TECHNICAL & SERVICE MANUAL

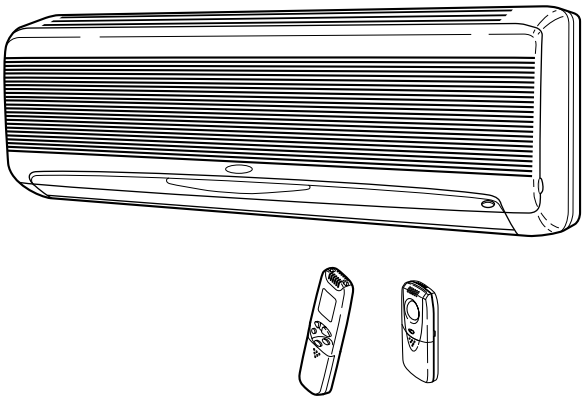
SAP-KRV121EH + SAP-CRV121EH

FILE NO.

INVERTER SPLIT SYSTEM AIR CONDITIONER

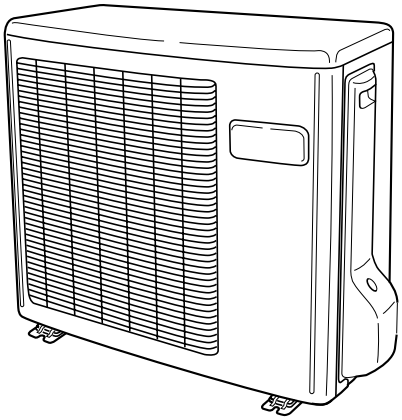
Indoor Model No.	Product Code No.	Outdoor Model No.	Product Code No.	Destination
SAP-KRV121EH	1 852 086 08	SAP-CRV121EH	1 852 086 09	Europe

Indoor Unit



SAP-KRV121EH

Outdoor Unit



SAP-CRV121EH

IMPORTANT

These air conditioners employ new refrigerant R410A.

Pay special attention when servicing the unit.

→ See "11. REFRIGERANT R410A SPECIAL PRECAUTIONS WHEN SERVICING THE UNIT".

REFERENCE NO. SM700535
Ⓦ

IMPORTANT!
Please Read Before Starting

This air conditioning system meets strict safety and operating standards. As the installer or service person, it is an important part of your job to install or service the system so it operates safely and efficiently.

For safe installation and trouble-free operation, you must:

- Carefully read this instruction booklet before beginning.
- Follow each installation or repair step exactly as shown.
- Observe all local, state, and national electrical codes.
- Pay close attention to all warning and caution notices given in this manual.

WARNING **This symbol refers to a hazard or unsafe practice which can result in severe personal injury or death.**

CAUTION **This symbol refers to a hazard or unsafe practice which can result in personal injury or product or property damage.**

If Necessary, Get Help

These instructions are all you need for most installation sites and maintenance conditions. If you require help for a special problem, contact our sales/service outlet or your certified dealer for additional instructions.

In Case of Improper Installation

The manufacturer shall in no way be responsible for improper installation or maintenance service, including failure to follow the instructions in this document.

SPECIAL PRECAUTIONS

WARNING When Wiring

ELECTRICAL SHOCK CAN CAUSE SEVERE PERSONAL INJURY OR DEATH. ONLY A QUALIFIED, EXPERIENCED ELECTRICIAN SHOULD ATTEMPT TO WIRE THIS SYSTEM.

- Do not supply power to the unit until all wiring and tubing are completed or reconnected and checked.
- Highly dangerous electrical voltages are used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause accidental injury or death.
- Ground the unit following local electrical codes.
- Connect all wiring tightly. Loose wiring may cause overheating at connection points and a possible fire hazard.

When Transporting

Be careful when picking up and moving the indoor and outdoor units. Get a partner to help, and bend your knees when lifting to reduce strain on your back. Sharp edges or thin aluminum fins on the air conditioner can cut your fingers.

When Installing…

…In a Ceiling or Wall

Make sure the ceiling/wall is strong enough to hold the unit's weight. It may be necessary to construct a strong wood or metal frame to provide added support.

…In a Room

Properly insulate any tubing run inside a room to prevent "sweating" that can cause dripping and water damage to walls and floors.

…In Moist or Uneven Locations

Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the outdoor unit. This prevents water damage and abnormal vibration.

…In an Area with High Winds

Securely anchor the outdoor unit down with bolts and a metal frame. Provide a suitable air baffle.

…In a Snowy Area (for Heat Pump-type Systems)

Install the outdoor unit on a raised platform that is higher than drifting snow. Provide snow vents.

When Connecting Refrigerant Tubing

- Use the flare method for connecting tubing.
- Apply refrigerant lubricant to the matching surfaces of the flare and union tubes before connecting them, then tighten the nut with a torque wrench for a leak-free connection.
- Check carefully for leaks before starting the test run.

When Servicing

- Turn the power OFF at the main power box (mains) before opening the unit to check or repair electrical parts and wiring.
- Keep your fingers and clothing away from any moving parts.
- Clean up the site after you finish, remembering to check that no metal scraps or bits of wiring have been left inside the unit being serviced.

Others

CAUTION

- Ventilate any enclosed areas when installing or testing the refrigeration system. Escaped refrigerant gas, on contact with fire or heat, can produce dangerously toxic gas.
- Confirm upon completing installation that no refrigerant gas is leaking. If escaped gas comes in contact with a stove, gas water heater, electric room heater or other heat source, it can produce dangerously toxic gas.

Table of Contents

1. OPERATING RANGE

	Temperature	Indoor Air Intake Temp.	Outdoor Air Intake Temp.
Cooling	Maximum	32°C D.B. / 23°C W.B.	43°C D.B.
	Minimum	19°C D.B. / 14°C W.B.	19°C D.B.
Heating	Maximum	27°C D.B.	24°C D.B. / 18°C W.B.
	Minimum	16°C D.B.	–8°C D.B. / –9°C W.B.

2. SPECIFICATIONS

2-1. Unit Specifications

Indoor unit **SAP-KRV121EH**
Outdoor unit **SAP-CRV121EH**

Power Source	220 – 230V Single phase 50Hz

Voltage Rating	230V

Performance			Cooling	Heating
Capacity		kW	3.20 (0.5 – 4.0)	4.50 (0.5 – 6.0)
		BTU/h	10,900 (1,700 – 13,600)	15,340 (1,700 – 20,500)
Air circulation (High)		m^3/h	570	700
Moisture removal (High)		Liters/h	1.45	—

Electrical Rating		Cooling	Heating
Available voltage range	V	198 – 253	
Running amperes	A	4.15 (0.7 – 6.2)	5.35 (0.6 – 7.8)
Power input	W	830 (105 – 1,360)	1,070 (90 – 1,760)
Power factor	%	87	87
C.O.P.	W/W	3.86	4.21
Compressor locked rotor amperes	A	15	

Features			
Controls / Temperature control			Microprocessor / I.C. thermostat
Control unit			Wireless remote control unit
Timer			ON / OFF 24 hours & Daily program, 1-hour OFF
Fan speeds	Indoor / Outdoor		3 and Auto / 1 (Hi)
Airflow direction (Indoor)		Horizontal	Auto
		Vertical	Auto
Air filter			Washable, Anti-Mold
Compressor			Rotary (Hermetic)
Refrigerant / Amount charged at shipment		g	R410A / 1,290
Refrigerant control			Electric Expansion Valve
Operation sound	Indoor: Hi / Me / Lo	dB-A	38 / 36 / 32 | 43 / 38 / 33
	Outdoor: Hi	dB-A	43 | 44
Refrigerant tubing connections			Flare type
Max allowable tubing length at shipment		m	7.5
Refrigerant tube diameter	Narrow tube	mm (in.)	6.35 (1/4)
	Wide tube	mm (in.)	9.52 (3/8)
Refrigerant tube kit / Accessories			Optional / Air Clean Filter

Dimensions & Weight			Indoor Unit	Outdoor Unit
Unit dimensions	Height	mm	285	620
	Width	mm	805	700
	Depth	mm	189	260
Package dimensions	Height	mm	264	681
	Width	mm	865	835
	Depth	mm	349	364
Weight	Net	kg	9.0	36.0
	Shipping	kg	12.0	38.0
Shipping volume		m^3	0.08	0.207

DATA SUBJECT TO CHANGE WITHOUT NOTICE.

Remarks: Rating conditions are:

Cooling: Indoor air temperature 27°C D.B. / 19°C W.B.
Outdoor air temperature 35°C D.B. / 24°C W.B.
Heating: Indoor air temperature 20°C D.B.
Outdoor air temperature 7°C D.B. / 6°C W.B.

2-2. Major Component Specifications

2-2-1. Indoor Unit

Indoor unit **SAP-KRV121EH**

Control PCB				
	Part No.			POW-KRV121EH
	Controls			Microprocessor
	Control circuit fuse			2.50V 3.15A

Remote Control Unit / People Sensor				RCS-1HPS41E / RCS-1HCS4E

Fan & Fan Motor				
	Type			Cross-flow
	Q'ty … Dia. and length		mm	1 … D88
	Fan motor model … Q'ty			DA4-23P36M … 1
	No. of poles … rpm (230V, High)			4 … 1190
	Nominal output		W	20
	Coil resistance (Ambient temp. 20°C)		Ω	BLU – RED: 5.67 RED – WHT: 5.67 WHT – BLU: 5.67
	Safety devices	Type		—
		Operating temp. Open	°C	—
		Close		—
	Run capacitor		µF	—
			VAC	—

Flap Motor and Louver Motor				
	Type			Stepping motor
	Model			MP24S1-5V / MP24S2-5V
	Rating			DC5V
	Coil resistance (Ambient temp. 25°C)		Ω	WHT – BLU (respectively 4 wires): 70 ± 7%

Heat Exchanger Coil			
	Coil		Aluminum plate fin / Copper tube
	Rows		2
	Fin pitch	mm	1.3
	Face area	m^2	0.130

DATA SUBJECT TO CHANGE WITHOUT NOTICE.

2-2-2. Outdoor Unit

Outdoor unit **SAP-CRV9121EH**

Control PCB (A) / Control PCB (B)	POW-CV121CH(A) / POW-CV121CH (B)

Compressor				
	Type			Rotary (Hermetic)
	Compressor model			C-6RVN73H0T 80879680
	Compressor oil … Amount		cc	FV50D … 350
	Coil resistance (Ambient temp. 25°C)		Ω	C – R: 0.781 C – S: 0.781
	Safety devices			
	CT (Peak current cut-off control)			YES
	Compressor discharge temp. control			YES
	Operation cut-off control in abnormal ambient temp.			YES
	Run capacitor		µF	—
			VAC	—
	Crankcase heater			—

Fan & Fan Motor				
	Type			Propeller
	Q'ty … Dia.		mm	1 … ø400
	Fan motor model … Q'ty			DB8-33B280H … 1
	No. of poles … rpm (230V, High)			8 … 730
	Nominal output		W	30
	Coil resistance (Ambient temp. 20°C)		Ω	RED – WHT: 150.3 BLU – WHT: 150.3 BLU – RED: 150.3
	Safety devices	Type		—
		Operating temp. Open	°C	—
		Close	°C	—
	Run capacitor		µF	—
			VAC	—

Heat Exchanger Coil	
Coil	Aluminum plate fin / Copper tube
Rows	2
Fin pitch mm	1.4
Face area m^2	0.383

External Finish	Acrylic baked-on enamel finish

DATA SUBJECT TO CHANGE WITHOUT NOTICE.

2-3. Other Component Specifications

2-3-1. Indoor Unit

Indoor unit **SAP-KRV121EH**

Thermistor (Coil sensor)		**DTN-TKS150Y**
Resistance	kΩ	25°C 5.0 ± 3%

DATA SUBJECT TO CHANGE WITHOUT NOTICE.

2-3-2. Outdoor Unit

Outdoor unit **SAP-CRV121EH**

4-way Valve (SC)	**VPV-M0AJ503B (Coil), VHV-0202 (Valve)**
Coil rating	AC 220 /240V, 50Hz, 6W

Thermostat (Suction sensor)		**KTM-35D-S1**
Resistance	kΩ	0°C 15

Thermistor (Coil sensor)		**DTN-TKS163B**
Resistance	kΩ	0°C 15

Thermistor (Air sensor)		**KTEC-35D-S3**
Resistance	kΩ	0°C 15

Thermistor (Compressor sensor)		**DTN-TKS164B**
Resistance	kΩ	25°C 58.3

PTC Thermistor (TH)		**ZPR0YCE400F250**
Resistance	Ω (at 25°C)	40

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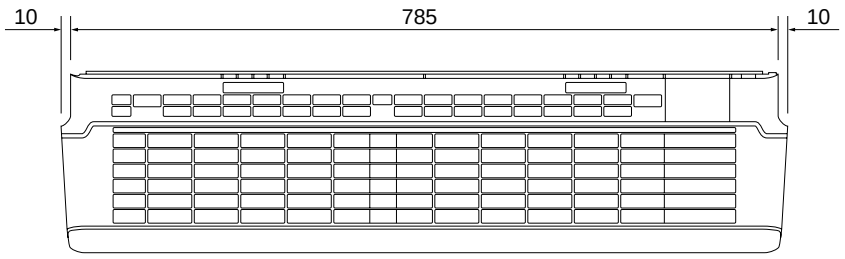
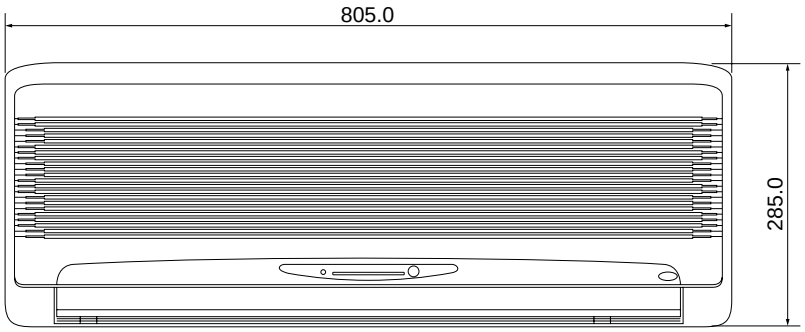
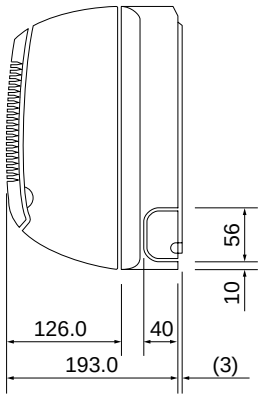
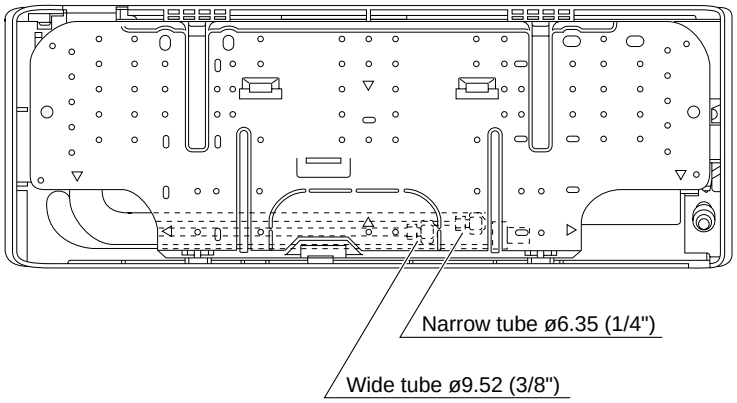
3. DIMENSIONAL DATA

Indoor unit **SAP-KRV121EH**

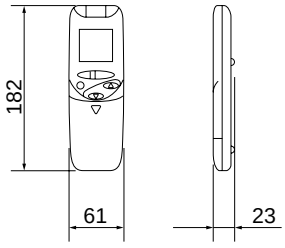




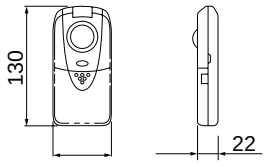




Remote control unit

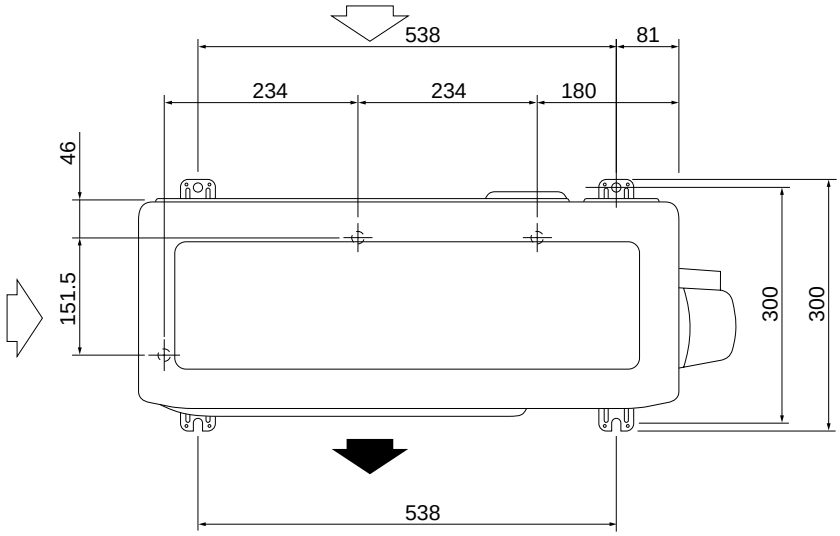


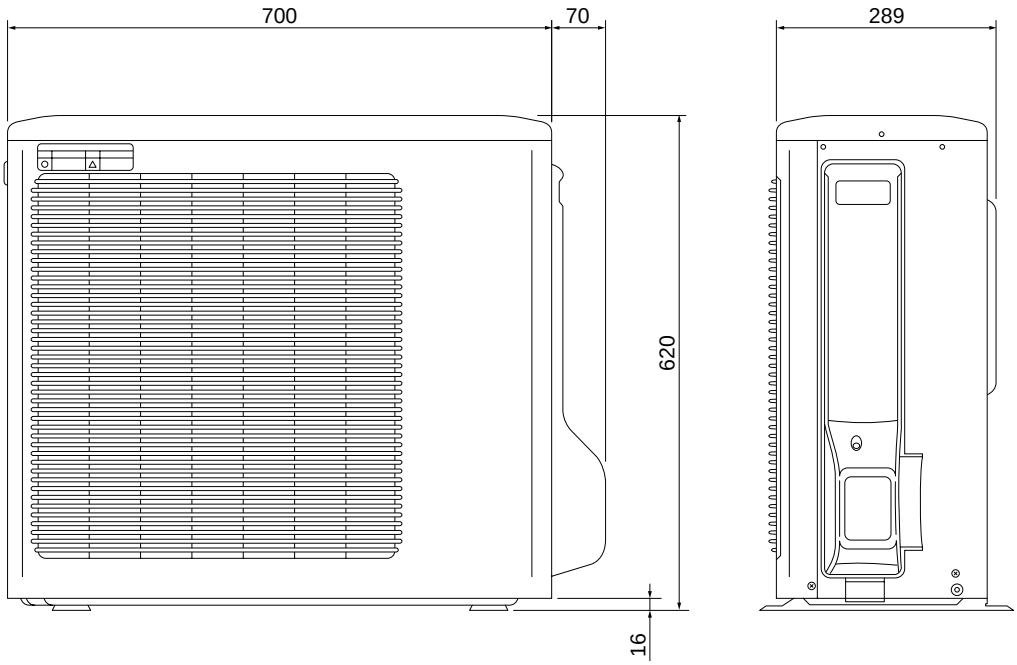
People sensor



Unit: mm

Outdoor unit **SAP-CRV121EH**

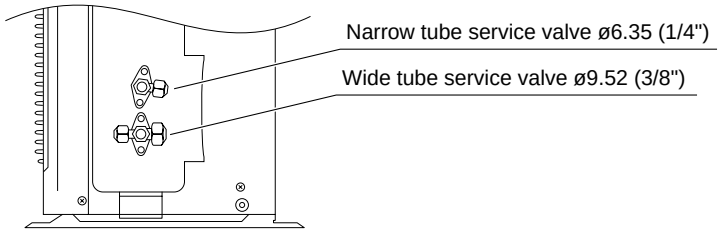




NOTE

Location of Service Valves

Service valves are located behind the side panel.
See the illustration below.

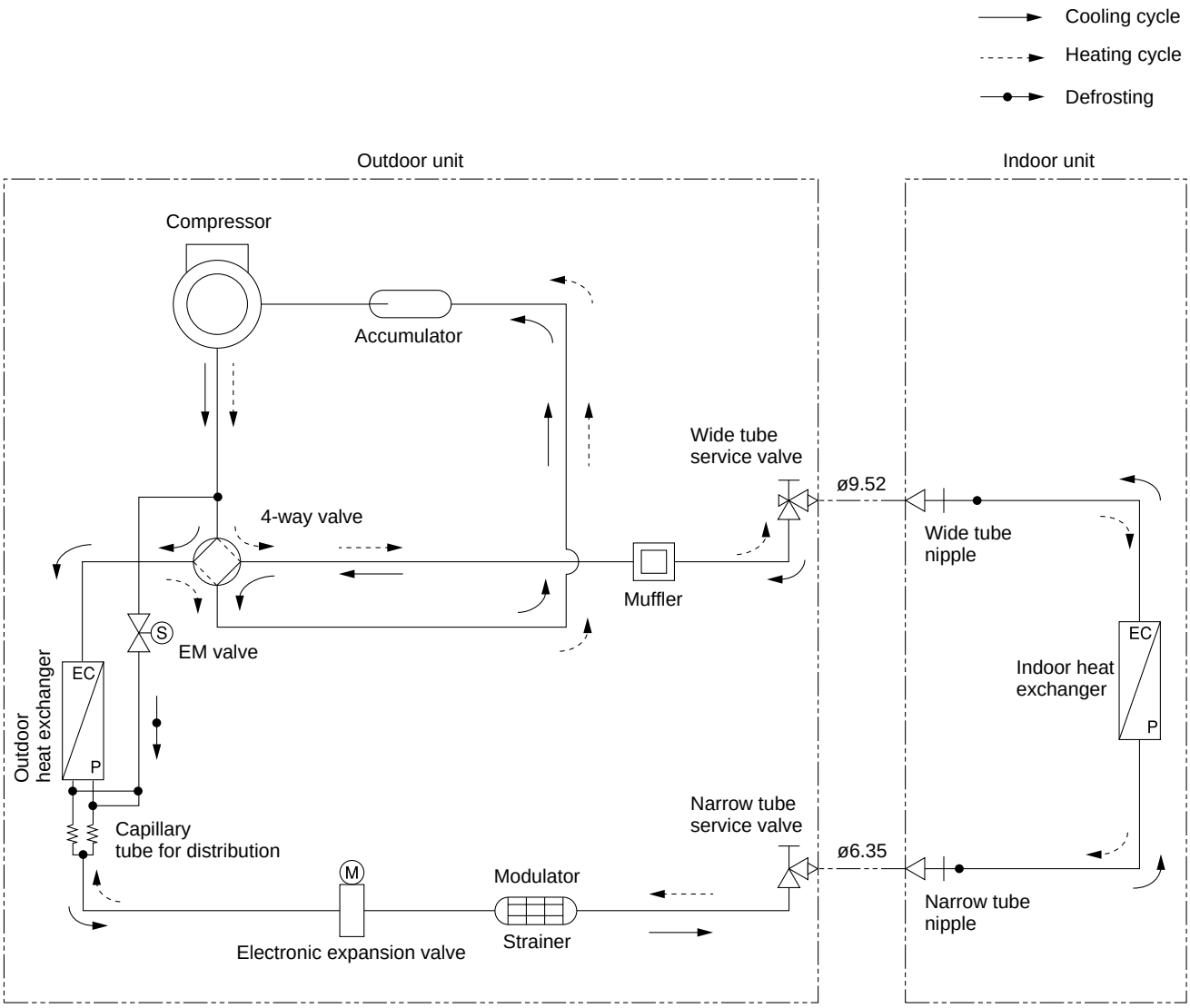


Unit: mm

4. REFRIGERANT FLOW DIAGRAM

4-1. Refrigerant Flow Diagram

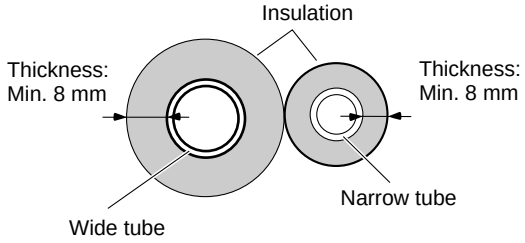
Indoor unit **SAP-KRV121EH**
Outdoor unit **SAP-CRV121EH**



Insulation of Refrigerant Tubing

IMPORTANT

Because capillary tubing is used in the outdoor unit, both the wide and narrow tubes of this air conditioner become cold. To prevent heat loss and wet floors due to dripping of condensation, **both tubes must be well insulated** with a proper insulation material. The thickness of the insulation should be a minimum 8 mm.



CAUTION

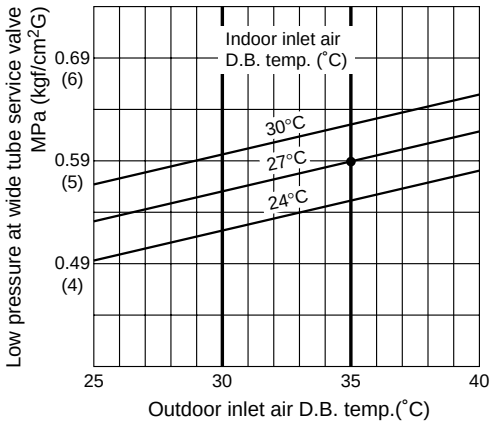
After a tube has been insulated, never try to bend it into a narrow curve because it can cause the tube to break or crack.

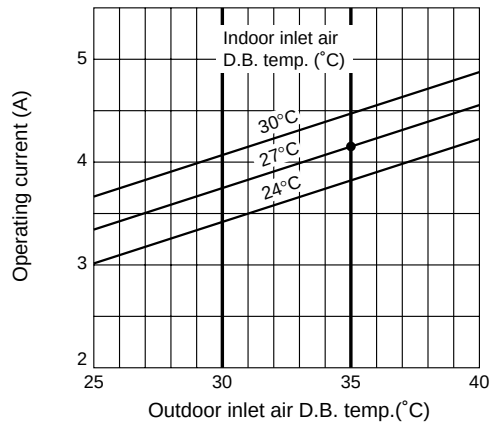
5. PERFORMANCE DATA

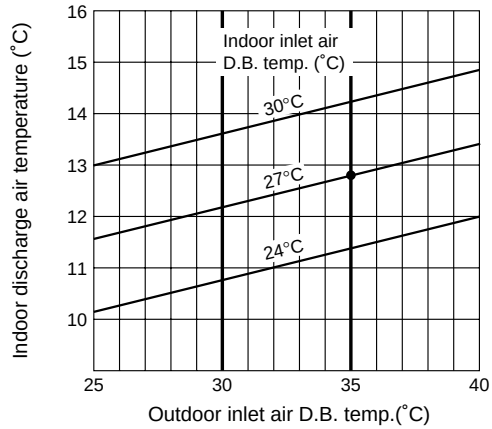
5-1. Temperature Charts

Indoor unit **SAP-KRV121EH**
Outdoor unit **SAP-CRV121EH**

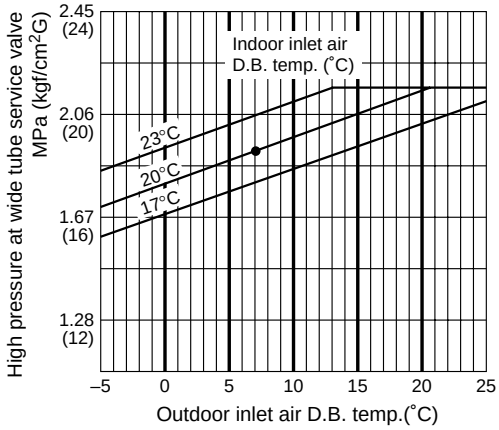
■ Cooling Characteristics (50Hz, 230V)

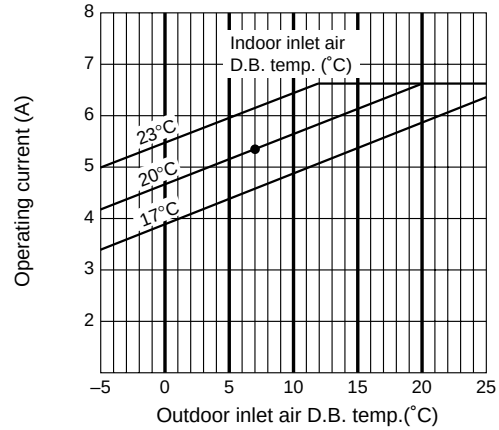


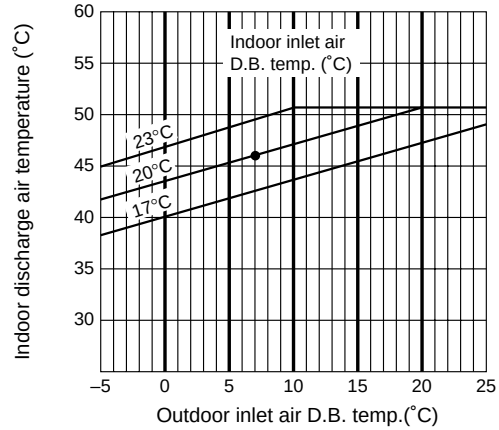




■ Heating Characteristics (50Hz, 230V)







NOTE

Overload prevention operates to protect the air conditioner when outdoor ambient temperature becomes extremely high in heating mode. (Refer to “9-2-3. Overload Prevention in Heating”.)

● … Points of rating condition
Black dots in above charts indicate the following rating conditions.

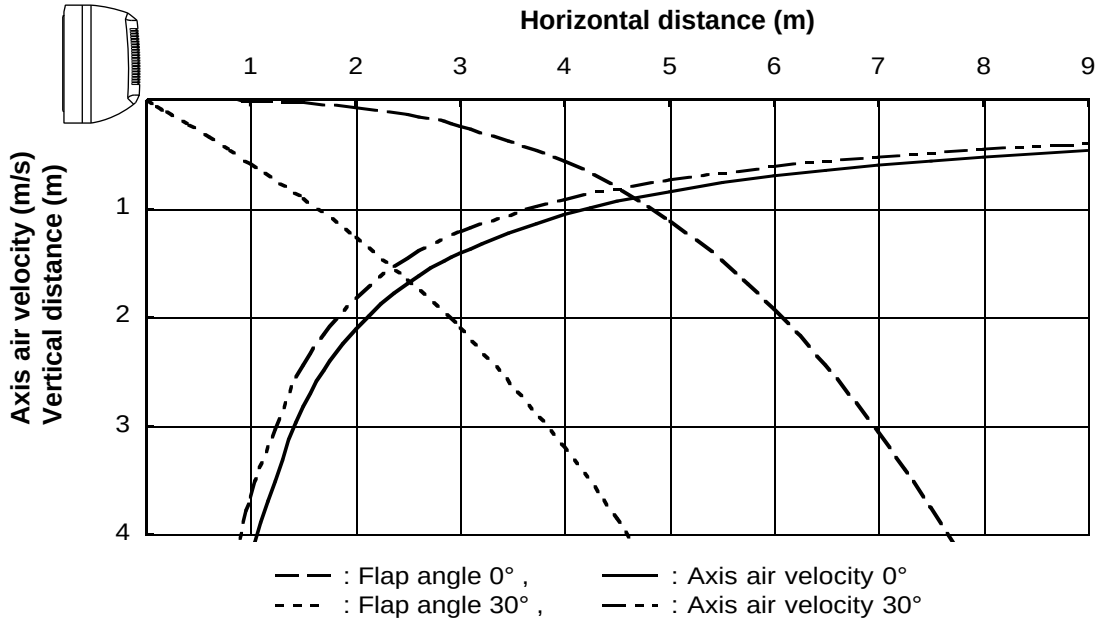
Cooling: Indoor air temperature 27°C D.B. / 19°C W.B. Heating: Indoor air temperature 20°C D.B.
Outdoor air temperature 35°C D.B. / 24°C W.B. Outdoor air temperature 7°C D.B. / 6°C W.B.

5-2. Air Throw Distance Charts

Indoor unit **SAP-KRV121EH**

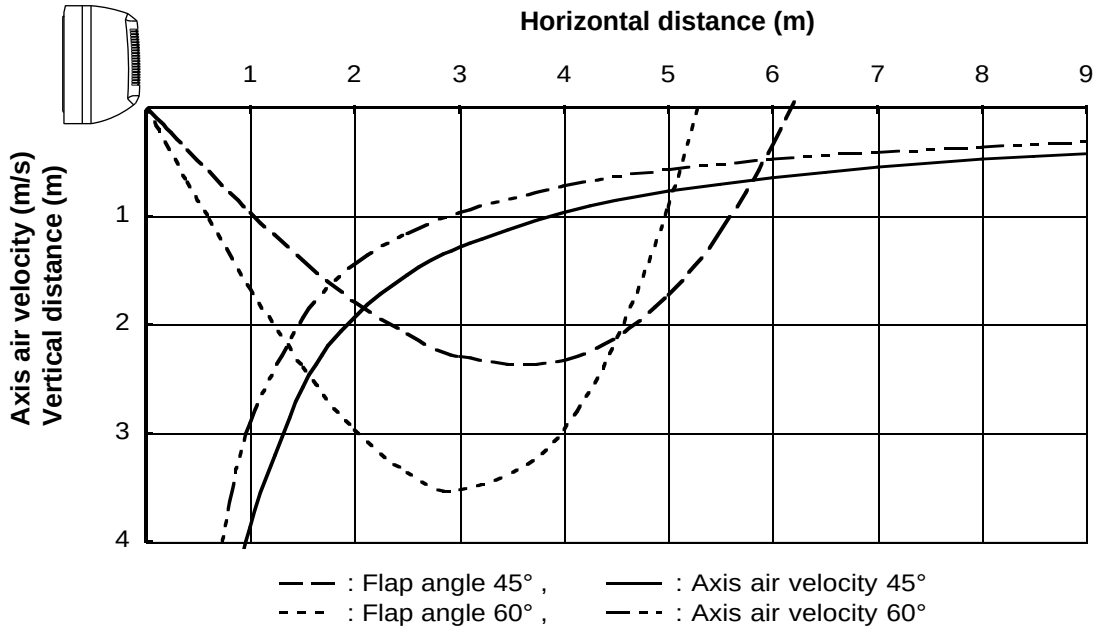
Cooling

Room air temp. : 27°C
Fan speed : High



Heating

Room air temp. : 20°C
Fan speed : High

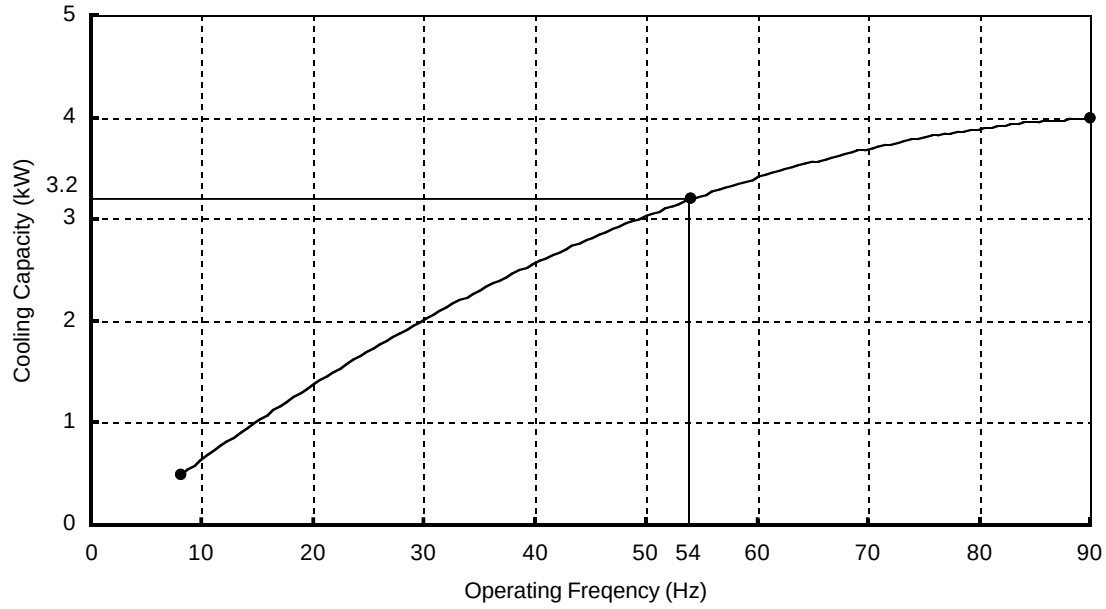


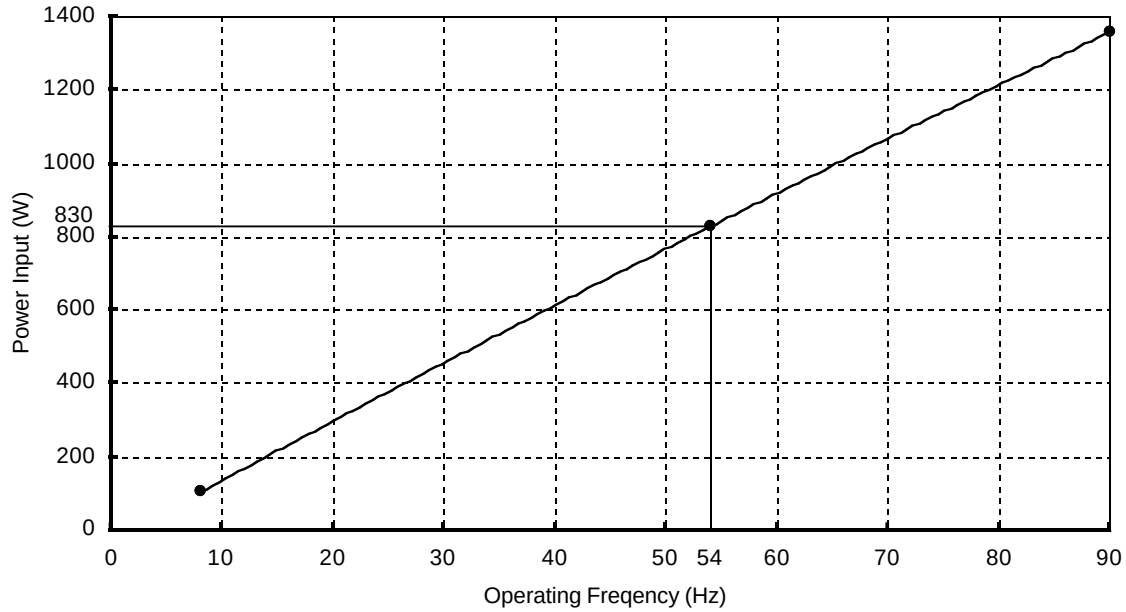
5-3. Frequency Charts

Indoor unit **SAP-KRV121EH**
Outdoor unit **SAP-CRV121EH**

■ Cooling

230V Single Phase 50Hz





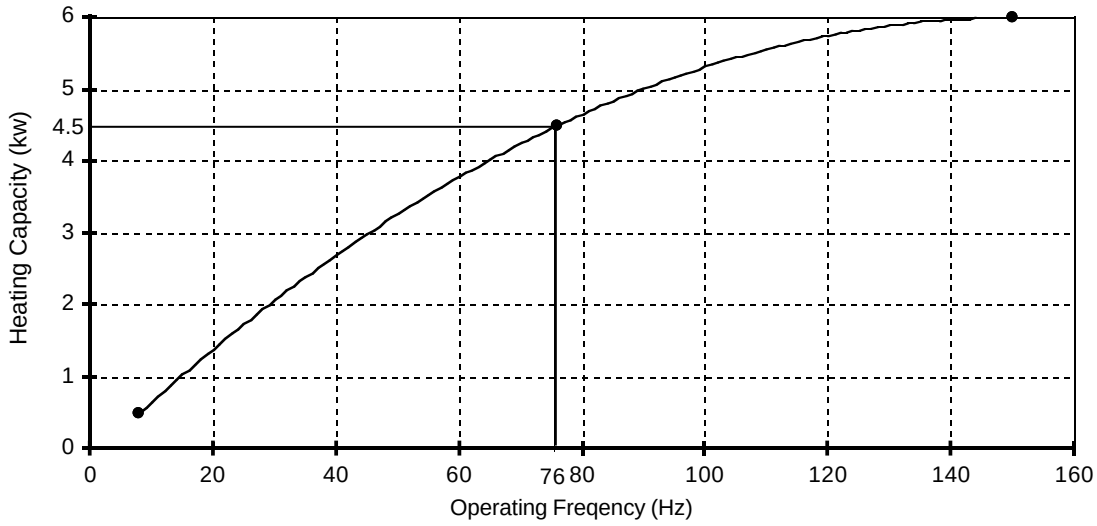
NOTE

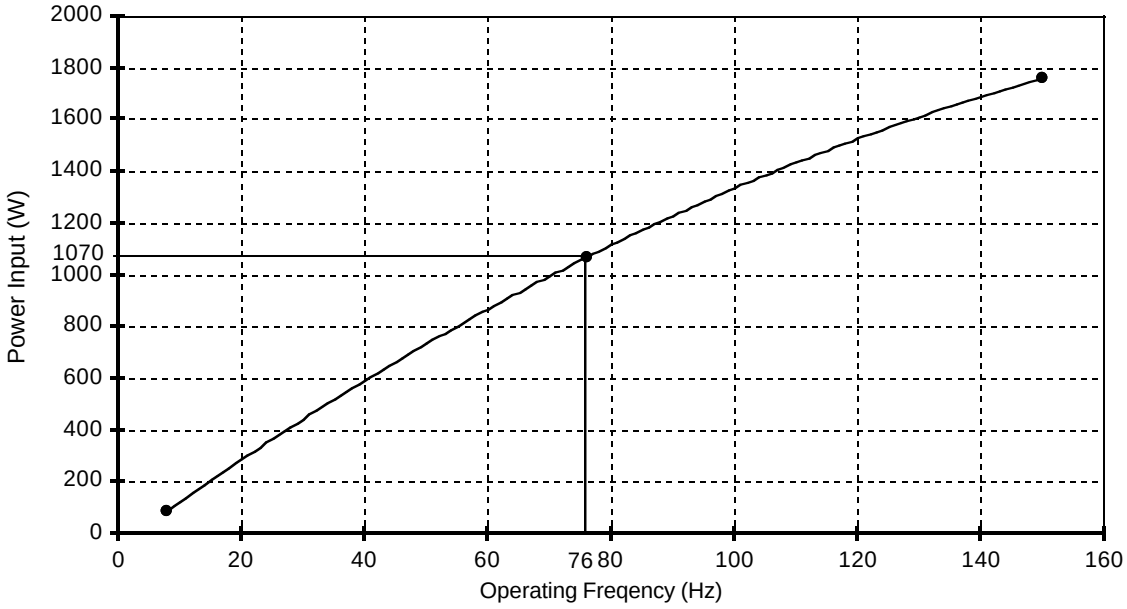
1) Rating conditions in cooling mode are:
   Indoor: 27°C D.B. / 19°C W.B.
   Outdoor: 35°C D.B. / 24°C W.B.

2) Fan speed: High

■ Heating

230V Single Phase 50Hz





NOTE

1) Rating conditions in heating mode are:
   Indoor: 20°C D.B.
   Outdoor: 7°C D.B. / 6°C W.B.

2) Fan speed: High

6. ELECTRICAL DATA

6-1. Electrical Characteristics

Indoor unit **SAP-KRV91EH**
Outdoor unit **SAP-CRV91EH**

Cooling

			Indoor Unit	Outdoor Unit		Complete Unit
			Fan Motor	Fan Motor	Compressor	
Performance at			230V Single phase 50Hz			
Rating conditions	Running amp.	A	0.23	0.37	3.55	4.15
	Power input	kW	0.026	0.043	0.761	0.83
Full load	Running amp.	A	0.23	0.37	4.91	5.51
	Power input	kW	0.026	0.043	1.101	1.17

Rating conditions: Indoor air temperature 27°C D.B. / 19°C W.B.
Outdoor air temperature 35°C D.B.

Heating

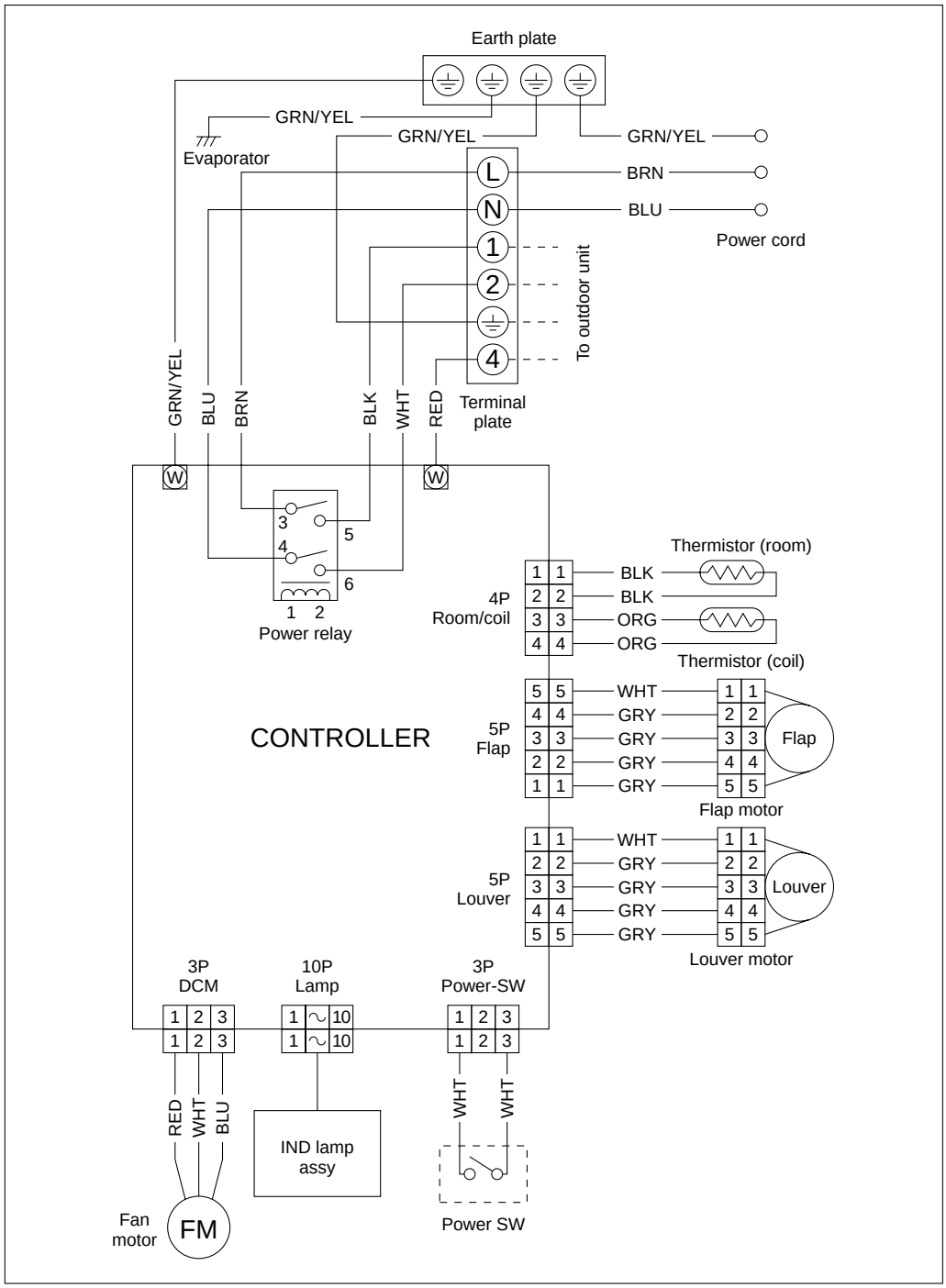
			Indoor Unit	Outdoor Unit		Complete Unit
			Fan Motor	Fan Motor	Compressor	
Performance at			230V Single phase 50Hz			
Rating conditions	Running amp.	A	0.35	0.34	4.66	5.35
	Power input	kW	0.041	0.037	0.992	1.07
Full load	Running amp.	A	0.35	0.34	5.75	6.44
	Power input	kW	0.041	0.037	1.322	1.40

Rating conditions: Indoor air temperature 20°C D.B.
Outdoor air temperature 7°C D.B. / 6°C W.B.

6-2. Electric Wiring Diagrams

Indoor unit **SAP-KRV121EH**

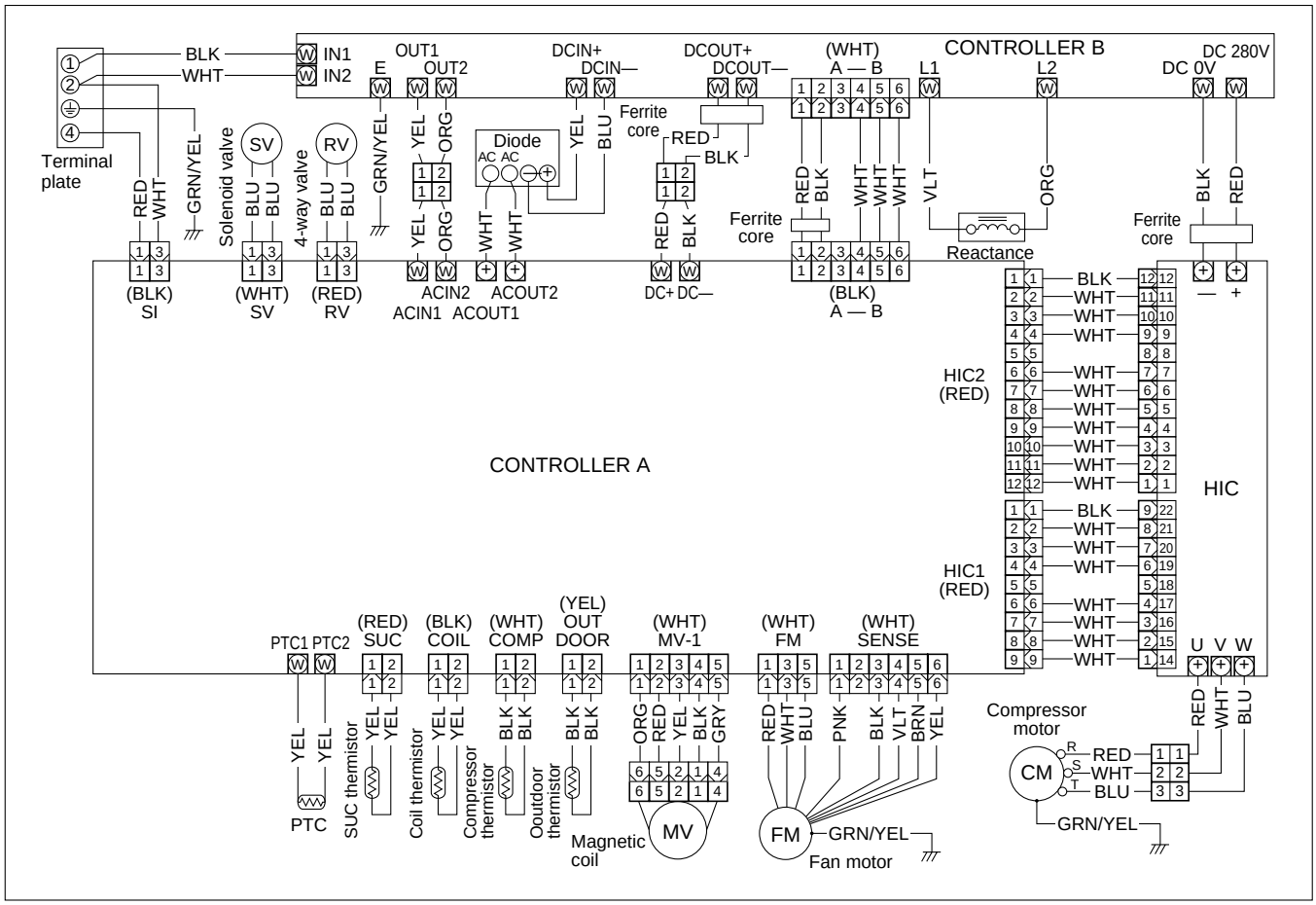
WARNING ***To avoid electrical shock hazard, be sure to disconnect power before checking, servicing and/or cleaning any electrical parts.***



8512-5253-520xx-2

Outdoor unit **SAP-CRV121EH**

WARNING ***To avoid electrical shock hazard, be sure to disconnect power before checking, servicing and/or cleaning any electrical parts.***



8512-5253-521xx-3

7. INSTALLATION INSTRUCTIONS

7-1. Installation Site Selection

7-1-1. Indoor Unit

WARNING

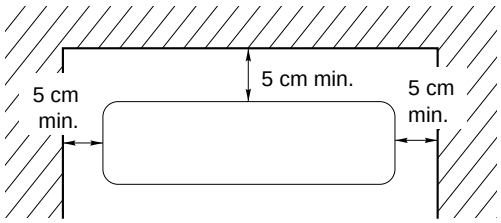
To prevent abnormal heat generation and the possibility of fire, do not place obstacles, enclosures and grilles in front of or surrounding the air conditioner in a way that may block air flow.

AVOID:

- direct sunlight.
- nearby heat sources that may affect performance of the unit.
- areas where leakage of flammable gas may be expected.
- places where large amounts of oil mist exist.

DO:

- select an appropriate position from which every corner of the room can be uniformly cooled. (High on a wall is best.)
- select a location that will hold the weight of the unit.
- select a location where tubing and drain hose have the shortest run to the outside. (Fig. 1)
- allow room for operation and maintenance as well as unrestricted air flow around the unit. (Fig. 2)
- install the unit within the maximum elevation difference (H) above or below the outdoor unit and within a total tubing length (L) from the outdoor unit as detailed in Table 1 and Fig. 3.



Front View

Fig. 1

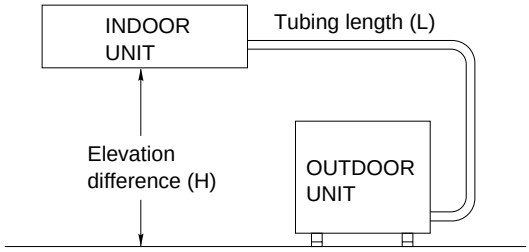


Fig. 2

CAUTION

For stable operation of the air conditioner, do not install wall-mounted type indoor units under 1.5 m from floor level.

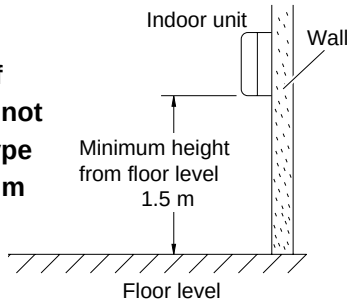


Fig. 3

Table 1

Model	Max. Allowable Tubing Length at Shipment (m)	Limit of Tubing Length (L) (m)	Limit of Elevation Difference (H) (m)	Required Amount of Additional Refrigerant (g/m)*
KRV121	7.5	15	7	15

* If total tubing length becomes 7.5 to 15 m (max.), charge additional refrigerant (R410A) by 15 g/m.
No additional compressor oil is necessary.

7-1-2. Outdoor Unit

AVOID:

- heat sources, exhaust fans, etc. (Fig. 4)
- damp, humid or uneven locations.

DO:

- choose a place as cool as possible.
- choose a place that is well ventilated.
- allow enough room around the unit for air intake/ exhaust and possible maintenance. (Fig. 5a)
- provide a solid base (level concrete pad, concrete block, 10 × 40 cm beams or equal), a minimum of 10 cm above ground level to reduce humidity and protect the unit against possible water damage and decreased service life. (Fig. 5a)
- Install cushion rubber under unit's feet to reduce vibration and noise. (Fig. 5b)
- use lug bolts or equal to bolt down unit, reducing vibration and noise.

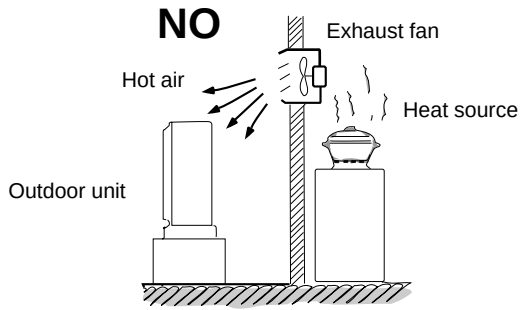
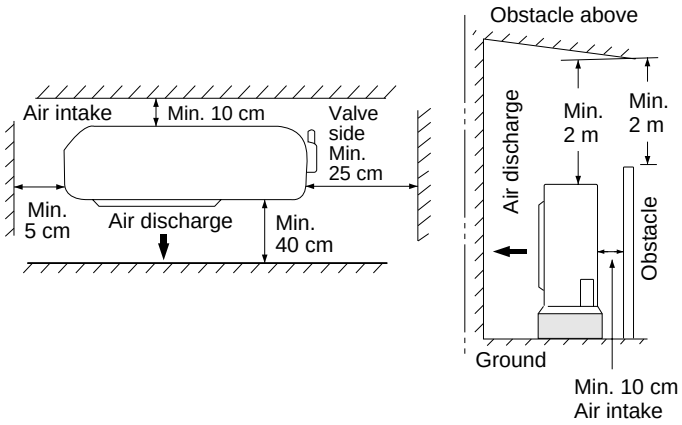


Fig. 4



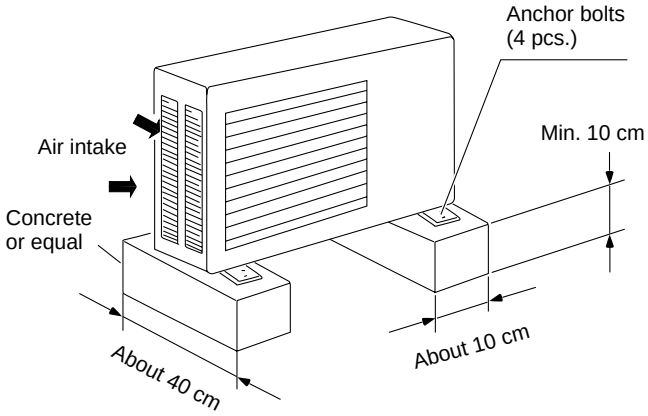


Fig. 5a

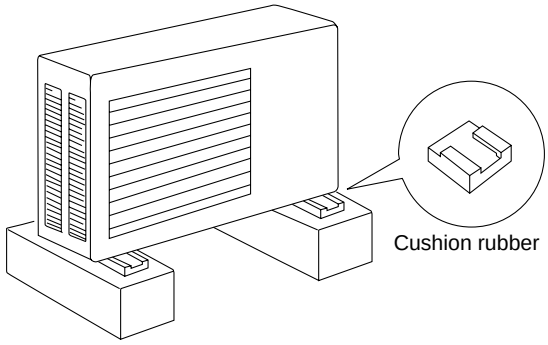


Fig. 5b

7-1-3. Recommended Wire Length and Diameter

Regulations on wiring diameter differ from locality to locality. For field wiring requirements, please refer to your local electrical codes. Carefully observe these regulations when carrying out the installation.
Table 2 lists recommended wire lengths and diameters for power supply systems.

NOTE

Refer to the wiring system diagram (Fig. 6) for the meaning of “A” and “B” in Table 2.

Table 2

Cross-Sectional Area (mm^2) / Model	(A)+(B) (A) Power Supply Wiring Length (m) (B) Power Line Length (m)		Fuse or Circuit Capacity
	2	3.5	
CRV121	33	51	15A

WARNING

- **Be sure to comply with local codes on running the wire from the indoor unit to the outdoor unit (size of wire and wiring method, etc.).**
- **Each wire must be firmly connected.**
- **No wire should be allowed to touch refrigerant tubing, the compressor, or any moving part.**

WARNING

- **To avoid the risk of electrical shock, each air conditioner unit must be grounded.**
- **For the installation of a grounding device, please observe local electrical codes.**
- **Grounding is necessary, especially for units using inverter circuits, in order to release charged electricity and electrical noise caused by high tension. Otherwise, electrical shock may occur.**
- **Place a dedicated ground more than 2 meters away from other grounds and do not have it shared with other electric appliances.**

CAUTION

Be sure to connect the power supply line to the indoor unit as shown in the wiring diagram. The outdoor unit draws its power from the indoor unit.

WIRING SYSTEM DIAGRAM

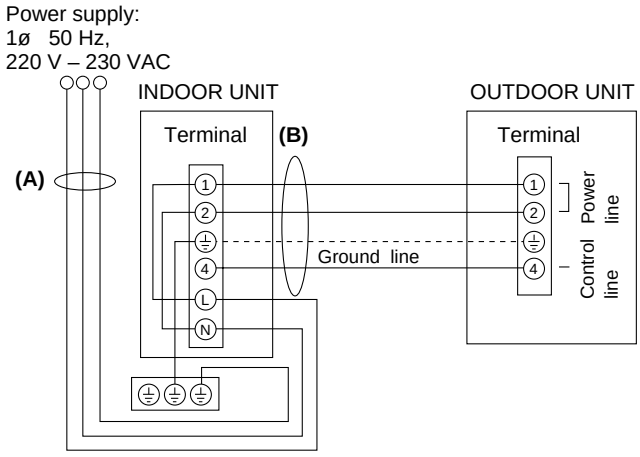


Fig. 6

7-2. Refrigerant Tubing

7-2-1. Use of the Flaring Method

Many of the conventional split system air conditioners employ the flaring method to connect refrigerant tubes which run between indoor and outdoor units. In this method, the copper tubes are flared at each end and connected with flare nuts.

7-2-3. Flaring Procedure with a Flare Tool

a) Cut the copper tube to the required length with a tube cutter. It is recommended to cut approx. 30 – 50 cm longer than the tubing length you estimate.

b) Remove burrs at the end of the copper tube with a tube reamer or file. This process is important and should be done carefully to make a good flare. (Fig. 7)

NOTE

When reaming, hold the tube end downward and be sure that no copper scraps fall into the tube. (Fig. 8)

c) Remove the flare nut from the unit and be sure to mount it on the copper tube.

d) Make a flare at the end of copper tube with a flare tool.* (Fig. 9)

(*Use “RIGID” or equivalent.)

e) Use the special flare tool for R410A for making a flare. If the conventional flare tool for R22 is utilized, use the spacer provided. (Fig. 10)

NOTE

A good flare should have the following characteristics:

- inside surface is glossy and smooth.
- edge is smooth.
- tapered sides are of uniform length.

7-2-4. Caution before Connecting Tubes Tightly

a) Be sure to apply a sealing cap or water-proof tape to prevent dust or water from getting into the tubes before they are used.

b) Be sure to apply refrigerant lubricant to the matching surfaces of the flare and union before connecting them together. This is effective for reducing gas leaks. (Fig. 11)

c) For proper connection, align the union tube and flare tube straight with each other, then screw on the flare nut lightly at first to obtain a smooth match. (Fig. 12)

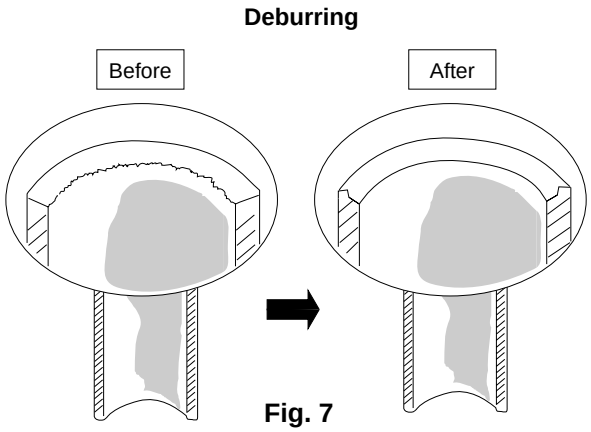


Fig. 7

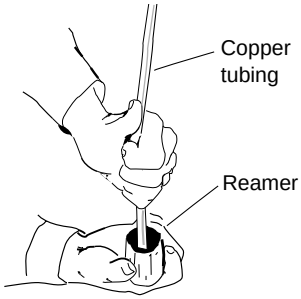


Fig. 8

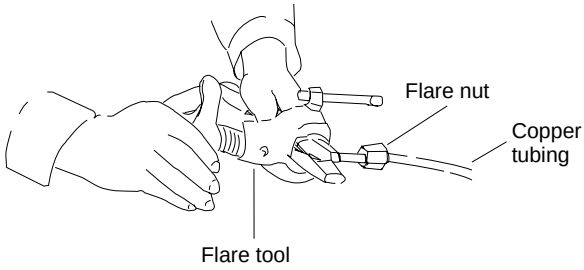


Fig. 9

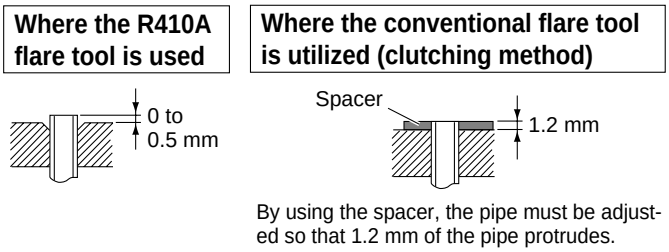


Fig. 10

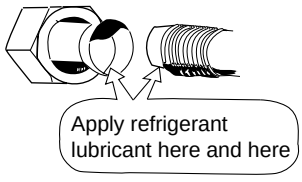


Fig. 11

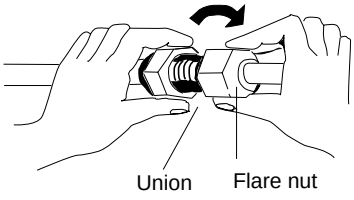


Fig. 12

7-3. Remote Control Unit Installation Position

The remote control unit can be operated from either a non-fixed position or a wall-mounted position.

To ensure that the air conditioner operates correctly, do not install the remote control unit in the following places:

- In direct sunlight
- Behind a curtain or other place where it is covered
- More than 8 m away from the air conditioner
- In the path of the air conditioner's airstream
- Where it may become extremely hot or cold
- Where it may be subject to electrical or magnetic interference
- Where the temperature changes rapidly (near heater, etc.)
- Where strong vibration or shock occurs
- Where there are obstacles which may block or interfere with the infrared signal, such as glass
- Near telephone, computer or radio
- Outside the detectable range, such as on top of refrigerator

7-3-1. Mounting on a Wall

a) Remote Control Unit

When attaching to wall

(1) Confirm the indoor unit beeps when the ON/OFF button is pressed at the wall location where the remote control unit is to be attached, then attach the holder to the wall. (Fig. 13)

(2) When taking out the remote control unit, pull it from the holder. (Fig. 14)

When using the remote control unit

- Point the transmission portion of the remote control unit at the receiver area of the indoor unit when operating the remote control unit, and during operation of the air conditioner.
- Do not place objects which may block the transmitted signals between the receiver and the remote control unit.

b) People Sensor

How to use the remote control unit holder

Turn the power source switch ON at the spot where you intend to install the holder, and confirm the indoor unit beeps. (Figs. 14 and 15)

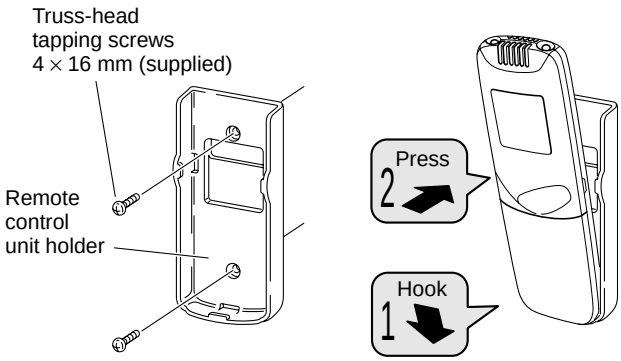


Fig. 13

When attaching to wall

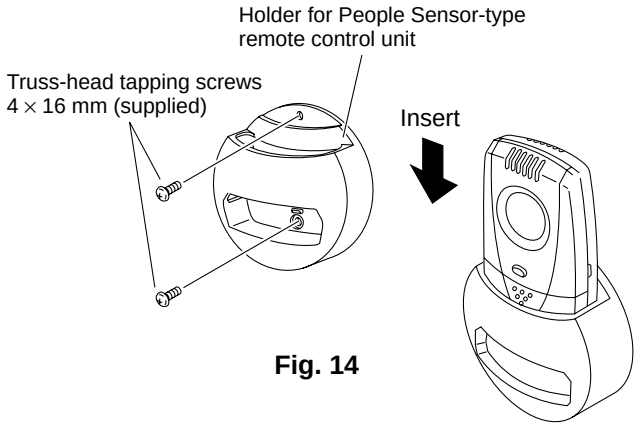


Fig. 14

When placed on table, etc.

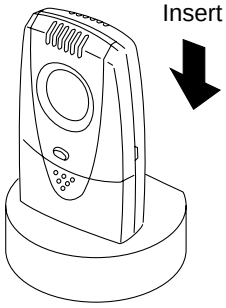


Fig. 15

8. MAINTENANCE

8-1. Changing Address of Indoor Unit and Remote Control Unit

If the operation is disturbed by radio interference of the remote control signals, change the address of the remote control unit by cutting the jumper wire on the PCB A of the indoor unit.

To Change Address on PCB

(1) Cut jumper wire (JP02) on the indoor unit PCB.

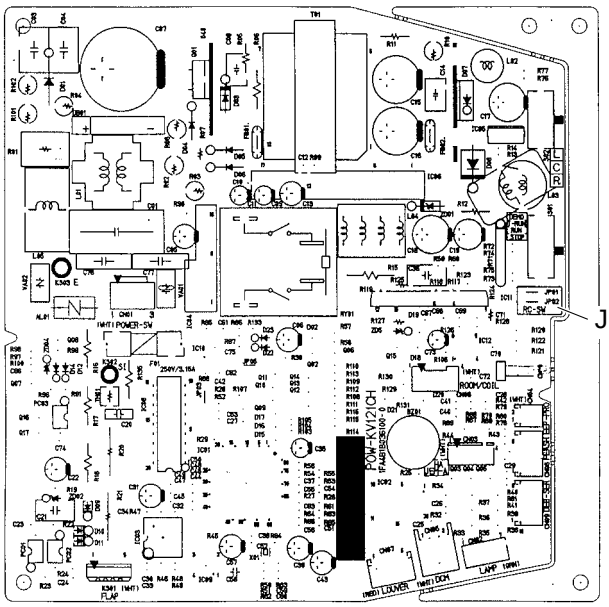
(2) Switch the address switch on the remote control unit to “B” position.

(3) After inserting the batteries, press reset button.

NOTE

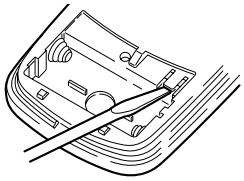
Once changed, you cannot restore the original address setting of the remote control unit.

Control PCB (POW-KRV121CH) on Indoor Unit

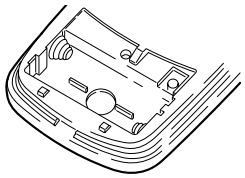


To Change Address on Remote Control

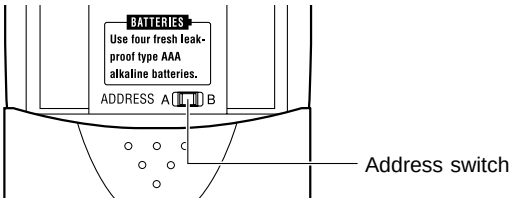
(1) Remove tab for changing the address of the remote control unit



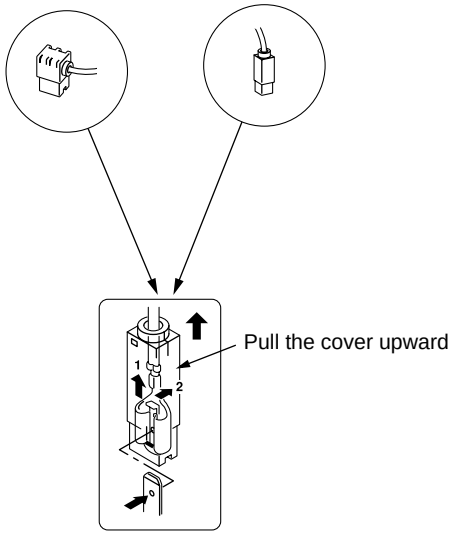
(2) When it is removed, the address is set to B.



People Sensor-type remote control unit (RCS-1HCS4E)



8-2. Disconnecting and Connecting Positive Connector for Outdoor Unit



When the cover is pulled upward, the lock is released with the sequence of 1 and 2.

One of the two types of connectors illustrated at left is used. Their basic structure is the same for each.

How to Disconnect

Hold the resin connector cover, and pull the connector off. You cannot disconnect the connector by pulling the wire since it is locked inside. Always hold the cover to disconnect. (See illustration at left.) For the connector without the resin cover, push the lock in the direction of “2” while pulling it off.

How to Connect

In order to connect, hold the resin cover of the connector and push it in. Confirm the click sound for the inside lock.

9. FUNCTIONS

9-1. Functions for Operation

9-1-1. Operation Selector

(1) OFF :
- Used when the remote control unit is not available

(Self-Diagnosis)
- Used for servicing and maintenance

(2) ON:
- Normal operation.....Operate using remote control unit
- Emergency operation.....This is used when the remote control unit is not available. When ON position is selected, the air conditioner starts operating with automatic switching between cooling and heating modes.

(3) TEST:
- Used to confirm operational characteristics
- Used for pump-down

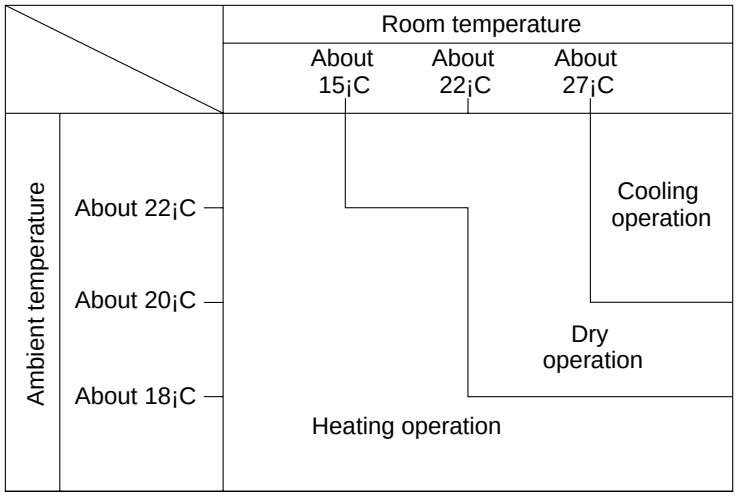
(The unit operates at nominal frequency. In this case, a lamp on the unit will flash and it will not accept signals from the remote control unit.)

(4) DEMO:
- Used for demonstration at shopfronts; not for normal use
- Used for service

9-1-2. Automatic Operation

Selection of Operation Mode

In Automatic Operation, indoor and outdoor temperature sensors operate and either Heating, Dry or Cooling Operation is selected automatically.



Set temperature (standard)	Mode
27¡C	Cool
Temperature at the start of operation (Range between 20¡C and 26¡C)	Dry
24¡C	Heat

9-1-3. Amperage

Operation is performed in which maximum current limit is lowered to reduce power consumption. (Operation performance is reduced accordingly.)

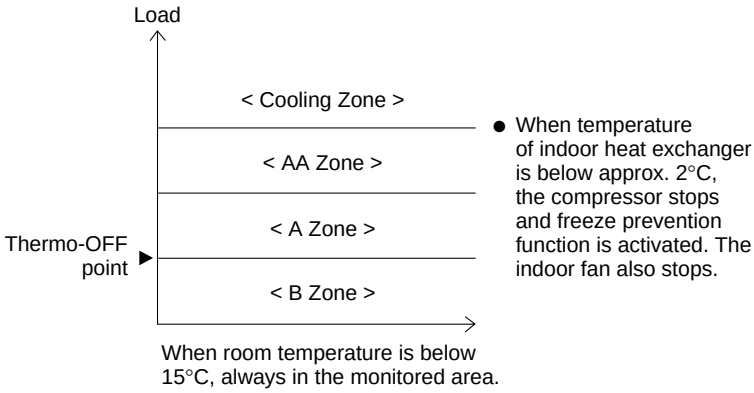
Single phase 230V	Cooling operation 8.9 ➡ 5A
	Heating operation 8.9 ➡ 6A

9-1-4. Frequency Control

During Automatic Operation, temperature and fan speed are adjusted according to the room conditions to keep the room comfortable.

< Dry Operation >

- Dry operation is as described in the diagram at right.
- If the room temperature drops below 15°C, the unit operates under monitored status.
- Within the monitored area, the air conditioner does not operate but the operation lamp remains on.



Dry AA

The compressor operates with 1/f fan operation. Also, the indoor fan operates under 1/f mode while the compressor is running.

Dry A

The compressor operates with 1/f fan operation with lower operation frequency than Dry AA. The indoor fan operates under 1/f mode while the compressor is running.

Dry B

The compressor repeats a cycle of ON for 3 minutes and OFF for 6 minutes.

The indoor fan operates under 1/f mode while the compressor is running.

NOTE If the compressor is turned OFF and the room temperature falls below approximately 20°C, the indoor fan also will be turned OFF.

9-1-5. HA Operation Mode (JEMA)

- When the operation is started by HA, it is switched to Automatic Operation mode.
- When the operation mode is changed by the remote control unit during the operation, the previous operation mode is selected in the following operation.

NOTE One cycle of HA Terminals 1 – 2 consists of short – open of input pins for operation / stop.

9-1-6. Lamp Colors

Operation Lamp

Heating Operation .....(red)
Cooling Operation .....(green)
Timer .....(green)
People Sensor Lamp.....(green)
Dry Operation.....(orange)
Air Cleaning.....(green)
Filter .....(orange, red)

9-1-7. ON Timer

- The air conditioner starts operation at the preset time.
- ON timer can be set / canceled while the air conditioner is not operating. When the timer is set, the timer lamp on the main unit illuminates.

9-1-8. OFF Timer

- The air conditioner stops operation at the preset time.
- OFF timer can be set / canceled while the air conditioner is operating. When the timer is set, the timer lamp on the main unit illuminates.

9-1-9. Timer Back-up

- If the indoor unit does not receive a time-up signal from the remote control unit at the preset ON / OFF time, time-up is carried out by the back-up timer of the indoor unit within 15 minutes.
- When the operation is started by using ON timer, and the air conditioner is not manually manipulated for 25 hours or more, then the operation is canceled automatically.

9-1-10. One-touch Eco

- For environmental protection and energy savings, “One-touch Eco” sets the temperature to 28°C for Cooling Operation, and to 20°C for Heating Operation, considered to be the recommended temperatures for cost efficiency. This mode carries out economical operation by somewhat lowering performance. If it does not meet your comfort needs, set instead to normal operation.
- One-touch Eco can be set together with any other operation such as 1H timer or Night Setback operation, and Eco setting has priority over other settings. (However, when Eco is used together with Night Setback operation, if the setting of these overlaps, then Night Setback setting prevails.)
- During One-touch Eco, temperature and amperage settings cannot be altered.

9-1-11. Multi-sensor Control

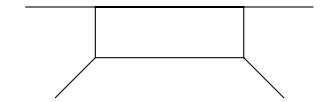
- This is performed during Heating, Dry or Cooling Operation. However it is not applicable to Air Cleaning Operation.
- Multi-sensor control is performed in combination with multi-room temperature control and multi-air flow control.

Multi-temperature Control

- Set temperature is adjusted by using the difference between the temperatures detected by the remote control unit and People Sensor remote control unit, in order to adjust the temperature of the entire room to make it comfortable.
- Judging temperature difference
  Type of swing and sweep is selected by comparing the difference between the effective temperature detected by the remote control unit and People Sensor remote control unit, and the temperatures detected 10 minutes previously.

Multi-air Flow Control

- Left/right flap, up/down flap and fan speed are controlled by monitoring the movement of the temperatures detected by the remote control unit and People Sensor remote control unit, in order to achieve uniform room temperature distribution.
- Type of horizontal sweep



Installation position Switching position		Right	Center	Left
Horizontal sweep angle			40 – 100%	0 – 100% 0 – 60%
Even temp-distribution		Mid-speed * Stop for 30 seconds at 100%	Mid-speed Nonstop	Mid-speed * Stop for 30 seconds at 0%
Emphasis on left	Right	High-speed	High-speed	High-speed
	Left	Low-speed	Low-speed	Low-speed
		* Stop for 30 seconds at 100%	Nonstop	Nonstop
Emphasis on right	Right	Low-speed	Low-speed	Low-speed
	Left	High-speed	High-speed	High-speed
		Nonstop	Nonstop	* Stop for 30 seconds at 0%

* Heating Operation only.

9-2. Protective Functions

9-2-1. Operation Cut-off Control in Abnormal Ambient Temperature

The following three protective actions are available to prevent the compressor from operating with abnormal loads. At that time, they initiate thermo-off (stopping the outdoor unit) of the air conditioner.

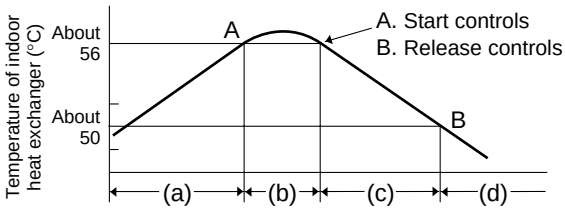
No.	Mode	Cut-off action	Thermo-off	Thermo-on
1	Cooling	Low ambient temp. cut-off	Ambient temp. –5°C	Ambient temp. –1°C
2	Heating	High ambient temp. cut-off	Ambient temp. +30°C	Ambient temp. +29°C

9-2-2. Operation Cut-off Control for Excessive / Low Voltage

If the voltage of the power supply is intolerably higher or lower than the rated voltage, power-off will trip (power supply to the outdoor unit is stopped) to protect the unit, regardless of the operating mode. When this function is activated, the speed of the indoor fan operates at LL speed and the operation lamp starts to flash.

9-2-3. Overload Prevention in Heating

This function reduces the load on the compressor by controlling the operating frequency before the protective circuit activates while operating in Heating mode.



(a) Area — the air conditioner follows auto performance control.

(b) When the temperature rises above point A, the operating frequency is reduced at a specified rate.

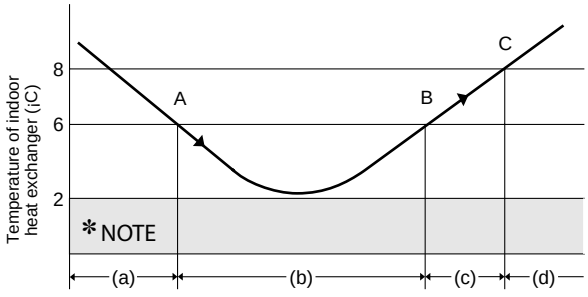
(c) Area — further frequency rise is not allowed.

(d) When the temperature falls below point B, overload prevention mode is released and the air conditioner operates as in (a).

9-2-4. Freeze Prevention

If the temperature of the indoor heat exchanger drops to the following level while the air conditioner is operating in Cooling or Dry mode, it will detect a freeze condition and stop operation as long as necessary.

1. When the temperature of the indoor heat exchanger is less than 6°C, the air conditioner enters Freeze Prevention mode.
2. Release of freeze prevention mode occurs when the temperature of the indoor heat exchanger is over 8°C.



(a) Area — the air conditioner follows auto performance control.

(b) When the temperature falls below point A, the operating frequency is reduced at a specified rate.

(c) Area — further frequency rise is not allowed.

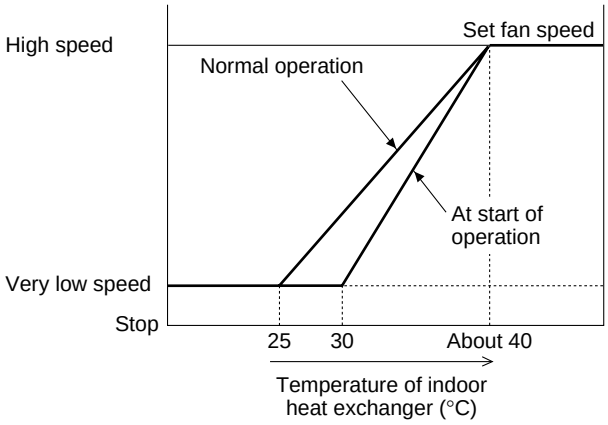
(d) When the temperature rises above point C, freeze prevention is released and the air conditioner operates as in (a).

NOTE If the temperature falls below 2°C (for more than 2 minutes) the compressor will stop operating. Once the freeze condition is detected, the air conditioner will work less than the maximum frequency until it is turned off.

9-2-5. Cold Draft Prevention in Heating

At the beginning of the heating operation, the fan does not start or else operates at LL speed.

As the temperature of the indoor heat exchanger rises, the fan operates at the set speed.

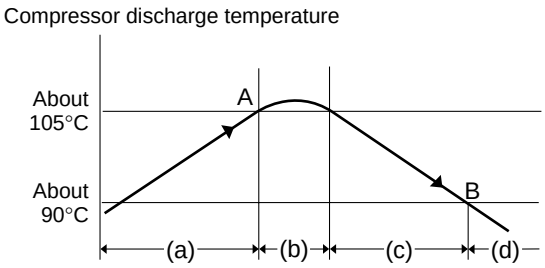


NOTE

- The fan speed is set to FORCED LL mode within 30 seconds following thermo OFF.
- Normal operation means operation when the room temperature and set temperature are close.
- When Heating operation is starting, the indoor fan will not operate until the temperature of the heat exchanger rises to over approximately 20°C.

9-2-6. Compressor Discharge Temperature Control

This function controls the operating frequency to prevent the compressor discharge temperature from rising more than a specified temperature.



(a) Area — the air conditioner follows auto performance control.

(b) When the temperature rises above point A, the operating frequency is reduced at a specified rate.

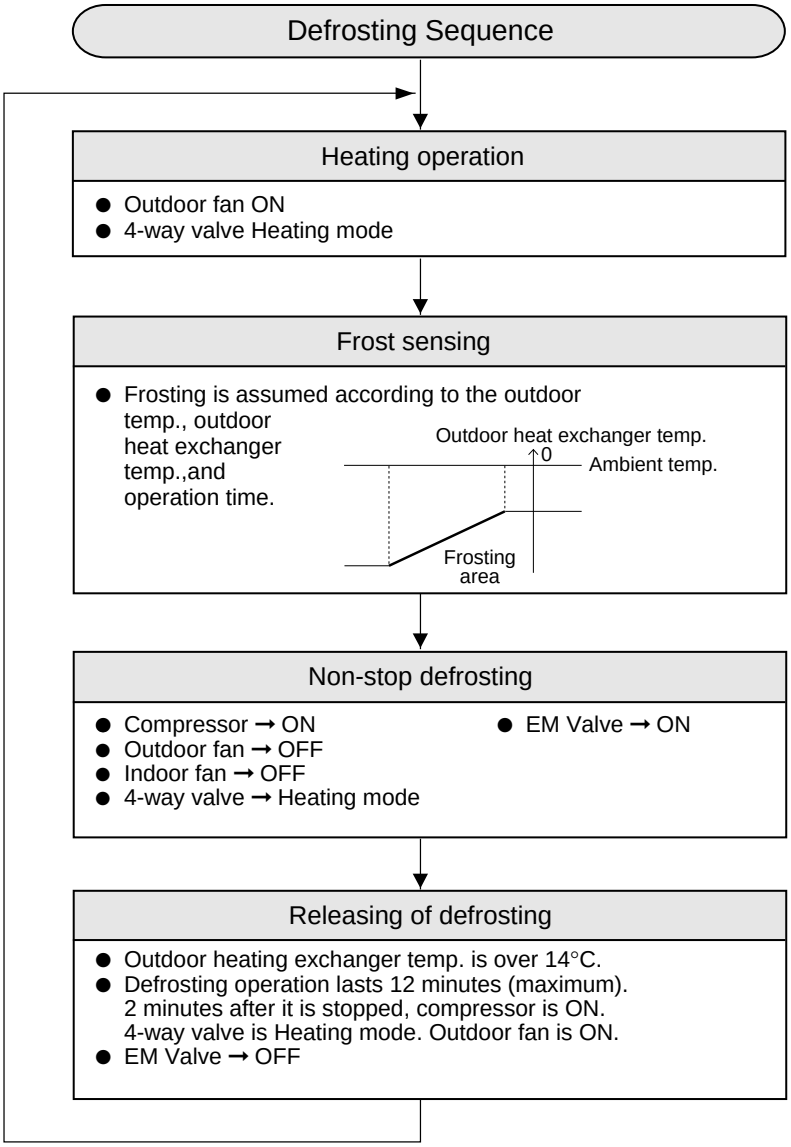
(c) Area — further frequency rise is not allowed.

(d) When the temperature falls below point B, prevention of a rise in frequency is released and the air conditioner operates as in (a).

NOTE The compressor will stop if the temperature of the compressor discharge exceeds 120°C due to shortage of gas or other reason.

9-2-7. Sensing of Frosting and Release of Defrosting

- Non-stop defrosting



NOTE If the air conditioner is turned off during the defrosting cycle, it will continue defrosting and turn itself off after defrosting is completed.

9-2-8. CT (Peak current cut-off control)

- This function prevents the circuit breaker or fuse from operating to open the circuit. This function works when electrical current has increased due to an increase in the cooling / heating load, or to a decrease in the power supply voltage. In these cases, operation frequency is reduced or operation is interrupted automatically to control the electrical current for operation.
- When the cause of the increase in electrical current is rectified, the system will resume operation in the original mode.

Operation at 230V

(A)

		Cooling • Dry	Heating
Peak current cut-off trips		10.0	
Hz down	Normal	8.9	8.9
	Amperage	5.0	6.0

NOTE Electrical current setting for Cooling operation is used during Defrosting operation.

10. TROUBLESHOOTING

■ Note before beginning inspection/repair

- After checking the self-diagnostic monitor, disconnect the power plug before beginning inspection and repair.
- Since the outdoor unit controller (inverter) contains a large electrolytic capacitor, a potentially dangerous charge (at a voltage of 280 VDC) remains even after breaker OFF. When the outdoor controller is operating normally, it takes about 30 seconds to discharge. If trouble with the outdoor controller is suspected, leave it for 5 minutes or more before handling.
- After the inspection/repair, erase the contents of the self-diagnostic monitor by setting the operation selector on the indoor unit to DEMO and then plugging back in the power supply.

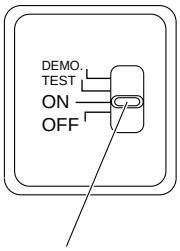
10-1. Operating State

	Customer Description	Explanation
Dry operation	Indoor fan sometimes stops.	● Based on the room temperature, the indoor fan and outdoor unit repeat the processes of Operation and Stop. ● When room temperature is below the set temperature, the indoor fan either slows down to 1/f speed or stops.
Heating mode	Indoor fan stops.	● Defrosting of the outdoor unit is occurring; indoor fan is halted to prevent cool drafts from blowing in the room.
	Indoor fan is not running at the set fan speed.	● To maintain temperature in the room, rotation speed of the indoor fan is increased according to the rise in indoor heat exchanger temperature.
	Moisture is rising.	● During defrosting of the outdoor unit, steam may arise. ● When operation is stopped during defrosting, the defrosting will continue. (Operation automatically stops after defrosting.)
Others	Air flap is still running at start-up and at operation stop.	● Flap motor positions the air flap by operating for 10 to 20 seconds after start-up and operation stop.
	It does not operate immediately after being switched on.	● When plugged in and operation button is pressed immediately, the outdoor unit will not operate for about 3 minutes. ● When restarted immediately after being stopped, the outdoor unit will not operate for about 3 minutes. Both are for preventing malfunctions.
	It makes a strange sound.	● You may hear sound similar to water flowing just after operation is started, during operation, or after the system is stopped. This is the sound of refrigerant gas flowing and is not a problem. ● When operation is started or after it is stopped, you may hear some small sounds. These are caused by switches or expansion / contraction of parts (heat exchanger / plastic parts) inside the air conditioner due changes in temperature.
	It smells during operation.	● Smells permeating walls, carpets, furniture, or clothes may become noticeable. ● If the recommended duration of use of the air clean filter (3 months) has elapsed, it may smell. Replace the filter as soon as possible. (Replacement is sold separately.)
	The speed of the indoor fan does not change.	● This during occurs cool draft prevention or when the room temperature has already reached the set temperature. (Heating mode) ● The room temperature already has reached the set temperature. (Dry operation) ● If MODE selector button is pressed during the operation, it will operate with the very low fan speed (LL) for about 3 minutes and after that, it will change to the set fan speed.
	Air conditioner does not operate.	● Protective circuit may have engaged due to lightning. Disconnect the power plug for at least 1 minute. Then reconnect the power plug and try operating the air conditioner. If the air conditioner operates, it is not malfunctioning.

10-2. Troubleshooting Using the Self-Diagnostic Monitor

10-2-1. Method of Self-Diagnosis

If the operation lamp of the indoor unit flashes every half-second, carry out detailed troubleshooting using the following method.



Operation selector
Normally set it to ON position.
OFF, TEST and DEMO positions are used for inspections, etc.

NOTE

- If the operation lamp flashes every half-second as soon as the power is plugged in, there is either a faulty external ROM (for OTP data) on the board of the indoor unit, an insertion fault, or the ROM is not installed.
- Even when power is not being supplied, the malfunction mode will remain in memory, so carry out the diagnosis as follows:

Procedure

(1) Restore power.

(2) Set the operation selector of the indoor unit to OFF (Self-Diagnosis).

(3) If an abnormality is sensed or an automatic protective action is taken, the self-diagnostic lamps No. 1, 2 and 3 respectively alternately blink on for 5 seconds and off for 2 seconds (the buzzer sounds when they go off).

NOTE When there is no abnormality detected, there will be no indication on self-diagnostic lamps No. 1, 2 and 3, nor will the buzzer sound.

(4) The buzzer sounds three times to inform that the diagnosis has been completed.

(5) After the repair, always set the operation selector to DEMO and restore power to delete the contents of the diagnosis. After that, set the operation selector to OFF to check that the contents were deleted.

10-2-2. Details of Diagnosis

Indication on indoor unit			×…Off ○…Flashing ●…Illuminated	
People Sensor	Timer	Operation	**Details of Diagnosis**	**Details of Abnormality**
×	×	○	Room temperature sensor abnormality	① Sensor open- and short-circuit ② Connector contact fault
×	○	×	Indoor heat exchanger temperature sensor abnormality	① Sensor open- and short-circuit ② Connector contact fault
○	×	×	Compressor temperature sensor abnormality SH sensor abnormality	① Sensor open- and short-circuit ② Connector contact fault
○	×	○	Outdoor heat exchanger temperature sensor abnormality Narrow tube A, B sensor abnormality	① Sensor open- and short-circuit ② Connector contact fault
○	○	×	Ambient temperature sensor abnormality Wide tube A, B sensor abnormality	① Sensor open- and short-circuit ② Connector contact fault
○	○	○	CT (electric current) abnormality	① Sensor open- and short-circuit ② Connector contact fault ③ HIC fault (no output from U, V and W phases)
×	×	●	Serial fault, erroneous inter-unit wiring connection	① Incorrect wiring of F cable, incorrect insertion, or contact between metal parts and electric leads ② Abnormality on 220 VAC / 280 VDC line ③ Defective insulation ④ Defective power relay ⑤ Defective boards (indoor or outdoor)
×	●	×	HIC / power transistor protection (electric current / temperature)	① Defective HIC ② Faulty contact / crimp of signal lead connector ③ Locked and worn AC compressor ④ Defective outdoor A board ⑤ Outdoor fan motor fails to rotate, or outdoor heat exchanger blocked
			Abnormality on DC compressor rotation	⑥Defective DC compressor position locating circuit

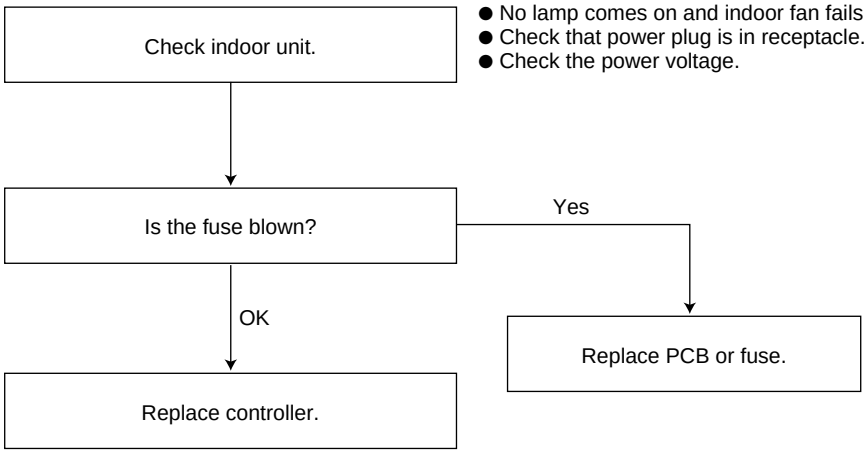
(continued)

Indication on indoor unit			×…Off ○…Flashing ●…Illuminated	
People Sensor	Timer	Operation	**Details of Diagnosis**	**Details of Abnormality**
×	●	●	Abnormality in external ROM of outdoor unit	① Forgot to attach OTP data ② Incorrect insertion ③ Defective OTP data ④ Defective contact of IC socket
●	×	×	Electric current peak cut-off (20A)	① Instantaneous power failure/voltage reduction ② Defective HIC ③ Worn compressor
●	×	●	Wrong voltage abnormality Active abnormality	① Compressor operation stop, abnormality on voltage application
●	●	×	Compressor discharge gas overheating protection	① Gas shortage during heating/cooling operation (more than 50% gas shortage) ② Blocked electronic expansion valve or capillary tube ③ Defective compressor temp. sensor ④ Outdoor fan motor fails to rotate during cooling operation
●	●	●	Indoor fan motor rotation abnormality	① Defective fan motor position locating sensor, disconnection of fan motor winding ② Disconnected connector ③ Defective fan motor drive circuit
○	○	●	Abnormality on switching 4-way valve Zero-cross abnormality	① 4-way valve does not switch ② Abnormality on control PCB
○	●	●	Compressor motor revolution abnormality	① Failure in DC compressor rotation which is not caused by defective HIC
●	○	○	Outdoor fan motor rotation abnormality	① Disconnected outdoor DC fan motor ② Locked ③ Defective PCB

NOTE

- Operation lamp flashes upon errors being detected by sensor, while it flashes to indicate protective actions after error mode occurs more than four times during operation.
- Microcomputer ceases to operate and operation lamp goes out if terminal fuse blows on the terminal block on the indoor unit PCB.

10-2-3. Self-Diagnosis Function Fails to Work



10-3. Fault Assessment of Indoor/Outdoor Unit

10-3-1. Fault Assessment of Indoor Unit

No.	Operation	Checkpoints (conditions of the unit)
1	Set operation selector of indoor unit to DEMO and start operation using remote control unit.	● Rated voltage exists for inter-unit wiring between 1 and 2. ● Connect 2 and 3 with a 5kΩ resistor. Measurement of the voltage between these must show 12V to 15V, with fluctuation occurring once every 4 seconds. Or insert LED jig and LED should flicker once in 4 seconds.

- If no abnormality is detected, carry out fault assessment of the outdoor unit.

10-3-2. Fault Assessment of Outdoor Unit

No.	Operation	Checkpoints (operation of the unit)
1	Apply rated voltage between 1 and 2 of terminal block on outdoor unit.	● RED LED on control board should turn on.
2	Short-circuit the COM and T-RUN terminal in outdoor unit.	● Compressor, fan motor and 4-way valve should all be ON.

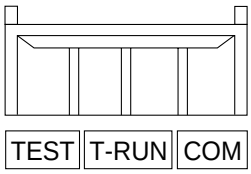
- If no abnormality is detected, carry out fault assessment of the indoor unit (if not previously done).

How to use the TEST/T-RUN terminals

T-RUN: Test run (compressor, fan motor, 4-way valve are all ON)

TEST: Time-scales are reduced to 1/60 (operations occur 60 times faster than normal).

TEST/T-RUN terminals



10-4. Problems with Noise and Radio Interference

Since an inverter-type air conditioner works at high frequency under pulse control, it can be affected by external noise and may also generate interference to nearby radio equipment. For this reason, this air conditioner is fitted with an electrical noise filter, so no trouble should arise in normal use. However, problems with noise or radio interference may still occasionally occur depending on where the air conditioner is installed. Take careful note of the following points.

10-4-1. Problems with Electrical Noise

- External noise, such as high-frequency signals, become superimposed on the signal wiring. This may affect the signal pulse, resulting in a malfunction of the air conditioner.

Places subject to noise problems	Symptoms	Remedy
1. Areas near broadcasting stations where strong radio waves are generated. 2. Areas near a ham radio operator. 3. Areas where high-frequency sewing machines or arc-welding equipment are used.	In such a case, the following symptoms may occur: 1. The air conditioner stops during operation 2. Indicator lamps flash	Ensure that the signal wiring is not affected by electrical noise. Isolate the noise or separate the signal wiring from the noise source. 1. Adopt shielded wiring. 2. Separate the air conditioner from the noise source.

10-4-2. Radio Interference

- The air conditioner contains a microcomputer and a compressor which perform switching operations at high speed. This generates electrical noise. If this noise escapes from the unit or gets into the wiring, interference to nearby radio equipment such as a television or radio may occur.

Possible noise sources	Symptoms	Remedy
1. A television or radio is near the air conditioner or its wiring. 2. The antenna cable for a television or radio is near the air conditioner or its wiring. 3. The signal received from a television or radio station is weak.	1. Television screen is disrupted by noise or the image is distorted. 2. Radio programs are affected by crackling noises.	1. Use another power outlet. 2. Keep radio equipment and antenna cables 1 meter or more from the air conditioner and its wiring. 3. Replace the antenna with a high-sensitivity antenna. 4. Replace the antenna cable with coaxial cable. 5. Install a noise filter (for radio equipment). 6. Install a booster.

11. REFRIGERANT R410A: SPECIAL PRECAUTIONS WHEN SERVICING UNIT

11-1. Characteristics of New Refrigerant R410A

11-1-1. What is New Refrigerant R410A?

R410A is a new refrigerant that contains two types of pseudo-non-azeotropic refrigerant mixture which do not adversely affect the earth's ozone layer. Its refrigeration capacity and energy efficiency are about the same level as the conventional refrigerant, R22.

11-1-2. Components (mixing proportions)

HFC32 (50%) / HFC125 (50%)

11-1-3. Characteristics

- Less toxic, more chemically stable refrigerant
- The composition of refrigerant R410A changes whether it is in a gaseous phase or liquid phase. Thus, when there is a refrigerant leak the basic performance of the air conditioner may be degraded because of a change in composition of the remaining refrigerant. ***Therefore, do not add new refrigerant.*** Instead, recover the remaining refrigerant with the refrigerant recovery unit. Then, after evacuation, totally recharge the specified amount of refrigerant with the new refrigerant at its normal mixed composition state (in liquid phase).
- When refrigerant R410A is used, the composition will differ depending on whether it is in gaseous or liquid phase, and the basic performance of the air conditioner will be degraded if it is charged while the refrigerant is in gaseous state. ***Thus, always charge the refrigerant while it is in liquid phase.***

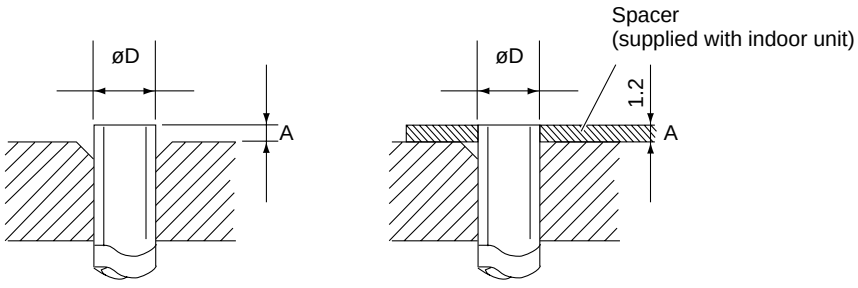
CAUTION **Ether-type oil is used for compressor oil for R410A-type units, which is different from the mineral oil used for R22. Thus more attention to moisture prevention and faster replacement work compared with conventional models are required.**

11-2. Checklist Before Servicing

Use a clutch-type flare tool for R410A or the conventional flare tool. Note that sizes of the resultant flares differ between these two tools. Where a conventional flare tool is used, make sure to observe A Specification (amount of extrusion) by using the flare spacer supplied with the indoor unit.

Diameter of tube (ø) D	A Specification	
	Flare tool for R410A	Conventional flare tool (for R22)
ø6.35 (1/4")	0 – 0.5 mm	1.0 – 1.5 mm
ø9.52 (3/8")	0 – 0.5 mm	1.0 – 1.5 mm

- **Size of flare**



Flare tool for R410A Conventional flare tool (R22)

- **Tubing precautions**

  Refrigerant R410A is more easily affected by dust or moisture compared with R22, thus be sure to temporarily cover the ends of the tubing with caps or tape prior to installation.

  Never use 0.7mm-thick copper pipe or pipes which are less than 0.8mm in thickness, since air conditioners with R410A are subject to higher pressure than those using R22 and R407C.

Diameter of narrow tube	Diameter of wide tube
ø6.35 (1/4") 2 minutes	ø9.52 (3/8") 3 minutes

- **No addition of compressor oil for R410A**

  No additional charge of compressor oil is permitted.

- **No use of refrigerant other than R410A**

  Never use a refrigerant other than R410A.

- **If refrigerant R410A is exposed to fire**

  Through welding, etc., toxic gas may be released when R410A refrigerant is exposed to fire. Therefore, be sure to provide ample ventilation during installation work.

- **Caution in case of R410A leak**

  Check for possible leak points with the special leak detector for R410A. If a leak occurs inside the room, immediately provide thorough ventilation.

11-3. Tools Specifically for R410A

- **For servicing, use the following tools for R410A**

Tool Distinction	Tool Name
Tools specifically for R410A	● Gauge manifold ● Charging hose ● Gas leak detector ● Refrigerant cylinder ● Charging cylinder ● Refrigerant recovery unit ● Vacuum pump with anti-reverse flow (***1**) (Solenoid valve-installed type, which prevents oil from flowing back into the unit when the power is off, is recommended.) ● Vacuum pump (***2**) … can be used if the following adapter is attached. ● Vacuum pump adapter (reverse-flow prevention adapter) (***3**). (Solenoid valve-installed adapter attached to a conventional vacuum pump.) ● Electronic scale for charging refrigerant ● Flare tool
Tools which can be commonly used for R22, R407C, and R410A	● Bender ● Torque wrench ● Cutter, reamer ● Welding machine, nitrogen gas cylinder

CAUTION

- **The above tools specifically for R410A must not be used for R22 and R407C. Doing so will cause malfunction of the unit.**
- **For the above vacuum pump (*1, *2) and vacuum pump adapter (*3), those for R22-type units can be used for R407C-type. However, they must be used exclusively for R410A and never alternately with R22 and R407C.**

- To prevent other refrigerants (R22, R407C) from being mistakenly charged to this unit, sizes of the service ports and flare nuts of the narrow tube service valve and wide tube service valve have been altered.

11-4. Tubing Installation Procedures

When the tubes are connected, ***always apply HAB oil on the flare portions to improve the sealing of tubing.***

The following is the **HAB oil** generally used:

Esso: ZERICE S32

NOTE For details on tubing installation procedures, refer to the installation manuals attached to the indoor unit and outdoor unit.

11-5. In Case of Compressor Malfunction

CAUTION

- **Should the compressor malfunction, be sure to make the switch to a replacement compressor as quickly as possible.**
- **Use only the tools indicated exclusively for R410A. → See "11-3. Tools Specifically for R410A."**

11-5-1. Procedure for replacing compressor

(1) Recovering refrigerant

- Any remaining refrigerant inside the unit should not be released to the atmosphere, but recovered using the refrigerant recovery unit for R410A.
- Do not reuse the recovered refrigerant, since will contain impurities.

(2) Replacing Compressor

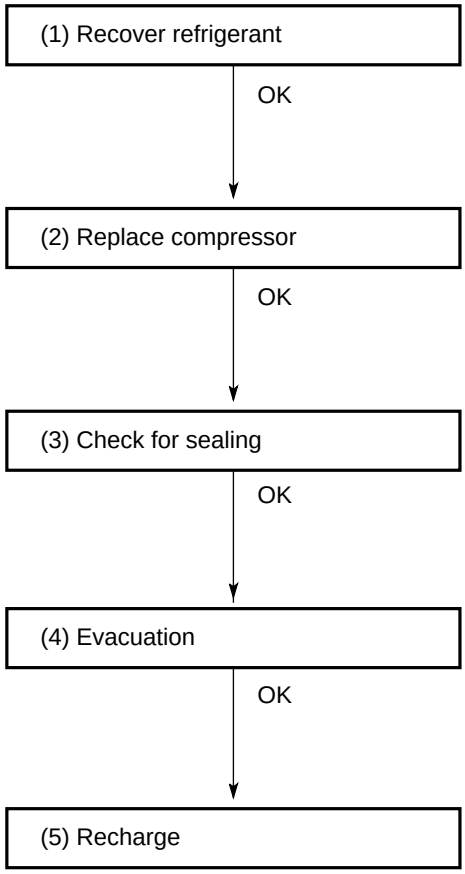
- Soon after removing seals of both discharge and suction tubes of the new compressor, replace it quickly.

(3) Checking for sealing

- Use nitrogen gas for the pressurized gas, and never use a refrigerant other than R410A. Also do not use oxygen or any flammable gas.

(4) Evacuation

- ***Use a solenoid valve-installed vacuum pump*** so that even if power is cut off in the middle of evacuation of air due to a power interruption, the valve will prevent the pump oil from flowing back.
- The equipment may be damaged if moisture remains in the tubing, thus carry out the evacuation thoroughly.
- When using a vacuum pump with exhaust air volume more than 25L/min. and ultimate vacuum pressure rate of 0.05Torr:



Standard time for evacuation

Length of tubing	Less than 10 meters	More than 10 meters
Time	More than 10 minutes	More than 15 minutes

(5) Recharging

- ***Be sure to charge the specified amount of refrigerant in liquid state*** using the service port of the wide tube service valve. The proper amount is listed on the unit's nameplate.

  When the entire amount cannot be charged all at once, charge gradually while operating the unit in Cooling Operation.

CAUTION

Never charge a large amount of liquid refrigerant at once to the unit. This may cause damage to the compressor.

- When charging with a refrigerant cylinder, use an electronic scale for charging refrigerant. In this case, if the volume of refrigerant in the cylinder becomes less than 20% of the fully-charged amount, the composition of the refrigerant starts to change. Thus, ***do not use the refrigerant if the amount in the charging cylinder is less than 20%.***

  Also, charge the minimum necessary amount to the charging cylinder before using it to charge the air conditioning unit.

Example:

In case of charging refrigerant to a unit requiring 0.76Kg using a capacity of a 10Kg cylinder, the minimum necessary amount for the cylinder is:

$$0.76 + 10 \times 0.20 = 2.76\text{Kg}$$

For the remaining refrigerant, refer to the instructions of the refrigerant manufacturer.

- If using a charging cylinder, transfer the specified amount of liquid refrigerant from the refrigerant cylinder to the charging cylinder.

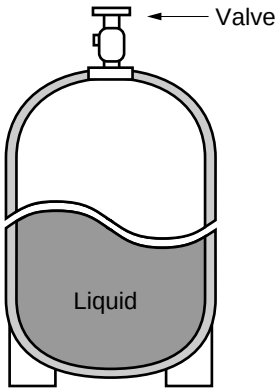
  Prepare an evacuated charging cylinder beforehand.

CAUTION

- **To prevent the composition of R410A from changing, never bleed the refrigerant gas into the atmosphere while transferring the refrigerant. (Fig. 3)**

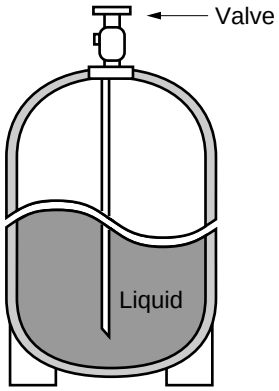
Do not use the refrigerant if the amount in the charging cylinder is less than 20%.

Configurations and characteristics of cylinders



Single valve
Charge liquid refrigerant with cylinder in up-side-down position.

Fig. 1



Single valve (with siphon tube)
Charge with cylinder in normal position.

Fig. 2

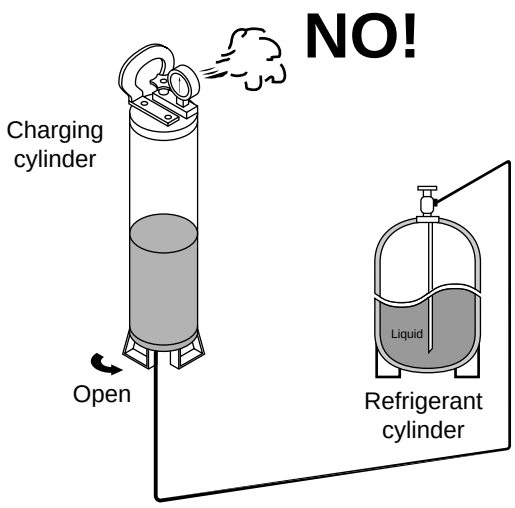


Fig. 3

11-6. In Case Refrigerant is Leaking

CAUTION **Never attempt to charge additional refrigerant when refrigerant has been leaking from the unit. Follow the procedure described below to locate points of leaks and carry out repairs, then recharge the refrigerant.**

(1) Detecting Leaks

- Use the detector for R410A to locate refrigerant leak points.

(2) Recovering refrigerant

- Never release the gas to the atmosphere, recover residual refrigerant using the refrigerant recovery unit for R410A, instead.
- Do not reuse the recovered refrigerant because its composition will have been altered.

(3) Welding leaking points

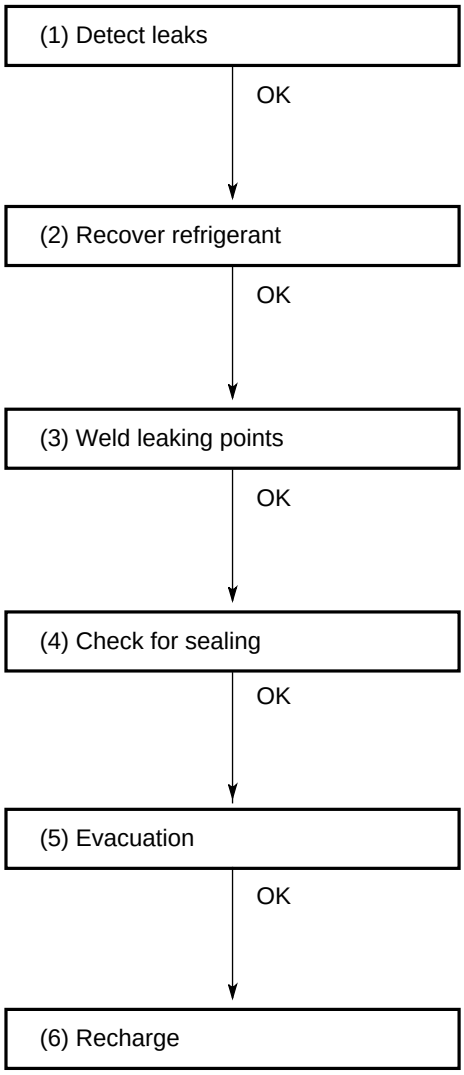
- Confirm again that no residual refrigerant exists in the unit before starting welding.
- Weld securely using flux and wax for R410A.
- Prevent oxide film from forming inside the tubes utilizing substitution with nitrogen (N2) in the refrigerant circuit of the unit. Leave ends of tubes open during welding.

(4) Checking for sealing

- Use nitrogen gas for the pressurized gas, and never use a refrigerant other than R410A. Also do not use oxygen or any flammable gas.

(5) Evacuation

- ***Use a solenoid valve-installed vacuum pump*** so that even if power is cut off in the middle of evacuation of air due to a power interruption, the valve will prevent the pump oil from flowing back.
- The equipment may be damaged if moisture remains in the tubing, thus carry out the evacuation thoroughly.
- When using a vacuum pump with exhaust air volume more than 25L/min. and ultimate vacuum pressure rate of 0.05Torr:



Standard time for evacuation

Length of tubing	Less than 10 m	More than 10 m
Time	More than 10 minutes	More than 15 minutes

(6) Recharging

- ***Be sure to charge the specified amount of refrigerant in liquid state*** using the service port of the wide tube service valve. The proper amount is listed on the unit's nameplate.

  When the entire amount cannot be charged all at once, charge gradually while operating the unit in Cooling Operation.

CAUTION

Never charge a large amount of liquid refrigerant at once to the unit. This may cause damage to the compressor.

- When charging with a refrigerant cylinder, use an electronic scale for charging refrigerant. In this case, if the volume of refrigerant in the cylinder becomes less than 20% of the fully-charged amount, the composition of the refrigerant starts to change. Thus, ***do not use the refrigerant if the amount in the charging cylinder is less than 20%.***

  Also, charge the minimum necessary amount to the charging cylinder before using it for charging the air conditioning unit.

Example:

In case of charging refrigerant to a unit requiring 0.76Kg using a capacity of a 10Kg cylinder, the minimum necessary amount for the cylinder is:

$$0.76 + 10 \times 0.20 = 2.76\text{Kg}$$

For the remaining refrigerant, refer to the instructions of the refrigerant manufacturer.

- If using a charging cylinder, transfer the specified amount of liquid refrigerant from the refrigerant cylinder to the charging cylinder.

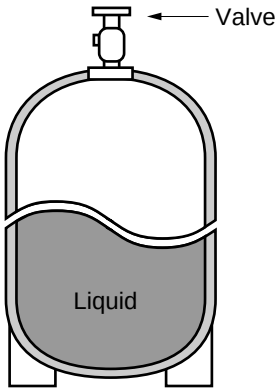
  Prepare an evacuated charging cylinder beforehand.

CAUTION

To prevent the composition of R410A from changing, never bleed the refrigerant gas into the atmosphere while transferring the refrigerant. (Fig. 6)

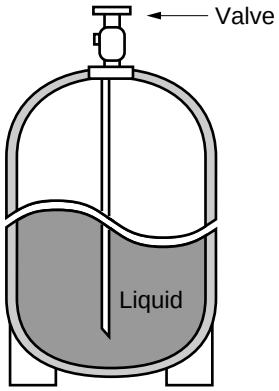
Do not use the refrigerant if the amount in the charging cylinder is less than 20%.

Configurations and characteristics of cylinders



Single valve
Charge liquid refrigerant with cylinder in up-side-down position.

Fig. 4



Single valve (with siphon tube)
Charge with cylinder in normal position.

Fig. 5

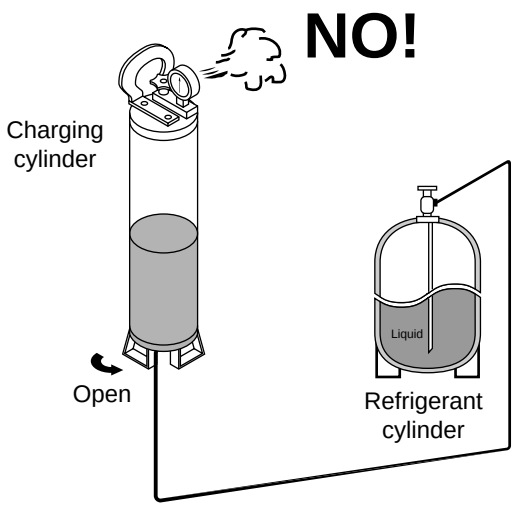


Fig. 6

11-7. Charging Additional Refrigerant

11-7-1. When Tubes are Extended

- Observe the proper amount of refrigerant as stated in this service manual or the installation manual that came with the indoor unit. ***Charge additional refrigerant in liquid state only.***

CAUTION

Never charge additional refrigerant if refrigerant is leaking from the unit. Follow instructions given in "11-6. In Case Refrigerant is Leaking" and completely carry out repairs. Only then should you recharge the refrigerant.

11-8. Retro-Fitting Existing Systems

11-8-1. Use of Existing Units

- ***Never use new refrigerant R410A for existing units which use R22.*** This will cause the air conditioner to operate improperly and may result in a hazardous condition.

11-8-2. Use of Existing Tubing

- If replacing an older unit that used refrigerant R22 with a R410A unit, ***do not use its existing tubing.*** Instead, completely new tubing must be used.

12. CHECKING ELECTRICAL COMPONENTS

12-1. Measurement of Insulation Resistance

- The insulation is in good condition if the resistance exceeds 1MΩ.

12-1-1. Power supply wires

Clamp the grounding terminal of the power plug with the lead clip of the insulation resistance tester and measure the resistance by placing a probe on either of the two power wires. (Fig. 1)

Then also measure the resistance between the grounding and other power terminals. (Fig. 1)

12-1-2. Indoor unit

Clamp an aluminum plate fin or copper tube with the lead clip of the insulation resistance tester and measure the resistance by placing a probe on each terminal screw where power supply lines are connected on the terminal plate. (Fig. 2)

12-1-3. Outdoor unit

Clamp an aluminum plate fin or copper tube with the lead clip of the insulation resistance tester and measure the resistance by placing a probe on each terminal screw on the terminal plate. (Fig. 2)

Note that the ground line terminal should be skipped for the check.

12-1-4. Measurement of insulation resistance for electrical parts

Disconnect the lead wires of the desired electric part from terminal plate, capacitor, etc. Similarly disconnect the connector. Then measure the insulation resistance. (Figs. 3 and 4)

NOTE

Refer to Electric Wiring Diagram.

If the probe cannot enter the poles because the hole is too narrow then use a probe with a thinner pin.

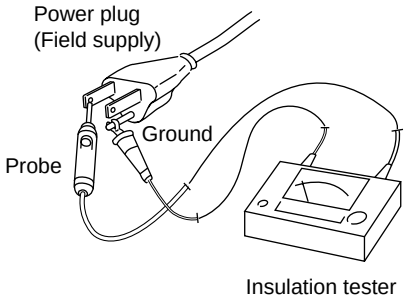


Fig. 1

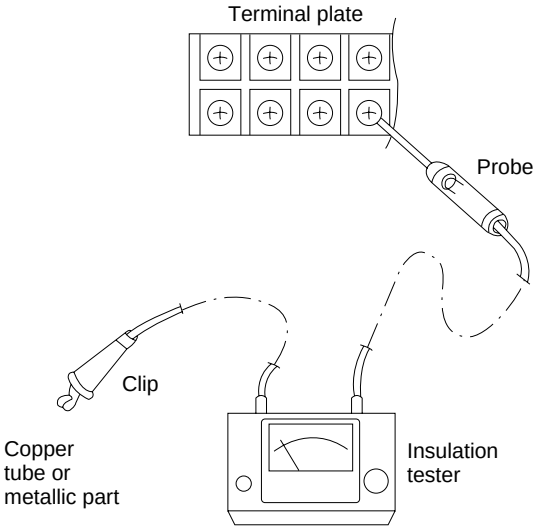


Fig. 2

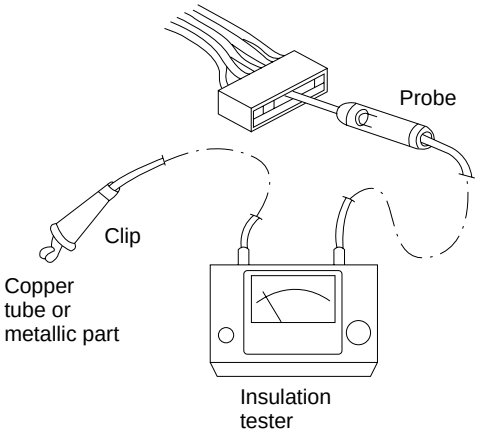


Fig. 3

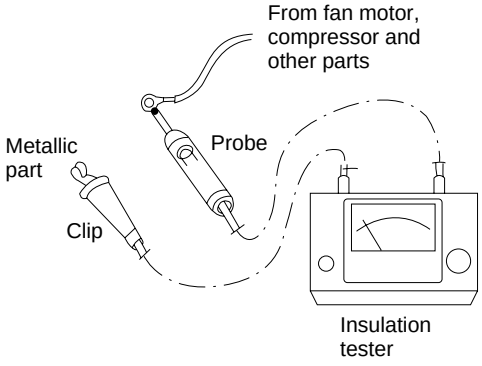


Fig. 4

12-2. Checking Continuity of Fuse on PCB Ass'y

- Remove the PCB Ass'y from the electrical component box. Then pull out the fuse from the PCB Ass'y. (Fig. 5)
- Check for continuity using a multimeter as shown in Fig. 6.

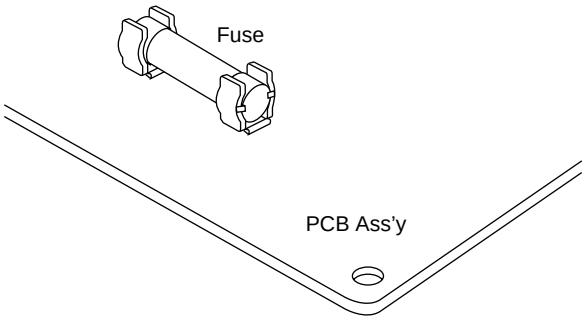


Fig. 5

12-3. Checking Motor Capacitor

Remove the lead wires from the capacitor terminals, and then place a probe on the capacitor terminals as shown in Fig. 7. Observe the deflection of the pointer, setting the resistance measuring range of the multimeter to the maximum value.

The capacitor is "good" if the pointer bounces to a great extent and then gradually returns to its original position.

The range of deflection and deflection time differ according to the capacity of the capacitor.

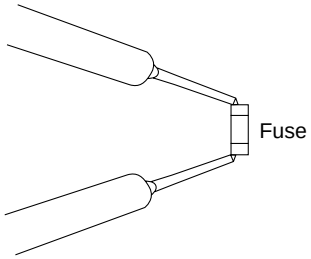


Fig. 6

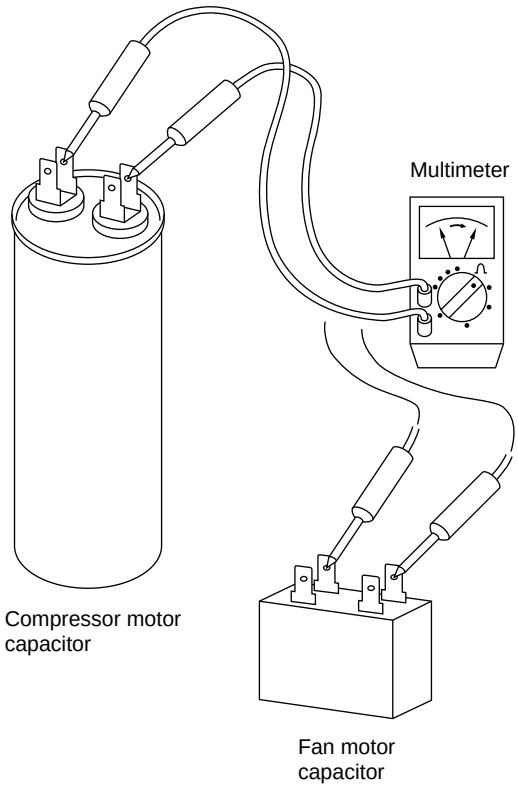


Fig. 7

APPENDIX INSTRUCTION MANUAL

SAP-KRV121EH + SAP-CRV121EH

Features

This air conditioner is an inverter type unit that automatically adjusts capacity as appropriate. Details on these functions are provided below; refer to these descriptions when using the air conditioner.

- **Microprocessor Controlled Operation**
  The interior compartment of the remote control unit contains several features to facilitate automatic operation, easy logically displayed for easy use.

- **Simple One-touch Wireless Remote Control**
  The remote control unit has several features to facilitate automatic operation.

- **Simple One-touch Wireless Remote Control (People Sensor)**
  The remote control uses the People Sensor to detect human movement by picking up changes in the infrared rays given off by people.

- **24-Hour ON or OFF Timer**
  This timer can be set to automatically turn the unit on or off at any time within a 24 hour period.

- **1-Hour OFF Timer**
  This timer can be set to automatically turn off the unit at any time after one hour.

- **Night Setback**
  Pressing this button changes the setting of the room temperature thermostat, allowing you to set the temperature at whatever level that you find comfortable.

- **Automatic and 3-step Fan Speed**
  Auto/High/Medium/Low

- **Air Sweep Control**
  This function moves a flap up and down and left and right in the air outlet, directing air in a sweeping motion around the room and providing comfort in every corner.

- **Hot Start Heating System**
  Right from the start, the air is warm and comfortable. This system prevents any cold blasts at the beginning while the heat pump is warming up, or even defrosting.

- **Anti-Mold Filter**
  This unit is equipped with an anti-mold filter that inhibits the growth of mold and bacteria.

- **Air Clean Filter**
  An air filter that uses activated charcoal to eliminate unpleasant odors and clean the air is available.

Contents

EG

Product Information

If you have problems or questions concerning your Air Conditioner, you will need the following information. Model and serial numbers are on the nameplate on the bottom of the cabinet.

Model No. _____ Serial No. _____

Date of purchase _____

Dealer's address _____

Phone number _____

DECLARATION OF CONFORMITY

This product is marked «CE» as it satisfies EEC Directive No. 89/336/EEC, 73/23/EEC, 93/68/EEC and 92/31/EEC.
This declaration will become void in case of mis-usage and/or from non observance though partial of Manufacturer's installation and/or operating instructions.

Alert Symbols

The following symbols used in this manual, alert you to potentially dangerous conditions to users, service personnel or the appliance:

WARNING **This symbol refers to a hazard or unsafe practice which can result in severe personal injury or death.**

CAUTION **This symbol refers to a hazard or unsafe practice which can result in personal injury or product or property damage.**

Installation Location

- **We recommend that this air conditioner be installed properly by qualified installation technicians in accordance with the Installation Instructions provided with the unit.**
- Before installation, check that the voltage of the electric supply in your home or office is the same as the voltage shown on the nameplate.

WARNING

- **Do not install this air conditioner where there are fumes or flammable gases, or in an extremely humid space such as a greenhouse.**
- **Do not install the air conditioner where excessively high heat-generating objects are placed.**

Avoid: To protect the air conditioner from heavy corrosion, avoid installing the outdoor unit where salty sea water can splash directly onto it or in sulphurous air near a spa.

Electrical Requirements

1. All wiring must conform to the local electrical codes. Consult your dealer or a qualified electrician for details.
2. Each unit must be properly grounded with a ground (or earth) wire or through the supply wiring.
3. Wiring must be done by a qualified electrician.

Safety Instructions

- **Read this Instruction Manual carefully before using this air conditioner. If you still have any difficulties or problems, consult your dealer for help.**
- **This air conditioner is designed to give you comfortable room conditions. Use this only for its intended purpose as described in this Instruction Manual.**

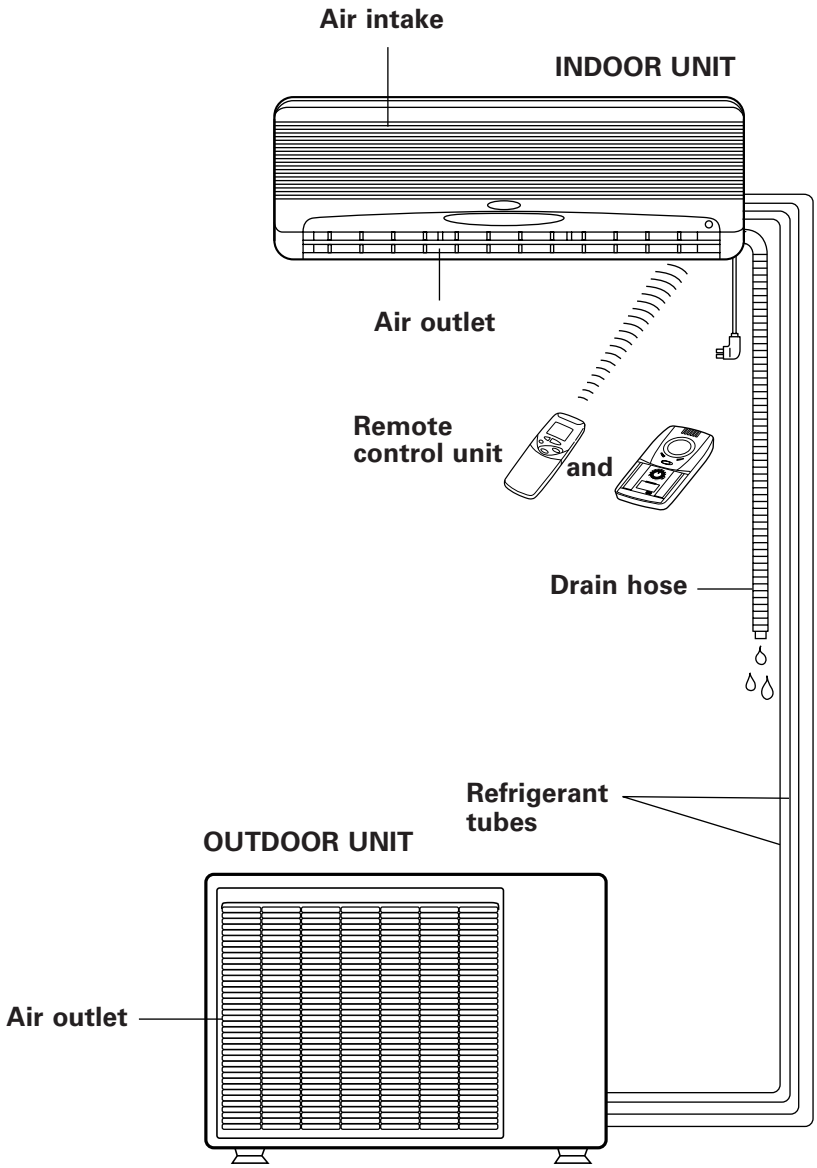
WARNING

- **Never use or store gasoline or other flammable vapor or liquid near the air conditioner — it is very dangerous.**
- **This air conditioner has no ventilator for intaking fresh air from outdoors. You must open doors or windows frequently when you use gas or oil heating appliances in the same room, which consume a lot of oxygen from the air. Otherwise there is a risk of suffocation in an extreme case.**

CAUTION

- **Do not turn the air conditioner on and off from the power mains switch. Use the ON/OFF operation button.**
- **Do not stick anything into the air outlet of the outdoor unit. This is dangerous because the fan is rotating at high speed.**
- **Do not let children play with the air conditioner.**
- **Do not cool or heat the room too much if babies or invalids are present.**

Names of Parts



NOTE This illustration is based on the external view of a standard model. Consequently, the shape may differ from that of the air conditioner which you have selected.

This air conditioner consists of an indoor unit and an outdoor unit. You can control the air conditioner with the remote control unit.

Air intake	Air from the room is drawn into this section and passes through air filters which remove dust.
Air outlet	Conditioned air is blown out of the air conditioner through the air outlet.
Remote control unit	The wireless remote control unit controls power ON/OFF, operation mode selection, temperature, fan speed, timer setting, and air sweeping.
Refrigerant tubes	The indoor and outdoor units are connected by copper tubes through which refrigerant gas flows.
Drain hose	Moisture in the room condenses and drains off through this hose.
Outdoor (Condensing) unit	The outdoor unit contains the compressor, fan motor, heat exchanger coil, and other electrical components.

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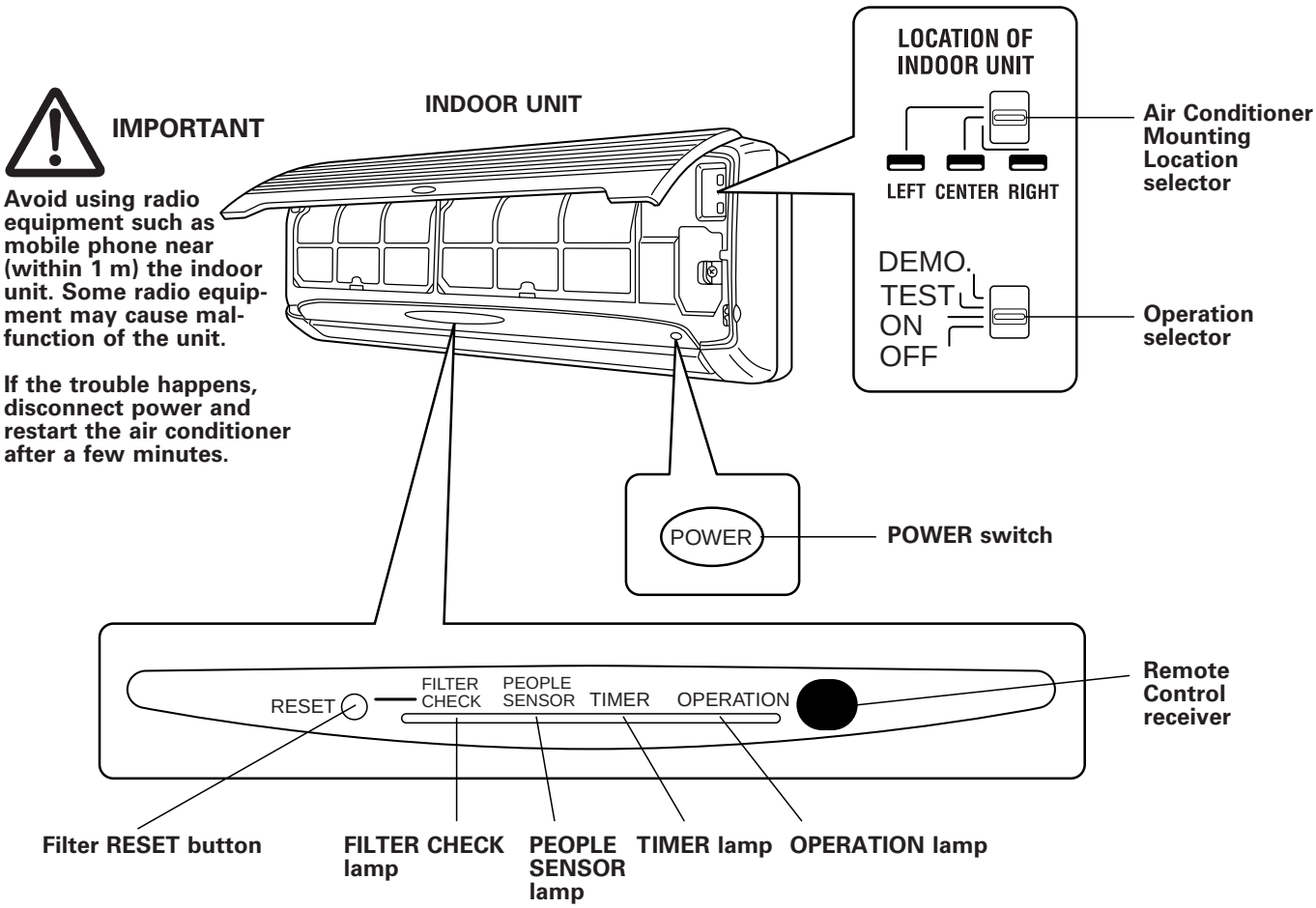
Unit Display and Operation Selector

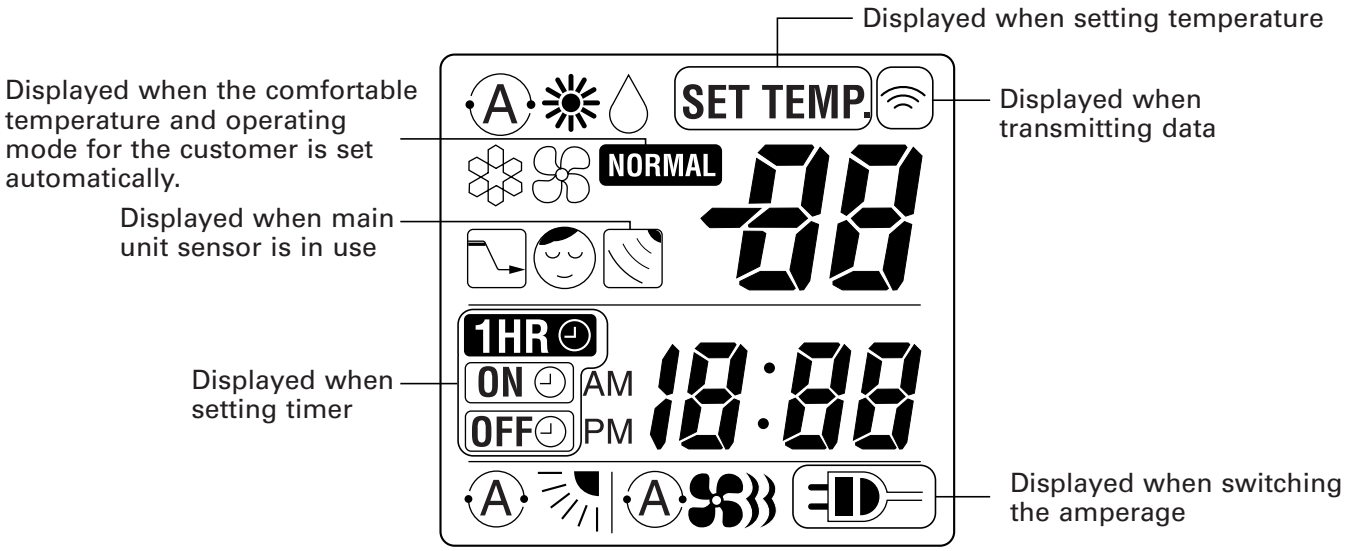


Remote Control receiver	This section picks up infrared signals from the remote control unit (transmitter).
Operation selector	
ON position	This position is for operating the air conditioner with the wireless remote control unit. Set the selector normally in this position.
OFF position	Switch the selector to the OFF position if you are not going to use the air conditioner for a few days or longer.
WARNING	**The OFF position does not disconnect the power. Use the main power switch to turn off power completely.**
TEST and DEMO. position	This position is used only when servicing the air conditioner.
CAUTION	**Do not set at the TEST and DEMO. position for normal operation.**
OPERATION lamp	This lamp lights when the system is in the continuous DRY, COOL, FAN and HEAT mode.
TIMER lamp	This lamp lights when the system is being controlled by the timer.

Unit Display and Operation Selector (continued)

Air Conditioner Mounting Location selector	Setting the air conditioner mounting location sets the swing range of the horizontal airflow control flaps to positions suitable for the mounting location.
POWER switch	Setting the POWER switch to OFF ensures that excess power is not consumed even when the air conditioner is plugged in. This is useful when the air conditioner will not be used for an extended period of time.
PEOPLE SENSOR lamp	This lamp lights for approximately 15 minutes when a signal is received from the People Sensor remote control unit.
FILTER CHECK lamp and Filter RESET button	When the air filter starts to become dirty, the lamp turns orange. When the air filter is further dirtied, the lamp changes to red. The lamp lights for three seconds when operation starts. Clean the air filter when the lamp turns red. Be sure to always press this button after cleaning the filter.

Remote Control Unit (Display)



Symbols

(1) Operation mode

AUTO .....

COOL .....

HEAT .....

MILD DRY .....

FAN .....

(2) Fan speed

Automatic operation .....

HIGH .....

MEDIUM .....

LOW .....

(3) Set temperature
16 – 30 °C

When set to 28 °C .....

Current temperature indication .....

(4) Timer

24-hour ON Timer .....

24-hour OFF Timer .....

1-hour OFF Timer .....

(5) NIGHT SETBACK .....

(6) SAVE .....

(7) Confirmation of transmission .....

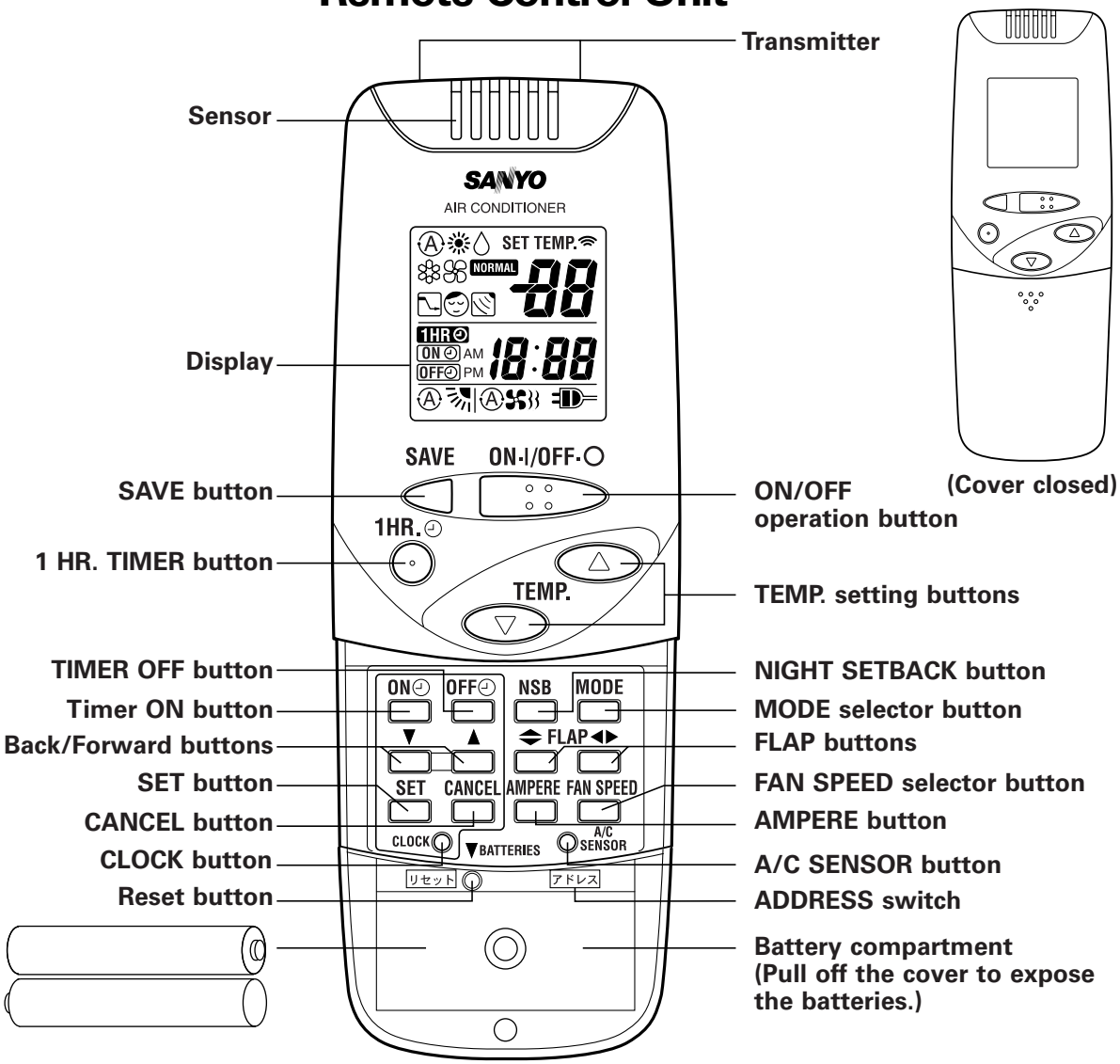
(8) Flap

AUTO .....

Angle indication .....

Sweep indication .....

Remote Control Unit



NOTE The illustration above pictures the remote control unit after the cover has been lowered and removed.

Transmitter	When you press the buttons on the remote control unit, the mark appears in the display to transmit the setting changes to the receiver in the air conditioner.
Sensor	A temperature sensor inside the remote control unit senses the room temperature.
Display	Information on the operating conditions is displayed while the remote control unit is switched on. If the unit is turned off, only the mode that was set previously is still displayed.
NIGHT SETBACK button	For details, see ''Night Setback Mode''. When you press this button in the HEAT, DRY or COOL mode, the mark appears in the display, and the remote control unit will automatically adjust the set temperature to save energy.
TEMP. setting buttons	Press the △ button to increase the set temperature. Press the ▽ button to reduce the set temperature.
ON/OFF operation button	This button is for turning the air conditioner on and off.
TIMER ON button	ON : The air conditioner starts at the set time.
TIMER OFF button	OFF : The air conditioner stops at the set time.
SET button	After using the TIMER ON button or TIMER OFF button to set the timer, press this button to activate the new setting.
CANCEL button	Press this button to cancel the current timer setting.

EG

Remote Control Unit (continued)

SAVE button	This button fixes the temperature setting and reduces the operating current to allow energy-conserving operation friendly to the environment.
AMPERE button	This button can be used to make it more difficult for the circuit breaker to trip when the air conditioner is used with devices consuming large amounts of power.
ADDRESS switch	• The address switch changes to prevent mixing of signals from remote control units when two Sanyo air conditioners are installed next to each other. Normally, the address switch is set to A. When switching the address, the remote control unit and People Sensor must be changed, and the jumper cables on the indoor unit board must be switched. For more information, please contact the dealer where you made the purchase. • Normally, the tabs on the remote control unit should not bent, and the address for the People Sensor should not be switched to B.
CLOCK button	Press this button to set the current time.
MODE selector button **Green or red (AUTO)** **Red (HEAT)** **Orange (DRY)** **Green (COOL)** **Green (FAN)**	Use this button to select the AUTO, HEAT, DRY, COOL or FAN mode. Ⓐ : The air conditioner automatically selects the type of operation (HEAT, DRY, COOL) suitable for the particular room environment. : The air conditioner makes the room warmer. : The air conditioner reduces the humidity in the room. : The air conditioner makes the room cooler. : The air conditioner works only as a circulation fan.
FLAP buttons **NOTE**	Press the ◆ button either to select to set the airflow direction to one of the six possible positions manually, or to select the sweep function, which moves the flap up and down automatically. Ⓐ : The airflow direction is set automatically. : The airflow direction can be set manually. (six positions) : The flap moves up and down automatically. To switch to the sweep function ( ) when in the manual ( ) mode, hold down the FLAP button. When ◀▶ button is pressed, the vertical vanes swing so that air is blown from side to side.
FAN SPEED selector button	Ⓐ : The air conditioner automatically decides the fan speeds. : High fan speed : Medium fan speed : Low fan speed
1 HR. TIMER button (1-HOUR OFF TIMER)	1HR : When you press this button, regardless of whether the unit is operating or stopping, the unit operates for one hour and then shuts down.
Reset (リセット) button (ALL CLEAR)	Puts the remote control unit into pre-operation status. Always press this button after replacing the batteries.
A/C SENSOR button **NOTE**	When you press this button (use a small-tipped object such as a ballpoint pen), the mark will appear at the display. And the room temperature is detected by the sensor which is built into the indoor unit and the air conditioner is controlled accordingly. If the remote control is located near a heat source, such as a space heater or in direct sunlight, press the A/C SENSOR button to switch to the sensor on the indoor unit.

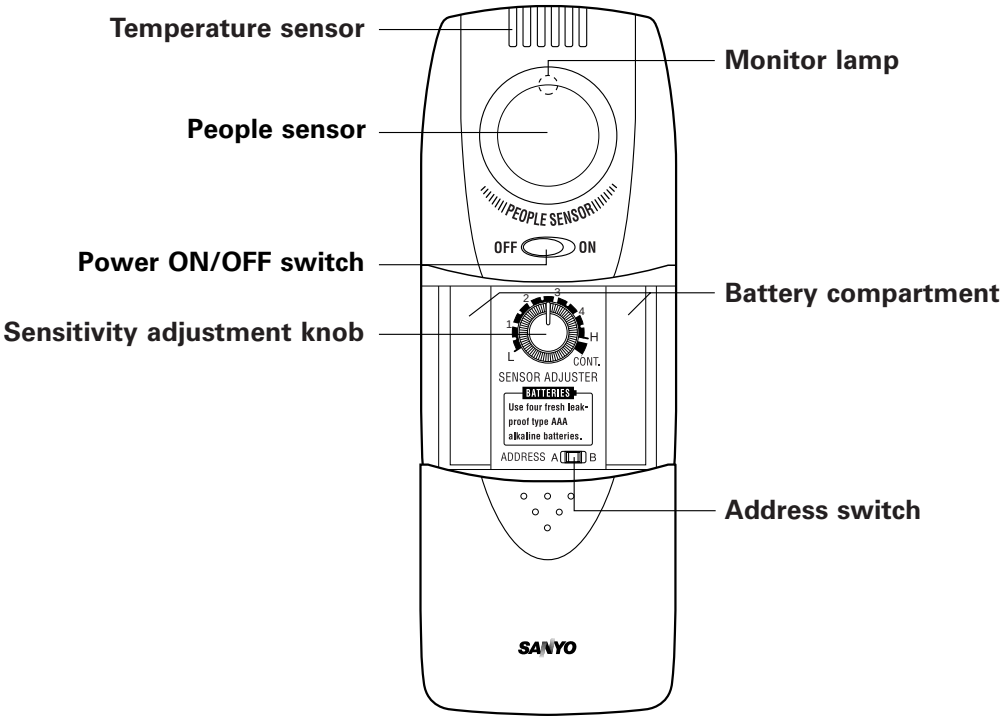
NOTE The remote control unit sends the temperature signal to the air conditioner regularly at five minute intervals. If the signal from the remote control unit stops for more than seventeen minutes due to the loss of the remote control unit or other trouble, the air conditioner will switch to the temperature sensor which is built into the indoor unit and control the room temperature. In these cases, the temperature around the remote control unit may differ from the temperature detected at the air conditioner's position.

Names of Parts

PEOPLE SENSOR

This sensor detects human movement using changes in the infrared rays given off by people. When people are detected in the vicinity of the PEOPLE SENSOR during operation, the air conditioner is controlled so that the surrounding room temperature reaches the temperature setting. Also, this eliminates wasteful operation when people are not near the remote control unit for added energy savings.

The figure below shows a cut-away view after the cover of the PEOPLE SENSOR is slid open.

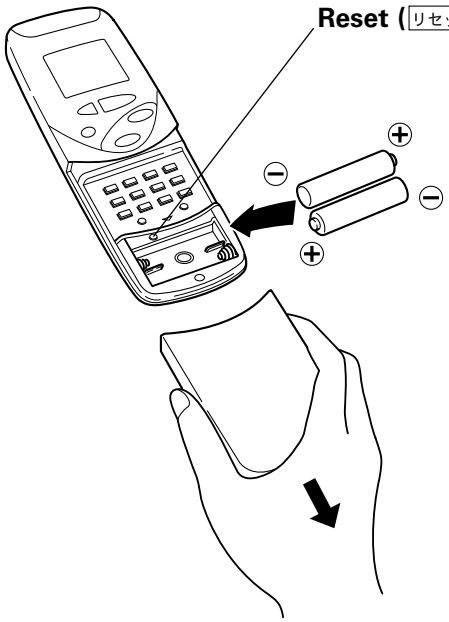


Temperature sensor	This sensor detects the surrounding temperature.
People sensor	This sensor detects when people are in the vicinity of the remote control unit. Do not press on this section. Doing so could dent the sensor so that it no longer operates normally.
Power ON/OFF switch	Set to ON when using the People sensor. Set to OFF when not in use or when replacing the batteries. (Note this switch cannot start or stop operation of the air conditioner.)
Sensitivity adjustment knob	This knob is used to adjust the sensitivity of the People sensor. Weak – Strong: Adjust the sensitivity so that the sensor can detect people in the required area under the room conditions. Continuous: This sets the air conditioner so that the People sensor is always activated.
Monitor lamp	The monitor lamp lights up in the following cases. • When the Power ON/OFF switch is set to ON. • When the People sensor detects movement of people about one to six minutes after the Power ON/OFF switch has been turned on. • When signals are sent at roughly 10-minute intervals during detection by the People sensor
Battery compartment	Inserting the Batteries 1. Set the Power ON/OFF switch to OFF. 2. Slide the cover down so that it comes off. 3. Insert four AAA alkaline batteries. Be sure that the + and – ends are facing the correct direction. 4. Set the Power ON/OFF switch to ON. The indoor unit should make a beeping sound to indicate that it has received the signal.
Address switch	See the description for ADDRESS switch in the section "Remote Control Unit" on page 10.

EG

Using the Remote Control Unit

How to Install Batteries



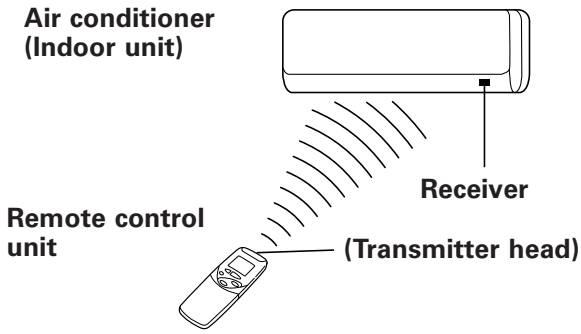
1. Slide the cover in the direction indicated by the arrow and remove it.
2. Install two AAA alkaline batteries. Make sure the batteries point in the direction marked in the battery compartment.
3. Use a thin object such as the tip of a pen to press the リセット button.

NOTE

- **The batteries last about six months, depending on how much you use the remote control unit. Replace the batteries when the remote control unit's display fails to light, or when the remote control cannot be used to change the air conditioner's settings.**
- **Use two fresh leak-proof type-AAA alkaline batteries.**
- **In replacing batteries, follow the instructions as mentioned in the sub-section "How to Install Batteries".**
- **If you do not use the remote control unit more than 1 month, take out the batteries.**

How to Use the Remote Control Unit

When using the remote control unit, always point the unit's transmitter head directly at the air conditioner's receiver.



Remote Control Unit Installation Position

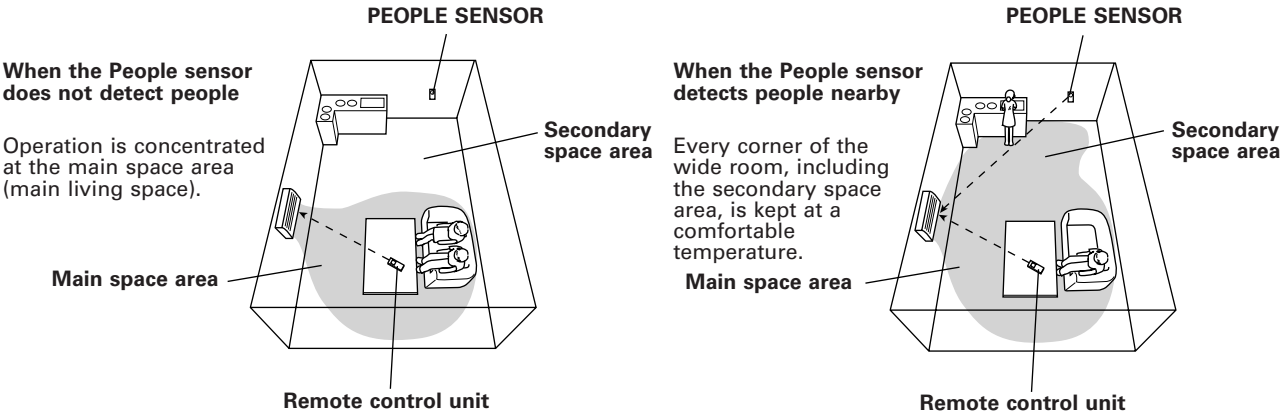
The remote control unit may be operated either from a non-fixed position or from a wall-mounted position. To ensure that the air conditioner operates correctly, DO NOT install the remote control unit in the following places:

DO NOT

- In direct sunlight
- Behind a curtain or other places where it is covered
- More than 8 m away from the air conditioner
- In the path of the air conditioner's airstream
- Where it may become extremely hot or cold
- Where it may be subject to electrical or magnetic noise
- Where there is an obstacle between the remote control unit and air conditioner (since a check signal is sent from the remote control unit every 3 minutes)

Using the PEOPLE SENSOR

- This sensor detects human movement using changes in the infrared rays given off by people. When people are detected in the vicinity of the PEOPLE SENSOR during operation, the air conditioner is controlled so that the surrounding room temperature reaches the temperature setting. Also, this eliminates wasteful operation when people are not near the remote control unit for added energy savings.
- Room temperature control and airflow control are performed during automatic operation. When you select a manual operation mode (HEAT, DRY, COOL), room temperature control only is performed.
- The People Sensor should be mounted vertically on a wall or other surface in the secondary space area facing the direction where people can be detected. Also, use the remote control unit to turn the horizontal airflow control flaps on the indoor unit toward the main space area.



NOTE

The above control is not performed when A/C Sensor appears on the display of the remote control unit.

Room temperature control and airflow control

- Room temperature and airflow control are performed in the following way when the room temperature reaches the setting temperature and people are detected by the People sensor.
- If there is a wide difference between the temperature detected by the remote control unit and PEOPLE SENSOR, this room temperature and airflow control may be unable to be performed.

Room temperature control

If there is a difference in temperature between the main space area and secondary space area, the setting temperature is adjusted by up to ±1 °C so that the entire room is at a comfortable temperature. The setting temperature display for the indoor unit does not change.

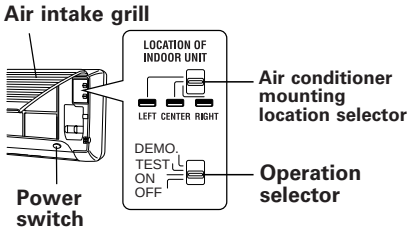
Airflow control

- Automatic operation
  The temperature difference between the main space area and secondary space area is checked about once every 10 minutes. Based on this, the swing time for the horizontal airflow control flaps are adjusted so that the room reaches a uniform temperature. (During automatic airflow control when heating, the flaps are raised one step if necessary.)
- Airflow control cannot be performed during manual operation.
- To cancel airflow control, press ◀▶ on the remote control unit. To start airflow control again, press ON·I/OFF·○ on the remote control unit so that operation stops, and then press this button again to restart operation.

Before Operation (Main Unit)

Make the following preparations before operating the air conditioner.

Before Operation



1. **Open the air intake grill.**
   To access the inner main operation panel, grip both ends of the air intake grill and pull towards you so that the grill comes off.

2. **Set the Operation selector to the ON position.**
   Normally, the selector should be set to the ON position. The OFF, TEST RUN, and DEMO. positions are used for inspection and other purposes. When set to TEST RUN, the display indicator flashes.

3. Plug the air conditioner into the outlet.

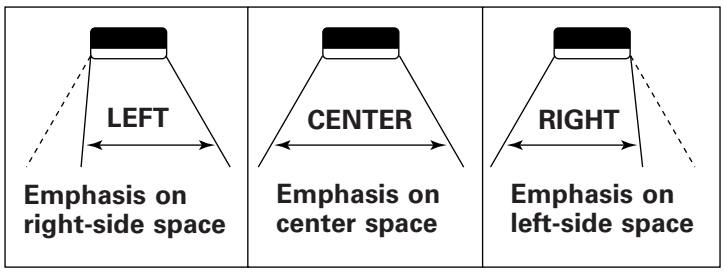
4. Press the Power switch to set it to ON.

   Off On

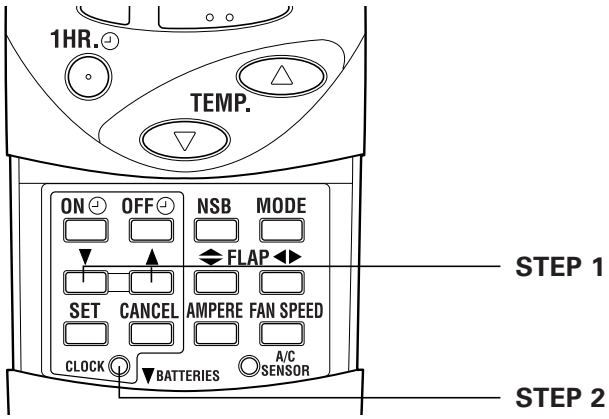
5. Set the Air Conditioner Mounting Location selector to the installation location for the room.

Air Conditioner Mounting Location Selector

Setting the air conditioner mounting location for the room sets the airflow range to positions suitable for the installation location. The swing ranges of the horizontal airflow control flaps for each setting are shown below.



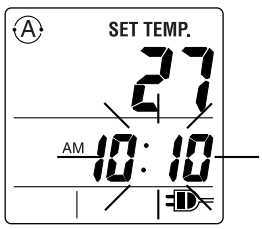
Before Operation (Remote Control Unit)



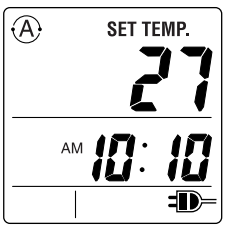
EG

Setting the Current Time

Example: Setting to 10:10 AM
Press リセット so that 0:00 PM is displayed.
(To correct the current time during air conditioner operation, press CLOCK. The clock display flashes.)



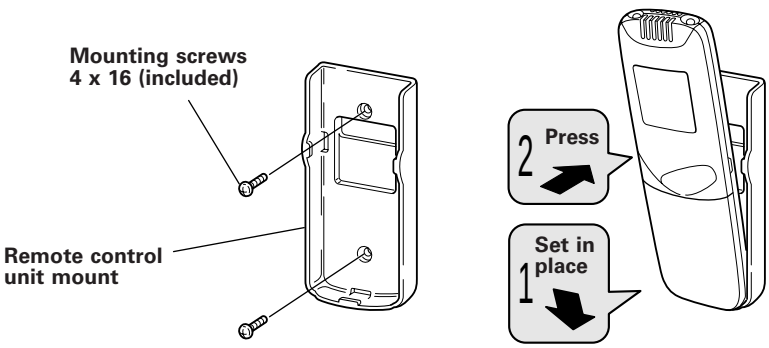
1. Use the ▼ and ▲ buttons to set the time to 10:10 AM.
   The time can be set in 1-minute units. Holding down the button changes the time in 10-minute units.



2. Press CLOCK.
   This sets the current time.

Mounting the Remote Control Unit

Before mounting the remote control unit, press the ON·I/OFF· button at the mounting location to make sure that the air conditioner operates from that location. The indoor unit should make a beeping sound to indicate that it has received the signal.



To take out the remote control unit, pull it forward.

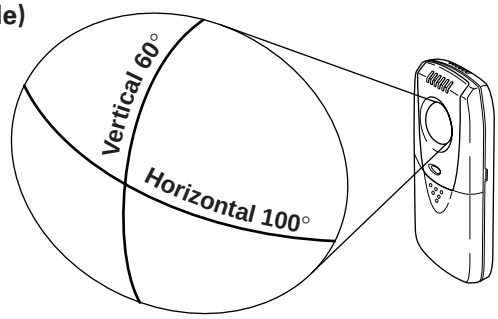
When Holding the Remote Control Unit

- When using the remote control unit and during air conditioner operation, the transmitter on the remote control unit should be pointed toward the receiver on the indoor unit.
- Make sure that there are no objects between the remote control unit and receiver which could block the signal.

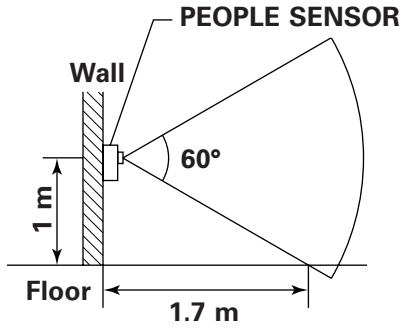
Before Operation (PEOPLE SENSOR)

Mounting Position and Detection Area

(Example)



(Example)



The detection area can be adjusted using the sensitivity adjustment knob.

Sensitivity Adjustment

The sensitivity of the People sensor can vary depending on the wall temperature and other conditions. Adjust the sensitivity if people cannot be detected in the required area.

Adjusting the Sensitivity

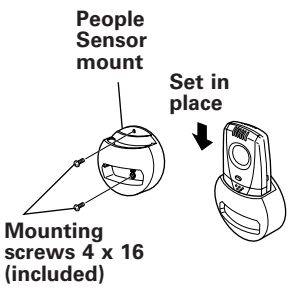
1. Set the Power ON/OFF switch to ON.
   Make sure that a beeping sound is heard from the indoor unit.
2. Wait for approximately one minute.
3. Then, adjust the sensitivity adjustment knob within the next five minutes so that the monitor lamp lights up when someone is detected in the required area.
   The People sensor lamp on the indoor unit lights up.

- If the sensitivity adjustment knob is set to CONTINUOUS, the People Sensor is constantly activated, regardless of the movement of people.

Using the PEOPLE SENSOR Mount

Set the Power ON/OFF switch to ON at the desired usage location, and make sure that a beeping sound is heard from the indoor unit.

Using in a wall-mounted position



Using in a stand-alone position

Do not mount (place) the People sensor in the following locations.

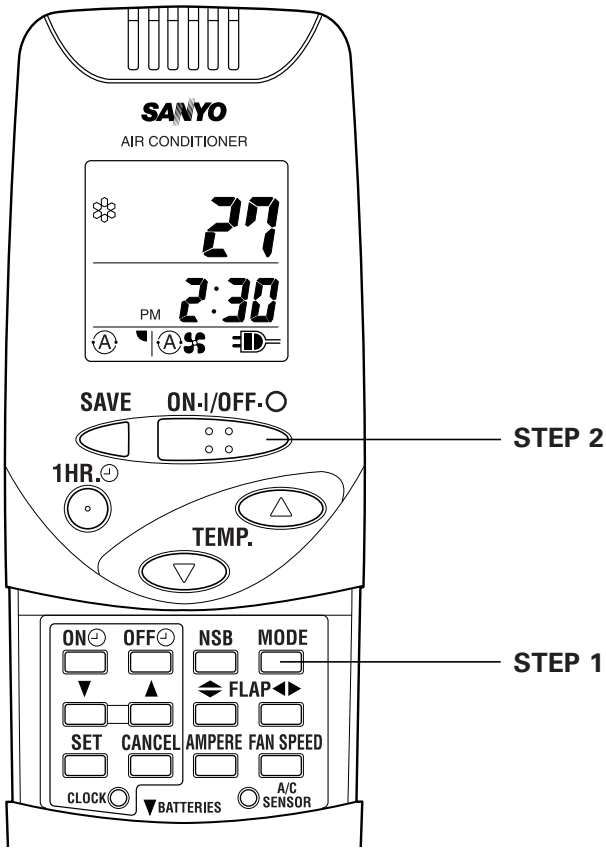
- Places exposed to direct sunlight or strong sources of light
- Places exposed to high humidity or water
- Places subject to sudden changes in temperature (such as near a stove)
- Places subject to strong vibrations or jolts
- Places having glass or other objects which can block infrared signals
- Places where blinds or curtains are contained within the detection area
- In the vicinity of telephones, computers, radios, or other devices which can generate noise
- On top of refrigerators or other places outside of the detection area

NOTE

- The People Sensor does not work until about one minute has elapsed after the Power switch is turned on. When it is on, the People Sensor sends signals at about 10-minute intervals if it detects that people are present. If people are not detected, it sends signals at up to 15-minute intervals.
- The sensitivity of the People sensor varies depending on the wall temperature, amount of clothing worn by people, and the quickness of their movement.
- The People sensor cannot detect people when they are not moving. If there is little movement of people, set the sensitivity adjustment knob to the CONTINUOUS position. The sensor also detects the movement of pets.

Operation with the Remote Control Unit

1. Automatic Operation



NOTE Check that the circuit breaker on the power panel is turned on and that the operation selector of the indoor unit is in the ON position.

Once the Ⓐ mode is selected and the unit is preset by following the steps below, you can have the air conditioner automatically bring the room to the desired temperature simply by pressing the ON/OFF operation button.

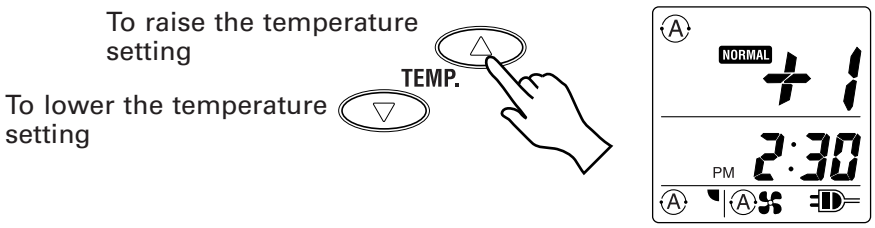
STEP 1	Press the MODE selector button to select Ⓐ.
STEP 2	Press the ON/OFF operation button.

To stop the air conditioner, press the ON/OFF operation button again.

EG

- To change the temperature setting, press the temperature setting buttons and change the setting to the desired temperature.

Press TEMP. to change the temperature setting.

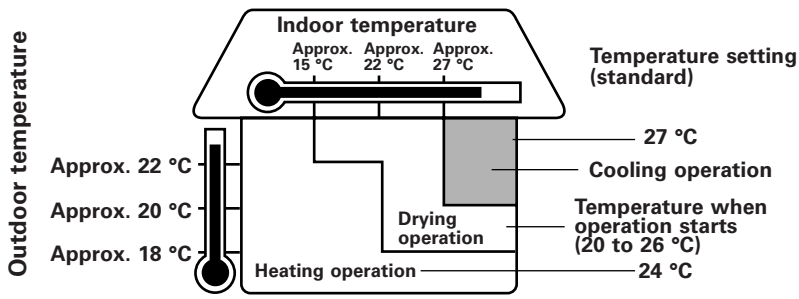


NOTE

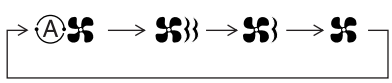
- The temperature setting changes by one degree each time one of the TEMP. setting buttons is pressed. The temperature setting may be changed within a range of ±4 °C of the standard temperature. (The temperature display changes back to the room temperature display three seconds after the temperature has been changed. However, the air conditioner remembers the new temperature setting even when it is turned off.)
- The type of operation and the temperature setting will differ depending on the ambient temperature when operation starts, as follows:

Operation type	Temperature setting (Standard)	Operation lamp
Cooling	27 °C	Green
Dry	Temperature when operation starts (20 to 26 °C)	Orange
Heating	24 °C	Red

- The temperature sensor of the indoor/outdoor unit automatically selects cooling, heating, or drying operation.
(If you stop the air conditioner and then restart it within four hours, the air conditioner operates in the same mode as before.)

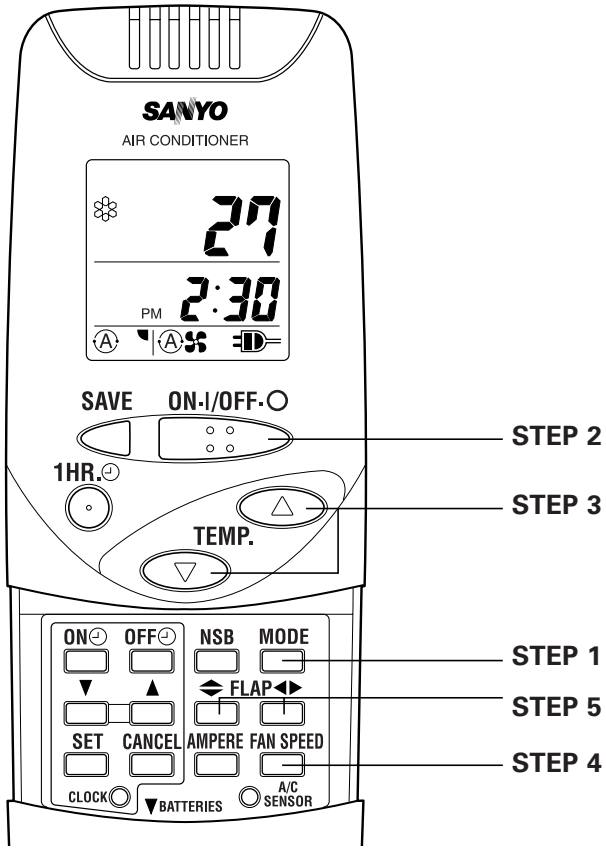


- The operation mode (cooling, heating, dry) does not change automatically during operation.
- Although the fan speed is set automatically, you can change the fan speed by pressing the FAN SPEED selector button.



To stop the air conditioner, press the ON/OFF operation button again.

2. Manual Operation



NOTE Check that the circuit breaker on the power panel is turned on and that the operation selector of the indoor unit is in the ON position.

If the automatic operation settings of the unit do not meet your needs, press the setting buttons as described below and change the settings as desired.

STEP 1	Press the MODE selector button and select the desired mode. For heating operation → ☀ For dehumidifying operation → 💧 For cooling operation → ❄ For circulating operation → 🌀
STEP 2	To start the air conditioner, press the ON/OFF operation button.
STEP 3	Press the TEMP. setting buttons to change the temperature setting to the desired temperature. Adjustable temperature range: 30 °C max. 16 °C min.
STEP 4 **NOTE**	Set the FAN SPEED selector button to the setting you want. If the fan speed is set to Ⓐ🌀 (Automatic), the fan speed switches automatically, according to the difference between the actual room temperature and the temperature setting.
STEP 5	Press the FLAP buttons and set the airflow direction as desired. (Refer to "Adjusting the Airflow Direction and Strength" on page 29.)

To stop the air conditioner, press the ON/OFF operation button again.

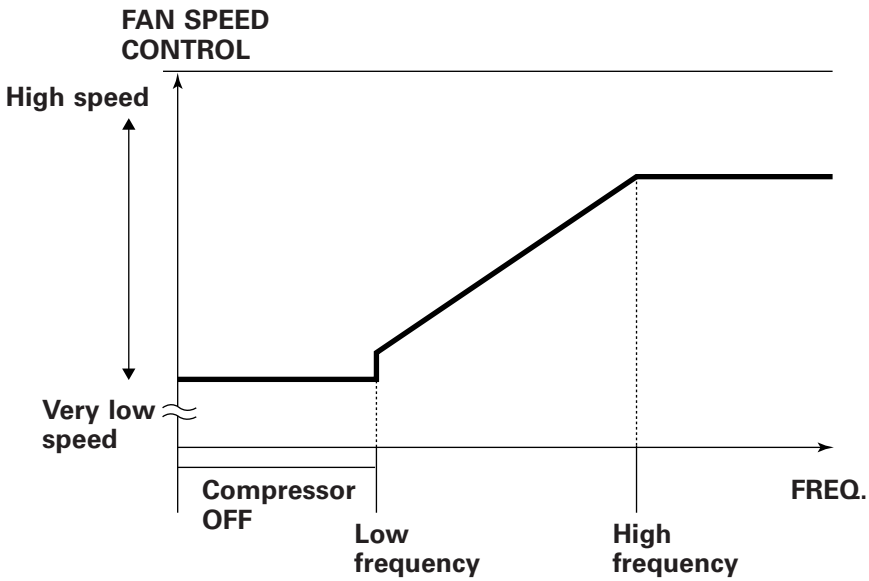
NOTE

- Choose the best position in the room for the remote control unit, which also acts as the sensor for room comfort and transmits the operating instructions. Once you've found this best position, always keep the remote control unit there.
- This appliance has a built-in 3-minute time delay circuit to ensure reliable operation. When the operation button is pressed, the compressor will start running within three minutes. In the event of power failure, the unit will stop. When the power is restored, the unit will restart automatically after three minutes.

3. Adjusting the Fan Speed

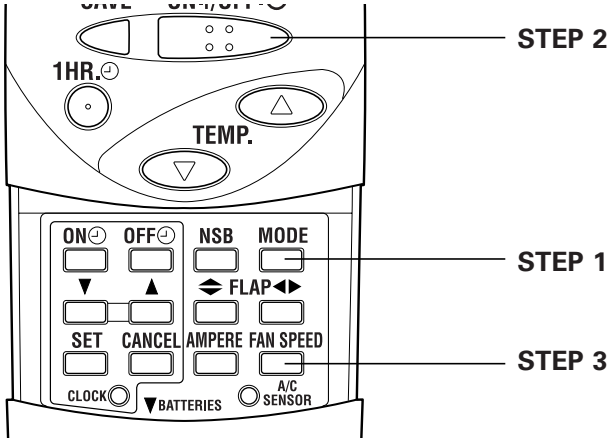
A. Automatic Simply set the FAN SPEED selector button to the Ⓐ position.

The fan speed is controlled automatically depending on the operating frequency, as shown below.



B. Manual If you want to adjust fan speed manually during operation, just set the FAN SPEED selector button as desired. [, , or]

4. Fan Only



EG

If you want to circulate air without any temperature control, follow these steps:

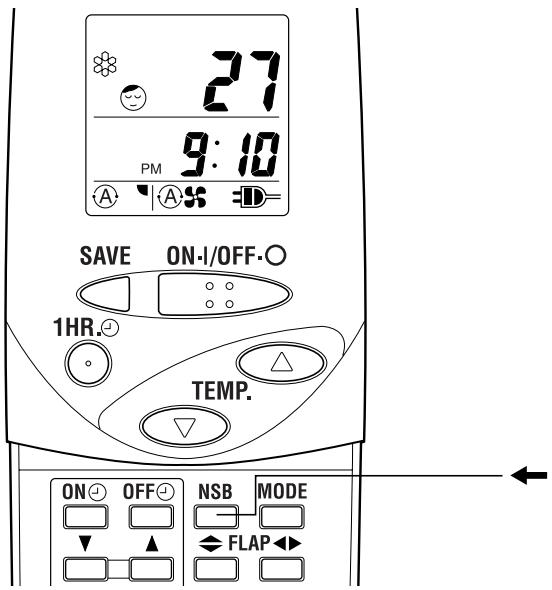
STEP 1: Press the MODE selector button to switch to the fan mode ( ).

STEP 2: Press the ON/OFF operation button.

STEP 3: Press the FAN SPEED selector button to select the fan speed of your choice (, , , or).

If the fan speed is set to auto ( ), the fan speed switches to low. Also, when the airflow direction is set to AUTO ( ), the flaps are in position ( ). (See ''Adjusting the Airflow Direction and Strength''.)

5. Night Setback Mode



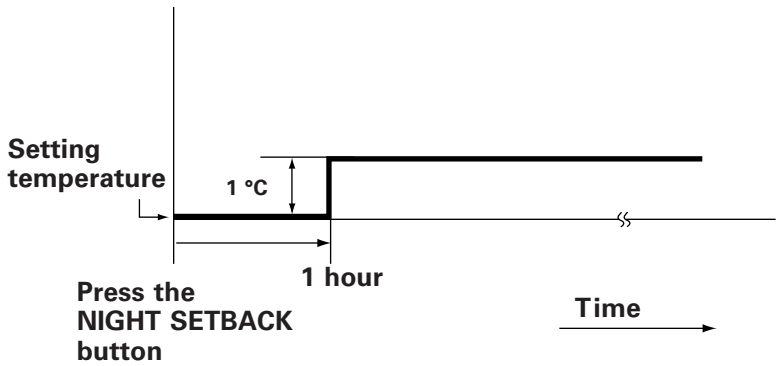
Night Setback Mode is used for saving energy.

Press the NIGHT SETBACK button while operation.
The mark appears in the display.

To release the night setback function, press the NIGHT SETBACK button again.

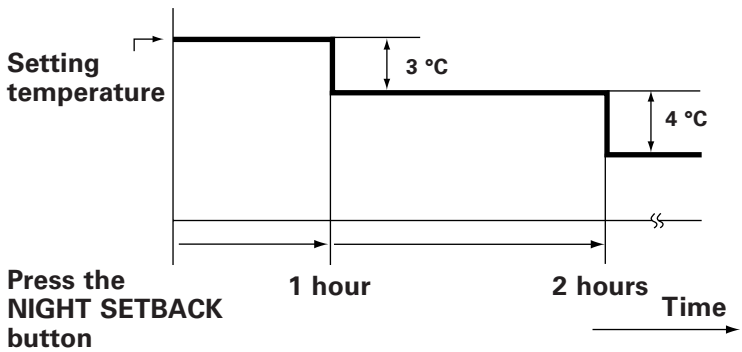
A. In Cooling and DRY Mode: (❄ and 💧)

When the night setback mode is selected, the air conditioner automatically raises the temperature setting 1 °C when 1 hour has passed after the selection was made, and then another 1 °C after another 1 hour has passed, regardless of the indoor temperature when night setback was selected. This enables you to save energy without sacrificing comfort. This function is convenient when gentle cooling is needed.



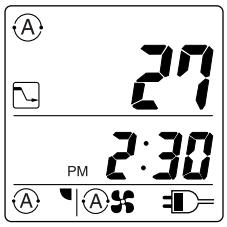
B. In Heating Mode: (☀)

When the night setback mode is selected, the air conditioner automatically lowers the temperature setting 3 °C when 1 hour has passed after the selection was made, and then another 4 °C after another 2 hours have passed, regardless of the indoor temperature when night setback was selected. This enables you to save energy without sacrificing comfort. This function is convenient when gentle heating is needed.



6. Save Mode

This mode fixes the temperature setting and reduces the operating current to allow energy-conserving operation friendly to the environment.



Press SAVE during operation or while stopped.

To cancel, press SAVE again.

- Save mode uses the following operation settings.

	Temperature setting (official recommended)	Airflow direction	Ampere display
Heating operation	20 °C	Flap position before the Save setting	
Cooling operation	28 °C	Swing	

- The temperature setting is not displayed on the remote control unit. The airflow direction and fan speed settings only can be changed. (These settings are stored.)
- During dry operation, the room temperature at dry save operation is used as the temperature setting (from 20 °C to 28 °C). Also, the airflow direction is the flap position before the Save setting was made.
- The settings for the mode selected automatically are used during automatic operation.
- SAVE mode does not function during FAN mode.

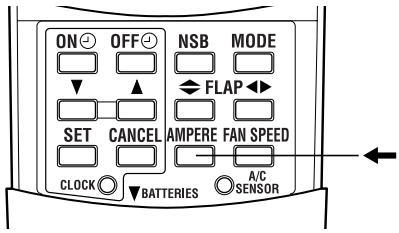
NOTE

- In the interest of environmental preservation and energy conservation, the temperature settings used are the officially recommended values of 28 °C for cooling and 20 °C for heating. This allows economical operation using minimum capacity. However, return the air conditioner to normal operation if this type of operation is not suitable.
- Save mode can be used with all operation modes, including 1-hour timer and Night Setback mode. When used with other modes, Save mode is given precedence. (However, Night Setback mode is given precedence when used with Save mode if the settings are the same.)
- During operation in Save mode, no changes can be made in the temperature or amperage.
- During cooling operation, irregular flap swing and fan speeds are used to maintain a comfortable environment.

EG

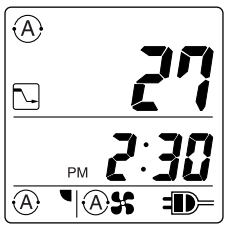
Amperage Selector

Amperage Selector



- If using the air conditioner with devices consuming large amounts of power, pressing the AMPERE button permits more electric capacity to make it more difficult for the circuit breaker to trip.
- The maximum operating current can be lowered for economical operation at reduced power.
- When cooling or heating operation is inadequate during summer days or winter nights and the room does not reach the temperature setting, press AMPERE and run the air conditioner under normal operation.
- The amperage can be changed even when the air conditioner is not running.

Press AMPERE during operation



The indoor unit makes a beeping sound, and the display changes.

	Single-phase 100 V	Single-phase 200 V
	20 A	15 A
	15 A	8 A

To cancel: Press AMPERE again to return to the original settings.
The amperage selector cannot be changed by pressing ON·I/OFF·○.

Special Remarks

"DRY" ( ) Operation

How it works?

- If the room temperature is higher than the setting temperature, the air conditioner operates in the same way as during cooling operation. When the room temperature approaches the setting temperature, the air conditioner switches to DRY operation and the indoor fans operate irregularly.
  In addition, the outdoor unit continues operation at lowered capacity, and repeats the cycle of operation and shutdown if the room temperature drops further.
  If the outdoor unit stops when the room temperature is less than 20 °C, the indoor fan also stops. If the room temperature is less than 15 °C, both the indoor fan and outdoor unit stop.

EG

Heating ( ) Operation

Heating performance

- Because this air conditioner heats a room by drawing in the heat of the outside air (heat pump system), the heating efficiency will fall off when the outdoor temperature is very low. If sufficient heat cannot be obtained with this air conditioner, use another heating appliance in conjunction with it.

Defrosting

- When the outdoor temperature is low, frost or ice may form on the heat exchanger coil, reducing heating performance. When this happens, a microcomputer defrosting system operates. At the same time, the fan on the indoor unit stops. Heating operation restarts after several minutes. (This interval will vary slightly depending upon the outdoor temperature and the way in which frost forms).

Clicking Sound

Clicking sound is heard from the air conditioner

- In heating or cooling operation, any plastic parts may expand or shrink due to a sudden temperature change. In this event, a clicking sound may occur. This is normal, and the sound will soon disappear.

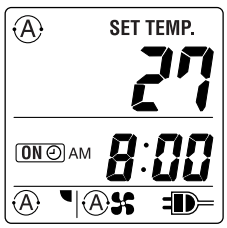
Remote control unit

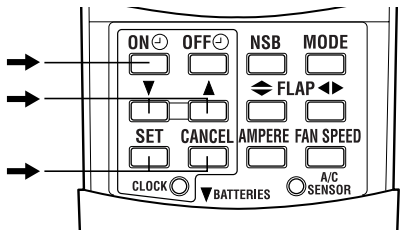
- The remote control unit sends the setting condition to the air conditioner regularly at five minute intervals.

Using the 24-Hour ON and OFF Timer

NOTE Before using the timer, be sure to set the current time on the remote control unit.

1. TIMER ON mode (Example)





After the length of time set for TIMER ON elapses, the unit begins operating.

The display depicted at left indicates that the air conditioner will begin operating in three hours.

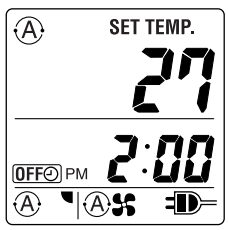
Setting procedure:

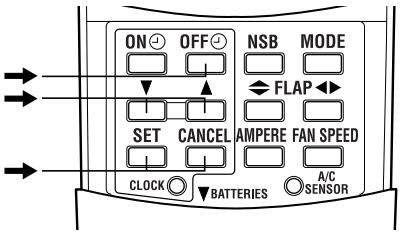
STEP 1	Press the MODE button and set the desired operation mode and press the ON/OFF operation button. (See "Operation with the Remote Control Unit", page 17.)
STEP 2	Press the TIMER ON button. (ON flashes.)
STEP 3	Use the ▼ or ▲ buttons to set to the time that you want operation to start. The time is set in 10-minute units. Hold down the button to fast-forward the time.
STEP 4	Press the SET button. The display returns to the current time once the timer is set.

- The display changes immediately to its status previous to timer setting, but the ON indication remains.
- To check the status of the timer while it is counting down, press the TIMER ON button. The display returns to the current time after 30 seconds.

Cancellation procedure: Press the CANCEL button.

2. TIMER OFF mode (Example)





After the length of time set for TIMER OFF elapses, the unit stops operating.

The display depicted at left indicates that the air conditioner will stop operating in five hours.

Setting procedure:

STEP 1	Press the TIMER OFF button. (OFF flashes.)
STEP 2	Use the ▼ or ▲ buttons to set to the time that you want operation to stop. The time is set in 10-minute units. Hold down the button to fast-forward the time.
STEP 3	Press the SET button. The display returns to the current time once the timer is set.

- The display changes immediately to its status previous to timer setting, but the OFF indication remains.
- To check the status of the timer while it is counting down, press the TIMER OFF button. The display returns to the current time after 30 seconds.

Cancellation procedure: Press the CANCEL button.

3. ON/OFF Program Timer

A combination of the TIMER ON and TIMER OFF modes, this function allows you to specify the time that the unit turns on and the time when it turns off.

Setting procedure:

STEP 1	Use the procedure described in the "1. TIMER ON mode" section on the preceding page to set the timer to turn the unit.
STEP 2	Use the procedure described in the "2. TIMER OFF mode" section on the preceding page to set the timer to turn the unit.

- The display changes immediately to its status previous to timer setting, but the ON or OFF indication remains.
- The timer function is cancelled after air conditioner operation. To use timer operation the next time, set the timer again.

Cancellation procedure: To cancel both the TIMER ON and TIMER OFF settings, press the CANCEL button. To cancel either the TIMER ON or TIMER OFF setting only, press the TIMER ON or TIMER OFF button, and then press the CANCEL button.

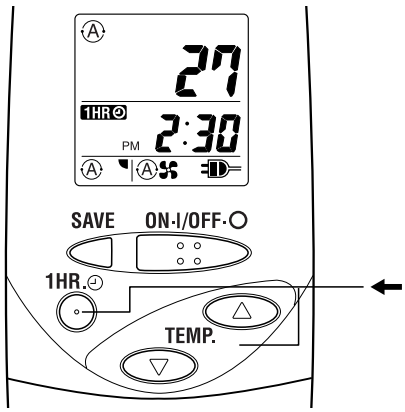
NOTE

- **Set the ON and OFF Timers simultaneously.**
  Unless you set the 24-Hour ON and OFF Timers at the same time, they may not operate at the specified time.

EG

Using the 1-Hour OFF Timer

1. 1-Hour OFF Timer



This function causes the unit to operate for one hour and then stop, regardless of whether the unit is on or off when this button is pressed.
The 1HR indicator in the display indicates that this function is operating.

Setting procedure:
Regardless of whether the unit is operating or stopped, press the 1 HR. TIMER button.
1HR appears in the display.

Cancellation procedure:
Press the ON/OFF operation button to turn the unit off, wait for the unit to stop operating, and then press the ON/OFF operation button again. The 1-Hour Timer function is now cancelled and the unit operates normally.

NOTE

- If, while the 1-Hour Timer function is operating, the 1HR. TIMER button is pressed once to cancel the function and then again, the unit continues to operate for one hour from that point in time and then stops.
- If the 1 HR. TIMER button is pressed while the TIMER OFF function operates, the OFF Timer is cancelled and the unit will stop operating one hour later.

2. Combining the 1-Hour OFF Timer and 24-Hour ON Timer

By combining the 1-Hour OFF Timer and 24-Hour ON Timer, it is possible to have the unit operate for just one hour from the present time, and then have it switch on again later at a time specified by you.

Setting procedure:

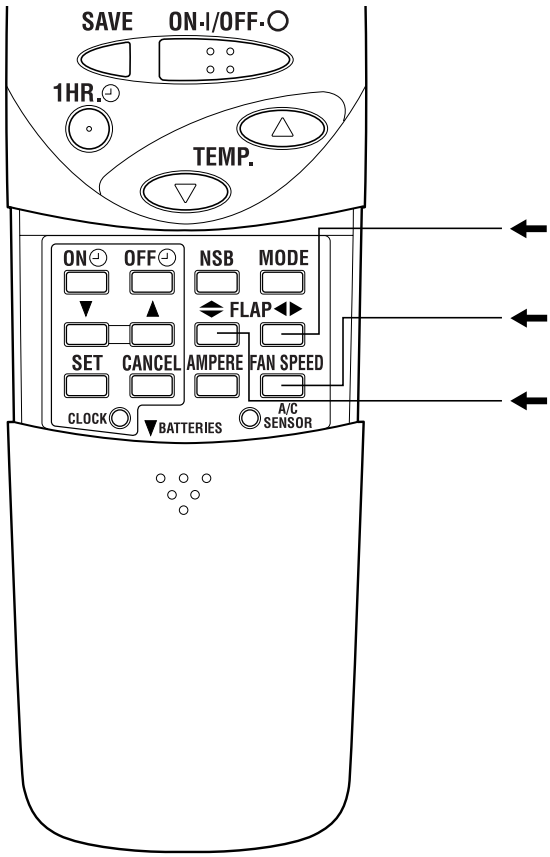
STEP 1	Press the 1 HR. TIMER button.
STEP 2	Press the TIMER ON button. Use the ▼ and ▲ buttons to set the time that you want operation to start.

NOTE

- **Set the 1-hour OFF Timer and the 24-hour ON Timer simultaneously.**
  Unless you set the 1-hour OFF Timer and the 24-hour ON Timer at the same time, the 1-hour OFF Timer may operate for one hour or more.

Adjusting the Airflow Direction and Strength

The direction of the cooling or heating air can be adjusted. (See page 30.)



EG

1. Horizontal

The horizontal and vertical airflow can be adjusted by moving the flap and vertical vanes with the remote control unit.
Do not move the flap with your hands. Confirm that the remote control unit has been turned on.

To Blow the Air from Side to Side

Press ◀▶ during operation.
The horizontal airflow control flaps start to move.
If airflow control is not performed using the People sensor, the horizontal airflow control flaps swing within a limited range to direct the airflow direction.

To Set the Horizontal Airflow Direction to One Side

Press ◀▶ again at the desired air direction.
The horizontal airflow control flaps stop moving.

To Blow the Air Up and Down and Side to Side

Press ▲▼ until the swing display appears, and then press ◀▶ .
To cancel, press ▲▼ and ◀▶ .

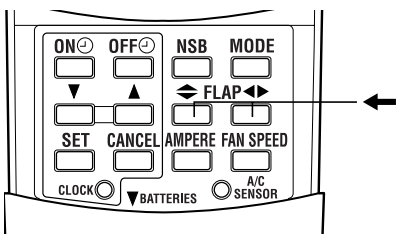
When Using the People Sensor

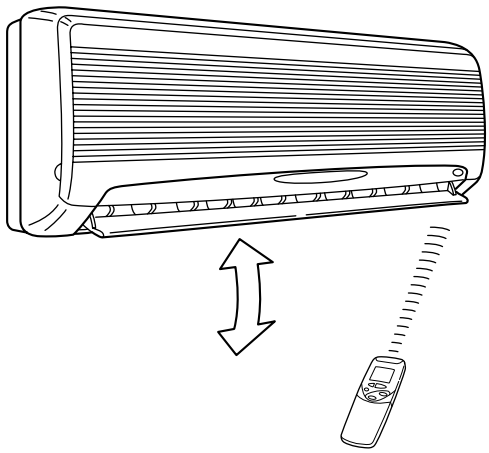
- When the People Sensor is used to control the airflow, pressing ◀▶ on the People sensor stops the horizontal airflow control flaps. When this button is pressed again, the horizontal airflow control flaps start moving within a limited range without airflow control.

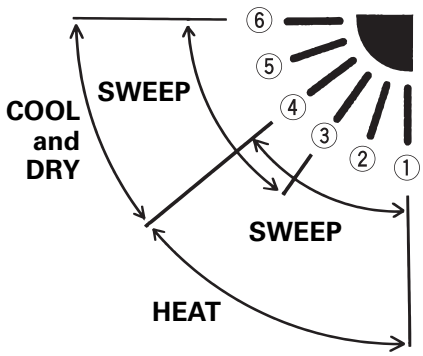
CAUTION

When the humidity is high, the vertical vanes should be in the front position during the cooling or dehumidifying operation. If the vertical vanes are positioned all of the way to the right or left, condensation may begin to form around the air vent and drip down.

2. Vertical Use the FLAP button (FLAP) to set either the sweep function or one of the six airflow direction settings.







A. Sweep function

The flap starts moving up and down to deliver air over the sweep range.

B. Setting the Airflow Manually

Referring to the above illustration, use the FLAP button (FLAP) to set the airflow direction within the range used during the heating, cooling, or dehumidifying operation.

NOTE

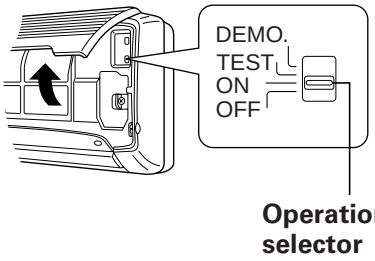
- When the FLAP button is pressed, the unit makes a beeping sound and the flaps start to move.
- The flap automatically closes when the unit is off.
- During the heating operation, the fan speed will be very low and the flap will be in the horizontal position (position ⑥) until the air being blown out of the unit begins to warm. Once the air warms up, the flap position and fan speed change to the settings specified with the remote control.

CAUTION

- Use the FLAP button (FLAP◀▶) on the remote control to adjust the position of the flap. If you move the flap by hand, the flap position according to the remote control and the actual flap position may no longer match. If this should happen, shut off the unit, wait for the flap to close, and then turn on the unit again; the flap position will now be normal again.
- Do not have the flap pointed down during cooling operation. Condensation may begin to form around the air vent and drip down.

Operation without the Remote Control Unit

INDOOR UNIT



Operation selector

If you have lost the remote control unit or it has trouble, follow the steps below.

1. When the air conditioner is not running
If you want to turn on the air conditioner, switch the operation selector to the OFF position, and then to the ON position.

NOTE The set temperature and fan speed are automatically set at the last selection before stopping.

2. When the air conditioner is running
If you want to turn off the air conditioner, switch the operation selector to the OFF position.

EG

Care and Cleaning

WARNING

1. **For safety, be sure to turn the air conditioner off and also to disconnect the power before cleaning.**
2. **Do not pour water on the indoor unit to clean it. This will damage the internal components and cause an electric shock hazard.**

Casing and Grille (Indoor Unit)

Clean the casing and grille of the indoor unit with a vacuum cleaner brush, or wipe them with a clean, soft cloth.

If these parts are stained, use a clean cloth moistened with a mild liquid detergent. When cleaning the grille, be careful not to force the vanes out of place.

CAUTION

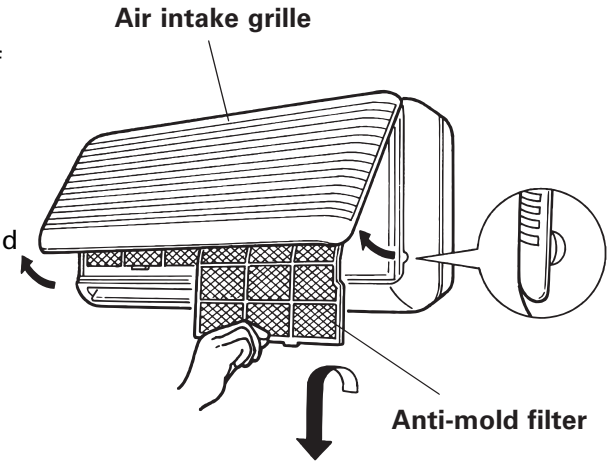
1. **Never use solvents, or harsh chemicals when cleaning the indoor unit. Do not wipe the plastic casing using very hot water.**
2. **Some metal edges and the fins are sharp and may cause injury if handled improperly; be especially careful when you clean these parts.**
3. **The internal coil and other components of the outdoor unit must be cleaned every year. Consult your dealer or service center.**

Anti-Mold Filter

The anti-mold filter behind the air intake grille should be checked and cleaned at least once every two weeks.

How to remove the anti-mold filter

1. Grasp both ends of the air intake grille and pull it out and up.
2. Push the anti-mold filter up slightly, and then pull it down.

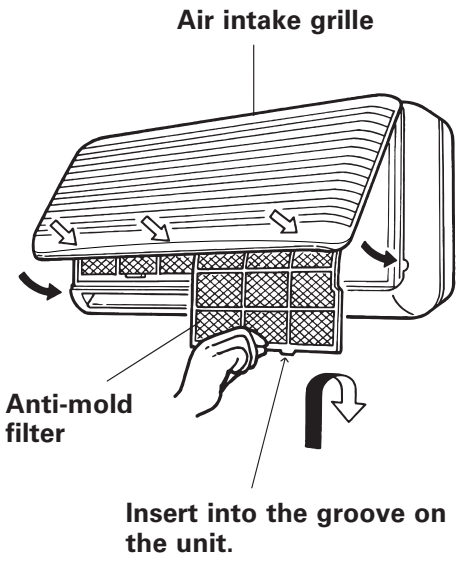


Cleaning

- The filter lamp turns orange to indicate that the air filter needs to be cleaned soon. Clean the air filter when the lamp turns red. The lamp turns on only for three seconds when operation starts. Be sure to always press the FILTER RESET button after cleaning the filter.
- Use a vacuum cleaner to remove light dust. If there is sticky dust on the filter, wash the filter in lukewarm, soapy water, rinse it in clean water, and dry it.

How to replace the anti-mold filter

1. With the "FRONT" mark facing you, slide the anti-mold filter up into the unit and then lower the handle into the groove on the unit.
2. After installing the anti-mold filter, press the locations marked by the arrows (⇩) and close the air intake grille.



Air Clean Filter

The air cleaning filter removes dust and dirt from the air, and reduces odors and smoke from tobacco.
The air clean filter is included with the unit when shipped from the factory. When changing the filter subsequently, it is only necessary to replace the filter itself (model **STK-F4B**).

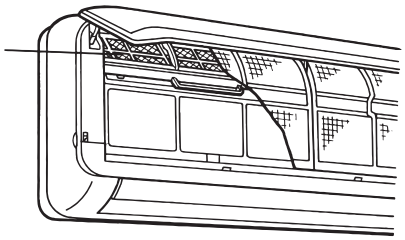
WARNING

This air clean filter cannot remove harmful gases or vapors nor ventilate air in the room. You must open doors or windows frequently when you use gas or oil heating appliances. Otherwise there is a risk of suffocation in extreme cases.

How to install the air clean filter

The air clean filter needs to be installed behind the anti-mold filter.

1. Remove the anti-mold filter.
2. Install the air clean filter in the position shown in the diagram, with the "前面" symbols (meaning "FRONT") facing the front.
3. Reinstall the anti-mold filter.



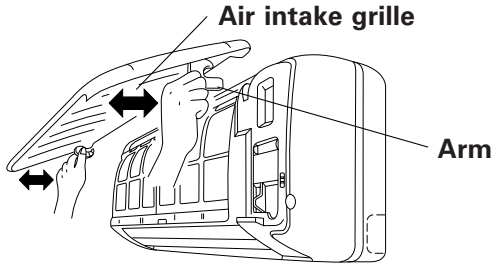
Cleaning the main unit and remote control unit

- Wipe clean using a soft, dry cloth.
- To remove stubborn dirt, moisten a cloth in warm water no hotter than 40 °C, wring thoroughly, and then wipe.
- The air intake grille can be removed in order to wash it with water.

EG

Removing and remounting the air intake grille

- With the air intake grille open all the way, grip both arms with your hands and pull toward you to remove.
  To remount, hold the air intake grille roughly horizontal and push it in until the arm shafts fit into the indentations in the main unit, then fit the grille into place.



CAUTION

When using a footstool or the like, be careful not to let it tip over.

Washing the grille with water

- Clean the grille gently using a soft sponge, or the like. Then wipe away any remaining moisture.
- Neutral detergent may be used to remove stubborn dirt. Then rinse thoroughly with water and wipe away any remaining moisture.

Tips for Energy Saving

Do not

- **Block the air intake and outlet of the unit. If they are obstructed, the unit will not work well, and may be damaged.**
- Let direct sunlight into the room. Use sunshades, blinds or curtains. If the walls and ceiling of the room are warmed by the sun, it will take longer to cool the room.

Do

- Always try to keep the air filter clean. (Refer to ''Care and Cleaning''.) A clogged filter will impair the performance of the unit.
- To prevent conditioned air from escaping, keep windows, doors and any other openings closed.

Troubleshooting

If your air conditioner does not work properly, first check the following points before requesting service. If it still does not work properly, contact your dealer or service center.

Trouble	Possible Cause	Remedy
Air conditioner does not run at all.	1. Power failure. 2. Leakage breaker tripped. 3. Line voltage is too low. 4. Operation button is OFF. 5. Batteries in remote control unit have run down.	1. Restore power. 2. Contact service center. 3. Consult your electrician or dealer. 4. Press the button again. 5. Replace batteries.
OPERATION lamp flashes and air conditioner does not operate.	Trouble in wiring system.	Contact service center.
Compressor runs but soon stops.	Obstruction in front of condenser coil.	Remove obstruction.
Poor cooling (or heating) performance.	1. Dirty or clogged air filter. 2. Heat source or many people in room. 3. Doors and/or windows are open. 4. Obstacle near air intake or air discharge port. 5. Thermostat is set too high for cooling (or too low for heating). 6. (Outdoor temperature is too low.) 7. (Defrosting system does not work.)	1. Clean air filter to improve airflow. 2. Eliminate heat source if possible. 3. Shut them to keep the heat (or cold) out. 4. Remove it to ensure good airflow. 5. Set the temperature lower (or higher). 6. (Try to use a back-up heater.) 7. (Consult your dealer.)
Clicking sound is heard from the air conditioner.	In heating or cooling operation, any plastic parts may expand or shrink due to a sudden temperature change. In this event, a clicking sound may occur.	This is normal, and the sound will soon disappear.
OPERATION lamp lights but outdoor unit will not run.	1. The use of portable telephones near the air conditioner may cause disturbance to its normal operation.	1. Turn off the power then restart the air conditioner after 1 minute. 2. Consult your dealer.

EG

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