

# SERVICE MANUAL (Expanded Information)

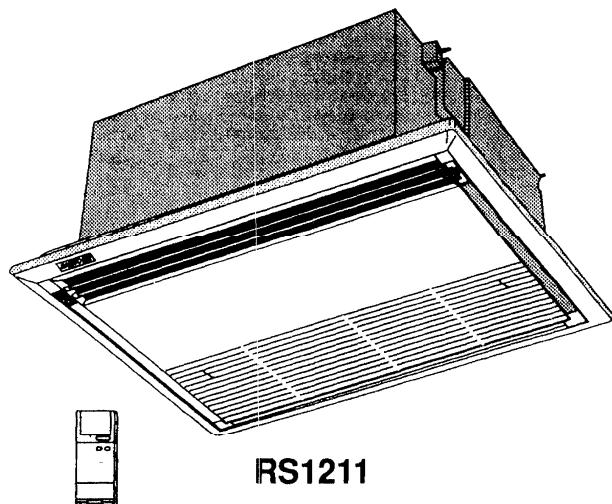
**RS1211**

**C1211  
CL1211**

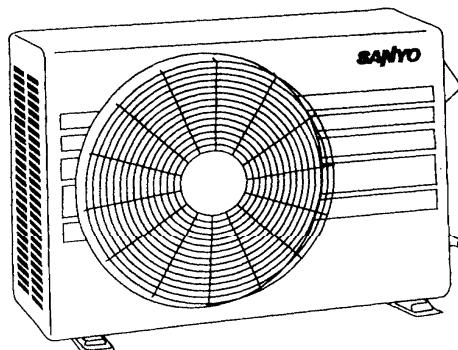
**SANYO**

## SPLIT SYSTEM AIR CONDITIONER

Indoor Unit



Outdoor Unit



**C1211 / CL1211**

# **SERVICE MANUAL**

**RS1211** —  **C1211**  
**CL1211**

**(Expanded Information)**

## **IMPORTANT!** **Please Read Before Starting**

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

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

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



#### **WARNING:**

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



#### **CAUTION:**

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

### **If Necessary, Get Help**

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

### **In Case of Improper Installation**

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

## **SPECIAL PRECAUTIONS**

### **When Wiring**

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

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

### **When Transporting**

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

### **When Installing ...**

#### **...In a Ceiling or Wall**

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

#### **...In a Room**

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

#### **...In Moist or Uneven Locations**

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

#### **...In an Area with High Winds**

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

#### **...In a Snowy Area (for Heat Pump-type Systems)**

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

### **When Connecting Refrigerant Tubing**

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

#### **NOTE:**

Depending on the system type, liquid and gas lines may be either narrow or wide. Therefore, to avoid confusion the refrigerant tubing for your particular model is specified as either "narrow" or "wide" rather than as "liquid" or "gas."

### **When Servicing**

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

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# 1. SPECIFICATIONS

## 1-1 Unit Specifications

Model No.		Indoor unit	RS1211
		Outdoor unit	C1211, CL1211
Performance	Capacity	BTU/h kW	Cooling 11,500 3.37
	Air circulation (High)	cu. ft./min.	280
	Moisture removal (High)	pints/h	3.1
	Phase, Frequency	Hz	Single, 60
Electrical Rating	Voltage rating	V	115
	Available voltage range	V	103 to 127
	Running amperes	A	11.2
	Power input	W	1,200
	Power factor	%	93
	Starting amperes	A	60
	S. E. E. R.	BTU/Wh	10.0
	Controls		Microprocessor
Features	Control unit		Wireless remote control unit
	Temperature control		IC thermostat
	Timer		ON/OFF, 24-hours & Program
	Fan speeds	Indoor / Outdoor	3 and Auto / 1 (CL1211 Auto)
	Air deflector	Horizontal / Vertical	— / Manual
	Air filter		Washable, easy access
	Compressor		Rotary
	Refrigerant amount charged at shipment	lbs. (kg)	R22: 2.66 (1.2)
	Refrigerant control		Capillary tube
	Refrigerant tubing connections		Flare type
	Operation sound	In-Hi / Me / Lo Out-Hi	dB-A 45 / 43 / 41 49
	Max. allowable tubing length at shipment	ft. (m)	33 (10)
	Limit of tubing length	ft. (m)	65 (20)
	Limit of elevation difference between the 2 units	ft. (m)	Outdoor unit is higher than indoor unit: 23 (7) Outdoor unit is lower than indoor unit: 23 (7)
	Refrigerant tube o.d.	Narrow tube Wide tube	in. (mm) 1/4 (6.35) 1/2 (12.7)
	Refrigerant tube kit		Optional
	Accessories		Mounting bracket
Dimensions & Weight			Indoor unit
	Height	in. (mm)	12-5/8 (320)
	Width	in. (mm)	31-29/32 (810)
	Depth	in. (mm)	24-13/32 (620)
	Net weight	lbs. (kg)	68 (30.8)
	Shipping volume	cu. ft. (cu. m)	11.7 (0.329)
Shipping weight		lbs. (kg)	99 (44.6)
Outdoor unit			90.4 (41)
			6.7 (0.19)
			97.1 (44)

DATA SUBJECT TO CHANGE WITHOUT NOTICE.

**Remarks:** Rating conditions are: Outside air temperature 95°F DB/75°F WB

Indoor unit entering air temperature 80°F DB/67°F WB

## 1-2 Major Component Specifications

### (1) Indoor and Outdoor Units

#### (a) RS1211 (Indoor unit)

Unit Model No.			RS1211
Remote Control Unit			RCS-KS0911
Controller PCB			POW-RS1211
Control circuit fuse			250V, 3A
Switch Ass'y			SW-TS2422
Panel			RS1211RW
Indicator Lamp Ass'y			IND-TS2422
Fan	Type	Centrifugal	
	No. ... Dia. and length	in. (mm)	1 ... O.D. 7 (180), L 9 (230)
Fan Motor	Model ... Number	KFH6Q-31A1P ... 1	
	No. of pole ... rpm (115V, High)	6 ... 1,030	
	Nominal output	W(H.P.)	30 (1/25)
	Coil resistance (Ambient temp. 68°F)	Ω	BLU - BRN: 40.3 BLU - VLT: 15.3 VLT - ORG: 13.9 ORG - YEL: 175.4 BLU - PNK: 49.3
	Safety devices	Type	Internal type
	Operating temp.	Open °F	248 ± 9
		Close °F	171 ± 27
	Run capacitor	μF	8
		VAC	220
	Model	WP20SL-4	
Louver Motor	Rating	115V, 60Hz	
	Output	W	3
	Coil resistance (at 68°F)	Ω	35.3
Heat Exch.	Coil	Aluminum plate fin / Copper tube	
	Rows ... Fins per inch	3 ... 14.1	
	Face area	ft. <sup>2</sup> (m <sup>2</sup> )	1.29 (0.12)

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(b) C1211 (Outdoor unit)

Unit Model No.				C1211		
Fuse				AC 250V, 3A		
				Rotary (hermetic)		
Type				C-R91H2Q ... 1		
Model ... Number				1 ... 3,500		
No. of cyl. ... rpm				900 (1-1/5)		
Nominal output W (H.P.)				650		
Compressor lubricant cc				C - R: 0.58		
Coil resistance $\Omega$				C - S: 2.80		
(Ambient temp. 77°F)						
Compressor	Type	Internal type		External type		
	Overload relay models			MRA98693-9200		
Safety devices	Operating temp.	Open	$^{\circ}\text{F}$	—		
		Close	$^{\circ}\text{F}$	—		
Operating amp. (Ambient temp. 77°F)				—		
				Trips in 6 to 16 sec. at 43A		
Run capacitor $\mu\text{F}$				35		
Run capacitor VAC				330		
Crank case heater				—		
Fan	Type	Propeller				
	Number ... dia.	in. (mm)		1 ... 15-3/4 (400)		
Model				FT6-21C1PE		
No. of pole ... rpm (115V, High)				6 ... 820		
Nominal output W (H.P.)				20 (1/38)		
Coil resistance $\Omega$				BLU - BRN: 35.2		
(Ambient temp. 68°F)				BLU - PNK: 43.4		
Fan Motor	Type	Internal type				
	Operating temp.	Open	$^{\circ}\text{F}$	266 $\pm$ 14		
		Close	$^{\circ}\text{F}$	174 $\pm$ 27		
Run capacitor $\mu\text{F}$				8		
Run capacitor VAC				220		
Heat Exch.	Coil	Aluminum plate fin / Copper tube				
	Rows ... Fins per inch	2 ... 15.9				
	Face area ft. <sup>2</sup> (m <sup>2</sup> )	3.46 (0.32)				
External Finish				Acrylic baked-on enamel finish		

DATA SUBJECT TO CHANGE WITHOUT NOTICE.

(c) CL1211 (Outdoor unit)

Unit Model No.				CL1211
Fuse				AC 250V, 3A
Controller PCB				POW-123CL
Control circuit fuse				AC 125V, 4A
Compressor				
Type				Rotary (hermetic)
Model ... Number				C-R91H2Q ... 1
No. of cyl. ... rpm				1 ... 3,500
Nominal output				W (H.P.) 900 (1-1/5)
Compressor lubricant				cc 650
Coil resistance				Ω C - R: 0.58
(Ambient temp. 77°F)				C - S: 2.80
Safety devices				Type Internal type External type
Overload relay models				MRA98693-9200
Safety devices	Operating temp.	Open	°F	—
		Close	°F	—
Operating amp. (Ambient temp. 77°F)				— Trips in 6 to 16 sec. at 43A
Run capacitor				μF 35 VAC 330
Crank case heater				115V, 20W
Fan				Propeller
Number ... Dia.				in. (mm) 1 ... 15-3/4 (400)
Fan Motor				
Model				FT6-21C1PE
No. of pole ... rpm (115V, High)				6 ... 820
Nominal output				W (H.P.) 20 (1/38)
Coil resistance				Ω BLU - BRN: 35.2
(Ambient temp. 68°F)				BLU - PNK: 43.4
Safety devices				Type Internal type
Safety devices	Operating temp.	Open	°F	266 ± 14
		Close	°F	174 ± 27
Run capacitor				μF 8 VAC 220
Heat Exch.				Aluminum plate fin / Copper tube
Coil				
Rows ... Fins per inch				2 ... 15.9
Face area				ft. <sup>2</sup> (m <sup>2</sup> ) 3.46 (0.32)
External Finish				Acrylic baked-on enamel finish

DATA SUBJECT TO CHANGE WITHOUT NOTICE.

### 1-3 Other Component Specifications

#### (I) Indoor Unit

<b>Transformer</b>		<b>ATR-H121U</b>
Rated	Primary	AC 115V, 60Hz
	Secondary	19V, 0.63A
	Capacity	7VA
Coil resistance	$\Omega$ (at 77°F)	Primary (WHT – WHT): 85.5 ± 15% Secondary (BRN – BRN): 3.4 ± 15%
Thermal cut-off temp.		259°F, 2A, 250V
<b>Thermistor (coil sensor)</b>		<b>PBC-41E-S15</b>
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%
<b>Thermistor (room sensor)</b>		<b>SDT-500B-6</b>
Resistance	kΩ	50°F 10.3 ± 4%      86°F 4.0 ± 4% 59°F 8.0 ± 4%      104°F 2.6 ± 4% 68°F 6.3 ± 4%      122°F 1.8 ± 4% 77°F 5.0 ± 4%
<b>Relay</b>		<b>G4F-11123T-TS</b>
Coil rating		DC 12V
Coil resistance	$\Omega$ (at 77°F)	160 ± 10%
Contact rating		AC 250V, 20A
<b>Float Switch</b>		<b>FS-3502-201</b>
Contact rating		DC 200V, 1A
Operation	Liquid surface	Down      ON Up      OFF

## (2) Outdoor Unit

### CL1211

Transformer		ATR-J71U
Rated	Primary	AC 115V, 60Hz
	Secondary	19V, 0.37A
	Capacity	7VA
Coil resistance	$\Omega$ (at 73°F)	Primary (WHT – WHT): 85.5 ± 15% Secondary (BRN – BRN): 3.4 ± 15%
Thermal cutoff temp.		259°F, 2A, 250V

### CL1211

SSR (solid state relay)		G3L-205TL-TS1
Input		DC 12V
	Rating voltage	DC 0 to 6.4V
	Control voltage range	AC 75 to 264V, 60Hz
Load voltage range		

### CL1211

Auxiliary Relay		MY2F-T1-USTS
Coil rating		AC 110/120V, 60Hz
Coil resistance	$k\Omega$ (at 77°F)	18.8 ± 15%
Contact rating		AC 100V, 5A

### CL1211

Relay		MY2F-T1-USTS
Coil rating		DC 24V
Coil resistance	$k\Omega$ (at 77°F)	650 ± 15%
Contact rating		AC 100V, 5A

### CL1211

Thermistor		PBC-41E-S8, PBC-41E-S15
Resistance	$k\Omega$	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%

### C1211 and CL1211

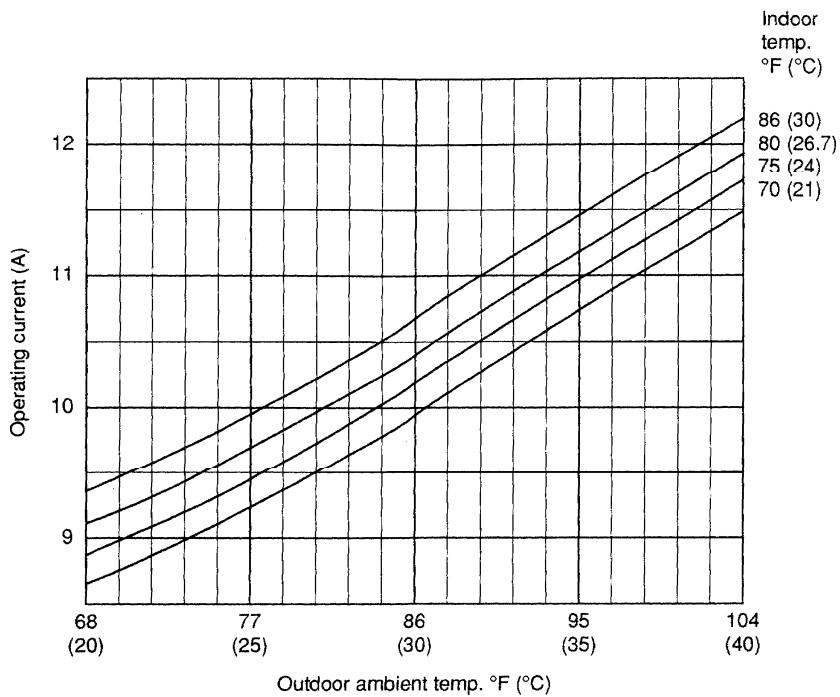
PTC (Thermistor)		PS2A E20-470
Resistance	$\Omega$ (at 77°F)	47 ± 25%

## 2. PERFORMANCE CHARTS

### 2-1 Operating Current

Operating current characteristics versus outdoor ambient temperature and indoor temperature  
(Indoor relative humidity: 50%, Indoor fan speed: High)

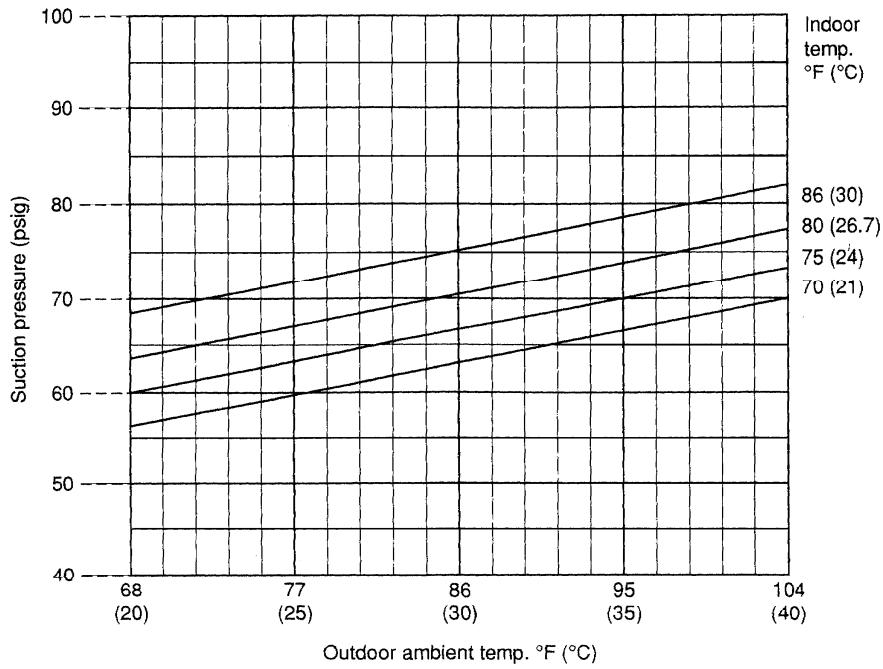
115V



### 2-2 Low Pressure

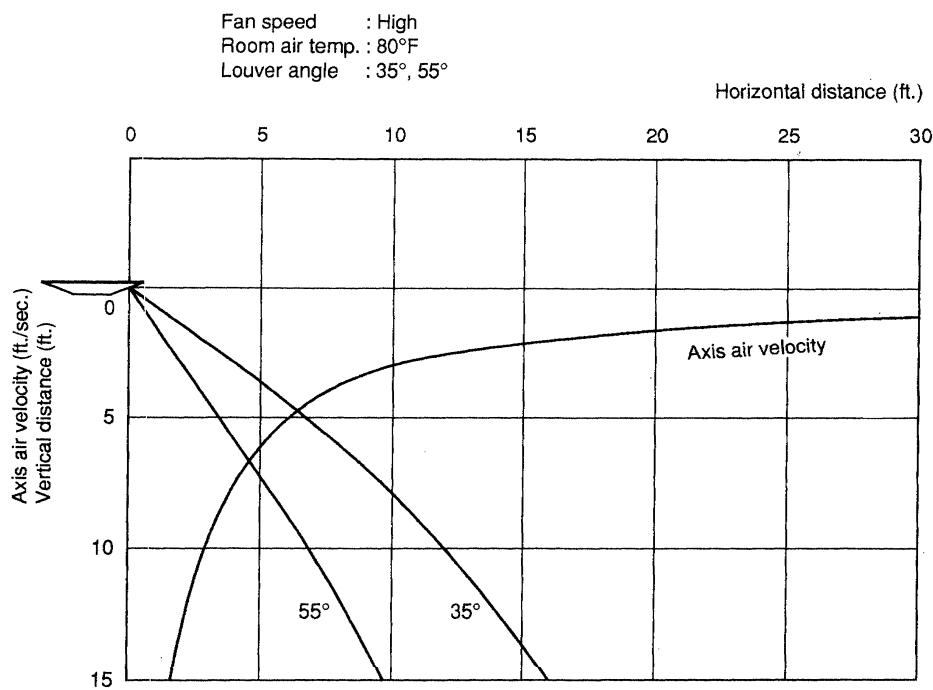
Low pressure characteristics versus outdoor ambient temperature and indoor temperature  
(Indoor relative humidity: 50%, Indoor fan speed: High)

115V



### 3. AIR THROW DISTANCE CHART

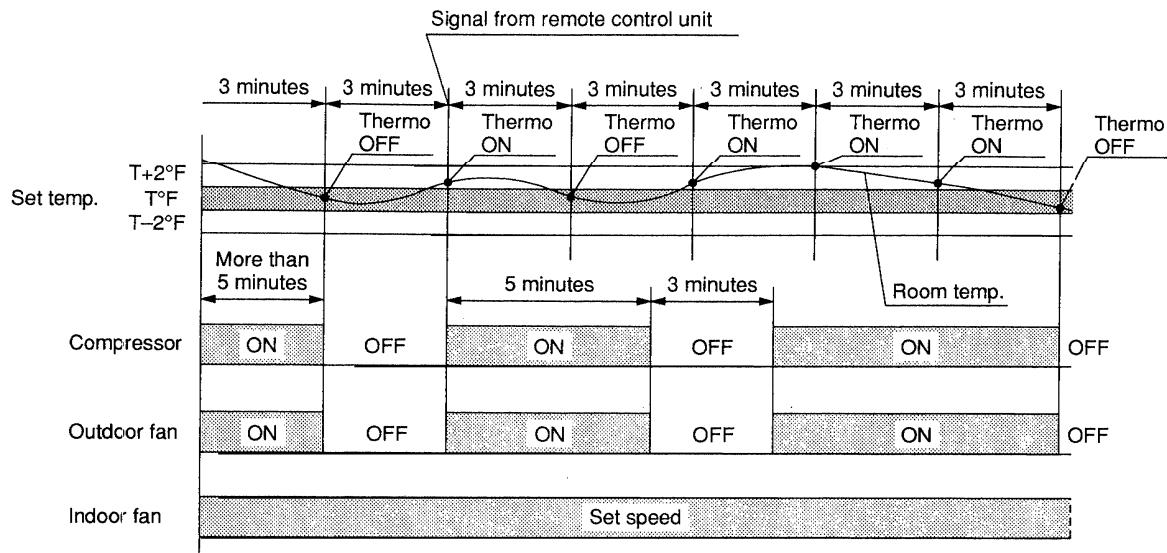
Model: RS1211



## 4. FUNCTION

### 4-1 Room Temperature Control

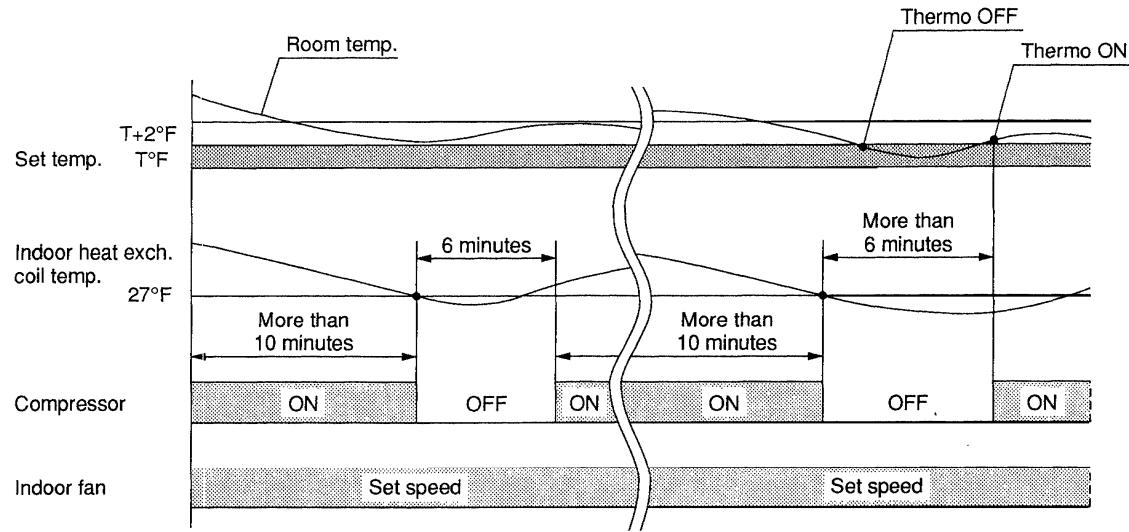
- Room temperature control is obtained by cycling the compressor ON and OFF under control of the room temperature sensor in the remote control unit.
- The room temperature (and other information) is transmitted every 3 minutes by the remote control unit to the controller in the indoor unit.



- The control circuit will not attempt to turn the compressor ON until the compressor has been OFF for at least 3 minutes. To protect the compressor from stalling out when trying to start against the high side refrigerant pressure, the control circuit has a built-in automatic time delay to allow the internal pressure to equalize.
- As a protective measure, the control circuit switches the compressor OFF after 5 minutes or more of compressor operation.
- Thermo ON : When the room temperature is above  $T + 2^{\circ}\text{F}$  ( $T^{\circ}\text{F}$  is set temperature).  
Compressor → ON
- Thermo OFF : When the room temperature is equal to or below set temperature  $T^{\circ}\text{F}$ .  
Compressor → OFF

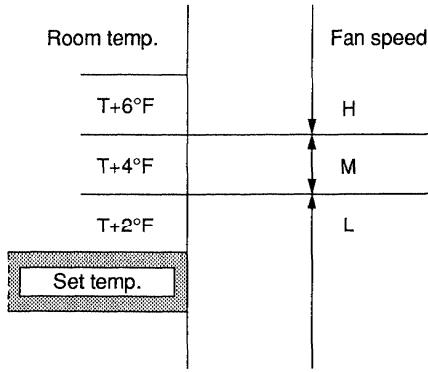
## 4-2 Freeze Prevention

- This function prevents freezing of the indoor heat exchange coil.
- When the compressor has been running for 10 minutes or more and the temperature of the indoor heat exchange coil falls below 27°F, the control circuit stops the compressor for at least 6 minutes.



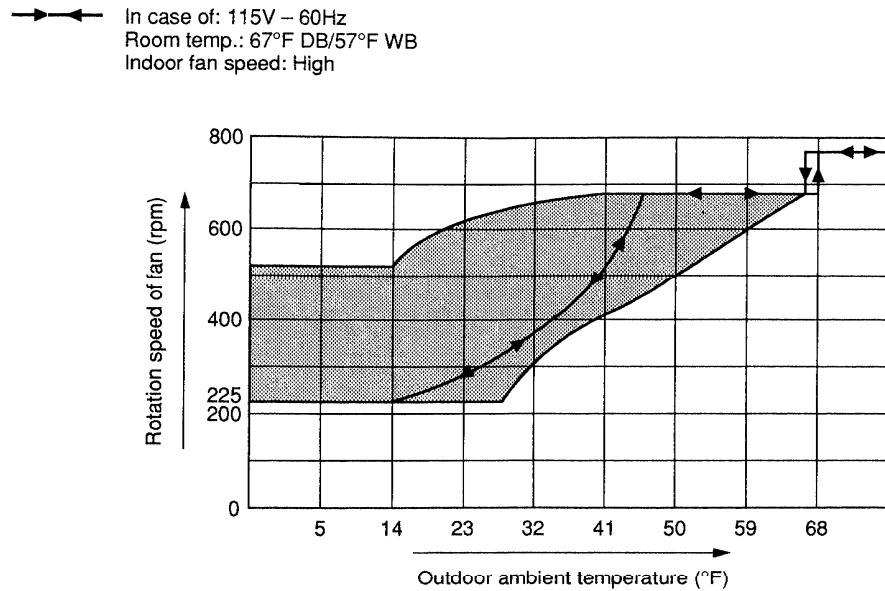
## 4-3 Fan Speed Auto (Indoor Fan)

- The fan speed does not change within 1 minute.
- The number shows temperature for REMOCON sensor.



#### 4-4 Outdoor Fan Speed Control (CL1211)

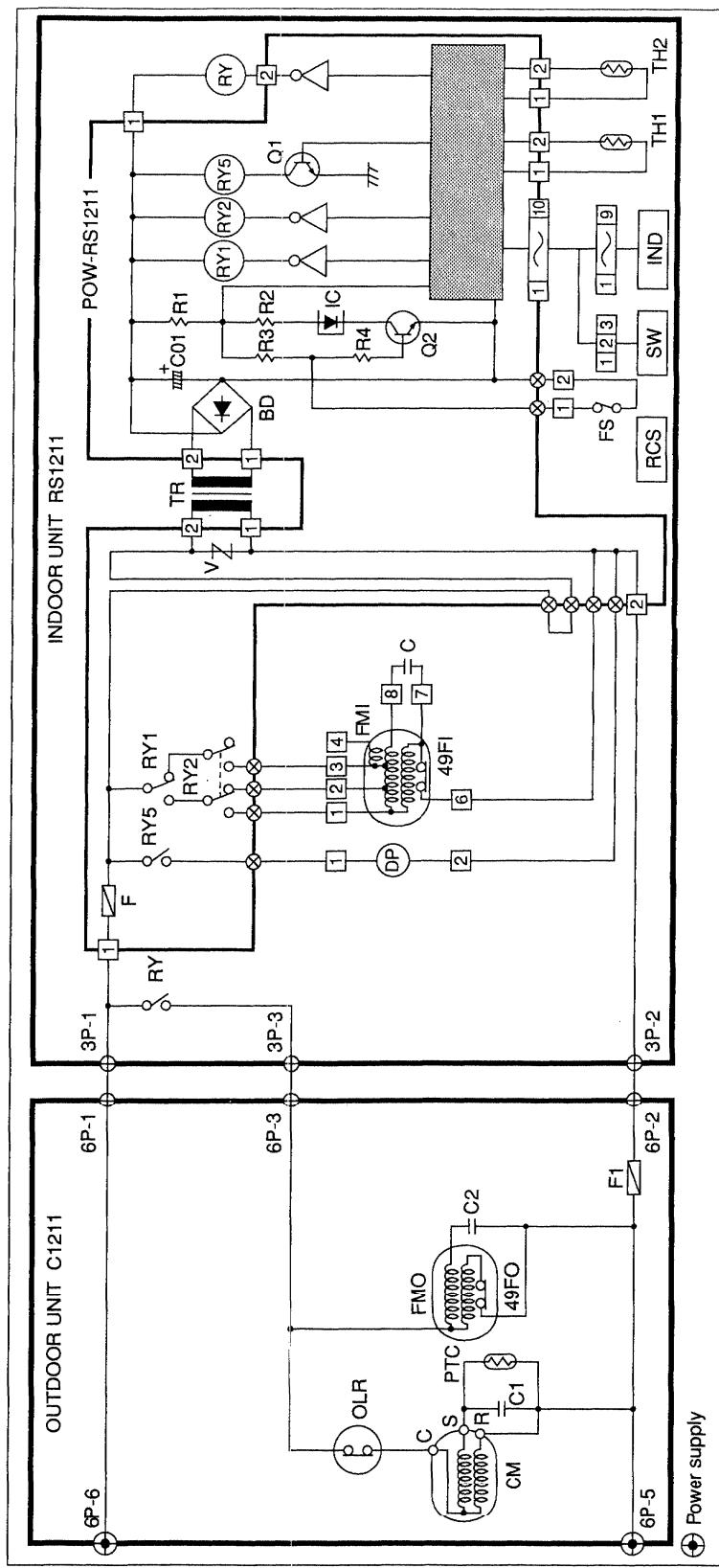
- When the outdoor air temperature falls below 66°F, the outdoor fan speed switches from HIGH to relative adjustment.
- The speed of fan rotation follows an oblique line under the outdoor and indoor air temperature conditions as shown in the diagram below.



## 5. ELECTRICAL DATA

### ● Schematic Diagram

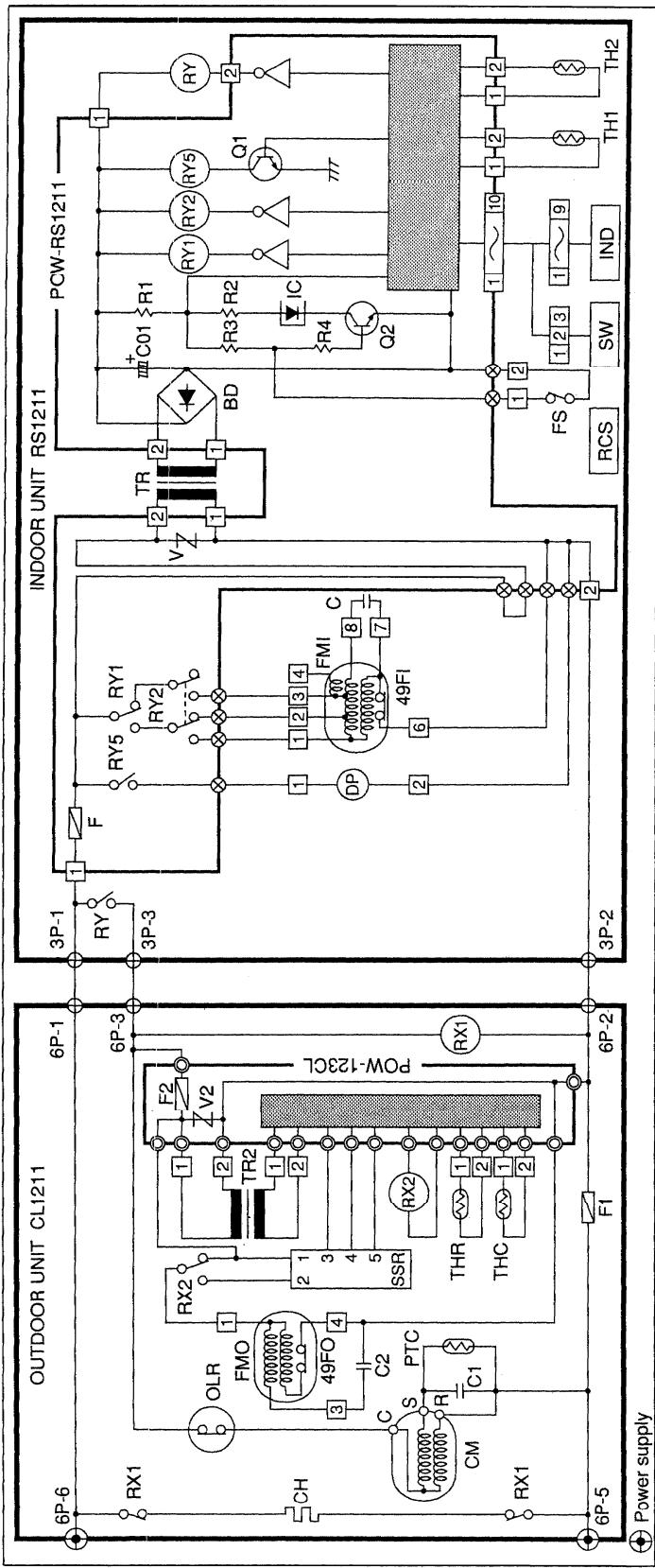
RS1211 / C1211



Symbol	Description	Symbol	Description
OOL	OVERLOAD RELAY	RY	COMPRESSOR RELAY
CM	COMPRESSOR MOTOR	TH1	THERMISTOR (COIL TEMP. SENSOR)
PTC	THERMISTOR	TH2	THERMISTOR (ROOM TEMP. SENSOR)
FMO	OUTDOOR FAN MOTOR	PS	FLOAT SWITCH
49FO	OUTDOOR FAN MOTOR INTERNAL PROTECTOR	IND	IND LAMP ASSY IND-RS1211
C1, C2	CAPACITOR	SW	SWITCH ASSY SW-TS2422
F1	FUSE 250V, 3A	RCS	WIRELESS REMOTE CONTROL UNIT RCS-KS0911
INDOOR UNIT		POW-RS1211	CONTROLLER PCB ASSY
DP	DRAIN PUMP	F	FUSE 250V, 3A
FMI	INDOOR FAN MOTOR	V	VARISTOR
49FI	INDOOR FAN INTERNAL MOTOR PROTECTOR	BD	BRIDGE DIODE
C	CAPACITOR	C01	CAPACITOR
TR	TRANSFORMER	R1-R4	RESISTOR
		IC	IC
			RY1, RY2, RY3
			AUXILIARY RELAY
			TRANSISTOR
			Q1, Q2

### ● Schematic Diagram

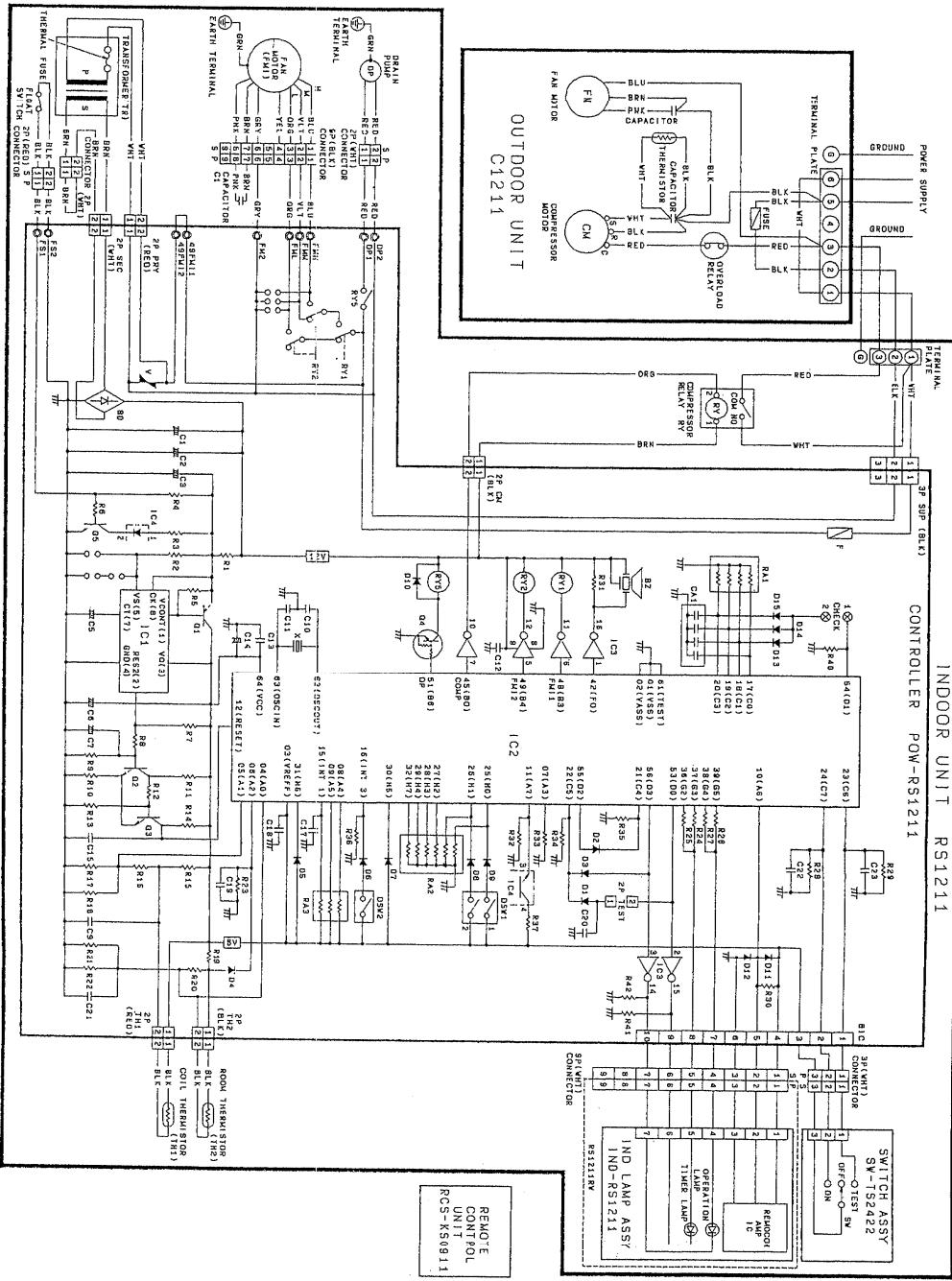
RS1211 / CL1211



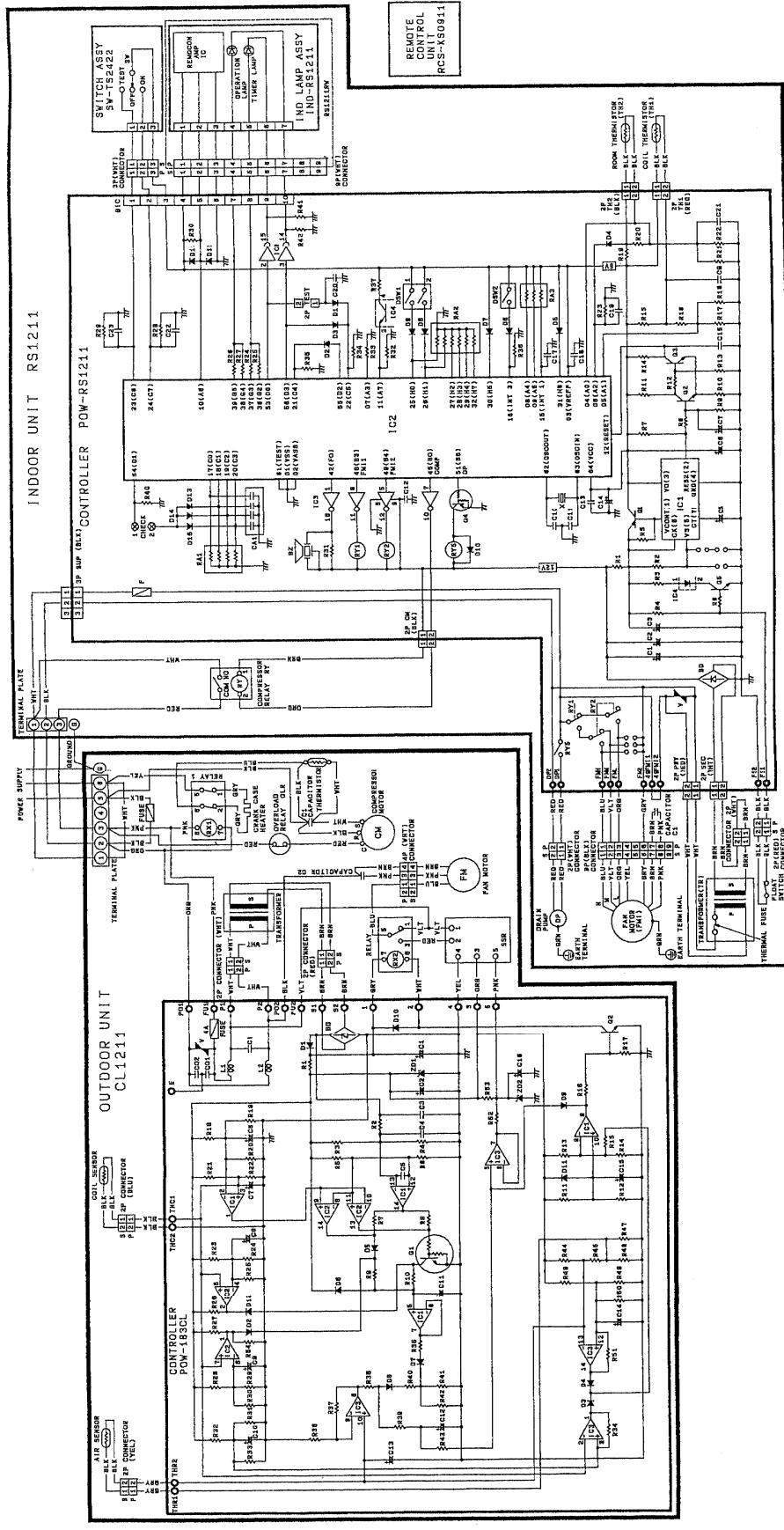
Symbol	Description	Symbol	Description
OUTDOC UNIT		49FI	INDOOR FAN MOTOR INTERNAL PROTECTOR
CH	CRANK CASE HEATER	C	CAPACITOR
OLR	OVERLOAD RELAY	TR	TRANSFORMER
CM	COMPRESSOR MOTOR	RY	COMPRESSOR RELAY
PTC	THERMISTOR	TH1	THERMISTOR (COIL TEMP. SENSOR)
FMO	OUTDOOR FAN MOTOR	TH2	THERMISTOR (ROOM TEMP. SENSOR)
49FO	OUTDOOR FAN MOTOR INTERNAL PROTECTOR	FS	FLOAT SWITCH
C1, C2	CAPACITOR	IND	IND LAMP ASSY IND-RS1211
SSR	SOLID STATE RELAY	SW	SWITCH ASSY SW-TZ422
TR2	TRANSFORMER	RCS	WIRELESS REMOTE CONTROL UNIT RCS-KS0911
RX1, RX2	RELAY	POW-RS1211	CONTROLLER PCB ASSY
TRIR	THERMISTOR (AIR SENSOR)	F	FUSE 250V 3A
THC	THERMISTOR (COIL SENSOR)	V	VARISTOR
F1	FUSE 115V 3A	BD	BRIDGE DIODE
POW-12CJL	CONTROLLER PCB ASSY	COL	CAPACITOR
F2	FUSE 250V 4A	R1-R4	RESISTOR
V2	VARISTOR	IC	IC
INDOOR UNIT		RY1, RY2, RYS	AUXILIARY RELAY
DP	DRAIN PUMP	Q1, Q2	TRANSISTOR

## • Electric Wiring Diagram (PCB Ass'y)

RS1211 / C1211



- Electric Wiring Diagram (PCB Ass'y)  
RS12H / CL1211



**POW-RS1211**

<b>Symbol</b>	<b>Description</b>	<b>Specifications</b>	
BZ101	BUZZER	PKM24SP3805	
C1	CAPACITOR	2200 $\mu$ F	25V
C2	CAPACITOR	1 $\mu$ F	50V
C3	CAPACITOR	10 $\mu$ F	50V
C5	CAPACITOR	1 $\mu$ F	50V
C6	CAPACITOR	220 $\mu$ F	16V
C7	CAPACITOR	1 $\mu$ F	50V
'			
C9	CAPACITOR	0.1 $\mu$ F	50V
C10	CAPACITOR	0.00003 $\mu$ F	50V
C11	CAPACITOR	0.00003 $\mu$ F	50V
C12	CAPACITOR	0.047 $\mu$ F	50V
C13	CAPACITOR	0.1 $\mu$ F	50V
C14	CAPACITOR	100 $\mu$ F	10V
C15	CAPACITOR	0.022 $\mu$ F	50V
C17	CAPACITOR	0.0047 $\mu$ F	50V
C18	CAPACITOR	0.022 $\mu$ F	50V
C19	CAPACITOR	0.022 $\mu$ F	50V
C20	CAPACITOR	0.022 $\mu$ F	50V
C21	CAPACITOR	0.1 $\mu$ F	50V
C22	CAPACITOR	0.0047 $\mu$ F	50V
C23	CAPACITOR	0.0047 $\mu$ F	50V
CA1	CAPACITOR	0.0047 $\mu$ F-4	50V
D1 to D15	DIODE	DS446	
DSW1	SWITCH	JKS1120-0402	
DSW2	SWITCH	JKS1120-0401	
BD	BRIDGE DIODE	DBA10C	
F	FUSE	250V, 3A	
IC1	IC	LA5693D	
IC2	IC	TMS73C161-C76577	
IC3	IC	LB1234	
IC4	IC	PC817	
Q1	TRANSISTOR	2SA1289	
Q2	TRANSISTOR	2SC536-E	
Q3	TRANSISTOR	2SC536-E	
Q4	TRANSISTOR	3402	
Q5	TRANSISTOR	2SC536-E	
R1	RESISTOR (CARBON)	5.6 $\Omega$	$\pm 5\%$ 1/2W
R2	RESISTOR (CARBON)	27 $\Omega$	$\pm 5\%$ 1/4W
R3	RESISTOR (CARBON)	1K $\Omega$	$\pm 5\%$ 1/4W
R4	RESISTOR (CARBON)	10K $\Omega$	$\pm 5\%$ 1/4W
R5	RESISTOR (CARBON)	390 $\Omega$	$\pm 5\%$ 1/4W
R6	RESISTOR (CARBON)	5.6K	$\pm 5\%$ 1/4W
R7	RESISTOR (CARBON)	1K $\Omega$	$\pm 5\%$ 1/4W
R8	RESISTOR (CARBON)	27K $\Omega$	$\pm 5\%$ 1/4W

**POW-RS1211**

<b>Symbol</b>	<b>Description</b>	<b>Specifications</b>	
R9	RESISTOR (CARBON)	22K $\Omega$	$\pm 5\%$ 1/4W
R10	RESISTOR (CARBON)	560 $\Omega$	$\pm 5\%$ 1/4W
R11	RESISTOR (CARBON)	4.7K $\Omega$	$\pm 5\%$ 1/4W
R12	RESISTOR (CARBON)	5.6K $\Omega$	$\pm 5\%$ 1/4W
R13	RESISTOR (CARBON)	8.2K $\Omega$	$\pm 5\%$ 1/4W
R14	RESISTOR (CARBON)	4.7K $\Omega$	$\pm 5\%$ 1/4W
R15	RESISTOR (METAL)	12K $\Omega$	$\pm 1\%$ 1/4W
R16	RESISTOR (METAL)	750 $\Omega$	$\pm 1\%$ 1/4W
R17	RESISTOR (METAL)	6.8K $\Omega$	$\pm 1\%$ 1/4W
R18	RESISTOR (METAL)	10K $\Omega$	$\pm 1\%$ 1/4W
R19	RESISTOR (METAL)	180 $\Omega$	$\pm 1\%$ 1/4W
R20	RESISTOR (METAL)	15K $\Omega$	$\pm 1\%$ 1/4W
R21	RESISTOR (METAL)	6.2K $\Omega$	$\pm 1\%$ 1/4W
R22	RESISTOR (METAL)	11K $\Omega$	$\pm 1\%$ 1/4W
R23	RESISTOR (CARBON)	100K $\Omega$	$\pm 5\%$ 1/4W
R24	RESISTOR (CARBON)	270 $\Omega$	$\pm 5\%$ 1/4W
R25	RFSISTOR (CARBON)	270 $\Omega$	$\pm 5\%$ 1/4W
R26	RESISTOR (CARBON)	270 $\Omega$	$\pm 5\%$ 1/4W
R27	RESISTOR (CARBON)	270 $\Omega$	$\pm 5\%$ 1/4W
R28	RESISTOR (CARBON)	5.6K $\Omega$	$\pm 5\%$ 1/4W
R29	RESISTOR (CARBON)	5.6K $\Omega$	$\pm 5\%$ 1/4W
R30	RESISTOR (CARBON)	100K $\Omega$	$\pm 5\%$ 1/4W
R31	RESISTOR (CARBON)	6.8K $\Omega$	$\pm 5\%$ 1/4W
R32	RESISTOR (CARBON)	56K $\Omega$	$\pm 5\%$ 1/4W
R33	RESISTOR (CARBON)	56K $\Omega$	$\pm 5\%$ 1/4W
R34	RESISTOR (CARBON)	56K $\Omega$	$\pm 5\%$ 1/4W
R35	RESISTOR (CARBON)	56K $\Omega$	$\pm 5\%$ 1/4W
R36	RESISTOR (CARBON)	56K $\Omega$	$\pm 5\%$ 1/4W
R37	RESISTOR (CARBON)	1K $\Omega$	$\pm 5\%$ 1/4W
R40	RESISTOR (CARBON)	56K $\Omega$	$\pm 5\%$ 1/4W
R41	RESISTOR (CARBON)	56K $\Omega$	$\pm 5\%$ 1/4W
R42	RESISTOR (CARBON)	56K $\Omega$	$\pm 5\%$ 1/4W
RA1	RESISTOR	56K $\Omega$ -4	$\pm 5\%$ 1/4W
RA2	RESISTOR	56K $\Omega$ -6	$\pm 5\%$ 1/4W
RA3	RESISTOR	20K $\Omega$ -3	$\pm 5\%$ 1/4W
RY1	RELAY	VB12TBU	
RY2	RELAY	VB12TBU	
RY5	RELAY	LZG-12HE	
V	VARISTOR	SNR681KD14	
X	CRYSTAL	CSA-4MG	
3P SUP	CONNECTOR	2-173270-3	
2P PRY	CONNECTOR	8-173270-2	
2P SEC	CONNECTOR	5273-02A	
2P TEST	CONNECTOR	NHK-P2T-N	
2P TH1	CONNECTOR	8-171825-2	
2P TH2	CONNECTOR	2-171825-2	
2P CM	CONNECTOR	5273-02A-BL	

POW-123CL

Symbol	Description	Specifications	
BD	BRIDGE DIODE	DBA10C	
C1	CAPACITOR	470 $\mu$ F	50V
C2	CAPACITOR	22 $\mu$ F	25V
C3	CAPACITOR	0.047 $\mu$ F	50V
C4	CAPACITOR	0.047 $\mu$ F	50V
C5	CAPACITOR	0.022 $\mu$ F	50V
C6	CAPACITOR	22 $\mu$ F	25V
C7	CAPACITOR	22 $\mu$ F	25V
C8	CAPACITOR	22 $\mu$ F	25V
C9	CAPACITOR	22 $\mu$ F	25V
C10	CAPACITOR	22 $\mu$ F	25V
C11	CAPACITOR	470 $\mu$ F	16V
C12	CAHAC110H	100 $\mu$ F	16V
C13	CAPACITOR	22 $\mu$ F	25V
C14	CAPACITOR	22 $\mu$ F	25V
C15	CAPACITOR	100 $\mu$ F	16V
C16	CAPACITOR	22 $\mu$ F	25V
C17	CAPACITOR	0.22 $\mu$ F	630V
C01	CAPACITOR	0.033 $\mu$ F	630V
C02	CAPACITOR	0.033 $\mu$ F	630V
D1	DIODE	DSF10C	
D2 to D12	DIODE	DS446	
FUSE	FUSE	125V, 4A	
IC1	IC	NJM2902	
IC2	IC	LA6339	
IC3	IC	NJM2902	
Q1	TRANSISTOR	2SC 3400	
Q2	TRANSISTOR	2SC2274E	
L1	FILTER COIL	SN12-500	
L2	FILTER COIL	SN12-500	
R1	RESISTOR (OXIDE)	240 $\Omega$	$\pm 5\%$ 2W
R2	RESISTOR (CARBON)	5.6K $\Omega$	$\pm 5\%$ 1/4W
R3	RESISTOR (CARBON)	18K $\Omega$	$\pm 5\%$ 1/4W
R4	RESISTOR (CARBON)	3.3K $\Omega$	$\pm 5\%$ 1/4W
R5	RESISTOR (CARBON)	22K $\Omega$	$\pm 5\%$ 1/4W
R6	RESISTOR (CARBON)	5.1K $\Omega$	$\pm 5\%$ 1/4W
R7	RESISTOR (CARBON)	22K $\Omega$	$\pm 5\%$ 1/4W
R8	RESISTOR (CARBON)	10K $\Omega$	$\pm 5\%$ 1/4W
R9	RESISTOR (CARBON)	910K $\Omega$	$\pm 5\%$ 1/4W
R10	RESISTOR (CARBON)	1M $\Omega$	$\pm 5\%$ 1/4W
R11	RESISTOR (CARBON)	150K $\Omega$	$\pm 5\%$ 1/4W
R12	RESISTOR (CARBON)	300K $\Omega$	$\pm 5\%$ 1/4W
R13	RESISTOR (CARBON)	5.6K $\Omega$	$\pm 5\%$ 1/4W

POW-123CL

Symbol	Description	Specifications	
R14	RESISTOR (CARBON)	7.5K $\Omega$	$\pm 5\%$ 1/4W
R15	RESISTOR (CARBON)	1.2K $\Omega$	$\pm 5\%$ 1/4W
R16	RESISTOR (CARBON)	7.5K $\Omega$	$\pm 5\%$ 1/4W
R17	RESISTOR (CARBON)	2.2K $\Omega$	$\pm 1\%$ 1/4W
R18	RESISTOR (METAL)	27K $\Omega$	$\pm 1\%$ 1/4W
R19	RESISTOR (METAL)	10K $\Omega$	$\pm 1\%$ 1/4W
R20	RESISTOR (CARBON)	56K $\Omega$	$\pm 5\%$ 1/4W
R21	RESISTOR (METAL)	27K $\Omega$	$\pm 1\%$ 1/4W
R22	RESISTOR (METAL)	100K $\Omega$	$\pm 1\%$ 1/4W
R23	RESISTOR (METAL)	27K $\Omega$	$\pm 1\%$ 1/4W
R24	RESISTOR (METAL)	8.2K $\Omega$	$\pm 1\%$ 1/4W
R25	RESISTOR (CARBON)	51K $\Omega$	$\pm 5\%$ 1/4W
R26	RESISTOR (CARBON)	13K $\Omega$	$\pm 5\%$ 1/4W
R27	RESISTOR (CARBON)	13K $\Omega$	$\pm 5\%$ 1/4W
R28	RESISTOR (METAL)	27K $\Omega$	$\pm 1\%$ 1/4W
R29	RESISTOR (METAL)	12K $\Omega$	$\pm 1\%$ 1/4W
R30	RESISTOR (CARBON)	68K $\Omega$	$\pm 5\%$ 1/4W
R31	RESISTOR (METAL)	1.5K $\Omega$	$\pm 1\%$ 1/4W
R32	RESISTOR (METAL)	27K $\Omega$	$\pm 1\%$ 1/4W
R33	RESISTOR (CARBON)	36K $\Omega$	$\pm 5\%$ 1/4W
R34	RESISTOR (CARBON)	120K $\Omega$	$\pm 5\%$ 1/4W
R35	RESISTOR (METAL)	510K $\Omega$	$\pm 1\%$ 1/4W
R36	RESISTOR (METAL)	12K $\Omega$	$\pm 1\%$ 1/4W
R37	RESISTOR (METAL)	36K $\Omega$	$\pm 1\%$ 1/4W
R38	RESISTOR (METAL)	1.8K $\Omega$	$\pm 1\%$ 1/4W
R39	RESISTOR (CARBON)	75K $\Omega$	$\pm 5\%$ 1/4W
R40	RESISTOR (METAL)	560 $\Omega$	$\pm 1\%$ 1/4W
R41	RESISTOR (METAL)	300 $\Omega$	$\pm 1\%$ 1/4W
R42			
R43	RESISTOR (CARBON)	100 $\Omega$	$\pm 5\%$ 1/4W
R44	RESISTOR (METAL)	82K $\Omega$	$\pm 1\%$ 1/4W
R45			
R46			
R47	RESISTOR (CARBON)	100 $\Omega$	$\pm 5\%$ 1/4W
R48	RESISTOR (METAL)	10K $\Omega$	$\pm 1\%$ 1/4W
R49	RESISTOR (METAL)	820 $\Omega$	$\pm 5\%$ 1/4W
R50	RESISTOR (CARBON)	22K $\Omega$	$\pm 5\%$ 1/4W
R51	RESISTOR (CARBON)	150K $\Omega$	$\pm 5\%$ 1/4W
R52	RESISTOR (CARBON)	200 $\Omega$	$\pm 5\%$ 1/4W
R53	RESISTOR (CARBON)	4.7K $\Omega$	$\pm 5\%$ 1/4W
R54	RESISTOR (CARBON)	75K $\Omega$	$\pm 5\%$ 1/4W
V	VARISTOR		SNR-14A275K
ZD1	ZENER DIODE		GZB-12C
ZD2	ZENER DIODE		GZA5, 6Y

## 6. TROUBLESHOOTING

### 6-1 Check before and after troubleshooting.

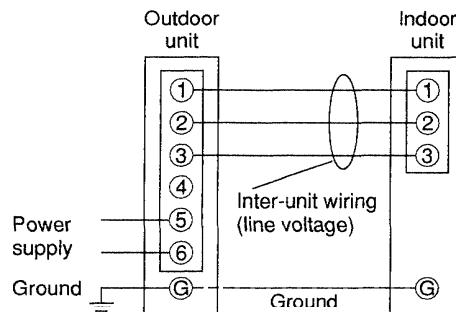
#### (1) Check power supply wiring.

- Check that power supply wires are correctly connected to terminals No. 5 and No. 6 on the 6P terminal plate in the outdoor unit.

#### (2) Check inter-unit wiring.

- Check that inter-unit wires are correctly connected to indoor unit from outdoor unit.

Power supply:  
60Hz, single-phase, 115V



#### (3) Check power supply.

- Check that voltage is in specified range ( $\pm 10\%$  of the rating).
- Check that power is being supplied.



#### WARNING:

If the following troubleshooting must be done with power being supplied, be careful about any uninsulated live part that can cause ELECTRIC SHOCK.

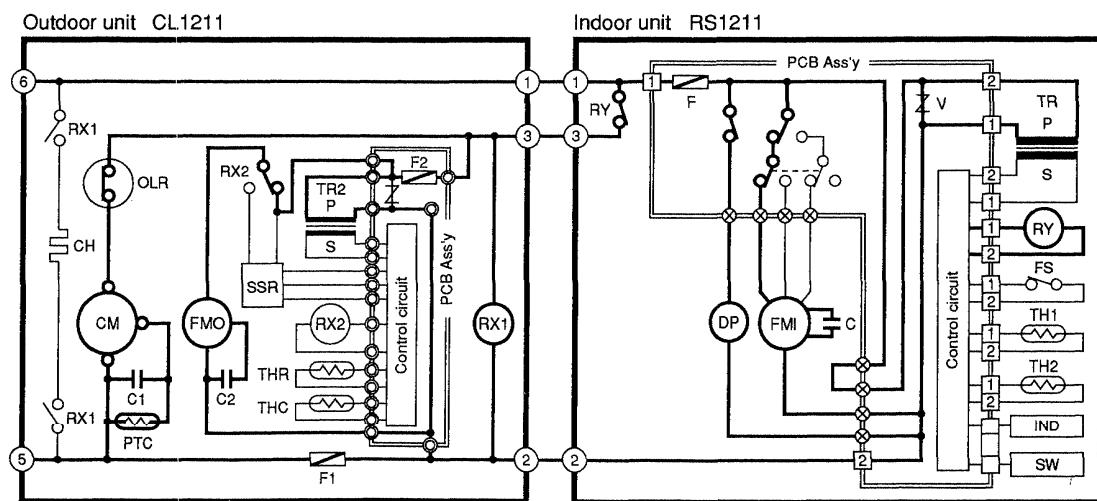
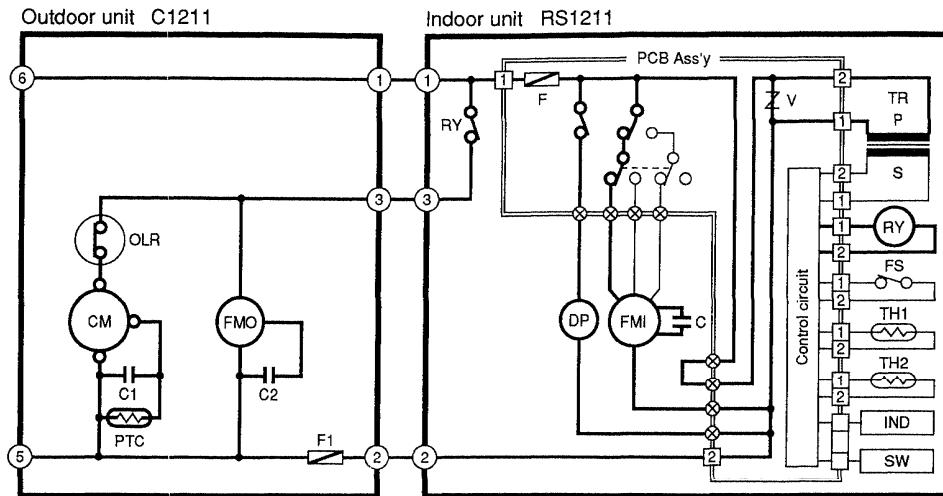
#### (4) Check lead wires and connectors in indoor and outdoor units.

- Check that coating of lead wires is not damaged.
- Check that lead wires and connectors are connected firmly.
- Check that wiring is correct.

## (5) Reference

### (a) Condition of general cooling operation

- ON/OFF operation button..... ON  
 COOL/FAN selector switch ..... COOL  
 Indoor fan speed ..... HIGH  
 Thermo..... ON



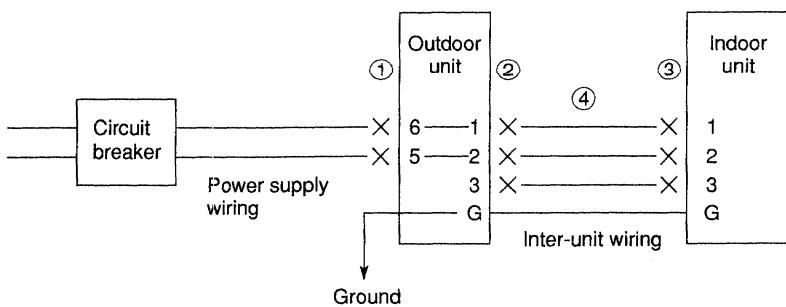
## 6-2 Air conditioner does not operate.

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

#### (a) When circuit breaker is set to ON, it trips in a few moments (resetting is not possible).

- There is a possibility of ground fault.
- Measure insulation resistance.

If resistance value is  $1M\Omega$  or less, insulation is defective ("NO").



\* Set circuit breaker to OFF.

- ① Remove power supply wires from terminal plate in outdoor unit.  
• Measure insulation resistance of power supply wires.

NO

Do rewiring.

- ② Remove inter-unit wires from terminal plate in indoor unit.  
• Measure insulation resistance of indoor unit.

NO

Insulation of indoor unit is defective.

- Measure insulation resistance of electrical parts in indoor unit.

- ③ Remove inter-unit wires from terminal plate in outdoor unit.  
• Measure insulation resistance of outdoor unit.

NO

Insulation of outdoor unit is defective.

- Measure insulation resistance of electrical parts in outdoor unit.

- ④ Measure insulation resistance of inter-unit wires.

NO

Do rewiring.

**(b) Circuit breaker trips in several minutes after turning air conditioner ON.**

- There is a possibility of short circuit.

• Check capacity of circuit breaker.

Is capacity of circuit breaker suitable?

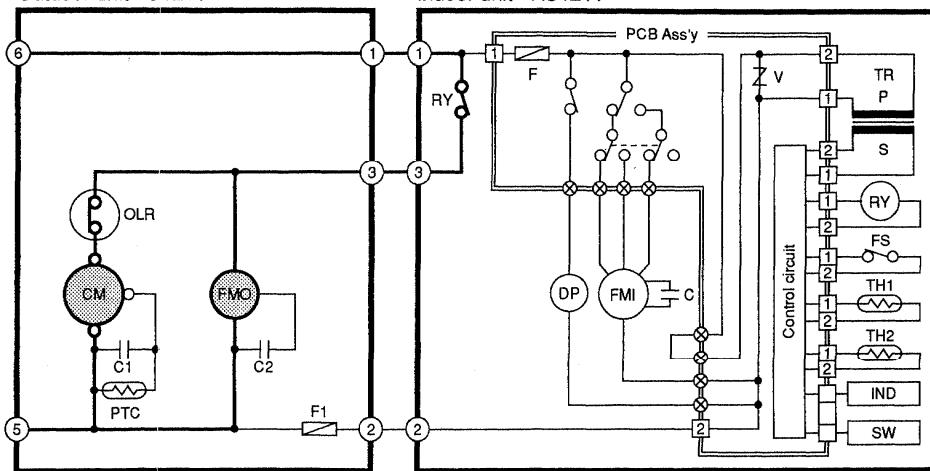
Replace it with suitable one  
(larger capacity).

• Measure resistance of compressor motor winding.

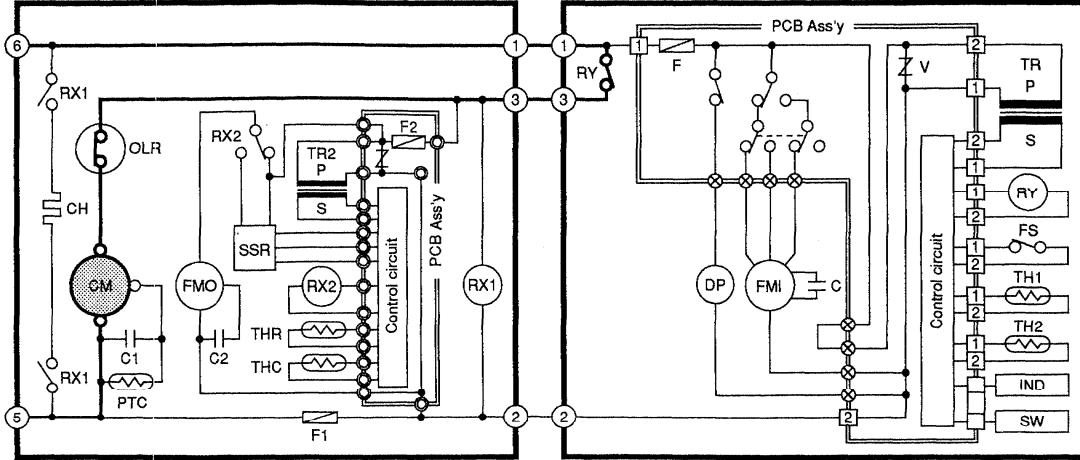
• Measure resistance of outdoor fan motor winding.

→ Only C1211

Outdoor unit C1211

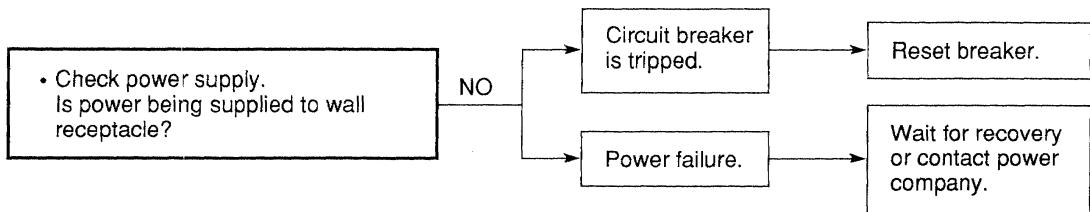


Outdoor unit CL1211

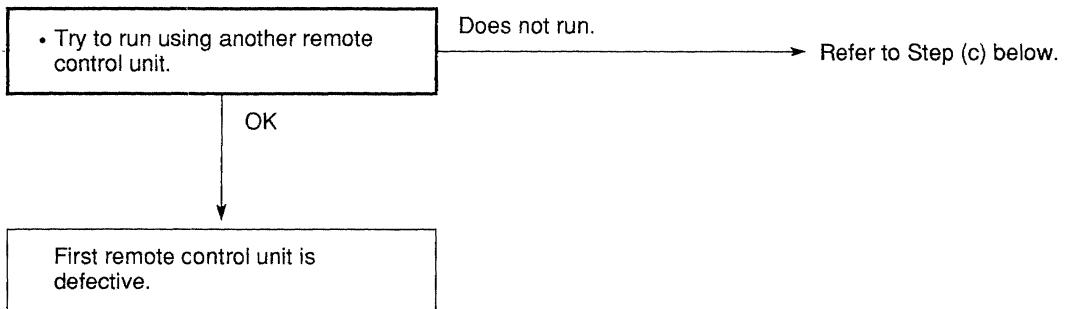


(2) Neither indoor unit nor outdoor unit runs.

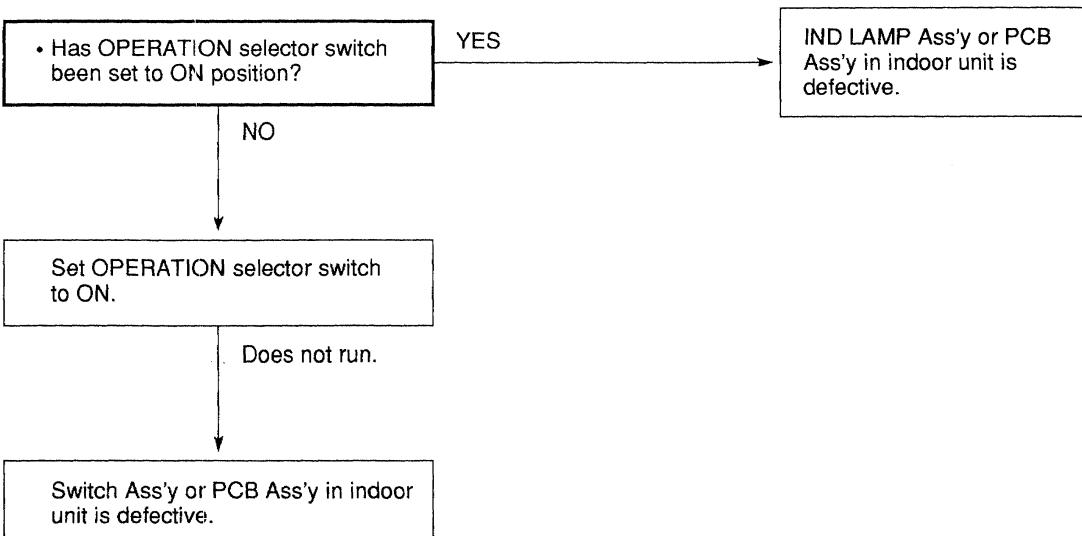
(a) Power is not supplied.



(b) Check remote control unit.



(c) Check OPERATION selector switch in indoor unit.



(Neither indoor unit nor outdoor unit runs.) (cont'd)

**(d) Check fuse in outdoor unit.**

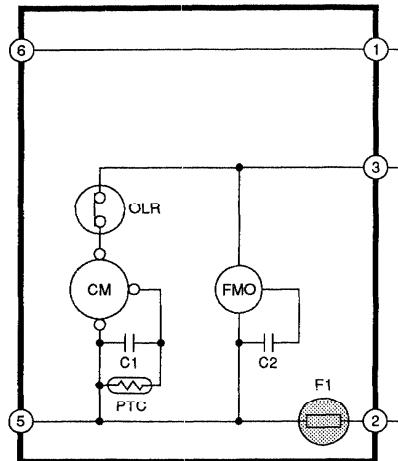
- Check fuse in outdoor unit for continuity.

If fuse blows,

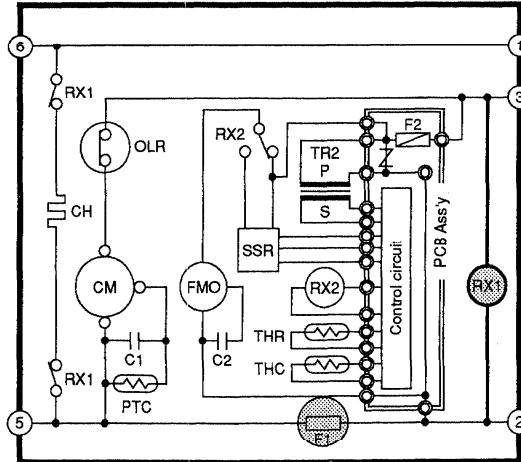
- Measure coil resistance of relay (RX1).

→ Only CL1211

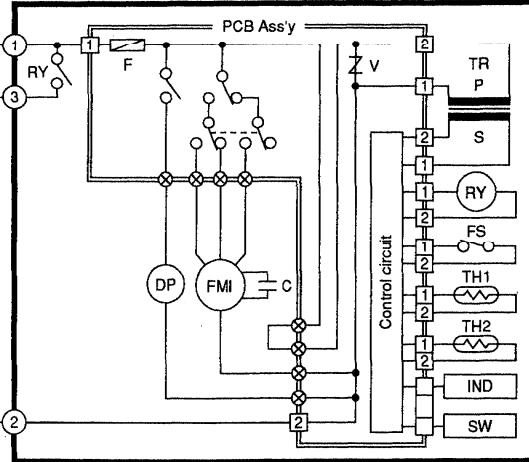
Outdoor unit C1211



Outdoor unit CL1211



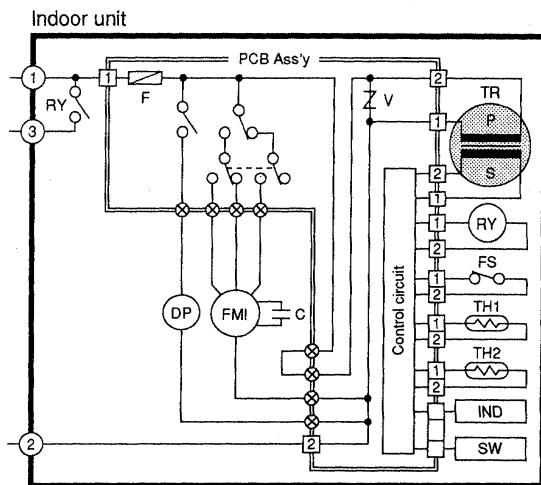
Indoor unit RS1211



(Neither indoor unit nor outdoor unit runs.) (cont'd)

**(e) Check transformer in indoor unit.**

- Measure resistance of primary and secondary winding.



**(f) Check fuse on PCB Ass'y in indoor unit.**

- Check fuse on PCB Ass'y in indoor unit for continuity.

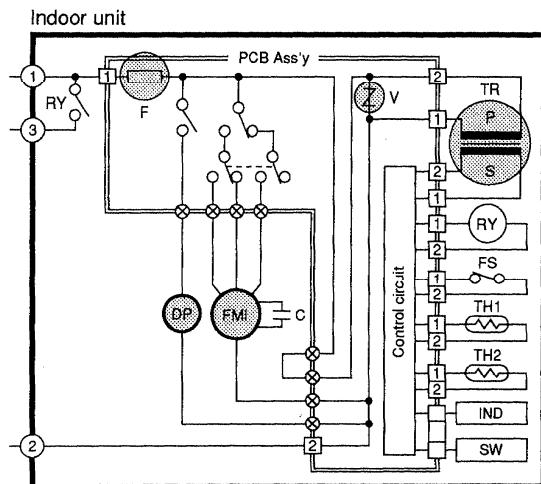
If fuse blows,

- Measure resistance of primary winding of transformer.

OK

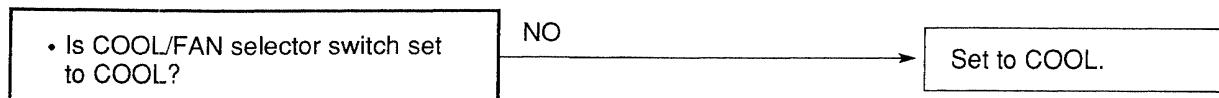
- Measure resistance of indoor fan motor winding.

- Measure resistance of drain pump motor winding.



(3) Only outdoor unit does not run.

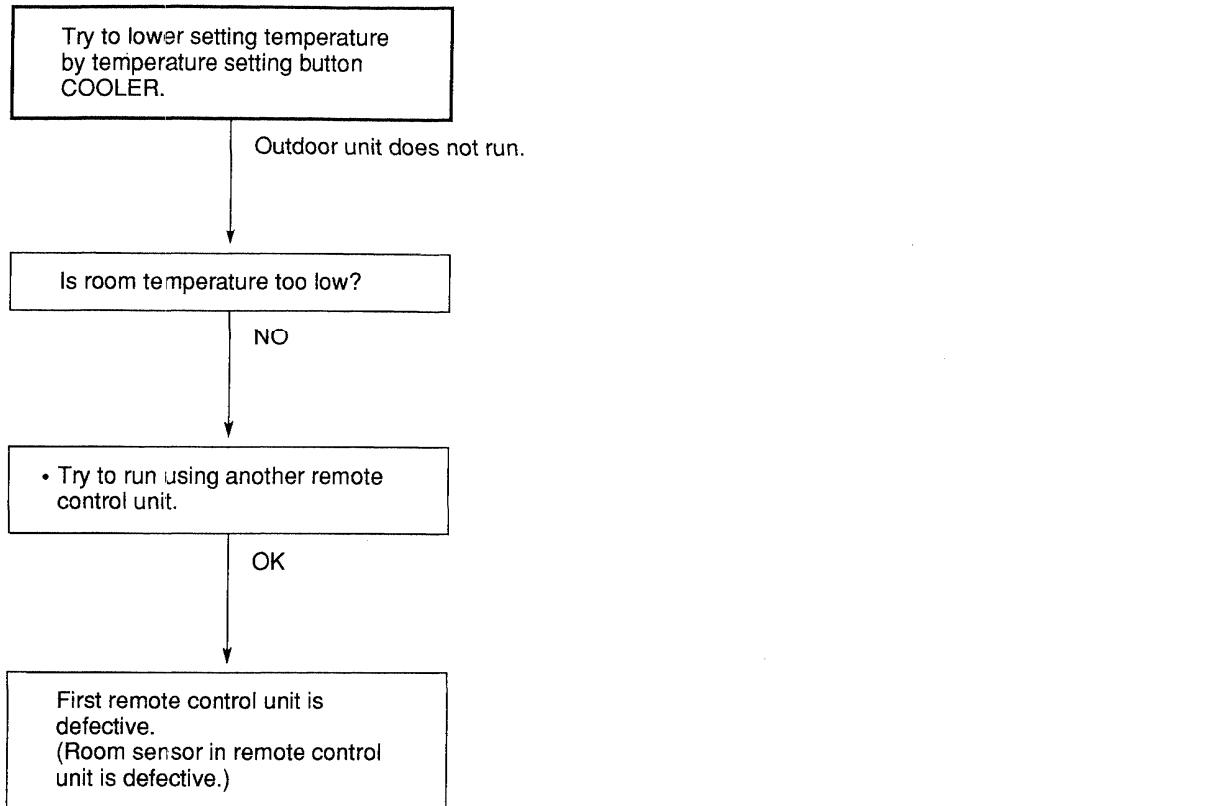
(a) Check COOL/FAN selector switch of remote control unit.



(b) Outdoor unit does not run when air conditioner is in following conditions.

- During thermo OFF (when the room temperature is below the setting temperature).
- During freeze prevention (for at least 6 minutes).

• Check setting temperature



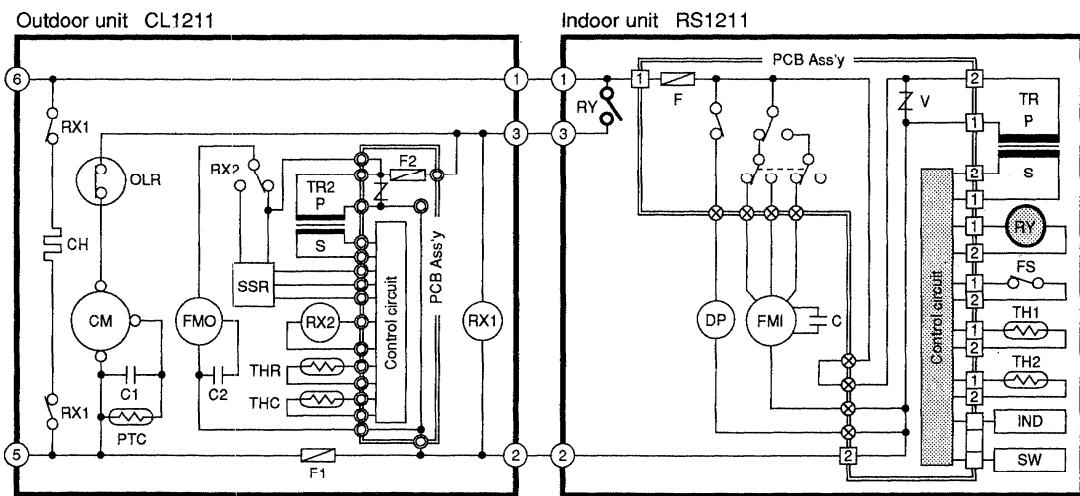
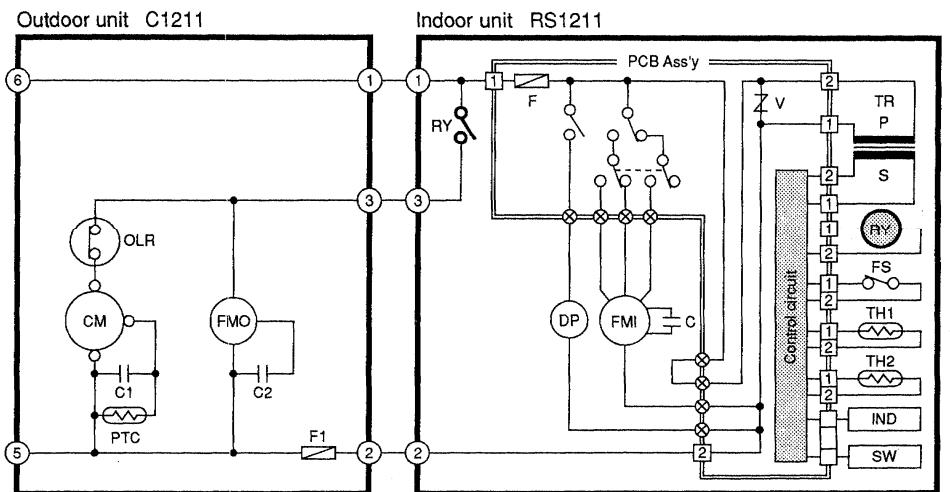
(Only outdoor unit does not run.) (cont'd)

**(c) Check relay (RY) in indoor unit.**

- Measure coil resistance of relay (RY).

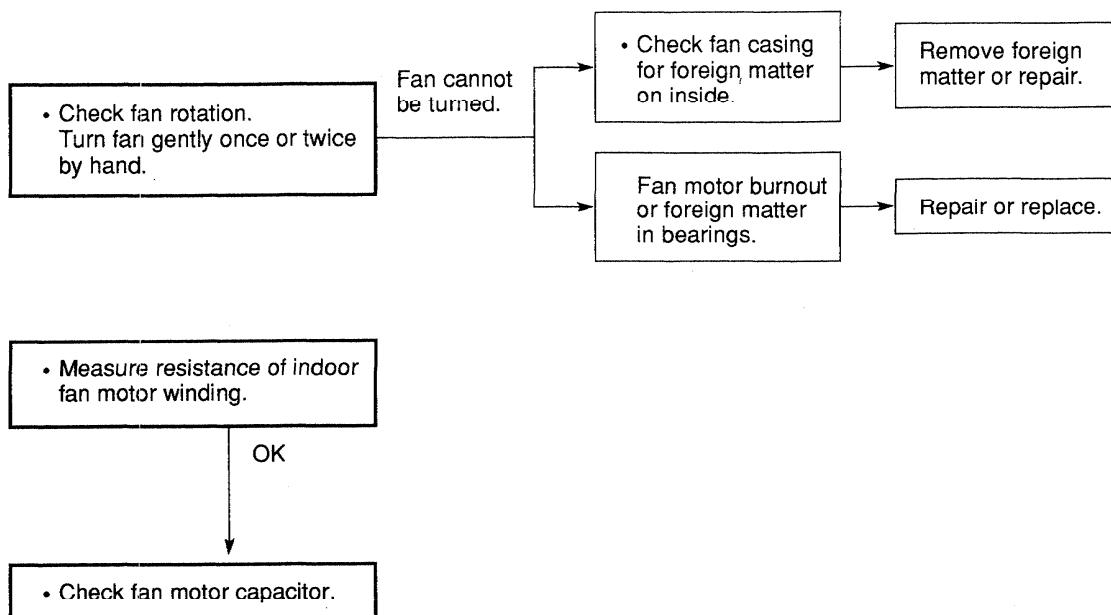
OK

PCB Ass'y is defective.

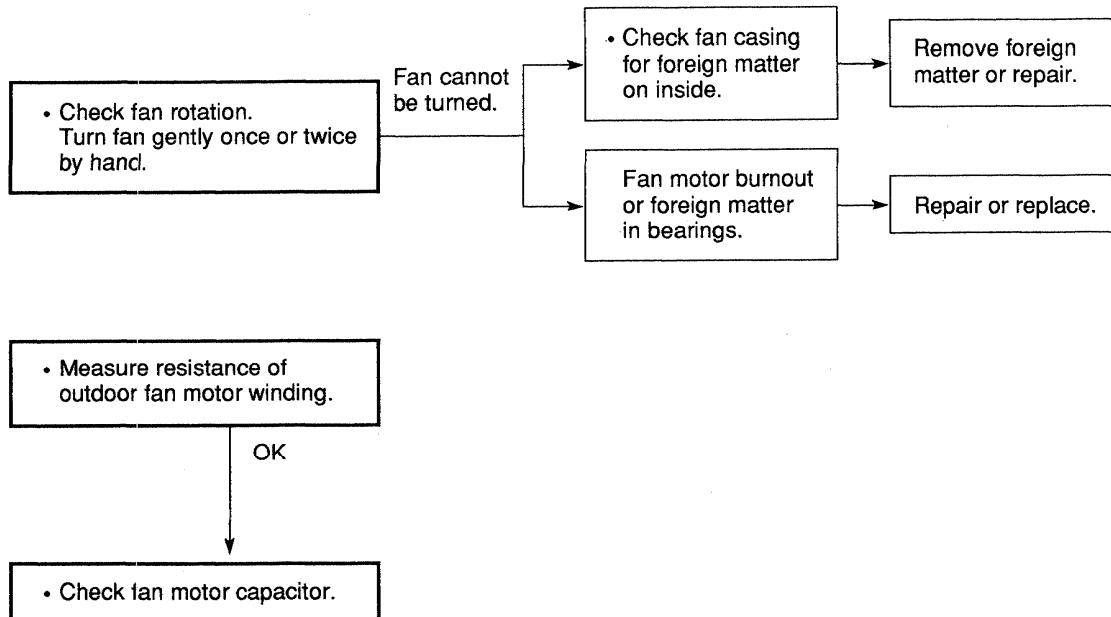


### 6-3 A particular component of air conditioner does not operate.

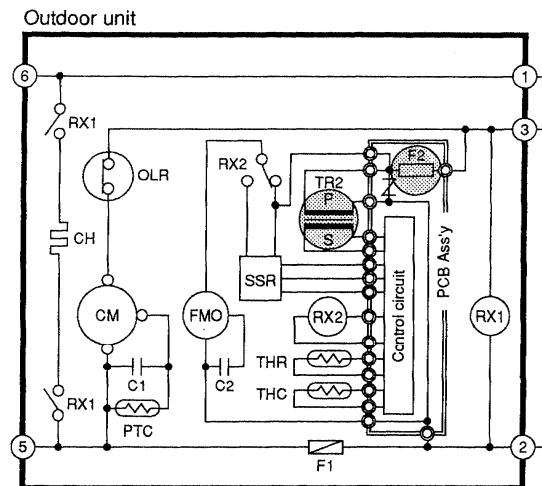
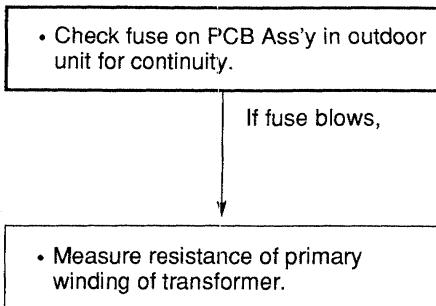
#### (1) Only indoor fan does not run.



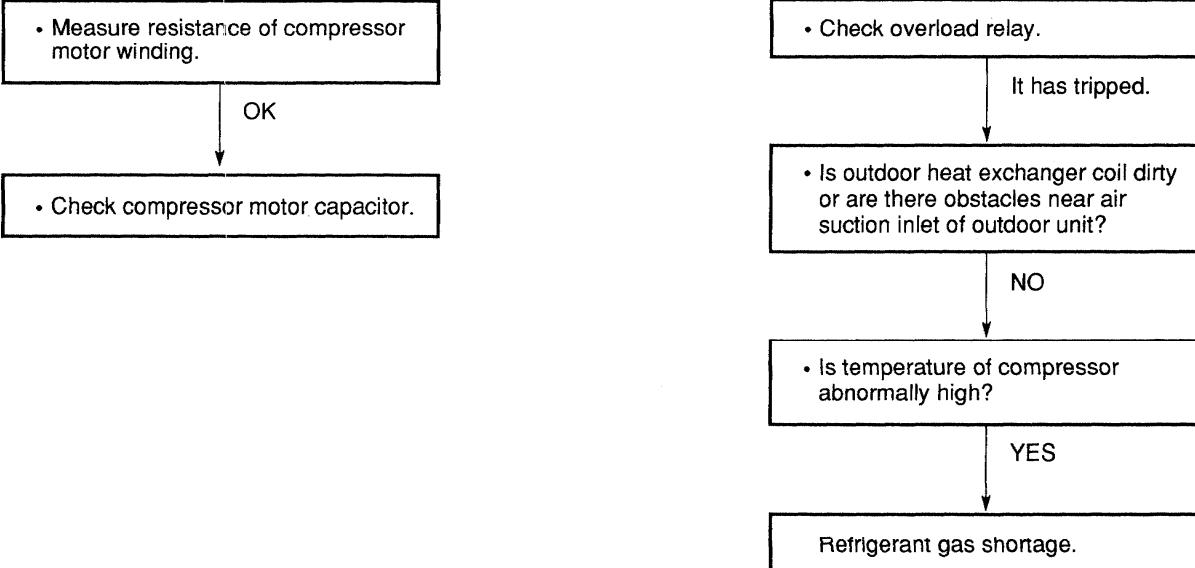
#### (2) Only outdoor fan does not run.



Only outdoor fan does not run for CL1211.

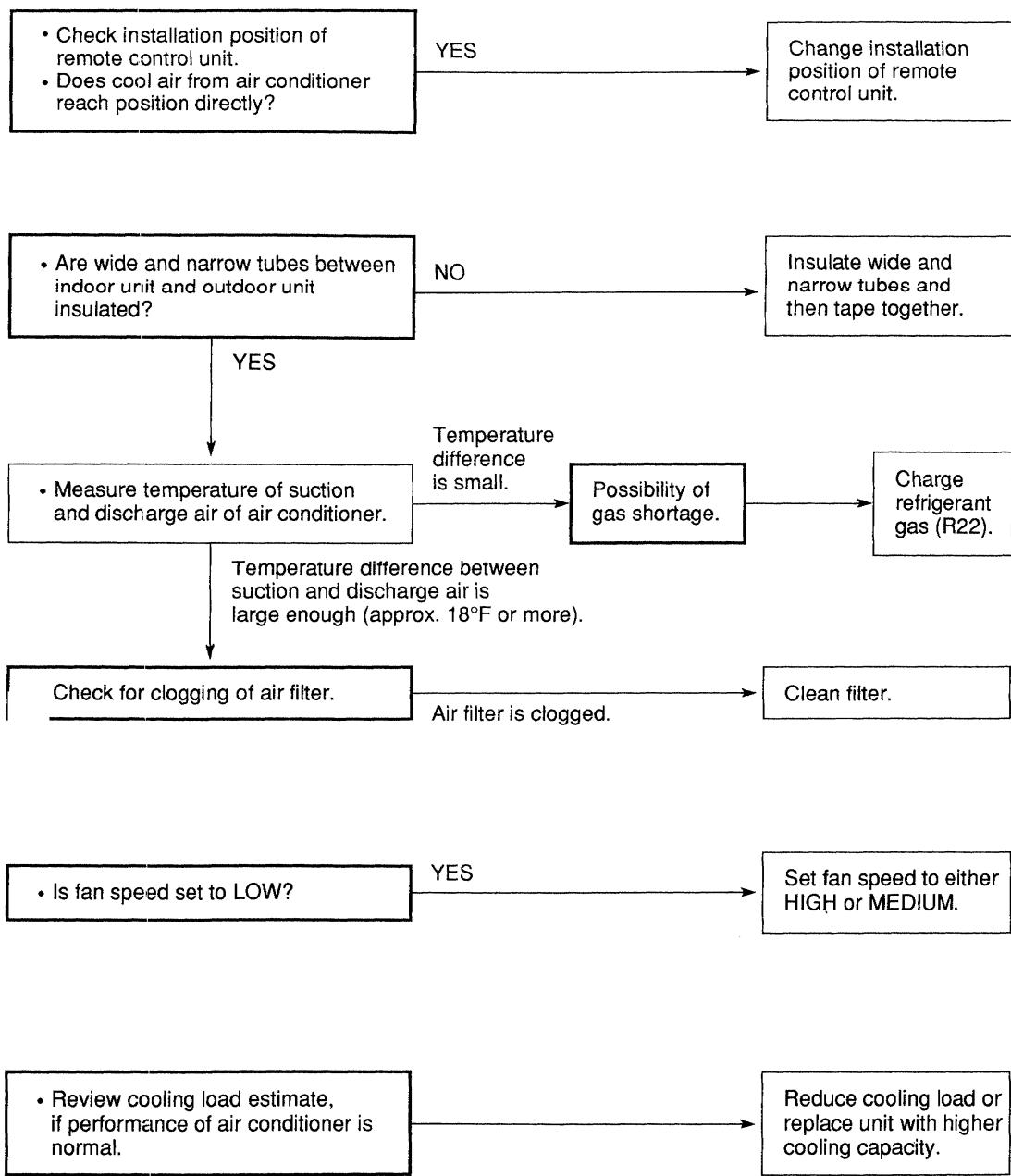


### (3) Only compressor does not run.

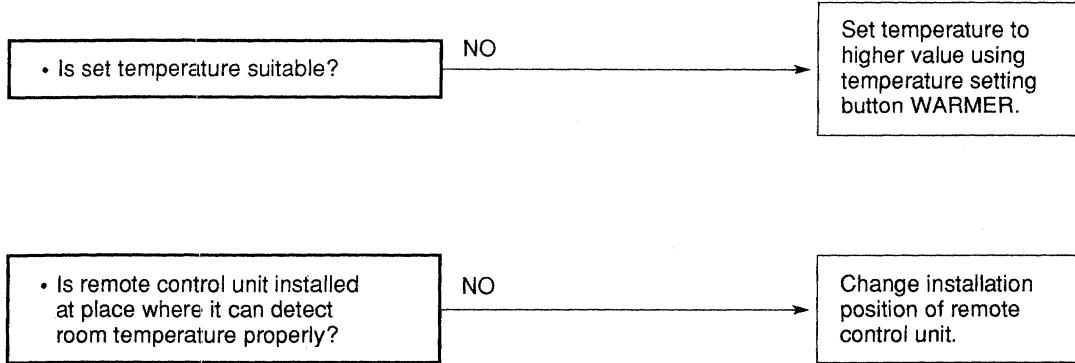


## 6-4 Air conditioner operates, but abnormalities occur.

### (1) Poor Cooling



**(2) Excessive Cooling**



**6-5 Indoor (heat exchanger) coil temperature sensor (TH1) is defective.**

**(1) Open**

Even though the air conditioner does not thermo OFF, compressor and outdoor fan repeat ON for 10 minutes and OFF for 6 minutes.

**(2) Shortage**

When dehumidified water freezes in the indoor coil, the freeze prevention function does not work.

## 7. CHECKING ELECTRICAL COMPONENTS

### 7-1 Measurement of Insulation Resistance

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

#### (1) Power Supply Wires

Clamp the grounded wire of the power supply wires with the lead clip of the insulation resistance tester and measure the resistance by placing a probe on either of the power wires. (Fig. 1)

Then measure the resistance between the grounded wire and the other power wires. (Fig. 1)

#### (2) Indoor Unit

Clamp an aluminum plate fin or copper tube with the lead clip of the insulation resistance tester and measure the resistance by placing a probe on ①, and then ② on the terminal plate. (Fig. 2)

#### (3) Outdoor Unit

Clamp a metallic part of the unit with the lead clip of the insulation resistance tester and measure the resistance by placing a probe on ⑤, and then ⑥ on the terminal plate. (Fig. 2)

#### (4) Measurement of Insulation Resistance for Electrical Parts

Disconnect the lead wires of the desired electric part from terminal plate, PCB Ass'y, capacitor, etc. Similarly disconnect the connector. Then measure the insulation resistance. (Figs. 1 to 4)

Refer to Electric Wiring Diagram.

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

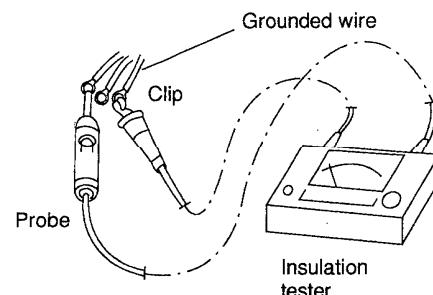


Fig. 1

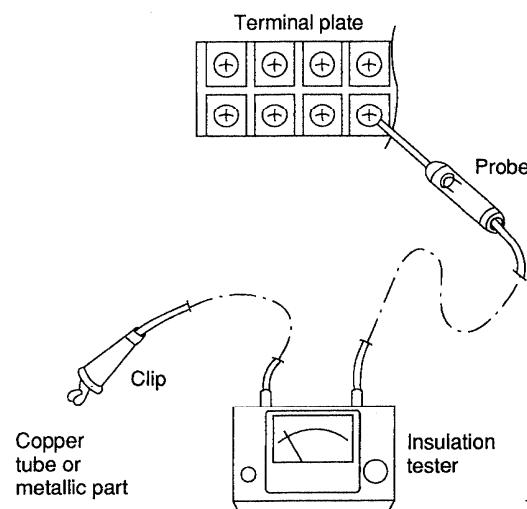


Fig. 2

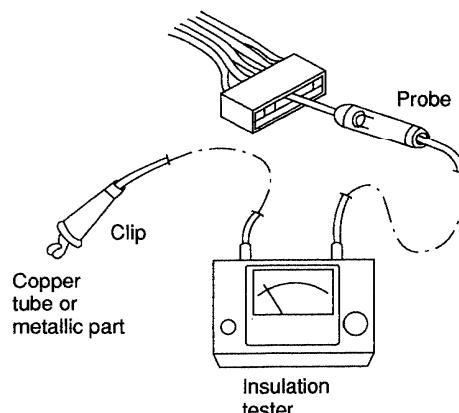


Fig. 3

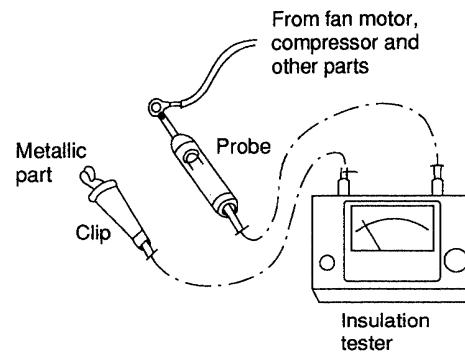


Fig. 4

## 7-2 Checking Continuity of Fuse on PCB Ass'y

- Check for continuity using a multimeter as shown in Fig. 5.

Note:

### Method Used to Replace Fuse on PCB Ass'y

- Remove the PCB Ass'y from the electrical component box.
- Pull out the fuse at the metal clasp using pliers while heating the soldered leads on the back side of the PCB Ass'y with a soldering iron (30W or 60W). (Fig. 6)
- 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:**

When replacing the fuse, be sure not to break down the varistor.

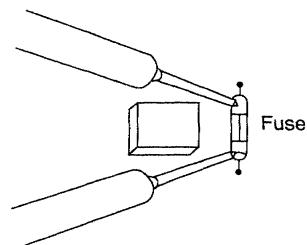


Fig. 5

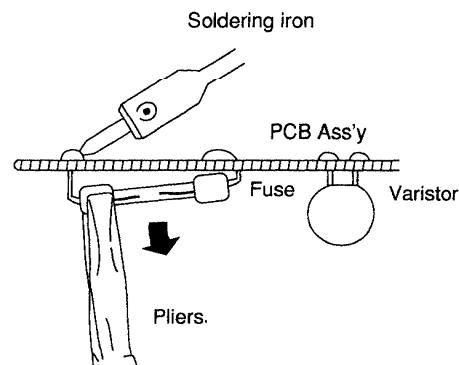


Fig. 6

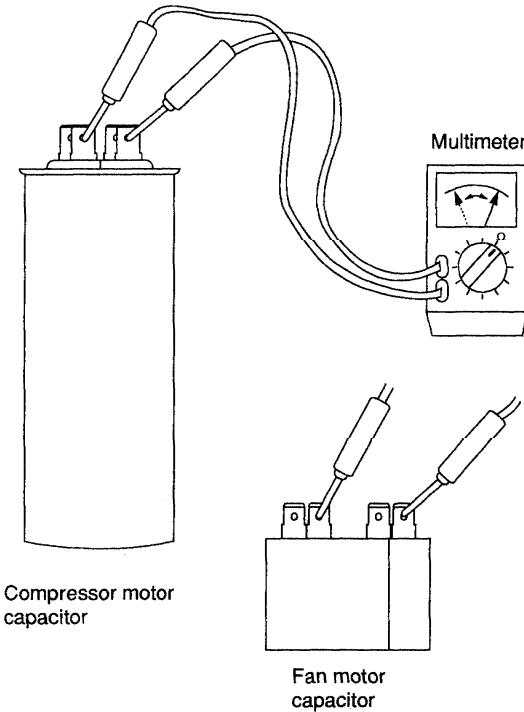


Fig. 7

## 7-4 Appearance of Electrical Parts

### (1) Relay

G4F-11123T-TS

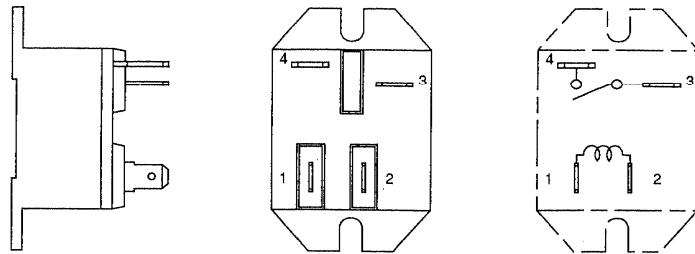


Fig. 8

### (2) Float Switch

FS-3502-201

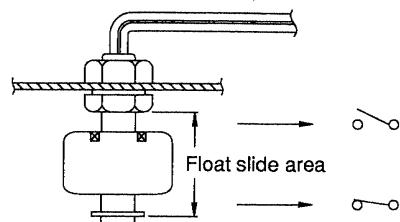


Fig. 9

### (3) SSR (solid state relay)

G3L-205TL-TS1

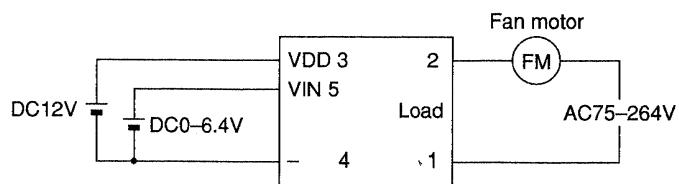
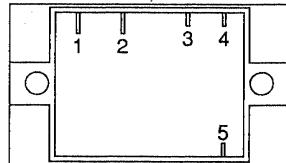
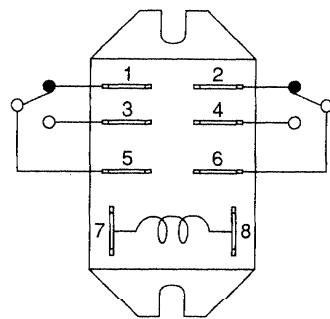


Fig. 10

**(4) Auxiliary Relay**

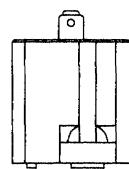
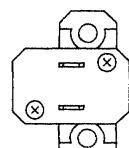
MY2F-T1-USTS



**Fig. 11**

**(5) PTC (Thermistor)**

PS2A E20-470



**Fig. 12**

For parts or service contact



SFS Corporation: 1200 West Artesia Blvd., Compton, California 90220

In Canada

SANYO Canada Inc.: Toronto, Ont. M4H 1M6

H408/12M

Printed in U.S.A.

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