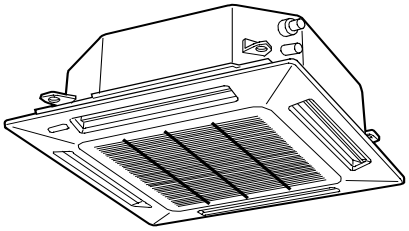
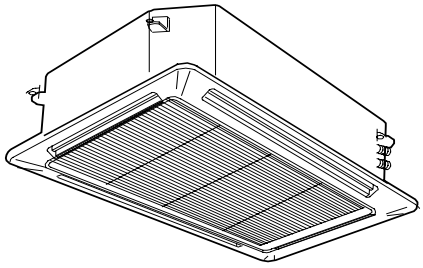
TECHNICAL DATA
& SERVICE MANUAL

INDOOR UNIT: **ASR525CL**
ASR536CL
ASR548CL

SPLIT SYSTEM AIR CONDITIONER

Model No.	Product Code No.
ASR525CL	387006100
ASR536CL	387006101
ASR548CL	387006102





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IMPORTANT!
Please read before installation

This air conditioning system meets strict safety and operating standards.
For the installer or service person, it is important to install or service the system so that 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.

•The unit must be supplied with a dedicated electrical line.

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 sale/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

- During installation, connect before the refrigerant system and then the wiring one; proceed in the reverse orden when removing the units.

WARNING **When wiring**

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

- Do not supply power to the unit until all wiring and tubing are completed or reconnected and checked, to ensure the grounding.
- 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 and death**.
- **Ground the unit** following local electrical codes.
- The Yellow/Green wire cannot be used for any connection different from the ground connection.
- Connect all wiring tightly. Loose wiring may cause overheating at connection points and a possible fire hazard.
- Do not allow wiring to touch the refrigerant tubing, compressor, or any moving parts of the fan.
- Do not use multi-core cable when wiring the power supply and control lines. Use separate cables for each type of line.

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 aluminium fins on the air conditioner can cut your fingers.

When installing...

… In a ceiling
Make sure the ceiling is strong enough to hold the unit-weight. It may be necessary to build a strong wooden or metal frame to provide added support.

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

... In moist or uneven locations
Use a raised concrete base to provide a solid level foundation for the outdoor unit. This prevents damage and abnormal vibrations.

... In area with strong 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 then 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; screw by hand and 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 narrow tube for liquid, wide tube for gas.

When servicing
- Turn the power OFF at the main power board 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 the work, remembering to check that no metal scraps or bits of wiring have been left inside the unit being serviced.
- Ventilate the room during the installation or testing the refrigeration system; make sure that, after the installation, no gas leaks are present, because this could produce toxic gas and dangerous if in contact with flames or heat-sources.

Table of Contents

1. SPECIFICATIONS

1-1 Unit Specifications

ASR525CL

Power source	220 - 240V ~ 50Hz

Voltage rating	230V

Performance		Cooling
Capacity		See catalogue with the requested matching
Air circulation (High/Med./Low)	m³/h	1140/1020/840

Features			
Controls/Temperature controls			Microprocessor/ I.C. thermostat
Remote Controller			Wireless remote control unit
Timer			ON/OFF 24 hours & Daily program, 1-hour OFF
Fan speed			3 and Auto
Airflow direction			Auto (Remote control)
Air Filter			Washable, easy acces, long life (2500 hr.)
Operation sound	High/Med./Low	dB-A	37/35/31
Refrigerant tubing connections			Flare type
Refrigerant	Narrow tube	mm(in.)	6,35 (1/4)
tube diameter	Wide tube	mm(in.)	15,88 (5/8)
Refrigerant			R407C
Refrigerant control			Capillary tube

Dimensions & Weight				
Dimensions (include panel)		Height	mm	338
		Width	mm	860
		Depth	mm	860
Package dimensions	Unit	Height	mm	320
		Width	mm	880
		Depth	mm	840
		Volume	m3	0,238
	Ceiling panel	Height	mm	110
		Width	mm	965
		Depth	mm	965
		Volume	m3	0,1
Weight (include panel)		Net	kg	22
		Shipping	kg	26
	Ceiling panel	Net	kg	6
		Shipping	kg	8

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ASR536CL

Power source	220 - 240V ~ 50Hz

Voltage rating	230V

Performance		Cooling
Capacity		See catalogue with the requested matching
Air circulation (High/Med./Low)	m³/h	1920/1680/1320

Features			
Controls/Temperature controls			Microprocessor/ I.C. thermostat
Remote Controller			Wireless remote control unit
Timer			ON/OFF 24 hours & Daily program, 1-hour OFF
Fan speed			3 and Auto
Airflow direction			Auto (Remote control)
Air Filter			Washable, easy acces, long life (2500 hr.)
Operation sound	High/Med./Low	dB-A	42/39/35
Refrigerant tubing connections			Flare type
Refrigerant	Narrow tube	mm(in.)	9,52 (3/8)
tube diameter	Wide tube	mm(in.)	19,05 (3/4)
Refrigerant			R407C
Refrigerant control			Capillary tube

Dimensions & Weight				
Dimensions (include panel)		Height	mm	368
		Width	mm	1150
		Depth	mm	860
Package dimensions	Unit	Height	mm	350
		Width	mm	1170
		Depth	mm	840
		Volume	m3	0,35
	Ceiling panel	Height	mm	110
		Width	mm	1250
		Depth	mm	965
		Volume	m3	0,131
Weight (include panel)		Net	kg	27
		Shipping	kg	32
	Ceiling panel	Net	kg	8
		Shipping	kg	10

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ASR548CL

Power source	220 - 240V ~ 50Hz

Voltage rating	230V

Performance		Cooling
Capacity		See catalogue with the requested matching
Air circulation (High/Med./Low)	m³/h	1920/1680/1320

Features			
Controls/Temperature controls			Microprocessor/ I.C. thermostat
Remote Controller			Wireless remote control unit
Timer			ON/OFF 24 hours & Daily program, 1-hour OFF
Fan speed			3 and Auto
Airflow direction			Auto (Remote control)
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		Volume	m3	0,35
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		Width	mm	1250
		Depth	mm	965
		Volume	m3	0,131
Weight (include panel)		Net	kg	27
		Shipping	kg	32
	Ceiling panel	Net	kg	8
		Shipping	kg	10

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1-2 Major Component Specifications

ASR525CL

Controller PCB		
Part No.		CR-XR254GS
Controls		Microprocessor

Fan & Fan Motor				
Type				Centrifugal fan
Q'ty ……. Diameter			mm	1…. Ø 443
Fan motor model…Q'ty				SFG6X-41D6P…1
No. Of poles…rpm (230 V, High)				6 … 470
Running Amps			A	0,611
Power input			W	31,4
Coil resistance (Ambient temp. 20 °C)			Ω	BRN-WHT: 170,3 WHT-VLT: 18,1 VLT-ORG: 43,2 ORG-YEL: 43,2 WHT-PNK: 83,5 YEL-BLK: 60,2
Safety devices	Type			Internal thermal protector
	Operating temp.	Open	°C	130 ± 8
		Close	°C	79 ± 15
Run capacitor			µF	4,5
			VAC	440

Panel			
Model			ASG25SCE
Flap motor			M2LB24ZA12
	rating		240 VAC
	rpm		2,5
	nominal output	W	3
	coil resistance (25°C)	kΩ	15,62 ± 15%
Dew proof heater			240 V, 26W

Heat Exch. Coil		
Coil		Aluminium plate fin / Copper tube
Rows		2
Fin pitch	mm	1,5
face area	m2	0,343

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ASR536CL

Controller PCB		
Part No.		CR-XR254GS
Controls		Microprocessor

Fan & Fan Motor				
Type				Centrifugal fan
Q'ty ……. Diameter			mm	1…. Ø 443
Fan motor model…Q'ty				SFG6X-81A6P…1
No. Of poles…rpm (230 V, High)				6 … 530
Running Amps			A	0,765
Power input			W	38
Coil resistance (Ambient temp. 20 °C)			Ω	BRN-WHT: 75,1 WHT-VLT: 6,7 VLT-ORG: 20,6 ORG-YEL: 27,4 WHT-PNK: 42,7 YEL-BLK: 58
Safety devices	Type			Internal thermal protector
	Operating temp.	Open	°C	130 ± 8
		Close	°C	79 ± 15
Run capacitor			µF	5
			VAC	440

Panel			
Model			ASG3648E
Flap motor			M2LB24ZA12
	rating		240 VAC
	rpm		2,5
	nominal output	W	3
	coil resistance (25°C)	kΩ	15,62 ± 15%
Dew proof heater			240 V, 26W

Heat Exch. Coil		
Coil		Aluminium plate fin / Copper tube
Rows		2
Fin pitch	mm	1,5
face area	m2	0,556

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Controller PCB		
Part No.		CR-XR254GS
Controls		Microprocessor

Fan & Fan Motor				
Type				Centrifugal fan
Q'ty ……. Diameter			mm	1…. Ø 443
Fan motor model…Q'ty				SFG6X-81A6P…1
No. Of poles…rpm (230 V, High)				6 … 530
Running Amps			A	0,871
Power input			W	51,9
Coil resistance (Ambient temp. 20 °C)			Ω	BRN-WHT: 75,1 WHT-VLT: 6,7 VLT-ORG: 20,6 ORG-YEL: 27,4 WHT-PNK: 42,7 YEL-BLK: 58
Safety devices	Type			Internal thermal protector
	Operating temp.	Open	°C	130 ± 8
		Close	°C	79 ± 15
Run capacitor			µF	6
			VAC	440

Panel			
Model			ASG3648E
Flap motor			M2LB24ZA12
	rating		240 VAC
	rpm		2,5
	nominal output	W	3
	coil resistance (25°C)	kΩ	15,62 ± 15%
Dew proof heater			240 V, 26W

Heat Exch. Coil		
Coil		Aluminium plate fin / Copper tube
Rows		2
Fin pitch	mm	1,5
face area	m2	0,556

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1-3 Other Component Specifications

Trasformer			**ATR-II215TA**
	Rating	Primary	VAC 230V, 50Hz
		Secondary	10,6V - 0.93A
		Capacity	7 VA
	Coil resistance	Ω	(WHT-WHT): 96,5 (BRN-BRN): 0,8 (at 20°C)
	Thermal cut-off temp.		150°C

Thermistor (Coil sensor)		**PBC-41E-S14**
	Resistance KΩ	-10 °C 23,7 ± 5% -5 °C 18,8 ± 5% 0 °C 15,0 ± 5% 5 °C 12,1 ± 5% 10 °C 9,7 ± 5% 15 °C 8,0 ± 5%

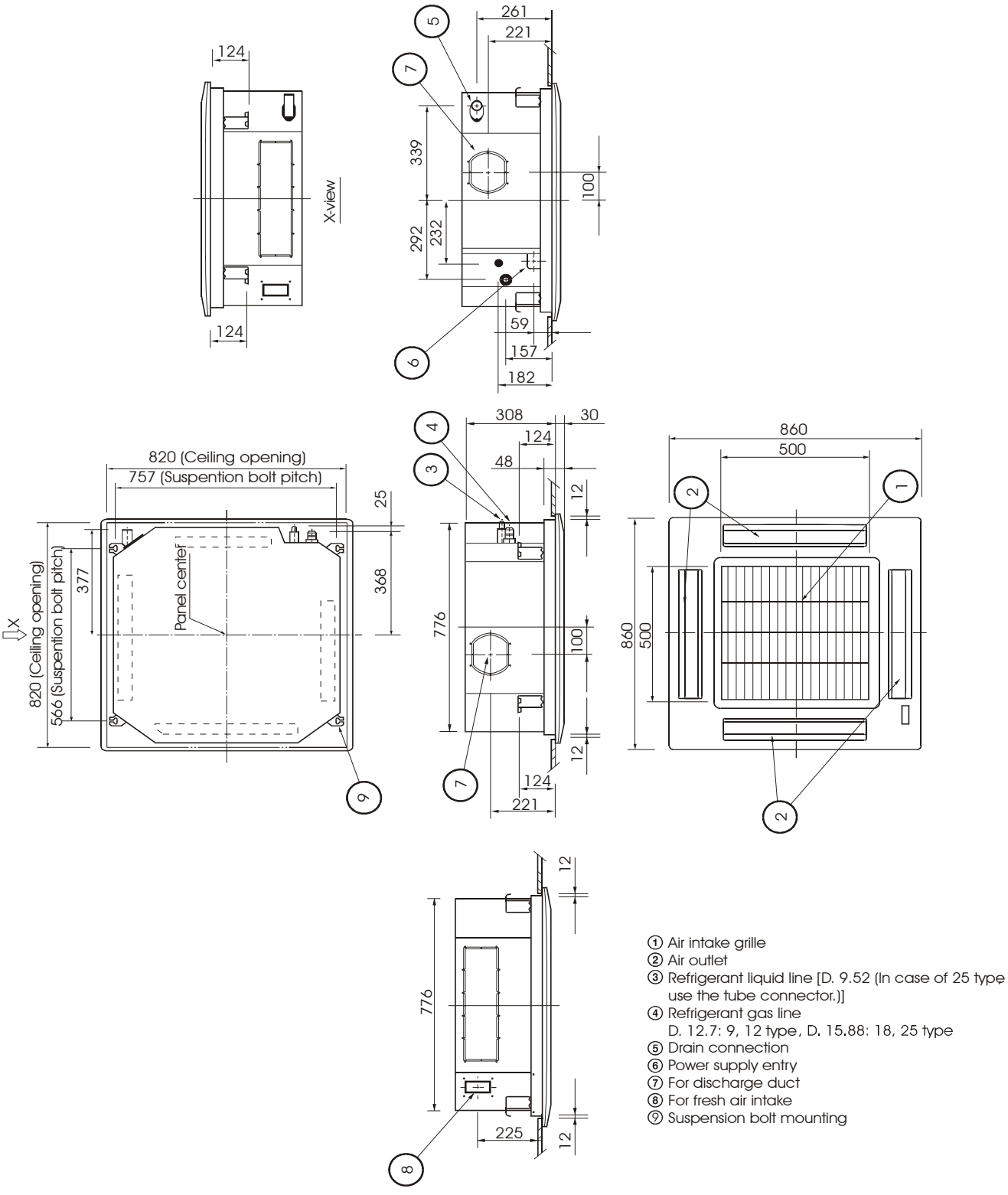
Thermistor (Room sensor TH1)		**KTEC-35-S6**
	Resistance KΩ	0 °C 16,5 ± 5% 5 °C 12,8 ± 5% 10 °C 10,0 ± 5% 20 °C 6,3 ± 5% 30 °C 4,0 ± 5% 40 °C 2,7 ± 5% 45 °C 2,2 ± 5% 50 °C 1,8 ± 5% 55 °C 1,5 ± 5%

Drain pump			
	Model		PJV-1434A
	Rating	Voltage	230V
		Input	12W
	Total head / capacity		500 mm / 400 cc/min.

Safety float switch		
	Model	FS-0218-102
	Contact rating	DC 5V - 50W

2. DIMENSIONAL DATA

ASR525CL



① Air intake grille
② Air outlet
③ Refrigerant liquid line [D. 9.52 (In case of 25 type use the tube connector.)]
④ Refrigerant gas line
D. 12.7: 9, 12 type, D. 15.88: 18, 25 type
⑤ Drain connection
⑥ Power supply entry
⑦ For discharge duct
⑧ For fresh air intake
⑨ Suspension bolt mounting

Units: mm

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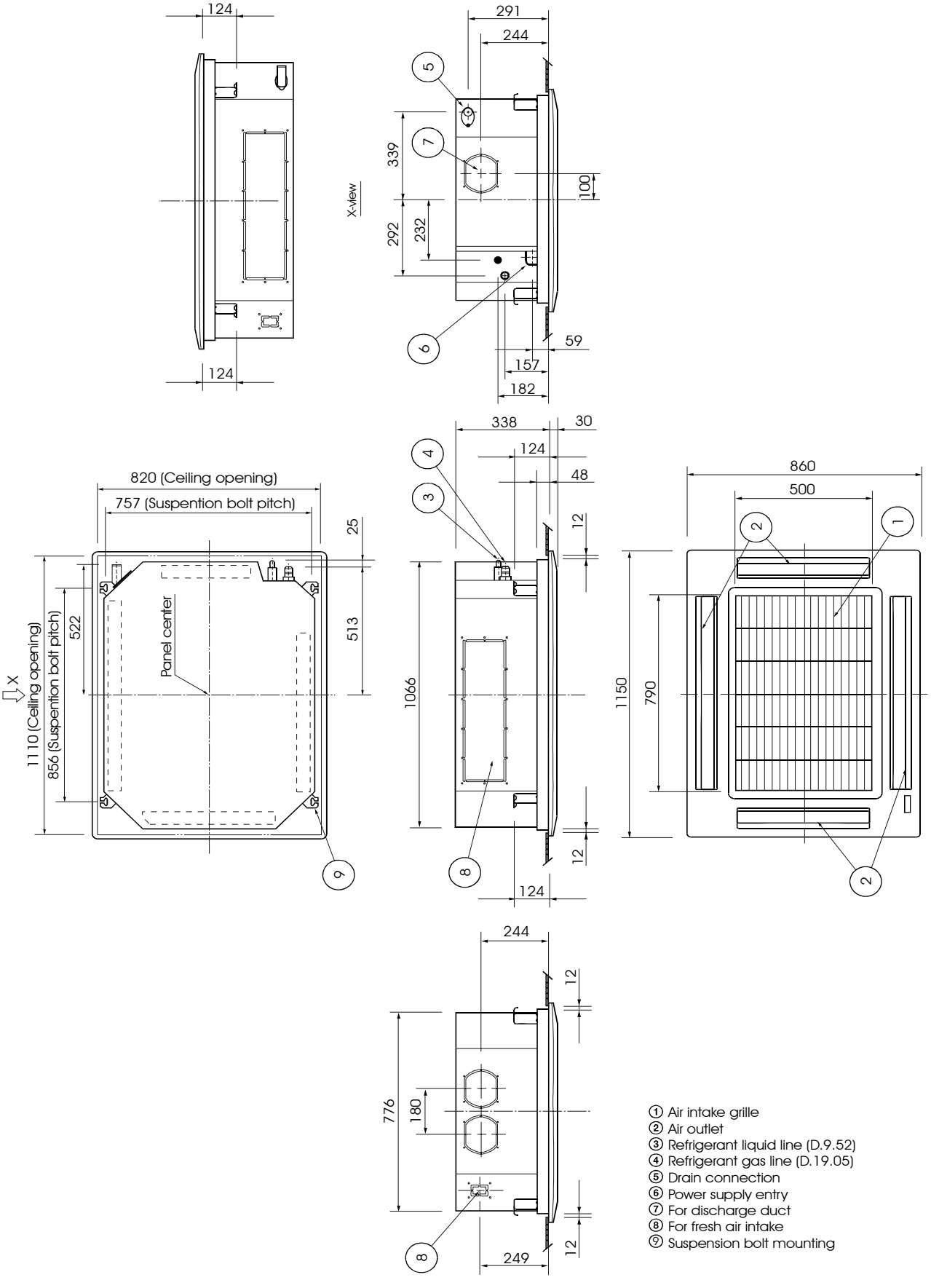
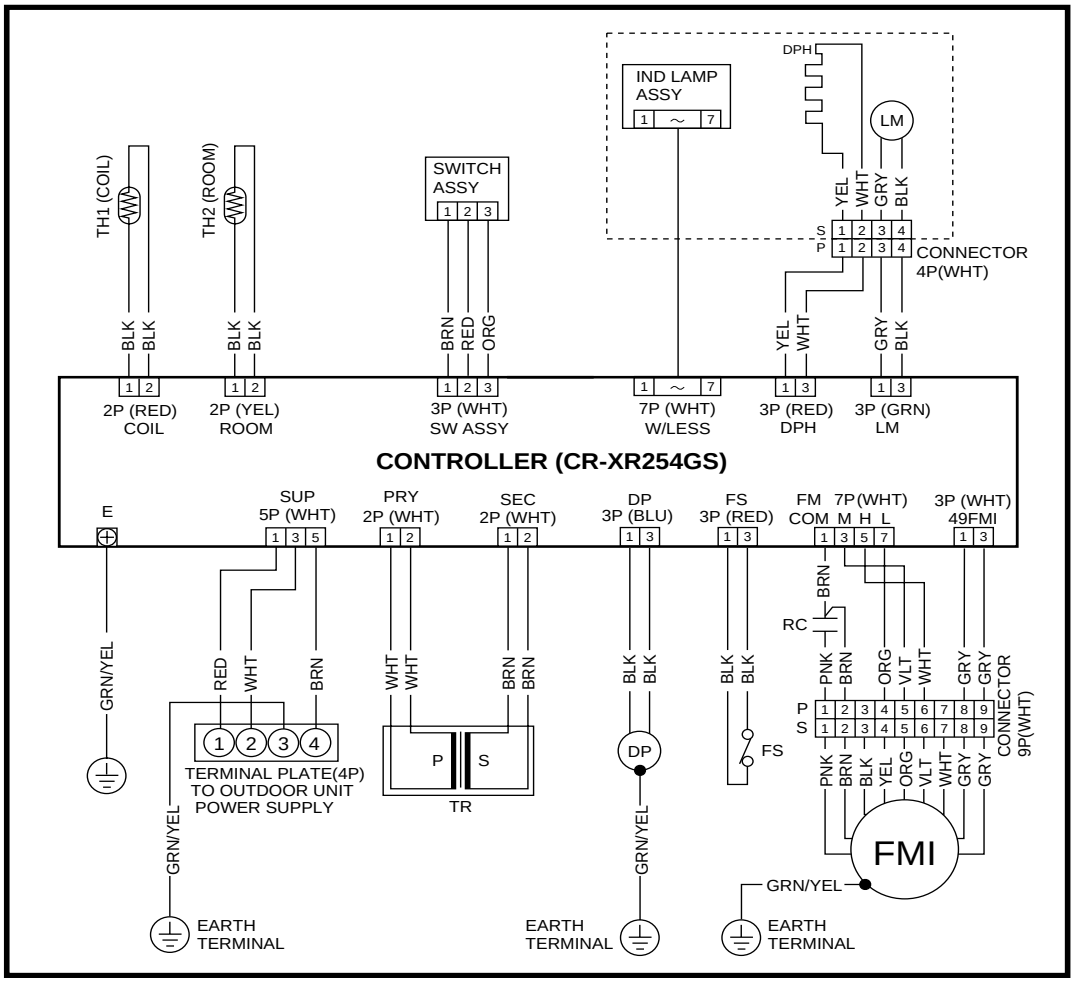


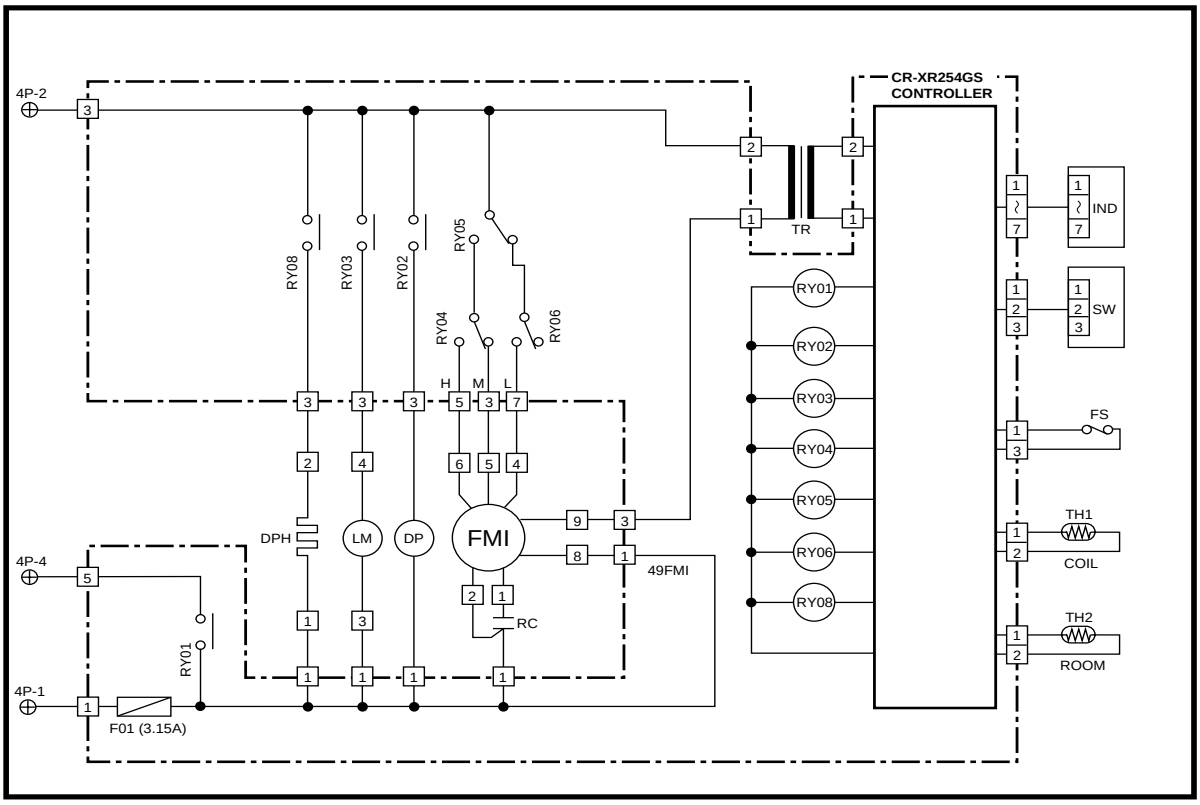
① Air intake grille
② Air outlet
③ Refrigerant liquid line (D.9.52)
④ Refrigerant gas line (D.19.05)
⑤ Drain connection
⑥ Power supply entry
⑦ For discharge duct
⑧ For fresh air intake
⑨ Suspension bolt mounting

3. ELECTRICAL DATA

3-1 Electric Wiring Diagram



3-2 Schematic Diagram



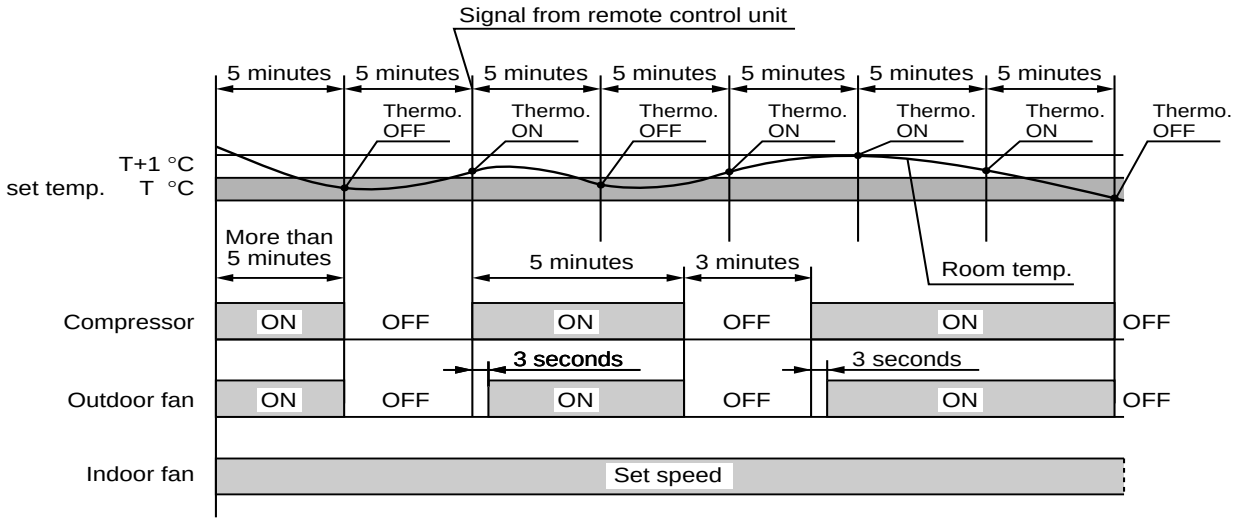
SYMBOLS	DESCRIPTION
FMI	INDOOR FAN MOTOR
49FMI	INDOOR MOTOR THERMAL PROTECTOR
RC	RUNNING CAPACITOR
F01	FUSE
DP	DRAIN PUMP
DPH	DEW PROOF HEATER
LM	AUTO LOUVER MOTOR
TR	POWER TRANSFORMER
RY01-RY06, RY08	AUXILIARY RELAY
FS	FLOAT SWITCH
TH1	THERMISTOR (INDOOR COIL)
TH2	ROOM THERMISTOR
CR-X254GS	INDOOR CONTROLLER
IND	INDICATOR LAMP ASSY
SW	SWITCH ASSY
⊕	TERMINAL PLATE
□	CONNECTOR
⊡	TERMINAL

4. FUNCTIONS

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 5 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 not before than 5 minutes of compressor operation.

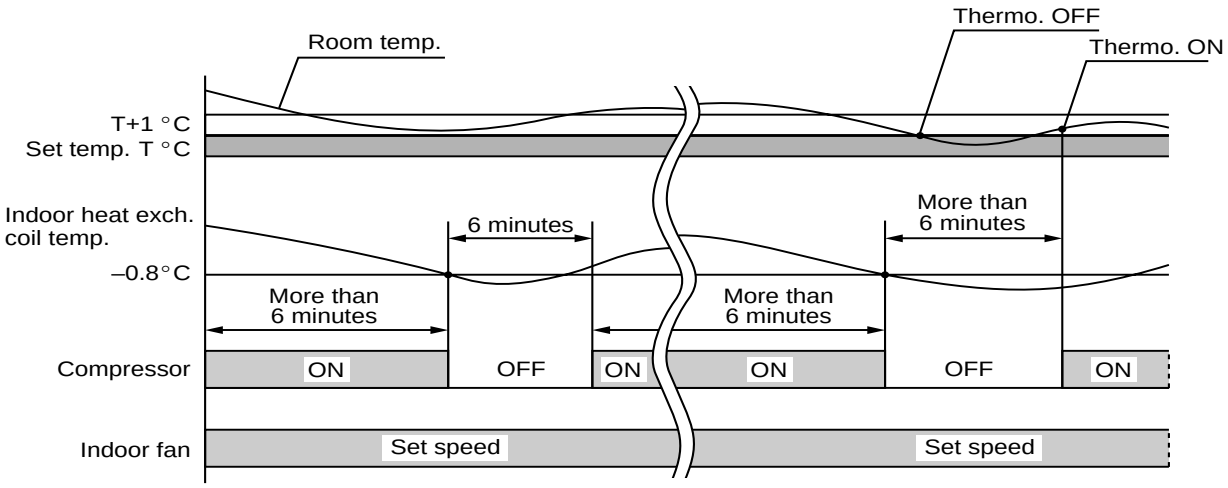
Thermo. ON : When the room temperature is above T + 1°C (T°C is set temperature).
Compressor → ON

Thermo. OFF : When the room temperature is equal to or below set temperature T°C.
Compressor → OFF

4-2 Freeze Prevention

This function prevents freezing of the indoor heat exchange coil.

When the compressor has been running for 6 minutes or more and the temperature of the indoor heat exchange coil falls below –0.8°C, the control circuit stops the compressor for at least 3 minutes. The compressor does not start again until the temperature rises above 8°C or 6 minutes has elapsed.



5. TROUBLESHOOTING

(1) Check before and after troubleshooting

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

1. Check power supply wiring

(a) Single-phase

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

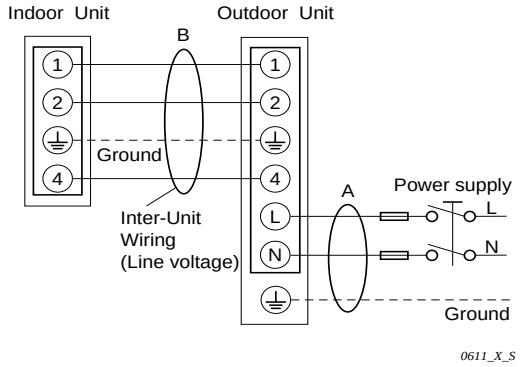
(b) 3-phase

Check that the power supply wires are correctly connected to terminal No.1 through No. 4 on the 4P terminal plate on the indoor unit and L1 through L3 and N on the 8P terminal on the outdoor unit.

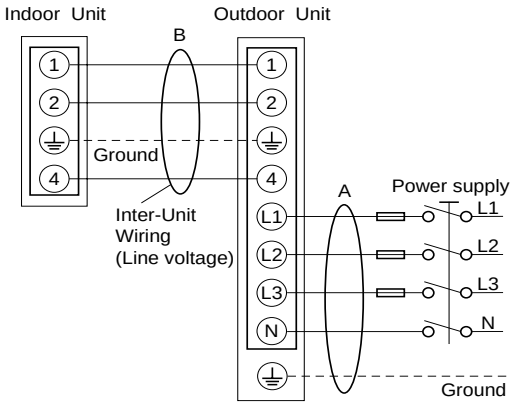
2. Check the inter-unit wiring

Check that the inter-unit control wires (AC 220 - 240 V Line voltage) are correctly connected between the indoor unit and outdoor unit.

Single-phase outdoor unit



3-phase outdoor unit



3. Check the power supply

Check that the voltage is within the specified range (±10% of the rating).

Check that power is supplied.

WARNING

If the following troubleshooting must be done with the power being supplied, take care not to touch any uninsulated live parts that will given an ELECTRIC SHOCK.

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

Check that the sheaths of the lead wires are not damaged.

Check that the lead wires are firmly connected to the terminal plate.

Check that the wiring has been performed correctly.

5. Reference

• Condition of general cooling operation (Thermo. ON)

SWEEP.....ON

Indoor fan speed....HIGH

(2) Air conditioner does not operate

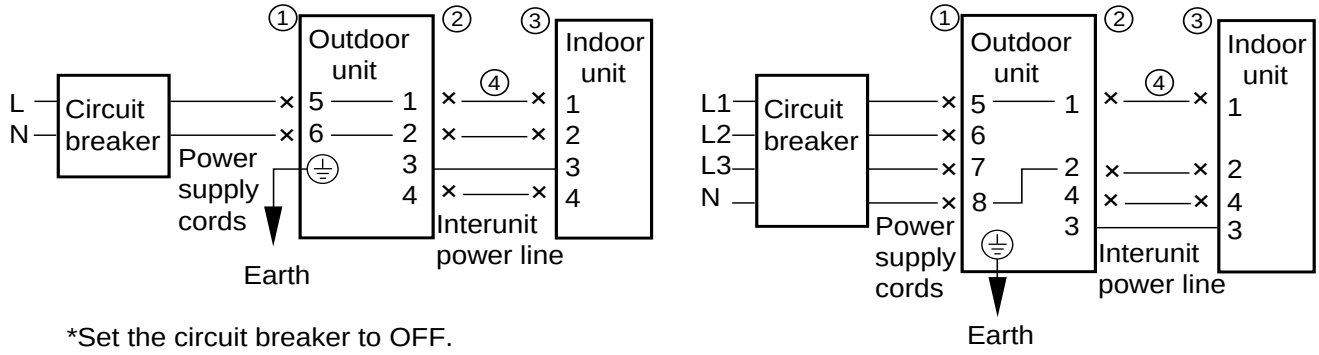
1. Circuit breaker trips (or fuse blows).

(a) When the circuit breaker is set to ON, it trips immedialely.

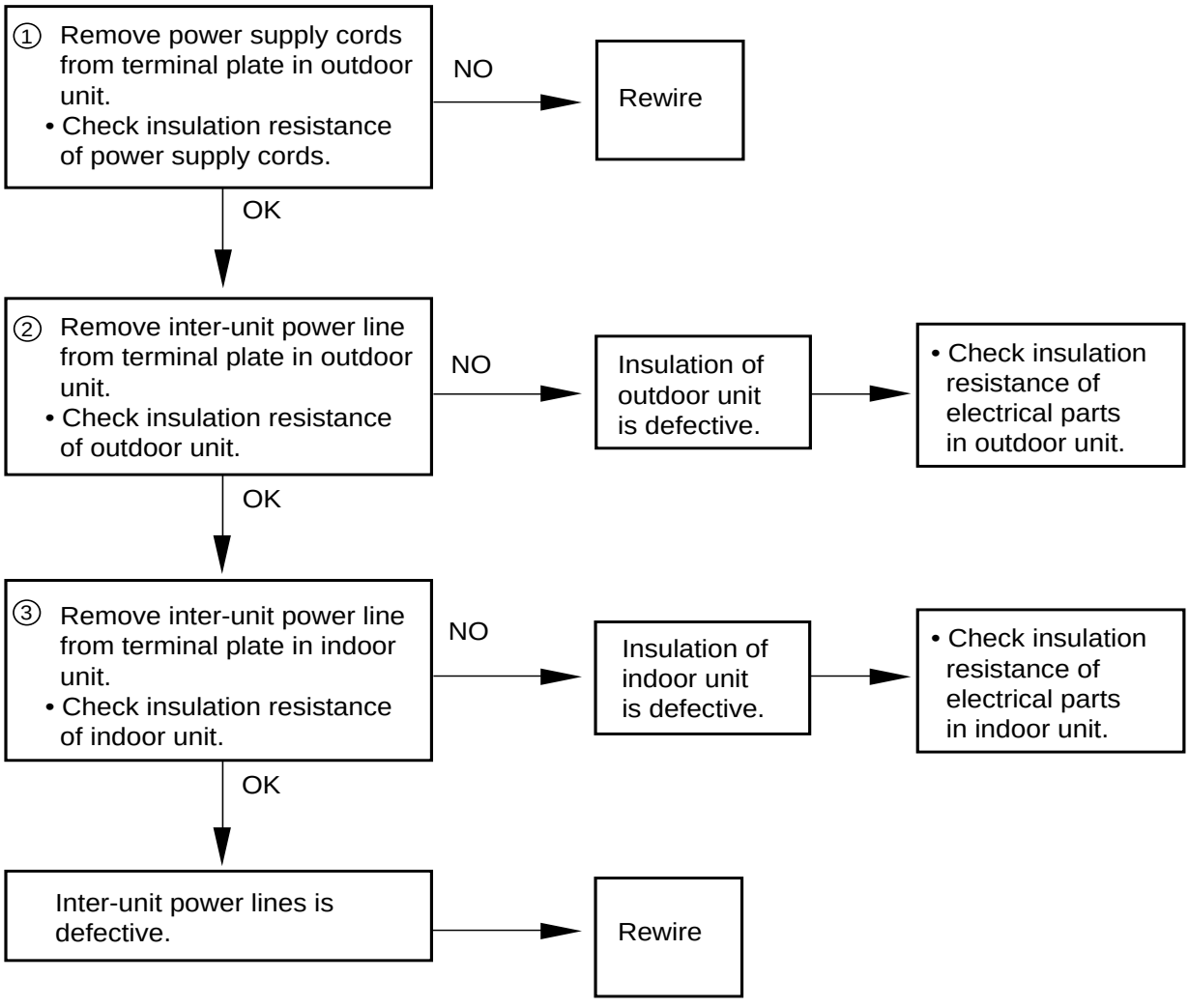
- There is a possibility of ground fault.
- Check insulation resistance.

If the resistance value is 1M½ or less, insulation is defective.

(Example)

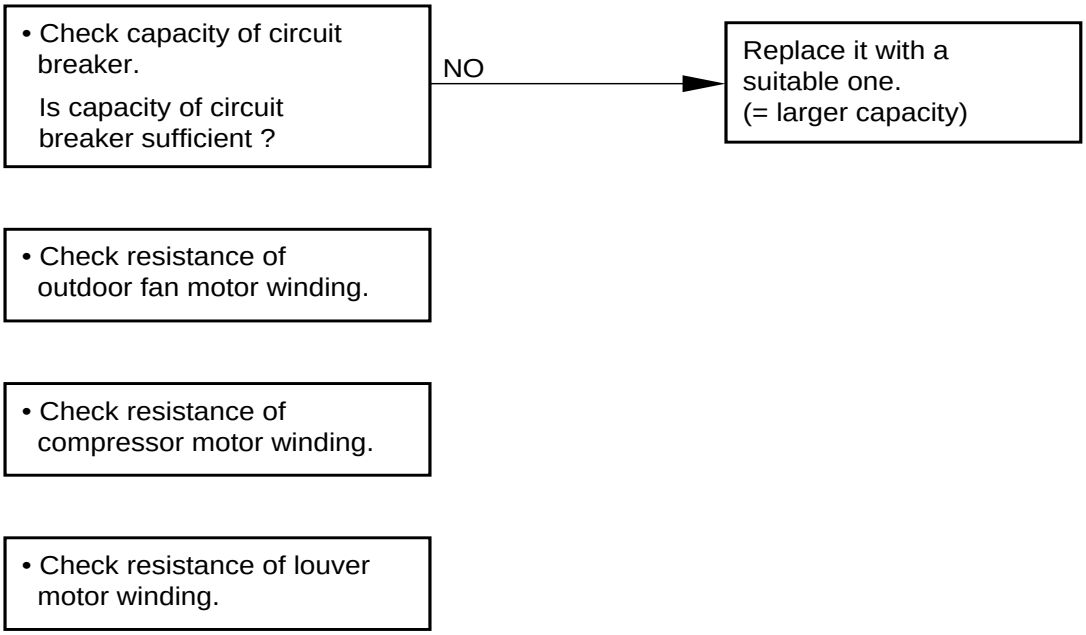


*Set the circuit breaker to OFF.



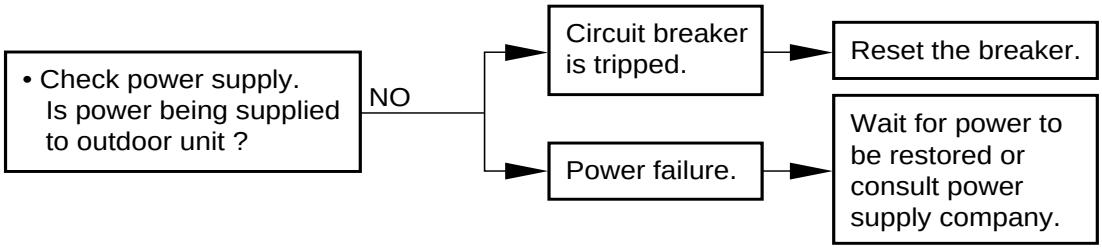
(b) Circuit breaker trips in several minutes after turning the air conditioner on.

- There is a possibility of short circuit.

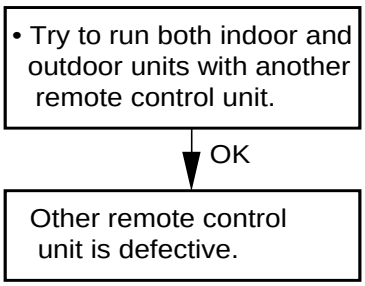


② **Neither indoor unit nor outdoor unit runs.**

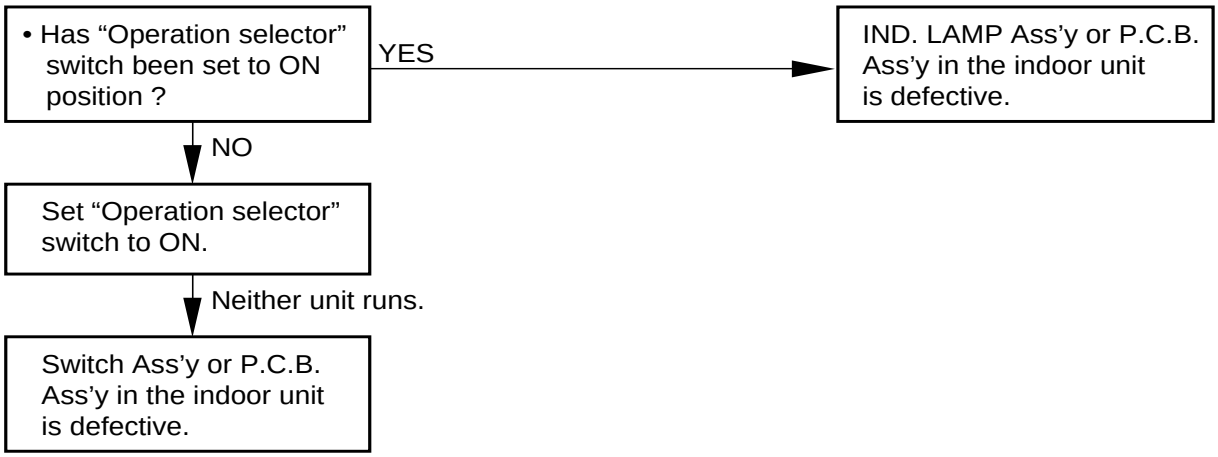
A. No power is supplied



B. Check remote control unit.

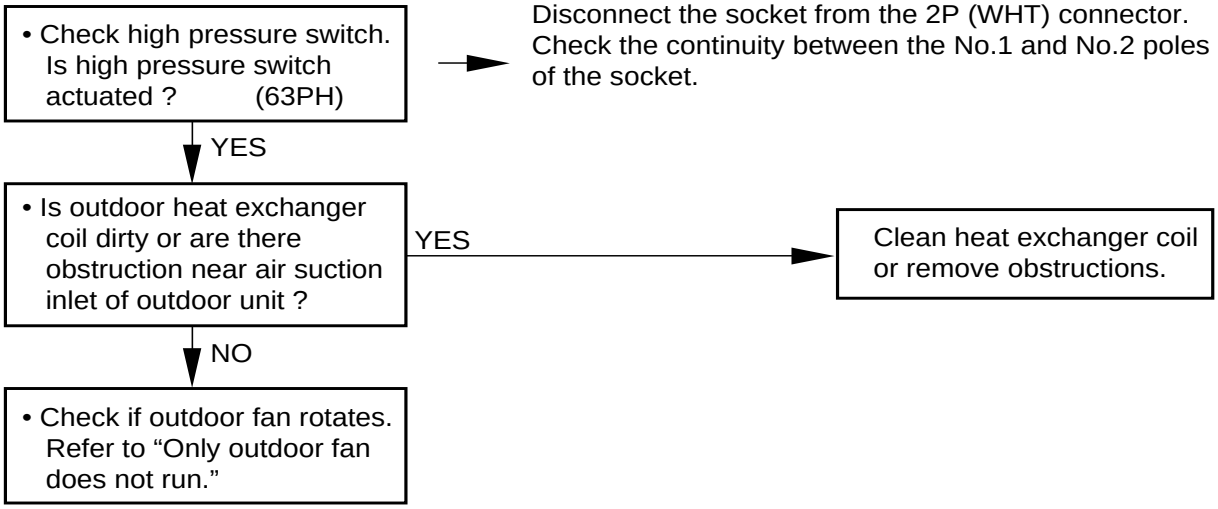


C. Check “Operation selector” switch in the indoor unit.

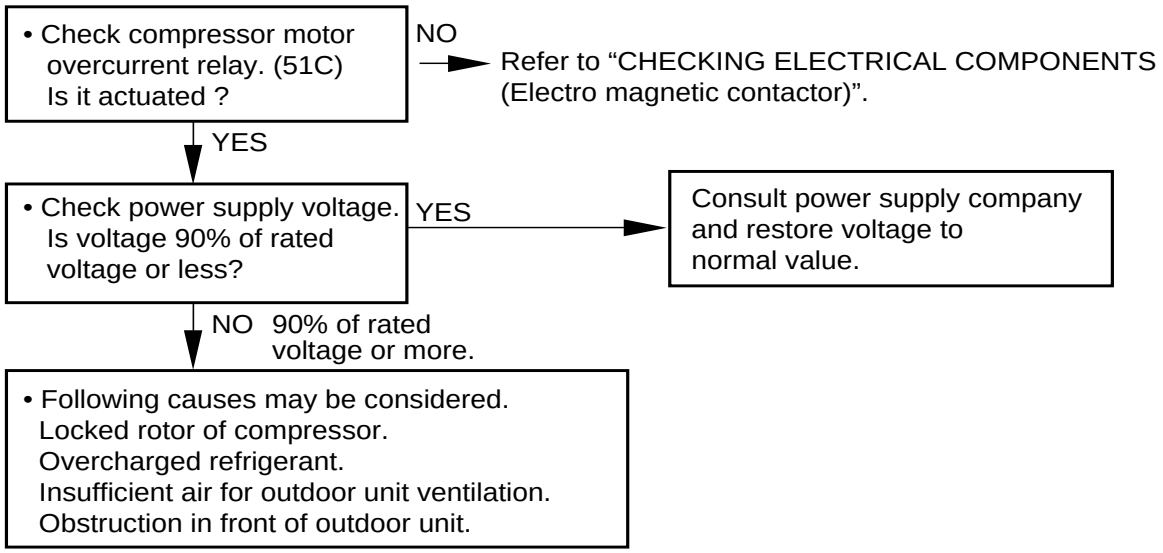


D. Check compressor motor protectors.

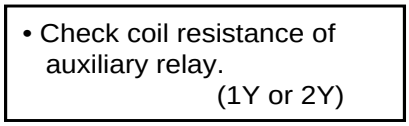
a) High pressure switch (63PH)



b) Compressor motor overcurrent relay

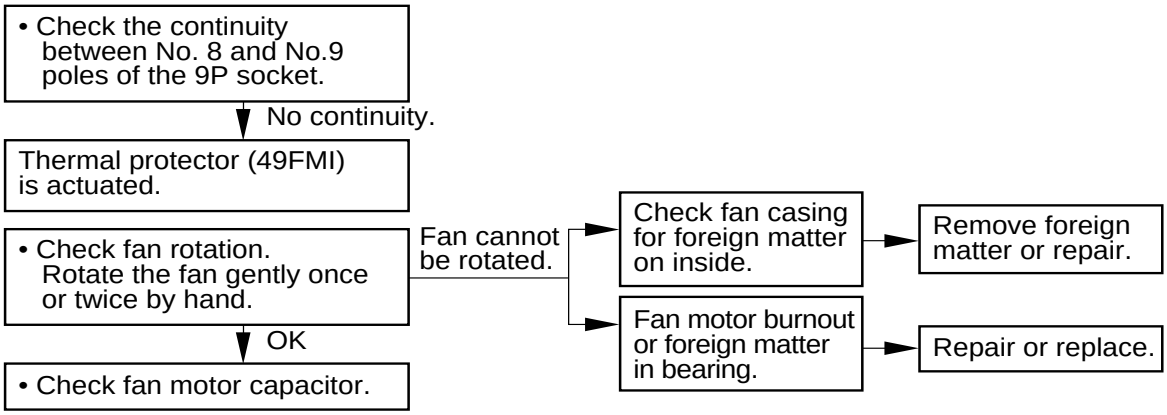


E. Check the auxiliary relay. (1Y or 2Y)

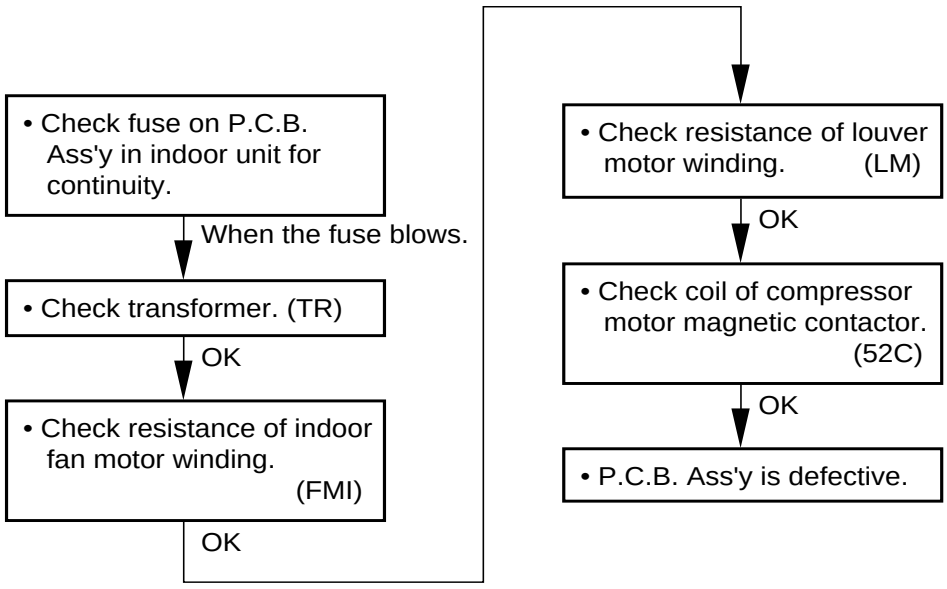


F. Check the indoor fan motor thermal protector (49FMI)

- Disconnect the socket from the 9P (WHT) connector.

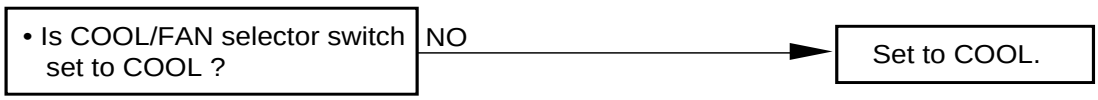


G. Check the fuse on the P.C.B. Ass'y in the indoor unit.

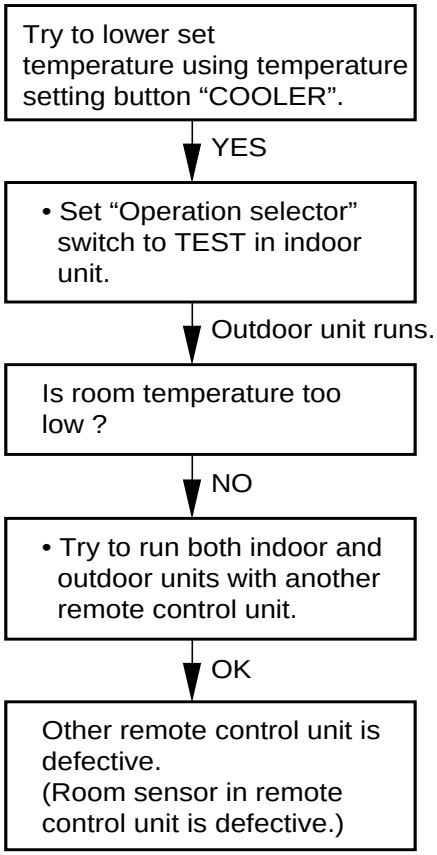


(3) Outdoor unit does not run.

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

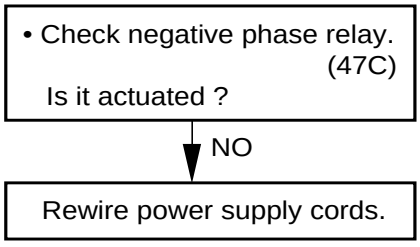


B. Check the set temperature.

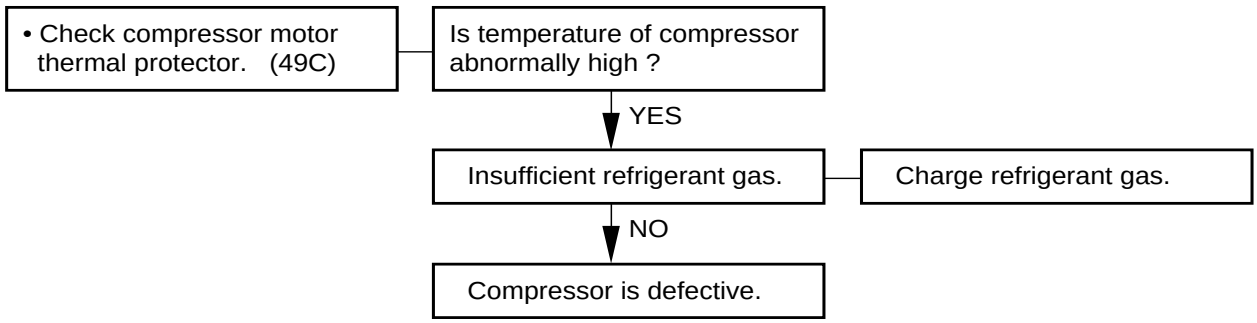


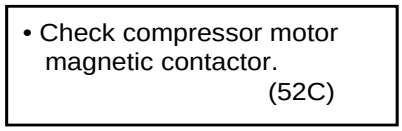
C. Outdoor unit is abnormal.

a) Check the power supply wiring



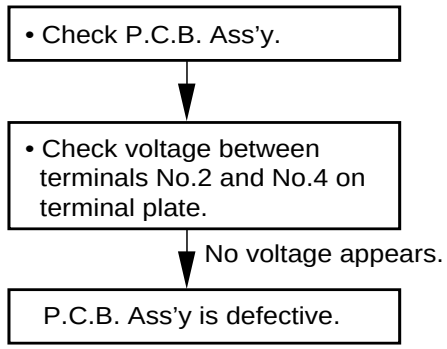
b) Check the compressor motor thermal protector (49C)





(Only the outdoor fan does not run.)

D. Check the indoor unit P.C.B.



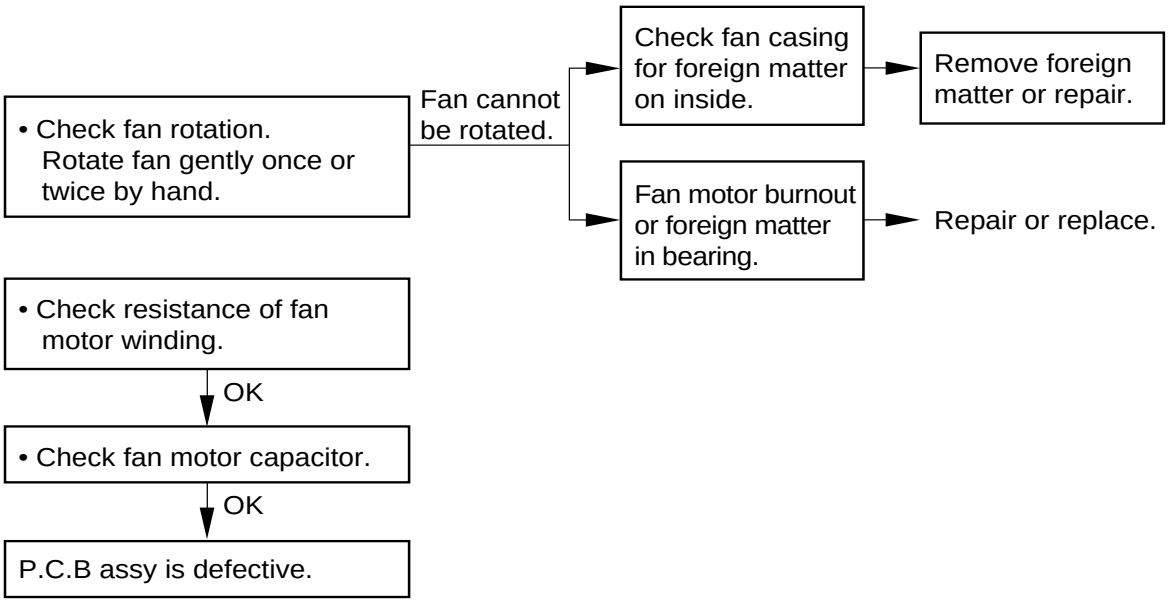
(4) Indoor unit does not run.

The indoor fan and louver motor do not run.

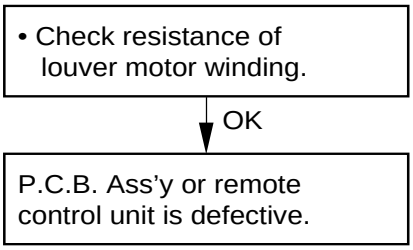
P.C.B. Ass'y is defective.

(5) Some parts fail to operate.

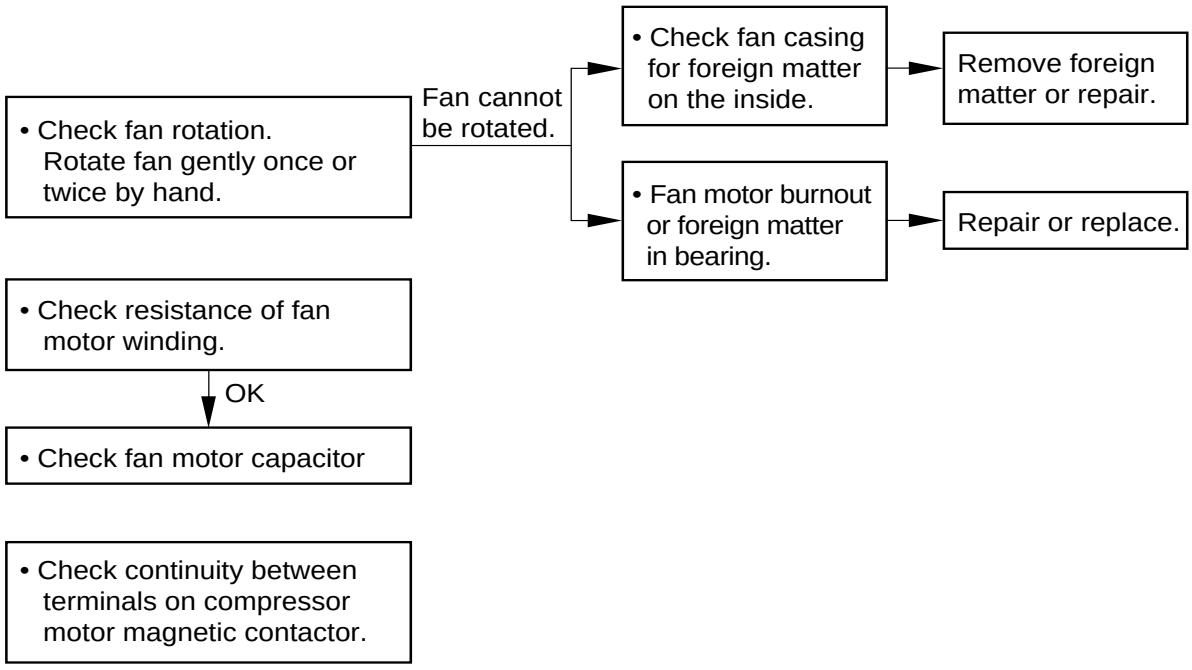
(1) Only indoor fan does not run.



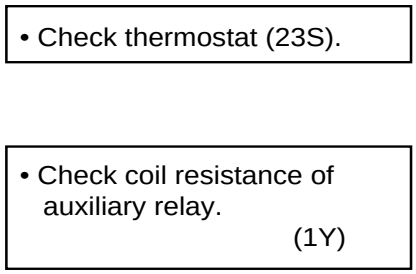
(2) Only louver motor does not run.



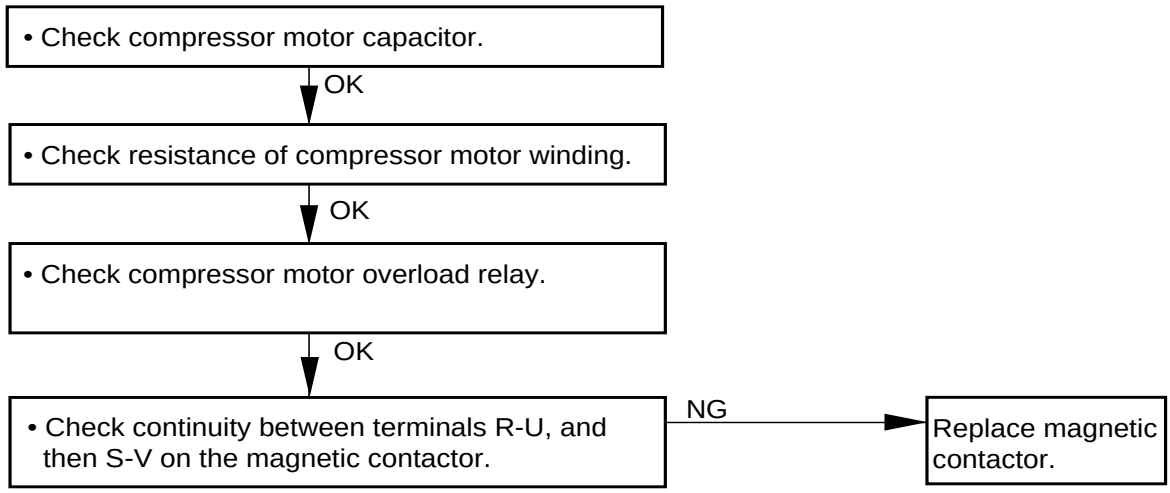
(6) Outdoor fan does not run.



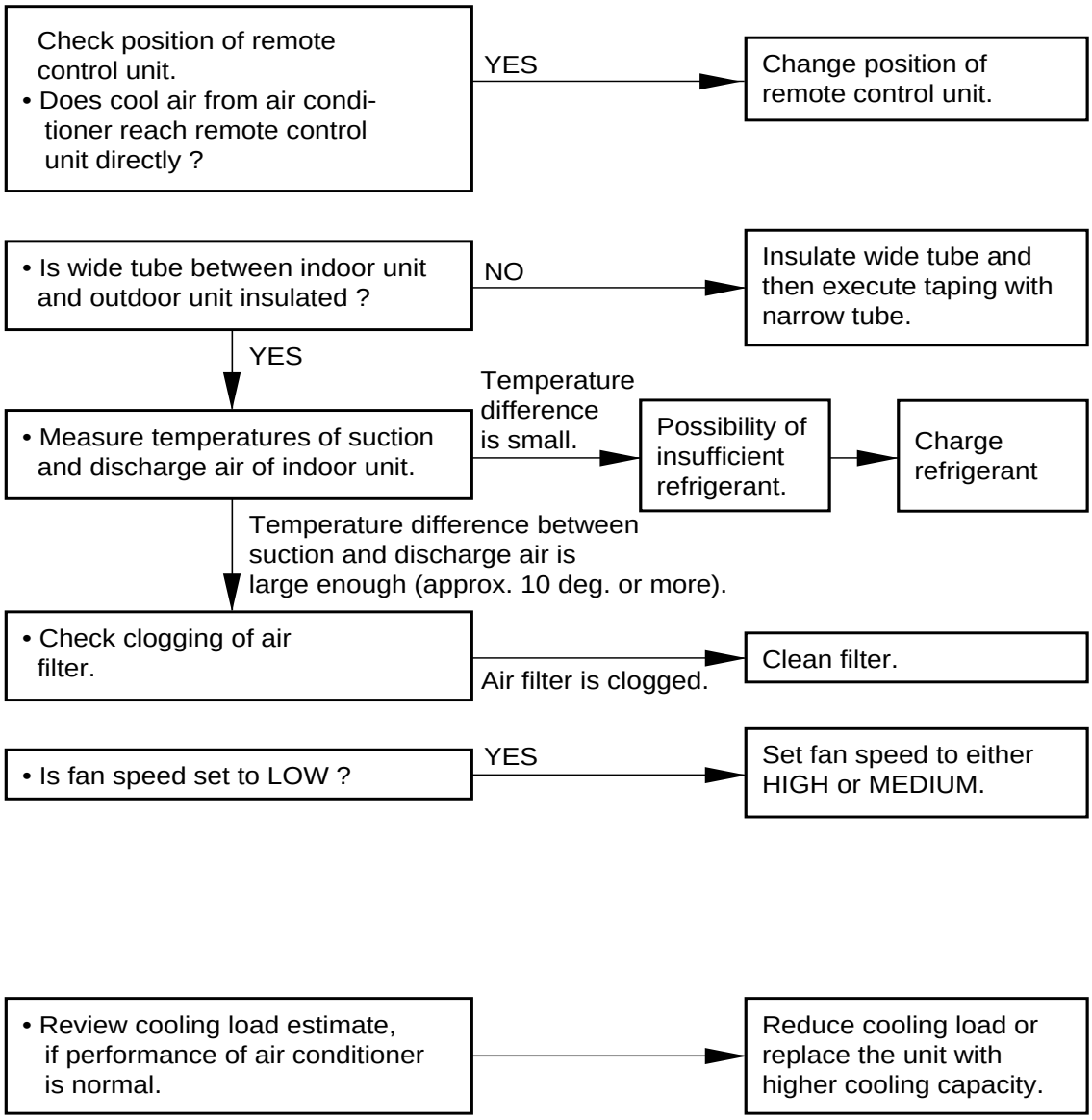
(7) Outdoor fan speed is not switched from High to Low even when the outdoor temperature falls below 25.5°C.



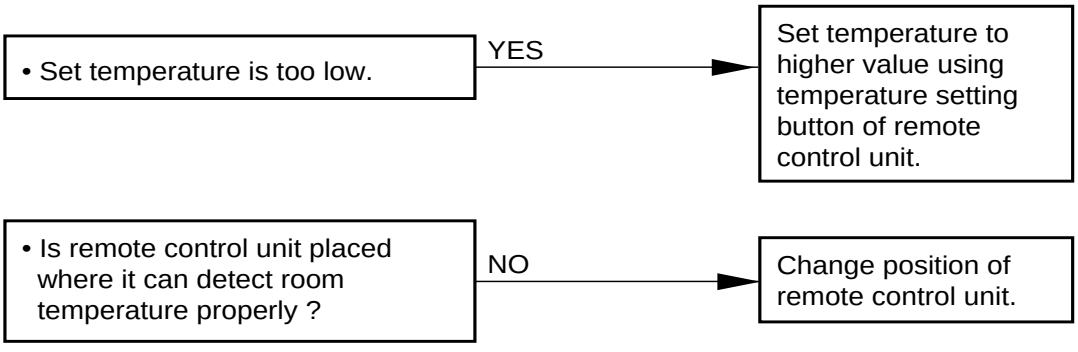
(8) Compressor does not run.



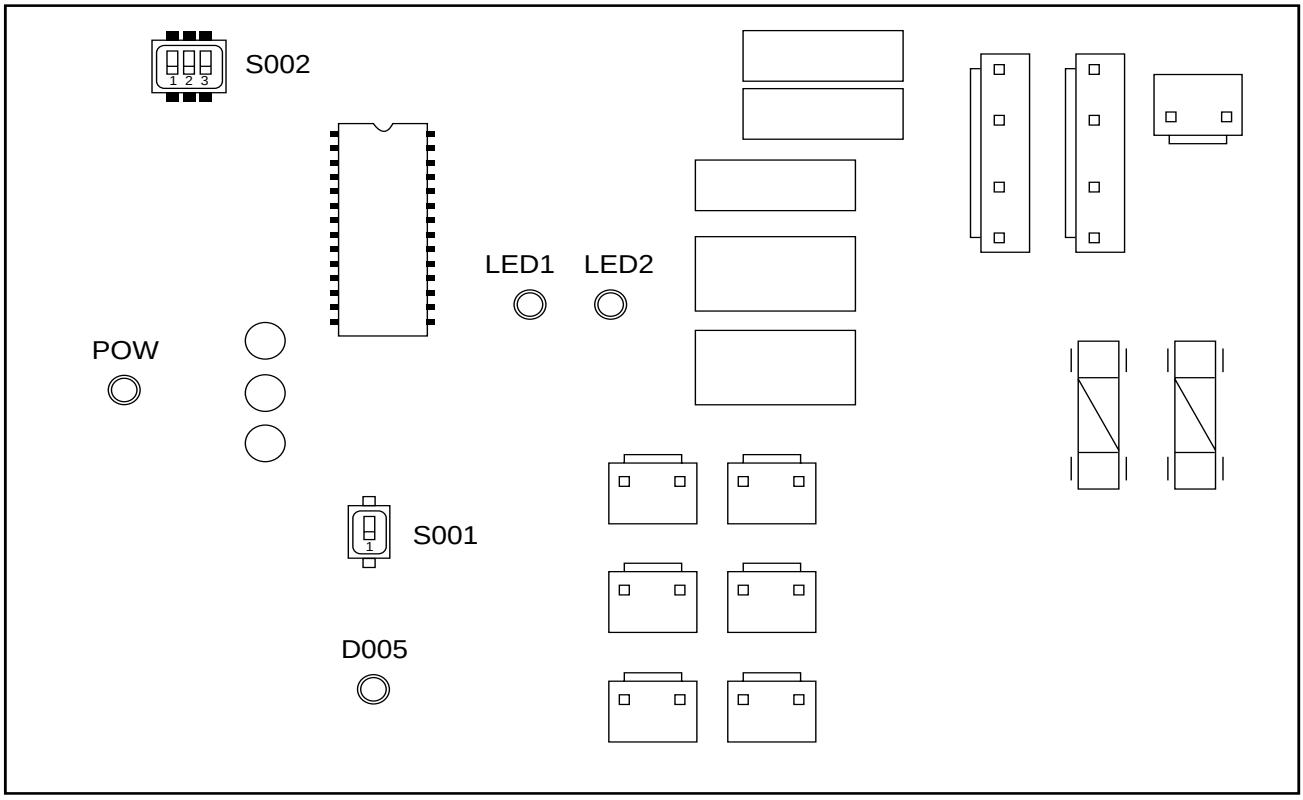
(9) Poor cooling



(10) Excessive cooling.



(11) PCB for "SCL" models



S002 (Capacity Code)

	1	2	3
25 type	OFF	OFF	OFF
36 type	ON	OFF	OFF
48 type	ON	ON	OFF

Meaning of LED indication

POW	LED1	LED2	D005	Cause of trouble
Light	Off	Off	Light	Normal state
Light	Flash	Light	Light	High pressure switch is activated, Outdoor fan thermal protector activated, Outdoor coil thermistor is open or short
Light	Off	Light	Light	Low pressure switch is activated
Light	Off	Light	Off	Negative phase, Defective phase

(12) Defective Sensor.

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

(a) Open (=No continuity in sensor)
Compressor and outdoor fan repeatedly go 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.

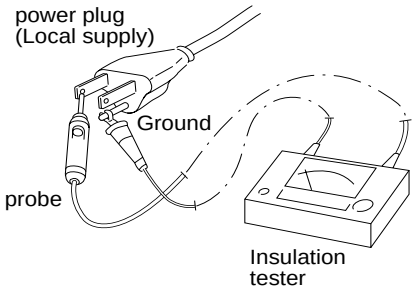
(a) Open (=No continuity in sensor)
Neither the outdoor fan nor compressor runs.

(b) Short
The outdoor fan and compressor do not stop. — Excessive cooling.

6. CHECKING ELECTRICAL COMPONENTS

6-1 Measurement of Insulation Resistance

The insulation is in good condition if the resistance exceeds 1MΩ



NOTE

The shape of the power plug may differ from that of the air conditioner which you are servicing.

Fig. 1

6-1-1. Power supply wires

Clamp the grounding terminal of the power plug with a lead clip of the insulation resistance tester and measure the resistance by placing a probe on both the two power terminals. (fig.1)

Then, also measure the resistance between the grounding and other power terminals. (fig.1)

6-1-2. Indoor 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 each terminal screw where power supply lines are connected on the terminal plate. (fig.2)

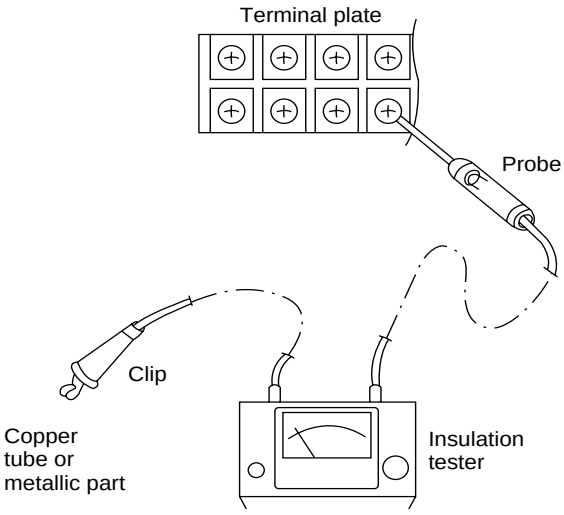


Fig. 2

6-1-3. Outdoor Unit

Clamp an aluminium plate fin or copper tube with the lead clip of the insulation resistance tester and measure the resistance by placing a probe on each terminal screw on the terminal plate. (fig.2)
Note that the ground line terminal should be skipped for the check.

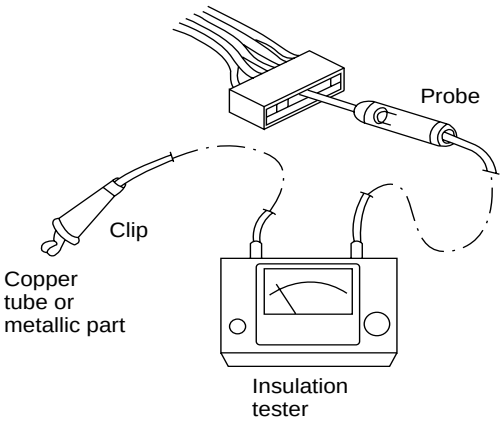


Fig. 3

6-1-4. Measurement of Insulation Resistance for Electrical Parts

Disconnect the lead wires of the desired electric part from terminal plate, capacitor, etc.
Similary disconnect the connector.
Then measure the insulation resistance. (fig.3 and 4)

NOTE: Refer to electric wiring diagram

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

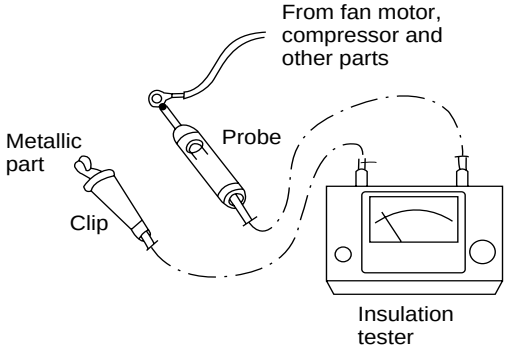


Fig. 4

6-2 Checking Continuity of Fuse on PCB Ass'y

Remove the PCB Ass'y from the electrical component box. Then pull out the fuse from the PCB Ass'y. (fig.5)

Check for continuity using a multimeter as shown in fig.6

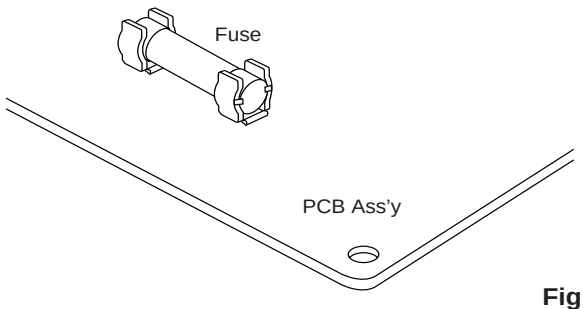


Fig. 5

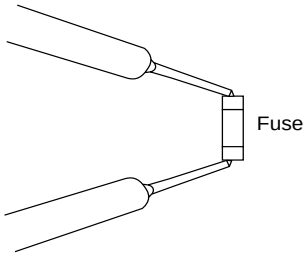


Fig. 6

6-3 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.

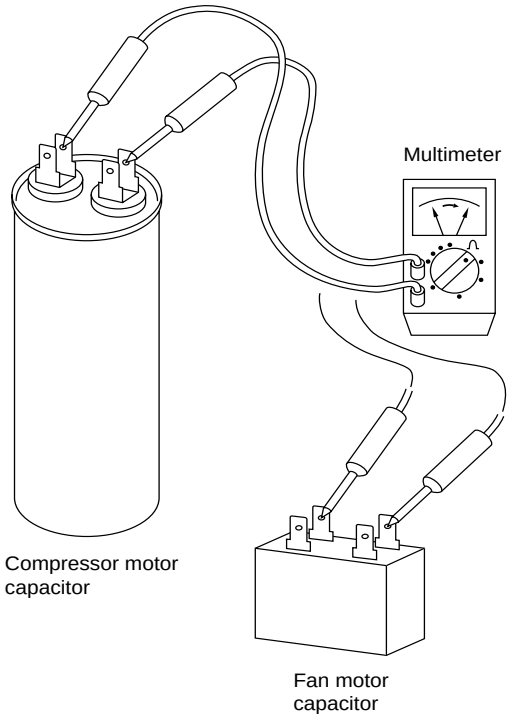
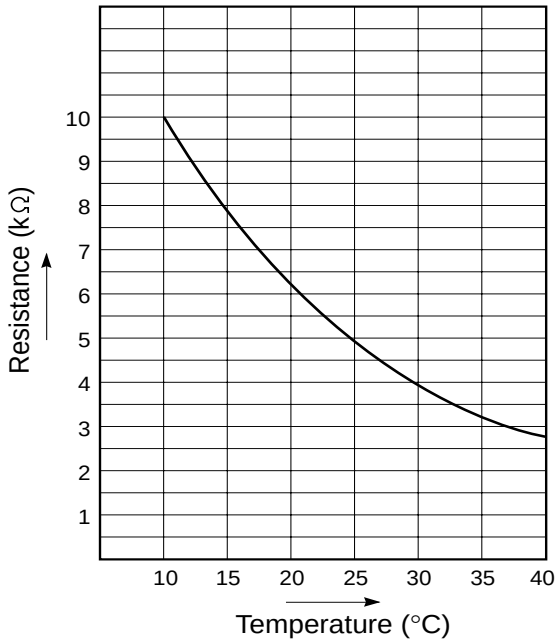


Fig. 7

6-4 Thermistor Characteristic Curve

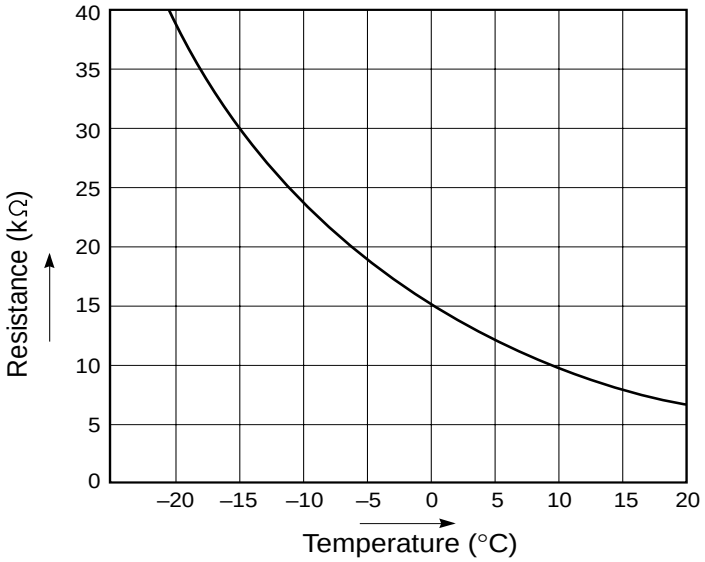
① Room temp. sensor

(KTEC-35)



① Coil sensor

(PBC-41E)



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