DAIKIN

SIE-85

Service Manual

SPLIT Pair H-Series

[APPLIED MODELS]

- **Split: Inverter Cooling Only model**
- **Split: Inverter type Heat Pump model**

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Safety cautions

☆ Be sure to read the following safety cautions before conducting repair work.

☆ The caution items are classified into "⚠ Warning" and "⚠ Caution". The "⚠ Warning" items are especially important since they can lead to death or serious injury if they are not followed closely. The "⚠ Caution" items can also lead to serious accidents under some conditions if they are not followed. Therefore, be sure to observe all the safety caution items described below.

☆ About the pictograms

△ This symbol indicates an item for which caution must be exercised.
The pictogram shows the item to which attention must be paid.
○ This symbol indicates a prohibited action.
The prohibited item or action is shown inside or near the symbol.
● This symbol indicates an action that must be taken, or an instruction.
The instruction is shown inside or near the symbol.

☆ After the repair work is complete, be sure to conduct a test operation to ensure that the equipment operates normally, and explain the cautions for operating the product to the customer.

I . Cautions in repair

⚠ Warning

(1) Be sure to disconnect the power cable plug from the plug socket before disassembling the equipment for a repair.
Working on the equipment that is connected to a power supply can cause an electrical shock.
If it is necessary to supply power to the equipment to conduct the repair or inspecting the circuits, do not touch any electrically charged sections of the equipment.

(2) If the refrigerant gas discharges during the repair work, do not touch the discharging refrigerant gas.
The refrigerant gas can cause frostbite.

(3) When disconnecting the suction or discharge pipe of the compressor at the welded section, release the refrigerant gas completely at a well-ventilated place first.
If there is a gas remaining inside the compressor, the refrigerant gas or refrigerating machine oil discharges when the pipe is disconnected, and it can cause injury.

(4) If the refrigerant gas leaks during the repair work, ventilate the area.
The refrigerant gas can generate toxic gases when it contacts flames.

⚠ Warning

(5) The step-up capacitor supplies high-voltage electricity to the electrical components of the outdoor unit.
Be sure to discharge the capacitor completely before conducting repair work.
A charged capacitor can cause an electrical shock.

(6) Do not start or stop the air conditioner operation by plugging or unplugging the power cable plug.
Plugging or unplugging the power cable plug to operate the equipment can cause an electrical shock or fire.

⚠ Caution

(7) Do not repair the electrical components with wet hands.
Working on the equipment with wet hands can cause an electrical shock.

(8) Do not clean the air conditioner by splashing water.
Washing the unit with water can cause an electrical shock.

(9) Be sure to provide the grounding when repairing the equipment in a humid or wet place, to avoid electrical shocks.

(10) Be sure to turn off the power switch and unplug the power cable when cleaning the equipment.
The internal fan rotates at a high speed, and can cause injury.

(11) Do not tilt the unit when removing it.
The water inside the unit can spill and wet the furniture and floor.

(12) Be sure to check that the refrigerating cycle section has cooled down sufficiently before conducting repair work.
Working on the unit when the refrigerating cycle section is hot can cause burns.

⚠ Caution

(13) Use the welder in a well-ventilated place.
Using the welder in an enclosed room can cause oxygen deficiency.

Ⅱ. Cautions regarding products after repair

⚠ Warning

(14) Be sure to use parts listed in the service parts list of the applicable model and appropriate tools to conduct repair work. Never attempt to modify the equipment. The use of inappropriate parts or tools can cause an electrical shock, excessive heat generation or fire.

(15) When relocating the equipment, make sure that the new installation site has sufficient strength to withstand the weight of the equipment.
If the installation site does not have sufficient strength and if the installation work is not conducted securely, the equipment can fall and cause injury.

【For integral units only】
(16) Be sure to install the product correctly be using the provided standard installation frame.
Incorrect use of the installation frame and improper installation can cause the equipment to fall, resulting in injury.

【For integral units only】
(17) Be sure to install the product securely in the installation frame mounted on a window frame.
If the unit is not securely mounted, it can fall and cause injury.

(18) Be sure to use an exclusive power circuit for the equipment, and follow the technical standards related to the electrical equipment, the internal wiring regulations and the instruction manual for installation when conducting electrical work.
Insufficient power circuit capacity and improper electrical work can cause an electrical shock or fire.

⚠ Warning

(19) Be sure to use the specified cable to connect between the indoor and outdoor units. Make the connections securely and route the cable properly so that there is no force pulling the cable at the connection terminals.
Improper connections can cause excessive heat generation or fire.

(20) When connecting the cable between the indoor and outdoor units, make sure that the terminal cover does not lift off or dismount because of the cable.
If the cover is not mounted properly, the terminal connection section can cause an electrical shock, excessive heat generation or fire.

(21) Do not damage or modify the power cable.
damaged or modified power cable can cause an electrical shock or fire.
Placing heavy items on the power cable, and heating or pulling the power cable can damage the cable.

(22) Do not mix air or gas other than the specified refrigerant (R22) in the refrigerant system.
If air enters the refrigerating system, an excessively high pressure results, causing equipment damage and injury.

(23) If the refrigerant gas leaks, be sure to locate the leak and repair it before charging the refrigerant. After charging refrigerant, make sure that there is no refrigerant leak.
If the leak cannot be located and the repair work must be stopped, be sure to perform pump-down and close the service valve, to prevent the refrigerant gas from leaking into the room. The refrigerant gas itself is harmless, but it can generate toxic gases when it contacts flames, such as fan and other heaters, stoves and ranges.

(24) When replacing the coin battery in the remote controller, be sure to disposed of the old battery to prevent children from swallowing it.
If a child swallows the coin battery, see a doctor immediately.

⚠ Caution

(25) Installation of a leakage breaker is necessary in some cases depending on the conditions of the installation site, to prevent electrical shocks.

(26) Do not install the equipment in a place where there is a possibility of combustible gas leaks.
If a combustible gas leaks and remains around the unit, it can cause a fire.

【For integral units only】

(27) Be sure to install the packing and seal on the installation frame properly.
If the packing and seal are not installed properly, water can enter the room and wet the furniture and floor.

Ⅲ. Inspection after repair

⚠ Warning

(28) Check to make sure that the power cable plug is not dirty or loose, then insert the plug into a power outlet all the way.
If the plug has dust or loose connection, it can cause an electrical shock or fire.

(29) If the power cable and lead wires have scratches or deteriorated, be sure to replace them.
Damaged cable and wires can cause an electrical shock, excessive heat generation or fire.

(30) Do not use a joined power cable or extension cable, or share the same power outlet with other electrical appliances, since it can cause an electrical shock, excessive heat generation or fire.

⚠ Caution

(31) Check to see if the parts and wires are mounted and connected properly, and if the connections at the soldered or crimped terminals are secure.
Improper installation and connections can cause excessive heat generation, fire or an electrical shock.

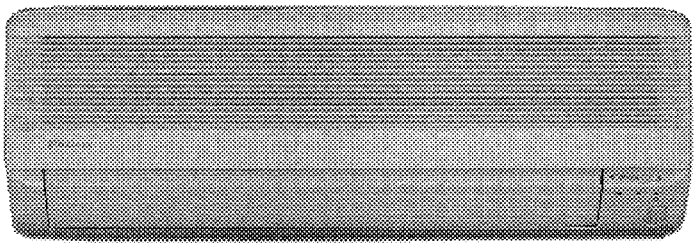
(32) If the installation platform or frame has corroded, replace it.
Corroded installation platform or frame can cause the unit to fall, resulting in injury.

(33) Check the grounding, and repair it if the equipment is not properly grounded.
Improper grounding can cause an electrical shock.

(34) Be sure to measure the insulation resistance after the repair, and make sure that the resistance is 1 Mohm or higher.
Faulty insulation can cause an electrical shock.

(35) Be sure to check the drainage of the indoor unit after the repair.
Faulty drainage can cause the water to enter the room and wet the furniture and floor.

Split-System Room Air Conditioner
Inverter type Cooling Only / Heat Pump Model

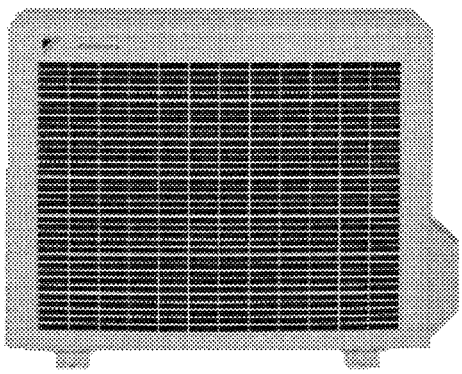


〈Cooling Only〉

FTK25HV1NB FTK35HV1NB

〈Heat Pump〉

FTX25HV1NB FTX35HV1NB



〈Cooling Only〉

RK25HV1NB RK35HV1NB

〈Heat Pump〉

RX25HV1NB RX35HV1NB

1. Printed circuit board connector wiring diagram and name

(1) FTK25/35H Series, FTX25/35H Series

Printed circuit board (1) (Control PCB)
Printed circuit board (2) (Power supply PCB)
Printed circuit board (3) (Display PCB)
Printed circuit board (4) (Signal receiver PCB)

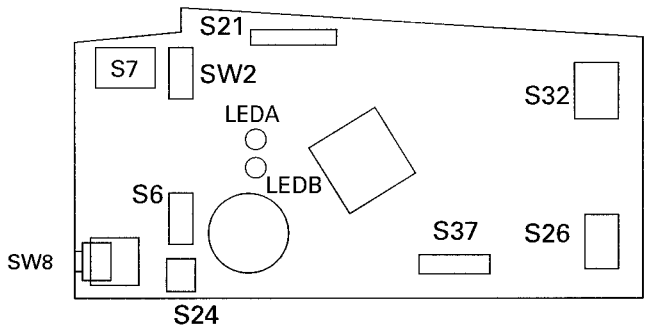
Name of connector

1) S1	Connector for fan motor
2) S6	Connector for swing motor (Horizontal Flap)
3) S7	Connector for fan motor
4) S21	Connector for centralized control to 5 rooms
5) S24	Connector for display PCB
6) S25, S27, S36	Connector for control PCB
7) S26	Connector for signal receiver PCB
8) S31, S32	Connector for room temp/Heat exchanger thermistor
9) S37	Connector for power supply PCB

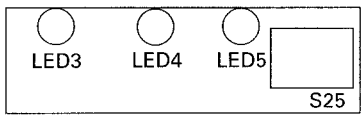
Note) Other designations

1) V1	Varistor
2) SW2 (S2W)	ADDRESS SWITCH
3) SW7 (S1W)	OPERATION SWITCH
4) SW8 (S8W)	CLEANING INDICATOR RESET SWITCH
5) LED3 (GRN)	LED for operation
6) LED4 (YLW)	LED for timer
7) LED5 (RED)	LED for cleaning
8) LEDA, LEDB	LED for Service Monitor

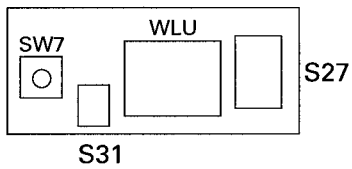
Control PCB (1)



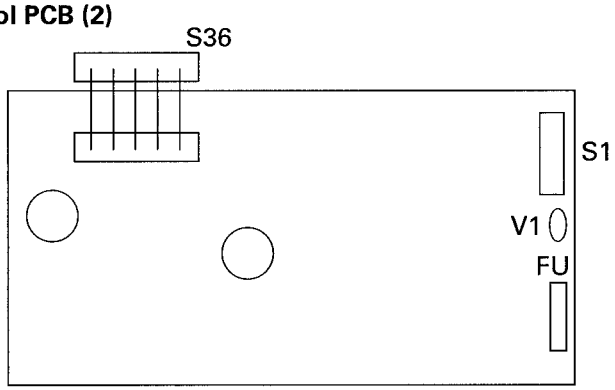
Control PCB (3)



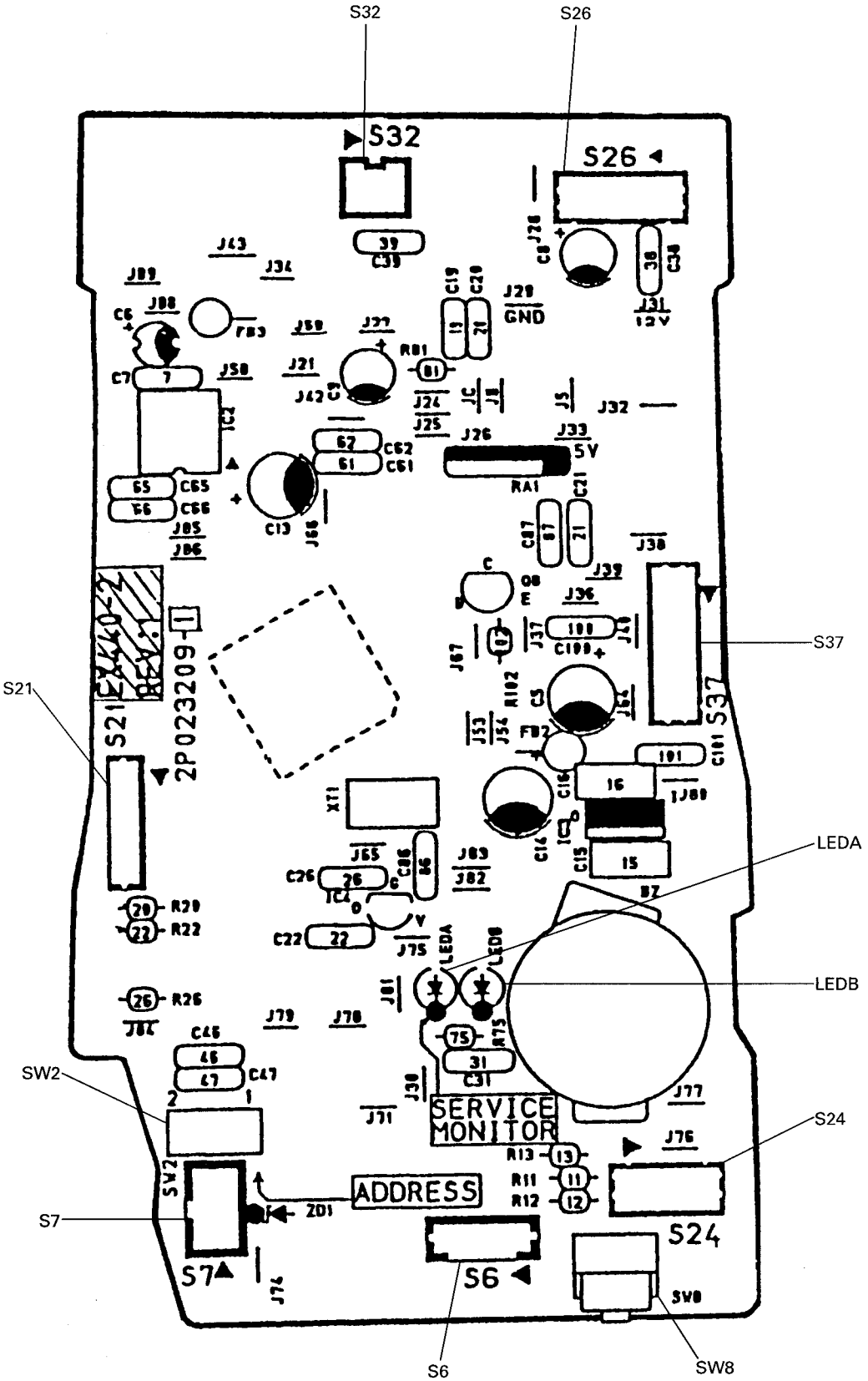
Control PCB (4)



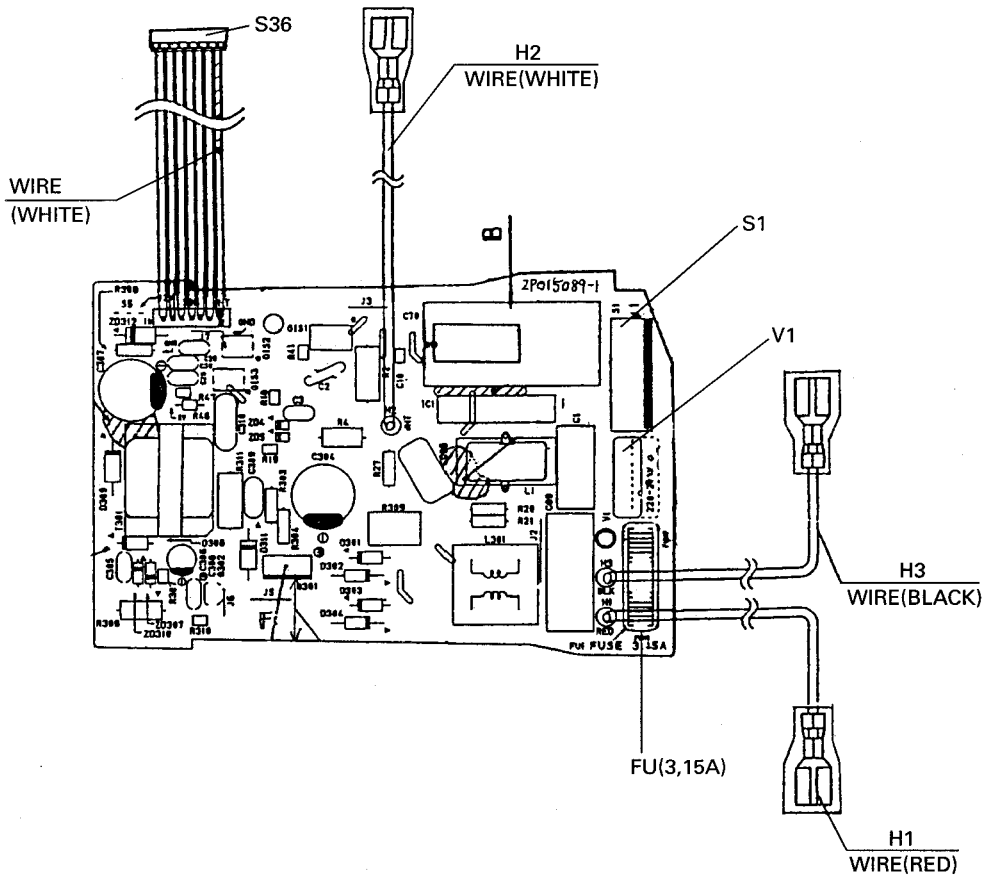
Control PCB (2)



P.C.B (1) (Control P.C.B) Detail

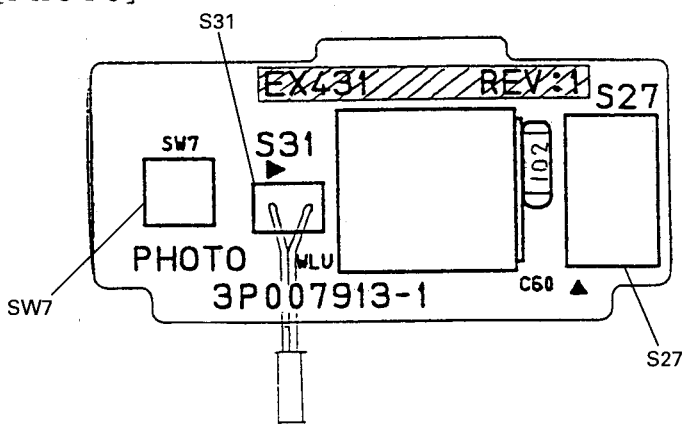


P.C.B (2) (Power supply P.C.B) Detail

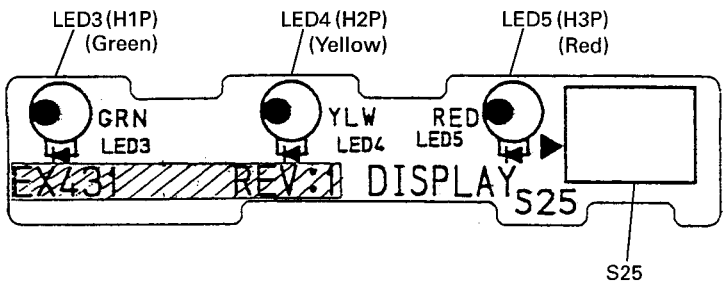


P.C.B (3), (4) Detail

[PHOTO]



[DISPLAY]

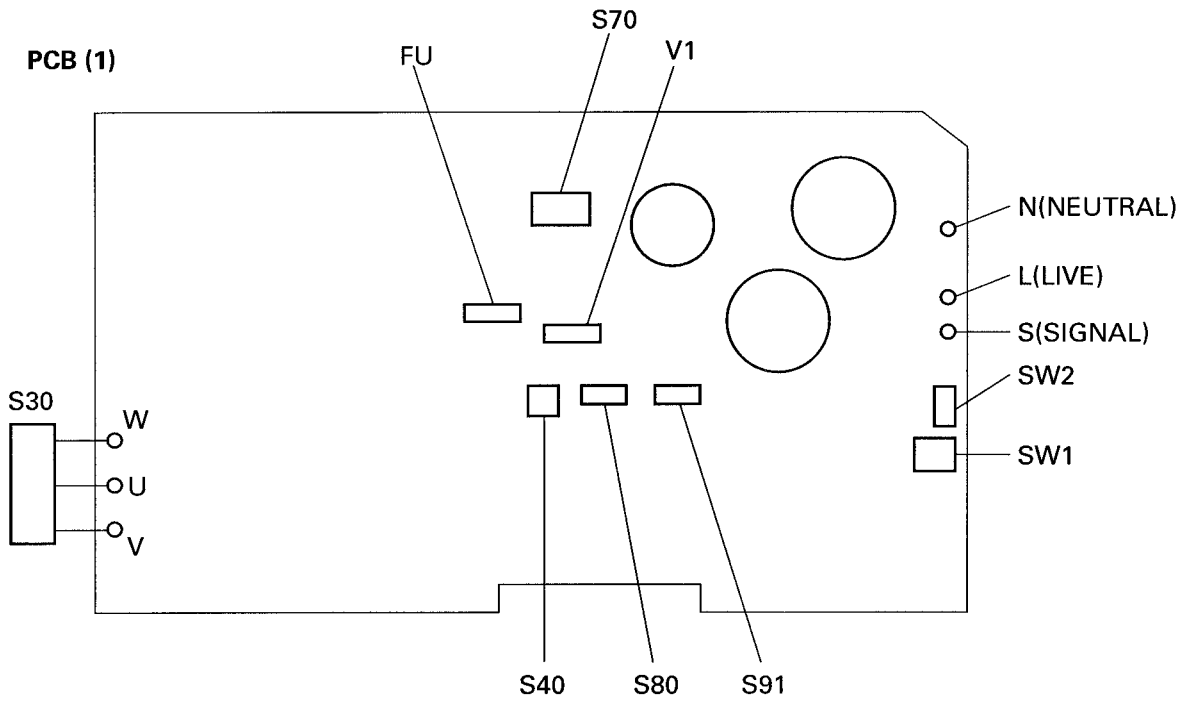


(2) RK25/35H Series, RX25/35H Series

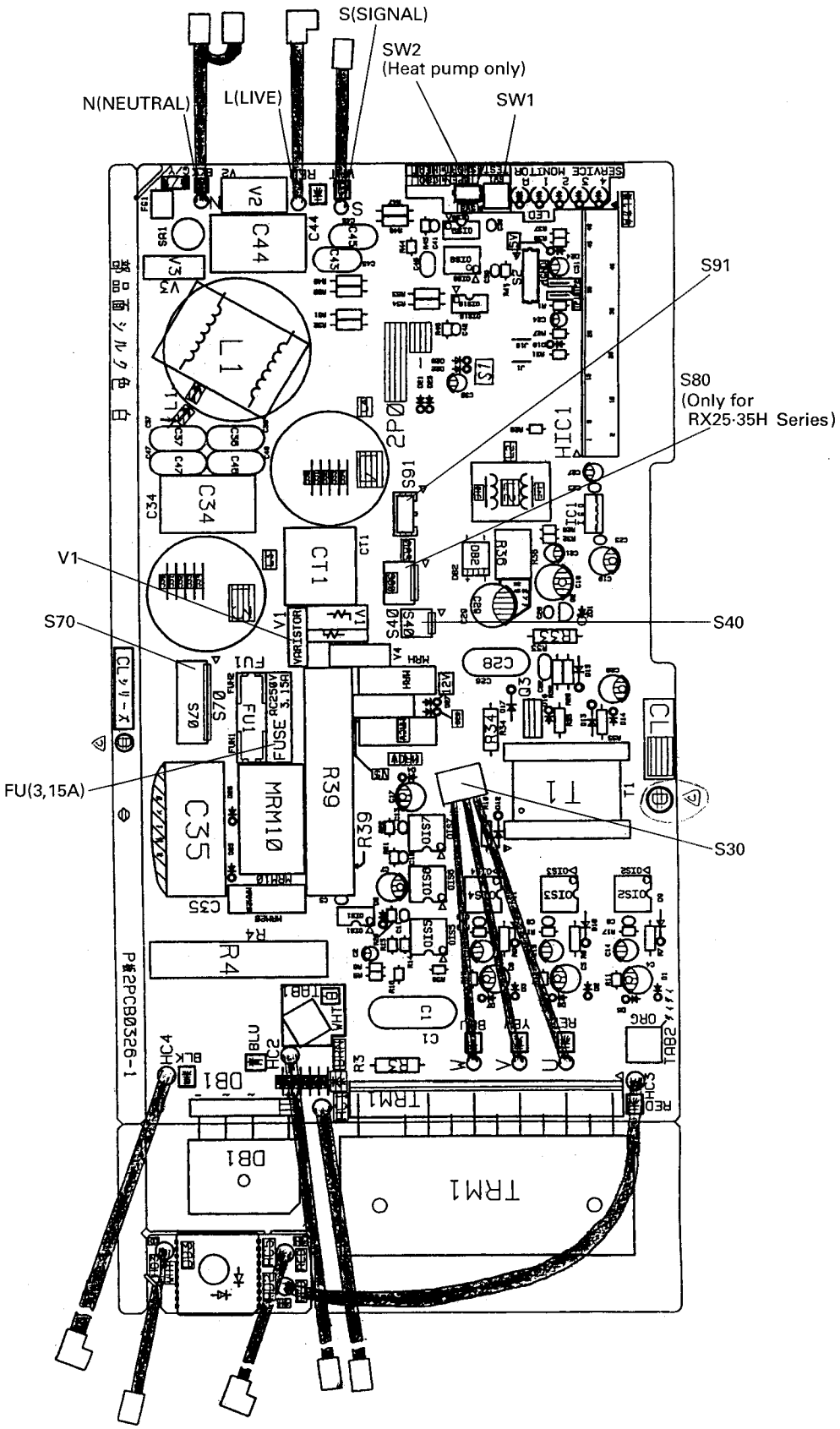
Printed circuit board (1) (Main-PCB)

Name of connector

1)	S30	Connector for compressor motor (with internal thermostat)
2)	S70	Connector for fan motor
3)	S80	Connector for 4 WAY VALVE COIL (RX25·35H Series only)
4)	S91	Connector for THERMISTOR
5)	S40	Connector for OL
6)	SW1	Forced operation ON/OFF switch
7)	SW2	Forced operation Mode selector switch (H/P only)



P.C.B (1) (Control P.C.B) Detail



2. List of Functions

(1) Cooling Only series

Category	Functions	FTK		RK		Category	Functions	FTK		RK	
		25 H Series	35 H Series	25 H Series	35 H Series			25 H Series	35 H Series	25 H Series	35 H Series
Basic Function	Energy Efficiency	○	○	○	○	Health Health & Clean	Air Purifying Filter (With Bacteriostatic Function, Virustatic Function, Deodrizing Function)	○	○	-	-
	Inverter, Inverter Power Control	○	○	○	○		Mold Proof Air Filter	○	○	-	-
	Cooling Operation Limit : Outdoor Temp.℃	-	-	*	*		Washable Grille	○	○	-	-
	Microprocessor Control	○	○	○	○		Filter Cleaning Indicator	○	○	-	-
Compressor	Scroll, Horizontal Scroll	-	-	-	-	Timer	24-Hour Clock Timer	○	○	-	-
	Swing	-	-	-	-		12-Hour Timer	-	-	-	-
	Rotary	-	-	○	○		On Timer	○	○	-	-
	Reluctance DC	-	-	-	-		Off Timer	○	○	-	-
Comfortable Airflow	Dual Flap	○	○	-	-		Night Set Mode	○	○	-	-
	Power-Airflow Flap	○	○	-	-		Alarm Timer	-	-	-	-
	Diffuser	○	○	-	-	Worry Free "Reliability & Durability"	Automatic Restart	○	○	-	-
	Wide-Angle Louvers	○	○	-	-		Self-Diagnosis Digital Display	○	○	-	-
	Vertical Auto-Swing	-	-	-	-		Self-Diagnosis LED Display	○	○	○	○
	Horizontal Auto-Swing	○	○	-	-		Theft Protection for Remote Controller (Option)	○	○	-	-
	3 Step Flow (H/P Only)	-	-	-	-		Wiring Error Check	-	-	-	-
"Comfortable Control" Comfort Control	Auto Fan Speed	○	○	-	-		Anti-Corrosion Treatment of Outdoor Heat Exchange Fins.	-	-	○	○
	Silent Operation Control	-	-	-	-	Flexibility	Multi-Split/Split Type Compatible Indoor Unit	○	○	-	-
	Double Thermostat Function	-	-	-	-		Flexible Voltage Correspondence	○	○	○	○
	Neuro-Heat Sensitive Control	-	-	-	-		Charge Less	-	-	10m	
	Quick Heating Control	-	-	-	-	Remote Control	5-Rooms Centralized Controller	○	○	-	-
	Hot Start	-	-	-	-		Time Clock (Field Supply)	○	○	-	-
	Automatic Defrosting	-	-	-	-		Remote Control Adaptor (Normal Open-Pluse Contact)	○	○	-	-
Operation Intelligent Operation	Automatic Operation	-	-	-	-		Remote Control Adaptor (Normal Open Contact)	○	○	-	-
	Programme Dry	○	○	-	-	Remote Controller	Wireless	○	○	-	-
	Circulation	-	-	-	-		Wired	-	-	-	-
	Fan Only	○	○	-	-						
Convenient Lifestyle Convenience	New Powerful Operation	-	-	-	-						
	Powerful Operation	-	-	-	-						
	Inverter Powerful-Operation	○	○	○	○						
	Quiet Operation	-	-	-	-						
	Laundry Program Operation	-	-	-	-						
	Energy Saving Operation	-	-	-	-						
	Power Select	-	-	-	-						
	On/Off Switch on Indoor Unit	○	○	-	-						
	Signal Reception Indicator	-	-	-	-						
	Temperature Indicator	-	-	-	-						

○:Holding Functions -:No Functions *:More Than 10℃

(2) Heat Pump series

Category	Functions	FTX		RX		Category	Functions	FTX		RX	
		25 H Series	35 H Series	25 H Series	35 H Series			25 H Series	35 H Series	25 H Series	35 H Series
Basic Function	Energy Efficiency	○	○	○	○	Health Health & Clean	Air Purifying Filter (With Bacteriostatic Function, Virustatic Function, Deodrizing Function)	○	○	-	-
	Inverter, Inverter Power Control	○	○	○	○		Mold Proof Air Filter	○	○	-	-
	Cooling Operation Limit : Outdoor Temp.℃	-	-	*	*		Washable Grille	○	○	-	-
	Microprocessor Control	○	○	○	○		Filter Cleaning Indicator	○	○	-	-
Compressor	Scroll, Horizontal Scroll	-	-	-	-	Timer	24-Hour Clock Timer	○	○	-	-
	Swing	-	-	-	-		12-Hour Timer	-	-	-	-
	Rotary	-	-	○	○		On Timer	○	○	-	-
	Reluctance DC	-	-	-	-		Off Timer	○	○	-	-
Comfortable Airflow	Dual Flap	○	○	-	-		Night Set Mode	○	○	-	-
	Power-Airflow Flap	○	○	-	-		Alarm Timer	-	-	-	-
	Diffuser	○	○	-	-	Worry Free "Reliability & Durability"	Automatic Restart	○	○	-	-
	Wide-Angle Louvers	○	○	-	-		Self-Diagnosis Digital Display	○	○	-	-
	Vertical Auto-Swing	-	-	-	-		Self-Diagnosis LED Display	○	○	○	○
	Horizontal Auto-Swing	○	○	-	-		Theft Protection for Remote Controller (Option)	○	○	-	-
	3 Step Flow (H/P Only)	○	○	-	-		Wiring Error Check	-	-	-	-
"Comfortable Control" Comfort Control	Auto Fan Speed	○	○	-	-		Anti-Corrosion Treatment of Outdoor Heat Exchange Fins.	-	-	○	○
	Silent Operation Control	-	-	-	-	Flexibility	Multi-Split/Split Type Compatible Indoor Unit	○	○	-	-
	Double Thermostat Function	-	-	-	-		Flexible Voltage Correspondence	○	○	○	○
	Neuro-Heat Sensitive Control	-	-	-	-		Charge Less	-	-	10m	
	Quick Heating Control	-	-	-	-	Remote Control	5-Rooms Centralized Controller	○	○	-	-
	Hot Start	○	○	-	-		Time Clock (Field Supply)	○	○	-	-
	Automatic Defrosting	-	-	○	○		Remote Control Adaptor (Normal Open-Pluse Contact)	○	○	-	-
Operation Intelligent Operation	Automatic Operation	○	○	-	-		Remote Control Adaptor (Normal Open Contact)	○	○	-	-
	Programme Dry	○	○	-	-	Remote Controller	Wireless	○	○	-	-
	Circulation	-	-	-	-		Wired	-	-	-	-
	Fan Only	-	-	-	-						
Convenient Lifestyle Convenience	New Powerful Operation	-	-	-	-						
	Powerful Operation	-	-	-	-						
	Inverter Powerful-Operation	○	○	○	○						
	Quiet Operation	-	-	-	-						
	Laundry Program Operation	-	-	-	-						
	Energy Saving Operation	-	-	-	-						
	Power Select	-	-	-	-						
	On/Off Switch on Indoor Unit	○	○	-	-						
	Signal Reception Indicator	-	-	-	-						
	Temperature Indicator	-	-	-	-						

○:Holding Functions -:No Functions *:More Than 10℃

See the list of functions for the functions applicable to different models.

3. Main Functions

(1) Inverter Power Control

■ Principle of Operation of an Inverter

The heating and cooling load on the air conditioner varies depending on the outside temperature and the load conditions inside the room. Although the capacity of the air conditioner also changes with the rotational speed of the compressor, since the frequency of the normal motors is fixed (50Hz or 60Hz depending on the country and region), the range over which the capacity can be varied becomes narrow. The inverter air conditioner is one in which the control of the air conditioner performance is made over a wide range by converting the frequency.

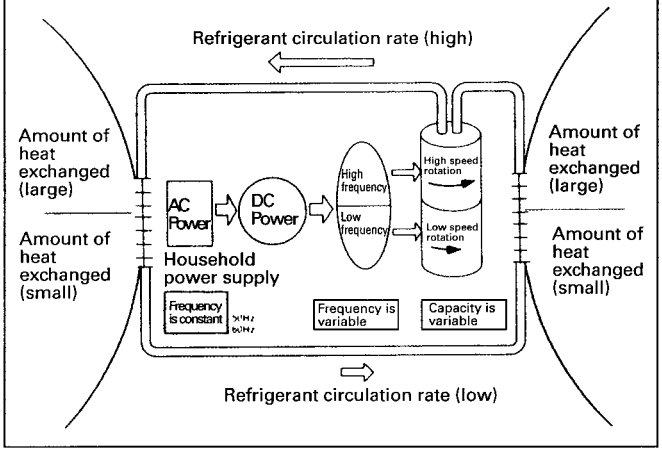
(1) The single phase AC is first converted into DC.

(2) The DC is then converted into three phase AC power supply whose frequency can be varied from the minimum frequency to the maximum frequency that are required.

(3) When the frequency is made higher, the rotational speed of the compressor increases, the circulation of the refrigerant becomes faster, and hence the amount of heat exchanged per unit time increases.

(4) When the rotational speed of the compressor is made lower, the circulation of the refrigerant becomes slower, and hence the amount of heat exchanged per unit time gets reduced.

[Schematic of an Inverter Air Conditioner]



■ Important Features of Inverters

(1) The capacity can be changed according to the changes in the outside temperature and cooling/heating load.

(2) Quick heating and quick cooling
The compressor rotational speed is increased at the time of starting the heating (or cooling). This increases (or decreases) the room temperature in a short time.

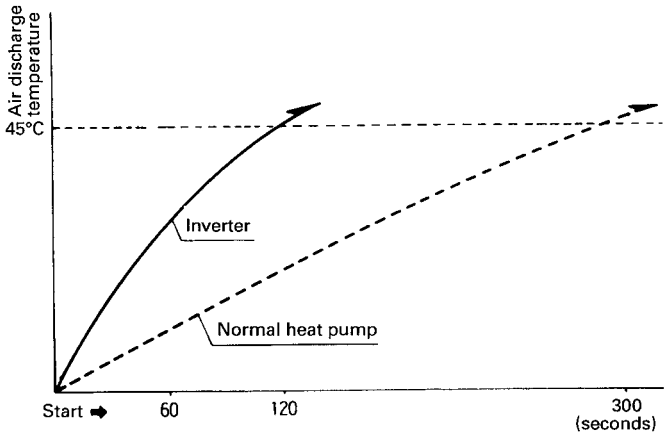
(3) High capacity is achieved even during extreme cold weather
High heating capacity is maintained even when the outside temperature is 0°C.

(4) Comfortable Air conditioning
Detailed adjustment is made to meet the changes in the room temperature. It is possible to Air condition with a very small room temperature variation.

(5) Energy saving heating and cooling
Once the room has been heated (during heating), energy saving operation is made at a low power while maintaining the room temperature.

(6) Defrosting without reducing the room temperature
Defrosting is completed in about 3 to 4 minutes while maintaining the hot air discharge. The reduction in the room temperature due to defrosting becomes small and a comfortable temperature is maintained constantly. (The time required may vary depending on the conditions.)

■ Quick Heating Capability



- The hot air discharge is started about 300 seconds after starting in the case of the general heating and cooling units and about 120 seconds after starting in the case of the inverter units (comparison of our company's products under the conditions of the outside temperature of 0°C and room temperature of 10°C).

(3) Power-airflow Flap & Diffuser

(For FTK, FTX25~60 H Series)

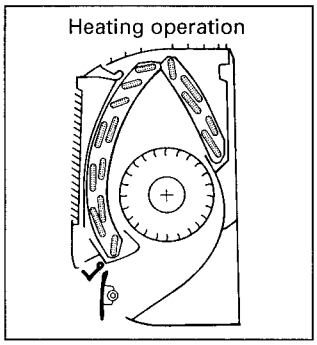
The large flaps send ample volume of warm air downward to heat the feet of people in the room, while the wide-angle diffuser ensures the air reaches every corner of the room. The upper and lower flaps located at the air outlet provide optimum air flow control in the cooling, heating and dry modes. In a heating operation, the large flaps direct warm air downward to heat the feet area. The wide-angle diffuser presses the air down to lay a "carpet" of warm air above the floor. In a cooling operation, the diffuser is retracted into the air conditioner body to distribute cool air throughout the room.

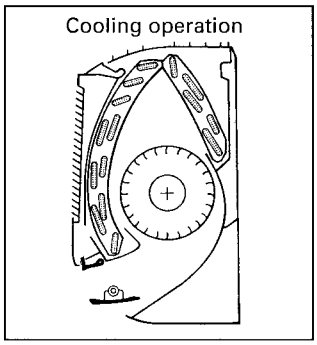
- **In heating operation**

Warm air is sent out straight down by the flaps, while the diffuser produces an air stream that presses down the warm air.

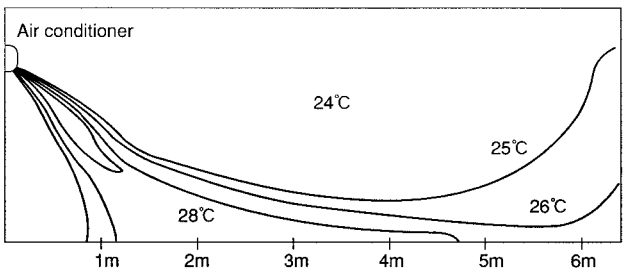
- **In cooling operation**

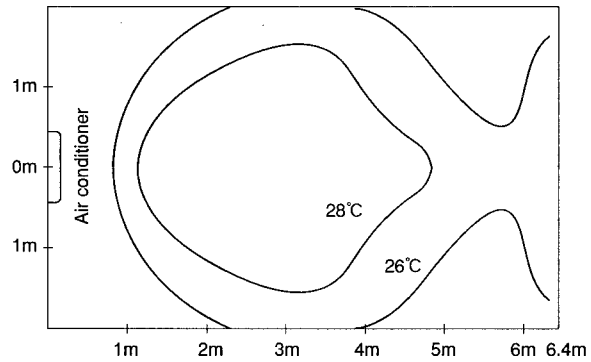
The diffuser is stored inside the unit, and the wide-angle flaps send cool air throughout the room.





■ Temperature distribution





< Conditions >

Outside temperature: 7°C DB, thermostat setting: 23°C, air flow setting: High (H tap), approximately 40 minutes after operation start, height of air outlet: approx. 2 m.

* Note that temperature distribution varies depending on the heat insulation, furniture arrange and other factors in the room.

(4) Wide-angle Louvers

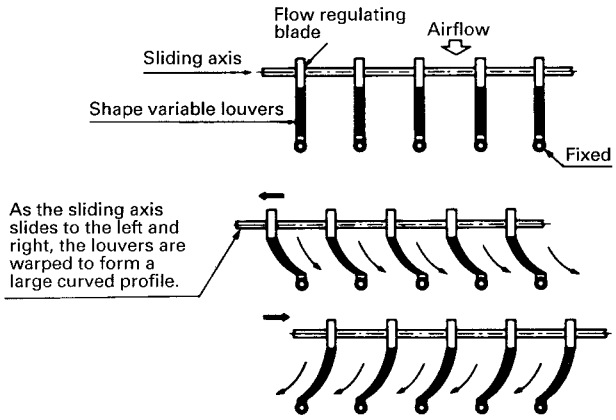
(For FTK, FTX50, 60 H Series)

The louvers provide wide-range airflow and minimize uneven temperature distribution that gives an uncomfortable feeling.

All-round louvers are adopted to create wide-range airflow. They can be easily warped to allow airflow control in a wide angle. They can swing to a maximum of 120° (during heating) as shown below, air can be distributed to every corner of the room.

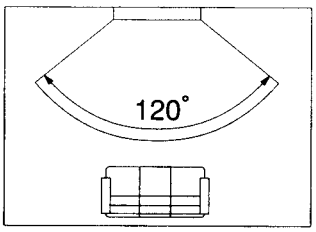
■ All-round louvers

Airflow direction changes depending on the curved blade shape.

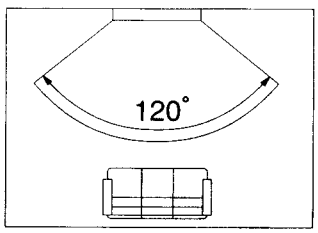


■ Flap angle

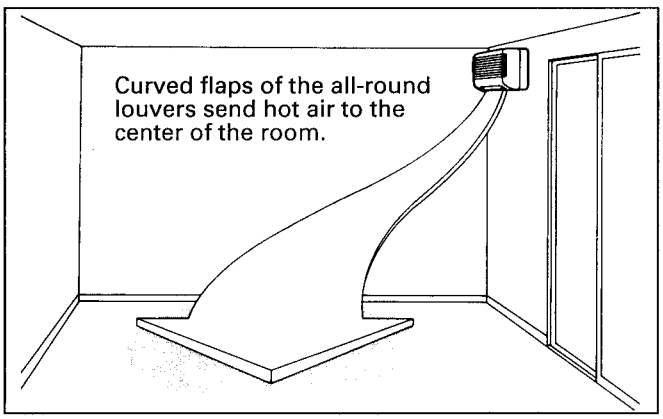
- **During heating**



- **During cooling**

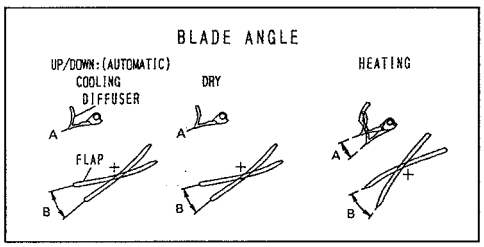


■ Capable of sending air to the center of a room even if it is installed at a corner of the room.



(4) Horizontal Auto-swing of flap(s)

Auto-swing angles are about "A" degrees when the fan is ON, and about "B" degrees when the cooling or program dry operation is ON. The up-and-down swing of the flaps widens the direction of wind.



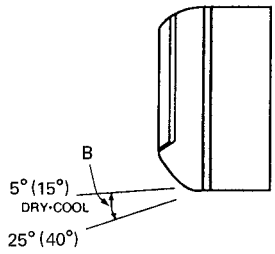
Fan, cooling, dry operation

		COOLING	DRY	HEATING
FTK25, 35H Series	A	20°	20°	20° ⟷ 30°
FTX25, 35H Series	B	5° ⟷ 25°	0° ⟷ 25°	20° ⟷ 50°

* FTK25·35H Series has no heating function.

Notes on flap angles

- The diffuser is kept open in DRY,COOL or FAN mode.



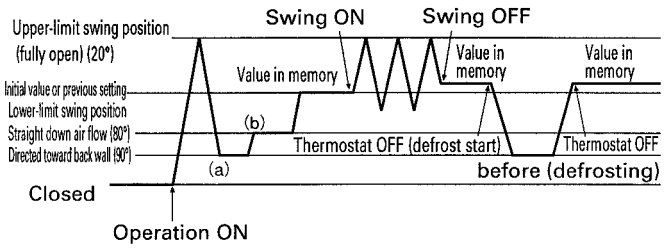
NOTE

Unless [SWING] is selected, you should set the flap at a near-horizontal angle in COOL or DRY mode to obtain the best performance.

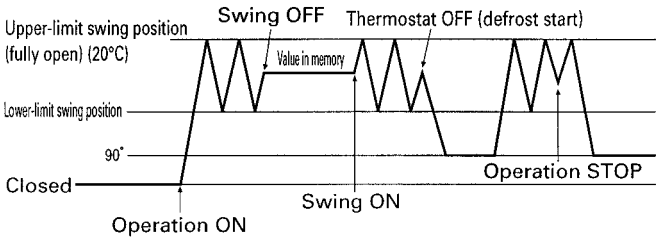
(5) 3-Step Flow (Heat pump only)

When the unit starts in a heating operation, it sends warm air towards the back wall to prevent it from directly blowing on people in the room. Then, the unit directs air straight down to quickly warm the feet of people in the room. When the walls and floor become sufficiently warm, the air flow angle and volume change to the settings (use the remote controller for air flow angle and volume setting.)

1) Heating (Swing-OFF start)



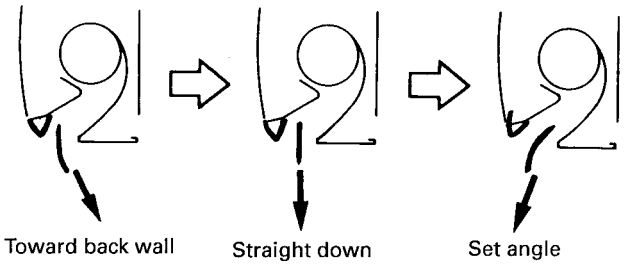
2) Heating (Swing-ON start)



1st step
Upper flap in straight-down position
Lower flap fixed at 90°

2nd step
Five minutes after (a) or when the heat exchanger temperature reaches 28°C or higher, the flap moves to send air straight down.

3rd step
Five minutes after (b) or when the room temperature reaches 15°C or higher after three minutes of operation, the flap moves to the set angle.



Notes
1. The movements of the large and small flap are not linked, and they move with a time lag of several seconds.
2. When the unit is not operating, the diffuser and flaps cover the air outlet.

(6) Auto Fan Speed

■ Automatic airflow rate control (linear)

If the AIRFLOW ADJUSTING button is set to AUTOMATIC, airflow rate is automatically controlled depending on the difference between the set temperature and room temperature.

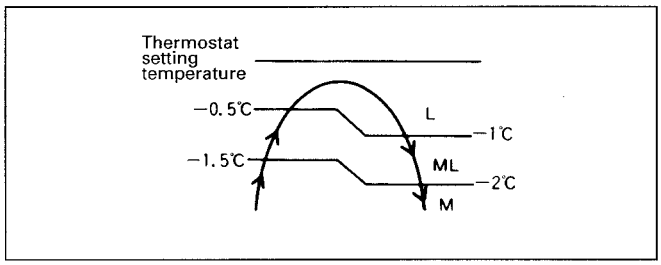
- Phase control (Revolution is controlled by Hall IC)
  STOP plus 8 steps (LLL, LL, L, ML, M, HM, H, and HH)

Scale mode \ Tap	LLL	LL	L	ML	M	HM	H	HH
Cooling			■					
Heating			■					
Drying								

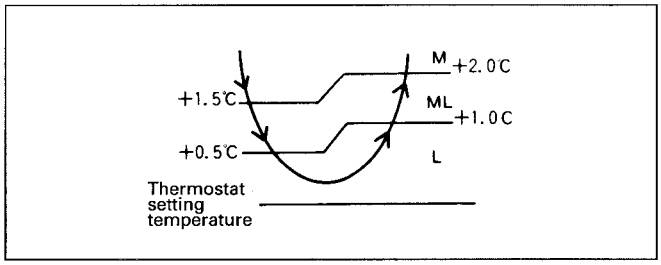
Note 1.When the AIRFLOW ADJUSTING button is set to AUTOMATIC, the airflow rate is automatically controlled within the range indicated with ( ).

■ Automatic airflow rate control (inverters)

- **Heating**



- **Cooling** (Some models give gentle changes in the airflow rate every 20 seconds.)



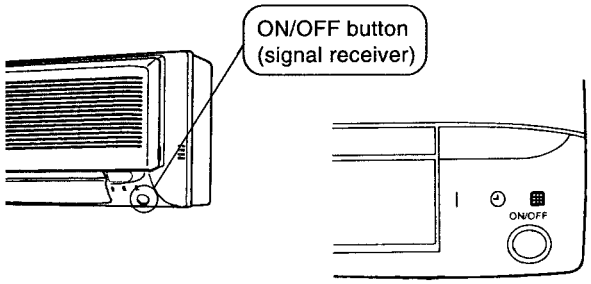
(7) ON/OFF Button on Indoor Unit

An ON/OFF button is provided on the front panel of the unit. Use this button when the remote controller is missing or if its battery has run out.

Every press of the button changes from Operation to Stop or from Stop to Operation

- Push this button once to start operation. Push once again to stop it.
- This button is useful when the remote controller is missing.
  - The operation mode refers to the following table.

	Mode	Temperature setting	Air flow rate
FTK	COOL	22°C	AUTO
FTX	AUTO	25°C	AUTO



(8) Signal Receiving Sign

When the indoor unit receives a signal from the remote controller, the unit emits a signal receiving sound.

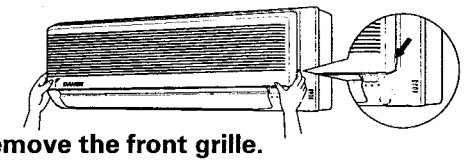
(9) Air Purifying Filter

The air purifying filter (electrostatic filter) catches pollen or smoke of cigarette as small as 0.01 micron through electro static charging. An activated carbon deodorizing filter in a net shape is also mounted to absorb and minimize fine odor particles.

(10) Washable Grille

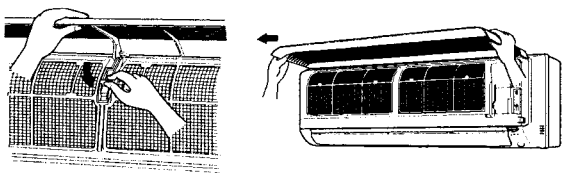
1) Open the front grille.

- Hold the grille by the tabs on the two sides and lift it until it stops with a click.



2) Remove the front grille.

- Supporting the front grille with one hand, release the lock by sliding down the knob with the other hand.
- To remove the front grille, pull it toward yourserf with both hands.

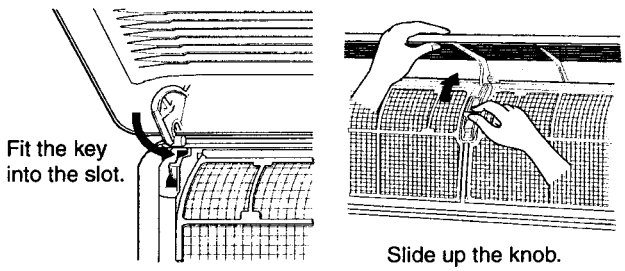


3) Clean the front grille.

- You may wipe it with a soft cloth soaked in water.
- Only neutral detergent may be used.
- You may wash the grille with water. After washing, dry it with cloth, then dry it up in the shade.

4) Attach the front grille.

- Set the 3 keys of the front grille into the slots and push them in all the way.
- Supporting the front grille with one hand, fit the lock by sliding up the knob with the other hand.
- Close the front grille slowly in this state. (Push the grille at the 3 points, two at both sides and in the middle.)



CAUTION

- When removing or attaching the front grille, use a robust and stable stool and watch your steps carefully.
- When removing or attaching the front grille, support the grille securely with hand to prevent it from falling.
- For cleaning, do not use water hotter than 40°C, benzine, gasoline, thinner,. nor other volatile oils, polishing compound, scrubbing brushes nor other hard stuff.
- After cleaning, make sure that the front grille is securely fixed.

(11) Filter Cleaning Indicator

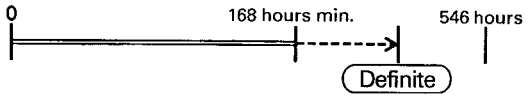
■ The filter check indicator located at the right hand side of the unit will indicate the time for cleaning the air filters.

The indicator will indicate an appropriate cleaning time depending on the environment (dusty place or not). This will prevent you from forgetting filter cleaning and also prevent performance drop that might be caused by using clogged filters and wasteful use of electricity by approximately 8%.

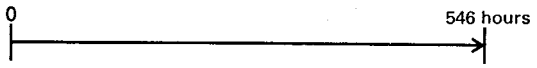
〈Contents of indication〉

- **Sensed by the operation hours and the fan motor voltage**

1) Filter clogging (※)



2) Accumulated operation hours



Indicates the earlier one of the above 1) or 2).

※ This indicator utilizes the characteristic that the fan motor voltage drops as the crossflow fan gets clogged; it does not detects the amount of filter clogging.

Note:

- When the power supply is reset, the accumulated operation hour is also reset.
- After cleaning and mounting the filters, press the reset button located inside the panel of the unit.

(12) Mold Resisting Treatment Filter

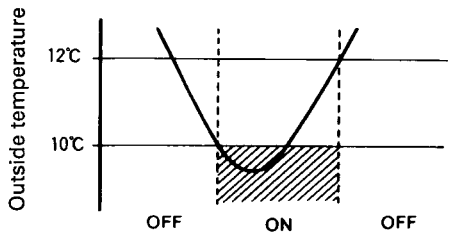
The filter net contains TBZ anti-mold agent (harmless, no color, no odor). Therefore, the filter allow much less mold growth than ordinary filters, and ensures a superb anti-mold effect.

(13) Warm-up Function (Heat Pump Only)

(1) When the equipment has been stopped, the compressor is warmed up by passing a small single-phasing current through the compressor motor so that the start up is speeded up.

(2) The power consumption during warming up is about 23W.

(3) This function operates only when the outside temperature is low (less than about 10°C) so that power saving is achieved.



(14) Hot Start Function (Heat Pump Only)

In order to prevent the cold air blast that normally comes when heating is started, the temperature of the heat exchanger of the indoor unit is detected, and either the air flow is stopped or is made very weak thereby carrying out comfortable heating of the room.

※ The cold air blast is also prevented using a similar control when the defrosting operation is started or when the thermostat gets turned ON.

(15) Timely Defrosting (Heat Pump Only)

■ Products with reverse-cycle defrosting system

(1) When the outdoor heat exchanger temperature drops below the defrost start temperature during the heating operation, the unit activates the defrosting operation. When the outdoor heat exchanger temperature rises above the defrost cancellation temperature, the defrosting operation stops.

(2) The defrost start temperature changes in each operation to ensure that the defrosting operation completes within the preset time to prevent unnecessary or extended defrosting operations.

- Preset time 4 to 7 minutes
- Time required for defrosting > Specified time: Defrost start temperature increases by 1°C
- Time required for defrosting < Specified time: Defrost start temperature decreases by 1°C
- Defrost start time varies in the range of −3° to −15°C.

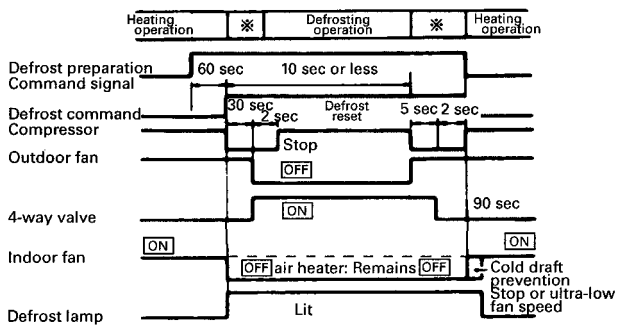
(3) Defrosting operation is not activated during the following guard time.

- 35 minutes of cumulative time after the starting of operation startup and the completion of defrosting
- 5 minutes after the starting of compressor

(4) To minimize the 4-way valve switching noise, the unit stops the compressor operation temporarily for switching.

(5) Defrosting time is 10 minutes maximum.

Time chart



(Note) The asterisk (※) indicates a cushioning time that reduces 4-way valve switching noise.

(16) Program Dry Function

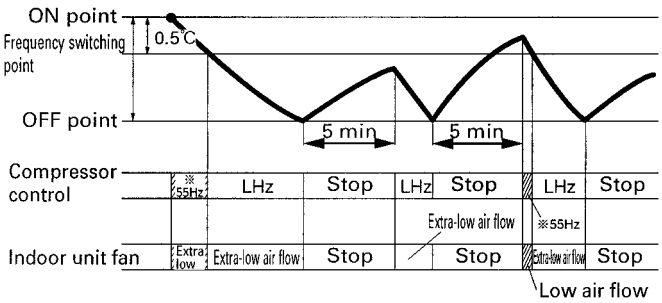
Program dry function removes humidity while preventing the room temperature from lowering.

Since the microcomputer controls both the temperature and air flow volume, the temperature adjustment and fan adjustment buttons are inoperable in this mode.

■ In the case of inverter units

The microcomputer automatically sets the temperature and fan settings. The difference between the room temperature at startup and the temperature set by the microcomputer is divided into two zones. Then, the unit operates in the dry mode with an appropriate capacity for each zone to maintain the temperature and humidity at a comfortable level.

Room temperature at startup	Temperature (ON point) at which operation starts	Frequency switching point	Temperature difference for operation stop
24°C	Room temperature at startup	0.5°C	1.5°C
18°C	18°C		1.0°C
17°C		—	



LHz indicates low frequency. Item marked with varies depending on models.

(17) Automatic Operation (Heat Pump Only)

Automatic cooling/heating function

When the AUTO mode is selected with the remote controller, the microcomputer automatically determines the operation mode from cooling and heating according to the room temperature and setting temperature at the time of the operation startup, and automatically operates in that mode.

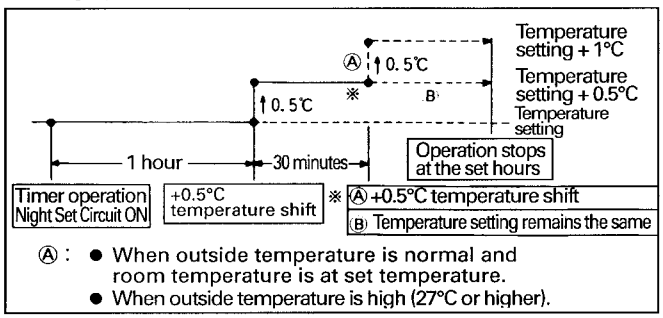
(18) Night Set Mode

When the OFF Timer is set, the New Night Set Circuit automatically activates.

The Night Set Circuit automatically switches the fan speed to a low setting to minimize operating noise. On the other hand, the New Night Set Circuit maintains the airflow setting made by users. (Some models are equipped with an Night Set Circuit ON switch.)

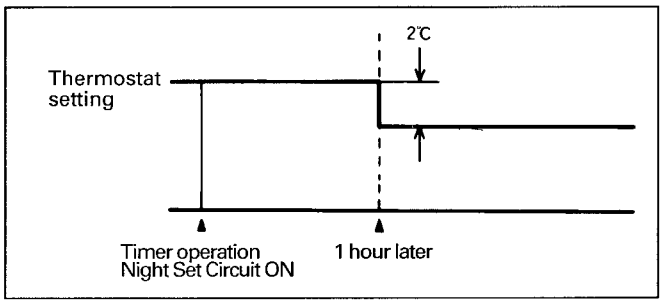
The Night Set Circuit continues heating or cooling the room at the set temperature for the first one hour, then automatically lowers the temperature setting slightly in the case of cooling, or raises it slightly in the case of heating, for economical operations. This prevents excessive heating in winter and excessive cooling in summer to ensure comfortable sleeping conditions, and also conserves electricity.

Cooling operation



※ For other models, the temperature setting increases by 1°C after one hour of operation.

Heating operation



(19) Self- Diagnosis Digital Display

The microcomputer continuously monitors main operating conditions of the indoor unit, outdoor unit and the entire system. Should an abnormality occur, the LCD remote controller displays information and the indicators on the indoor and outdoor units light. These indications allow prompt maintenance operations.

(20) Self- Diagnosis LED Display

The lighting patterns of the indoor unit LEDs (Operation, Timer and Dry/Hot Start indicators) and the LEDs on the outdoor unit's printed circuit board allow diagnosis of problem areas and faulty conditions of the interconnecting wire.

(21) Auto-Restart Function

Even if a power failure (including one for just a moment) occurs during the operation, the operation restarts in the condition before power failure automatically when power is restored.

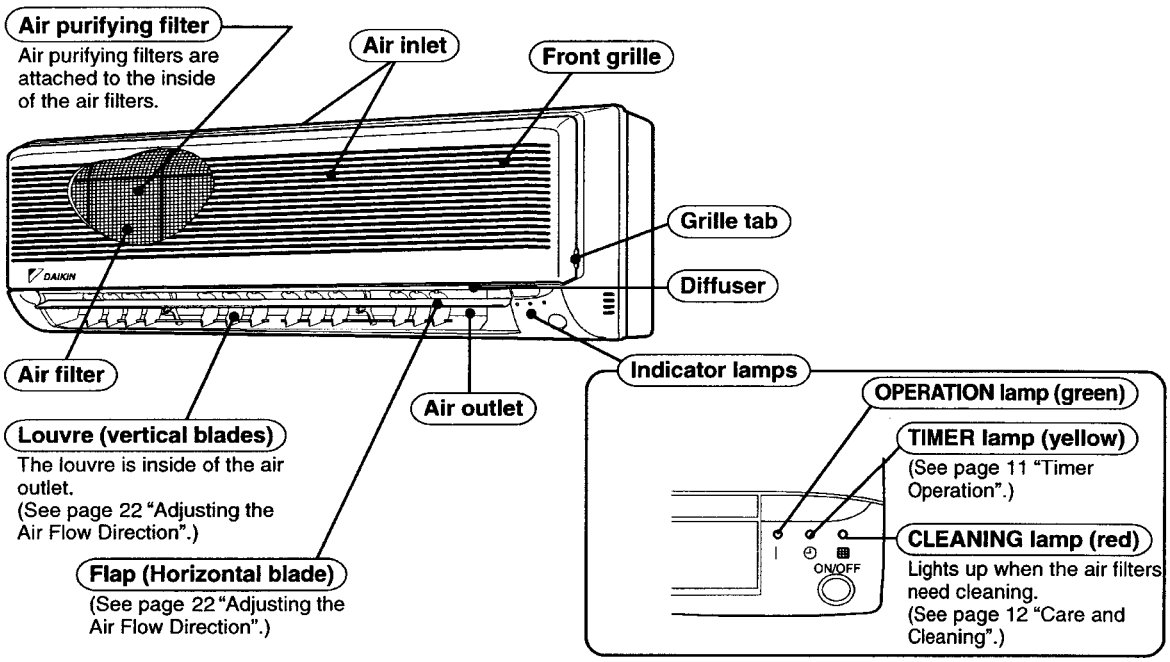
(Note) It takes 3 minutes to restart the operation because the 3-minute standby function is activated.

(1) Operation Instructions

After the installation and test operation of the room airconditioner have been completed, it should be operated and handled as described below. Every user would like to know the correct method of operation of the room airconditioner, to check if it is capable of cooling (or heating) well, and to know a clever method of using it.
In order to meet this expectation of the users, giving sufficient explanations taking enough time can be said to reduce about 80% of the requests for servicing. However good the installation work is and however good the functions are, the customer may blame either the room airconditioner or its installation work because of improper handling. The installation work and handing over of the unit can only be considered to have been completed when its handling has been explained to the user without using technical terms but giving full knowledge of the equipment.

(2) Indoor, Outdoor Unit and Remote Controller

Indoor unit

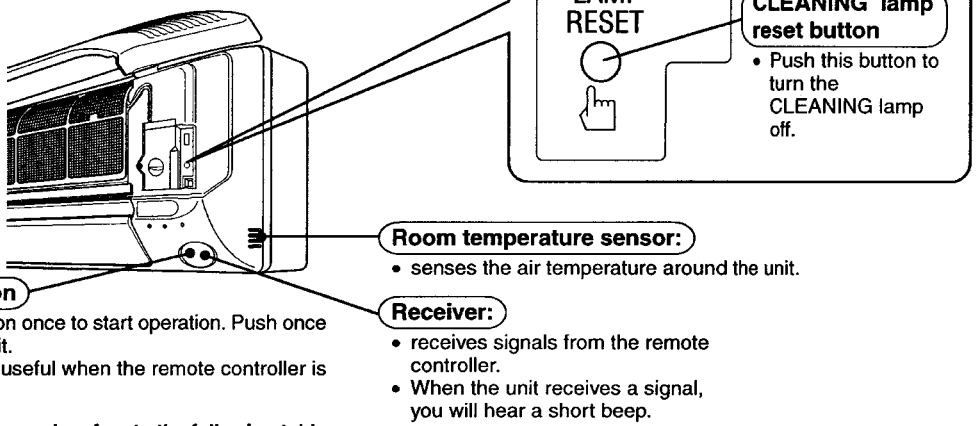


Opening the front grille

How to open the front grille: (See page 24 "Care and Cleaning")

⚠CAUTION

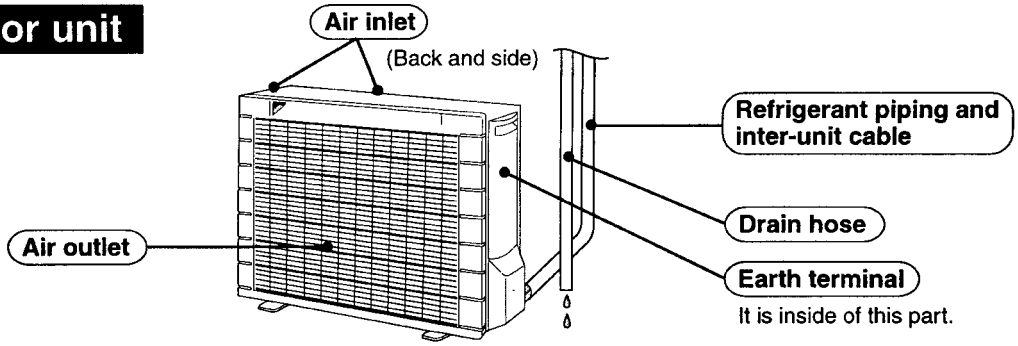
Before opening the front grille, be sure to stop the operation and turn the breaker OFF. If the power is on, the fan may rotate inside and may cause injury.



•The operation mode refers to the following table.

	Mode	Temperature setting	Air flow rate
FTK	COOL	22°C	AUTO
FTX	AUTO	25°C	AUTO

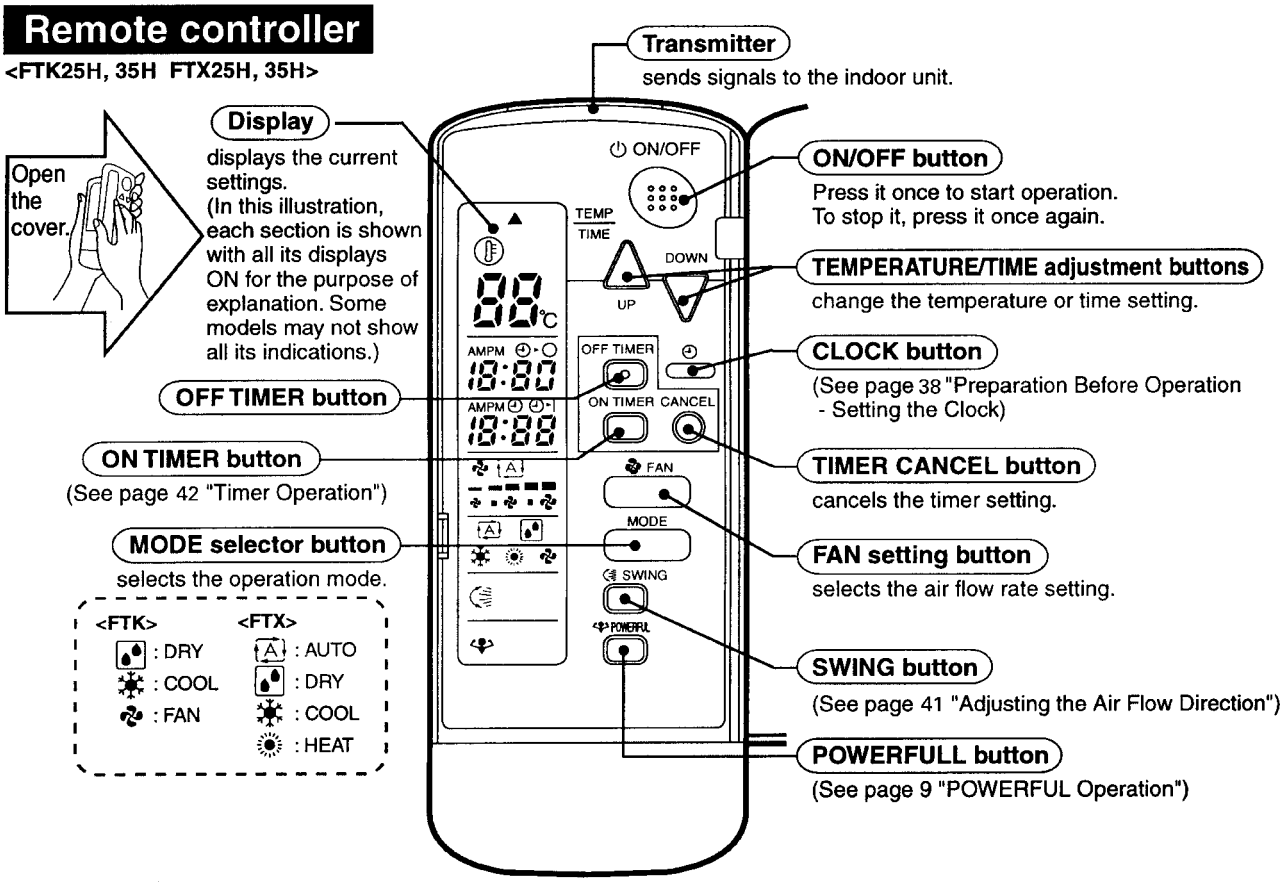
Outdoor unit



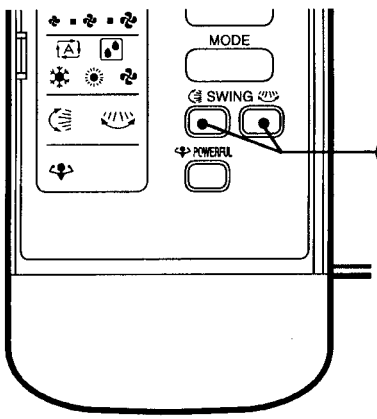
Appearance of the outdoor unit may differ with some models.

Remote controller

<FTK25H, 35H FTX25H, 35H>



<FTK50H, 60H FTX50H, 60H>



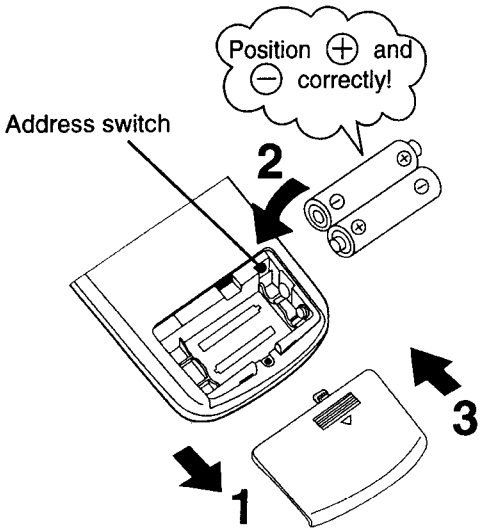
SWING button

(See page 41 "Adjusting the Air Flow Direction")

(3) Preparation Before Operation

Remote controller

■ Setting the batteries



1 Press ▭ with a finger and slide the back cover to take it off.

2 Set two alkaline dry batteries (LR03).

3 Set the back cover as before.
- This will cause the figures on the display to flash. Set the clock at this point.

- The address switch is used when two indoor units are to be installed in a single room.
- If there is only one indoor unit in the room, it must be set to "1".
- To install two units in a single room, consult the shop where you bought the air conditioner.

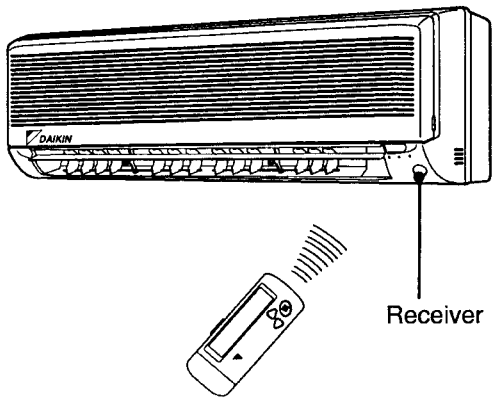
ATTENTION

About batteries

- Always replace two batteries at the same time. Replace them with new ones of an identical type.
- Do not use manganese dry batteries since their use may cause a malfunction.
- If you are not going to use the air conditioner for a long period, take out all the batteries.
- Batteries should last for about a year under normal conditions. When you find the displays unclear and signal communication often failing, replace them with new ones.
- Batteries may be exhausted even before the recommended date of consumption printed on them, if the air conditioner was manufactured many months ago.
- Never try to recharge the batteries.

■ Operating the remote controller

- To use the remote controller, aim the transmitter at the indoor unit. If there is anything to block signals between the unit and the remote controller, such as a curtain, the unit will not operate.
- Do not drop the remote controller. Do not get it wet.
- The maximum distance for communication is about 7 m.

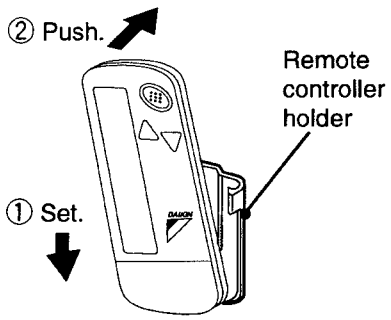


■ To fix the remote controller holder on the wall

1 Choose a place from where the signals reach the unit.

2 Fix the holder to a wall, a pillar, etc. with the screws supplied with the holder.

3 Fit the claw of the holder into the bottom of the remote controller, and push the remote controller onto the wall.



- To remove, pull it upwards.

ATTENTION

About the remote controller

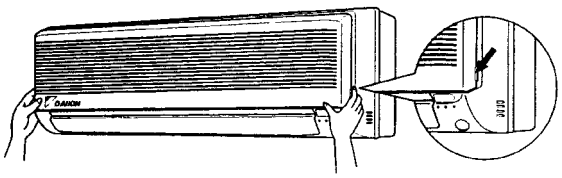
- Never expose the remote controller to direct sunlight.
- Dust on the signal transmitter or receiver will reduce the sensitivity. Wipe off dust with soft cloth.
- Signal communication may be disabled if an electronic-starter-type fluorescent lamp (such as inverter-type lamps) is in the room. Consult the shop if that is the case.
- If the remote control signals happen to operate another appliance, move that appliance to somewhere else, or consult the shop.

Indoor unit

■ Setting the air purifying filters

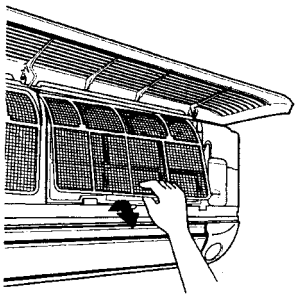
1 Open the front grille.

- Hold the grille by the tabs on the two sides and lift it until it stops with a click. (about 60°)



2 Pull out the air filters.

- Push upwards the tab at the center of each air filter, then pull it down.



3 Set the air purifying filters.

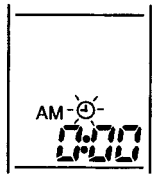
- Attach an air purifying filter to each air filter. (See page 43 "Care and Cleaning".)

4 Set the air filters in their original positions and close the front grille.

- Operation without air filters may result in troubles as dust will accumulate inside the indoor unit.

■ Setting the clock

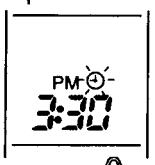
1 Press ⏲.



AM 0:00 is displayed.

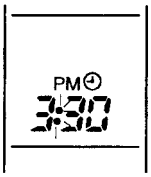
⏲ blinks.

2 Press UP / DOWN to set the clock to the present time.



- Holding down (UP) or (DOWN) button rapidly increases or decreases the time display.

3 Press ⏲.



: blinks.

(Now the clock is set.)

■ Turn the breaker ON

- Turning ON the breaker opens the flap, then closes it again. (This is a normal procedure.)

NOTE

Tips for saving energy

- Be careful not to cool the room too much. Keeping the temperature setting at a moderate level helps save energy.

Recommended temperature setting

For cooling: 26°C ~ 28°C
For heating: 20°C ~ 24°C

- Cover windows with a blind or a curtain. Blocking sunlight and air from outdoors increases the cooling effect.
- Clogged air filters cause inefficient operation and waste energy. Cleaning lamp tells you when the air filters need cleaning. Clean them once in about every two weeks.

Please note

- The air conditioner always consumes 15 ~ 35 watts of electricity even while it is not operating.
- If you are not going to use the air conditioner for a long period, for example in spring or autumn, turn the breaker OFF.
- Use the air conditioner in the following conditions.

Mode	Operating conditions	If operation is continued out of this range:
COOL	Outdoor temperature : 10 to 46°C Indoor temperature : 18 to 32°C Indoor humidity : 80% max.	• A safety device may work to stop the operation. (In multi system, it may work to stop the operation of the outdoor unit only.) • Condensation may occur on the indoor unit and drip.
HEAT	Outdoor temperature : −10 to 21°C Indoor temperature : 14 to 28°C	• A safety device may work to stop the operation.
DRY	Outdoor temperature : 21 to 46°C Indoor temperature : 18 to 32°C Indoor humidity : 80% max.	• A safety device may work to stop the operation. • Condensation may occur on the indoor unit and drip.

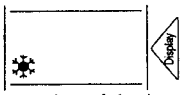
- Operation outside this humidity or temperature range may cause a safety device to disable the system.

(4) Operation

① Manual Operation

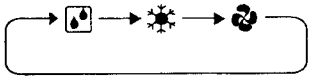
The air conditioner operates with the settings of your choice.
From the next time on, the air conditioner will operate with the same settings.

1 Press MODE and select a mode.

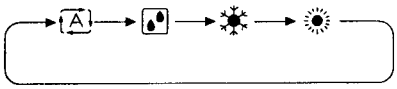


- Each pressing of the button advances the mode setting in sequence.

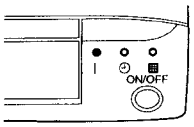
<FTK>



<FTX>



2 Press ⏻ ON/OFF .



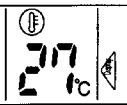
Then OPERATION lamp lights up.

■ To stop:

Press ⏻ ON/OFF once again.

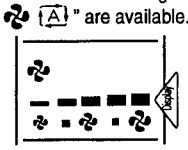
Then OPERATION lamp goes off.

■ To change the temperature setting:

DRY or FAN mode	HEAT or COOL mode
The temperature setting is not variable.	Press △ UP to raise the temperature and press ▽ DOWN to lower the temperature.
	Set to the temperature you like. 

■ To change the air flow rate setting:

Press FAN .

DRY mode	HEAT or COOL or FAN mode
The air flow rate setting is not variable.	Five levels of air flow rate setting from " " to " " plus " A " are available. 

- At smaller air flow rates, the cooling or heating effect is also smaller.

■ To change the air flow direction:

(See page 41.)

NOTE

<Note on HEAT mode operation>

Since this air conditioner heats the room by taking heat from outdoor air to indoors, the heating capacity becomes smaller in lower outdoor temperatures. If the heating effect is insufficient, it is recommended to use another heating appliance in combination with the air conditioner.
The heat pump system heats the room by circulating hot air around all parts of the room. After the start of heating operation, it takes some time before the room gets warmer.
In heating operation, frost may occur on the outdoor unit and lower the heating capacity. In that case, the system switches into defrosting operation to take away the frost. During defrosting operation, hot air does not flow out of indoor unit.

<Note on DRY mode operation>

This operation dehumidifies the indoor air when it is humid.

MORE FEATURE

(Three step flow)

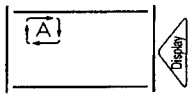
At the start heating, the human body feels uncomfortable if it is directly exposed to the air flow even if it is warm. To overcome this problem, the air conditioner is equipped with a three step flow system to provide a comfortable warm air around you.

1) At the start of operation, the flap is set toward the back.
2) When the air temperature has risen, the air starts blowing downward to warm up the floor.
3) When the floor and walls are warmed up, the warm air starts blowing toward the area around people.

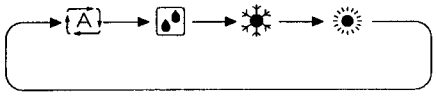
② AUTO Mode Operation

In AUTO mode, the air conditioner automatically selects the most appropriate settings. (FTX only)

1 Press MODE and select "Ⓐ".



- Each pressing of the button advances the mode setting in sequence.



2 Press ⏻ ON/OFF .

Then OPERATION lamp lights up.

■ To stop:

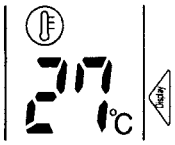
Press ⏻ ON/OFF once again.

Then OPERATION lamp goes off.

■ To change the temperature setting:

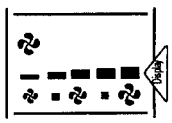
Press △ UP to raise the temperature and press ▽ DOWN to lower the temperature.

Set to the temperature you like.



■ To change the air flow rate setting:

Five levels of air flow rate setting from "▁" to "▇" plus "Ⓐ" are available.



■ To change the air flow direction:

(See page 41 "Adjusting the Air Flow Direction")

NOTE

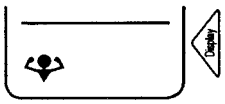
- In AUTO operation, the system selects a temperature setting and an appropriate mode (COOL or HEAT) based on the room temperature at the start of the operation.
- The system automatically reselects settings at a regular interval to bring the room temperature to user-setting level.
- If you do not like AUTO operation, you can select manually the mode and settings you like.

③ POWERFUL Operation

POWERFUL operation quickly maximizes the cooling effect in any operation mode. You can get the maximum capacity with a touch of a button.

- Pressing the (POWERFUL) button during operation starts POWERFUL operation.
- POWERFUL operation ends in 20 minutes. Then the system automatically operates again with the settings which were used before POWERFUL operation.

1 Press POWERFUL .



■ To cancel POWERFUL operation:

Press POWERFUL .

Notes on POWERFUL operation

- **In COOL and HEAT mode**
  To maximize the cooling and heating effect, the capacity of outdoor unit must be increased and the air flow rate be fixed to the maximum setting.
  The temperature and air flow settings are not variable.
- **In DRY mode**
  The temperature setting is lowered by 3°C and the air flow rate is slightly increased.
- **In FAN mode**
  The air flow rate is fixed to the maximum setting.

④ Note for Multi System

- **Precedence-room setting**
  When setting the preference-room during installation, the indoor unit's operation mode always takes priority.
  When the precedence-setting room unit is operated in POWERFUL mode, there are times that air conditioners in other rooms will temporarily stop in order to centralize power to the unit in the room.
  Please adjust the precedence-room setting to match your life style. Moreover, for precedence-room settings, please consult the service shop where you bought the unit.
- **COOL/HEAT mode**
  This mode is used to set the unit to only cool or heat. For information on using this mode, consult the service shop where you bought the unit.

NOTE

<Note for heat pump multi system>

When two or more indoor units have no precedence-room settings and are set to modes that differ from each other, the indoor unit which is operated first activates, while the other indoor unit does not activate and the OPERATION lamp blinks. (This is not a malfunction.)
An indoor unit that is not in operation will automatically start and operate in the mode in which a previously operated indoor unit was stopped. However, if the unit in operation provides only COOL and DRY modes, simultaneous operation is possible.

⑤ Adjusting the Air Flow Direction

You can adjust the air flow direction to increase your comfort.

Adjusting the horizontal blade (flap)

Press SWING .

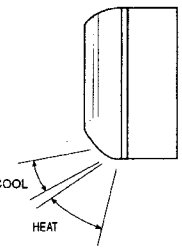
- Every time the button is pressed, "" appears or disappears.

..... The flap automatically swings up and down.

No display ..... To stop the flap at an angle you like, press SWING .

Notes on flap angles

- When [SWING] is selected, the flap swinging range depends on the operation mode. (See the figure.)
- When [SWING] is selected in heating operation, the flap and the diffuser swing up and down in combination.



- The diffuser is kept open in DRY or COOL mode.

NOTE

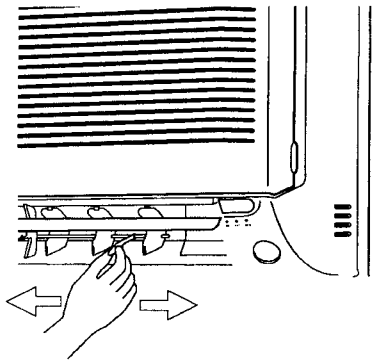
- Unless [SWING] is selected, you should set the flap at a downward position in HEAT mode and at a near-horizontal angle in COOL or DRY mode to obtain the best performance.
- In DRY mode, if the flap is fixed at a upward position, the flap automatically moves in about 60 minutes to prevent condensation on it.

ATTENTION

- Always use a remote controller to adjust the flap angle. If you attempt to move it forcibly with hand when it is swinging, the mechanism may be broken.

Adjusting the louvre

<FTK25H, 35H FTX25H, 35H>



Hold the knob and move the louvre.
(You will find a knob on the left-end and the right-end blades.)

ATTENTION

- Be careful when adjusting the louvre. Inside the air outlet, a fan is rotating at a high speed.

<FTK50H, 60H FTX50H, 60H>

Press SWING .

- Every time the button is pressed, "" appears or disappears.

..... The louver automatically swings right and left.

No display ..... To stop the louver at an angle you like, press SWING .

ATTENTION

- Always use a remote controller to adjust the louver angle. If you attempt to move it forcibly with hand when it is swinging, the mechanism may be broken.

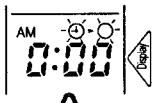
⑥ Timer Operation

Timer functions are useful for automatically switching the air conditioner on or off at night or in the morning. You can also use OFF TIMER and ON TIMER in combination.

OFF TIMER operation

- Check that the clock is correct.
  If not, set the clock to the present time. (See page 38.)

1 Press OFF TIMER ⊙ while the air conditioner is operating.

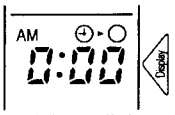


AM 0:00 is displayed.
⊙·○ blinks.

2 Press ▲ UP ▼ DOWN until the time setting reaches the point you like.

- Every pressing of either button increases or decreases the time setting by ten minutes. Holding down either button changes the setting rapidly.

3 Press OFF TIMER ⊙ once again.



Then the TIMER lamp lights up.

■ To cancel the timer:

Press CANCEL ◯ . Then the TIMER lamp goes off.

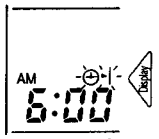
Notes on OFF TIMER

- When the OFF TIMER is set, the air conditioner automatically adjusts the temperature setting (0.5°C up in COOL, 2.0°C down in HEAT) to prevent excessive cooling for your pleasant sleep.

ON TIMER operation

- Check that the clock is correct. If not, set the clock to the present time (See page 38).

1 Press ON TIMER ▭ while the air conditioner is not operating.

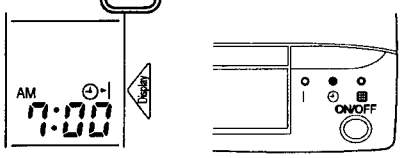


AM 6:00 is displayed.
⊙·| blinks.

2 Press ▲ UP ▼ DOWN until the time setting reaches the point you like.

- Every pressing of either button increases or decreases the time setting by ten minutes. Holding down either button changes the setting rapidly.

3 Press ON TIMER ▭ once again.



Then the TIMER lamp lights up.

■ To cancel the timer:

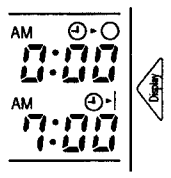
Press CANCEL ◯ .

Then the TIMER lamp goes off.

Combining ON TIMER and OFF TIMER

- A sample setting for combining the two timers is shown below.

(Example)
Present time: 11:00 PM
(The unit operating)
OFF TIMER at 0:00 a.m.) Combined
ON TIMER at 7:00 a.m.)



Notes on ON,OFF TIMER

- When TIMER is set, the present time is not displayed.
- Once you set ON,OFF TIMER, the time setting is kept in the memory. (The memory is canceled when remote controller batteries are replaced.)

ATTENTION

■ In the following cases, set the timer again.
- After a breaker has turned OFF.
- After a power failure.
- After replacing batteries in the remote controller.

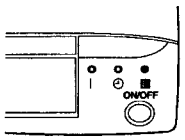
(5) Care and Cleaning

⚠ CAUTION

Before cleaning, be sure to stop the operation and turn the breaker OFF.

Cleaning the air filters

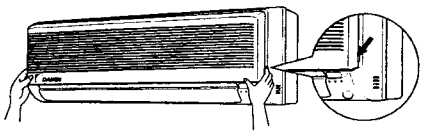
(It is recommended to clean them every two weeks.)



- Clean the air filters, when cleaning lamp lights up.

1 Open the front grille.

- Hold the grille by the tabs on the two sides and lift it until it stops with a click. (about 60°)

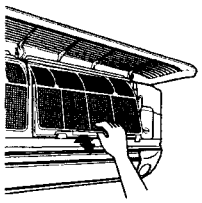


2 Push cleaning lamp reset button.

(See page 35 "Names of Parts".)

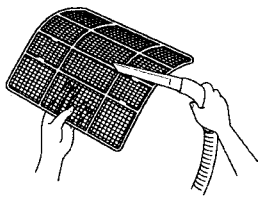
3 Pull out the air filters.

- Push a little upwards the tab at the center of each air filter, then pull it down.

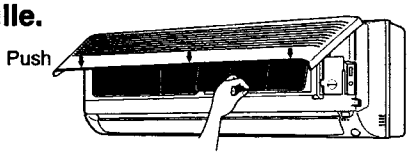


4 Take off the air purifying filters and clean them.

- Wash them with water, or clean them with a vacuum cleaner.
- If the dust does not come off easily, wash them with neutral detergent thinned with lukewarm water, then dry them up in the shade.



5 Set the air purifying filters and the air filters as they were and close the front grille.



- Insert claws of the filters into slots of the front panel. The front grille should lock at both sides and at the point in the middle. Push the grille at the 3 points indicated by ⬇.

NOTE

- In a dusty environment, clean the air filters at least once in every two weeks even before the cleaning lamp lights up.
- Operation with dusty air filters lowers the cooling and heating capacity and wastes energy.

Cleaning the indoor and outdoor units and the remote controller

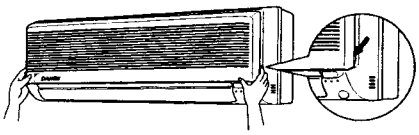
- Wipe them with dry soft cloth.
  For cleaning, do not use water hotter than 40°C, benzine, gasoline, thinner, nor other volatile oils, polishing compound, scrubbing brushes nor other hard stuff.

Replacing air purifying filters

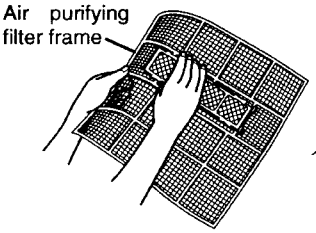
(It is recommended to replace them every three months.)

- Air purifying filters need to be replaced regularly.

1 Open the front grille and pull out the air filters.

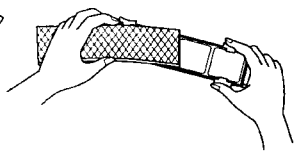


2 Take off the air purifying filters.

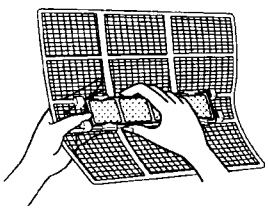


- Hold the recessed parts of the frame and unhook the four claws.

3 Detach the filter element and attach a new one.



4 Attach the air purifying filter.



5 Set the air filters as they were and close the front grille.

(Push the grille at the 3 points, two at both sides and in the middle.)

NOTE

- To order air purifying filters, contact the service shop where you bought the air conditioner.
- Once the air purifying filter element gets dirty, it is not reusable but must be thrown away.
- Operation with dirty air purifying filters:
  - cannot clean the air.
  - results in poor cooling.
  - may cause odour.

Item	Part No.
Air purifying filter (with frame)	KAF918A41
Air purifying filter (without frame)	KAF918A42

Cleaning the front grille

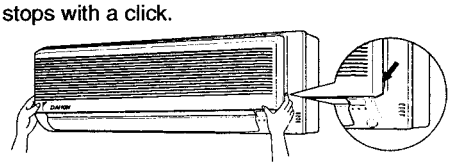
You may remove the front grille for cleaning.

⚠ CAUTION

- When removing or attaching the front grille, use a robust and stable stool and watch your steps carefully.
- When removing or attaching the front grille, support the grille securely with hand to prevent it from falling.
- For cleaning, do not use water hotter than 40°C, benzine, gasoline, thinner, nor other volatile oils, polishing compound, scrubbing brushes nor other hard stuff.
- After cleaning, make sure that the front grille is securely fixed.

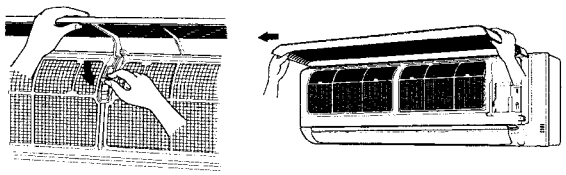
1 Open the front grille.

- Hold the grille by the tabs on the two sides and lift it until it stops with a click.



2 Remove the front grille.

- Supporting the front grille with one hand, release the lock by sliding down the knob with the other hand.
- To remove the front grille, pull it toward yourself with both hands.

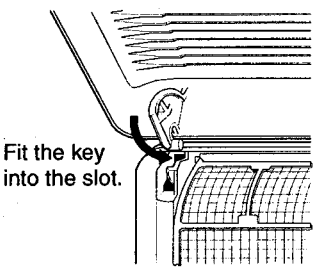


3 Clean the front grille.

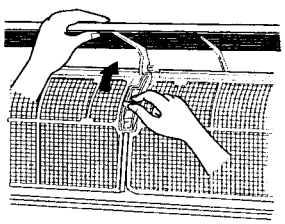
- You may wipe it with a soft cloth soaked in water.
- Only neutral detergent may be used.
- You may wash the grille with water. After washing, dry it with cloth, then dry it up in the shade.

4 Attach the front grille.

- Set the 3 keys of the front grille into the slots and push them in all the way.
- Supporting the front grille with one hand, fit the lock by sliding up the knob with the other hand.
- Close the front grille slowly in this state. (Push the grille at the 3 points, two at both sides and in the middle.)



Fit the key into the slot.



Slide up the knob.

Check

Check that the base, stand and other fittings of the outdoor unit are not decayed or corroded.

Check that nothing blocks the air inlets and the outlets of the indoor unit and the outdoor unit.

Check that the earth wire is not disconnected or broken.

Check that the drain comes smoothly out of the drain hose during COOL or DRY operation.

- If no drain water is seen, water may be leaking from the indoor unit. Stop operation and consult the service shop if this is the case.

Before a long idle period

1 Operate the fan alone for several hours on a fine day to dry out the inside.

<FTK>

1 Press MODE and select " ".

2 Press ⏻ ON/OFF .

<FTX>

1 Press MODE and select " ".

2 Press △ UP and set the temperature to 32°C

3 Press ⏻ ON/OFF .

- The air flow rate is fixed regardless of the setting.
- Perform this operation when the room temperature is under 28°C.

2 Clean the air filters and set them again.

3 Take out batteries from the remote controller.

4 Turn OFF the breaker for the room air conditioner.

- The air conditioner consumes 15 – 35 watts of electricity even when it is stopped with the remote controller.

(6) Troubleshooting

● These cases are not troubles.

The following cases are not air conditioner troubles but have some reasons. You may just continue using it.

Case	Explanation
Operation does not start soon. ● When ON/OFF button was pressed soon after operation was stopped. ● When the mode was reselected.	● This is to protect the air conditioner. You should wait for about 3 minutes.
Hot air does not flow out soon after the start of heating operation.	● The air conditioner is warming up. You should wait for 1 to 4 minutes. (The system is designed to start discharging air only after it has reached a certain temperature.)
The heating operation stops suddenly and a flowing sound is heard.	● The system is taking away the frost on the outdoor unit. You should wait for about 3 to 8 minutes.
The outdoor unit emits water or steam.	■ In HEAT mode • The frost on the outdoor unit melts into water or steam when the air conditioner is in defrost operation. ■ In COOL or DRY mode • Moisture in the air condenses into water on the cool surface of outdoor unit piping and drips.
Mists come out of the indoor unit.	■ This happens when the air in the room is cooled into mist by the cold air flow during cooling operation.
The indoor unit gives out odour.	■ This happens when smells of the room, furniture, or cigarettes are absorbed into the unit and discharged with the air flow. (If this happens, we recommend you to have the indoor unit washed by a technician. Consult the service shop where you bought the air conditioner.)
The outdoor fan rotates while the air conditioner is not in operation.	■ After operation is stopped: • The outdoor fan continues rotating for another 30 seconds for system protection. ■ While the air conditioner is not in operation: • When the outdoor temperature is very high, the out door fan starts rotating for system protection.
The operation stopped suddenly. (OPERATION lamp is on)	■ For system protection, the air conditioner may stop operating on a sudden large voltage fluctuation. It automatically resumes operation in about 3 minutes.

● Check again

Please check again before calling a repair person.

Case	Check
The air conditioner does not operate. (OPERATION lamp is off)	● Hasn't a breaker turned OFF or a fuse blown? ● Isn't it a power failure? ● Are batteries set in the remote controller? ● Is the address switch in the remote controller set correctly? (See page 18 "Preparation Before Operation".) ● Is the timer setting correct?
Cooling or Heating effect is poor.	● Are the air filters clean? ● Is there anything to block the air inlet or the outlet of the indoor and the outdoor units? ● Is the temperature setting appropriate? ● Are the windows and doors closed? ● Are the air flow rate and the air direction set appropriately?
Operation stops suddenly. (OPERATION lamp blinks.)	● Are the air filters clean? ● Is there anything to block the air inlet or the outlet of the indoor and the outdoor units? Clean the air filters or take all obstacles away and turn the breaker OFF. Then turn it ON again and try operating the air conditioner with the remote controller. If the lamp still blinks, call the service shop where you bought the air conditioner. ● Are operation modes all the same for indoor units connected to outdoor units in the **multi system**? If not, set all indoor units to the same operation mode and confirm that the lamps blink. Moreover, when the operation mode is in "AUTO", set all indoor unit operation modes to "COOL" or "HEAT" for a moment and check again that the lamps are normal. If the lamps stop blinking after the above steps, there is no malfunction. (See page 20.)
An abnormal functioning happens during operation.	● The air conditioner may malfunction with lightening or radio waves. Turn the breaker OFF, turn it ON again and try operating the air conditioner with the remote controller.

● **Call the service shop immediately.**

⚠ WARNING

■ When an abnormality (such as a burning smell) occurs, stop operation and turn the breaker OFF.

Continued operation in an abnormal condition may result in troubles, electric shocks or fire.

Consult the service shop where you bought the air conditioner.

■ Do not attempt to repair or modify the air conditioner by yourself.

Incorrect work may result in electric shocks or fire.

Consult the service shop where you bought the air conditioner.

If one of the following symptoms takes place, call the service shop immediately.

- **The power cord is abnormally hot or damaged.**
- **An abnormal sound is heard during operation.**
- **The safety breaker, a fuse, or the earth leakage breaker cuts off the operation frequently.**
- **A switch or a button often fails to work properly.**
- **There is a burning smell.**
- **Water leaks from the indoor unit.**

Turn the breaker OFF and call the service shop.

■ After a power failure

The air conditioner automatically resumes operation in about three minutes. You should just wait for a while.

■ Lightening

If lightening may strike the neighbouring area, stop operation and turn the breaker OFF for system protection.

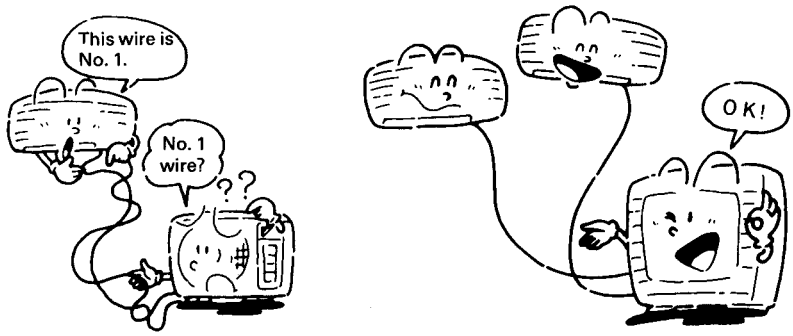
We recommend periodical maintenance

In certain operating conditions, the inside of the air conditioner may get foul after several seasons of use, resulting in poor performance. It is recommended to have periodical maintenance by a specialist aside from regular cleaning by the user. For specialist maintenance, contact the service shop where you bought the air conditioner.
The maintenance cost must be born by the user.

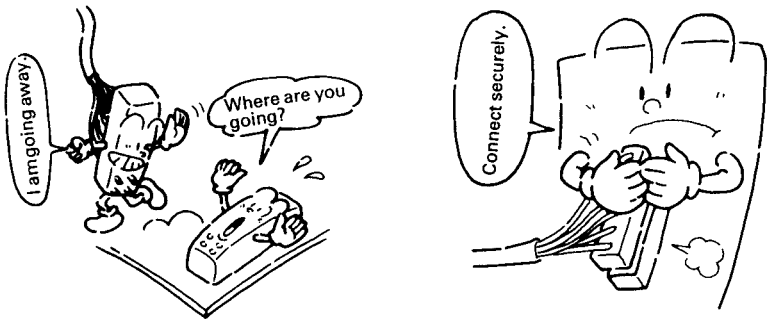
5. Service Diagnosis

(1) Cautions for Diagnosis

(1) Check for connection errors in the connection wires between the indoor and outdoor units.



(2) Check the PCB connector for disconnection and faulty contact.



(3) Check for breaking of wire in the wire harness.

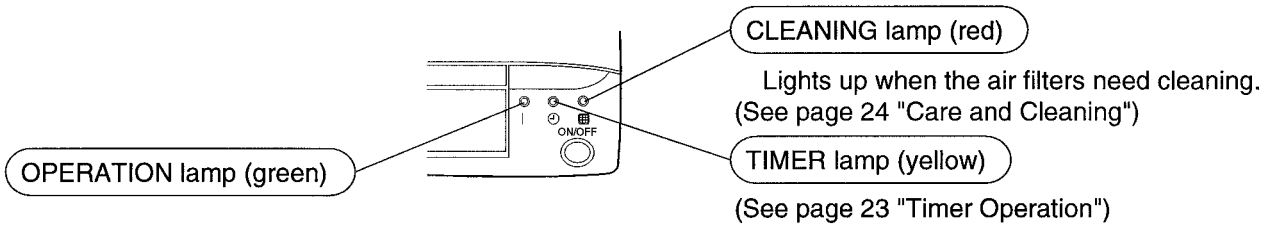
• Trouble shooting with Operation lamp

The Operation lamp flashes when any of the following abnormalities is detected.

(1) When the protection device of the indoor or outdoor unit is activated or the thermistor malfunctions to disable equipment operation.

(2) When an abnormality in the signal transmission between the indoor and outdoor units occurs.

For either type of malfunction, follow the instructions described in the section "Fault diagnosis by wireless remote controller."



(2) Service Check Functions

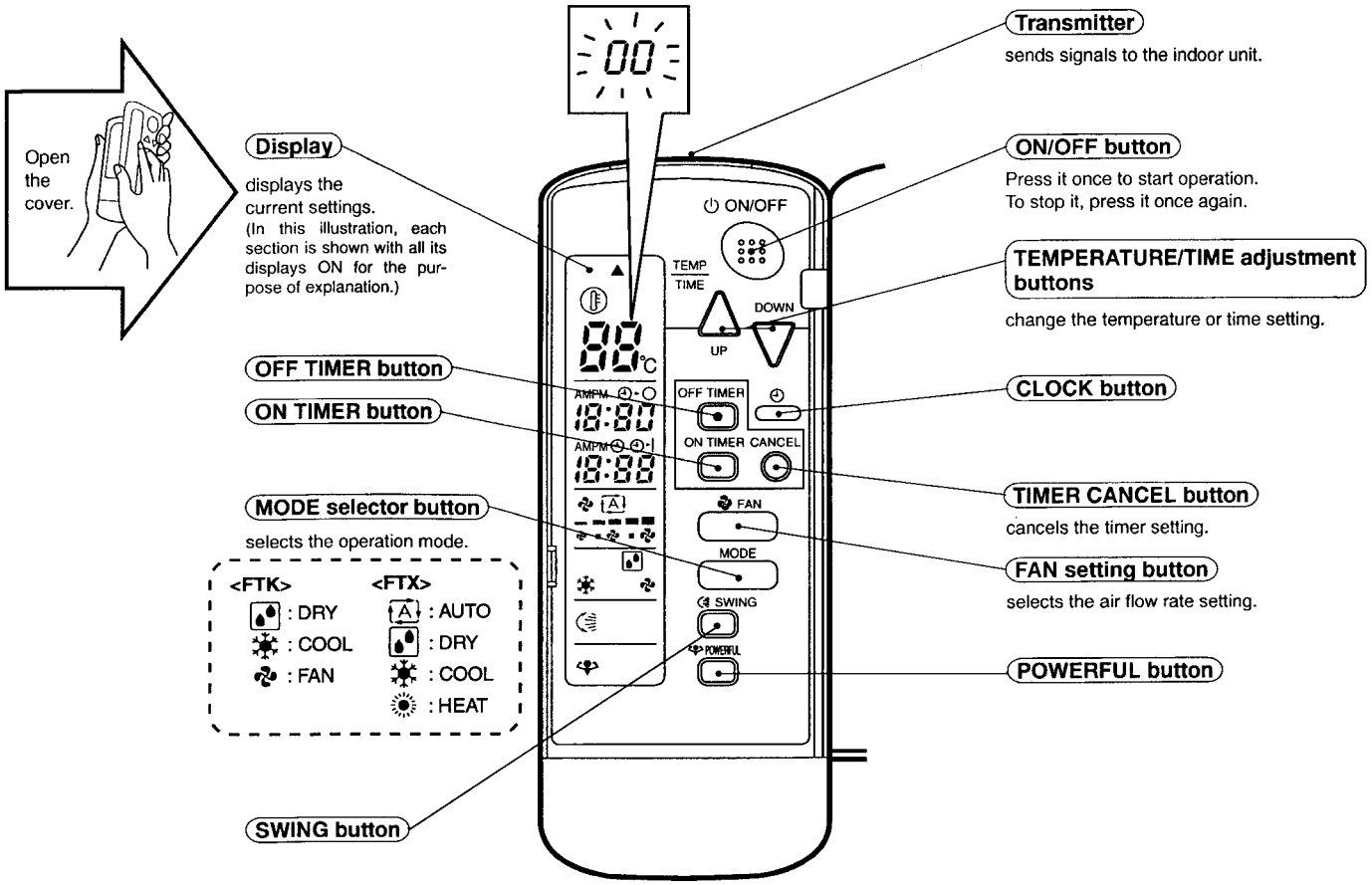
1) Fault diagnosis by wireless remote controller

ARC417 series

In the ARC417A series, the temperature display sections on the main unit indicate corresponding codes.

(1) When the timer cancel button is held down for 5 seconds, a "00" indication flashes on the temperature display section.

< Cover in open position >



(2) Press the timer cancel button repeatedly until a continuous beep is produced.

- The code indication changes in the sequence shown below, and notifies with a long beep.

No.	Code	No.	Code	No.	Code
①	00	⑪	C4	㉑	P4
②	E5	⑫	C5	㉒	LC
③	H8	⑬	E0	㉓	E7
④	U4	⑭	J3	㉔	U2
⑤	A6	⑮	C9	㉕	AJ
⑥	L4	⑯	J6	㉖	UF
⑦	E6	⑰	J9	㉗	A1
⑧	L5	⑱	U0	㉘	L3
⑨	A5	⑲	UA		
⑩	F3	⑳	H9		

< Notes >

1. A short beep and two consecutive beeps indicate non-corresponding codes.
2. To cancel the code display, hold the timer cancel button down for 5 seconds. The code display also cancels itself if the button is not pressed for 1 minute.

2) Test run from the remote controller

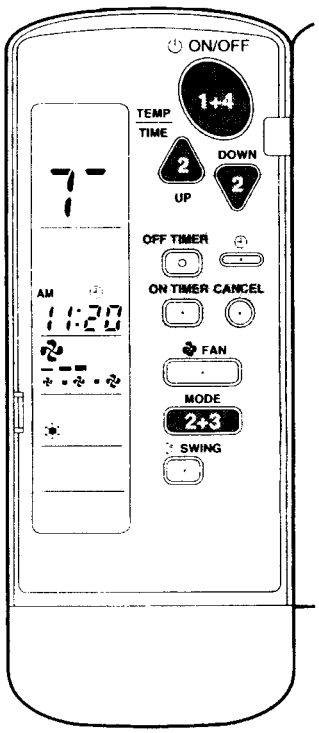
This program is to test the air conditioner independent from the room temperature and the tempersture setting (i.e. as the thermostat of the indoor unit is bridged).
Carry out the test operation in accordance with the operation manual to ensure that all functions and parts, such as louvre movement, are working properly.

Using the remote controller for trial operation

(1) Press the ON/OFF button to turn on the system.
(2) Simultaneously press DOWN, UP and MODE buttons.
(3) Press the MODE button twice. ("7" appears on the display to indicate that the trial operation mode is selected.)
(4) Trial run mode terminates in approximately 30 minutes and switches into normal mode. To quit a trial operation, press the ON/OFF button.

Note:

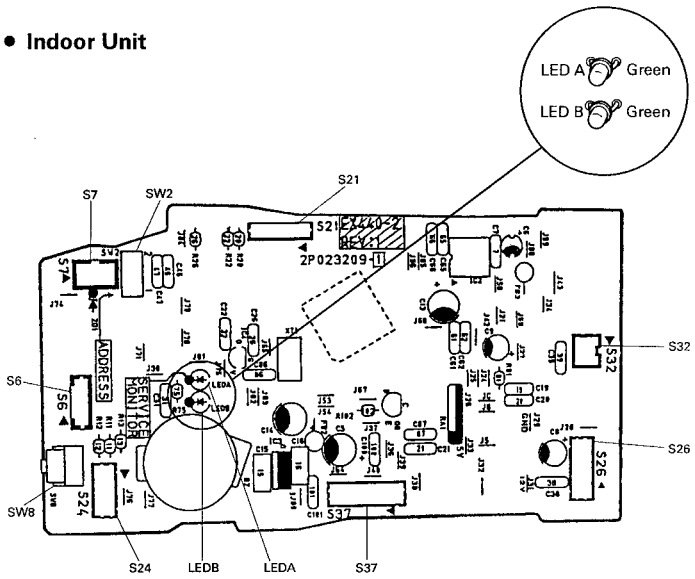
The air conditioner requires a small amount of power in stand-by mode. If the system is not to be used for some time after installation, shut off the circuit breaker to eliminate unnecessary power consumption.



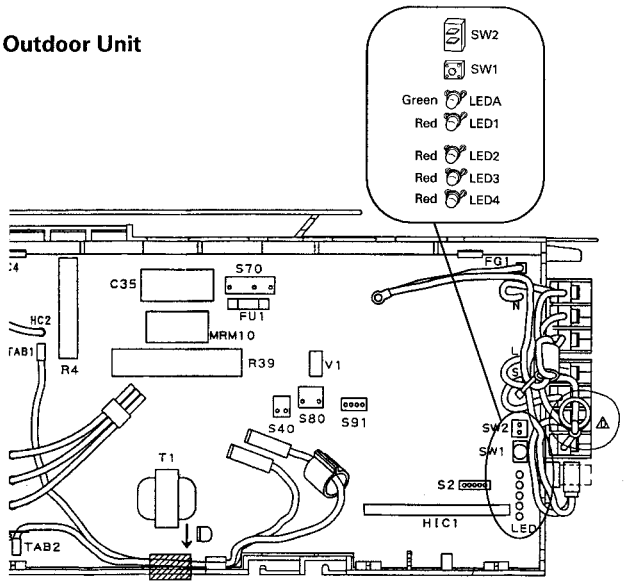
(3) Code Indication on The Remote Controller

■ In case of fault diganosis by LED display

• **Indoor Unit**



• **Outdoor Unit**



(1) Green and red LED lamps are located on PCB. When the operation is normal, the green lamps flash and the red lamps are turned off.

(Diagnosis by the green lamps) One green lamp is installed in an outdoor unit and two green lamps are installed in an indoor unit. The LED lamp of an outdoor unit and LED A of an indoor unit show the malfunction related with microcomputers, while LED B of an indoor unit is for transmission error. (Note 1)

When LED B of an indoor unit is turned off, check the improper connection wiring or disconnection, first.

Cause	Frequency
OL	2 times
Gas shortage	4 times
Faulty CT	4 times
Output overcurrent	6 times
Compressor startup error	

(2) Concerning the cause listed on the left, system error will be identified when the respective error occurs over the specified time and then stops the operation.
At this time, the display shows the cause by which the system error has been confirmed. (Note 1)
The operation lamp will be flashed, too. (Note 2)

(3) When the power is turned on again, the malfunction display will be disappeared, and the operation halt status caused by the system error will be cancelled.

(4) During forced operation, all LED lamps of an outdoor unit flash, but it doesn't mean malfunction.

Caution

(Note 1) When a system error caused by an indoor unit occurs, the display of the outdoor unit may not appear, or a display that does not correspond to the system error confirmation cause may appear.

(Note 2) The system error confirmation counter will be reset in 60 minutes after cancellation of the error cause. Thus, the system error is confirmed in case of a repeating error within 60 minutes.

■ Error codes and description of fault

	Code indication	Description of problem
System	00	Normal
	U0	Insufficient gas
	U2	Power factor module abnormality
	U4	Signal transmission error (between indoor and outdoor units)
	U5	Signal transmission error (between indoor unit and remote controller)
Indoor unit	A3	Faulty drainage
	A5	Operation halt due to the freeze protection function or high pressure control
	A6	Fan motor or related abnormality
	C4 or C5	Heat exchanger temperature thermistor abnormality
	C9	Room temperature thermistor abnormality
	CA	Discharge air temperature thermistor abnormality
Outdoor unit	E5	OL activation (IT activation) or High discharge pipe temperature
	E6	Compressor startup error
	F3	Operation halt due to discharge pipe control funciton
	H8	CT or related abnormality
	H9	Outside air thermistor or related abnormality
	J3	Discharge pipe temperature thermistor or related abnormality
	J6	Heat exchanger temperature thermistor or related abnormality
	J9	Gas pipe temperature thermistor or related abnormality
	L4	Radiation fin temperature rise
	P3	Heat radiation fin thermistor or related abnormality
	P4	Heat radiation fin thermistor or related abnormality
	E0	Protectors Function

(4) Problem Symptoms and Measures

1. Do not operate.

1. Applicable models

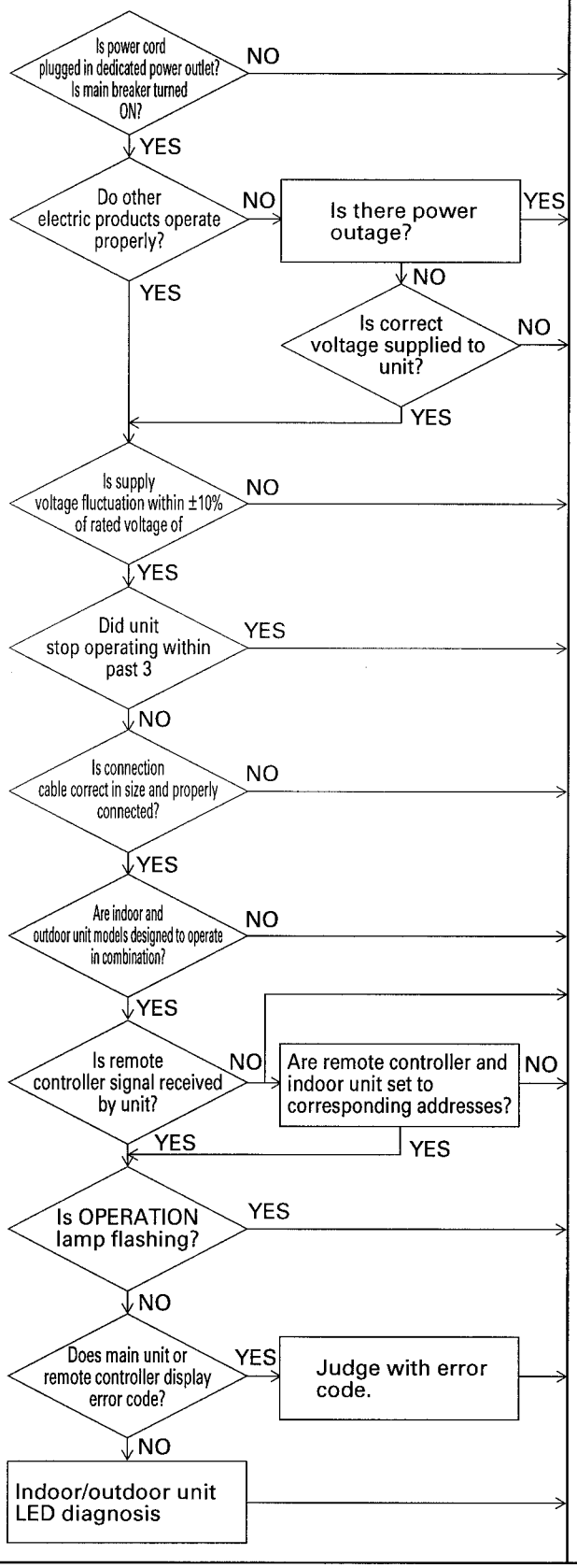
2. Error detection method

3. Error generating condition

4. Possible causes

- Power switch not turned on
- Incorrect power supply voltage
- Erroneous wiring of connection cable
- Incorrect combination of indoor and outdoor units
- Worn batteries in remote controller Incorrect address setting
- Activation of protection device [dirty air filter, refrigerant shortage, mixing of air due to overcharge]

5. Troubleshooting



2. Cooling or heating effect is poor.

1. Applicable models

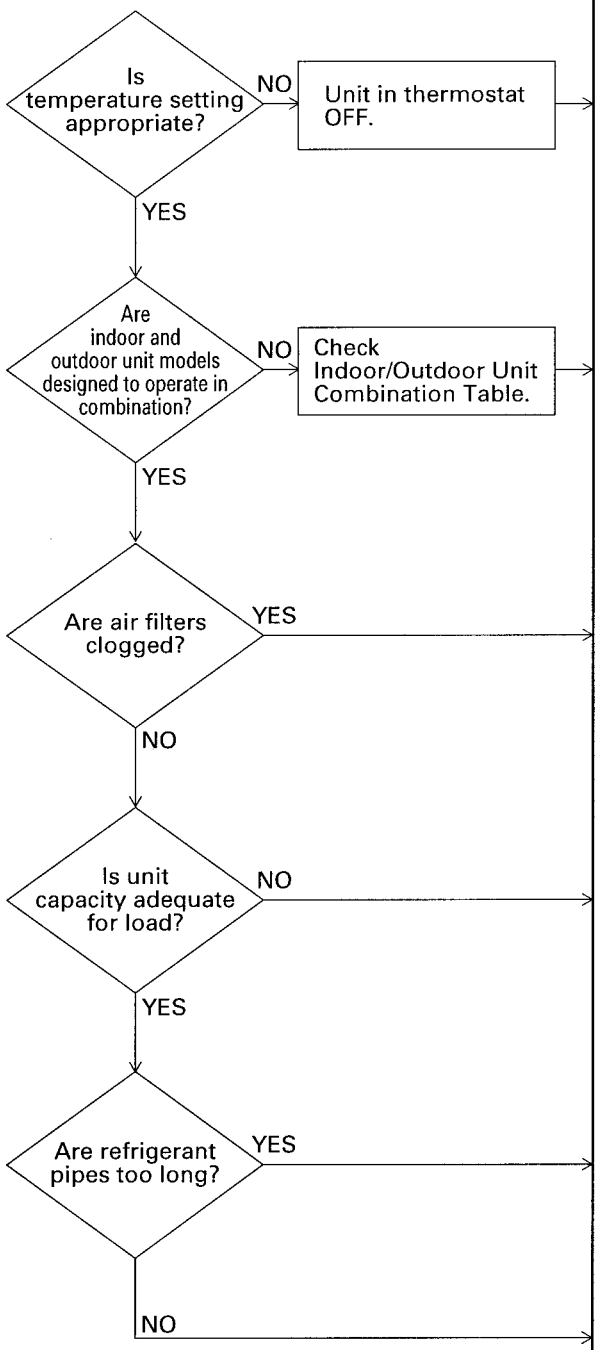
2. Error detection method

3. Error generating condition

4. Possible causes

- Improper temperature setting
- Incorrect combination of indoor and outdoor units
- Clogged air filters
- Insufficient capacity
- Refrigerant pipes too long

5. Troubleshooting



3. Operation stops by breaker.

1. Applicable models

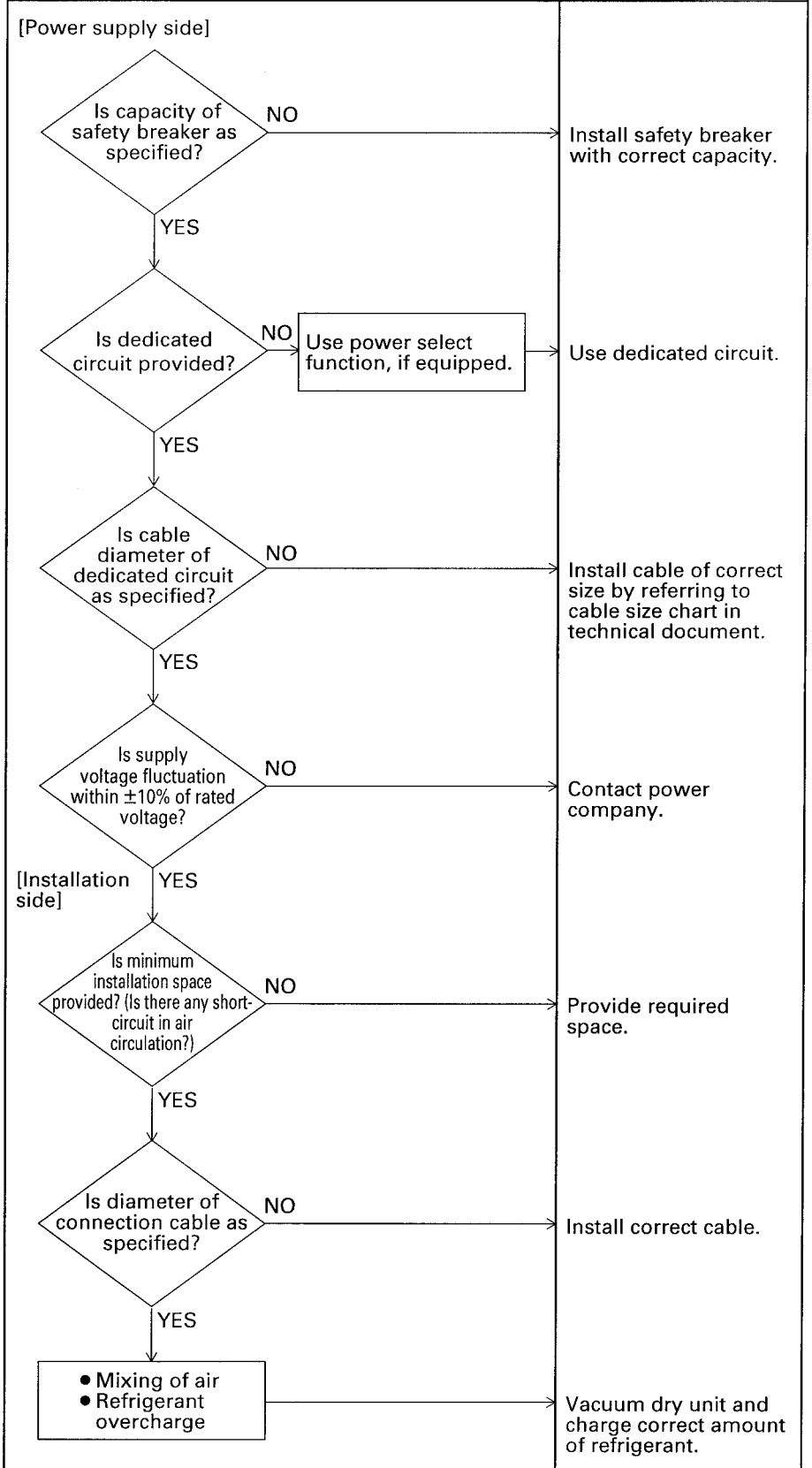
2. Error detection method

3. Error generating condition

4. Possible causes

- Insufficient capacity of safety breaker
- Dedicated circuit not provided
- Diameter of power cable too small
- Supply voltage fluctuation more than ±10% of rated voltage
- Diameter of connection cable too small (indoor unit power supply)
- Mixing of air (overcharge)

5. Troubleshooting



4. Operation sound and vibration are abnormal.

1. Applicable models

2. Error detection method

3. Error generating condition

4. Possible causes

- Pipes too short
- Mounting wall too thin
- Inadequate vibration-isolating measures
- Product shape deformation
- Insufficient refrigerant

5. Troubleshooting

Diagnosis	Measure
[Installation side]	
Is sound generated by mounting wall vibration? YES	Correct installation condition (wall reinforcement) Relocate unit.
NO	
Is sound generated by mounting base vibration? YES	Add cushioning material on mounting base.
NO	
Are pipes secured firmly? NO	Add cushioning material and secure with saddles.
YES	
[Product side]	
Does fan contact other parts? YES	Correct problem.
NO	
Are pipes in contact with casing? YES	Manually correct problem, or install weight on pipes.
NO	
Is sound produced by refrigerant passing through pressure reducing valve? YES	Wrap sound-insulating putty.
NO	
• Refrigerant overcharge • Mixing of air • Flushing sound due to insufficient refrigerant	Vacuum dry unit and charge correct amount of refrigerant.

(5) Trouble shooting

Inverter units

Green : Flashes when in normal condition ☼: ON
Red : OFF in normal condition ●: OFF
— : Not used for troubleshooting ◑: Flashing

Indoor unit LED indication		Indication on the remote controller	Description of the fault	Details of fault (Refer to the indicated page.)
Green				
A	B			
◑	◑	*	Indoor unit in normal condition (Conduct a diagnosis of the outdoor unit.)	—
●	●	A1	Faulty indoor unit PCB	40
◑	◑	A5	Operation halt due to the High pressure control and freeze protection function.	41
◑	◑	A6	Faulty fan motor	42
◑	◑	C4	Heat exchanger temperature thermistor or related abnormality	43
◑	◑	C9	Suction air thermistor or related abnormality	43
☼	*	*	Faulty indoor unit PCB	44
◑	☼			45
●	*	* OR U4	Faulty power supply or indoor unit PCB	46, 47
◑	●	U4	Signal transmission error (between indoor and outdoor units)	48

Inverter units

Green : Flashes when in normal condition ☼: ON
Red : OFF in normal condition ●: OFF
— : Not used for troubleshooting ◑: Flashing

Outdoor unit LED indication					Indication on the remote controller	Description of the fault	Details of fault (Refer to the indicated page.)
Green	Red						
A	1	2	3	4			
◑	●	●	●	●	✻ Various case exist	Outdoor unit in normal condition (Conduct a diagnosis of the indoor unit.)	—
◑	●	●	☼	☼	[U0]	Operation halt due to detection of insufficient gas.	49
◑	☼	●	☼	●	[E5],[F3]	Abnormal discharge pipe temperature.	—
						Operation halt due to OL activation.	50
◑	●	☼	☼	☼	L5	Operation halt due to output overcurrent	51
◑	☼	☼	●	●	H8	Operation halt due to detection of CT abnormality.	52
◑	☼	☼	●	●	H9	Operation halt due to outside air thermistor abnormality.	53
					J6	Operation halt due to outdoor unit heat exchanger thermistor abnormality.	53
◑	●	☼	●	☼	——	Operation halt due to detection of input overcurrent.	54
◑	☼	●	☼	☼	——	Peak cut, Operation halt due to the freeze protection function or indoor unit icing protection.	— (Conduct a diagnosis of the indoor unit.)
☼	—	—	—	—	✻	Faulty outdoor unit PCB Note 4	55
●	—	—	—	—	✻	Faulty outdoor unit PCB or signal transmitting/receiving circuit. Note 5	56, 57

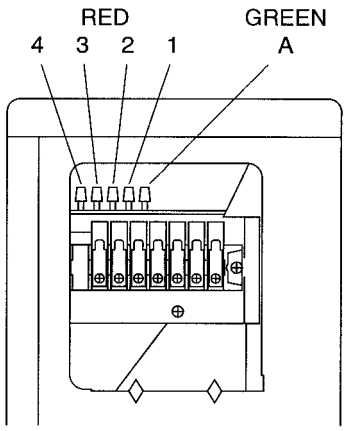
Note 1: The indications in the parenthesis ( ) in the remote controller display column are displayed only when system-down occurs.

Note 2: When a sensor error occurs, check the remote controller display to determine which sensor is malfunctioning.
If the remote controller does not indicate the error type, conduct the following operation.
- Turn the power switch off and back on again. If the same LED indication appears again immediately after the power is turned on, the fault is in the thermistor.
- If the above condition does not result, the fault is in the CT.

Note 3: The indoor unit error indication may take the precedence in the remote controller display.

Note 4: Switch the power off and back on again if the LED display recurs, the outdoor unit PCB is fault.

Note 5: Switch the power off and back on again if the LED display recurs, turn the power off. disconnect the connection wire (2), turn the power on again.
If LED-A off: the outdoor unit PCB is fault.
If LED-A flashing: the indoor unit PCB is fault.



LED LOCATION

Remote controller Indication	Indoor unit LED Indication A	Indoor unit LED Indication B	**Inverter units** Faulty PCB
A1	●	●	

1. Error detection method

Evaluation of zero-cross detection of power supply by indoor unit.

2. Error generating condition

When there is no zero-cross detection in approximately 10 continuous seconds.

3. Possible causes

- Faulty indoor unit PCB
- Faulty connector connection

4. Troubleshooting

Diagnosis	Measure
Connector connection check(note).	
Is it normal? NO	Correct connections.
YES	Replace PCBs (1) and/or (2).

(Note)
Connector Nos. vary depending on models.
Control connector·····S24, S25 and S26, S27
Power supply connector·····S36 , S37

Remote controller indication	Indoor unit LED indication A	Indoor unit LED indication B	
A5	◑	◑	**Inverter units** Operation shutdown due to high-pressure control or freeze-up protection (thermistor activation)

1. Error detection method

- High pressure control
  During heating operations, the temperature detected by the indoor heat exchanger thermistor is used for the high pressure control (stop, outdoor fan stop, etc.)
- The freeze protection control (operation halt) is activated during cooling operation according to the temperature detected by the indoor unit heat exchanger thermistor.

2. Error generating condition

- High pressure control
  During heating operations, the temperature detected by the indoor heat exchanger thermistor is above 67℃
- Freeze protection
  When the indoor unit heat exchanger temperature is below 0 ℃ during cooling operation.

3. Possible causes

- Operation halt due to clogged air filter of the indoor unit.
- Operation halt due to dust accumulation on the indoor unit heat exchanger.
- Operation halt due to short-circuit.
- Detection error due to faulty indoor unit heat exchanger thermistor.
- Detection error due to faulty indoor unit PCB.

4. Troubleshooting

Diagnosis	Measure
Check the air passage.	
Is there any short-circuit? YES	Provide sufficient air passage.
NO	
Check the intake air filter.	
Is it very dirty? YES	Clean the air filter.
NO	
Check the dust accumulation on the indoor unit heat exchanger.	
Is it very dirty? YES	Clean the heat exchanger.
NO	
Check No. 1 Indoor unit heat exchanger thermistor check	
Does it conform to the thermistor characteristic chart? YES	Replace the indoor unit PCB.
NO	Replace the thermistor (replace the indoor unit PCB).

Remote controller indication	Indoor unit LED indication A	Indoor unit LED indication B	**Inverter units** Shutdown due to abnormality in fan motor system (AC motor)
A6	◑	◑	

1. Error detection method

Rotation speed detected by hall IC during fan motor operation is used to detect abnormalities in fan motor system.

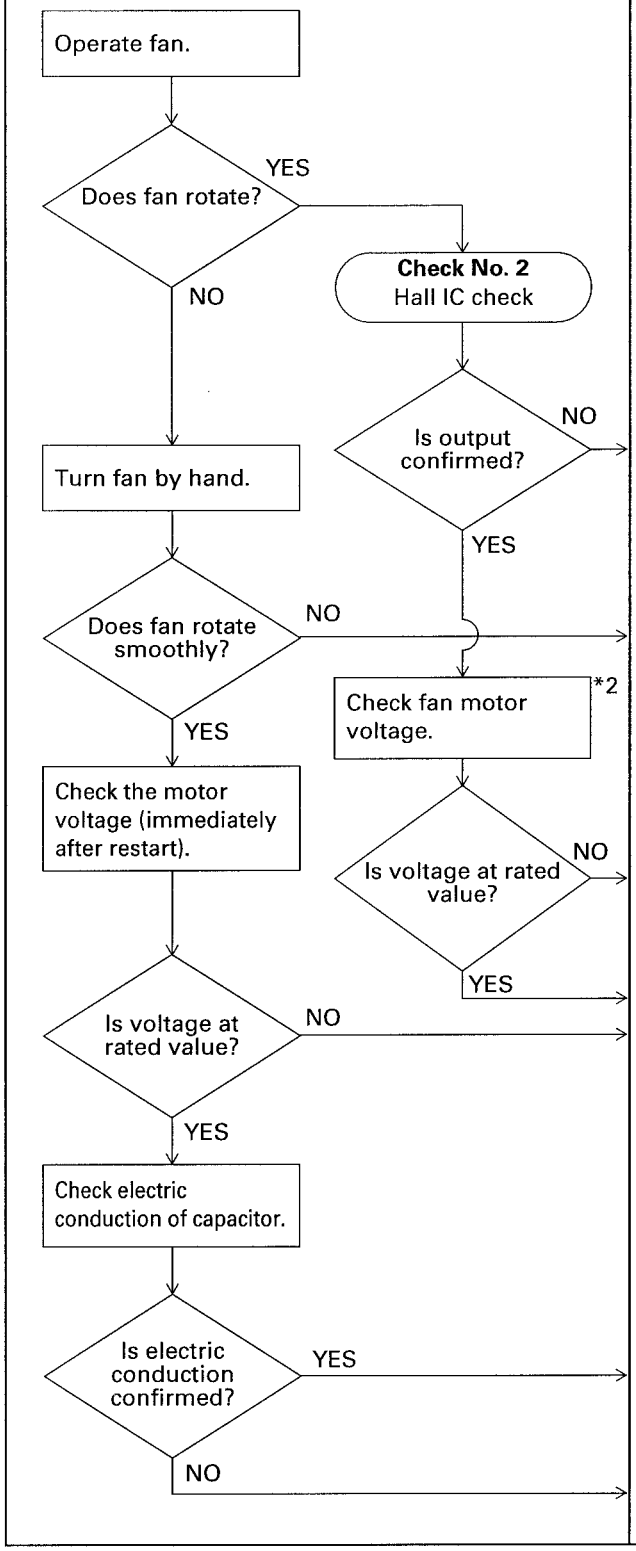
2. Error generating condition

When detected speed in maximum fan motor speed demand is less than 50% of HH tap.

3. Possible causes

- Shutdown due to layer shorting in fan motor
- Shutdown due to internal wire breakage in fan motor
- Shutdown due to fan motor lead wire breakage
- Shutdown due to faulty fan motor capacitor
- Erroneous detection due to faulty indoor unit PCB (1)
- Erroneous detection due to faulty indoor unit PCB (2)

4. Troubleshooting



Remote controller indication	Indoor unit LED Indication A	Indoor unit LED Indication B	**Inverter units** Operation halt due to detection of thermistor or related abnormality
C4,C9	◑	◑	

1. Error detection method

The temperatures detected by the thermistors are used to determine thermistor errors.

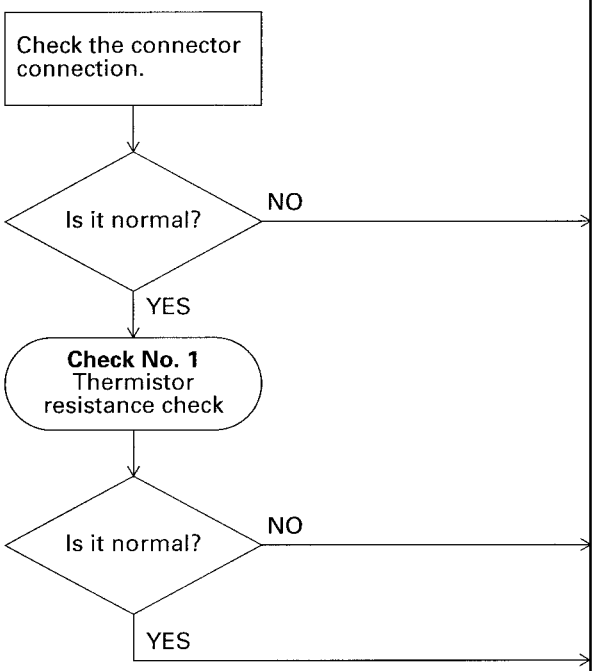
2. Error generating condition

When the thermistor input is more than 4.96 V or less than 0.04 V during compressor operation*.
* (reference)
When above about 212℃ (less than 120 ohms) or below about −50℃ (more than 1,860 kohms).
(Note) The values vary slightly in some models.

3. Possible causes

- Faulty connector connection
- Faulty thermistor
- Faulty PCB

4. Troubleshooting



C4: Heat exchanger temperature thermistor
C9: Room temperature air thermistor

Remote controller indication	Indoor unit LED indication A	Indoor unit LED indication B	
*	☼	*	Faulty indoor unit PCB

1. Error detection method

The proper program operation of the microcomputer is checked by the program.

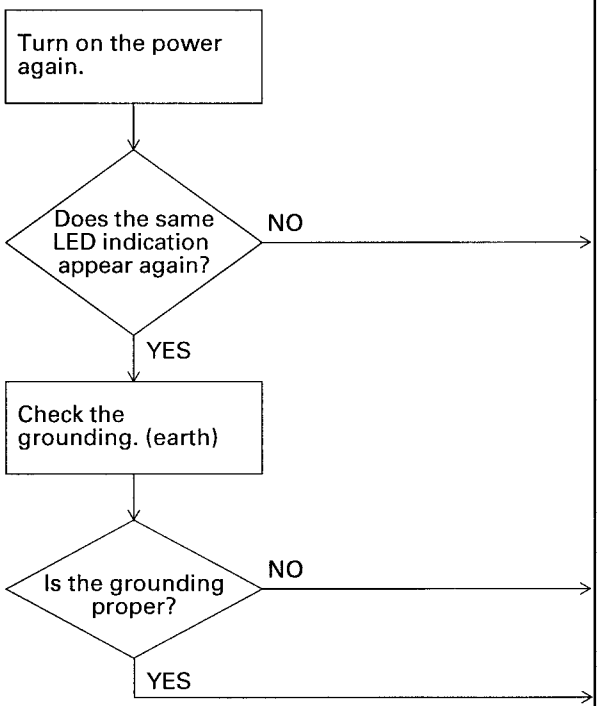
2. Error generating condition

When the microcomputer program does not function properly.

3. Possible causes

- Microcomputer program is in abnormal condition due to an external factor.
  - Noise.
  - Momentary voltage drop.
  - Momentary power failure, etc.
- Faulty indoor unit PCB.

4. Troubleshooting



Remote controller indication	Indoor unit LED indication A	Indoor unit LED indication B	Faulty indoor unit PCB
*	◑	☼	

1. Error detection method
The condition of the transmission circuit for indoor-outdoor signal transmission is detected.
2. Error generating condition
When the transmission circuit remains ON.
3. Possible causes
• Faulty indoor unit PCB

4. Troubleshooting	
Diagnosis	Measure
Replace the indoor unit PCB.	

Remote controller indication	Indoor unit LED indication A	Indoor unit LED indication B	
* or U4	●	*	**Inverter units** Power supply abnormalities or faulty indoor printed circuit boards

1. Error detection method

1) The proper program operation of the microcomputer is checked by the program.
2) In indoor-outdoor signal communications, the indoor unit determines whether the outdoor unit receives signals properly by detecting signals transmitted by the outdoor unit to the indoor unit.

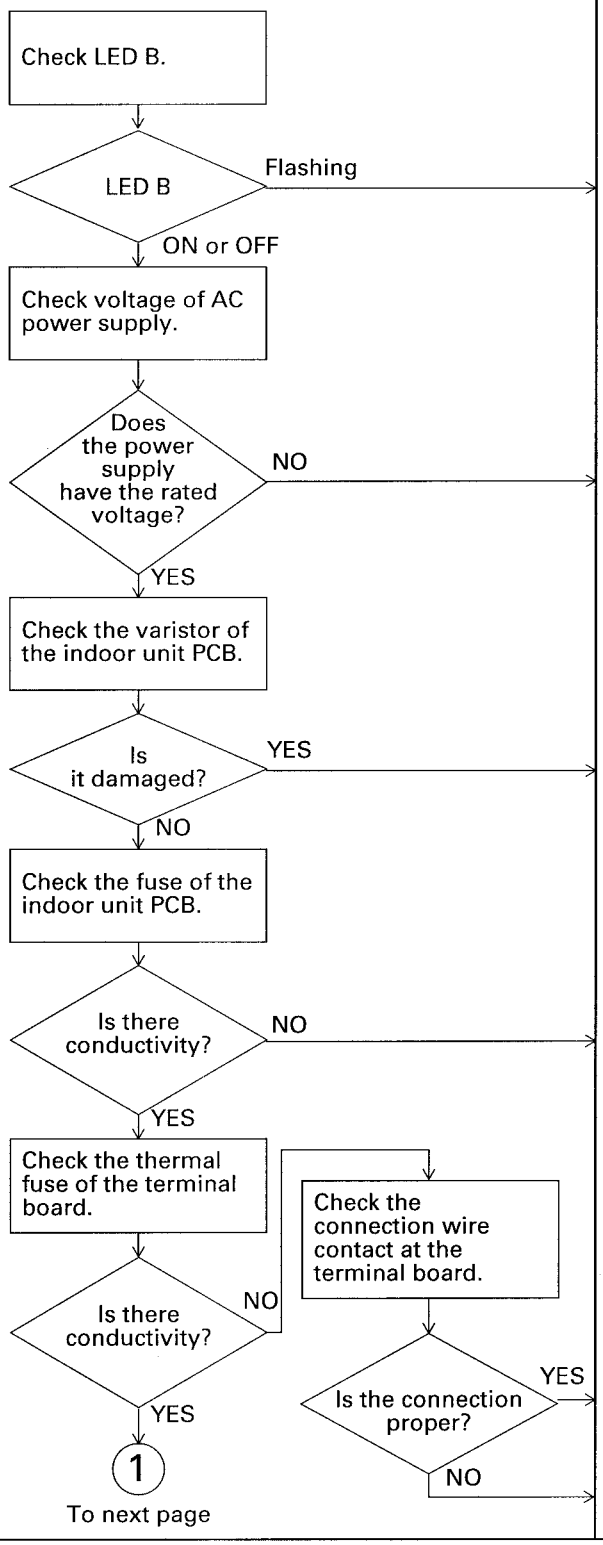
2. Error generating condition

1) When the microcomputer program does not function properly.
2) When the indoor unit determines that the indoor unit does not properly receive signals transmitted by the outdoor unit in indoor-outdoor signal communications.

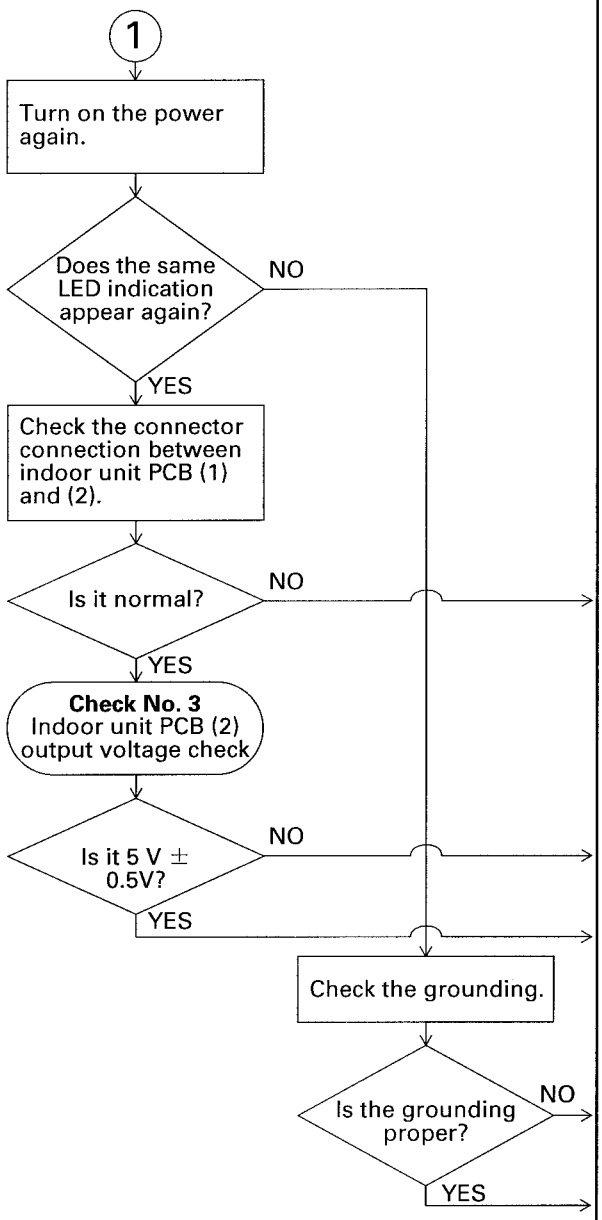
3. Possible causes

- Display disabled by fault power supply.
- Faulty signal transmitting/receiving circuit in indoor printed circuit boards (1) and (2)
- Microcomputer program is in abnormal condition due to an external factor.
  - Noise.
  - Momentary voltage drop.
  - Momentary power failure, etc.
- Faulty indoor unit PCBs (1) and (2).

4. Troubleshooting



4. Troubleshooting

Diagnosis	Measure
	

Remote controller indication	Indoor unit LED indication A	Indoor unit LED indication B	**Inverter units** Signal transmission error (between indoor and outdoor units)
U4	◑	●	

1. Error detection method

The data received from the outdoor unit in indoor unit-outdoor unit signal transmission is checked whether it is normal.

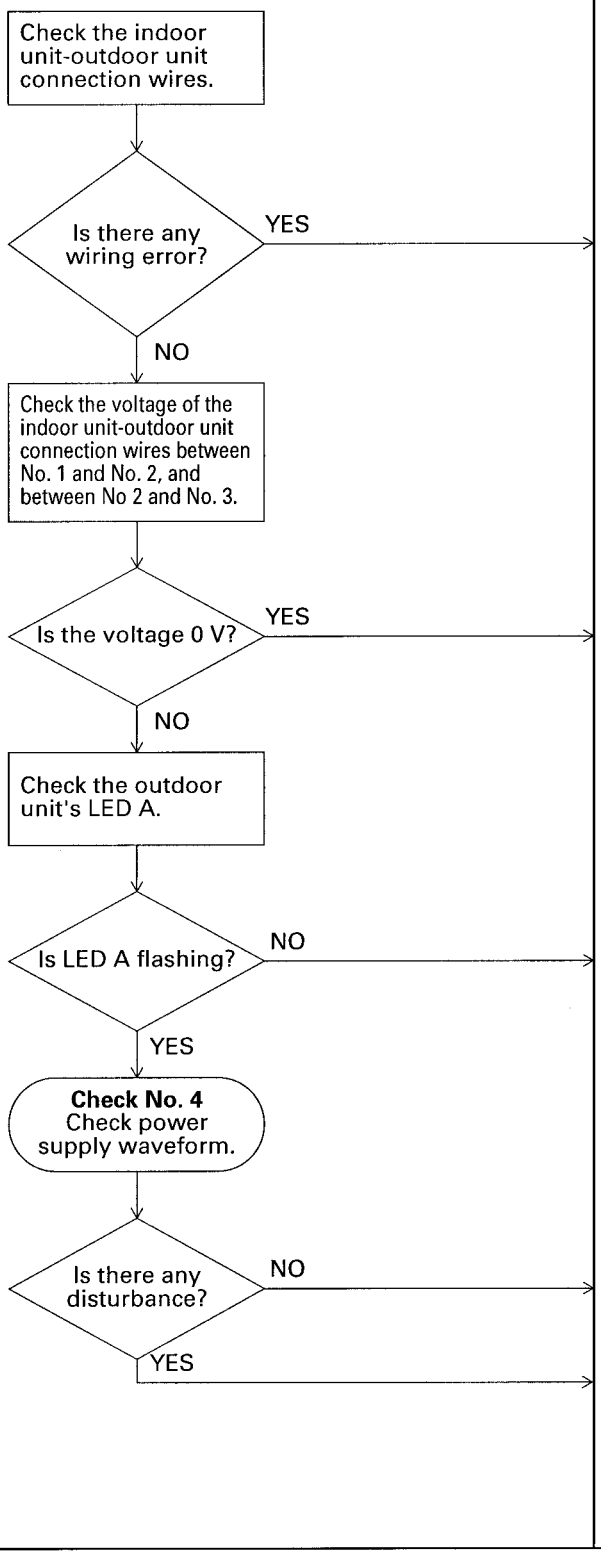
2. Error generating condition

When the data sent from the outdoor unit cannot be received normally, or when the content of the data is abnormal.

3. Possible causes

- Faulty outdoor unit PCB.
- Faulty indoor unit PCB.
- Indoor unit-outdoor unit signal transmission error due to wiring error.
- Indoor unit-outdoor unit signal transmission error due to disturbed power supply waveform.
- Indoor unit-outdoor unit signal transmission error due to breaking of wire in the connection wires between the indoor and outdoor units (wire No. 2).

4. Troubleshooting



Remote controller Indication	Outdoor unit LED Indication	**Inverter units** Operation shutdown due to gas insufficiency detection
U0	A 1 2 3 4 ◑ ● ● ☼ ☼	

1. Error detection method

The CT-detected input current and the compressor operating frequency are used to determine the condition of insufficient gas.

2. Error generating condition

Input current < [A] (A/Hz) x Compressor operating frequency [B] when a condition of (Operating frequency > Judgment (Hz)) remains for a 14 minutes.

- If an insufficient gas condition is detected four times, the equipment shuts down. (After the detection, the 4-time counter resets itself when any of the following abnormalities does not occur within 60 minutes of cumulative compressor operating time: OL activation, insufficient gas, and CT abnormality .)

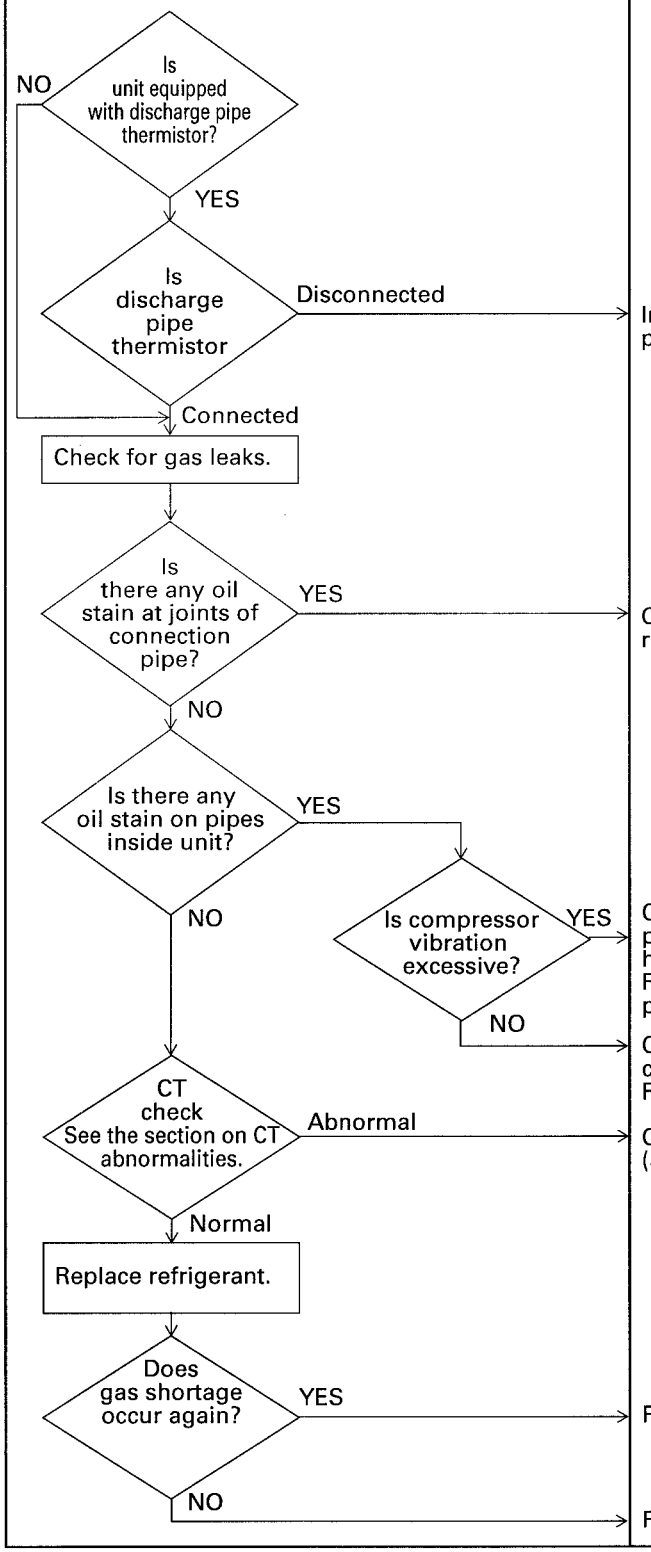
Set value of protection function

		-V1NB	Other than -V1NB
Refrigerant shortage	Judgment Hz	68 or over	64 or over
	[A]	2/256	8/256
	[B]	2.25	0.5
	Detection time (min)	14	14

3. Possible causes

- Insufficient gas due to refrigerant leaks
- Input current drop due to faulty compression operation in compressor

4. Troubleshooting



Remote controller Indication	Indoor unit LED Indication	**Inverter units**
E5,F3	A 1 2 3 4 ◑ ☼ ● ☼ ●	Operation shutdown due to discharge pipe temperature abnormality and OL activation

1. Error detection method

An OL activation is detected by the condition (open) of the OL contact.

2. Error generating condition

When the OL detection circuit generates an OL activation (open) input to the microcomputer

- Detection of 8 OL activation signals results in operation shutdown. (After the detection, the 8-time counter resets itself when any of the following abnormalities does not occur within 60 minutes of cumulative compressor operating time: OL activation, abnormal heat-radiating fin temperature increase, insufficient gas, faulty compressor startup, CT abnormality and abnormal discharge pipe temperature.)
  OL setting: 130±3°C --- Open
  95±10°C --- Close

3. Possible causes

- OL activation due to insufficient refrigerant
- OL activation due to faulty 4-way valve
- Erroneous detection due to faulty OL contact .
- Erroneous detection due to faulty connector connection
- Erroneous detection due to broken wire in OL harness
- Erroneous detection due to outdoor unit printed circuit board
- OL activation due to moisture mixed in during pipe installation

4. Troubleshooting

Diagnosis	Measure
Is discharge pipe thermistor connected? — Disconnected	Insert thermistor into place.
Connected → Check conductivity at OL contact using tester.	
Is there conductivity? — NO	OL activation: Replace OL
YES → Check OL connector connection.	
Is it normal? — NO	Correct OL connector connection.
YES → Check conductivity of OL harness	
Is there conductivity? — NO	Repair OL harness.
YES → Short-circuit OL connector, and turn on outdoor unit.	
Does abnormality recur? — NO	Replace outdoor unit printed circuit board(1).
YES → **Check No. 5** Check refrigerant system.	

- Insufficient refrigerant
- Faulty 4-way valve operation
- Moisture in refrigerant

Remote controller indication	Outdoor unit LED indication	**Inverter units** Output overcurrent
L5	A 1 2 3 4 ◑ ● ☼ ☼ ☼	

1. Error detection method

Detection of output overcurrent based on current flowing in DCCT.

2. Error generating condition

When output overcurrent enters microcomputer from output overcurrent detection circuit.

- In some models, this results in system error.

When error occurs 6 times, system shuts down.

Condition for error counter reset
When compressor operates for 8 minutes without output overcurrent.

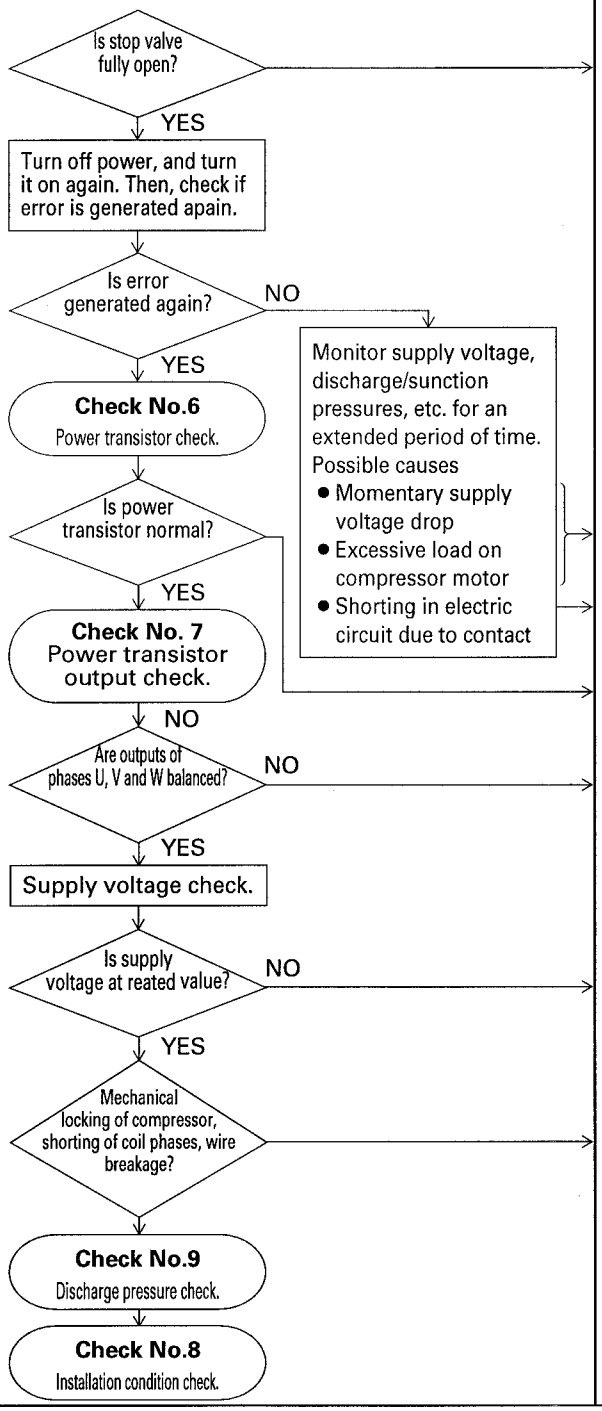
3. Possible causes

- Overcurrent due to faulty power transistor.
- Overcurrent due to faulty internal wiring.
- Overcurrent due to supply voltage abnormality.
- Overcurrent due to faulty PCB.
- Erroneous detection due to closed stop valve.
- Overcurrent due to closed stop valve.
- Overcurrent due to faulty compressor.
- Overcurrent due to improper installation condition.

4. Troubleshooting

Diagnosis	Measure

*Erroneous internal wiring can result in output overcurrent in some cases. If system stops due to output overcurrent after parts replacement that requires disconnection of wires, check wiring carefully



Remote controller indication	Outdoor unit LED indication	**Inverter units**
H8	A 1 2 3 4 ◑ ☼ ☼ ● ●	Operation halt due to detection of CT error

1. Error detection method

CT errors are detected using the compressor's operating frequency and the input current detected by the CT.

2. Error generating condition

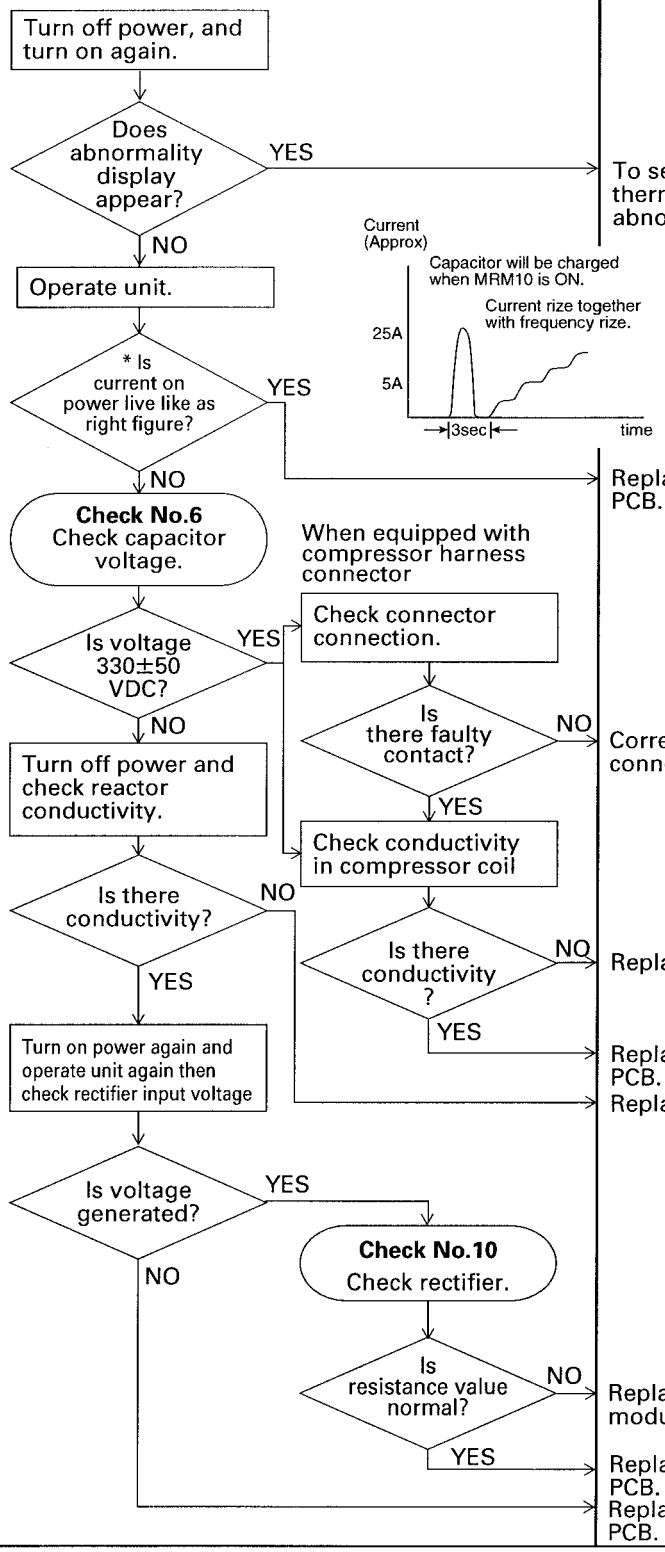
When the compressor's operating frequency is more than 62 Hz and the CT input is less than 0.75 A.

- When a CT error is generated 4 times, the system shuts down.

3. Possible causes

- Faulty power transistor
- Breaking of wire or faulty connection of internal wiring
- Faulty reactor.
- Faulty outdoor PCB (1).

4. Troubleshooting



Remote controller indication	Indoor unit LED indication	**Inverter units**
J6, H9	A 1 2 3 4 ◑ ☼ ☼ ● ●	Operation halt due to thermistor error or disconnection detection

1. Error detection method

Thermistor errors are detected using the temperatures detected by the thermistors.

2. Error generating condition

When the thermistor input during compressor operation is more than 4.96 V or less than 0.04 V.

3. Possible causes

- Faulty connector connection
- Faulty thermistor
- Faulty PCB

4. Troubleshooting

Diagnosis	Measure
Check the connector connection.	
Is it normal? NO	Correct the connection.
YES	
Check No. 1 Thermistor resistance check	
Is it normal? NO	Replace the thermistor.
YES	Replace the outdoor unit P.C.B.

J6: Outdoor unit heat exchanger thermistor
H9: Outside air thermistor

Remote controller indication	Outdoor unit LED indication					**Inverter units** Faulty outdoor unit PCB
	A	1	2	3	4	
*	☼	—	—	—	—	

1. Error detection method

The proper program operation of the microcomputer is checked by the program.

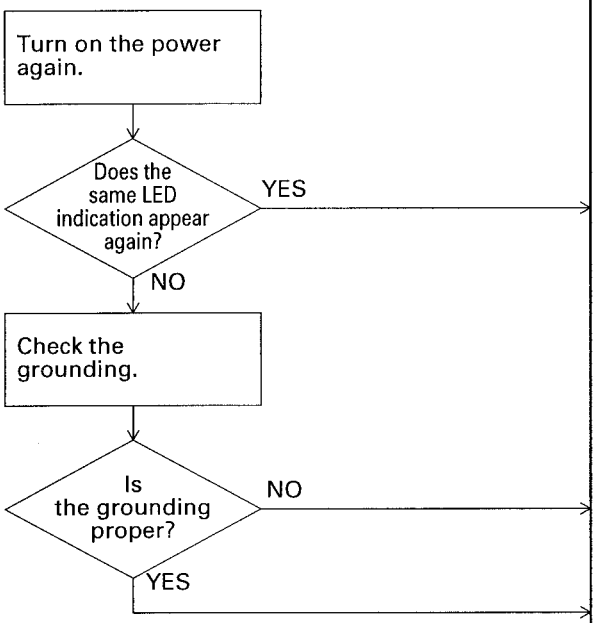
2. Error generating condition

When the microcomputer program does not function properly.

3. Possible causes

- Microcomputer program is in abnormal condition due to an external factor.
  - Noise
  - Momentary voltage drop
  - Momentary power failure, etc.
- Faulty outdoor unit PCB.

4. Troubleshooting



Remote controller indication	Outdoor unit LED indication					**Inverter units** Faulty outdoor unit PCB and transmitting/receiving circuit
	A	1	2	3	4	
*	●	—	—	—	—	

1. Error detection method

(1) The proper program operation of the microcomputer is checked by the program.
(2) Signals transmitted from the outdoor unit to the indoor unit are received by the outdoor unit itself in indoor unit -outdoor unit signal transmission mode, and proper receiving of the signals by the indoor unit is checked.

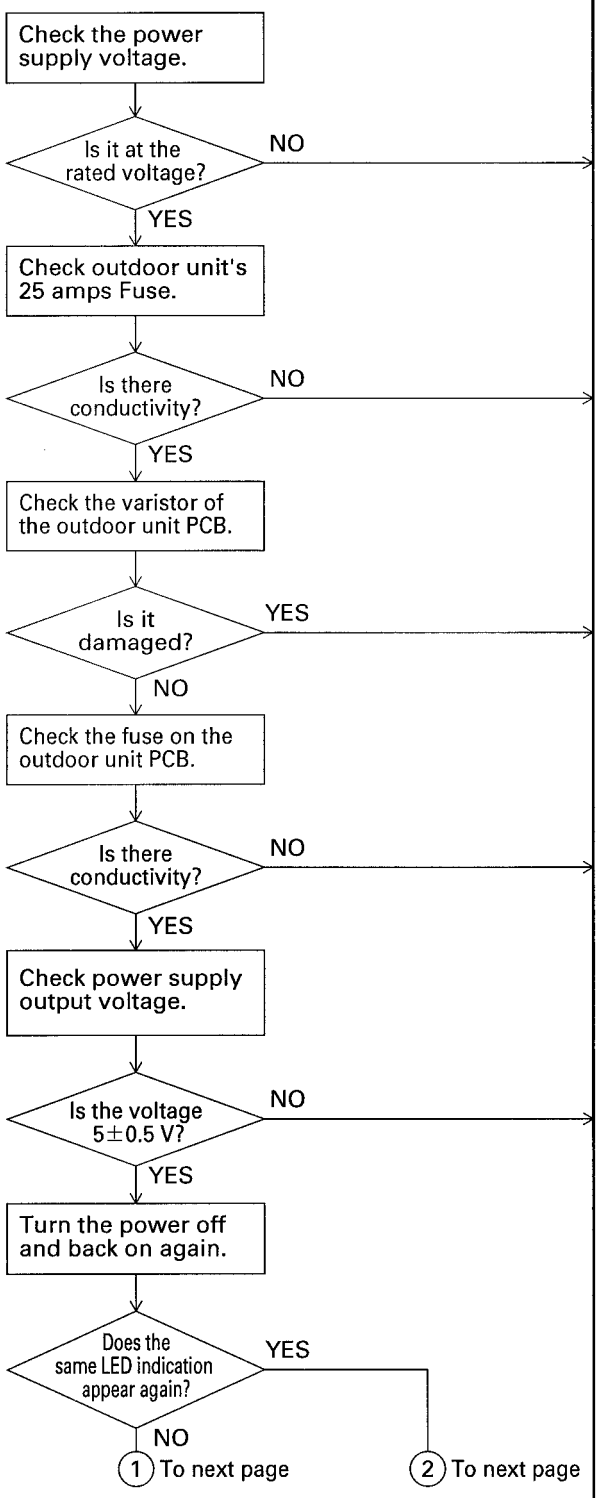
2. Error generating condition

(1) When the microcomputer program does not function properly.
(2) When the signals transmitted from the outdoor unit to the indoor unit are received by the outdoor unit itself in indoor unit-outdoor unit signal transmission mode, but not properly.

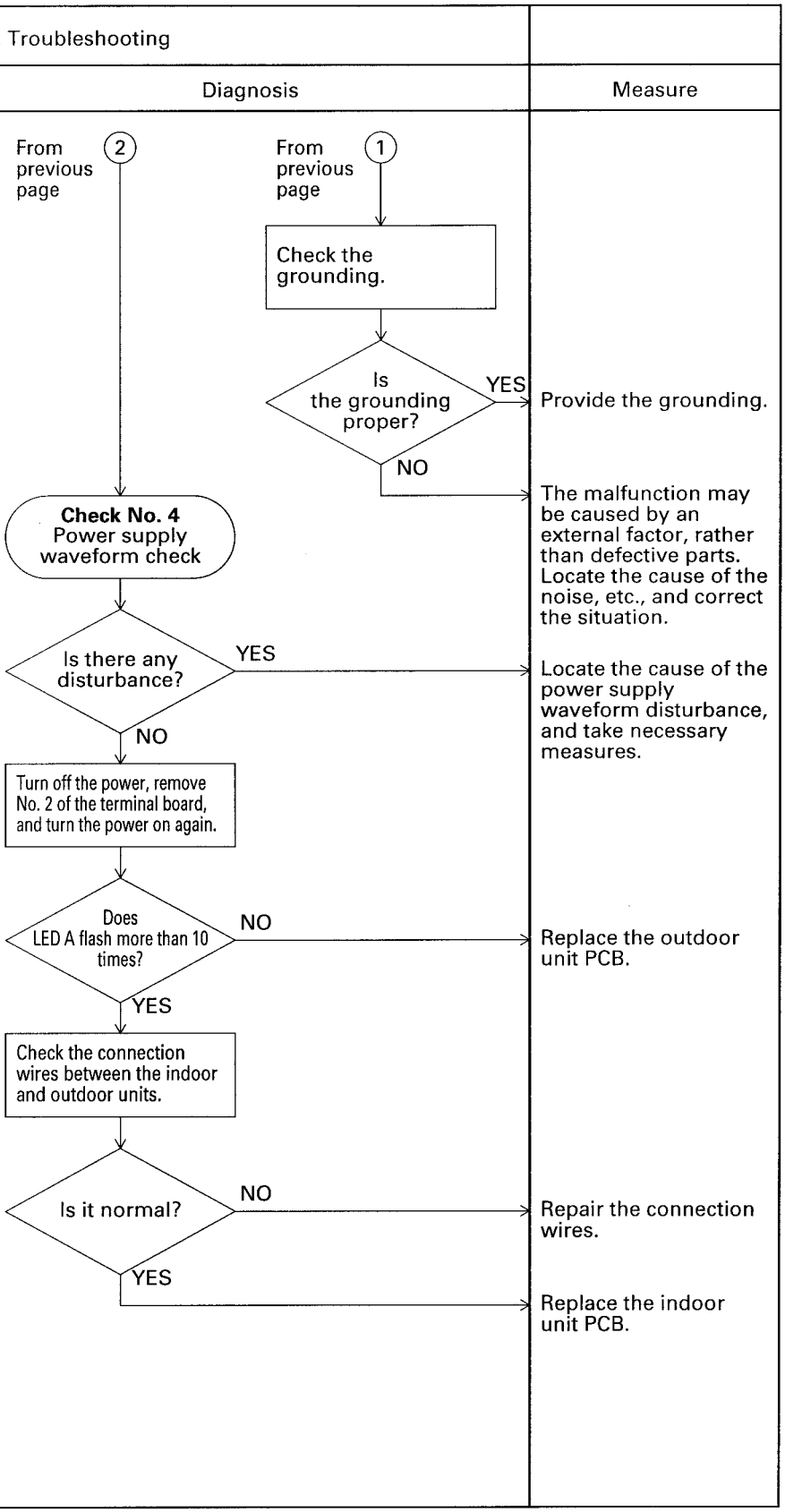
3. Possible causes

- Display disabled by faulty power supply.
- Faulty signal transmitting/receiving circuit of the outdoor unit PCB.
- Microcomputer program run-away due to an external factor.
  - · Noise.
  - · Momentary voltage drop.
  - · Momentary power failure, etc.
- Faulty outdoor unit PCB.

4. Troubleshooting



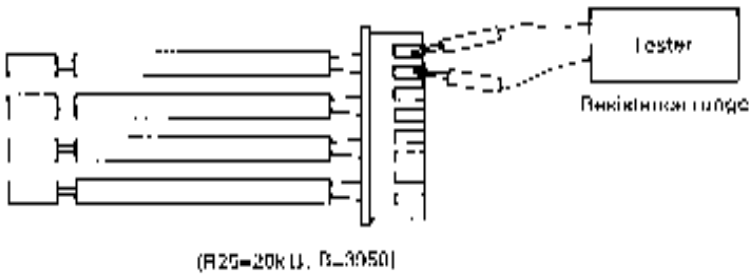
4. Troubleshooting



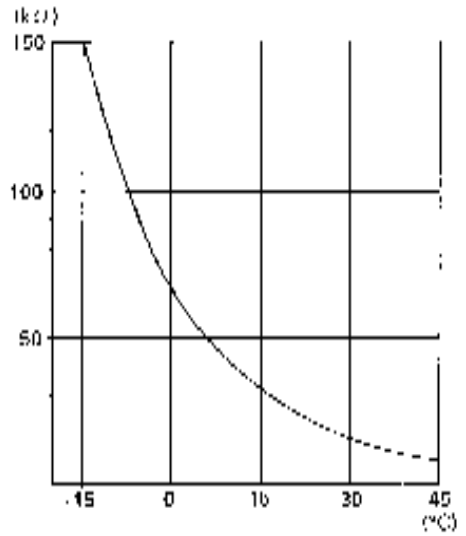
Check No.1 **Inverter units** Thermister resistance check

Remove the connectors of the thermisters on the PCB, and measure the resistance of each thermister.
The relationship between normal temperature and resistance is shown in the graph and table below.

	R25°C=20kΩ B=3950
-20	211.0 (kΩ)
-15	150.0
-10	116.5
-5	88.0
0	67.7
5	51.9
10	40.0
15	31.8
20	25.0
25	20.0
30	16.0
35	13.0
40	10.6
45	8.7
50	7.2



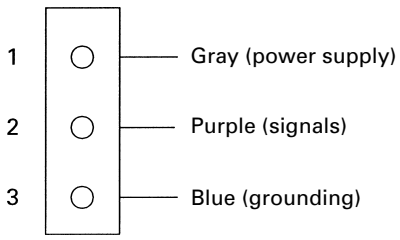
(R25=20kΩ, B=3950)



Check No.2 **Inverter units** Hall IC check

If	**then**
the measured voltage between pin 1 and 3 does not equal 5V	replace indoor PCB1.
the generated pulses do not equal 3 pulses	replace the fan motor.
the measured voltage does not equal 5V and the generated pulses do not equal 3 pulses	replace indoor PCB1.

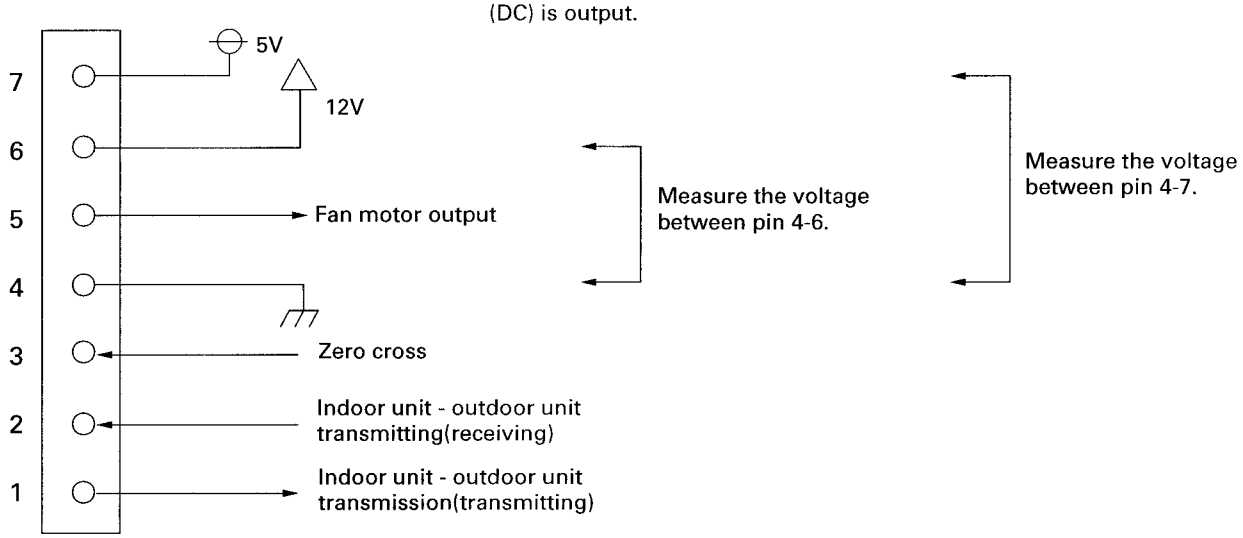
The connector has 3 pins, and there are three patterns of lead wire colors.



Check No.3 **Inverter units** Indoor unit PCB (2) output voltage check

(1) Check the connector connection.
(2) Check to see if a voltage is output.

- Measure the voltage between pin 4 and 6 if approx. 12V (DC) is output.
- Measure the voltage between pin 4 and 7 if approx. 5V (DC) is output.

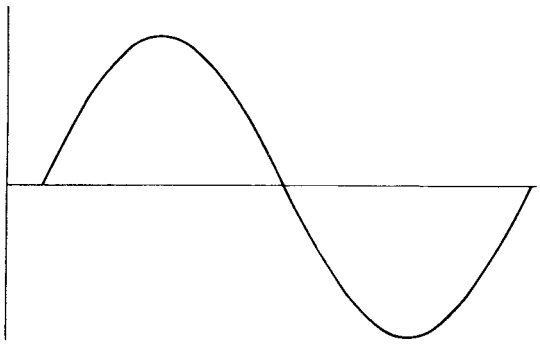


Check No.4 **Inverter units** Power supply waveform check

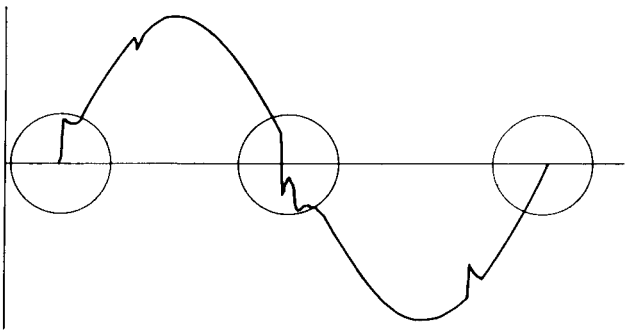
Measure the power supply waveform between pins 1 and 3 on the terminal board, and check the waveform disturbance.

- Check to see if the power supply waveform is a sine wave (Fig. 1).
- Check to see if there is waveform disturbance near the zero cross (sections circled in Fig. 2.)

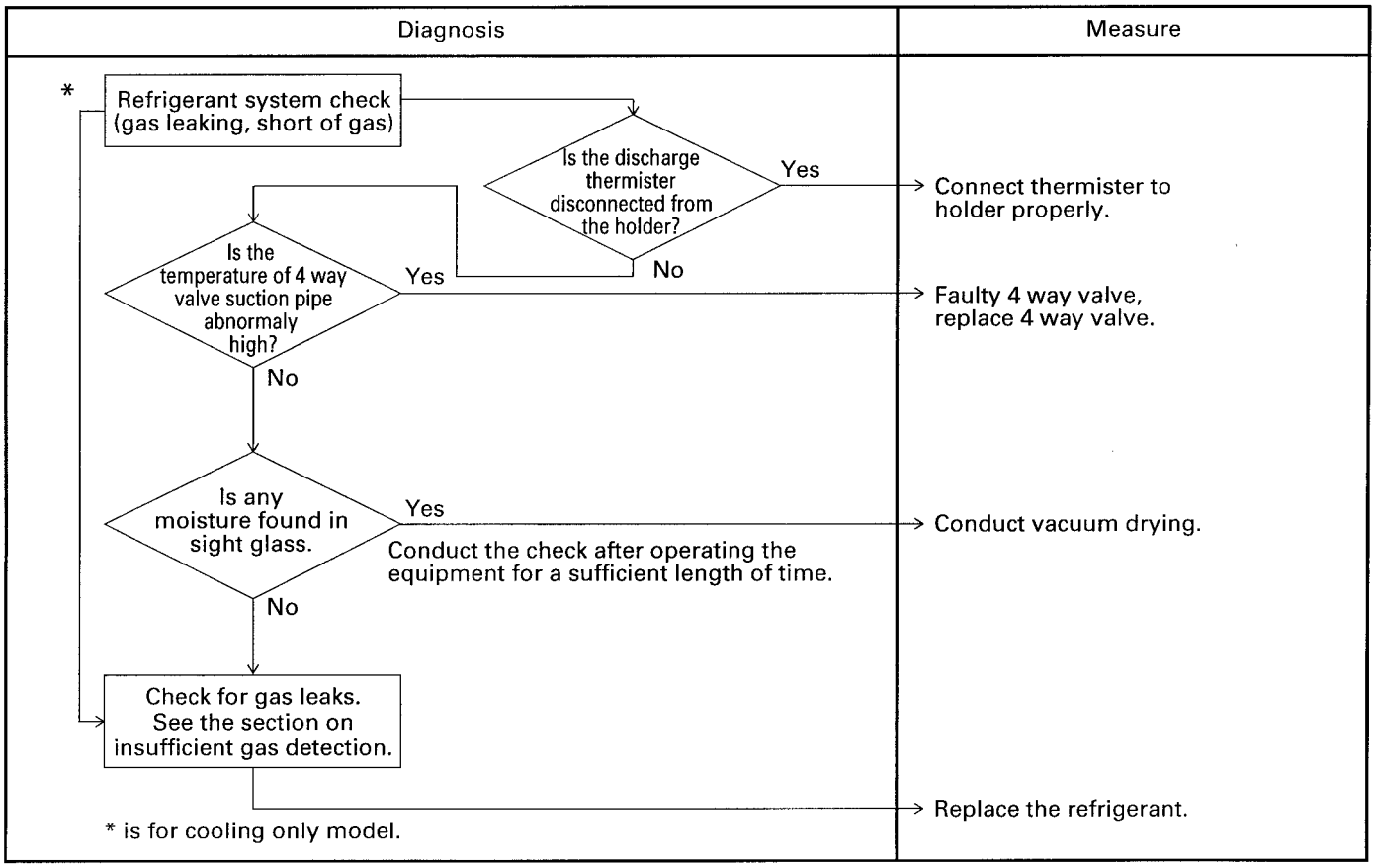
[Fig. 1]



[Fig. 2]



Check No.5 **Inverter units** Refrigerant system check



Check No.6	**Inverter units**	• Power transistor check • Capacitor voltage check

1. Power transistor check

Note: Check to make sure that the voltage between the terminal of Power transistor (+) and (-) is approx. 0 volt before checking power transistor.

< Measuring method >

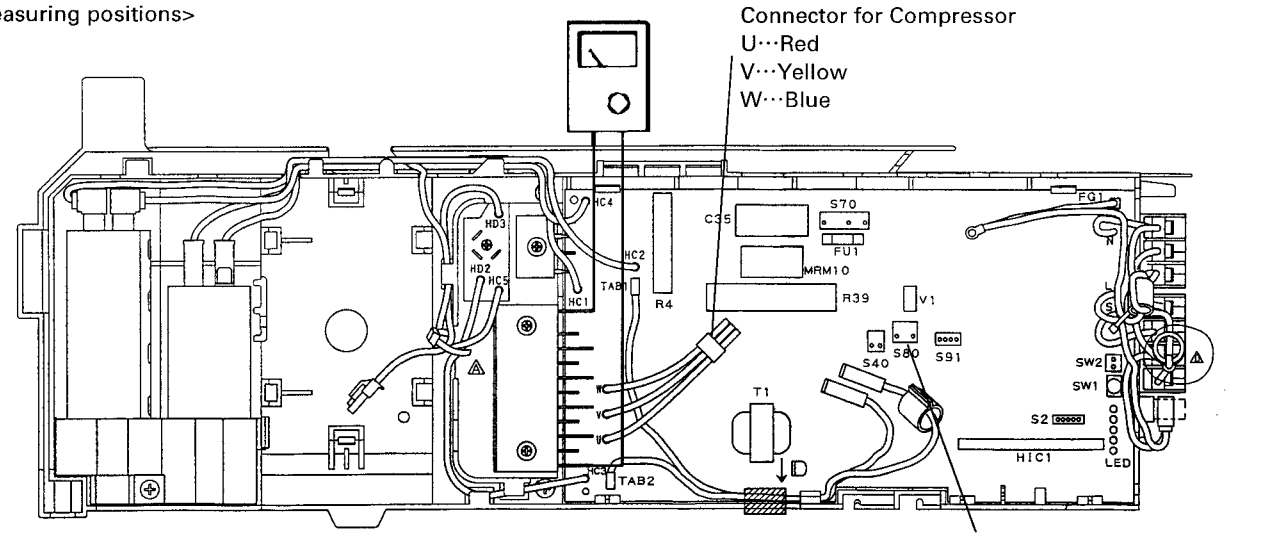
Disconnect the compressor harness connector from the outdoor unit PCB. To disengage the connector, press the protrusion on the connector.

Then, follow the procedure below to measure resistance between power transistor (+) and (-) and the U, V and W terminals of the compressor connector with a multi-tester. Evaluate the measurement results for a pass/fail judgment.

〈**Power transistor check**〉

Negative (−) terminal of tester (positive terminal (+) for digital tester)	Power transistor (+)	UVW	Power transistor (−)	UVW
Positive (+) terminal of tester (negative terminal (−) for digital tester)	UVW	Power transistor (+)	UVW	Power transistor (−)
Normal resistance	Several kΩ to several MΩ(※)			
Unacceptable resistance	Short (0 Ω) or open			

<Measuring positions>



S80 is not exist in cooling only model (For 4 way valve)

2. Capacitor voltage check

< Measuring method >

Before measuring, operate the unit for several minutes, then shut down the operation by force using the circuit breaker.

- If the unit is shut down using the remote controller instead of the circuit breaker, the capacitor discharges the electric load, thus disallowing accurate measurement.

(Note) The charge section is applied with high voltage. Therefore, exercise caution during measurement to prevent electric shock.

< Measuring positions >

Take measurements at the power transistor (+) and (-) terminals in the same way as described in section 1.
Set the multi-tester to DC and VOLTAGE RANGE before measurement.

* Since capacitor (+) and (-) are connected to power transistor (+) and (-), capacitor voltage can be measured at the power transistor (+) and (-) terminals.

Check No.7 **Inverter units** Power transistor output check

Measure the output current and voltage of the power transistor.

(1) Output current measurement

Remove the front panel (for multi-system air conditioner: top panel and side panel (front)), and measure the current in the red, yellow and blue wire harness inside the compressor using a clamp meter.

① Attach the clamp meter to the red, yellow and blue wire harness, and conduct forced cooling operation.
② When the output frequency has stabilized, measure the output current of each phase.
③ If the current outputs of all the phases are balanced, it is normal.
④ If even one phase is out of balance, replace the outdoor unit PCB.
⑤ If the compressor stops before the output frequency stabilizes, measure the output voltage.

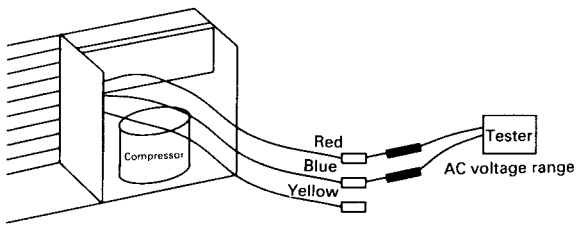
(2) Output voltage measurement

Remove the front panel (for multi-system air conditioner: top panel and side panel (front)), and disconnect the red, yellow and blue wire harness inside the compressor from the terminals. Measure the output voltages of the red, yellow and blue wires using a tester.

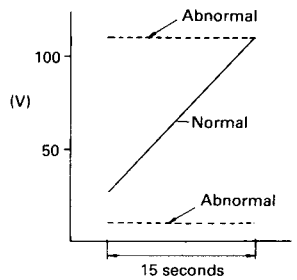
① Conduct forced cooling operation with the equipment in the condition shown in Fig. 1.
②Measure the voltage between the operation start (when the outdoor unit fan starts rotating) to operation halt caused by an CT error (about 15 seconds).
③ Reset the power, and repeat steps (1) to (3) for each phase of U-V, V-W and W-U.
④ If the voltages of all the phases show results similar to the solid line in the graph shown in Fig. 2, the outdoor PCB is normal.
⑤ If the voltage of even one phase deviates from the solid line shown in Fig. 2, conduct the following test.
- Check the harness between the power transistor and compressor (check items: breaking of wire and wiring errors). If the harness is normal, replace the PCB.

[Fig. 1]

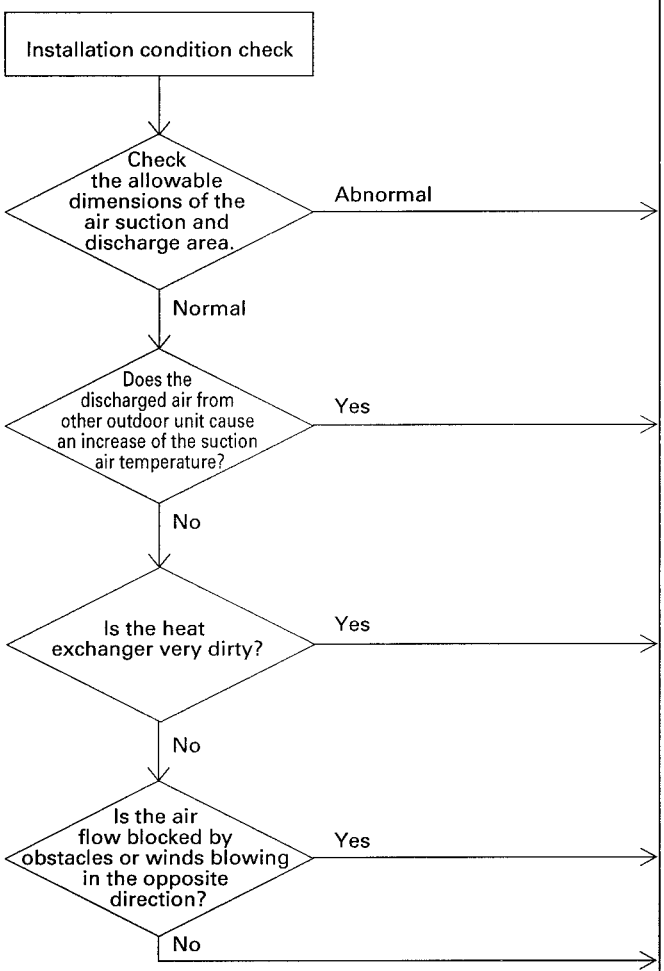
(Notes)
1. Do not touch the terminals of the red, yellow and blue wires when the power is supplied. (Touching them is very dangerous since a voltage of over 100 V is applied.)
2. Do not short-circuit the terminals of the red, yellow and blue wires.



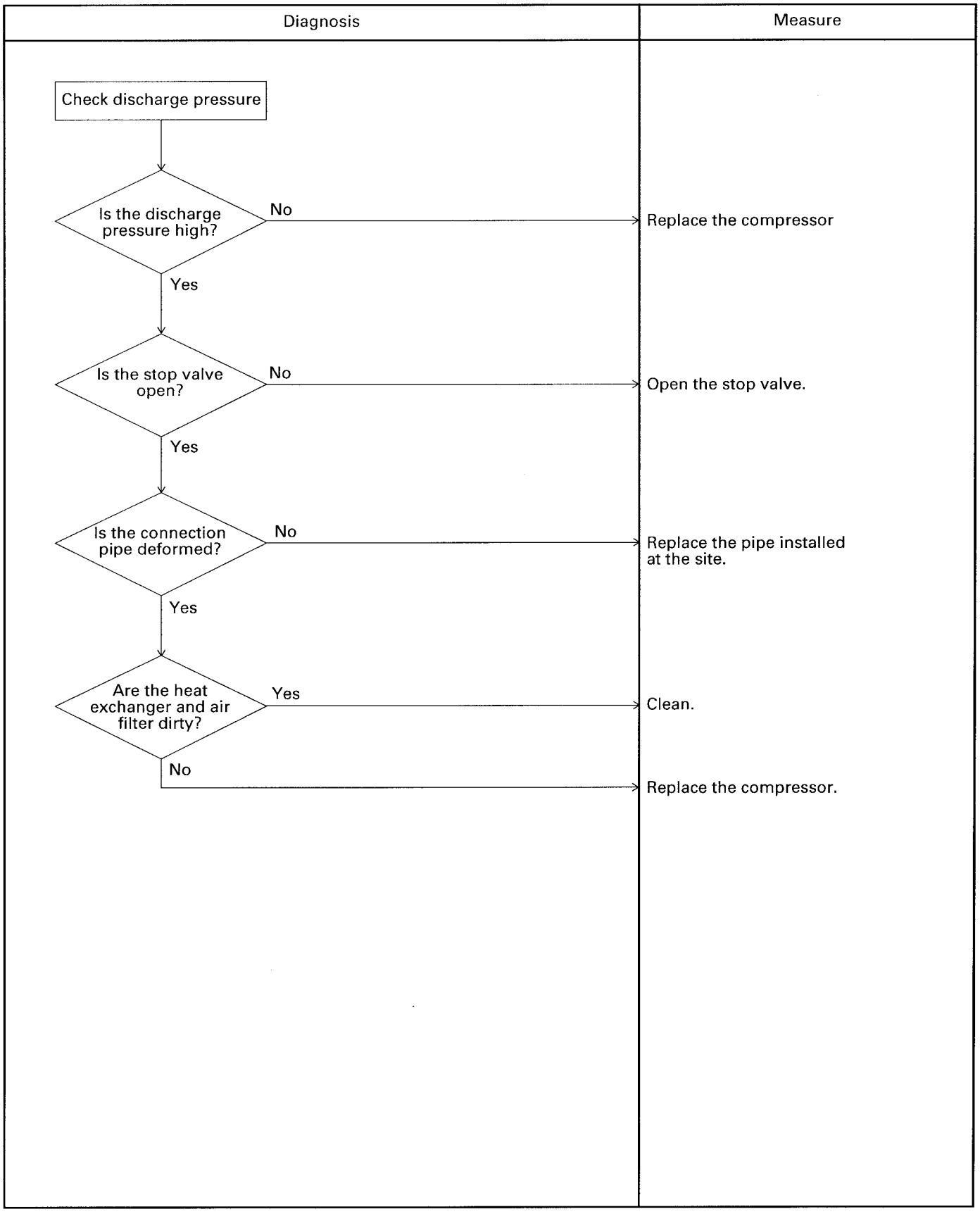
[Fig. 2]



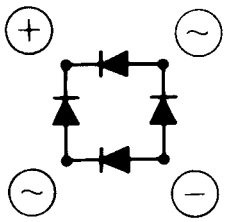
Check No. 8 **Installation condition check**

Diagnosis	Measure
	

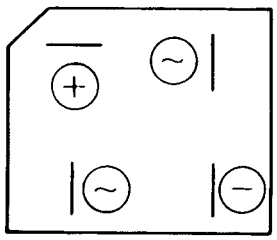
Check No.9 **Inverter units** Discharge pressure check



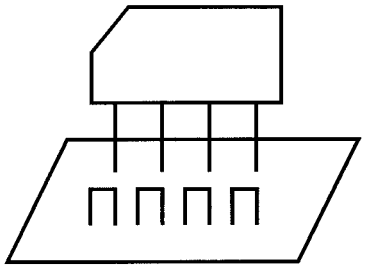
Check No.10 **Inverter units** Rectifier check

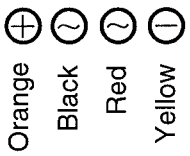


Upper side of Diode module



There are several different terminal position patterns.
Therefore, be sure to check the terminal marks.



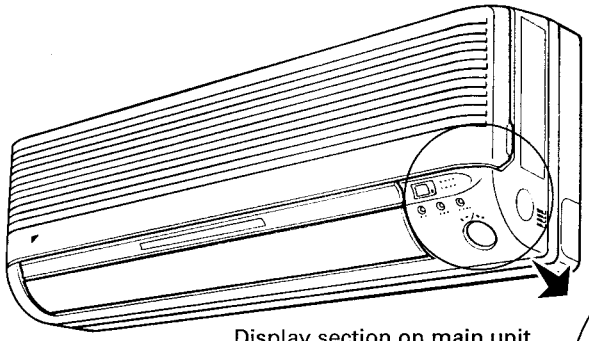
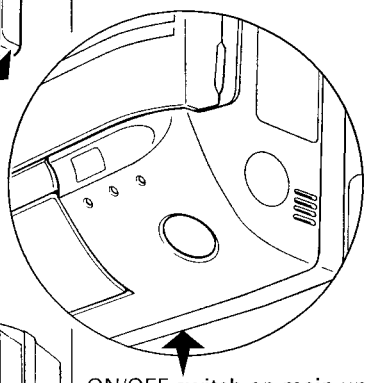
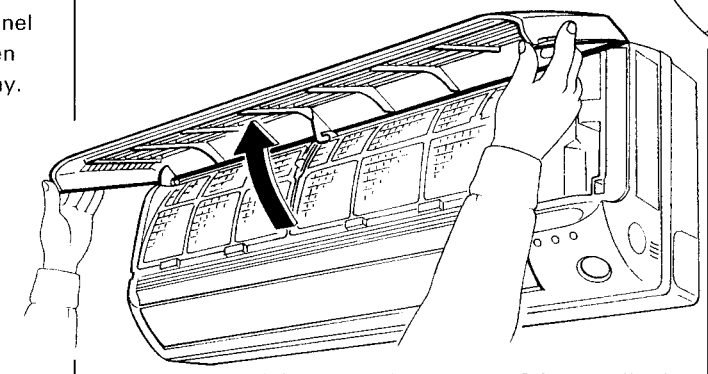
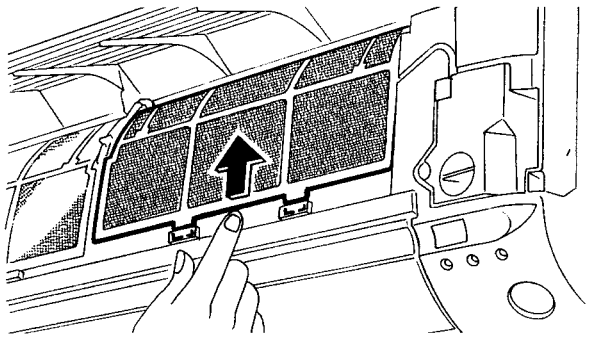
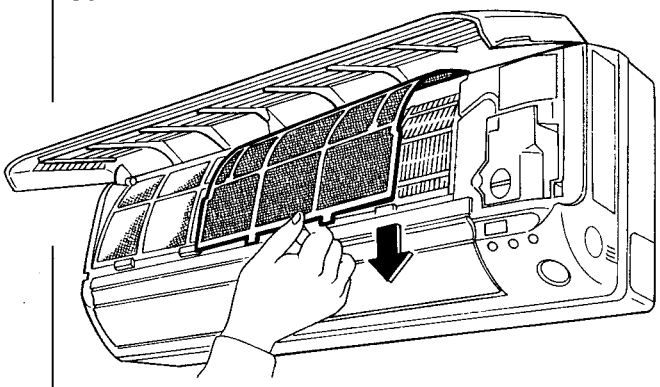


Negative (-) terminal of tester (positive terminal (+) for digital tester)	~	+	~	−
Negative (+) terminal of tester (positive terminal (-) for digital tester)	+	~	−	~
Normal resistance	Several kΩ to several MΩ	∞	∞	Several kΩ to several MΩ
Resistance at unacceptable	0 or ∞	0	0	0 or ∞

6. Removal Procedure

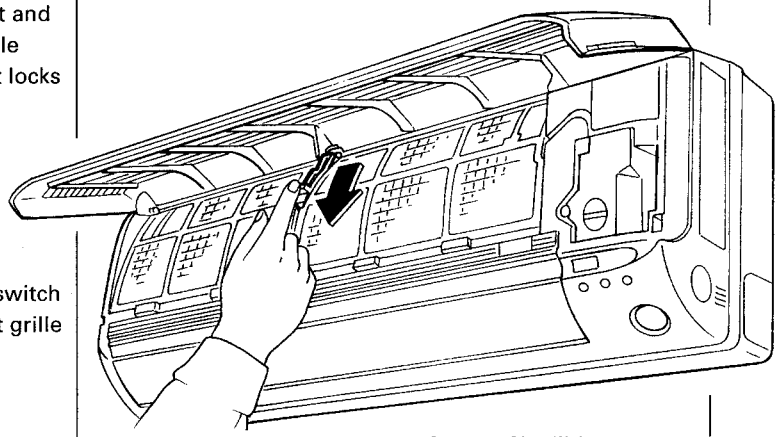
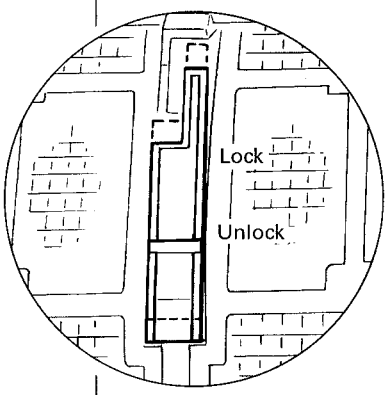
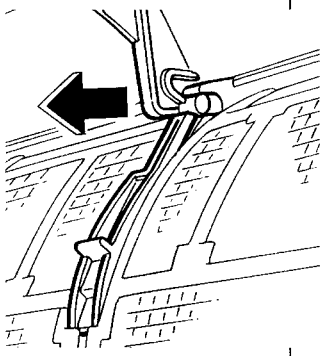
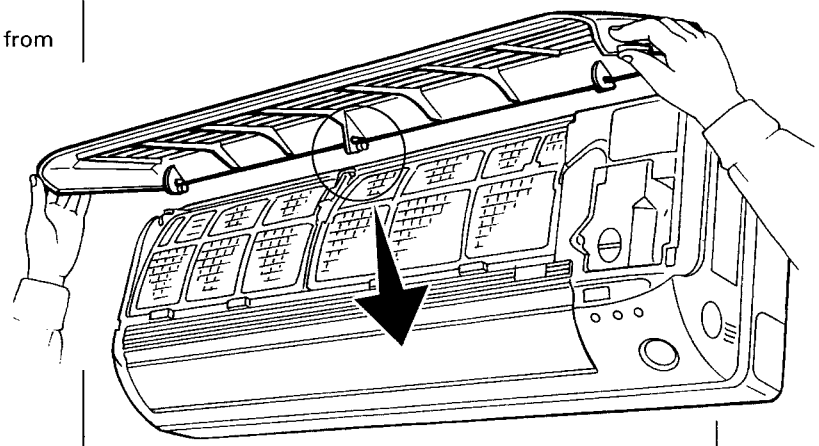
(1) FTK25/35H Series and FTX25/35H Series

Removal of air filter	**Warning! Be sure to turn off all power supplies before disarrangement work.**

Procedure	Points
1. External features	
 Display section on main unit.	 ON/OFF switch on main unit also functions as remote controller signal receiving section.
2. Removing air filters ① Pull protrusions on left and right sides of panel with fingers and open front grille all the way.	
② Lift center section of air filter and disengage hooks at two locations.	
③ Remove air filter by pulling forward.	 * Left and right filters are interchangeable. * To re-install,insert air filter along the guide.

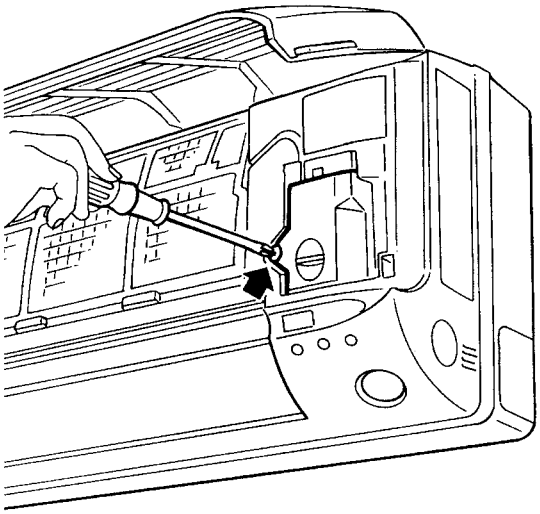
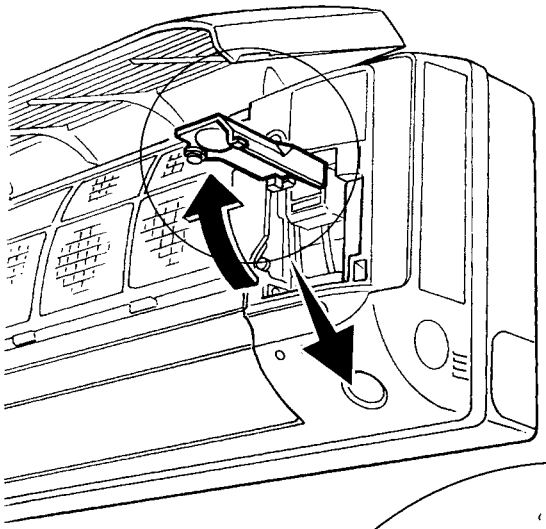
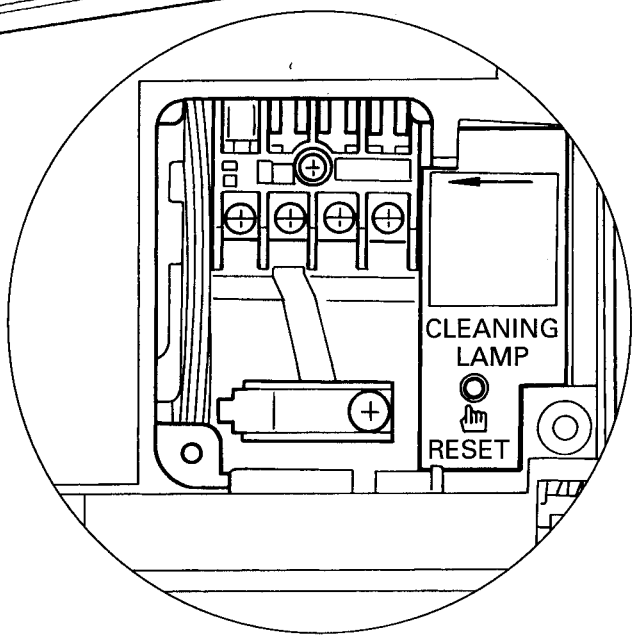
Removal of front grille

Warning! Be sure to turn off all power supplies before disarrangement work.

Procedure	Points
* Pull protrusions on left and right sides of front grille and open panel until it locks in position. 	
① Slide down locking switch at the center of front grille and disjoin hinge.  	
② Remove front grille from the unit. 	* Lift front panel until a clicking sound is produced.

Opening and closing of service cover / Changing settings at installation site

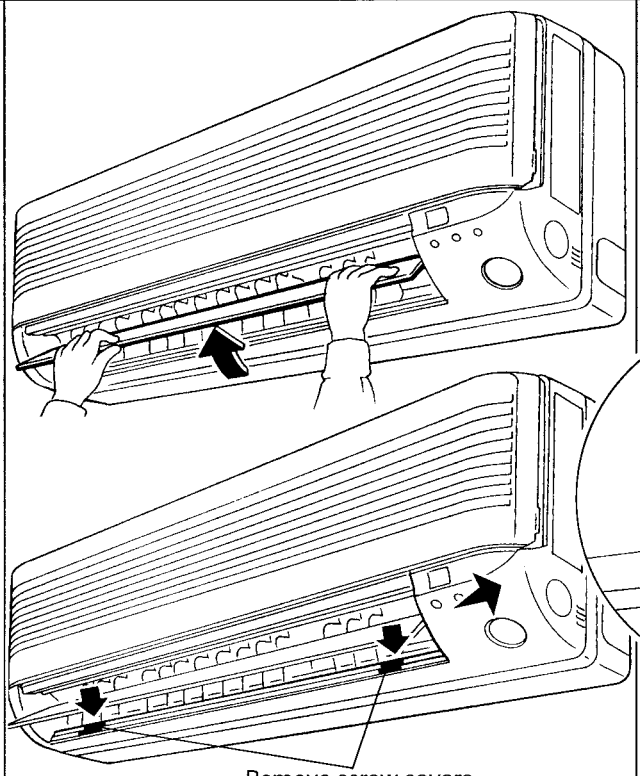
Warning! Be sure to turn off all power supplies before disarrangement work.

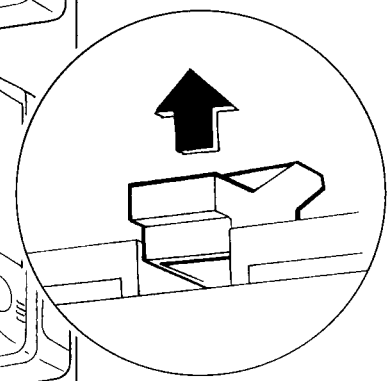
Procedure	Points
1. Opening and closing of service cover ① Remove service cover mounting screw.	
	
② Open service cover upward	
	
2. Changing settings at installation site ① Reminder timer is set to OFF at the factory. ② Filter sign can be reset.	
	

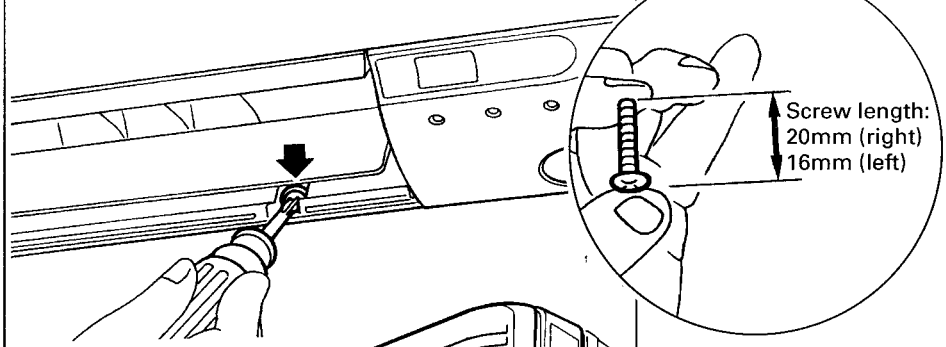
Removal of front panel

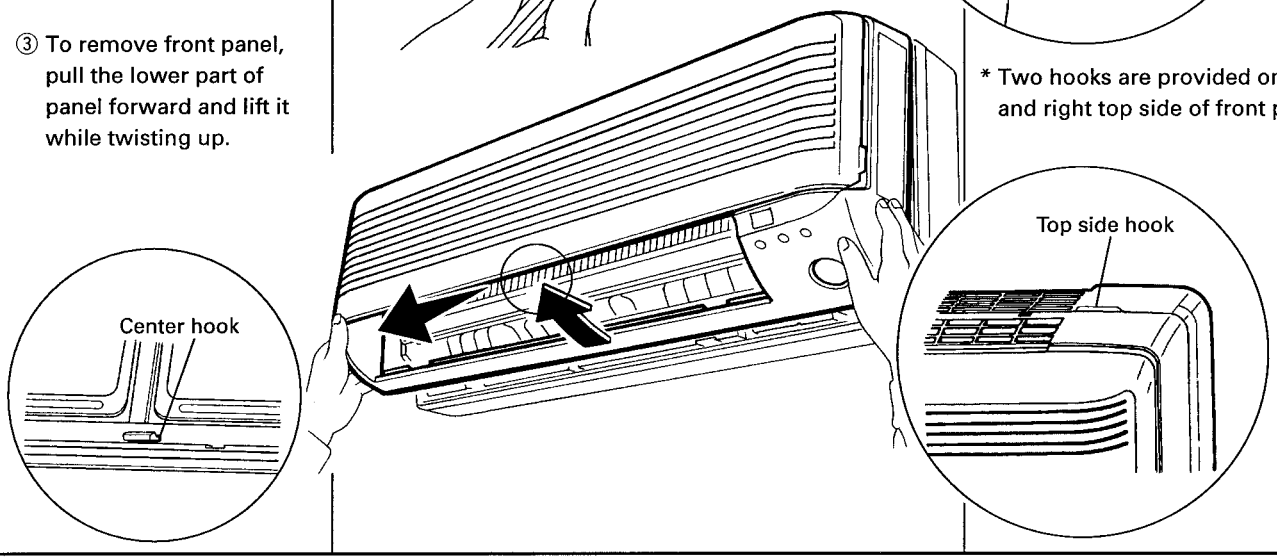
Warning! Be sure to turn off all power supplies before disarrangement work.

Procedure	Points
① Lift horizontal blade to open position.	
② Remove screw covers at two locations, then remove screws. Front cover can be now dismounted from the unit.	* Screws are longer than screws used previous models.
③ To remove front panel, pull the lower part of panel forward and lift it while twisting up.	* Two hooks are provided on left and right top side of front panel.



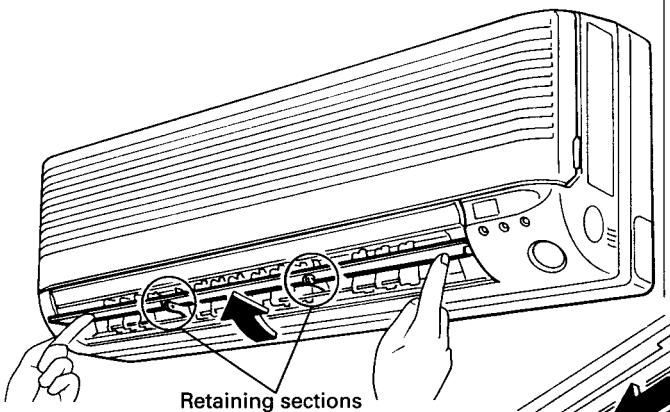
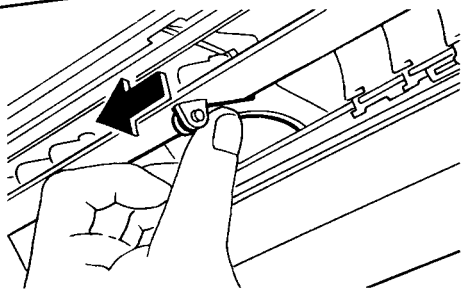
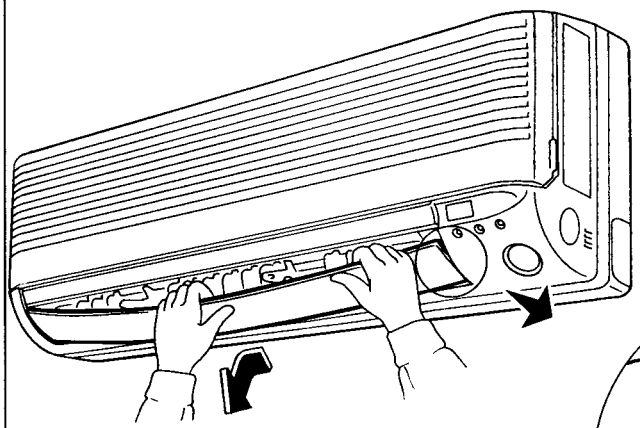
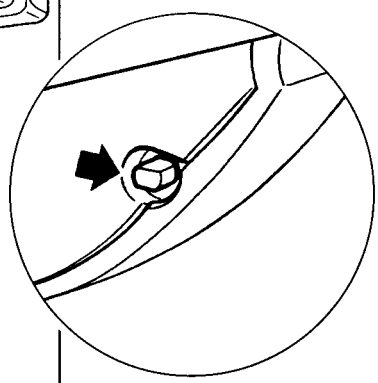






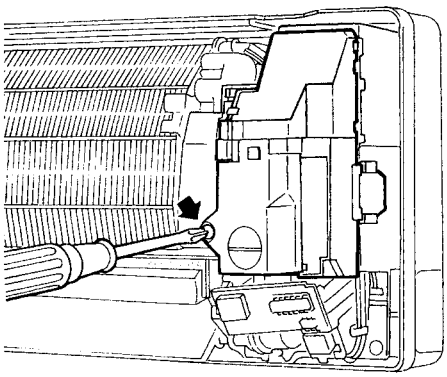
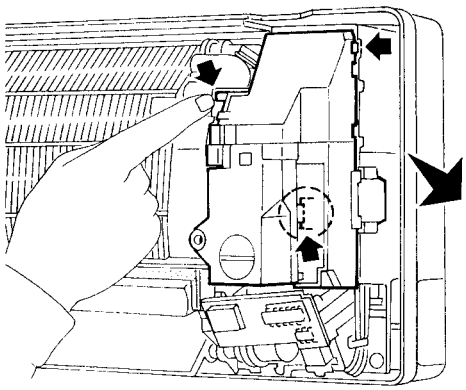
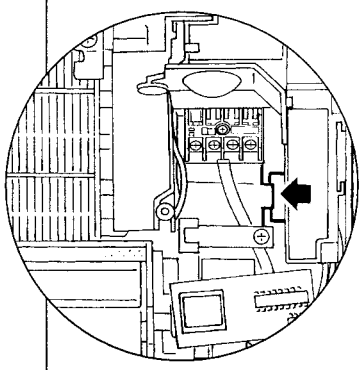
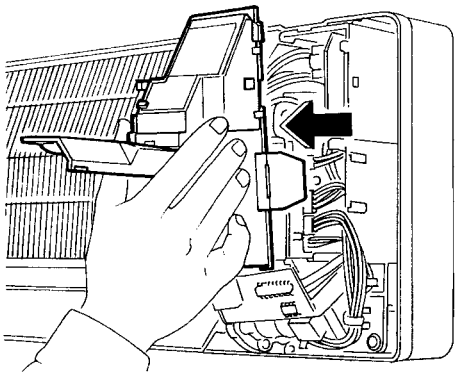
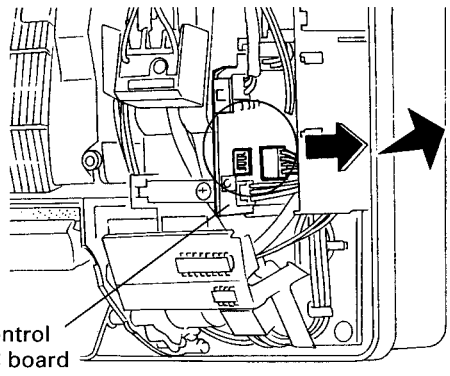
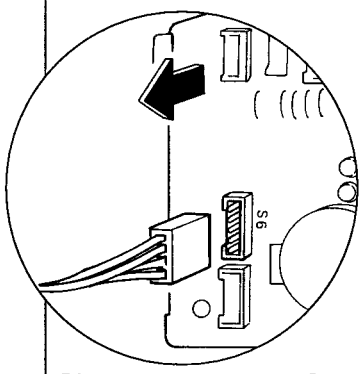
Removal of horizontal blades

Be sure to turn off all power supplies!

Procedure	Points
① Lift horizontal blade to open position.  ② Disengage horizontal blade from two blade retaining sections.  ③ Bend blade slightly and remove it from the unit. 	* Re-installation ① Set blade while twisting onto the alignment key on right side first. ② Engage blade retaining sections at two locations. 

Removal of PC board (1/4)

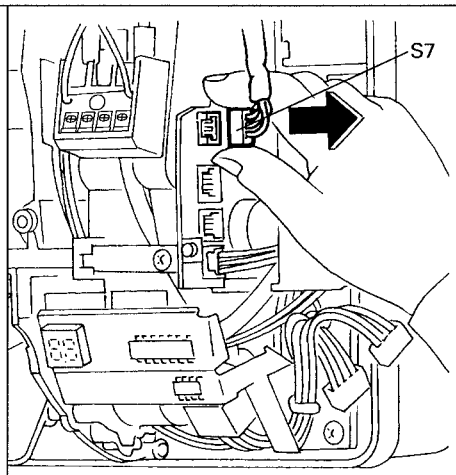
Warning! Be sure to turn off all power supplies before disarrangement work.

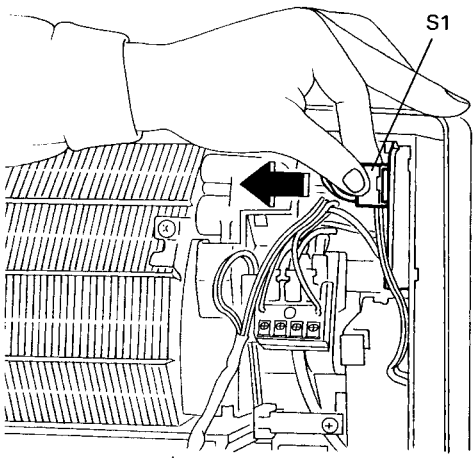
Procedure	Points
* Remove front panel. ① Remove screw of service cover.	
② Disengage three hooks of electrical parts box.	 
③ Remove box cover	
④ Disconnect a connector of swing motor.	  Disconnect connectors"S6" .

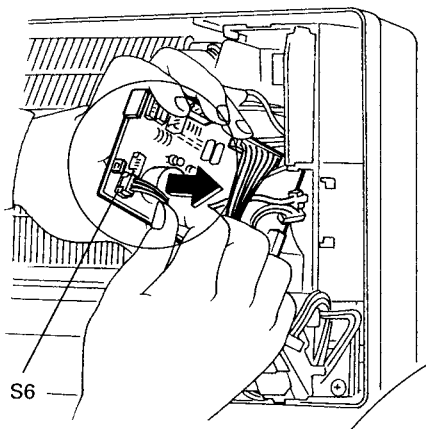
Removal of PC board (2/4)

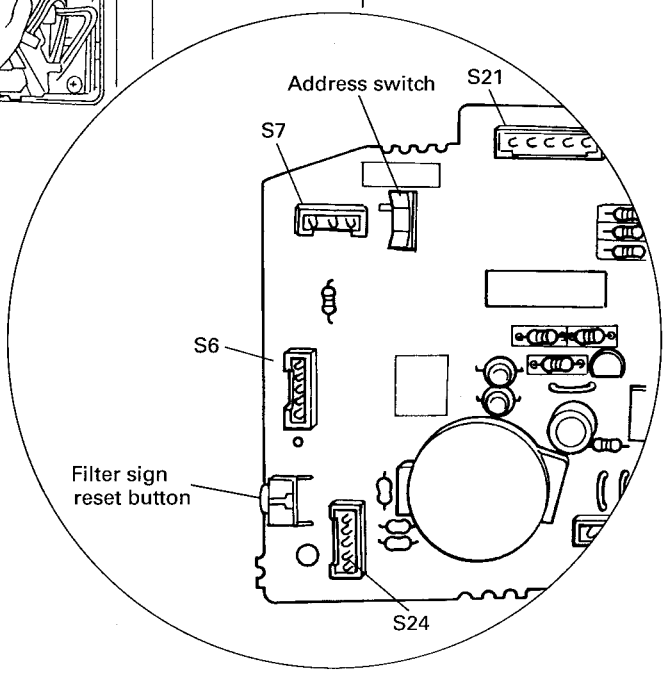
Be sure to turn off all power supplies!

Procedure	Points
⑤ To remove connector of fan motor, remove control PC board "S7" and power supply PC board "S1".	When disconnecting wire harness, pull out the connector holding terminal section of connector. Do not hold lead wire.
⑥ Pull control PC board forward, then disconnect connectors.	





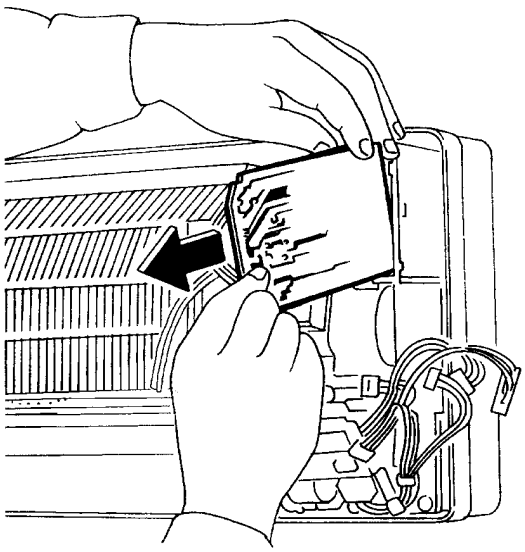


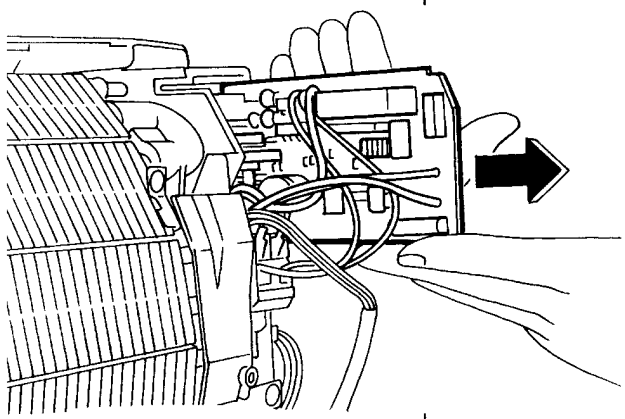


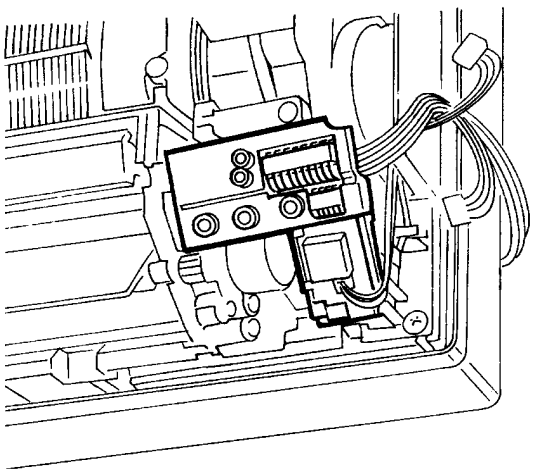
Removal of PC board (3/4)

Warning! Be sure to turn off all power supplies before disarrangement work.

Procedure	Points
⑦ Remove power supply PC board.	
⑧ Remove lamp house and signal receiving PC board	

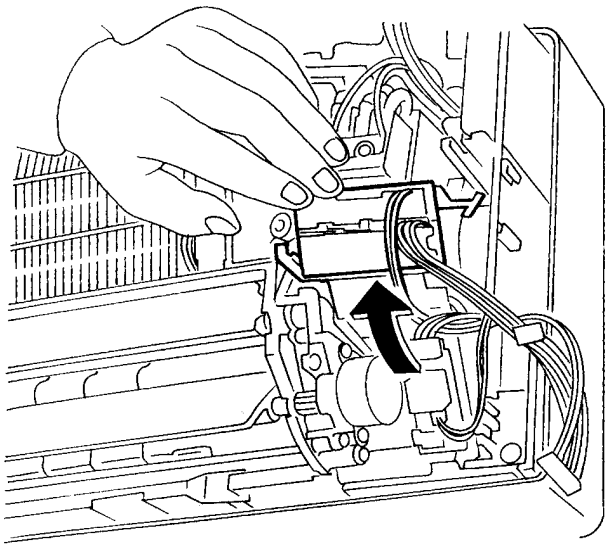
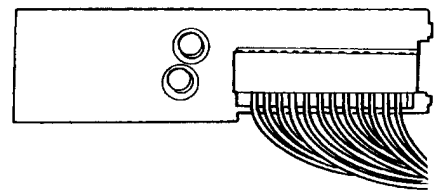
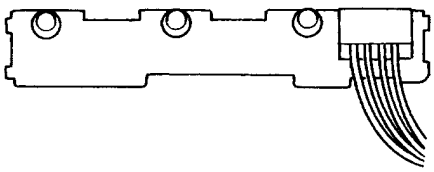
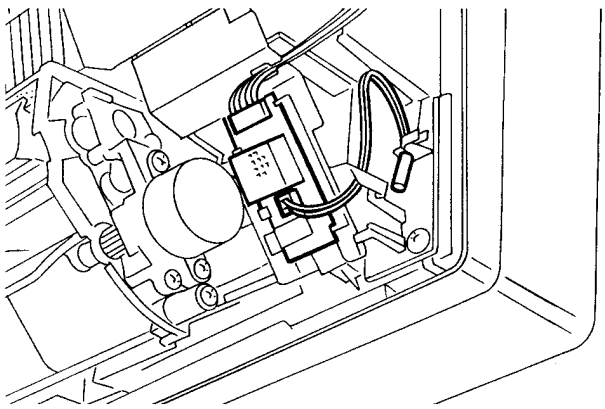






Removal of PC board (4/4)

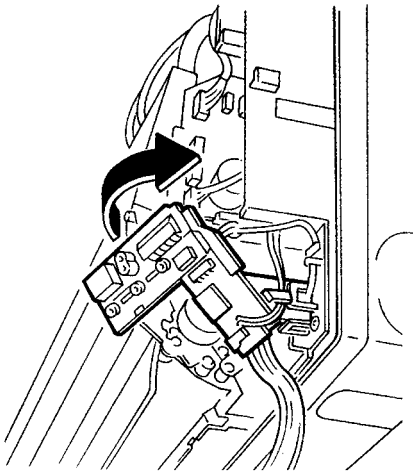
Warning! Be sure to turn off all power supplies before disarrangement work.

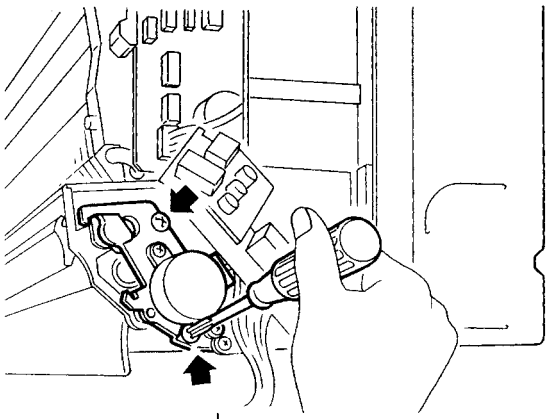
Procedure		Points
⑨ Disengage hook of lamp house, and open upward.		
⑩ Each PC board of indicator can be removed individually.	 	
⑪ Remove signal receiving PC board.		* Be sure to mount room temperature thermistor in correct direction.

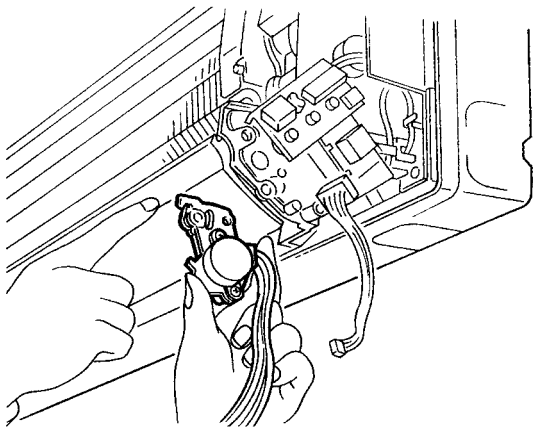
Removal of swing motor assembly.

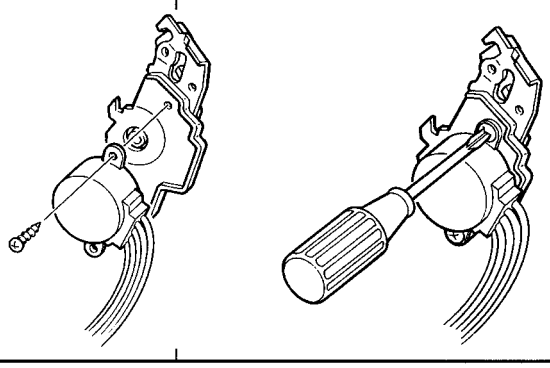
Warning! Be sure to turn off all power supplies before disarrangement work.

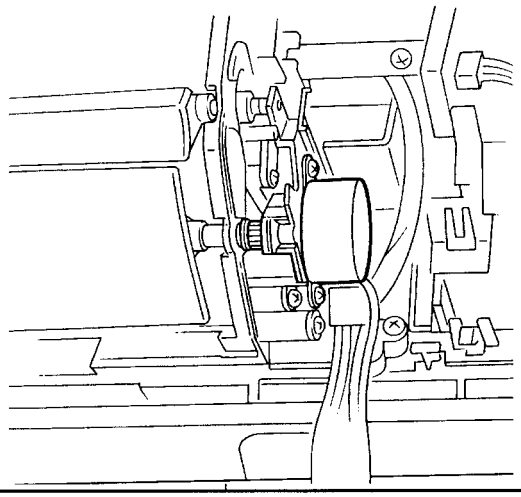
Procedure	Points
* Remove front panel. ① Open lamp house assembly.	
② To remove swing motor assembly, remove two screws.	
③ Remove swing motor assembly.	* Mounting screws for swing motor assembly and for swing motor are different in length respectively.
④ Remove swing motor. (Two screws)	





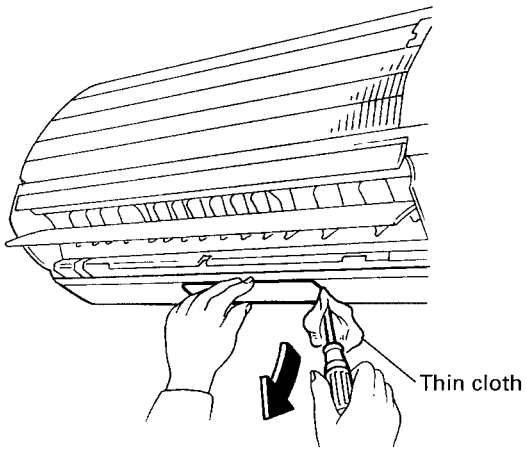
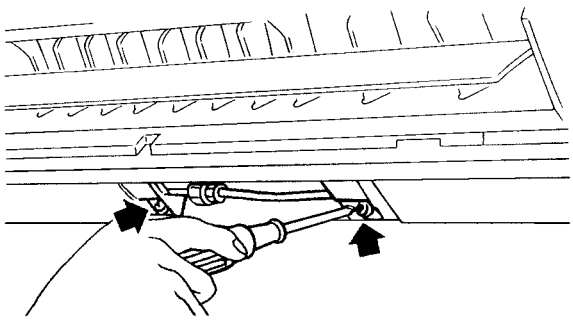
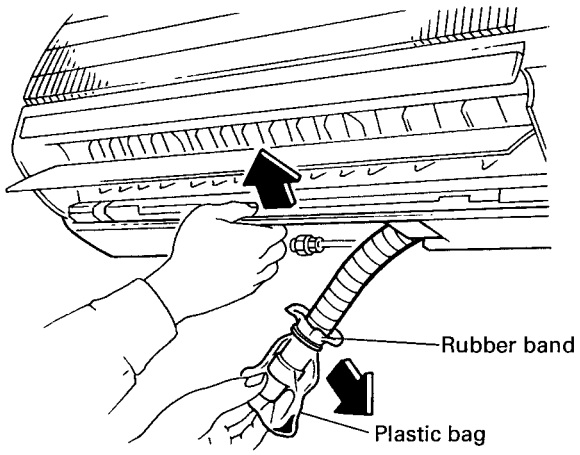






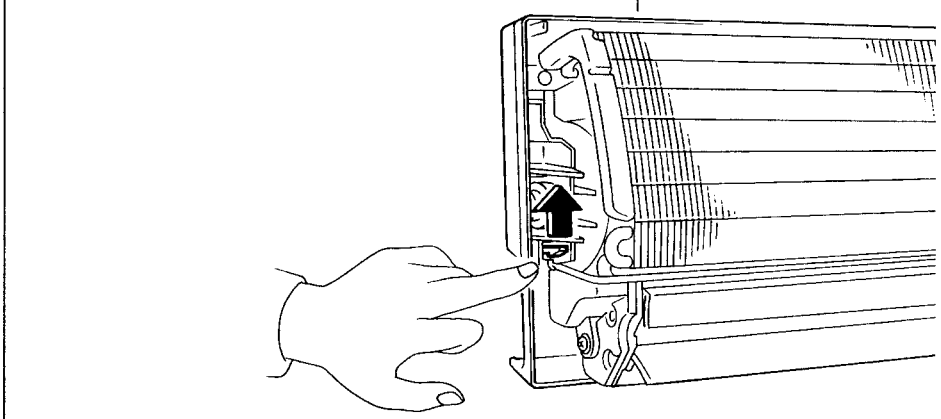
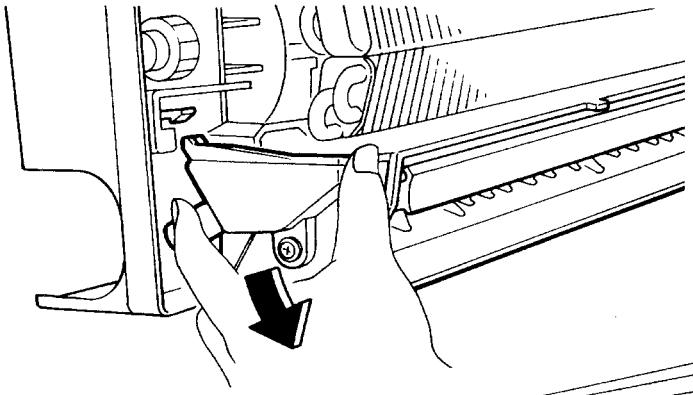
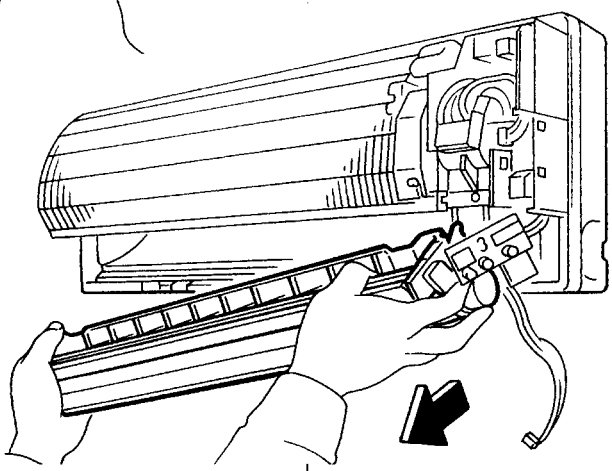
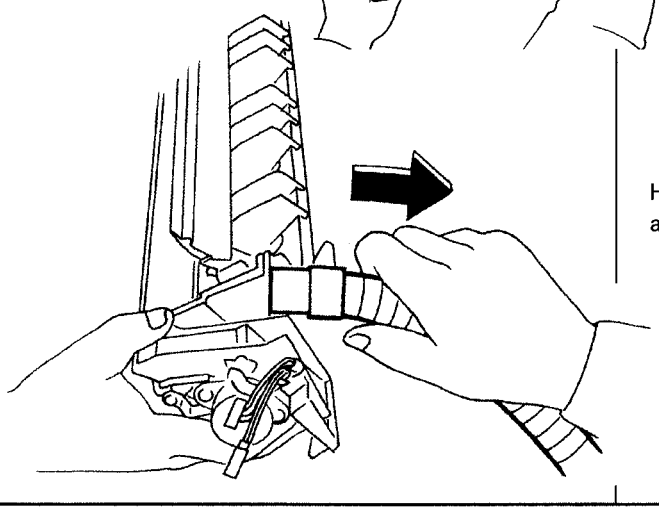
Removal of drain pan (1/2)

Warning! Be sure to turn off all power supplies before disarrangement work.

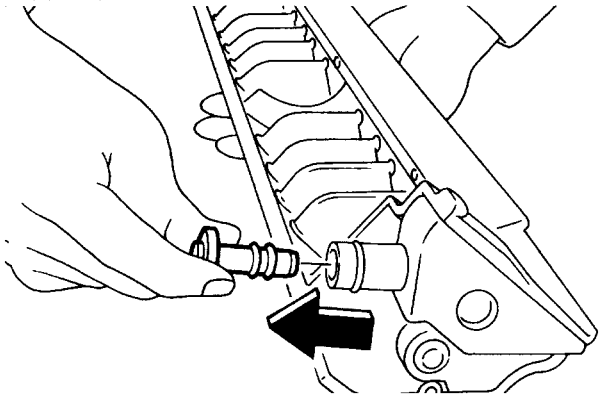
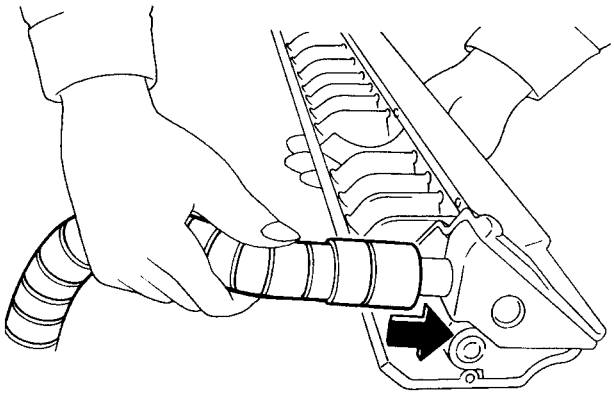
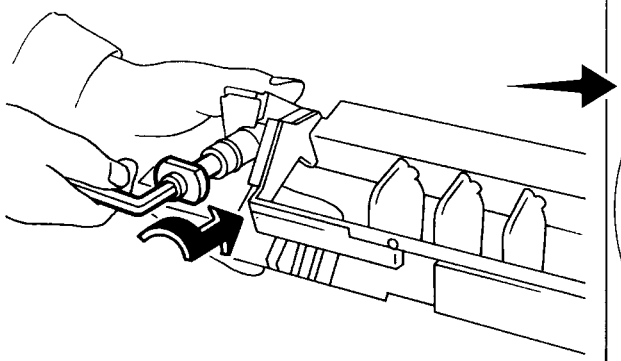
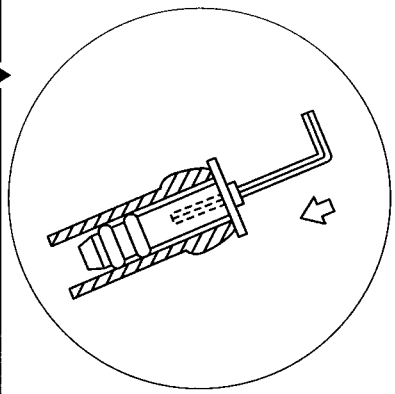
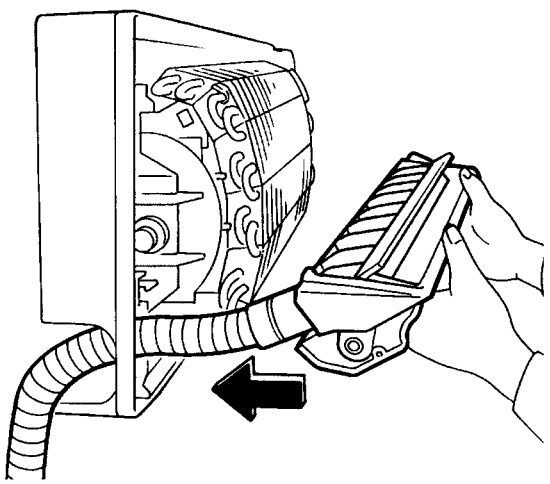
Procedure		Points
① Remove bottom cover to access drain hose (for left-handed piping).		* Wrap a thin cloth around the tip of screwdriver, and pry open the cover. * This step is not necessary for backside piping.
② Remove two screws that secure bottom frame to mounting plate.		
③ Lift the unit slightly and pull out drain hose.		* Be careful not to soil the floor with drain water.

Removal of drain pan (2/2)

Warning! Be sure to turn off all power supplies before disarrangement work.

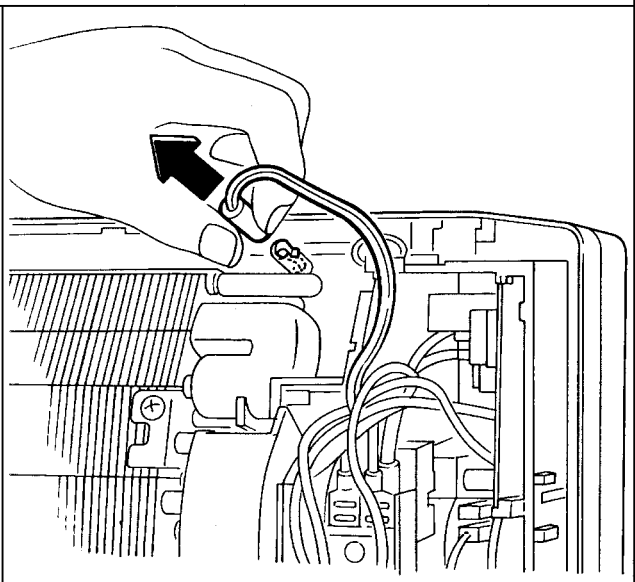
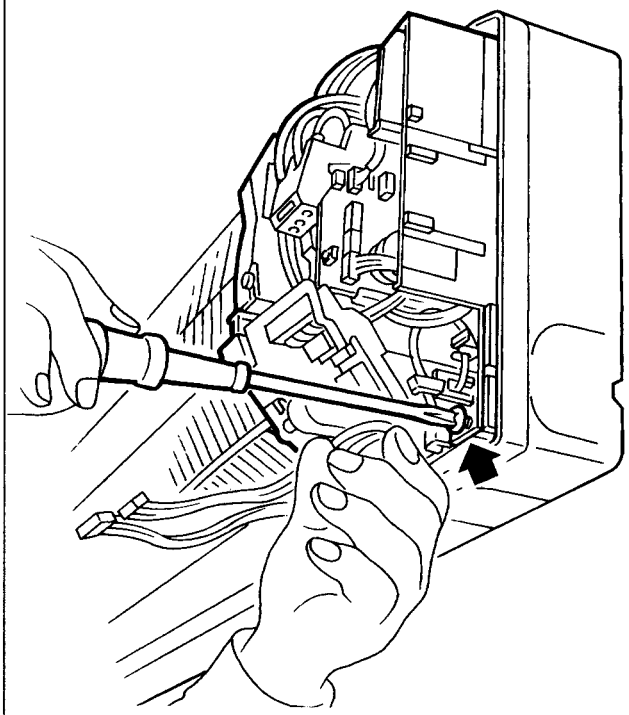
Procedure	Points
④ Disengage hook on left side.	
⑤ Dismount left side of drain pan from the unit.	
⑥ Dismount right side of drain pan from the unit.	
⑦ Disconnect drain hose.	 Warning! Hold the bottom of the drain hose and disconnect drain hose.

Piping of drain hose at left side	**Warning! Be sure to turn off all power supplies before disarrangement work.**

Procedure		Points
① Pull out drain plug located on left side of drain pan with fingers.		
② Insert drain hose.		Warning! Hold the bottom of the drain hose and insent drain hose properly.
③ Insert drain plug into the opening on right side, and press it in using hexagon wrench (4mm).		
④ Place drain hose into left side of the unit, and mount drain pan.		

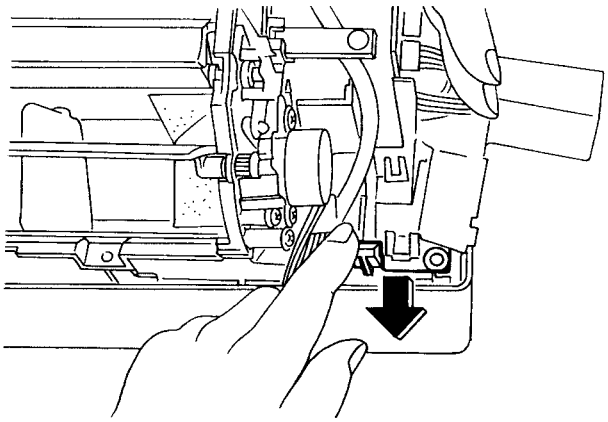
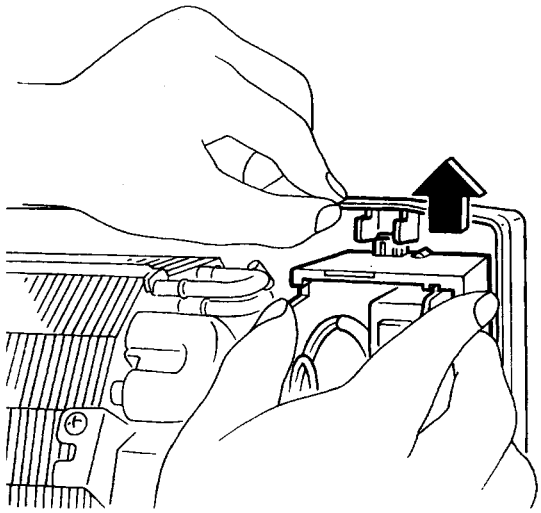
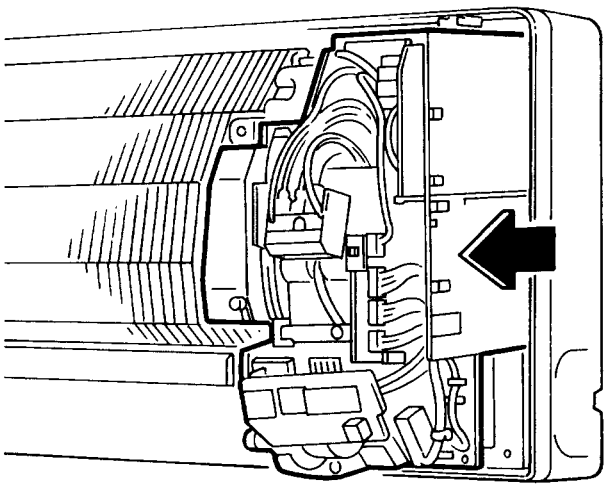
Removal of electrical parts box (1/2)

Warning! Be sure to turn off all power supplies before disarrangement work.

Procedure		Points
* Remove drain pan according to the procedure of "Removal of drain pan". ① Remove heat exchanger thermistor. Then disconnect all connectors of electrical parts box. (S1, S7, S6)		
② Remove screw located at bottom of electrical parts box.		

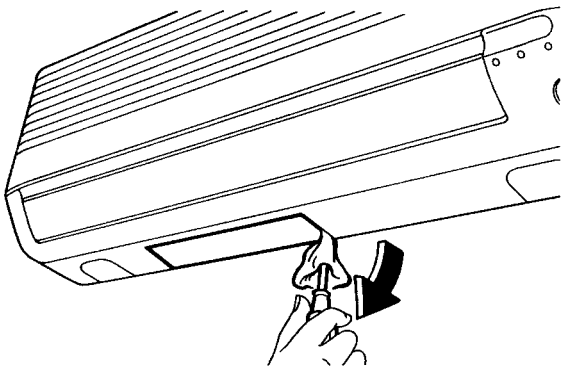
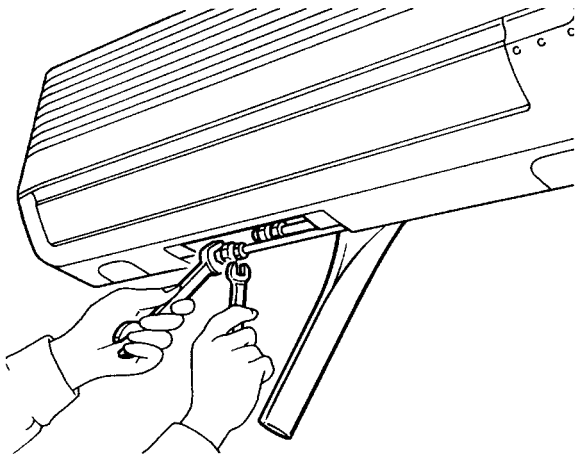
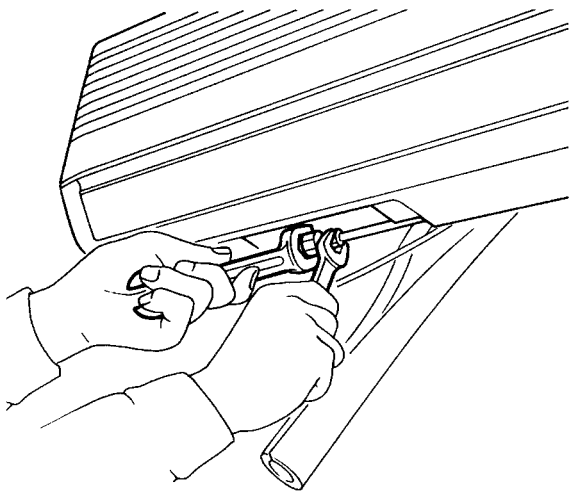
Removal of electrical parts box (2/2)

Warning! Be sure to turn off all power supplies before disarrangement work.

Procedure		Points
③ Lift up electrical parts box slightly and disengage hook located at bottom side.		
④ Disengage hook located at top side.		
⑤ Pull forward and remove electrical parts box.		

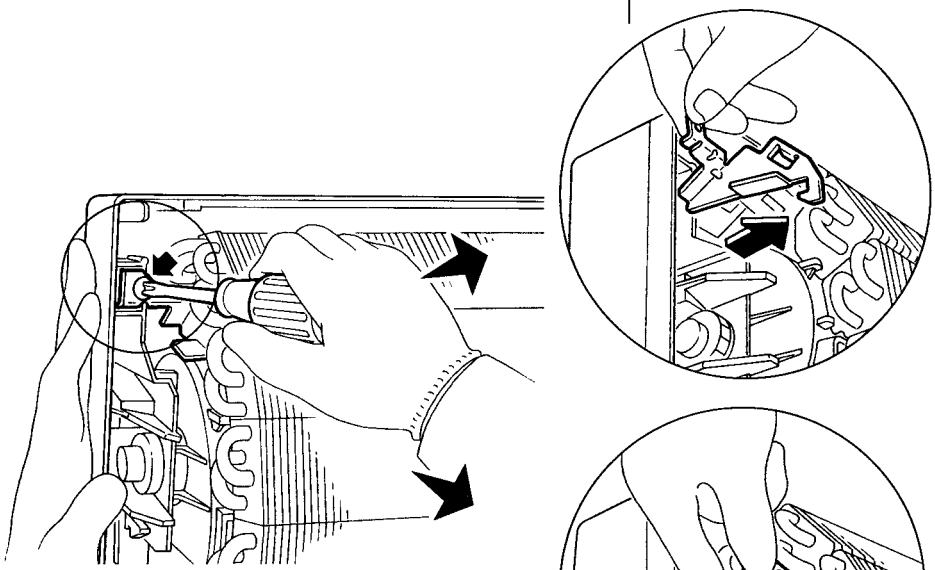
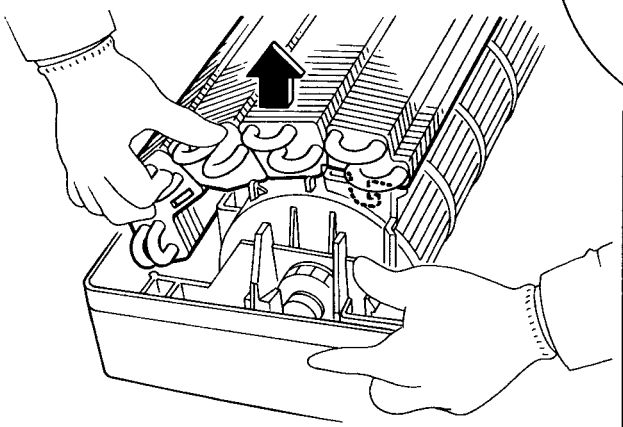
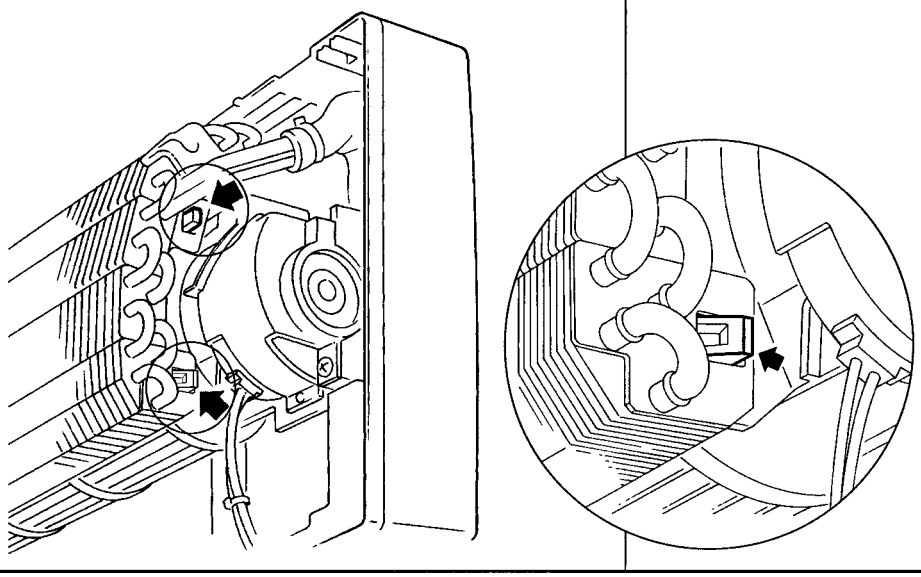
Removal of heat exchanger (1/4)

Warning! Be sure to turn off all power supplies before disarrangement work.

Procedure		Points
* Conduct pump-down operation. ① Remove bottom cover located at lower part of the unit and disconnect two screws. ② Push two positions at lower part of the unit to disengage bottom frame hooks from mounting plate. Lift the unit slightly. Refer page 202.		Warning! If gas leaks,repair the leak location, then connect all refrigerant from the unit. Conduct vacuum drying, and charge proper amount of refrigerant. Warning! Do not mix any gas (including air) other than the specified refrigerant (R22) into refrigerating cycle. (Mixing of air or other gas causes abnormal temperature rise in refrigerating cycle, and this results in pipe rupture or personal injuries.)
③ Remove insulation tube, and disconnect liquid pipe at the flare.		* Use two wrenches to disconnect pipe.
④ Disconnect gas pipe at the flare.		* After pipes are disconnected, close all pipe openings with caps to prevent dust and moisture from entering pipes.

Removal of heat exchanger (2/4)

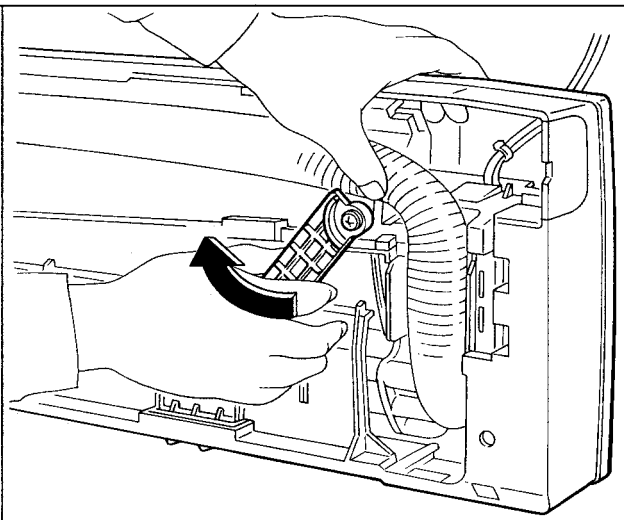
Warning! Be sure to turn off all power supplies before disarrangement work.

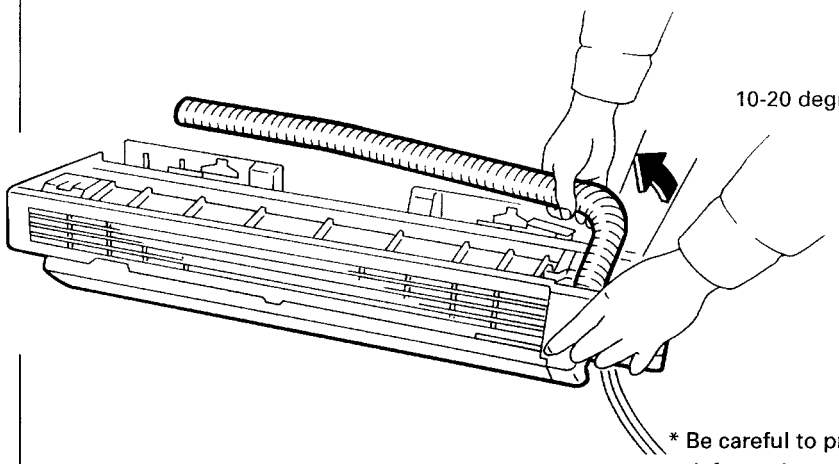
Procedure	Points
* For removal of front panel, drain pan, electrical box and other parts, see reference pages.	
1. Lifting heat exchanger ① Remove screw holding heat exchanger mounting plate in place.	
② While raising heat exchanger, pull it forward and disengage hooks. ③ Lift heat exchanger.	 Caution! When removing or reinstalling heat exchanger, be sure to wear protective gloves or wrap heat exchanger with cloths. (Fins can cut fingers.)
2. Disconnecting right side ① Disengage hook located on right side.	

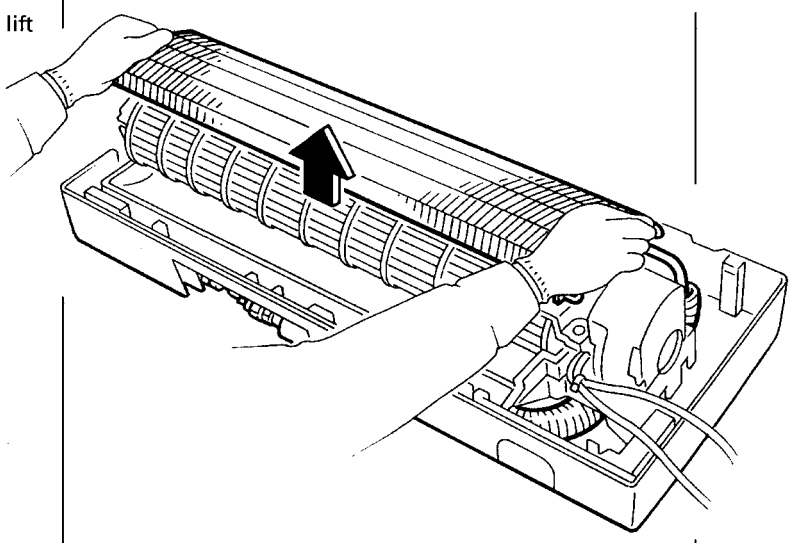
Removal of heat exchanger (3/4)

Warning! Be sure to turn off all power supplies before disarrangement work.

Procedure	Points
3. Loosening pipe retaining plate ① Disengage hook on pipe retaining plate, and turn the plate 90 degrees.	
② Pull auxiliary pipe forward to an angle of 10 to 20 degrees.	10-20 degree * Be careful to prevent pipe deformation.
③ Disengage hooks and lift heat exchanger.	

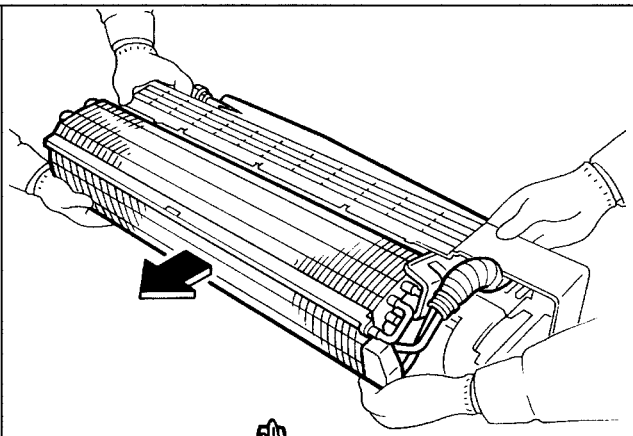
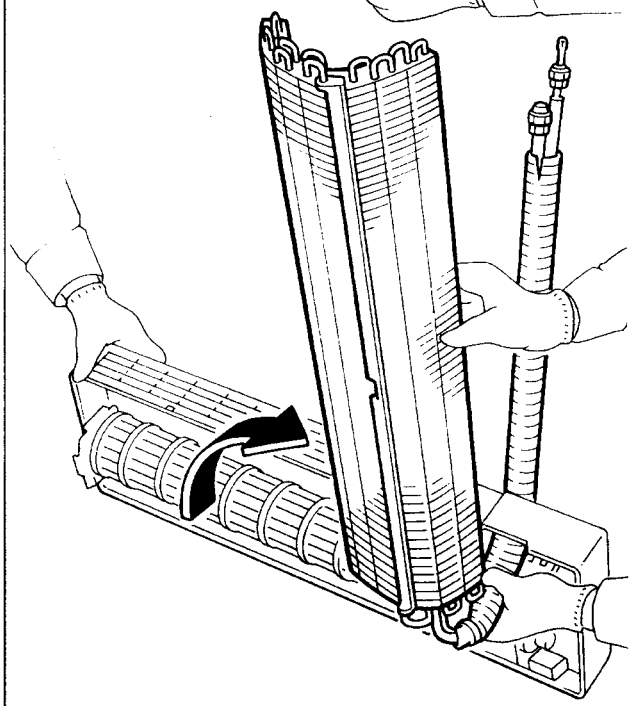
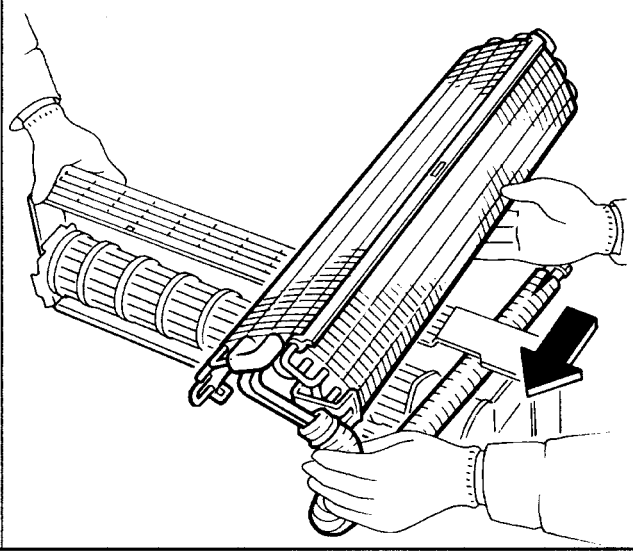






Removal of heat exchanger (4/4)

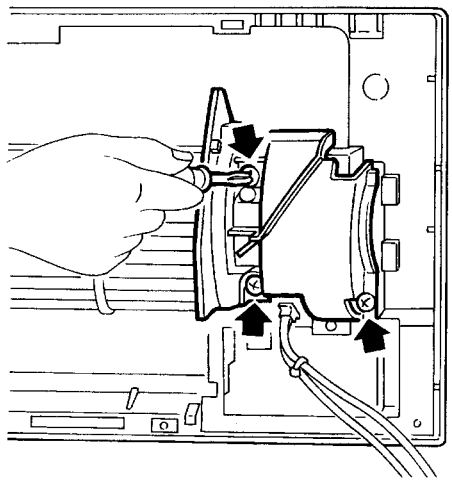
Warning! Be sure to turn off all power supplies before disarrangement work.

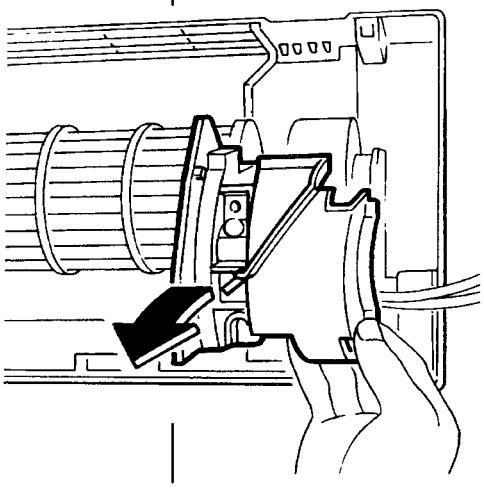
Procedure		Points
④ Pull heat exchanger forward.		Warning! Do not mix any gas (including air) other than the specified refrigerant (R22) into refrigerating cycle. (Mixing of air or other gas causes abnormal temperature rise in refrigerating cycle, and this results in pipe rupture or personal injuries.) Warning! If gas leaks, repair the leak location, then collect all refrigerant from the unit. Conduct vacuum drying, and charge proper amount of refrigerant.
⑤ Turn heat exchanger 90 to upright position.		Caution! When removing or re-installing heat exchanger, be sure to wear protective gloves or wrap heat exchanger with cloths. (Fins can cut fingers.)
⑥ Pull out the heat exchanger along the pipe from the unit.		

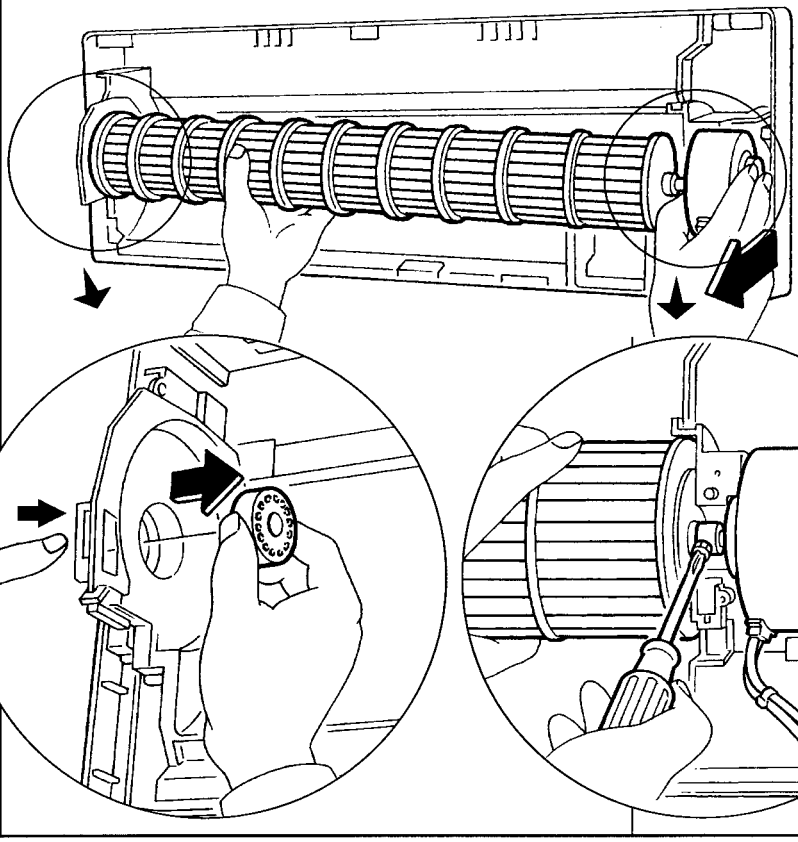
Removal of fan rotor and motor

Warning! Be sure to turn off all power supplies before disarrangement work.

Procedure	Points
① To remove right side panel, remove three screws.	
② Remove fan rotor and motor together from the unit.	
③ Loosen the hexagon head set screw on the fan rotor, and remove the motor. ⊕ screwdriver can be also used.	
④ Press the bearing with finger from the outside to remove it.	



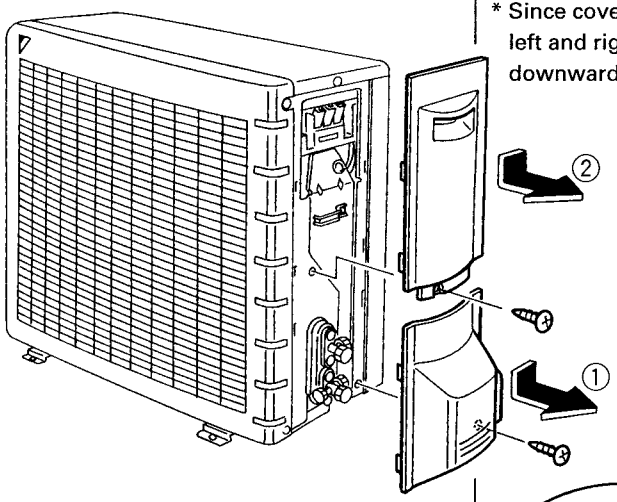


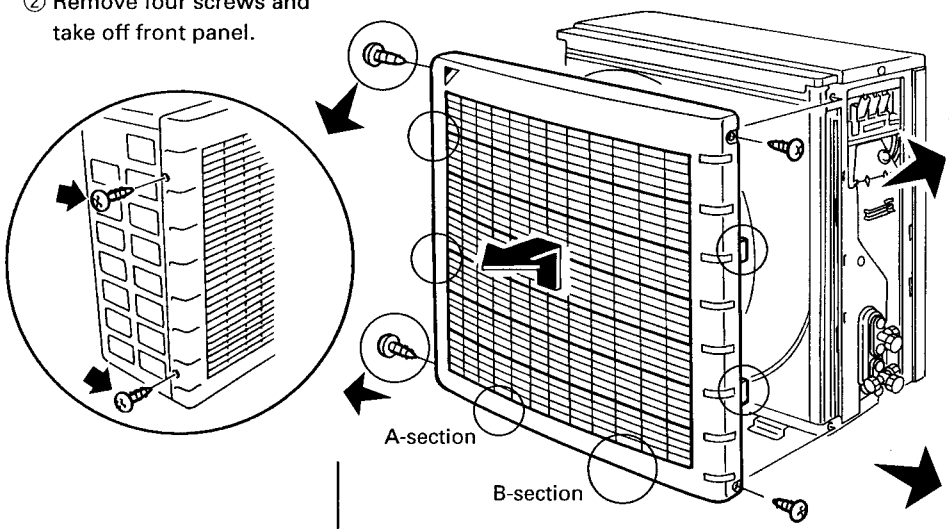


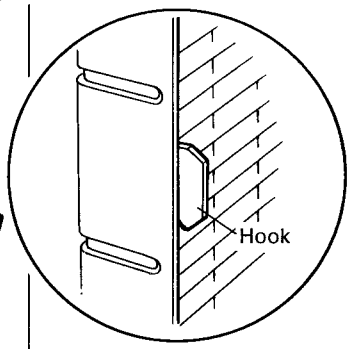
Removal of outer panels

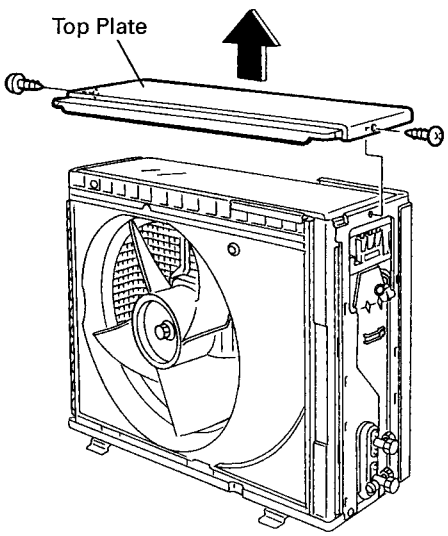
Be sure to turn off all power supplies!

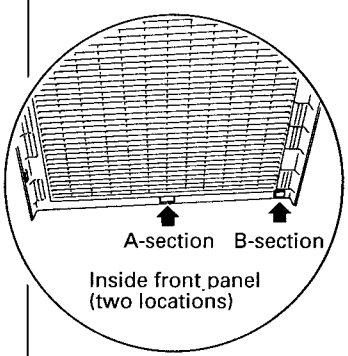
Procedure	Points
① To remove stop valve cover and service cover, unscrew a set screw for each cover.	* Since covers have hooks in both left and right sides, slide covers downward before take them off.
② Remove four screws and take off front panel.	* Front panel has six hooks. To remove, slide it upward then pull it to your side.
③ Remove two screws and take off top panel.	* Remove front panel then remove top panel.



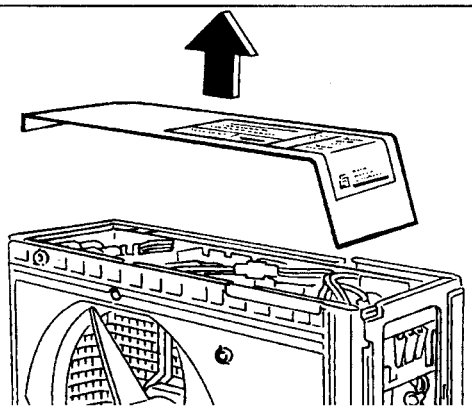
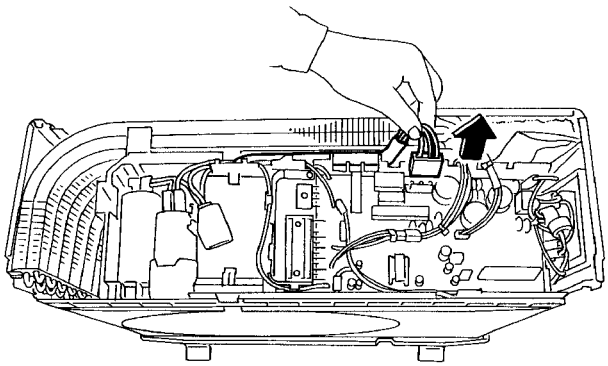
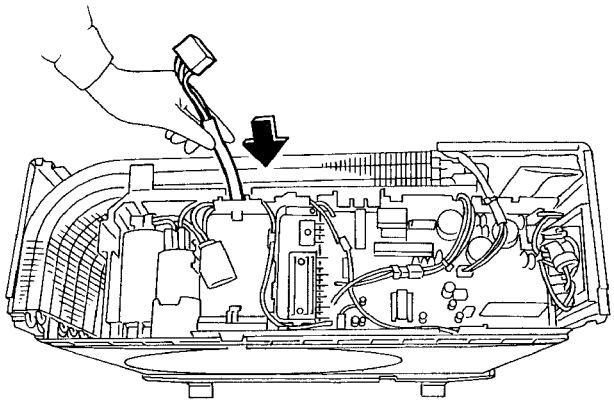






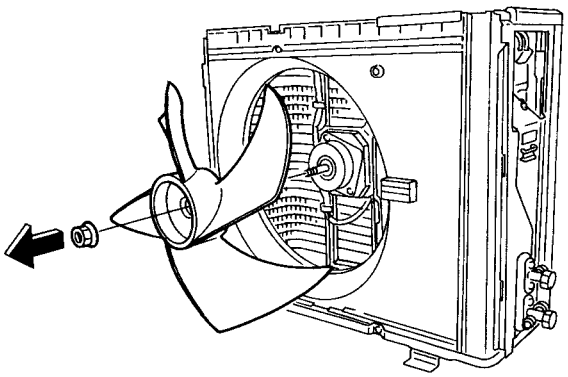


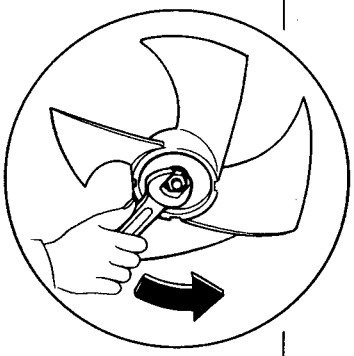
Removal of propeller fan and motor (1/3) **Be sure to turn off all power supplies!**

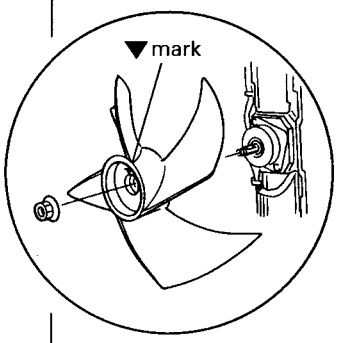
Procedure		Points
① Remove drip proof cover for electrical parts.		* Be careful not to lose or break the drip proof cover.
② Disconnect a connector of fan motor from PCB.		
③ Remove motor lead wire through the gap between heat exchanger and electrical parts.		

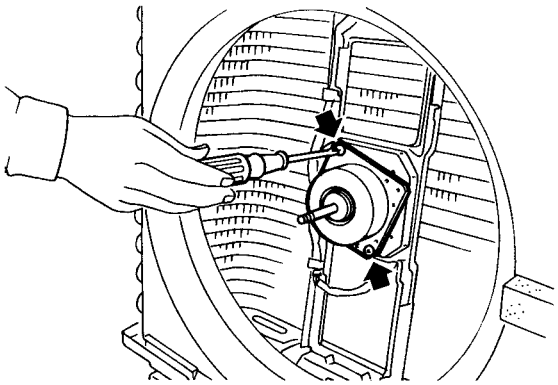
Removal of propeller fan and motor (2/3) **Be sure to turn off all power supplies!**

Procedure	Points
④ To take off propeller fan, remove washer based nut.	* For reassembling, align ▼ mark of propeller fan with D-cut section of motor shaft.
⑤ Remove two screws to take off fan motor.	



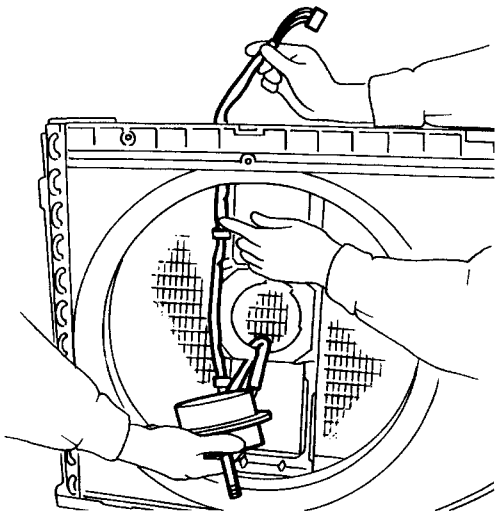
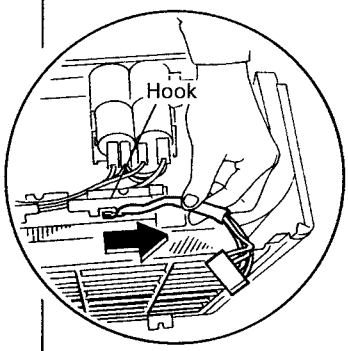
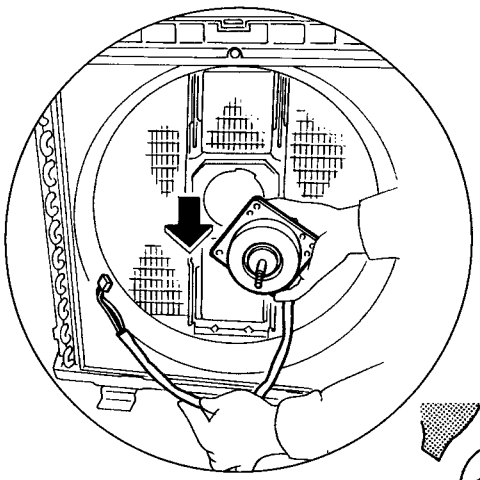
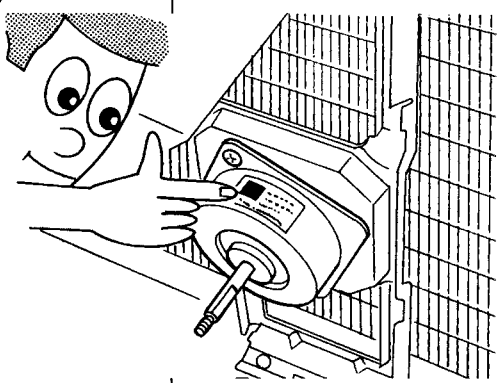






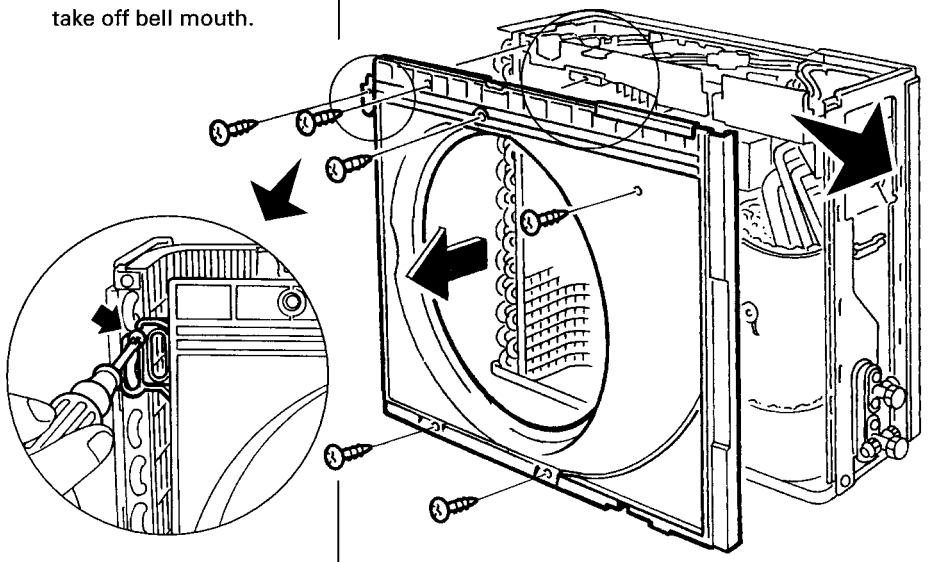
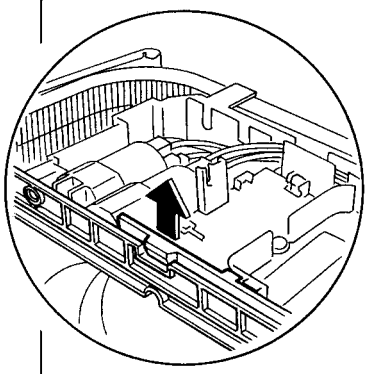
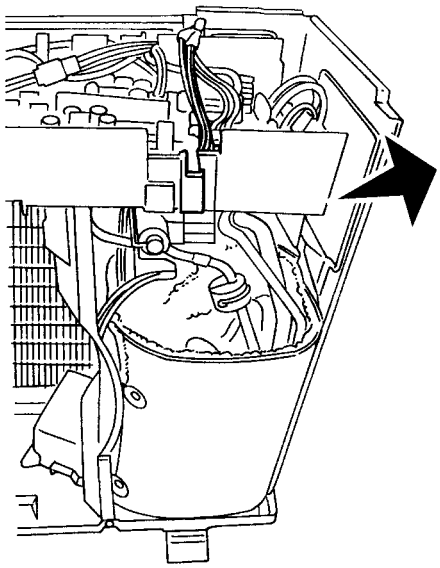
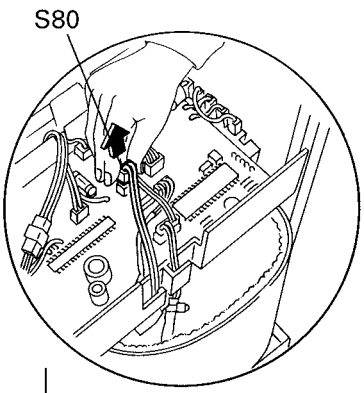
Removal of propeller fan and motor (3/3)

Be sure to turn off all power supplies!

Procedure	Points
⑥ To remove lead wires, disengage hooks affixing motor lead wires.	 
⑦ Remove motor	 * Reassemble motor in the position making specification plate upward. 

Removal of electrical parts (1/2)

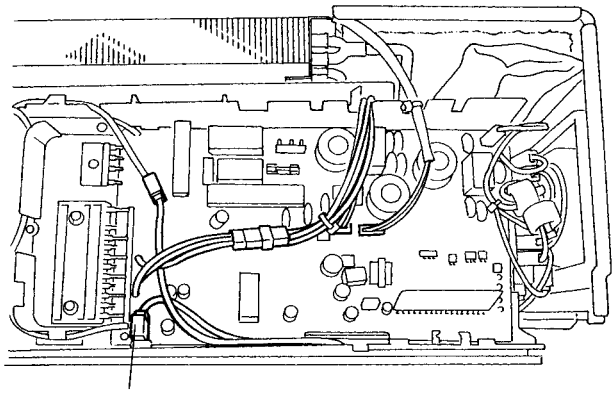
Be sure to turn off all power supplies!

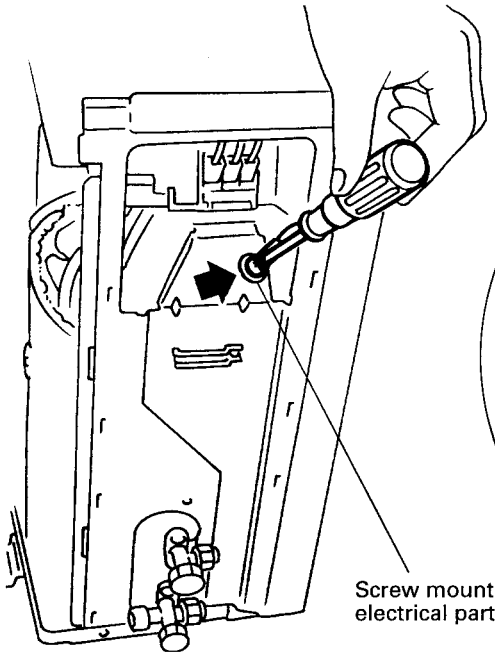
Procedure	Points
① Remove six screws to take off bell mouth. 	 * A hook located at upper right position.
② Disconnect connector of 4-way valve from PCB. And remove lead wires from clamps in electrical parts box. 	

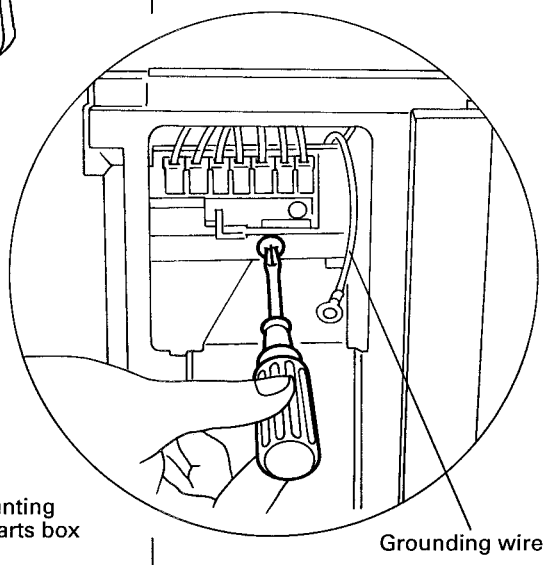
Removal of electrical parts (1/2)

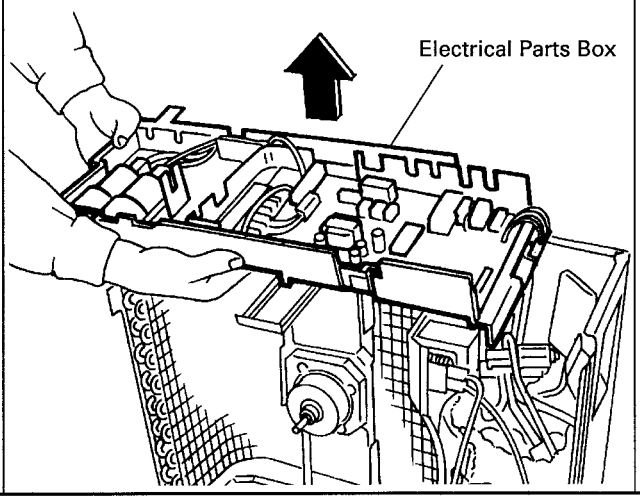
Be sure to turn off all power supplies!

Procedure	Points
③ Disconnect connectors of all wire harness.	
④ Disconnect grounding wire.	
⑤ Remove one screw mounting electrical parts box to main body of outdoor unit.	
⑥ Lift up electrical parts box to take off.	



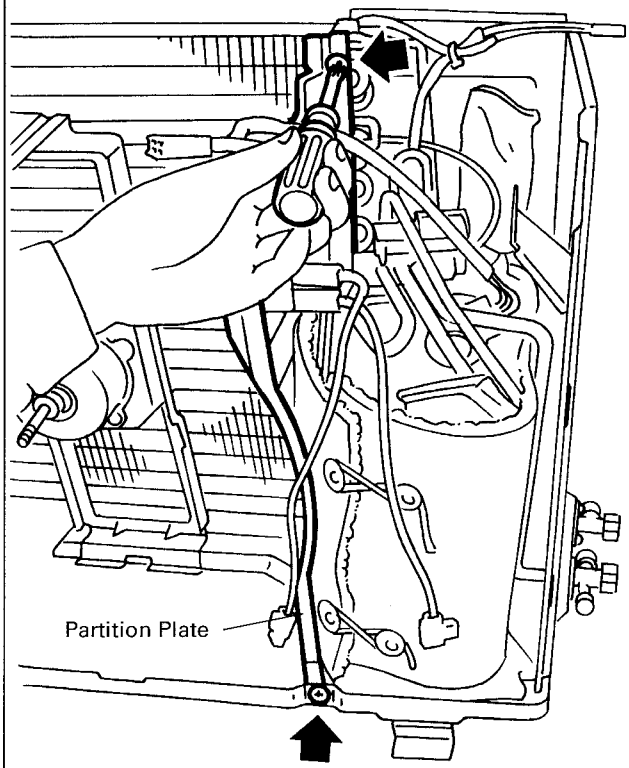
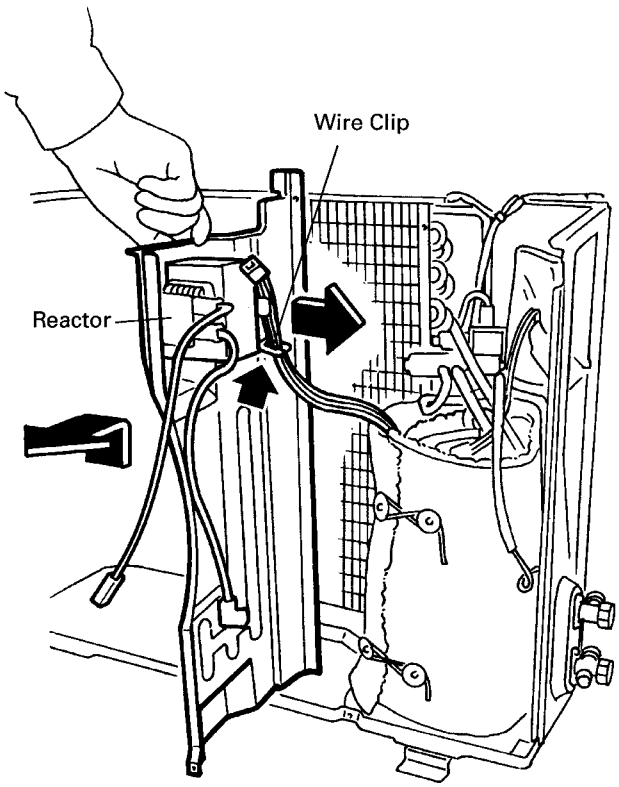






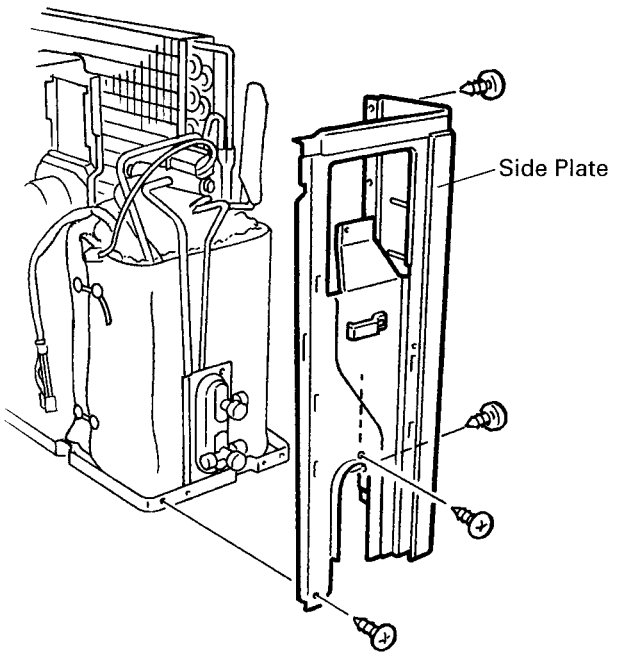
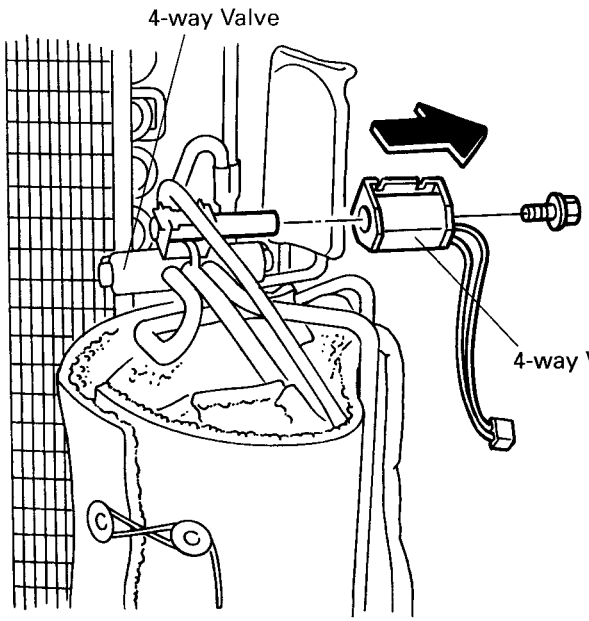
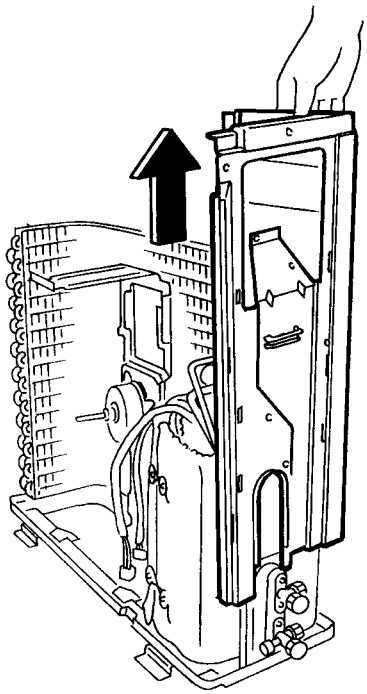
Removal of reactor

Be sure to turn off all power supplies!

Procedure	Points
① Remove two screws to take off partition plate.  ② Release lead wires of reactor from clamp (wire clip). ③ Lift up partition plate to take off. 	* Reactor for HV1NB model are located in the right side of bottom frame and partion plate.

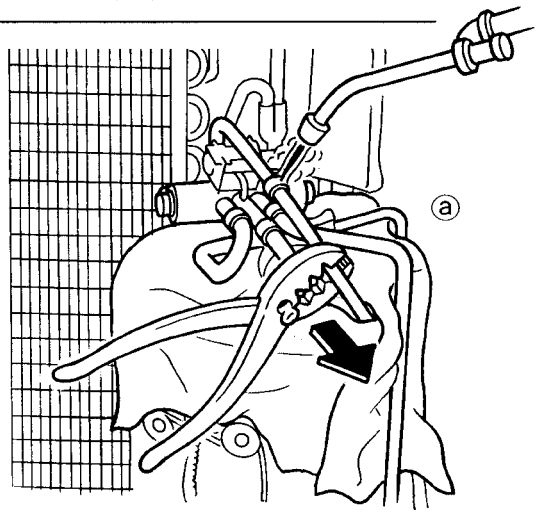
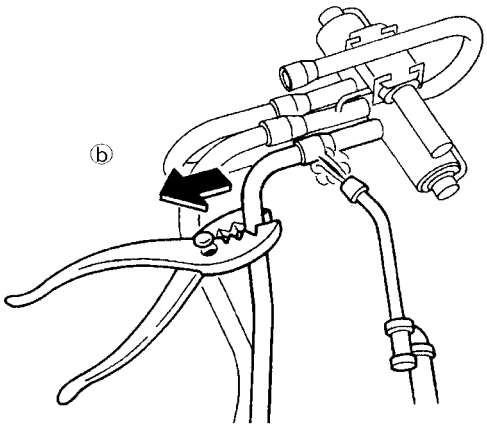
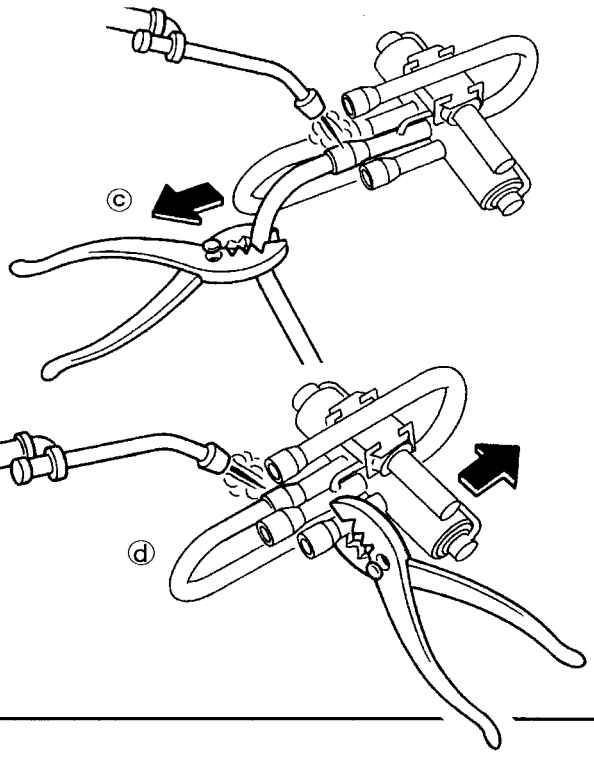
Removal of 4-way valve (1/2)

Be sure to turn off all power supplies!

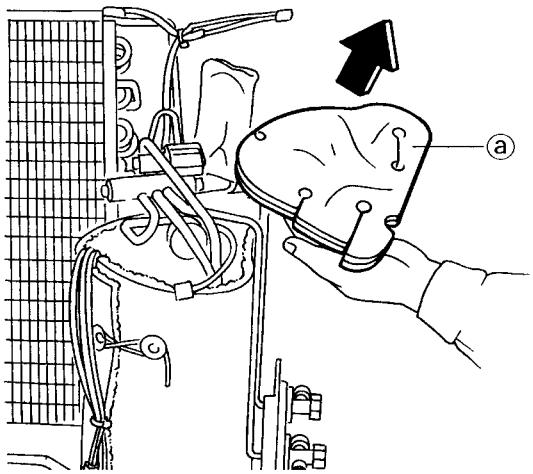
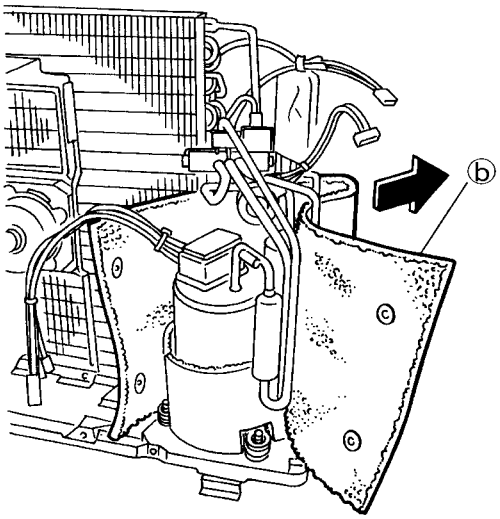
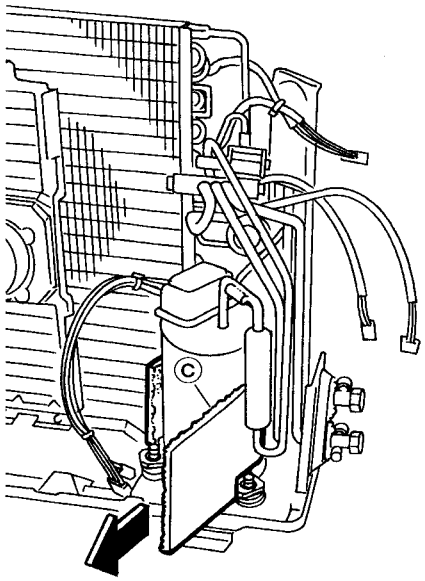
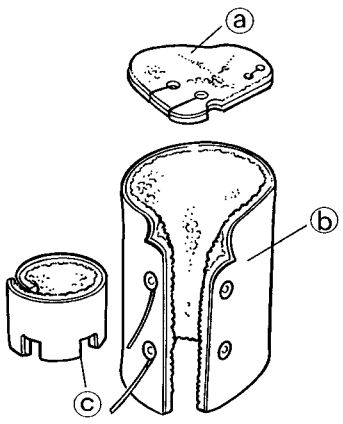
Procedure		Points
* Make sure that there is no refrigerant in the unit before disassembling. ① Remove the four screws, and take off the side panel. ② Pull out side plate. ③ Remove the 4-way valve coil.	 	 **WARNING !** If refrigerant gas leaks during servicing work, ventilate the area. (If refrigerant gas contacts flames, hazardous gas can generate.)

Removal of 4-way valve (2/2)

Be sure to turn off all power supplies!

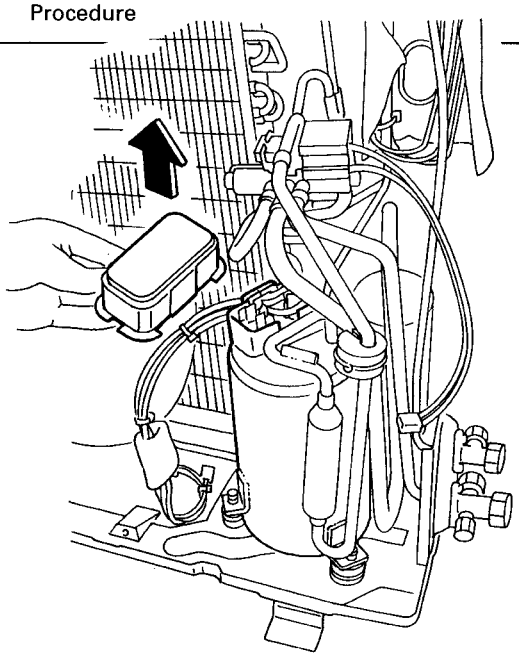
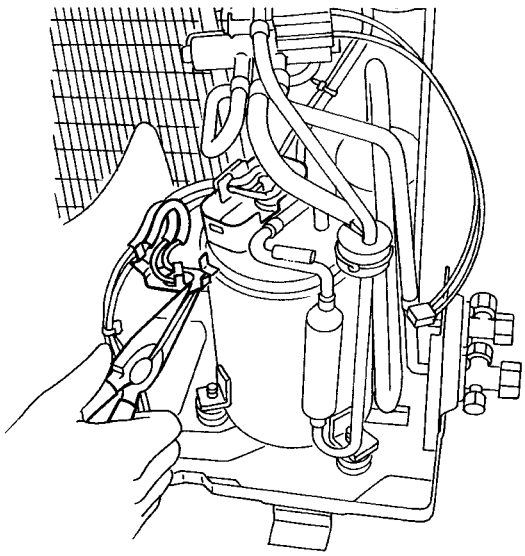
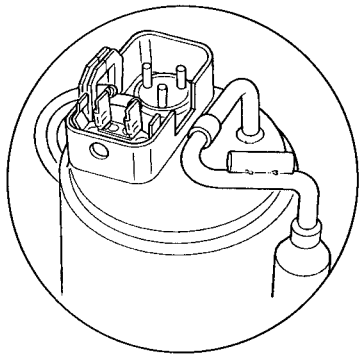
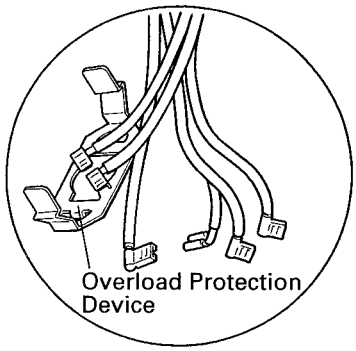
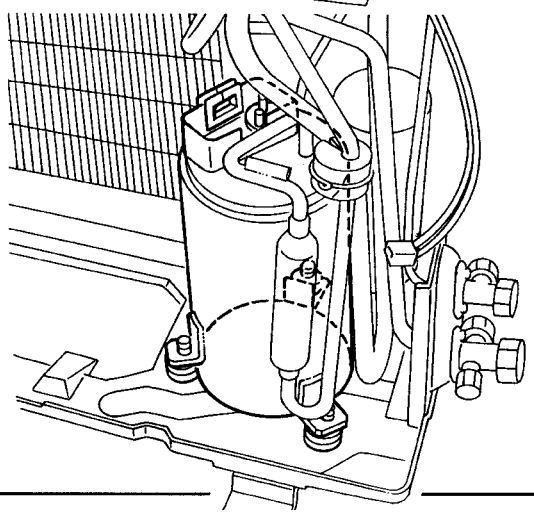
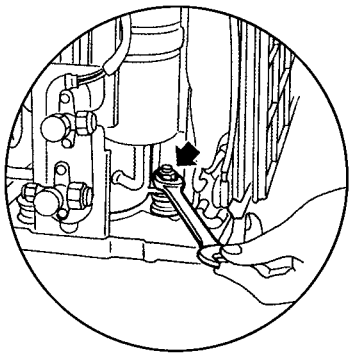
Procedure		Points
* Cover 4-way valve with welding protective sheet or steel sheet to protect the valve from a heat affection of welding flame.		**Caution !** Be careful to prevent burn with hot 4-way valve or piping.
⑤ Heat the four brazed sections of the 4-way valve, and disconnect the sections in an order of ⓐ, ⓑ, ⓒ,and ⓓ.		Caution in reassembly ① Use an oxidizing prevention measure during brazing. If a nitrogen gas cannot be used,conduct brazing as quickly as possible. ② It is necessary to prevent packing deterioration caused by heat and carbonization of oil inside the 4-way valve. Cover the 4-way valve body with a wet cloth, and keep it moist by continuously supplying water to prevent the valve from heating. (Maintain the unit temterature below + 120°C.)
⑥ Heat joint and pull pipe with pliers.		If it is difficult to use gas welding in the removal operation: 1. Disconnect the pipe joints (brazed sections) that are easy to remove and reconnect. 2. Cut the main pipe using a mini copper pipe cutter to facilitate removal. (Note) Do not use a hack-saw since it produces metal particles during cutting. * When using pliers to pull out pipe, be careful not to flatten pipe with excessive force.

Removal of insulation materials **Be sure to turn off all power supplies!**

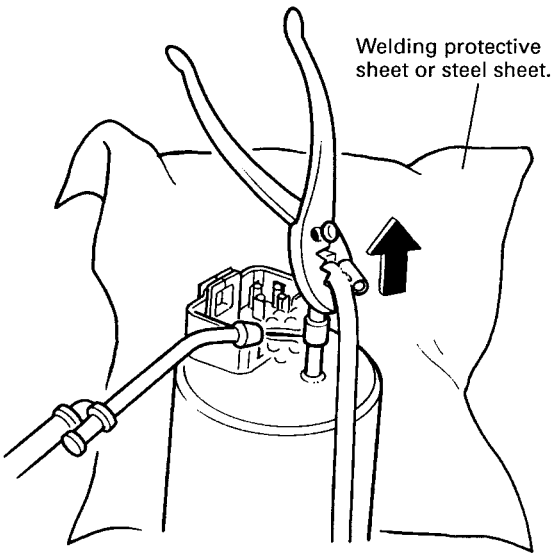
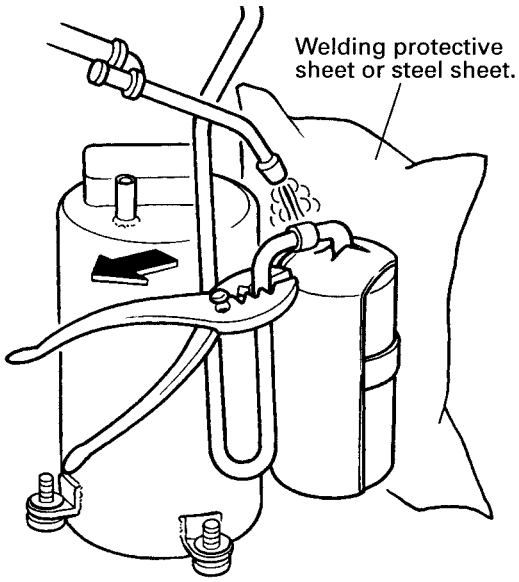
Procedure		Points
① Remove the sound insulation material of ⓐ ~ ⓒ. Especially, since pipe connection port section of insulation ⓐ is easy to split, remove the insulation material in the order of ⓐ to ⓒ.	  	* When removing sound-insulation material, do not pull it with excessive force, since it is inserted between pipes. 

Removal of compressor (1/2)

Be sure to turn off all power supplies!

Procedure		Points
① Disconnect terminals and remove protection device.		* Terminal code is printed. Do not scorch the indication with the flame of burner. It is recommendable to record terminal code on a memo paper in case the indication becomes illegible.
		
		
② Remove compressor. (Remove one mounting nut.)		

Removal of compressor (2/2) **Be sure to turn off all power supplies!**

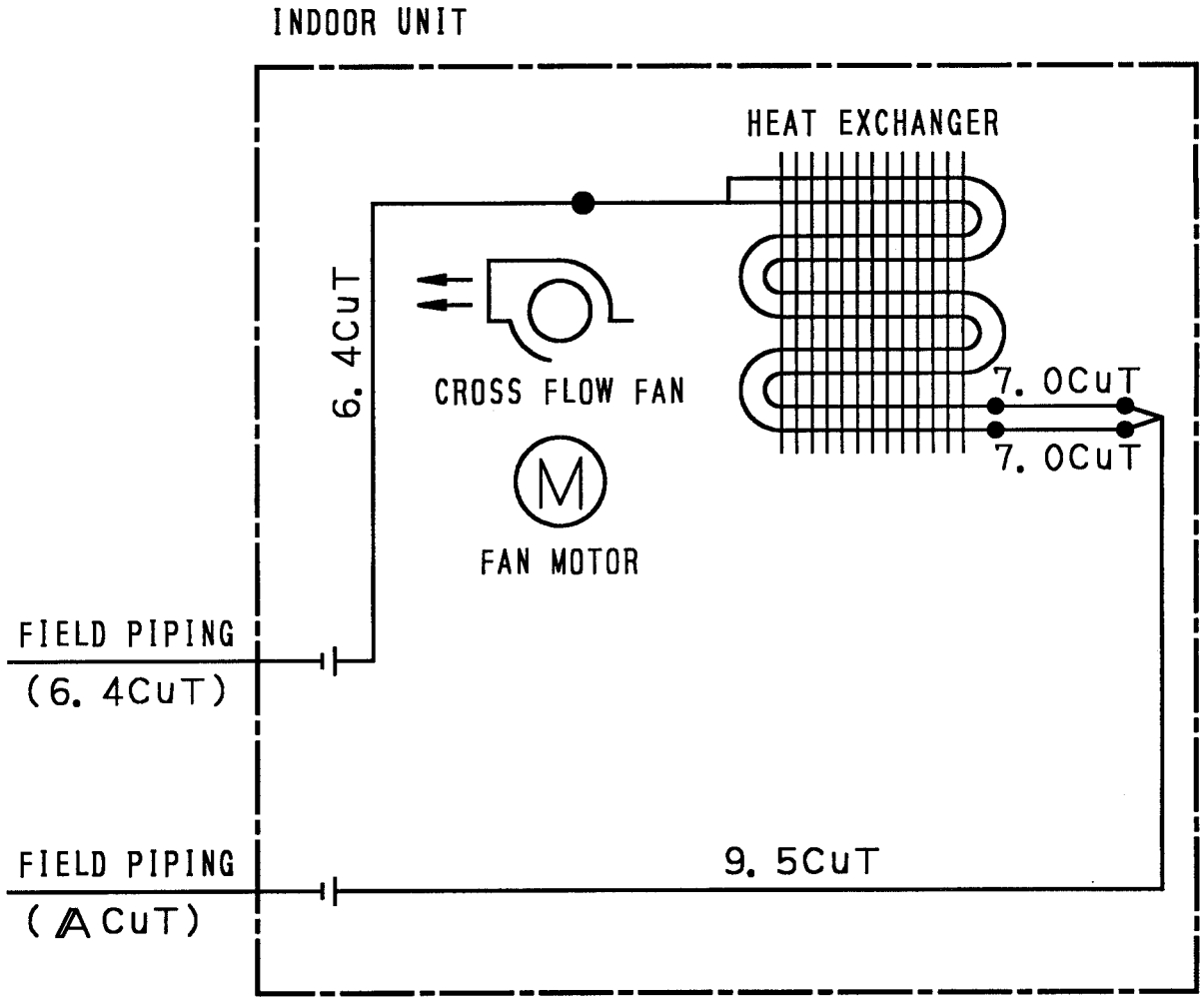
Procedure		Points
③ Heat discharge side brazed section for disconnecting. ④ Heat brazed section of accumulator suction side to disconnect pipe. ⑤ Lift and remove compressor.	 	

7. Appendix

(1) Piping Diagrams

- Indoor Units

FTK25/35HV1NB FTX25/35HV1NB
FTK25/35HVE FTX25/35HVEA
FTX25/35HVEC
FTX25/35HVET

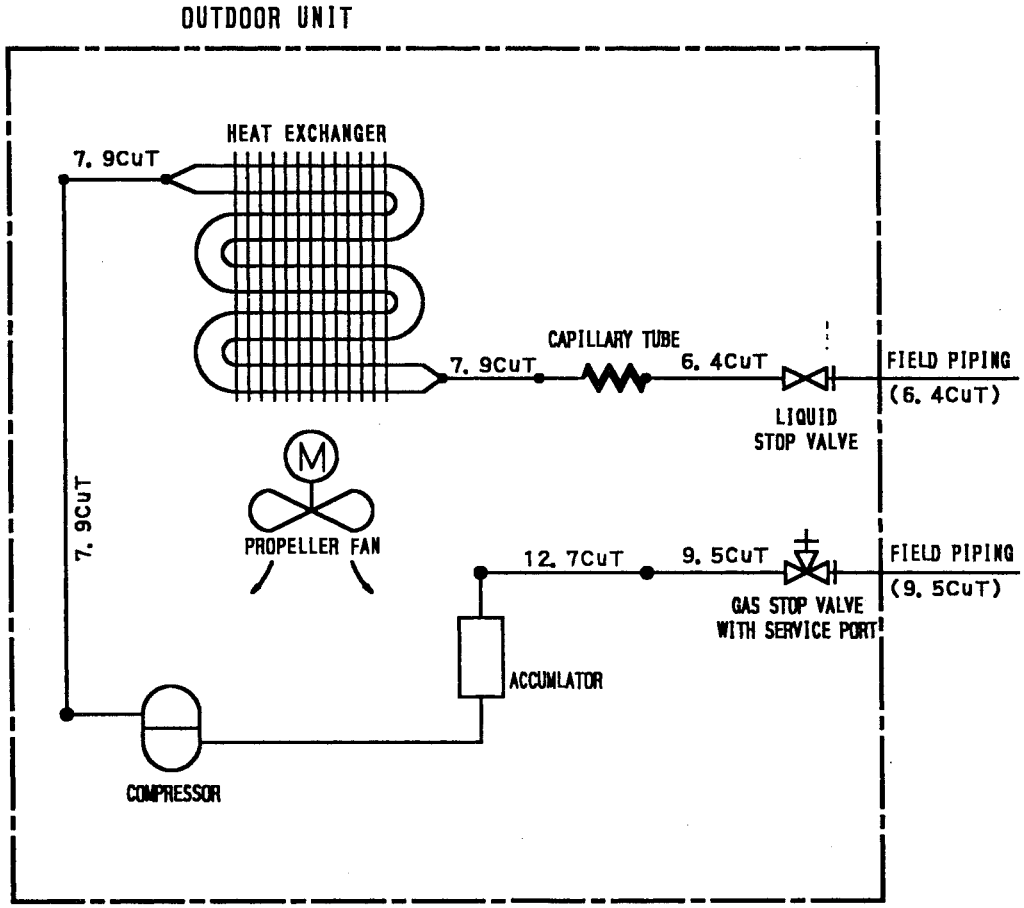


	Ⓐ
FTK25- FTX25-	9. 5
FTK35- FTX35-	12. 7

4D007431A

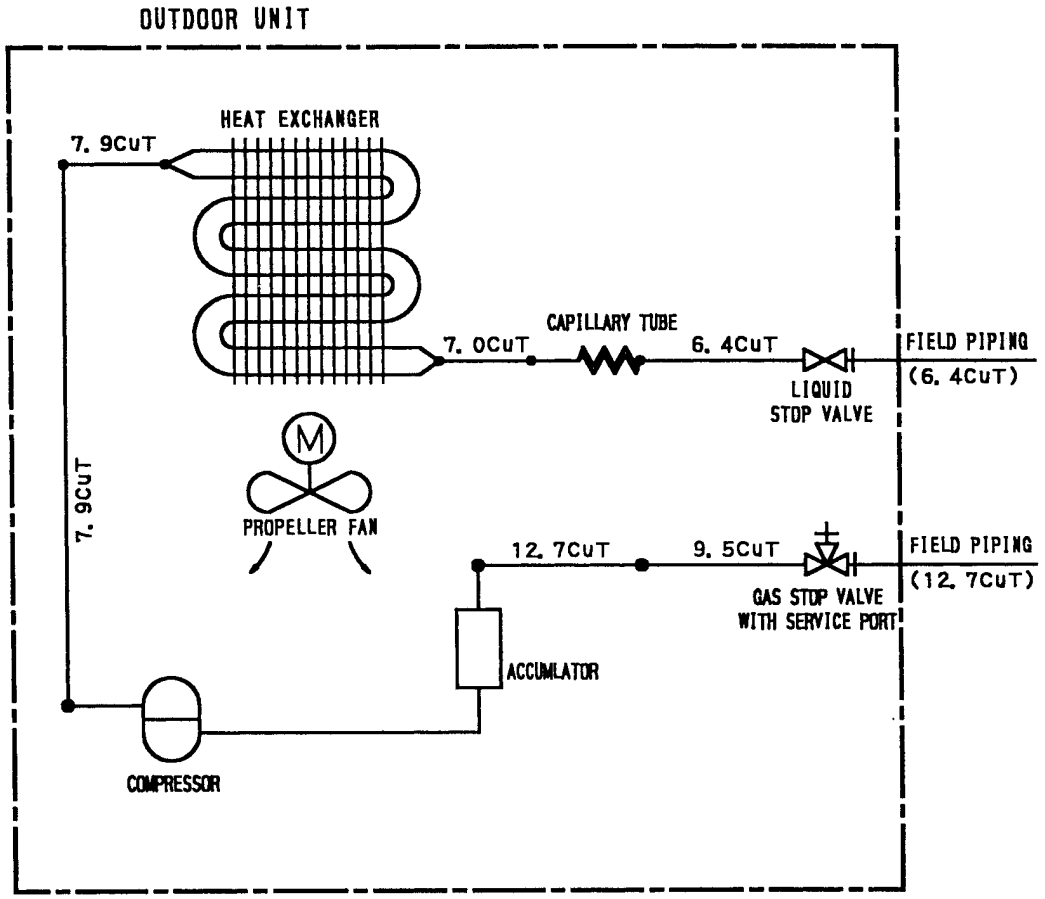
- Outdoor Units

RK25HV1NB
RK25HVE



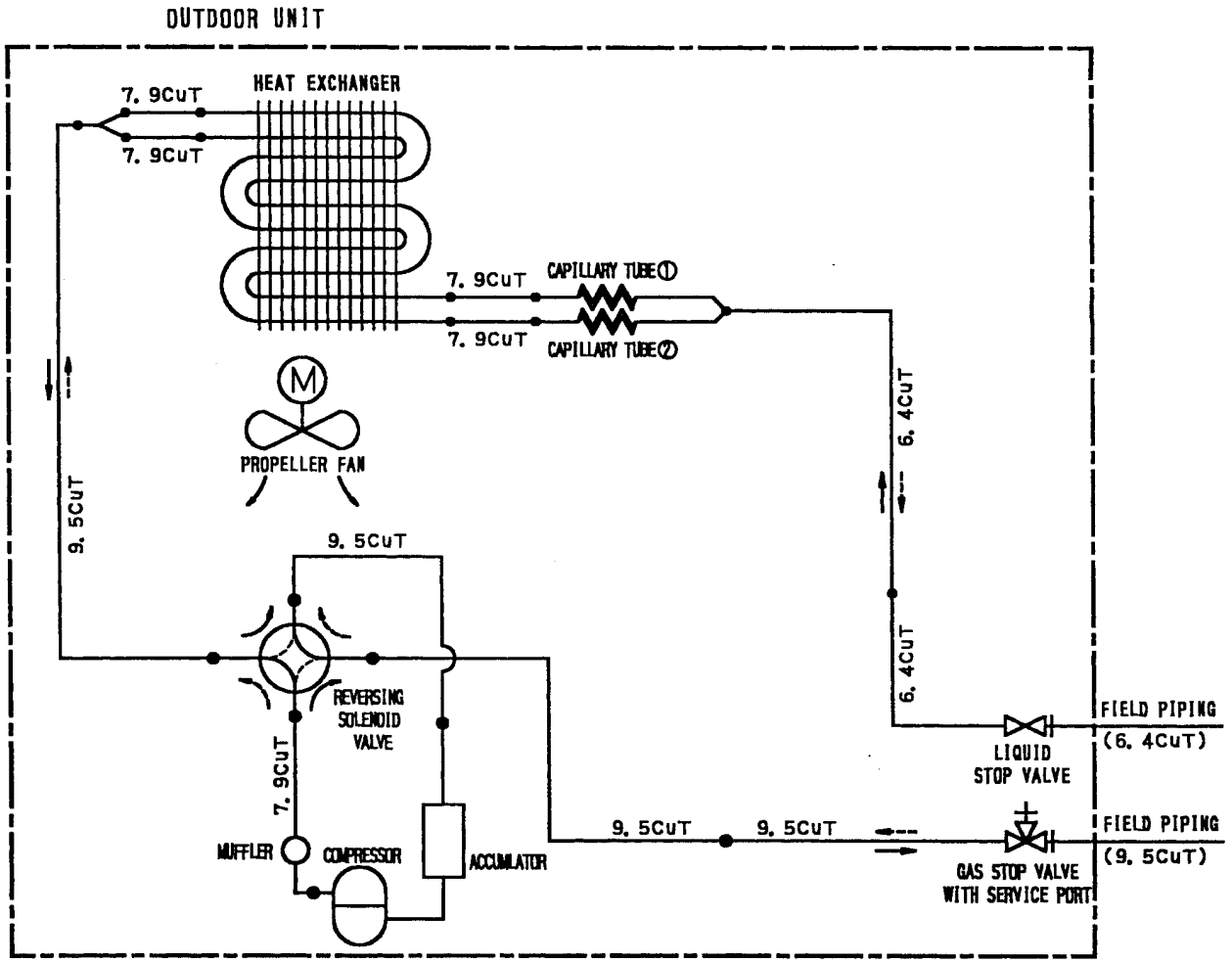
3D013570

RK35HV1NB
RK35HVE



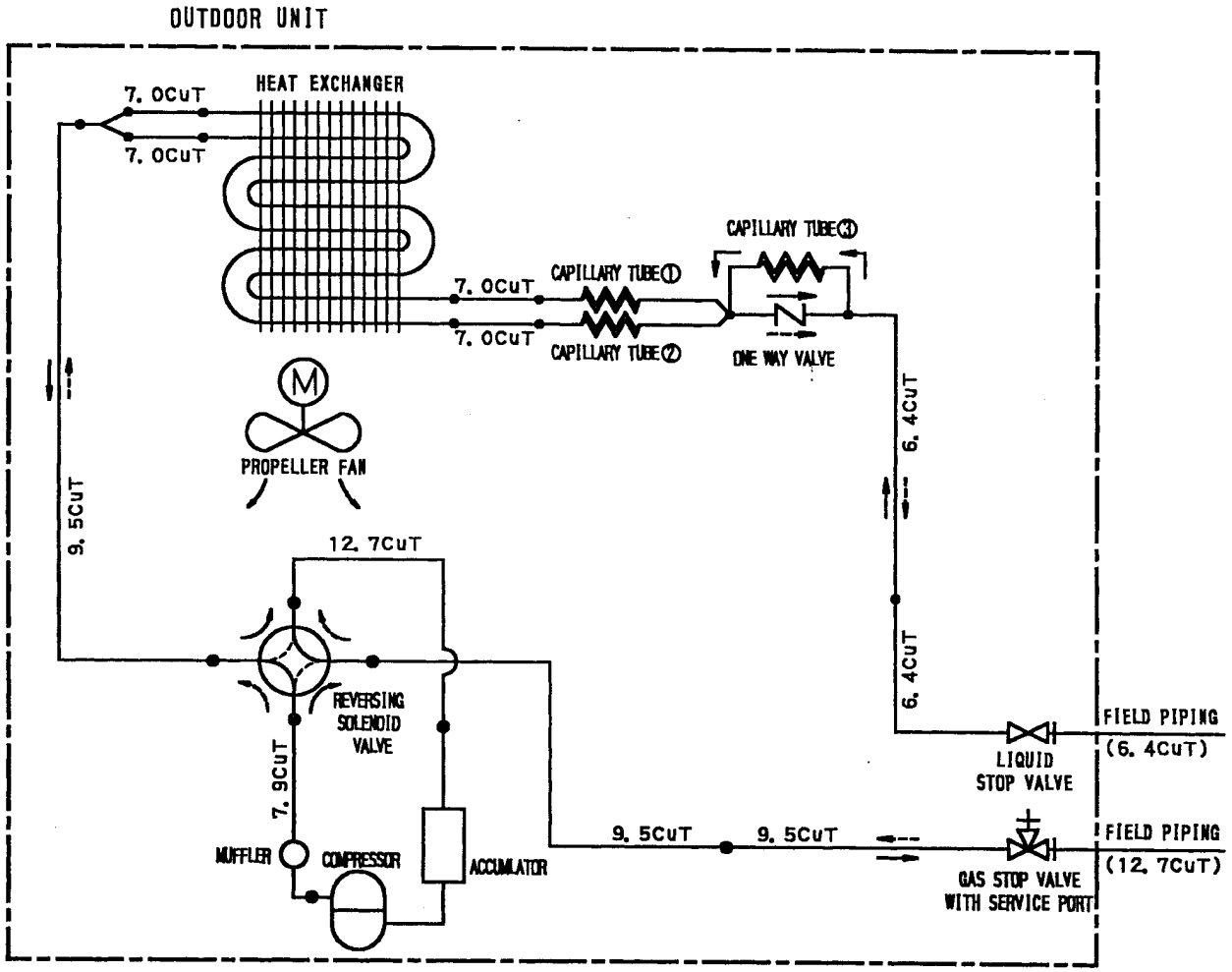
3D013569

RX25HV1NB
RX25HVEA
RX25HVEC
RX25HVET



3D013568

RX35HV1NB
RX35HVEA
RX35HVEC
RX35HVET

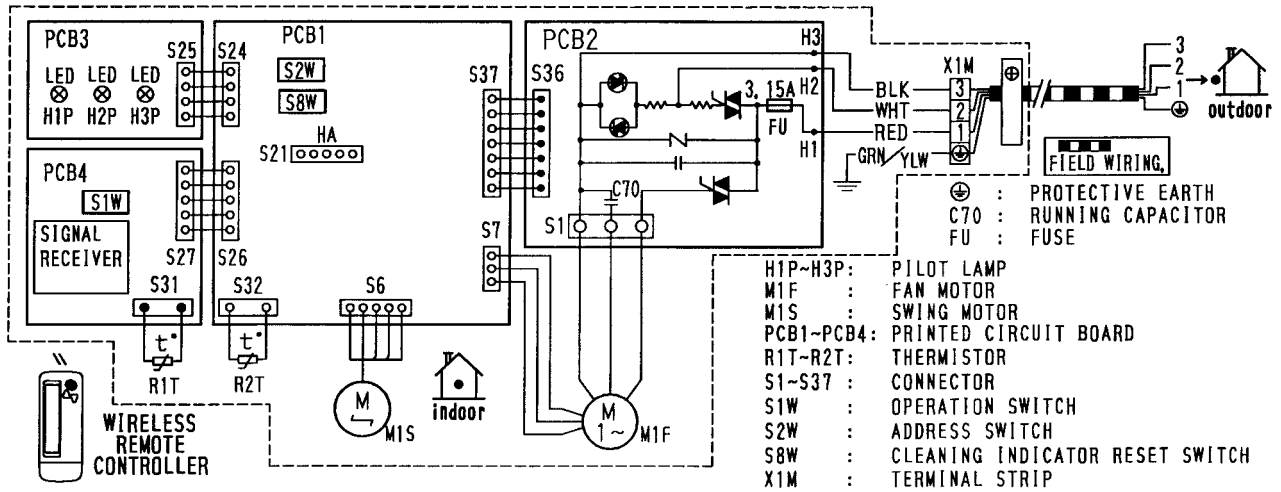


3D013567

(2) Wiring Diagrams

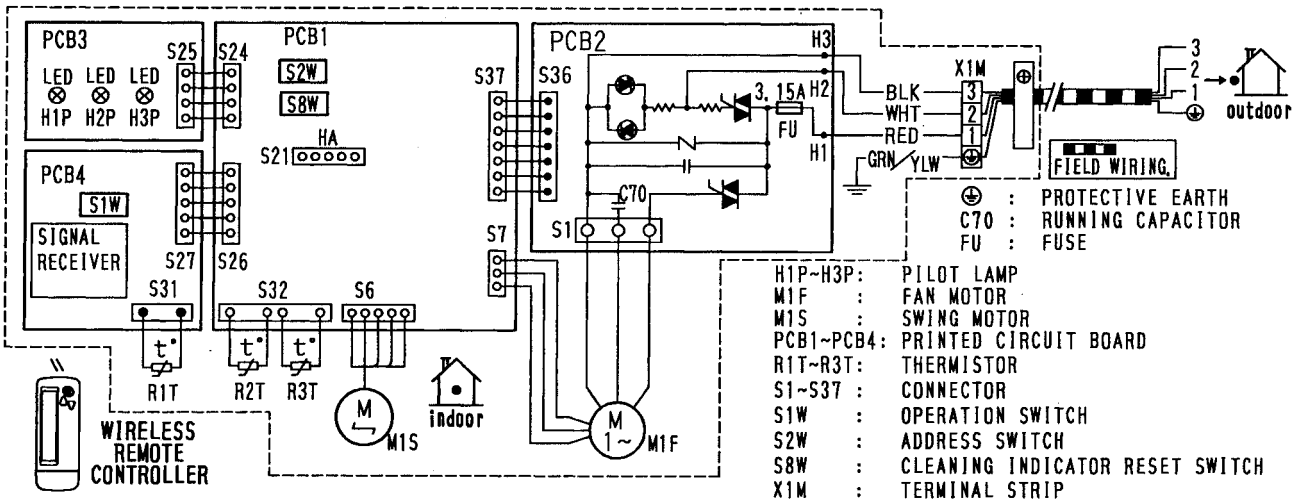
- Indoor Units

FTK25/35HV1NB
FTK25/35HVE



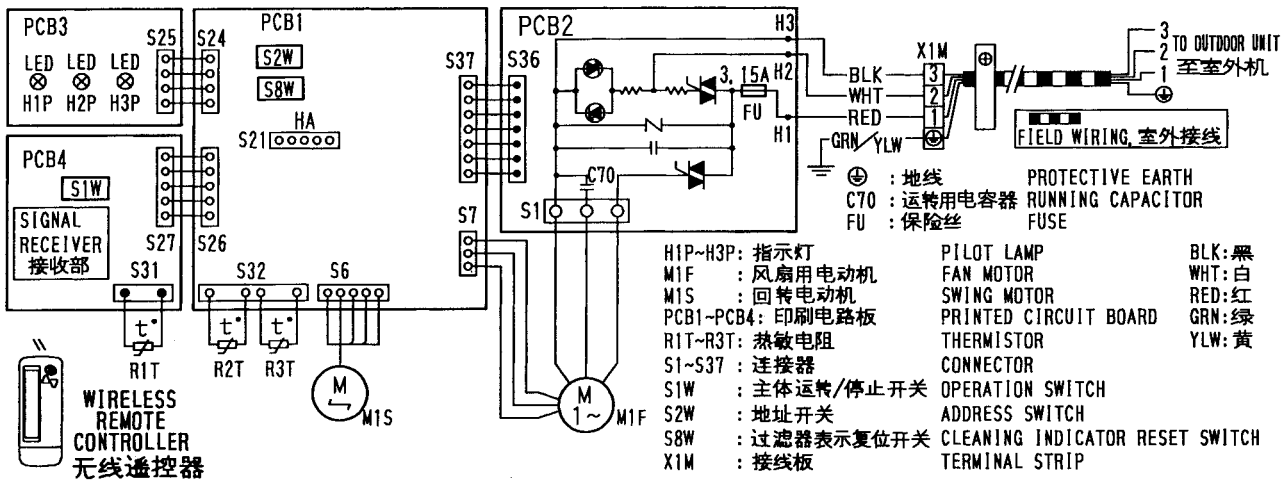
3D012212

FTX25/35HV1NB
FTX25/35HVEA



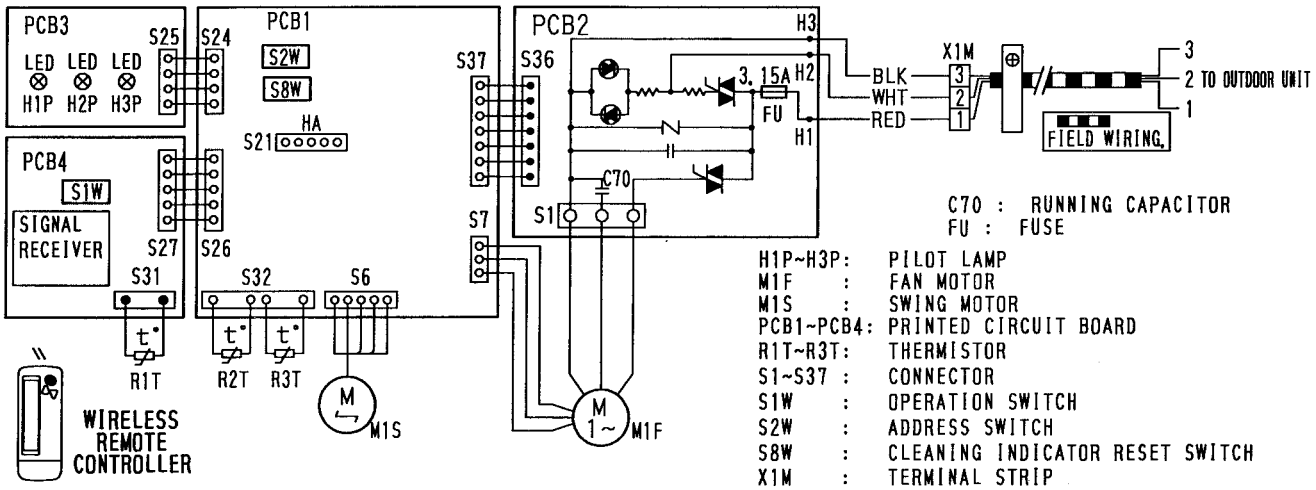
3D012215

FTX25/35HVEC



3D012216

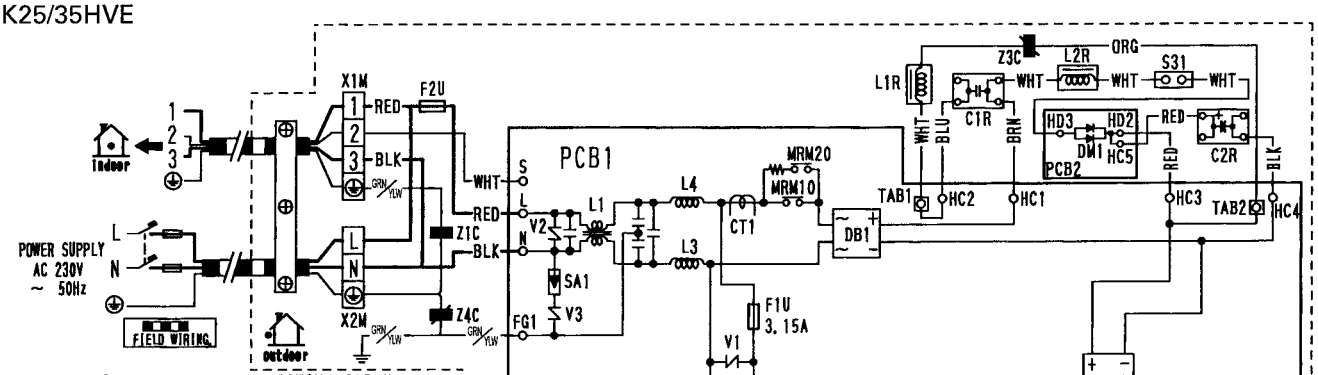
FTX25/35HVET



3D012217

- Outdoor Units

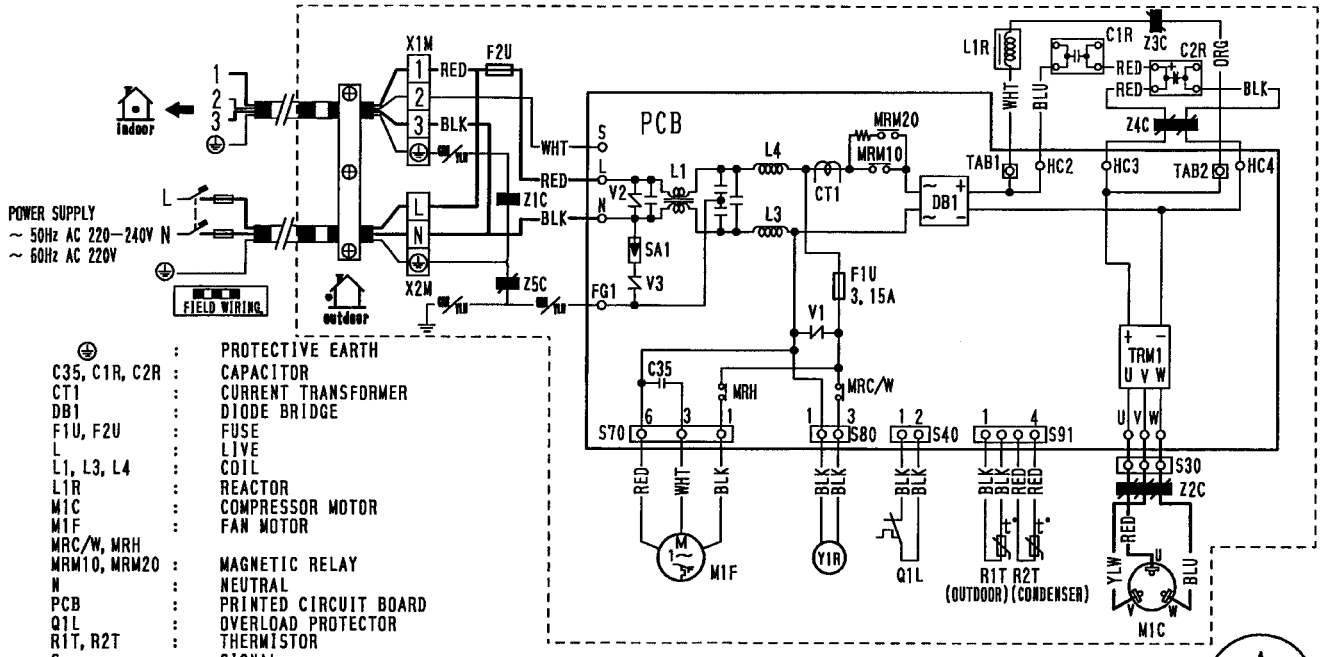
RK25/35HV1NB
RK25/35HVE



⏚	:	PROTECTIVE EARTH
C35, C1R, C2R	:	CAPACITOR
CT1	:	CURRENT TRANSFORMER
DB1	:	DIODE BRIDGE
DM1	:	DIODE MODULE
F1U, F2U	:	FUSE
L	:	LIVE
L1, L3, L4	:	COIL
L1R, L2R	:	REACTOR
M1C	:	COMPRESSOR MOTOR
M1F	:	FAN MOTOR
MRH		
MRM10, MRM20	:	MAGNETIC RELAY
N	:	NEUTRAL
PCB1, 2	:	PRINTED CIRCUIT BOARD
Q1L	:	OVERLOAD PROTECTOR
R1T, R2T	:	THERMISTOR
S	:	SIGNAL
S30~S91	:	CONNECTOR
SA1	:	SURGE ARRESTER
TAB1, TAB2	:	CONNECTOR
TRM1	:	TRANSISTOR MODULE
V1, V2, V3	:	VARISTOR
X1M, X2M	:	TERMINAL STRIP
Z1C, Z2C, Z3C, Z4C	:	FERRITE CORE

3D012354A

RX25/35HV1NB
RX25/35HVEA

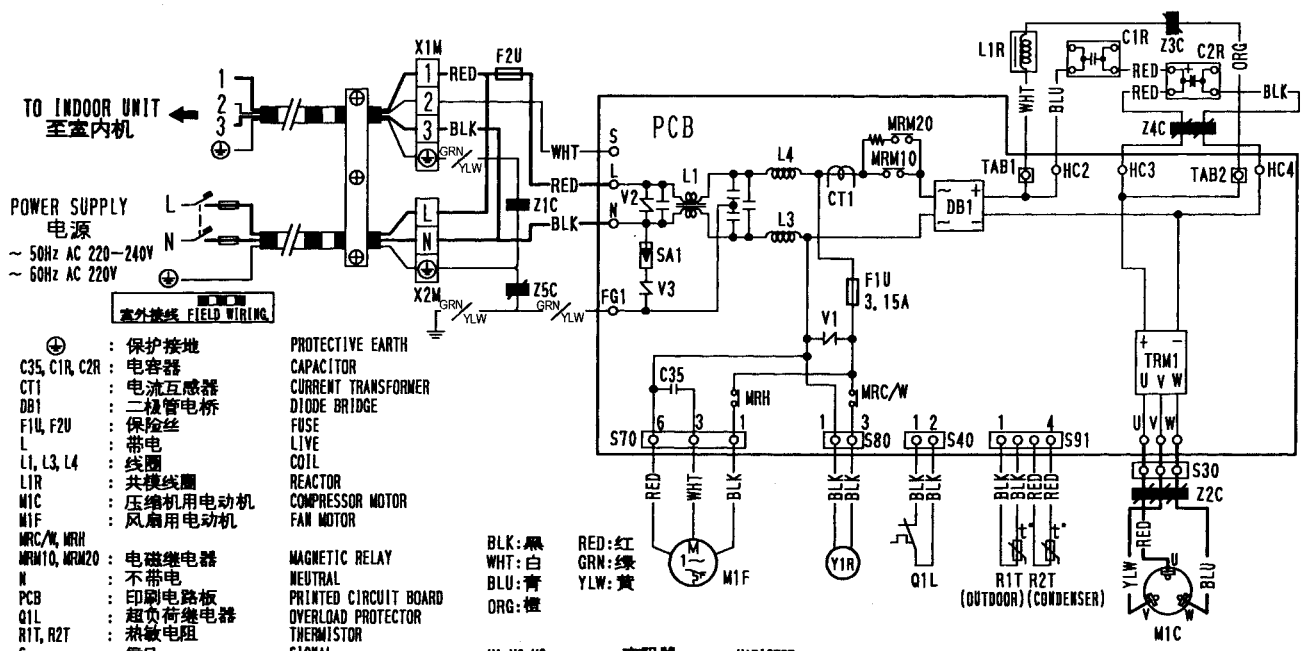


⏚	:	PROTECTIVE EARTH
C35, C1R, C2R	:	CAPACITOR
CT1	:	CURRENT TRANSFORMER
DB1	:	DIODE BRIDGE
F1U, F2U	:	FUSE
L	:	LIVE
L1, L3, L4	:	COIL
L1R	:	REACTOR
M1C	:	COMPRESSOR MOTOR
M1F	:	FAN MOTOR
MRC/W, MRH		
MRM10, MRM20	:	MAGNETIC RELAY
N	:	NEUTRAL
PCB	:	PRINTED CIRCUIT BOARD
Q1L	:	OVERLOAD PROTECTOR
R1T, R2T	:	THERMISTOR
S	:	SIGNAL
S30~S91	:	CONNECTOR
SA1	:	SURGE ARRESTER
TAB1, TAB2	:	CONNECTOR
TRM1	:	TRANSISTOR MODULE
V1, V2, V3	:	VARISTOR
X1M, X2M	:	TERMINAL STRIP
Y1R	:	REVERSING SOLENOIDE VALVE COIL
Z1C, Z2C		
Z3C, Z4C, Z5C	:	FERRITE CORE

A

3D012351A

RX25/35HVEC

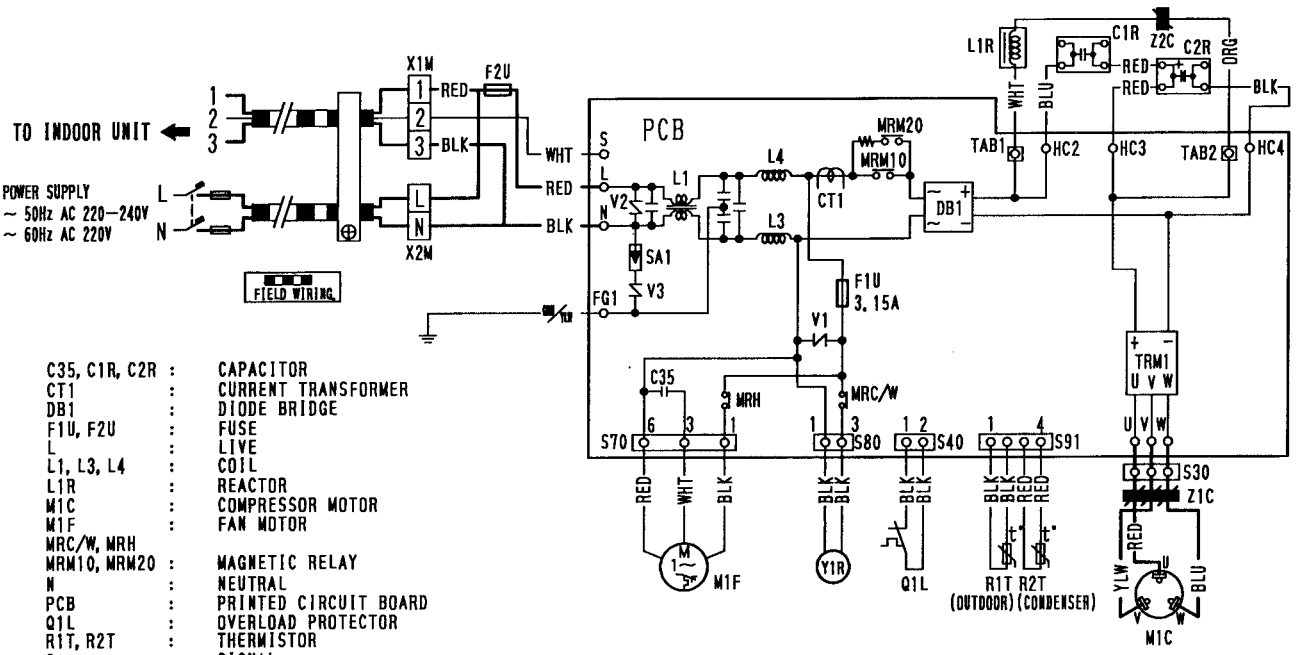


⏚	:	保护接地	PROTECTIVE EARTH				
C35, C1R, C2R	:	电容器	CAPACITOR				
CT1	:	电流互感器	CURRENT TRANSFORMER				
DB1	:	二极管电桥	DIODE BRIDGE				
F1U, F2U	:	保险丝	FUSE				
L	:	带电	LIVE				
L1, L3, L4	:	线圈	COIL				
L1R	:	共模线圈	REACTOR				
M1C	:	压缩机用电动机	COMPRESSOR MOTOR				
M1F	:	风扇用电动机	FAN MOTOR				
MRC/W, MRH							
MRM10, MRM20	:	电磁继电器	MAGNETIC RELAY				
N	:	不带电	NEUTRAL				
PCB	:	印刷电路板	PRINTED CIRCUIT BOARD				
Q1L	:	超负荷继电器	OVERLOAD PROTECTOR				
R1T, R2T	:	热敏电阻	THERMISTOR				
S	:	信号	SIGNAL				
S30~S91	:	连接器	CONNECTOR				
SA1	:	电涌放电器	SURGE ARRESTER				
TAB1, TAB2	:	连接器	CONNECTOR				
TRM1	:	晶体管模块	TRANSISTOR MODULE				

V1, V2, V3	:	变阻器	VARISTOR		
X1M, X2M	:	接线板	TERMINAL STRIP		
Y1R	:	换向电磁阀	REVERSING SOLENOIDE VALVE COIL		
Z1C, Z2C					
Z3C, Z4C, Z5C	:	铁氧体磁芯	FERRITE CORE		

3D012352A

RX25/35HVET



C35, C1R, C2R	:	CAPACITOR			
CT1	:	CURRENT TRANSFORMER			
DB1	:	DIODE BRIDGE			
F1U, F2U	:	FUSE			
L	:	LIVE			
L1, L3, L4	:	COIL			
L1R	:	REACTOR			
M1C	:	COMPRESSOR MOTOR			
M1F	:	FAN MOTOR			
MRC/W, MRH					
MRM10, MRM20	:	MAGNETIC RELAY			
N	:	NEUTRAL			
PCB	:	PRINTED CIRCUIT BOARD			
Q1L	:	OVERLOAD PROTECTOR			
R1T, R2T	:	THERMISTOR			
S	:	SIGNAL			
S30~S91	:	CONNECTOR	V1, V2, V3	:	VARISTOR
SA1	:	SURGE ARRESTER	X1M, X2M	:	TERMINAL STRIP
TAB1, TAB2	:	CONNECTOR	Y1R	:	REVERSING SOLENOIDE VALVE COIL
TRM1	:	TRANSISTOR MODULE	Z1C, Z2C	:	FERRITE CORE

3D012353A