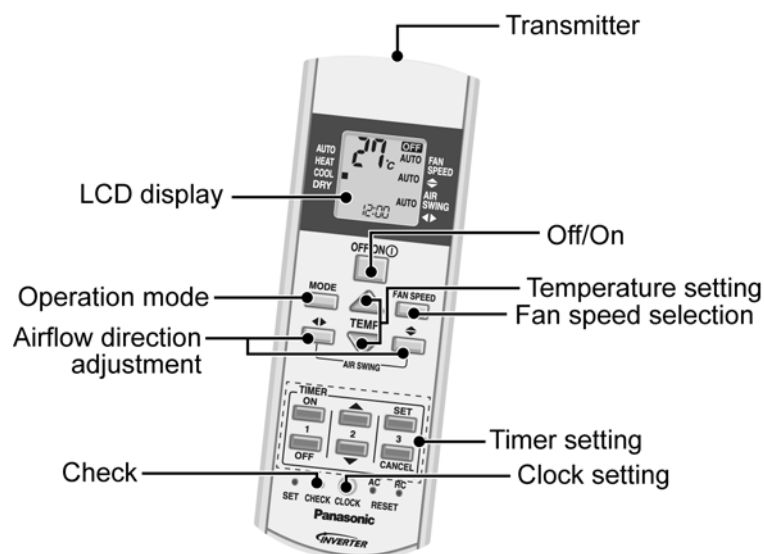
### 4.1. Indoor Unit



### 4.2. Outdoor Unit

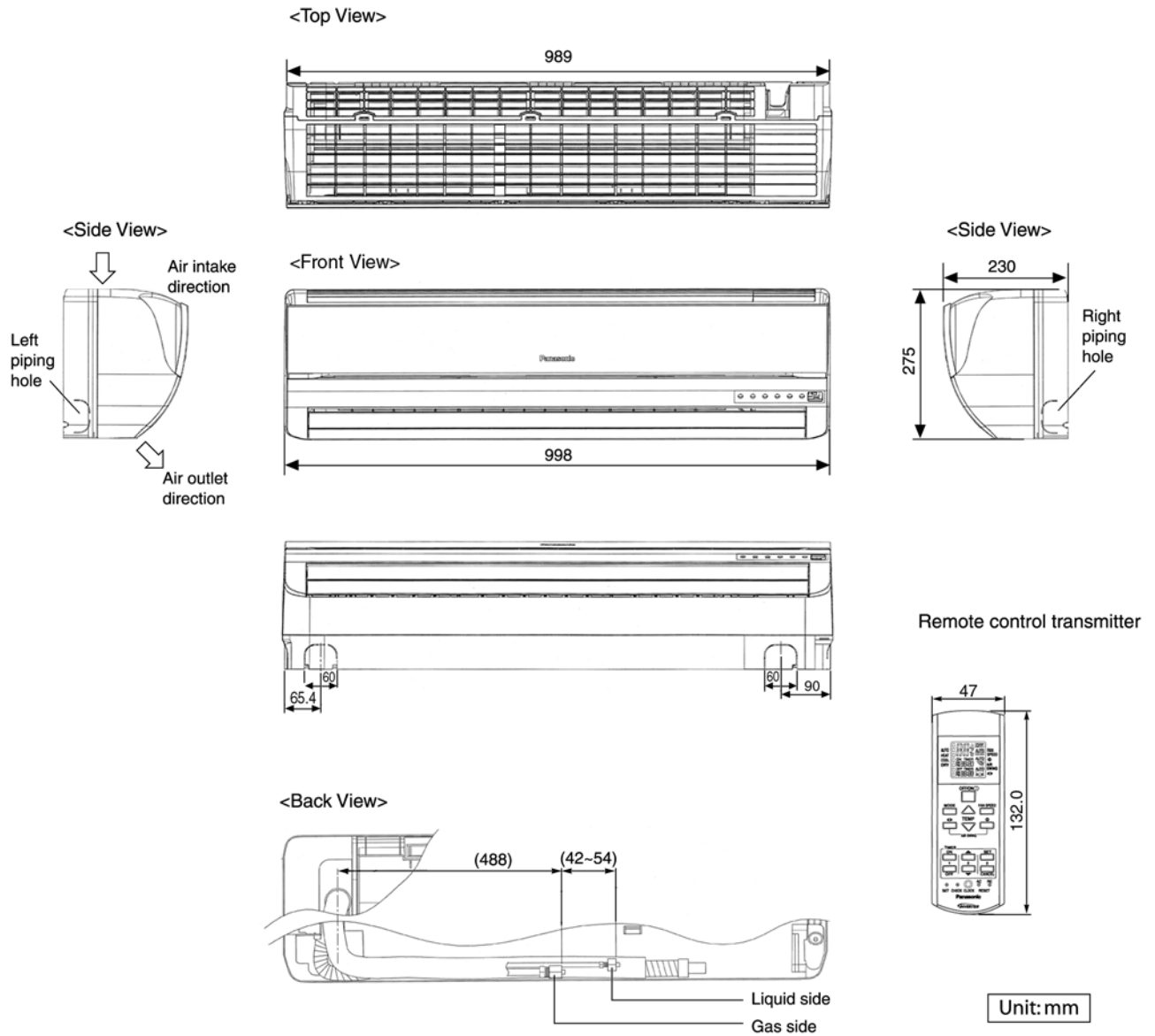


### 4.3. Remote Control

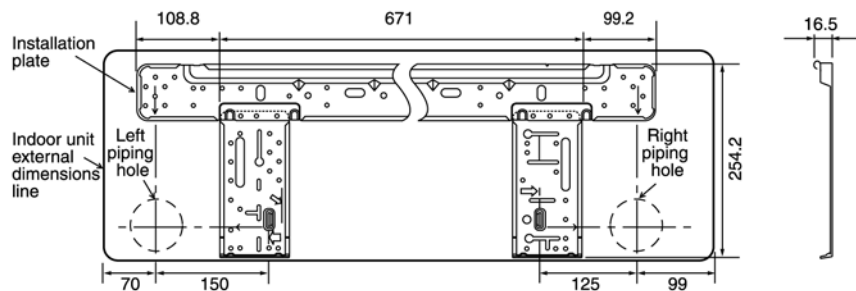


# 5 Dimensions

## 5.1. Indoor Unit & Remote Control

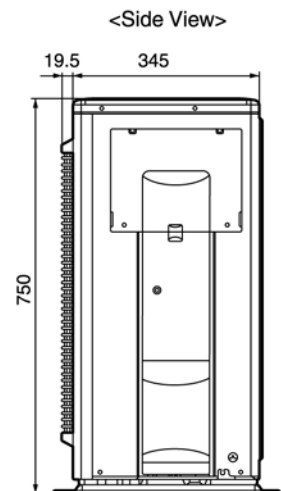
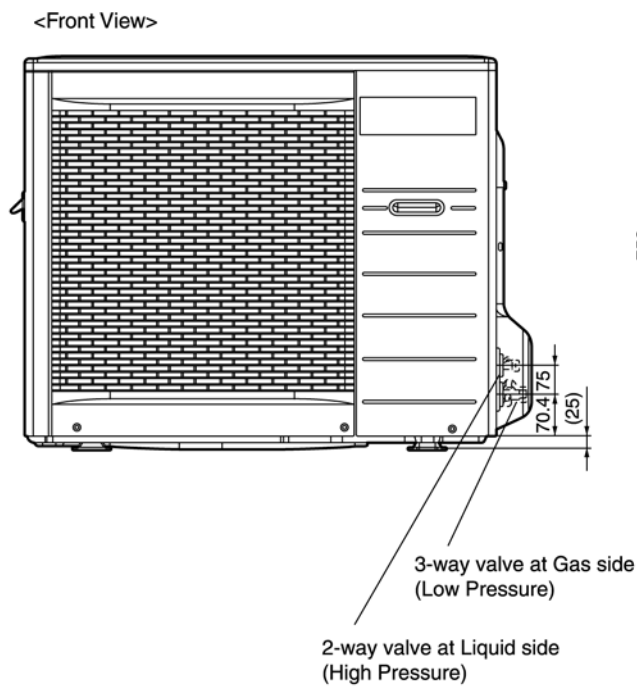
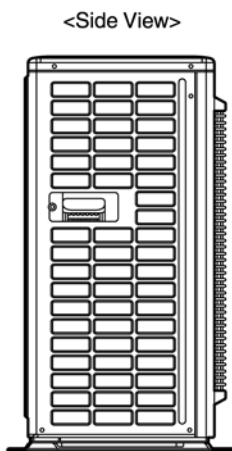
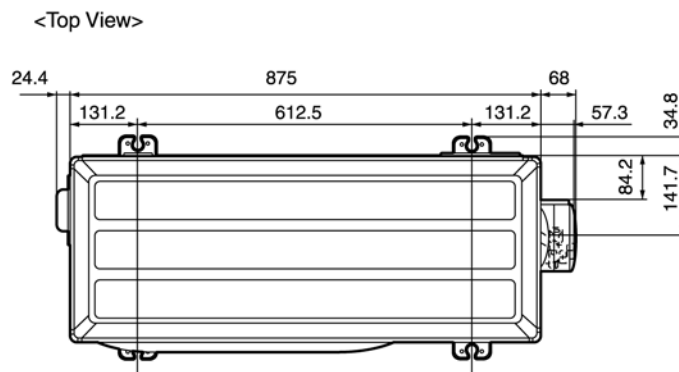
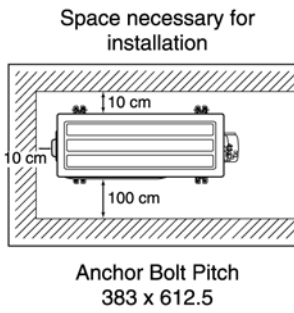


Relative position between the indoor unit and the installation plate <Front View>



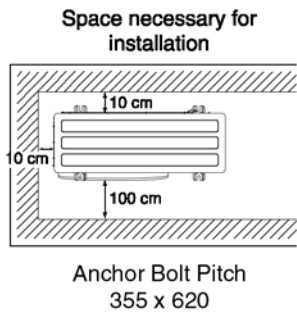
## 5.2. Outdoor Unit

### 5.2.1. CU-RE18HKE

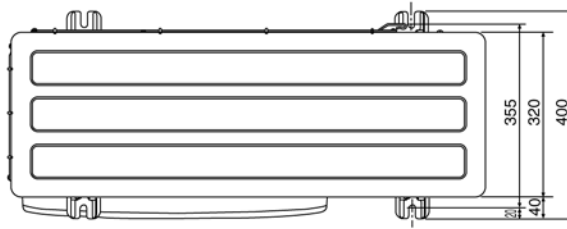


Unit: mm

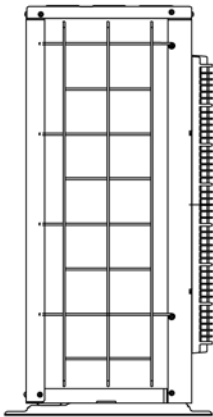
## 5.2.2. CU-RE24HKE



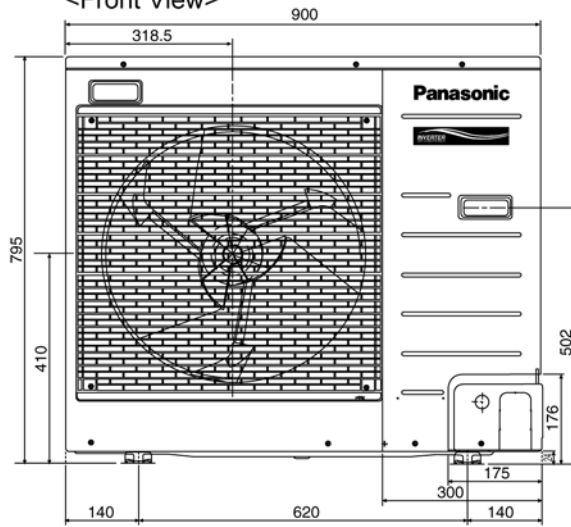
<Top View>



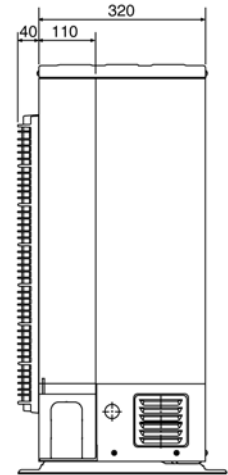
<Side View>



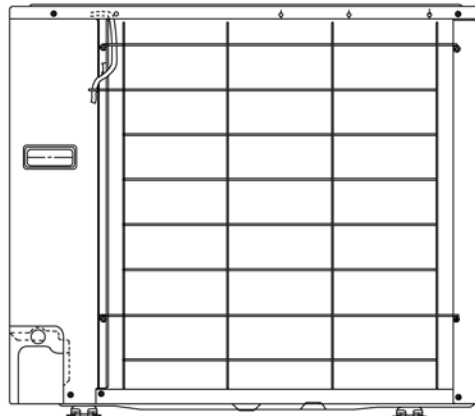
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<Side View>

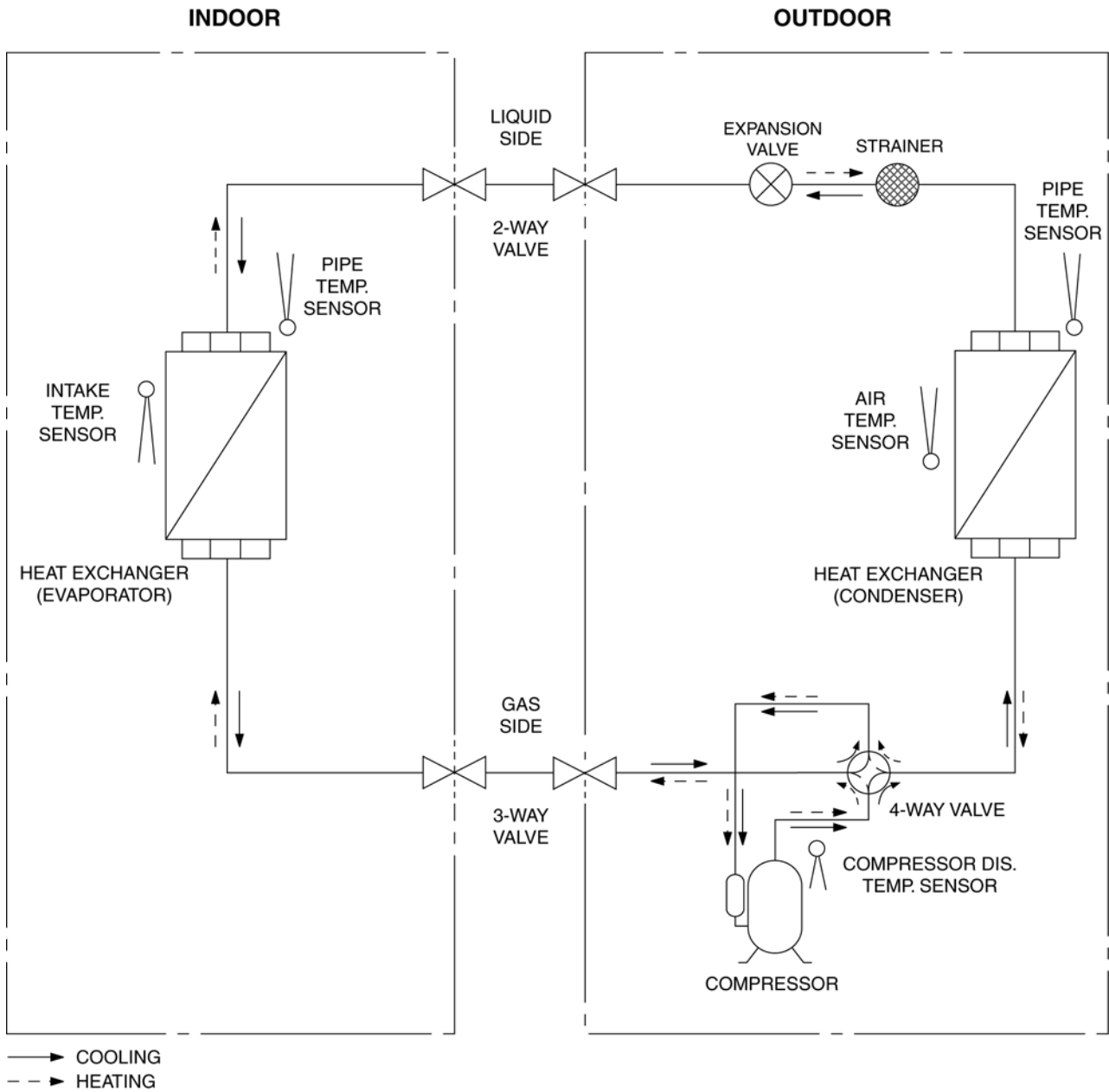


<Back View>



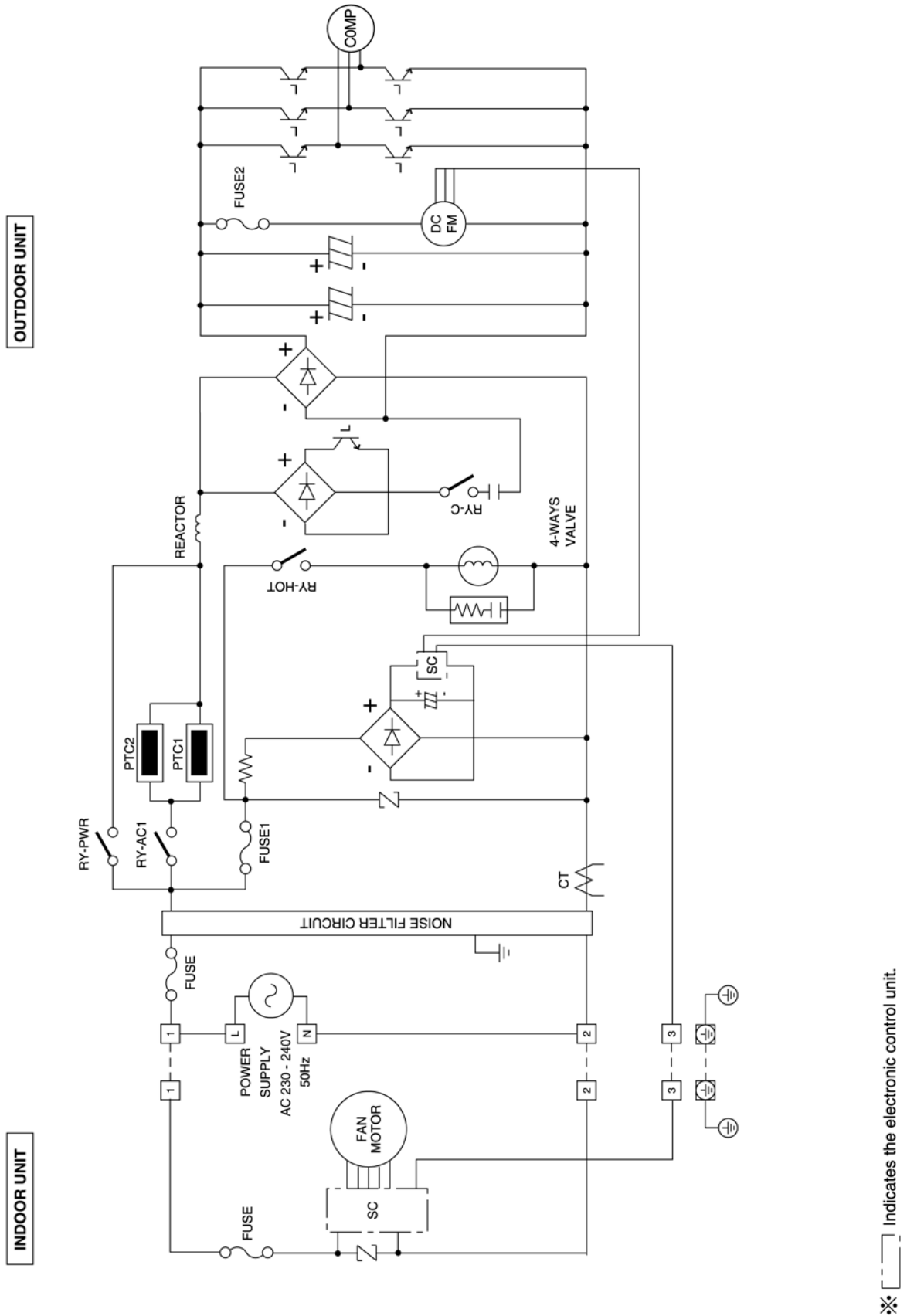
Unit : mm

# 6 Refrigeration Cycle Diagram



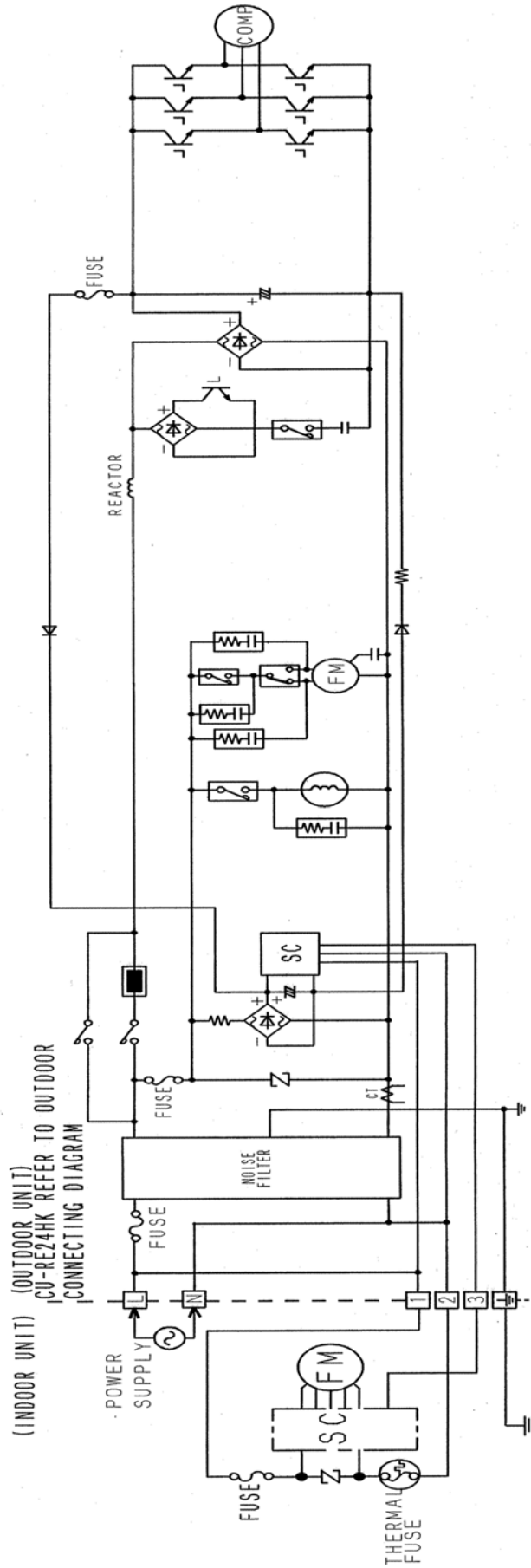
# 7 Block Diagram

## 7.1. CS-RE18HKE CU-RE18HKE



✱ [ ] Indicates the electronic control unit.

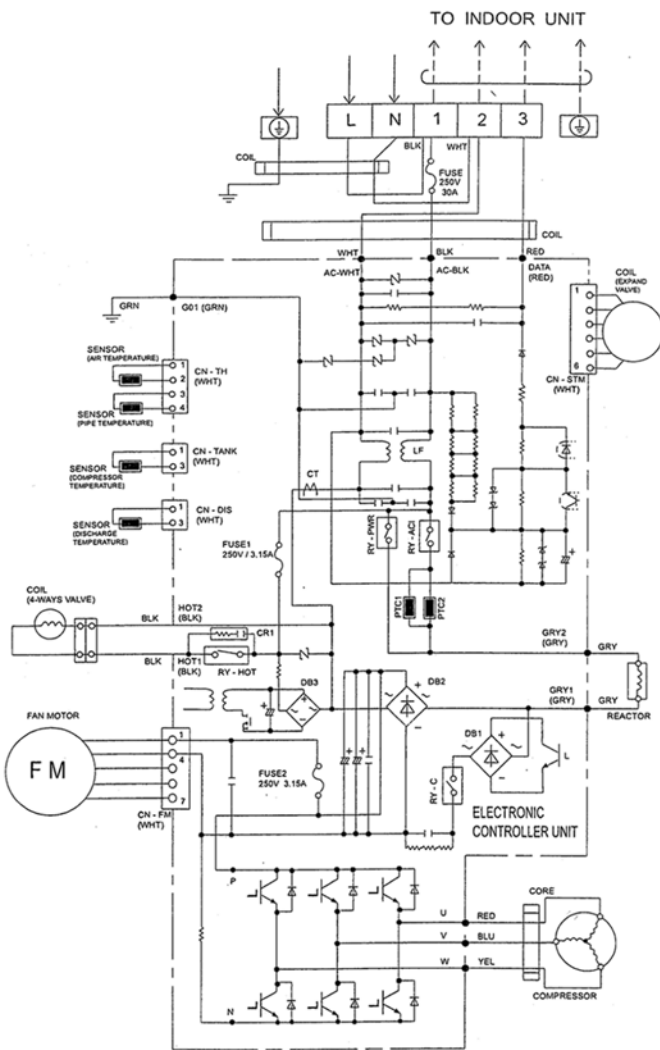
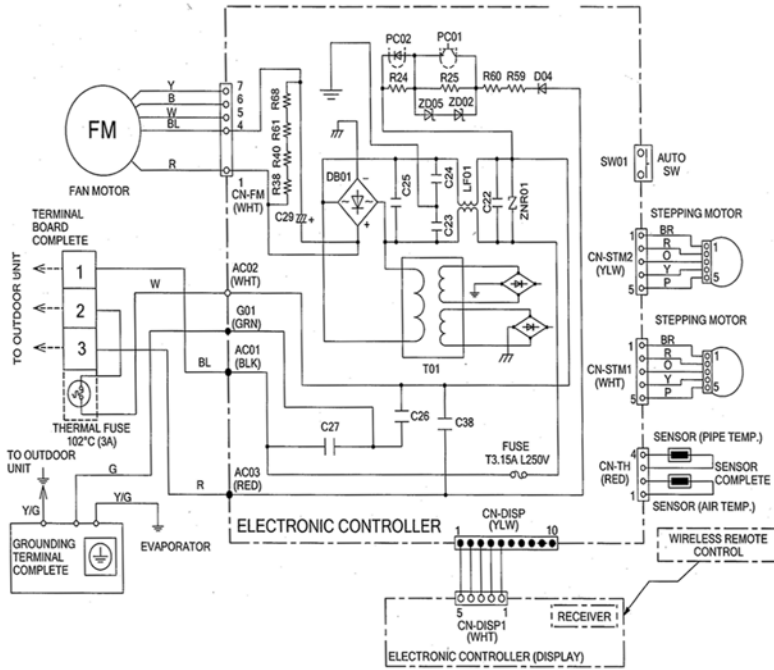
## 7.2. CS-RE24HKE CU-RE24HKE





# 8 Wiring Connection Diagram

## 8.1. CS-RE18HKE CU-RE18HKE

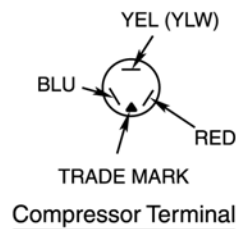


**Remarks:**

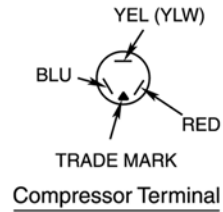
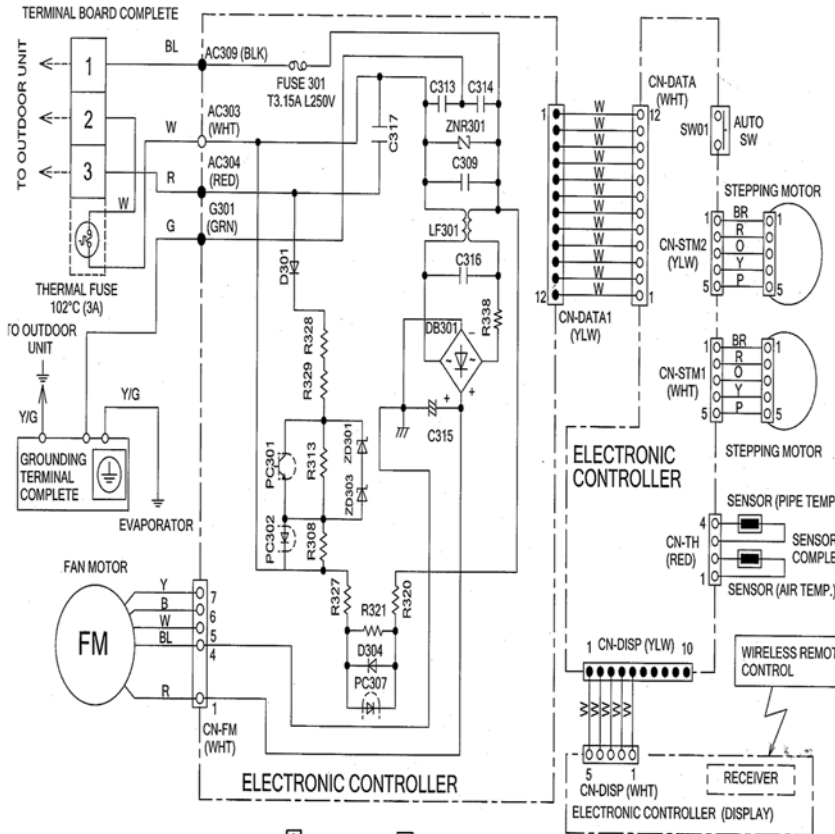
- B : BLUE
- BR : BROWN
- BL : BLACK
- W : WHITE
- G : GREEN
- R : RED
- O : ORANGE
- P : PINK
- VLT : VIOLET
- GRY : GRAY
- Y/G : YELLOW / GREEN

**Resistance of Compressor Windings**

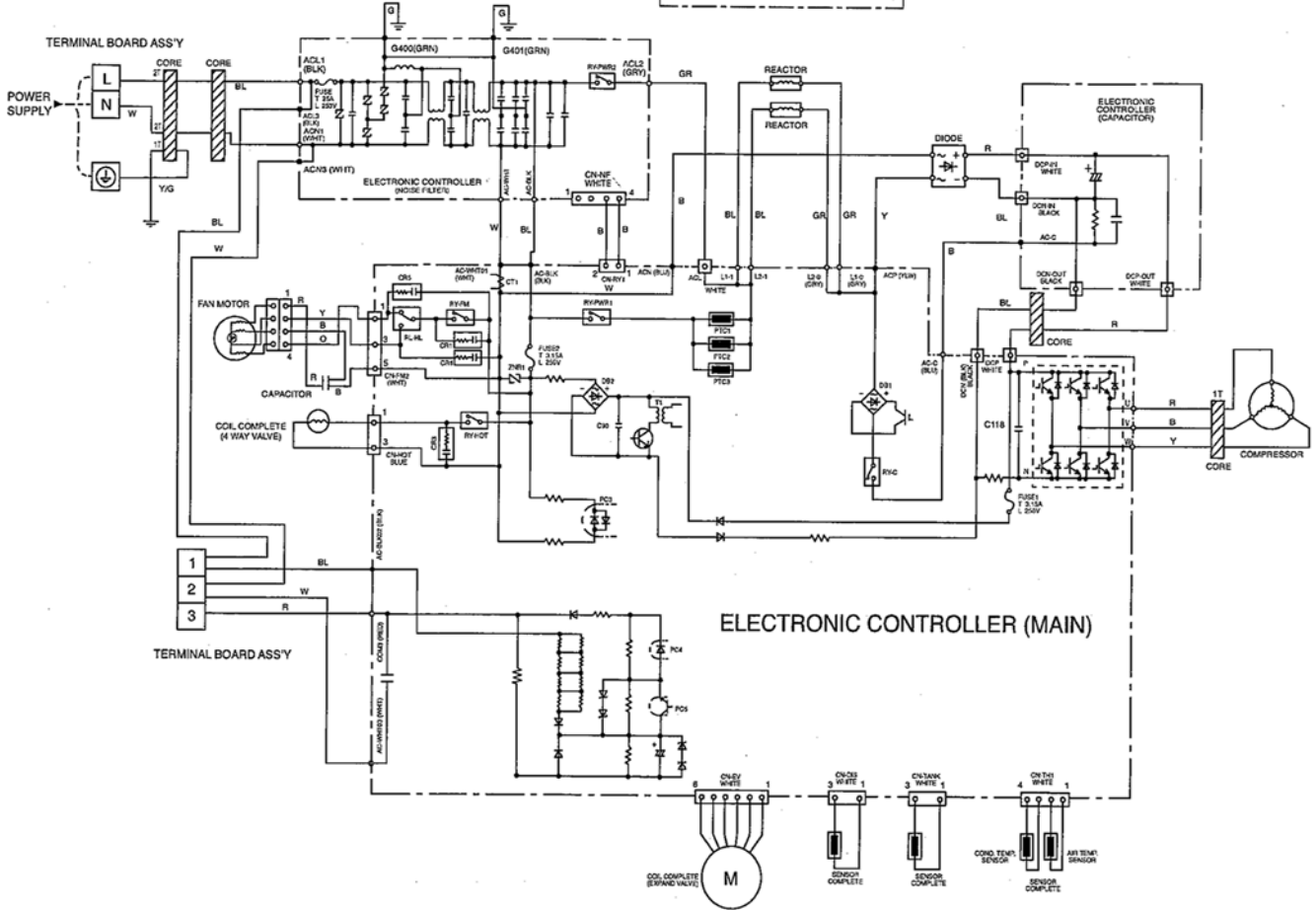
CONNECTION	5CS130XAD04 (Ω)
U - V	0.9
V - W	0.9
U - W	0.9



## 8.2. CS-RE24HKE CU-RE24HKE



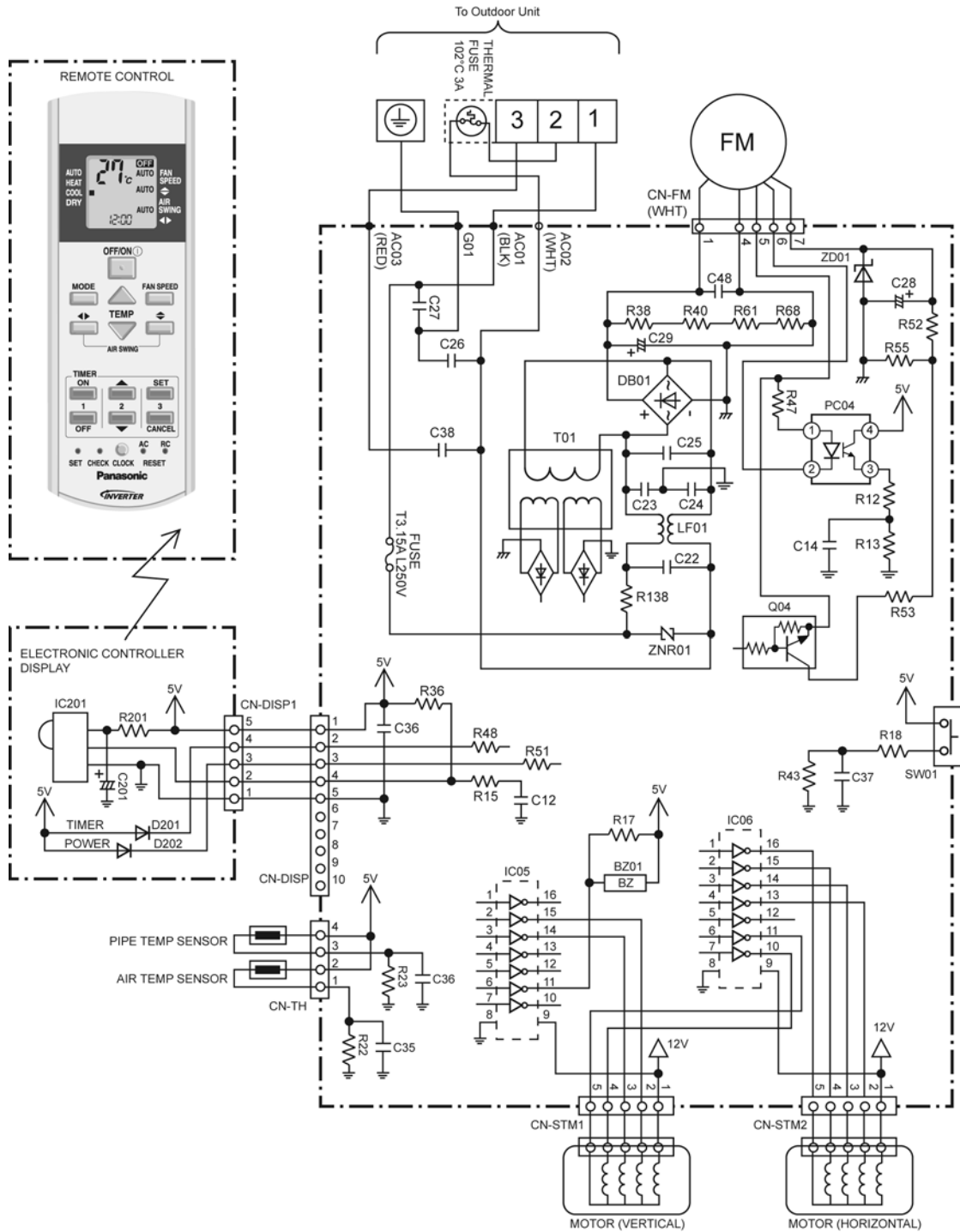
- Remarks:**
- B : BLUE
  - BR : BROWN
  - BL : BLACK
  - W : WHITE
  - G : GREEN
  - R : RED
  - O : ORANGE
  - P : PINK
  - VLT : VIOLET
  - GRY : GRAY
  - Y/G : YELLOW / GREEN



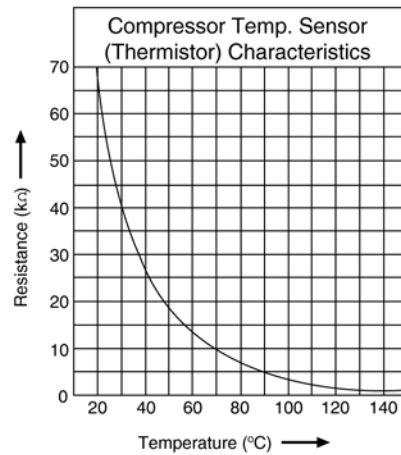
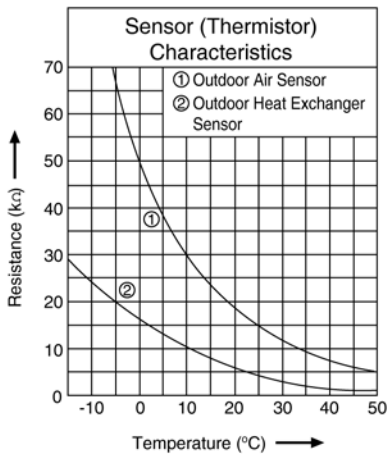
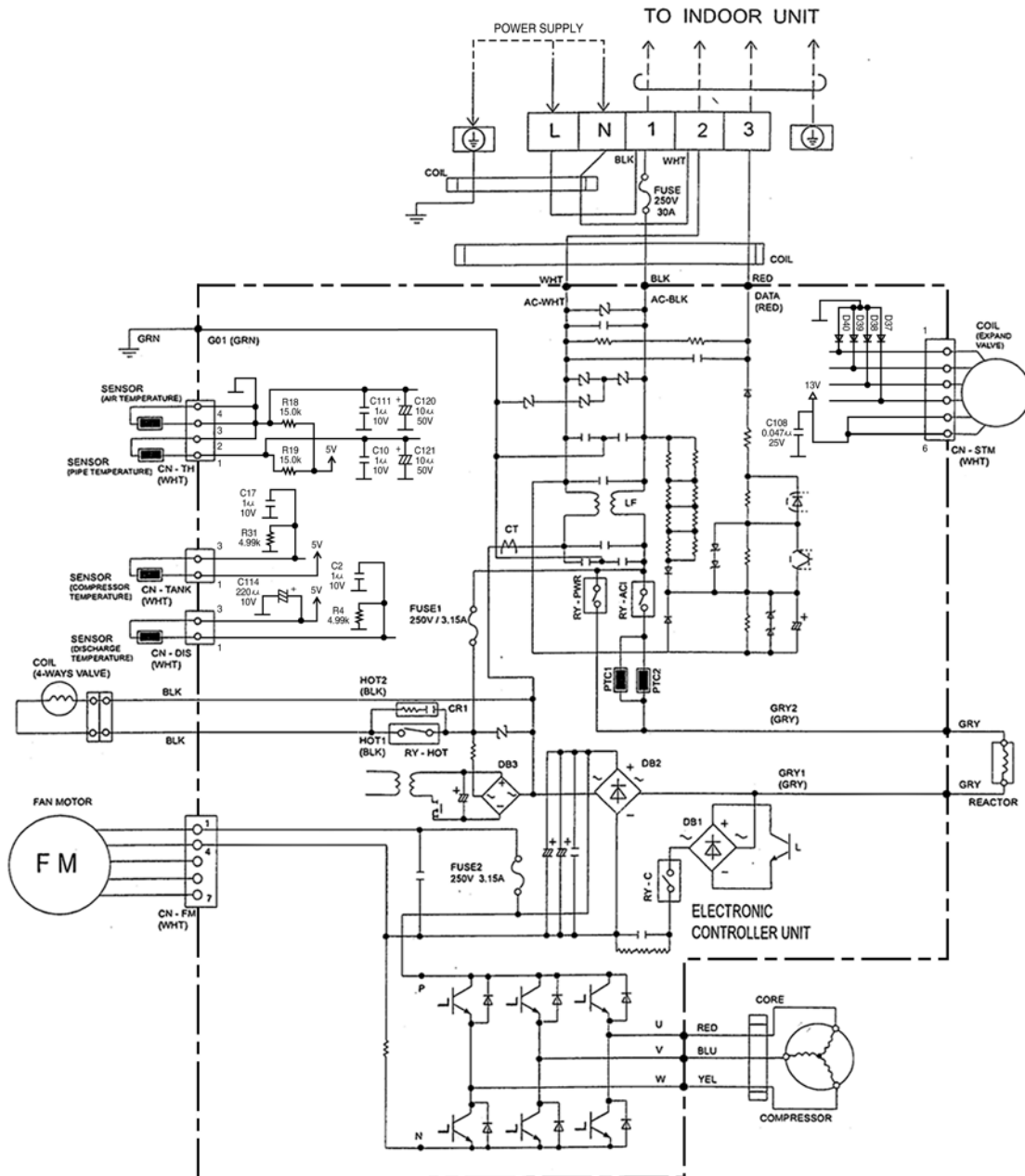
# 9 Electronic Circuit Diagram

## 9.1. CS-RE18HKE CU-RE18HKE

### 9.1.1. Indoor Unit

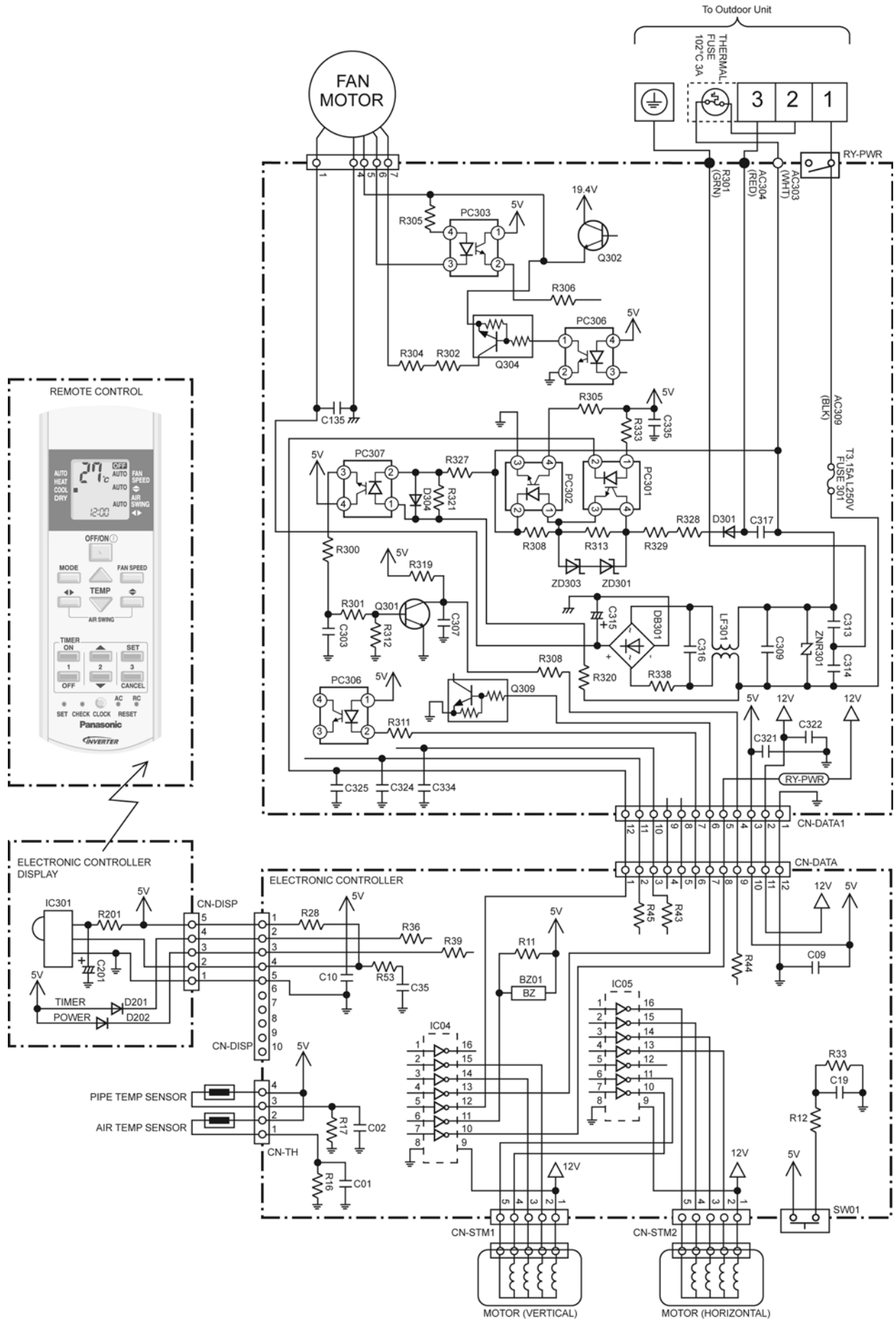


## 9.1.2. Outdoor Unit

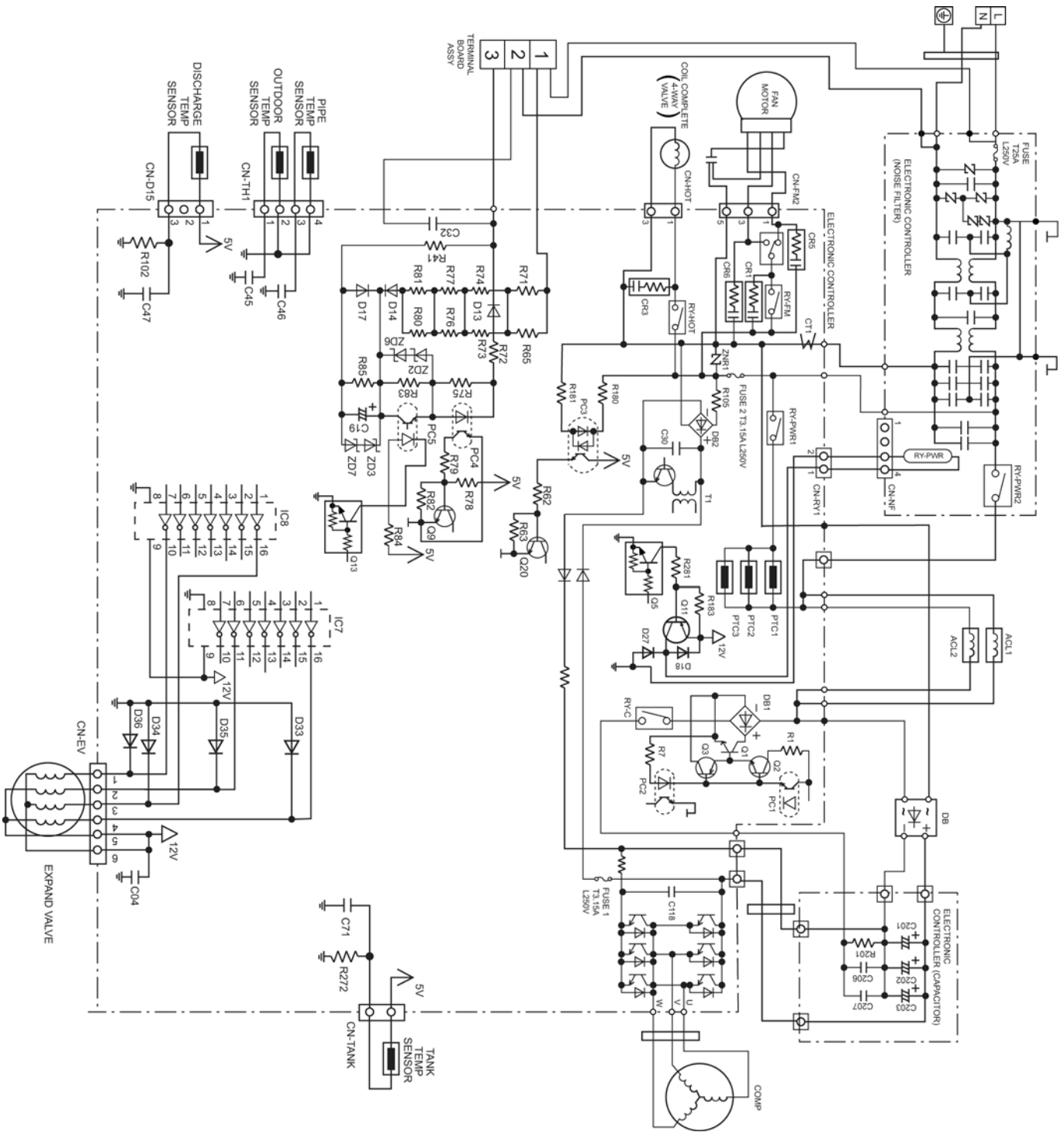


## 9.2. CS-RE24HKE CU-RE24HKE

### 9.2.1. Indoor Unit



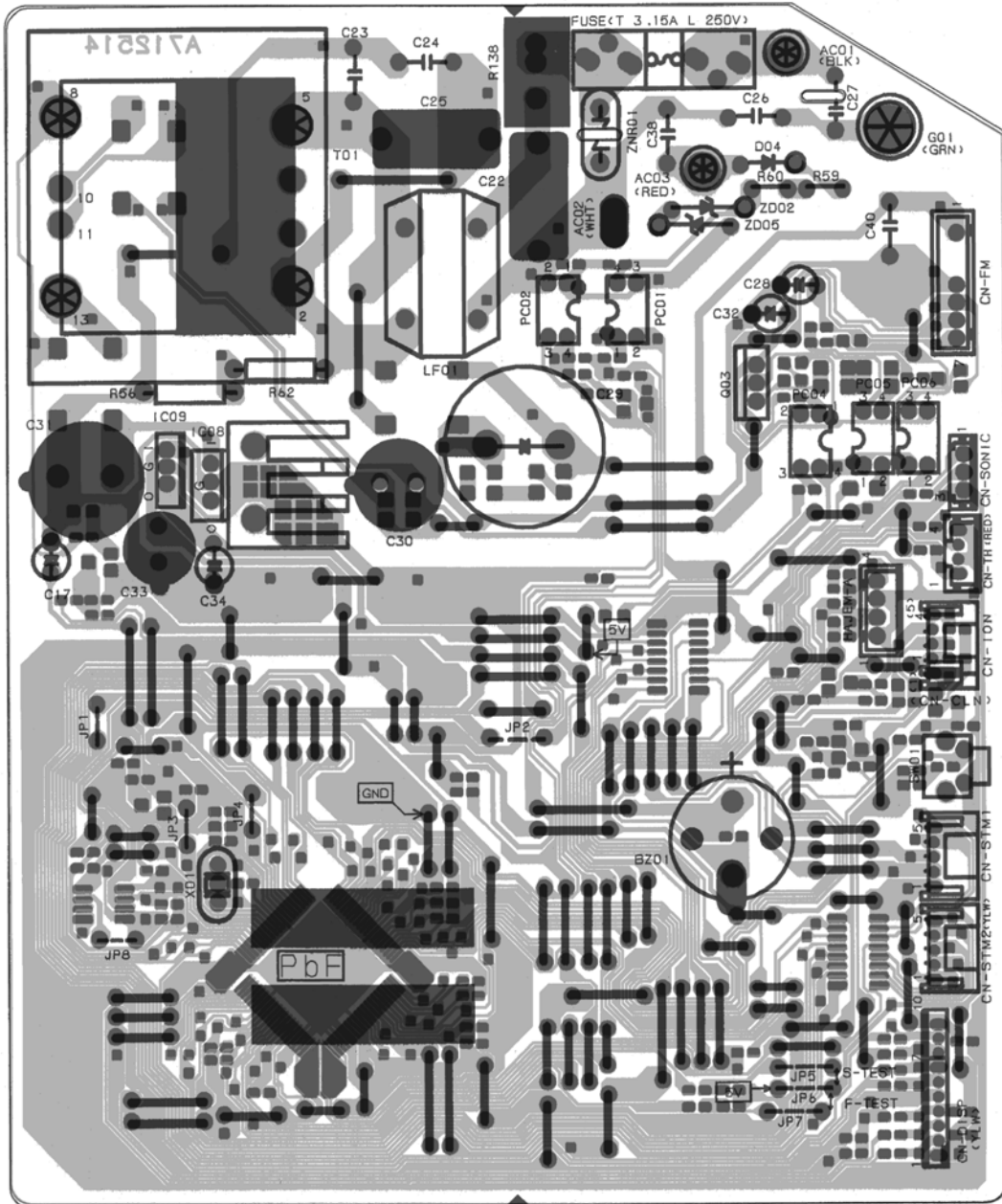
## 9.2.2. Outdoor Unit



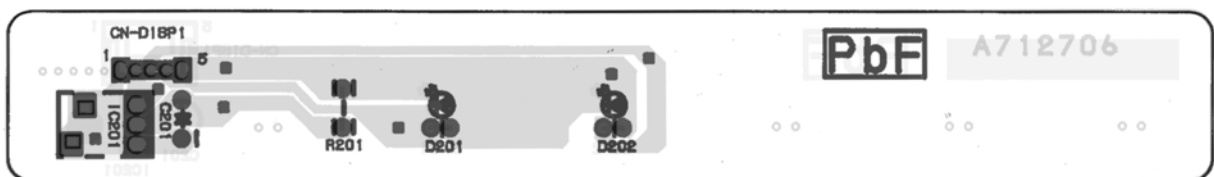
# 10 Printed Circuit Board

## 10.1. Indoor Unit

### 10.1.1. Main Printed Circuit Board



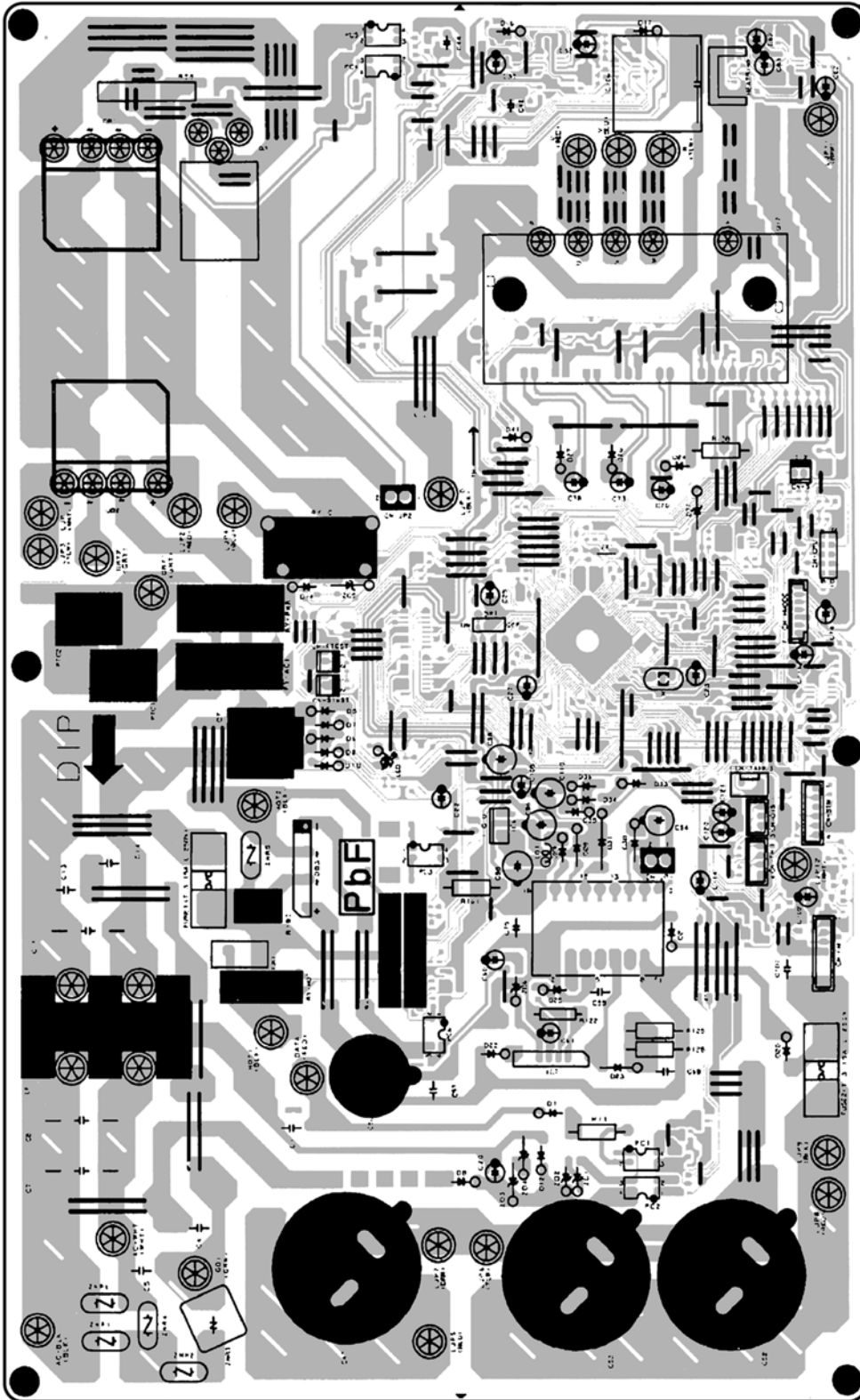
### 10.1.2. Indicator Printed Circuit Board



## 10.2. Outdoor Unit

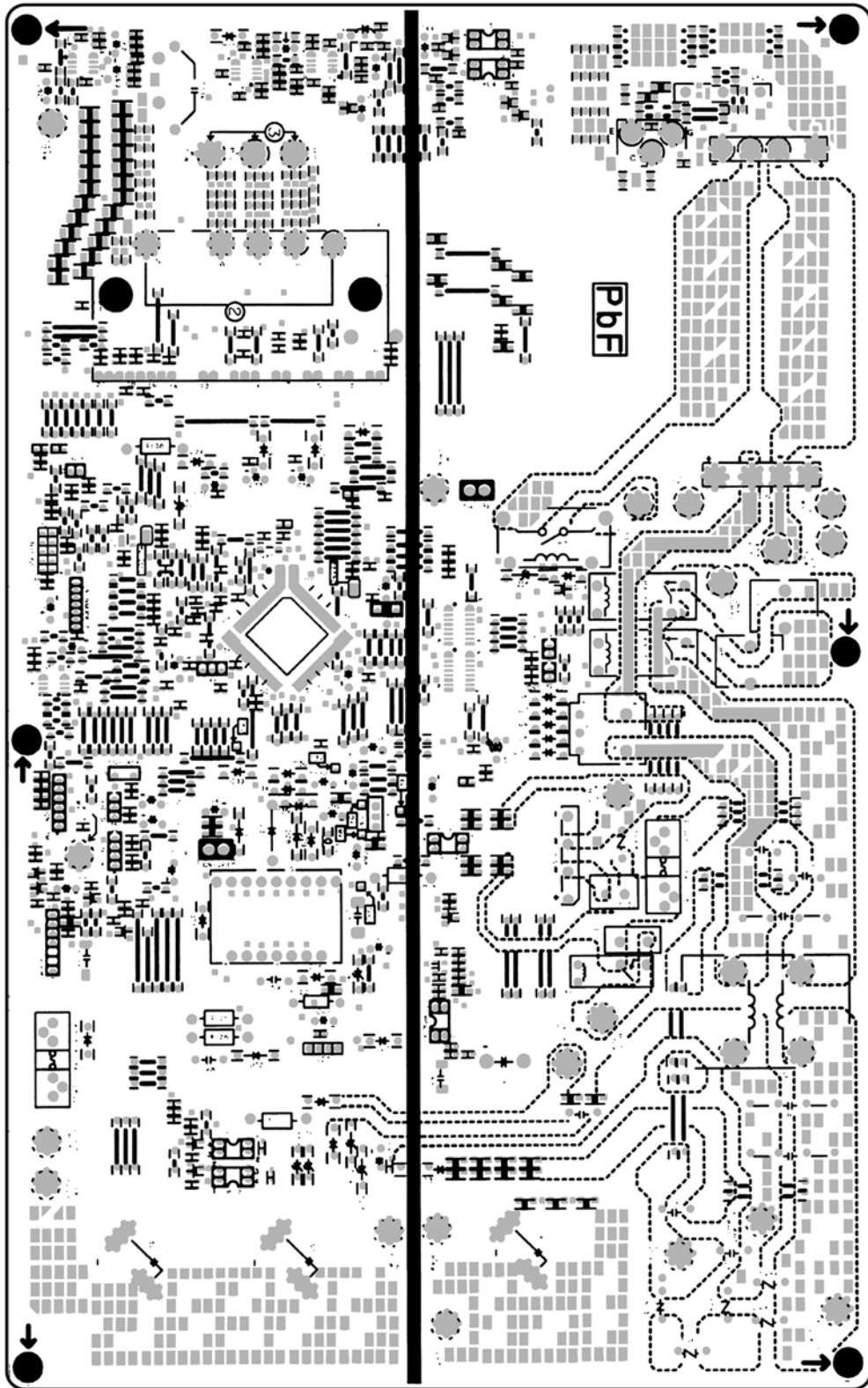
### 10.2.1. Main Printed Circuit Board

#### 10.2.1.1. CU-RE18HKE



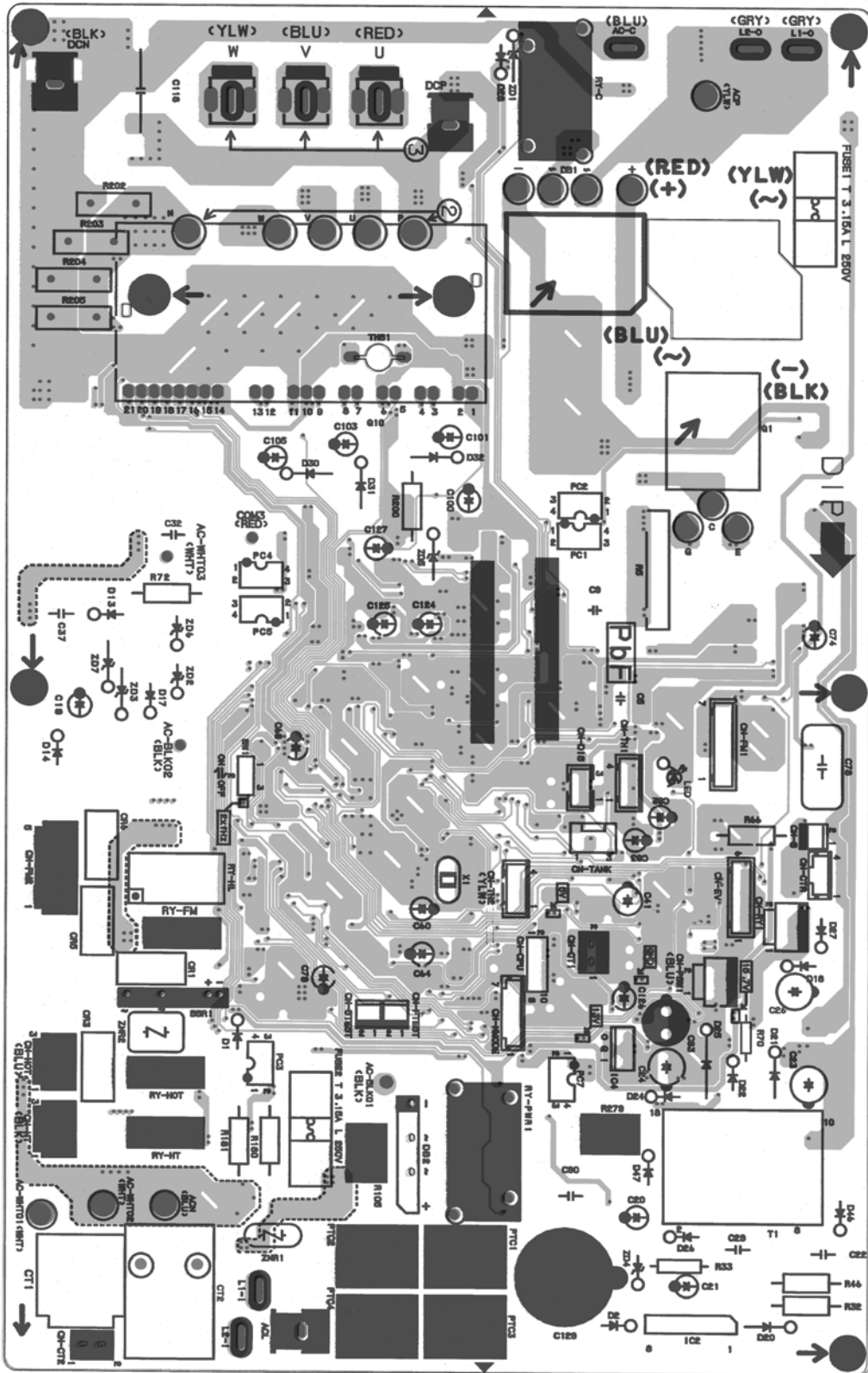


# Bottom View



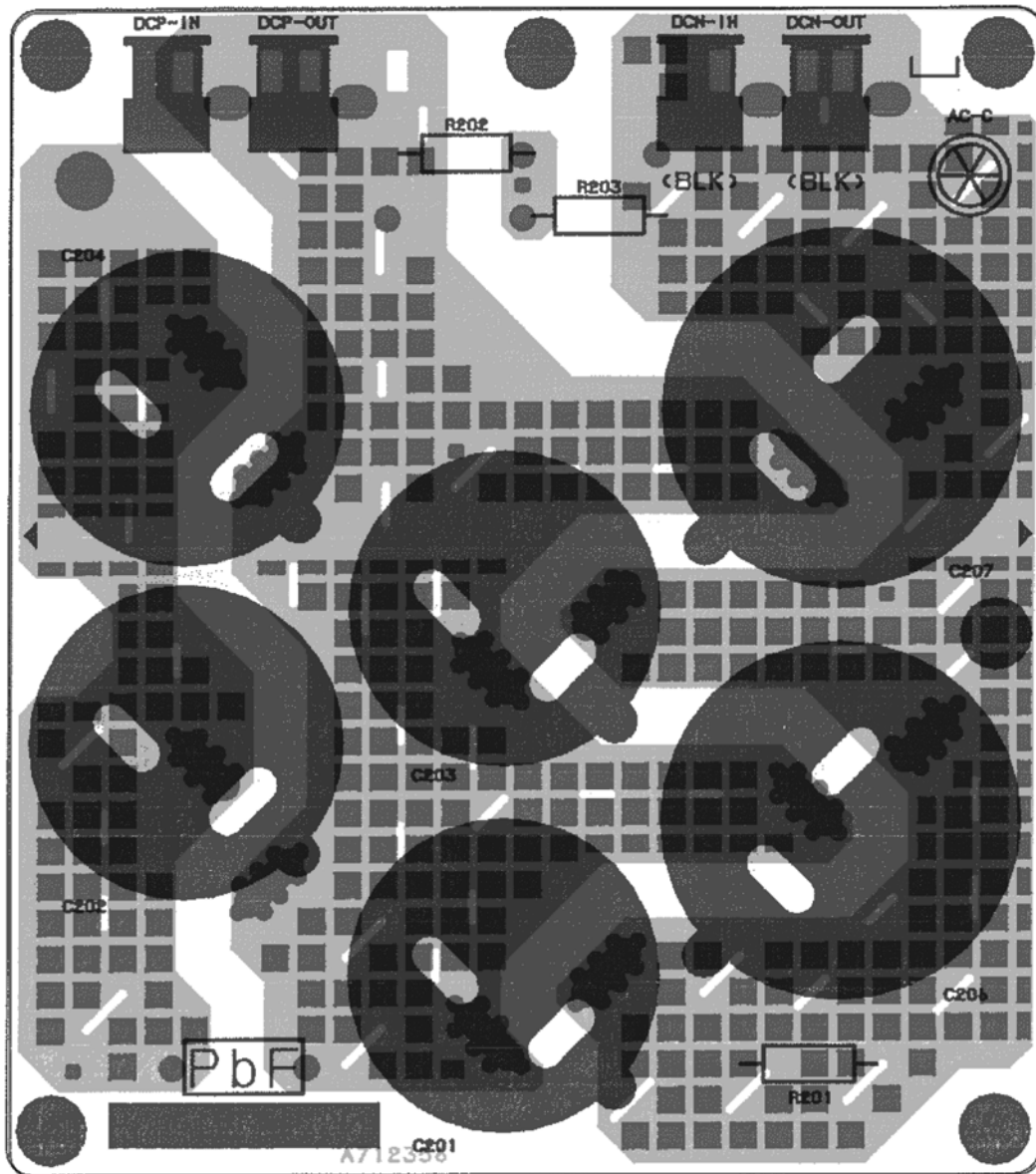
## 10.2.2. Main Printed Circuit Board

### 10.2.2.1. CU-RE24HKE

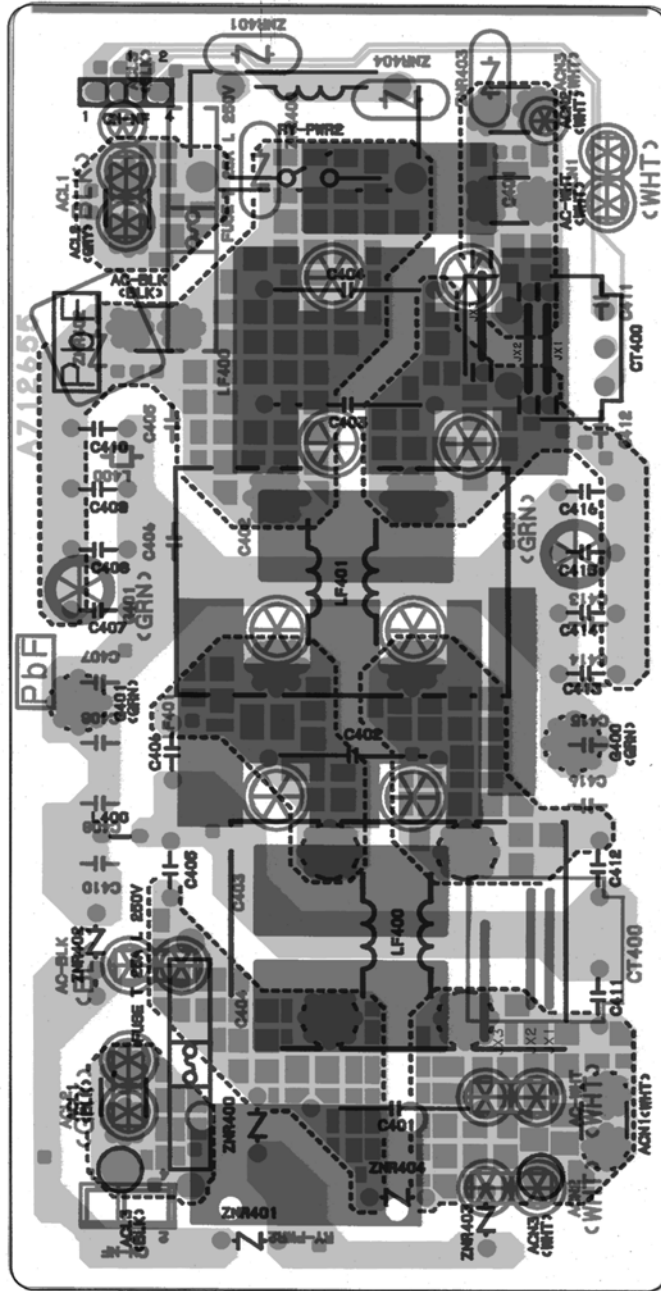




### 10.2.3. Power Printed Circuit Board



### 10.2.4. Noise Filter Printed Circuit Board



# 11 Installation Instruction

## 11.1. Select The Best Location

### 11.1.1. Indoor Unit

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

### 11.1.2. Outdoor Unit

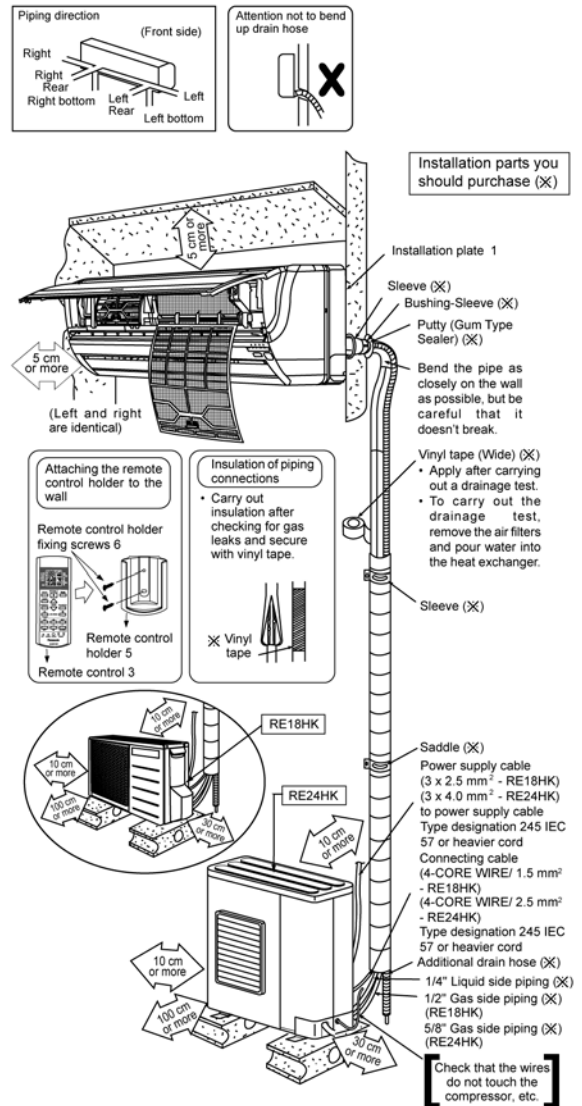
- If an awning is built over the unit to prevent direct sunlight or rain, be careful that heat radiation from the condenser is not obstructed.
- There should not be any animal or plant which could be affected by hot air discharged.
- Keep the spaces indicated by arrows from wall, ceiling, fence or other obstacles.
- Do not place any obstacles which may cause a short circuit of the discharged air.
- If piping length is over 10 m, additional refrigerant should be added as shown in the table.

Model	Piping size		Rated Length (m)	Max Elevation (m)	Min. Piping Length (m)	Max. Piping Length (m)	Additional Refrigerant (g/m)
	Gas	Liquid					
RE18HK	1/2"	1/4"	5	15	3	20	20
RE24HK	1/2"	1/4"	5	20	3	30	30

Example : For RE18HKE

If the unit is installed at 15 m distance, the quantity of additional refrigerant should be 100 g .....  $(15 - 10) \text{ m} \times 20 \text{ g/m} = 100 \text{ g}$ .

### 11.1.3. Indoor/Outdoor Unit Installation Diagram

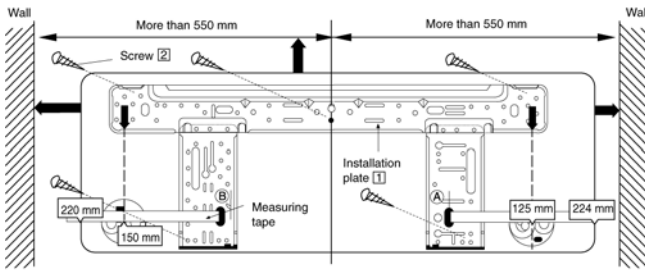


- This illustration is for explanation purposes only. The indoor unit will actually face a different way.

## 11.2. Indoor Unit

### 11.2.1. How To Fix Installation Plate

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



The centre of installation plate should be at more than 550 mm at right and left of the wall.

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

From installation plate left edge to unit's left side is 47 mm.

From installation plate right edge to unit's right is 73 mm.

- Ⓑ :
- For left side piping, piping connection for liquid should be about 126 mm from this line.
  - For left side piping, piping connection for gas should be about 174 mm from this line.
  - For left side piping, piping connection cable should be about 984 mm from this line.

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

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

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

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

- Line according to the left and right side of the installation plate. The meeting point of the extended line is the centre of the hole. Another method is by putting measuring tape at position as shown in the diagram above. The hole centre is obtained by measuring the distance namely 150 mm and 125 mm for left and right hole respectively.
- Drill the piping hole at either the right or the left and the hole should be slightly slanted to the outdoor side.

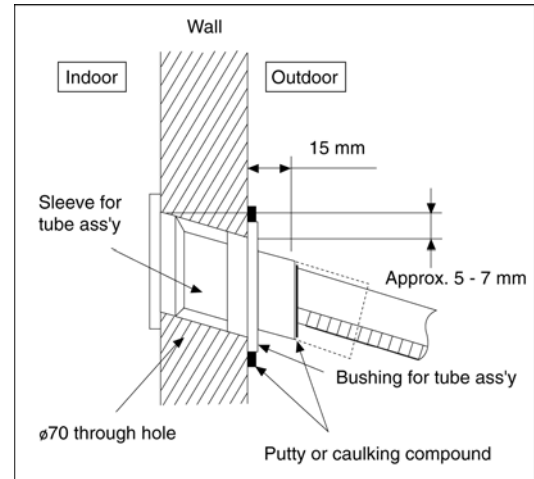
### 11.2.2. To Drill A Hole In The Wall And Install A Sleeve Of Piping

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

#### Caution

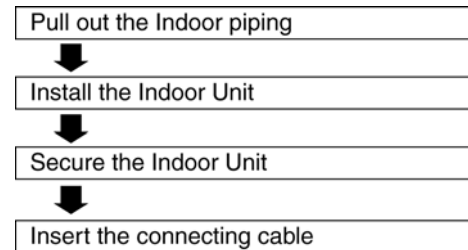
When the wall is hollow, please be sure to use the sleeve for tube ass'y to prevent dangers caused by mice biting the connecting cable.

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

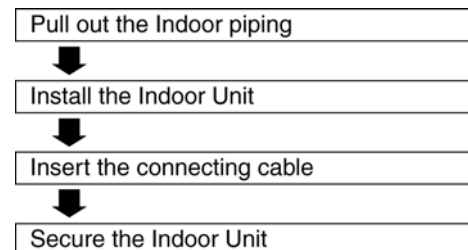


### 11.2.3. Indoor Unit Installation

#### 1. For the right rear piping



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



### 3. For the embedded piping

Replace the drain hose



Bend the embedded piping



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

Install the Indoor Unit



Cut and flare the embedded piping



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

Pull the connecting cable into Indoor Unit



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

Connect the piping



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

Insulate and finish the piping

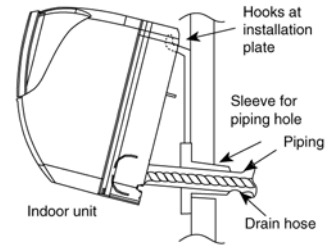


- Please refer to "Piping and finishing" column of outdoor section and "Insulation of piping connections" column as mentioned in Indoor/Outdoor Unit Installation.

Secure the Indoor Unit

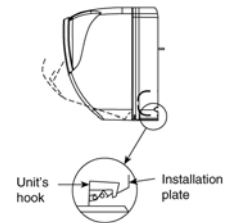
Install the indoor unit

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

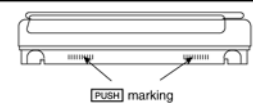


Secure the Indoor Unit

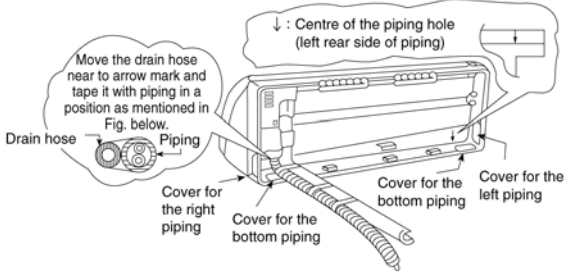
1. Press the lower left and right side of the unit against the installation plate until hooks engages with their slot (sound click).



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



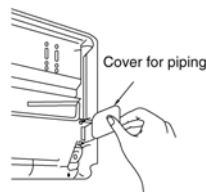
Pull out the piping and drain hose



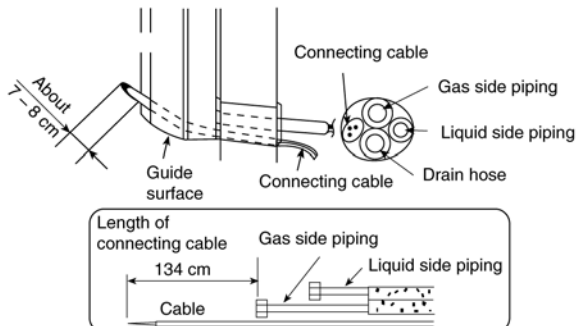
How to keep the cover

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

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



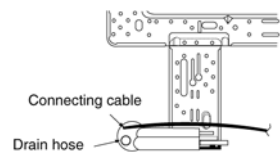
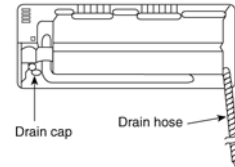
Insert the connecting cable



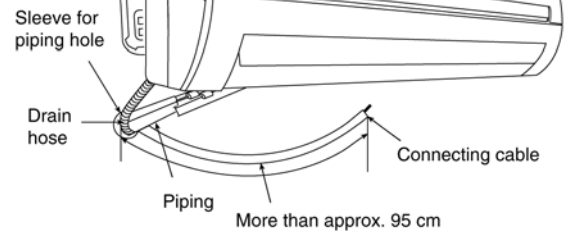
(This can be used for left rear piping & left bottom piping also.)

Exchange the drain hose and the cap

Rear view for left piping installation

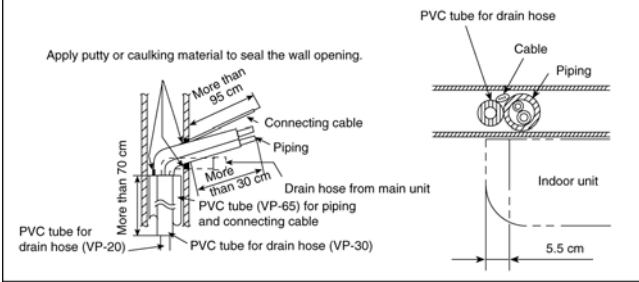


Adjust the piping slightly downwards.

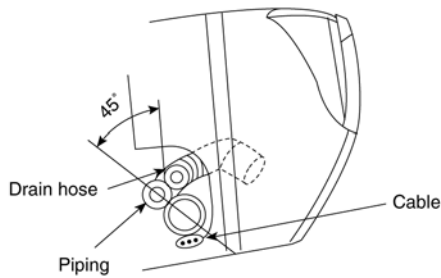




- How to pull the piping and drain hose out, in case of the embedded piping.



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



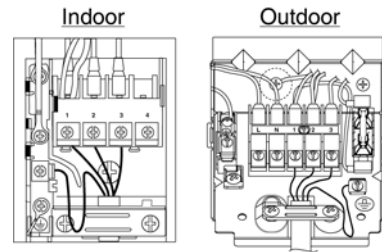
(For the right piping, follow the same procedure)

## 11.2.4. Connect The Cable To The Indoor Unit

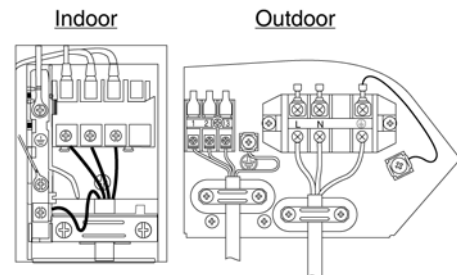
1. The inside and outside connecting cable can be connected without removing the front grille.
  2. Connecting cable between indoor unit and outdoor unit shall be approved polychloroprene sheathed  $4 \times 1.5 \text{ mm}^2$  (RE18HK)  $4 \times 2.5 \text{ mm}^2$  (RE24HK) flexible cord, type designation 245 IEC 57 or heavier cord.
- Ensure the colour of wires of outdoor unit and the terminal Nos. are the same to the indoor's respectively.
  - Earth lead wire shall be longer than the other lead wires as shown in the figure for the electrical safety in case of the slipping out of the cord from the anchorage.

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

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



RE18HK



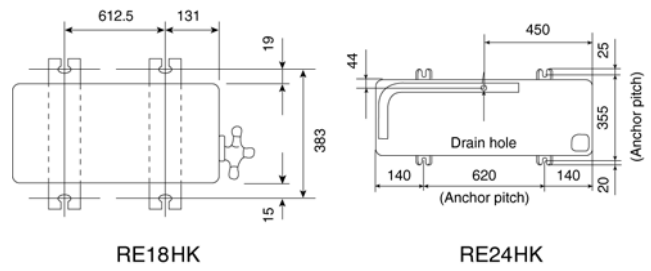
RE24HK

Terminal screw	Tightening torque N-cm (kgf-cm)
M3	69 ~ 98 (7 - 10)
M4	157 ~ 196 (16 - 20)
M5	196 ~ 245 (20 - 25)

## 11.3. Outdoor Unit

### 11.3.1. Install The Outdoor Unit

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



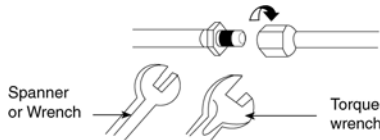
### 11.3.2. Connecting The Piping

#### Connecting The Piping To Indoor Unit

Please make flare after inserting flare nut (locate at joint portion of tube assembly) onto the copper pipe. (in case of using long piping).

Connect the piping

- Align the center of piping and sufficiently tighten the flare nut with fingers.
- Further tighten the flare nut with torque wrench in specified torque as stated in the table.



Model	Piping size (Torque)	
	Gas	Liquid
RE18HK	1/2" [55 N·m]	1/4" [18 N·m]
RE24HK	5/8" [65 N·m]	1/4" [18 N·m]

**⚠ CAUTION**

Do not over tighten, over tightening cause gas leakage.

#### Connecting The Piping To Outdoor Unit

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

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

Local pipes can project in any of four directions.

- Make holes in the pipe panels for the pipes to pass through.
- Be sure to install the pipe panels to prevent rain from getting inside the outdoor unit.

[Removing the service panel].

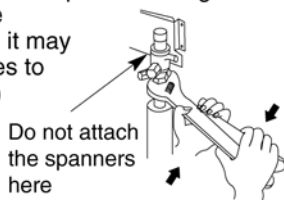
(1) Remove the two mounting screws.

(2) Slide the service panel downward to release the pawls.

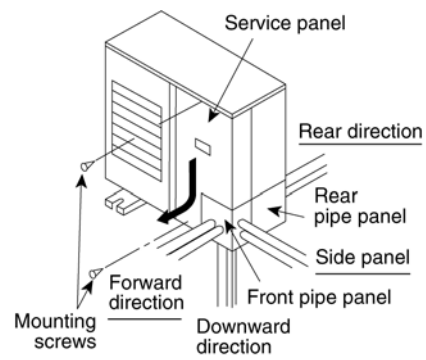
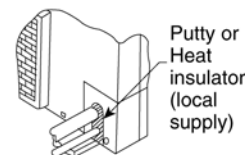
After this, pull the service panel toward you to remove it.

Be sure to use two spanners to tighten.

(If the nuts are overtightened, it may cause the flares to break or leak.)



Close the tube joining area with putty heat insulator (local supply) without any gap as shown in right figure. (To prevent insects or small animal entering.)

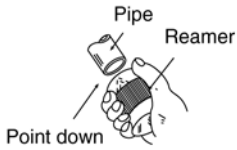


**Cutting And Flaring The Piping**

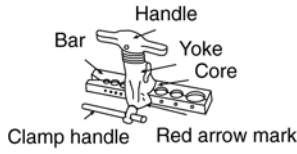
1. Please cut using pipe cutter and then remove the burrs.
2. Remove the burrs by using reamer. If burrs is not removed, gas leakage may be caused.  
Turn the piping end down to avoid the metal powder entering the pipe.
3. Please make flare after inserting the flare nut onto the copper pipes.



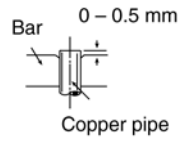
1. To cut



2. To remove burrs



3. To flare



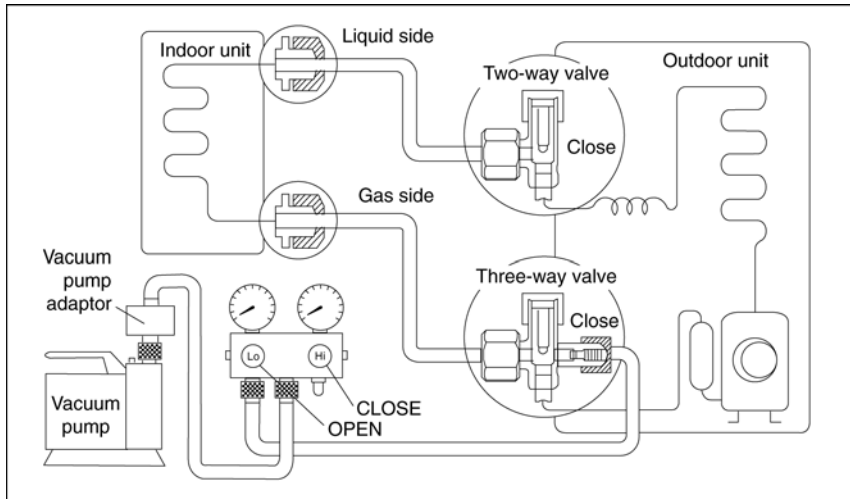
■ Improper flaring ■



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

### 11.3.3. Evacuation Of The Equipment

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



1. Connect a charging hose with a push pin to the Low side of a charging set and the service port of the 3-way valve.
  - Be sure to connect the end of the charging hose with the push pin to the service port.
2. Connect the center hose of the charging set to a vacuum pump with check valve, or vacuum pump and vacuum pump adaptor.
3. Turn on the power switch of the vacuum pump and make sure that the needle in the gauge moves from 0 cmHg (0 MPa) to -76 cmHg (-0.1 MPa). Then evacuate the air approximately ten minutes.
4. Close the Low side valve of the charging set and turn off the vacuum pump. Make sure that the needle in the gauge does not move after approximately five minutes.

Note: BE SURE TO FOLLOW THIS PROCEDURE IN ORDER TO AVOID REFRIGERANT GAS LEAKAGE.

5. Disconnect the charging hose from the vacuum pump and from the service port of the 3-way valve.
6. Tighten the service port caps of the 3-way valve at a torque of 18 Nm with a torque wrench.
7. Remove the valve caps of both of the 2-way valve and 3-way valve. Position both of the valves to "OPEN" using a hexagonal wrench (4 mm).
8. Mount valve caps onto the 2-way valve and the 3-way valve.
  - Be sure to check for gas leakage.

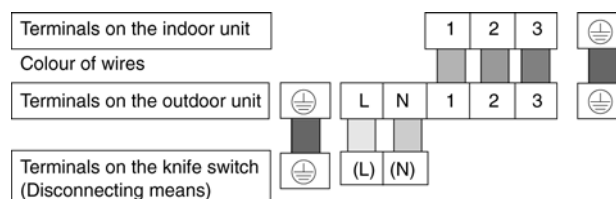
#### CAUTION

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

### 11.3.4. Connect The Cable To The Outdoor Unit

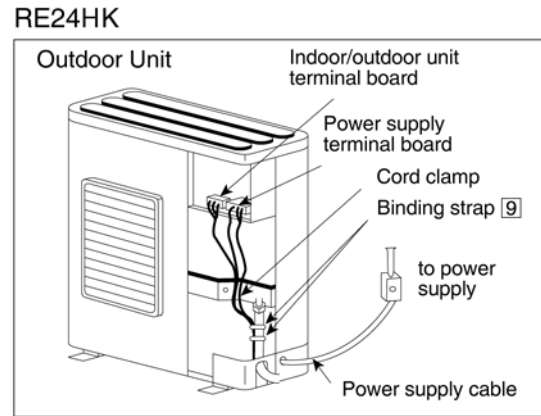
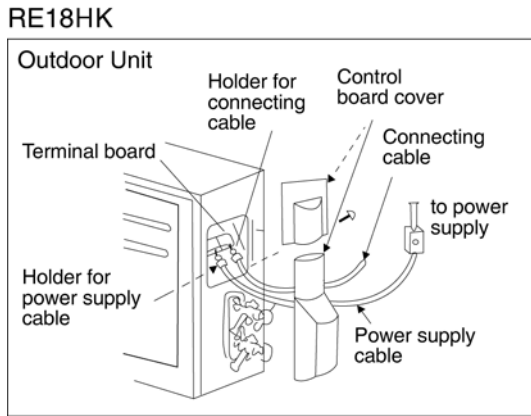
(FOR DETAIL REFER TO WIRING DIAGRAM AT UNIT)

1. Remove the control board cover from the unit by loosening the screw.
2. Connecting cable between indoor unit and outdoor unit shall be approved polychloroprene sheathed 4 x 1.5 mm<sup>2</sup> (RE18HK), 4 x 2.5 mm<sup>2</sup> (RE24HK) flexible cord, type designation 245 IEC 57 or heavier cord.



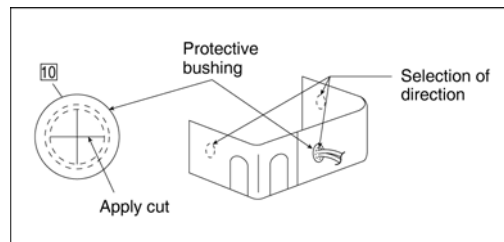
3. Secure the cable onto the control board with the holder (clammer).

4. Cable connection to the power supply through knife switch (Disconnecting means).
  - Connect the approved polychloroprene sheathed power supply cable (3 x 2.5 mm<sup>2</sup>) RE18HK, (3 x 4.0 mm<sup>2</sup>) RE24HK type designation 245 IEC 57 or heavier cord to the terminal board, and connect the other end of the cable to knife switch (Disconnecting means).
5. Select required direction and apply protective bushing provided in accessories to protect cables from sharp edges.
6. Once all wiring work has been completed, tie the wires and cord together with the binding strap so that they do not touch other parts such as the compressor and pipes.



Note : Knife switch (Disconnecting means) should have minimum 3.5 mm contact gap.

- Secure the cable onto the control board with the holder (clammer).
- Power supply earth cable must connect to the left earth terminal.



### 11.3.5. Pipe Insulation

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

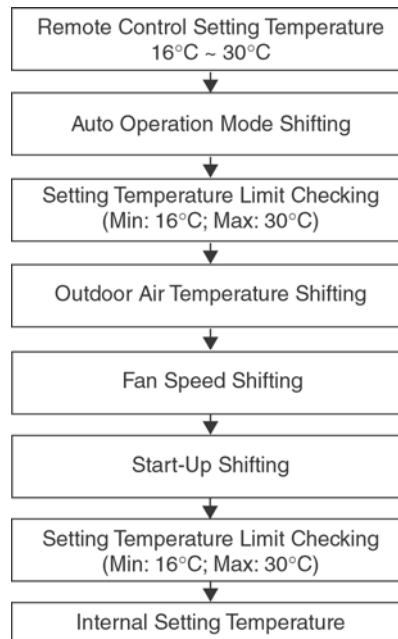
# 12 Operation and Control

## 12.1. Basic Function

Inverter control, which equipped with a microcomputer in determining the most suitable operating mode as time passes, automatically adjusts output power for maximum comfort always. In order to achieve the suitable operating mode, the microcomputer maintains the set temperature by measuring the temperature of the environment and performing temperature shifting. The compressor at outdoor unit is operating following the frequency instructed by the microcomputer at indoor unit that judging the condition according to internal setting temperature and intake air temperature.

### 12.1.1. Internal Setting Temperature

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



### 12.1.2. Cooling Operation

#### 12.1.2.1. Thermostat control

- Compressor is OFF when Intake Air Temperature - Internal Setting Temperature < -1.5°C.
- Compressor is ON after waiting for 3 minutes, if the Intake Air Temperature - Internal Setting Temperature > Compressor OFF point.

### 12.1.3. Soft Dry Operation

#### 12.1.3.1. Thermostat control

- Compressor is OFF when Intake Air Temperature - Internal Setting Temperature < -1.5°C.
- Compressor is ON after waiting for 3 minutes, if the Intake Air Temperature - Internal Setting Temperature > Compressor OFF point.

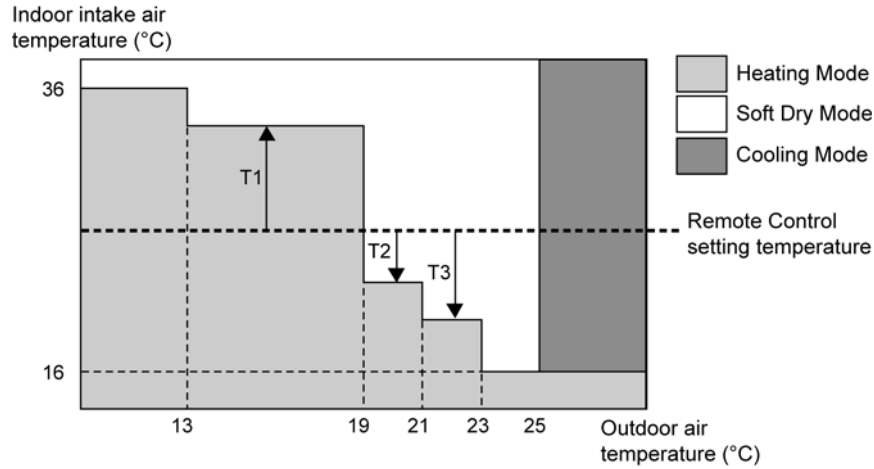
### 12.1.4. Heating Operation

#### 12.1.4.1. Thermostat control

- Compressor is OFF when Intake Air Temperature - Internal Setting Temperature > +2.0°C.
- Compressor is ON after waiting for 3 minutes, if the Intake Air Temperature - Internal Setting Temperature < Compressor OFF point.

### 12.1.5. Automatic Operation

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



Every 30 minutes, the indoor and outdoor temperature is judged. Based on remote control setting temperature, the value of T1 will increase up to 10°C, T2 will decreased by 3°C and T3 will decreased up to 8°C. The Auto Operation Mode shifting will take place whenever operation mode changed from Cooling/Soft Dry to Heating or vice versa.

### 12.1.6. Indoor Fan Motor Operation

#### A. Basic Rotation Speed (rpm)

##### i. Manual Fan Speed

[Cooling, Dry]

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

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

[Heating]

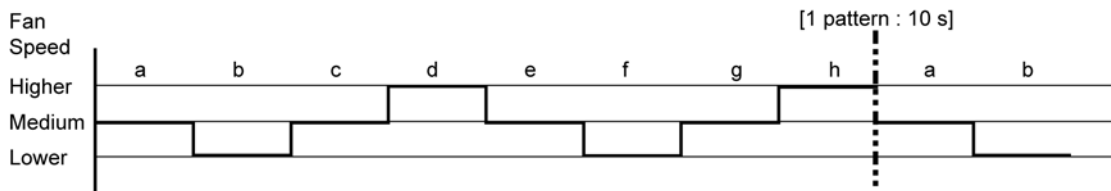
- Fan motor's number of rotation is determined according to remote control setting.

Remote Control	O	O	O	O	O
Tab (rpm)	Shi	Me+	Me	Me-	Lo

##### ii. Auto Fan Speed

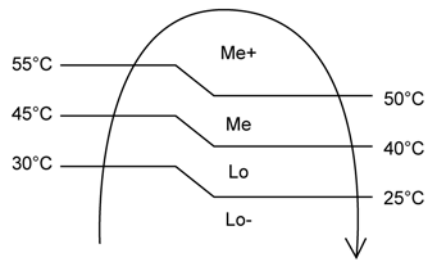
[Cooling, Dry]

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



[Heating]

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

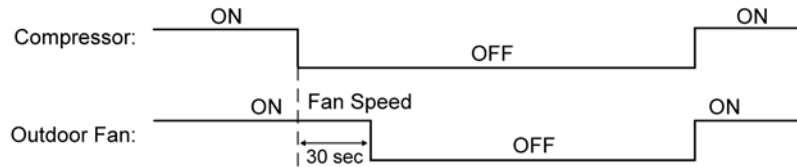


### B. Feedback control

- Immediately after the fan motor started, feedback control is performed once every second.
- During fan motor on, if fan motor feedback  $\geq 2550$  rpm or  $< 50$  rpm continue for 10 seconds, then fan motor error counter increase, fan motor is then stop and restart. If the fan motor counter becomes 7 times, then H19 - fan motor error is detected. Operation stops and cannot on back.

### 12.1.7. Outdoor Fan Motor Operation

Outdoor fan motor is operated with one fan speed only. It starts when compressor starts operation and it stops 30 seconds after compressor stops operation.



## 12.2. Airflow Direction

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

### 12.2.1. Vertical Airflow

Operation Mode	Airflow Direction		Vane Angle (°)				
			1	2	3	4	5
Heating	Auto with Heat Exchanger	A	0				
		B	45				
	Temperature	C	0				
		D	0				
	Manual		12	25	37	49	60
Cooling and e-ion	Auto		10 ~ 32				
	Manual		12	18	25	31	37
Soft Dry	Auto		10 ~ 32				
	Manual		12	18	25	31	37



- Automatic vertical airflow direction can be set using remote control; the vane swings up and down within the angles as stated above. For heating mode operation, the angle of the vane depends on the indoor heat exchanger temperature as Figure 1 below. When the air conditioner is stopped using remote control, the vane will shift to close position.
- Manual vertical airflow direction can be set using remote control; the angles of the vane are as stated above and the positions of the vane are as Figure 2 below. When the air conditioner is stopped using remote control, the vane will shift to close position.

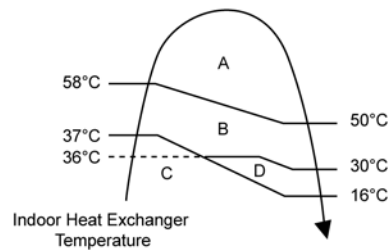


Figure 1

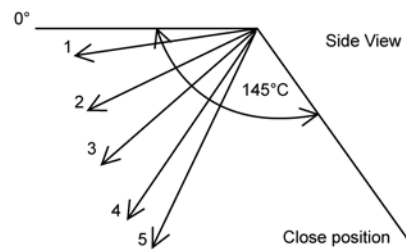


Figure 2

### 12.2.2. Horizontal Airflow

- Automatic horizontal airflow direction can be set using remote control; the vane swings left and right within the angles as stated below. For heating mode operation, the angle of the vane depends on the indoor heat exchanger temperature as Figure 1 below.

Operation Mode		Vane Angle (°)
Heating, with heat exchanger temperature	A	68 ~ 112
	B	90
Cooling and Soft Dry		68 ~ 112

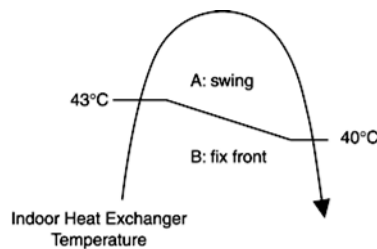


Figure 1

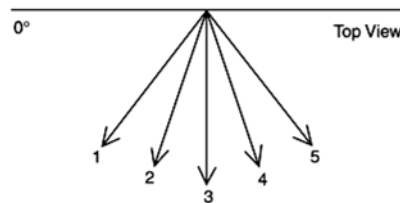


Figure 2

- Manual horizontal airflow direction can be set using remote control; the angles of the vane are as stated below and the positions of the vane are as Figure 2 above.

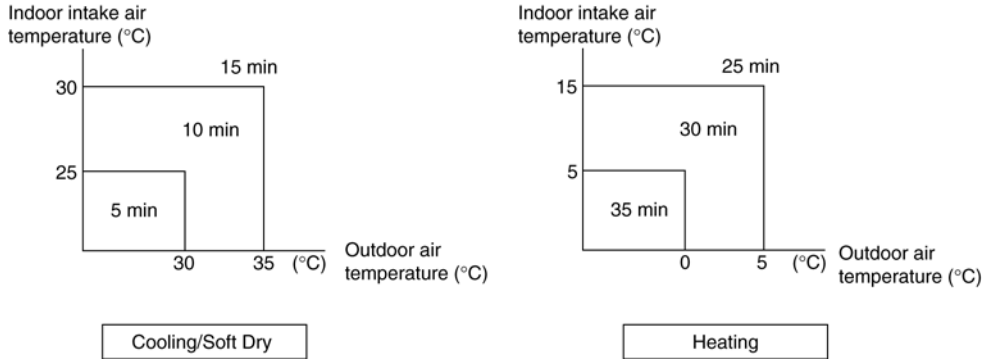
Pattern	1	2	3	4	5
Airflow Direction Patterns at Remote Control					
Vane Angle (°)	90	65	78	102	115

### 12.3. ON Timer Control

ON timer can be set using remote control, the unit with timer set will start operate earlier than the setting time. This is to provide a comfortable environment when reaching the set ON time.

60 minutes before the set time, indoor (at fan speed of Lo-) and outdoor fan motor start operate for 30 seconds to determine the indoor intake air temperature and outdoor air temperature in order to judge the operation starting time.

From the above judgment, the decided operation will start operate earlier than the set time as shown below.



### 12.4. OFF Timer Control

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

### 12.5. Auto Restart Control

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

# 13 Protection Control

## 13.1. Protection Control For All Operations

### 13.1.1. Time Delay Safety Control

1. The compressor will not start for three minutes after stop of operation.
2. This control is not applicable if the power supply is cut off and on again or after 4-way valve deices condition.

### 13.1.2. 30 Seconds Forced Operation

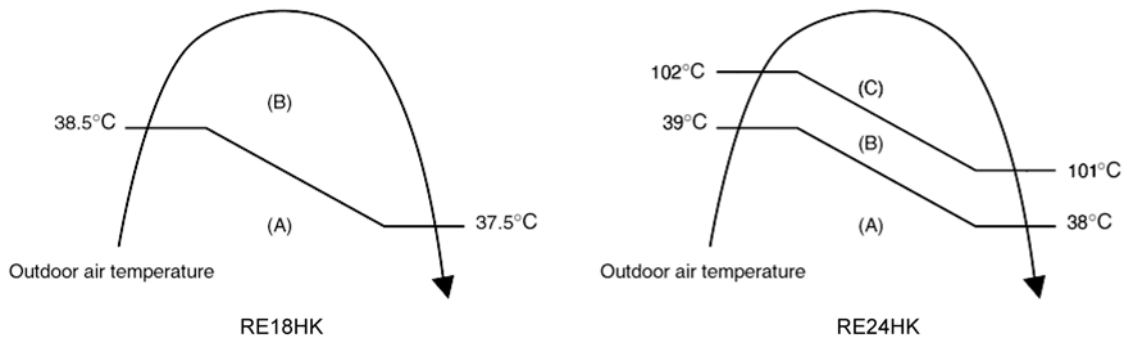
1. Once the compressor starts operation, it will not stop its operation for 30 seconds.
2. However, it can be stopped using remote control or Auto Switch at indoor unit.

### 13.1.3. Total Running Current Control

1. When the outdoor unit total running current (AC) exceeds X value, the frequency instructed for compressor operation will be decreased.
2. If the running current does not exceed X value for five seconds, the frequency instructed will be increased.
3. However, if total outdoor unit running current exceeds Y value, compressor will be stopped immediately for three minutes.

Operation Mode	RE18HK		RE24HK	
	X (A)	Y (A)	X (A)	Y (A)
Cooling/Soft Dry (A)	8.8	15.0	14.0	20.0
Cooling/Soft Dry (B)	7.7	15.0	12.0	20.0
Cooling/Soft Dry (C)	—	—	14.0	20.0
Heating	10.8	17.0	12.8	20.0

4. The first 30 minutes of cooling operation, (A) will be applied.



### 13.1.4. IPM (Power transistor) Prevention Control

#### A. Overheating Prevention Control

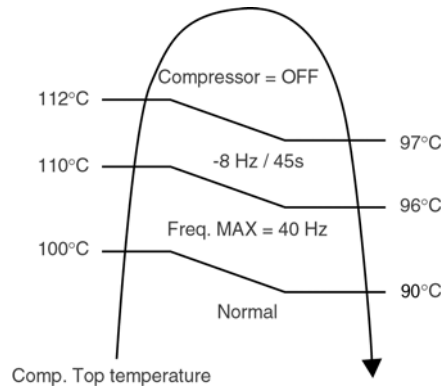
1. When the IPM temperature rises to 110°C, compressor operation will stop immediately.
2. Compressor operation restarts after three minutes the temperature decreases to 95°C.

#### B. DC Peak Current Control

1. When electric current to IPM exceeds set value of  $25.0 \pm 4.0$  A, the compressor will stop operate. Then, operation will restart after three minutes.
2. If the set value is exceeded again more than 30 seconds after the compressor starts, the operation will restart after two minute.
3. If the set value is exceeded again within 30 seconds after the compressor starts, the operation will restart after one minute. If this condition repeats continuously for seven times, all indoor and outdoor relays will be cut off.

### 13.1.5. Compressor Overheating Prevention Control

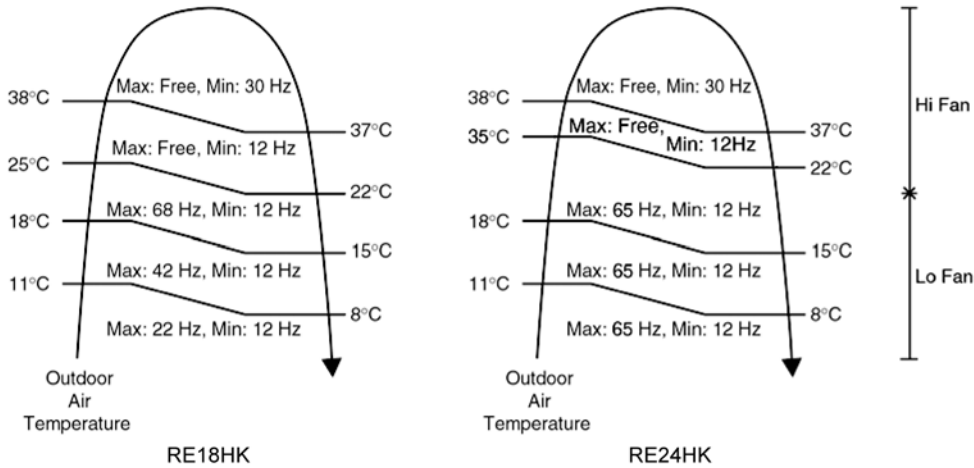
Instructed frequency for compressor operation will be regulated by compressor top temperature. The changes of frequency are as below figure.



## 13.2. Protection Control For Cooling & Soft Dry Operation

### 13.2.1. Outdoor Air Temperature Control

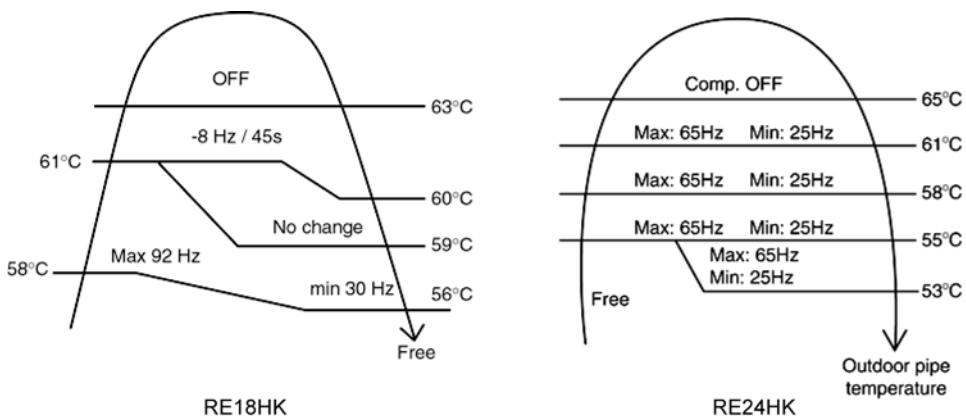
The compressor operating frequency is regulated in accordance to the outdoor air temperature as shown in the diagram below.



### 13.2.2. Cooling Overload Control

i. Pipe temperature limitation/restriction

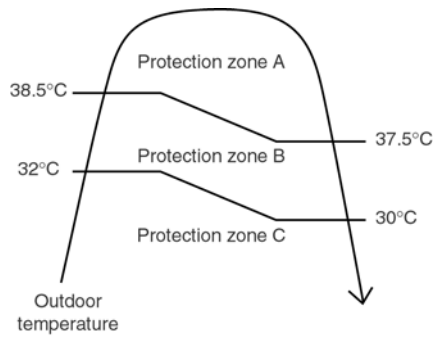
- Detects the Outdoor pipe temperature and carry out below restriction/limitation (Limit the compressor Operation frequency)
- The compressor stop if outdoor pipe temperature exceeds 63°C
- If the compressor stops 4 times in 20 minutes, Timer LED blinking (F95: outdoor high pressure rise protection)



ii. Electrical part temperature rise protection control

- To prevent electrical component temperature rise during cooling overload.
- Judgement condition is by outdoor temperature (sampled every 10s).

- Control contents:
  - Outdoor fan speed (switch to zone A and B minimum fan speed).
  - Outdoor total current (zone C) higher than the specified.
- Cancellation condition: When one of above is not satisfied.

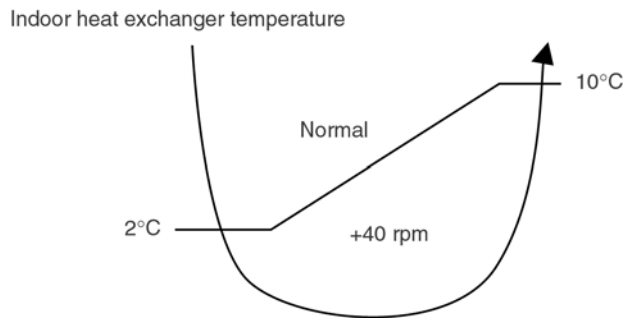


Outdoor total current

zone A	13.0 A
zone B	11.0 A
zone C	5.0 A

### 13.2.3. Freeze Prevention Control

1. When indoor heat exchanger temperature is lower than 2°C continuously for six minutes, compressor will stop operating.
2. Compressor will resume its operation three minutes after the indoor heat exchanger is higher than 10°C.
3. At the same time, indoor fan speed increase +40 rpm compared to its normal operation.
4. If indoor heat exchanger temperature is higher than 10°C for five minutes, the fan speed will return to its normal operation.



### 13.3. Protection Control For Heating Operation

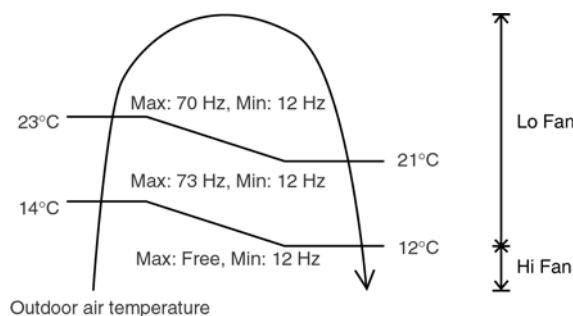
#### 13.3.1. Intake Air Temperature Control

Compressor will operate at rated freq. or less respectively if either one of the below conditions occur:

1. When the indoor intake air temperature is above 10°C and remote control setting fan speed is lower Me-.
2. When the indoor intake air temperature is 30°C or above.

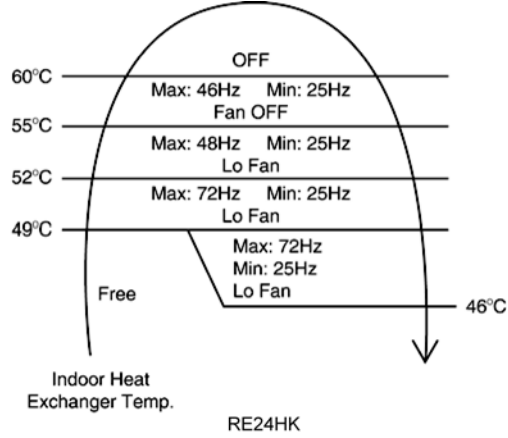
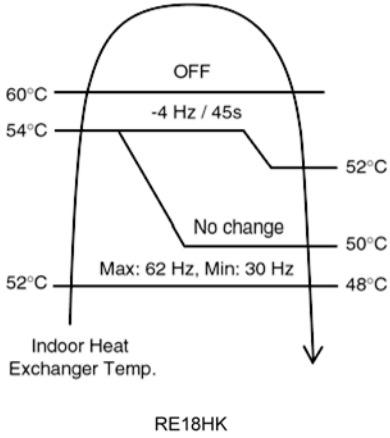
#### 13.3.2. Outdoor Air Temperature Control

The compressor operating frequency is regulated in accordance to the outdoor air temperature as shown in the below figures. This control will begin one minute after the compressor starts.



### 13.3.3. Overload Protection Control

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



# 14 Servicing Mode

## 14.1. CS-RE18HKE CU-RE18HKE

### 14.1.1. Auto Switch Operation

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

**1. AUTO OPERATION MODE**

The Auto operation will be activated immediately once the Auto Switch is pressed and release before 5 sec..

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

**3. HEATING TRIAL OPERATION**

Press the AUTO switch continuously for more than 8 sec. to below 11 sec. and release when a "pep pep" sound is occurred at eight sec. (However, a "pep" sound is occurred at fifth sec..) then press Remote controller "A/C Reset" button once. Remote controller signal will activate operation to force heating mode.

**4. REMOTE CONTROLLER RECEIVING SOUND ON/OFF**

The ON/OFF of Remote controller receiving sound can be change over by the following steps:

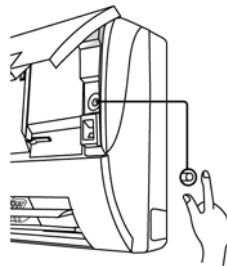
a. Press "AUTO" Switch continuously for more than 16 sec. to below 21 sec.

A "pep", "pep", "pep", "pep" sound will occur at the sixteenth sec..

b. Press the "A/C Reset" button once. Remote controller signal will activate the Remote controller sound setting mode.

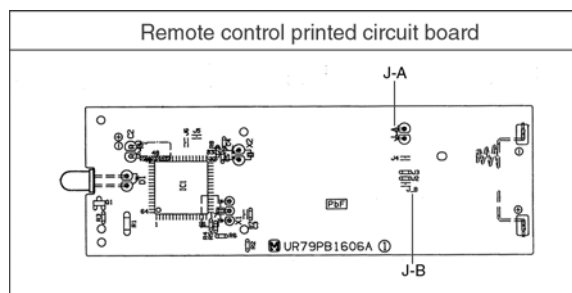
c. Press the "Check" button once at Remote controller. A "pep" sound will occur.

d. Press the "AUTO" switch once to select Remote controller receiving sound ON/OFF. A "pep" sound indicates receiving sound ON, and a "pep" sound indicates receiving sound OFF.



### 14.1.2. Selecting The Wireless Remote Control Transmission Code

When there are more than one indoor units installed in the same room, it is possible to set different remote control receiving signal by modifying the jumpers inside Remote Control.



	Remote control printed circuit board		Note
	J - A	J - B	
0	SHORT	OPEN	At product delivery
1	OPEN	OPEN	
2	SHORT	SHORT	
3	OPEN	SHORT	

## 14.2. CS-RE24HKE CU-RE24HKE

### 14.2.1. Auto Switch Operation

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

#### 1. AUTO OPERATION MODE

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

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

The Test Run operation will be activated if the Auto Switch is pressed continuously for more than 5 sec. A "beep" 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 change over by pressing the following step:

a. Release the Auto Switch after Test Run operation is activated.

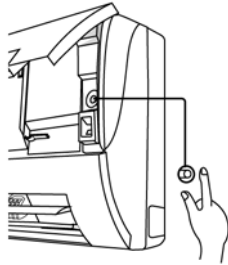
b. Then, within 20 sec., after a., press Auto Switch for more than 5 sec.

A "beep" "beep" sound will occur at the fifth sec., then release the Auto Switch.

c. Within 20 sec. after b., press Auto Switch again. Everytime Auto Switch is pressed (within 20 sec. interval), remote controller receiving sound status will be reversed between ON and OFF.

Long "beep" sound indicates that remote controller receiving sound is OFF.

Short "beep" sound indicates that remote controller receiving sound is ON.



4.

Number of "beep":	1	2	3	4		
Function:	Auto Operation	Forced Cool	Forced Heat	Various Setting Mode	Individual Counter-action	
Duration (s):	0	5	8	11	16	21

a. When the switch is pressed between 0 to 5 seconds, Auto Mode operation starts to function.

b. When the switch is pressed between 5 to 8 seconds, the unit is forced to operate in Cooling Mode.

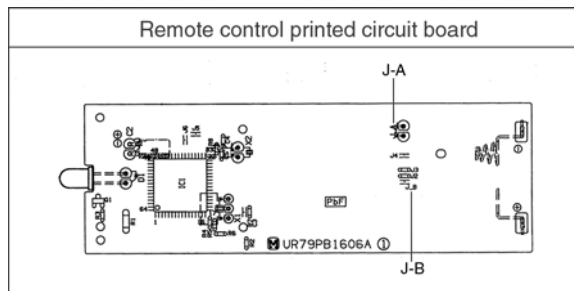
c. When the switch is pressed between 8 to 11 seconds, the unit will enter forced Heating Mode standby. Press timer decrement button for 5S for the unit to operate in Heating Mode.

d. When the switch is pressed between 11 to 16 seconds and together with the signal from remote control (timer decrement button for 5S), the unit can be changed to different controlling setting (4 type of transmission codes).

e. When the switch is pressed between 16 to 21 seconds, either "H14" error detection selection mode or the remote control signal receiving sound can be cancelled or turned on.

### 14.2.2. Selecting The Wireless Remote Control Transmission Code

When there are more than one indoor units installed in the same room, it is possible to set different remote control receiving signal by modifying the jumpers inside Remote Control.





	Remote control printed circuit board		Note
	J - A	J - B	
0	SHORT	OPEN	At product delivery
1	OPEN	OPEN	
2	SHORT	SHORT	
3	OPEN	SHORT	

# 15 Troubleshooting Guide

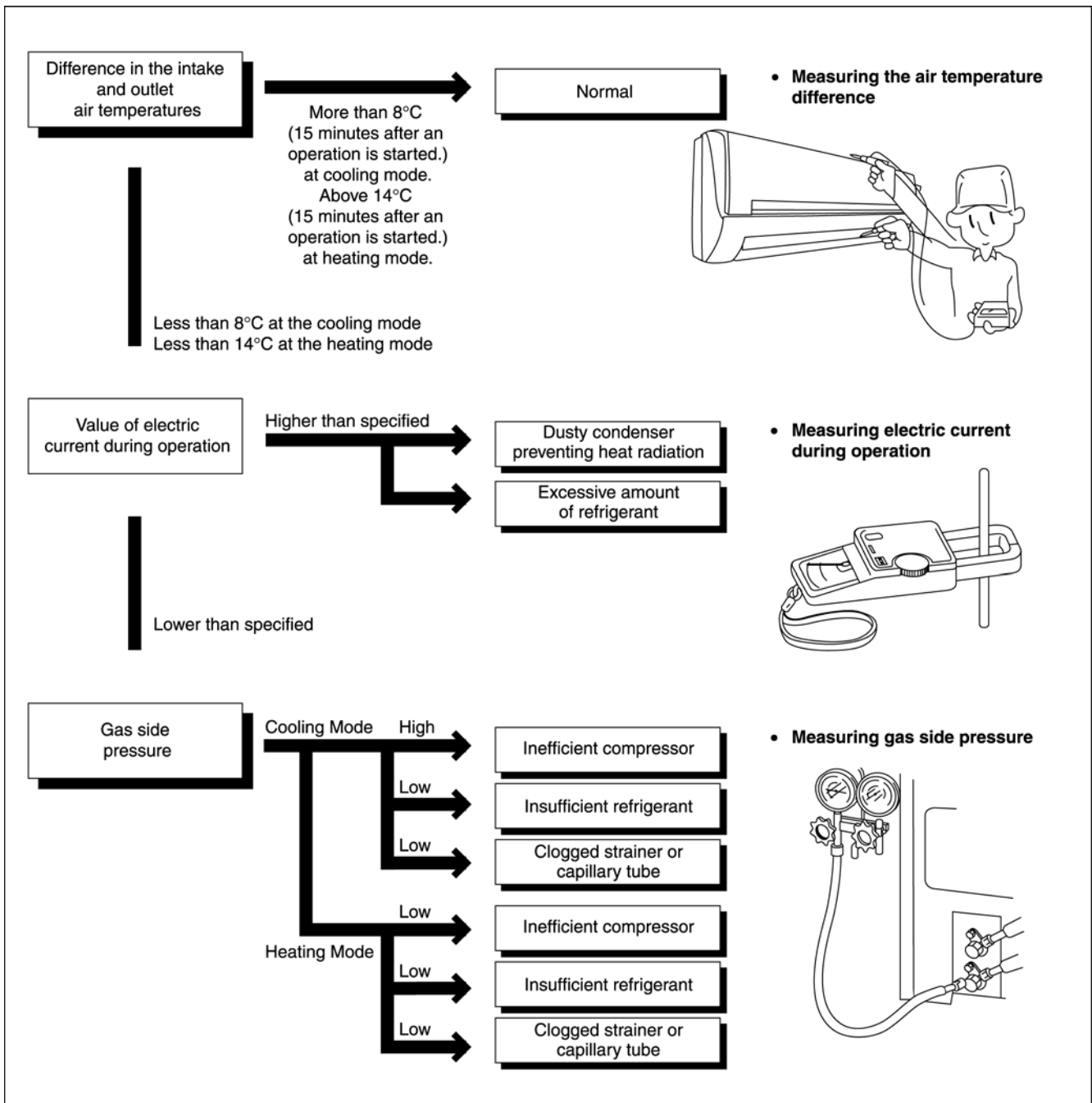
## 15.1. Refrigeration Cycle System

In order to diagnose malfunctions, make sure that there are no electrical problems before inspecting the refrigeration cycle. Such problems include insufficient insulation, problem with the power source, malfunction of a compressor and a fan. The normal outlet air temperature and pressure of the refrigeration cycle depends on various conditions, the standard values for them are shown in the table on the right.

Normal Pressure and Outlet Air Temperature (Standard)

	Gas pressure MPa (kg/cm <sup>2</sup> G)	Outlet air temperature (°C)
Cooling Mode	0.9 ~ 1.2 (9 ~ 12)	12 ~ 16
Heating Mode	2.3 ~ 2.9 (23 ~ 29)	36 ~ 45

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



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

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

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

## 15.3. Breakdown Self Diagnosis Function

### 15.3.1. Self Diagnosis Function (Three Digits Alphanumeric Code)

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

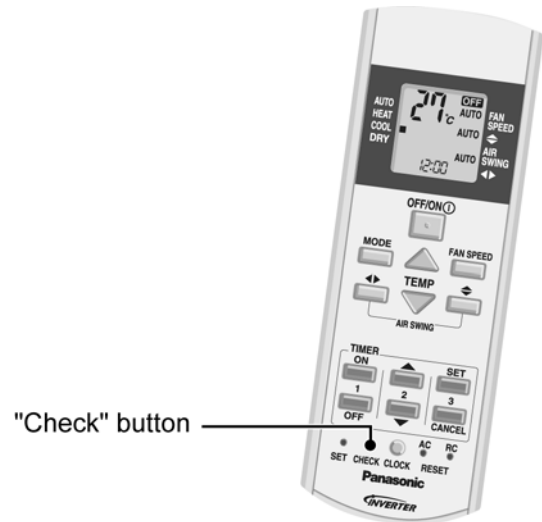
#### • To make a diagnosis

1. Timer LED start to blink and the unit automatically stops the operation.
2. Press the CHECK button on the remote controller continuously for 5 seconds.
3. “- -” will be displayed on the remote controller display.  
Note: Display only for “- -”. (No transmitting signal, no receiving sound and no Power LED blinking.)
4. Press the “TIMER” ▲ or ▼ button on the remote controller. The code “H00” (no abnormality) will be displayed and signal will be transmitted to the main unit.
5. Every press of the button (up or down) will increase abnormality numbers and transmit abnormality code signal to the main unit.
6. When the latest abnormality code on the main unit and code transmitted from the remote controller are matched, power LED will light up for 30 seconds and a beep sound (continuously for 4 seconds) will be heard. If no codes are matched, power LED will light up for 0.5 seconds and no sound will be heard.
7. The breakdown diagnosis mode will be canceled by pressing the CHECK button continuously for 5 seconds or without any operation the remote control for 30 seconds.
8. The LED will be off if the unit is turned off or the RESET button on the main unit is pressed.

#### • To display memorized error (Protective operation) status:

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

7. The breakdown diagnosis mode will be canceled unless pressing the CHECK button continuously for 5 seconds or operating the unit for 30 seconds.
8. The same diagnosis can be repeated by turning power on again.



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

1. Turn power on.
2. Press the AUTO button for 5 seconds (A beep receiving sound) on the main unit to operate the unit at Forced Cooling Operation mode.
3. Press the CHECK button on the remote controller for about 1 second with a pointed object to transmit signal to main unit. A beep sound is heard from main unit and the data is cleared.

#### • Temporary Operation (Depending on breakdown status)

1. Press the AUTO button (A beep receiving sound) on the main unit to operate the unit. (Remote control will become possible.)
2. The unit can temporarily be used until repaired.

Error Code	Operation	Temporary items
H23	Cooling	Emergency Operation with limited power
H27, H28	Cooling, Heating	Emergency Operation with limited power
H26	Cooling, Heating	Emergency Operation with limited power

## 15.4. Error Codes Table

Diagnosis display	Abnormality / Protection control	Abnormality Judgement	Emergency operation	Primary location to verify
H00	No abnormality detected	—	Normal operation	—
H11	Indoor / outdoor abnormal communication	> 1 min after starting operation	Indoor fan operation only	<ul style="list-style-type: none"> <li>• Internal / external cable connections</li> <li>• Indoor / Outdoor PCB</li> </ul>
H12	Connection capability rank abnormal	—	—	—
H14	Indoor intake air temperature sensor abnormality	Continue for 5 sec.	—	<ul style="list-style-type: none"> <li>• Intake air temperature sensor (defective or disconnected)</li> </ul>
H15	Outdoor compressor temperature sensor abnormality	Continue for 5 sec.	—	<ul style="list-style-type: none"> <li>• Compressor temperature sensor (defective or disconnected)</li> </ul>
H16	Outdoor Current Transformer open circuit	—	—	<ul style="list-style-type: none"> <li>• Outdoor PCB</li> <li>• IPM (Power transistor) module</li> </ul>
H19	Indoor fan motor mechanism lock	—	—	<ul style="list-style-type: none"> <li>• Indoor PCB</li> <li>• Fan motor</li> </ul>
H23	Indoor heat exchanger temperature sensor abnormality	Continue for 5 sec.	O (Cooling only)	<ul style="list-style-type: none"> <li>• Heat exchanger temperature sensor (defective or disconnected)</li> </ul>
H27	Outdoor air temperature sensor abnormality	Continue for 5 sec.	O	<ul style="list-style-type: none"> <li>• Outdoor temperature sensor (defective or disconnected)</li> </ul>
H28	Outdoor heat exchanger temperature sensor abnormality	Continue for 5 sec.	O	<ul style="list-style-type: none"> <li>• Outdoor heat exchanger temperature sensor (defective or disconnected)</li> </ul>
H30	Discharge temperature sensor abnormality	Continue for 5 sec.	—	<ul style="list-style-type: none"> <li>• Discharge temperature sensor</li> </ul>
H33	Indoor/Outdoor wrong connection	—	—	<ul style="list-style-type: none"> <li>• Indoor/Outdoor supply voltage</li> </ul>
H38	Indoor/Outdoor mismatch (brand code)	—	—	—
H97	Outdoor Fan Motor lock abnormality	—	—	<ul style="list-style-type: none"> <li>• Outdoor PCB</li> <li>• Outdoor Fan Motor</li> </ul>
H98	Indoor high pressure protection	—	—	<ul style="list-style-type: none"> <li>• Air filter dirty</li> <li>• Air circulation short circuit</li> </ul>
H99	Indoor heat exchanger anti-freezing protection	—	—	<ul style="list-style-type: none"> <li>• Insufficient refrigerant</li> <li>• Air filter dirty</li> </ul>
F11	Cooling / Heating cycle changeover abnormality	4 times occurrence within 30 minutes	—	<ul style="list-style-type: none"> <li>• 4-way valve</li> <li>• V-coil</li> </ul>
F90	PFC control	4 times occurrence within 10 minutes	—	<ul style="list-style-type: none"> <li>• Voltage at PFC</li> </ul>
F91	Refrigeration cycle abnormality	7 times occurrence continuously	—	<ul style="list-style-type: none"> <li>• No refrigerant (3-way valve is closed)</li> </ul>
F93	Outdoor compressor abnormal revolution	4 times occurrence within 20 minutes	—	<ul style="list-style-type: none"> <li>• Outdoor compressor</li> </ul>
F95	Cool high pressure protection	4 times occurrence within 20 minutes	—	<ul style="list-style-type: none"> <li>• Outdoor refrigerant circuit</li> </ul>
F96	IPM (power transistor) overheating protection	—	—	<ul style="list-style-type: none"> <li>• Excess refrigerant</li> <li>• Improper heat radiation</li> <li>• IPM (Power transistor)</li> </ul>
F97	Outdoor compressor overheating protection	4 times occurrence within 20 minutes	—	<ul style="list-style-type: none"> <li>• Insufficient refrigerant</li> <li>• Compressor</li> </ul>
F98	Total running current protection	3 times occurrence within 20 minutes	—	<ul style="list-style-type: none"> <li>• Excess refrigerant</li> <li>• Improper heat radiation</li> </ul>
F99	Outdoor Direct Current (DC) peak detection	7 times occurrence continuously	—	<ul style="list-style-type: none"> <li>• Outdoor PCB</li> <li>• IPM (Power transistor)</li> <li>• Compressor</li> </ul>

Note:

“O” - Frequency measured and fan speed fixed.

The memory data of error code is erased when the power supply is cut off, or press the Auto Switch until “beep” sound heard following by pressing the “CHECK” button at Remote Control.

Although operation forced to stop when abnormality detected, emergency operation is possible for certain errors (refer to Error Codes Table) by using Remote Control or Auto Switch at indoor unit. However, the Remote Control signal receiving sound is changed from one “beep” to four “beep” sounds.

# 16 Disassembly and Assembly Instructions



**WARNING**

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

## 16.1. Indoor Electronic Controllers, Cross Flow Fan And Indoor Fan Motor Removal Procedures

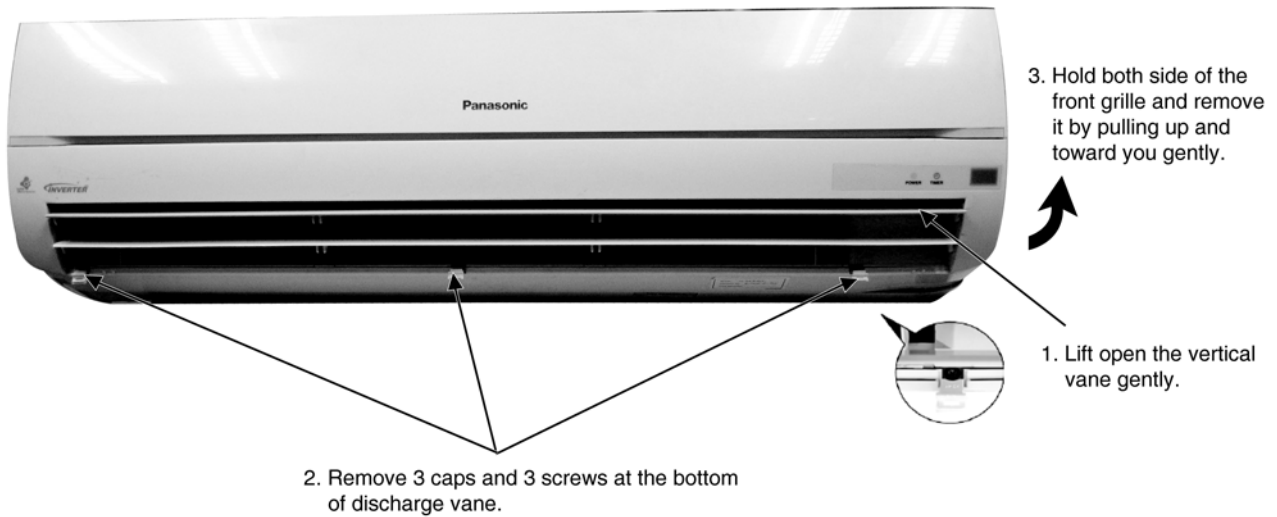


Fig. 1

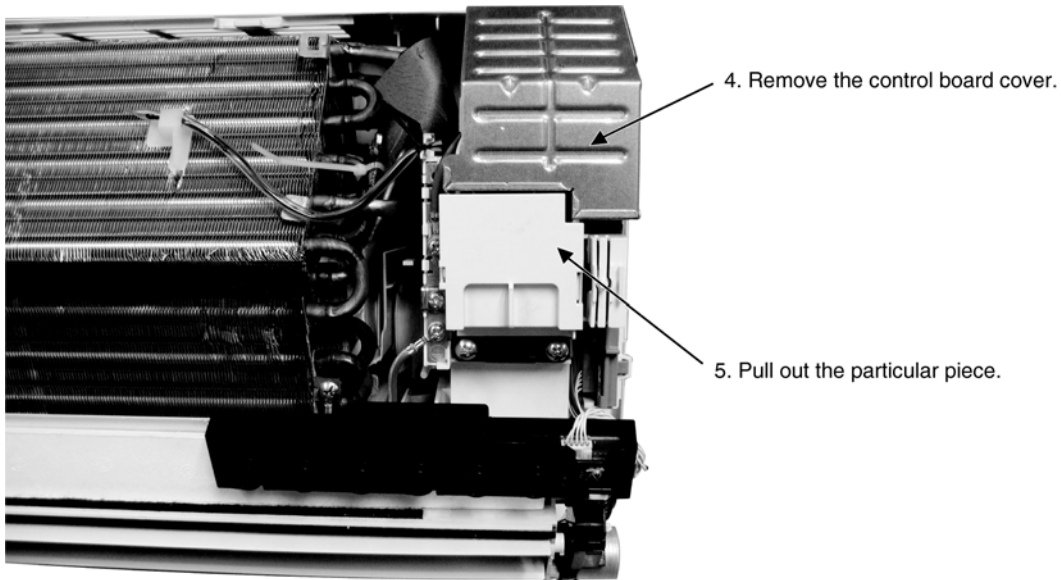


Fig. 2

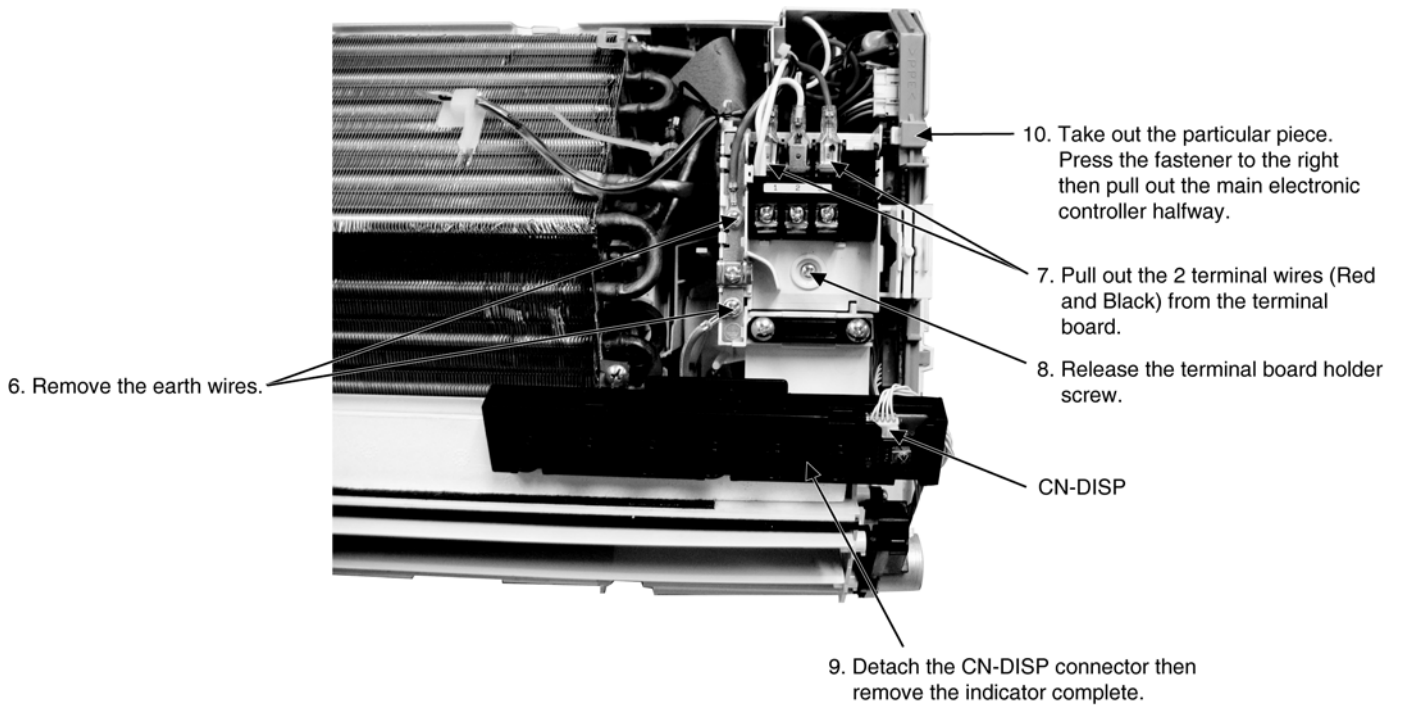


Fig. 3 (RE18HK)

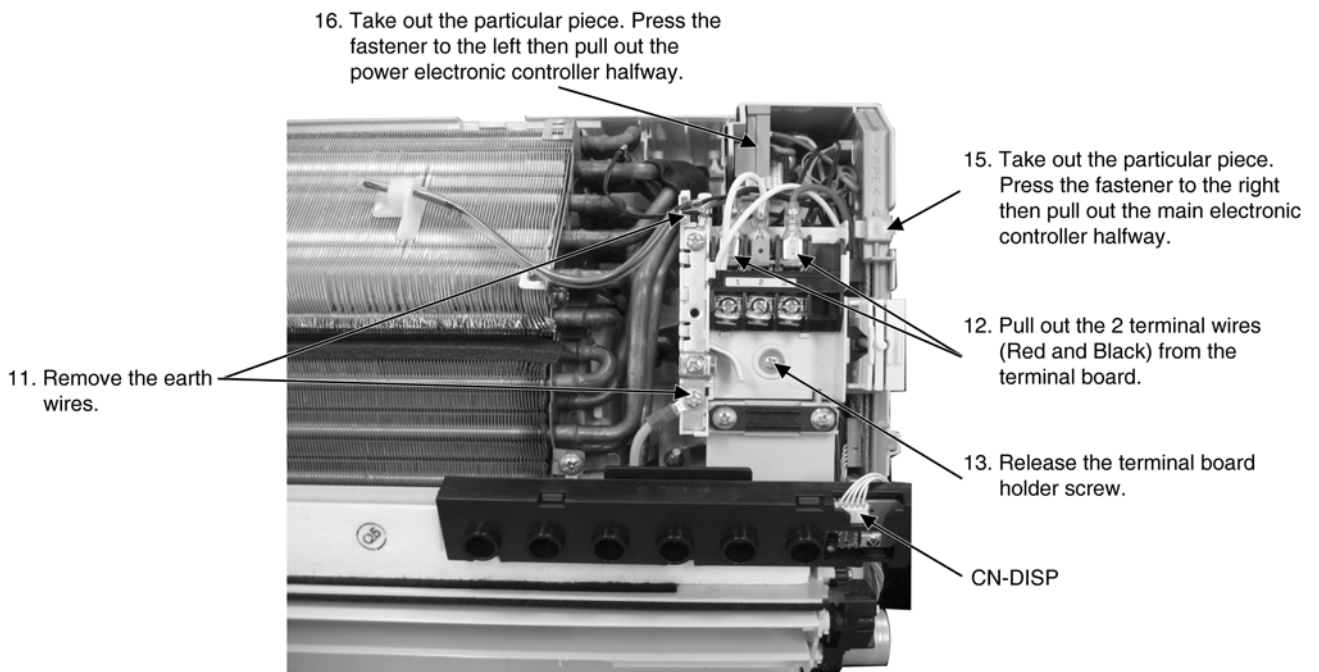


Fig. 4 (RE24HK)

17. Detach 5 connectors as labeled from the electronic controller. Then pull out slowly while pressing the fastener to the right.

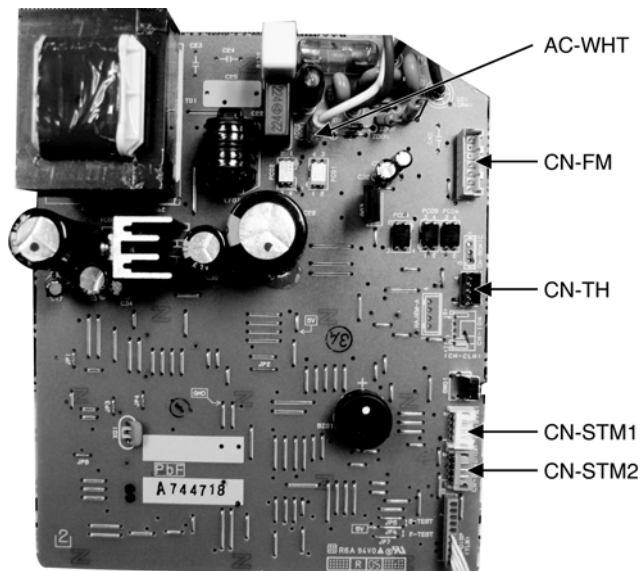


Fig. 5 (RE18HK)

18. Detach 4 connectors as labeled from the electronic controller. Then pull out slowly while pressing the fastener to the right.

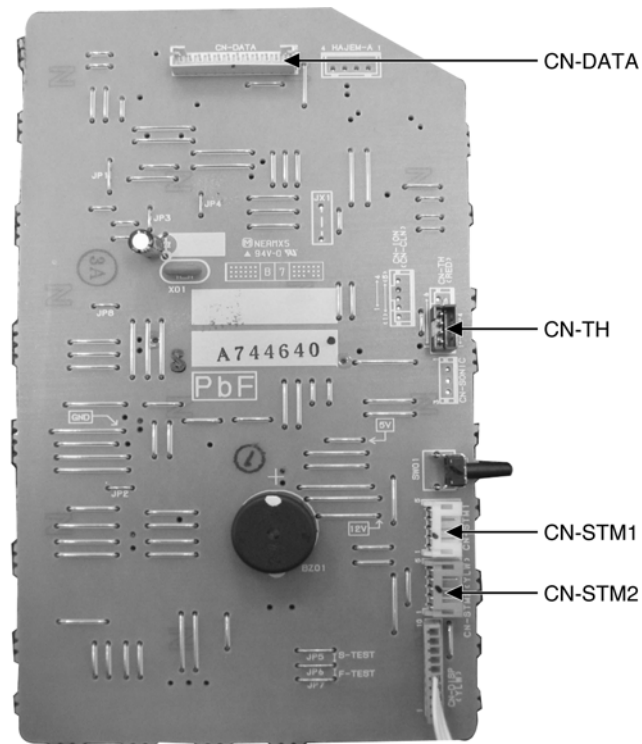


Fig. 6 (RE24HK)



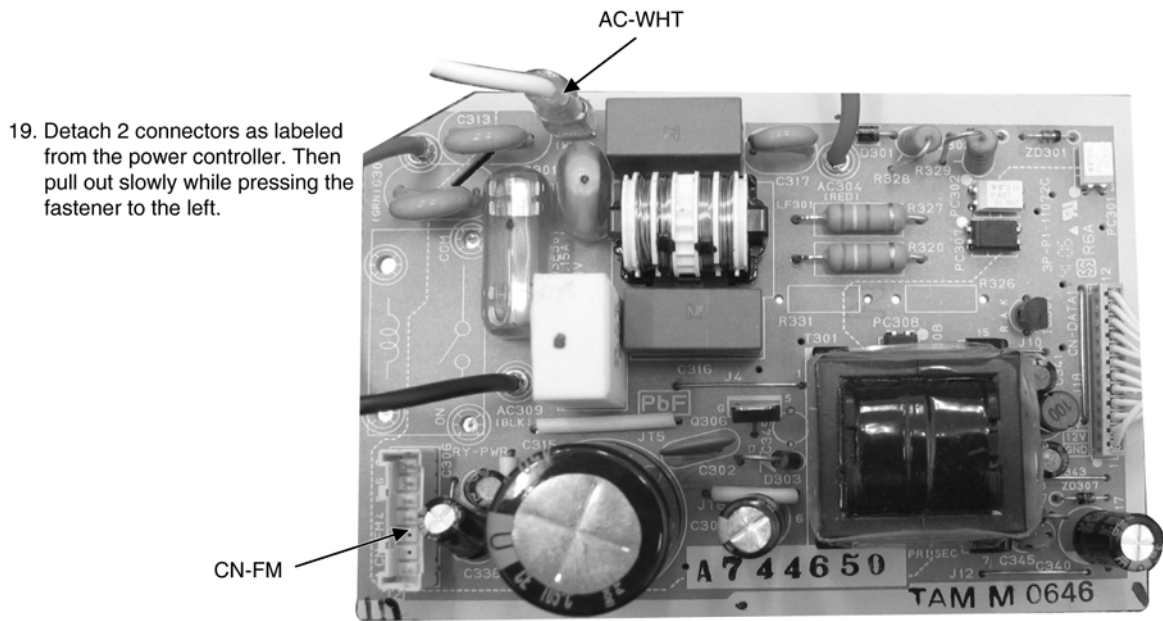
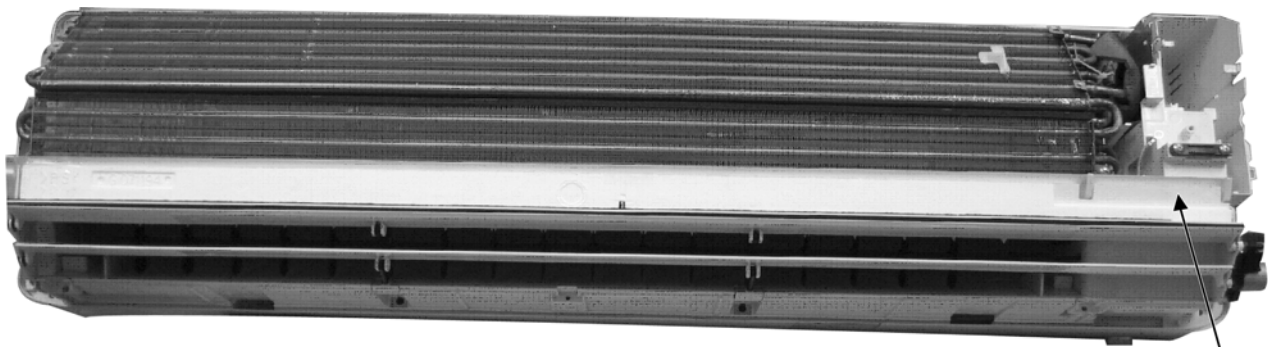


Fig. 7 (RE24HK)



20. Remove the drain hose from the discharge grille.

21. Then pull out the discharge grille downward gently to dismantle it.

Fig. 8

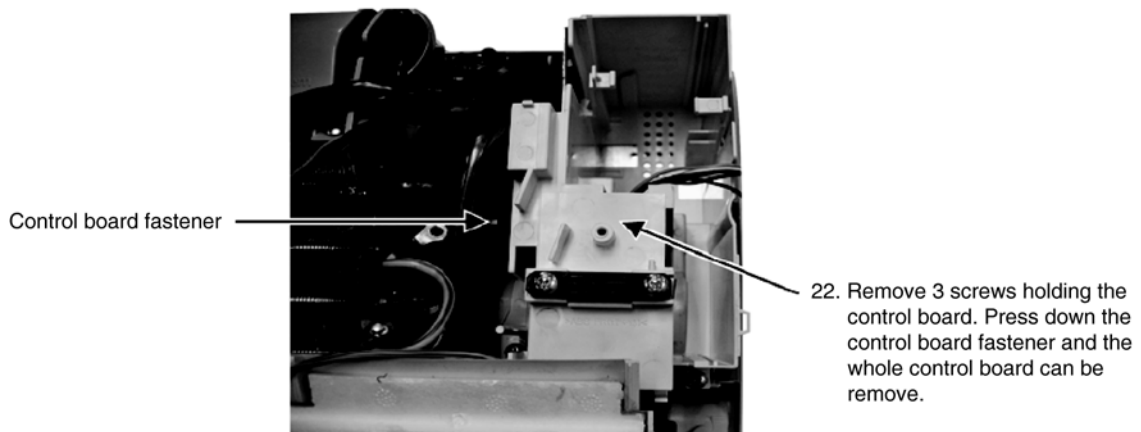
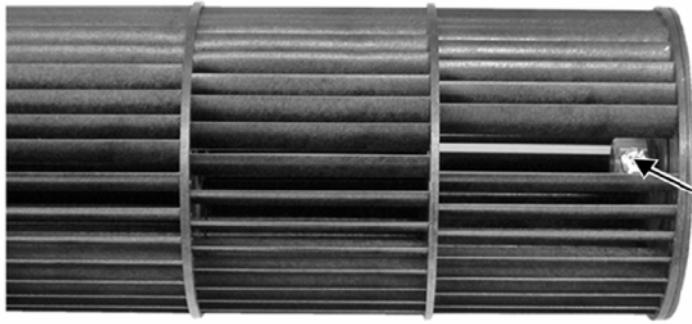


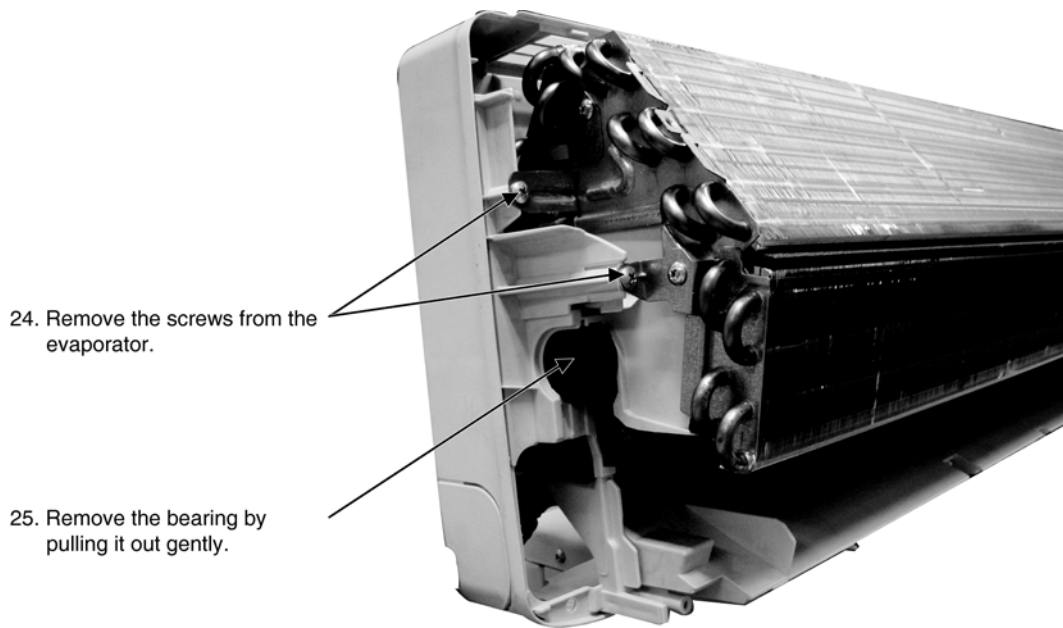
Fig. 9

## 16.2. Indoor Fan Motor And Cross Flow Fan Removal Procedures



23. Remove the screw that holding the cross flow fan and fan motor axis.

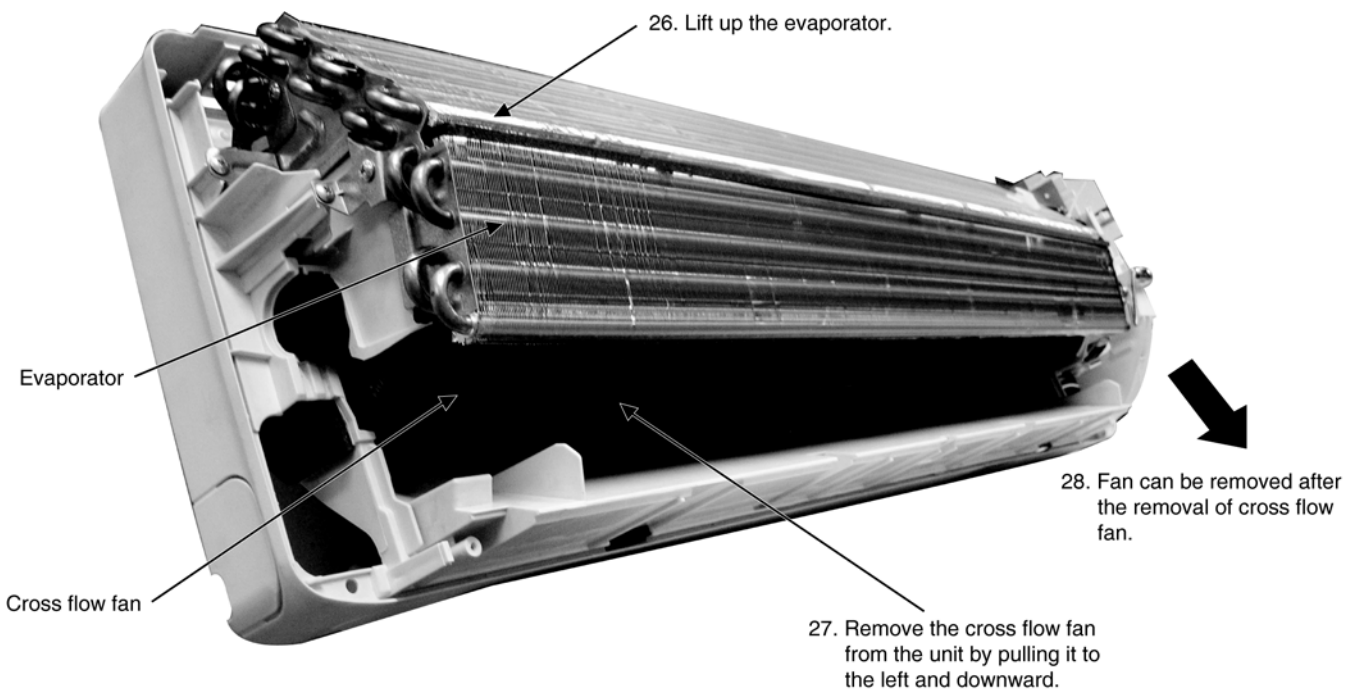
Fig. 10



24. Remove the screws from the evaporator.

25. Remove the bearing by pulling it out gently.

Fig. 11



26. Lift up the evaporator.

Evaporator

Cross flow fan

28. Fan can be removed after the removal of cross flow fan.

27. Remove the cross flow fan from the unit by pulling it to the left and downward.

Fig. 12

### 16.3. Outdoor Electronic Controller Removal Procedure (RE18HK)

1. Remove the 4 screws of the Top Panel.



Fig. 1

2. Remove the 10 screws of the Front Panel.

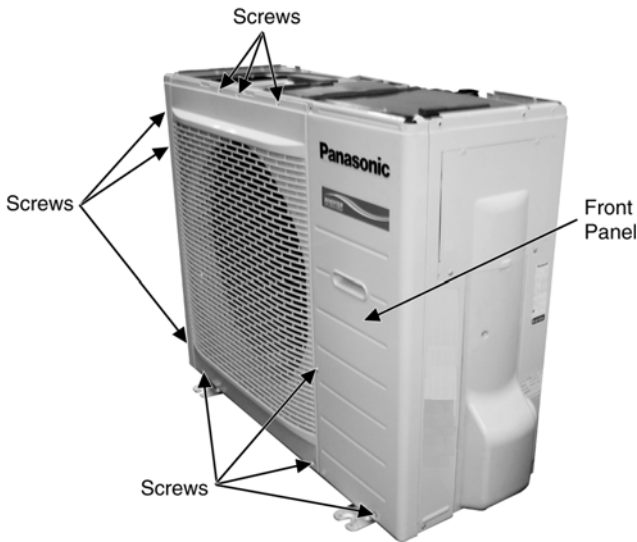


Fig. 2

3. Remove the Top Cover of the Electronic Controller.



Fig. 3

4. Remove the Control Board.

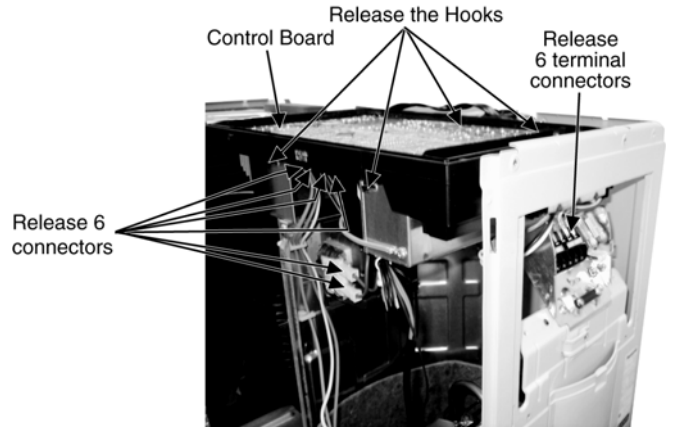


Fig. 4

5. Remove the 8 screws of the Electronic Controller.

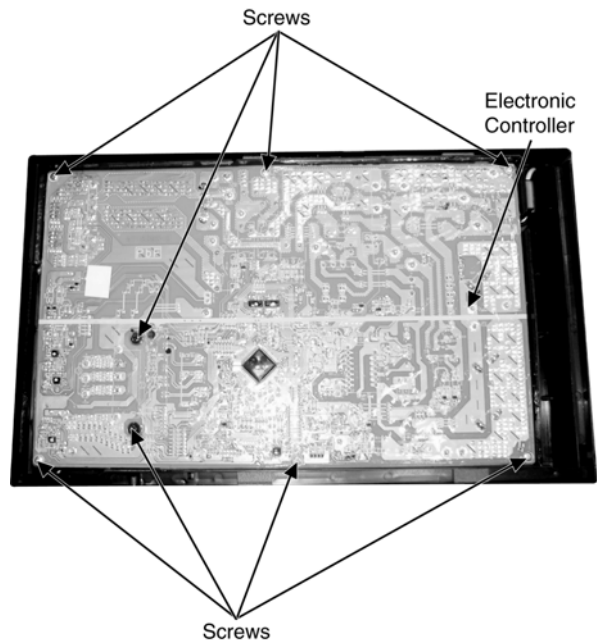


Fig. 5

⚠ Caution! When handling electronic controller, be careful of electrostatic discharge.

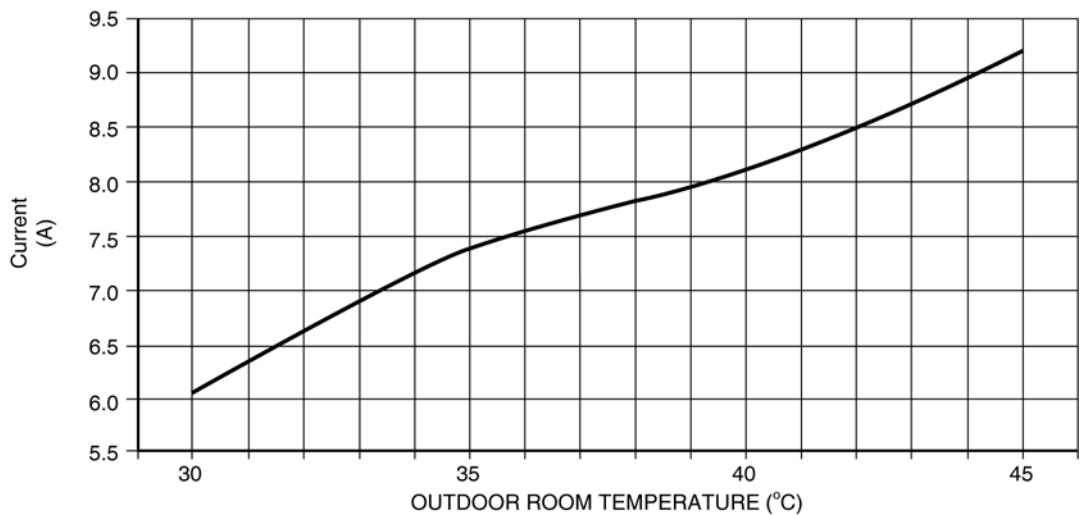
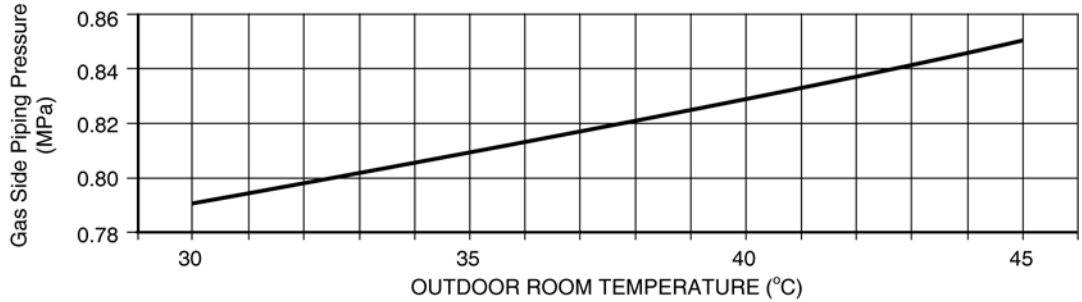
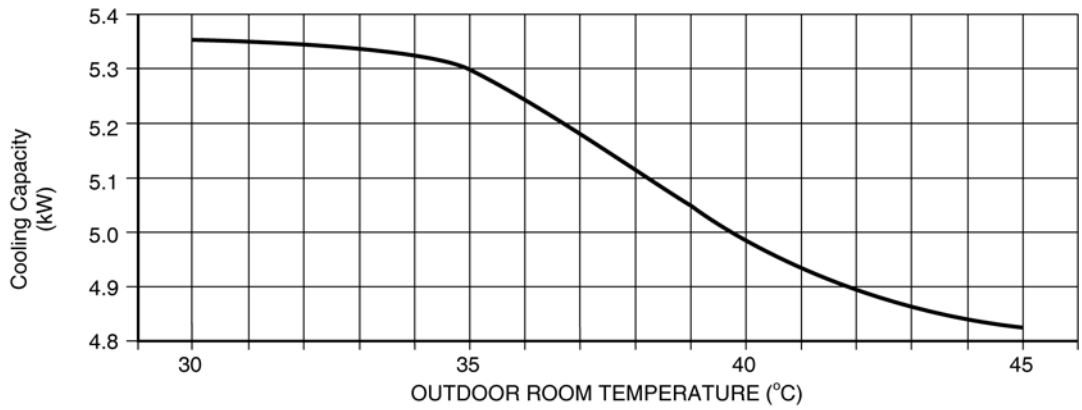
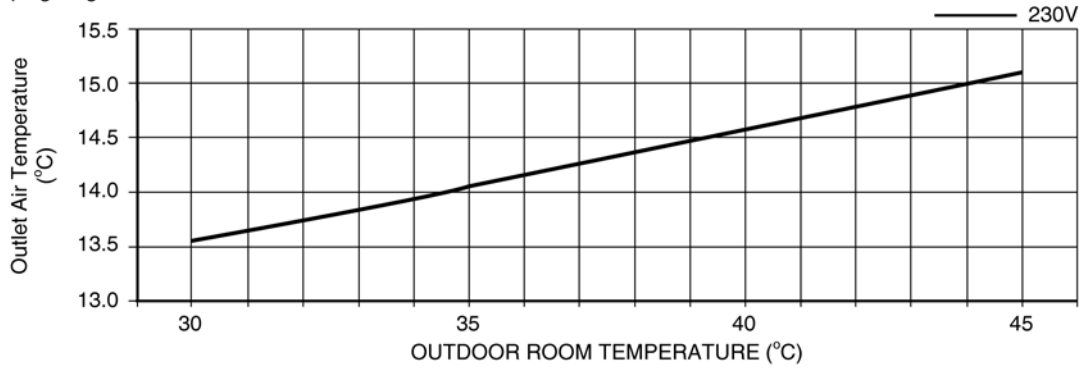
# 17 Technical Data

## 17.1. Operation Characteristics

### 17.1.1. CS-RE18HKE CU-RE18HKE

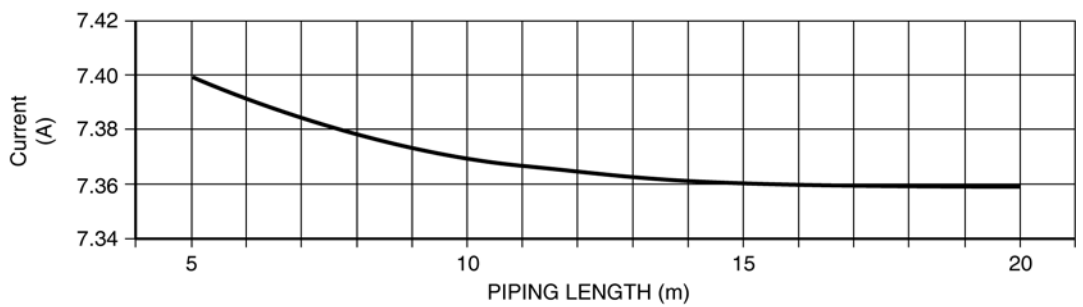
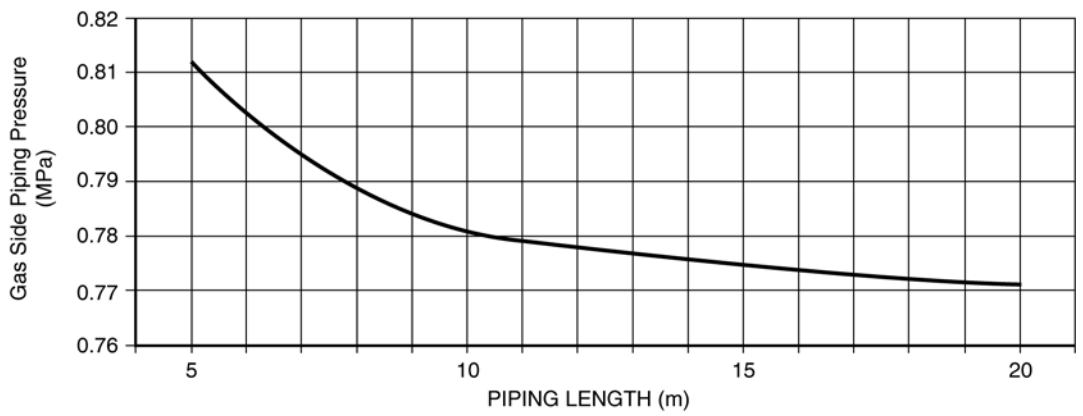
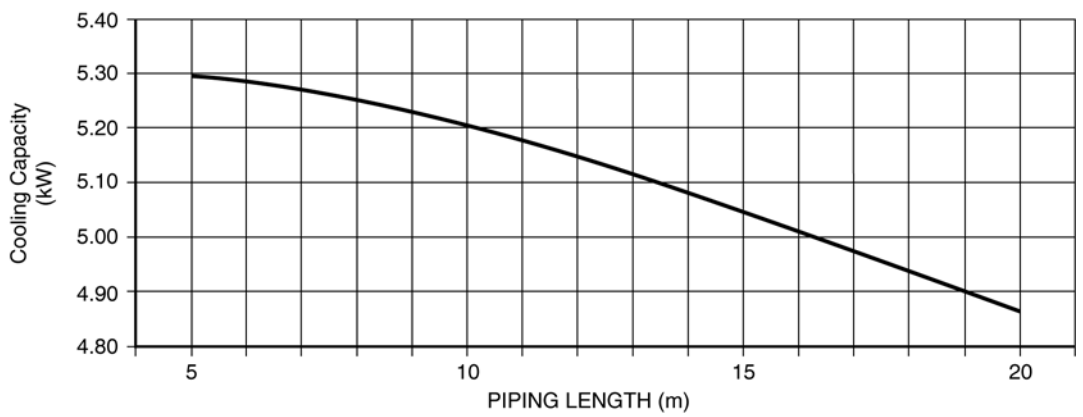
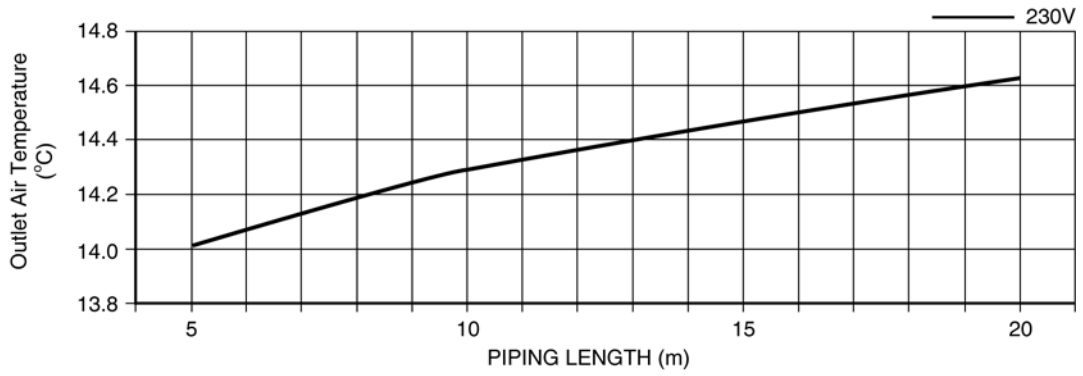
#### • Cooling Characteristic

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



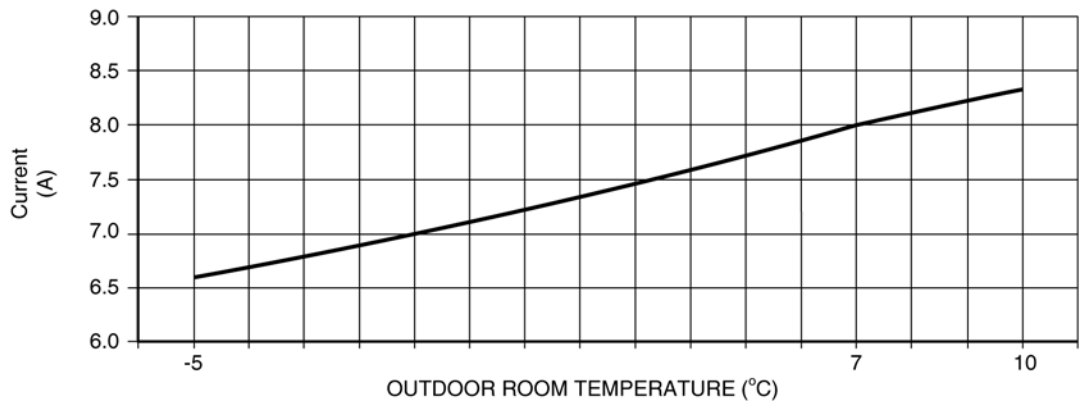
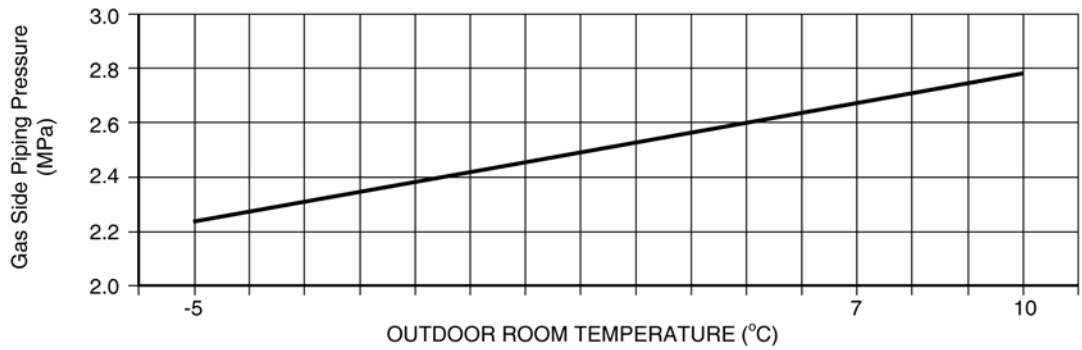
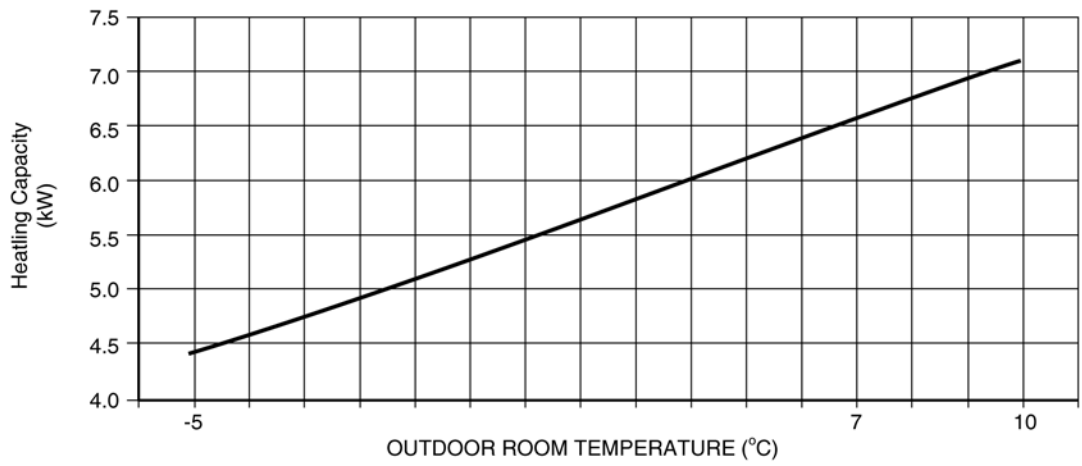
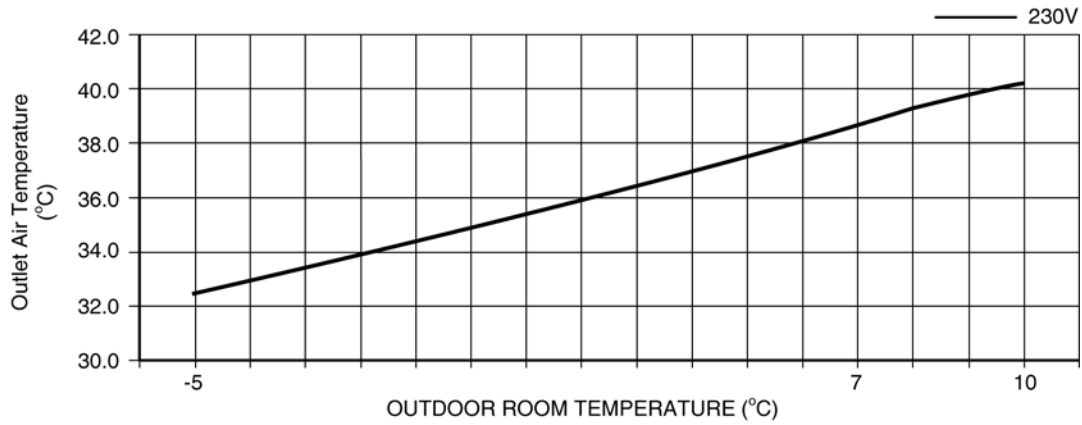
## • Piping Length Characteristic (Cooling)

[Condition] Room temperature: 27/19°C  
 Outdoor temperature: 35/24°C  
 Cooling operation: At High fan



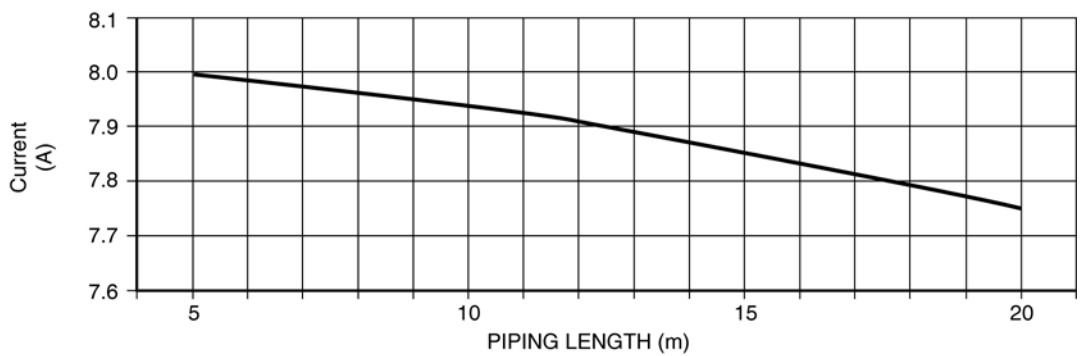
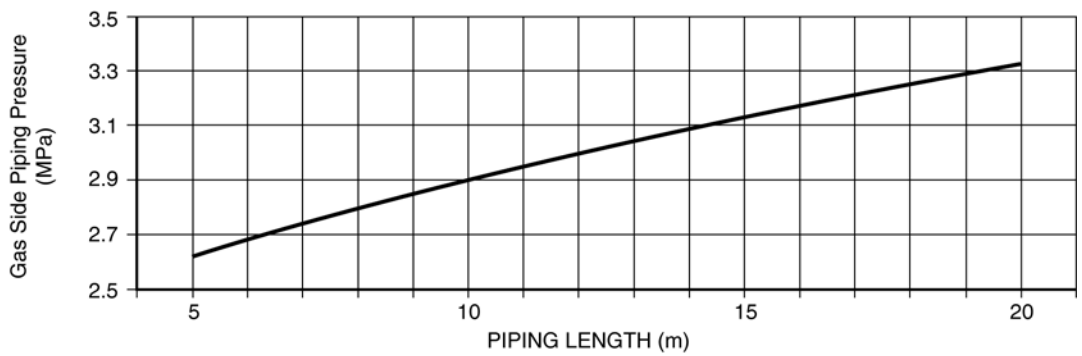
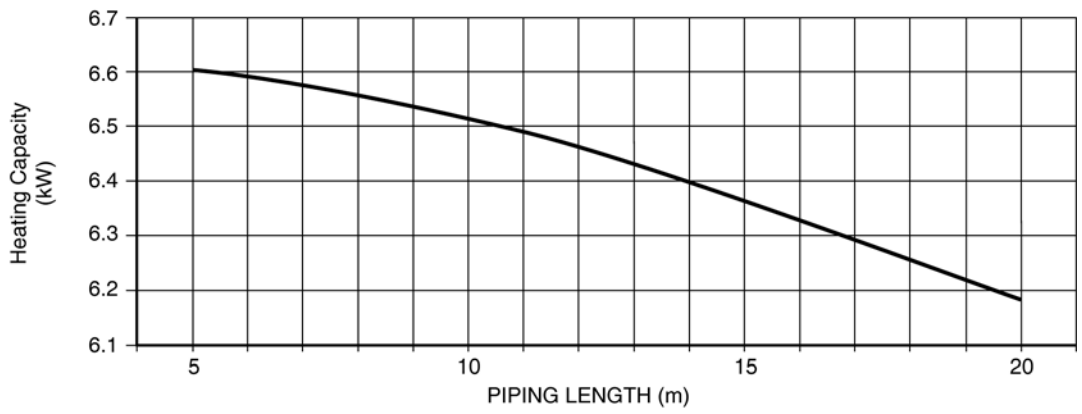
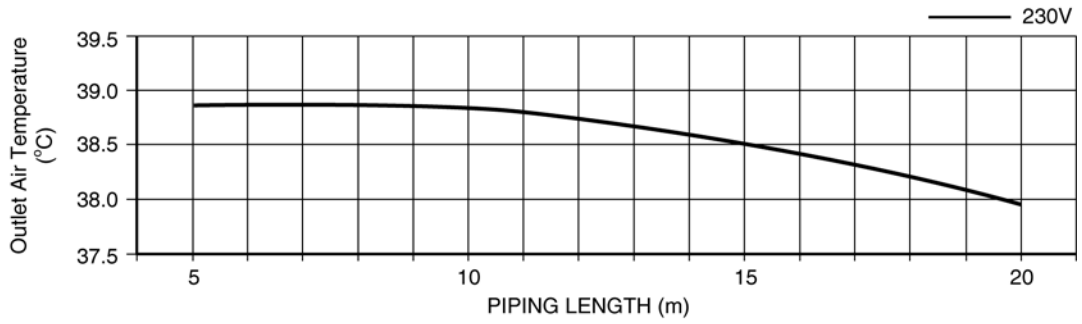
## • Heating Characteristic

[Condition] Room temperature: 20°C  
 Cooling operation: At High fan  
 Piping length: 5 m



# • Piping Length Characteristic (Heating)

[Condition] Room temperature: 20°C  
Outdoor temperature: 7/6°C  
Cooling operation: At High fan



## 17.1.2. CS-RE24HKE CU-RE24HKE

### Cooling Characteristic at Different Outdoor Air Temperature

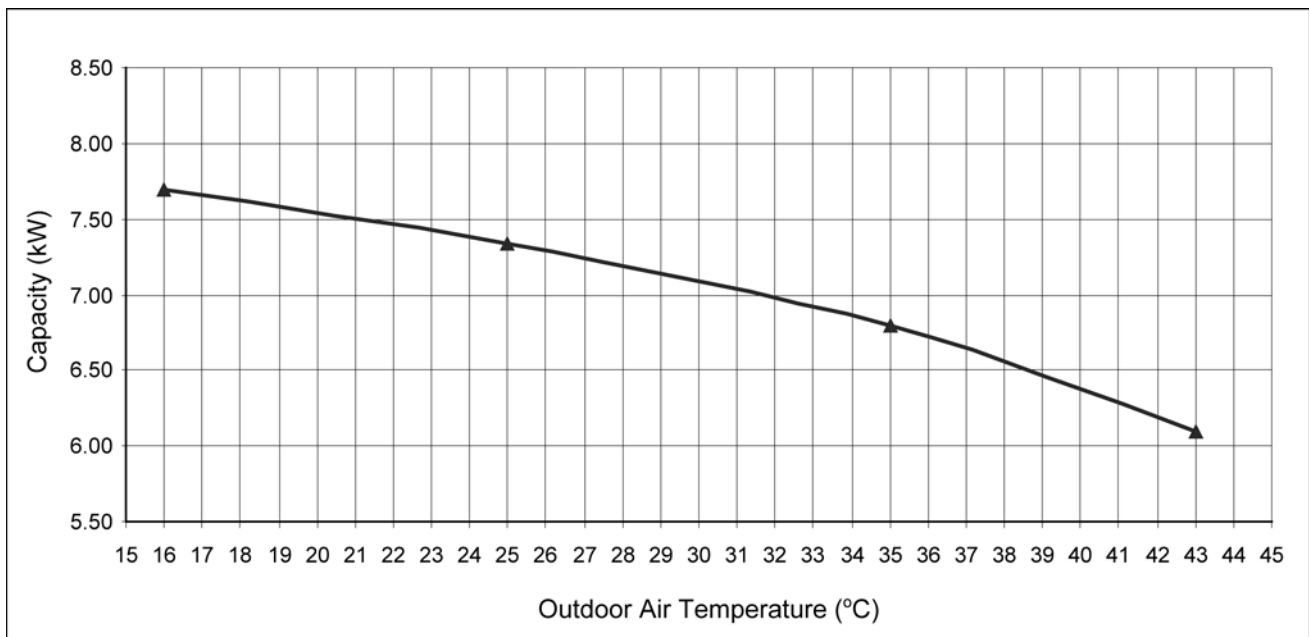
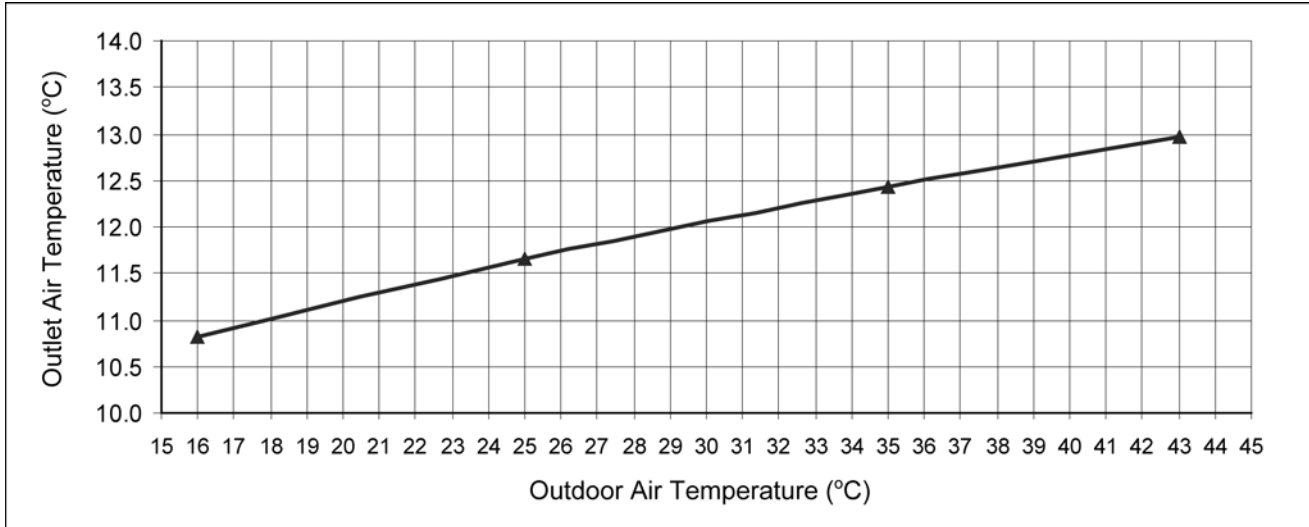
#### Condition

Indoor room temperature: 27/19 °C

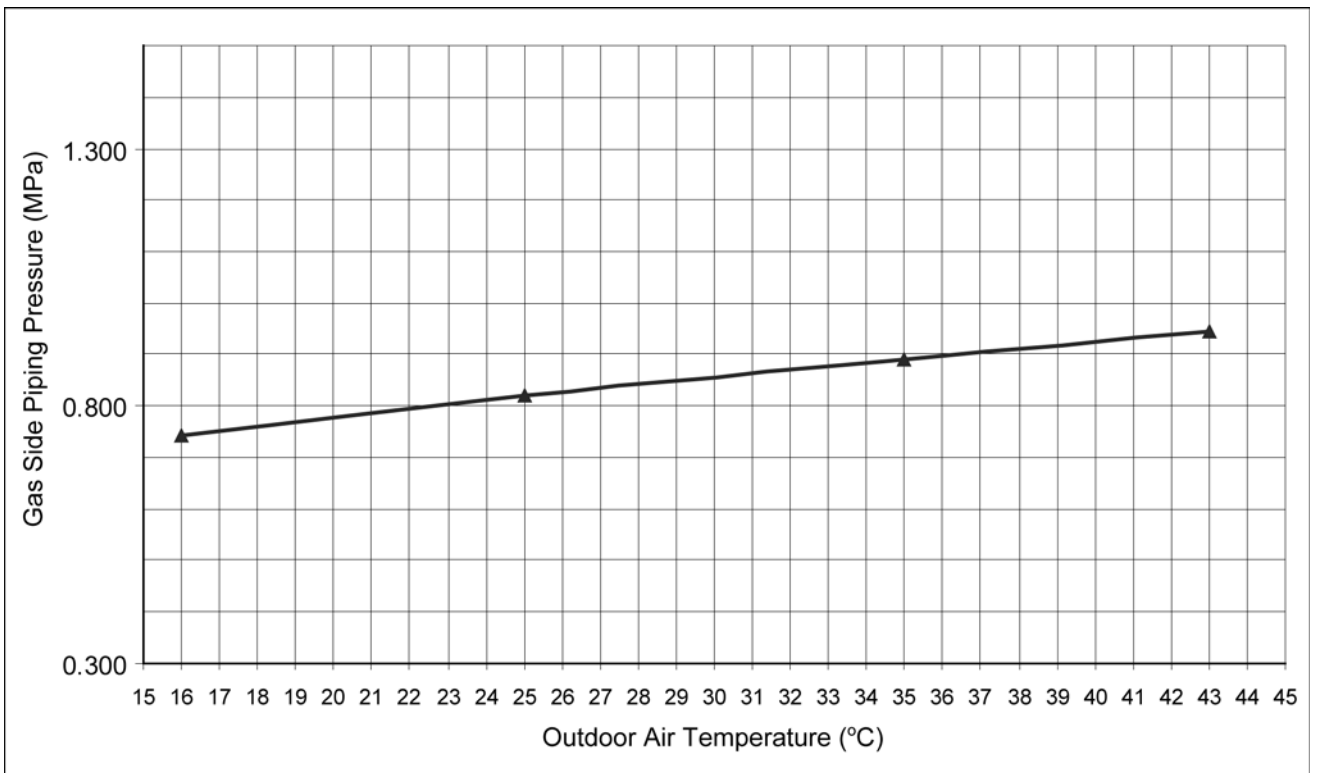
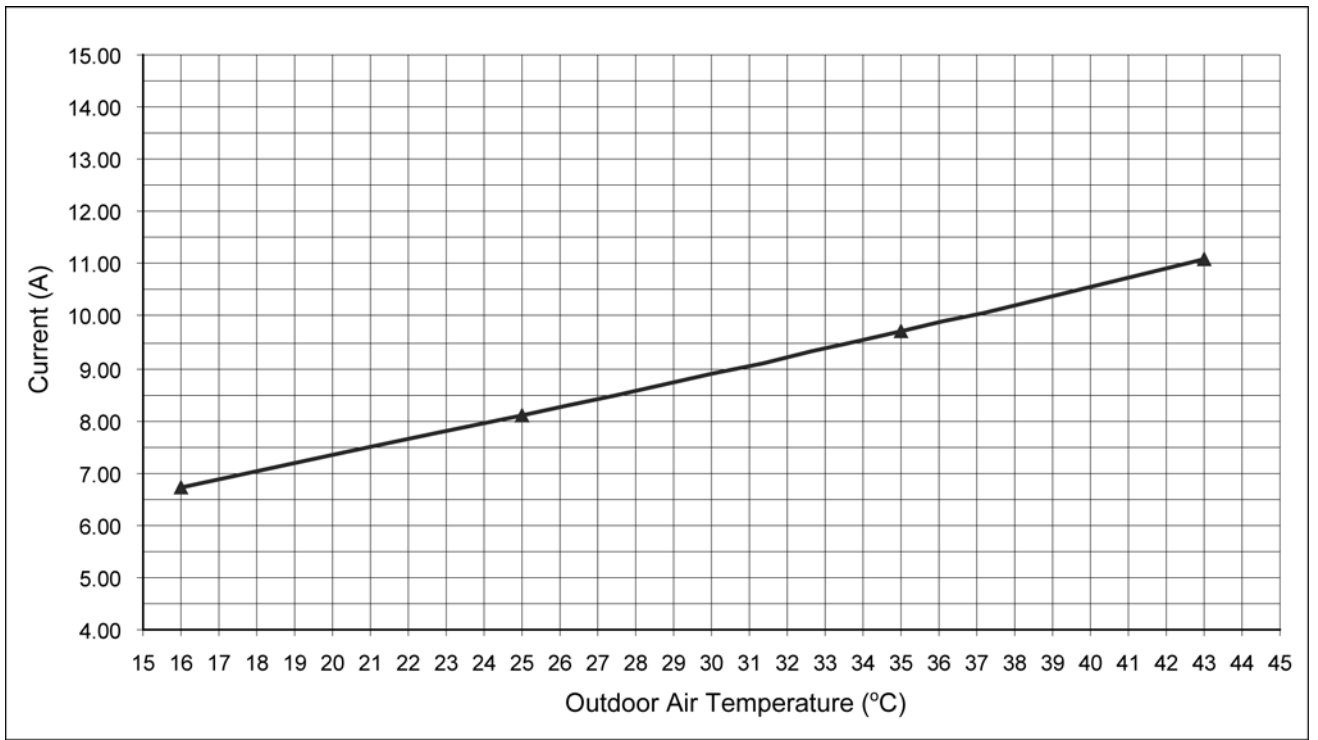
Remote control setting: HI fan, COOL 16 °C

Compressor frequency: Rated cooling

Voltage: 230 V







## Heating Characteristic at Different Outdoor Air Temperature

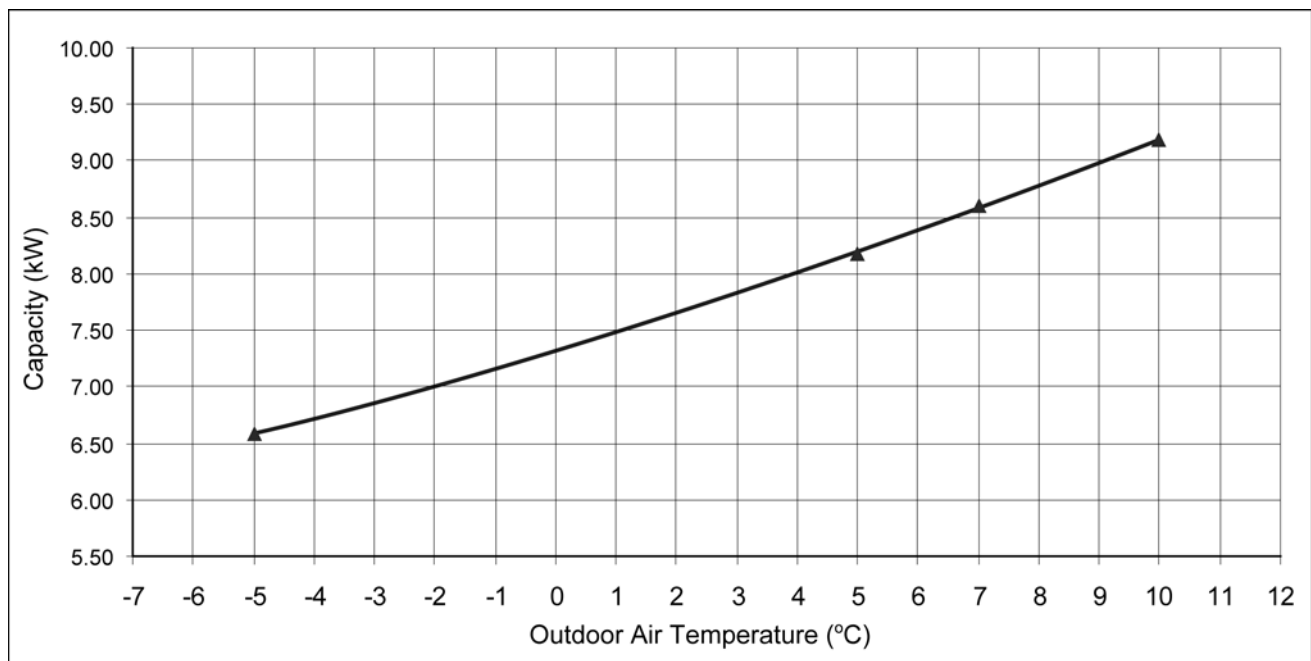
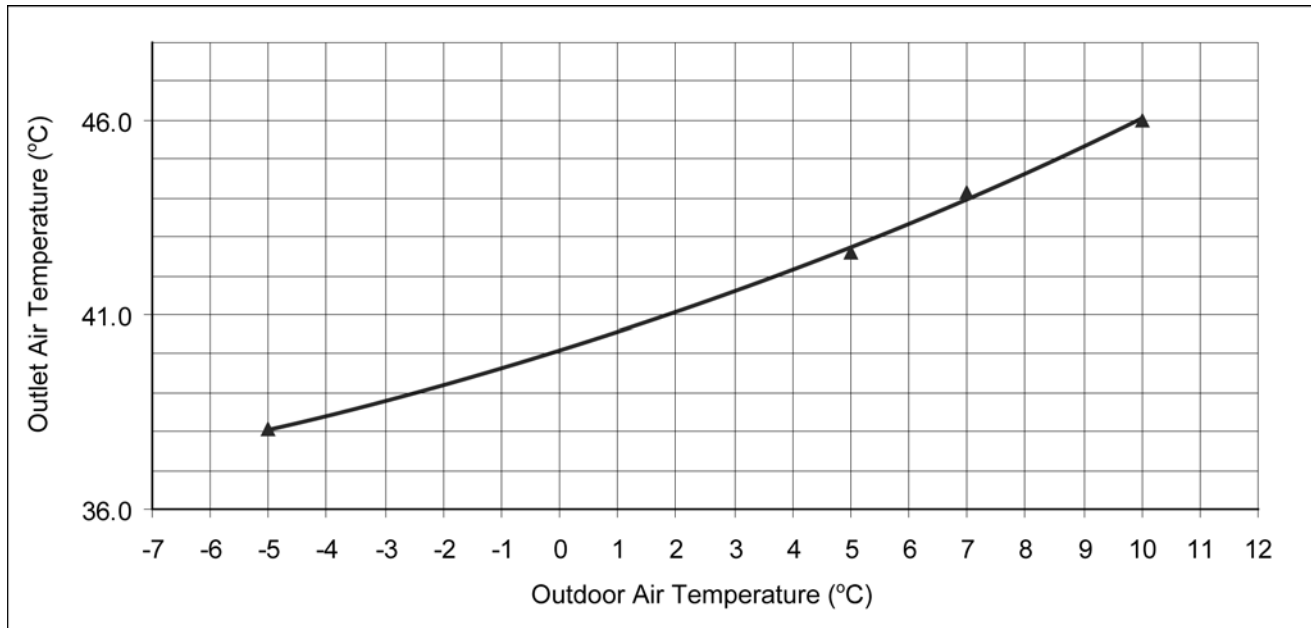
### Condition

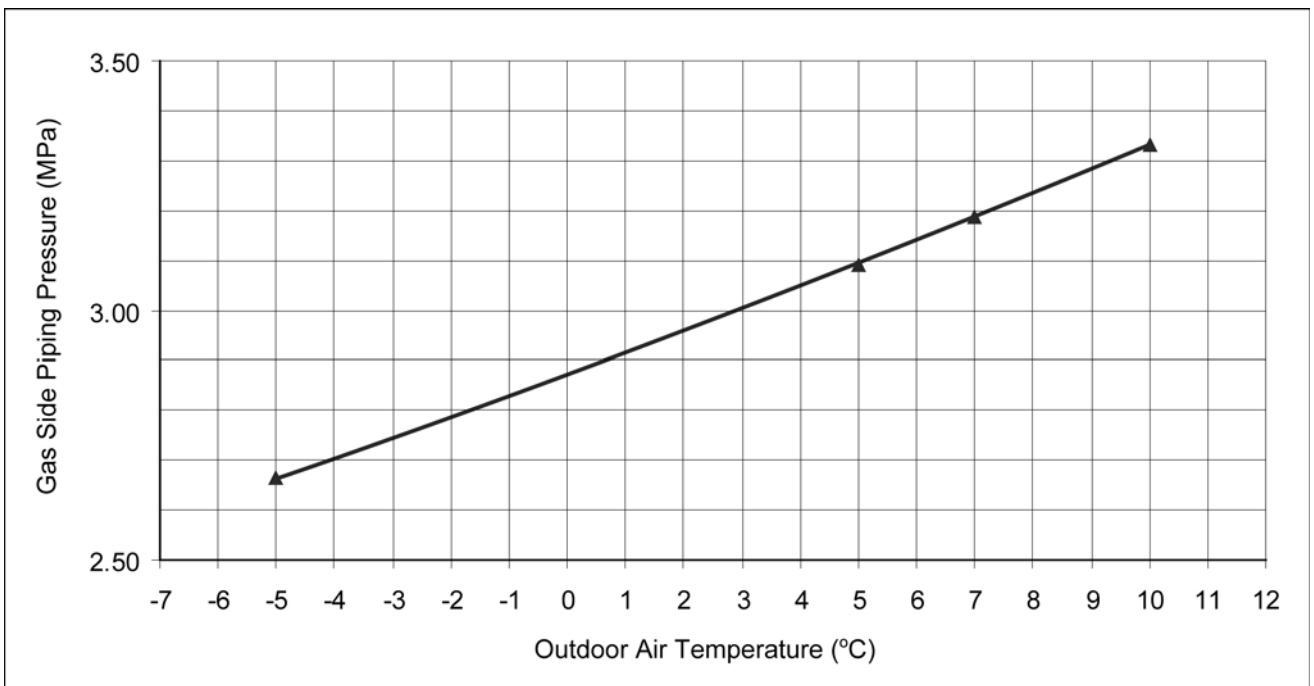
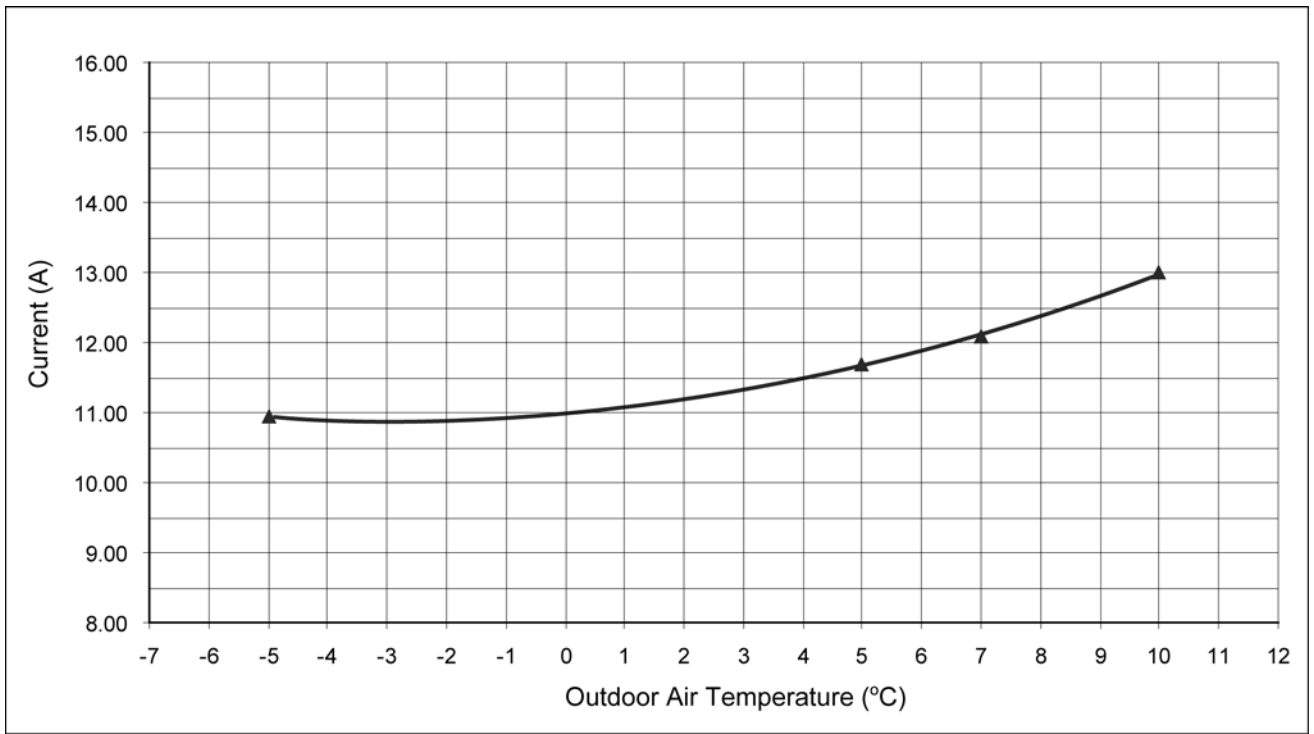
Indoor room temperature : 20°C

Remote control setting : Hi Fan, HEAT 30°C

Compressor frequency : Rated heating

Voltage : 230 V





## Cooling Characteristic at Different Piping Length

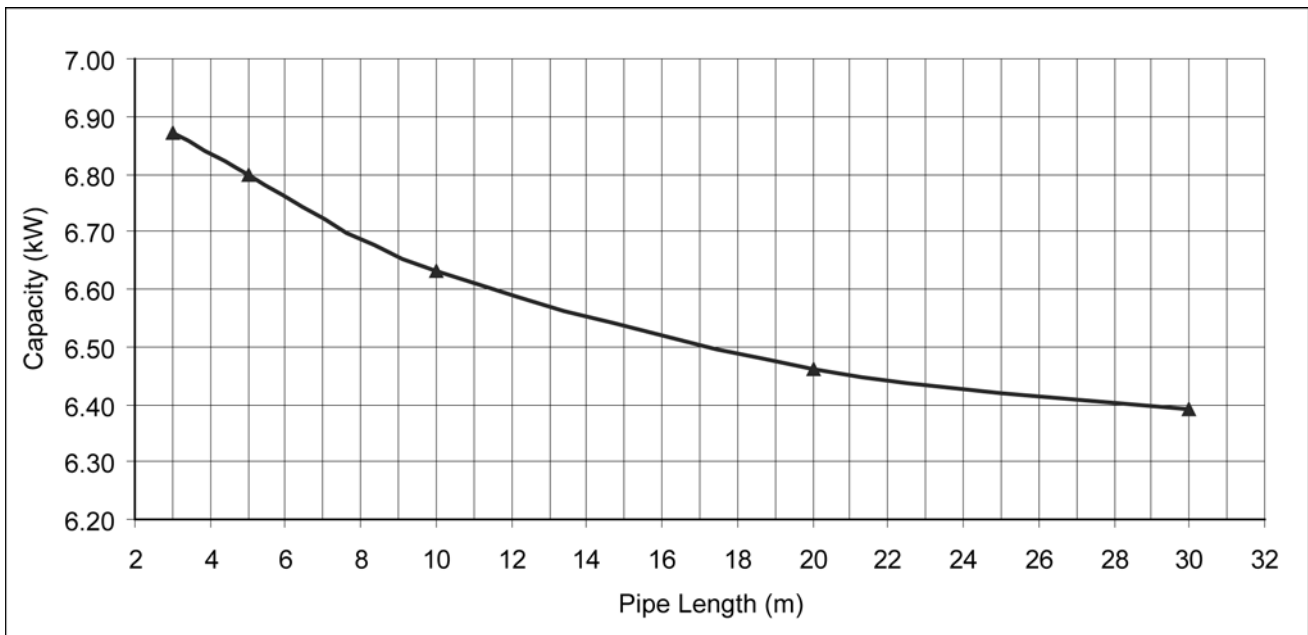
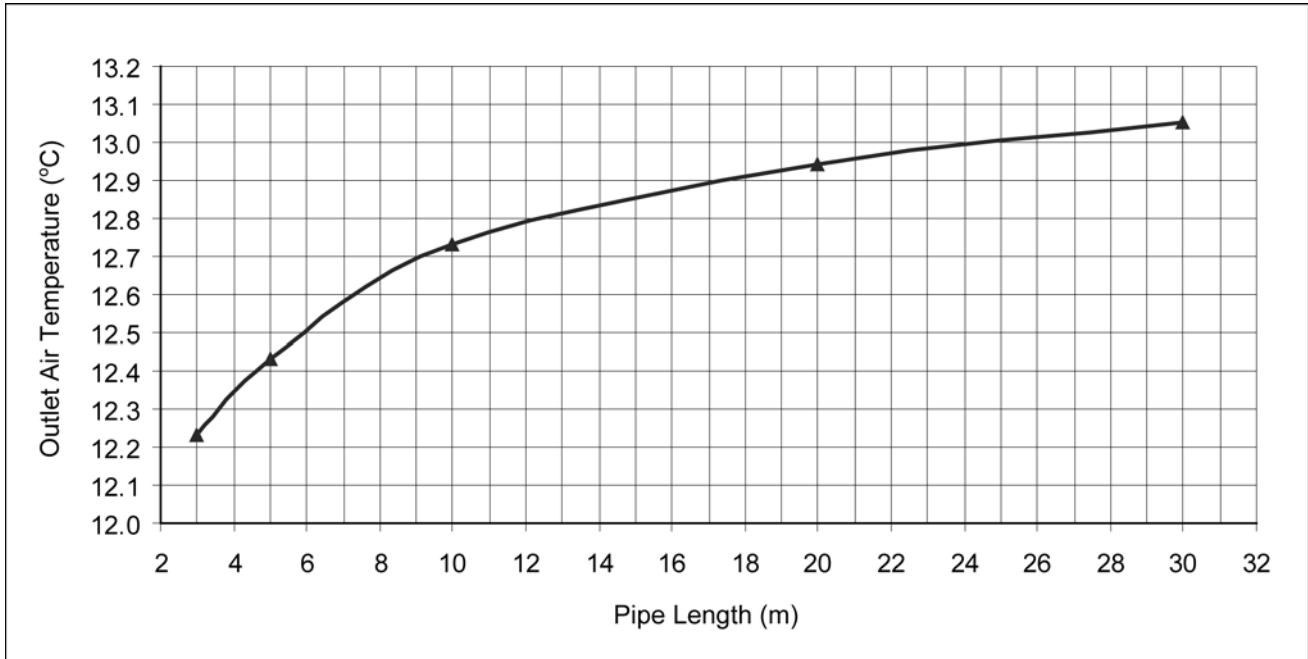
### Condition

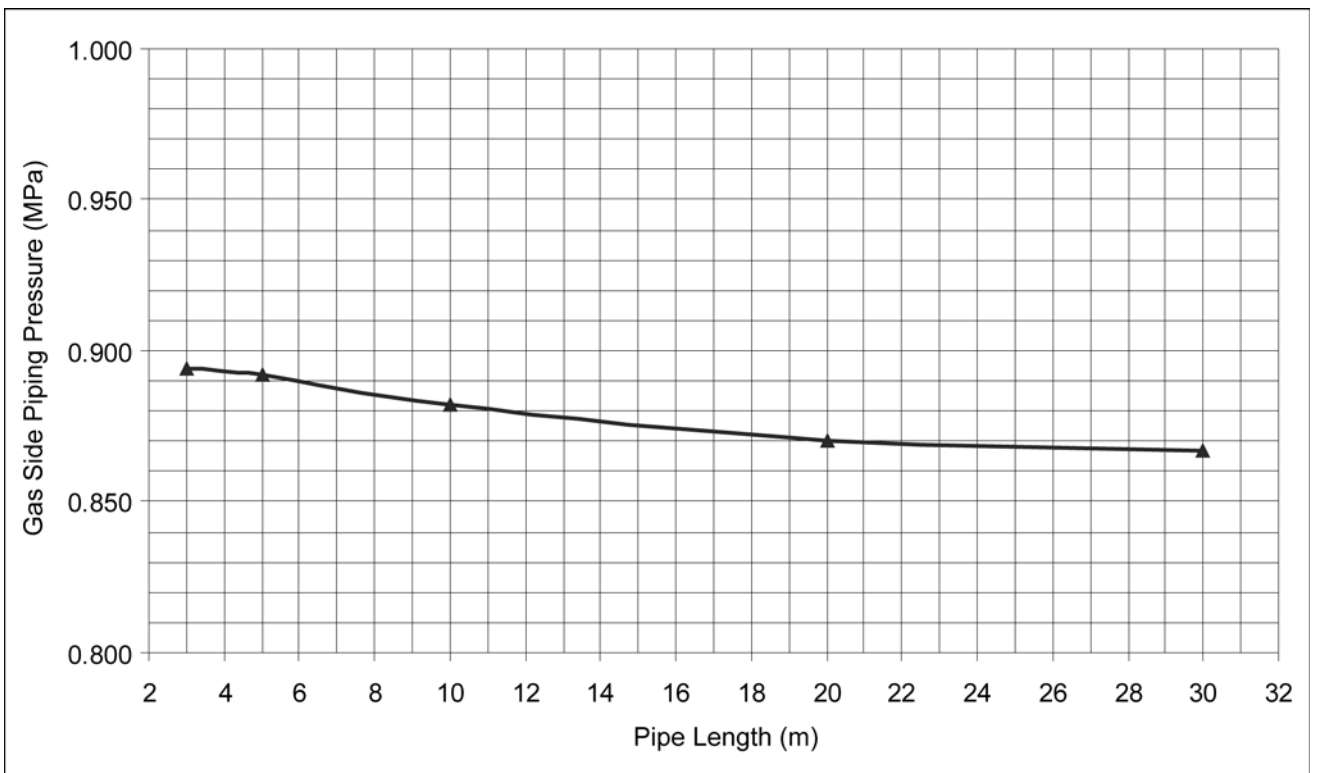
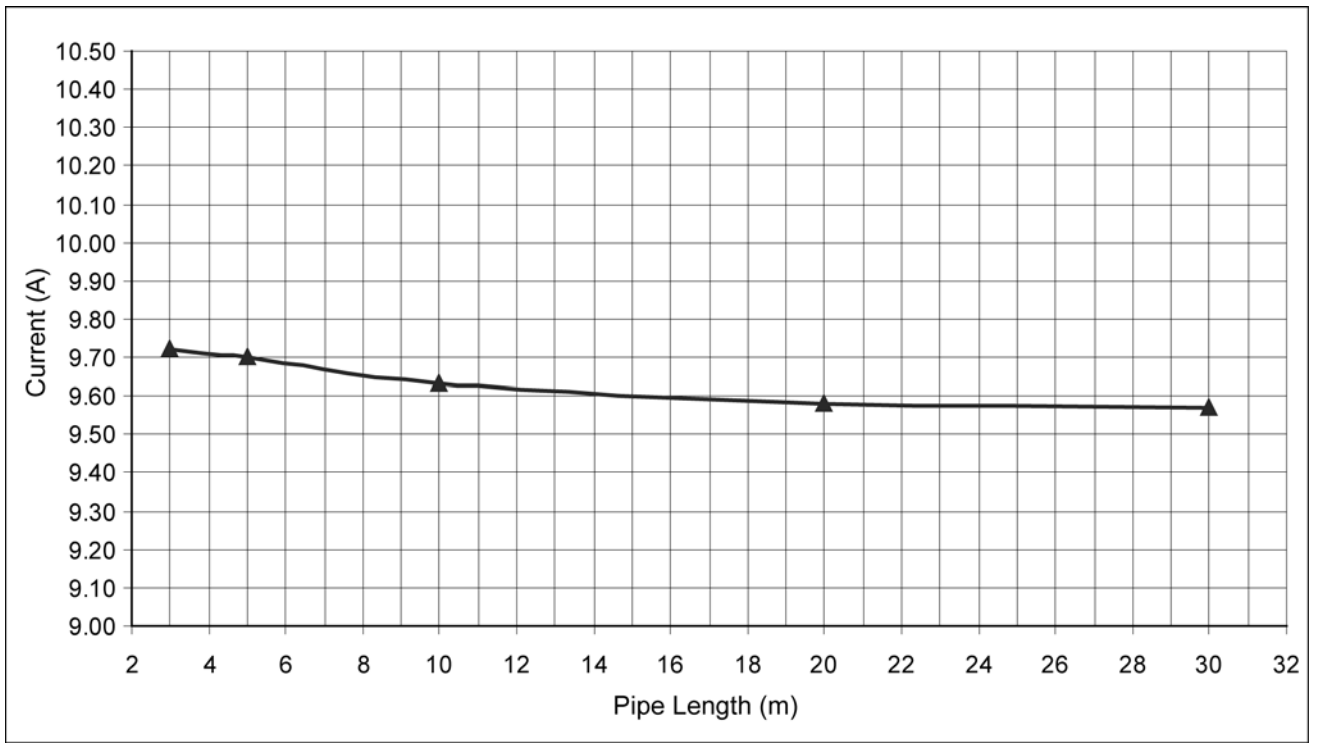
Indoor room temperature : 27/19°C

Remote control setting : Hi Fan, COOL 16°C

Compressor frequency : Rated cooling

Voltage : 230 V





## Heating Characteristic at Different Piping Length

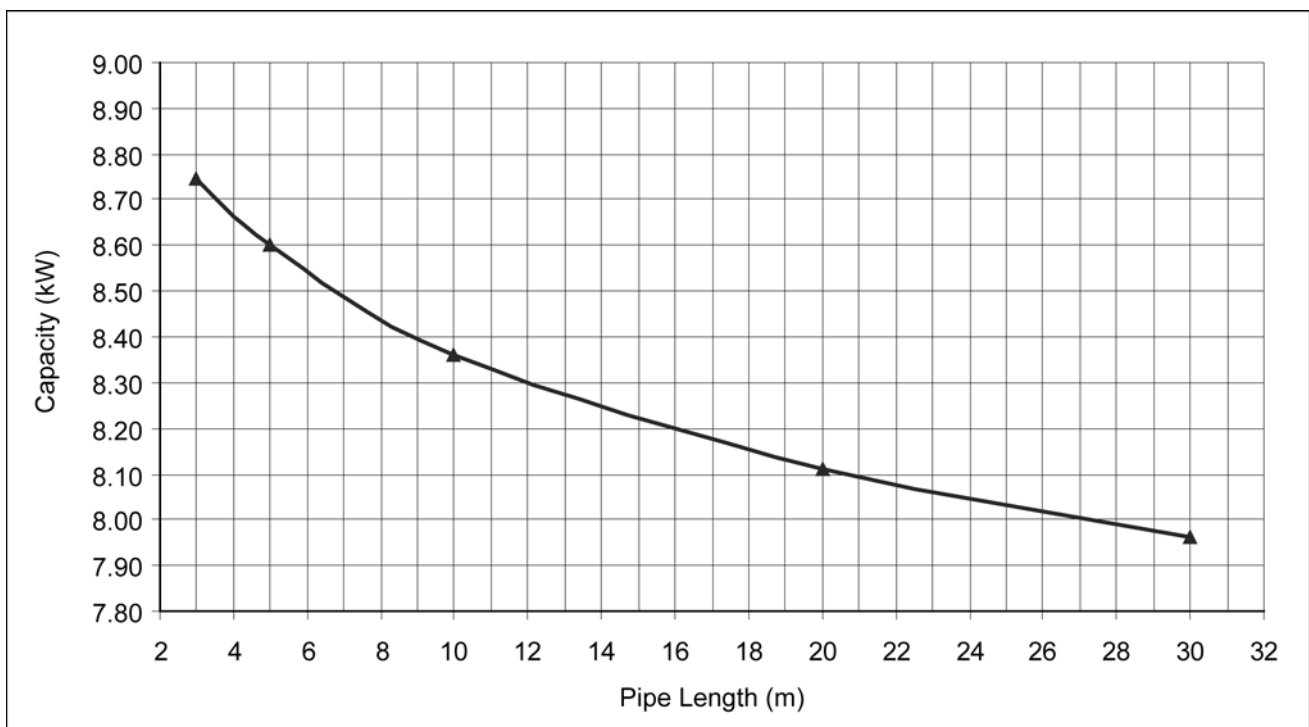
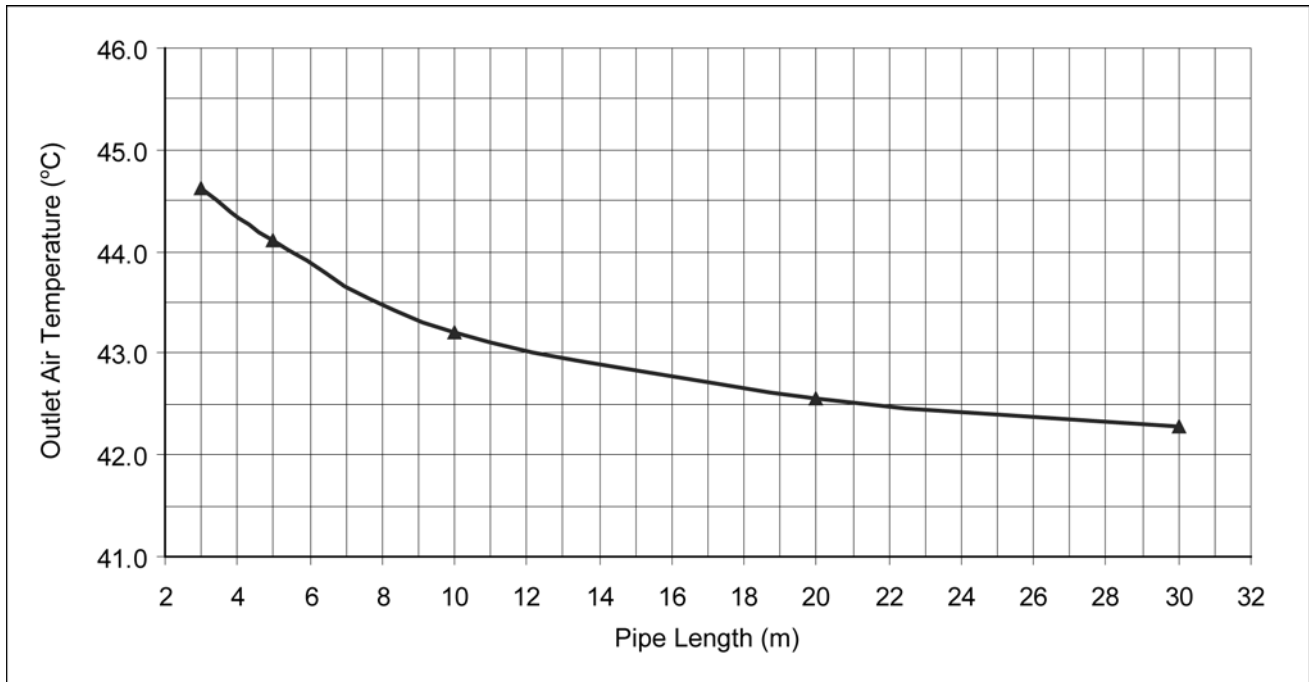
### Condition

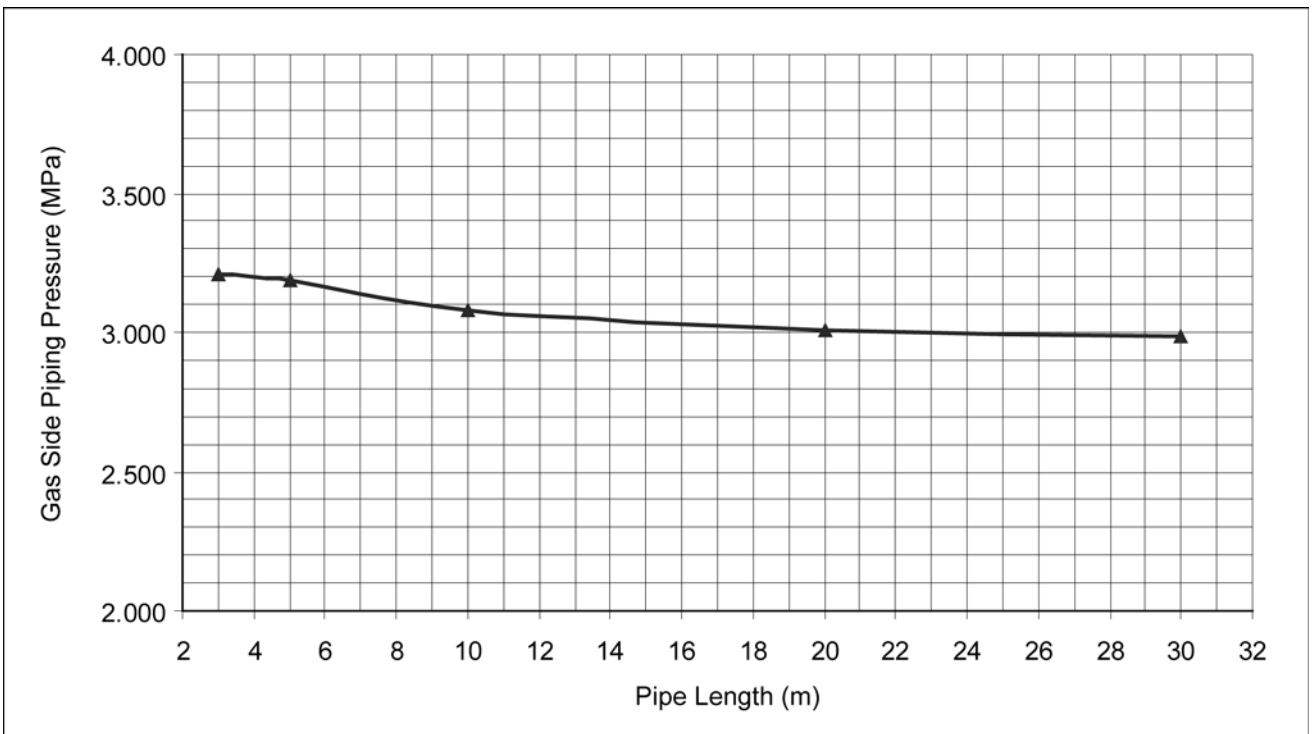
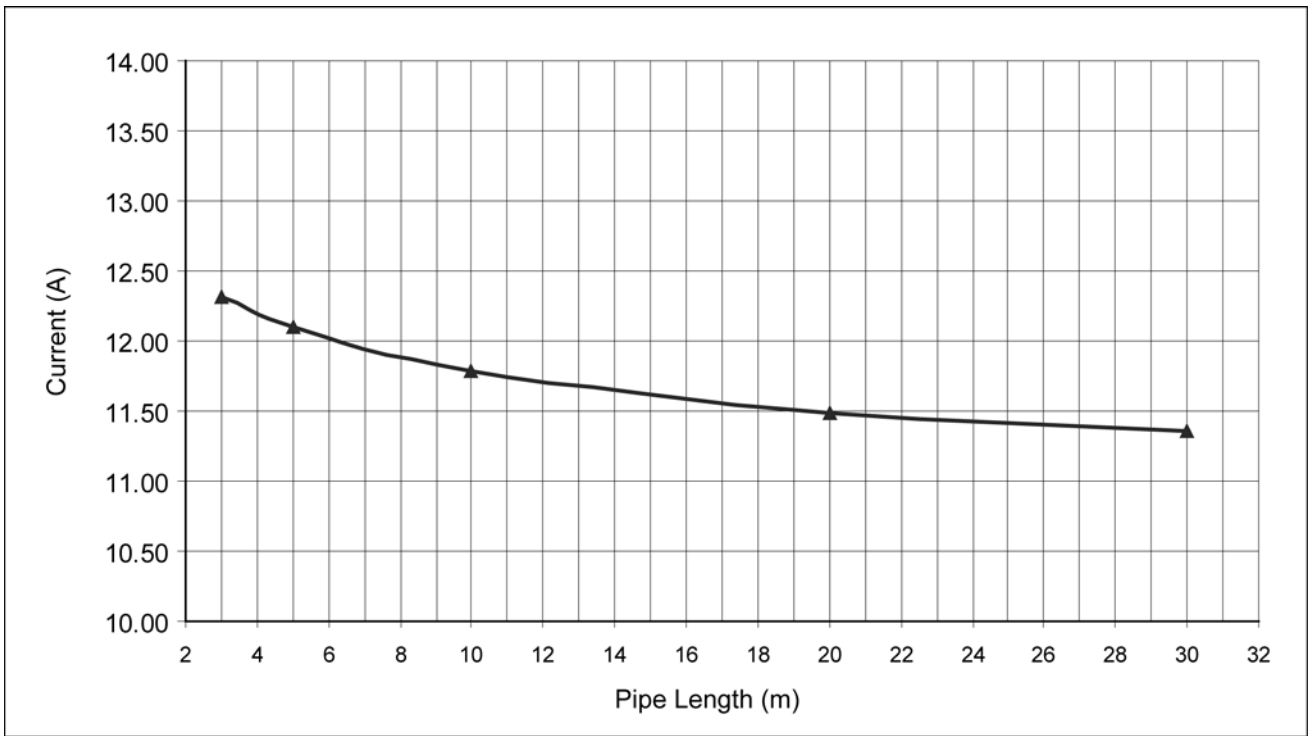
Indoor room temperature: 20 °C

Remote control setting: HI fan, HEAT 30 °C

Compressor frequency: Rated heating

Voltage: 230 V





## 17.2. Sensible Capacity Chart

### ● CS-RE18HKE CU-RE18HKE

Indoor wet bulb temp.	Outdoor Temp. (°C)											
	30			35			40			46		
	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP
17.0°C	5.26	3.99	1.51	4.91	3.82	1.63	4.57	3.67	1.74	4.16	3.49	1.88
19.0°C				5.30		1.65						
19.5°C	5.77	4.17	1.54	5.40	4.01	1.66	5.02	3.86	1.77	4.56	3.67	1.91
22.0°C	6.29	4.33	1.57	5.88	4.16	1.69	5.47	4.01	1.80	4.97	3.83	1.95

### ● CS-RE24HKE CU-RE24HKE

Indoor wet bulb temp.	Outdoor Temp. (°C)											
	30			35			40			46		
	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP	TC	SHC	IP
17.0°C	6.75	5.11	1.94	6.30	4.90	2.09	5.86	4.71	2.23	5.33	4.48	2.41
19.0°C				6.80		2.12						
19.5°C	7.41	5.35	1.98	6.92	5.14	2.13	6.44	4.95	2.28	5.85	4.71	2.45
22.0°C	8.07	5.55	2.01	7.54	5.34	2.17	7.02	5.15	2.32	6.38	4.91	2.50

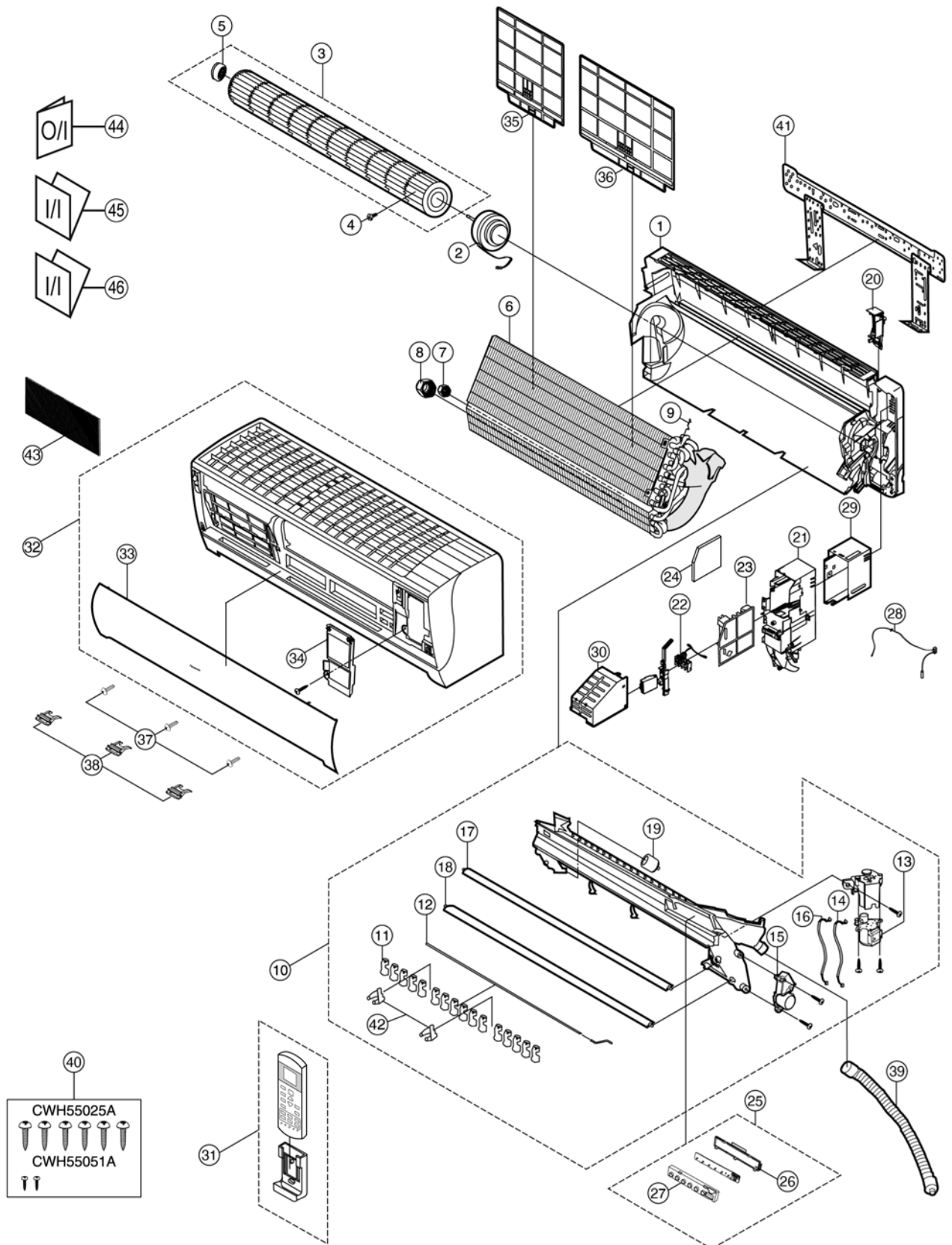
TC - Total Cooling Capacity (kW)  
 SHC - Sensible Heat Capacity (kW)  
 IP - Input Power (kW)

Indoor 27°C/19°C  
 Outdoor 35°C/24°C



# 18 Exploded View and Replacement Parts List

## 18.1. Indoor Unit



Note:

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

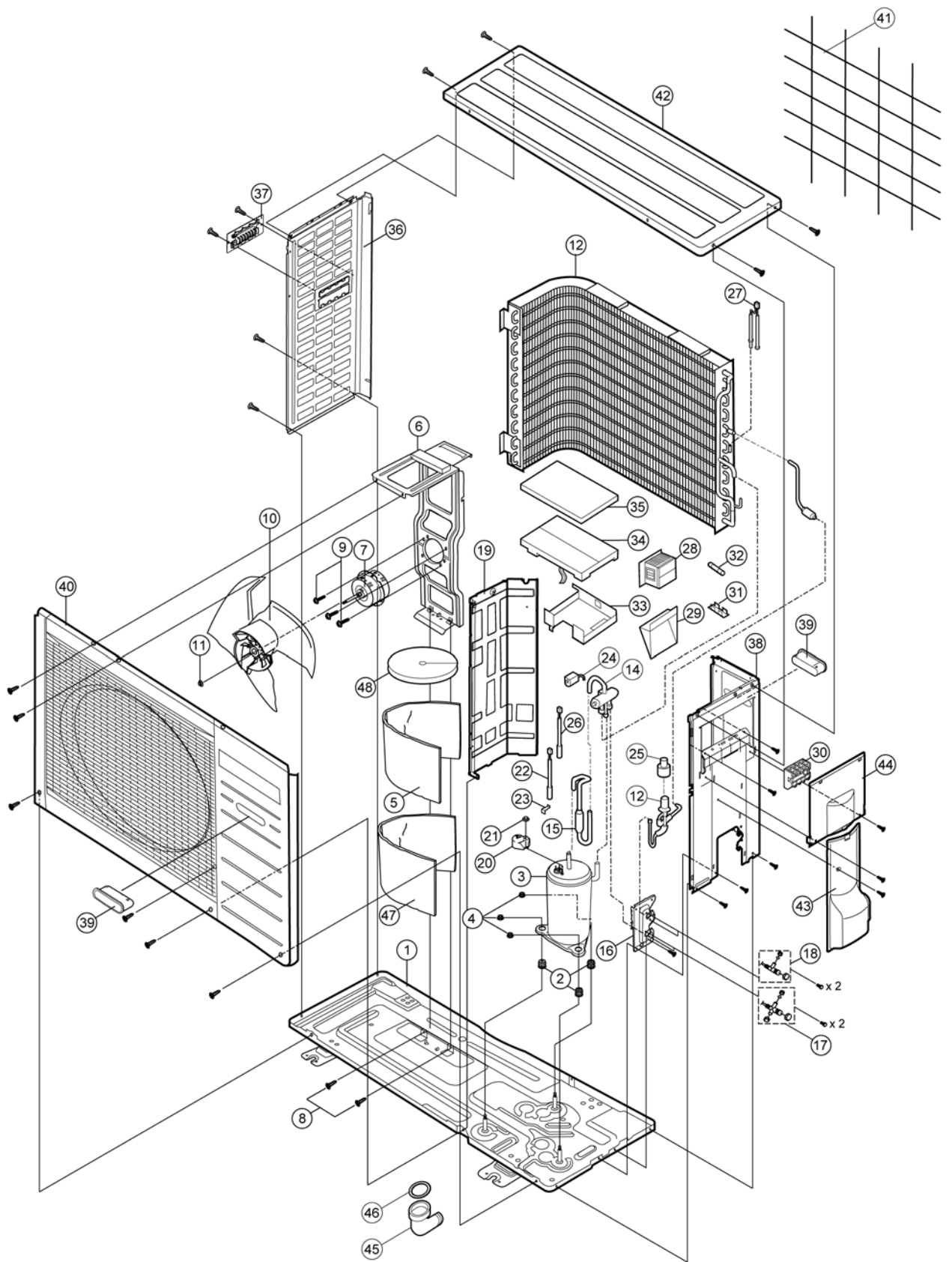
The non-numbered parts are not kept as standard service parts.

REF NO.	PART NAME & DESCRIPTION	QTY.	CS-RE18HKE	CS-RE24HKE
1	CHASSY COMPLETE	1	CWD50C1394	←
2	FAN MOTOR	1	ARW51H8P30AC	←
3	CROSS FLOW FAN COMPLETE	1	CWH02C1010	←
4	SCREW - CROSS FLOW FAN	1	CWH551146	←
5	BEARING ASS'Y	1	CWH64K007	←
6	EVAPORATOR	1	CWB30C1533	CWB30C1678
7	FLARE NUT (1/4")	1	CWT251030	←
8	FLARE NUT (1/2") (5/8")	1	CWT251032	CWT251033
9	HOLDER SENSOR	1	CWH32143	←
10	DISCHARGE GRILLE COMPLETE	1	CWE20C2636	←
11	VERTICAL VANE	15	CWE241088	←
12	CONNECTING BAR	1	CWE261025	←
13	AIR SWING MOTOR	1	CWA98260+MJ	←
14	LEAD WIRE - AIR SWING MOTOR	1	CWA67C3849	←
15	AIR SWING MOTOR	1	CWA98K1008	←
16	LEAD WIRE - AIR SWING MOTOR	1	CWA67C4445	←
17	HORIZONTAL VANE	1	CWE241152C	←
18	HORIZONTAL VANE	1	CWE241153C	←
19	CAP - DRAIN TRAY	1	CWH521096	←
20	BACK COVER CHASSIS	1	CWD932162B	←
21	CONTROL BOARD CASING	1	CWH102250	CWH102291
22	TERMINAL BOARD COMPLETE	1	CWA28C2305	←
23	ELECTRONIC CONTROLLER - MAIN	1	CWA73C2585	CWA73C2586
24	ELECTRONIC CONTROLLER - POWER	1	—	CWA744650
25	INDICATOR COMPLETE	1	CWE39C1173	←
26	INDICATOR HOLDER	1	CWD932435	←
27	INDICATOR HOLDER	1	CWD932436	←
28	SENSOR COMPLETE	1	CWA50C2122	←
29	CONTROL BOARD TOP COVER	1	CWH131209	←
30	CONTROL BOARD FRONT COVER	1	CWH131210	←
31	REMOTE CONTROL COMPLETE	1	CWA75C3010	←
32	FRONT GRILLE COMPLETE	1	CWE11C3659	CWE11C3658
33	INTAKE GRILLE COMPLETE	1	CWE22C1336	←
34	GRILLE DOOR	1	CWE141076	←
35	AIR FILTER (L)	1	CWD001137	←
36	AIR FILTER (R)	1	CWD001138	←
37	SCREW - FRONT GRILLE	3	XTT4+16CFJ	←
38	CAP - FRONT GRILLE	3	CWH521062A	←
39	DRAIN HOSE	1	CWH851063	←
40	BAG COMPLETE - INSTALLATION SCREW	1	CWH82C067	←
41	INSTALLATION PLATE	1	CWH36K1007	←
42	FULCRUM	2	CWH621047	←
43	SUPER ALLERU BUSTER FILTER	1	CWD00C1263	←
44	OPERATING INSTRUCTION	1	CWF565945	←
45	INSTALLATION INSTRUCTION	1	CWF613416	CWF613419
46	INSTALLATION INSTRUCTION	1	CWF613417	CWF613420

(Note)

- All parts are supplied from PHAAM, Malaysia (Vendor Code: 061).

## 18.2. CU-RE18HKE



**Note:**

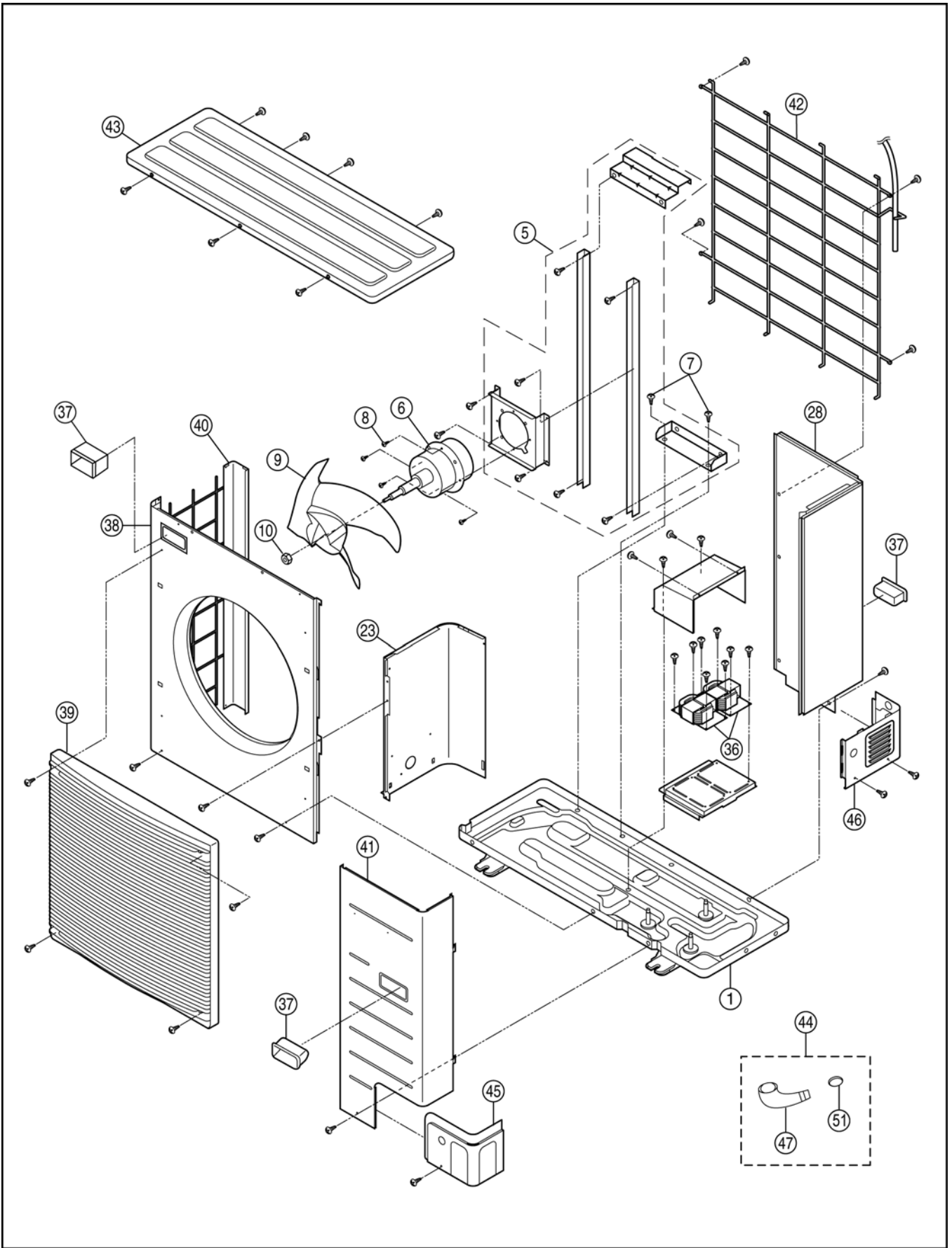
The above exploded view is for the purpose of parts disassembly and replacement.  
The non-numbered parts are not kept as standard service parts.

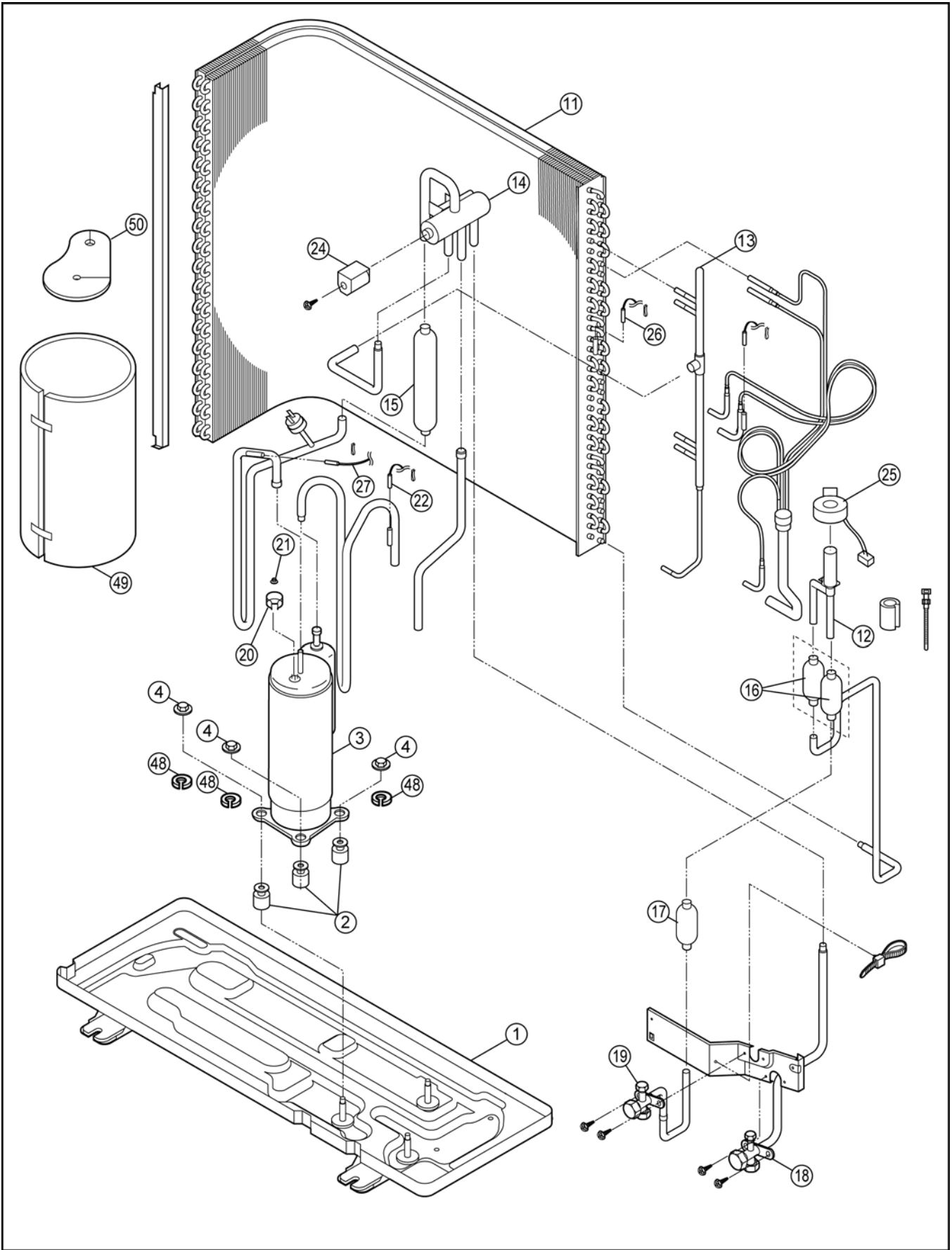
REF. NO.	DESCRIPTION & NAME	QTY.	CU-RE18HKE
1	CHASSY ASS'Y	1	CWD50K2085
2	ANTI-VIBRATION BUSHING	3	CWH50077
3	COMPRESSOR	1	5CS130XAD04
4	NUT-COMPRESSOR MOUNT	3	CWH56000J
5	SOUND PROOF MATERIAL	1	CWG302302
6	FAN MOTOR BRACKET	1	CWD541054
7	FAN MOTOR	1	CWA981166J
8	SCREW - FAN MOTOR BRACKET	2	CWH551060J
9	SCREW - FAN MOTOR MOUNT	3	CWH551106J
10	PROPELLER FAN ASS'Y	1	CWH03K1016
11	NUT - PROPELLER FAN	1	CWH56053J
12	CONDENSER COMPLETE	1	CWB32C2055
13	TUBE ASS'Y (EXP. VALVE)	1	CWT023679
14	4 WAYS VALVE	1	CWB001026J
15	STRAINER	1	CWB11094
16	HOLDER - COUPLING	1	CWH351056
17	3 WAYS VALVE (GAS)	1	CWB011361
18	2 WAYS VALVE (LIQUID)	1	CWB021292
19	SOUND PROOF BOARD	1	CWH151050
20	TERMINAL COVER	1	CWH171039A
21	NUT-TERMINAL COVER	1	CWH7080300J
22	SENSOR COMPLETE (COMP. TOP)	1	CWA50C2185
23	HOLDER SENSOR	1	CWH32074
24	V-COIL COMPLETE (4-WAYS VALVE)	1	CWA43C2168J
25	V-COIL COMPLETE (EXPAND VALVE)	1	CWA43C2058J
26	SENSOR COMPLETE (COMP. DISC.)	1	CWA50C2180
27	SENSOR COMPLETE	1	CWA50C2181
28	REACTOR	1	CWA421069
29	CONTROL BOARD CASING (SIDE)	1	CWH102273
30	TERMINAL BOARD ASS'Y	1	CWA28K1110J
31	FUSE HOLDERS	1	K3GB1PH00016
32	FUSE	1	K5D303BBA002
33	CONTROL BOARD CASING (BOTTOM)	1	CWH102282
34	ELECTRONIC CONTROLLER - MAIN	1	CWA73C2581R
35	CONTROL BOARD COVER (TOP)	1	CWH131167
36	CABINET SIDE PLATE (LEFT)	1	CWE041255A
37	HANDLE	1	CWE161010
38	CABINET SIDE PLATE (RIGHT)	1	CWE041158A
39	HANDLE	2	CWE16000E
40	CABINET FRONT PLATE ASS'Y	1	CWE06K1043
41	WIRE NET	1	CWD041041A
42	CABINET TOP PLATE	1	CWE031031A
43	CONTROL BOARD COVER (BOTTOM)	1	CWH131168
44	CONTROL BOARD COVER (TOP)	1	CWH131169A
45	DRAIN HOSE	1	CWH5850080
46	PACKING - L. TUBE	1	CWB81012
47	SOUND PROOF MATERIAL	1	CWG302270
48	SOUND PROOF MATERIAL	1	CWG302300

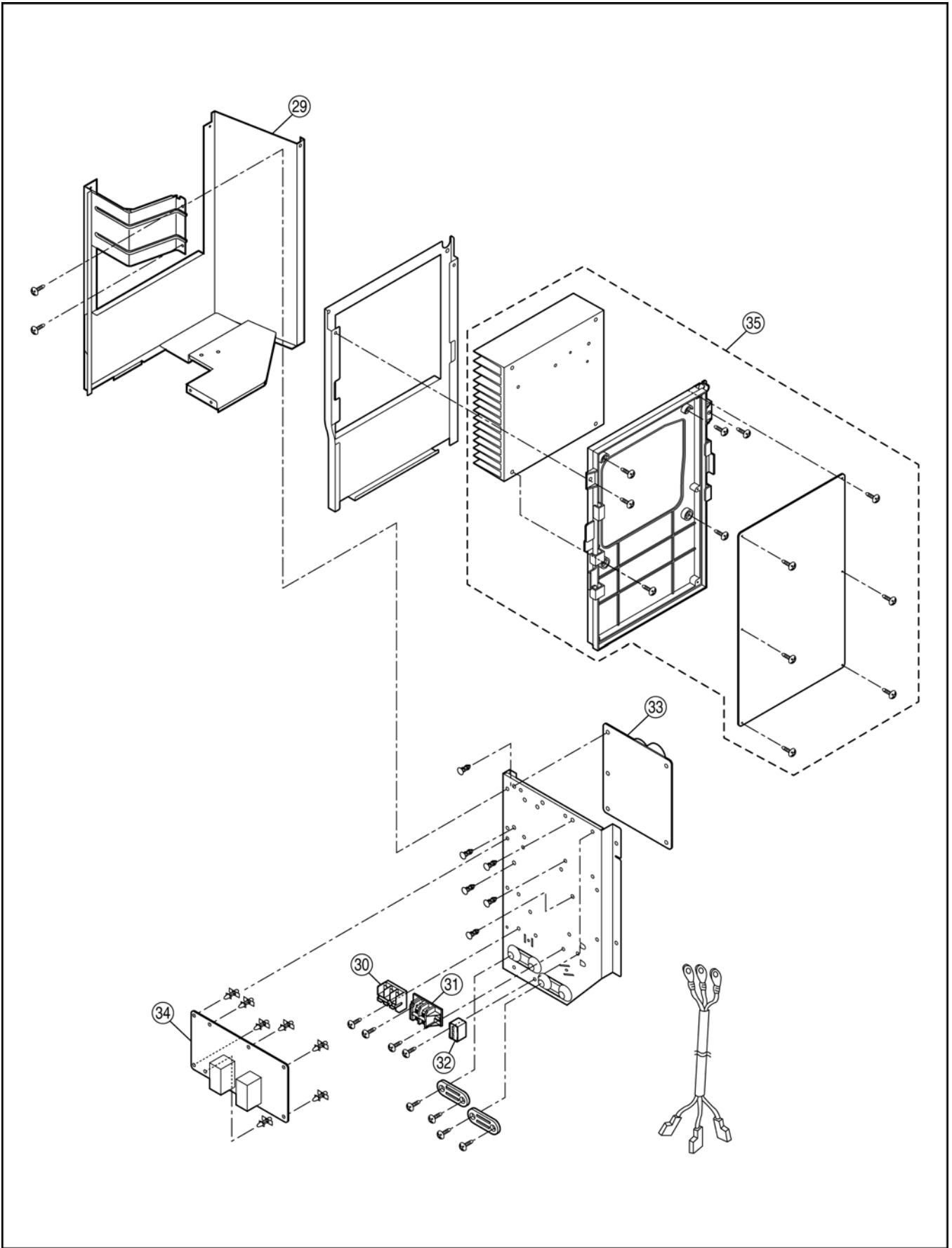
(Note)

- All parts are supplied from PHAAM, Malaysia (Vendor Code: 061).

### 18.3. CU-RE24HKE







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

REF. NO.	DESCRIPTION & NAME	QTY.	CU-RE24HKE
1	CHASSY ASS'Y	1	CWD52K1098
2	BUSHING - COMPRESSOR MOUNT	3	CWH50055
3	COMPRESSOR DC 280V	1	5KD240XAA21
4	NUT-COMPRESSOR MOUNT	3	CWH561049
5	BRACKET FAN MOTOR	1	CWD54K1034
6	FAN MOTOR	1	CWA951510
7	SCREW - BRACKET FAN MOTOR	2	CWH551040J
8	SCREW - FAN MOTOR BRACKET	4	CWH551040J
9	PROPELLER FAN	1	CWH001019
10	NUT - PROPELLER FAN	1	CWH561038J
11	CONDENSER CO.	1	CWB32C1995
12	EXPANSION VALVE	1	CWB051016J
13	TUBE ASS'Y (CAPILLARY TUBE)	1	CWT07K1350
14	4 WAYS VALVE	1	CWB001026J
15	DISCHARGE MUFFLER	1	CWB121013
16	STRAINER	2	CWB111032
17	RECEIVER	1	CWB14030
18	3 WAYS VALVE (GAS)	1	CWB011251
19	2 WAYS VALVE (LIQUID)	1	CWB021330
20	TERMINAL COVER	1	CWH171039A
21	NUT FOR TERMINAL COVER	1	CWH7080300J
22	SENSOR COMPLETE (COMP. TOP)	1	CWA50C2185
23	SOUND PROOF BOARD	1	CWH151075
24	V-COIL COMPLETE	1	CWA43C2169J
25	V-COIL COMPLETE FOR EXP.VALVE	1	CWA43C2058J
26	SENSOR COMPLETE	1	CWA50C2381
27	SENSOR - COMP. DISCHARGE	1	CWA50C2214
28	CABINET REAR PLATE COMP.	1	CWE02C1037
29	CONTROL BOARD ASS'Y	1	CWH10K1046
30	TERMINAL BOARD ASS'Y	1	CWA28K1107
31	TERMINAL BOARD ASS'Y	1	CWA28K1076J
32	CAPACITOR - FM (3.5MF/440V)	1	DS441355NPQA
33	ELECTRONIC CONT. - HARMONIC DC	1	CWA743402
34	ELECTRONIC CONT. - NOISE FILTER	1	CWA744495
35	ELECTRONIC CONTROLLER (MAIN)	1	CWA73C2723R
36	REACTOR	2	CWA421066
37	HANDLE	3	CWE161008
38	CABINET FRONT PLATE	1	CWE061118A
39	DISCHARGE GRILLE	1	CWE201073
40	CABINET SIDE PLATE ASS'Y	1	CWE04K1019A
41	CABINET FRONT PLATE CO.	1	CWE06C1086
42	WIRE NET	1	CWD041102A
43	CABINET TOP PLATE	1	CWE03C1040
44	BAG - COMPLETE (DRAIN ELBOW)	1	CWG87C2030
45	PIPE COVER (FRONT)	1	CWD601074A
46	PIPE COVER (BACK)	1	CWD601075A
47	DRAIN HOSE	1	CWH5850080
48	GASKET FOR TERMINAL COVER	3	CWB811017
49	SOUND PROOF MATERIAL	1	CWG302245
50	SOUND PROOF MATERIAL	1	CWG302246
51	PACKING - L.TUBE	1	CWB811010

(Note)

- All parts are supplied from PHAAM, Malaysia (Vendor Code: 061).