Order No. MAC0510077C3

Service Manual

Air Conditioner

CS-C18EKQ CU-C18EKQ
CS-C24EKQ CU-C24EKQ

⚠ WARNING

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

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Panasonic®

1 Safety Precaution

- 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.

⚠ **WARNING**	This indication shows the possibility of causing death or serious injury.

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

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

⃠	This symbol denotes item that is PROHIBITTED from doing.

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

⚠ **WARNING**	
1. Engage dealer or specialist for installation and servicing. If installation or servicing done by the user is defective, it will cause water leakage, electrical shock or fire.	
2. Install according to this installation instruction strictly. If installation is defective, it will cause water leakage, electrical shock or fire.	
3. Use the attached accessories parts and specified parts for installation and servicing. Otherwise, it will cause the set to fall, water leakage, fire or electrical shock.	
4. Install at a strong and firm location which is able to withstand the set's weight. If the strength is not enough or installation is not properly done, the set will drop and cause injury.	
5. For electrical work, follow the local national wiring standard, regulation and the installation instruction. An independent circuit and single outlet must be used. If electrical circuit capacity is not enough or defect found in electrical work, it will cause electrical shock or fire.	
6. Use the specified cable and connect tightly for indoor/outdoor connection. Connect tightly and clamp the cable so that no external force will be acted on the terminal. If connection or fixing is not perfect, it will cause heat-up or fire at the connection.	
7. Wire routing must be properly arranged so that control board cover is fixed properly. If control board cover is not fixed perfectly, it will cause heat-up at connection point of terminal, fire or electrical shock.	
8. When connecting the piping, do not allow air or any substances other than the specified refrigerant to enter the refrigeration cycle. Otherwise, this may lower the capacity, cause abnormally high pressure in the refrigeration cycle, and possibly result in explosion and injury.	⃠
9. Thickness of copper pipes used must be more than 0.8 mm. Never use copper pipes thinner than 0.8 mm.	⃠
10. It is desirable that the amount of residual oil is less than 40 mg/10 m.	⃠
11. Do not modify the length of the power supply cord or use of the extension cord, and do not share the single outlet with other electrical appliances. Otherwise, it will cause fire or electrical shock.	⃠

⚠ CAUTION

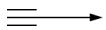
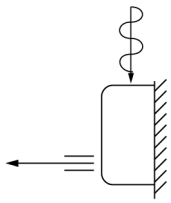
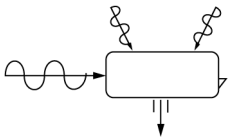
1. The equipment must be earthed. It may cause electrical shock if grounding is not perfect.
2. Do not install the unit at place where leakage of flammable gas may occur. In case gas leaks and accumulates at surrounding of the unit, it may cause fire.
3. Carry out drainage piping as mentioned in installation instructions. If drainage is not perfect, water may enter the room and damage the furniture.
4. Pb free solder has a higher melting point than standard solder; typically the melting point is 50 - 70°F (30 - 40°C) higher. Please use a high temperature soldering iron. In case of the soldering iron with temperature control, please set it to 700 ± 20°F (370 ± 10°C).Pb free solder will tend to splash when heated too high (about 1100°F/600°C).

ATTENTION

1. Selection of the installation location. Select an installation location which is rigid and strong enough to support or hold the unit, and select a location for easy maintenance.
2. Power supply connection to the conditioner. Connect the power supply cord of the air conditioner to the mains using one of the following methods.
   Power supply point shall be the place where there is ease for access for the power disconnection in case of emergency.
   In some countries, permanent connection of this room air conditioner to the power supply is prohibited.
   1. Power supply connection to the receptacle using a power plug. Use an approved power plug with earth pin for the connection to the socket.
   2. Power supply connection to a circuit breaker for the permanent connection. Use an approved circuit breaker for the permanent connection. It must be a double pole switch with a minimum 3.5 mm contact gap.
3. Do not release refrigerant during piping work for installation, servicing, reinstallation and during repairing a refrigeration parts. Take care of the liquid refrigerant, it may cause frostbite.
4. Installation work. It may need two people to carry out the installation work.
5. Do not install this appliance in a laundry room or other location where water may drip from the ceiling, etc.

2 Specifications

2.1. CS-C18EKQ CU-C18EKQ

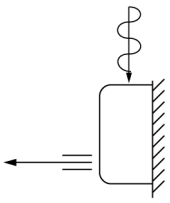
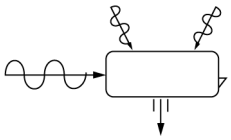
		Unit	CS-C18EKQ	CU-C18EKQ
Performance Test Condition			NEW JIS	
Power Source (Phase, Voltage, Cycle)		ø, V, Hz	Single, 230, 60	
Cooling Capacity		kW (BTU/h)	5.30 (18,100)	
Moisture Removal		l/h (Pint/h)	2.9 (6.1)	
Airflow Method		OUTLET  INTAKE 	SIDE VIEW 	TOP VIEW 
Air Volume	Lo	m^3/min (cfm)	12.8 (450)	—
	Me	m^3/min (cfm)	13.8 (486)	—
	Hi	m^3/min (cfm)	14.8 (520)	52.5 (1,850)
	SHi	m^3/min (cfm)	15.5 (546)	—
Noise Level		dB (A)	High 42, Low 37	High 55
Electrical Data	Input Power	kW	1.73	
	Running Current	A	7.7	
	EER	W/W (BTU/hW)	3.06 (10.46)	
	Starting Current	A	47.0	
Piping Connection Port (Flare piping)		inch inch	G ; Half Union 1/2” L ; Half Union 1/4”	G ; 3-way valve 1/2” L ; 3-way valve 1/4”
Pipe Size (Flare piping)		inch inch	G ; (gas side) 1/2” L ; (liquid side) 1/4”	G ; (gas side) 1/2” L ; (liquid side) 1/4”
Drain Hose	Inner diameter	mm	16	—
	Length	mm	650	—
Power Cord	Length	m	1.9	—
	Number of core-wire		3 (1.5 mm^2)	—
Dimensions	Height	inch (mm)	10 - 13/16 (275)	29 - 17/32 (750)
	Width	inch (mm)	39 - 9/32 (998)	34 - 7/16 (875)
	Depth	inch (mm)	9 - 1/16 (230)	13 - 19/32 (345)
Net Weight		lb (kg)	24 (11.0)	105 (47.5)
Compressor	Description		—	Rotary (1 cylinder) rolling piston type
	Motor Type		—	Induction (2-poles)
	Rated Output	kW	—	1.2

			Unit	CS-C18EKQ	CU-C18EKQ
Air Circulation	Description			Cross-flow Fan	Propeller Fan
	Material			ASHT-18	PP
	Motor	Type		Transistor (8-poles)	Induction (6-poles)
		Input	W	—	138
	Rated	Output	W	30	69
	Fan Speed	Low	rpm	1,150	—
		Medium	rpm	1,250	—
		High	rpm	1,360	870
		SuperHigh	rpm	1,420	—
Heat Exchanger	Description			Evaporator	Condenser
	Tube material			Copper	Copper
	Fin material			Aluminium (Pre Coat)	Aluminium (Blue Coat)
	Fin Type			Slit Fin	Corrugated Fin
	Row/Stage			(Plate fin configuration, forced draft)	
				2 × 15	2 × 34
	FPI			21	16
	Size (W × H × L)		mm	810 × 315 × 25.4	850.5 × 714 × 25.4 870.5
Refrigerent Control Device				—	Capillary Tube
Refrigeration Oil			(cm^3)	—	SUNISO 4GDID or ATMOS M60 (650)
Refrigerant (R-22)			g (oz)	—	1,330 (46.9)
Thermostat				Electronic Control	—
Protection Device				—	O.L.P
Capillary Tube	Length		mm	—	754
	Flow Rate		l/mm	—	22.0
	Inner Diameter		mm	—	2.0
Air Filter	Material Style			P.P. Honeycomb	—
Capacity Control				Capillary Tube	
Compressor Capacitor			μF, VAC	—	40 μF, 370/400VAC
Fan Motor Capacitor			μF, VAC	—	3.5 μF, 440VAC

Note

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

2.2. CS-C24EKQ CU-C24EKQ

		Unit	CS-C24EKQ	CU-C24EKQ
Performance Test Condition			NEW JIS	
Power Source (Phase, Voltage, Cycle)		ø, V, Hz	Single, 230, 60	
Cooling Capacity		kW (BTU/h)	7.03 (24,000)	
Moisture Removal		l/h (Pint/h)	4.0 (8.5)	
Airflow Method		OUTLET  INTAKE 	SIDE VIEW 	TOP VIEW 
Air Volume	Lo	m^3/min (cfm)	13.9 (490)	30.8 (1,090)
	Me	m^3/min (cfm)	15.4 (550)	—
	Hi	m^3/min (cfm)	16.9 (600)	52.5 (1,850)
	SHi	m^3/min (cfm)	17.5 (620)	—
Noise Level		dB (A)	High 46, Low 40	High 56
Electrical Data	Input Power	kW	2.58	
	Running Current	A	11.7	
	EER	W/W (BTU/hW)	2.72 (9.30)	
	Starting Current	A	63.0	
Piping Connection Port (Flare piping)		inch inch	G ; Half Union 5/8” L ; Half Union 1/4”	G ; 3-way valve 5/8” L ; 3-way valve 1/4”
Pipe Size (Flare piping)		inch inch	G ; (gas side) 5/8” L ; (liquid side) 1/4”	G ; (gas side) 5/8” L ; (liquid side) 1/4”
Drain Hose	Inner diameter	mm	16	—
	Length	mm	650	—
Power Cord	Length	m	1.9	—
	Number of core-wire		3 (2.5 mm^2)	—
Dimensions	Height	inch (mm)	10 - 13/16 (275)	29 - 17/32 (750)
	Width	inch (mm)	39 - 9/32 (998)	34 - 7/16 (875)
	Depth	inch (mm)	9 - 1/16 (230)	13 - 19/32 (345)
Net Weight		lb (kg)	24 (11.0)	131 (59.5)
Compressor	Description		—	Rotary (1 cylinder) rolling piston type
	Motor Type		—	Induction (2-poles)
	Rated Output	kW	—	1.8

			Unit	CS-C24EKQ	CU-C24EKQ
Air Circulation	Description			Cross-flow Fan	Propeller Fan
	Material			ASHT-18	PP
	Motor	Type		Transistor (8-poles)	Induction (6-poles)
		Input	W	—	144
	Rated	Output	W	30	72
	Fan Speed	Low	rpm	1,250	510
		Medium	rpm	1,390	—
		High	rpm	1,530	870
		SuperHigh	rpm	1,590	—
Heat Exchanger	Description			Evaporator	Condenser
	Tube material			Copper	Copper
	Fin material			Aluminium (Pre Coat)	Aluminium (Blue Coat)
	Fin Type			Slit Fin	Corrugated Fin
	Row/Stage			(Plate fin configuration, forced draft)	
				2 × 15	2 × 34
	FPI			21	18
	Size (W × H × L)		mm	810 × 315 × 25.4	850.5 × 714 × 25.4 870.5
Refrigerent Control Device				—	Capillary Tube
Refrigeration Oil			(cm^3)	—	SUNISO 4GDID or ATMOS M60 (1,130)
Refrigerant (R-22)			g (oz)	—	1,410 (49.8)
Thermostat				Electronic Control	Mechanical Control
Protection Device				—	Inner Protector
Capillary Tube	Length		mm	—	435
	Flow Rate		l/mm	—	24.1
	Inner Diameter		mm	—	2.2
Air Filter	Material Style			P.P. Honeycomb	—
Capacity Control				Capillary Tube	
Compressor Capacitor			μF, VAC	—	60 μF, 370/400VAC
Fan Motor Capacitor			μF, VAC	—	3.5 μF, 440VAC

Note

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

3 Features

- High efficiency.
- Compact design.
- Wider range of horizontal discharge air.
- Air Filter with function to reduce dust and smoke.
- Automatic air swing and manual adjusted by Remote Control for horizontal and vertical airflow.
- Long installation piping up to 25 meter (C18EK & C24EK).
- Supersonic Air Purifying System with super alleru-buster filter and auto refresh deo filter.
  - Inactive various harmful airbone elements including allergens, viruses and bacteria.
  - Generated supersonic waves enhance the ability to collect dust and dirt in the air.

- **Quality Improvement**
  - Random auto restart after power failure for safety restart operation.
  - Gas leakage detection.
  - Prevent Compressor reverse cycle.
  - Inner protector to protect Compressor.
  - Noise prevention during soft dry operation.
  - Blue coated Condenser for high resistance to corrosion.
  - Anti-dew formation control (Cooling & Soft Dry).

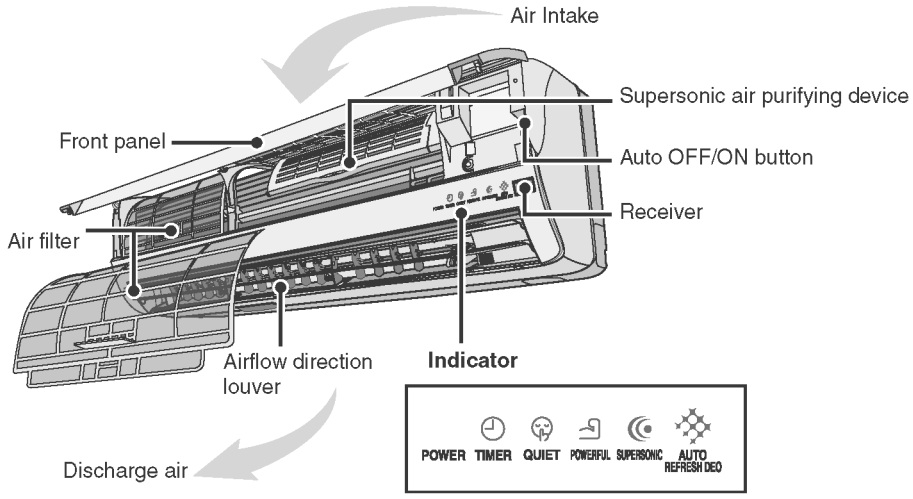
- **Operation Improvement**
  - Quiet mode to provide quiet operation.
  - Powerful mode to reach the desired room temperature quickly.
  - 24-hour timer setting.

- **Serviceability Improvement**
  - Removable and washable Front Panel.

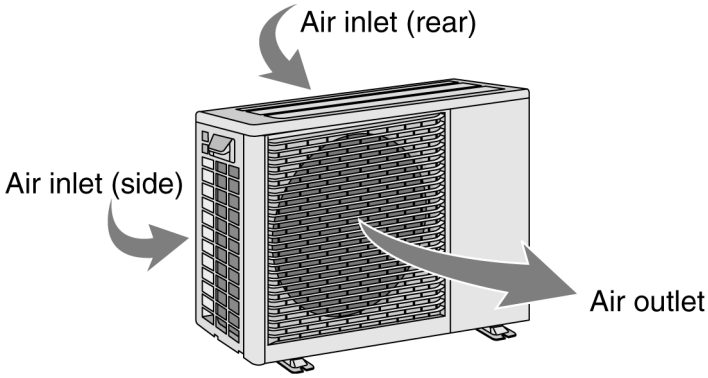
4 Location of Controls and Components

4.1. Product Overview

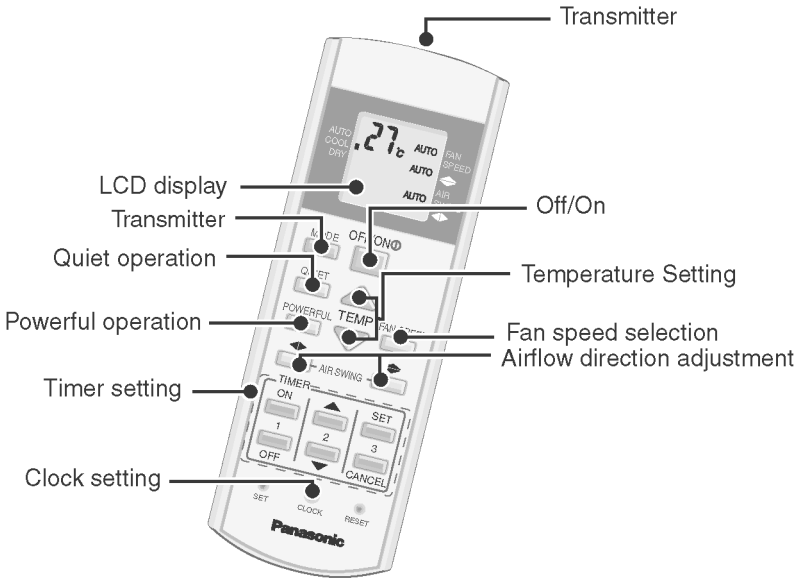
4.1.1. Indoor Unit



4.1.2. Outdoor Unit



4.1.3. Remote Control

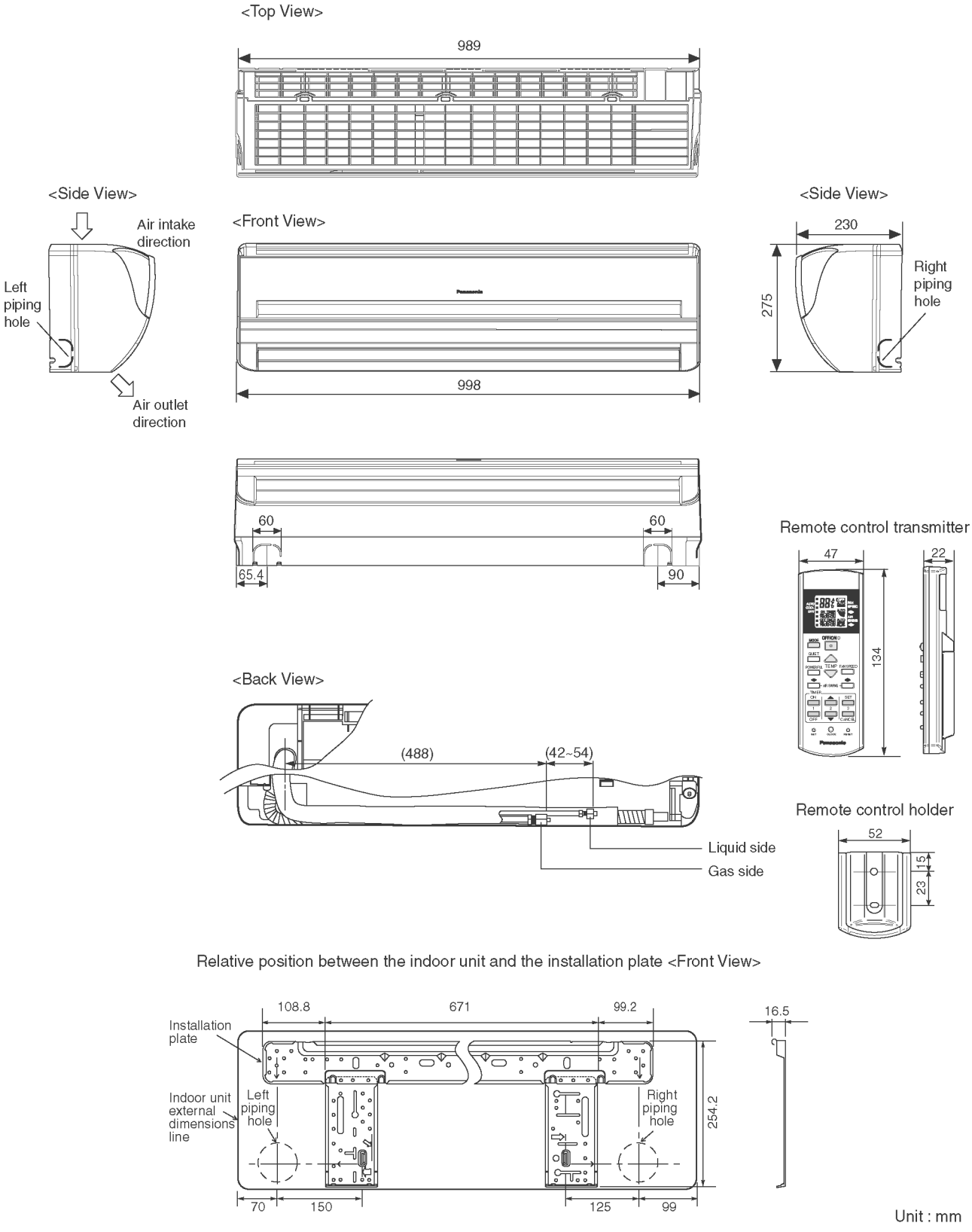


* For normal operation, the SET button is not in use.
* Press RESET button to restore the remote control's default setting.

5 Dimensions

5.1. Indoor Unit

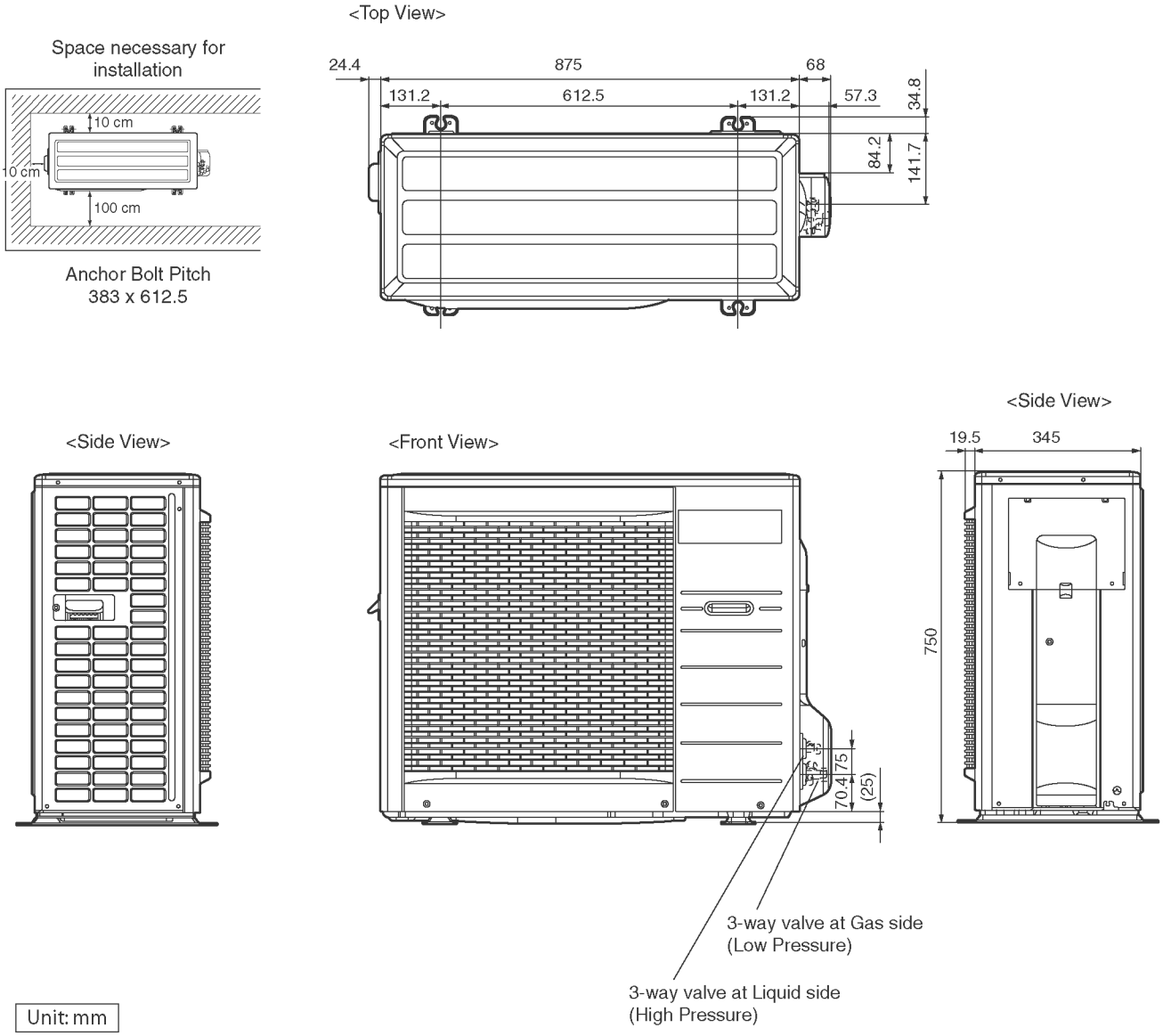
CS-C18EKQ CS-C24EKQ



Unit : mm

5.2. Outdoor Unit

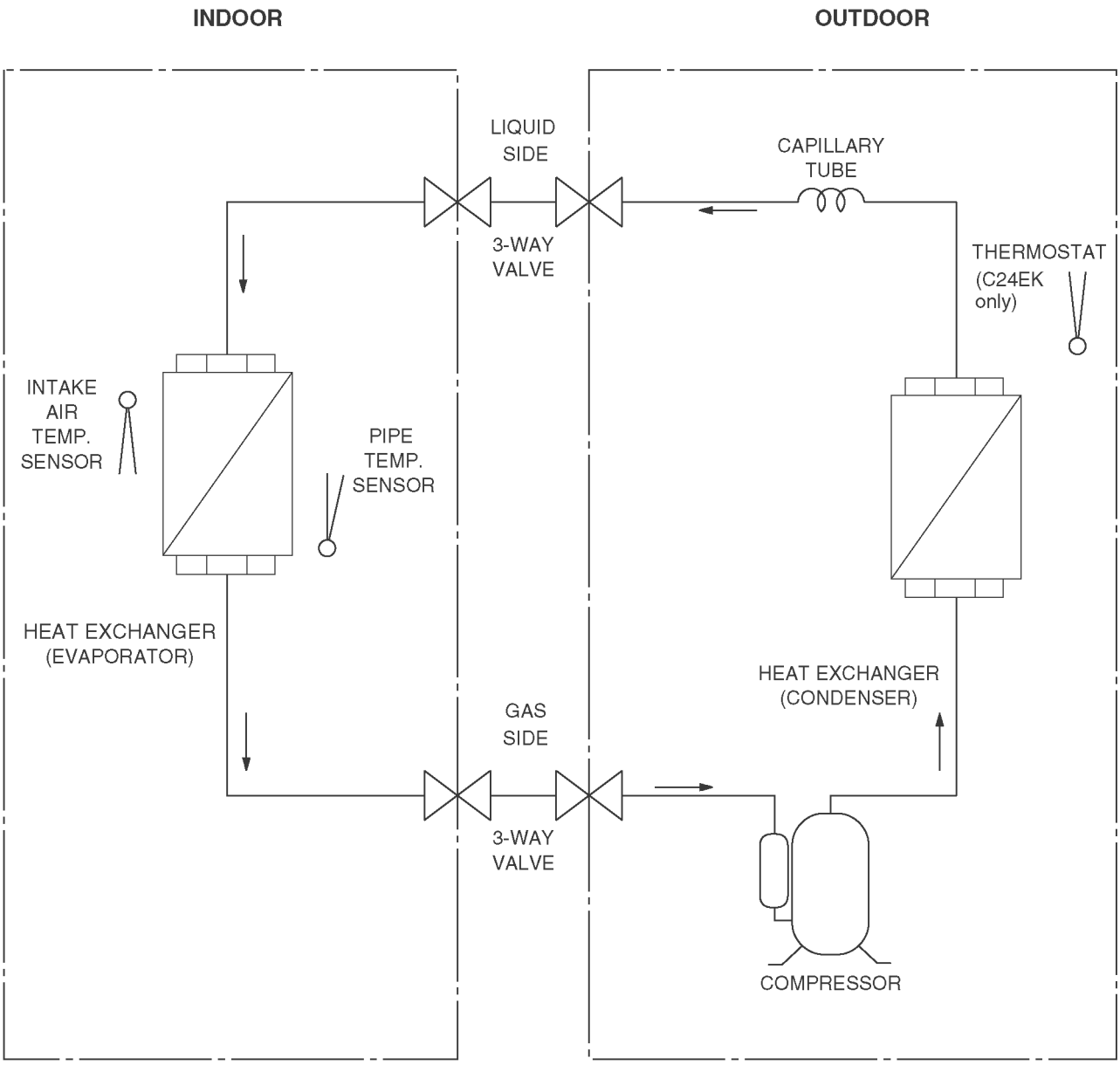
CU-C18EKQ CU-C24EKQ



Unit: mm

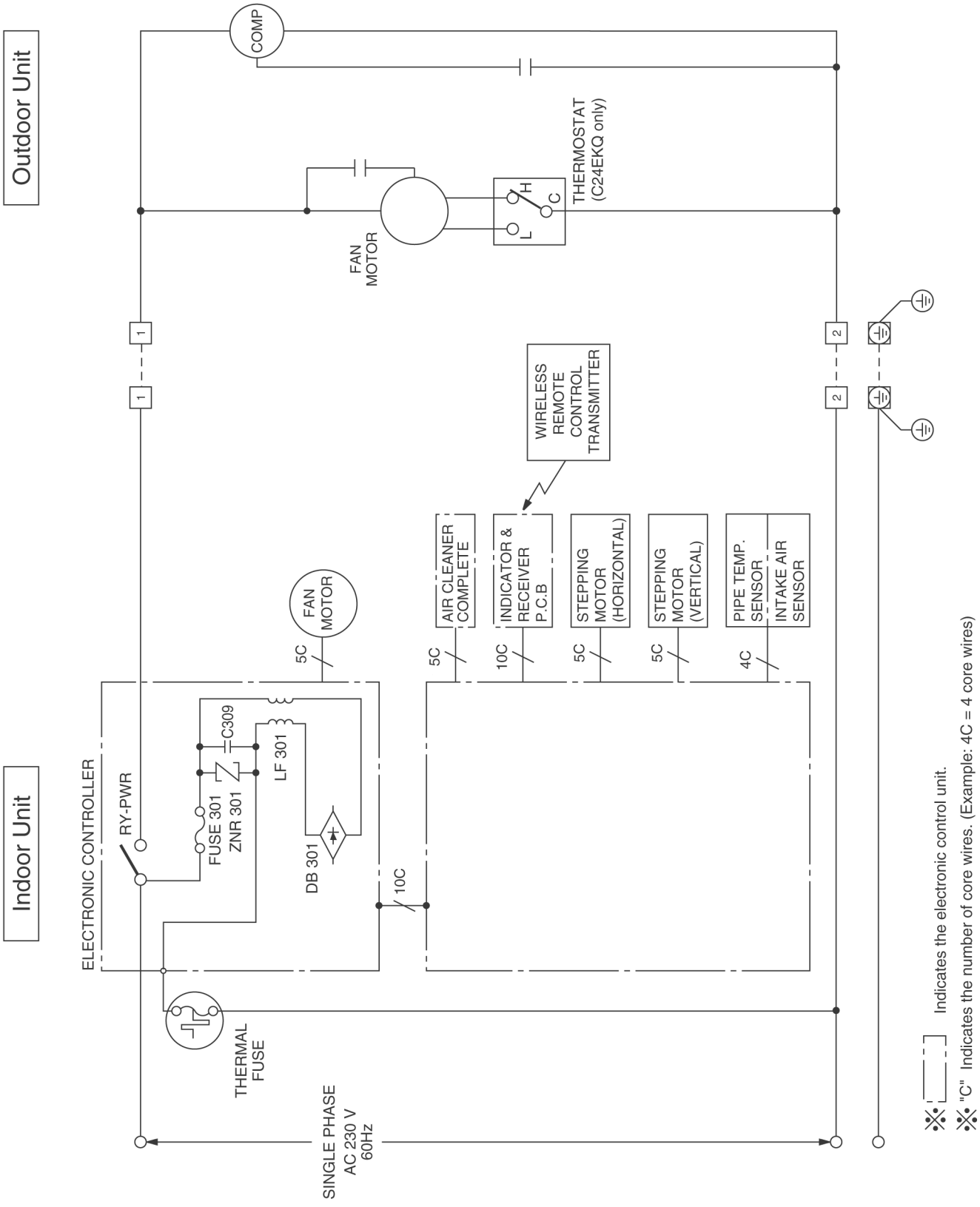
6 Refrigeration Cycle Diagram

CS-C18EKQ CU-C18EKQ
CS-C24EKQ CU-C24EKQ



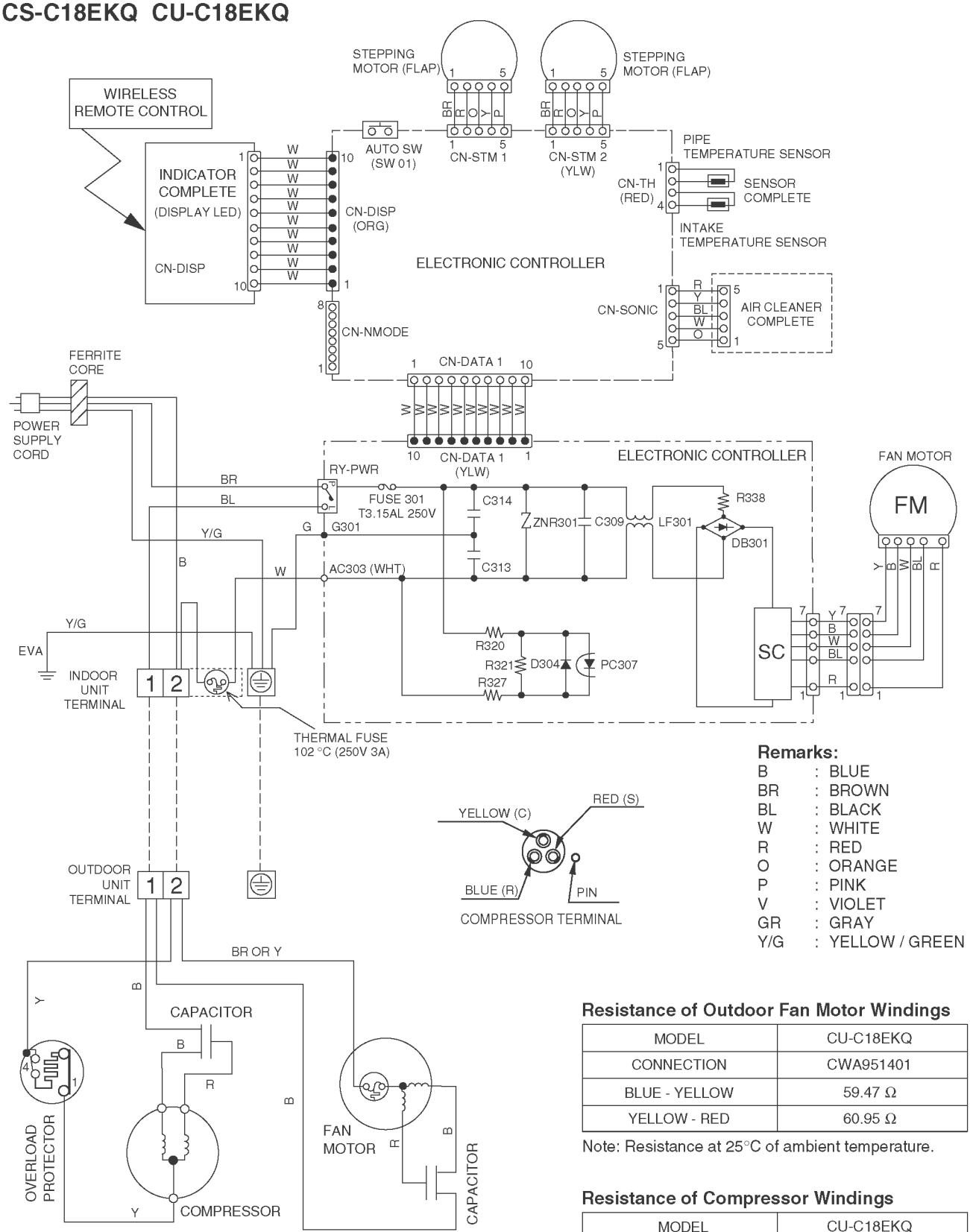
7 Block Diagram

CS-C18EKQ CU-C18EKQ
CS-C24EKQ CU-C24EKQ



8 Wiring Connection Diagram

CS-C18EKQ CU-C18EKQ



Remarks:

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

Resistance of Outdoor Fan Motor Windings

MODEL	CU-C18EKQ
CONNECTION	CWA951401
BLUE - YELLOW	59.47 Ω
YELLOW - RED	60.95 Ω

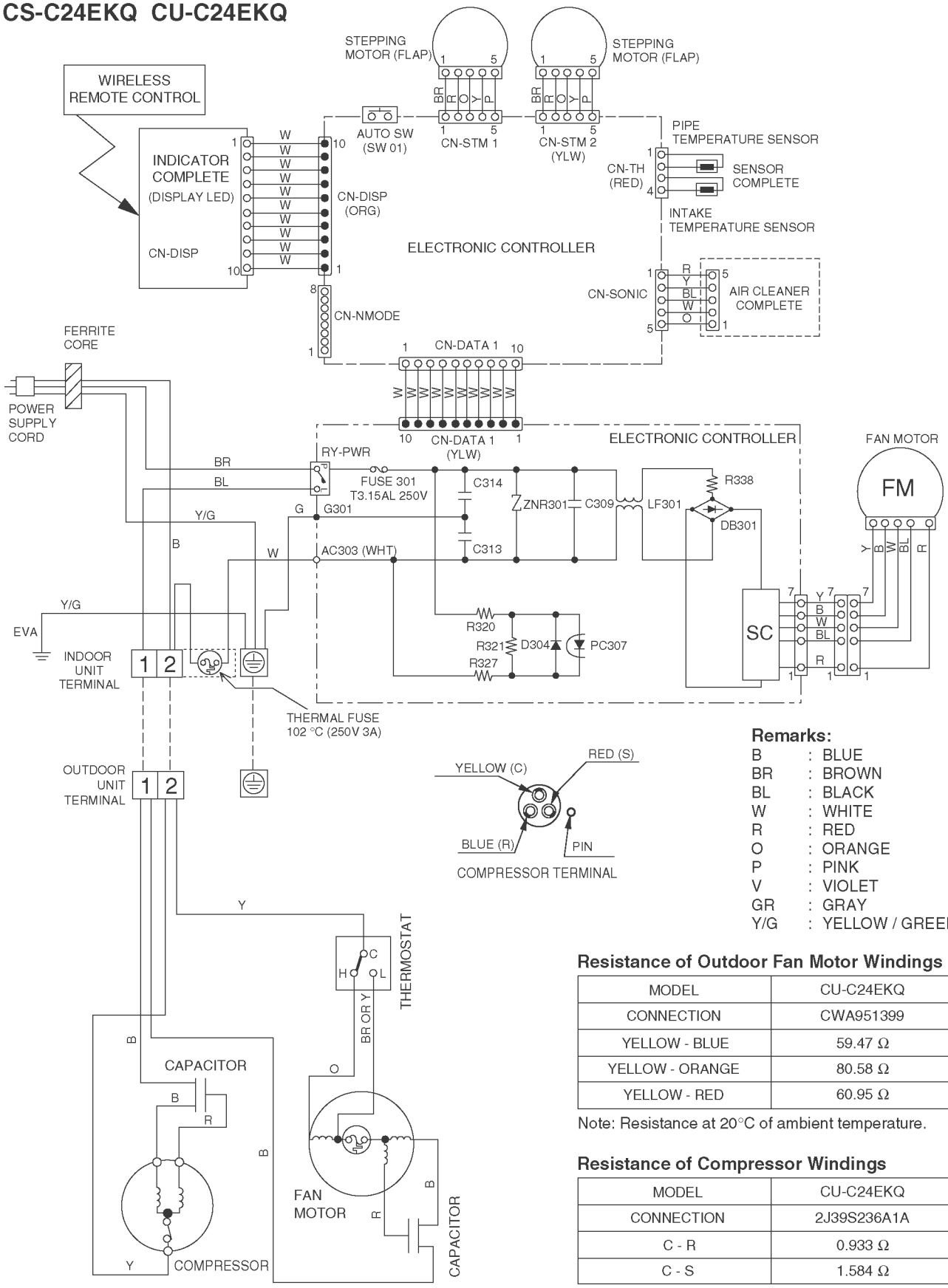
Note: Resistance at 25°C of ambient temperature.

Resistance of Compressor Windings

MODEL	CU-C18EKQ
CONNECTION	2K25S236F6A
C - R	1.505 Ω
C - S	1.809 Ω

Note: Resistance at 20°C of ambient temperature.

CS-C24EKQ CU-C24EKQ



Remarks:

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

Resistance of Outdoor Fan Motor Windings

MODEL	CU-C24EKQ
CONNECTION	CWA951399
YELLOW - BLUE	59.47 Ω
YELLOW - ORANGE	80.58 Ω
YELLOW - RED	60.95 Ω

Note: Resistance at 20°C of ambient temperature.

Resistance of Compressor Windings

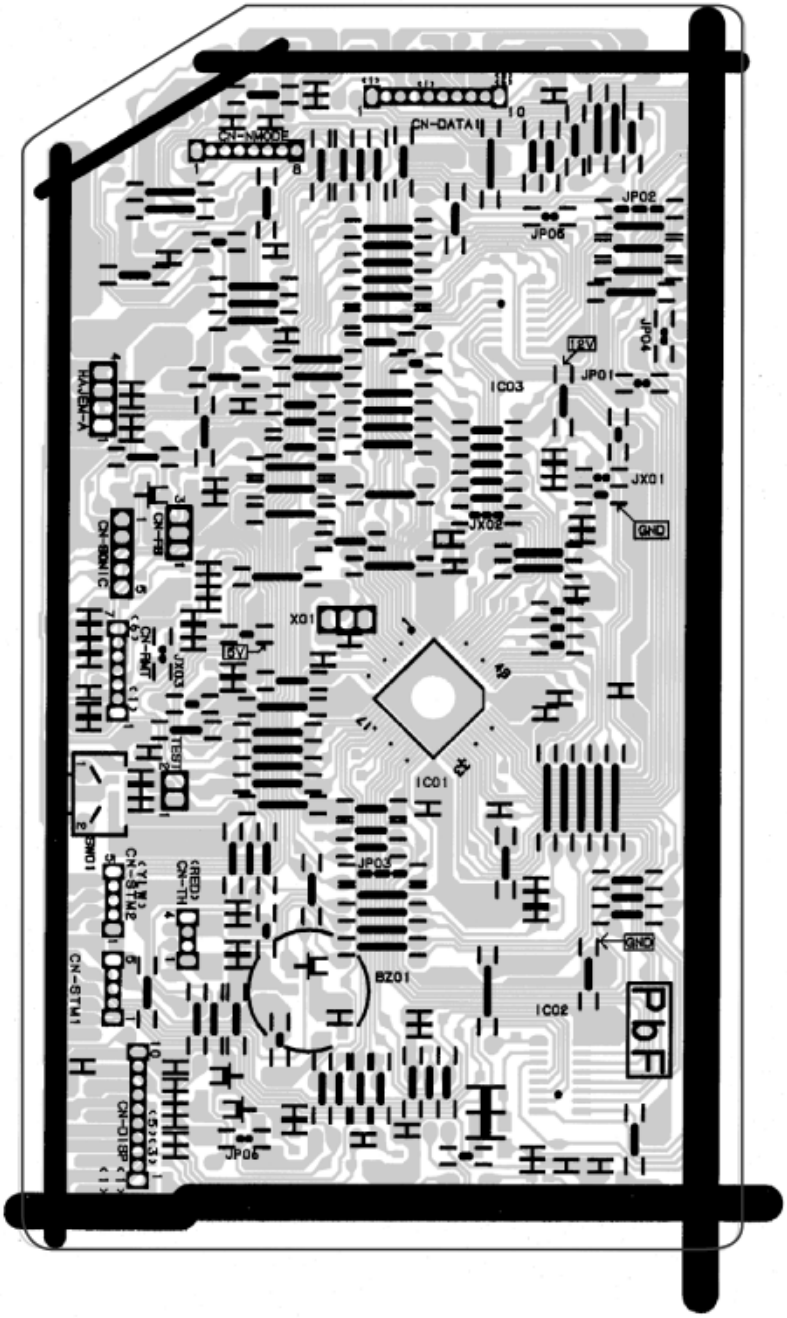
MODEL	CU-C24EKQ
CONNECTION	2J39S236A1A
C - R	0.933 Ω
C - S	1.584 Ω

Note: Resistance at 20°C of ambient temperature.

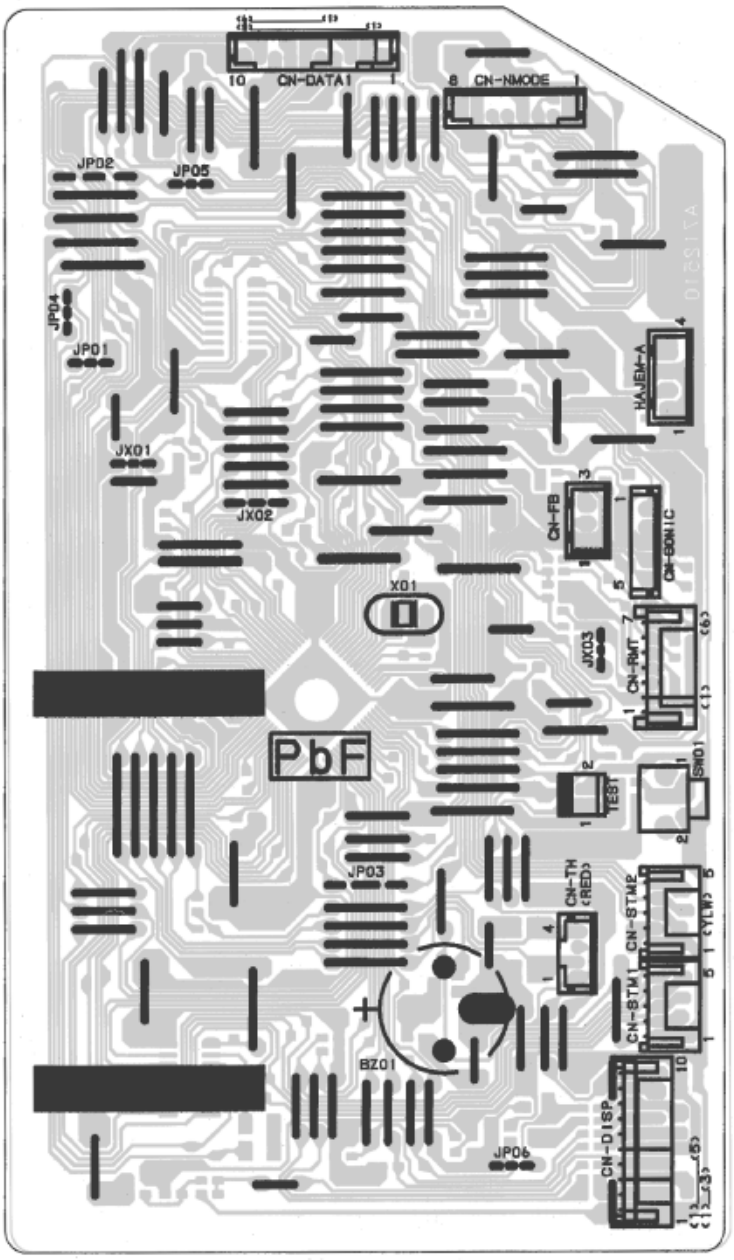
9 Printed Circuit Board

9.1. Main Printed Circuit Board

TOP VIEW

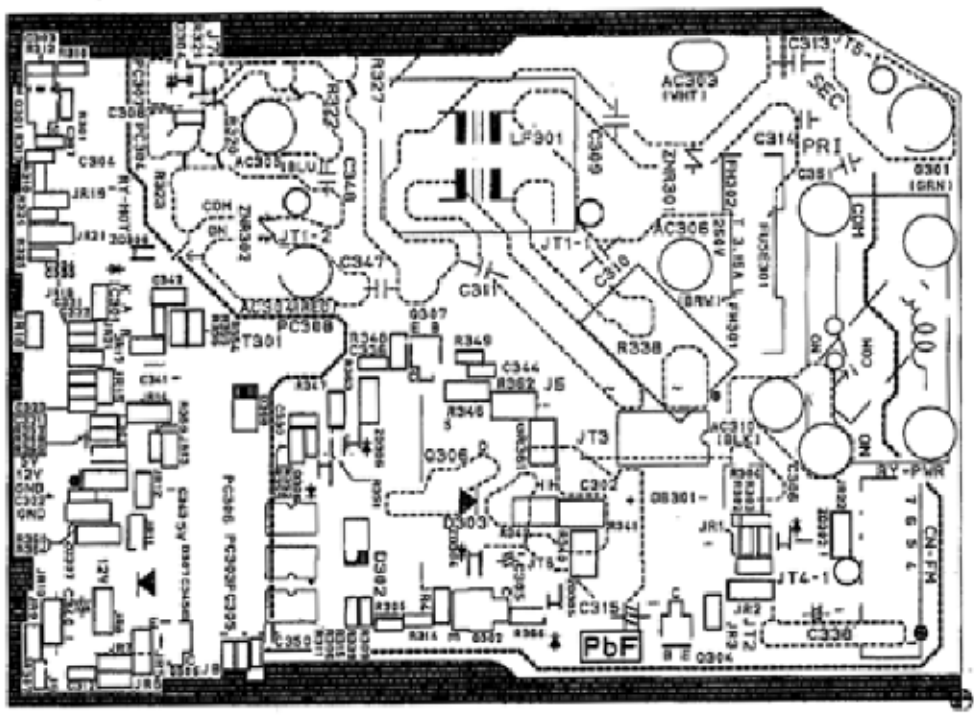


BOTTOM VIEW

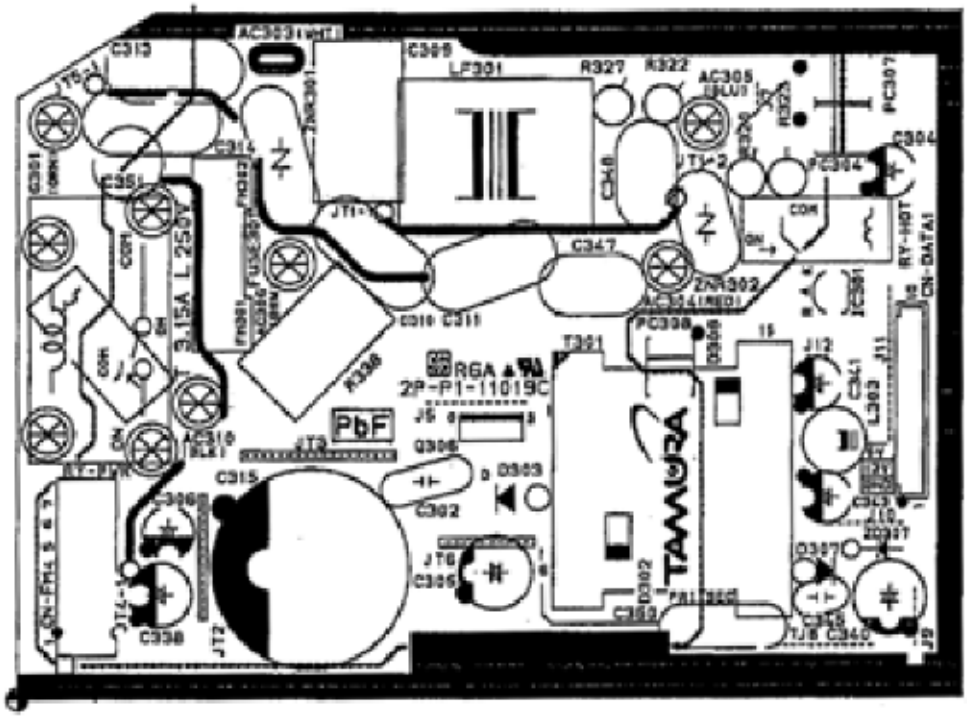

CN-DATA1
CN-NMODE
JPD2
JPD5
JPD4
JPD1
JX01
JX02
X01
JX03
PbF
JP03
BZ01
JP06
CN-DISP
CN-STM1
CN-STM2
CN-TH
CN-FB
CN-BOWIC
CN-RMT
TEST
SW01

9.2. Power Printed Circuit Board

TOP VIEW



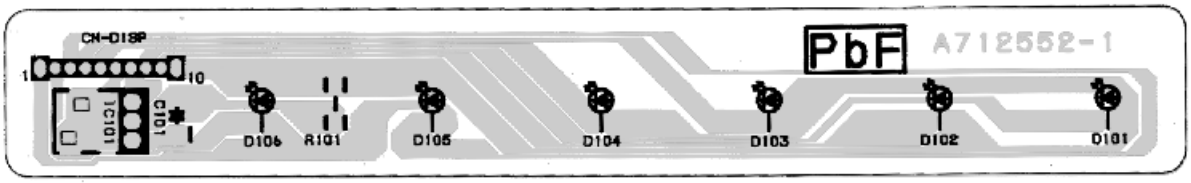
BOTTOM VIEW



9.3. Indicator panel

TOP VIEW

BOTTOM VIEW



10 Installation Instruction

SELECT THE BEST LOCATION

INDOOR UNIT

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

OUTDOOR UNIT

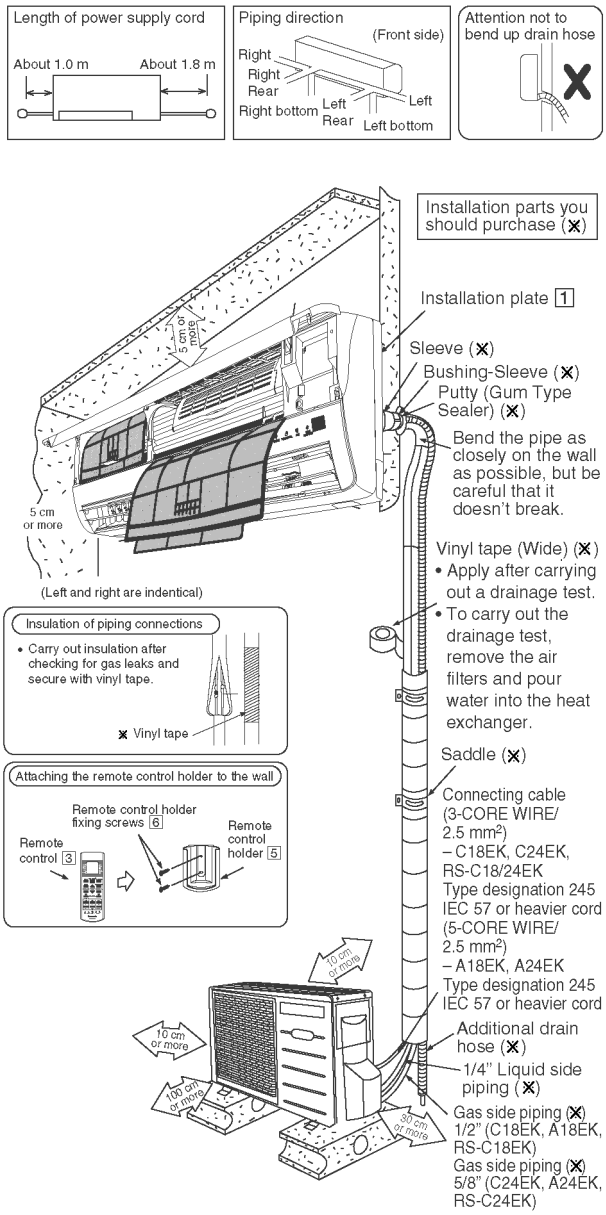
- If an awning is built over the unit to prevent direct sunlight or rain, be careful that heat radiation from the condenser is not obstructed.
- There should not be any animal or plant which could be affected by hot air discharged.
- Keep the spaces indicated by arrows from wall, ceiling, fence or other obstacles.
- Do not place any obstacles which may cause a short circuit of the discharged air.
- If piping length is over 7.5m, additional refrigerant should be added as shown in the table.

Model	Piping size		Rate Length (m)	Max. Elevation (m)	Max. Piping Length (m)	Additional Refrigeration (g/m)
	Gas	Liquid				
C18EK, RS-C18EK	1/2”	1/4”	5	20	25	20
C24EK, RS-C24EK	5/8”	1/4”	5	20	25	30
A18EK	1/2”	1/4”	5	20	25	20
A24EK	5/8”	1/4”	5	20	25	30

Example: For A24EK

If the unit is installed at a 10m distance, the quantity of additional refrigerant should be 75g....(10 - 7.5)m x 30g/m =75g

Indoor/Outdoor Unit Installation Diagram

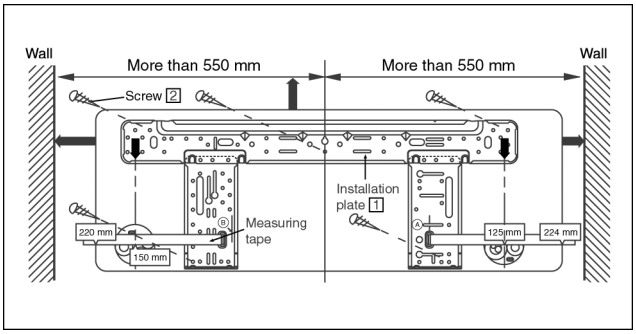


• This illustration is for explanation purposes only. The indoor unit will actually face a different way.

10.1. Indoor Unit

10.1.1. 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 about 174 mm from this line.
: For left side piping, piping connection 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

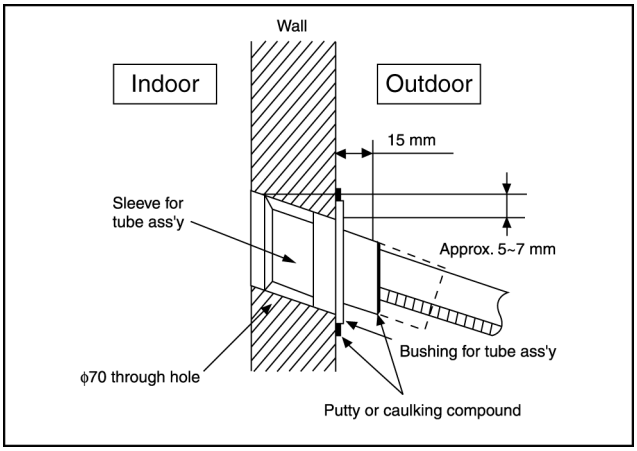
2. Drill the piping plate hole with ø70 mm hole-core drill.
   • Line according to the arrows marked on the lower left and right side of the installation plate. The meeting point of the extended line is the centre of the hole. Another method is by putting measuring tape at position as shown in the diagram above. The hole centre is obtained by measuring the distance namely 150 mm and 125 mm for left and right hole respectively.
   • Drill the piping hole at either the right or the left and the hole should be slightly slanted to the outdoor side.

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

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

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

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



10.1.3. INDOOR UNIT INSTALLATION

1. **For the right rear piping**

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

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

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

3. **For the embedded piping**

Replace the drain hose

⬇

Bend the embedded piping

⬇

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

Install the Indoor Unit

⬇

Cut and flare the embedded piping

⬇

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

Pull the connecting cable into Indoor Unit

⬇

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

Connect the piping

⬇

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

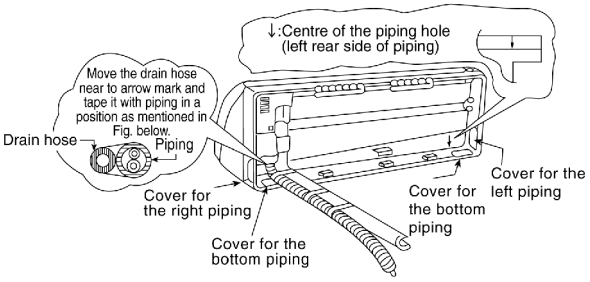
Insulate and finish the piping

⬇

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

Secure the Indoor Unit

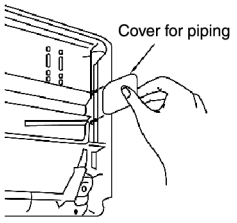
Pull out the piping and drain hose



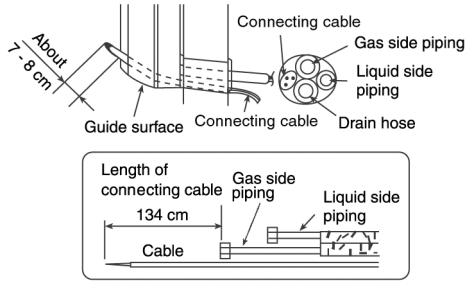
How to keep the cover

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

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

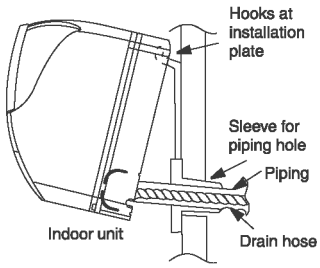


Insert the connecting cable



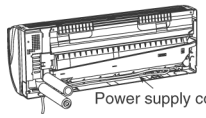
Install the Indoor Unit

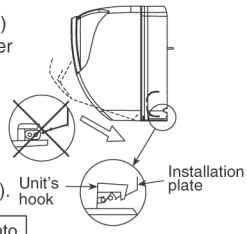
Hook the indoor unit onto the upper portion of installation plate (Engage the indoor unit with the upper edge of the installation plate). Ensure the hooks are properly seated on the installation plate by moving in left and right.



Secure the Indoor Unit

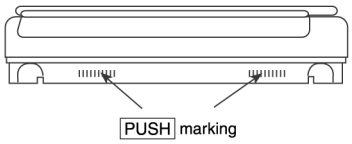
1. Power supply cord arrangement.
   Excess length of power supply cord should bearranged behind the chassis at piping keeping areaas shown in the diagram without tying up in abundle. Ensure that the power supply cord is not clamped inbetween unit's hook (2 position) and installation plate.Ensure that the power supply cord is not stretchedbetween chassis back and installation plate. It maycreate squeak sound.
2. Press the lower left and right side of the unit against the installation plate until hooks engages with their slot (sound click).





⚠ Warning: Do not tie up power supply cord into a bundle by band. It may generate heat and cause fire.

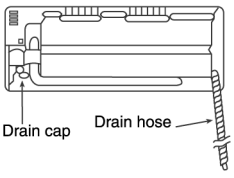
To take out the unit, push the PUSH marking at the bottom unit, and pull it slightly towards you to disengage the hooks from the unit.

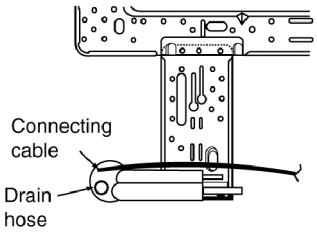


(This can be used for left rear piping and left bottom piping also.)

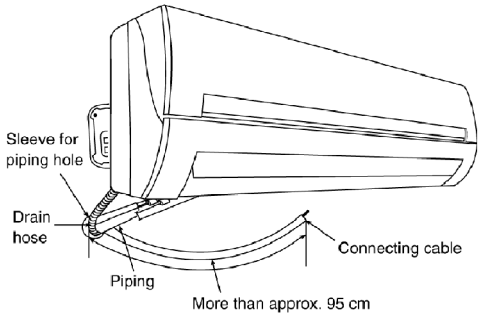
Exchange the drain hose and the cap

Rear view for left piping installation

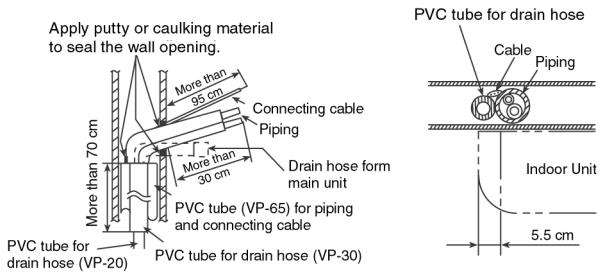




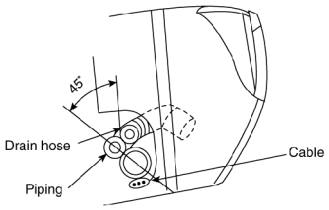
Adjust the piping slightly downwards.



• 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)

10.1.4. CONNECT THE CABLE TO THE INDOOR UNIT

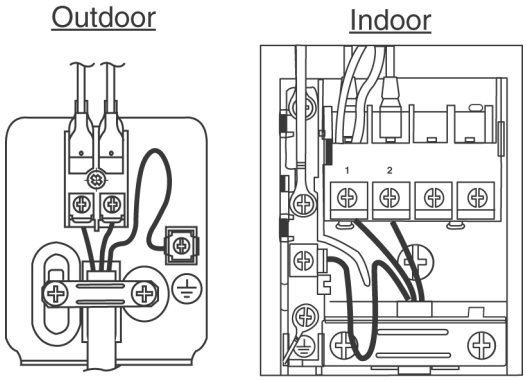
1. The inside and outside connecting cable can be connected without removing the front grille.
2. Connecting cable between indoor unit and outdoor unit shall be approved polychloroprene sheathed 3 × 2.5 mm^2 (C18EK, C24EK, RS/RU-C18/24EK) or 5 × 2.5 mm^2 (A18EK, A24EK) flexible cord, type designation 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.
   - Secure the cable onto the control board with the holder (clamper).

CS/CU-C18EK, C24EK, RS-C18/24EK

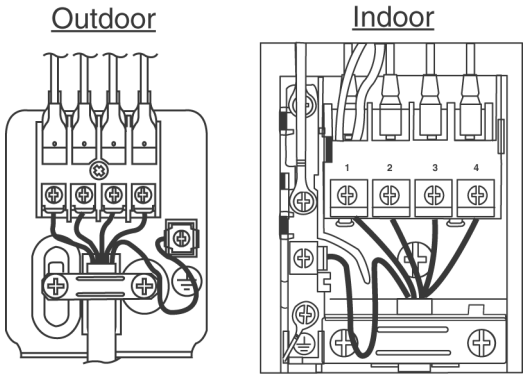
Terminals on the indoor unit	1	2	⏚
Colour of wires			
Terminals on the outdoor unit	1	2	⏚

CS/CU-A18EK, A24EK

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



C18EK, C24EK, RS-C18/24EK

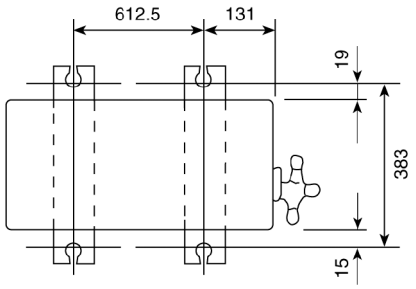


A18EK, A24EK

10.2. Outdoor Unit

10.2.1. 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 (ø10 mm).
  2. When installing at roof, please consider strong wind and earthquake. Please fasten the installation stand firmly with bolt or nails.



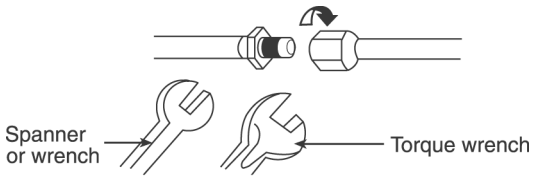
10.2.2. CONNECTING THE PIPING

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.



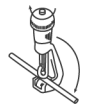
MODEL	Piping size (Torque)	
	Gas	Liquid
C18EK, A18EK, RS-C18EK	1/2” (55 N•m)	1/4” (18 N•m)
C24EK, A24EK, RS-C24EK	5/8” (65 N•m)	1/4” (18 N•m)

Connect The Piping to Outdoor Unit

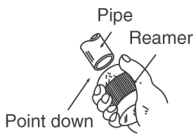
Decide piping length and then cut by using pipe cutter. Remove burrs from cut edge. Make flare after inserting the flare nut (located at valve) onto the copper pipe.
Align center of piping to valves and then tighten with torque wrench to the specified torque as stated in the table.

Cutting and Flaring the Piping

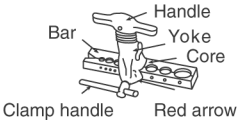
1. Please cut using pipe cutter and then remove the burrs.
2. Remove the burrs by using reamer. If burrs is not removed, gas leakage may be caused. Turn the piping end down to avoid the metal powder entering the pipe.
3. Please make flare after inserting the flare nut onto the copper pipes.



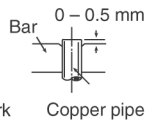
1. To cut

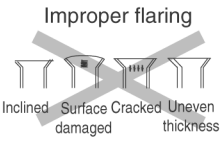


2. To remove burrs



3. To flare



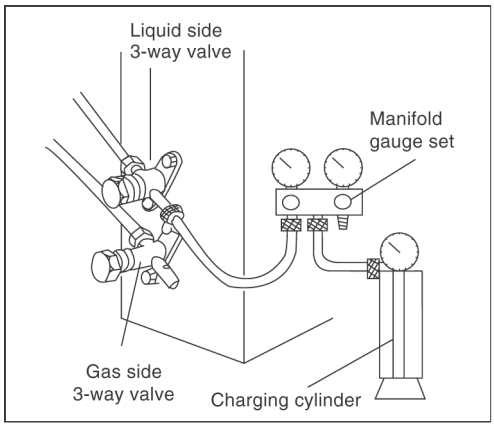


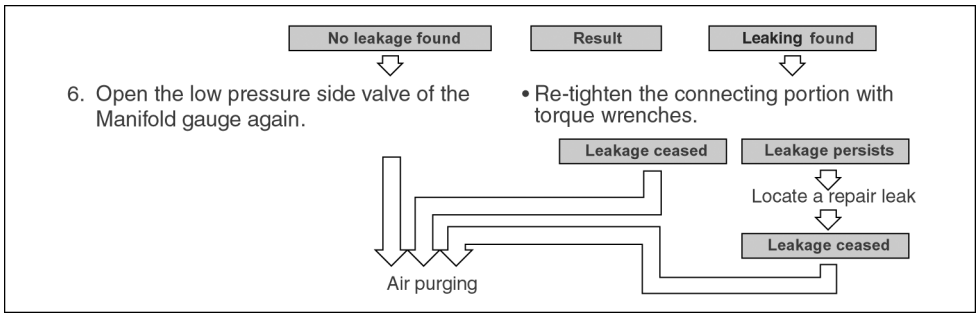
When properly flared, the internal surface of the flare will evenly shine and be of even thickness. Since the flare part comes into contact with the connections, carefully check the flare finish.

10.2.3. AIR PURGING OF THE PIPINGS AND INDOOR UNIT

1) Checking a gas leakage

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





<For the left pipings>

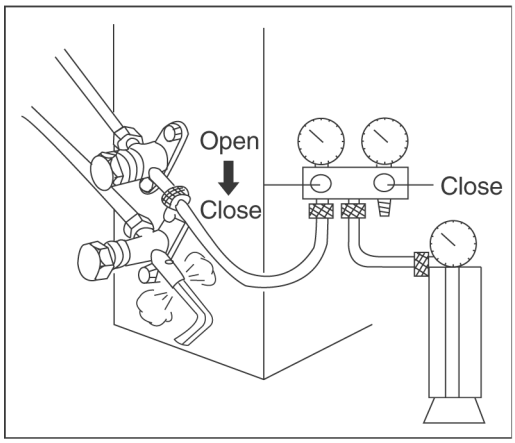
1) Measure the pressure.
2) Keep it for 5-10 minutes

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

2) Air purging

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

1. To purge the air, push the pin on the Gas side 3-way valve for three seconds with a Hexagonal wrench and set it free for one minute.
   • Repeat this for three times.
2. To balance the refrigerant, close the low pressure side valve on the Manifold gauge and release refrigerant from the piping through service port until the gauge indicates 0.5 - 0.3 MPa.
3. Set both 3-way valves to open position with the Hexagonal wrench for the unit operation.



10.2.4. CONNECT THE CABLE TO THE OUTDOOR UNIT

1. Remove the control board cover from the unit by loosening the screw.
2. Connecting cable between indoor unit and outdoor unit shall be approved polychloroprene sheathed 3 × 2.5 mm^2 (C18EK, C24EK, RS/RU-C18/24EK) or 5 × 2.5 mm^2 (A18EK, A24EK) flexible cord, type designation 245 IEC 57 or heavier cord.

CS/CU-C18EK, C24EK, RS/RU-C18/24EK

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

CS/CU-A18EK, A24EK

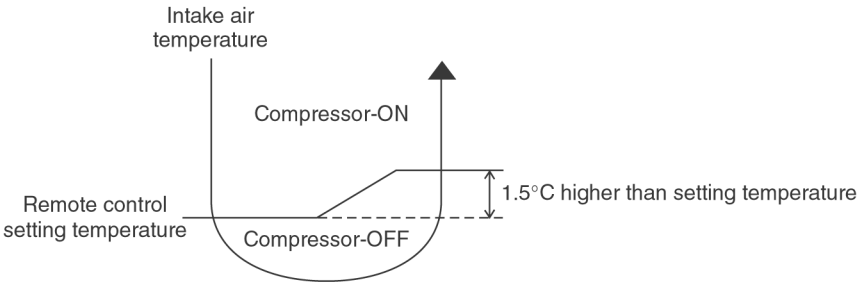
Terminals on the indoor unit	1	2	3	4	⏚
Colour of wires					
Terminals on the outdoor unit	1	2	3	4	⏚

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

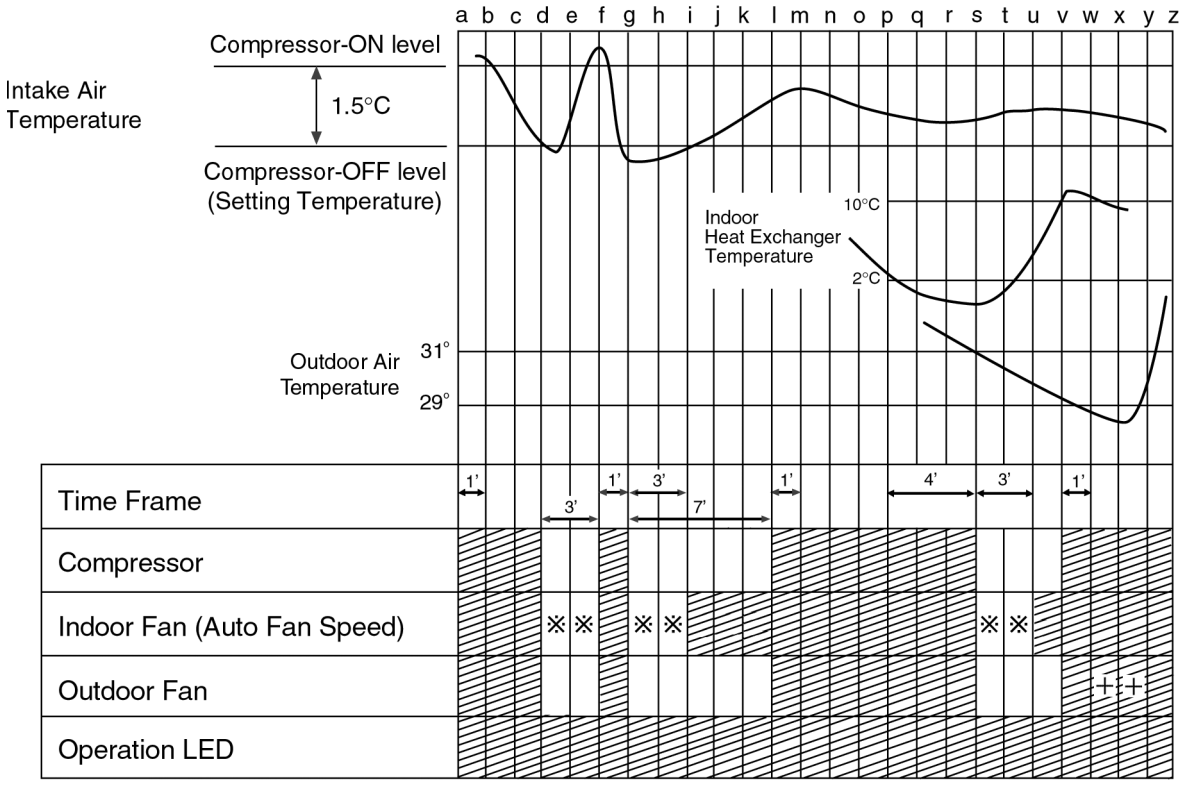
11 Operation and Control

11.1. Cooling Operation

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



11.1.1. Cooling Operation Time Diagram



<Description of operation>

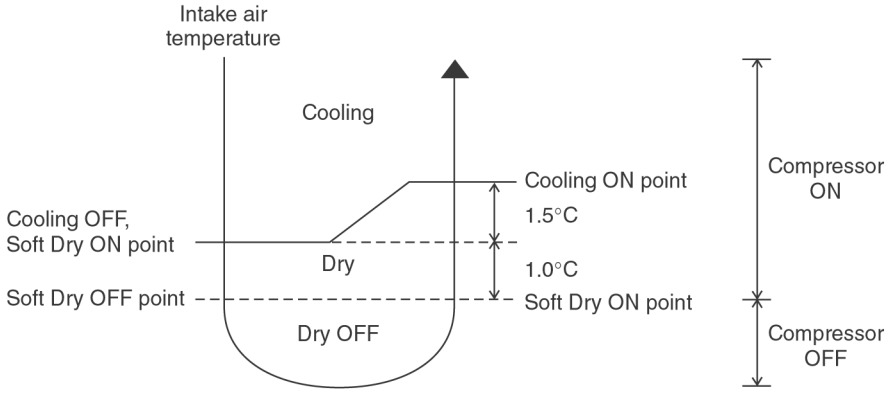
a – b, f – g, l – m, v – w	:	Minimum 60 seconds forced operation
d – f, g – i, s – u	:	Minimum 3 minutes restart control (Time Delay Safety Control)
g – l	:	Maximum 7 minutes time save control
p – v	:	Anti-Freezing Control
(※) d – f, g – i, s – u	:	Indoor fan rotates at Lo- for 20 seconds and off for 160 seconds.
(+) w-y	:	Outdoor fan rotates at Lo (Outdoor fan control for C24EK only)

Operation

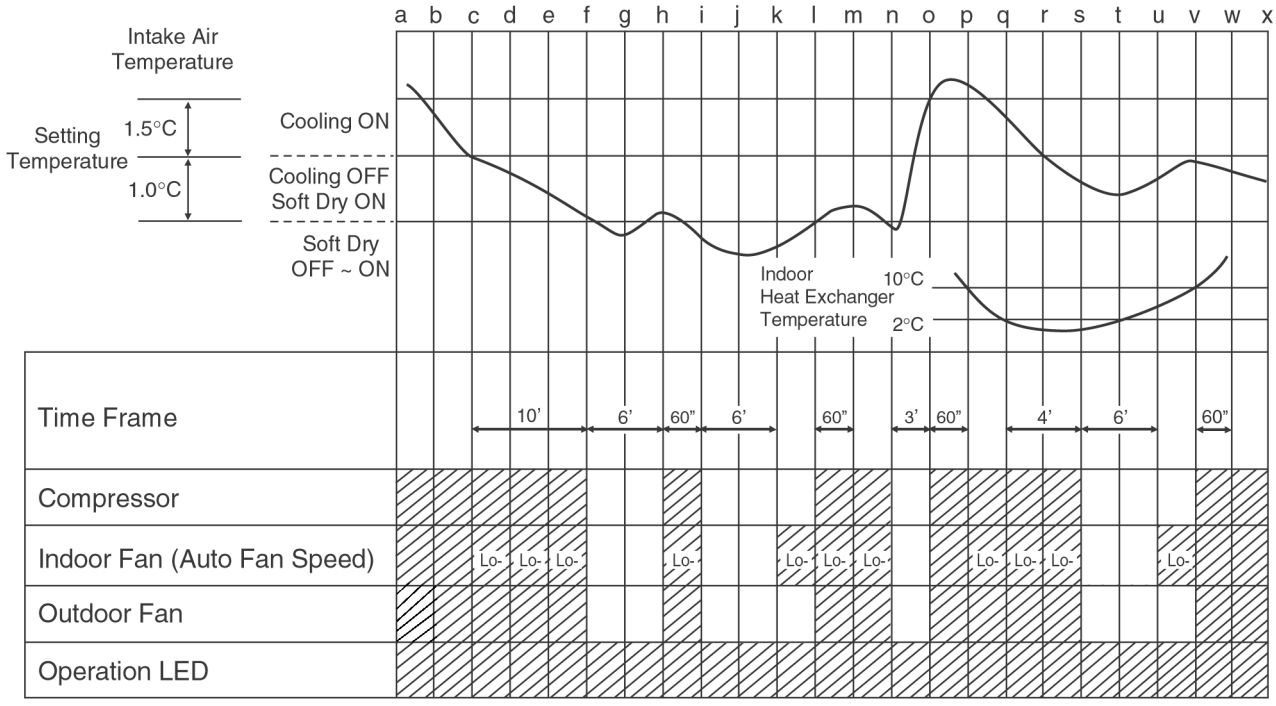
Stop

11.2. Soft Dry Operation

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



11.2.1. Soft Dry Operation Time Diagram



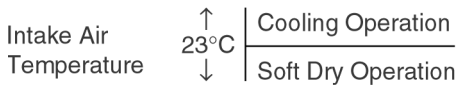
<Description of operation>

h – i, l – m, o – p, v – w : Minimum 60 seconds foreced operation
n – o : Minimum 3 minutes restart control (Time Delay Safety Control) - Cooling operation
f – h, i – k, s – u : Minimum 6 minutes restart control (Time Delay Safety Control) - Soft dry operation
q – v : Anti-Freezing Control

Operation
Stop

11.3. Automatic Operation

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



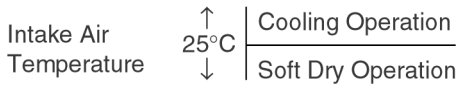
- Then, the unit start to operate at determined operation mode, until it is switched off using remote control, with the setting temperature as shown in below table.

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

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

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

- The operation mode judging temperature and standard setting temperature can be increased by 2°C permanently, by open the circuit of JX03 at printed circuit board indoor unit.



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

11.4. Operation Control

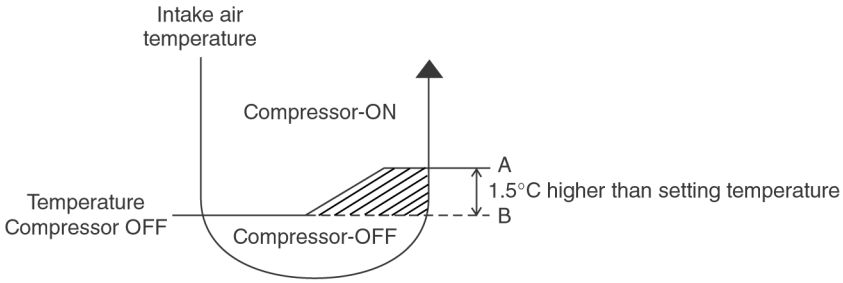
(For 11.4.1. to 11.4.7. information applies only to Cooling and Soft Dry Operation)

11.4.1. Restart Control (Time Delay Safety Control)

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

11.4.2. 7 Minutes Time Save Control

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

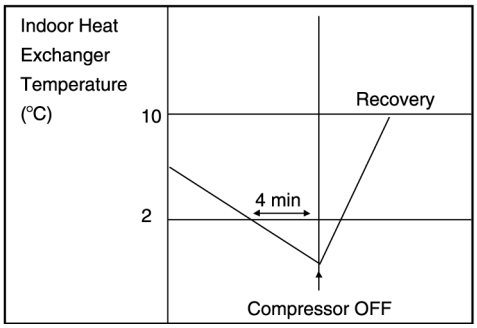


11.4.3. 60 Seconds Forced Operation

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

11.4.4. Anti-Freezing Control

- If the temperature of the indoor heat exchanger falls below 2°C continuously for 4 minutes or more, the compressor turns off. The fan speed setting remains the same.
- This phenomenon is to protect the indoor heat exchanger from freezing and to prevent higher volume of refrigerant in liquid form returning to the compressor.
- Compressor will restart again when the indoor heat exchanger temperature rises to 10°C (Recovery).
- Restart control (Time Delay Safety Control) will be applied in this Control if the recovery time is too short.



11.4.5. Compressor Reverse Rotation Protection Control

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

▲T = Intake air temperature - Indoor heat exchanger temperature

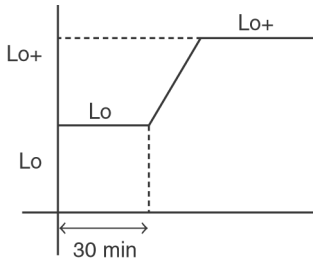
- This is to prevent compressor from rotate reversely when there is an instantaneous power failure.

11.4.6. Starting Current Control

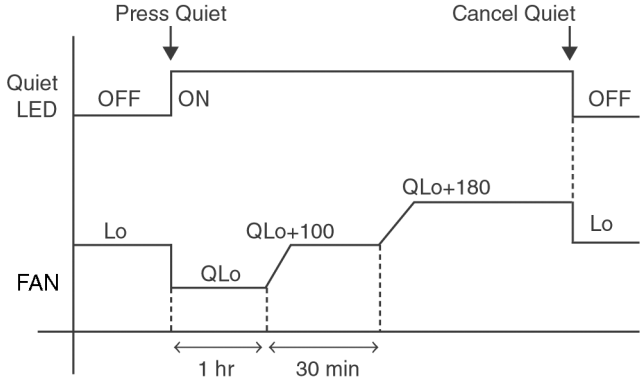
- When the compressor, outdoor fan motor and indoor fan motor are simultaneously started, the indoor fan motor will start to operate at 1.6 second later.
- The reason of the difference is to reduce the starting current flow.

11.4.7. Anti-Dew Formation Control

- Purpose is to prevent dew formation on indoor unit air discharge area.
- When room temperature is constant (±1°C) the following conditions occur for 30 minutes continuously, anti-dew formation will activate:
  - Remote Control setting temperature is less than 25°C.
  - Compressor is on.
  - Cooling operation mode.
  - Indoor Fan motor operate at Low fan speed or QLo.
- This control is cancelled immediately when above condition is changed.
- Anti-Dew formation is control by:
  1. Increasing Air Flow Volume
     a. Lo fan speed
     Lo fan speed is changed to Lo+ after 30 min to prevent dew formation.



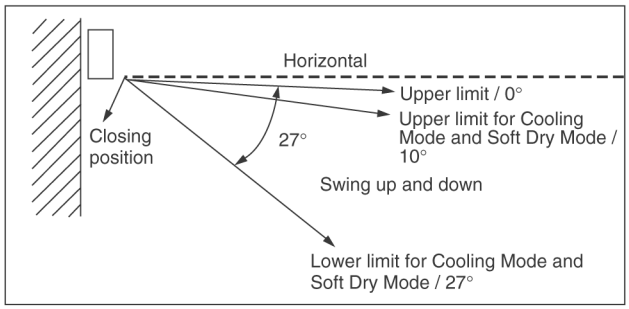
     b. QLo fan speed
     Dew formation may occurs at QLo cool, therefore QLo cool is operated only 1 hr 30 min (1 hr QLo, 30 min QLo +100 rpm). After that, it operates at QLo +180rpm (However Quiet LED remains on).



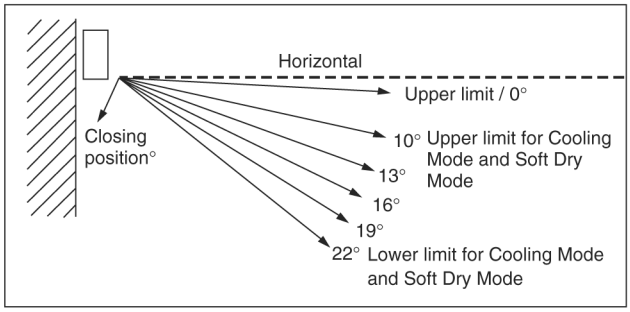
2. Norrowing

Vertical Airflow Direction

– During Anti-dew condensation prevention, Airflow Direction Auto-control angle change from 10° - 38° to 10° - 27° under Cooling and Soft Dry operation mode.



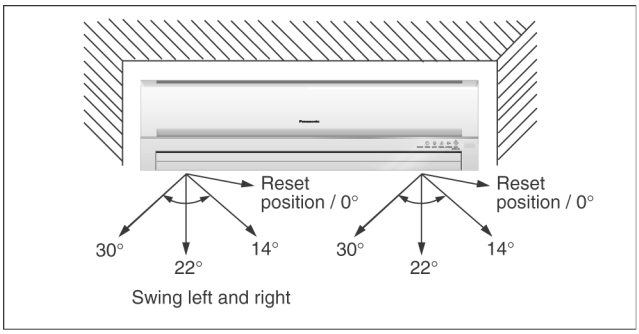
– During Anti-dew condensation prevention, Airflow Direction Manual control angle change from 10°, 14°, 18°, 22°, 27° to 10°, 13°, 16°, 19°, 22° under Cooling and Soft Dry operation mode.



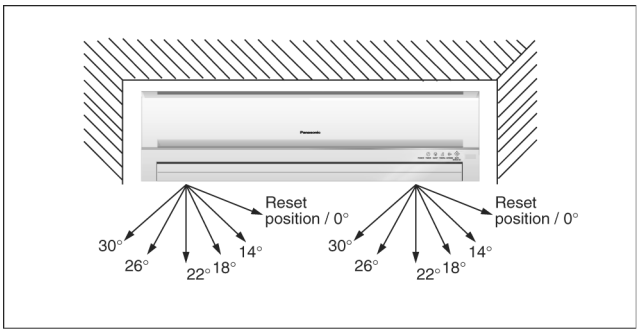
3. Narrowing

Horizontal Airflow Direction

– During Anti-dew condensation prevention, Airflow Direction Auto-control angle change form 0° - 44° to 14° - 30° under Cooling and Soft Dry operation mode.



– During Anti-dew condensation prevention, Airflow Direction Manual control angle change from 0°, 11°, 22°, 33°, 44° to 14°, 18°, 22°, 26°, 30° under Cooling and Soft Dry operation mode.



11.5. Indoor Fan Speed Control

• Indoor Fan Speed can be set using remote control.

11.5.1. Fan Speed Rotation Chart

COOL/DRY	CS-C24EKQ	CS-C18EKQ
S Hi	1590	1420
Hi	1530	1360
Me	1390	1250
Lo+	1330	1220
Lo	1250	1150
Lo-	1100	980
S Lo	860	780
Q Hi	1430	1260
Q Me	1290	1150
Q Lo	1150	1050

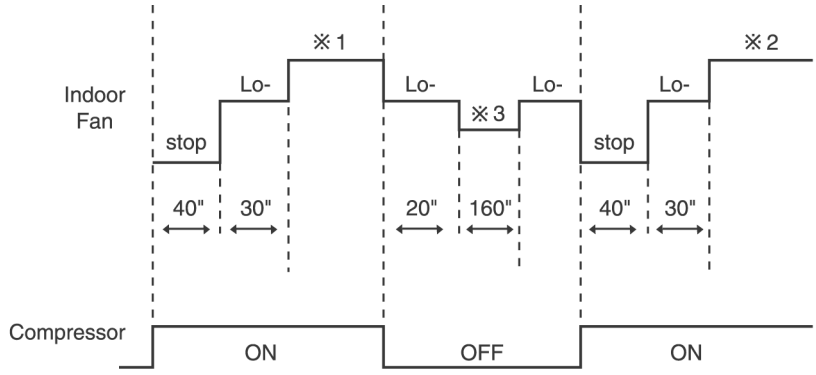
11.5.2. Automatic Fan Speed Control

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

Tap				S Hi	Hi	Me	Lo+	CLo	Lo-	SLo	Stop
Cooling	Normal	Manual	Hi		◯						
			Me			◯					
			Lo					◯			
		Auto			◯	◯			◯		◯
	Powerful	Manual		◯							
		Auto		◯							
Soft Dry		Manual							◯		◯
		Auto							◯		◯
Auto Mode judgement										◯	
Cooling	Quiet	Manual	QHi		Hi-100						
			QMe			Me-100					
			QLo					cLo-100			
		Auto			Hi-100	Me-100			◯		◯
Soft Dry	Quiet	Manual							◯		◯
		Auto							◯		◯

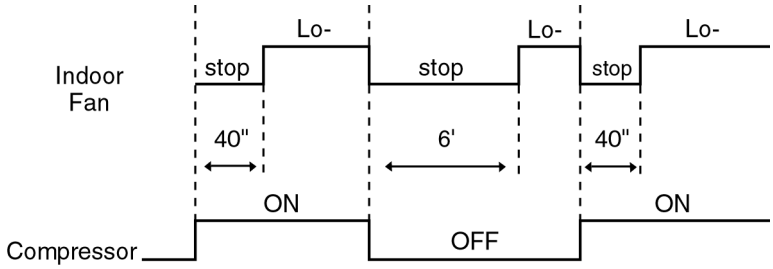
• Auto Fan Speed during Cooling operation:

1. Indoor fan will rotate alternately between off and on as shown in below diagram.
2. At the beginning of each compressor start operation, indoor fan will increase fan speed gradually for deodorizing purpose.
3. For the first time the compressor operate, indoor fan will be switched to Hi fan speed from Lo- after 70 seconds from the start of compressor. This cause the room temperature to achieve the setting temperature quickly.
4. During compressor stop, indoor fan will operate at Lo- for the beginning 20 seconds to prevent higher volume of refrigerant in liquid form returning to the compressor.
5. After the compressor at turn off condition for 3 minutes, indoor fan will start to operate at Lo- to circulate the air in the room.
   This is to obtain the actual reading of the intake air temperature.
6. For the resume of compressor operation, indoor fan will operate at Me fan speed to provide comfort and lesser noise environment, after 70 seconds from the restart of compressor.



※ 1 Fan Speed is Hi until the compressor stops (when the room temperature reaches setting temperature).
※ 2 Fan Speed is Me after the compressor restarts.
※ 3 Variable rpm is equivalent to Lo- rpm.

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



11.5.3. Manual Fan Speed Control

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

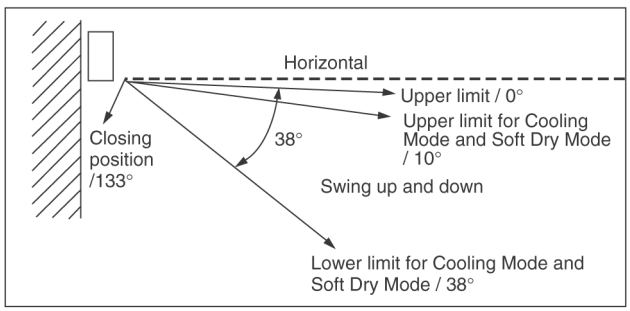
11.6. Outdoor Fan Speed Control

• There is only one speed for outdoor fan motor (C18EK).
• There is 2 speed for outdoor fan motor. Outdoor fan speed can be changed to Hi or Lo according to outdoor temperature (C24EK).
• For Cooling or Soft Dry operation when outdoor temperature reaches to 31°C (Hi-speed), 29°C (Lo-speed).
• When the air conditioner is turned on, the compressor and the outdoor fan will operate simultaneously.
• Likewise, both compressor and outdoor fan will stop at the same time if the unit is turned off.

11.7. Vertical Airflow Direction Control

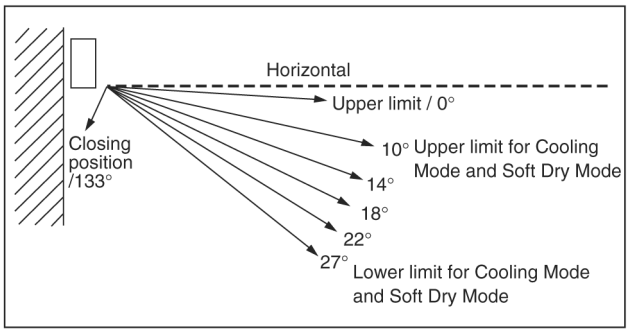
11.7.1. Auto Control

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



11.7.2. Manual Control

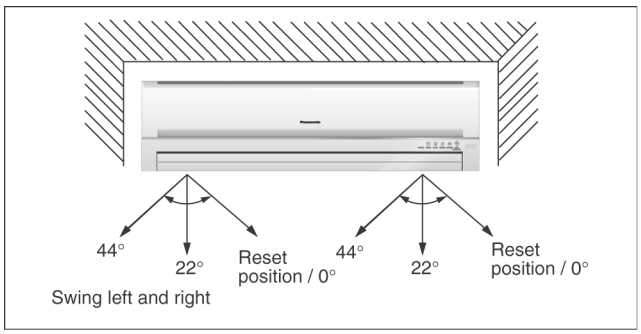
- When the vertical airflow direction is set to Manual using the remote control, the automatic airflow is released and the airflow direction louver move up and down in the range shown in the diagram.
- The louver can be adjusted by pressing the button to the desired louver position.
- When stopped with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



11.8. Horizontal Airflow Direction Control

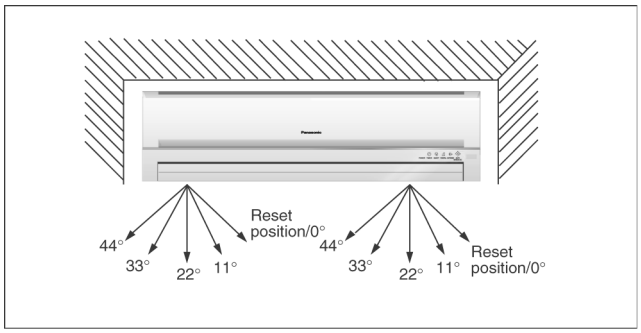
11.8.1. Auto Control

- When the horizontal airflow direction is set to Auto using the remote control, the vanes swings left and right as shown in the diagram.
- When stopped with remote control, the discharge vane is reset, and stop at the reset position.
- During Cooling operation or Soft Dry operation, indoor fan motor may stop to rotate at certain periods. At that condition, the vane will stop swinging and rest at 22° angle.



11.8.2. Manual Control

- When the horizontal airflow direction is set to Manual using the remote control, the automatic airflow is released and the airflow direction vane move left and right in the range shown in the diagram.
  The louver can be adjusted by pressing the button to the desired vane position.
- When stopped with remote control, the vanes is reset, and stopped at reset position.



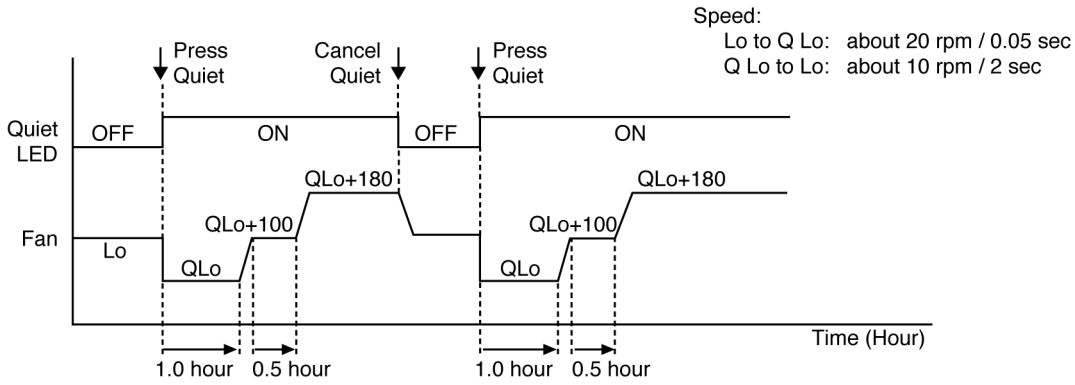
11.9. Powerful Operation

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

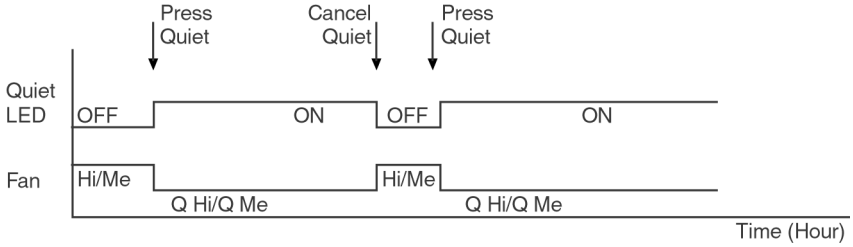
11.10. Quiet Operation

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

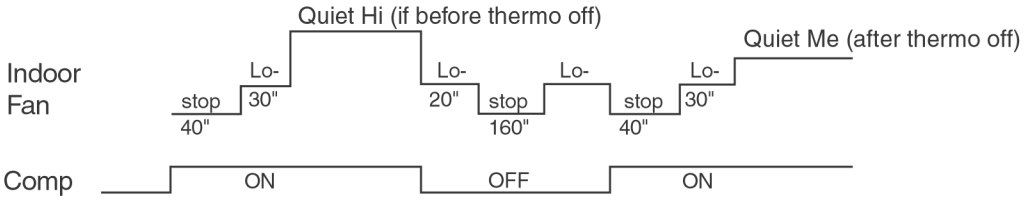
- The Quiet operation is to provide quiet/cooling operation condition compare to normal operation.
- Once the Quiet Mode is set at the remote control, the Quiet Mode LED illuminated. The sound level will reduce around 2 dB (A) for Lo fan speed or 3 dB(A) for Hi/Me fan speed against the present operation sound level.
- Manual Fan Speed:-
  - RPM control during Lo cool



  - RPM control during Hi & Me cool



- Auto Fan Speed:-



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

11.11. Timer Control

11.11.1. ON Timer

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

11.11.2. OFF Timer

- When the OFF Timer is set by using the remote control, the unit will stop operate according to the desired setting.
  Notes
  1. By pressing ON/OFF operation button, the ON Timer or OFF Timer setting will not be cancelled.
  2. To cancel the previous timer setting, press CANCEL button.
  3. To activate the previous timer setting, press SET button.
  4. If main power supply is switched off, the Timer setting will be cancelled.

11.12. Random Auto Restart Control

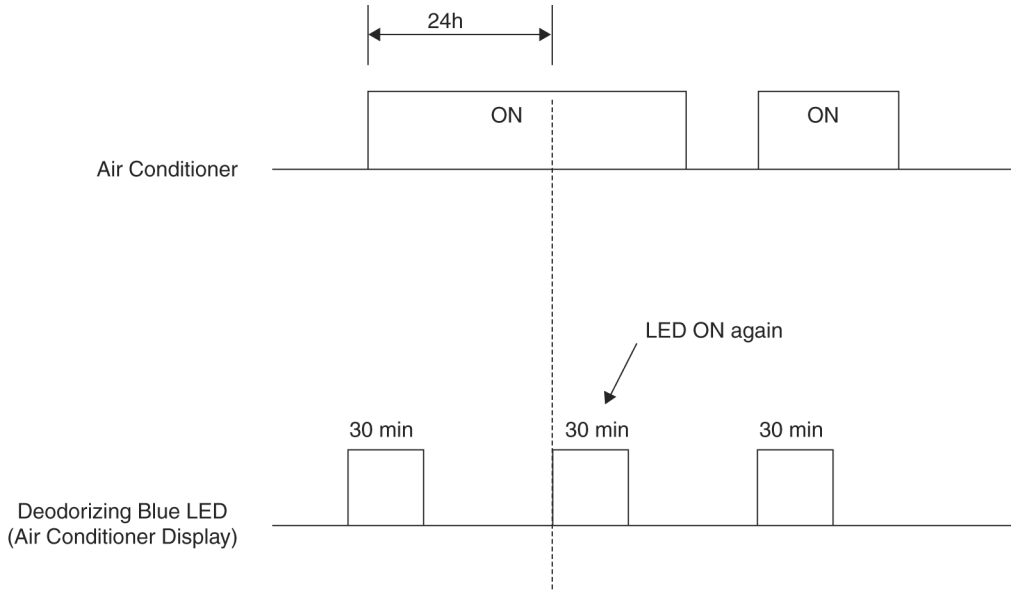
- If there is a power failure during operation, the air conditioner will automatically restart after 3 to 4 minutes when the power is resumed.
- It will start with previous operation mode and airflow direction.
- If there are more than one air conditioner unit in operation and power failure occur, restart time for each unit to operate will be decided randomly using 4 parameters:- intake air temperature, setting temperature, fan speed and air swing louver position.
- This Random Auto Restart Control is not available when Timer is set.
- This control can be omitted by open the circuit of JX02. (Refer printed circuit board indoor unit)

11.13. Remote Control Signal Receiving Sound

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

11.14. Auto Refresh Deo

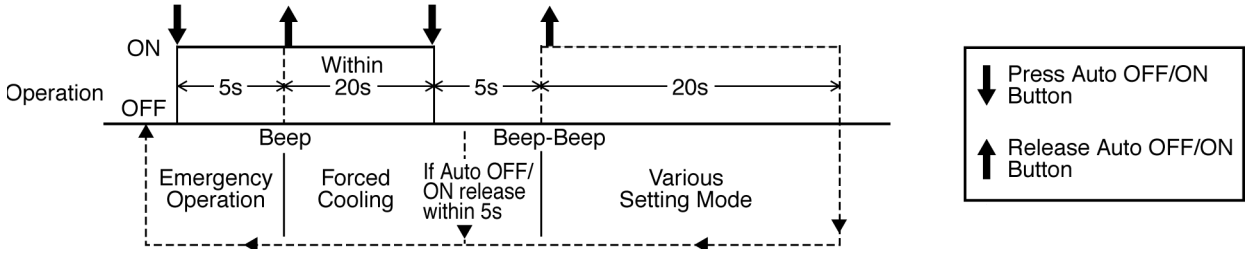
- Deodorizing Blue LED (Auto refresh Deo) is ON for 30 min only once air conditioner is ON; after 30 min it will be off.
- In case the air conditioner is ON continuously for more that 24h, then the Deodorizing Blue LED will be reactive again after 24h x n (n = 1,2,3,4 etc.) for 30 min each.



12 Servicing Mode

12.1. Auto OFF/ON Button

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

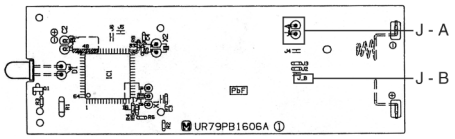


12.1.1. Toggle Remote Control Signal Receiving Sound

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

12.1.2. Select Remote Control Transmission Code

- There are 4 type of remote control transmission code could be selected and stored in EEPROM of indoor unit. The indoor unit will only operate when received signal with same transmission code from remote control. This could prevent signal interference when there are 2 or more indoor unit installed nearby together.
- To change remote control transmission code, short or open jumpers at the remote control printed circuit board.

Remote Control Printed Circuit Board	Transmission Code Combination		
	J-A	J-B	Remote Control No.
	* Short	Open	A (default)
	Open	Open	B
	Short	Short	C
	Open	Short	D

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

12.2. Remote Control Button

12.2.1. SET

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

12.2.2. CLOCK

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

12.2.3. RESET

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

12.2.4. TIMER "▲"

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

12.2.5. TIMER "▼"

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

12.3. Test Mode Timer Table

Name		Time	Test Mode (When test point Short-circuited)	Remarks
Real Timer		1 hr.	1 min.	
		10 min	10 sec.	
		1 min.	1 sec.	
Timer Delay Safety Control		2 min. 58 sec.	0 sec.	
Forced Operation		60 sec.	0 sec.	
Timer Save Control		7 min.	42 sec.	
Anti-Freezing		4 min.	0 sec.	
Auto Mode Judgement		20 sec.	0 sec.	
Soft Dry	OFF	6 min.	36 sec.	
	ON	10 min.	60 sec.	Soft Dry: 10 min. operation
Deodorizing Control	Cooling	40 sec.	4 sec.	
		70 sec.	7 sec.	
		20 sec.	2 sec.	
		180 sec.	18 sec.	
	Soft Dry	40 sec.	4 sec.	
		360 sec.	36 sec.	
Comp. Reverse Rotation Detection		5 min.	30 sec.	Com. ON 5 min. and above
		2 min.	0 sec.	
Comp./ Fan Motor Delay Timer		1.6 sec.	0 sec.	
Powerful Mode Operation		15 min.	15 sec.	
Random Auto Restart Control		0 ~ 62 sec.	0 ~ 6.2 sec.	
Quiet operation timer		1 hr. 30 min.	9 sec.	

13 Troubleshooting Guide

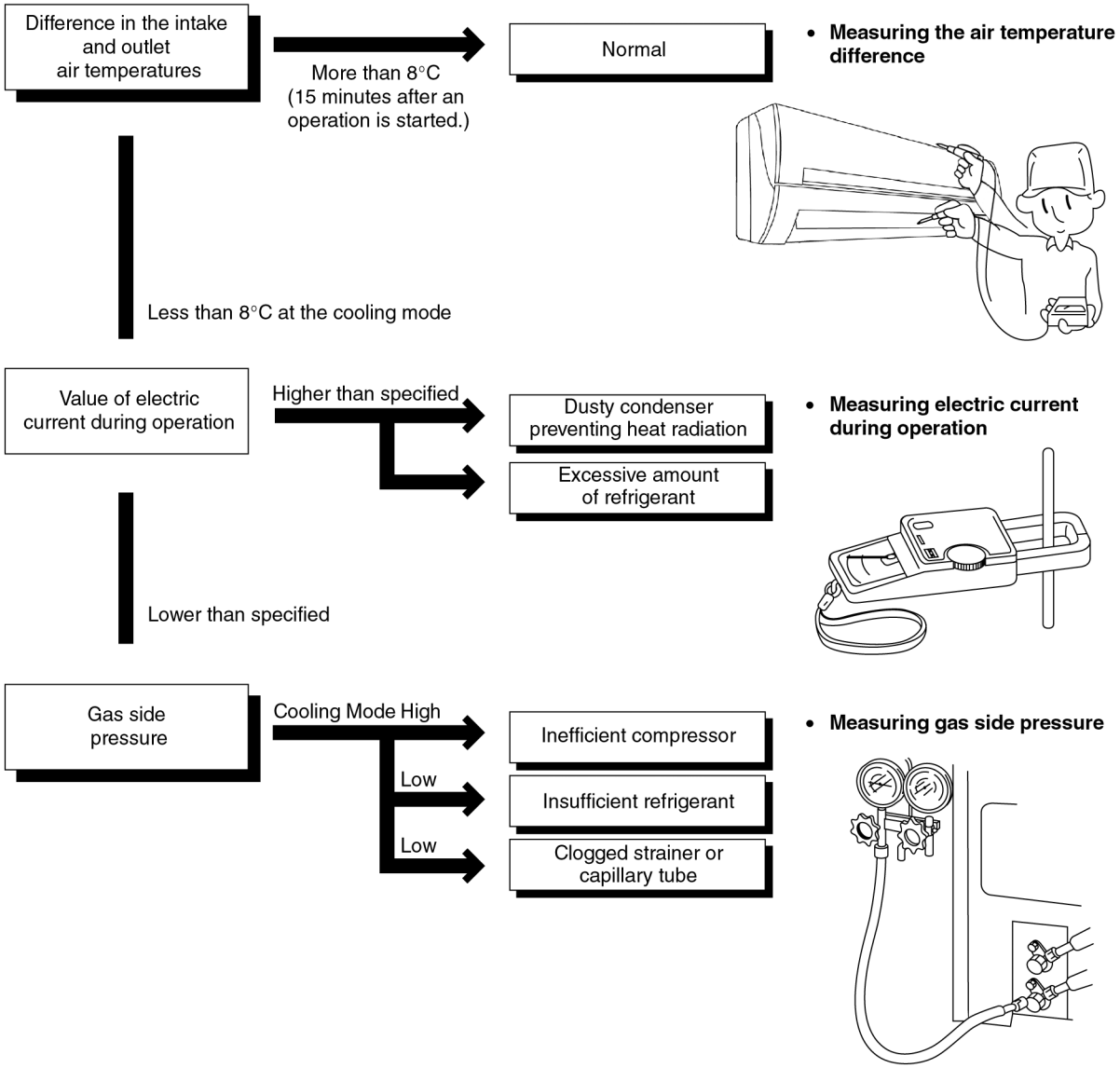
13.1. Refrigeration Cycle System

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

Normal Pressure and Outlet Air Temperature (Standard)

	Gas pressure Mpa (kg/cm²G)	Outlet air temperature (°C)
Cooling Mode	0.4 ~ 0.6 (4 ~ 6)	12 ~ 16

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



- **Measuring the air temperature difference**

- **Measuring electric current during operation**

- **Measuring gas side pressure**

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

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

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

13.1.2. Diagnosis methods of a malfunction of a compressor

Nature of fault	Symptom
Insufficient compressing of a compressor	• Electric current during operation becomes approximately 20% lower than the normal value. • The discharge tube of the compressor becomes abnormally hot (normally 70 to 90°C). • The difference between high pressure and low pressure becomes almost zero.
Locker compressor	• Electric current reaches a high level abnormally, and the value exceeds the limit of an ammeter. In some cases, a breaker turns off. • The compressor has a humming sound.

14 Disassembly and Assembly Instructions

14.1. Indoor Electronic Controllers, Cross Flow Fan and Indoor Fan Motor Removal Procedures

14.1.1. To remove the Front Grille

- Remove the 3 caps and 3 screws at the bottom of the Front Grille. (Fig. 1)
- Remove the Front Grille by releasing the 3 hooks at the top of the Front Grille. (Fig. 1)

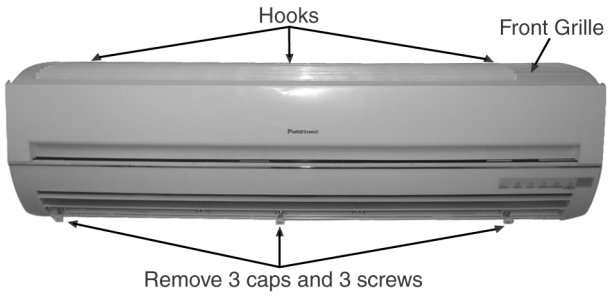


Fig. 1

- Unhook the tabs at the Control Board to remove the Control Board Cover. (Fig. 2)

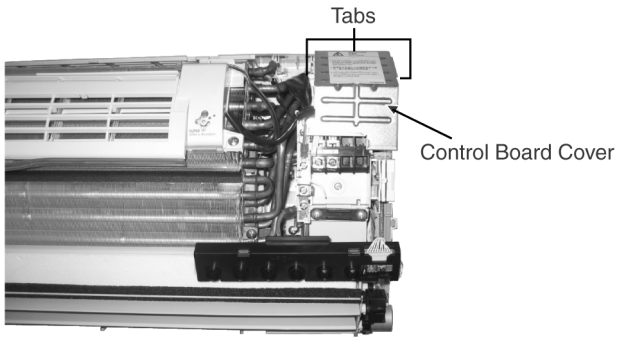


Fig. 2

14.1.2. To remove the Main Electronic Controller

- Release the 2 Particular Piece. (Fig. 3)
- Release the Indicator. (Fig. 3)
- Release the 2 screws for the earth wire. (Fig. 3)
- Release the screw Holder Terminal Board. (Fig. 3)

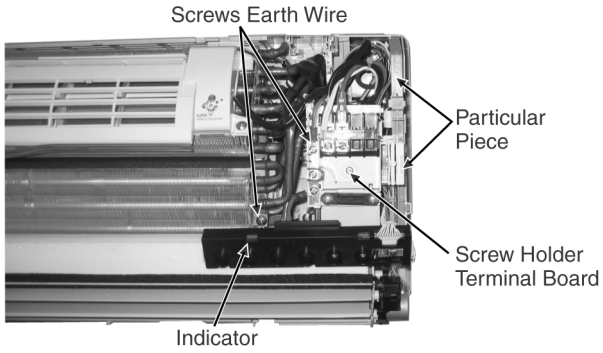


Fig. 3

- Release the hooks that hold the Main Electronic Controller and pull out the Main Electronic Controller. (Fig. 4)

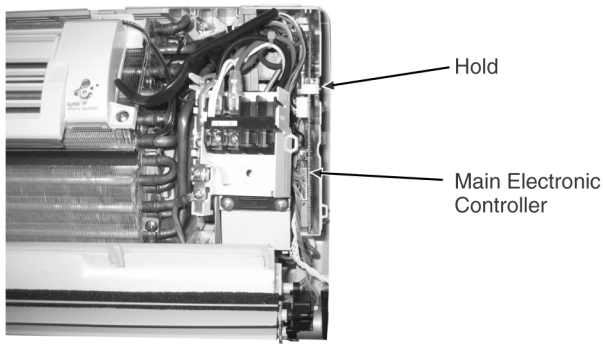


Fig. 4

- Release the CN-DATA1 connector. (Fig. 5)
- Release the CN-SONIC connector. (Fig. 5)
- Release the CN-STM2 connector. (Fig. 5)
- Release the CN-STM1 connector. (Fig. 5)
- Release the CN-TH connector. (Fig. 5)

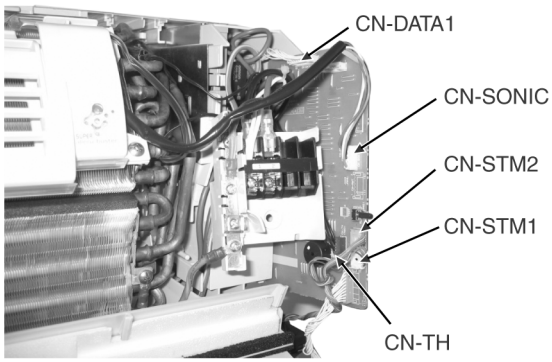


Fig. 5

14.1.3. To remove the Power Electronic Controller

- Release the hook that hold the Particular Piece and pull out the Power Electronic Controller. (Fig. 6)

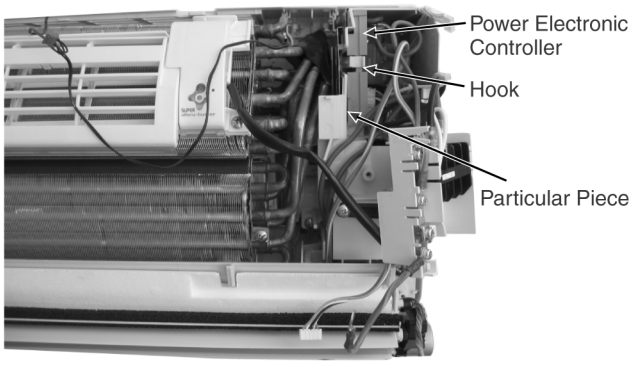


Fig. 6

- Release the AC-303 connector. (Fig. 7)
- Release the CN-FM connector. (Fig. 7)
- Release the 2 connector P Terminal (BROWN) and L Terminal (BLACK) at the RY-PWR.

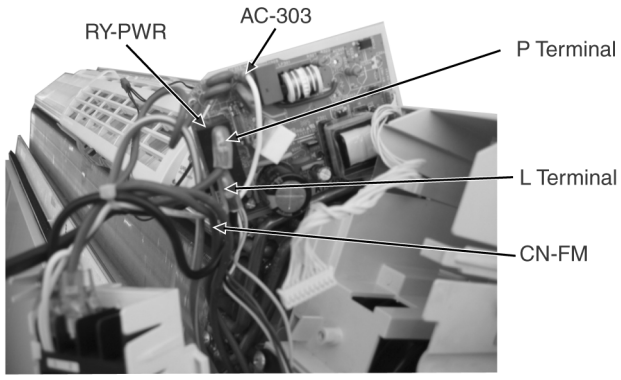


Fig. 7

14.1.4. To remove the Discharge Grille

- Pull out the Drain Hose (behind the Discharge Grille) from outlet to remove the Discharge Grille. (Fig. 8)

Fig. 8

14.1.5. To remove the Control Board

- Release the 3 screws. (Fig. 9)
- By pressing down the hook at the left, you will be able to remove the Control Board. (Fig. 9)

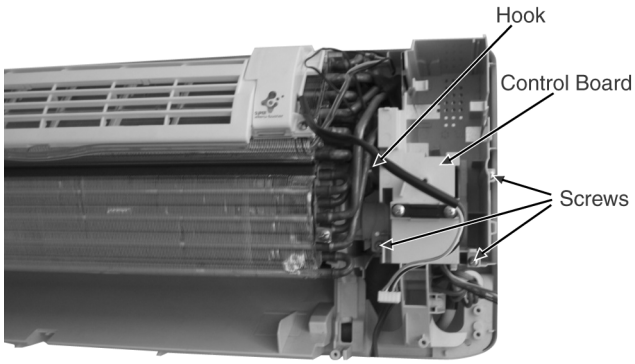


Fig. 9

14.1.6. To remove the Cross Flow Fan and Indoor Fan Motor

- Remove the screw at the Cross Flow Fan. (Fig. 10)

  Reminder:-
  To reinstall the Fan Motor, please adjust the connector location is positioned 90° with Fan Motor before fixing Control Board. (Fig. 10)

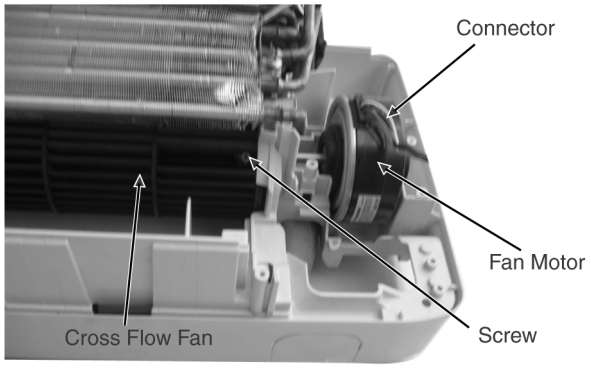


Fig. 10

- Remove the Bearing. (Fig. 11)
- Remove the screws at the left of the Evaporator. (Fig. 11)

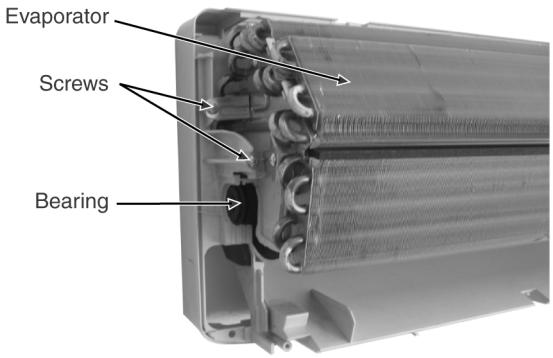


Fig. 11

- Push up the Evaporator and pull out the Cross Flow Fan from shaft. By then, Fan Motor can be taken out. (Fig. 12)

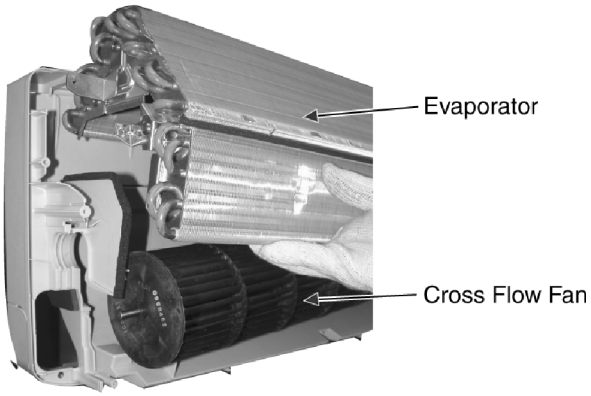


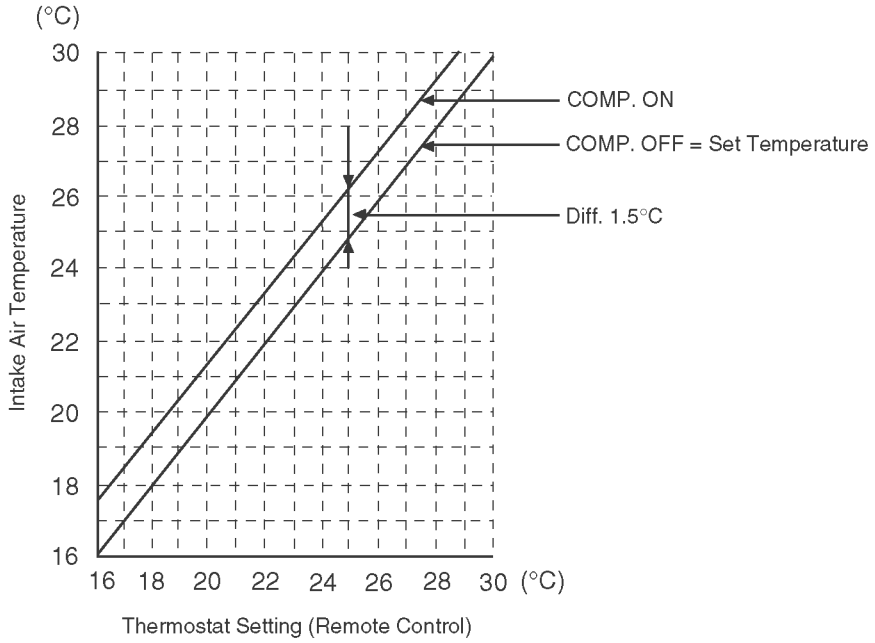
Fig. 12

15 Technical Data

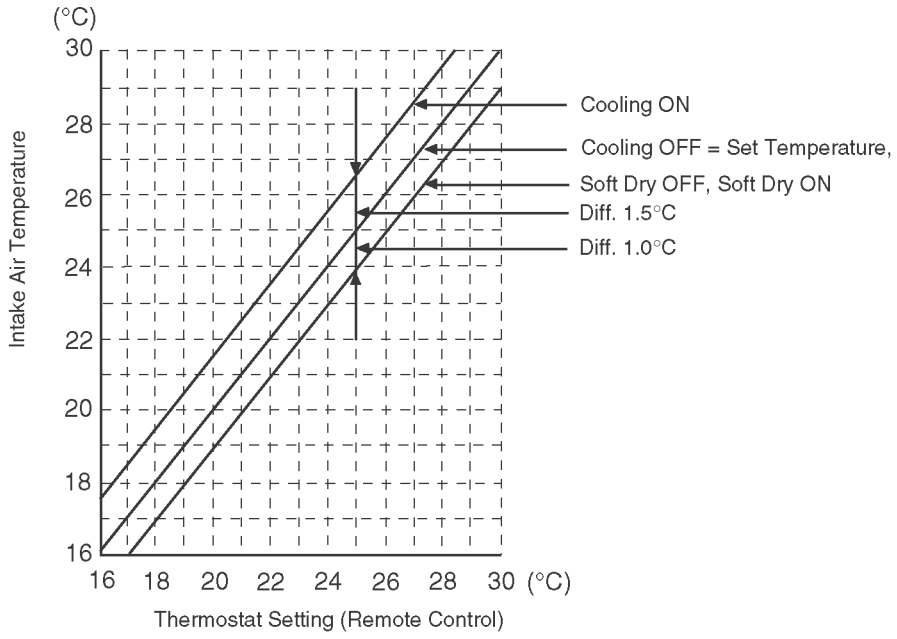
15.1. Thermostat Characteristics

CS-C18EKQ CS-C24EKQ

- **Cooling**



- **Soft Dry**



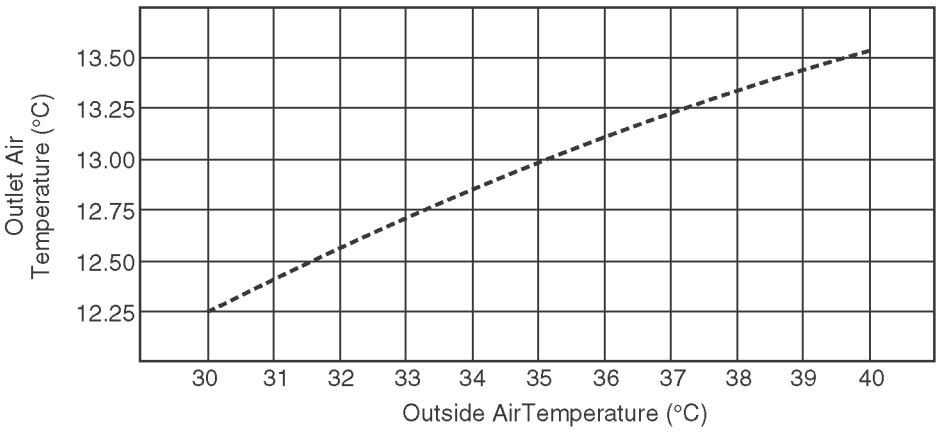
15.2. Operation Characteristics

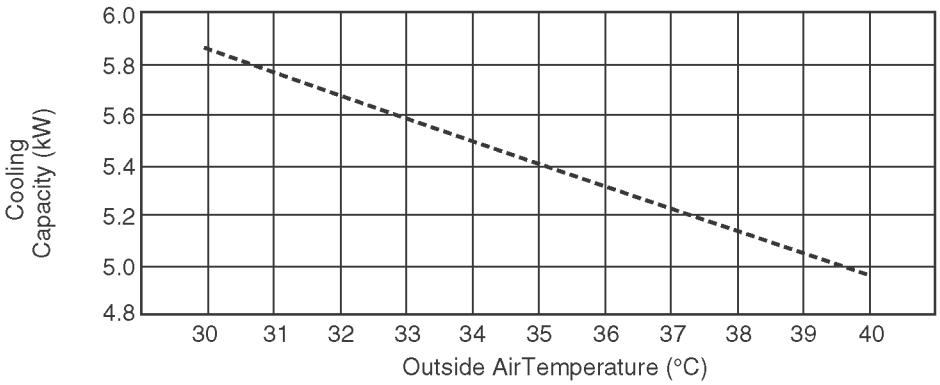
CS-C18EKQ CU-C18EKQ

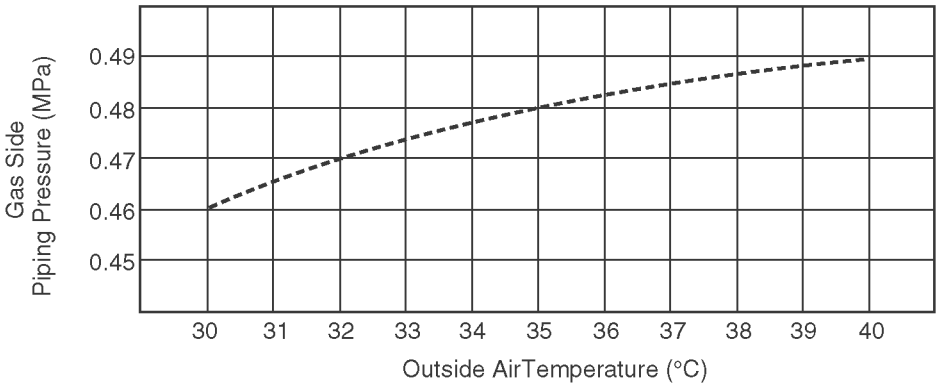
- **Cooling Characteristic**

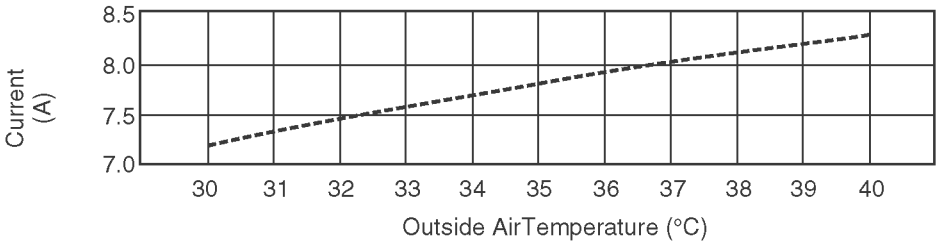
[Condition] Room temperature: 27/19°C
Cooling operation: At High fan
Piping length: 5 m

----- 230V





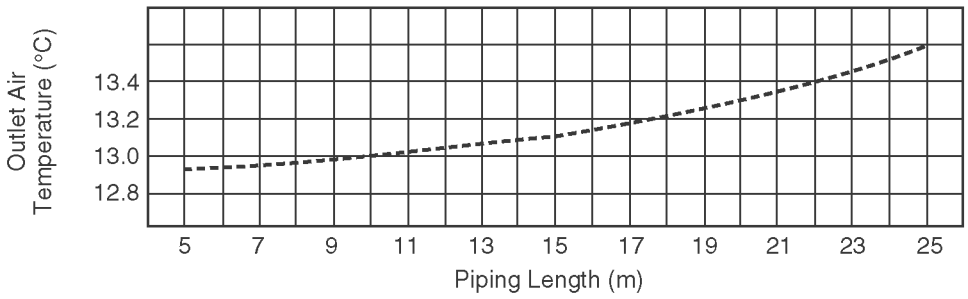


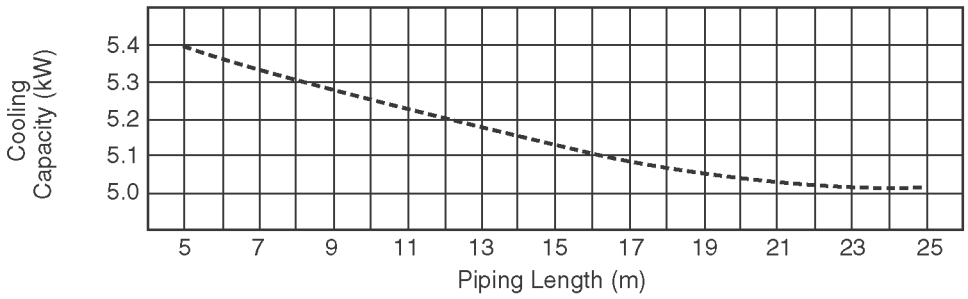


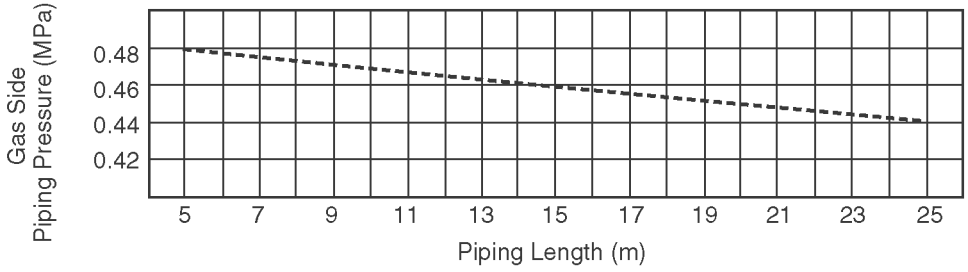
• Piping Length Characteristic

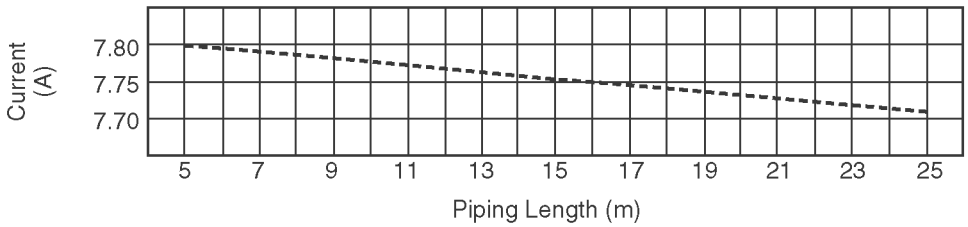
[Condition] Room temperature: 27/19°C
Outdoor temperature: 35/24°C
Cooling opeartion: At High fan

----- 230V







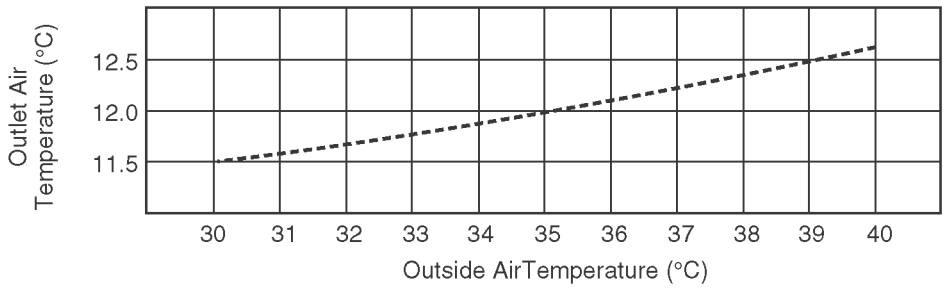


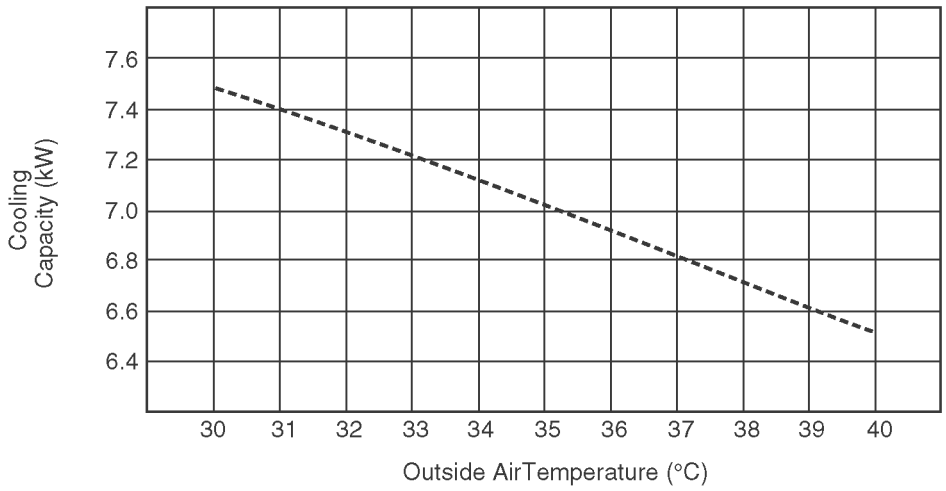
CS-C24EKQ CU-C24EKQ

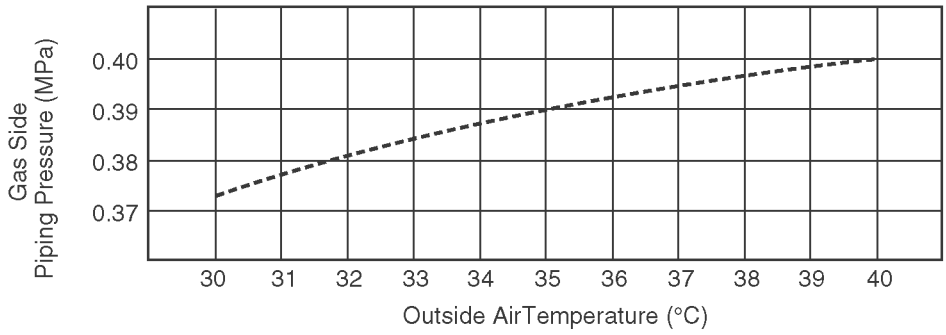
- **Cooling Characteristic**

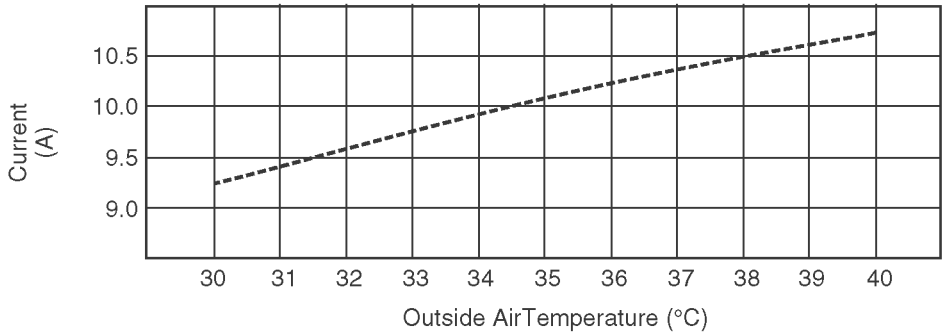
[Condition] Room temperature: 27/19°C
Cooling operation: At High fan
Piping length: 5 m

----- 230V





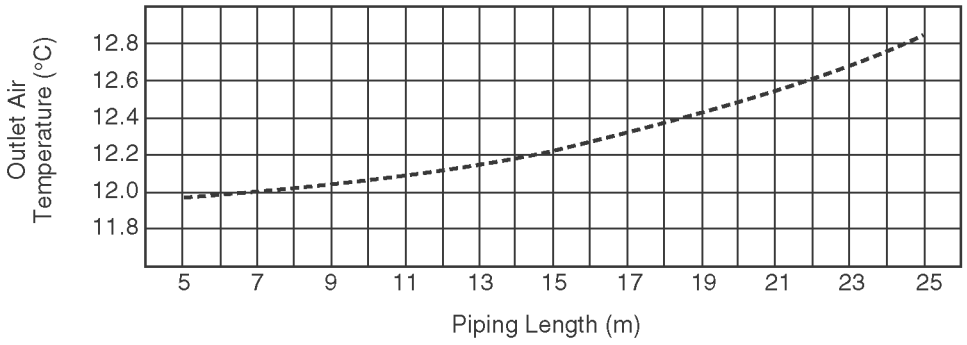


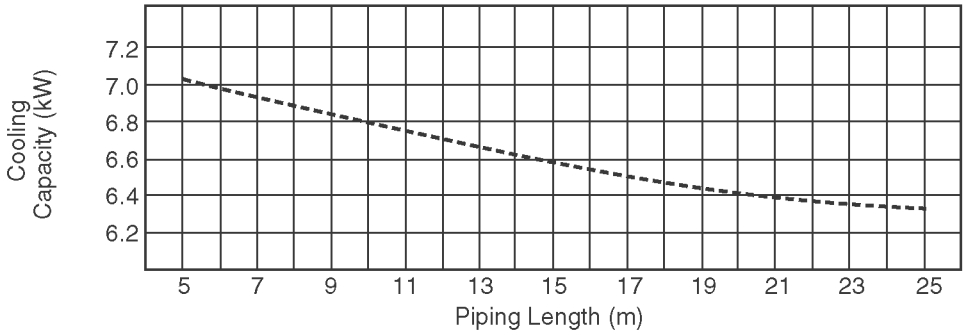


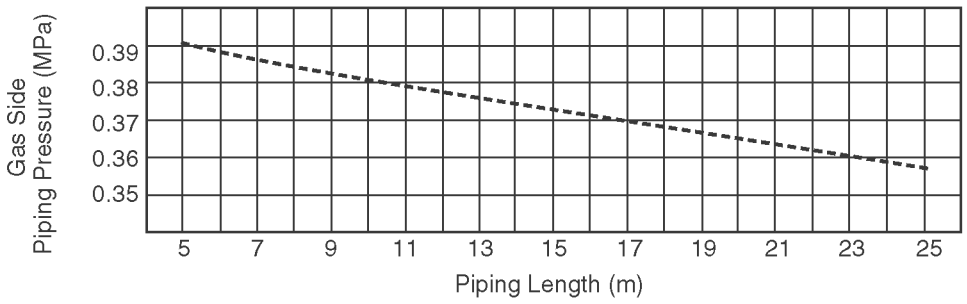
• Piping Length Characteristic

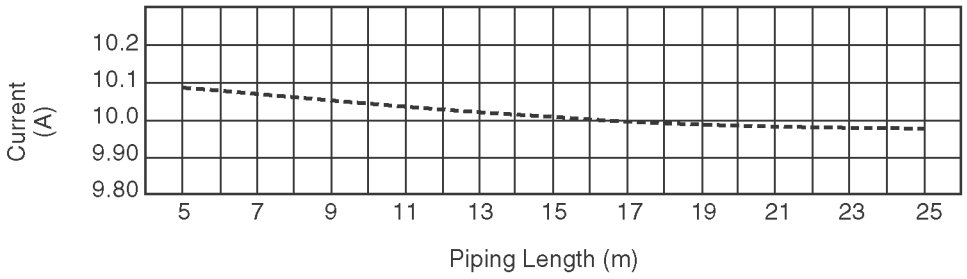
[Condition] Room temperature: 27/19°C
Outdoor temperature: 35/24°C
Cooling opeartion: At High fan

----- 230V





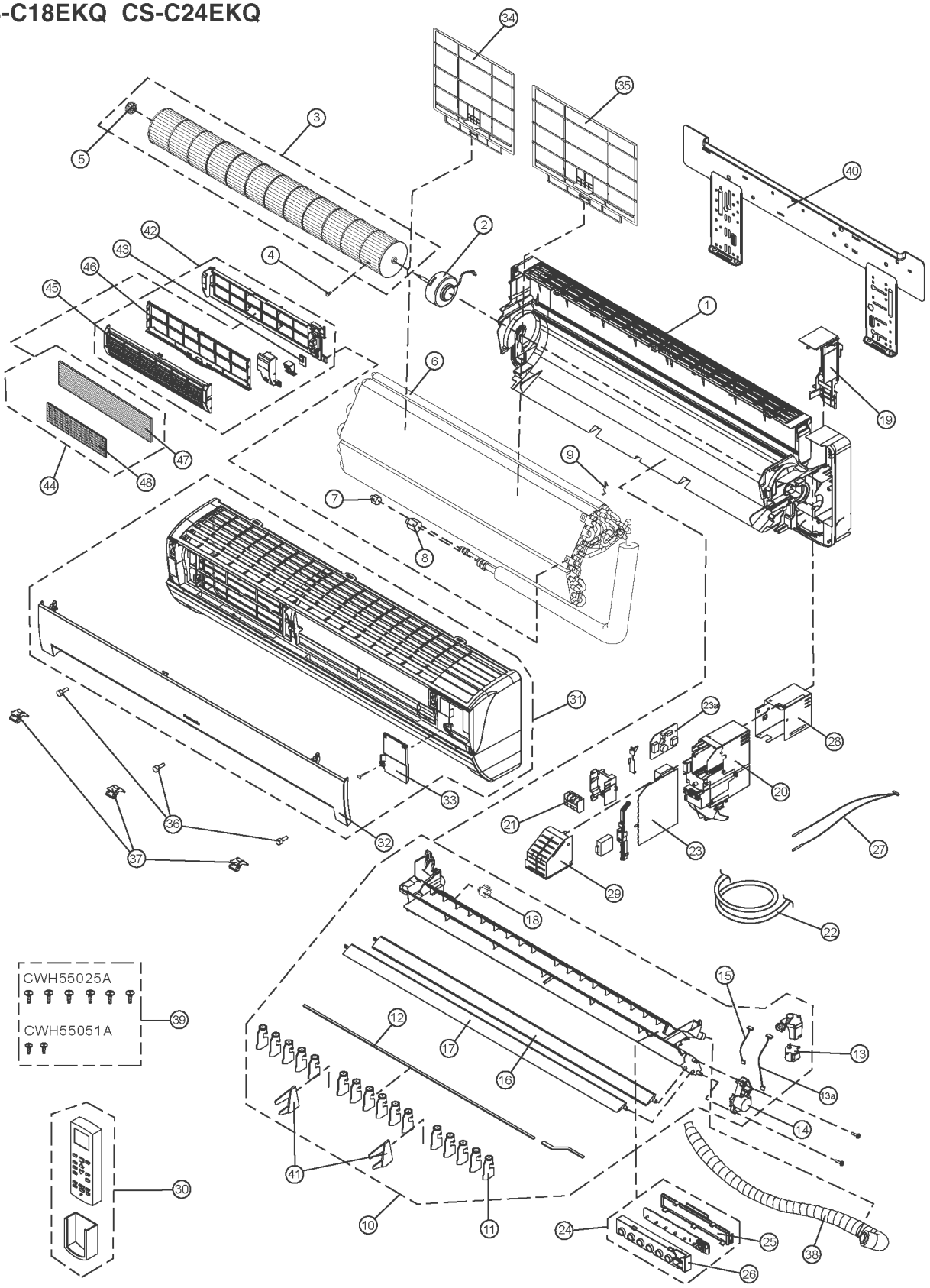




16 Exploded View and Replacement Parts List

16.1. Indoor Unit

CS-C18EKQ CS-C24EKQ



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.

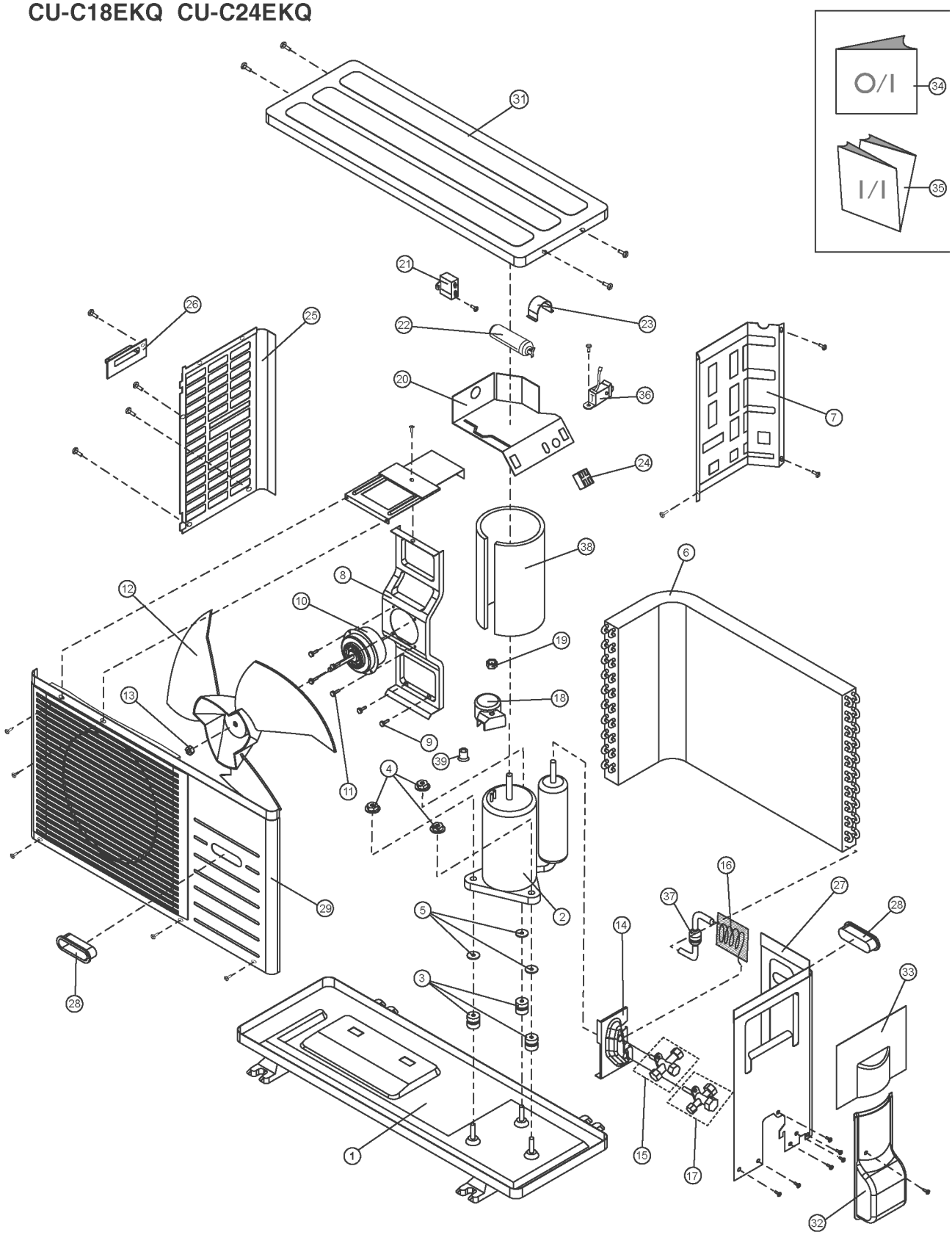
REF. NO.	PART NAME & DESCRIPTION	QTY.	CS-C18EKQ	CS-C24EKQ	REMARKS
1	CHASSY COMPLETE	1	CWD50C1394	←	
2	FAN MOTOR	1	CWA981149J	←	0
3	CROSS FLOW FAN COMPLETE	1	CWH02C1010	←	
4	SCREW - CROSS FLOW FAN	1	CWH551146	←	
5	BEARING ASS'Y	1	CWH64K007	←	
6	EVAPORATOR	1	CWB30C1551	CWB30C1550	
7	FLARE NUT (1/4")	1	CWT251026	←	
8	FLARE NUT (1/2") (5/8")	1	CWT251035	CWT251036	
9	INTAKE AIR SENSOR HOLDER	1	CWH32143	←	
10	DISCHARGE GRILLE COMPLETE	1	CWE20C2500	←	
11	VERTICAL VANE	16	CWE241088	←	
12	CONNECTING BAR	1	CWE261025	←	
13	AIR SWING MOTOR	1	CWA981106J	←	0
13a	LEAD WIRE - AIR SWING MOTOR	1	CWA67C3849	←	
14	AIR SWING MOTOR	1	CWA98K1008	←	0
15	LEAD WIRE - AIR SWING MOTOR	1	CWA67C3731	←	
16	HORIZONTOL VANE	1	CWE241152	←	
17	HORIZONTOL VANE	1	CWE241153	←	
18	CAP - DRAIN TRAY	1	CWH52C1001	←	
19	BACK COVER CHASIS	1	CWD932162B	←	
20	CONTROL BOARD CASING	1	CWH102291	←	
21	TERMINAL BOARD COMPLETE	1	CWA28C2153	CWA28C2154	0
22	POWER SUPPLY CORD	1	CWA20C2506	CWA20C2510	
23	ELECTRONIC CONTROLLER - MAIN	1	CWA73C2043	CWA73C2045	0
23a	ELECTRONIC CONTROLLER - POWER	1	CWA744053	←	0
24	INDICATOR COMPLETE	1	CWE39C1152	←	0
25	INDICATOR HOLDER	1	CWD932435	←	
26	INDICATOR HOLDER	1	CWD932436	←	
27	SENSOR COMPLETE	1	CWA50C2122	←	0
28	CONTROL BOARD TOP COVER	1	CWH131209	←	
29	CONTROL BOARD FRONT COVER	1	CWH131210	←	
30	REMOTE CONTROL COMPLETE	1	CWA75C2821	←	0
31	FRONT GRILLE COMPLETE	1	CWE11C3458	←	0
32	INTAKE GRILLE COMPLETE	1	CWE22C1159	←	
33	GRILLE DOOR	1	CWE141076	←	
34	AIR FILTER (L)	1	CWD001137	←	
35	AIR FILTER (R)	1	CWD001138	←	
36	SCREW - FRONT GRILLE	3	XTT4+16CFJ	←	
37	CAP - FRONT GRILLE	3	CWH521062A	←	
38	DRAIN HOSE	1	CWH851063	←	
39	BAG COMPLETE - INSTALLATION SCREW	1	CWH82C067	←	
40	INSTALLATION PLATE	1	CWH36K1007	←	
41	FULCRUM	2	CWH621047	←	
42	SUPERSONIC AIR PURIFYING DEVICE	1	CWH91C1016	←	
43	ELEC. CONTROLLER - SUPERSONIC	1	CWA744249	←	0
44	SUPER ALLERU BUSTER FILTER	1	CWD00C1161	←	0
45	FRAME FR AIR FILTER SUPERSONIC	1	CWD011035	←	
46	FRAME FR AIR FILTER SUPERSONIC	1	CWD011027	←	
47	AIR FILTER - SUPERSONIC	1	CWD001147	←	
48	DEODORIZING FILTER	1	CWD001192	←	

(NOTE)

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

16.2. Outdoor Unit

CU-C18EKQ CU-C24EKQ



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.	CU-C18EKQ	CU-C24EKQ	REMARKS
1	CHASSY ASS'Y	1	CWD50K2115	CWD50K2100	
2	COMPRESSOR	1	2K25S236F6A	2J39S236A1A	0
3	ANTI - VIBRATION BUSHING	3	CWH50055	←	
4	NUT - COMPRESSOR UNIT	3	CWH561049	←	
5	PACKING	3	CWB81043	←	
6	CONDENSER	1	CWB32C1625	CWB32C1352	
7	SOUND PROOF BOARD ASS'Y	1	CWH151051	←	
8	FAN MOTOR BRACKET	1	CWD541065	←	
9	SCREW - FAN MOTOR BRACKET	2	CWH551060J	←	
10	FAN MOTOR	1	CWA951401	CWA951399	0
11	SCREW - FAN MOTOR MOUNT	3	CWH55252J	←	
12	PROPELLER FAN ASS'Y	1	CWH03K1017	←	
13	NUT - PROPELLER FAN	1	CWH561038J	←	
14	HOLDER COUPLING	1	CWH351036	←	
15	3-WAY VALVE (LIQUID)	1	CWB011161	←	0
16	TUBE ASS'Y (CAPILLARY TUBE)	1	CWT023522	CWT023554	
17	3-WAY VALVE (GAS)	1	CWB011212	CWB011213	0
18	TERMINAL COVER	1	CWH171011	CWH171012	
19	NUT- TERMINAL COVER	1	CWH7080300J	←	
20	CONTROL BOARD CASING	1	CWH102206	←	
21	CAPACITOR - F.M	1	DS441355NPQA	DS441355NPQA	0
22	CAPACITOR - COMP	1	CWA312078	DS441606CPNA	0
23	HOLDER CAPACITOR	1	CWH30060	CWH30071	
24	TERMINAL BOARD ASS'Y	1	CWA28K1064J	←	
25	CABINET SIDE PLATE (L)	1	CWE041207A	←	
26	HANDLE	1	CWE161010	←	
27	CABINET SIDE PLATE (R)	1	CWE041208A	←	
28	HANDLE	2	CWE16000E	←	
29	CABINET FRONT PLATE ASS'Y	1	CWE06K1043	←	
31	CABINET TOP PLATE ASS'Y	1	CWE03K1009A	←	
32	CONTROL BOARD COVER	1	CWH131168	←	
33	CONTROL BOARD COVER COMPLETE	1	CWH131169A	←	
34	OPERATION INSTRUCTIONS	1	CWF565123	←	
35	INSTALLATION INSTRUCTIONS	1	CWF612905	←	
36	THERMOSTAT	1	-	CWA151040	O
37	STRAINER	1	CWB11025	←	
38	SOUND PROOF MATERIAL	1	CWG302278	←	
39	OVERLOAD PROTECTOR	1	CWA67C3892	-	

(NOTE)

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

[PHAAM] Printed in Malaysia
SPYW0510-00