

TECHNICAL DATA & SERVICE MANUAL

SANYO

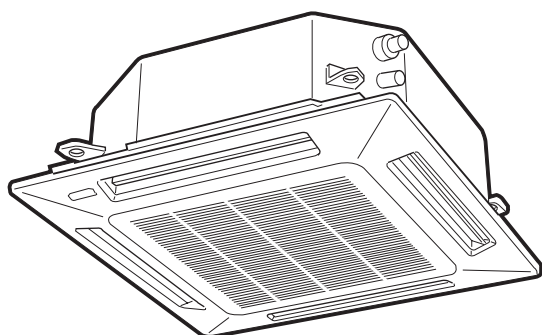
FILE NO.

XS1852 / C1852, CL1852

SPLIT SYSTEM AIR CONDITIONER

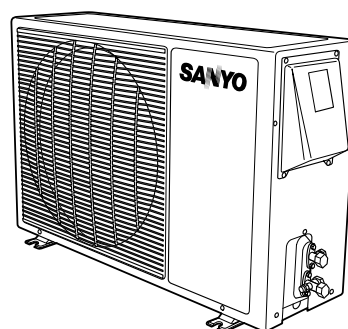
INDOOR MODEL No.	PRODUCT CODE No.	OUTDOOR MODEL No.	PRODUCT CODE No.
XS1852	854 016 13	C1852	852 068 35
		CL1852	852 068 36

Indoor Unit



XS1852

Outdoor Unit



C1852
CL1852

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 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

- Ventilate the room well, in the event that refrigerant gas leaks during the installation. Be careful not to allow contact of the refrigerant gas with a flame as this will cause the generation of poisonous gas.
- 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 when installation is finished. Check that no metal scraps or bits of wiring have been left inside the unit.



CAUTION

- Ventilate any enclosed areas when installing or testing the refrigeration system. Contact of refrigerant gas with fire or heat can produce poisonous gas.
- Confirm after installation that no refrigerant gas is leaking. If the gas comes in contact with a burning stove, gas water heater, electric room heater or other heat source, it can cause the generation of poisonous gas.

Table of Contents

1.	OPERATING RANGE	5
2.	SPECIFICATIONS	6
	(1) Unit Specifications	6
	(2) Major Component Specifications	8
	(A) Indoor Unit	8
	(B) Outdoor Unit	9
	(3) Other Component Specifications	10
	(A) Indoor Unit	10
	(B) Outdoor Unit	11
3.	DIMENSIONAL DATA	12
	(1) Indoor Unit	12
	(2) Outdoor Unit	13
4.	PERFORMANCE CHARTS	14
	(1) Operating Current	14
5.	AIR THROW DISTANCE CHART	15
6.	REFRIGERANT FLOW DIAGRAM	16
7.	INSTALLATION INSTRUCTIONS	17
8.	ELECTRICAL DATA	22
9.	ELECTRICAL WIRING DIAGRAMS	23
	(1) Indoor Unit	23
	(2) Outdoor Unit	25
10.	PROCESSES AND FUNCTIONS	27
	(1) Room Temperature Control	27
	(2) Freeze Prevention	28
	(3) Drain Pump Control	28
	(4) Outdoor Fan Speed Control	29
11.	SERVICE PROCEDURES	30
	(1) Troubleshooting	30
	(2) A Sensor is Defective	40
	(3) Operation of Major Electrical Parts	40
	(4) Checking the Electrical Components	41

Introduction: *Read Me First!*

This manual will help you understand and service the air conditioner. To help you find the information you need, we have divided it into 5 main sections. Each section is divided into chapters with charts, tables and explanations to help you find and repair problems.

- ❑ **Section 1: Specifications**, tells you about the physical and electrical make up of the unit, as well as its heating and cooling capacities. Look in this section to find the correct values for components and functions.
- ❑ **Section 2: Processes and Functions**, explains each different part of the cooling and heating cycle, and how each control function reacts to changing conditions to keep the room at the set temperature range.
- ❑ **Section 3: Electrical Data**, which has fold-out schematic and wiring diagrams so you can find the parts you need to check when something is wrong, and see how they should be connected.
- ❑ **Section 4: Service Procedures**, has two main parts, a *diagnostic* chapter to help you find the specific component to replace or adjust, and a chapter with specific procedures and values to guide you in checking the electrical components in the unit.

HOW TO USE THIS MANUAL

You can use this manual both as a *reference* to find specific information about the capacity, functions and construction of this unit, and as a source of information to help you set up and maintain the unit.

When this unit is not working properly, and the cause is not known, you can use the procedures in **Section 3: Servicing Procedures** to find the problem, fix it, and restore the unit to its proper functioning.

This air conditioner has many helpful self diagnostic features to help you identify problem areas quickly.

So you will be ready when a problem happens, we suggest you look this manual over and become familiar with it by following these steps:

1. **Look at the TABLE OF CONTENTS** to get an idea of what is in this manual and where to find it.
2. **Look at the chapter about TROUBLE SHOOTING**, so you are familiar with the way the flow charts work. They are designed to guide you quickly through the possible causes for each kind of problem that is likely to happen to the Unit. Particularly read the introduction to this section, and the parts about the self-diagnosis and error codes which show on the display.
3. **Look at the chapter about CHECKING ELECTRICAL COMPONENTS**. You already know about most of these procedures. This chapter gives you the specific values and methods for these components. If you don't know some of these procedures, you can easily learn them here.
4. **Read the Instruction Manual!** The Instruction Manual is included here because it helps you help the user to set the temperature controls properly and know how to take care of any simple problems that may happen, as well as know when to call for service. The Instruction Manual also has illustrations, care, and installation information not found in the rest of the service manual. It is short, and if you read it carefully, you will be able to answer the customers questions easily, and also know the most efficient ways for setting times and temperatures.

Please use this manual to make your work easier, keep the air conditioner functioning well, and keep your customers satisfied.

1. OPERATING RANGE

XS1852 / C1852

Temperature	Indoor Air Intake Temp.	Outdoor Air Intake Temp.
Maximum	95 °F DB / 71 °F WB	115 °F DB
Minimum	67 °F DB / 57 °F WB	67 °F DB

XS1852 / CL1852

Temperature	Indoor Air Intake Temp.	Outdoor Air Intake Temp.
Maximum	95 °F DB / 71 °F WB	115 °F DB
Minimum	67 °F DB / 57 °F WB	0 °F DB

2. SPECIFICATIONS

(1) Unit Specifications

MODEL No.	Indoor Unit		XS1852	
	Outdoor Unit		C1852 , CL1852	
POWER SOURCE			230 - 208 V / 1 Phase / 60 Hz	
PERFORMANCE			Cooling	
Capacity	BTU / h		18,000	17,500
	kW		5.27	5.13
Air circulation (Hi)	cu.ft. / min.		540	510
Moisture removal (High)	Pints / h		5.5	5.4
ELECTRICAL RATINGS				
Voltage rating	VAC		230	208
Available voltage range	VAC		187 - 253	
Running amperes*	A		8.2	8.77
Max. running amperes**	A		9.7	10.6
Power input	W		1,780	1,740
Power factor	%		97	98
S.E.E.R	BTU / Wh		10.6	10.6
Max. starting amperes	A		44.7	44.6
Maximum fuse size	A		20	
FEATURES				
Controls			Microprocessor	
Low ambient control			Built-in 0 °F (Only for CL1852)	
Timer			ON / OFF 24-hours & Program	
Fan speed Indoor / Outdoor			3 and Automatic control / 1 (3 : CL1852)	
Air deflection	Horizontal / Vertical		- / Automatic	
Air filter			Washable, easy access	
Remote controller (Accessory)			RCS - 5PS4U	
Refrigerant control			Capillary tube	
Refrigerant tubing connections			Flare type	
Drain pump (drain connection)			Max. head 9-27/32 in. above drain connection	
Compressor			Rotary	
Operation sound	Indoor - Hi / Me / Lo	dB - A	37 / 35 / 31	
	Outdoor - Hi	dB - A	52	
REFRIGERANT TUBING				
Limit of tubing length		ft. (m)	65 (20)	
Limit of tubing length at shipment		ft. (m)	33 (10)	
Limit of elevation difference between the two units		ft. (m)	Outdoor unit is higher than indoor unit: 23 (7) Outdoor unit is lower than indoor unit: 23 (7)	
Refrigerant tube outer diameter	Narrow tube	in. (mm)	1 / 4 (6.35)	
	Wide tube	in. (mm)	5 / 8 (15.88)	
Refrigerant amount at shipment		lbs. (kg)	R22 : 4.45 (2.02)	

2. SPECIFICATIONS

(1) Unit Specifications

DIMENSIONS & WEIGHT			Indoor unit		Outdoor unit	
Unit dimensions	Height	in. (mm)	9-27/32	(250)	24-19/32	(625)
	Width	in. (mm)	29-29/32	(760)	32-21/32	(880)
	Depth	in. (mm)	29-29/32	(760)	12-19/32	(320)
Net weight		lbs. (kg)	49	(22)	104	(47)
Indoor grille dimensions	Height	in. (mm)	3-1/16	(78)		
	Width	in. (mm)	33-27/32	(860)		
	Depth	in. (mm)	33-27/32	(860)		
Net weight		lbs. (kg)	11	(5)		
Indoor Unit Package dimensions	Height	in. (mm)	11-6/32	(284)	27-30/32	(710)
	Width	in. (mm)	32-14/32	(824)	40-18/32	(1,030)
	Depth	in. (mm)	32-25/32	(833)	16-6/32	(411)
Shipping weight		lbs. (kg)	57	(26)	112	(51)
Shipping volume		cu. ft. (m ³)	6.9	(0.195)	10.3	(0.301)
Indoor grille Package dimensions	Height	in. (mm)	4-3/32	(104)		
	Width	in. (mm)	38-2/32	(967)		
	Depth	in. (mm)	39-11/32	(999)		
Shipping weight		lbs. (kg)	18	(8)		
Shipping volume		cu. ft. (m ³)	3.5	(0.100)		

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Cooling :

Rating conditions (*) : Indoor air temperature 80 °F DB / 67 °F WB, Outdoor air temperature 95 °F DB / 75 °F WB
 Full load conditions (**) : Indoor air temperature 80 °F DB / 67 °F WB, Outdoor air temperature 115 °F DB

2. SPECIFICATIONS

(2) Major Component Specifications

(A) Indoor Unit

MODEL No.		XS1852	
Source		230 - 208 V / 1 phase / 60 Hz	
Remote controller (Accessory)		RCS - 5PS4U	
Controller P. C. B Ass'y		CR - TS2432	
Control circuit fuse		250 V, 3 A	
Switch Ass'y		SW - X363GS	
Fan (Number ... diameter)	in. (mm)	Turbo (1...19-9/32 (490))	
Fan motor			
Model		SFG6X - 41A5P	
Source		230 - 208 V / 1 phase / 60 Hz	
No. of pole ... r.p.m. (230 V, High)	rpm	6 ... 451	
Nominal output	W	40	
Coil resistance (Ambient temperature 68 °F)	Ω	BRW - WHT : 114.0 , ORG - YEL : 66.4 WHT - VLT : 23.9 , WHT - PNK : 77.4 VLT - ORG : 12.4 , YEL - BLK : 82.1	
Safety device			
Operating temperature	Open °F	266 ± 14.4	
	Close °F	174.2 ± 27	
Run capacitor	VAC, μF	440 V , 3.5 μF	
Heat exchanger			
Coil		Aluminum plate fin / Copper tube	
Rows ... Fins per inch		2 ... 14.9	
Face area	ft. ² (m ²)	3.2 (0.297)	
Panel			
Model No.		PNR - XS2432	
Indicator Lamp Ass'y		IND - XS2432	
Auto louver motor		MT8 - 3C	
Auto louver motor ... Rated	V, W, rpm	240 VAC , 3 W , 3 rpm	
Coil resistance (Ambient temperature 77 °F)	Ω	16,430 Ω ± 8 %	

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2. SPECIFICATIONS

(2) Major Component Specifications

(B) Outdoor Unit

MODEL No.	C1852		CL1852	
Source	230 - 208 V / 1 phase / 60 Hz			
Controller P.C.B. Ass'y	—		POW - CL125	
Control circuit fuse	250 VAC, 5 A			
Compressor	Rotary (Hermetic)			
Model	C - R132H6D			
Source	230 - 208 V / 1 phase / 60 Hz			
Nominal output	W	1,300		
Compressor oil	cc	500		
Coil resistance (Ambient temperature 77 °F)	Ω	C - R : 1.442 , C - S : 2.567		
Safety device	Internal type			
Overload relay models	—			
Operating temperature	Open °F	311 ± 9		
	Close °F	188 ± 20		
Operating ampere (at 77 °F)	A	—		
Run capacitor	VAC, μF	400 V, 35 μF		
Crank case heater	VAC, W	—	230 V, 20 W	
Refrigerant amount charged at shipment	lbs. (kg)	R22 : 3.59 (1.63)		
Fan	Propeller			
Number...diameter	in. (mm)	1 ... 16 - 17/32 (ø420)		
Fan motor				
Model	KFG6 - 51E6P ... 1		KFG6T - 51B6P ... 1	
Source	230 - 208 V / 1 phase / 60 Hz			
No. of pole rpm (230 V, High)	C type : 6 ... 830 , CL type : 6 ... 813			
Nominal output	W	50		
Coil resistance (Ambient temperature 68 °F)	Ω	BRN - WHT : 102 , WHT - PNK : 199		
Safety device	Internal type			
Operating temperature	Open °F	266 ± 14		
	Close °F	174 ± 27		
Run capacitor	VAC, μF	440 V, 2 μF		
Heat exchange				
Coil	Aluminum plate fin / Copper tube			
Rows Fins per inch	2 ... 1/16 (1.6)			
Face area	ft. ² (m ²)	4.0 (0.372)		

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2. SPECIFICATIONS

(3) Other Component Specifications

(A) Indoor Unit

MODEL No.		XS1852	
Power Transformer		ATR – I104A	
Rated	Primary	AC 220 V, 60 Hz	
	Secondary	10.6 V, 0.93 A	
	Capacity	9.85 VAC	
Coil resistance (Ambient temprature 77 °F)	Ω	WHT - WHT : 101 , BRN - BRN : 0.42	
Thermistor cut off temperature	°F	266	
Thermistor (Coil sensor)		PBC - 41E - S26	
Coil resistance	kΩ	14 °F : 23.7 , 41 °F : 12.1 23 °F : 18.8 , 50 °F : 9.7 32 °F : 15.0 , 59 °F : 8.0	
Thermistor (Room or coil sensor)		KTEC - 35 - S6	
Coil resistance	kΩ	32 °F : 16.5 , 104 °F : 2.7 41 °F : 12.8 , 113 °F : 2.2 50 °F : 10.0 , 122 °F : 1.8 68 °F : 6.3 , 131 °F : 1.5 86 °F : 4.0 ,	
Reray		G7L - 2A - TUB	
Coil rated	V	AC 220 - 240 V	
Contact rating	V, A	277 VAC, 25A	
Drain pump		WP20SL - 21	
Rated		AC 200 V, 14.7 W	
Float switch		FS - 0218 - 102	
MAX Rated (Contact rated)		AC 200 V, 50 W	
Switch Ass'y		SW - X363GS	
Indicator Lamp Ass'y		IND - XS2432	
Synchronized Motor		MT8 - 3C	

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2. SPECIFICATIONS

(3) Other Component Specifications

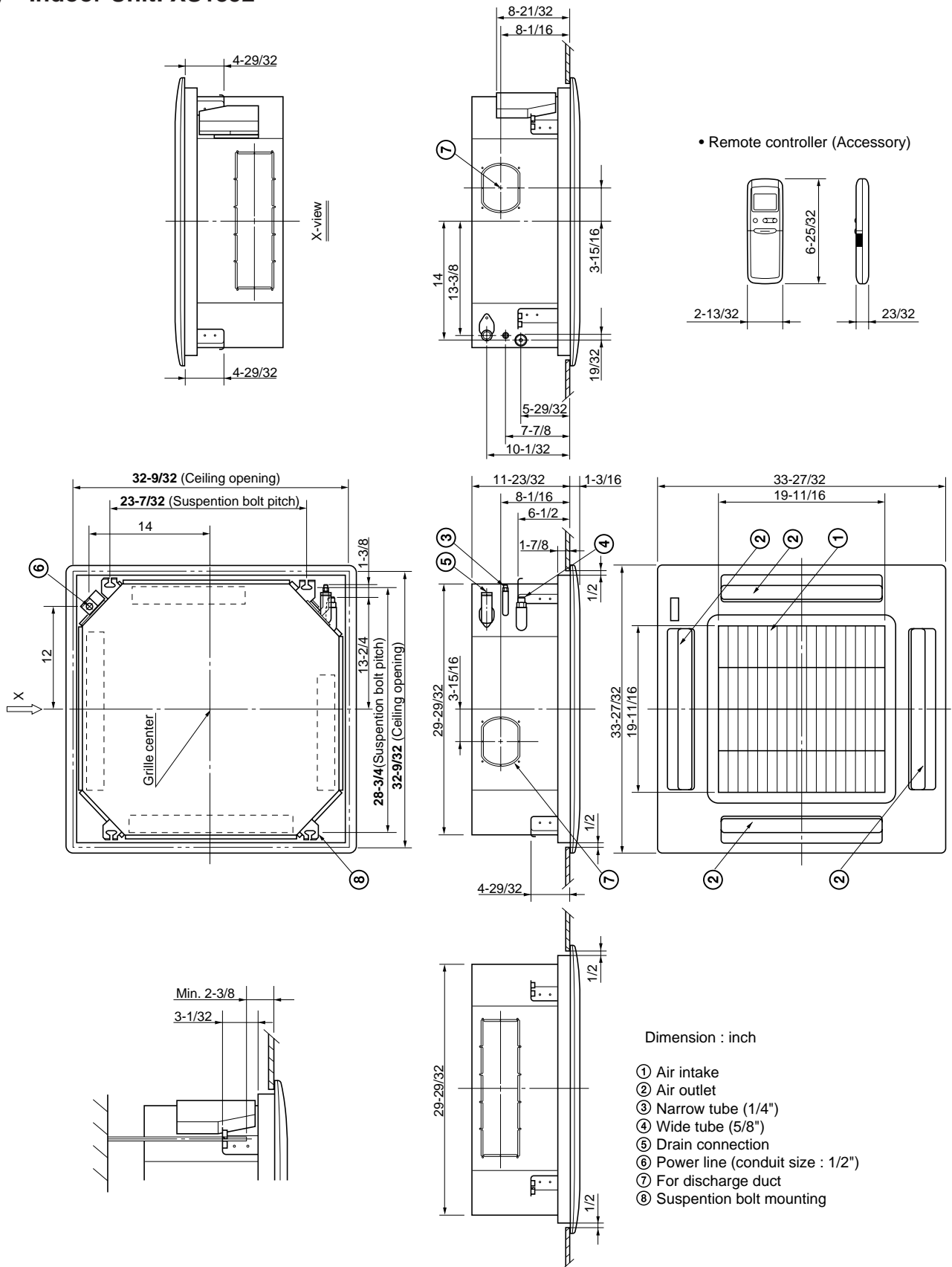
(B) Outdoor Unit

MODEL No.	CL1852	
Compressor Motor Magnetic Contactor	-	
Coil rated	-	
Coil resistance (at 77 °F)	kΩ	-
Contact rated (Main)	-	
Contact rated (Auxiliary)	-	
Power Transformer	ATR - T5	
Rated		
Primary	VAC	220 VAC, 60 Hz
Secondary	19 V, 15 A	
Capacity	10 VA	
Coil resistance (at 77 °F)	Ω	Primary (WHT - WHT) : 385 ± 10 % Secondary (BRN - BRN) : 3.3 ± 10 %
Thermal cut off temperature	°F	276 °F, 1A 250 VAC
Thermistor (Outdoor Temp. sensor)	DTNTKS132B	
Coil resistance	kΩ	14 °F : 23.7 , 50 °F : 9.7 23 °F : 18.8 , 68 °F : 6.5 32 °F : 15.0 , 86 °F : 4.4 41 °F : 12.1 , 104 °F : 3.1 113 °F : 2.6
Reray (1X)	HH62S	
Coil rated	DC 12 V	
Coil resistance (at 77 °F)	Ω	650 ± 15 %
Contact rated	V, A	AC 240 V, 5A

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3. DIMENSIONAL DATA

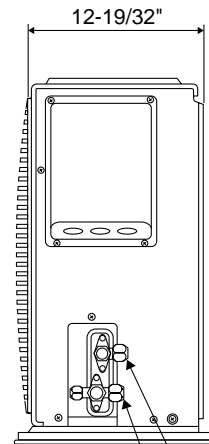
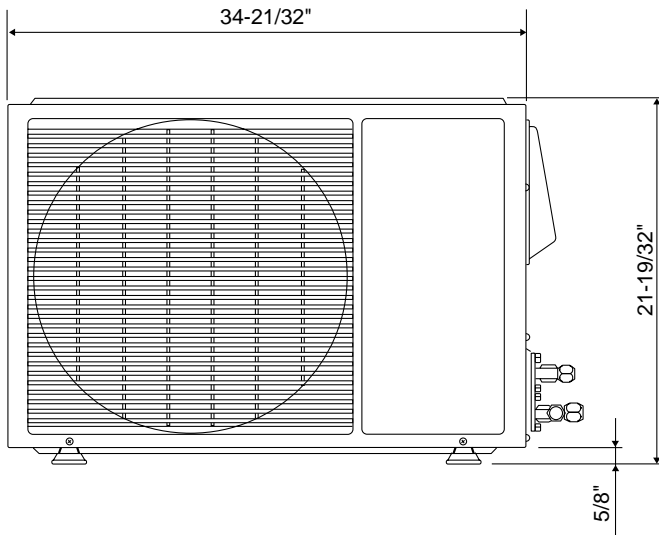
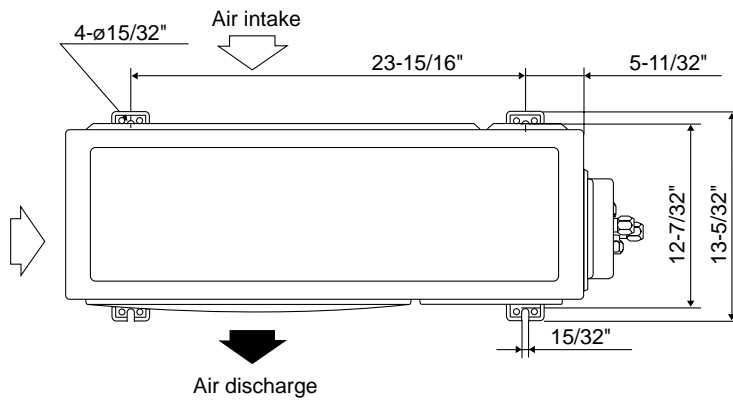
(1) Indoor Unit: XS1852



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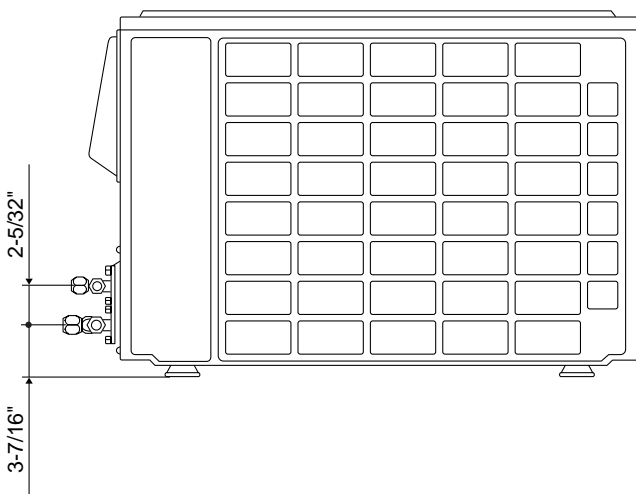
3. DIMENSIONAL DATA

(2) Outdoor Unit: C1852, CL1852



Narrow tube service valve
 $\phi 1/4$ (6.35)

Wide tube service valve
 $\phi 5/8$ (15.88)



Unit: inch (mm)

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4. PERFORMANCE CHARTS

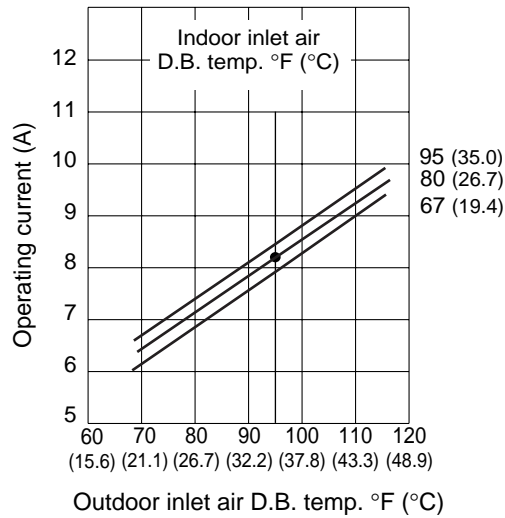
(1) Operating Current

① Indoor Unit: XS1852

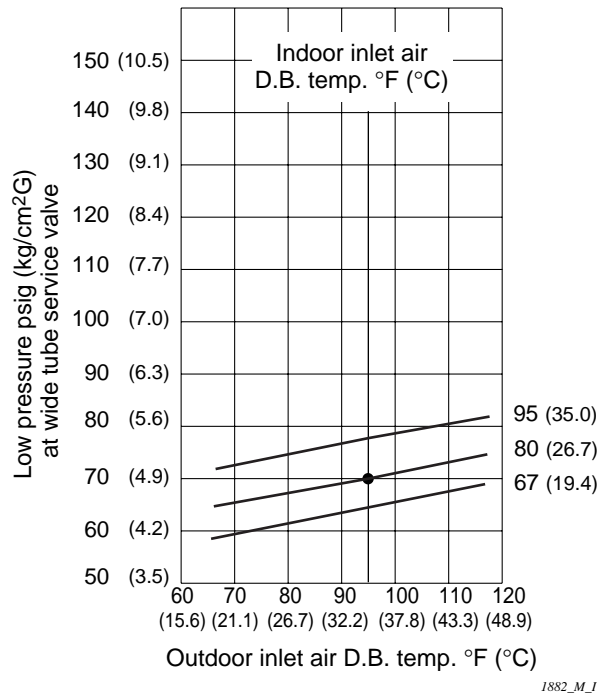
Outdoor Unit: C1852, CL1852

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

230V

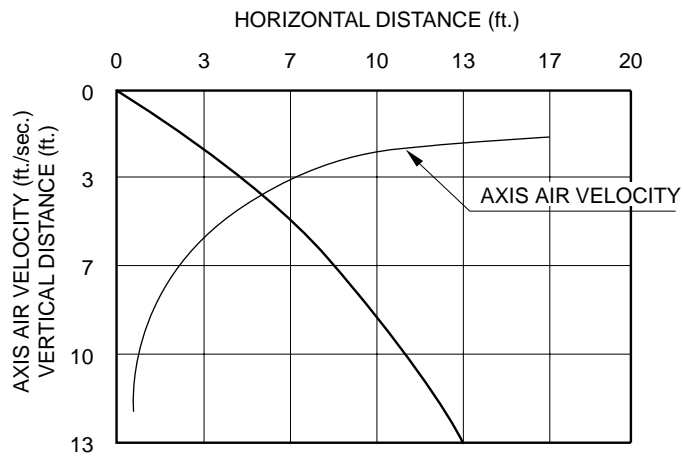


230V / 208V



5. AIR THROW DISTANCE CHART

MODEL: XS1852



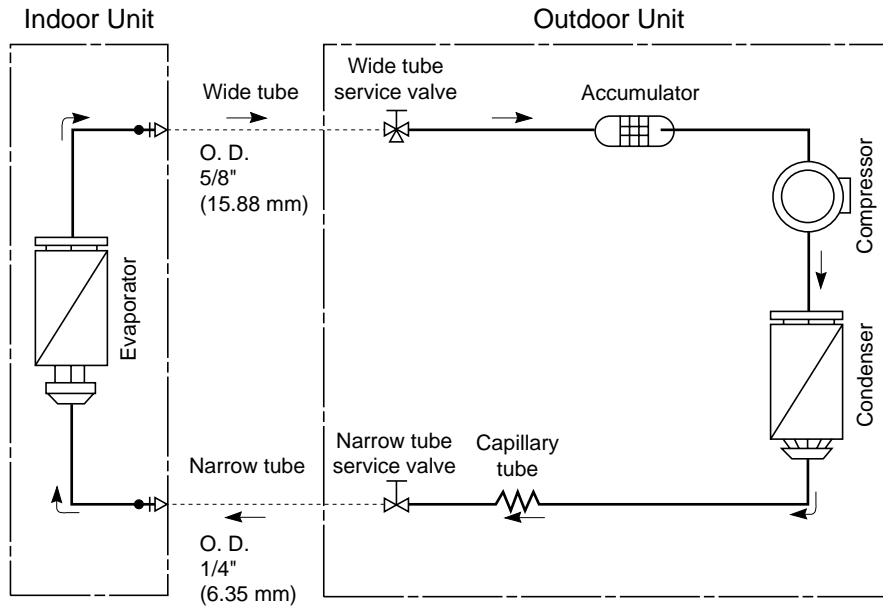
	COOLING
FAN SPEED	HIGH
ROOM AIR TEMP.	80°F
LOUVER ANGLE	30°

1052_X_S

6. REFRIGERANT FLOW DIAGRAM

Indoor Unit: XS1852

Outdoor Unit: C1852, CL1852

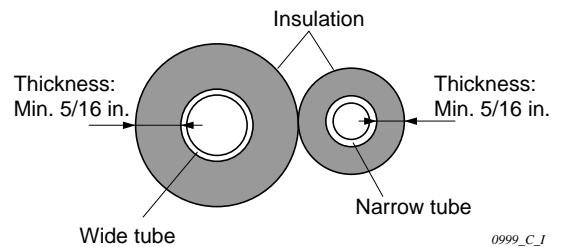


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Insulation of Refrigerant Tubing

IMPORTANT

To prevent heat loss and wet floors due to dripping of condensation, **both the wide and narrow tubes must be well insulated with a proper insulation material.** The thickness of the insulation should be a min. 5/16 in.



0999_C_1



CAUTION

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

7. INSTALLATION INSTRUCTIONS

1) Tubing Length

- Refrigerant tubing between the indoor and outdoor units should be kept as short as possible.
- Select and decide the installation location so that the length of the refrigerant tubing will be within the limits given in Table 1.

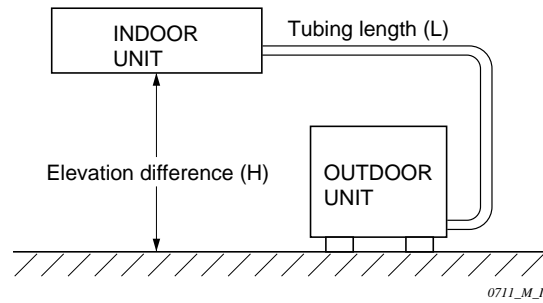


Fig. 1

Table 1

Tubing Data		Models	C1852 CL1852
Tubing size outer dia.	Narrow tube	in. (mm)	1/4 (6.35): Thickness 0.0314" (0.8 mm)
	Wide tube	in. (mm)	5/8 (15.88): Thickness 0.0394" (1.0 mm)
Limit of tubing length		(ft.)	65
Limit of elevation difference between the 2 units than indoor unit	Outdoor unit is higher than indoor unit (ft.)		23
	Outdoor unit is lower (ft.)		23
Max. allowable tubing length at shipment		(ft.)	33
Required additional refrigerant *1		(oz./ft.)	0.27

No additional charge of compressor oil is necessary.

*1 If total tubing length becomes 33 to 65 ft., charge additional refrigerant (R22) by 0.27 oz./ft..

7. INSTALLATION INSTRUCTIONS

2) Selecting the Installation Site

Indoor Unit

AVOID:

- areas where leakage of flammable gas may be expected.
- places where large amount of oil mist exist.
- direct sunlight.
- locations near heat sources which may affect performance of the unit.
- locations where external air may enter the room directly. This may cause “sweating” on the air discharge ports, causing them to spray or drip.
- locations where the remote control unit will be splashed with water or affected by dampness or humidity.
- installing the remote control unit behind curtains or furniture.
- locations where the receiver in the indoor unit is exposed to the inverter lamp light. Faulty operation of the unit occurs.

DO:

- select an appropriate position from which every corner of the room can be uniformly cooled.
- select a location where the ceiling is strong enough to support the weight of the unit.
- select a location where tubing and drain pipe have the shortest run to the outdoor unit.
- allow room for operation and maintenance as well as unrestricted air flow around the unit. (Fig. 2)
- install the unit within the maximum elevation difference above or below the outdoor unit and within a total tubing length from the outdoor unit as detailed in Table 1.
- allow room for mounting the remote control unit about 3 ft. off the floor, in an area that is not in direct sunlight nor in the flow of cool air from the indoor unit.

NOTE

Air delivery will be degraded if the distance from the floor to the ceiling is greater than 10 ft..

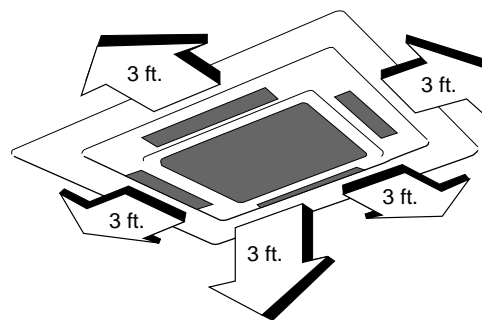


Fig. 2

1330_X_S

7. INSTALLATION INSTRUCTIONS

Outdoor Unit

AVOID:

- heat sources, exhaust fans, etc. (Fig. 3)
- damp, humid or uneven locations.

DO:

- choose a place as cool as possible.
- choose a place that is well ventilated.
- allow enough room around the unit for air intake/exhaust and possible maintenance. (Fig. 4)



CAUTION

- **Install the outdoor unit above snowfall line.**
- **Do not place objects on or sit on the outdoor unit. Also, never block the air intake/outlet or exhaust. Distortion of the outdoor unit or incomplete combustion may result.**
- **Do not introduce foreign matter into the air intake/outlet or exhaust. Do not poke them with such objects as a stick.**

- provide a solid base (level concrete pad, concrete block, 4 in. × 16 in. (10 × 40 cm) beams or equal), a minimum of 4 in. (10 cm) above ground level to reduce humidity and protect the unit against possible water damage and decreased service life (Fig. 5).
- use lug bolts or equal to bolt down unit, reducing vibration and noise.

3) Baffle Plates for the Outdoor Unit (CLxx models only)

NOTE

It is recommended to use baffle plates for model CL1852. The baffle plates are not normally required for the other models.

When the outdoor unit is installed in a position exposed to strong wind (like seasonal winds with low air temperature in winter), baffle plates must be installed on the outdoor unit. (Fig. 6)

This unit is designed so that the fan of the outdoor unit runs at low speed when the air conditioner is operated at low outdoor air temperatures. When the outdoor unit is exposed to strong wind, the system pressure drops because of the freeze protector.

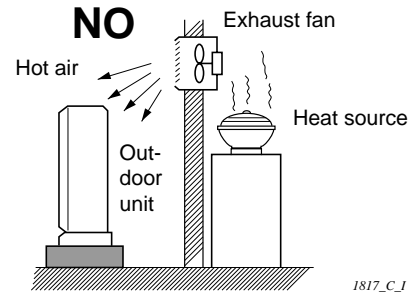


Fig. 3

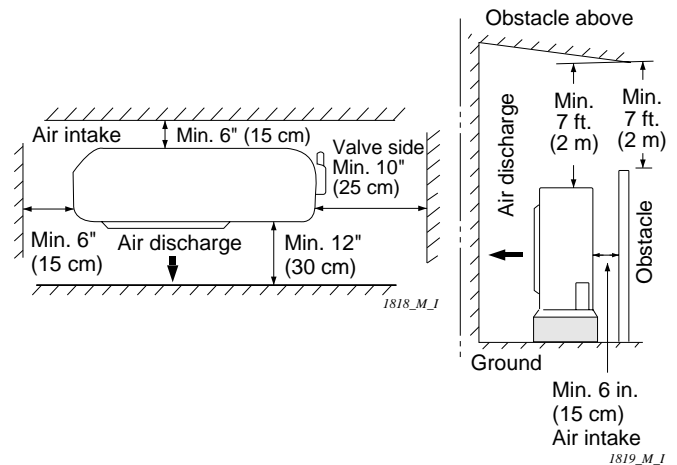


Fig. 4

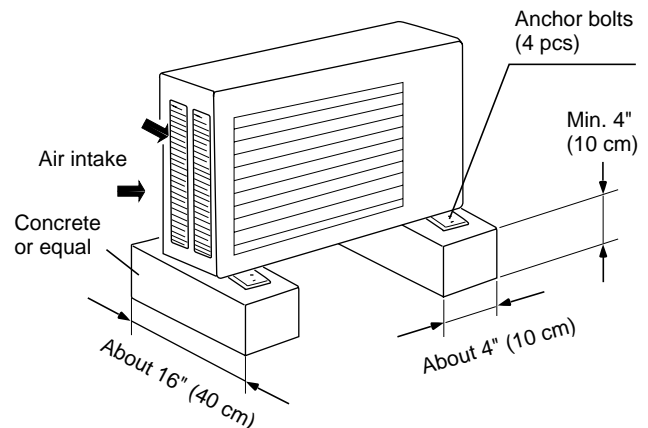


Fig. 5

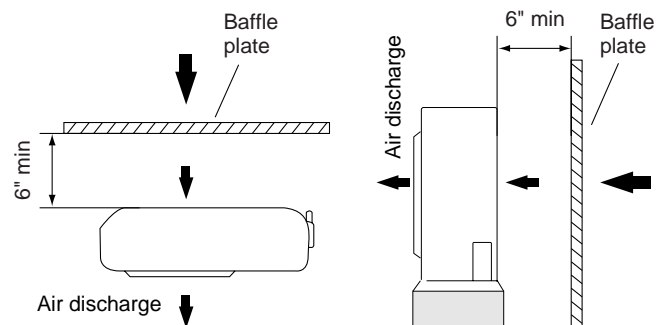


Fig. 6

7. INSTALLATION INSTRUCTIONS

4) Electrical Wiring

General Precautions on Wiring

- (1) Before wiring, confirm the rated voltage of the unit as shown on its nameplate, then carry out the wiring closely following the wiring diagram.
- (2) Provide a power outlet to be used exclusively for each unit, and a power supply disconnect and circuit breaker for overcurrent protection should be provided in the exclusive line.
- (3) To prevent possible hazards from insulation failure, the unit must be grounded.
- (4) Each wiring connection must be done in accordance with the wiring system diagram. Wrong wiring may cause the unit to misoperate or become damaged.
- (5) Do not allow wiring to touch the refrigerant tubing, compressor, or any moving parts of the fan.
- (6) Unauthorized changes in the internal wiring can be very dangerous. The manufacturer will accept no responsibility for any damage or misoperation that occurs as a result of such unauthorized changes.
- (7) Regulations on wire diameters differ from locality to locality. For field wiring rules, please refer to your LOCAL ELECTRICAL CODES (ex. National Electric Code: ANSI/NFPA70) before beginning. You must ensure that installation complies with all relevant rules and regulations.
- (8) To prevent malfunction of the air conditioner caused by electrical noise, care must be taken when wiring as follows:
 - The inter-unit control wiring and the remote control wiring (option) should be wired apart from the inter-unit power wiring.

7. INSTALLATION INSTRUCTIONS

Recommended Wire Length and Wire Diameter for Power Supply System

Models	(A)*1 Power Supply	(B)*1 Inter-unit Wiring	Time Delay Fuse or Circuit Capacity	Power Supply Terminal Base (Outdoor Unit)	
	AWG #12	AWG #12		Capacity	Max. Wire Diameter
C1852, CL1852	75 ft.	65 ft.	15 A	20 A	AWG #12

*1 Refer to the Wiring System Diagrams (See below diagram) for the meaning of "A", "B".

AWG = American Wire Gauge

NOTE

To access the electrical component box, open the air intake grille and remove the electrical component box cover.

Wiring System Diagram

Single-phase
60 Hz, 230 / 208 V

- Conduit's trade size for this unit is 1/2". The conduit can be purchased at a hardware store.
- The fuse located in the outdoor unit provides power supply protection and may blow when power is applied if the system has been incorrectly wired.

- (1) Ground the unit in accordance with local codes.
- (2) Be sure to size each wire allowing several inches longer than the required length for wiring.
- (3) Use lock nuts to secure the conduit tubes.

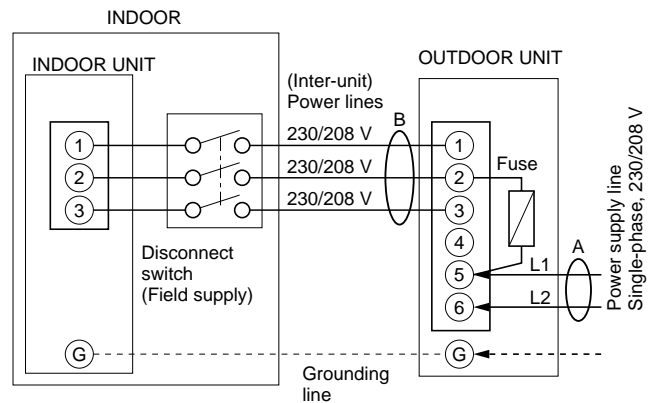


Fig. 7



WARNING

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



WARNING

- To avoid the risk of electric shock, each air conditioner unit must be grounded.



CAUTION

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

8. ELECTRICAL DATA

● Electrical characteristics

Indoor model: XS1852 / Outdoor model: C1852, CL1852

		Indoor Unit	Outdoor Unit		Complete Unit
		Fan Motor	Fan Motor	Compressor	
Performance at		230 - 208 V / 1 phase / 60 Hz		230 - 208 V / 1 phase / 60 Hz	
Rating conditions	A	0.60 - 0.60	0.5 - 0.5	7.1 - 7.7	8.2 - 8.77
	kW	0.12 - 0.11	0.11 - 0.10	1.56 - 1.53	1.79 - 1.74
Full load conditions	A	0.60 - 0.60	0.5 - 0.5	8.4 - 9.5	9.7 - 10.57
	kW	0.12 - 0.11	0.11 - 0.10	1.93 - 1.96	2.16 - 2.17
Starting amperes	A	1 - 1	0.7 - 0.6	43 - 43	44.7 - 44.6

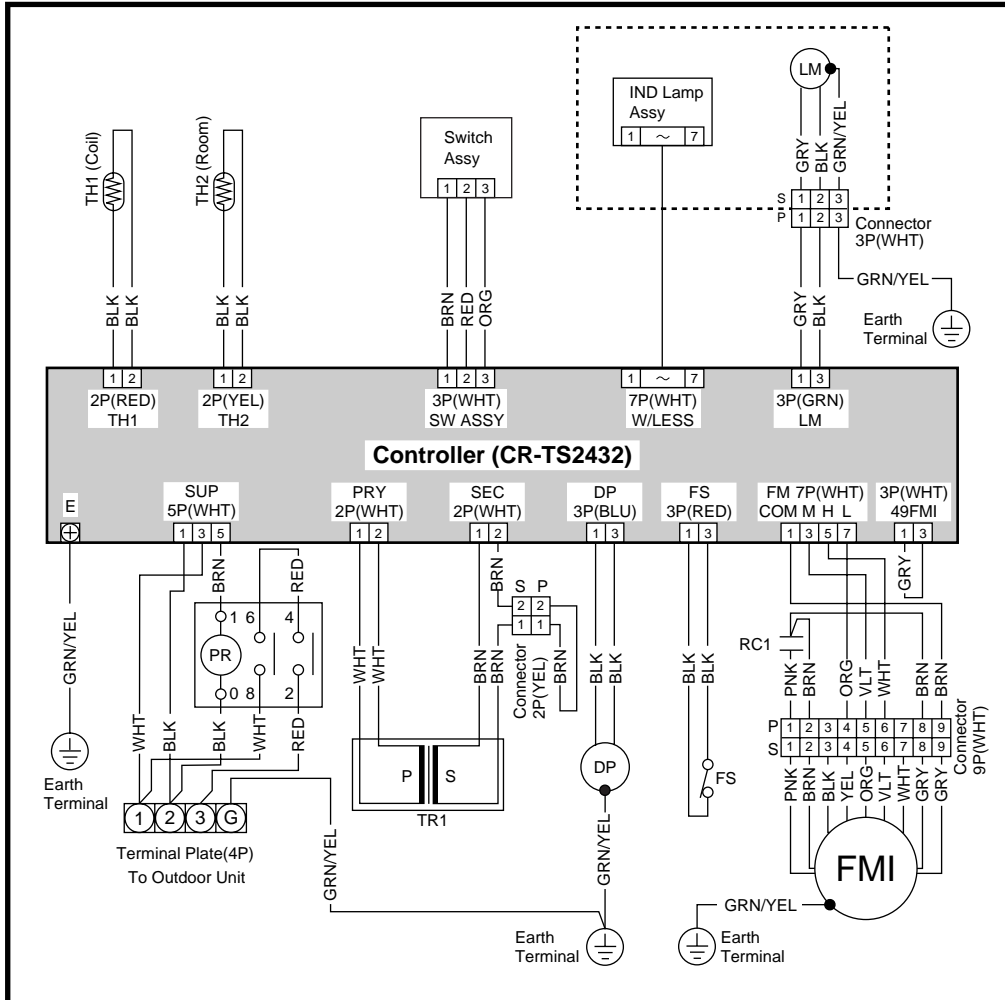
Rating Conditions : Indoor Air Temperature 80 °F DB / 67 °F WB
 Outdoor Air Temperature 95 °F DB
 Full Load Conditions : Indoor Air Temperature 80 °F DB / 67 °F WB
 Outdoor Air Temperature 115 °F DB

9. ELECTRICAL WIRING DIAGRAMS

(1) Indoor Unit

① XS1852

• Electric Wiring Diagram

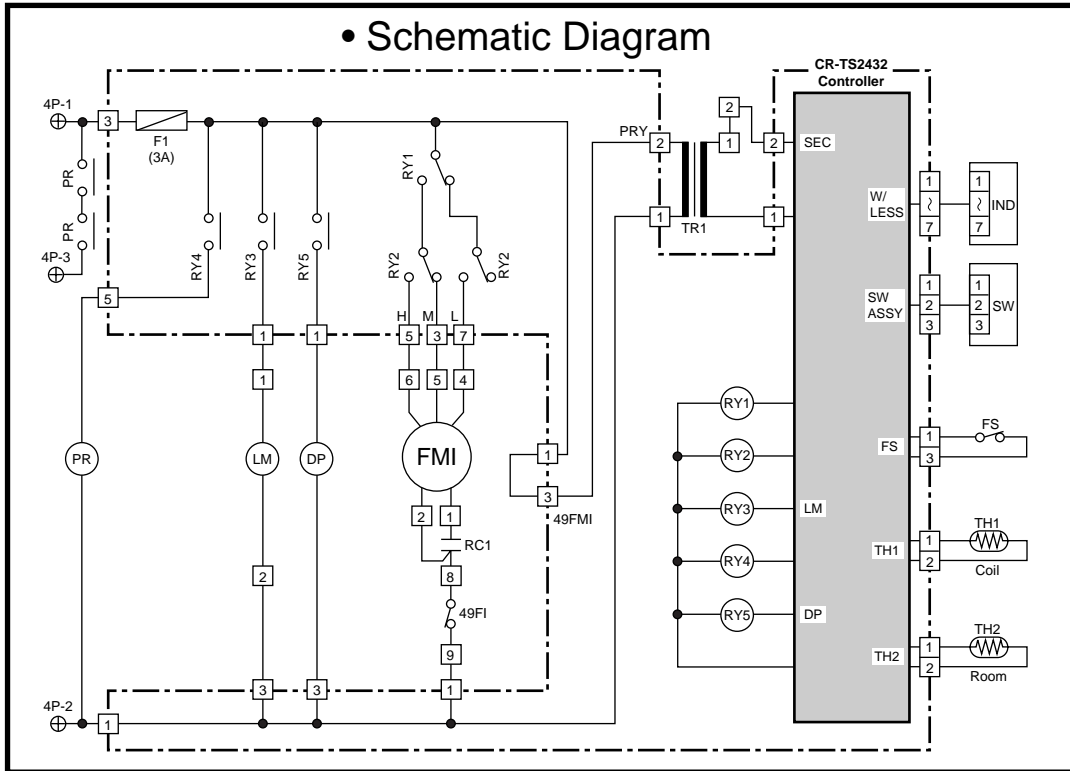


① 854-2-5268-872-00-0 (XS1852)

9. ELECTRICAL WIRING DIAGRAMS

(1) Indoor Unit

① XS1852



Symbols	Description	Symbols	Description
FMI	Indoor Fan Motor	FS	Float Switch
49FI	Indoor Motor Thermal Protector	TH1	Thermistor (Indoor Coil)
RC1	Running Capacitor	TH2	Room Thermistor
F1	Fuse	CR-TS2432	Indoor Controller
DP	Drain Pump	IND	Indicator Lamp Assy
LM	Auto Louver Motor	SW	Switch Assy
TR1	Power Transformer	⊕	Terminal Plate
PR	Power Relay	□	Connector
RY1-RY5	Auxiliary Relay	⊕	Terminal

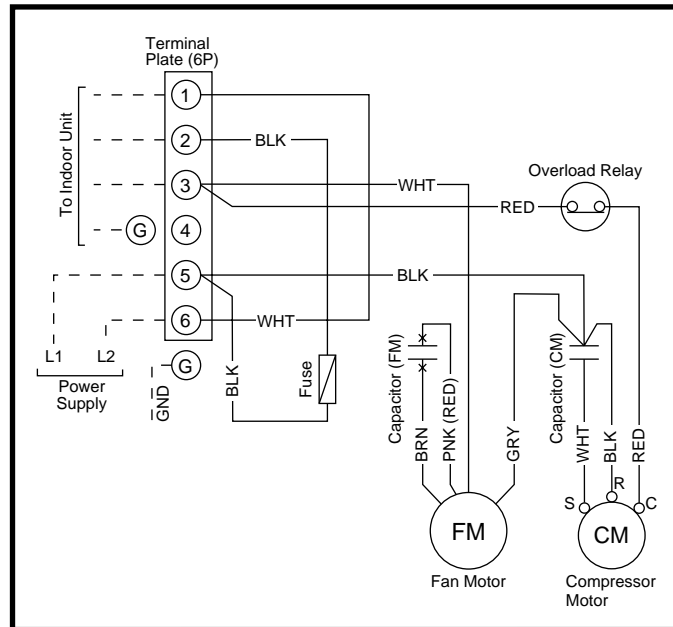
© 854-2-5268-872-00-0 (XS1852)

9. ELECTRICAL WIRING DIAGRAMS

(2) Outdoor Unit

① C1852

• Electric Wiring Diagram

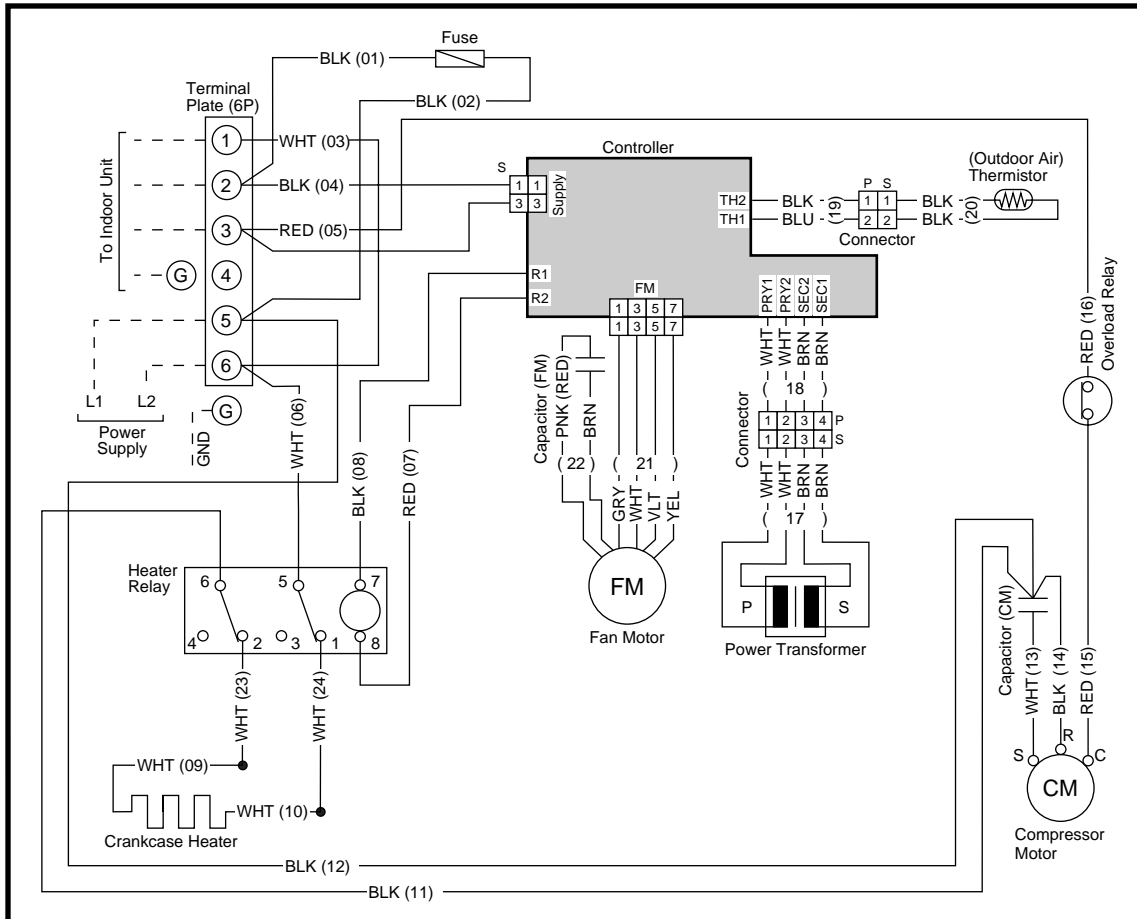


9. ELECTRICAL WIRING DIAGRAMS

(2) Outdoor Unit

① CL1852

• Electric Wiring Diagram



10. PROCESSES AND FUNCTIONS

(1) Room Temperature Control

The Unit adjusts room temperature by turning the outdoor unit's compressor ON and OFF. This process is controlled by the **thermostat** located in the remote control unit. The figures on this and the next pages show how each part of the system performs when the room temperature changes and the thermostat activates the compressor to start (**thermo ON**) or stop (**thermo OFF**). Fig. 8 shows about the cooling cycle.

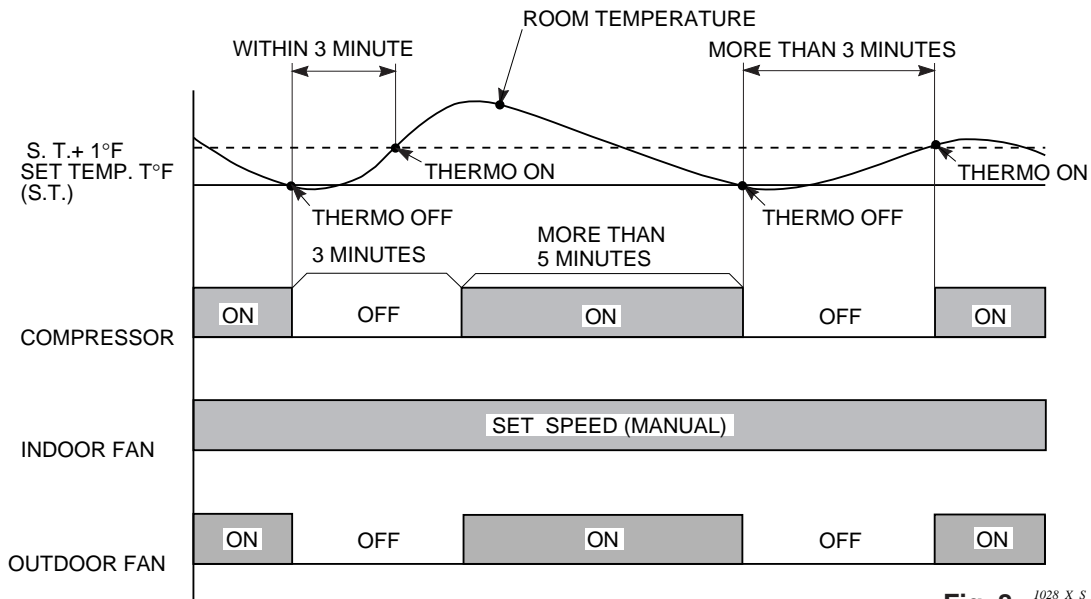


Fig. 8 1028_X_S

Chart Summary and Explanations

- ❑ Once the compressor **starts**, it keeps running for 5 minutes.
- ❑ Once the compressor **stops**, it will not start running again for 3 minutes.
- ❑ If you **change** the operation mode during the cooling cycle, the control circuit **stops** the compressor for 3 minutes.
- ❑ For 5 minutes after the compressor is first turned on, and for 3 minutes after it is turned off, the compressor is not controlled by the room sensor.
- ❑ **Thermo ON:** When room temperature rises 1 °F above the set temperature T° , ($T^\circ + 1 \text{ }^\circ\text{F}$):
Compressor → **ON**
- ❑ **Thermo OFF:** When the room temperature is equal to or below the set temperature T° :
Compressor → **OFF**

10. PROCESSES AND FUNCTIONS

(2) Freeze Prevention

Freeze Prevention keeps the indoor heat exchange coil from freezing. Freezing reduces the efficiency of the unit, and frost buildup on the coil blocks cool air circulation from the indoor unit's fan.

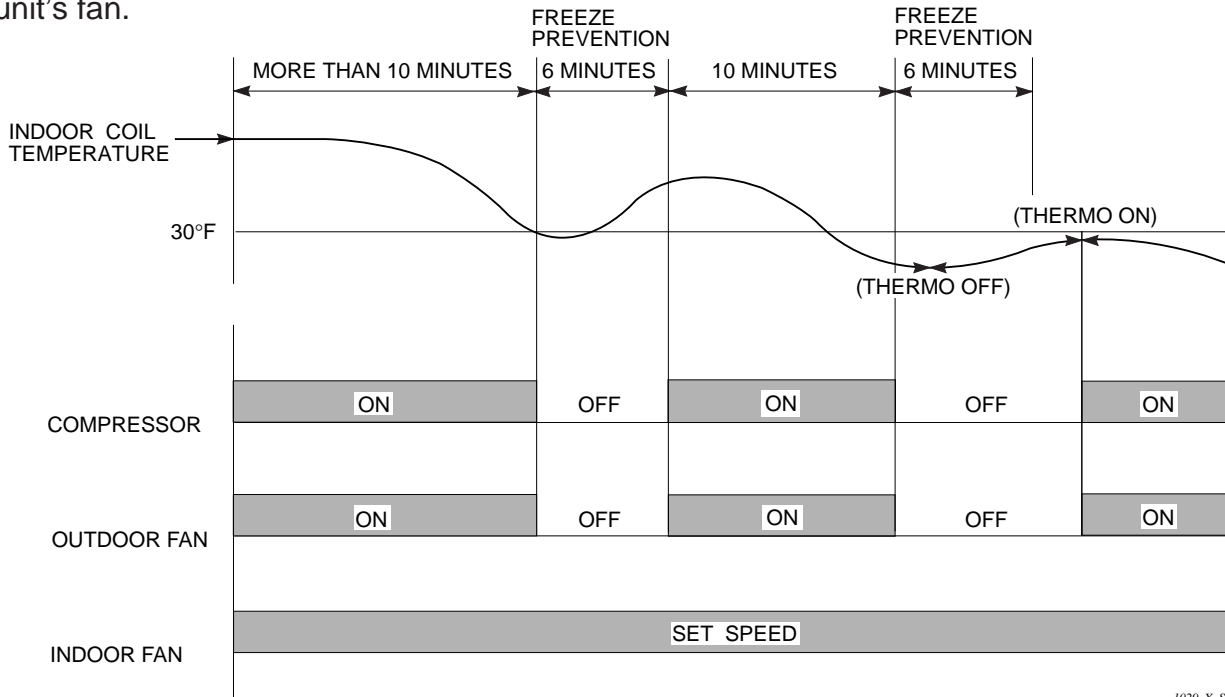


Fig. 9

1029_X_S

(3) Drain Pump Control

Drain pump operates when compressor starts to operate or when Float Switch turns off.

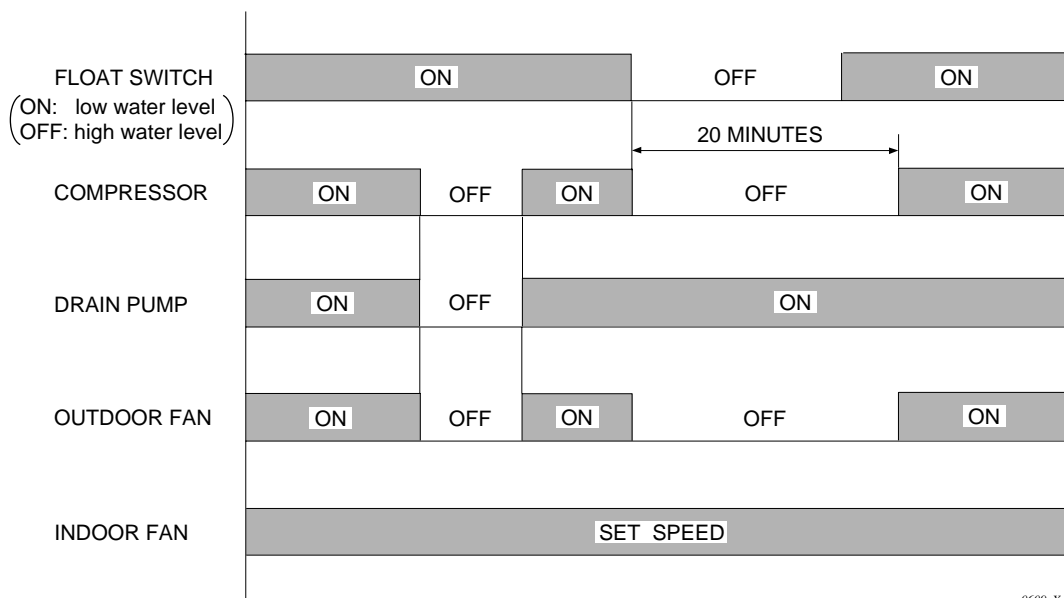


Fig. 10

0609_X_S

10. PROCESSES AND FUNCTIONS

(4) Outdoor Fan Speed Control (CL1852)

Low ambient fan speed control

- This function protects the compressor from being damaged due to flowback of the liquid refrigerant to the compressor when the outdoor temperature is very low.
- When the air temp. thermistor (TH) on the outdoor units detects a change in temperature, the controller on the electrical component box activates to control the fanspeed automatically.
- If the outdoor temperature falls below 57°F, the fan speed switches to MED.
- If the outdoor temperature falls below 30°F, the fan speed switches to LOW.

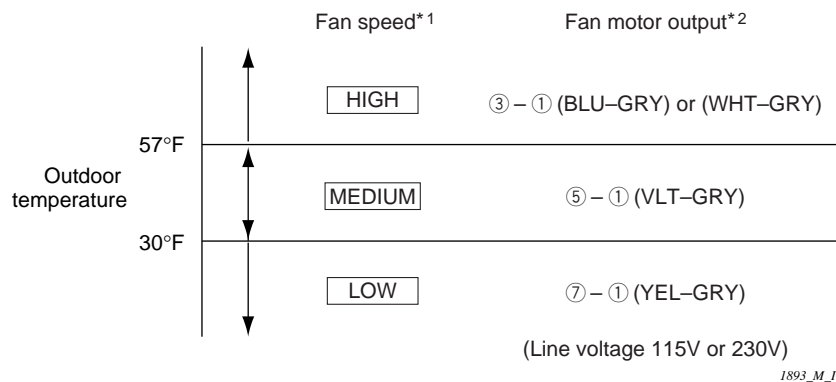


Fig. 11

*1 Regardless of outdoor temperature, outdoor fan motor operates at first at HIGH speed for 23 ± 5 seconds to give the motor an initial boost.

*2 When the fan speed switches, the controller terminal's location where line voltage comes out (○-○) shifts accordingly.

11. SERVICE PROCEDURES

(1) Troubleshooting

1) Check before and after Troubleshooting

Many problems may happen because of wiring or power supply problems, so you should check these areas first. Problems here can cause false results in some of the other tests, and so should be corrected first.

① Check power supply wiring

(a) Single-phase

- Check that power supply wires are correctly connected to terminal No. 1 through No. 4 on the 4P terminal plate in the indoor unit and No. 5 and No. 6 on the 6P terminal in the outdoor unit.

② Check inter-unit wiring

- Check that inter-unit control wiring (AC 230 - 208 V Line voltage) is correctly connected between the indoor unit and outdoor unit.

Single-phase outdoor unit

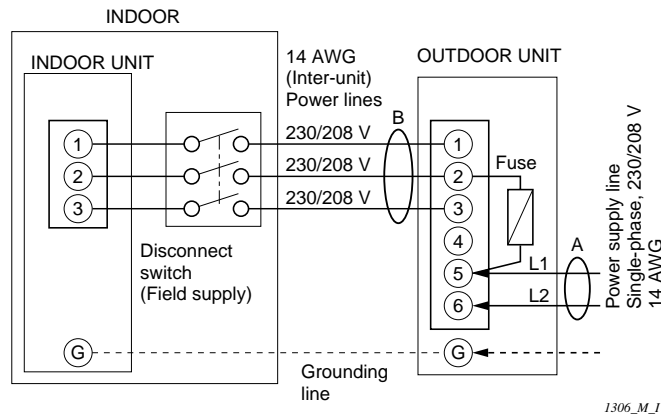


Fig. 12

1306_M_1

③ Check power supply

- Check that voltage is within the 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 not to touch any uninsulated live part that can cause **ELECTRIC SHOCK**.

④ Check the lead wires and connectors in indoor and outdoor units.

- Check that the sheath of lead wires is not damaged.
- Check that the lead wires are firmly connected at the terminal plate.
- Check that the wiring is correct.

⑤ Reference

- Condition of general cooling operation (Thermo. ON)
SWEEP ON
Indoor fan speed HIGH

11. SERVICE PROCEDURES

2) Air Conditioner does not Operate

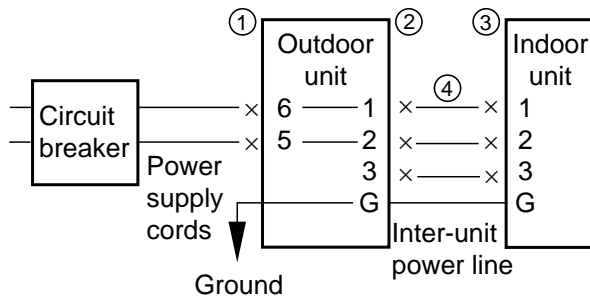
① Circuit breaker trips (or fuse blows).

(a) When the circuit breaker is set to ON, it is tripped soon.

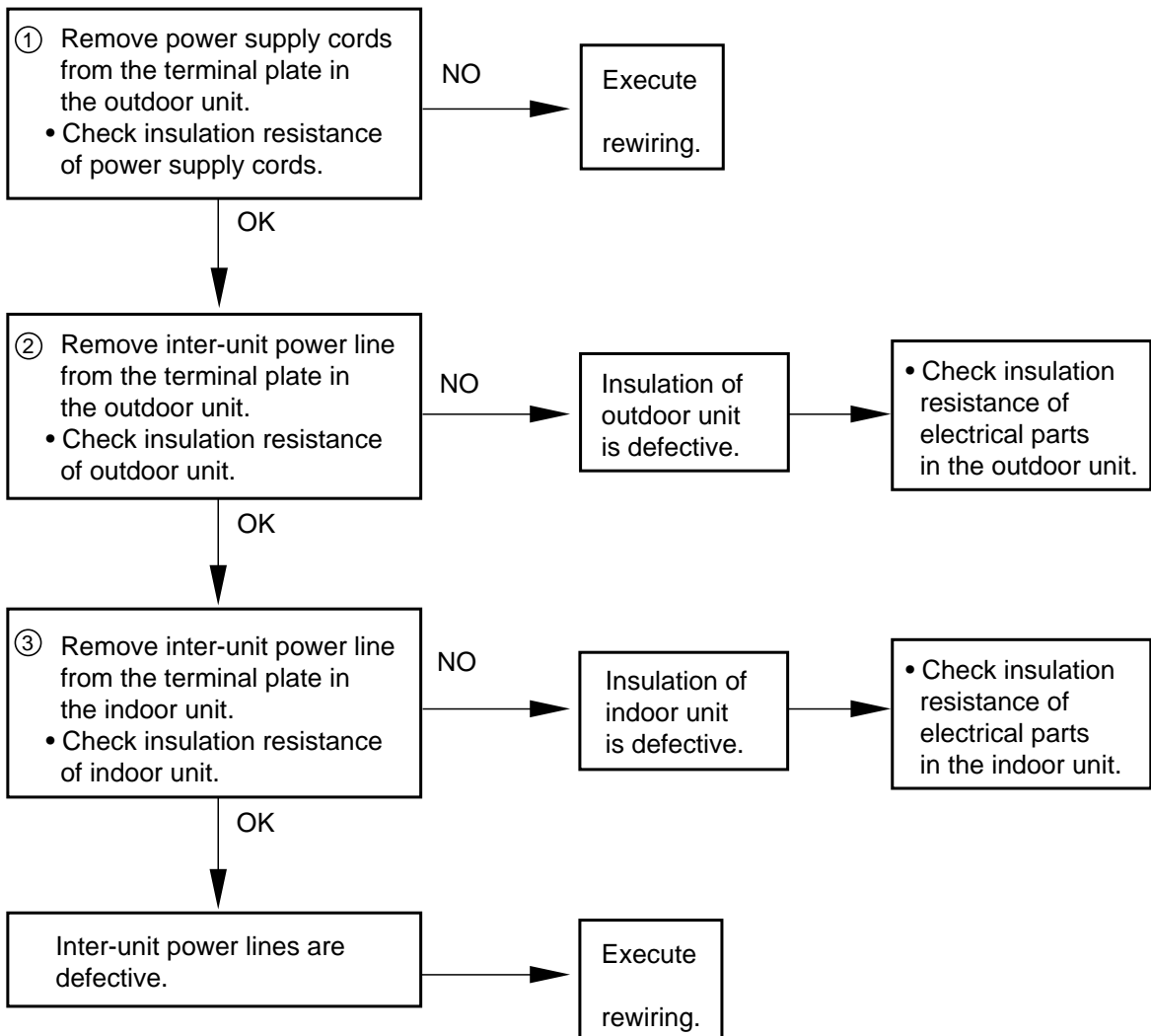
- There is a possibility of ground fault.
- Check insulation resistance.

If resistance value is 1 MΩ or less, it is a defect of insulation.

(Example)



*Set the circuit breaker to OFF.

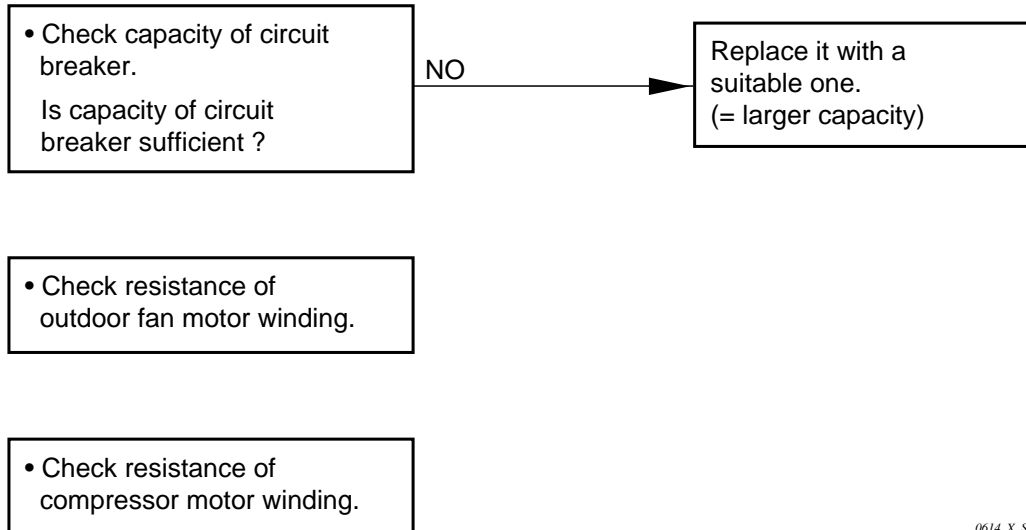


1334_X_S

11. SERVICE PROCEDURES

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

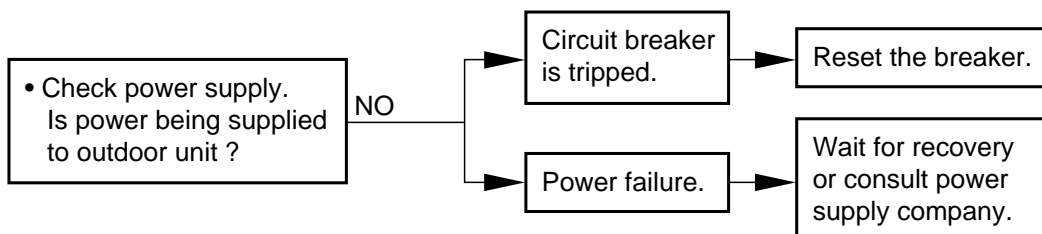
- There is a possibility of short circuit.



0614_X_S

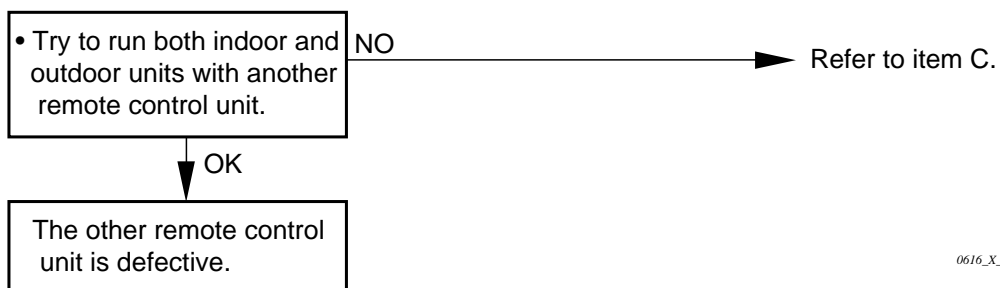
② Neither indoor unit nor outdoor unit runs.

A. Power is not supplied



0615_X_S

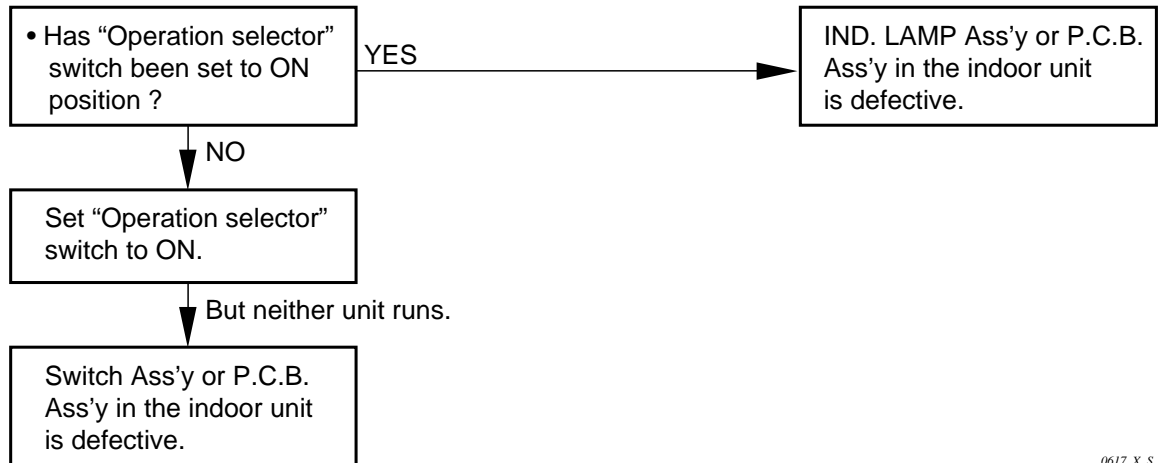
B. Check remote control unit.



0616_X_S

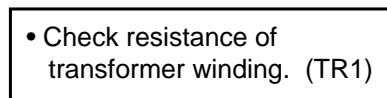
11. SERVICE PROCEDURES

C. Check "Operation selector" switch in the indoor unit.



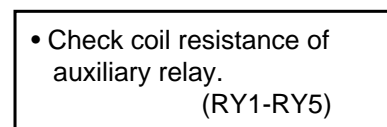
0617_X_S

D. Transformer in indoor unit.



1033_X_S

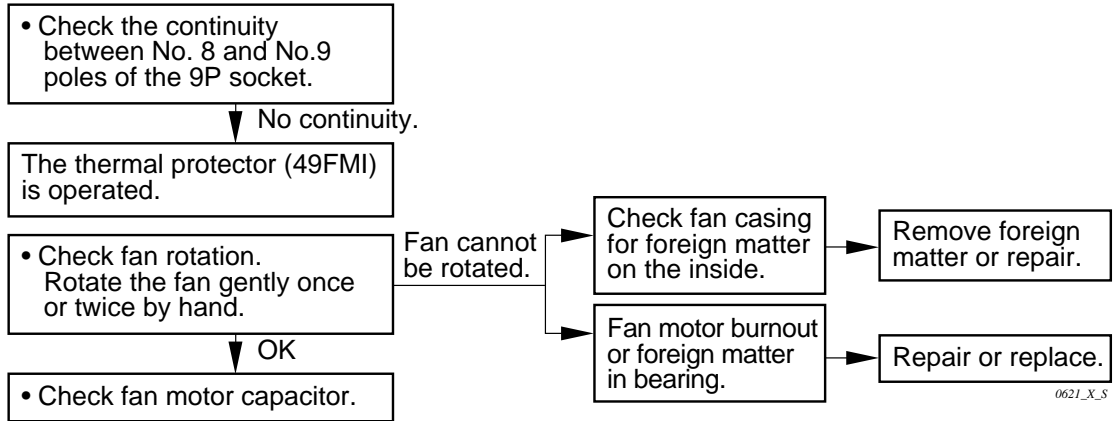
E. Check. auxiliary relay.



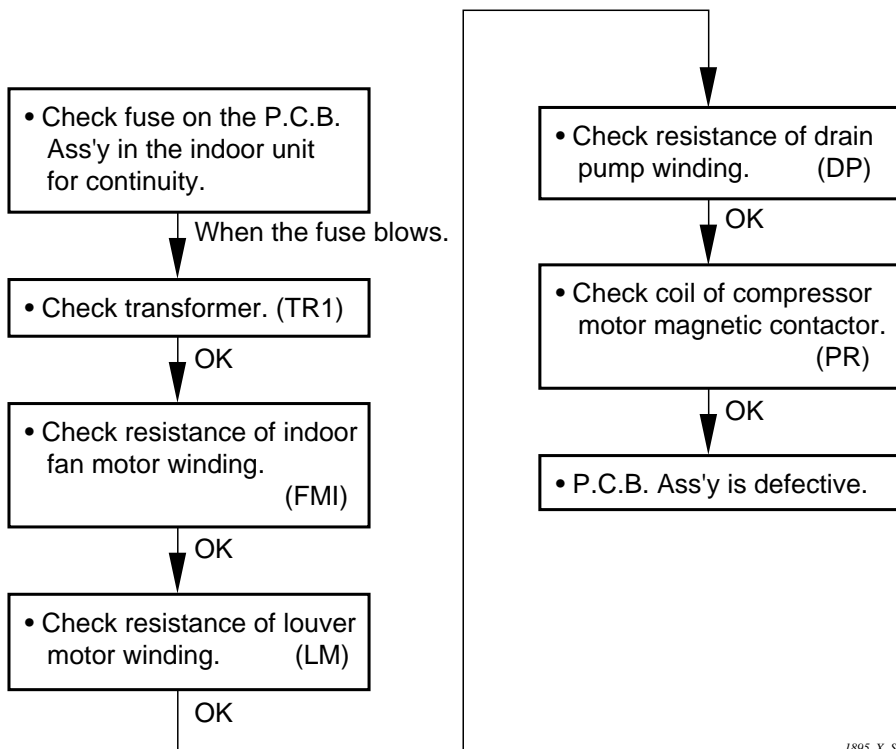
1894_X_I

11. SERVICE PROCEDURES

- F. Check indoor fan motor thermal protector (49FMI)
- Disconnect the socket from 9P (WHT) connector.



- G. Check fuse on the P.C.B. Ass'y in the indoor unit.



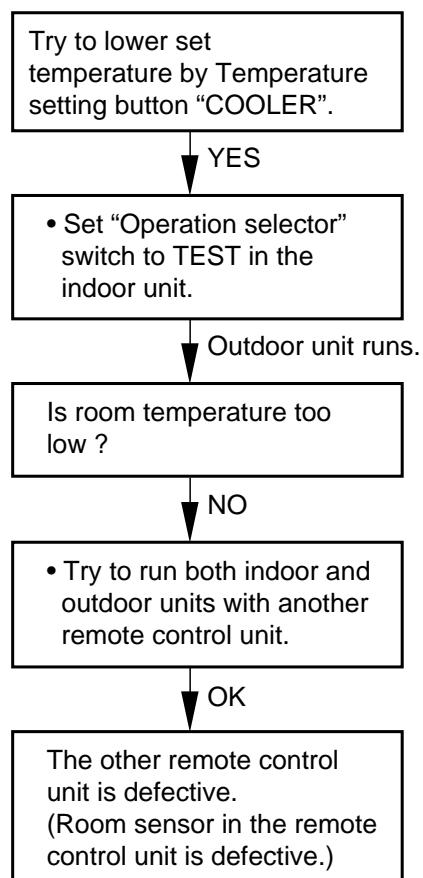
11. SERVICE PROCEDURES

3) Outdoor Unit does not Run.

A. Check COOL / FAN selector switch in the remote control unit.

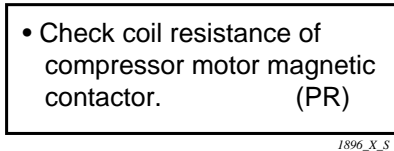


B. Check set temperature.

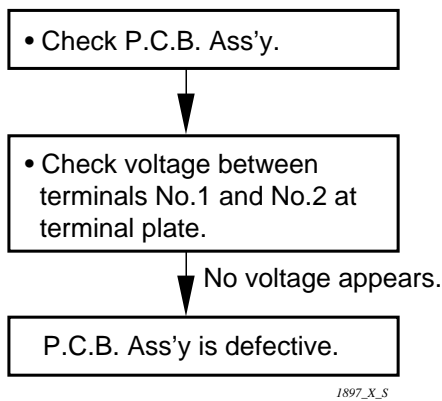


11. SERVICE PROCEDURES

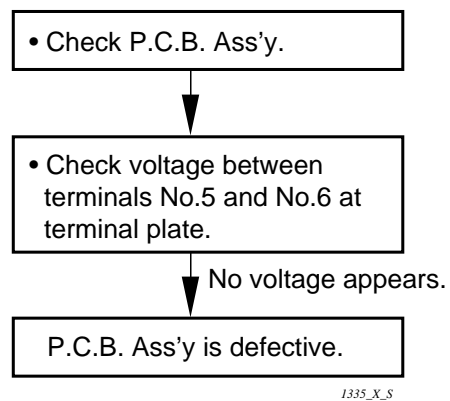
C. Check compressor motor magnetic contactor.



D. Check indoor unit P.C.B.

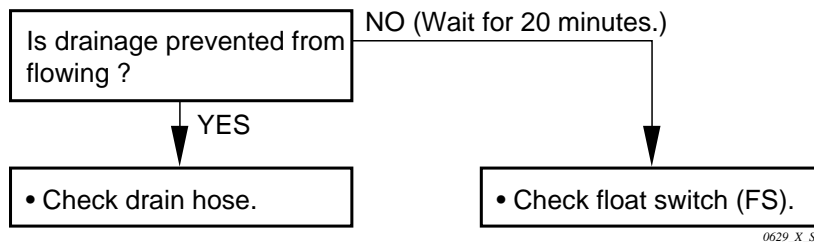


E. Check outdoor unit P.C.B. (CL1822 Type)



F. Check float switch.

- Refer to “11. (3) Drain Pump Control”



11. SERVICE PROCEDURES

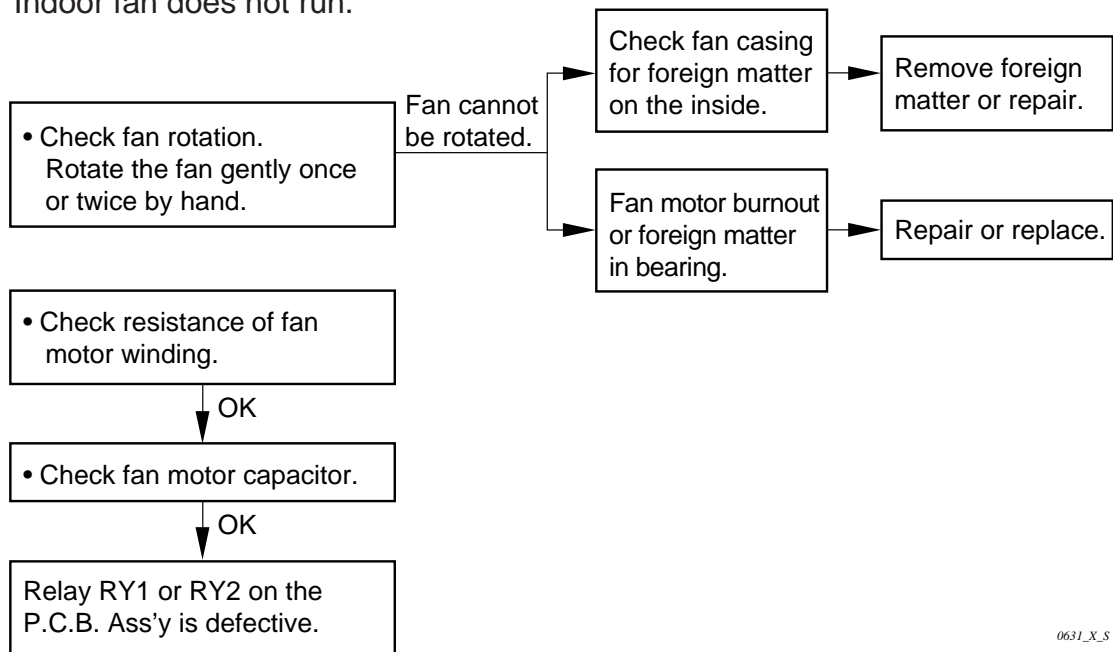
4) Indoor Unit does not Run. (Indoor fan and louver motor do not run.)

P.C.B. Ass'y is defective.

0630_X_S

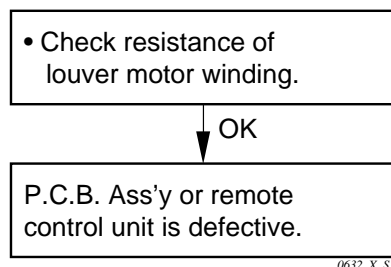
5) Some Part does not Operate.

A. Indoor fan does not run.



0631_X_S

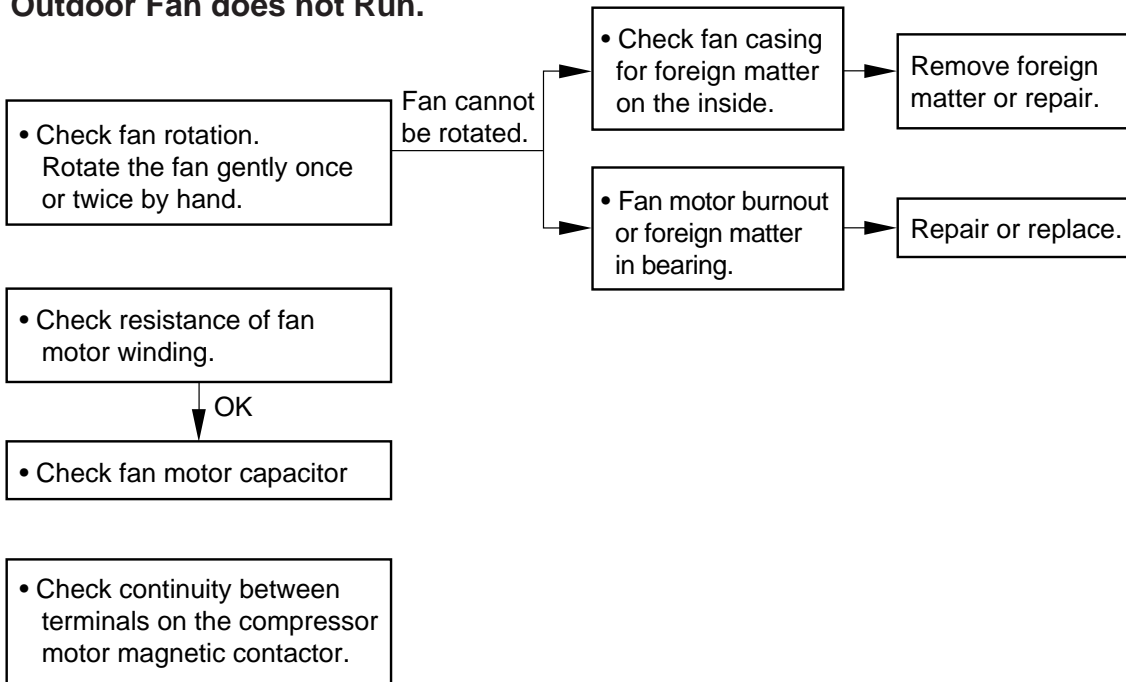
B. Louver motor does not run.



0632_X_S

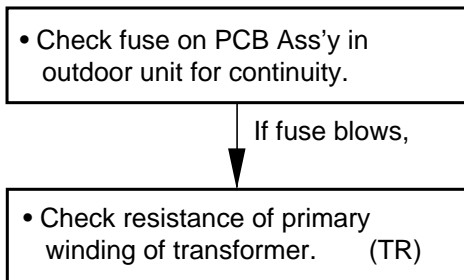
11. SERVICE PROCEDURES

6) Outdoor Fan does not Run.



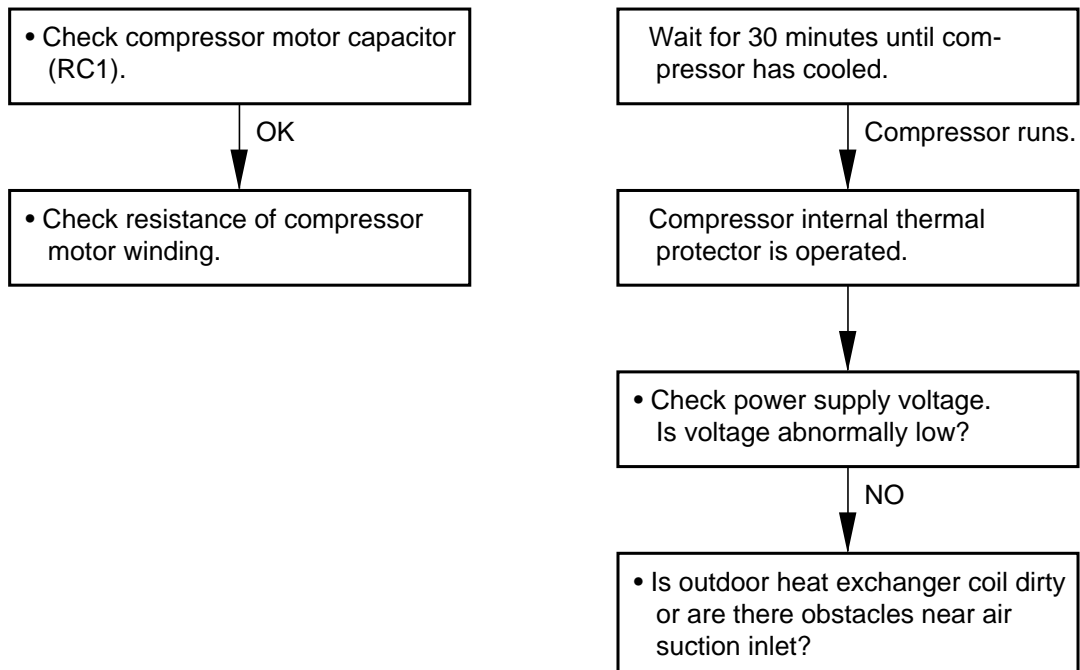
7) Outdoor Fan does not Run for CL1852.

0633_X_S



1038_X_S

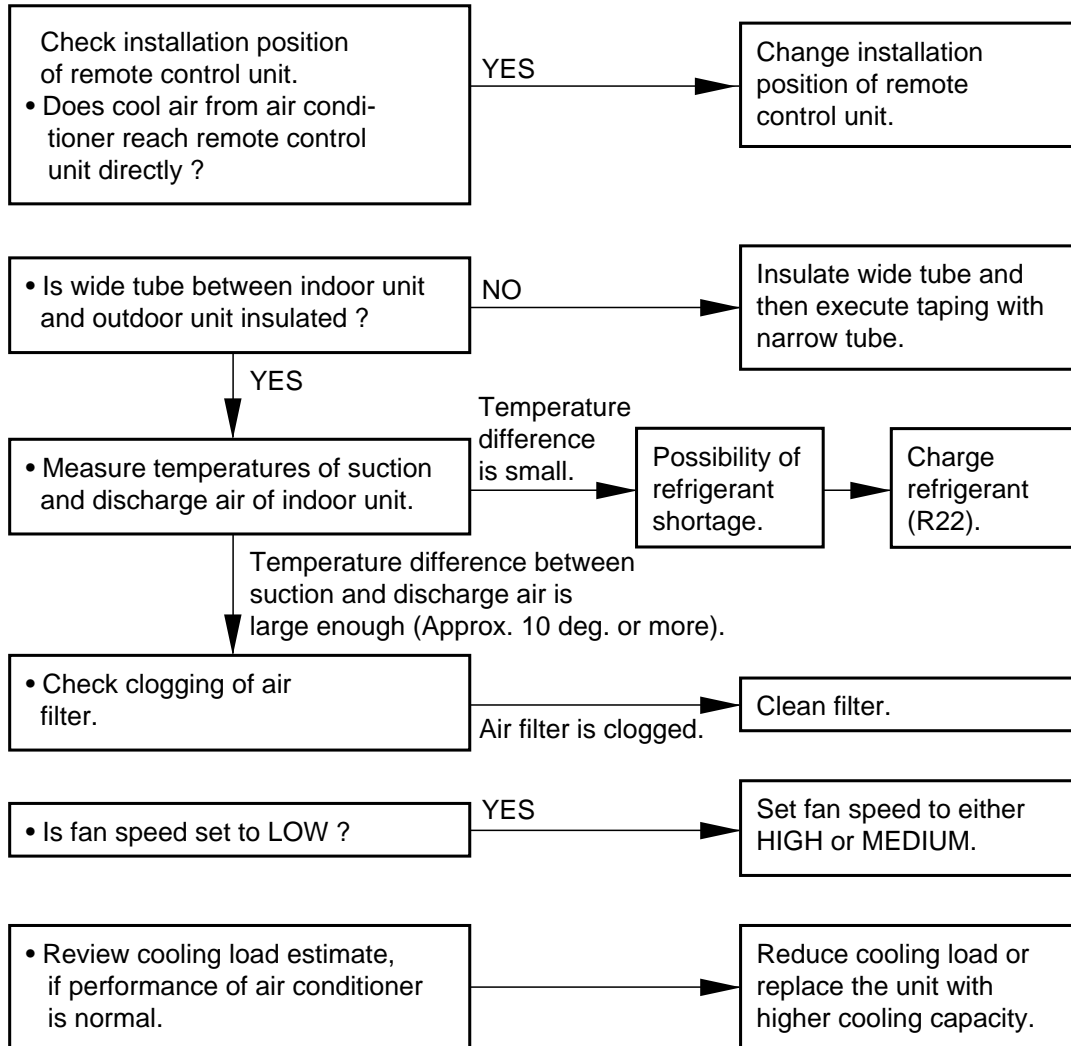
8) Compressor does not Run.



1336_X_S

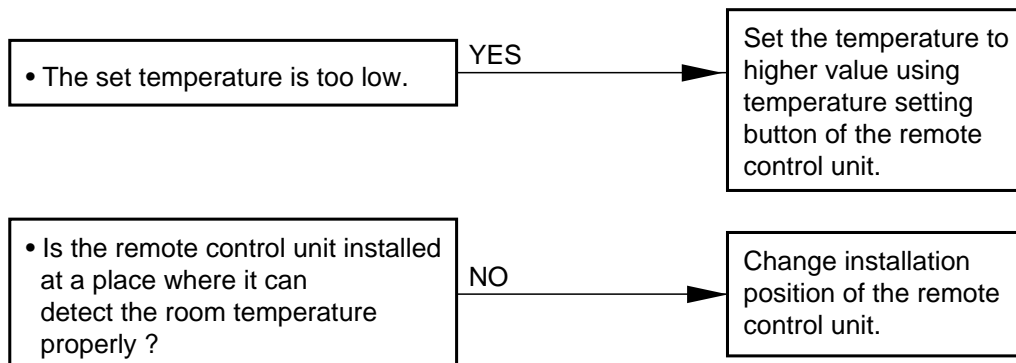
11. SERVICE PROCEDURES

9) Poor Cooling



1040_X_S

10) Excessive Cooling.



0637_X_S

11. SERVICE PROCEDURES

(2) A Sensor is Defective

① Indoor (heat exchanger) coil temp. Sensor is defective.

(a) Open (=No continuity in sensor)

Compressor and outdoor fan repeat ON for 10 minutes and OFF for 6 minutes when sensor opens.

(b) Short

“Freeze Prevention” does not operate when dehumidified water is frozen on the indoor coil.

② Room temp. Sensor (in the remote control unit) is defective.

(a) Open (=No continuity in sensor)

Neither outdoor fan nor compressor runs.

(b) Short

Outdoor fan and compressor do not stop. — Excessive cooling.

(3) Operation of Major Electrical Parts

Operation Mode (Function)		Operation	Indoor unit and Remote Control unit					Outdoor unit		
			Indicator lamps					Fan	Fan	Compressor
			Room Temp.	Cool	Timer	Night setback Energy saver	Sweep			
Cool- ing	Manual	Thermo.ON	○	○				○	○	○
		Thermo.OFF	○	○				○		
	Night setback	Thermo.ON	○	○		○		○	○	○
		Thermo.OFF	○	○		○				
	Timaer (set)	ON Timer			○					
		OFF Timer	○	○	○			○	○	○
Freeze prevention			○	○			○			
Fan			○				○			
Flap	Sweep	Cool	○	○*		○*		○	○*	○*
		Fan	○					○		
	Stop	Cool	○	○*		○*		○	○*	○*
		Fan	○					○		

NOTE ○* Refer to Cooling Mode.

11. SERVICE PROCEDURES

(4) Checking the Electrical Components

1) Measurement of Insulation Resistance

- The electrical insulation is acceptable when the resistance exceeds 1 MΩ.

① Power Supply Wires

Clamp the earthed wire of the Power Supply wires with a lead clip of the insulation resistance tester and measure the resistance by placing a probe on either of the power wires. (Fig. 13)

Then measure the resistance between the earthed wire and the other power wires. (Fig. 13)

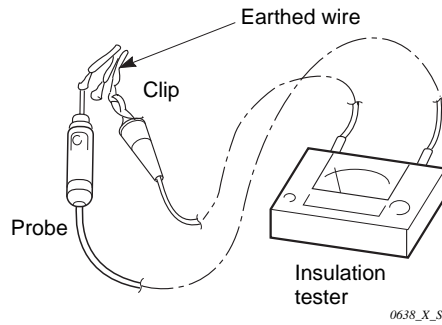


Fig. 13

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 the terminal plate (Fig. 14)

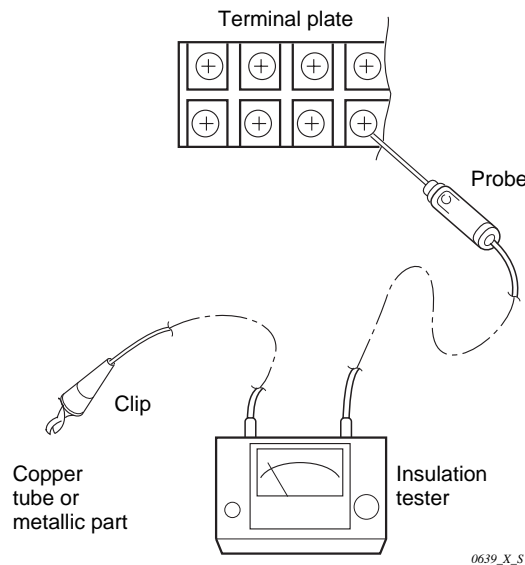


Fig. 14

③ Outdoor Unit

Measure the resistance by placing a probe on the terminal plate in the same manner as explained above ②. (Fig. 14)

④ Measurement of Insulation Resistance for Electrical parts

- Disconnect the connector of the desired electric part from terminal plate, P.C.B. Ass'y, etc. (Fig. 15)
- Similarly, disconnect the lead wires from compressor, capacitor, etc. (Fig. 16)
- Measure the resistance in the same manner as illustrated on the right. Refer to Electrical Wiring Diagram.

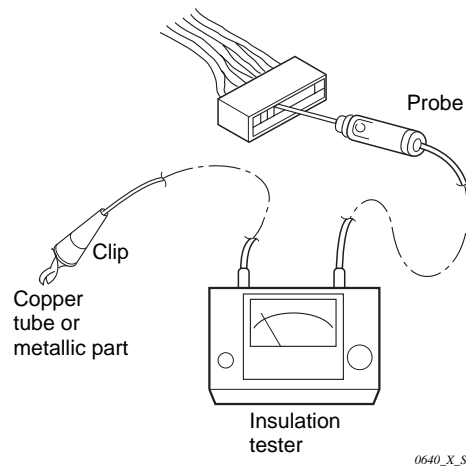


Fig. 15

NOTE

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

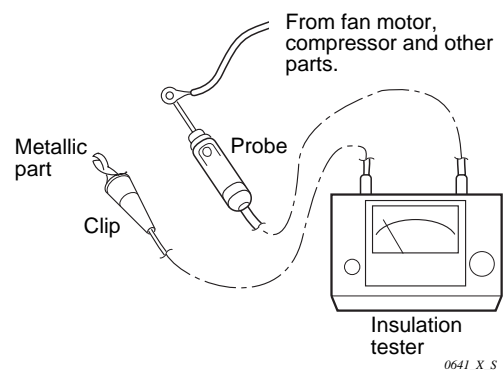


Fig. 16

11. SERVICE PROCEDURES

2) Checking the Protective Devices

- Disconnect the connector, which consists of P (plug) and S (socket) when you want to check the protective device.
- Then check continuity among plug's (and/or socket's) terminal as in **Fig. 17**.
- Normality of the protective device can be judged by the following table.
The Protective Device is proved normal if there is a continuity between terminals.

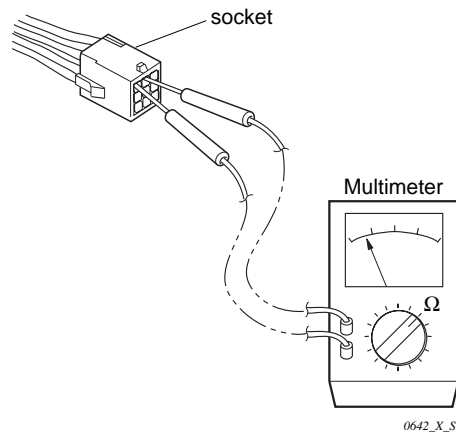


Fig. 17

① Indoor fan motor thermal protector (49FI) Indoor unit

- Disconnect the connector which leads to the indoor fan motor (FMI).
- Check the socket's terminals.

② Compressor motor thermal protector Outdoor unit

- Disconnect the wires from terminals of compressor.
- Check the terminals of compressor.

③ Outdoor fan motor thermal protector (49FO) Outdoor unit

- Disconnect both the connector which leads to the outdoor fan motor (FMO).
- Check socket's terminal.

11. SERVICE PROCEDURES

3) Checking the Electrical Parts

- ① **Power transformer (TR1) Indoor unit** *Measure the coil resistance.
- Primary 230-208 V ; Measure the resistance between two WHT lead wire terminals of socket connected to power transformer.
 - Secondary 10.6 V ; Measure the resistance between two BRN lead wires.
Refer to “2. (3) (A) Other component specifications”.
- ② **Power transformer (TR) Outdoor unit** *Measure the coil resistance.
- Primary 230-208 V ; Measure the resistance between two WHT lead wire terminals of socket jointed to power transformer.
 - Secondary 19 V ; Measure the resistance between two BRN lead wires.
Refer to “2. (3) (B) Other component specifications”.
- ③ **Indoor fan motor (FMI) Indoor unit** *Measure the coil resistance.
- Measure the resistance between each terminal of the socket connected to the indoor fan motor.
Refer to “2. (2) (A) Major component specifications”.
- ④ **Outdoor fan motor (FMO) Outdoor unit** *Measure the coil resistance.
- Measure the resistance in the same manner as explained above ②.
Refer to “2. (2) (B) Major component specifications”.
- ⑤ **Motor capacitor Both in indoor and outdoor unit**

- Remove the lead wires from the capacitor terminals, and then place a probe on the capacitor terminals as shown in **Fig. 18**. 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.

NOTE

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

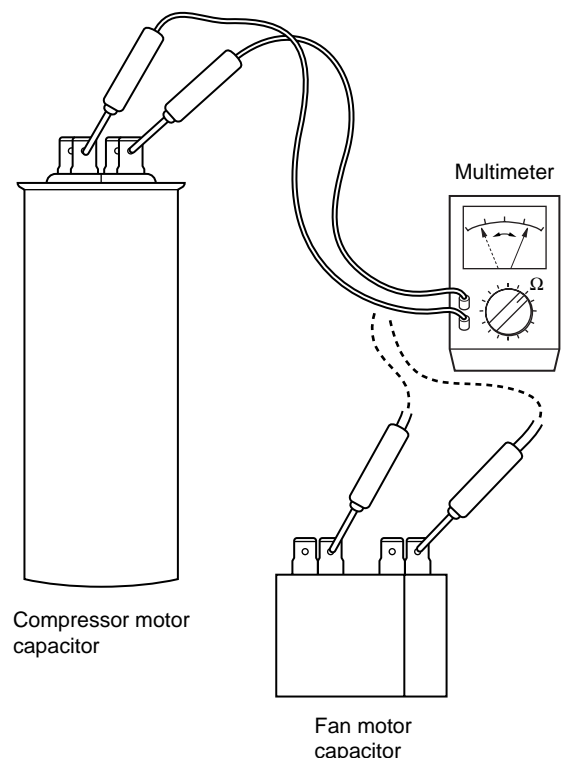


Fig. 18

1041_X_S

11. SERVICE PROCEDURES

⑥ Continuity of fuse on P.C.B. Ass'y

- Check for continuity using a multimeter as shown in Fig. 19.

NOTE

Method Used to Replace Fuse on PCB Ass'y

1. Remove the PCB Ass'y from the electrical component box.
2. Remove the fuse from PCB Ass'y using pliers while heating the soldered leads on the back side of the PCB Ass'y with a soldering iron (30W or 60W). (Fig. 20)
3. For replacement, insert a fuse of the same rating to the intended position and solder it. (Allow time to radiate heat during soldering so that the fuse does not melt.)

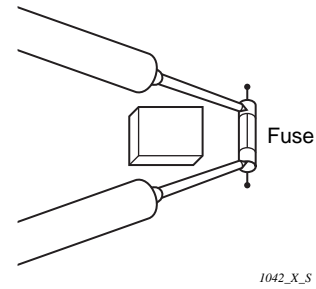


Fig. 19

Soldering iron

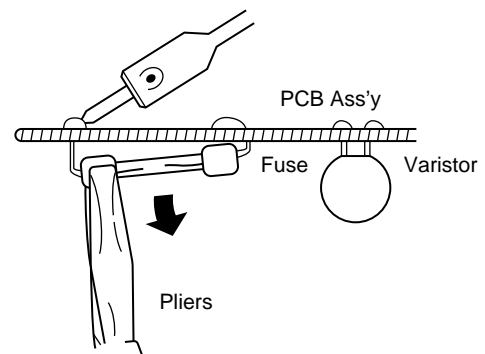


Fig. 20

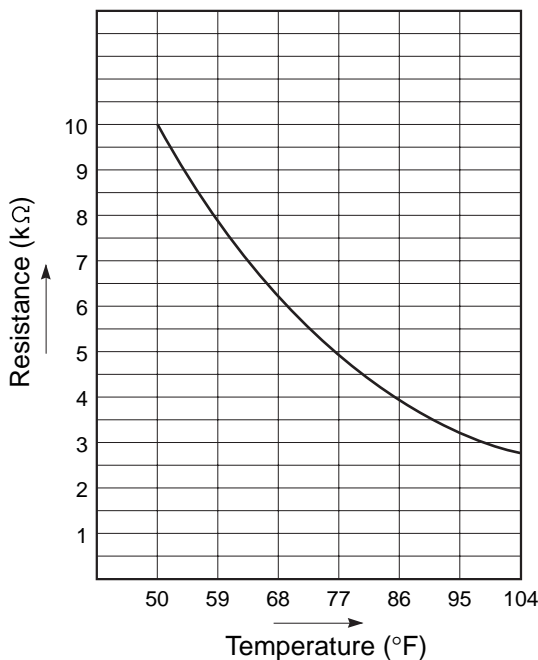


CAUTION

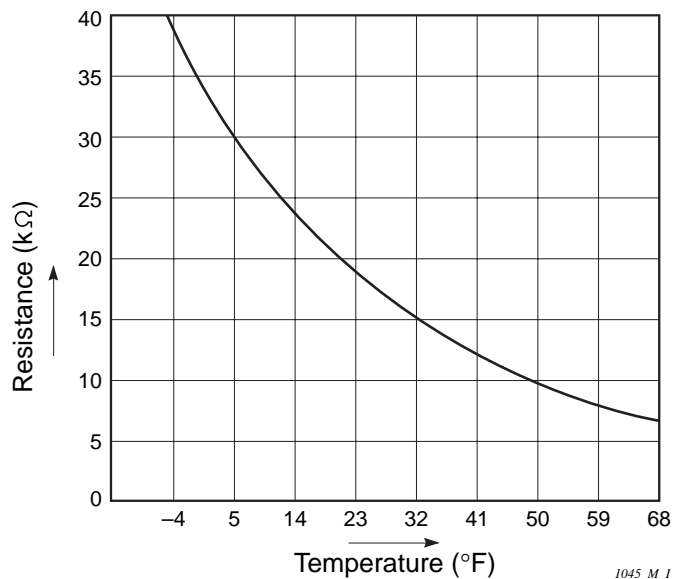
When replacing the fuse, be sure not to break down the varistor.

4) Thermistor Characteristic Curve

- ① Room temp. sensor (KTEC-35)



- ① Coil sensor (PBC-41E)



- The specifications, designs, and information in this brochure are subject to change without notice.

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Sep. / '2000

Printed in U.S.A.