

SERVICE MANUAL

18KMH12W  
18KMH12X

**SANYO**

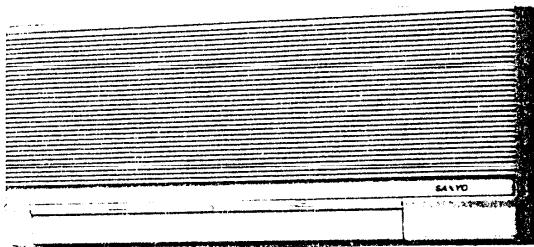
---

## MULTI-SPLIT AIR CONDITIONER

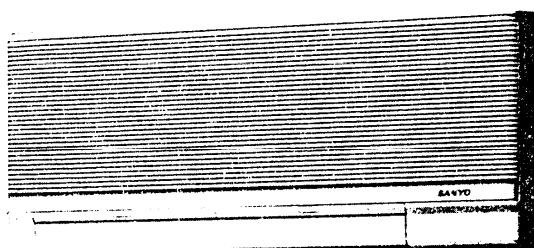
Jul. 1989

Indoor Unit

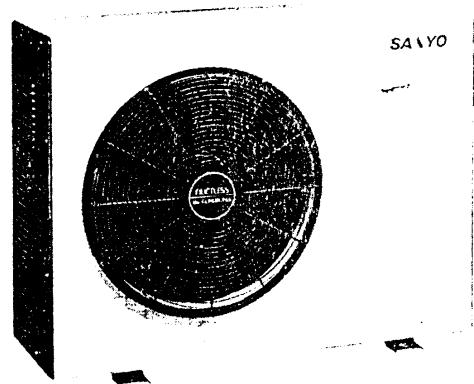
Outdoor Unit



KMH0912W or  
KMH0912X



KMH0912W or  
KMH0912X



CMH1812

## Table of Contents

	Page
1. SPECIFICATIONS .....	1
1) Unit Specifications .....	1
2) Major Component Specifications .....	2
3) Other Component Specifications .....	3
2. OPERATING RANGE .....	5
3. CONSTRUCTION OF THE UNIT .....	6
4. DIMENSIONAL DATA .....	7
5. CAPACITY .....	8
1) COOLING CAPACITY .....	8
2) HEATING CAPACITY .....	10
6. OPERATING INSTRUCTIONS .....	12
Controls and Indicators .....	12
Operation Thumbnails .....	13
Operation .....	14
1) Cooling .....	14
A. Manual Cooling .....	14
B. Energy Saving Modes .....	15
B1. Energy Saver mode in cooling .....	15
B2. Night Setback mode in cooling .....	15
2) Adjusting the Fan Speed .....	16
A. Automatic .....	16
B. Manual .....	16
3) Fan Only .....	17
4) Using the Timer .....	17
A. TIMER OFF Mode .....	17
B. TIMER ON Mode .....	17
5) Heating .....	18
A. Manual Heating .....	18
B. Energy Saving Modes .....	19
B1. Energy Saver mode in heating .....	19
B2. Night Setback mode in heating .....	19
6) Adjusting the Air Flow Direction .....	20
A. Horizontal .....	20
B. Vertical .....	20
Care and Cleaning .....	21
7. FUNCTION .....	22
1) Temperature control .....	22
2) Energy Saver Mode Timing Chart .....	24
3) Night Setback Mode Timing Chart .....	25
4) Freeze Prevention (Cooling) .....	26
5) Overload Prevention (Heating) .....	27
6) Cold Draft Prevention (Heating) .....	28
7) Defrosting Mode (Heating) .....	29

8. INSTALLATION INSTRUCTIONS .....	31
1) Installation Site Selection .....	31
2) Connecting Pipes between Indoor and Outdoor Units .....	33
3) Insulation of Refrigerant Piping .....	33
4) Wiring Instructions .....	34
5) Air Purging .....	35
6) Test Run .....	37
9. REFRIGERANT FLOW DIAGRAM .....	38
10. ELECTRICAL DATA .....	39
●Schematic Diagram .....	39
●Electrical Wiring Diagram .....	40
●Electrical Characteristics .....	41
●P.C.B. Ass'y (Printed Pattern) .....	42
11. TROUBLESHOOTING .....	44
12. CHECKING AND REPLACING ELECTRICAL COMPONENTS .....	60
13. DISASSEMBLY PROCEDURES .....	68
14. PARTS LIST .....	73

# 1. SPECIFICATIONS

## 1) Unit Specifications

Model No.		18KMH12W / 18KMH12X						
Unit Model No. Indoor unit - Outdoor unit		KMH0912W / KMH0912X - CMH1812						
Indoor Unit No.		1 - Unit		2 - Units				
PERFORMANCE		Cooling	Heating	Cooling	Heating			
Capacity	BTU/hr.	8,500/8,300	9,700/9,500	16,800/16,600	19,200/18,900			
Air circulation (High)	cu. ft. / min.	220 / 210		440 / 420				
Moisture removal (High)	Pints/hr.	2.2 / 2.1		4.4 / 4.2				
ELECTRICAL RATING								
Frequency	Hz	60						
Phase		Single						
Voltage rating	V	230 / 208						
Available voltage range	V	187 ~ 253						
Running amperes	A	4.4 / 4.5	4.4 / 4.5	8.8 / 9.0	8.5 / 8.5			
Power input	W	960 / 900	960 / 900	1,900 / 1,820	1,800 / 1,700			
Power factor	%	95 / 96	95 / 96	94 / 97	92 / 96			
S.E.E.R.	BTU/Whr. (COP)	9.0 / 9.2	(2.95/3.10)	9.0 / 9.2	(3.10/3.25)			
Heat element	kW - HSPF	1.0 / 0.82	- 6.6 / 6.6	2.0 / 1.64	- 6.6 / 6.6			
FEATURES								
Controls		Microcomputer						
Control switch		Remote control						
Temperature control		IC Thermostat						
Timer		ON/OFF , 12-hours						
Fan speeds	Indoor fan / Outdoor fan	3 / 1						
Air deflection	Horizontal / Vertical	Manual / Manual						
Air filter		Washable, easy access						
Compressor		Rotary						
Refrigerant (R-22) amount	lbs. (g)	{ 2.54(1,150) + 0.088(40)(for quick air purge) } × 2						
Refrigerant control		Capillary tube						
Operation sound	In-Hi/Med/Lo	dB-A	40 / 35 / 30					
	Out-Hi	dB-A	54					
Refrigerant piping connections		Flare type						
Max. allowable piping length	ft. (m)	33 (10) (Refer to Page 31)						
Max. elevation difference between two units	ft. (m)	16 (5) (Refer to Page 31)						
Refrigerant pipe diameter o.d.	Narrow pipe	in. (mm)	1/4 (6.35) 2-Sets					
	Wide pipe	in. (mm)	3/8 (9.52) 2-Sets					
Refrigerant piping kit		Optional						
Accessories		Hanging wall bracket						
DIMENSIONS & WEIGHT		Indoor unit		Outdoor unit				
Height	in. (mm)	13-19/32 (345)		24-13/16 (630)				
Width	in. (mm)	31-1/2 (800)		32-11/16 (830)				
Depth	in. (mm)	7-3/32 (180)		12-13/32 (315)				
Net weight	lbs. (kg)	24 (11)		134 (60.8)				
Shipping volume	cu. ft. (cu. m)	3.3 (0.093)		10.34 (0.96)				
Shipping weight (Approx.)	lbs. (kg)	29 (13)		140.8 (63.9)				

DATA SUBJECT TO CHANGE WITHOUT NOTICE.

Remarks: Rated conditions : Cooling, Outdoor unit entering air temperature 95°F D.B. / 75°F W.B.  
 Indoor unit entering air temperature 80°F D.B. / 67°F W.B.  
 Heating, Outdoor unit entering air temperature 47°F D.B. / 43°F W.B.  
 Indoor unit entering air temperature 70°F D.B.

2) Major Component Specifications

Unit Model No.	KMH0912W / KMH0912X	
Controller P.C.B.	POW-KMH0912	
Control circuit fuse	250V - 3A	
Remote control unit	RCS-KMH2412W / RCS-KMH2412X	
Electric heater	AH-KH0912	
Heater element	230V 1kW	

Unit Model No.	CMH1812	
Defrost controller	POW-186CMH	
Compressor	Hermetic Rotary Type	
Compressor model No.	C-R70H6V × 2	
Source	230/208V, 60Hz, Single phase	
Pole	2	
Nominal output	W(H.P.)	700 (1) × 2
Compressor oil	cc	500 × 2 (Special oil for Rotary Compressor)
Coil resistance (Ambient temp. 77°F)	Ω	C - R : 2.51 C - S : 5.58
Protective Devices, Compressor	Internal line type	External line type
Overload relay model	-	MRA98735-9201 × 2
Operating temp.	Open °F	-
	Close °F	311 ± 9
		156 ± 20
Operating amperes (Ambient temp. 77°F)	-	Trip in 6~16 sec. at 24.0 A
Run capacitor	μF	17.5 × 2
	VAC	370
Crankcase heater	V - W	-

Unit Model No.	KMH0912W / KMH0912X		CMH1812
Fan	Cross-flow		Propeller
Number....dia. (length) mm	1....φ 90, (L626)		1....φ 400
Fan motor model	SV4T-11D6P		SG6S-51CSP
Source	230/208V, 60Hz, Single phase		
No. of pole....rpm. (230/208V)	4....1,518/1,455(Hi)		6....1,000/953
Nominal output	W	10	50
Coil resistance (Ambient temp. 68°F)	Ω	WHT - GRY : 464.8 WHT - VLT : 209.8 VLT - YEL : 93.4 YEL - PNK : 539.6	WHT - BRN : 85.9 WHT - YEL : 73.7 YEL - PNK : 59.6
Safety Devices			
Fan motor, internal type	Open °F	266 ± 18	266 ± 18
Operating temp.	Close °F	174 ± 27	174 ± 27
Run capacitor	μF	0.6	2
	VAC	440	440

DATA SUBJECT TO CHANGE WITHOUT NOTICE.

3) Other Component Specifications

Relay (Heater relay)		G4E-2123T-US
Coil rated		DC 24V
Coil resistance	$\Omega$ (at 68 °F)	533 ± 15%
Contact rated (2a)		AC 240V : 15A
Unit Model No.		KMH0912W/X
Relay (Power relay)		DFU24D1-F(M)
Coil rated		DC 24V
Coil resistance	$\Omega$ (at 68 °F)	650 ± 10%
Contact rated (1a)		AC250V, { FLA 20A LRA 60A 20A 265VAC, 275VAC 2 HP 240VAC, 265VAC
Unit Model No.		CMH1812
Thermistor (PTC)		TDK 101YV
Rated max. voltage		AC 400V
max. ampere		11.5A
Resistance	$\Omega$ (at 77 °F)	100 ± 25%
Unit Model No.		CMH1812
Thermister (Indoor coil temp. sensor)		PTC-51H-S3
Resistance	kΩ	32°F 185.5 ± 5%      86°F 45.1 ± 5% 50°F 112.2 ± 5%      104°F 29.7 ± 5% 68°F 70.1 ± 5%      122°F 20.0 ± 5%
Unit Model No.		KMH0912W/X
Thermister (Outdoor coil temp. sensor)		PBC-41E-S15
Resistance	kΩ	14°F 23.7 ± 5%      77°F 5.3 ± 5% 32°F 15.0 ± 5%      86°F 4.4 ± 5% 50°F 9.7 ± 5%      104°F 3.1 ± 5% 68°F 6.5 ± 5%
Unit Model No.		CMH1812
Transformer		ATR-J122U
Rating	Primary	AC 220V 60HZ
	Secondary	19V 0.63A
	Capacity	12VA
Resistance	$\Omega$	Primary (WHT - WHT): 143.5
(Ambient temp. 79 °F)		Secondary (BRN - BRN): 1.2
Thermal Cutoff		259 °F 2A 250V
Unit Model No.		KMH0912W/X

Other Component Specifications

Solenoid Valve (4-way valve)	CHV-01AQ020UA1(Coil) , CHV-01U1(Valve)
Rating Coil resistance $\Omega$ (at 68 °F)	AC 208~240V , 60HZ , 6W
Unit Model No.	CMH1812

Heater Protector

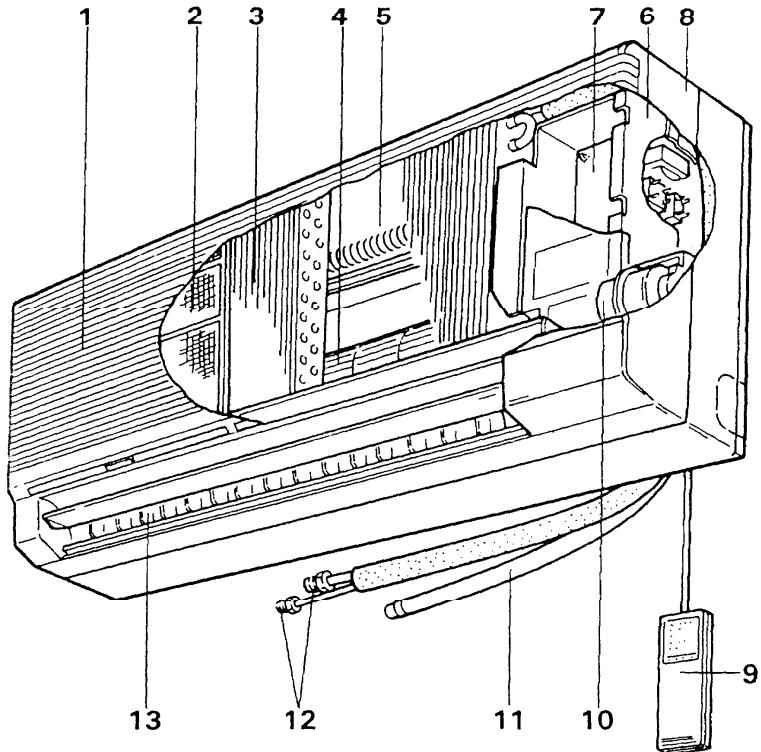
Unit Model No.	Thermostat			Fuse
KMH0912W/X (AH-KH0912)	S334	Rating Operating Temps.	AC 240V , 15A OFF 131 ± 5°F ON 111 ± 9°F	SF169U Cutoff 336 +2, -5°F

## 2. OPERATING RANGE

	Temperature	Indoor air intake	Outdoor air intake
Cooling	Maximum	95°F DB / 71°F WB	115°F DB
	Minimum	67°F DB / 57°F WB	67°F DB
Heating	Maximum	80°F DB / 67°F WB	75°F DB / 65°F WB
	Minimum	- DB / - WB	17°F DB / 15°F WB

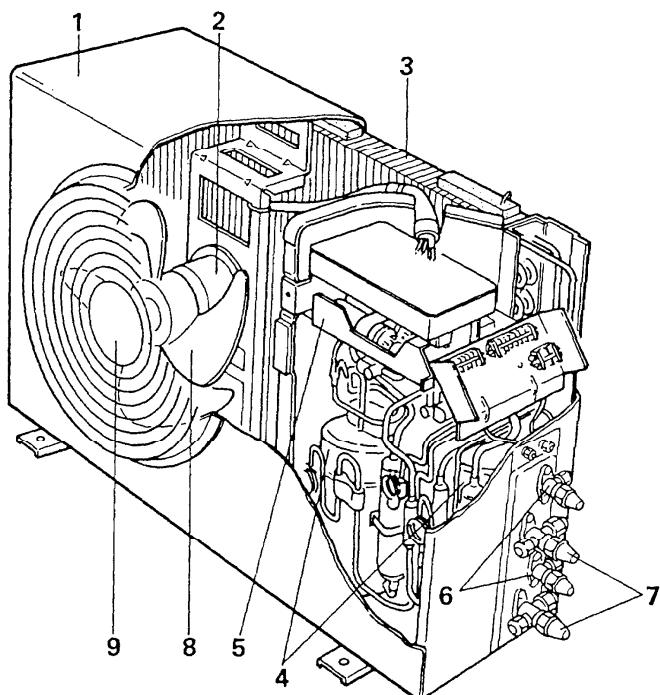
### 3. CONSTRUCTION OF THE UNIT

INDOOR UNIT KMH0912W, KMH0912X



1. Air intake
2. Air filter (slide-out)
3. Evaporator (=Indoor heat exchanger)
4. Indoor fan
5. Heater ass'y
6. Electrical component box
7. PCB ass'y
8. Casing
9. Remote control unit
10. Fan motor
11. Drain hose
12. Refrigerant piping
13. Air outlet

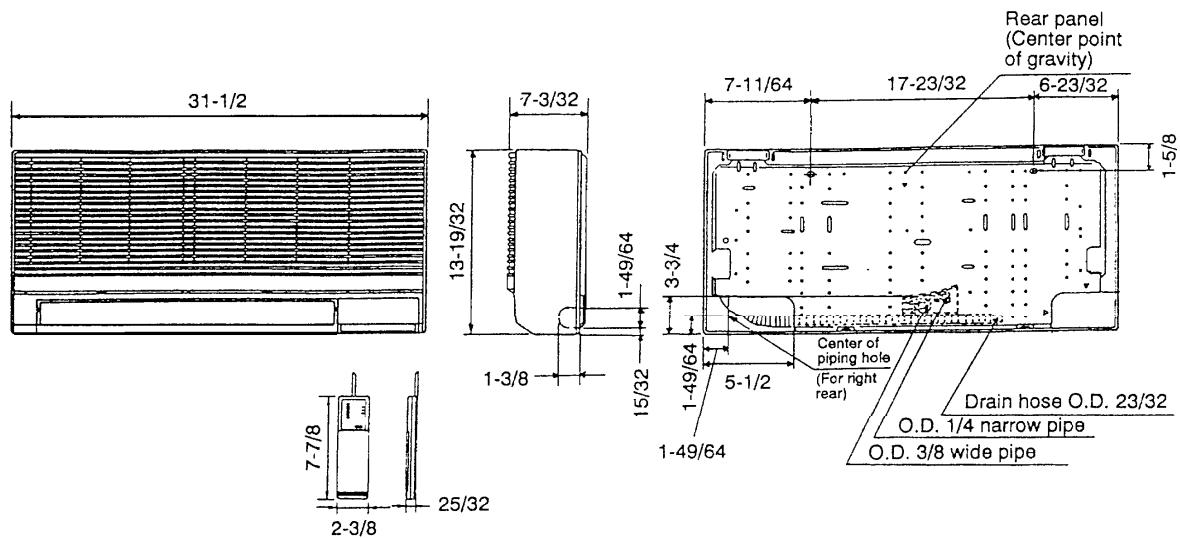
OUTDOOR UNIT CMH1812



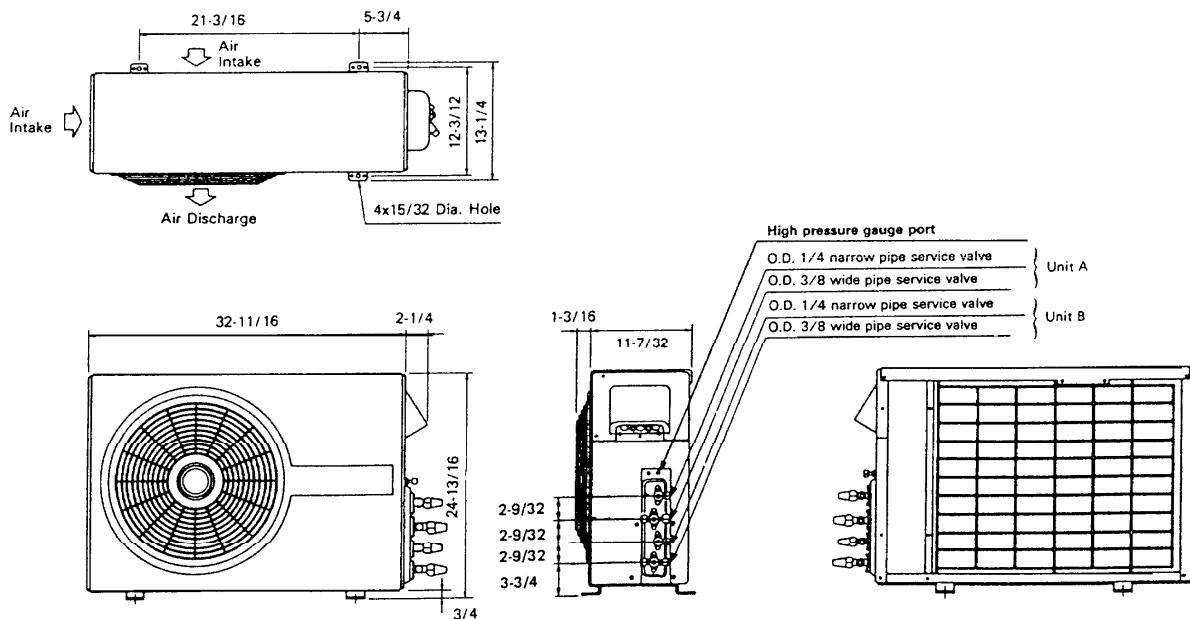
1. Casing
2. Fan motor
3. Condenser (= Outdoor heat exchanger)
4. Compressor
5. Electrical component box
6. Service valve (Narrow pipe)
7. Service valve (Wide pipe)
8. Outdoor fan
9. Fan guard

## 4. DIMENSIONAL DATA

Indoor Unit: KMH0912W, KMH0912X



Outdoor Unit: CMH1812



## 5. CAPACITY

### 1) COOLING CAPACITY

1PHASE 60Hz 230 V

MODEL NAME : 18KMH12W/18KMH12X

		RATED CAPACITY : 8,500 BTU/H		AIR FLOW RATE : 220 CFM					
EVAPORATOR		CONDENSER							
ENTERING TEMP °F(°C)		AMBIENT TEMP °F(°C)							
H.B	D.B		75(23.9)	85(29.4)	95(35)	105(40.6)			
59 (15.0)		TC KW	8,420 0.67	8,030 0.73	7,650 0.80	7,220 0.87			
	72 ( 22.2 )	SHC	6,040	5,840	5,640	5,430			
	76 ( 24.4 )	SHC	6,780	6,580	6,390	6,170			
	80 ( 26.7 )	SHC	7,560	7,360	7,160	6,940			
	84 ( 28.9 )	SHC	8,300	8,030	7,650	7,220			
	88 ( 31.1 )	SHC	8,420	8,030	7,650	7,220			
63 (17.2)		TC KW	8,700 0.68	8,430 0.74	8,100 0.81	7,660 0.88			
	72 ( 22.2 )	SHC	5,100	4,970	4,820	4,610			
	76 ( 24.4 )	SHC	5,840	5,710	5,560	5,350			
	80 ( 26.7 )	SHC	6,620	6,490	6,330	6,130			
	84 ( 28.9 )	SHC	7,360	7,230	7,070	6,870			
	88 ( 31.1 )	SHC	8,100	7,970	7,820	7,610			
67 (19.4)		TC KW	8,940 0.68	8,800 0.75	* 8,500 0.82	8,030 0.89			
	72 ( 22.2 )	SHC	4,140	4,070	3,940	3,740			
	76 ( 24.4 )	SHC	4,880	4,810	4,690	4,490			
	80 ( 26.7 )	SHC	5,650	5,590	5,460	5,260			
	84 ( 28.9 )	SHC	6,390	6,330	6,200	6,000			
	88 ( 31.1 )	SHC	7,140	7,070	6,940	6,740			
71 (21.?)		TC KW	9,220 0.69	9,070 0.76	8,840 0.83	8,440 0.92			
	72 ( 22.2 )	SHC	3,140	3,080	2,990	2,840			
	76 ( 24.4 )	SHC	3,880	3,820	3,730	3,580			
	80 ( 26.7 )	SHC	4,660	4,600	4,510	4,350			
	84 ( 28.9 )	SHC	5,400	5,340	5,250	5,090			
	88 ( 31.1 )	SHC	6,140	6,080	5,990	5,840			
75 (23.9)		TC KW	9,400 0.71	9,300 0.77	9,100 0.84	8,770 0.94			
	76 ( 24.4 )	SHC	2,890	2,850	2,780	2,670			
	80 ( 26.7 )	SHC	3,670	3,630	3,560	3,450			
	84 ( 28.9 )	SHC	4,410	4,370	4,300	4,190			
	88 ( 31.1 )	SHC	5,150	5,110	5,040	4,930			
						4,810			

TC:Total Cooling Capacity (BTU/H)

SHC:Sensible Heat Capacity (BTU/H)

KW:Compressor Input (KW)

Rating conditions(\*MARK) are

:Outdoor Ambient Temp. 95°F D.B.

:Indoor Unit Entering Air Temp. 80°F D.B./67°F H.B.

## COOLING CAPACITY

1PHASE 60Hz 208 V

MODEL NAME : 18KMH12W/18KMH12X

			RATED CAPACITY : 8,300 BTU/H		AIR FLOW RATE : 210 CFM							
EVAPORATOR		CONDENSER										
ENTERING TEMP °F(°C)		AMBIENT TEMP °F(°C)										
W.B	D.B		75(23.9)	85(29.4)	95(35)	105(40.6)	115(46.1)					
59 (15.0)		TC KW	8,220 0.64	7,840 0.69	7,470 0.76	7,050 0.82	6,470 0.90					
	72 ( 22.2 )	SHC	5,880	5,680	5,490	5,280	5,000					
	76 ( 24.4 )	SHC	6,590	6,400	6,200	5,990	5,710					
	80 ( 26.7 )	SHC	7,340	7,140	6,950	6,740	6,450					
	84 ( 28.9 )	SHC	8,050	7,840	7,470	7,050	6,470					
	88 ( 31.1 )	SHC	8,220	7,840	7,470	7,050	6,470					
63 (17.2)		TC KW	8,500 0.64	8,230 0.70	7,910 0.77	7,480 0.83	6,890 0.92					
	72 ( 22.2 )	SHC	4,980	4,850	4,690	4,490	4,230					
	76 ( 24.4 )	SHC	5,690	5,560	5,410	5,210	4,940					
	80 ( 26.7 )	SHC	6,430	6,310	6,150	5,950	5,680					
	84 ( 28.9 )	SHC	7,150	7,020	6,870	6,670	6,400					
	88 ( 31.1 )	SHC	7,860	7,730	7,580	7,380	6,890					
67 (19.4)		TC KW	8,730 0.65	8,590 0.71	* 8,300 0.78	7,840 0.84	7,300 0.94					
	72 ( 22.2 )	SHC	4,040	3,980	3,850	3,660	3,430					
	76 ( 24.4 )	SHC	4,760	4,690	4,570	4,370	4,150					
	80 ( 26.7 )	SHC	5,500	5,440	5,310	5,120	4,890					
	84 ( 28.9 )	SHC	6,210	6,150	6,030	5,830	5,600					
	88 ( 31.1 )	SHC	6,930	6,860	6,740	6,540	6,320					
71 (21.7)		TC KW	9,010 0.65	8,860 0.72	8,630 0.79	8,240 0.87	7,760 0.96					
	72 ( 22.2 )	SHC	3,080	3,020	2,940	2,780	2,600					
	76 ( 24.4 )	SHC	3,800	3,740	3,650	3,500	3,310					
	80 ( 26.7 )	SHC	4,540	4,480	4,390	4,240	4,060					
	84 ( 28.9 )	SHC	5,250	5,190	5,110	4,960	4,770					
	88 ( 31.1 )	SHC	5,970	5,910	5,820	5,670	5,480					
75 (23.9)		TC KW	9,180 0.67	9,080 0.73	8,880 0.80	8,570 0.89	8,220 0.98					
	76 ( 24.4 )	SHC	2,840	2,800	2,730	2,620	2,500					
	80 ( 26.7 )	SHC	3,580	3,550	3,480	3,370	3,250					
	84 ( 28.9 )	SHC	4,300	4,260	4,190	4,080	3,960					
	88 ( 31.1 )	SHC	5,010	4,970	4,900	4,790	4,670					

TC:Total Cooling Capacity (BTU/H)

SHC:Sensible Heat Capacity (BTU/H)

KW:Compressor Input (KW)

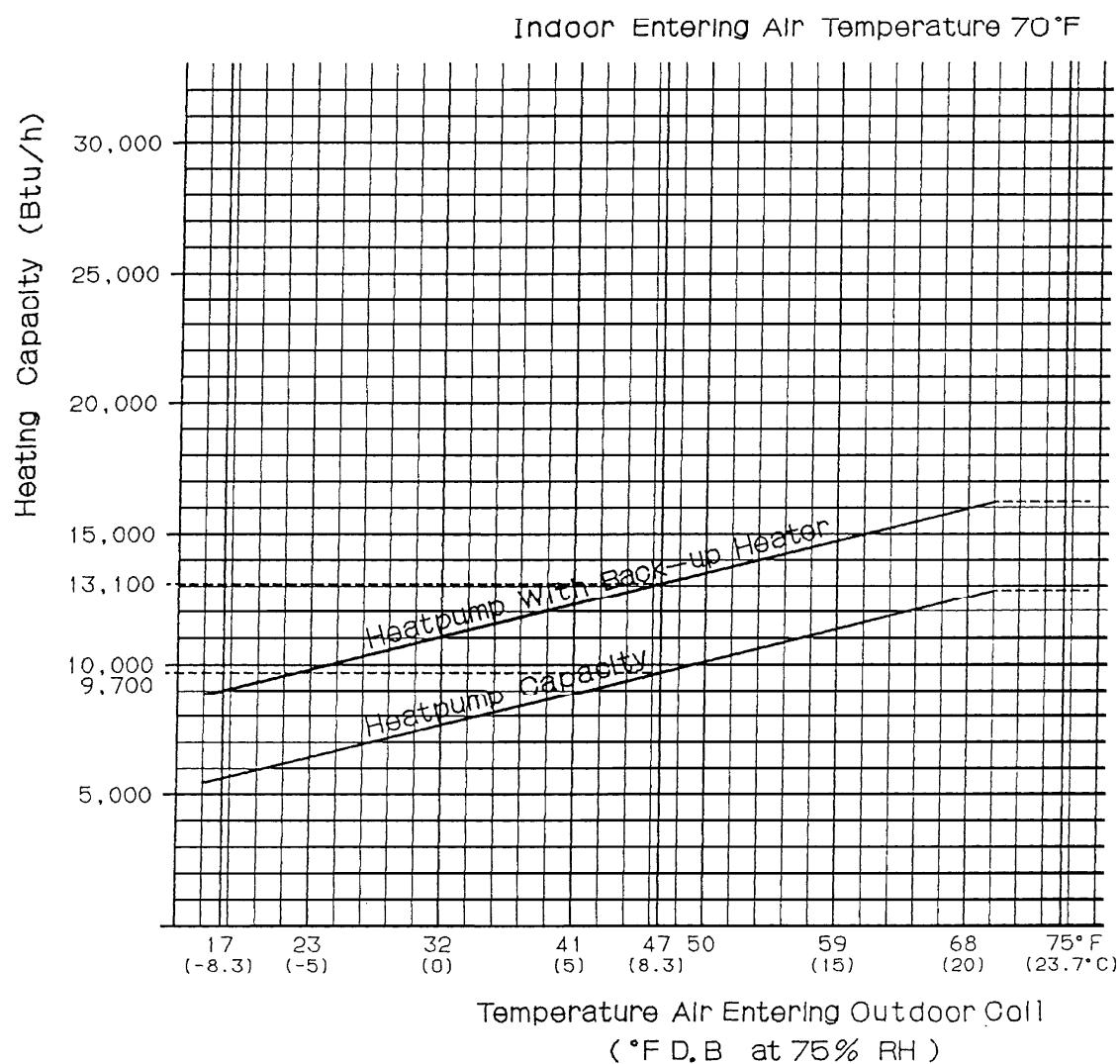
Rating conditions(\*MARK) are

:Outdoor Ambient Temp.95°F D.B.

:Indoor Unit Entering Air Temp.80°F D.B./67°F W.B.

2) HEATING CAPACITY

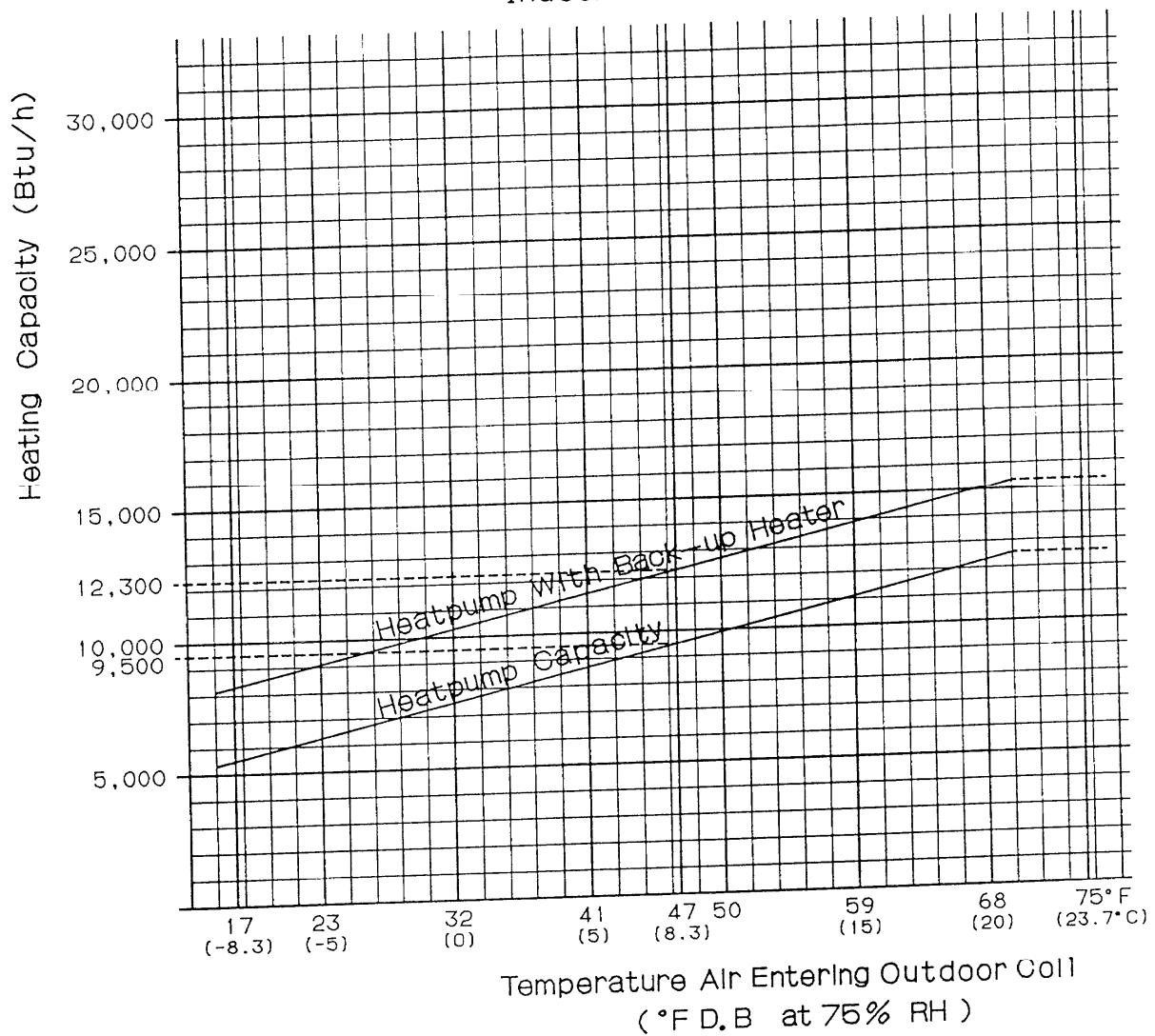
1 Phase 60Hz 230V MODEL NAME: 18KMH12W/18KMH12X



## HEATING CAPACITY

1 Phase 60Hz 208V MODEL NAME: 18KMH12W/18KMH12X

Indoor Entering Air Temperature 70°F



## 6. OPERATING INSTRUCTIONS

### Controls and Indicators

#### A. OPERATION BUTTON

This button is used to turn the heat pump ON/OFF.

#### B1. COOLING OPERATION LAMP

This lamp lights when the "COOL" mode is selected.

#### B2. HEATING OPERATION LAMP

This lamp lights when the "HEAT" mode is selected.

#### C. TIMER LAMP

This lamp lights when the system is operating on the timer.

#### D. SAVING MODE LAMP

This lamp lights when the NIGHT SETBACK or ENERGY SAVER mode is selected.

#### E. ROOM TEMPERATURE INDICATOR LAMPS

These lamps indicate the approximate room temperature at the location of the remote control unit.

#### F. TEMPERATURE SCALE

The numbers constitute the temperature scale (°F).

#### G. MODE SELECTOR

This has three options:

**HEAT:** Used for normal heating operation.

**COOL:** Used for normal cooling operation.

**FAN:** Choose this setting to run the fan only, without the heating or cooling function.

#### H. OPERATION SELECTOR

This has five options:

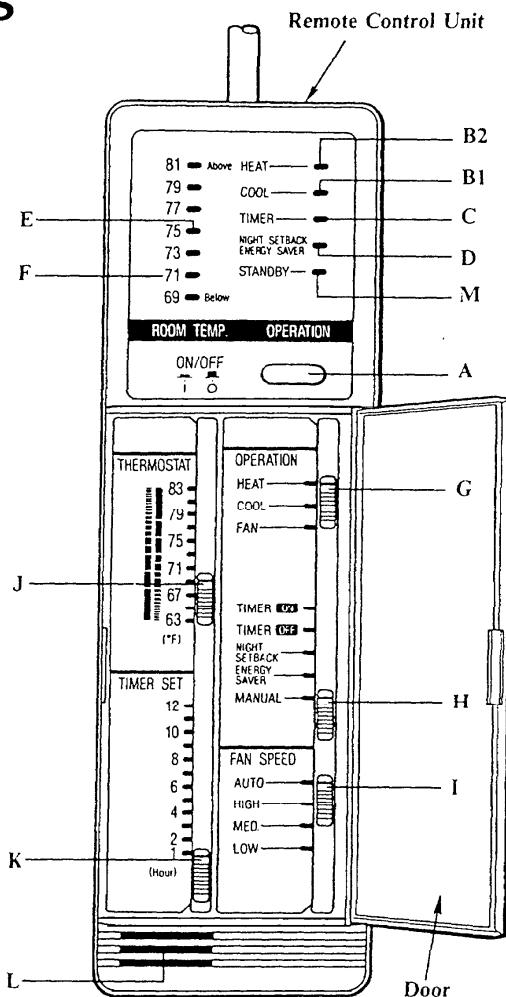
**TIMER ON:** Used to start the system at the set time.

**TIMER OFF:** Used to stop the system at the set time.

**NIGHT SETBACK:** Used for programmed energy saving operation at night.

**ENERGY SAVER:** Used for programmed energy saving operation during the day.

**MANUAL:** Used for conventional temperature control operation using the thermostat.



#### I. FAN SPEED SELECTOR

**AUTO:** In this mode the fan speed is set automatically.

**HIGH** You can manually select the desired fan speed.

**MED.:**

**LOW**

#### J. THERMOSTAT KNOB

You can regulate the room temperature as desired by adjusting this knob.

#### K. TIMER SET KNOB

This control is used to set the time at which you wish the heat pump to go on or off. Each number on the scale shows setting hour.

#### L. SENSOR

The sensor detects any change in the room temperature.

#### M. STANDBY LAMP

This lamp lights at the beginning of heating and when the system is in defrosting.

# Operation Thumbnails

By setting this heat pump once to the desired temperature, it will automatically regulate the room temperature to that value. Thus you can operate the heat pump or stop it by simply pressing the OPERATION ON/OFF button.

First, open the door of the remote control unit to gain access to the control panel. Next, carry out the following steps while referring to the sub-section "Controls and Indicators" on the previous page.

## What you wish to do



- Start the air conditioner and cool the room to the desired temperature

## How to do it



1. Set the "G" knob to COOL.
2. Set the "H" knob to MANUAL.
3. Set the "I" knob to AUTO.
4. Set the "J" knob to the desired temperature.
5. Press the "A" OPERATION ON/OFF button.

- To stop the air conditioner immediately while it is operating

1. Press the "A" OPERATION ON/OFF button.

- To use the TIMER to stop the air conditioner after several hours

1. Set the "K" knob to the number of hours at which you wish to stop the air conditioner.
2. Set the "H" knob to the TIMER OFF position.

- To switch the air conditioner to the ENERGY SAVING mode during manual cooling

1. Set the "H" knob from the MANUAL to the NIGHT SETBACK or ENERGY SAVER position.

- To use the TIMER to start the air conditioner after several hours

1. Set the "K" knob to the number of hours at which you wish to start the air conditioner.
2. Set the "H" knob to the TIMER ON position.
3. Press the "A" OPERATION ON/OFF button.

- To circulate the air in the room without cooling it (fan only operation)

1. Set the "G" knob to FAN.
2. Press the "A" OPERATION ON/OFF button.

## What will happen



The "B" and "E" lamps will light, then after a few minutes the air conditioner will start cooling operation.

The air conditioner will stop immediately, and all indicator lamps will go out.

The "C" lamp will light and after the set hours have elapsed the air conditioner will stop automatically.

The "D" lamp will light, the set temperature will automatically change, and the air conditioner will continue to operate in the ENERGY SAVING mode.

The "C" lamp will light and after the set hours have elapsed the air conditioner will start to operate automatically.

The air conditioner will operate as a circulation fan without changing the room temperature. In this case, only the "E" ROOM TEMPERATURE INDICATOR LAMP will light.

The above description is intended to provide you with basic knowledge of your heat pump. For details of each function, read the relevant sections.

# Operation

## 1) Cooling

### A. Manual Cooling

The Manual mode is used for normal cooling operation.

- STEP 1: Set the "G" MODE SELECTOR knob to COOL.
- STEP 2: Set the "H" OPERATION SELECTOR knob to MANUAL.
- STEP 3: Set the "I" FAN SPEED as desired.
- STEP 4: Press the "A" OPERATION ON/OFF button.  
*To stop the heat pump, press the OPERATION ON/OFF button again.*

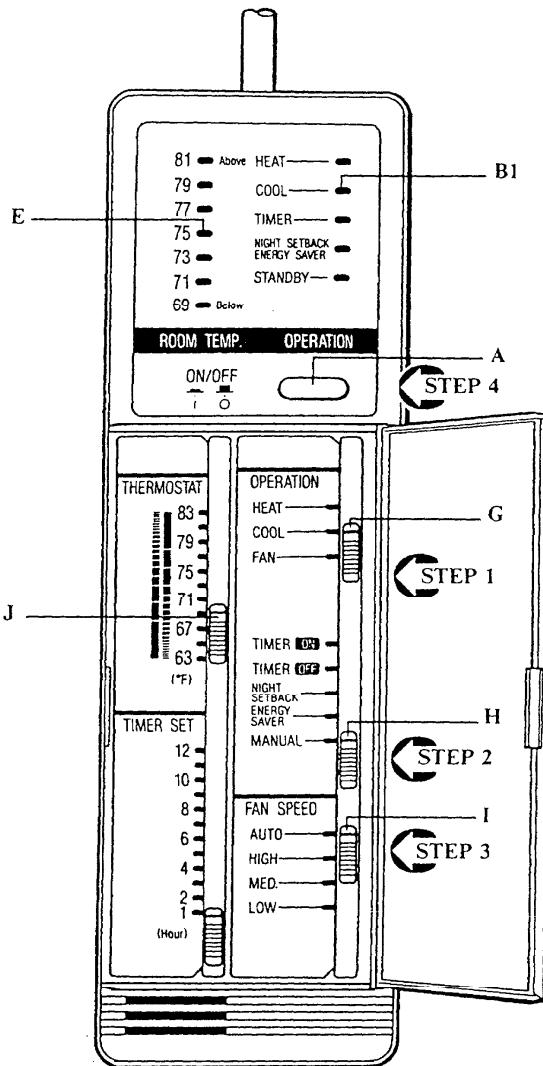
#### NOTE

1. This appliance has a built-in time delay circuit to ensure reliable operation. If the operation button is pressed, the compressor will start running after a few minutes.  
In the event of power failure, the unit will stop. When the power is applied, the unit will re-start automatically after 3 minutes.
2. To prevent the appliance from malfunctioning, do not set the selector knob between the two indicated positions. Make sure that it clicks into position.

#### IMPORTANT

##### Limitation on cooling operation

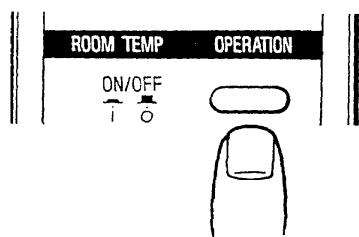
This "Dual-Zone" split system cannot operate with the indoor units in different modes at the same time. In other words, if one zone is in the heating mode, the other zone can also be operated in the heating mode but not in the cooling mode.



## B. Energy Saving Modes

### B.1 Energy saver mode in cooling

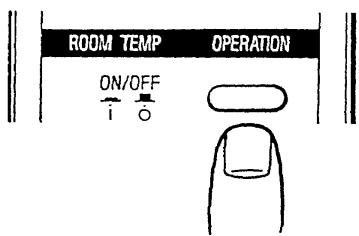
- STEP 1:** Set the "H" OPERATION SELECTOR knob to NIGHT SETBACK before turning the system on.
- STEP 2:** Press the "A" OPERATION ON/OFF button. The NIGHT SETBACK and COOL lamps will light.



To cancel the Night Setback mode, move the selector to MANUAL.

### B.2 Night Setback mode in cooling

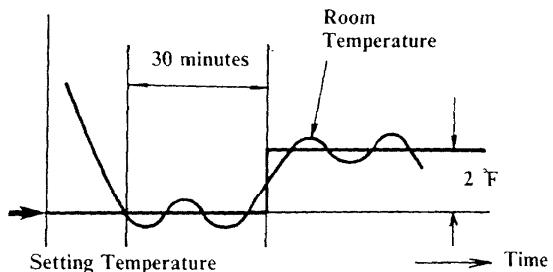
- STEP 1:** Set the "H" OPERATION SELECTOR knob to NIGHT SETBACK before turning the system on.
- STEP 2:** Press the "A" OPERATION ON/OFF button. The NIGHT SETBACK and COOL lamp will light.



To cancel the Night Setback mode, move the selector to MANUAL.

#### ■ What does the Energy Saver mode mean ?

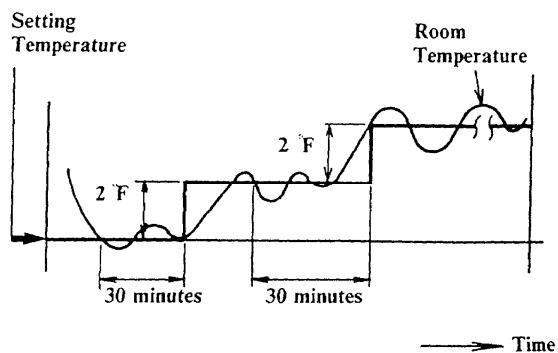
By selecting this mode then pressing the OPERATION ON/OFF button, the heat pump will perform cooling operation until the temperature in the room reaches the set value, then the thermostat will cause the unit to pause. After about 30 minutes, the heat pump will automatically raise the set temperature 2 °F as shown in the diagram below. This enables you to save energy without sacrificing comfort. This function is convenient for when the room is vacant or soft cooling is needed in the daytime.



#### ■ What does the Night Setback mode mean ?

By selecting this mode then pressing the OPERATION ON/OFF button, the heat pump will perform cooling operation until the temperature in the room reaches the set value, then the thermostat will cause the unit to pause.

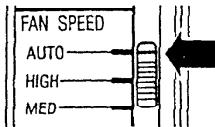
After about 30 minutes, the heat pump will automatically raise the set temperature 2 °F. When the room temperature reaches the newly set value, the thermostat will cause the unit to pause. After about 30 minutes the temperature is again raised by 2 °F as shown below. This enables you to save energy. This function is convenient for when leaving the heat pump on all night or soft cooling is needed.



## 2) Adjusting the Fan Speed

### A. Automatic

Simply set the "I" FAN SPEED selector to the "AUTO" position.



A microcomputer in the heat pump automatically controls the fan speed when the AUTO mode is selected. When the heat pump starts operating, the difference between the room temperature and the set temperature is detected by the microcomputer which then automatically switches the fan speed to the most suitable level.

**Cooling mode:**

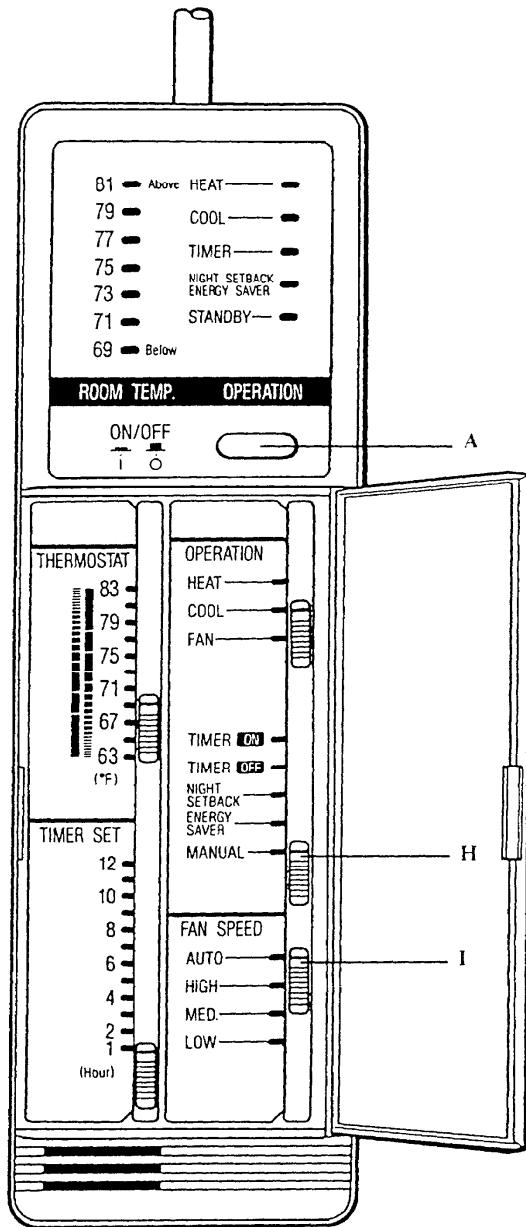
When difference between room temperature and set temperature is	FAN SPEED
Above 4 °F	High
Between 4 and 2 °F	Medium
Below 2 °F	Low

**Heating mode:**

When difference between room temperature and set temperature is	FAN SPEED
2 °F and over	High
Below 2 °F	Medium

### B. Manual

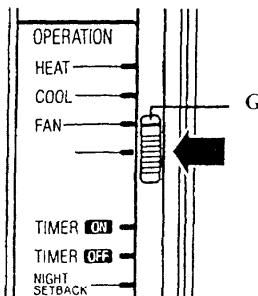
If you want to adjust fan speed manually during cooling, just set the FAN SPEED selector as desired. [HIGH, MED., or LOW]



### 3) Fan Only

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

- STEP: 1** Set the "G" MODE SELECTOR knob to FAN.



- STEP: 2** Press the "A" OPERATION ON/OFF button.

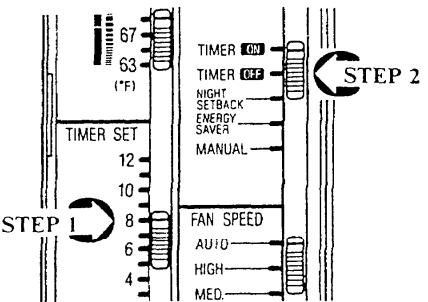
### B. TIMER ON Mode

The system starts at the set time.

- STEP 1:** Set the TIMER SET knob to the desired time.

When the timer is set to 8, for instance, the system starts after eight hours.

- STEP 2:** Set the "H" OPERATION SELECTOR knob to TIMER ON.



- STEP 3:** Press the "A" OPERATION ON/OFF button. The TIMER lamp will light.

#### NOTE

If you set the SELECTOR to the TIMER ON position while the heat pump is operating in the NIGHT SET BACK, ENERGY SAVER or MANUAL mode, the heat pump will stop, then after several minutes it will re start automatically.

### 4) Using the Timer

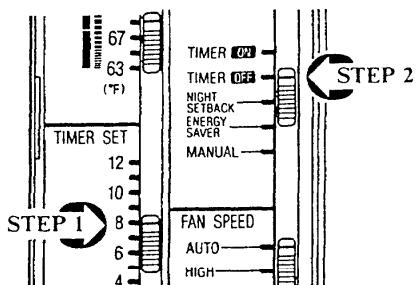
#### A. TIMER OFF Mode

The system stops at the set time.

- STEP 1:** Set the TIMER SET knob to the desired time.

When the timer is set to 8, for instance, the system stops after eight hours.

- STEP 2:** Set the "H" OPERATION SELECTOR knob to TIMER OFF.



The TIMER lamp will light.

#### Power failure during timer operation

If power failure occurs, the time counted up to that point will become void. After the power is applied, the timer newly starts counting at the set time.

## 5) Heating

### A. Manual Heating

The Manual mode is used for normal heating operation.

- STEP 1:** Set the "G" MODE SELECTOR knob to HEAT.
- STEP 2:** Set the "H" OPERATION SELECTOR knob to MANUAL.
- STEP 3:** Set the "I" FAN SPEED as desired.
- STEP 4:** Press the "A" OPERATION ON/OFF button.  
*To stop the heat pump, press the OPERATION ON/OFF button again.*

#### NOTE

1. This appliance has a built-in time delay circuit to ensure reliable operation. If the operation button is pressed, the compressor will start running after a few minutes.  
In the event of power failure, the unit will stop. When the power is applied, the unit will re-start automatically after 3 minutes.
2. To prevent the appliance from malfunctioning, do not set the selector knob between the two indicated positions. Make sure that it clicks into position.
3. In order to protect the appliance from an overload, the fan sometimes continues to rotate for about 30 seconds after the OPERATION ON/OFF button is pressed OFF.

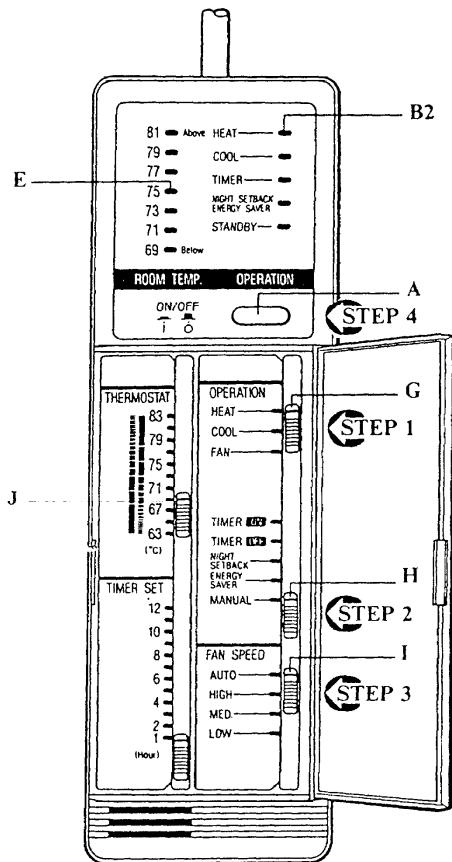
### Special remarks on heating

#### Heating performance

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

#### Defrosting

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



### IMPORTANT

#### Limitation on cooling operation

This "Dual-Zone" split system cannot operate with the indoor units in different modes at the same time. In other words, if one zone is in the heating mode, the other zone can also be operated in the heating mode but not in the cooling mode.

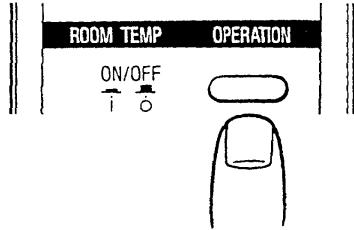
#### STANDBY LAMP

- For several minutes after the start of heating operation, the indoor fan will not start running until the indoor heat exchanger coil has warmed up sufficiently. This is because the COLD DRAFT PREVENTION SYSTEM is operating. During this period, the STANDBY LAMP remains lit.
- The STANDBY lamp also remains lit during defrosting or when the compressor has been turned off by the thermostat when the system is in the heating mode.
- Upon completion of defrosting and when the compressor is turned on again, for heating operation, the STANDBY LAMP will go off automatically.

## B. Energy Saving Modes

### B.1 Energy saver mode in heating

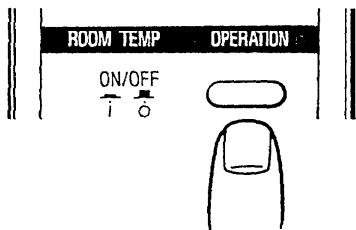
- STEP 1: Set the "H" OPERATION SELECTOR knob to ENERGY SAVER before turning the system on.
- STEP 2: Press the "A" OPERATION ON/OFF button. The ENERGY SAVER and HEAT lamps will light.



To cancel the Energy Saver mode, move the selector to MANUAL.

### B.2 Night Setback mode in heating

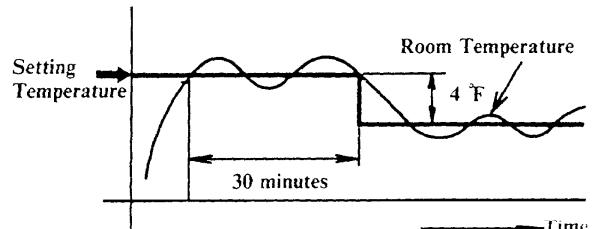
- STEP 1: Set the "H" OPERATION SELECTOR knob to NIGHT SETBACK before turning the system on.
- STEP 2: Press the "A" OPERATION ON/OFF button. The NIGHT SETBACK and HEAT lamps will light.



To cancel the Night Setback mode, move the selector to MANUAL.

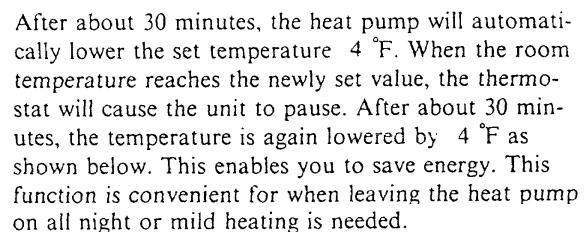
#### ■ What does the Energy Saver mode mean ?

By selecting this mode then pressing the OPERATION ON/OFF button, the heat pump will perform heating operation until the temperature in the room reaches the set value, then the thermostat will cause the unit to pause. After about half an hour, the heat pump will automatically lower the set temperature 4 °F as shown in the diagram below. This enables you to save energy without sacrificing comfort. This function is convenient for when the room is vacant or mild heating is needed in the daytime.



#### ■ What does the Night Setback mode mean ?

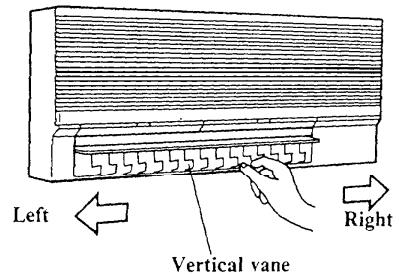
By selecting this mode then pressing the OPERATION ON/OFF button, the heat pump will perform heating operation until the temperature in the room reaches the set value, then the thermostat will cause the unit to pause. After about 30 minutes, the heat pump will automatically lower the set temperature 4 °F. When the room temperature reaches the newly set value, the thermostat will cause the unit to pause. After about 30 minutes, the temperature is again lowered by 4 °F as shown below. This enables you to save energy. This function is convenient for when leaving the heat pump on all night or mild heating is needed.



## 6) Adjusting the Air Flow Direction

### A. Horizontal

The horizontal air flow can be adjusted by moving the vertical vane to the left or right.



### B. Vertical

Hold both ends of the flap and move the flap up and down to adjust the vertical air flow.

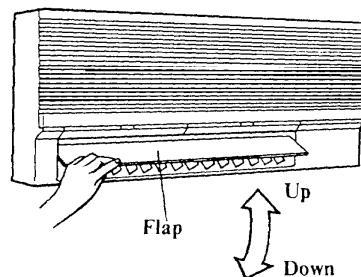
Recommended flap positions:

#### COOLING

- Be sure to set the flap within zone "A".

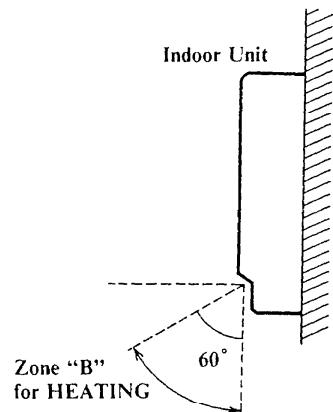
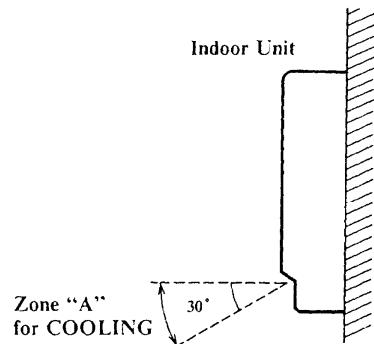
#### NOTE

- If the flap is set within zone "B", condensation may form near the air outlet grille and drip onto the floor.



#### HEATING

- Set the flap within zone "B" for effective heating.



## Care and Cleaning



For safety's sake, be sure to turn the heat pump off and also disconnect it from the power mains before cleaning it.

### Casing and Grille (Indoor Unit)

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

If these parts are stained, use a clean cloth moistened with a mild liquid detergent.

When cleaning the grille, be careful so as not to force the vanes out of place.

### CAUTION

1. Do not pour water on the unit to clean it. This will damage the internal components and cause an electric shock hazard.
2. Never use solvents, or harsh chemicals. Do not wipe the plastic casing using very hot water.

### Outdoor Unit

### CAUTION

1. Certain metal edges and the condenser fins are sharp and may cause injury if handled improperly; special care should be taken when you clean these parts.
2. Periodically check the outdoor unit to see if the air outlet or air intake are clogged with dirt or soot.
3. The internal coil and other components of the outdoor unit must also be cleaned periodically. Consult your dealer or service shop.

### NOTE

#### Service TEST RUN switch (recessed)

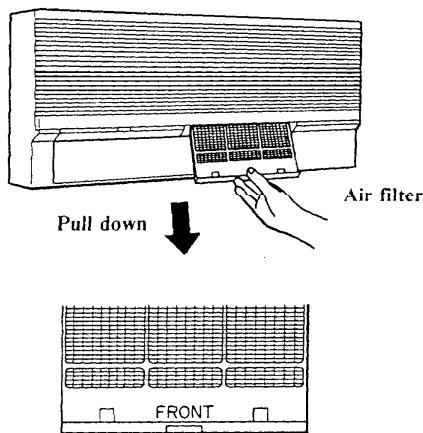
The Service TEST RUN switch is located at the rear bottom of the remote control unit. It is used for servicing the heat pump. Do not touch it, therefore. During normal operation, this switch must be set in the RUN position. If the heat pump is used with the switch in the TEST RUN position, it will not operate normally.

### Air Filter

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

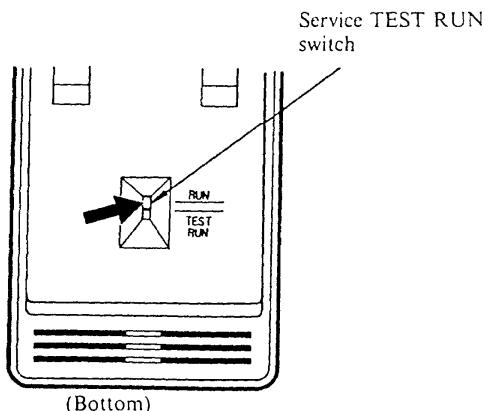
### How to remove the filter

1. Place the flap on the air outlet grille in the bottom-most position.
2. Grasp the air filter by the tab at the bottom, and pull downward.



Use a vacuum cleaner to remove light dust. If there is sticky dust on the filter, wash the filter in lukewarm, soapy water, rinse it in clean water, and dry it.

When replacing the filter, check that the FRONT mark is facing you.



Remote control unit viewed from the rear

## 7. FUNCTION

### 1) Temperature Control

#### ■ Cooling

- Temperature control is obtained by cycling the compressor ON and OFF under control of the room temperature sensor in the remote control unit.
- The compressor turn to OFF below the setting temperature (Thermo OFF), and turn to ON above 1°F from setting temperature (Thermo ON).

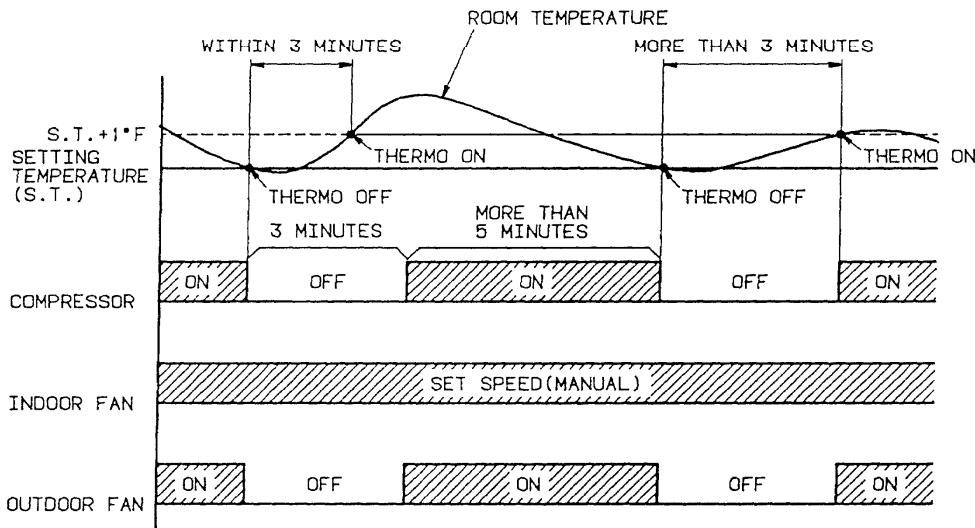


Fig. 1

- In order to keep the compressor from stalling out when trying to start against the hight side refrigerant pressure, the control circuit has a built-in automatic time delay to allow the internal pressure to equalize. The control circuit will not try to start the compressor unit it has been off for (3) minutes.
- The compressor keep to turn forced for five (5) minutes, but the operation button is set to OFF, the compressor stop to turn.
- The compressor is not controlled by thermostat while the compressor run within five (5) minutes, or stop to run within three (3) minutes.
- \* The outdoor fan interlock to turn with either or both compressors.
- If the other indoor unit (for example indoor unit B) is set to the heating mode, this split system (indoor unit A, compressor A and etc. A) can not operate for the cooling.  
At this time compressor A stop to turn, but the cooling operation lamp lights and the indoor fan is turning.

## ■ Heating

- Temperature control is obtained by cycling the compressor ON and OFF under control of the room temperature sensor in the remote control unit.
- The compressor turn to OFF above the setting temperature (Thermo OFF), and turn to ON below 1°F from the setting temperature (Thermo ON).

The compressor start to run at Thermo ON and heating operation start, then if the room temperature is down below 3.6°F from the setting temperature, the electric heater will be ON. (When the operation button is set to ON to start heating operation, the electric heater will be ON following the compressor operation.)

- The electric heater is OFF when the operation is Thermo OFF and the compressor stop.

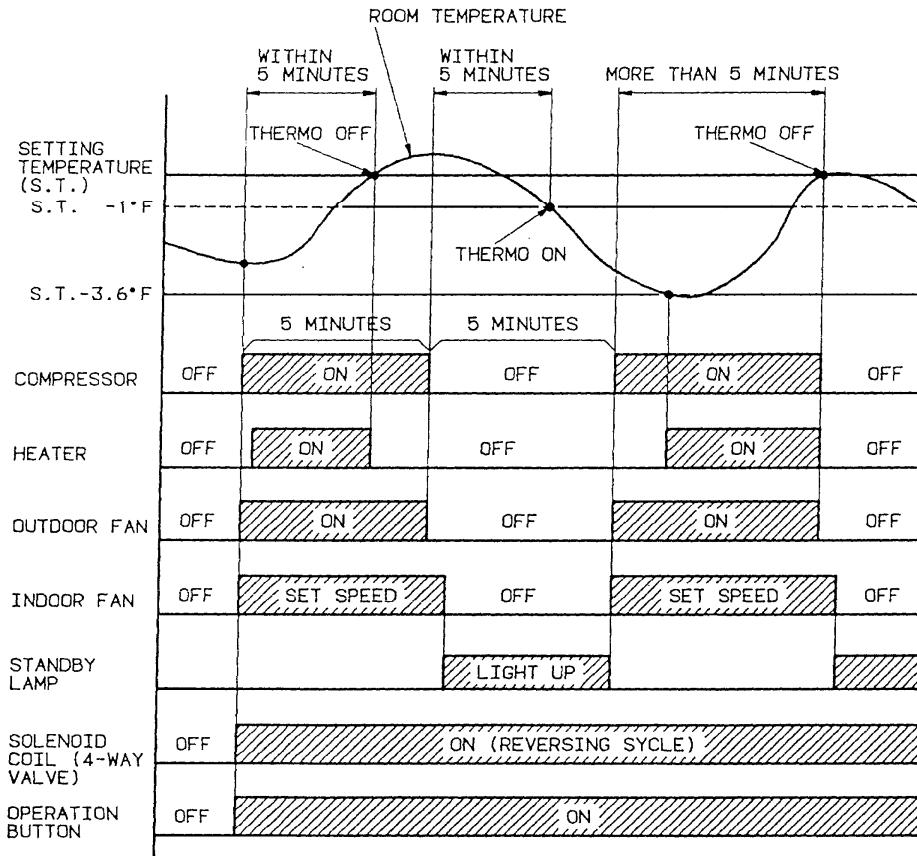


Fig. 2

- In order to keep the compressor from stalling out when trying to start against the hight side refrigerant pressure, the control circuit has a built-in automatic time delay to allow the internal pressure to equalize. The control circuit will not try to start the compressor until it has been off for five (5) minutes.
- The compressor keep to turn forced for five(5) minutes, but the operation button is set to OFF, the compressor stop to turn.
- The compressor is not controlled by thermostat while the compressor run within five (5) minutes or stop to run.

\* The outdoor fan interlock to turn with either or both compressors.  
(Except operations of Overload Prevention and Defrosting.)

## 2) Energy Saver Modes Timing Chart

■ Cooling Refer to page 15.

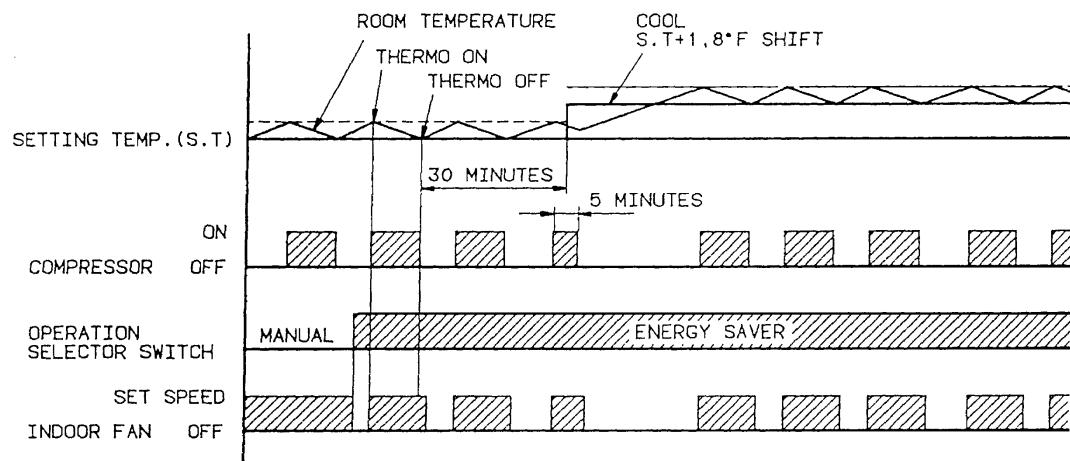


Fig. 3

■ Heating Refer to page 19.

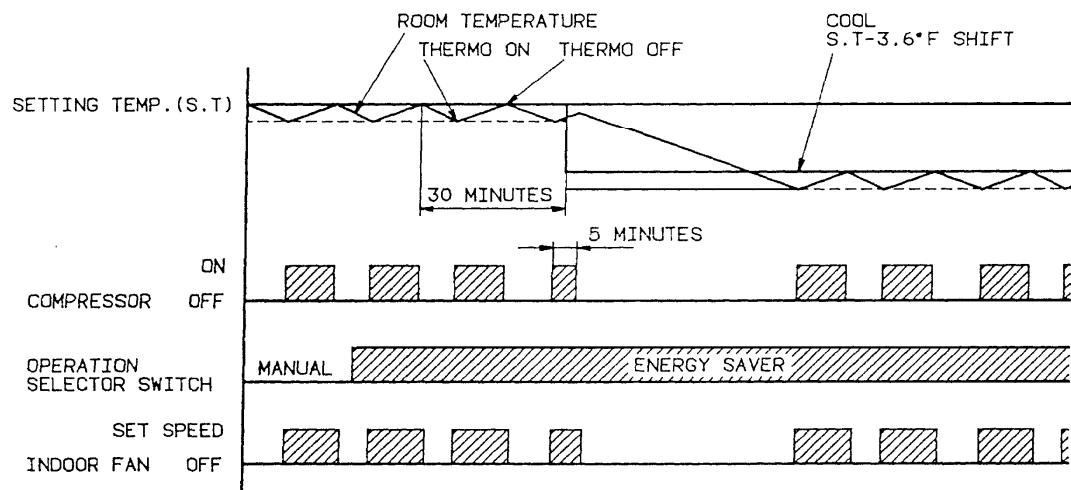


Fig. 4

### 3) Night Setback Modes Timing Chart

■ Cooling Refer to page 15.

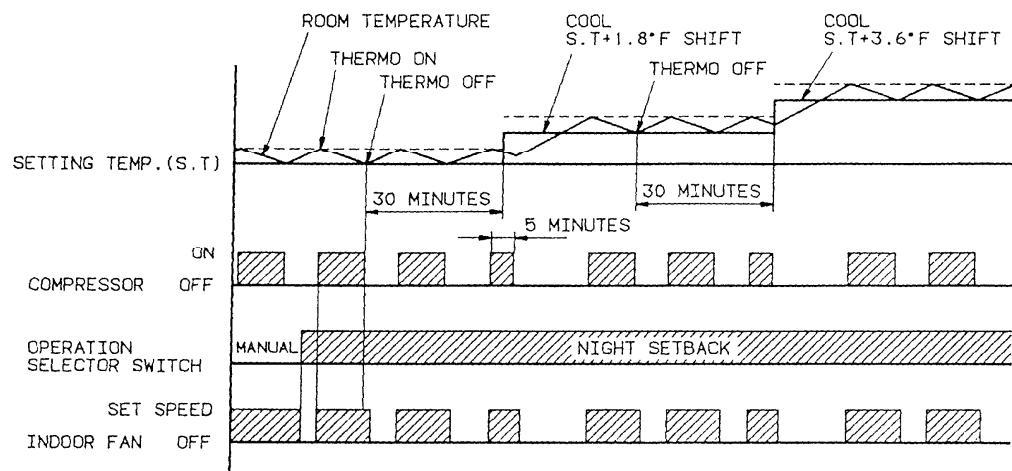


Fig. 5

■ Heating Refer to page 19.

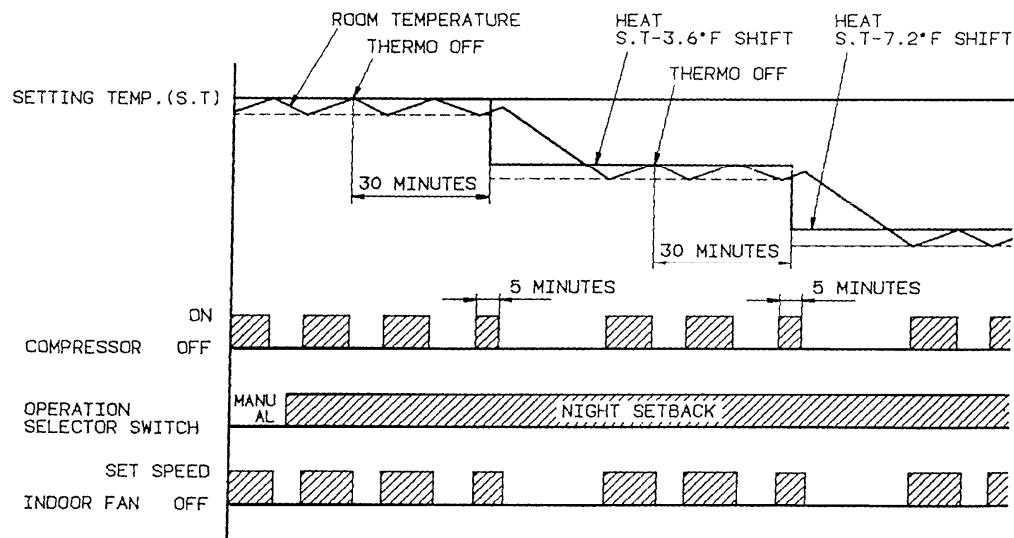


Fig. 6

#### 4) Freeze prevention (Cooling)

If the indoor coil temperature falls below 30°F when the compressor has been turning for 10 minutes or more, the controller signals to stop turning to the compressor and outdoor fan.

The compressor and outdoor fan motor will start to turn after 6 minutes.

- \* But if either of two compressors is turning, the outdoor fan is also turning.

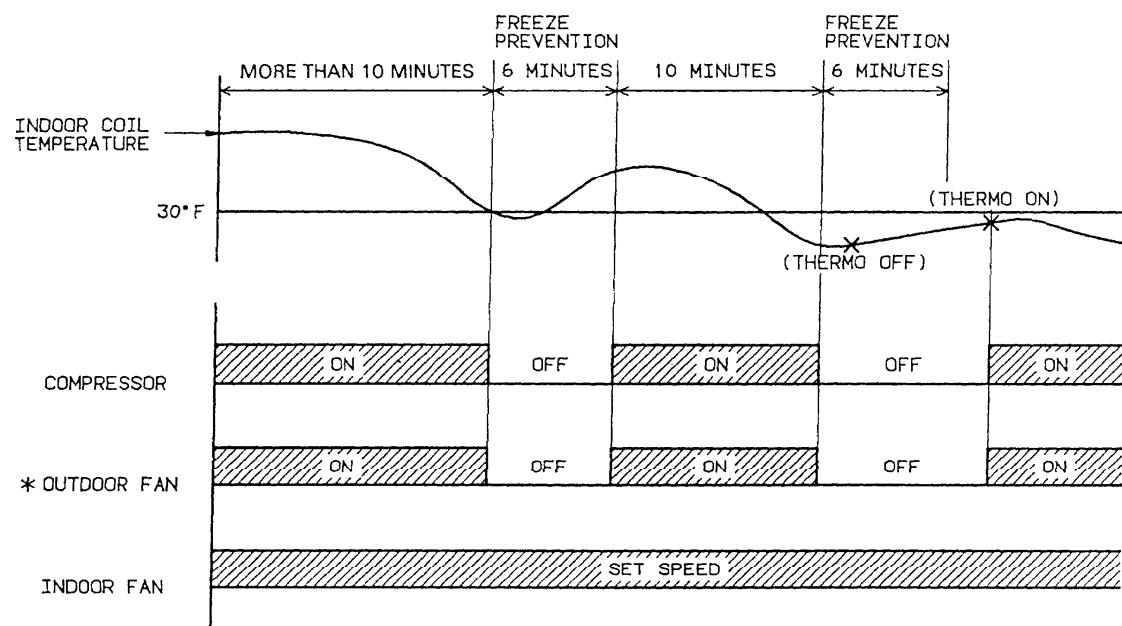


Fig. 7

## 5) Overload Prevention (Heating)

When the indoor coil temperature rises above 129°F, if the set speed of the indoor fan is LOW, the fan speed changes to MED. When the temperature reaches to 133°F, the outdoor fan stop to turn. When the temperature falls below 118°F, the outdoor fan turn to ON. When the temperature falls below 111°F, the indoor fan speed return to LOW from MED.

Thus the system is protected from the overload.

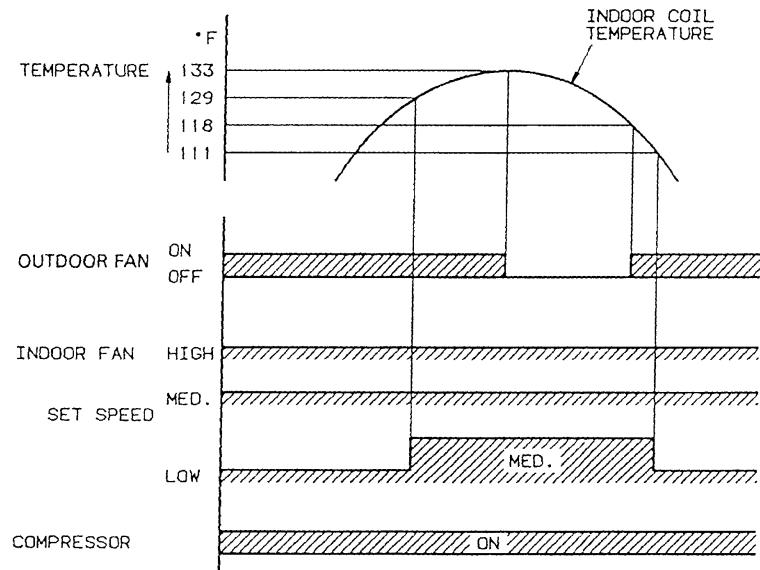


Fig. 8

\* When the coil temperature of either one of indoor units rises above 133°F, the outdoor fan stop to turn.

## 8) Cold Draft Prevention (Heating)

When the standby lamp lights up, the indoor fan stop, and blowout of cool air is prevented. Refer to page 18, 23 and 30.

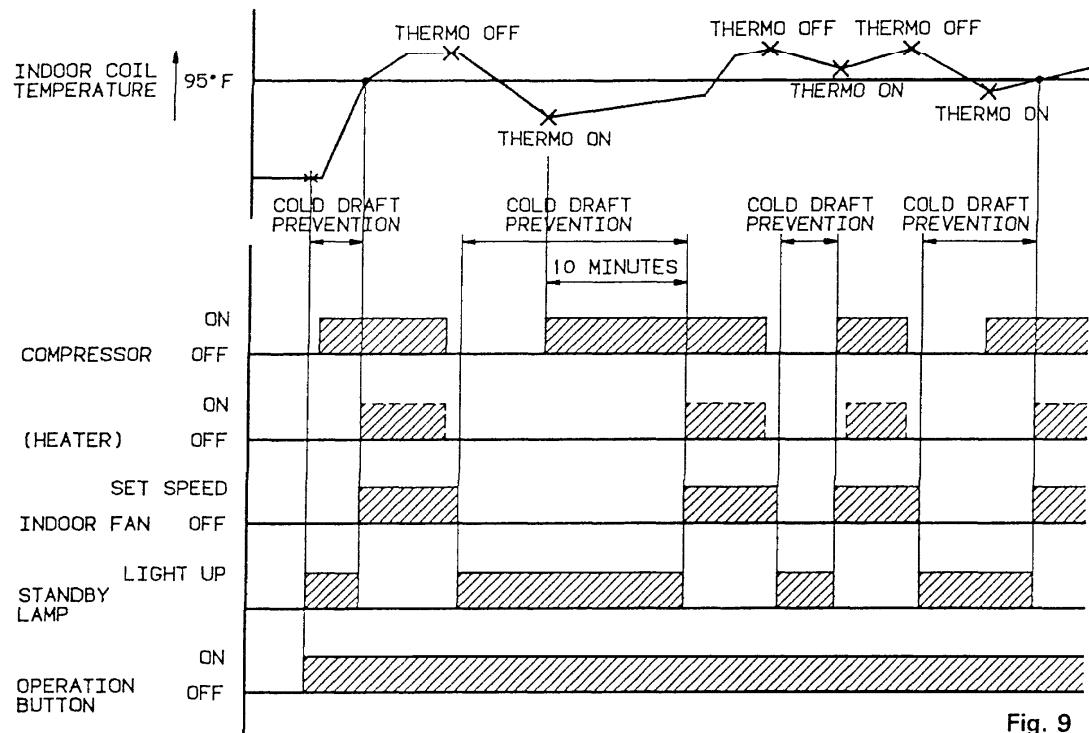
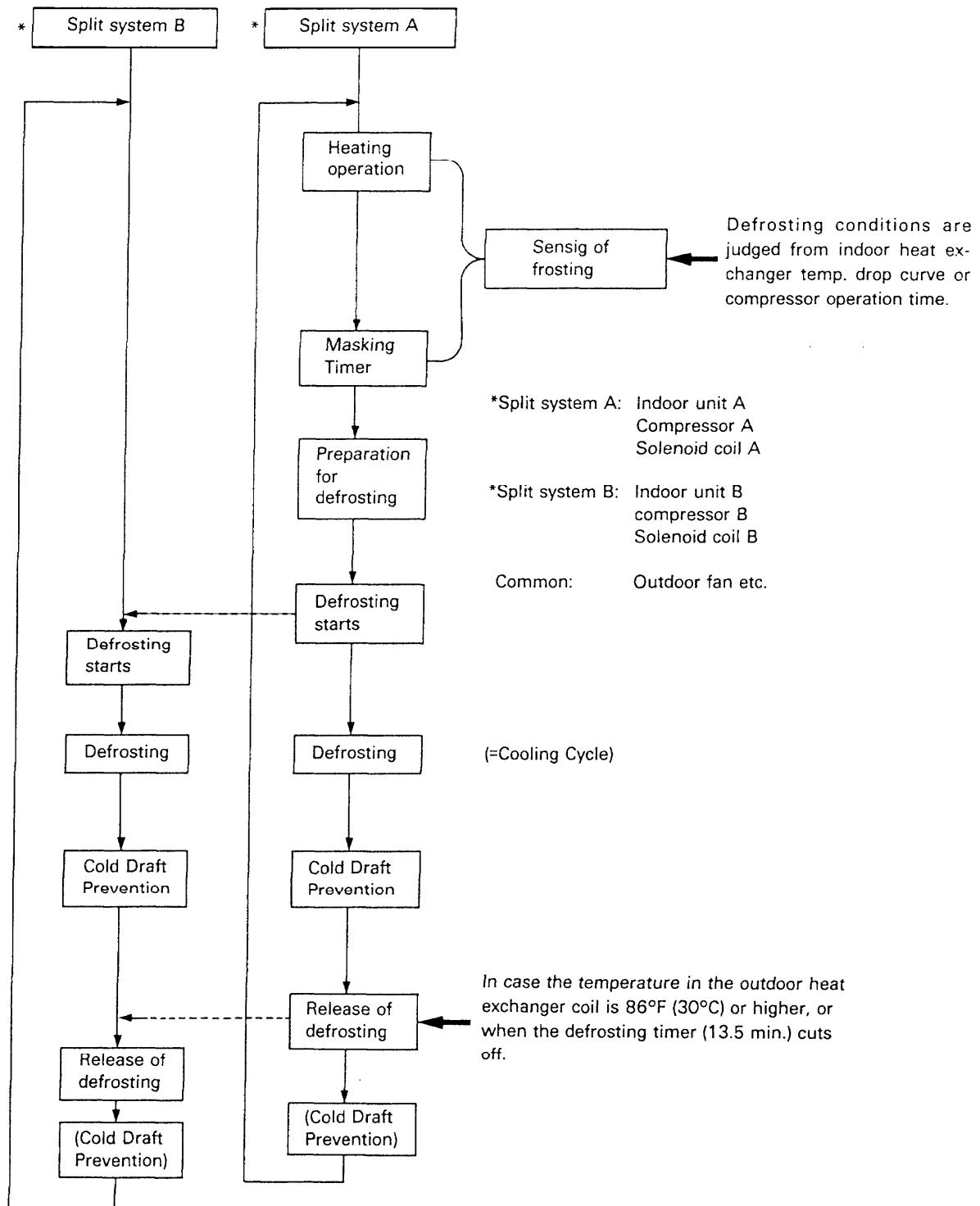


Fig. 9

## 7) Defrosting Mode (Heating)

When the capacity of unit has been decreased due to frost sticking to the outdoor heat exchanger during heating, the temperature drop gradient is detected by the microcomputer controlled temperature sensing system, and defrosting operation is started. At this time, the indoor and outdoor fan motors will stop, only the compressor is operated, and the system is automatically changed to cooling operation mode.

**Flow of Defrosting**



Timing chart of Defrosting

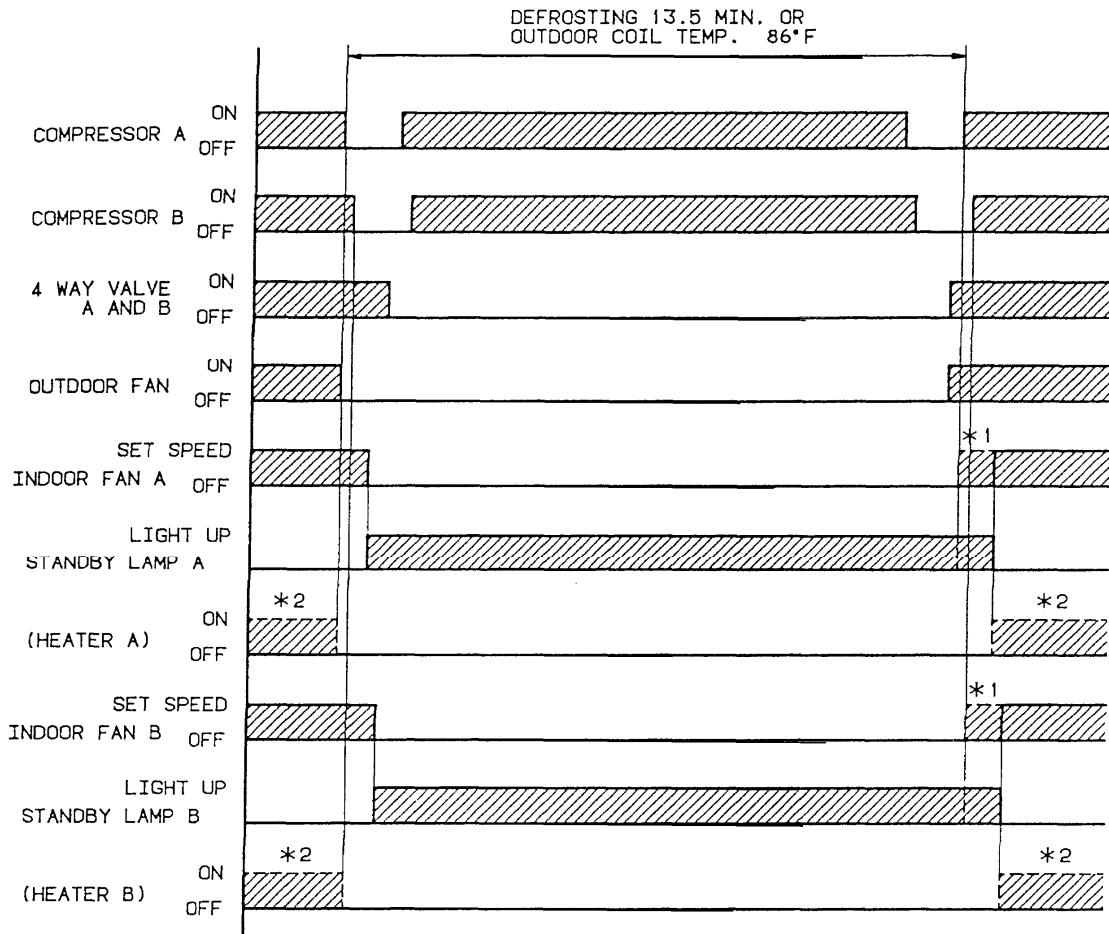


Fig. 10

Notes: \*1. In case of Cold Draft Prevention.

\*2. There is the case of Heater OFF.

#### 4) Wiring Instructions

##### WIRING SYSTEM DIAGRAM

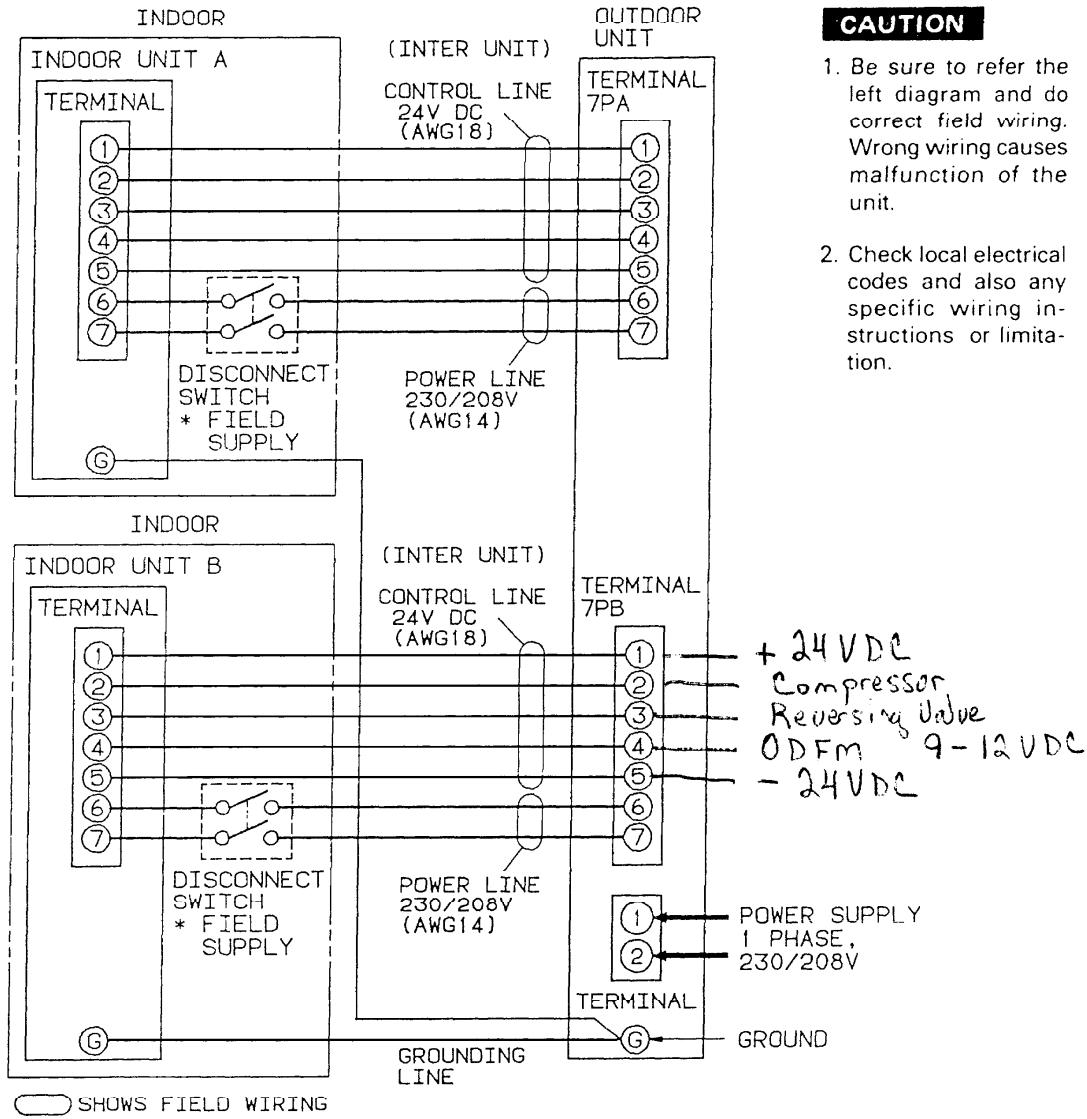


Fig. 9

**NOTE:**

All wiring between indoor and outdoor units, grounding lines and disconnect switches should be provided by the installer.

## 5) Air Purging

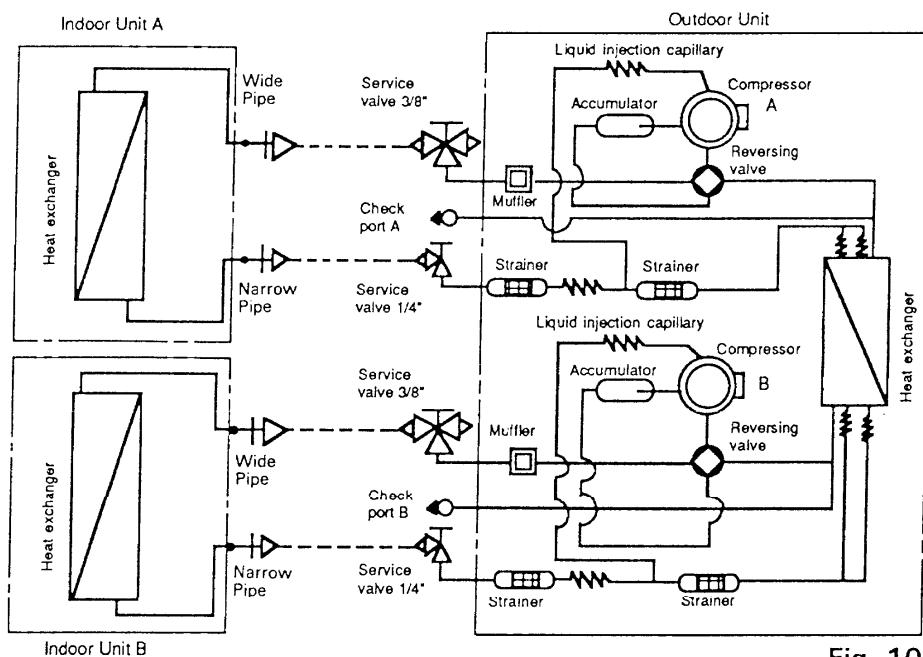
Air does not function as a refrigerant, because it cannot be liquefied in the condenser. Air and moisture remaining in the refrigerant system have undesirable effects as indicated at right. Therefore, they must be purged completely.

- The pressure in the system rises.
- The operating current rises.
- Cooling and/or heating efficiency drops.
- Water contained in the air may freeze and block the capillary tubing.
- Water may lead to corrosion of parts in the refrigerant circuit.

### Piping Diagram for Air Purging

#### CAUTION

Inadequate refrigerant charge may cause freeze-up problem of the evaporator. Follow the correct air purging procedures and be sure not to overbleed refrigerant.



#### NOTE

\* Each outdoor unit has a check port for measuring system pressure with a pressure gauge or the like during service.

\*\* The refrigerant circuits A and B are independent circuits individually.

Fig. 10

## 6-2. Quick Air Purge System

Quick air purge system represents purging the air stayed in the indoor unit and connection tubes by the aid of refrigerant gas charged in the outdoor unit. By this system, air purging has become much simpler and installation time has become shorter than conventional methods.

\* Interval required for air purging is only 15 SECOND.

**NOTE** Outdoor unit is pre-charged at the factory.  
Don't open valves until piping is hooked up and you are ready to proceed with purging procedure.

### Air Purging Procedure

- a) Remove the valve caps from the service valves on the narrow pipe and wide pipe.
- b) Slacken off the flare nut at the charging port one full turn. (Fig. 11)
- c) Open the service valve on the narrow pipe side by 90 degrees (1/4 turn).  
(During this operation, air will be discharged from the charging port of the service valve on the wide pipe.)
- d) **15 seconds** after opening the spindle, tighten up the flare nut of the charging port.
- e) Shut the spindle of the service valve on the narrow pipe. (Fig. 12)

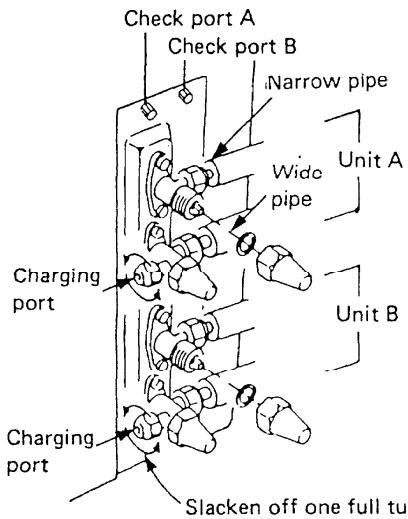


Fig. 11

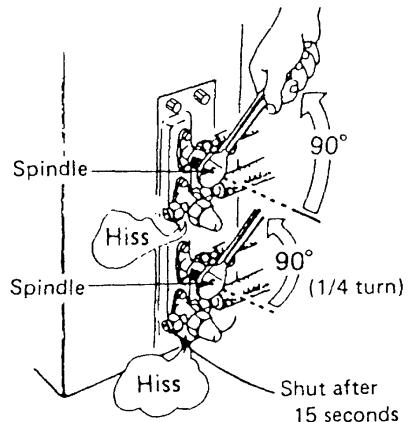


Fig. 12

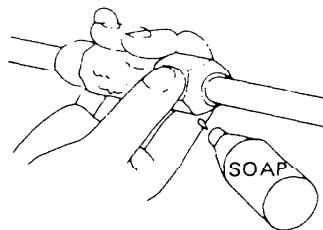


Fig. 13

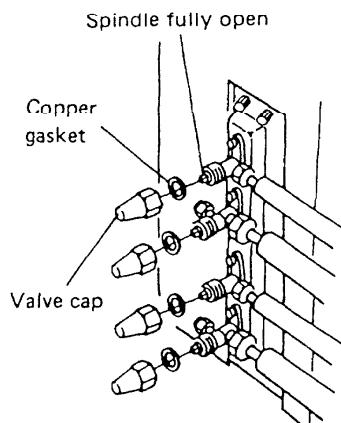


Fig. 14

- f) Leak test the joints with liquid soap. (Fig. 13)
- g) Fully open the spindles of the service valves on the wide pipe and the narrow pipe.
- h) Next, re-install the valve caps in which copper gaskets have been inserted. (Fig. 14)
- i) The all air purge procedure has been completed and the unit is ready for trial operation.

## 6) Test Run

Check that all piping and wiring have been completed correctly. Check again that wide and narrow pipe service valves are fully opened. Turn on power and run the unit.

## ■ SERVICE VALVE CONSTRUCTION

### • Valve Position -a-

The valve spindles of both wide and narrow pipes are turned all the way in. The unit is shipped from the factory in this position. (Fig. 15a)

### • Valve Position -b-

The valve spindles of both wide and narrow pipes are turned all the way out ("BACK SEAT" position). This is the normal operating position. (Fig. 15-b)

### • Valve Position -c-

With the narrow pipe valve kept at BACK SEAT, only the wide pipe valve spindle is turned half-way down position. This position is used for pressure measurement and gas charging. (Fig. 15-c)

### • Valve Position -d-

Like position -a-, but with the flare nut of wide pipe slack. This position is used for air purging. (Fig. 15-d)

### **CAUTION**

Be sure to use the valve tool or ratchet wrench when opening or closing the shut-off valve spindle.

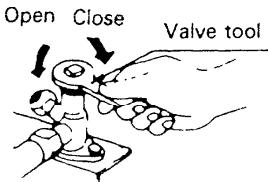
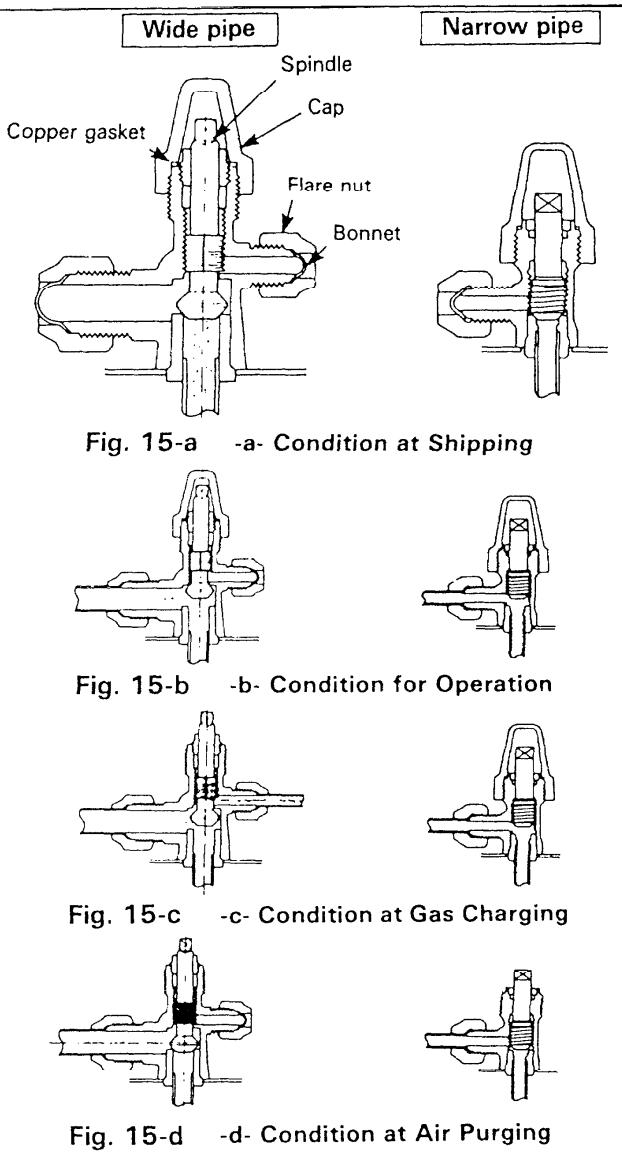


Fig. 16



## ■ PUMP DOWN

Pump down means collecting all refrigerant in the system back into the outdoor unit without losing refrigerant gas. Pump down is used when unit is moved or for servicing the refrigerant circuit.

### Pump Down Procedure (Be sure to carry out Pump Down in cooling operation)

- 1) Close valve on wide pipe halfway (2 turns).
- 2) Close valve on narrow pipe all the way (4 turns).
- 3) Turn unit on (cooling) for approximately 3 minutes then shut off.
- 4) Close valve on wide pipe all the way (2 additional turns).
- 5) Disconnect pipes slowly allowing pressure to equalize inside and out.

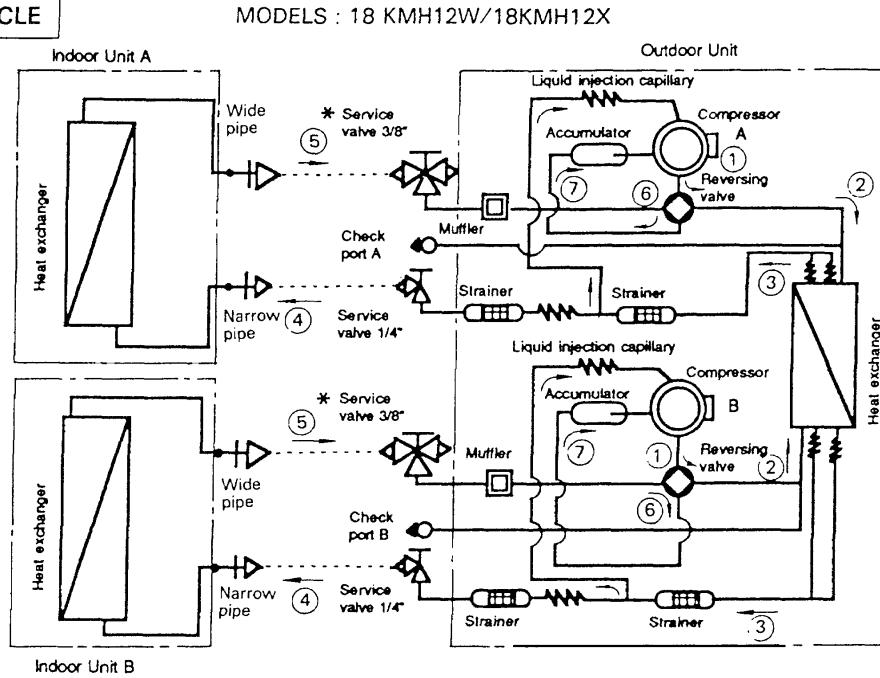
- 6) When piping is disconnected provide dust covers for both valves and pipes until unit is reconnected.

### **CAUTION WHEN THE UNIT IS REINSTALLED**

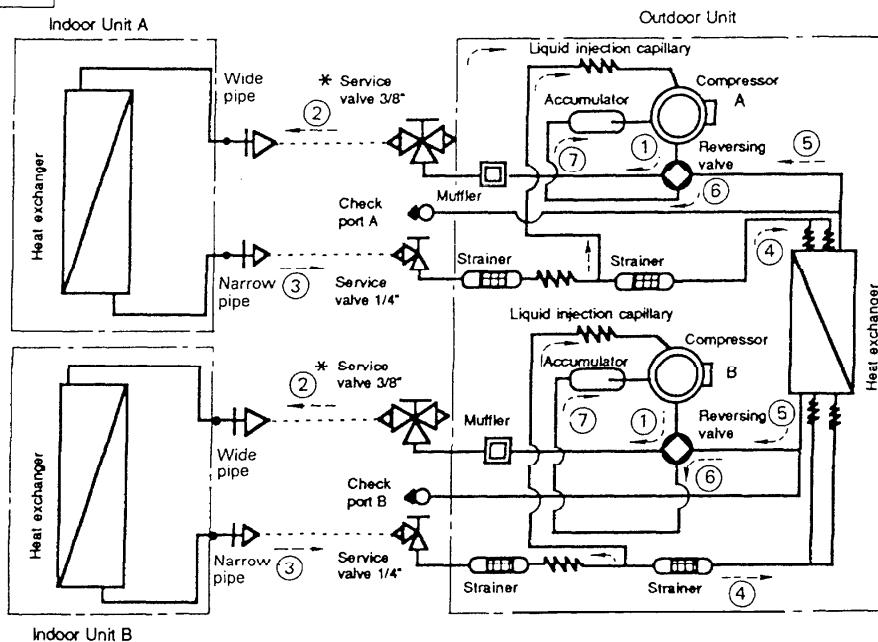
- After reinstalling the unit, flush in the piping with the gas contained in the outdoor unit. Be sure to charge 1.4 oz. (40 g) of refrigerant from wide pipe service valve at position -c- during cooling operation.
- No additional charging of refrigerant is necessary when vacuum evacuation was taken place for servicing.

## 9. REFRIGERANT FLOW DIAGRAM

### COOLING CYCLE

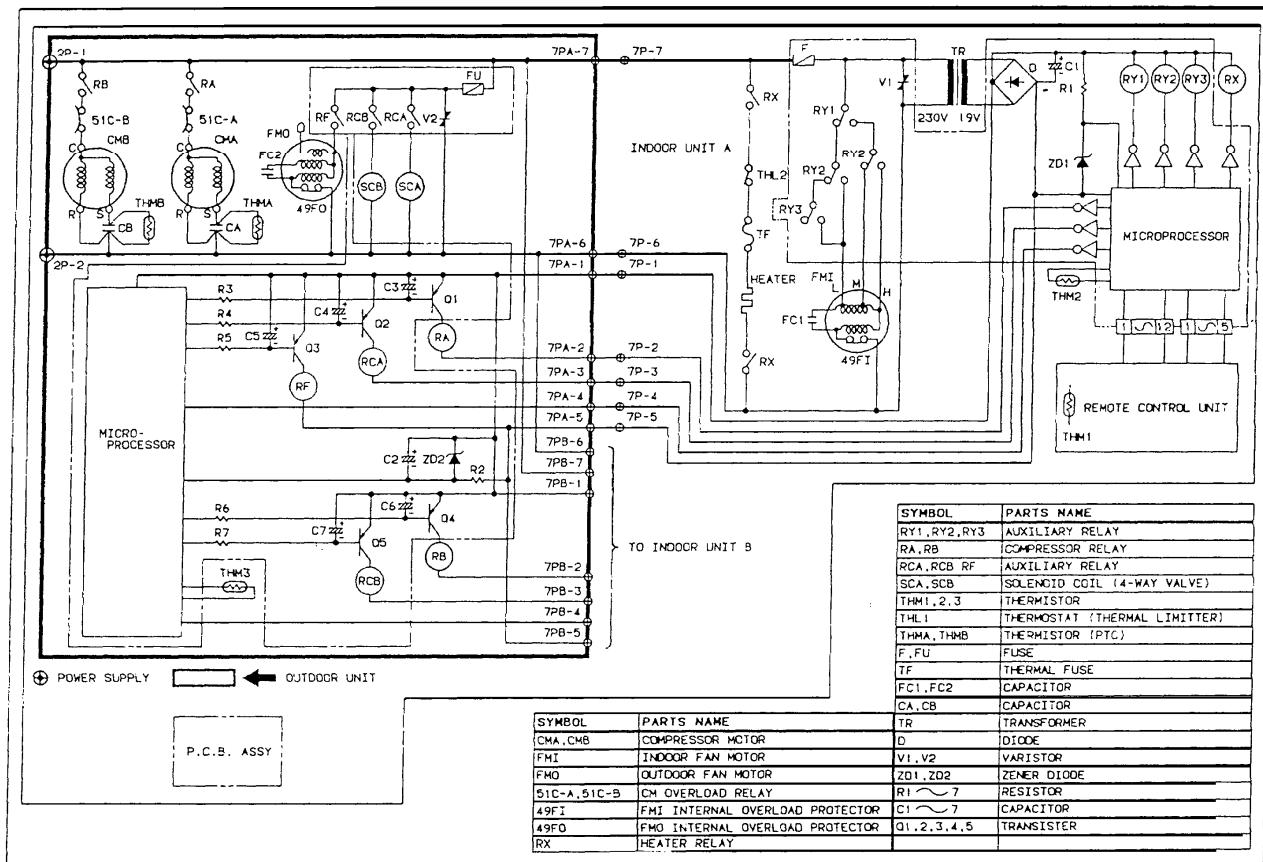


### HEATING CYCLE

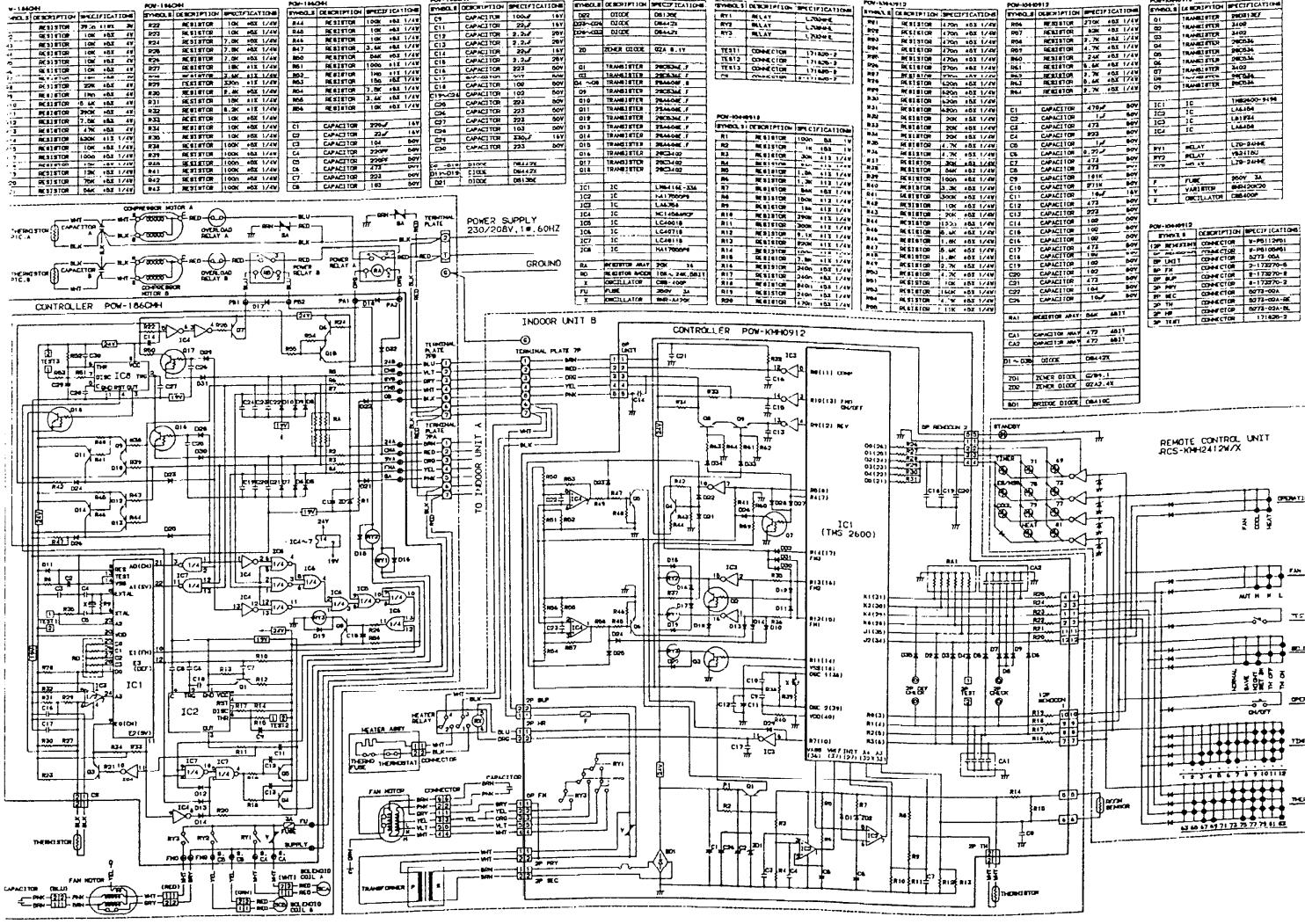


## 10. ELECTRICAL DATA

### ● Schematic Diagram 18KMH12W/18KMH12X



● Electrical Characteristics



- Electrical Characteristics

18KMH12W or 18KMH12X 1 - Unit

Performance at 230 / 208V 1φ - 60Hz			Indoor Unit × 1		Outdoor Unit		Complete Unit	
			Fan Motor	Max. Heat	Fan Motor	Compressor	Cool or Heat	Max. Heat
Cool	Rated Load	A	0.15/0.14	-	0.47/0.47	3.78/3.89	4.4/4.5	-
		W	34/29	-	106/96	820/775	960/900	-
Heat	Rated Load	A	0.15/0.14	4.35/3.93	0.47/0.47	3.78/3.89	4.4/4.5	8.75/8.43
		W	34/29	1,000/818	106/96	820/775	960/900	1,960/1,718
Locked Rotor Amps.		A	0.18/0.17	-	0.67/0.67	27	-	-

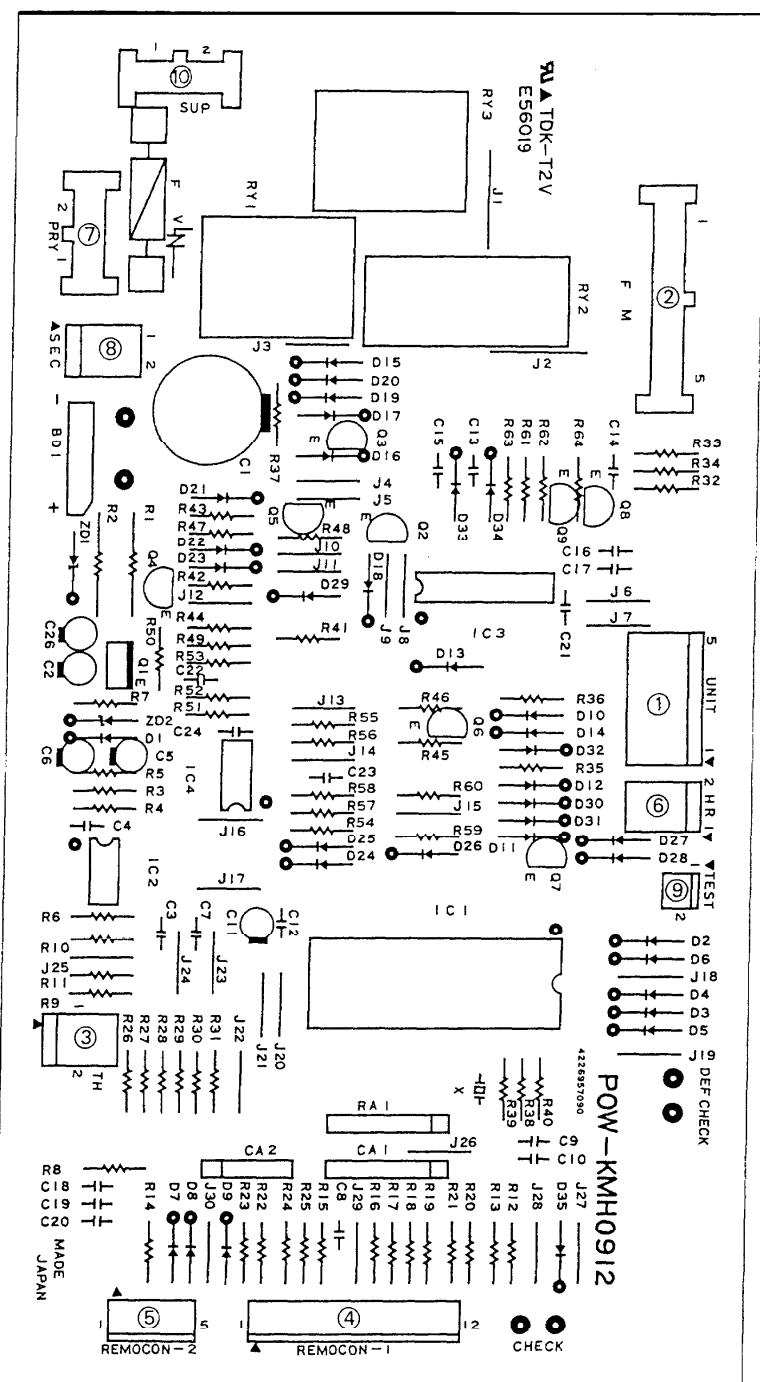
18KMH12W or 18KMH12X 2 - Units

Performance at 230 / 208V 1φ - 60Hz			Indoor Unit × 2		Outdoor Unit		Complete Unit	
			Fan Motor	Max. Heat	Fan Motor	Compressor	Cool or Heat	Max. Heat
Cool	Rated Load	A	0.30/0.28	-	0.47/0.47	8.03/8.25	8.8/9.0	-
		W	68/58	-	106/96	1,726/1,666	1,900/1,820	-
Heat	Rated Load	A	0.30/0.28	8.70/7.86	0.47/0.47	7.73/7.75	8.5/8.5	17.2/16.36
		W	68/58	2,000/1,636	106/96	1,626/1,546	1,800/1,700	3,800/3,336
Locked Rotor Amps.		A	0.36/0.34	-	0.67/0.67	27 × 2	-	-

Remarks: Rated Conditions : Cool, Outdoor unit entering air temperature 95°F D.B./75°F W.B.  
                           Indoor unit entering air temperature 80°F D.B./67°F W.B.  
                           Heat, Outdoor unit entering air temperature 47°F D.B./43°F W.B.  
                           Indoor unit entering air temperature 70°F D.B.

● P.C.B. Ass'y (Printed Pattern)

POW-KMH0912 (for KMH0912W and KMH0912X)



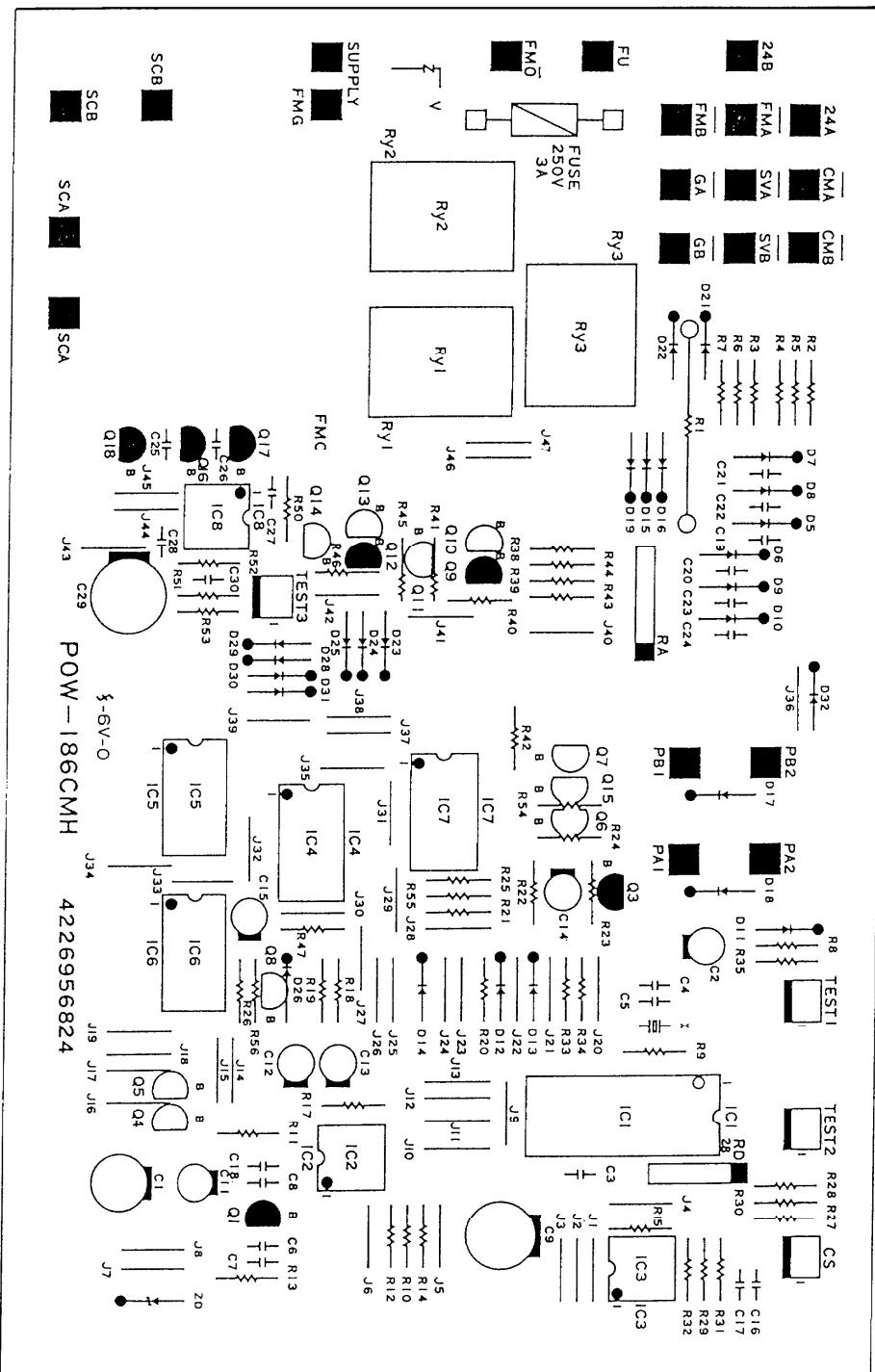
- ① Connector, Inter Unit Power Line 24 V.D.C.
- ② Connector, Fan Motor\*
- ③ Connector, Thermistor, 9 V.D.C.
- ④ Connector, Remote Control Unit 1 12P, 9 V.D.C.
- ⑤ Connector, Remote Control Unit 2 5P, 9 V.D.C.
- ⑥ Connector, Heater Relay, 24 V.D.C
- ⑦ Connector, Transformer (Primary\*)

- ⑧ Connector, Transformer (Secondary, 19 V.A.C.)
- ⑨ Connector, Test, 9 V.D.C.
- ⑩ Connector, Power Supply to P.C.B.\*

The asterisk \*\* indicates that line voltage is applied.

### ● P.C.B. Ass'y (Printed Pattern)

### POW-186CMH (for CMH1812)



# 11. TROUBLESHOOTING

## — Quick Access Index —

	Page
<b>1. Air conditioner does not operate .....</b>	46
(1) Circuit breaker trips (or fuse blows) .....	46
a) When circuit breaker is set to ON, it is tripped soon (Resetting is not possible) .....	46
b) Circuit breaker trips when the operation switch is depressed .....	47
(2) Neither indoor unit nor outdoor unit runs .....	48
<b>2. Some part of air conditioner does not operate .....</b>	49
(1) Only indoor fan does not run .....	49
(2) Neither outdoor fan nor compressor runs .....	50
(3) Only outdoor fan does not run .....	51
(4) Only compressor does not run .....	52
(5) Compressor frequently repeats ON and OFF .....	53
<b>3. Air conditioner operates, but abnormalities are observed .....</b>	54
(1) Heating operation cannot be done .....	54
(2) Cooling operation cannot be done .....	55
(3) Poor cooling .....	56
(4) Excessive cooling .....	57
(5) Poor heating .....	58
(6) The electric heater does not work .....	59

Note 1: Check the following operations at first.

	Operations	
	Cooling	Heating
1-(2) Neither indoor unit nor outdoor unit runs.	—	Thermo. OFF 5 minutes OFF timer
2-(1) Indoor fan does not run.	—	Cold Draft Prevention
2-(2) Neither outdoor fan nor compressor runs.	Thermo. OFF 3 minutes OFF timer Freeze Prevention	—
2-(3) Only outdoor fan does not run.	—	Overload Prevention
3-(1) Heating operation cannot be done.	—	Defrosting Mode

Refer to 7 FUNCTION.

Table 1

Note 2: Control line voltage at the outdoor unit's terminal plate (7PA or 7PB) at normal operation.

#### Cooling operation

	Terminal No.	Thermo.		Freeze Prevention
		ON	OFF	
Compressor	1 - 2	24VDC	0V	0V
Solenoid coil (4-way valve)	1 - 3	0V	0V	0V
Outdoor fan	1 - 4	24VDC	0V	0V

Table 2

#### Heating operation

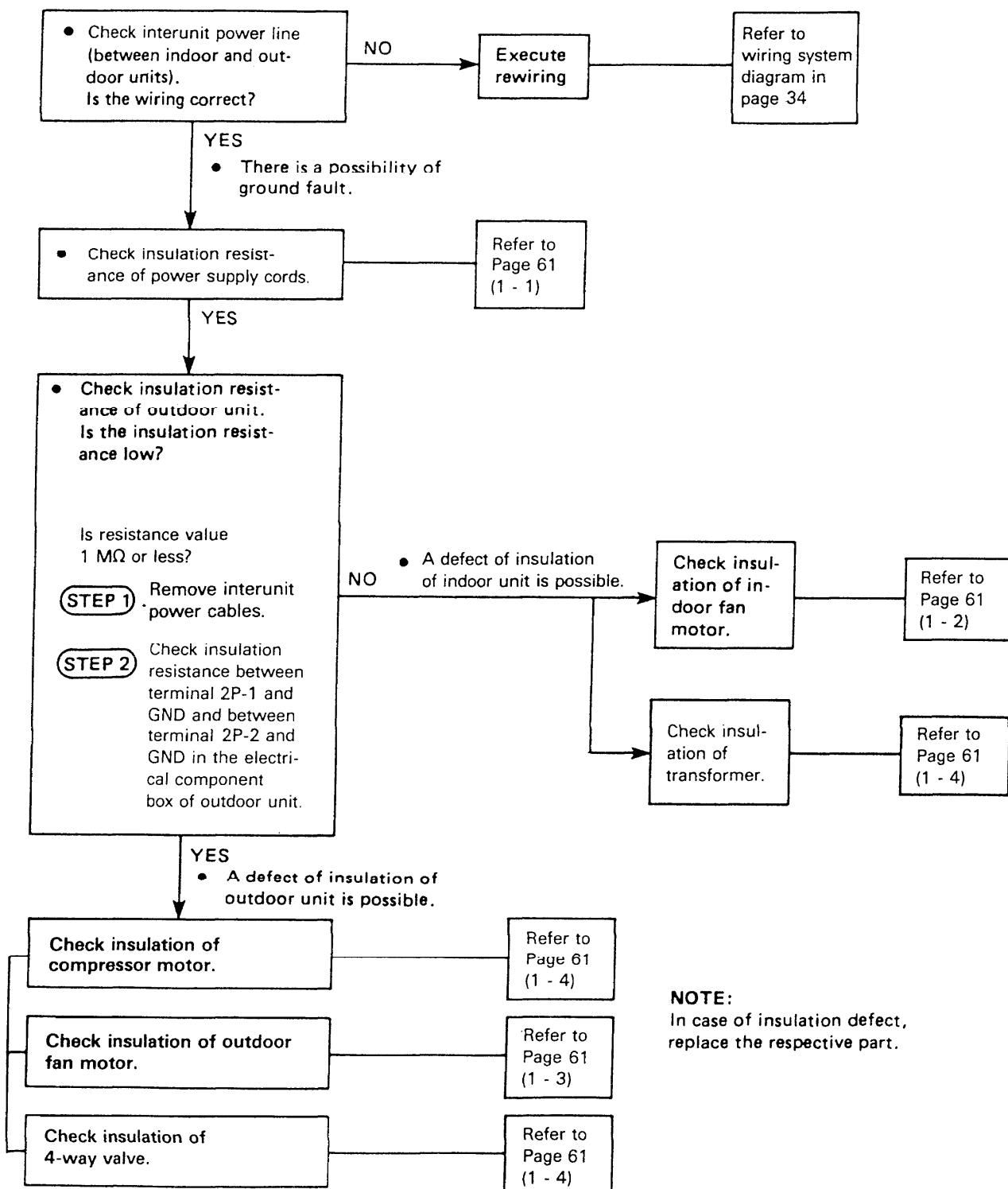
	Terminal No.	Thermo.		Overload Prevention	Cold Draft Prevention	Defrosting
		ON	OFF			
Compressor	1 - 2	24VDC	0V	24VDC	24VDC	24VDC
Solenoid coil (4-way valve)	1 - 3	24VDC	24VDC	24VDC	24VDC	0V
Outdoor fan	1 - 4	24VDC	0V	0V	24VDC	0V

Table 3

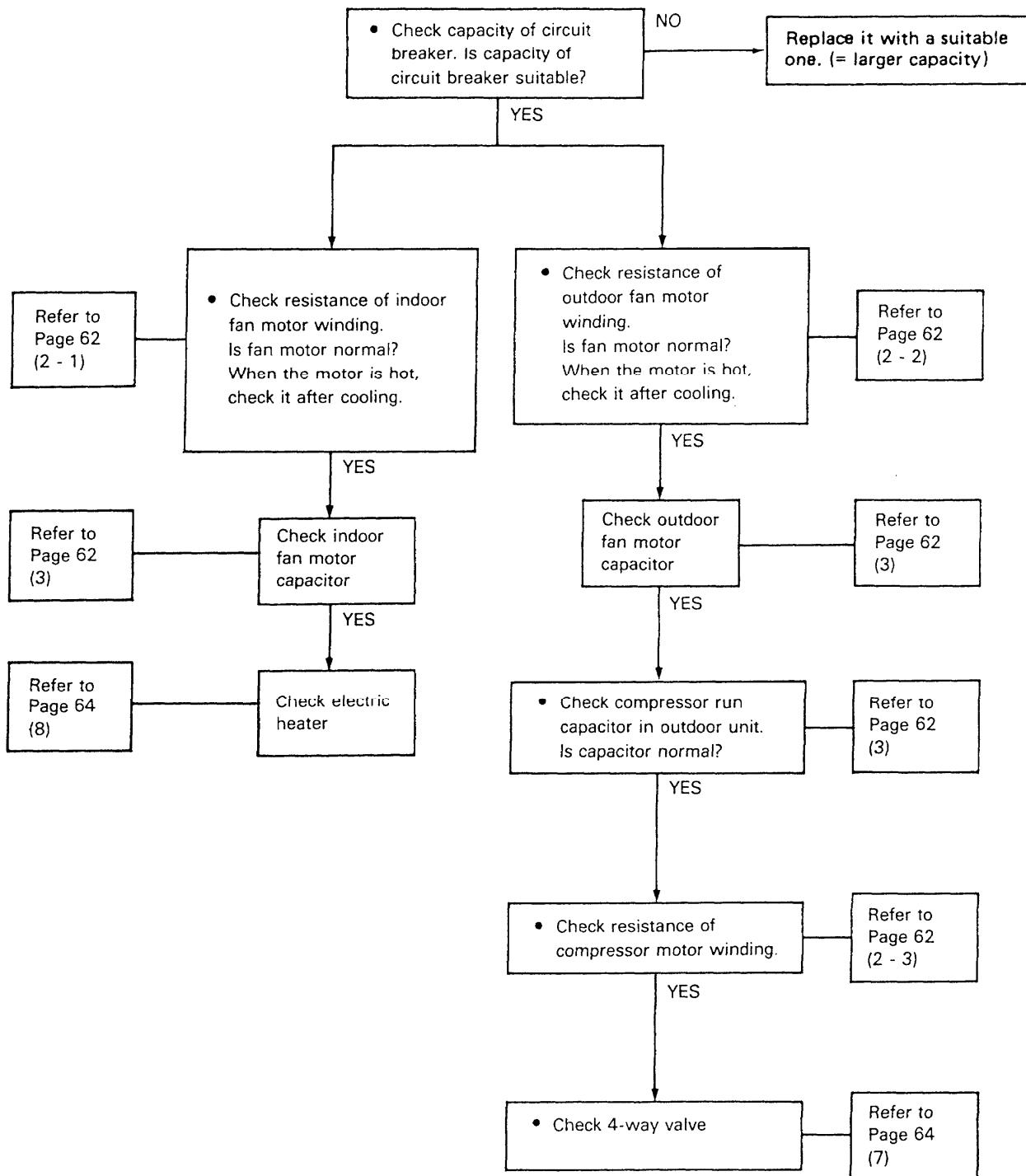
## 1. Air conditioner does not operate

### (1) Circuit breaker trips (or fuse blows)

- a) When circuit breaker is set to ON, it is tripped soon  
(Resetting is not possible)

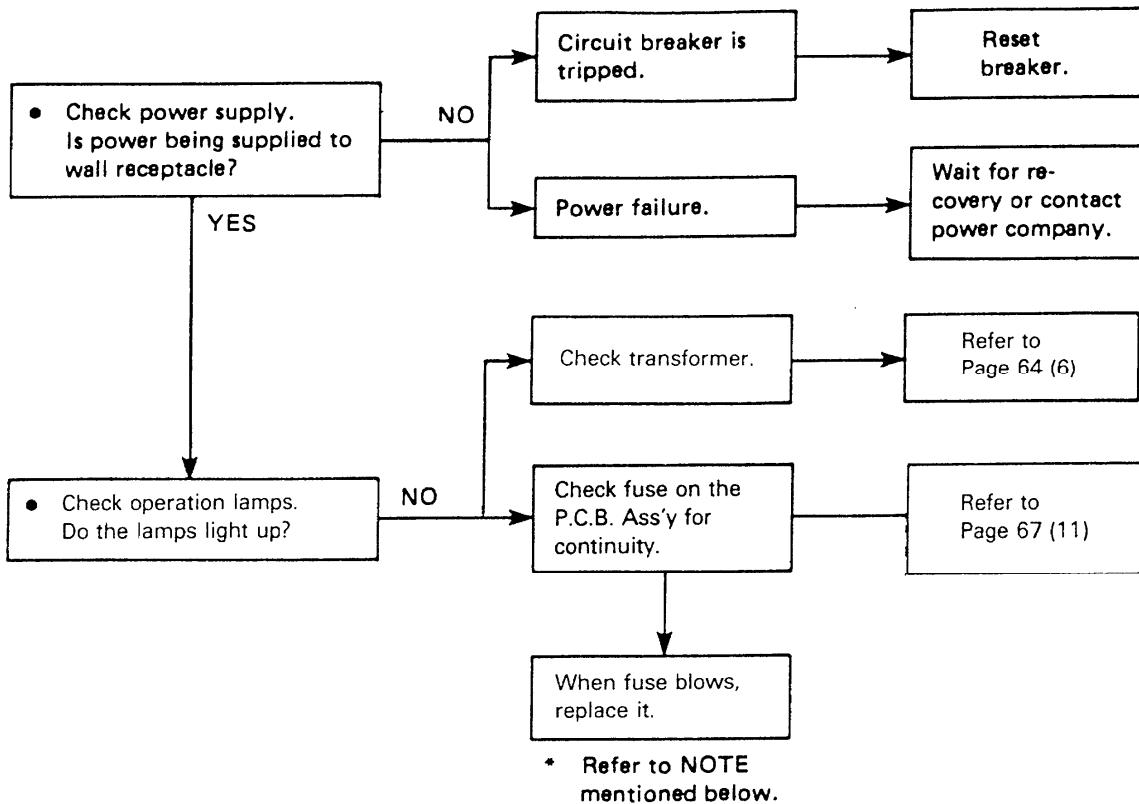


b) Circuit breaker trips when the operation switch is depressed.

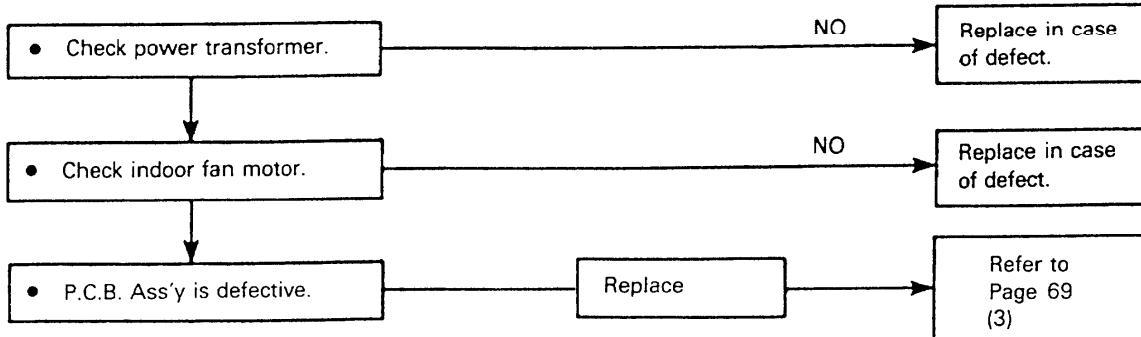


NOTE: In case of defect, replace the respective part.

(2) Neither indoor unit nor outdoor unit runs

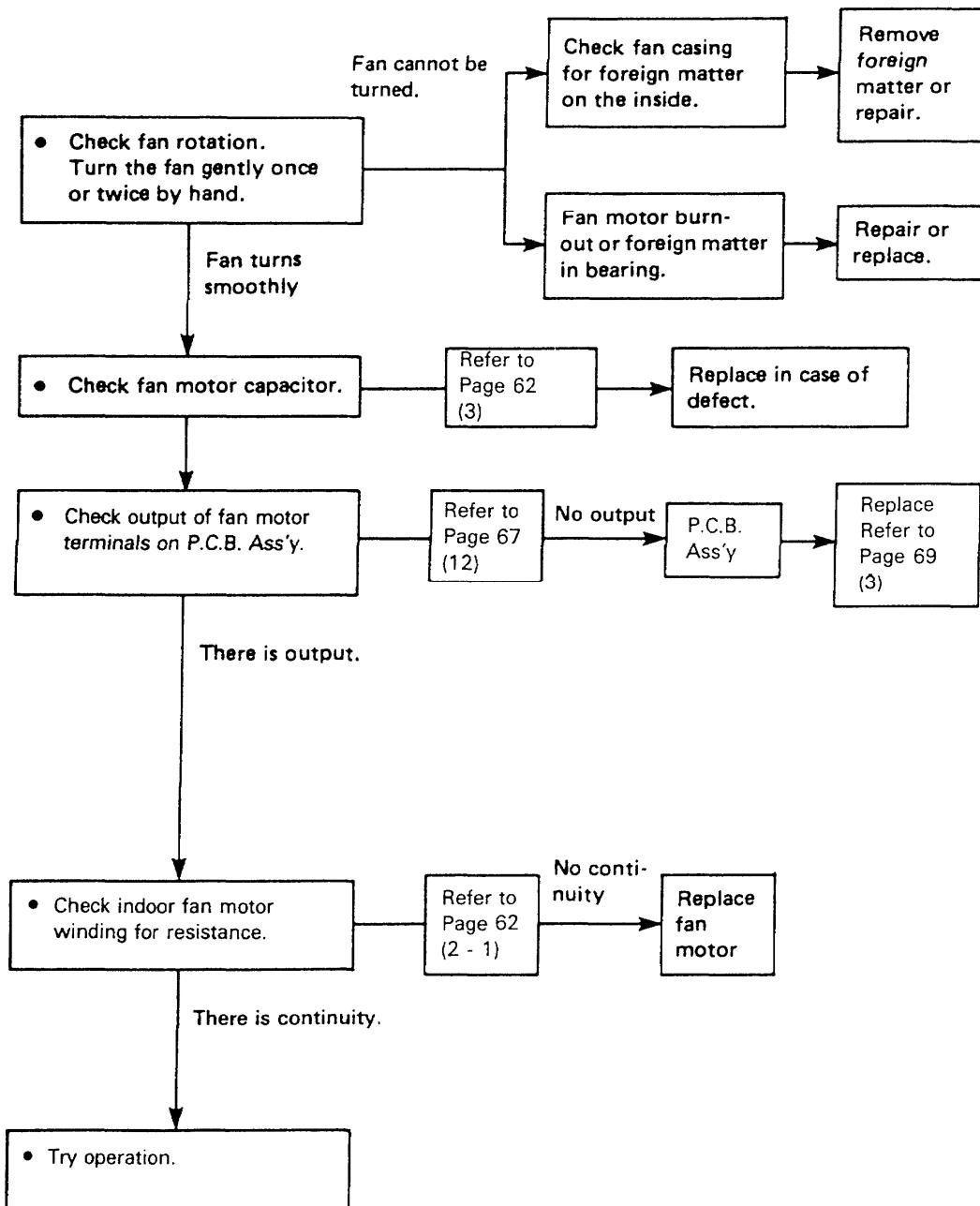


NOTE: If fuse blows again, check the following items:

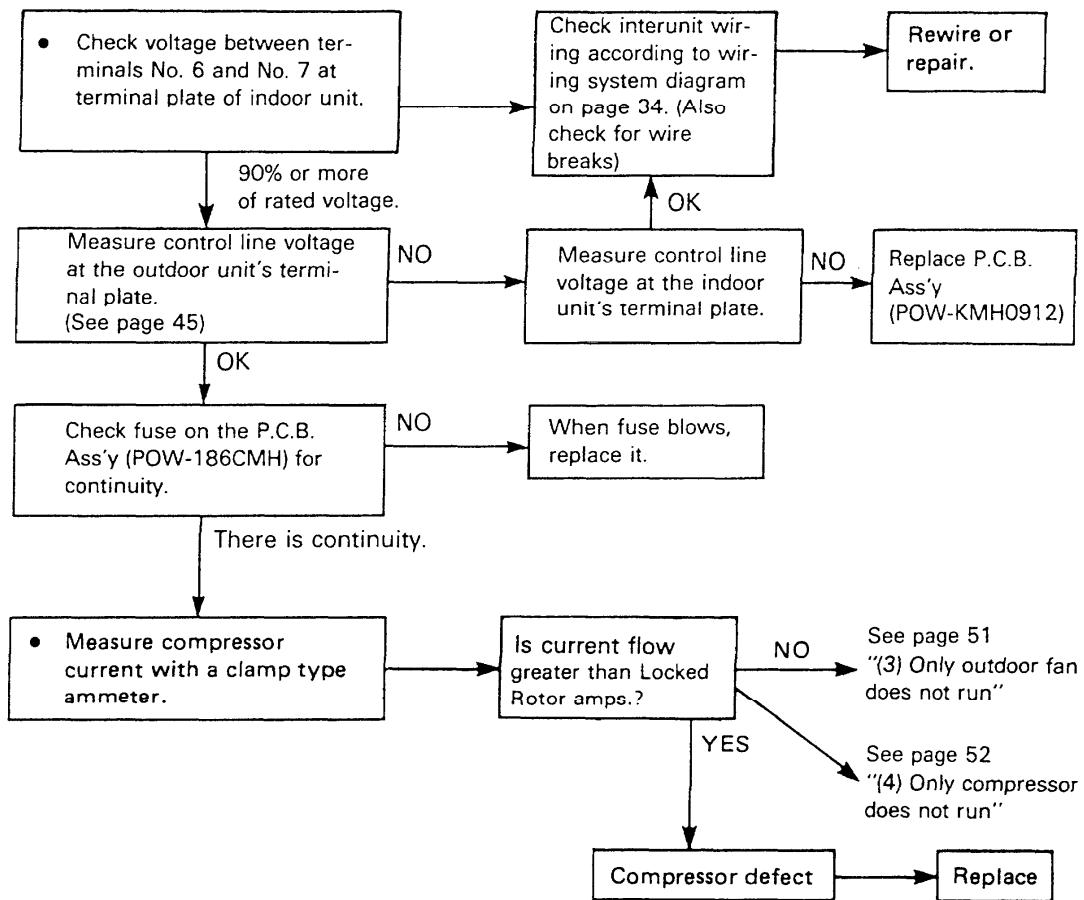


## 2. Some part of air conditioner does not operate

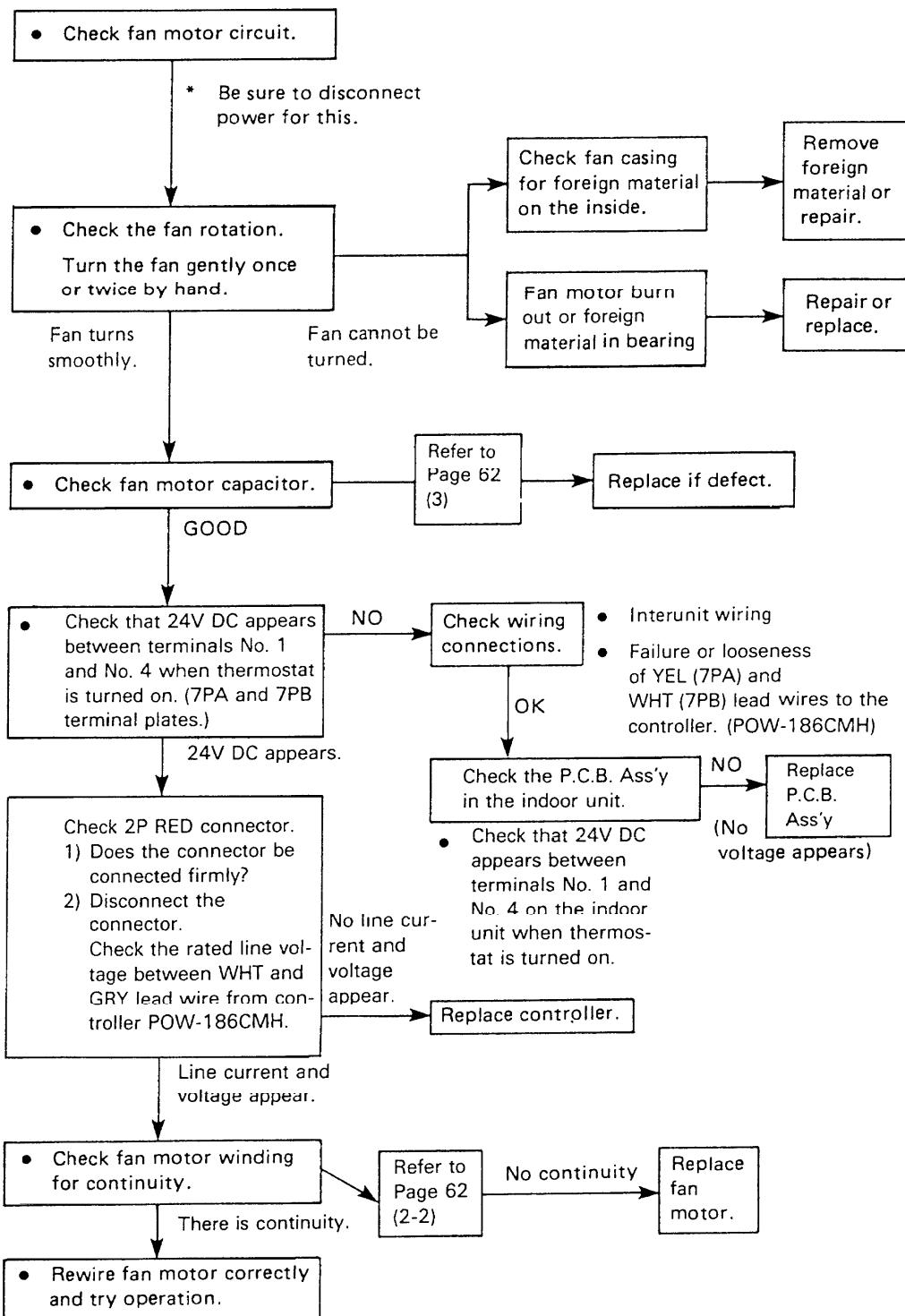
### (1) Only indoor fan does not run



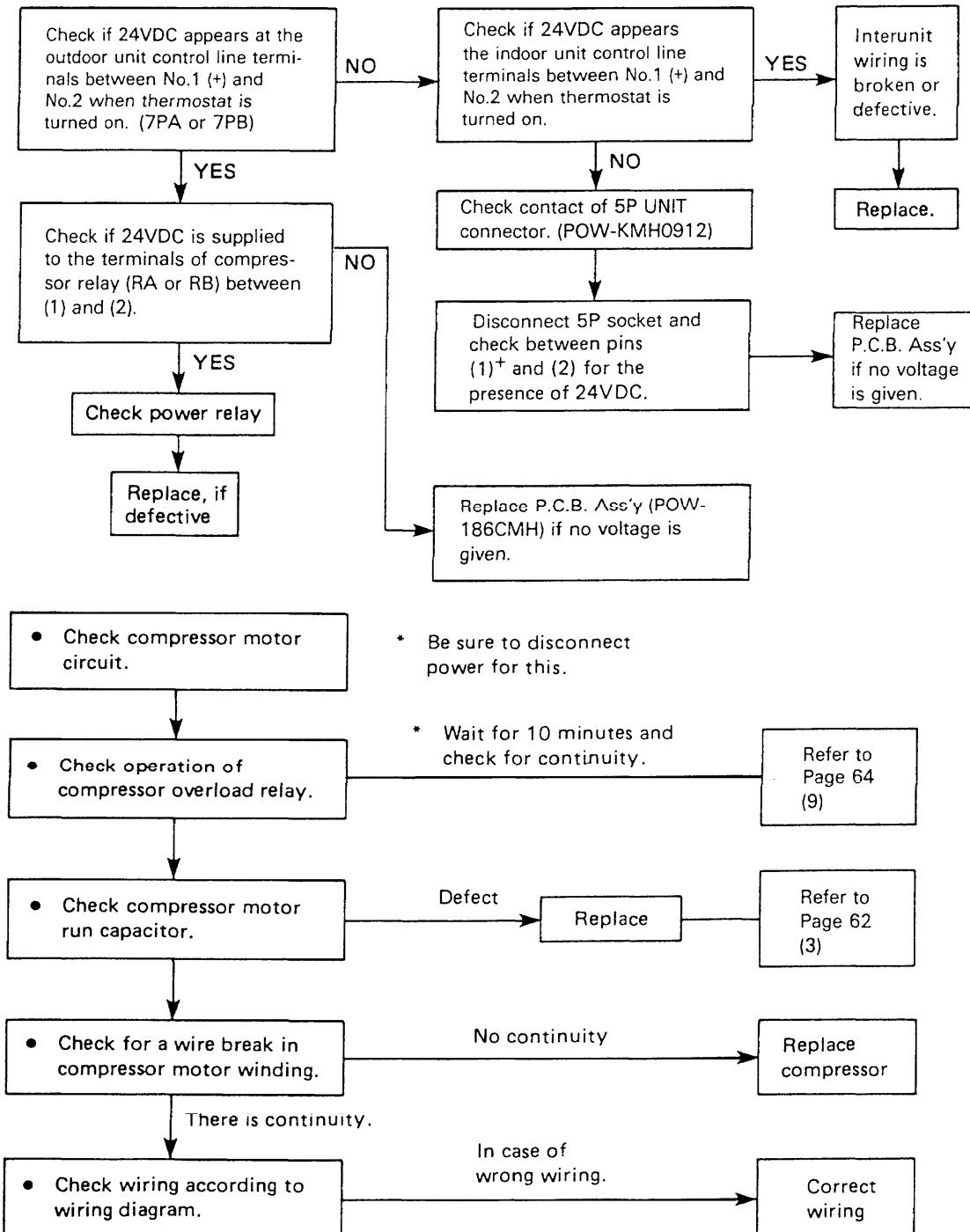
(2) Neither outdoor fan nor compressor runs



(3) Only outdoor fan does not run

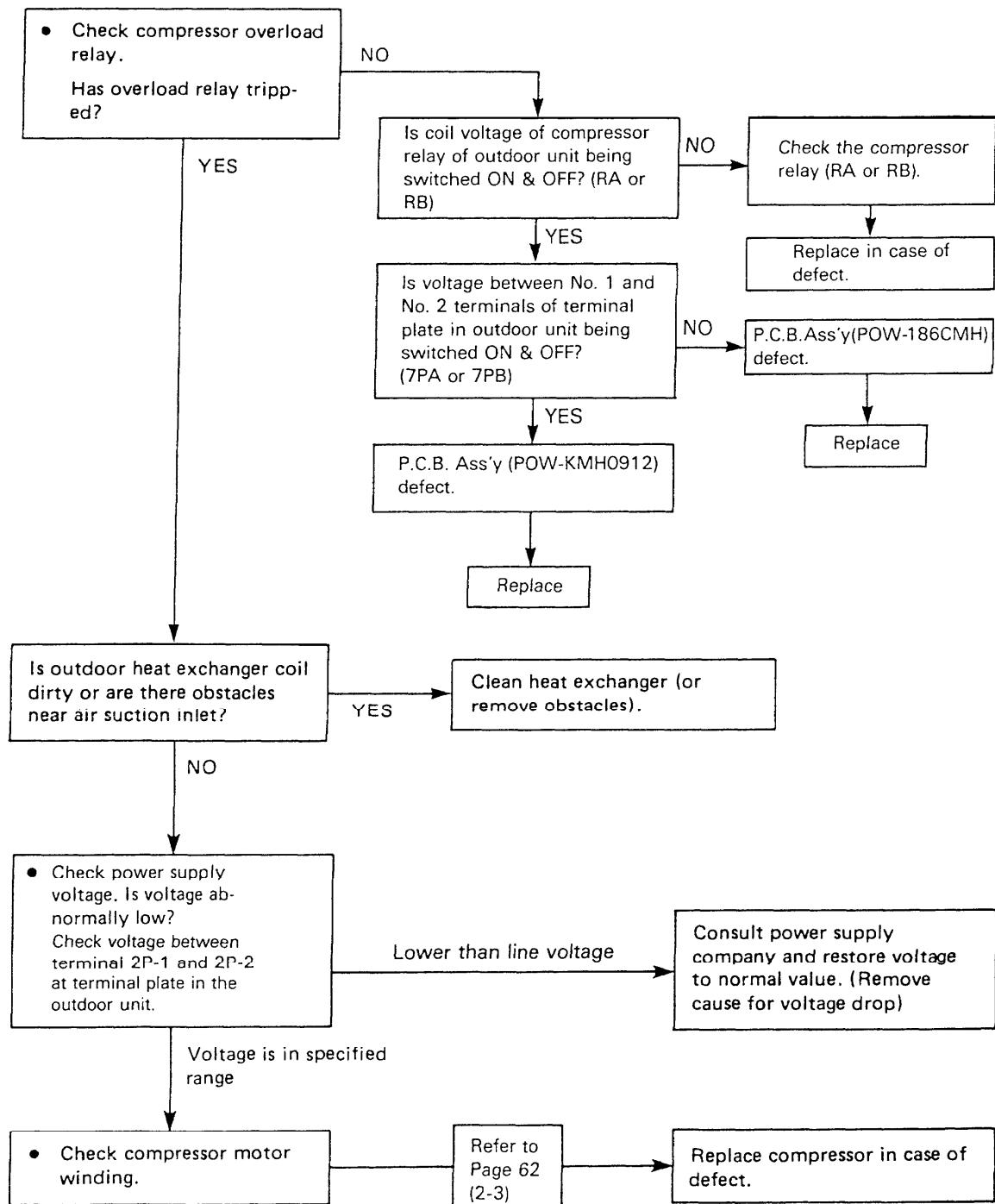


(4) Only compressor does not run



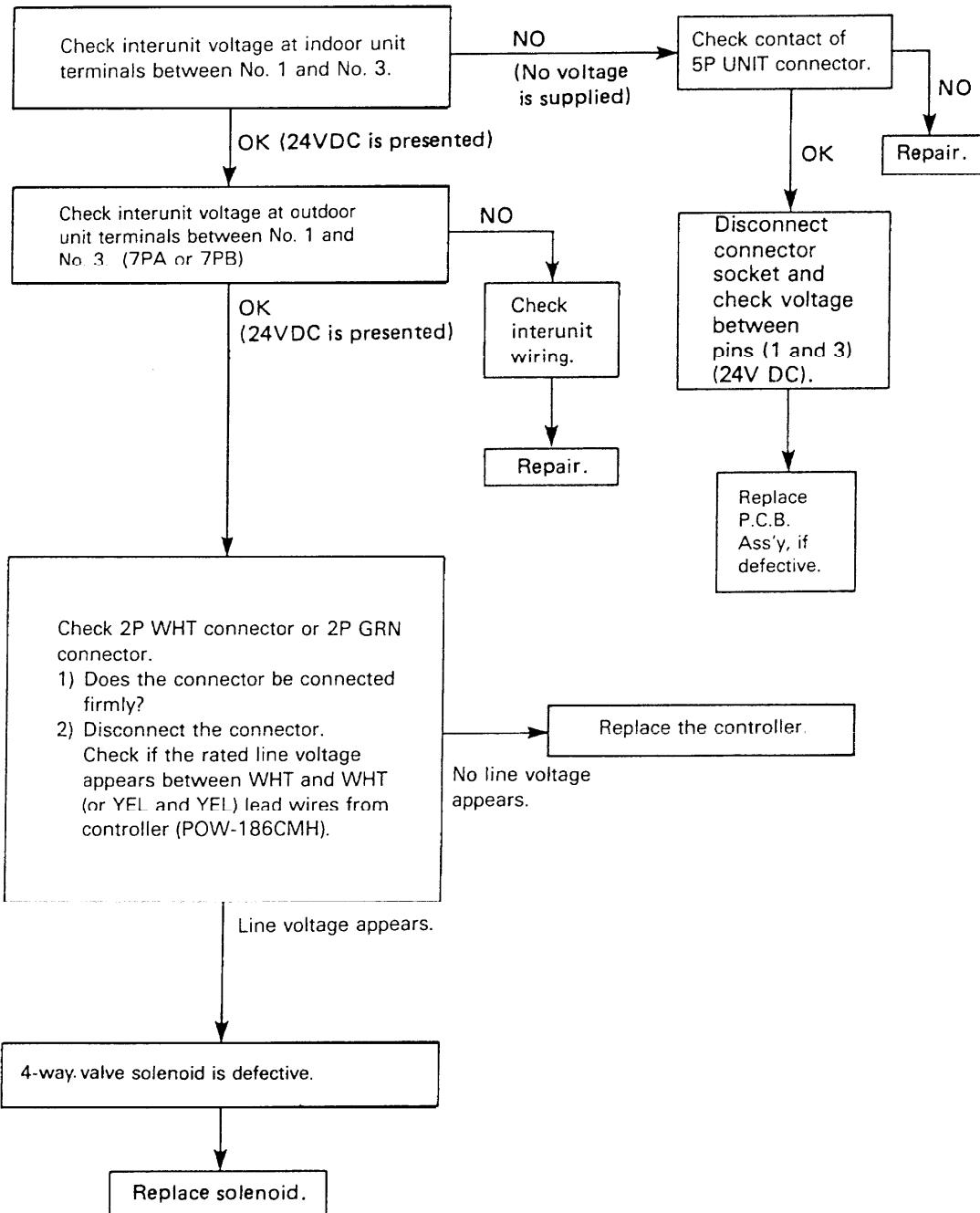
## (5) Compressor frequently repeats ON and OFF

(Only compressor repeats ON and OFF, while indoor unit and outdoor fan runs without fail.)



**3. Air conditioner operates, but abnormalities are observed**

- (1) Heating operation cannot be done (4-way valve malfunction).  
(only cooling is possible).



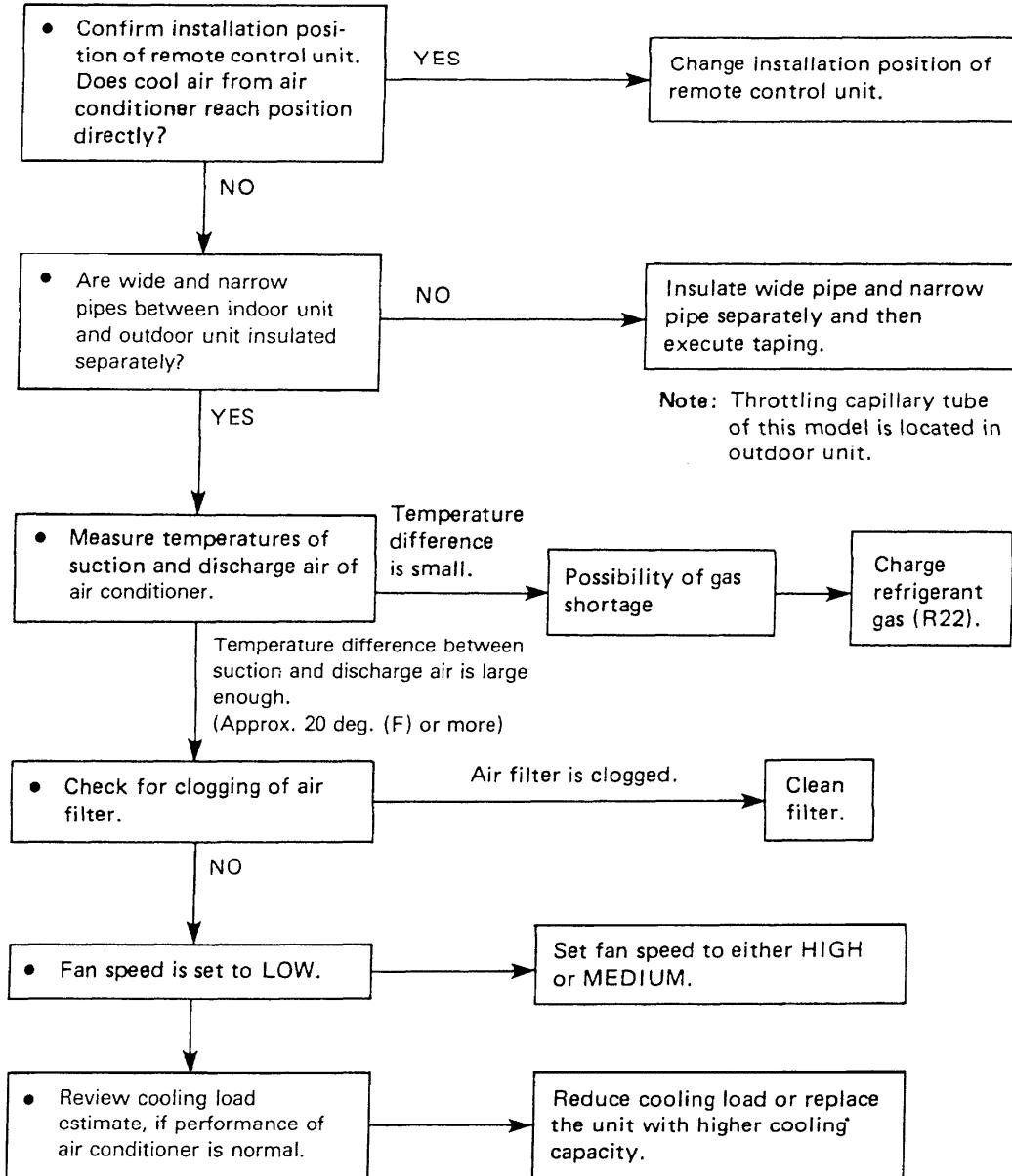
**(2) Cooling operation cannot be done. (only heating is possible.)**

**Note: Check the following points at first.**

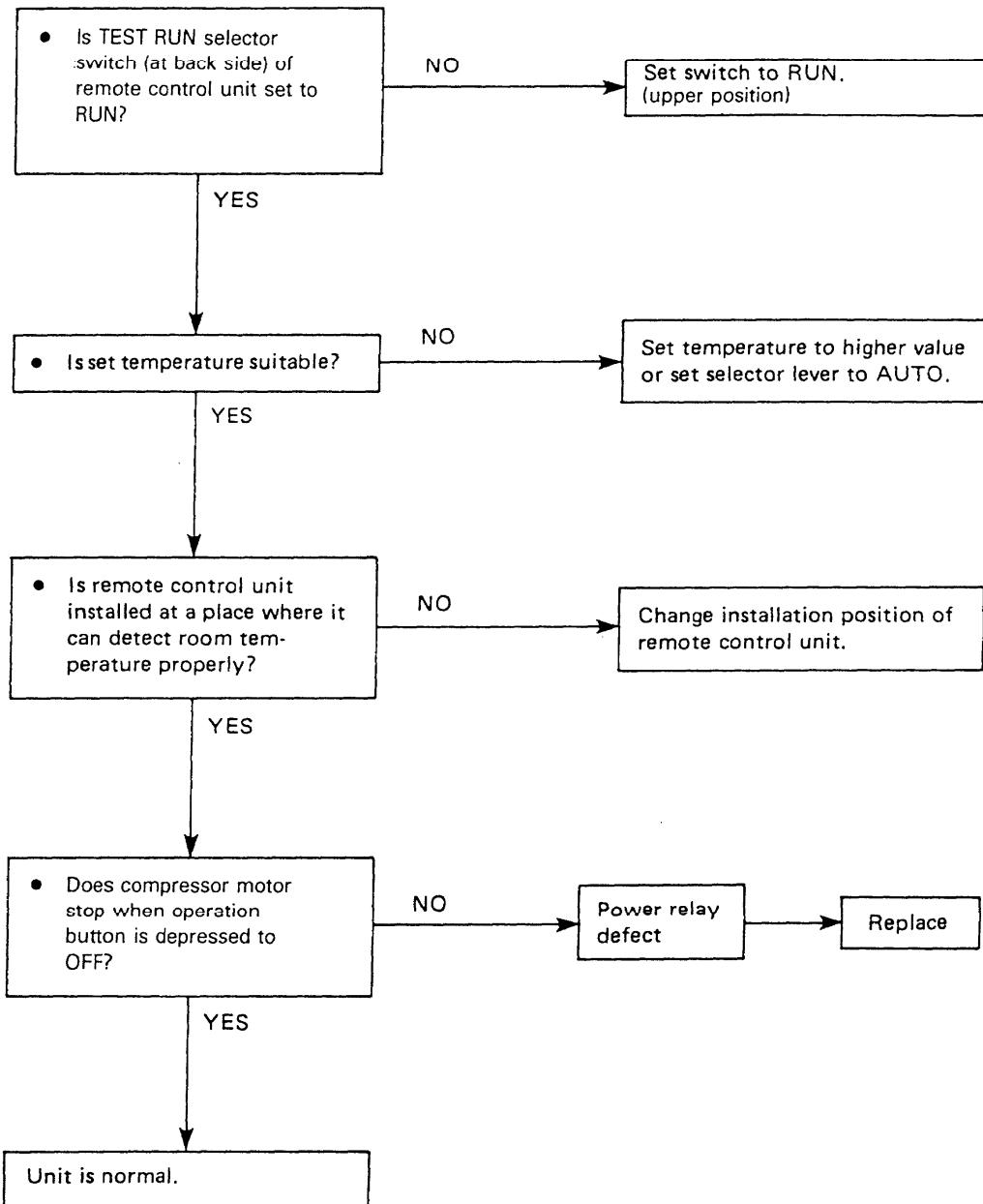
- Is another indoor unit set to heating mode?

If one of pairs is set to heating mode, another cannot be done cooling operation.

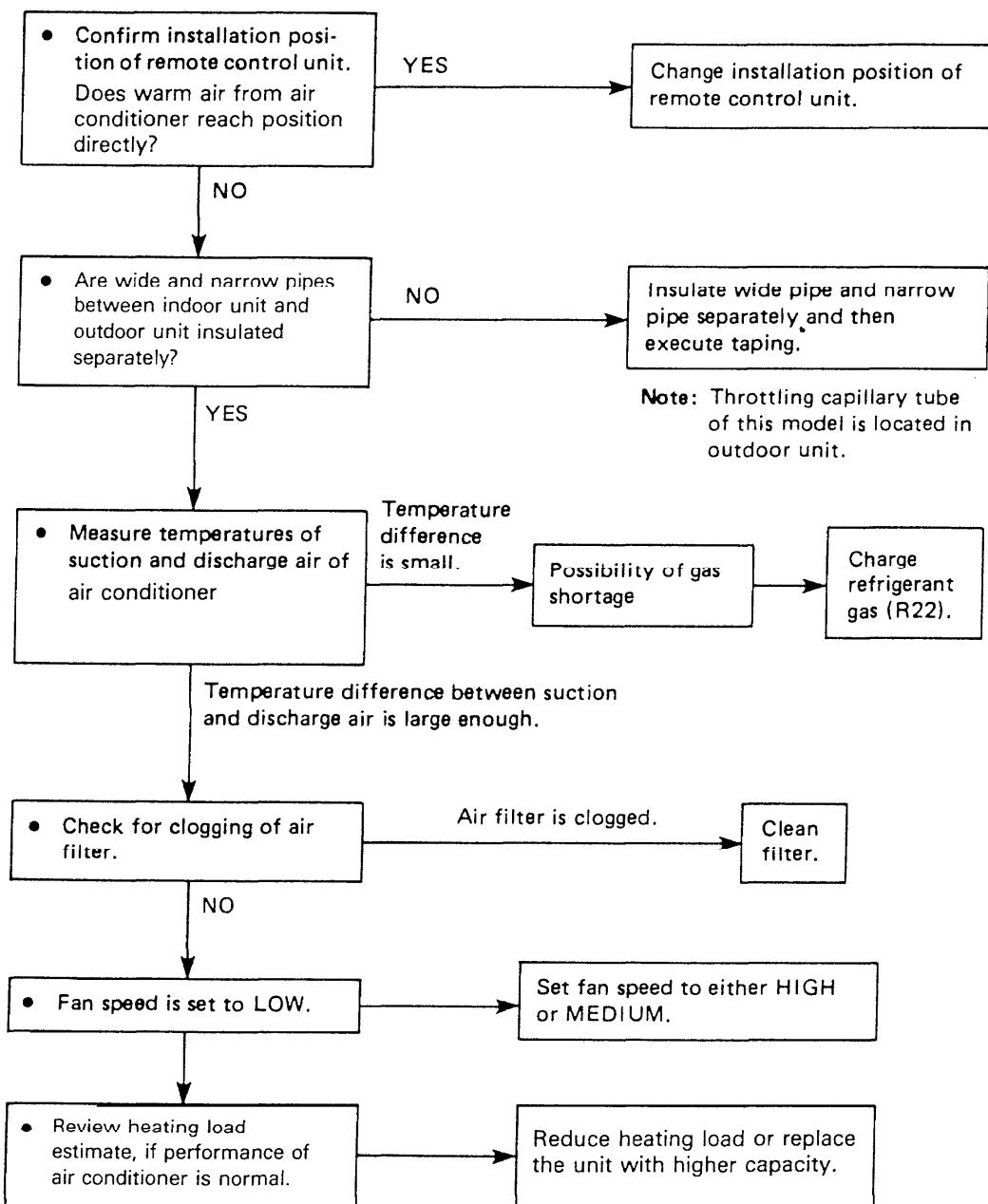
(3) Poor cooling



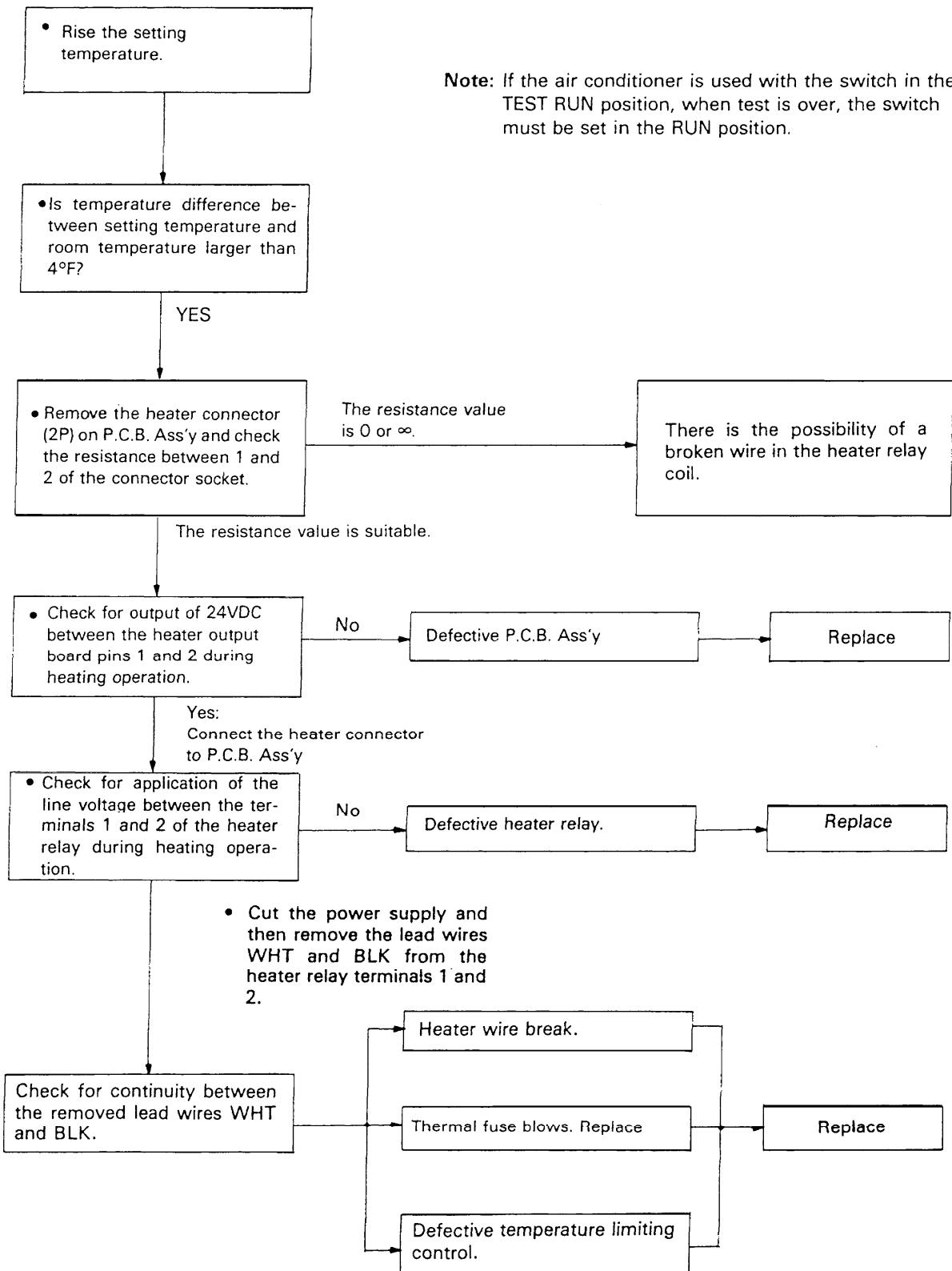
**(4) Excessive cooling**



(5) Poor heating



(6) The electric heater does not work



## 8. INSTALLATION INSTRUCTIONS

### 1) Installation Site Selection

#### Indoor Unit

- AVOID:**
- area where leakage of flammable gas may be expected.
  - place where a large amount of oil mist exists.
  - direct sunlight.
  - nearby heat source that may affect performance of the unit.
  - location where remote control will be splashed with water or affected by dampness or humidity.
  - installing remote control unit behind curtains or furniture that obstruct air circulation.

- DO:**
- select an appropriate position from which every corner of the room can be uniformly air-conditioned.  
(High on the wall is best.)
  - select a location that will hold the weight of the unit.
  - select a location where piping and drain pipe have shortest run to the outside. Fig. 1
  - allow room for operation and maintenance as well as unrestricted air flow around the unit.
  - install unit within 16' up or down of outdoor unit and within 33' from outdoor unit. Fig. 2
  - allow room for mounting control unit about 4' off the floor, in an area that is not in direct sunlight or in the flow of conditioned-air from the unit.

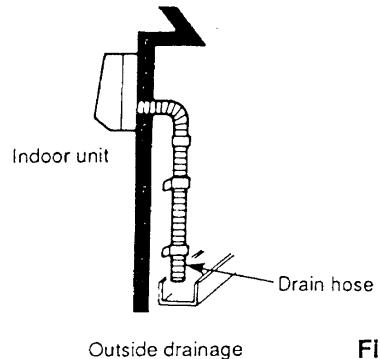


Fig. 1

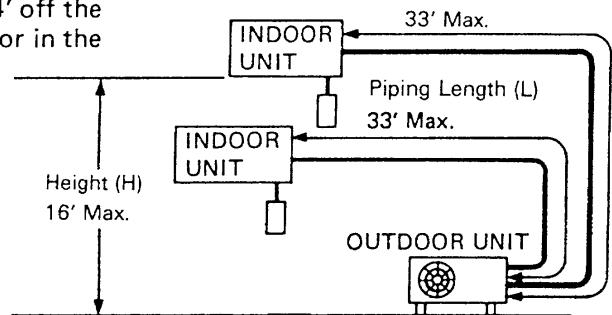
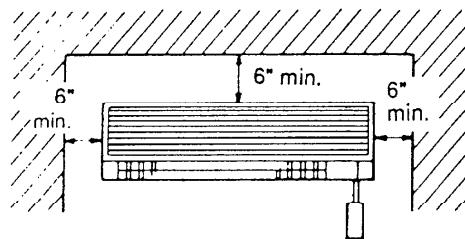


Fig. 2

## Outdoor Unit

**AVOID:** • heat source, exhaust fan, etc. Fig. 3  
• direct sunlight.  
• damp, humid or uneven location.

**DO:** • choose a place as cool as possible.  
• choose a place that is well ventilated and outside air temperature does not exceed 113°F constantly.  
• allow enough room around unit for air intake/exhaust and possible maintenance. Fig. 4  
• provide a solid base; concrete or concrete blocks, about 4" above ground level to reduce humidity and possible water damage in unit and decrease service life. Fig. 5  
• use lag bolts or equal to bolt down unit, reducing vibration and noise.

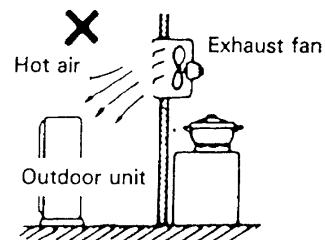


Fig. 3

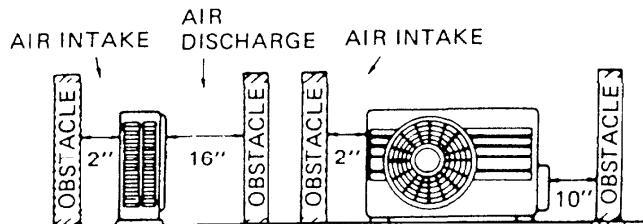


Fig. 4

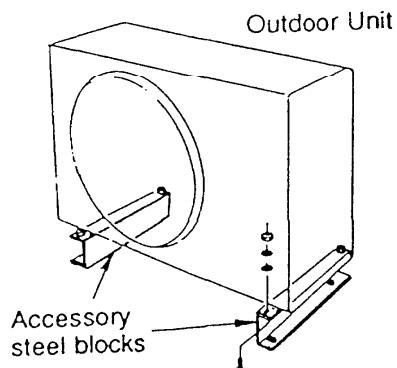


Fig. 5

## 2) Connecting Pipes between Indoor and Outdoor Units

1. Connect the indoor side refrigerant piping extended from the wall with the outdoor side piping tightly.
2. Flare nut on large dia. pipe should be torqued to 300 ~ 340 lb in. Flare nut small dia. pipe should be torqued to 130 ~ 170 lb in. Fig. 6
3. After performing a leak test on the connecting part insulation and finish with a vinyl masking tape over it. Fig. 7

**CAUTION**

Never connect up pipes by brazing them. If it is inevitable, be sure to blow nitrogen gas while brazing to avoid oxidation of inside copper pipes

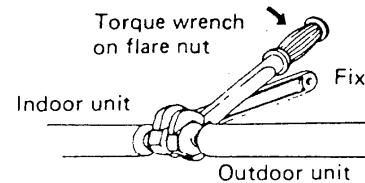


Fig. 6

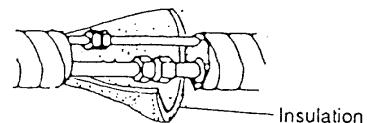


Fig. 7

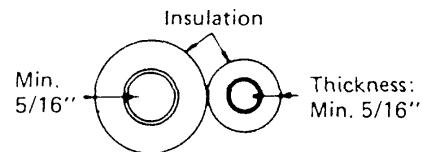


Fig. 8

## 3) Insulation of Refrigerant Piping

Because the capillary tube is installed in the outdoor unit, both wide and narrow pipes of this air conditioner become coil. Therefore, to prevent heat loss and wet floors due to dripping of condensation, both pipes must be well insulated with proper insulation material. Thickness of insulation material should be min. 5/16''. Fig. 8

## **12. CHECKING AND REPLACING ELECTRICAL COMPONENTS**

### **— Quick Access Index —**

	<b>Page</b>
1. Measurement of Insulation Resistance .....	61
2. Checking of the Motor Winding .....	62
3. Checking of the Motor Capacitor .....	62
4. Checking of the Relay .....	63
5. Checking of the Thermistor (PTC) .....	63
6. Checking of the Transformer .....	64
7. Checking of the 4-way valve .....	64
8. Checking of the Heater Protector .....	64
9. Checking of the Compressor Overload Relay .....	64
10. Checking of the Remote Control Unit Proper .....	65
11. Checking of the Continuity of Fuse on the P.C.B. Ass'y .....	67
12. Checking of the Output of the P.C.B. Ass'y for Fan Motor Terminals .....	67

## 1. Measurement of Insulation Resistance

- The insulation is in good condition if the resistance exceeds  $1 \text{ M}\Omega$

### 1-1 Power Supply Cords

Clamp the ground line of the Power Supply Cord with a lead clip of the insulation resistance tester and measure the resistance by placing a probe on either of the two power lines.

Then also measure the resistance between the ground line and the other power line. (Fig. 1)

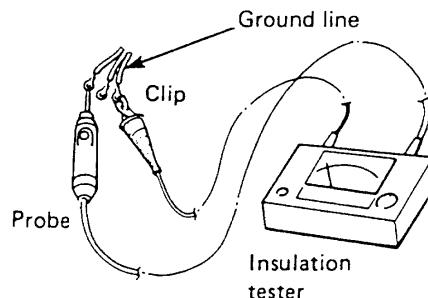


Fig. 1

### 1-2 Indoor Unit

Clamp the aluminum plate fin or copper tube with a lead clip of the insulation resistance tester and measure the resistance by placing a probe on ⑥, and then ⑦ on the terminal plate. (Fig. 2)

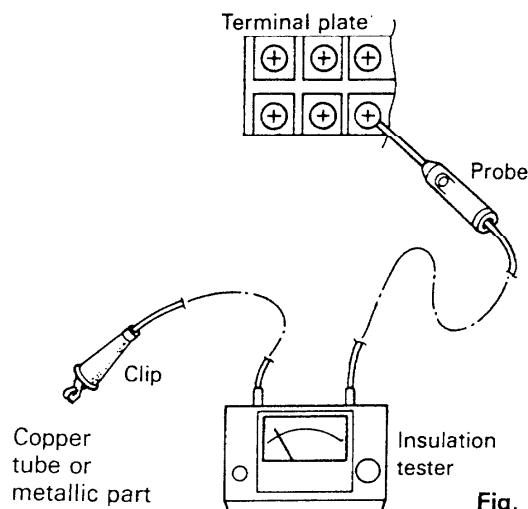


Fig. 2

### 1-3 Outdoor Unit

Clamp the metallic part of the unit with a lead clip of the insulation resistance tester and measure the resistance by placing a probe on ⑤, and then 2P-2 on the terminal plate. (Fig. 2)

### 1-4 Measurement of Insulation Resistance for Electric Parts.

Disconnect the lead wires of electric part from terminal plate, P.C.B. Ass'y or capacitor etc. Like remove the connector.

Then measure the insulation resistance by method of Fig. 1-4.

Refer to Electric Wiring Diagram.  
(See page 40.)

#### Note:

If the probe does not enter the pole because the hole is too narrow then use a probe with a thinner pin.

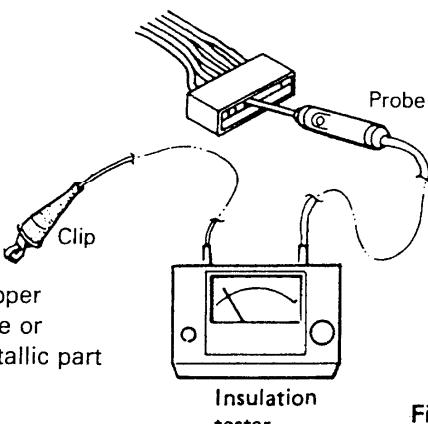


Fig. 3

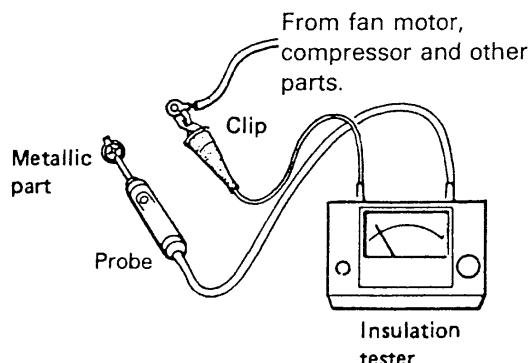


Fig. 4

## 2. Checking of the Motor Winding

- Refer to Major Component Specifications (Coil resistance)

### 2-1 Indoor Fan Motor

See page 2.

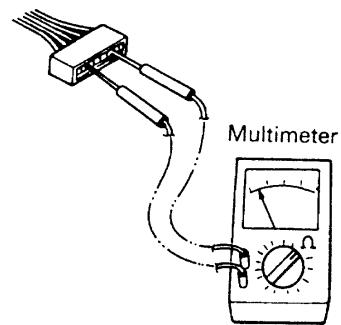


Fig. 5

### 2-2 Outdoor Fan Motor

See page 2.

### 2-3 Compressor Motor

Remove the terminal cover of the compressor motor, set the resistance measuring range of the multimeter to "X1Ω" and check the continuity between each pair out of the 3 terminals as indicated in Fig. 6.

See page 2.

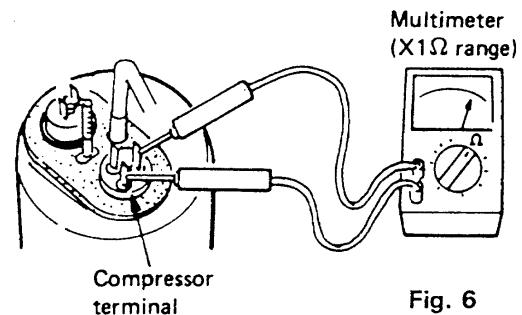


Fig. 6

## 3. Checking of the Motor Capacitor

Checking of any of the indoor fan motor capacitor, outdoor fan motor capacitor and compressor motor capacitor can be done by the same method.

Remove both the lead wire terminals connected to the capacitor, place the probe on the capacitor terminals as shown in the Fig. 7 and observe the deflection of the pointer, setting the resistance measuring range of the multimeter to the maximum value.

For good condition of the capacitor the pointer bounces to a great extent and then gradually returns to its original position.

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

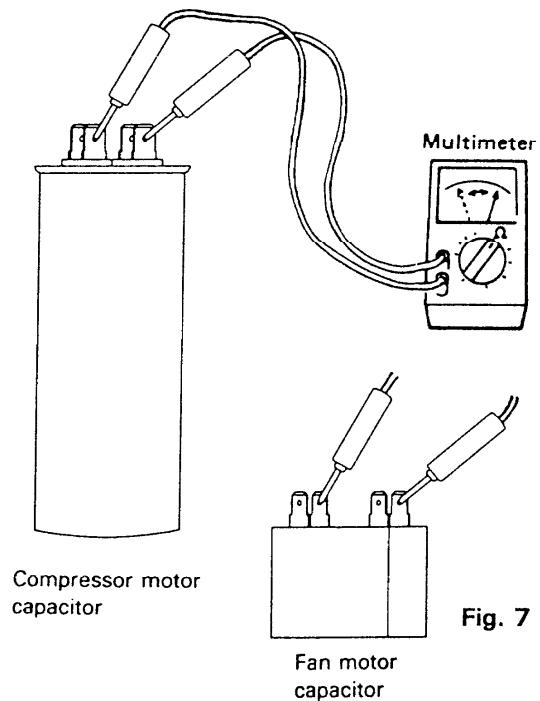


Fig. 7

#### 4. Checking of the Relay

- Refer to Other Component Specifications

See page 3.

G4E-2123T-US  
(Heater relay)

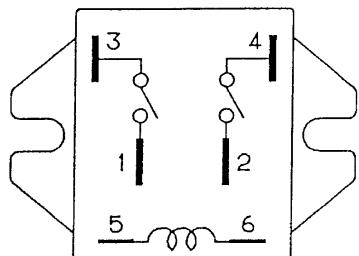


Fig. 8

DFU24D1-F(M)  
(Power relay)

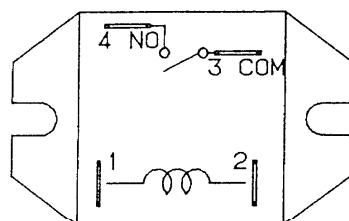


Fig. 9

#### 5. Checking of the Thermistor (PTC)

- Refer to Other Component Specifications.

See page 3.

TDK101YV

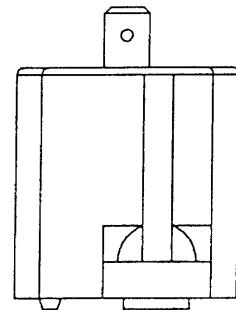
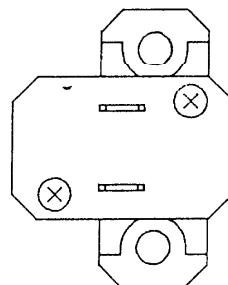


Fig. 10

## **6. Checking of the Transformer**

- Refer to Other Component Specifications

See page 3.

## **7. Checking of the 4-way valve**

- Refer to Other Component Specifications.

See page 4.

## **8. Checking of the Heater Protector**

- Refer to Other Component Specifications.

See page 4.

## **9. Checking of the Compressor Overload Relay**

Remove both lead wires connected to the compressor overload relay. Set the resistance measuring range of the multimeter to "X1Ω" and check the continuity between terminals of the overload relay. After leaving the Compressor Overload Relay at room temperature at least half an hour perform the measurement.

## 10. Checking of the Remote Control Unit Proper

(Check each item, referring to the P.C.B. Ass'y and the circuit diagrams)

### A. Caution: Use of the Test Switch (RUN/TEST RUN)

"TEST RUN" shows the position to run the air conditioner for the test at the installment.

If this operation is continued for a long time, there would be a bad effect on the air conditioner because of over-cooling. Therefore, use this switch only for checking, and in any case, **DO NOT KEEP ON COOLING FOR MORE THAN 15 MIN. UNDER TEST RUN MODE.**

When the checking is over, **TURN THE SWITCH BACK TO ITS ORIGINAL POSITION (= RUN) WITHOUT FAIL.**

### B. Checking of the Items of the Remote Control Unit

At first, pull out the connector (12P) of the remote control unit from the P.C.B. ass'y of the unit.

#### (1) Checking of the Room Temperature Sensor

Measure the resistance between No. 5 and No. 6 connectors.

#### **NOTE :**

If the probe does not enter the pole because the hole is too narrow then use a probe with a thinner pin.

(For an ambient temperature of 77°F the resistance is about 5 kΩ).

#### (2) Fan Speed Selector

Check the continuity of the connector No. 3 and No. 4 against No. 10 (place the positive (+) probe on No. 10 and negative (-) probe on No. 3 and then No. 4).

Checking points	Position of the selector			
	High	Med.	Low	Auto
10 - 3	NO	YES	YES	NO
10 - 4	YES	YES	NO	NO

NOTE: YES ..... Continuity (Table-1)  
NO ..... Discontinuity

#### (3) Checking of the Operation

Measure the continuity between No. 11, 12 and No. 9 (placing the positive (+) probe).

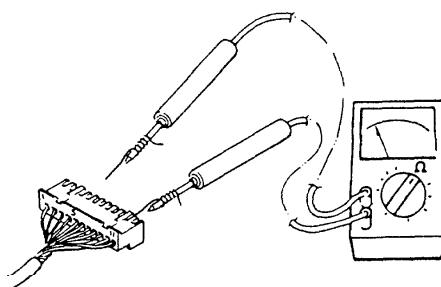


Fig. 11

Checking points	Position of the selector		
	Fan	Cool	Heat
9 - 11	NO	NO	YES
9 - 12	NO	YES	YES

(Table-2)

NOTE: YES ..... Continuity  
NO ..... Discontinuity

**(4) Checking of the Selector**

Check the continuity of the connectors No. 1, 2 and 3 (placing the negative (-) probe) against No. 9 (placing the positive (+) probe).

Connector No.	Position of the Selector					
	MANUAL		ENERGY SAVER	NIGHT SETBACK	TIMER	
	ON	OFF			ON	OFF
9 - 3	NO	NO	NO	NO	YES	NO
9 - 1	NO	NO	YES	YES	YES	YES
9 - 2	NO	YES	YES	YES	NO	NO

NOTE  
YES ..... Continuity  
NO ..... Discontinuity

(Table-3)

**(5) Checking of the Operation Button**

The operating switch is in good working condition if there is continuity between No. 4 (placing the negative (-) probe) and No. 9 (placing positive (+) probe) while the button is pressed.

**(6) Checking of the Timer**

Measure the continuity between No. 4, 3, 1, 2 and No. 8 (placing the positive (+) probe).

Connector No.	Position of the Selector											
	1	2	3	4	5	6	7	8	9	10	11	12
8 - 4	-	-	-	-	-	-	-	-	Y	Y	Y	Y
8 - 3	-	-	-	-	Y	Y	Y	Y	Y	Y	Y	Y
8 - 1	-	-	Y	Y	Y	Y	-	-	-	-	Y	Y
8 - 2	-	Y	Y	-	-	Y	Y	-	-	Y	Y	-

Y for YES = There is continuity.

(Table-4)

**(7) Checking of the Thermostat**

Measure the continuity between No. 4, 3, 1, 2 and No. 7 (placing the positive (+) probe).

Connector No.	Position of the Selector											
	63	65	67	69	71	73	75	77	79	81	83	
7 - 4	-	-	-	-	-	Y	Y	Y	Y	Y	Y	Y
7 - 3	-	Y	Y	Y	Y	Y	Y	Y	Y	-	-	-
7 - 1	Y	Y	Y	-	-	-	-	Y	Y	Y	Y	Y
7 - 2	-	-	Y	Y	-	-	Y	Y	-	-	-	Y

Y for YES = There is continuity.

(Table-5)

If there is abnormality during checking at any of the above step from (1) to (7), replace the remote control unit as it is.

**CAUTION:**

Do not disassemble the Remote Control Unit.

It is supplied as a complete assembly and is carefully adjusted in the factory by skillful workmanship.  
Inexperienced disassembly will cause trouble and malfunction in the unit.

## 11. Checking of the Continuity of Fuse on the P.C.B. Ass'y

Check the continuity by the multimeter as shown in Fig. 12

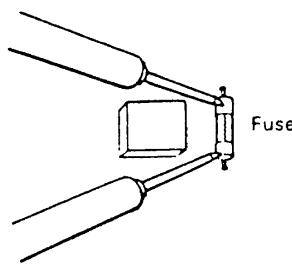


Fig. 12

### NOTE Method to Replace Fuse on the P.C.B. Ass'y

1. Remove the P.C.B. ass'y.
2. Pull out the fuse at the metal clasp by a pair of pliers while heating the soldered leads on the back side of the P.C.B. ass'y with a soldering iron (30W or 60W). Fig. 13
3. Remove the fuse ends one by one. For replacement, insert a fuse of the same rating and solder it.  
(Allow time to radiate heat during soldering so that the fuse does not melt).

**CAUTION** : Be sure to replace the varistor adjacent to the fuse when the fuse is blown.

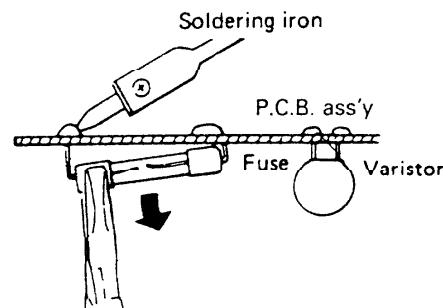


Fig. 13

## 12. Checking of the Output of the P.C.B. Ass'y for Fan Motor Terminals

Take out the fan motor connector from P.C.B. Ass'y and be sure that there is no danger of short circuit in other parts before supplying electricity to the unit. After that, supply electricity to the unit and set the selector to "MANUAL". Then, turn on the operation switch.

Now measure the voltage between these pins by the multimeter. The P.C.B. Ass'y is in good working condition if the voltage output becomes same as those shown in the below tables.

Pair of Pins	FAN		
	Low	Med.	High
1—3	*	0	0
1—5	0	*	0
1—4	0	0	*

\* Line voltage

(Table-6)

## 13. DISASSEMBLY PROCEDURES

### — Quick Access Index —

	Page
<b>INDOOR UNIT</b>	
1. Casing — Removal .....	69
2. Electrical Component Box .....	69
— Access and Removal —	
3. P.C.B. Ass'y — Removal .....	69
4. Evaporator (= Indoor Heat Exchanger) — Removal .....	70
5. Fan and Fan Motor — Removal .....	70
6. Heater Thermal Protector — Removal .....	71
7. Electric Heater — Removal .....	71
<b>OUTDOOR UNIT</b>	
8. Casing — Removal .....	72
9. Fan and Fan Motor — Removal .....	72

# INDOOR UNIT KMH0912W/KMH0912X

## 1. Casing — Removal

- 1) Remove two screws holding the casing to the indoor unit.
- 2) Pull up the casing by hand, press down on tabs on top, then withdraw the casing by pulling it back straight. Fig. 1 .

### NOTE

When replacing the removed casing as it was before, push two positions as shown in Fig. 1 ② until the casing clicks properly.

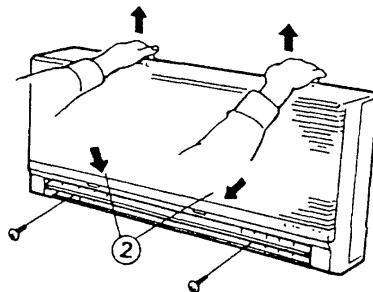


Fig. 1

## 2. Electrical Component Box — Access and Removal

- 1) Remove casing.
- 2) Disengage the electrical component box by the following procedure.

### CAUTION

: Before accessing inside the electrical component box, be sure to check that power to the unit is disconnected.

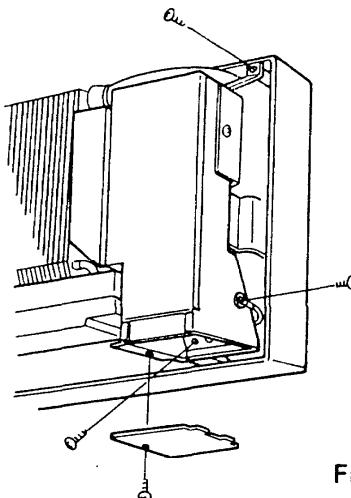


Fig. 2

## 3. P.C.B. Ass'y — Removal

- 1) Disconnect all connectors from P.C.B.
- 2) Pull the P.C.B. Ass'y. Fig. 3

Electrical component box

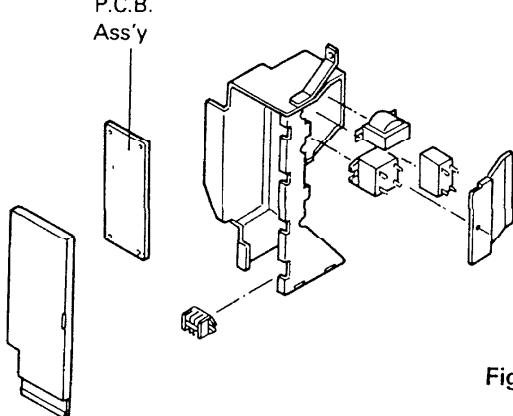


Fig. 3

#### 4. Evaporator (= Indoor Heat Exchanger) — Removal

- 1) Remove the electrical component box.
- 2) Remove the drain pan ass'y by unfastening two screws.
- 3) Loosen the fixing screws of the evaporator mounting plates **(A)** and fan motor mounting plate **(B)**, and remove them respectively.
- 4) Lift up the evaporator with both hand, then withdraw the evaporator together with the piping.  
(If the piping is fixed with a clamp or saddle, first remove the clamp.)

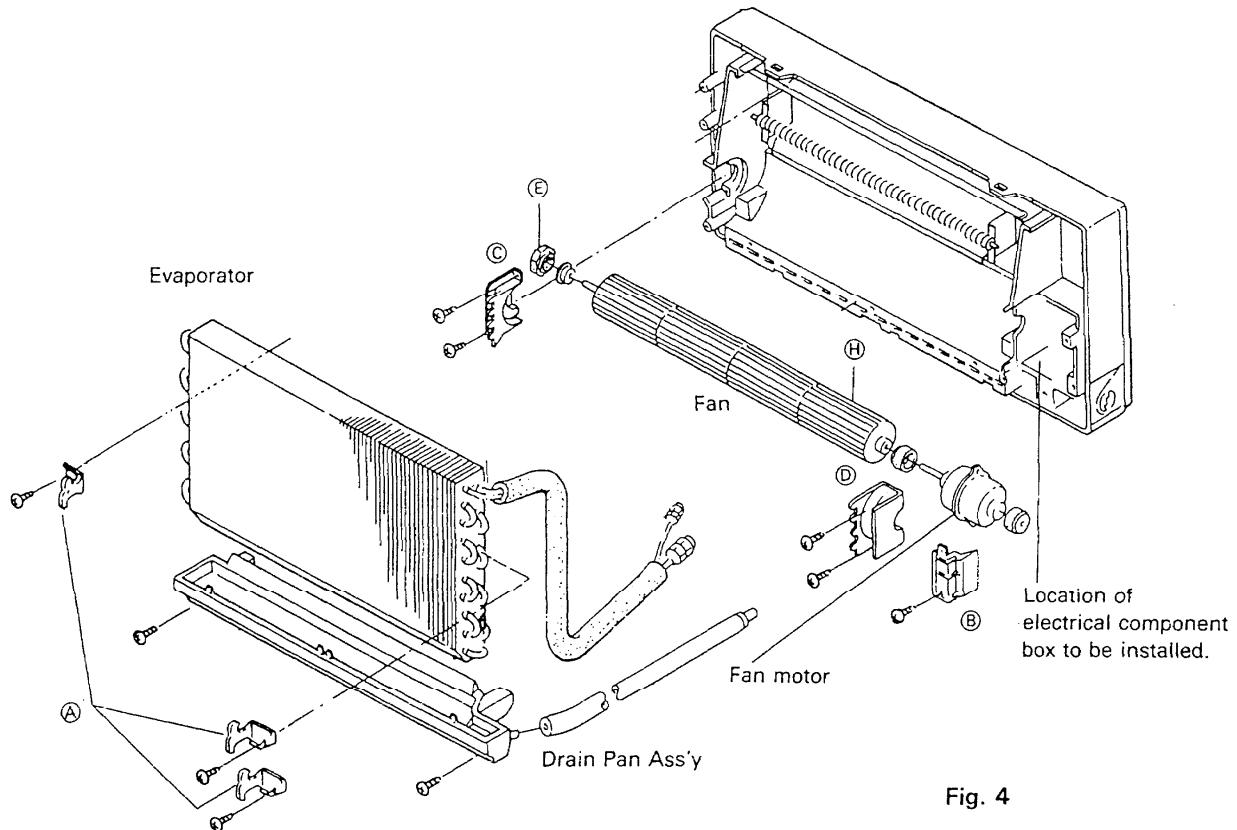


Fig. 4

#### 5. Fan and Fan Motor — Removal

- 1) As shown in Fig. 4 loosen the screws of the plastic mounting plates **(C)** and **(D)** which secure the fan, using a Phillips screwdriver, then remove the fan and fan motor.
- 2) When withdrawing the fan from the motor, first loosen the fan fixing bolts using a hexagonal key **(H)**.
- 3) Withdraw the Bearing Ass'y **(E)** retaining the left side of the fan, by hand, then pull the fan to the left and withdraw it from the motor shaft.

## 6. Heater thermal protector — Removal

- 1) Alternately remove the left and right claws of the upper plate  $\textcircled{K}$  of the evaporator. (When the evaporator is in place, the upper plate  $\textcircled{K}$  of the evaporator can be removed more easily by loosening the screws of the evaporator mounting plate and creating extra space above the evaporator.)

Note:

At the time of reinstallation, confirm that the claws securely engage the catches.

- 2) Remove the thermostat mounting plate after removing the screws at the right and the left. Fig. 5

## 7. Electric Heater — Removal

- 1) Remove the evaporator.
- 2) Remove the wiring connection screws on both sides of the heater  $\textcircled{J}$ .
- 3) Remove the screws of the heater mounting plate  $\textcircled{I}$ , and separate the installation fittings from the heater. Fig. 5

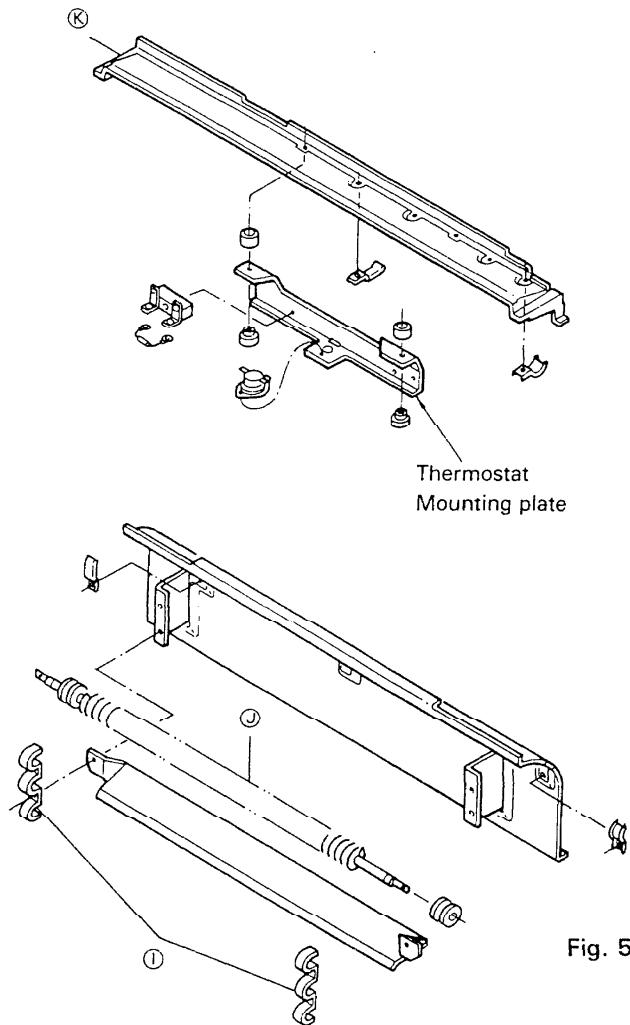


Fig. 5

## OUTDOOR UNIT CMH1812

### 8. Casing — Removal

Remove the casing by removing fixing screws using a Phillips screwdriver. Fig. 6.

**NOTE** When working only on the wiring, it is possible to gain access to the wiring terminals by simply removing the Side Panel (A). Fig. 7.

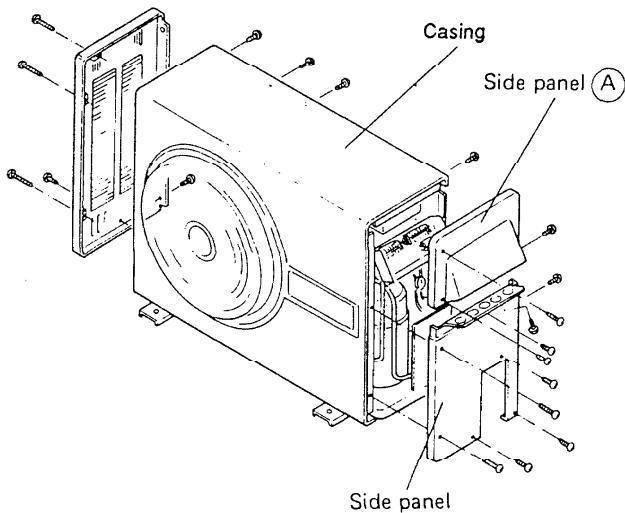


Fig. 6

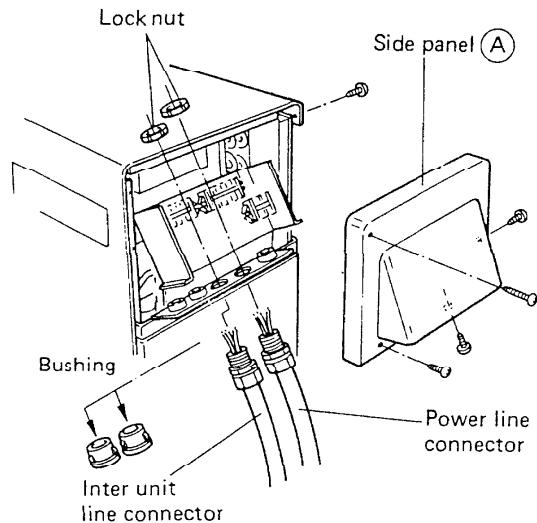


Fig. 7

### 9. Fan and Fan Motor — Removal

- (1) Remove the fan by removing the propeller fan fixing screw A using a straight blade screwdriver. Refer to Fig. 8.
- (2) Using a pincher, cut the plastic wire ties fixing the fan motor lead wires connected to fan motor capacitor or other terminals.
- (3) Using a Phillips screwdriver, remove the three fixing screws of the fan motor, then withdraw the fan motor.

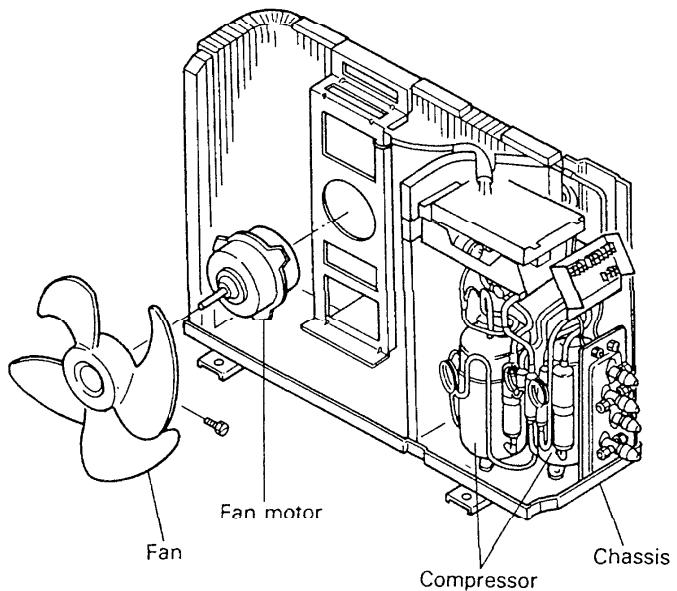


Fig. 8

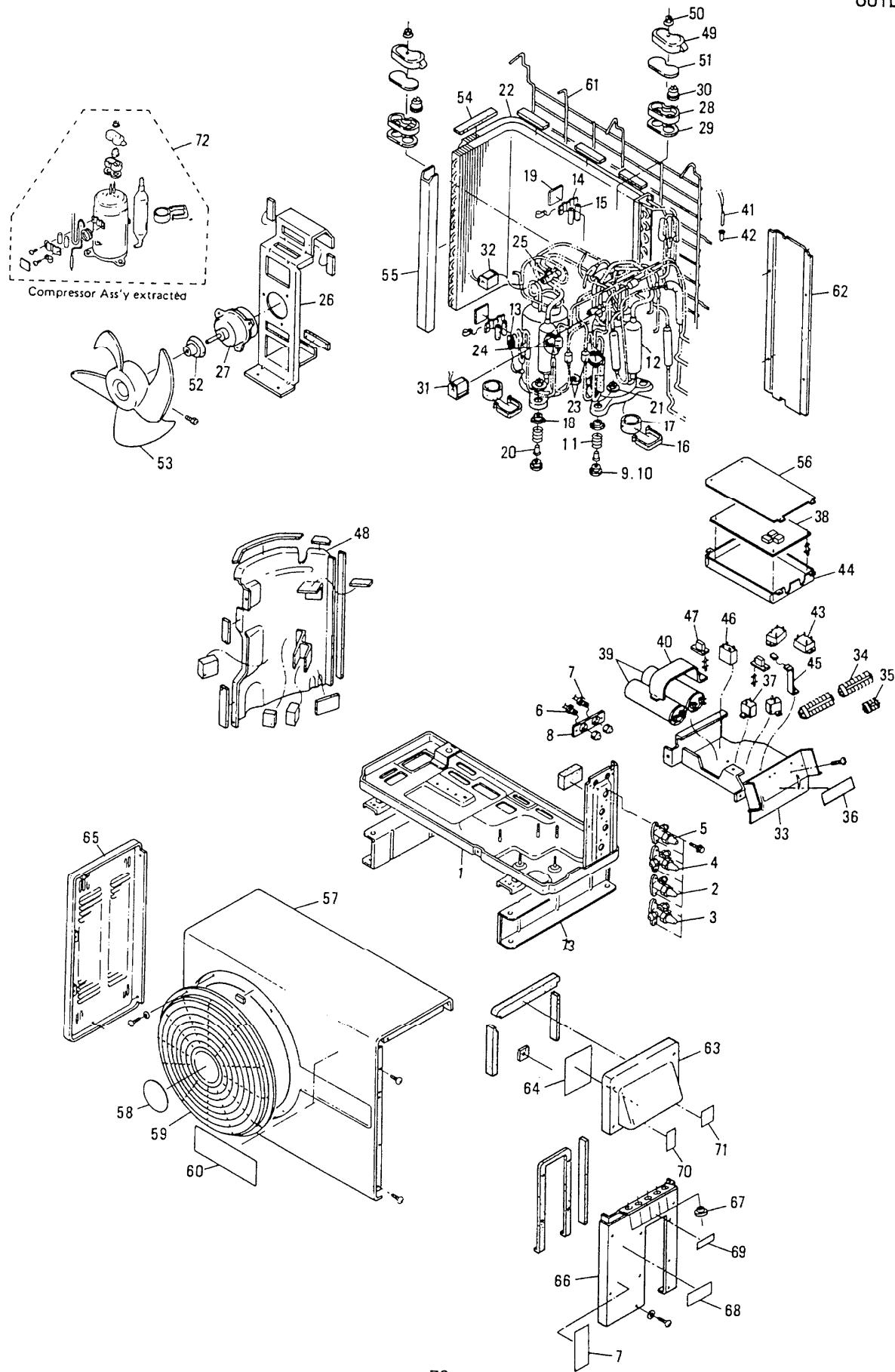
## ATTENTION !

To ensure correct parts supply, please let us know followings,  
when you make service parts order:

1. Part No. 2. Description 3. Q'ty 4. Volts-Hz-Ph 5. Product Model No.

Key No.	Part No.	Description	Q'ty
51	623 099 4270	Cover Plate Ass'y (incl. No. 52, 53)	1
52	623 098 8460	Elec. Wiring Diagram	1
53	623 090 7331	Label	1
54	623 050 2475	Rear Panel	1
55	623 099 4287	Grille Ass'y (incl. No. 56~70)	1
56	623 097 9918	Sash Grille	1
57	623 097 3954	Ornamental Plate Ass'y (incl. No. 58~66)	1
58	623 097 3961	Blade	12
59	623 097 3978	Mounting Blade	1
60	623 097 3985	Mounting	4
61	623 097 3992	Flap	1
62	623 097 6610	Mounting	1
63	623 049 1465	Mounting	1
64	623 096 1784	Mounting	2
65	623 096 4242	Cap	6
66	623 097 3882	Wire	3
67	623 097 4005	Ornamental Plate	1
68	623 097 4012	Air Filter Ass'y	2
69	623 097 4029	Handle	2
70	623 097 8584	Indicator Plate	1
71	623 098 8545	Name Plate	1
•	623 098 8484	Installation Instructions	1
•	623 098 8491	Operation Manual	1

NOTE: Metal and plastic parts will be supplied basically  
with necessary heat insulation pads or packing.



ATTENTION !

To ensure correct parts supply, please let us know followings,  
when you make service parts order:

1. Part No. 2. Description 3. Q'ty 4. Volts-Hz-Ph 5. Product Model No.

Key No.	Part No.	Description	Q'ty
1	623 099 4294	Bottom Plate Ass'y	1
2	623 043 2338	Valve Ass'y 1/4 in.	1
3	623 043 2345	Valve Ass'y 3/8 in.	1
4	623 043 2352	Valve Ass'y 3/8 in.	1
5	623 043 2390	Valve Ass'y 1/4 in.	1
6	623 090 7201	Nipple Ass'y	1
7	623 088 9934	Nipple Ass'y	1
8	623 050 6091	Mounting Plate	1
9	623 035 0052	Cushion Rubber	4
10	623 035 0113	Cushion Rubber	2
11	623 034 5799	Spring	6
12	623 043 6718	Accumulator Ass'y	2
13	623 099 4300	Capillary Tube	2
14	623 050 5735	Mounting Plate	2
15	623 051 0128	Packing	4
16	623 051 3086	Band Mounting	2
17	623 051 1705	Packing	2
18	623 035 0106	Cushion Rubber	6
19	623 051 0159	Packing	2
20	623 031 9875	Stopper	6
21	623 029 6534	Nut Special Ass'y	6
22	623 098 8583	Condenser Ass'y	1
23	623 043 4202	Strainer Ass'y	3
24	623 030 1764	Strainer Ass'y	1
25	623 088 9941	Solenoid Valve Ass'y CHV-01U1	2
26	623 051 3204	Mounting Plate Ass'y, Fan Motor	1
27	623 099 4348	Pan Motor Ass'y SGS-5106P	1
28	626 040 0680	Cover Terminal	2
29	626 040 0291	Gasket Terminal	2
30	626 100 1060	Relay MRA98735-9201	2
31	623 099 4355	Solenoid Ass'y CHV-01A0020UA1	1
32	623 099 4362	Solenoid Ass'y CHV-01A0020UA1	1
33	623 090 7218	Elec. Component Box Ass'y	1
34	623 090 7225	Terminal Base KTU15N-7J	2
35	623 003 3061	Terminal Base JTU30-2	1
36	623 099 4379	Label	1
37	626 100 0056	Thermistor TDK 101Y-A	2
38	623 088 6797	P.C.B. Ass'y POW-186CMH	1
39	623 090 7232	Fixed Capacitor WME-RS 370V 17.5MFD	2
40	623 054 8183	Clip, Capacitor	1
41	623 099 4386	Thermistor Ass'y PBC-41E-S15	1
42	623 054 9012	Clip, Wire	1
43	623 002 4762	Relay DFU24D1-F(M)	2
44	623 090 7249	Cover Plate	1
45	623 055 1787	Mounting Plate	1
46	623 001 1816	Fixed Capacitor 440V 2MFD	1
47	623 088 7022	P.C.B. Ass'y POW-186CMH-S	2
48	623 090 7263	Partition Plate Ass'y	1
49	626 040 0802	Cap Terminal Cover	2
50	626 040 0956	Nut, Compressor	2

NOTE: Metal and plastic parts will be supplied basically  
with necessary heat insulation pads or packing.

ATTENTION !

To ensure correct parts supply, please let us know followings,  
when you make service parts order:

1. Part No. 2. Description 3. Q'ty 4. Volts-Hz-Ph 5. Product Model No.

Key No.	Part No.	Description	Q'ty
51	626 040 0482	Cover Gasket	2
52	623 053 2496	Cover Rubber	1
53	623 041 8752	Propeller Fan Ass'y	1
54	623 051 1514	Packing	4
55	623 051 5642	Cover	1
56	623 090 7270	Cover Plate	1
57	623 044 0845	Cabinet	1
58	623 089 0367	Mark	1
59	623 040 9682	Guard Ass'y	1
60	623 090 7287	Mark	1
61	623 040 9675	Guard Ass'y	1
62	623 044 4539	Rear Panel	1
63	623 090 7294	Side Panel Ass'y	1
64	623 098 8651	Elec. Wiring Diagram	1
65	623 040 8388	Side Panel Ass'y	1
66	623 090 7317	Side Panel Ass'y (incl. No. 67)	1
67	623 088 3432	Bushing	5
68	623 098 8644	Name Plate	1
69	623 092 5984	Label	1
70	623 084 8269	Label	1
71	623 090 7331	Label	1
72	623 090 8081	Compressor Ass'y (80671746)	2
73	623 099 5949	Leg Pedestal	2

NOTE: Metal and plastic parts will be supplied basically  
with necessary heat insulation pads or packing.