

SERVICE MANUAL (Expanded Information)

KS2422

C2422

CL2422

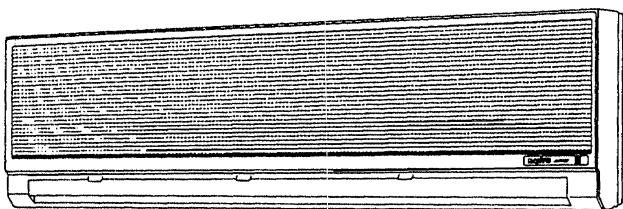
KS3622

C3622

SANYO

SPLIT SYSTEM AIR CONDITIONER

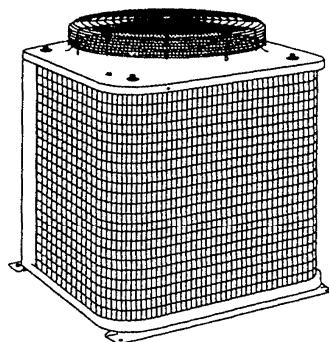
Indoor Unit



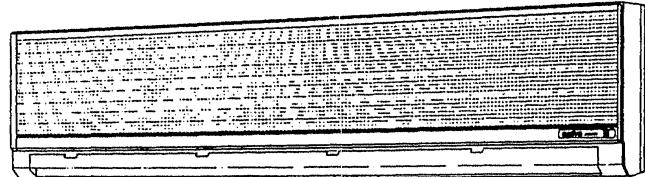
KS2422



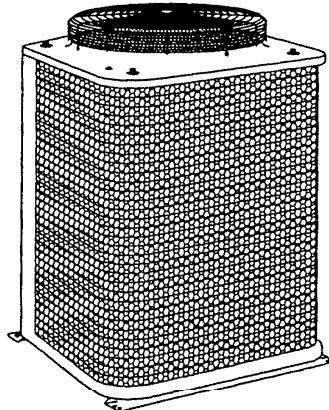
Outdoor Unit



C2422 / CL2422



KS3622



C3622

SERVICE MANUAL

KS2422 —— **C2422**
 └—— **CL2422**
KS3622 —— **C3622**

(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.

Table of Contents

	Page
1. SPECIFICATIONS	
1-1 Unit Specifications	1
1-2 Major Component Specifications	3
(1) Indoor and Outdoor Units	3
(a) KS2422 (Indoor unit)	
(b) C2422 (Outdoor unit)	
(c) CL2422 (Outdoor unit)	
(d) KS3622 (Indoor unit)	
(e) C3622 (Outdoor unit)	
1-3 Other Component Specifications.....	8
(1) Indoor Unit	8
(2) Outdoor Unit.....	9
2. PERFORMANCE CHARTS	
2-1 Operating Current.....	11
2-2 High and Low Pressure.....	13
3. AIR THROW DISTANCE CHART	17
4. FUNCTION	
4-1 Room Temperature Control	18
4-2 Freeze Prevention	19
4-3 Fan Speed Auto (Indoor Fan)	19
4-4 Outdoor Fan Speed Control (C2422 and C3622)	20
4-5 Outdoor Fan Speed Control (CL2422)	20
5. ELECTRICAL DATA	
● Schematic Diagram.....	21
● Electric Wiring Diagram (PCB Ass'y)	24
6. TROUBLESHOOTING	
6-1 Check before and after troubleshooting.....	29
(1) Check power supply wiring	29
(2) Check inter-unit wiring.....	29
(3) Check power supply	29
(4) Check lead wires and connectors in indoor and outdoor units	29
(5) Reference	30
(a) Condition of general cooling operation	
(b) Condition of cooling operation under low ambient temperature	

6-2	Air conditioner does not operate	32
(1)	Circuit breaker trips (or fuse blows).....	32
(a)	When circuit breaker is set to ON, it trips in a few moments	
(b)	Circuit breaker trips in several minutes after turning air conditioner ON	
(2)	Neither indoor unit nor outdoor unit runs.....	34
(a)	Power is not supplied	
(b)	Check remote control unit	
(c)	Check OPERATION selector switch in indoor unit	
(d)	Check transformer in indoor unit	
(e)	Check fuse on PCB Ass'y in indoor unit	
(f)	Check high pressure switch (63PH) (C3622 only)	
(3)	Only outdoor unit does not run.....	37
(a)	Check COOL/FAN selector switch of remote control unit	
(b)	Outdoor unit does not run when air conditioner is in following conditions	
(c)	Check electro-magnetic connector	
(d)	Check PCB Ass'y	
6-3	A particular component of air conditioner does not operate	40
(1)	Only indoor fan does not run	40
(2)	Only outdoor fan does not run.....	40
(3)	Only outdoor fan does not run for CL2422	41
(4)	Only compressor does not run	42
6-4	Air conditioner operates, but abnormalities occur.....	43
(1)	Poor Cooling.....	43
(2)	Excessive Cooling	44
6-5	Indoor (heat exchanger) coil temperature sensor (TH1) is defective	44
(1)	Open.....	44
(2)	Shortage	44

7. CHECKING ELECTRICAL COMPONENTS

7-1	Measurement of Insulation Resistance	45
(1)	Power Supply Wires	45
(2)	Indoor Unit	45
(3)	Outdoor Unit.....	45
(4)	Measurement of Insulation Resistance for Electrical Parts	45
7-2	Checking Continuity of Fuse on PCB Ass'y	46
7-3	Checking Motor Capacitor	46
7-4	Appearance of Electrical Parts	47
(1)	Electro-Magnetic Contactor.....	47
(2)	Auxiliary Relay.....	47
(3)	Thermostat	47
(4)	Electro-Magnetic Contactor.....	47
(5)	SSR (solid state relay)	48
(6)	Thermostat	48
(7)	Thermistor (PTC)	48
(8)	High Pressure Switch.....	48

1. SPECIFICATIONS

1-1 Unit Specifications

Model No.	Indoor unit	Outdoor unit	KS2422 C2422 / CL2422
Performance			Cooling
Capacity	BTU/h kW		22,800 / 22,400 6.68 / 6.56
Air circulation (High)	cu. ft./min.		540 / 510
Moisture removal (High)	pints/h		6.5 / 6.4
Electrical Rating			
Phase, Frequency	Hz		Single, 60
Voltage rating	V		230 / 208
Available voltage range	V		187 to 253
Running amperes	A		10.9 / 11.5
Power input	W		2,340 / 2,300
Power factor	%		93 / 96
Starting amperes	A		66
S. E. E. R.	BTU/Wh		10.0 / 10.0
Features			
Controls			Microprocessor
Control unit			Wireless remote control unit
Temperature control			IC thermostat
Timer			ON/OFF, 24-hours & Program
Fan speeds	Indoor / Outdoor		3 and Auto / 1
Air deflector	Horizontal / Vertical		Manual / Automatic
Air filter			Washable, easy access
Compressor			Rotary
Refrigerant amount charged at shipment	lbs. (kg)		R22: 6.4 (2.9)
Refrigerant control			Capillary tube
Refrigerant tubing connections			Flare type
Operation sound	In-Hi / Me / Lo Out-Hi	dB-A	45 / 42 / 40 52
Max. allowable tubing length at shipment	ft. (m)		50 (15)
Limit of tubing length	ft. (m)		100 (30)
Limit of elevation difference between the 2 units	ft. (m)		Outdoor unit is higher than indoor unit: 50 (15) Outdoor unit is lower than indoor unit: 50 (15)
Refrigerant tube o.d.	Narrow tube Wide tube	in. (mm)	1/4 (6.35) 3/4 (19.05)
Refrigerant tube kit			Optional
Accessories			Hanging wall bracket
Dimensions & Weight		Indoor unit	Outdoor unit
Height	in. (mm)	14-9/16 (370)	30-1/8 (765)
Width	in. (mm)	49-7/32 (1,250)	26-3/8 (670)
Depth	in. (mm)	8-9/32 (210)	26-3/8 (670)
Net weight	lbs. (kg)	40 (18)	178 (81)
Shipping volume	cu. ft. (cu. m)	6.9 (0.195)	16.3 (0.461)
Shipping weight	lbs. (kg)	53 (24)	195 (86)

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

Unit Specifications (cont'd)

Model No.		Indoor unit	Outdoor unit	KS3622 C3622 Cooling
Performance	Capacity	BTU/h kW		34,000 / 33,000 9.96 / 9.67
	Air circulation (High)	cu. ft./min.		740 / 680
	Moisture removal (High)	pints/h		10.0 / 9.6
	Phase, Frequency	Hz		Single, 60
Electrical Rating	Voltage rating	V		230 / 208
	Available voltage range	V		187 to 253
	Running amperes	A		15.2 / 16.3
	Power input	W		3,300 / 3,250
	Power factor	%		94 / 96
	Starting amperes	A		98
	S. E. E. R.	BTU/Wh		10.6 / 10.8
Features	Controls			Microprocessor
	Control unit			Wireless remote control unit
	Temperature control			IC thermostat
	Timer			ON/OFF, 24-hours & Program
	Fan speeds	Indoor / Outdoor		3 and Auto / 1
	Air deflector	Horizontal / Vertical		Manual / Automatic
	Air filter			Washable, easy access
	Compressor			Rotary
	Refrigerant amount charged at shipment	lbs. (kg)		R22: 9.9 (4.5)
	Refrigerant control			Capillary tube
	Refrigerant tubing connections			Flare type
	Operation sound	In-Hi / Me / Lo Out-Hi	dB-A	48 / 45 / 42 62
	Max. allowable tubing length at shipment	ft. (m)		50 (15)
	Limit of tubing length	ft. (m)		130 (40)
	Limit of elevation difference between the 2 units	ft. (m)		Outdoor unit is higher than indoor unit: 50 (15) Outdoor unit is lower than indoor unit: 50 (15)
Dimensions & Weight	Refrigerant tube o.d.	Narrow tube Wide tube	in. (mm)	3/8 (9.52) 3/4 (19.05)
	Refrigerant tube kit			Optional
	Accessories			Hanging wall bracket
			Indoor unit	Outdoor unit
	Height	in. (mm)	14-9/16 (370)	38 (965)
	Width	in. (mm)	59-1/16 (1,500)	26-3/8 (670)
	Depth	in. (mm)	9-7/16 (240)	26-3/8 (670)
	Net weight	lbs. (kg)	68 (31)	209 (95)
	Shipping volume	cu. ft. (cu. m)	9.2 (0.260)	25 (0.708)
	Shipping weight	lbs. (kg)	85 (39)	235 (107)

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) KS2422 (Indoor unit)

Unit Model No.				KS2422
Remote Control Unit				RCS-KS2412W
Controller PCB				POW-KS2412B
Control circuit fuse				250V, 3A
Fan				Cross-flow
Number ... Dia. and length				in. (mm) 1 ... O.D. 4-1/3 (110), L 39 (990)
Model ... Number				UF4Q-31A6P ... 1
No. of pole ... rpm (230V, High)				4 ... 1,280
Nominal output				W(H.P.) 30 (1/25)
Coil resistance (Ambient temp. 68°F)				Ω WHT – BRN: 197.2 WHT – VLT: 41.4 VLT – ORG: 22.2 ORG – YEL: 59.1 YEL – PNK: 48.8
Fan Motor				Internal
Safety devices				Type Operating temp. 248 ± 9 Open °F Close °F 171 ± 27
Run capacitor				μF 1.8 VAC 440
Louver Motor				Model M2EA24ZA01 Rating 208 to 230V, 60Hz No. of pole ... rpm 8 ... 3 Output 2.5 Coil resistance (at 68°F) 16.45 ± 15%
Heat Exch.				Coil Aluminum plate fin / Copper tube Rows ... Fins per inch 2 ... 12.7 Face area ft. ² (m ²) 2.66 (0.25)

DATA SUBJECT TO CHANGE WITHOUT NOTICE.

(b) C2422 (Outdoor unit)

Unit Model No.				C2422
Type				Rotary (hermetic)
Model ... Number				C-2R170H6U ... I
No. of cyl ... rpm				1 ... 3,500
Nominal output				W (H.P.) 1,700 (2-1/4)
Compressor lubricant				cc 800
Coil resistance (Ambient temp. 77°F)				Ω C - R: 0.885 C - S: 1.773
Compressor	Type	Internal		
	Overload relay models			
	Safety devices	Operating temp.	Open °F	297 ± 9
		Close °F		198 ± 20
	Operating amp. (Ambient temp. 77°F)			
Fan	Run capacitor	μF	VAC	40 370
	Crank case heater			
	Type	Propeller		
Fan Motor	Number ... Dia.	in. (mm)		1 ... 19-15/16 (500)
	Model	KFC8S-101A6P		
	No. of pole ... rpm (230V, High)	6 ... 827		
	Nominal output	W (H.P.)		100 (1/8)
	Coil resistance (Ambient temp. 68°F)	Ω	WHT - BRN: 24.2 BLK - PNK: 53.1	
Heat Exch.	Safety devices	Type	Internal	
		Operating temp.	Open °F	248 ± 9
		Close °F		171 ± 27
	Run capacitor	μF	VAC	5 440
Coil				Aluminum plate fin / Copper tube
Rows ... Fins per inch				2 ... 12.7
Face area				ft. ² (m ²) 9.87 (0.92)
External Finish				Acrylic baked-on enamel finish

DATA SUBJECT TO CHANGE WITHOUT NOTICE.

(c) CL2422 (Outdoor unit)

Unit Model No.			CL2422	
Controller PCB			POW-CL2412	
Control circuit fuse			250V, 5A	
Type			Rotary (hermetic)	
Model ... Number			C-2R170H6U ... 1	
No. of cyl. ... rpm			1 ... 3,500	
Nominal output			W (H.P.)	
Compressor lubricant			cc	
Coil resistance (Ambient temp. 77°F)			Ω	
Type			Internal	
Overload relay models			—	
Safety devices	Operating temp.	Open	°F	297 ± 9
		Close	°F	170 ± 20
Operating amp. (Ambient temp. 77°F)			—	
Run capacitor			μF	
Crank case heater			VAC	
Fan			40	
Type			370	
Number ... Dia.			230V 30W	
Fan Motor			Propeller	
Model			KFC8S-101A6P	
No. of pole ... rpm (230V, High)			6 ... 827	
Nominal output			W (H.P.)	
Coil resistance (Ambient temp. 68°F)			Ω	
Safety devices			WHT - BRN: 24.2	
Type			BLK - PNK: 53.1	
Fan Motor	Operating temp.	Open	°F	248 ± 9
		Close	°F	171 ± 27
Run capacitor			μF	
			5	
			VAC	
			440	
Heat Exch.			Aluminum plate fin / Copper tube	
Coil			2 ... 12.7	
Rows ... Fins per inch			9.87 (0.92)	
Face area			ft. ² (m ²)	
External Finish			Acrylic baked-on enamel finish	

DATA SUBJECT TO CHANGE WITHOUT NOTICE.

(d) KS3622 (Indoor unit)

Unit Model No.			KS3622
Remote Control Unit			RCS-KS2412W POW-KS2412B
Controller PCB	Control circuit fuse		250V, 3A
Fan	Type		Cross-flow
	Number ... Dia. and length	in. (mm)	1 ... O.D. 4-13/18 (120), L 46 (1,170)
Fan Motor	Model ... Number		SFG4T-51A6P ... 1
	No. of pole ... rpm (230V, High)		4 ... 1,330
	Nominal output	W(H.P.)	50 (1/15)
	Coil resistance (Ambient temp. 68°F)	Ω	WHT - GRY: 118.2 WHT - VLT: 15.5 VLT - YEL: 13.6 YEL - PNK: 33.4
	Safety devices	Type	Internal
	Operating temp.	Open °F	248 ± 9
		Close °F	171 ± 27
	Run capacitor	μF	4
		VAC	440
Louver Motor	Model		M2EA24ZA01
	Rating		208 to 230V, 60Hz
	No. of pole ... rpm		8 ... 3
	Output	W	2.5
	Coil resistance (at 68°F)	kΩ	16.45 ± 15%
Heat Exch.	Coil		Aluminum plate fin / Copper tube
	Rows ... Fins per inch		3 ... 12.7
	Face area	ft. ² (m ²)	3.33 (0.31)

DATA SUBJECT TO CHANGE WITHOUT NOTICE.

(e) C3622 (Outdoor unit)

Unit Model No.			C3622
Type			Rotary (hermetic)
Model ... Number			C-R221H8U ... 1
No. of cyl ... rpm			1 ... 3,500
Nominal output W (H.P.)			2,200 (3)
Compressor lubricant cc			1,500
Coil resistance Ω (Ambient temp. 77°F)			C - R: 0.76 C - S: 2.76
Compressor	Type	Internal	
	Overload relay models	—	
	Operating temp.	Open °F	160 ± 5
		Close °F	87 ± 11
	Operating amp. (Ambient temp. 77°F)	—	
Fan	Run capacitor	μF	40
		VAC	370
	Crank case heater	—	
Fan Motor	Type	Propeller	
	Number ... Dia.	in. (mm)	1 ... 19-15/16 (500)
	Model	KFC6S-161A6P	
	No. of pole ... rpm (230V, High)	6 ... 820	
	Nominal output W (H.P.)	160 (1/5)	
Heat Exch.	Coil resistance Ω (Ambient temp. 68°F)	WHT - BRN: 34.9 WHT - PNK: 72.1 PNK - YEL: 81.6	
	Type	Internal	
	Operating temp.	Open °F	248 ± 9
		Close °F	171 ± 27
	Run capacitor	μF	4
		VAC	440
	Coil	Aluminum plate fin / Copper tube	
	Rows ... Fins per inch	2 ... 12.7	
	Face area ft. ² (m ²)	13.17 (1.22)	
	External Finish	Acrylic baked-on enamel finish	

DATA SUBJECT TO CHANGE WITHOUT NOTICE.

1-3 Other Component Specifications

(1) Indoor Unit: KS2422 and KS3622

KS2422 and KS3622

Transformer		ATR-H122U
Rated	Primary	AC 220V, 60Hz
	Secondary	10V, 1.2A
	Capacity	12VA
Coil resistance	Ω (at 77°F)	Primary (WHT – WHT): 146 ± 15% Secondary (BRN – BRN): 0.5 ± 15%
Thermal cut-off temp.		259°F, 2A, 250V

KS2422 and KS3622

Thermistor (coil sensor)		PBC-41E-S4			
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%		

KS2422 and KS3622

Thermistor (room sensor)		SDT-500B-6			
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%		

(2) Outdoor Unit

C2422

Electro-Magnetic Contactor	FMCA-1UL
Coil rating	AC 240V, 60Hz
Coil resistance	Ω (at 77°F)
Contact rating (Main)	580 ± 15%
(Auxiliary)	AC 240V, 20A
	AC 240V, 3A

C2422

Auxiliary Relay	MY2F-T1-USTS
Coil rating	AC 240V, 60Hz
Coil resistance	$k\Omega$ (at 77°F)
Contact rating	18.8 ± 15%
	AC 240V, 5A

C2422

Thermostat	VTB-4U201F
Operating temp.	$^{\circ}\text{F}$
	ON
	OFF
Contact rating	75 + 3, -1
	79 ± 3
	200 to 240V, 1A

CL2422

Transformer	ATR-J122U
Rated	AC 220V, 60Hz
Primary	19V, 0.63A
Secondary	12VA
Capacity	Primary (WHT – WHT): 146 ± 15%
Coil resistance	Secondary (BRN – BRN): 1.3 ± 15%
Ω (at 79°F)	259°F, 2A, 250V
Thermal cut-off temp.	

CL2422

Electro-Magnetic Contactor	CLK-16E3-21
Coil rating	AC 240V, 60Hz
Coil resistance	$k\Omega$ (at 77°F)
Contact rating (Main)	2.5 ± 15%
(Auxiliary)	AC 240V, 18A
	AC 240V, 3A

CL2422

Relay	MY2F-T1-USTS
Coil rating	DC 24V
Coil resistance	650 ± 15%
Contact rating	AC 240V, 5A

CL2422

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	

CL2422

Thermistor (THR and THC)		PBC-41E-S4			
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%		

CL2422 and C3622

Thermostat		YTB-4U305F	
Operating temp.	°F	ON	75 + 3, -1
		OFF	79 ± 3
Contact rating		200 to 240V, 1A	

CL2422 and C3622

Thermistor (PTC)		TDK-101YV	
Rating max. voltage		AC 400V	
max. ampere		11.5A	
Resistance	Ω (at 77°F)	100 ± 25%	

C3622

High Pressure Switch		FTB-2UC01	
Operating pressure	psig	OFF	412 + 14, -7
		ON	Manual
Contact rating		AC 240V, 4A	

C3622

Electro-Magnetic Contactor		FMCA-1SUL	
Coil rating		AC 240V	
Coil resistance	Ω (at 77°F)	580 ± 15%	
Contact rating (Main)		AC 240V, 26A	
(Auxiliary)		AC 240V, 3A	

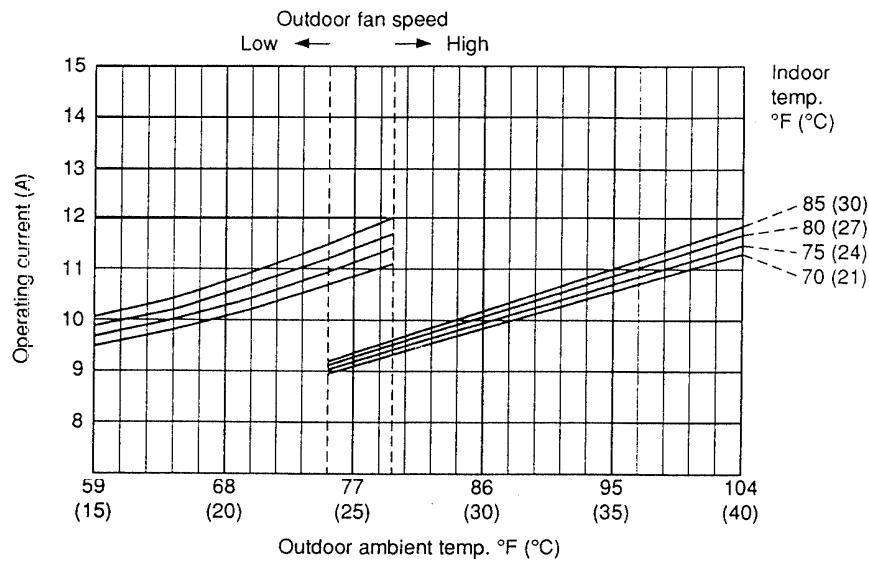
2. PERFORMANCE CHARTS

2-1 Operating Current

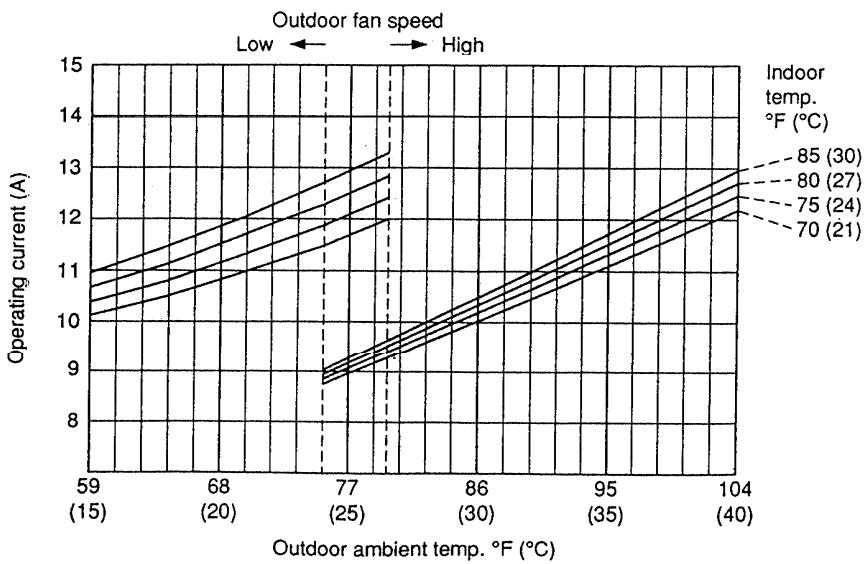
■ KS2422 / C2422

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

230V



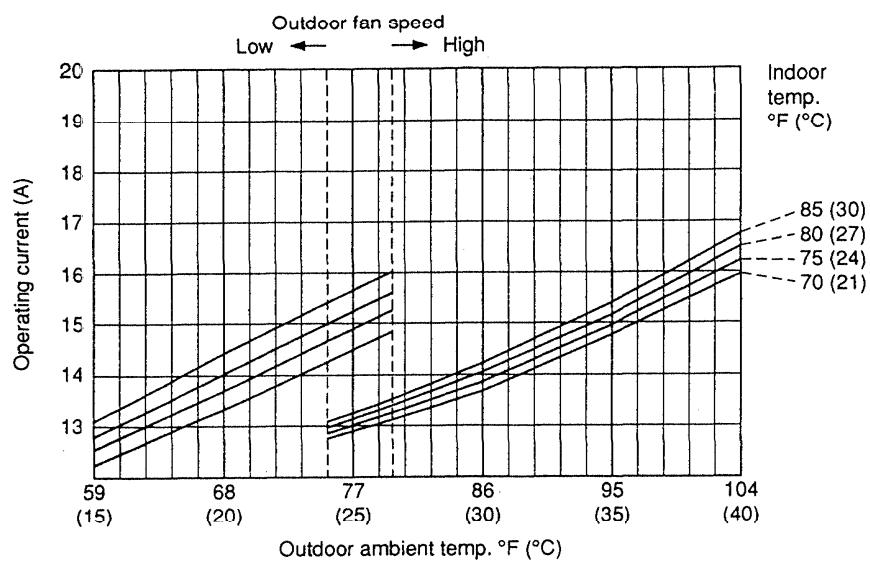
208V



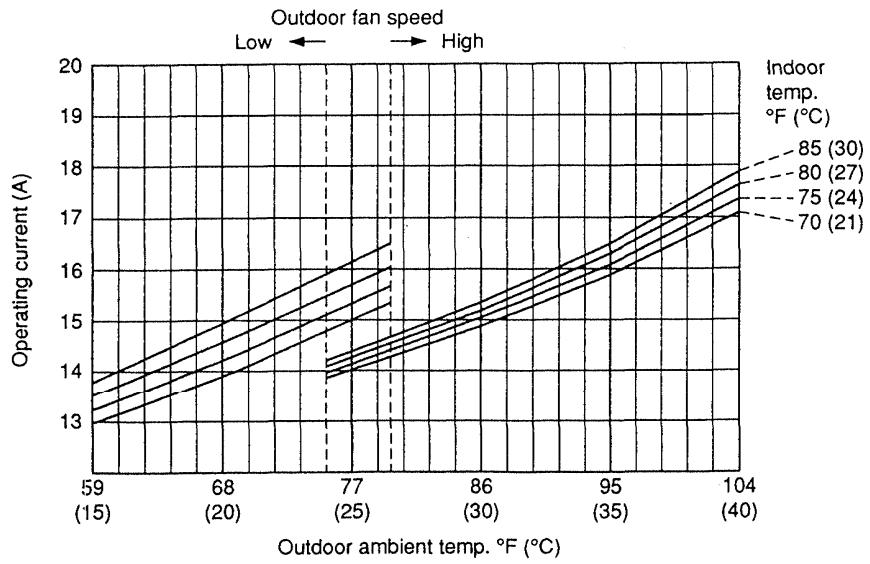
Operating Current

■ KS3622 / C3622

230V



208V



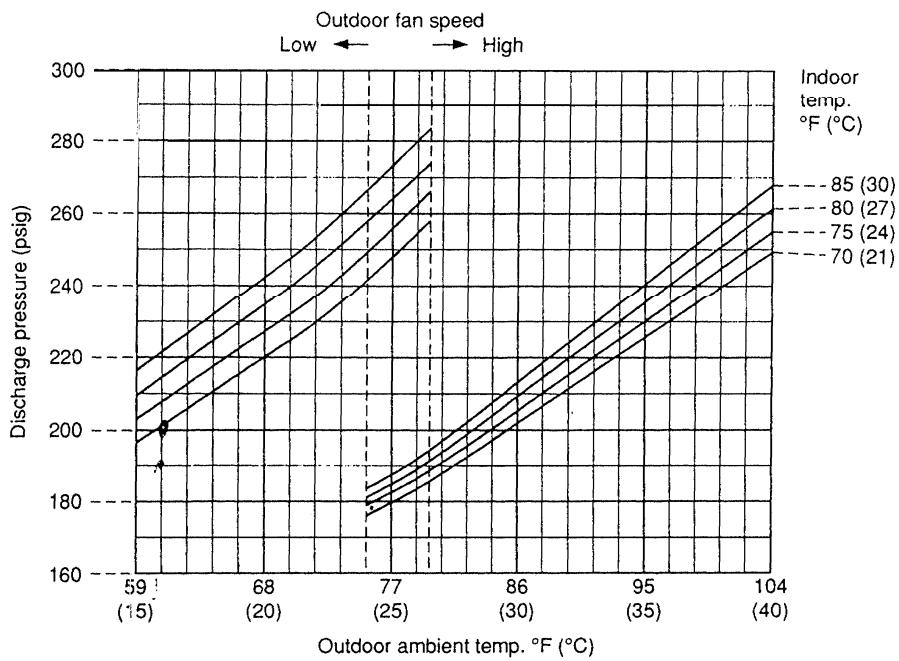
2-2 High and Low Pressure

■ KS2422 / C2422

● High Pressure

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

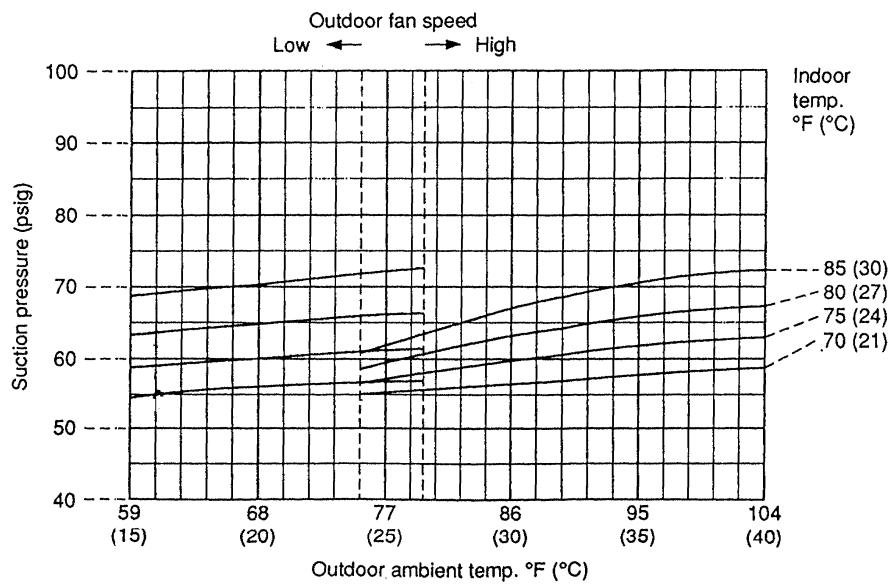
230V



● Low Pressure

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

230V

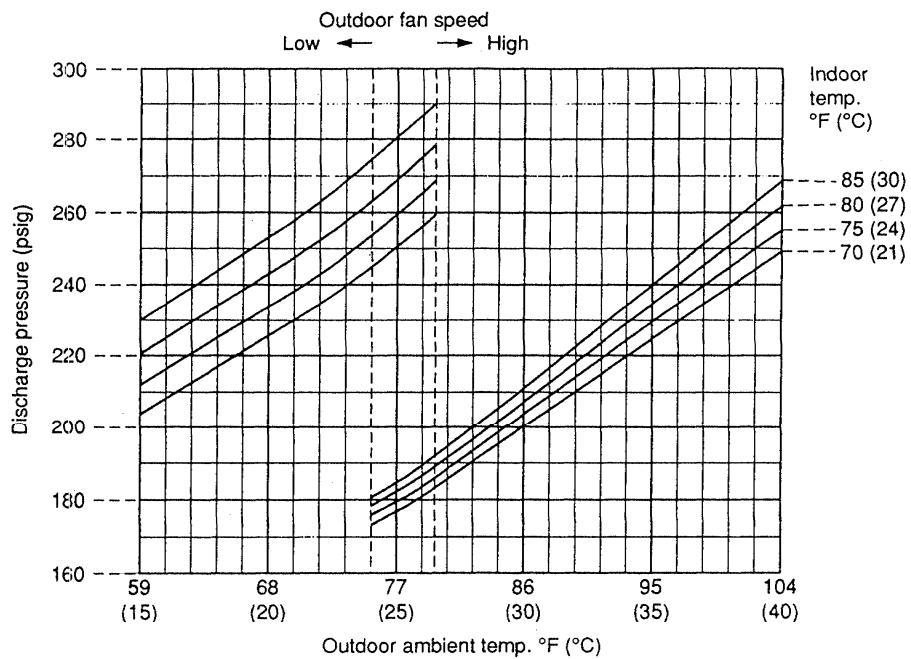


■ KS2422 / C2422

● High Pressure

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

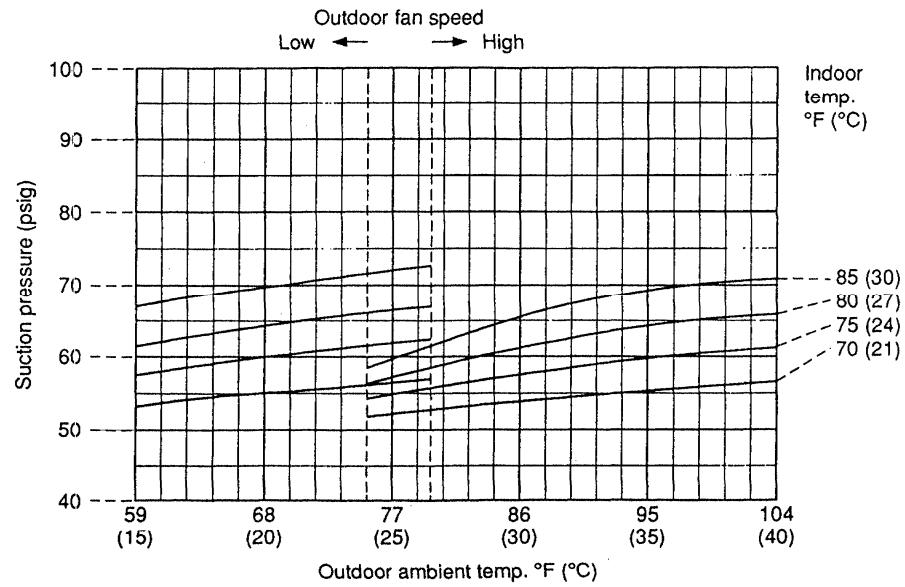
208V



● Low Pressure

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

208V

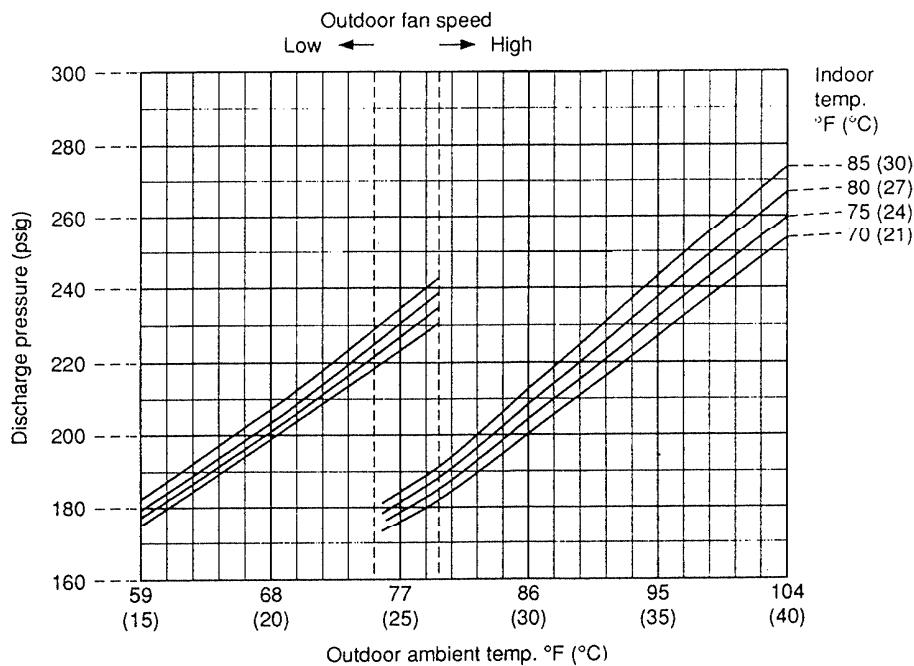


■ KS3622 / C3622

● High Pressure

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

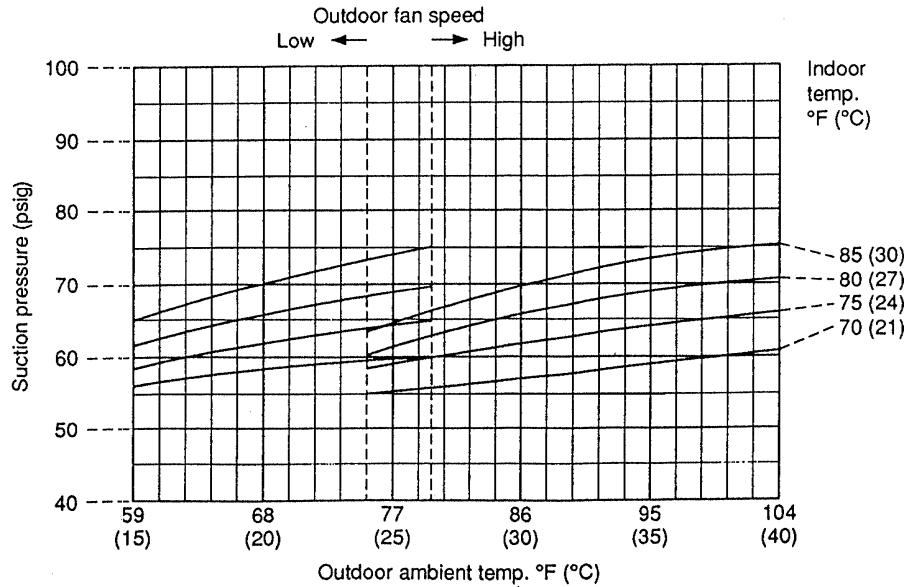
230V



● Low Pressure

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

230V

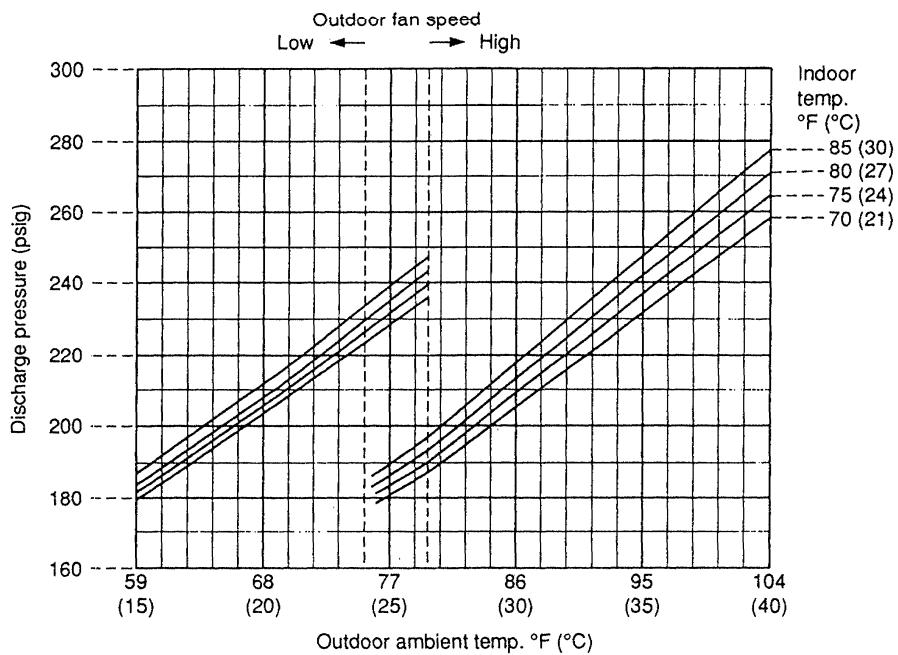


■ KS3622 / C3622

● High Pressure

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

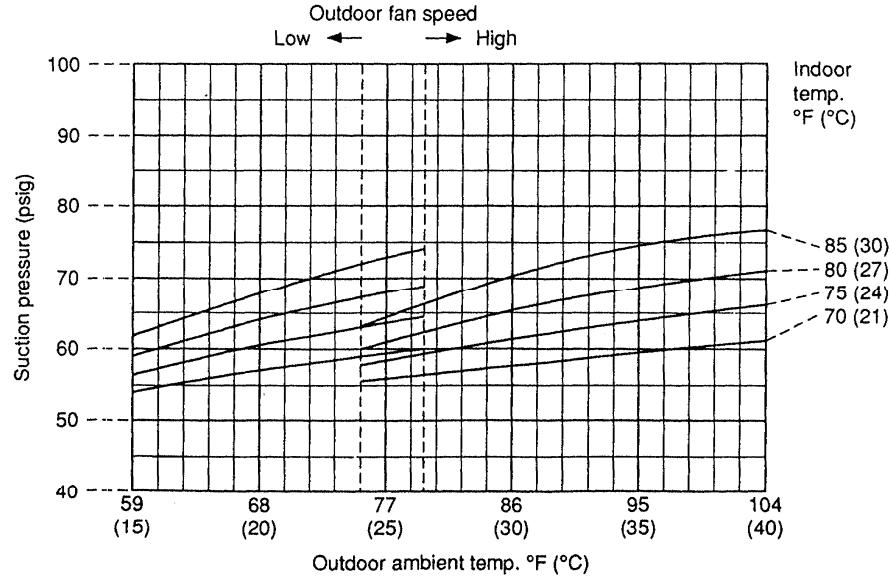
208V



● Low Pressure

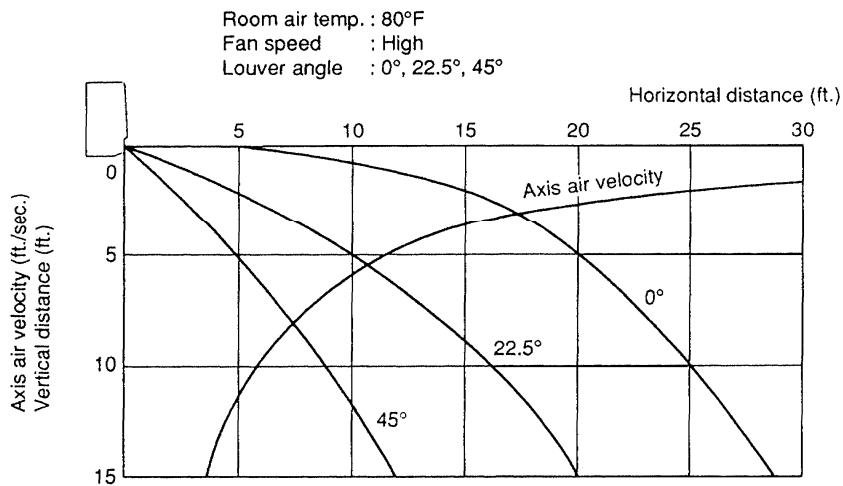
Low pressure characteristics versus outdoor ambient temperature and indoor temperature
(Indoor relative humidity: 50%, Indoor fan speed: High)

208V

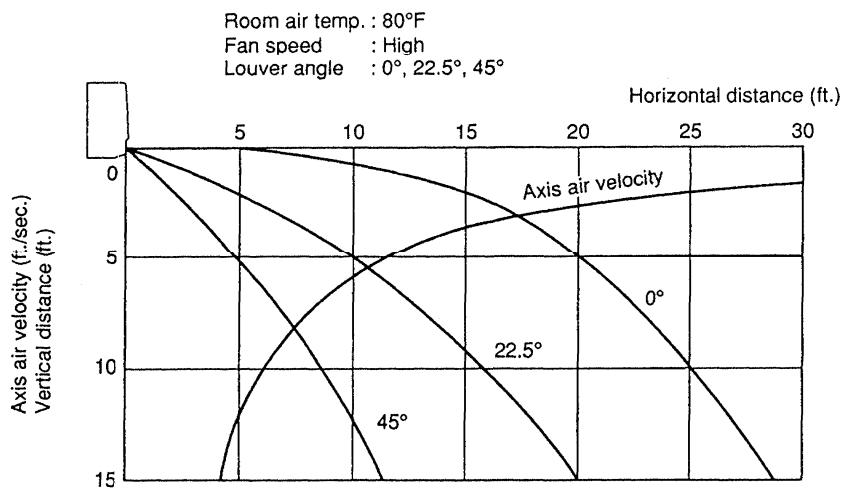


3. AIR THROW DISTANCE CHART

Model: KS2422



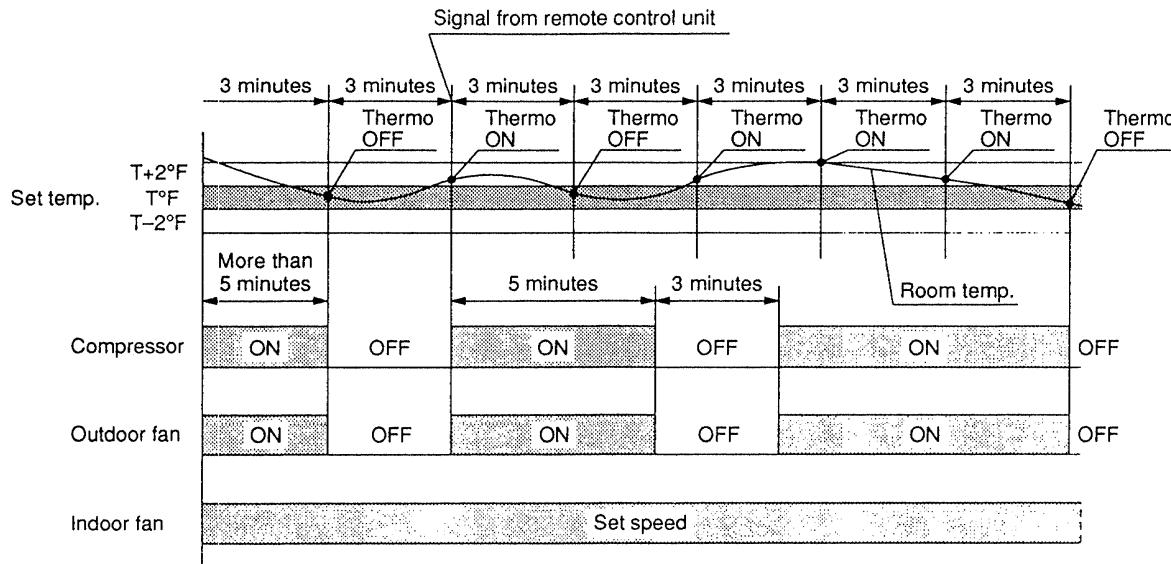
Model: KS3622



4. FUNCTION

4-1 Room Temperature Control

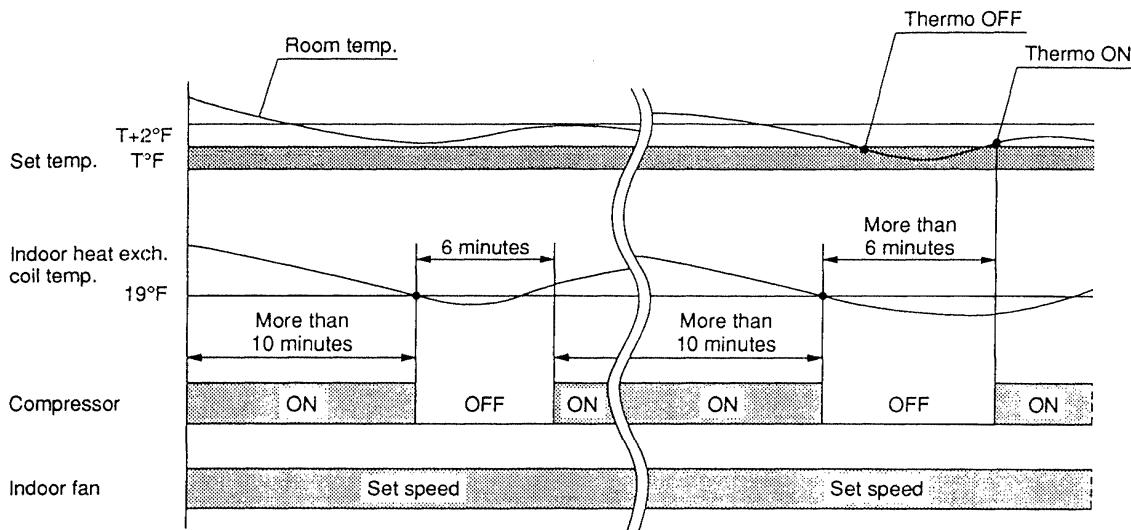
- Room temperature control is obtained by cycling the compressor ON and OFF under control of the room temperature sensor in the remote control unit.
- The room temperature (and other information) is transmitted every 3 minutes by the remote control unit to the controller in the indoor unit.



- 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

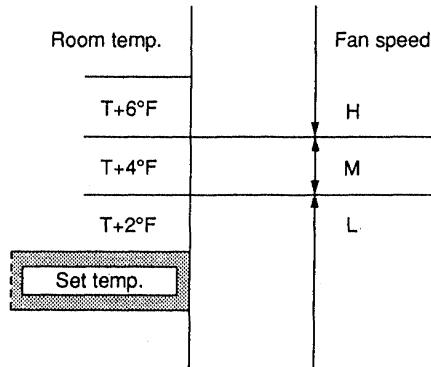
4-2 Freeze Prevention

- 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 19°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 (C2422 and C3622)

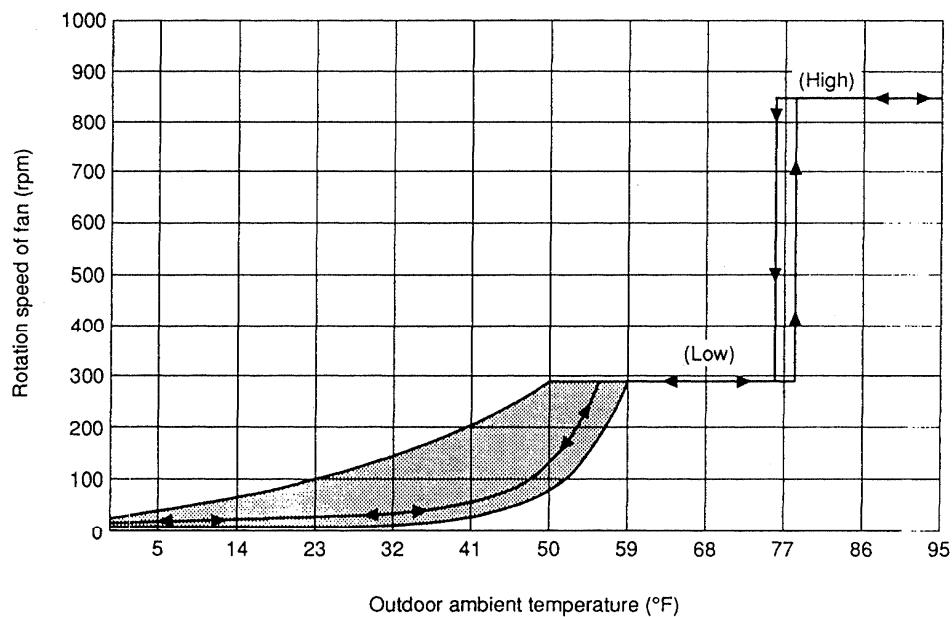
- In low temperature areas, the outdoor fan goes automatically to LOW to prevent freezing.
- When the outdoor air temperature falls below 75°F, the outdoor fan is set to LOW.
When the outdoor air temperature rises to 79°F, the outdoor fan is set to HIGH.

4-5 Outdoor Fan Speed Control (CL2422)

- In low temperature areas, the outdoor fan goes automatically to LOW to prevent freezing.
- When the outdoor air temperature falls below 75°F, the outdoor fan is set to LOW.
- When the outdoor air temperature rises to 79°F or the outdoor unit heat exchanger temperature is above 145°F, the outdoor fan is set to HIGH.
- The speed of fan rotation follows an oblique line under the outdoor and indoor air temperature conditions as shown in the diagram below.

Rotation speed of outdoor fan

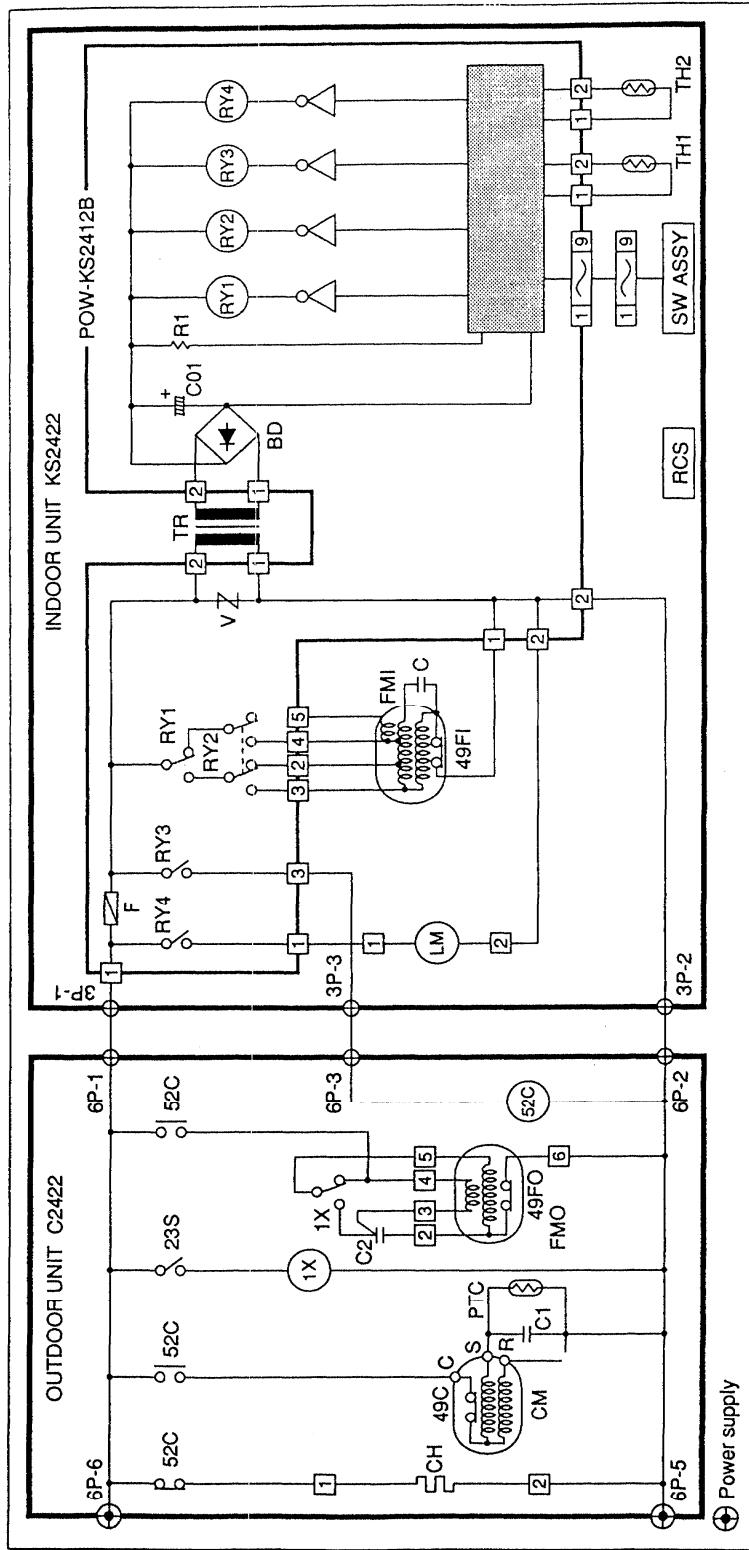
→ In case of: 230V – 60Hz
Room temp.: 67°F DB/57°F WB
Indoor fan speed: Low



5. ELECTRICAL DATA

● Schematic Diagram

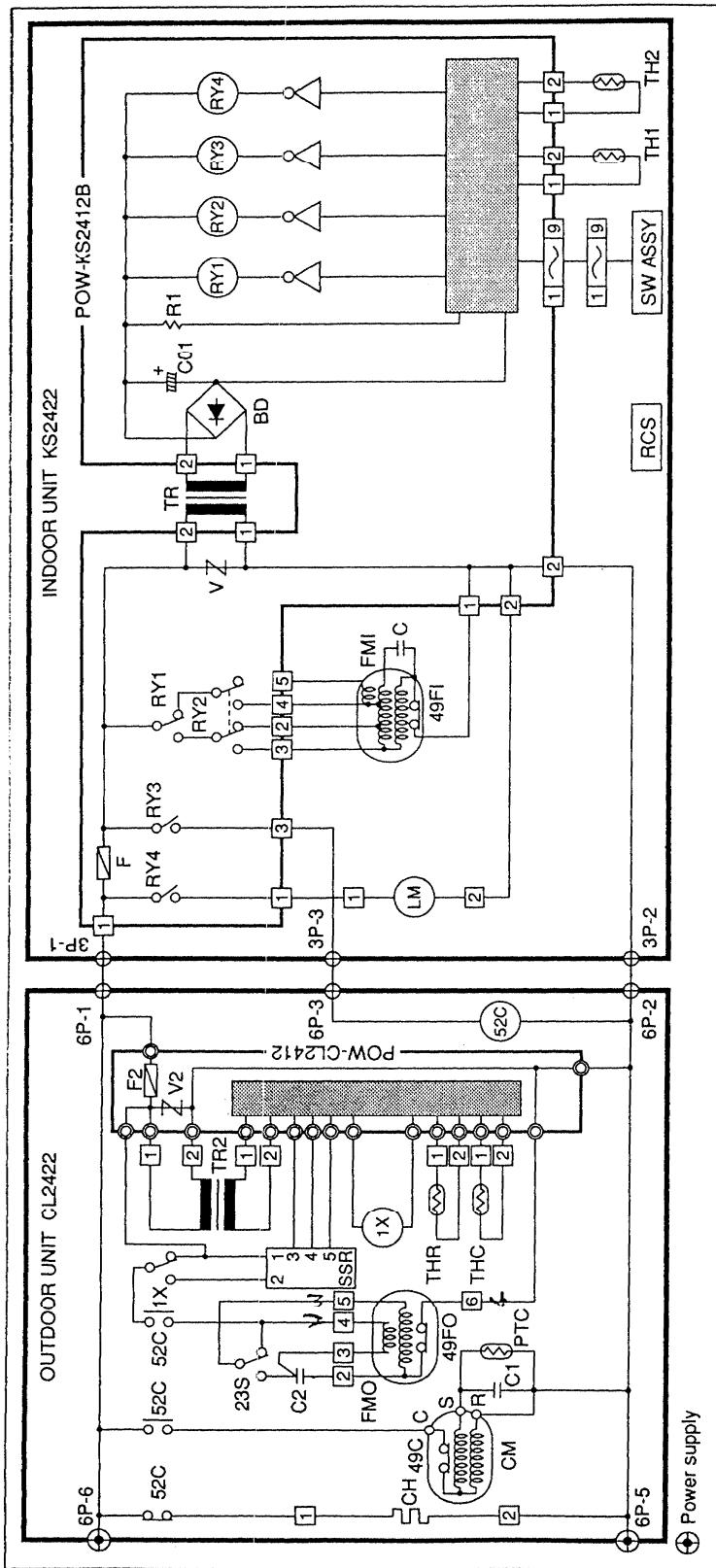
KS2422 / C2422



Symbol	Description	Symbol	Description
OUTDOOR UNIT		49FI	INDOOR FAN MOTOR INTERNAL PROTECTOR
CH	CRANK CASE HEATER	C	CAPACITOR
CM	COMPRESSOR MOTOR	TR	TRANSFORMER
49C	COMPRESSOR MOTOR INTERNAL PROTECTOR	TH1	THERMISTOR (COIL TEMP. SENSOR)
PTC	THERMISTOR	TH2	THERMISTOR (ROOM TEMP. SENSOR)
23S	: OUTDOOR AIR TEMP THERMOSTAT	SW ASSY	SWITCH ASSY SW-KS2412W
1X	: RELAY	RCS	WIRELESS REMOTE CONTROL UNIT PCB ASSY
FMO	OUTDOOR FAN MOTOR	POW-KS2412B	CONTROLLER PCB ASSY
49HO	OUTDOOR FAN MOTOR INTERNAL PROTECTOR	F	EL SE 250V 3A
C1, C2	CAPACITOR	V	VARISTOR
52C	ELECTRO-MAGNETIC CONTACTOR	BD	BRIDGE DIODE
INDOOR UNIT		C01	CAPACITOR
LM	LOIVER MOTOR	R1	RESISTOR
FMI	INDOOR FAN MOTOR	RY1, 2, 3, 4	AUXILIARY RELAY

● Schematic Diagram

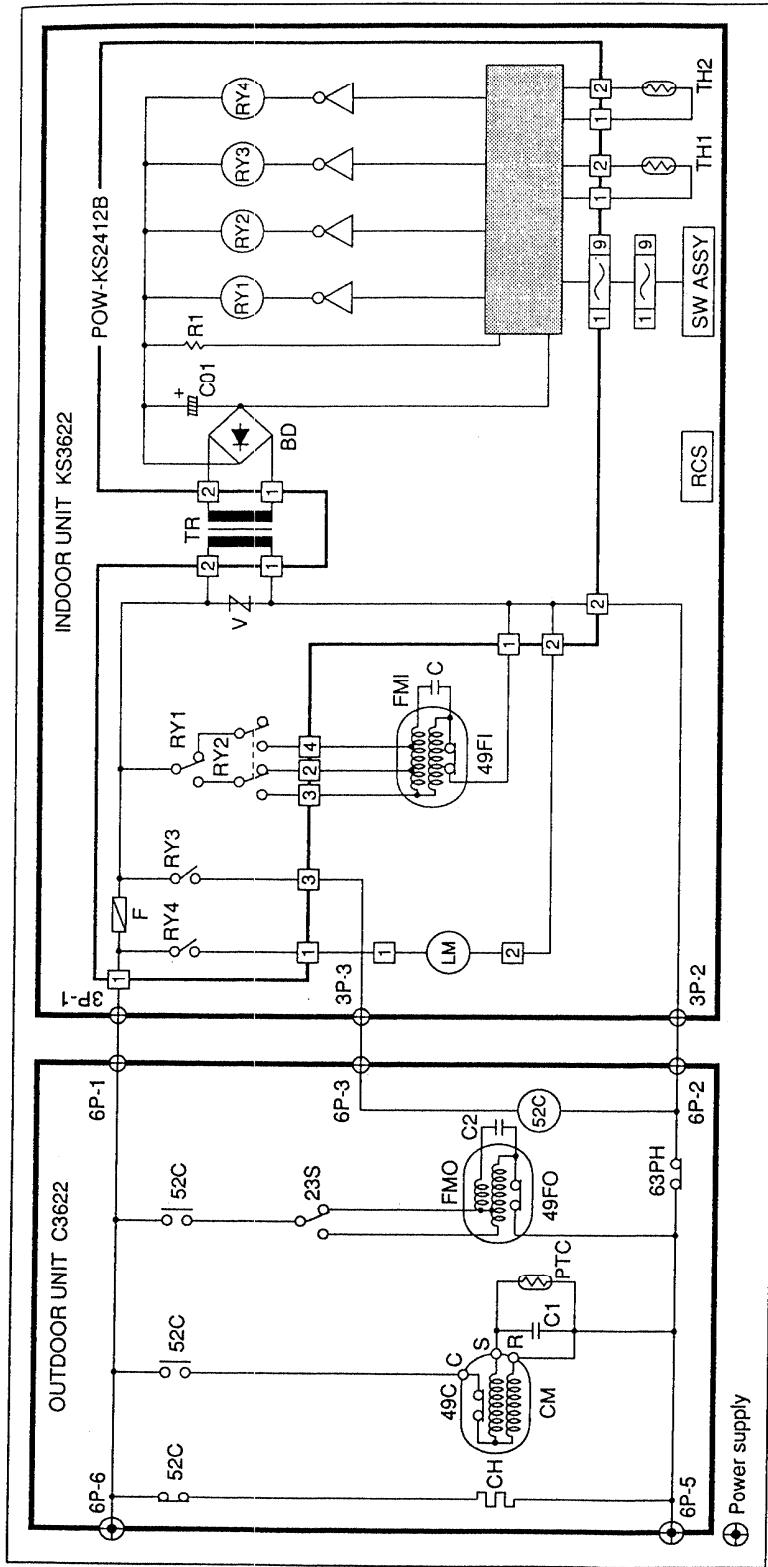
KS2422 / CL2422



Symbol	Description	Symbol	Description
OUTDOOR UNIT		INDOOR UNIT	
CH	CRANKCASE HEATER	LM	LOUVER MOTOR
CM	COMPRESSOR MOTOR	FM1	INDOOR FAN MOTOR
49C	COMPRESSOR MOTOR INTERNAL PROTECTOR	49F1	INDOOR FAN MOTOR INTERVAL PROTECTOR
PTC	THERMISTOR	C	CAPACITOR
23S	OUTDOOR AIR TEMP.THERMOSTAT	TR	TRANSFORMER
FMO	OUTDOOR FAN MOTOR	TII1	THERMISTOR (COIL TEMP. SENSOR)
49FO	OUTDOOR FAN MOTOR INTERVAL PROTECTOR	TII2	THERMISTOR (ROOM TEMP. SENSOR)
C1, C2	CAPACITOR	SW ASSY	SWITCH ASSY SW-KS2412W
SSR	SOLID STATE RELAY	RCS	WIRELESS REMOTE CONTROL L/N/T RCS-KS2412W
TR2	TRANSFORMER	POW-KS2412B	CONTROLLER PCB ASSY
IX	RELAY	F	FUSE 250V, 3A
TIR	THERMISTOR (AIR SENSOR)	V	VARISTOR
THC	THERMISTOR (COIL SENSOR)	BD	BRIDGE DIODE
52C	PTC	C01	CAPACITOR
POW-CL2412	CONTROLLER PCB ASSY	R1	RESISTOR
I2	FUSE 240V, 5A	RY1, 2, 3, 4	AUXILIARY RELAY
V2	VARISTOR		

● Schematic Diagram

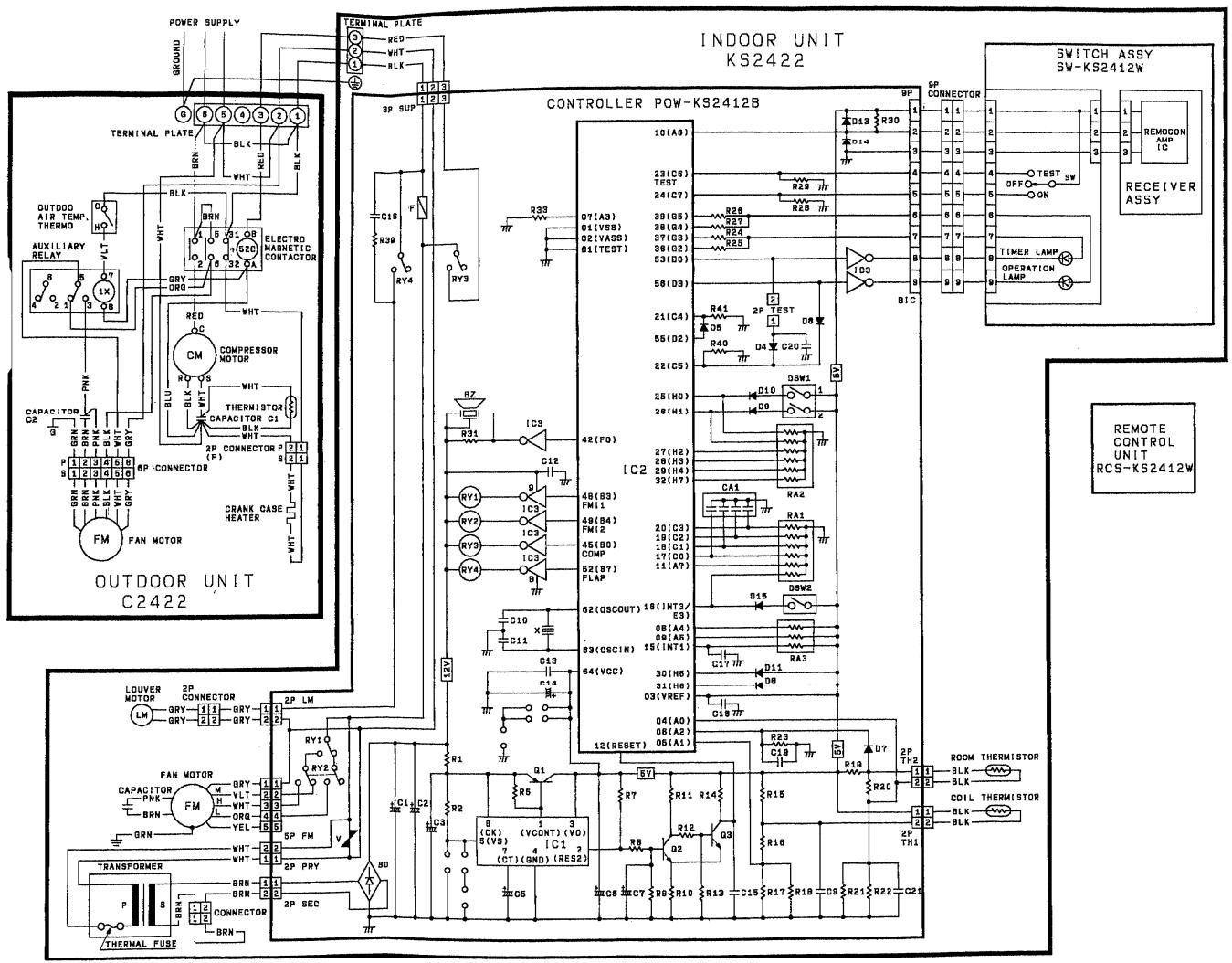
KS3622 / C3622

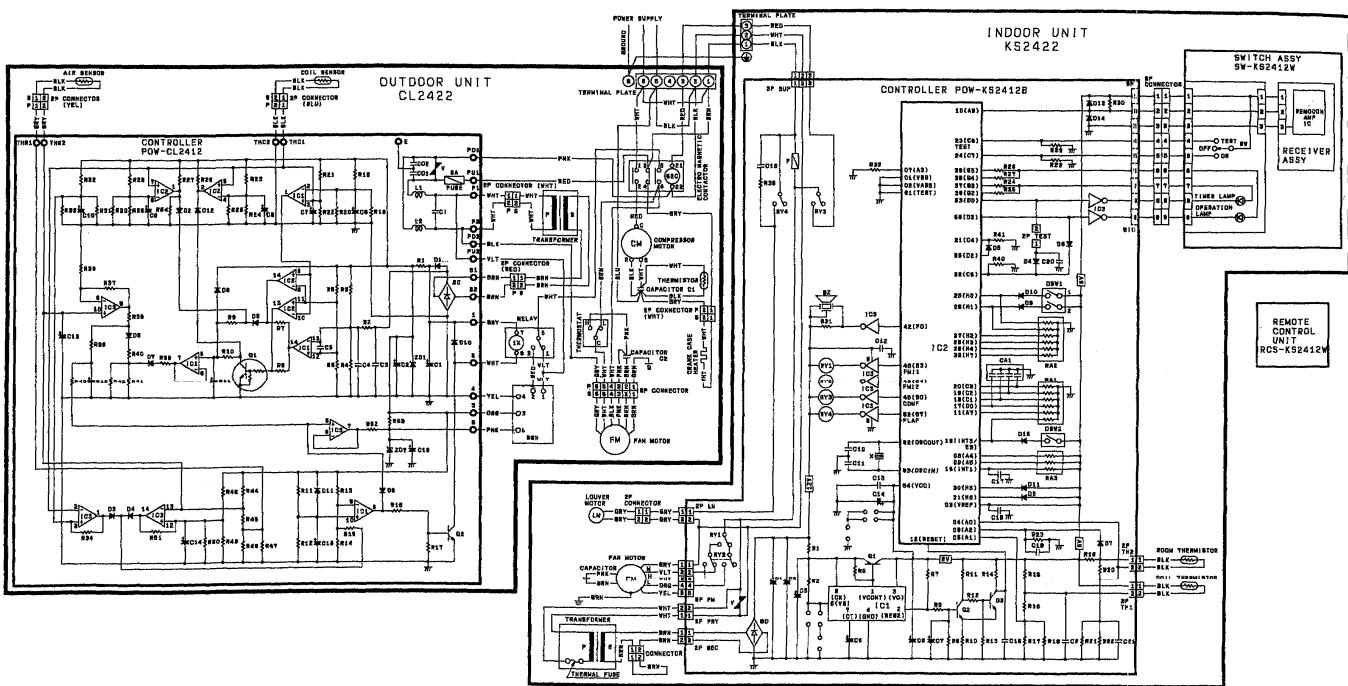


Symbol	Description	Symbol	Description
OUDOR UNIT CH	CRANK CASE HEATER	49F1	INDOOR FAN MOTOR INTERNAL PROTECTOR
CM	COMPRESSOR MOTOR	C	CAPACITOR
49C	COMPRESSOR MOTOR INTERNAL PROTECTOR	TR	TRANSFORMER
PTC	THERMISTOR	TH1	THERMISTOR (COIL TEMP. SENSOR)
25	OUTDOOR AIR TEMP. THERMOSTAT	TH2	THERMISTOR (ROOM TEMP. SENSOR)
FMO	OUTDOOR FAN MOTOR	SW ASSY	SWITCH ASS'Y SW-KS2412W
49FO	OUTDOOR FAN MOTOR INTERNAL PROTECTOR	RCS	WIRELESS REMOTE CONTROL UNIT RCS-KS2412W
C1, C2	CAPACITOR	POW-KS2412B	CONTROLLER PCB ASS'Y
SIC	ELECTRO-MAGNETIC CONTACTOR	F	FUSE 250V, 3A
63PH	HIGH PRESSURE SWITCH	V	VARISTOR
INDOOR LNT		BD	BRIDGE DIODE
LM	LOUVER MOTOR	C01	CAPACITOR
		R1	RESISTOR
		RY1, 2, 3, 4	AUXILIARY RELAY
		FMT	INDOOR FAN MOTOR

● Electric Wiring Diagram (PCB Ass'y)

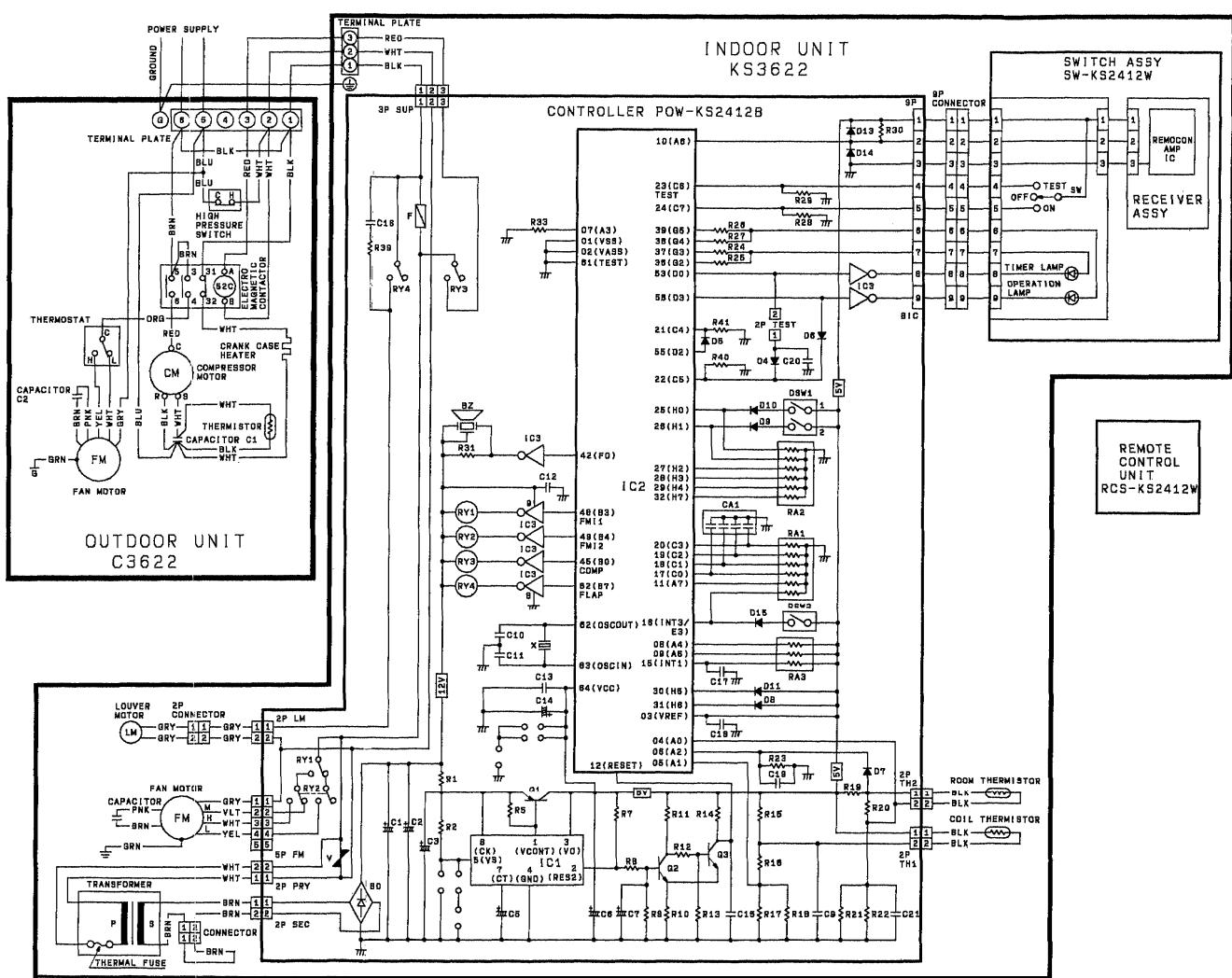
KS2422 / C2422





● Electric Wiring Diagram (PCB Ass'y)

KS3622 / C3622



6. TROUBLESHOOTING

6-1 Check before and after troubleshooting.

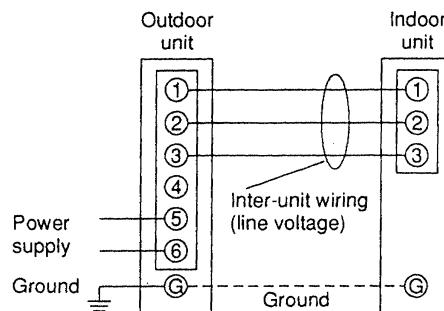
(1) Check power supply wiring.

- 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, 230/208V



(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.

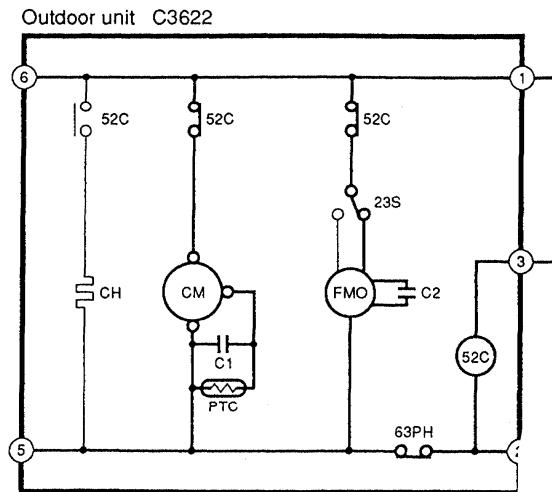
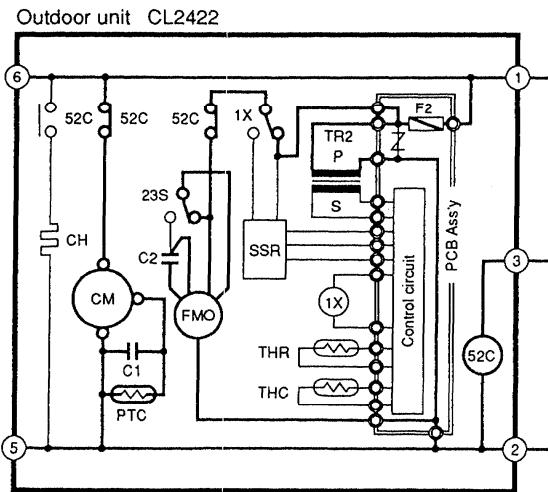
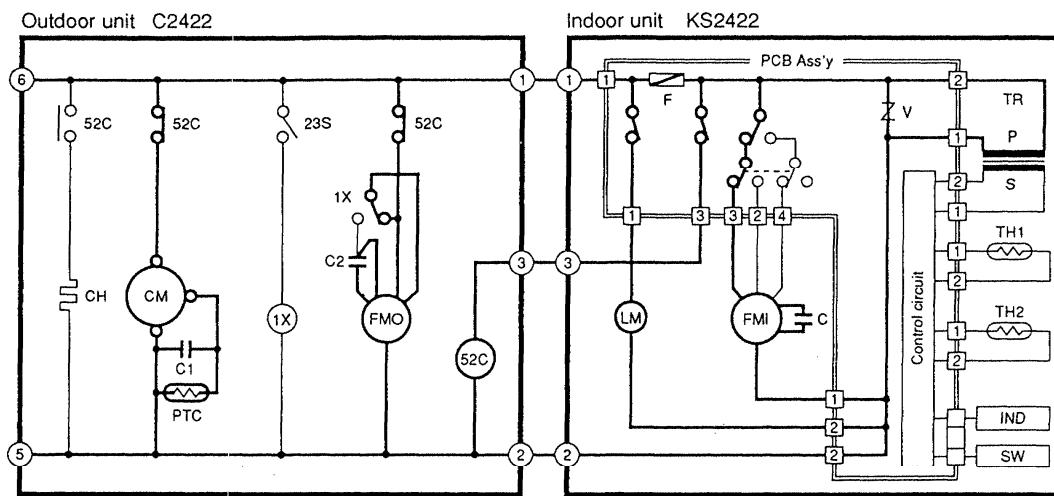
- Check that coating of lead wires is not damaged.
- Check that lead wires and connectors are connected firmly.
- Check that wiring is correct.

(5) Reference

(a) Condition of general cooling operation

- ON/OFF operation button..... ON
- COOL/FAN selector switch..... COOL
- SWEEP button..... ON
- Indoor fan speed HIGH
- Thermo. ON
- Outdoor air temperature..... above 79°F

(Electric wiring diagram is same for KS2422 and KS3622.)



(b) Condition of cooling operation under low ambient temperature

ON/OFF operation button..... ON

COOL/FAN selector switch..... COOL

SWEET button..... ON

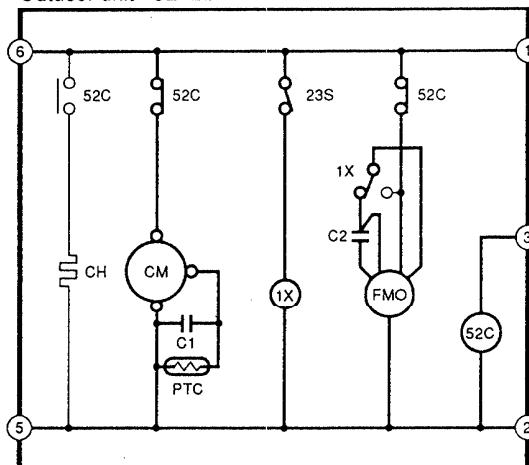
Indoor fan speed LOW

Thermo. ON

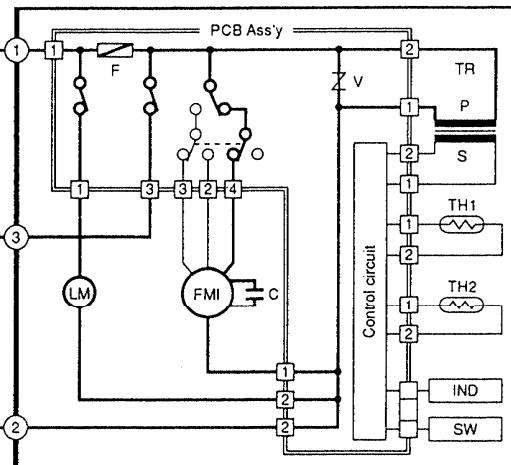
Outdoor air temperature..... below 75°F (Only CL2422: below 59°F)

(Electric wiring diagram is same for KS2422 and KS3622.)

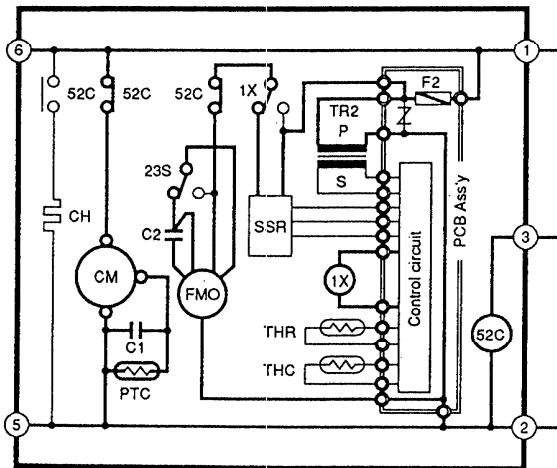
Outdoor unit C2422



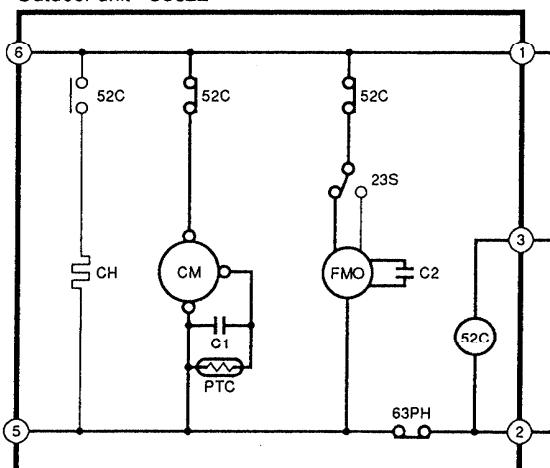
Indoor unit KS2422



Outdoor unit CL2422



Outdoor unit C3622



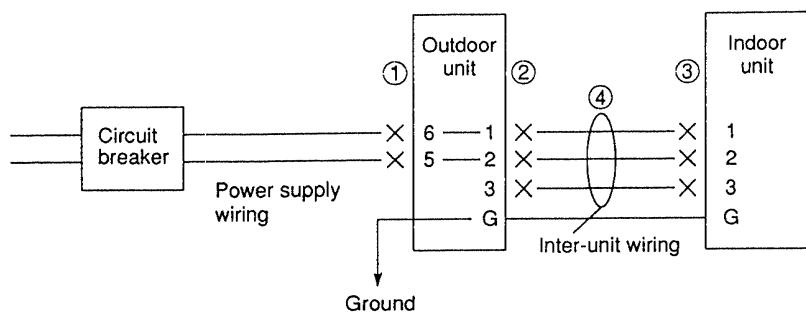
6-2 Air conditioner does not operate.

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

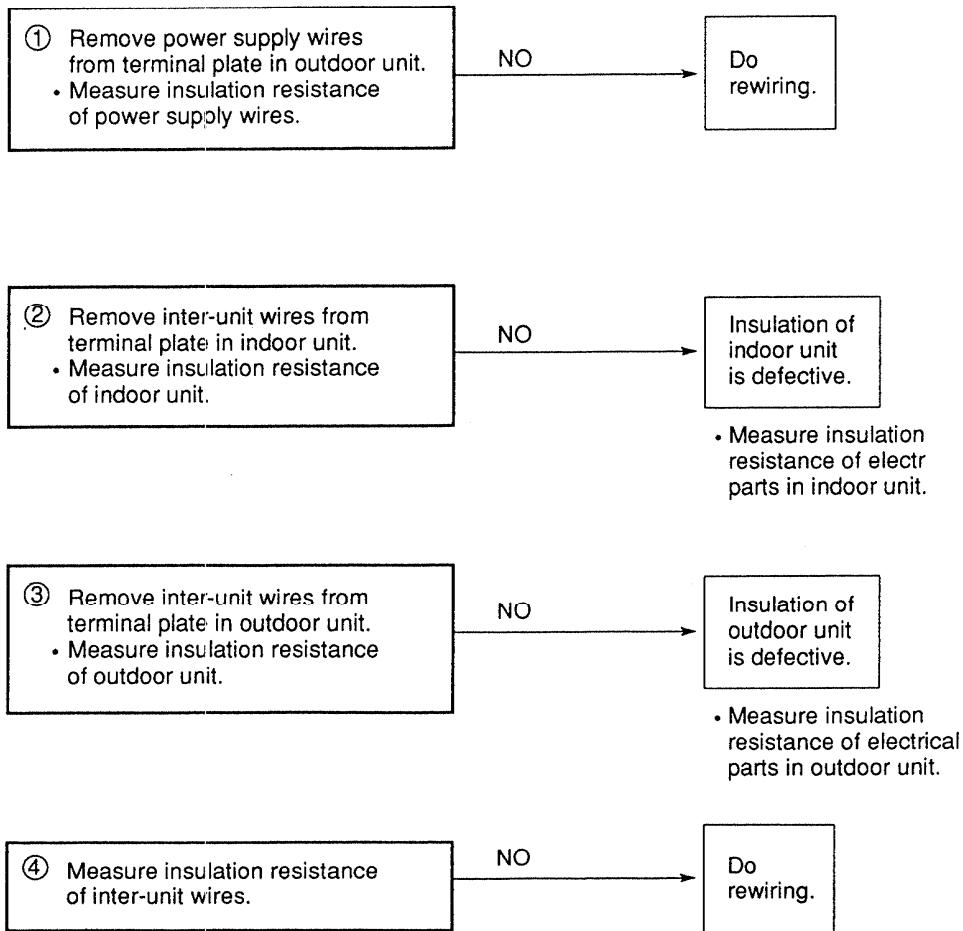
(a) When circuit breaker is set to ON, it trips in a few moments (resetting is not possible).

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

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

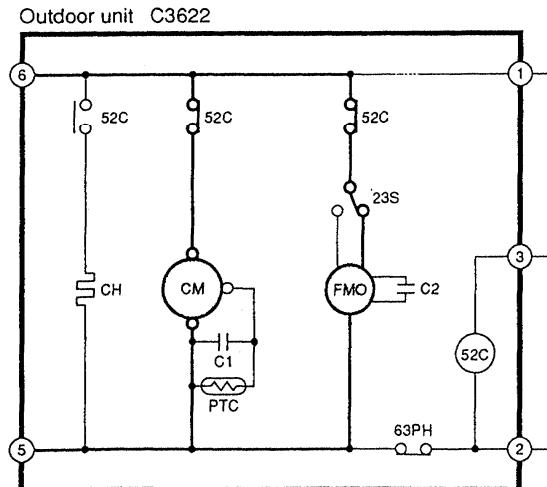
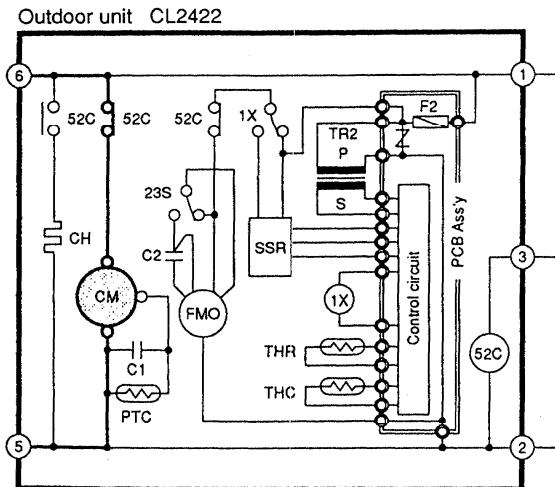
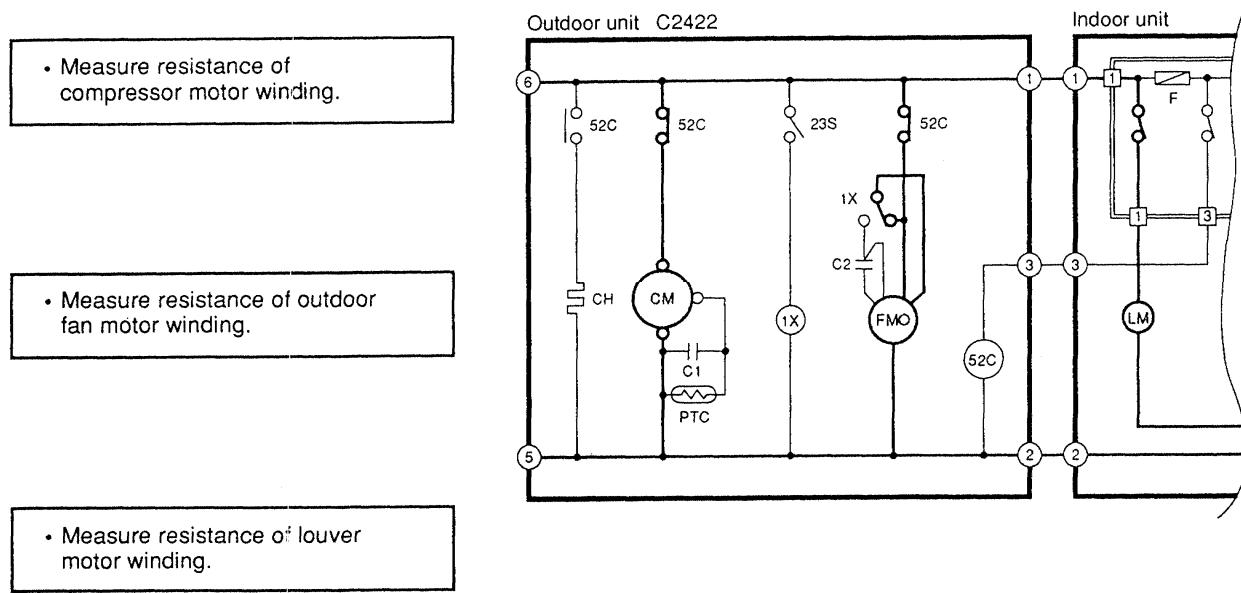
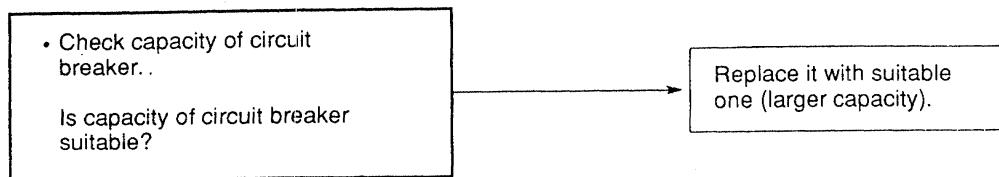


* Set circuit breaker to OFF



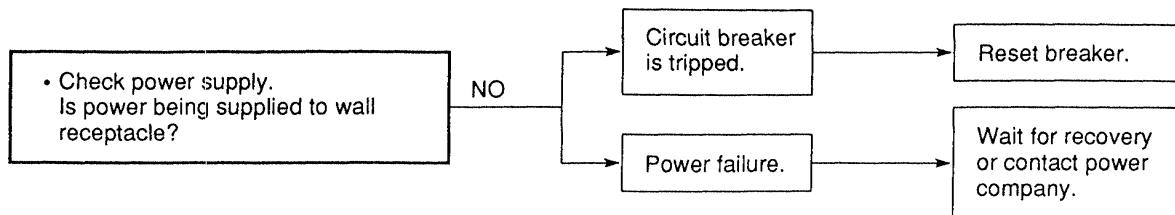
(b) Circuit breaker trips in several minutes after turning air conditioner ON.

- There is a possibility of short circuit.

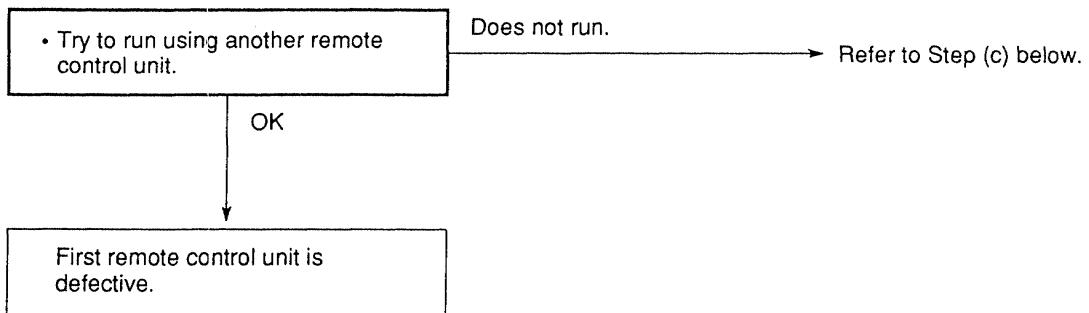


(2) Neither indoor unit nor outdoor unit runs.

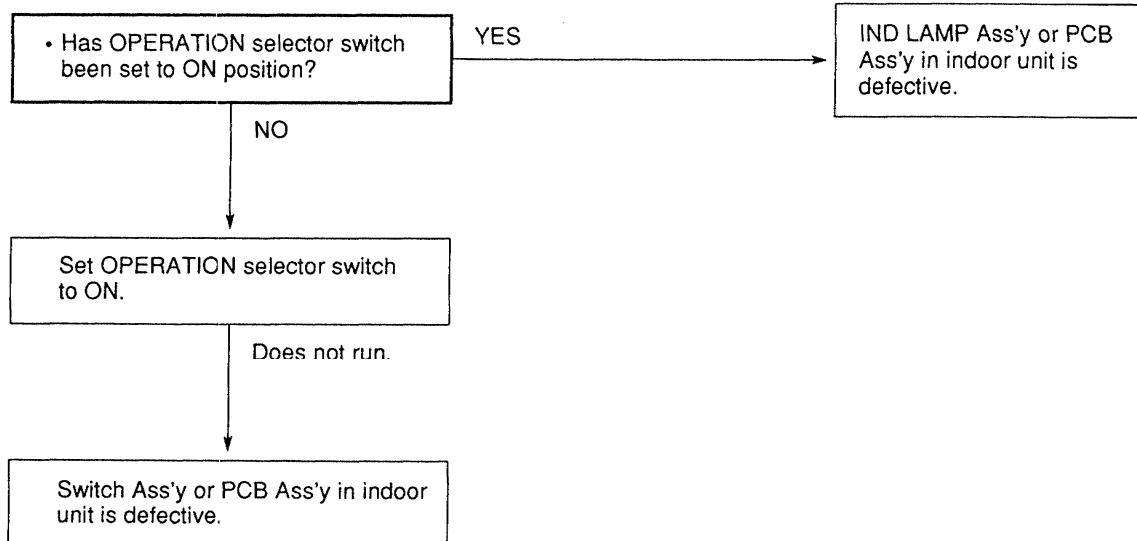
(a) Power is not supplied.



(b) Check remote control unit.



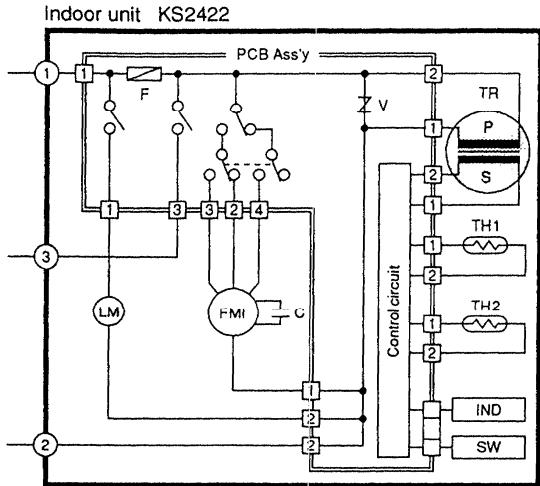
(c) Check OPERATION selector switch in indoor unit.



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

(d) Check transformer in indoor unit.

- Measure resistance of transformer winding.



(e) 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. (TR)

OK

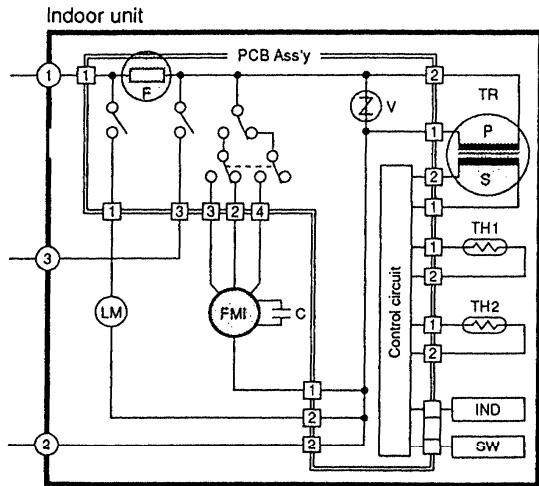
- Measure resistance of indoor fan motor winding. (FMI)

OK

- Measure coil resistance of electro-magnetic contactor. (52C)

OK

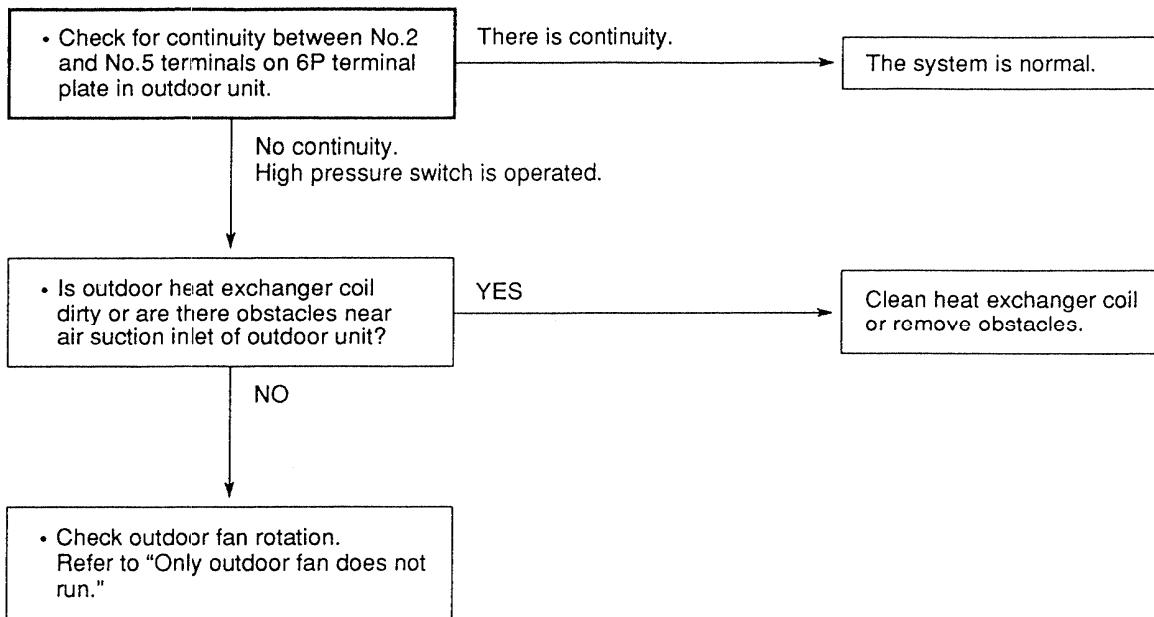
- PCB Ass'y is defective.



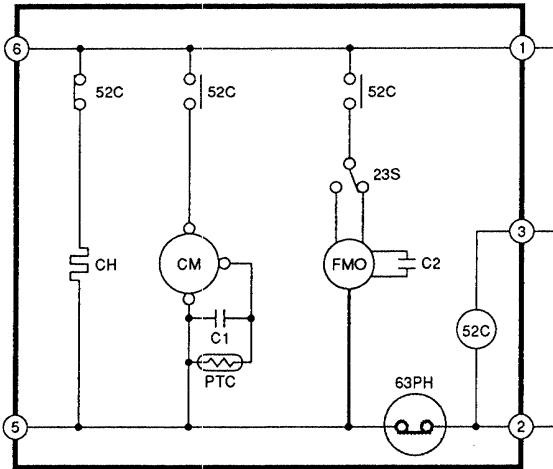
(Neither indoor unit nor outdoor unit runs.) (cont'd)

(f) Check high pressure switch (63PH) (C3622 only).

- System does not run when high pressure switch is operated.

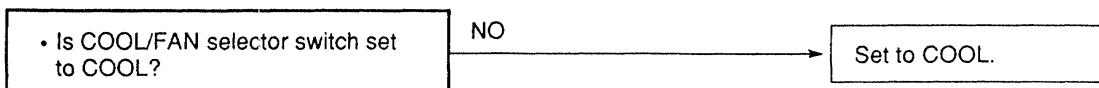


Outdoor unit C3622



(3) Only outdoor unit does not run.

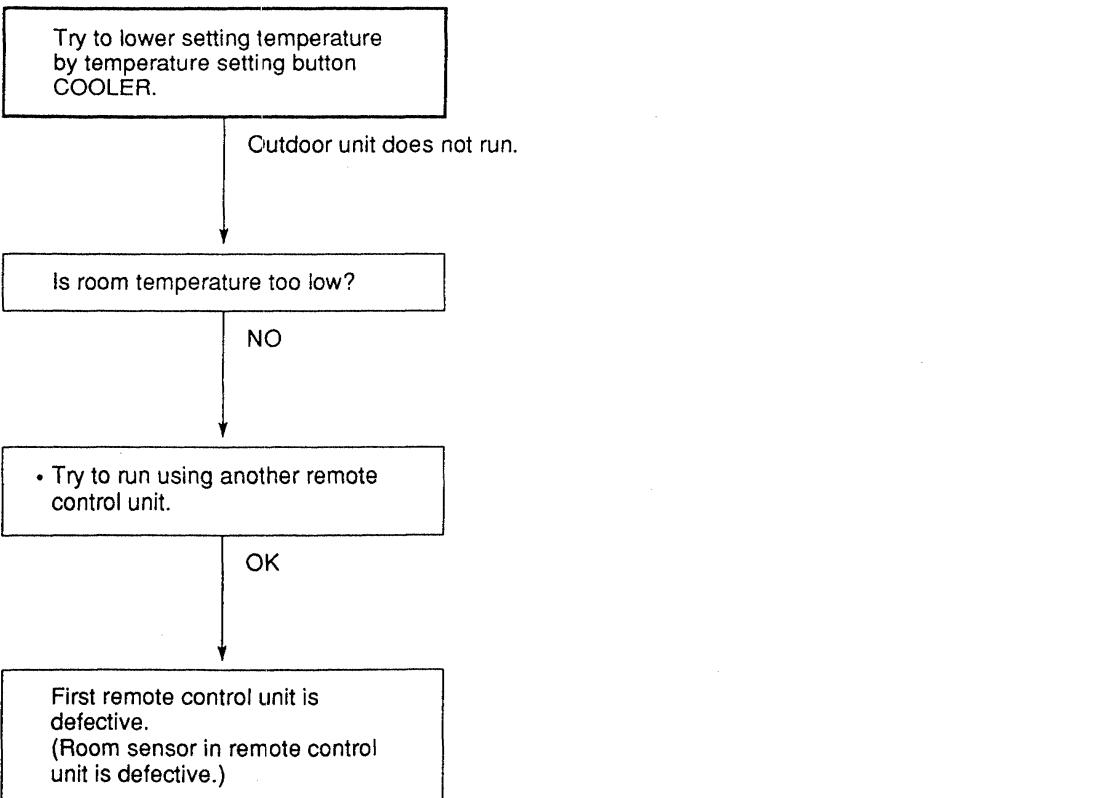
(a) Check COOL/FAN selector switch of remote control unit.



(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

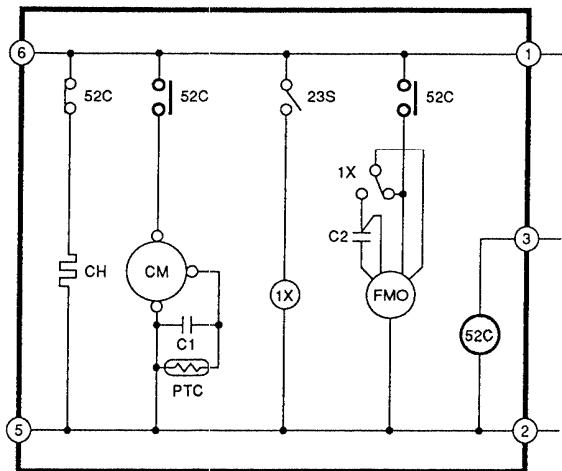


(Only outdoor unit does not run.) (cont'd)

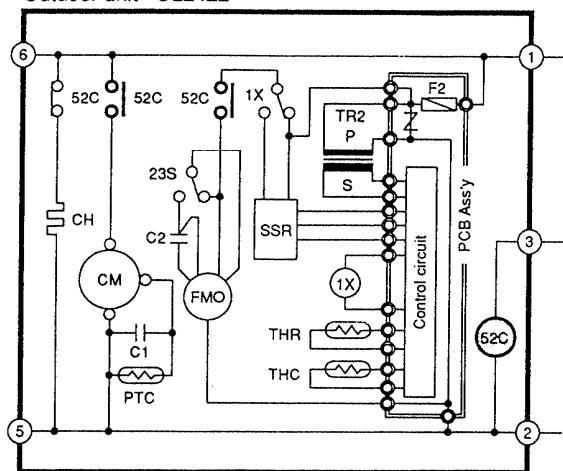
(c) Check electro-magnetic contactor.

- Measure coil resistance of electro-magnetic contactor.
(52C)

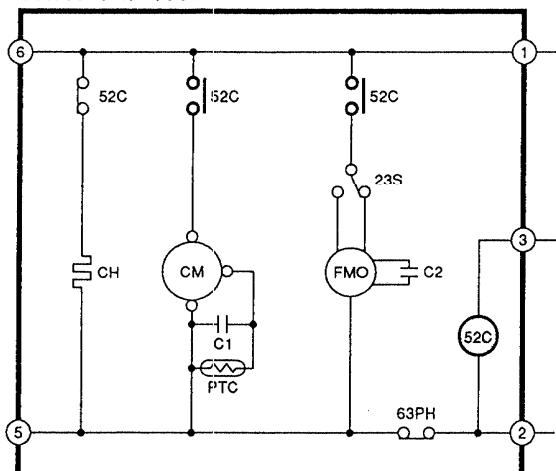
Outdoor unit C2422



Outdoor unit CL2422



Outdoor unit C3622



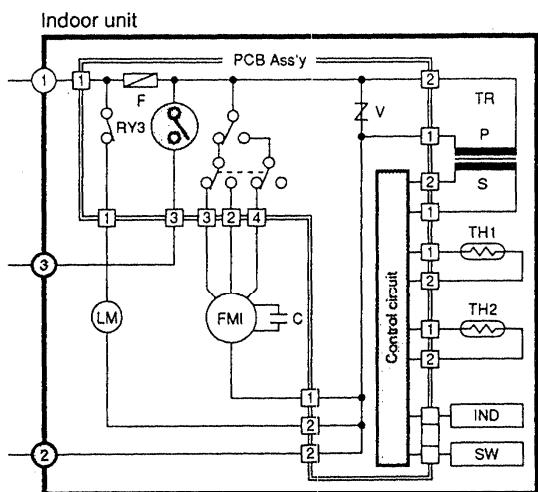
(Only outdoor unit does not run.) (cont'd)

(d) Check PCB Ass'y.

- Measure voltage between terminals No.2 and No.3 on terminal plate.

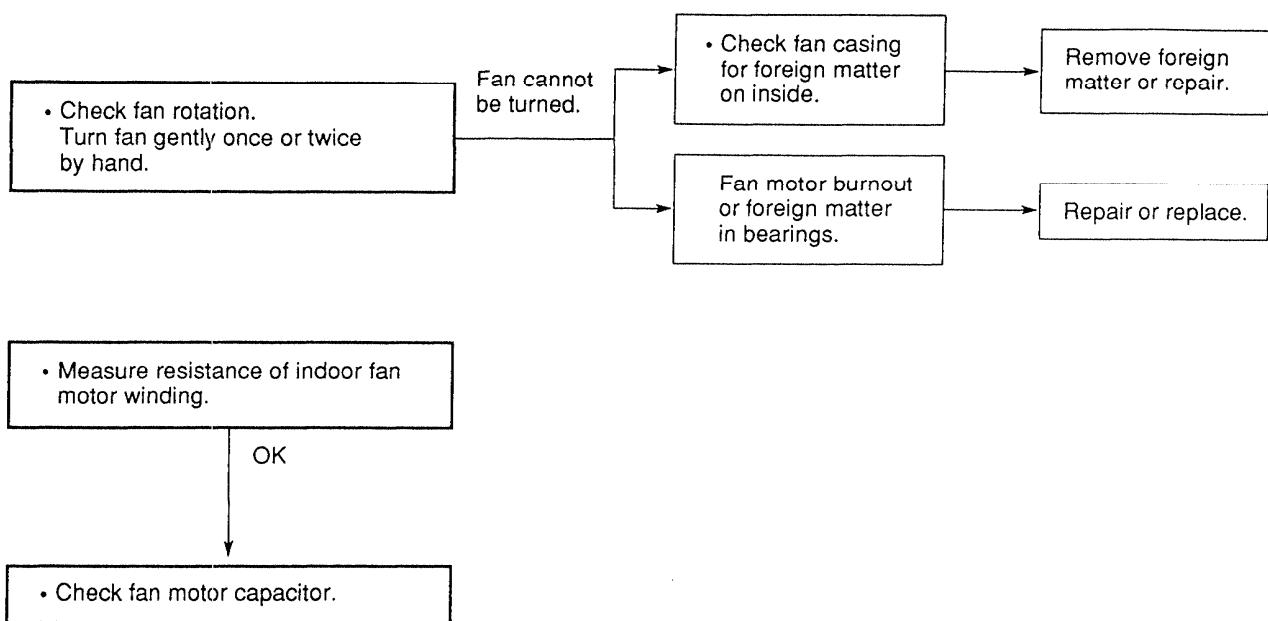
No voltage registers.

PCB Ass'y is defective.
(RY3 is defective.)

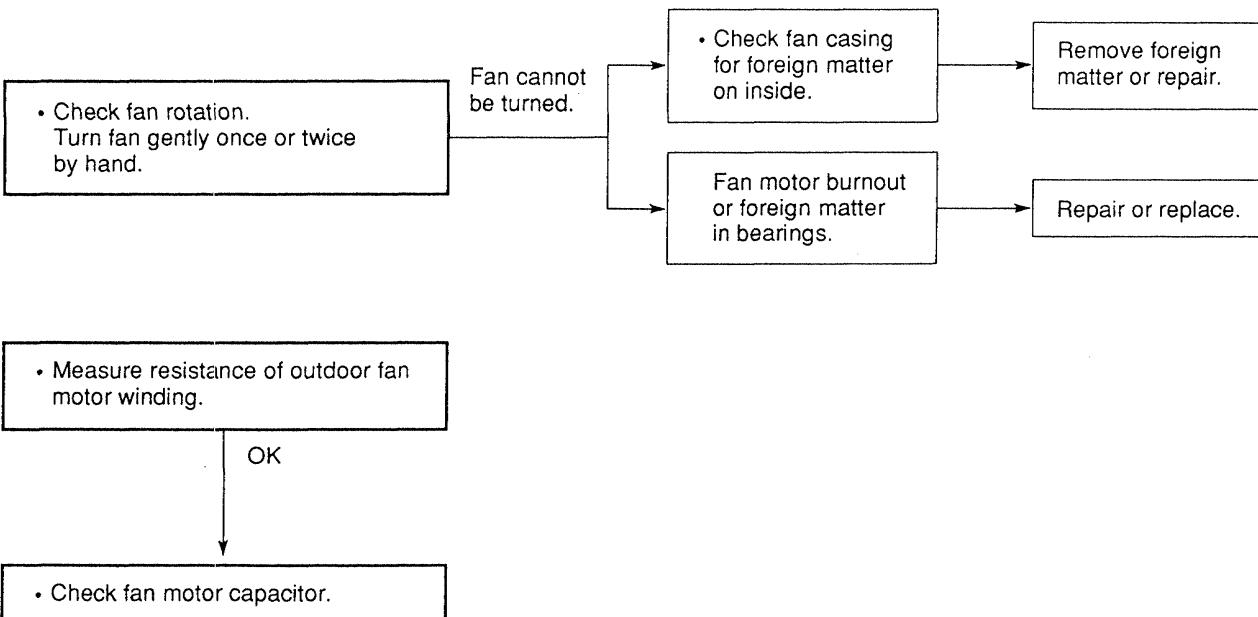


6-3 A particular component of air conditioner does not operate.

(1) Only indoor fan does not run.



(2) Only outdoor fan does not run.



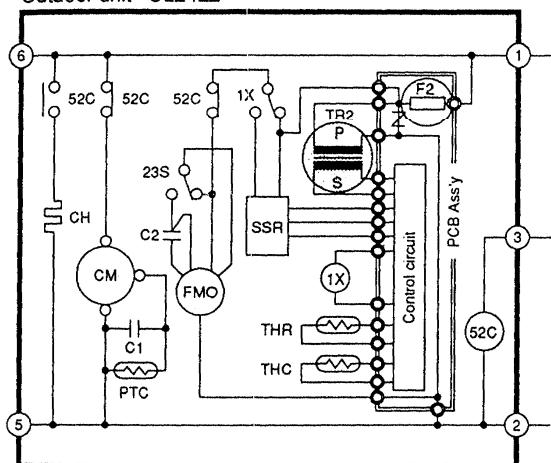
Only outdoor fan does not run for CL2422.

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

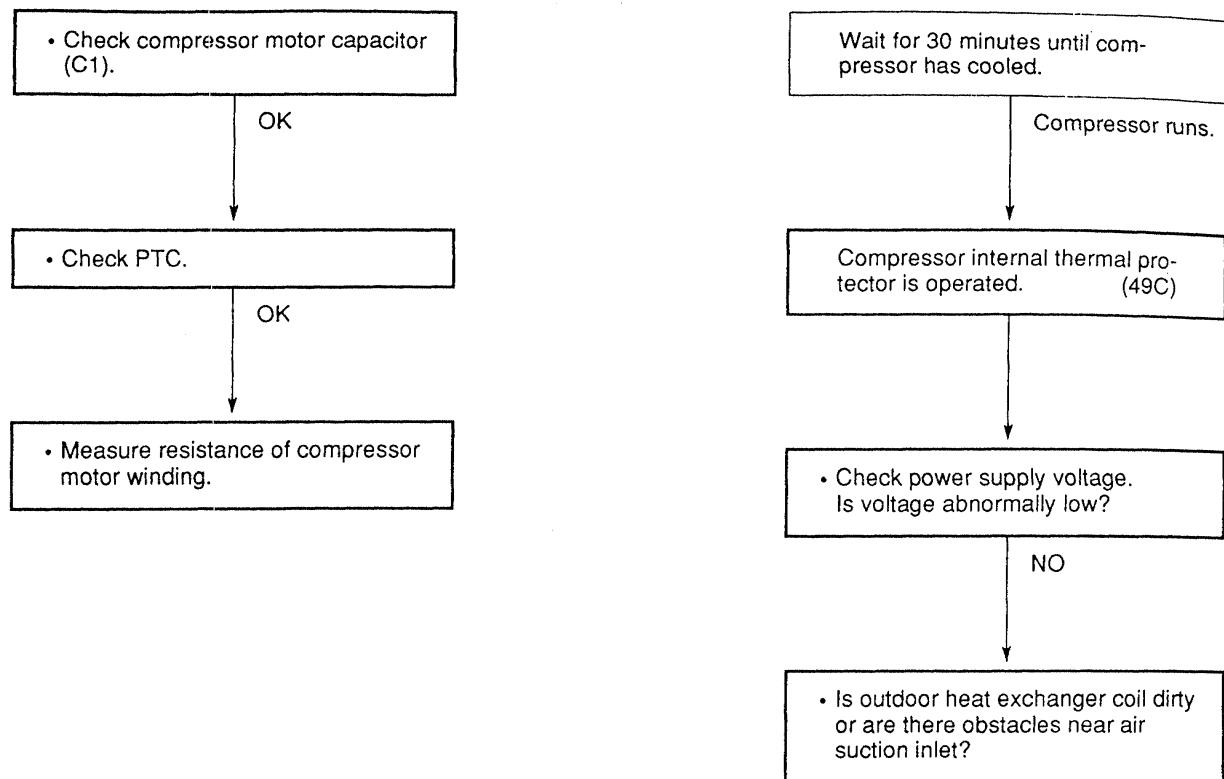
If fuse blows,

- Measure resistance of primary winding of transformer. (TR2)

Outdoor unit CL2422

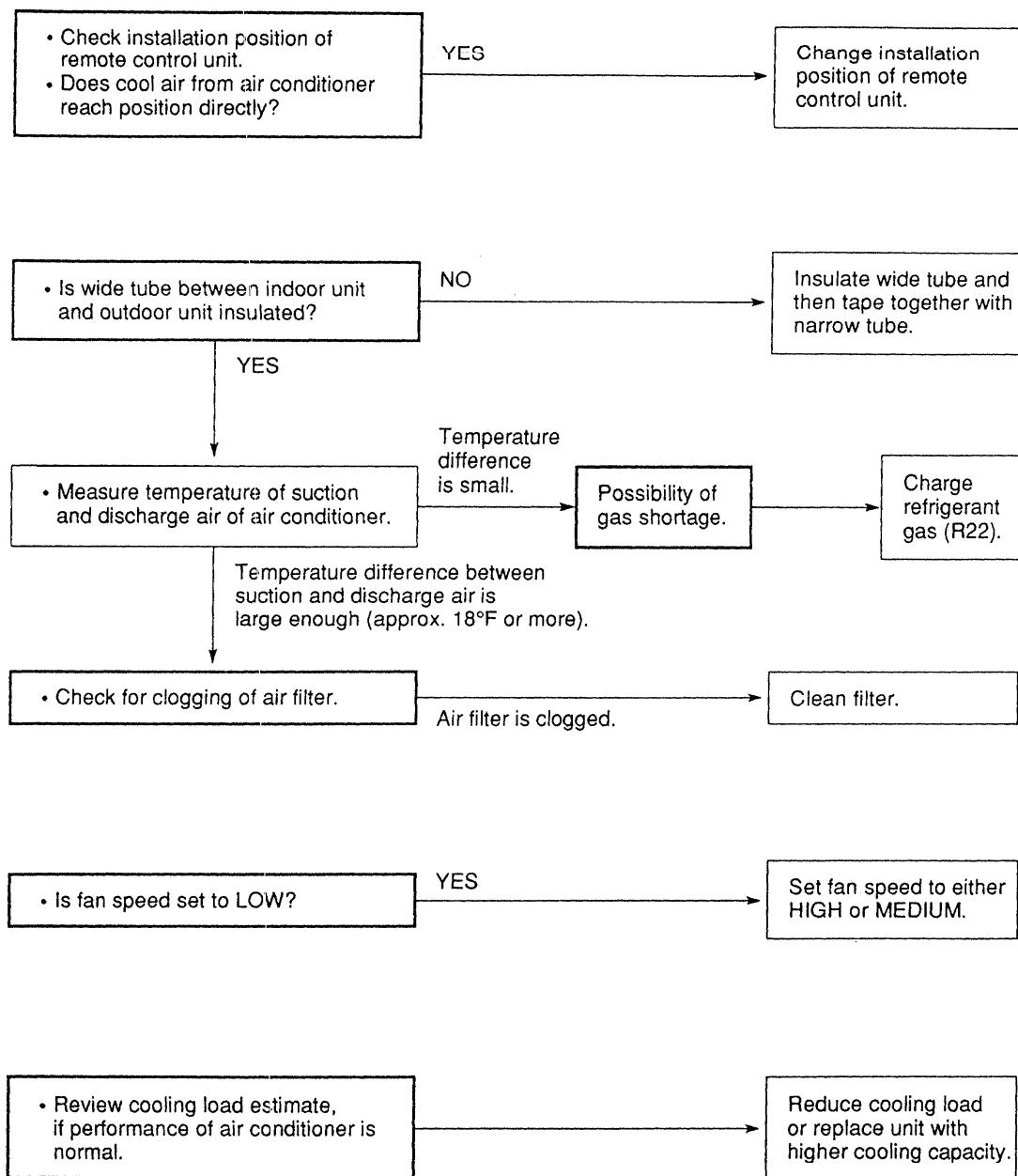


(4) Only compressor does not run.

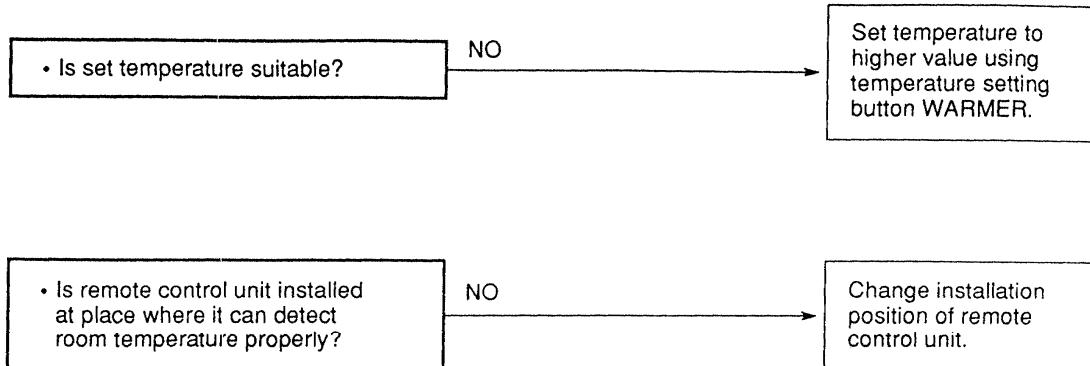


6-4 Air conditioner operates, but abnormalities occur.

(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 MΩ.

(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.

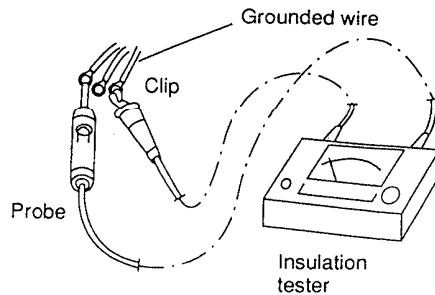


Fig. 1

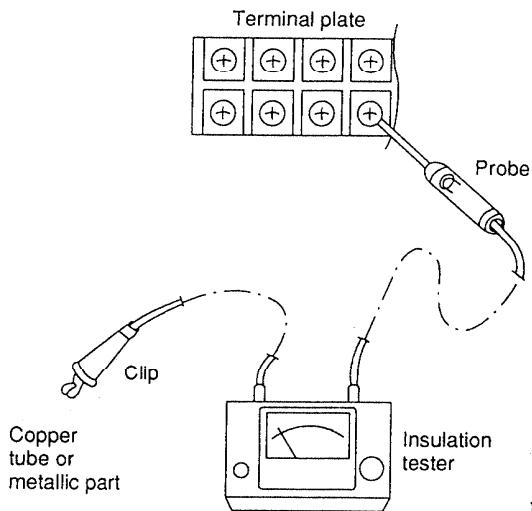


Fig. 2

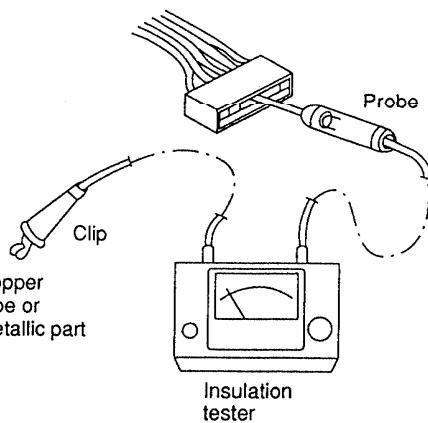


Fig. 3

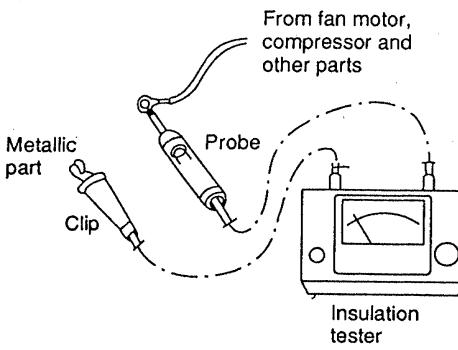


Fig. 4

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.

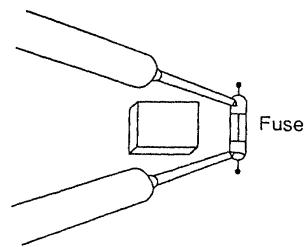


Fig. 5

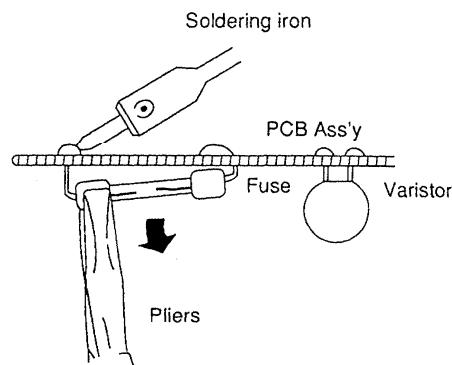


Fig. 6

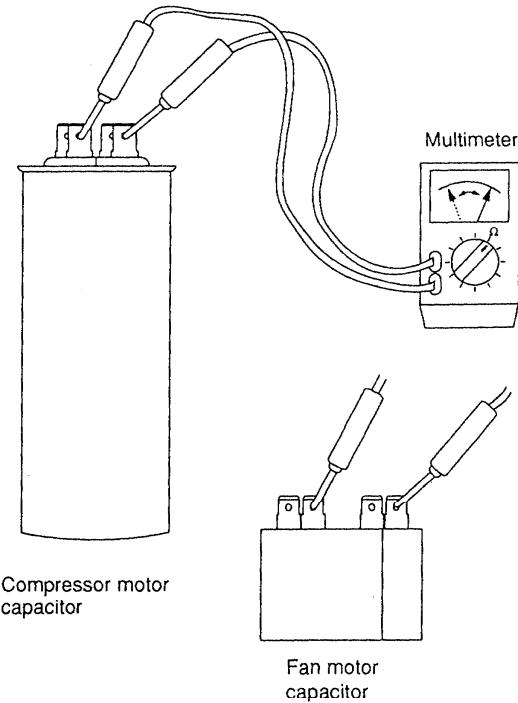


Fig. 7

7-3 Checking Motor Capacitor

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

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

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

7-4 Appearance of Electrical Parts

(1) Electro-Magnetic Contactor

FMCA-1UL

FMCA-1SUL

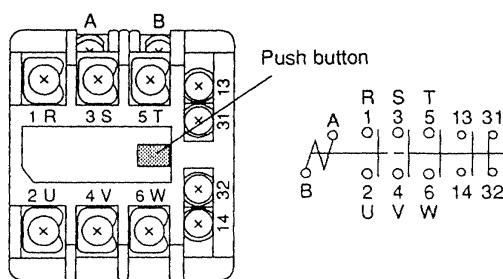


Fig. 8

(2) Auxiliary Relay

MY2F-T1-USTS

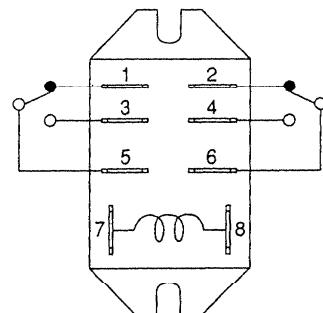


Fig. 9

(3) Thermostat

YTB-4U201F

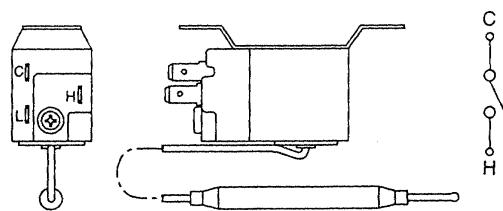


Fig. 10

(4) Electro-Magnetic Contactor

CLK-16E3-21

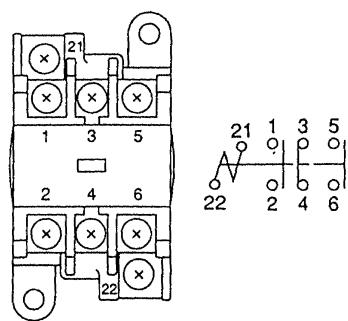


Fig. 11

(5) SSR (solid state relay)

G3L-205TL-TS1

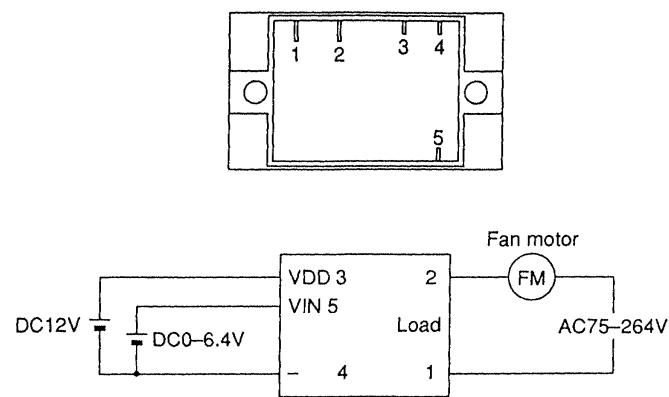


Fig. 12

(6) Thermostat

YTB-4U305F

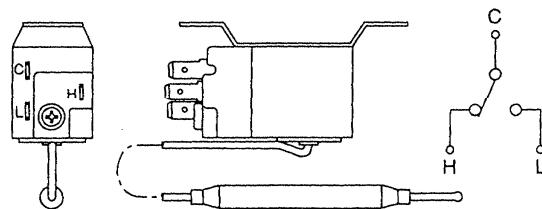


Fig. 13

(7) Thermistor (PTC)

TDK-101YV

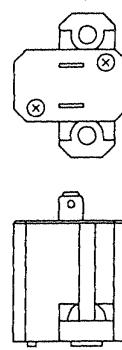


Fig. 14

(8) High Pressure Switch

FTB-2UC01

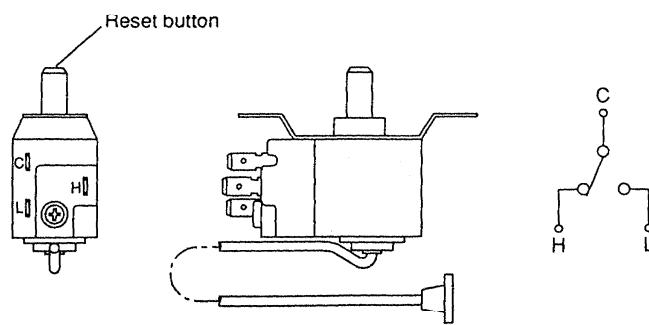


Fig. 15