# TECHNICAL DATA
# & SERVICE MANUAL

Euro-Line®

**INDOOR UNIT: ADR609CL**
**ADR612CL**

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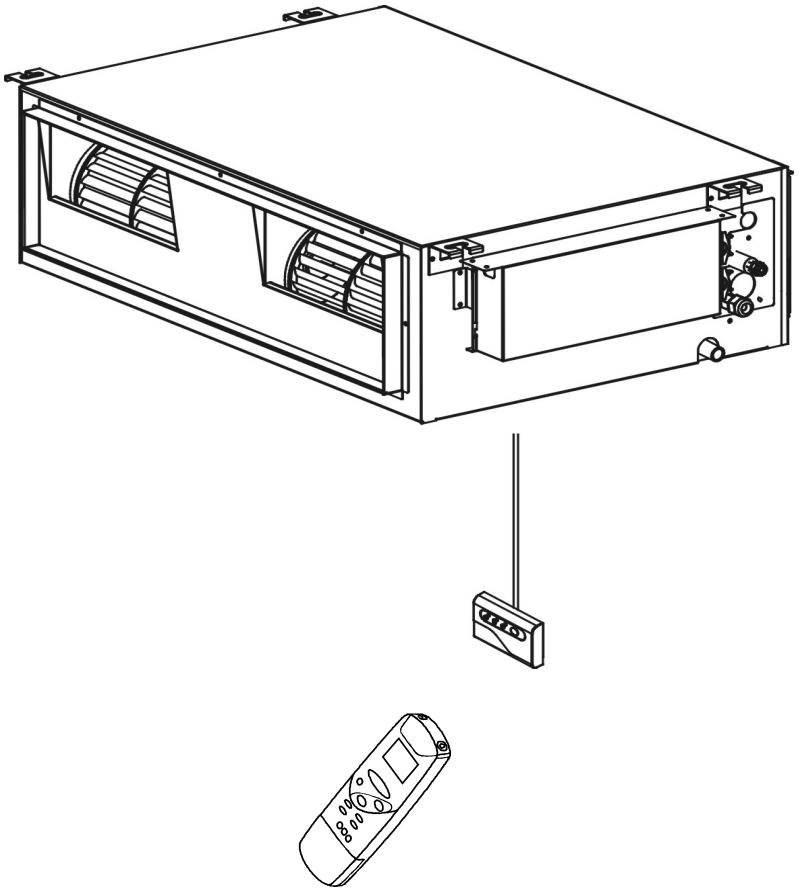
# SPLIT SYSTEM AIR CONDITIONER

| Model No. | Product Code No. |
|---|---|
| ADR609CL | 387006980 |
| ADR612CL | 387006981 |



0.8180.306.1 12/2003

## 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

### ADR609CL

| | |
|---|---|
| **Power source** | 220 - 240V ~ 50Hz |

| | |
|---|---|
| **Voltage rating** | 230V |

| | | | |
|---|---|---|---|
| **Performance** | | | Cooling |
| Capacity | | | See catalogue with the requested matching |
| Air circulation (High/Med./Low) | | $m^3/h$ | 600/510/440 |
| External static pressure (High) | | Pa (mm W.G.) | 49(5) at shipment - 69 (7) with booster cable |

| | | | |
|---|---|---|---|
| **Features** | | | |
| Controls/Temperature controls | | | Microprocessor/ I.C. thermostat |
| Control unit | | | Wireless remote control unit |
| Timer | | | ON/OFF 24 hours & Daily program, 1-hour OFF |
| Fan speed | | | 3 and Auto /1(Hi) |
| | | | |
| Air Filter | | | Washable |
| Operation sound (*) | High/Med./Low | dB-A | 54/52/49 |
| Refrigerant tubing connections | | | Flare type |
| Refrigerant | Narrow tube | mm(in.) | 6,35 (1/4) |
| tube diameter | Wide tube | mm(in.) | 9,52 (3/8) |
| Refrigerant | | | R407C |

| | | | | |
|---|---|---|---|---|
| **Dimensions & Weight** | | | | |
| Dimensions | Unit | Height | mm | 266 |
| | | Width | mm | 571 |
| | | Depth | mm | 852 |
| Package dimensions | Unit | Height | mm | 365 |
| | | Width | mm | 745 |
| | | Depth | mm | 1086 |
| | | Volume | m3 | 0,3 |
| Weight | Unit | Net | kg | 30 |
| | | Shipping | kg | 34 |

DATA SUBJECT TO CHANGE WITHOUT NOTICE

(*) Power level measured at operating conditions (HIGH speed / 5mmH20 external static pressure) and inside discharge air duct

## ADR612CL

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| **Power source** | 220 - 240V ~ 50Hz |

| | |
|---|---|
| **Voltage rating** | 230V |

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| **Performance** | | | Cooling |
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| Fan speed | | | 3 and Auto /1(Hi) |
| | | | |
| Air Filter | | | Washable |
| Operation sound (*) | High/Med./Low | dB-A | 54/52/49 |
| Refrigerant tubing connections | | | Flare type |
| Refrigerant | Narrow tube | mm(in.) | 6,35 (1/4) |
| tube diameter | Wide tube | mm(in.) | 12,7 (1/2) |
| Refrigerant | | | R407C |

| | | | | |
|---|---|---|---|---|
| **Dimensions & Weight** | | | | |
| Dimensions | Unit | Height | mm | 266 |
| | | Width | mm | 571 |
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| | | Volume | m3 | 0,3 |
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| | | Shipping | kg | 34 |

DATA SUBJECT TO CHANGE WITHOUT NOTICE

(*) Power level measured at operating conditions (HIGH speed / 5mmH20 external static pressure) and inside discharge air duct

## 1-2 Major Component Specifications

### ADR609CL

| **Controller PCB** | | | |
|---|---|---|---|
| | Part No. | | XR99/129E |
| | Controls | | Microprocessor |
| | Control circuit fuse | | 250 V - 3,15 A |

| **Remote Control Unit** | | | |
|---|---|---|---|
| | | | RCS-6PN4E-G |

| **Fan & Fan Motor** | | | | |
|---|---|---|---|---|
| | Type | | | Centrifugal fan |
| | Q'ty ……. Dia. and lenght | | mm | 2…. Ø 160 / L 240 |
| | Fan motor model…Q'ty | | | 3RGB-CO-45-30 5V/1….1 |
| | No. Of poles…rpm (230 V) (*) | | | 4 … 1060/1000/910 |
| | Running Amps (HIGH speed) | | A | 0,45 |
| | Power input (HIGH speed) | | W | 110 |
| | Coil resistance (Ambient temp. 20 °C ) | | Ω | BLU-BRN: 95<br>BRN-BLK: 37<br>BLK-GRY: 15<br>GRY-VLT: 15<br>WLT-RED: 30<br>RED-YEL: 101 |
| | Safety devices | Type | | Internal thermal protector - 7AM 037 A 5 |
| | | Operating temp. Open | °C | 150 ± 5K |
| | Run capacitor | | µF | 1,8 |
| | | | VAC | 450 |

| **Heat Exch. Coil** | | | |
|---|---|---|---|
| | Coil | | Aluminium plate fin / Copper tube |
| | Rows | | 2 |
| | Fin pitch | mm | 1,6 |
| | face area | m2 | 0,126 |

DATA SUBJECT TO CHANGE WITHOUT NOTICE

(*) Fan speeds: H / M / L measured at operating conditions( HIGH speed / 5mmH20 external static pressure)

## ADR612CL

| Controller PCB | | | |
|---|---|---|---|
| | Part No. | | XR99/129E |
| | Controls | | Microprocessor |
| | Control circuit fuse | | 250 V - 3,15 A |

| Remote Control Unit | | | |
|---|---|---|---|
| | | | RCS-6PN4E-G |

| Fan & Fan Motor | | | | |
|---|---|---|---|---|
| | Type | | | Centrifugal fan |
| | Q'ty ……. Dia. and lenght | | mm | 2…. Ø 160 / L 240 |
| | Fan motor model…Q'ty | | | 3RGB-CO-45-30 5V/1….1 |
| | No. Of poles…rpm (230 V) (*) | | | 4 … 1060/1000/910 |
| | Running Amps (HIGH speed) | | A | 0,45 |
| | Power input (HIGH speed) | | W | 110 |
| | Coil resistance (Ambient temp. 20 °C ) | | Ω | BLU-BRN: 95<br>BRN-BLK: 37<br>BLK-GRY: 15<br>GRY-VLT: 15<br>WLT-RED: 30<br>RED-YEL: 101 |
| | Safety devices | Type | | Internal thermal protector - 7AM 037 A 5 |
| | | Operating temp. Open | °C | 150 ± 5K |
| | Run capacitor | | µF | 1,8 |
| | | | VAC | 450 |

| Heat Exch. Coil | | | |
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| | Coil | | Aluminium plate fin / Copper tube |
| | Rows | | 2 |
| | Fin pitch | mm | 1,6 |
| | face area | m2 | 0,126 |

DATA SUBJECT TO CHANGE WITHOUT NOTICE

(*) Fan speeds: H / M / L measured at operating conditions( HIGH speed / 5mmH20 external static pressure)

## 1-3 Other Component Specifications

**ADR609CL**
**ADR612CL**

| **Trasformer** | | **ATR-J105** |
|---|---|---|
| Rating | Primary | AC 230V, 50/60Hz |
| | Secondary | 19V - 0.526A |
| | Capacity | 10 VA |
| Coil resistance | Ω (at 21°C) | Primary (WHT-WHT): 205 ± 10%<br>Secondary (BRN-BRN): 2,0 ± 10% |
| Thermal cut-off temp. | | 150°C |

| **Thermistor ( Coil sensor TH1)** | | **PBC-41E-S14** |
|---|---|---|
| Resistance | KΩ | 0 °C 15,3 ± 5% |

| **Thermistor ( Room sensor TH2)** | | **DTN-TKS134B** |
|---|---|---|
| Resistance | KΩ | 25 °C 5,0 ± 3% |

| **Drain pump** | | |
|---|---|---|
| Model | | PC 309564003 |
| Rating | Voltage | 220/240V - 50Hz |
| | Input | 14W |
| Total head capacity | | 0,4 l/min |

| **Safety float switch** | |
|---|---|
| Model | BI 1300 2725 |
| Contact rating | 230V AC/DC - 0,5A |

## 1-4 Indoor Fan Performance

If external static pressure is too great (due to long extension of ducts, for example), the air flow volume may drop too low at each air outlet. This problem may be solved by increasing the fan speed using the following procedure:

(1) Remove the screw on the electrical component box and remove the cover plate.

(2) Disconnect the fan motor sockets in the box.

(3) Take out the booster cable (sockets at both ends) clamped in the box.

(4) Securely connect the booster cable sockets between the disconnected fan motor sockets in step 2 as shown in the Fig. 1-1.

(5) Place the cable neatly in the box and reinstall the cover plate.

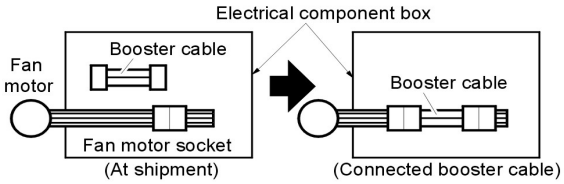
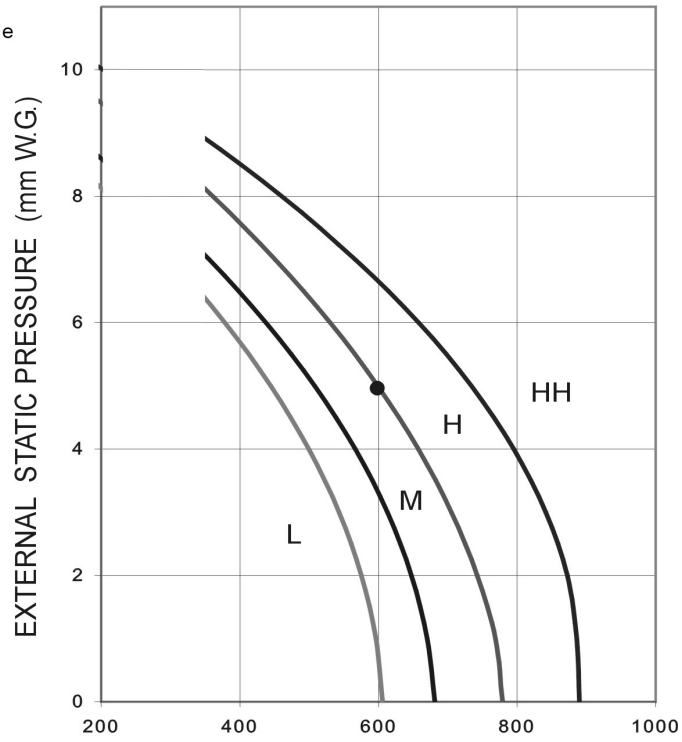



Fig. 1-1




NOTE

HH: Using the booster cable

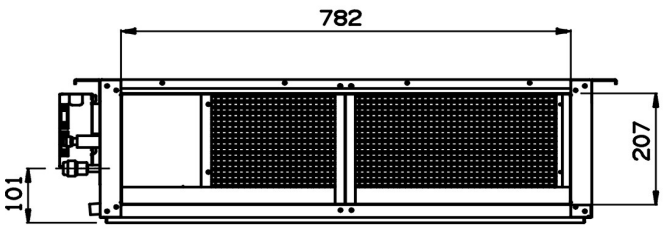
H : At shipment

Fig. 1-2

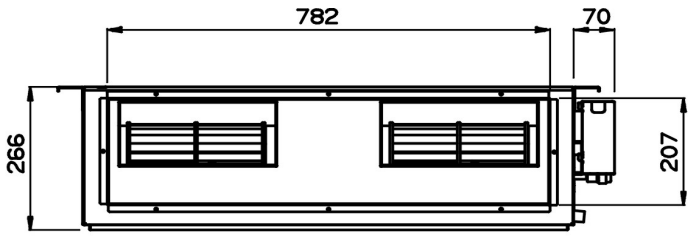
- How to read the diagram

The vertical axis is the external static pressure (Pa) while the horizontal one is the AIR FLOW RATE (m3/h).The characteristic curves for HH, H, M and L fan speed are shown.
The nameplate values shown are based on the H air flow rate. For the type 09/12 flow rate is 600m3/h while the external static pressure is 49 Pa at H position. If external static pressure is too great (due, for example, to long duct extension), the air flow rate may drop too much at each air outlet.
This problem can be solved increasing the fan speed with the booster cable.

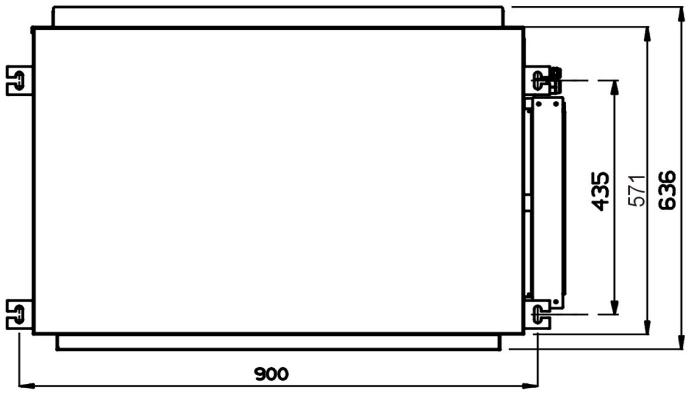
# 2. DIMENSIONAL DATA



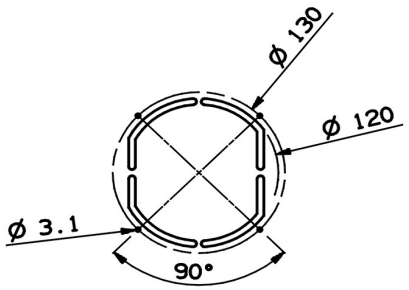

REAR VIEW




FRONT VIEW

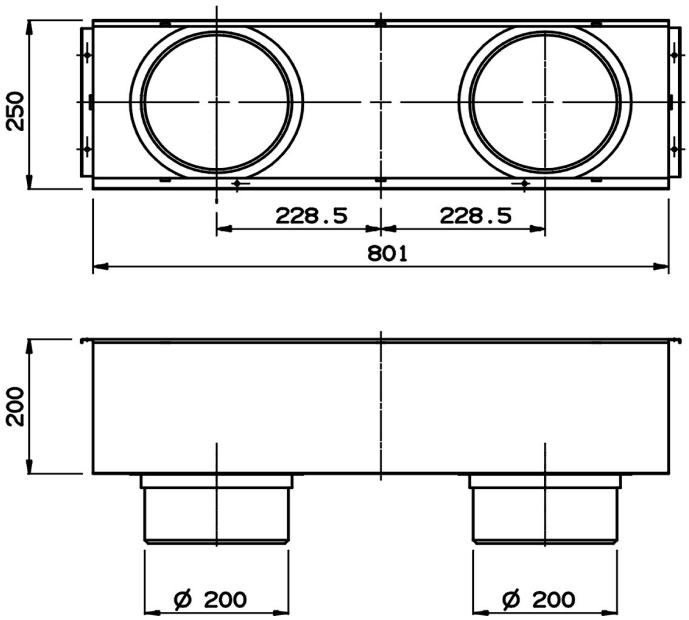



TOP VIEW

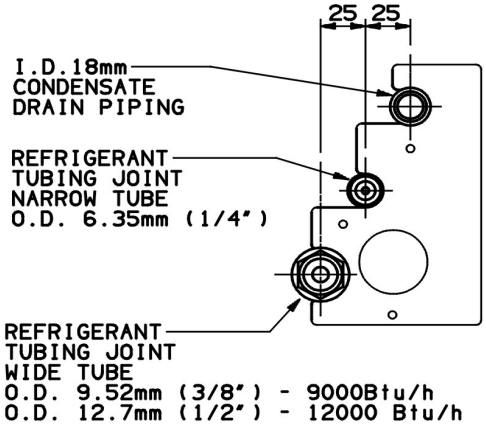



FRESH AIR INTAKE PORT

AIR CONVEYOR
(OPTIONAL PART)



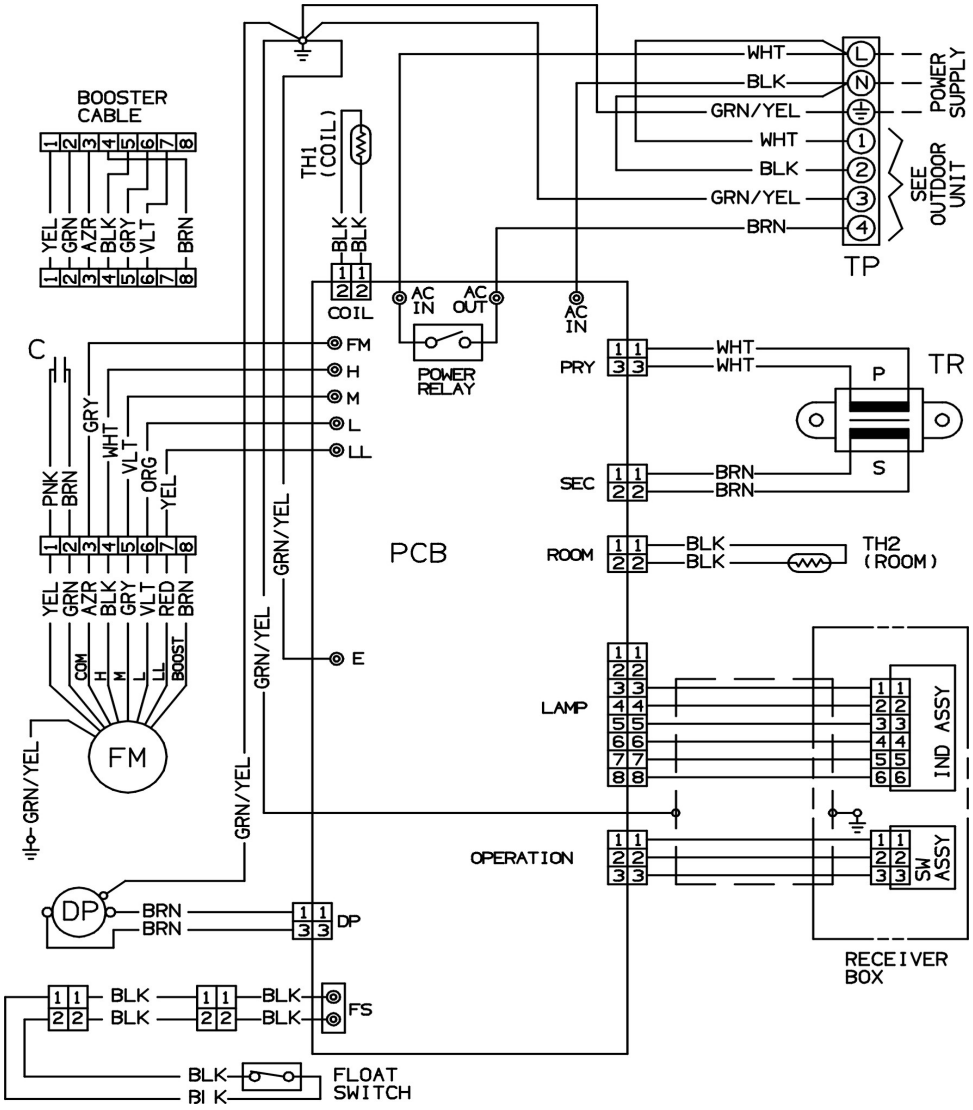

REFRIGERANT TUBING SIDE




Units: mm

# 3. ELECTRICAL DATA

## 3-1 Electric Wiring Diagrams

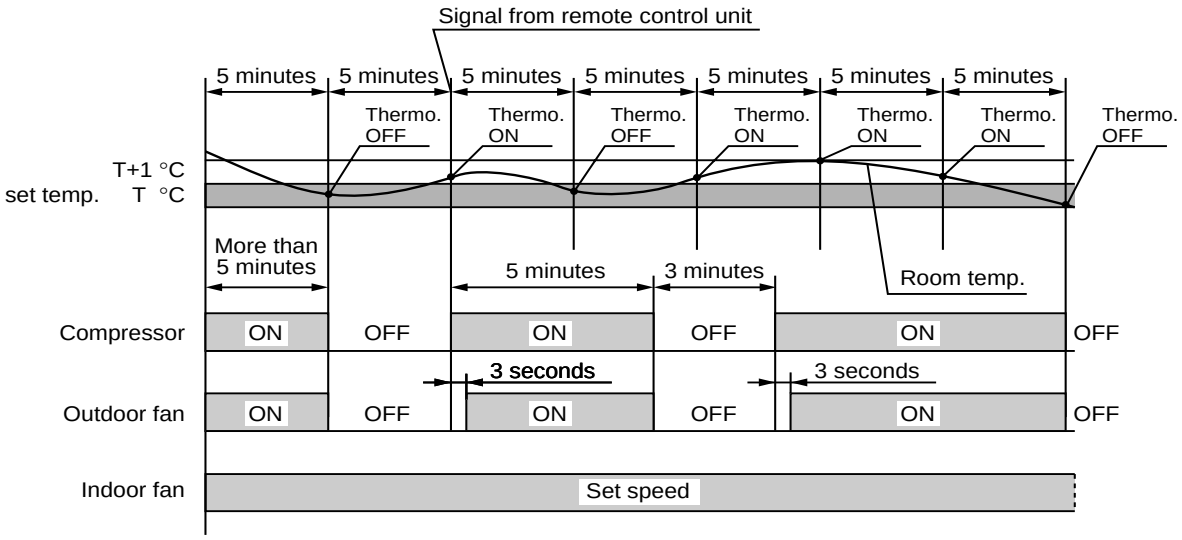


# 4. FUNCTION

## 4-1. Room Temperature Control

### ■ Cooling

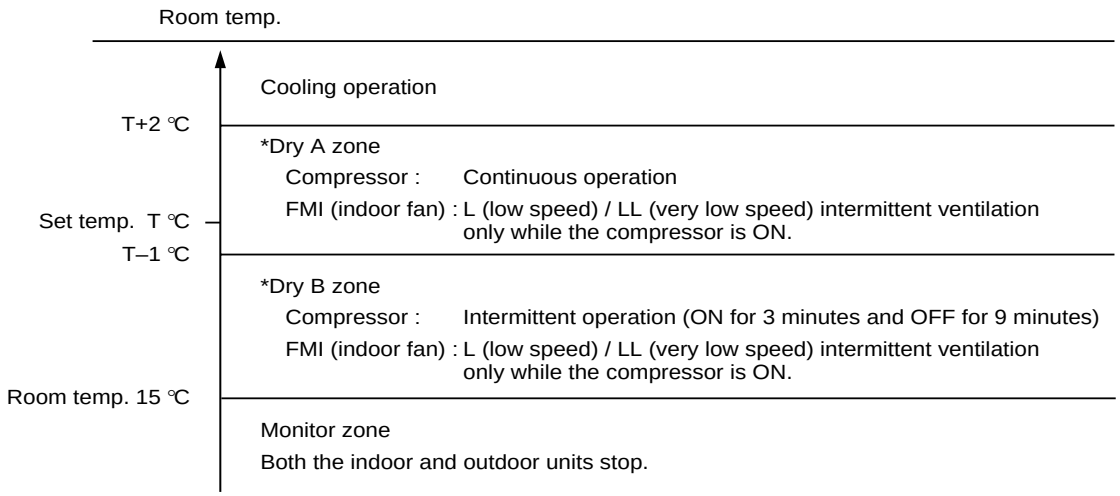
- Room temperature control is obtained by cycling the compressor ON and OFF under control of the room temperature sensor in the remote control unit.
- The room temperature (and other information) is transmitted every 5 minutes by the remote control unit to the controller in the indoor unit.




- 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. Dry Operation (Dehumidification)

- Dry operation uses the ability of the cooling cycle to remove moisture from the air, but by running at low level to dehumidify without greatly reducing the room temperature. The air conditioner repeats the ON/OFF cycle automatically as shown in the chart below according to the room temperature.

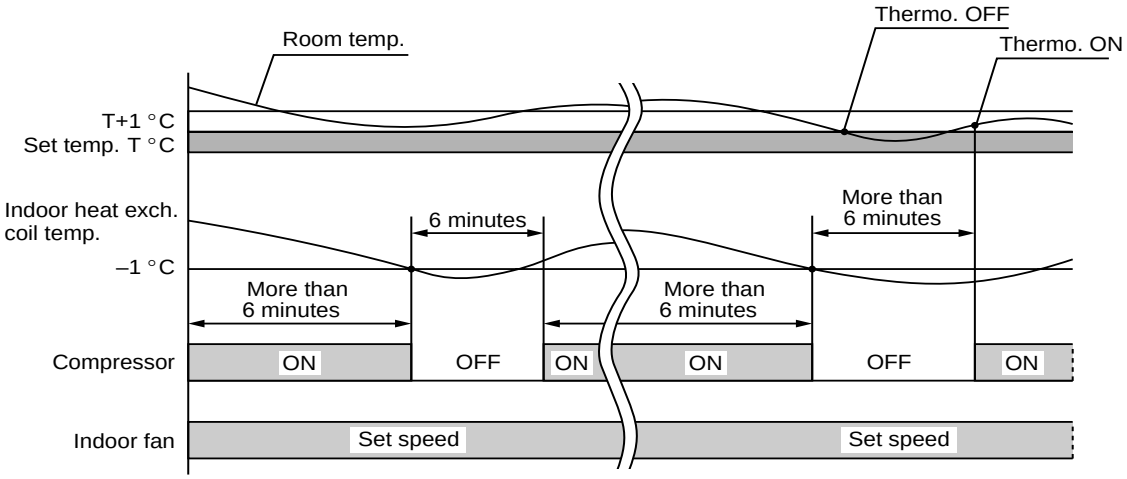



**NOTE**

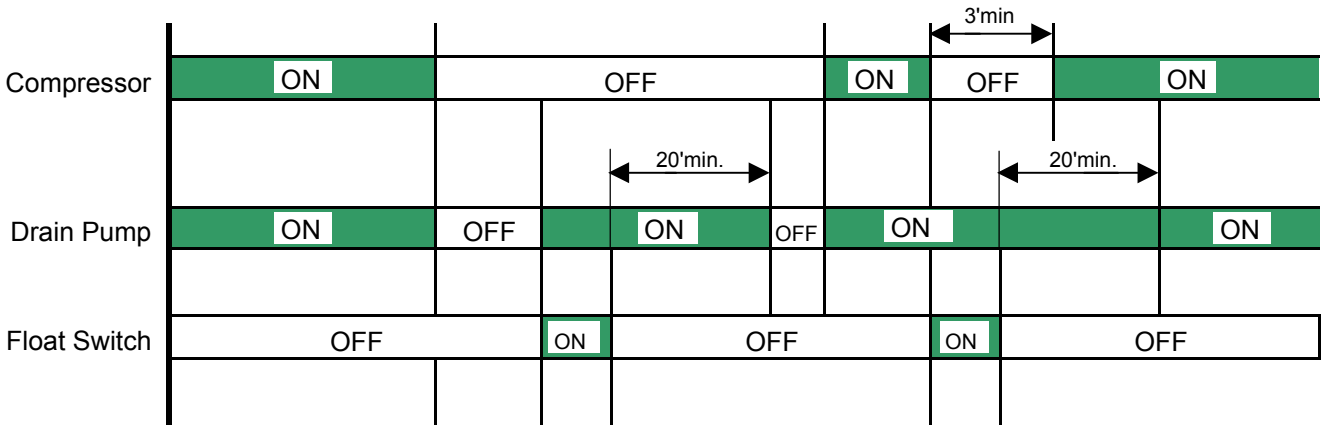
- Intermittent ventilation occurs by switching the indoor fan speed between L ↔ LL.
- Dry operation does not occur when the room temperature is under 15°C, which is the monitor zone.
- When the compressor stops, the indoor fan stops as well.

## 4-3. Freeze Prevention (Cooling and Dry)

- 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 –1°C, the control circuit stops the compressor for at least 6 minutes. The compressor does not start again until the temperature rises above 8°C or 6 minutes has elapsed.



## 4-4 Drain Pump and Float Switch




**NOTE:**

Either in Heating or another mode or the unit is stopped, when the float switch is turned ON, the drain pump operates for 20 minutes minimum

# 5. TROUBLESHOOTING

## 5-1. Check before and after troubleshooting

**WARNING**

**Hazardous voltage can cause ELECTRIC SHOCK or DEATH. Disconnect power or turn off circuit breaker before you start checking or servicing.**

### 5-1-1. Check power supply wiring.

- Check that power supply wires are correctly connected to terminals **L** and **N** on the terminal plate in the indoor unit.

### 5-1-2. Check inter-unit wiring.

- Check that inter-unit wiring is correctly connected to the outdoor unit from the indoor unit.

### 5-1-3. Check power supply.

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

### 5-1-4. 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 firmly connected.
- Check that wiring is correct.

## 5-2. Air conditioner does not operate.

### 5-2-1. Circuit breaker trips (or fuse blows).

**A. When the circuit breaker is set to ON, it trips immediately. (Resetting is not possible.)**

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

If resistance value is 2MΩ or less, insulation is defective (“NO”).

**WARNING**

*Set circuit breaker to OFF.

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

NO → Insulation of outdoor unit is defective.

• Measure insulation resistance of electrical parts in outdoor unit.

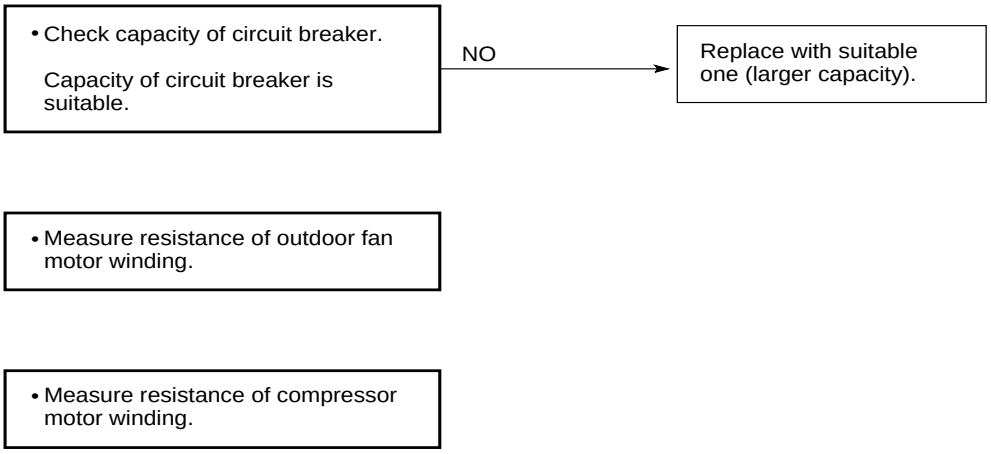
② Remove inter-unit wires from terminal plate in indoor unit. Then, pull the power plug out of the wall outlet
• Measure insulation resistance of indoor unit.

NO → Insulation of indoor unit is defective.

• Measure insulation resistance of electrical parts in indoor unit.

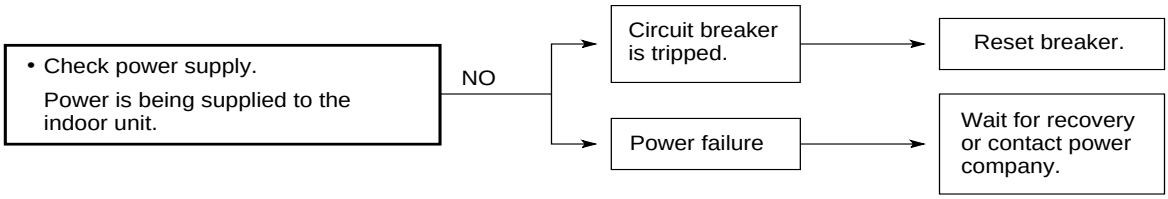
**B. Circuit breaker trips in several minutes after turning the air conditioner on.**

● There is a possibility of short circuit.

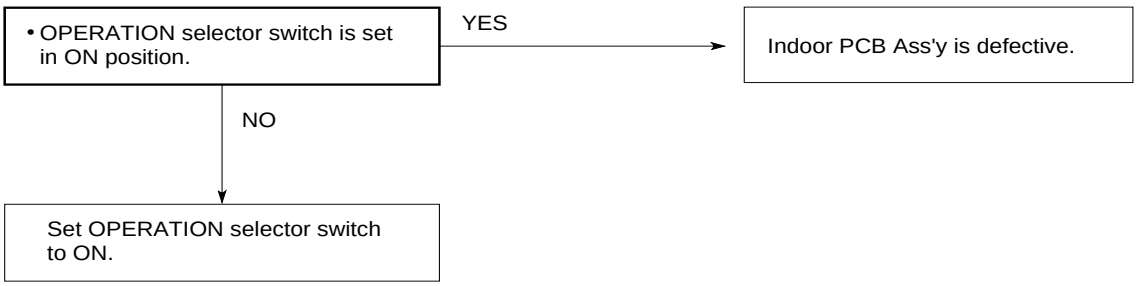



## 5-2-2. Neither indoor nor outdoor unit runs.

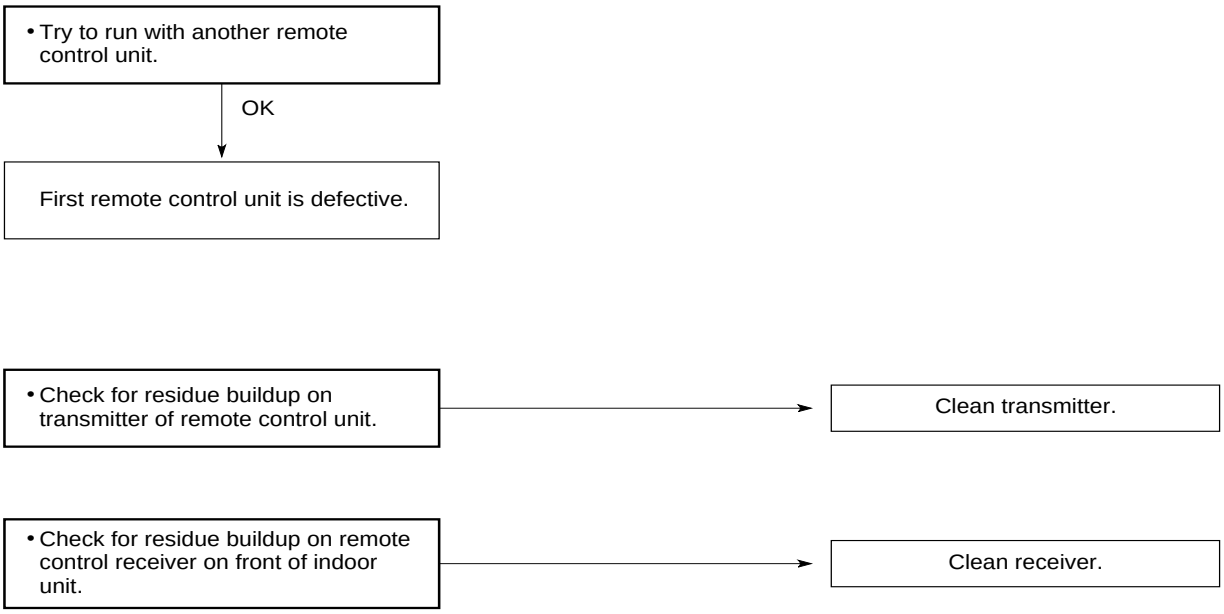
**A. Power is not supplied.**



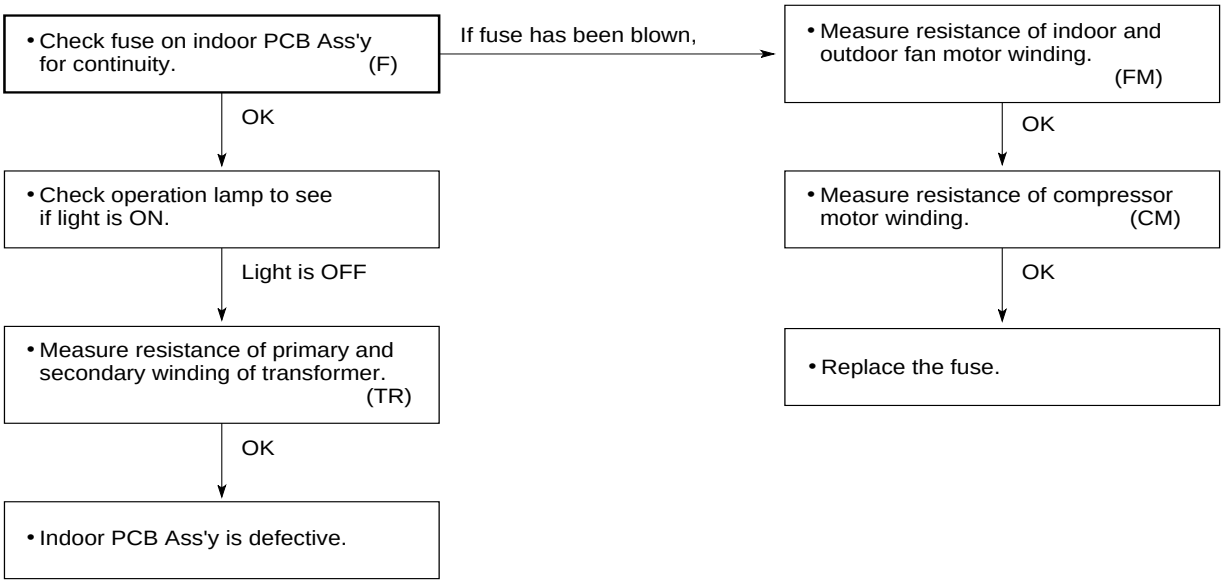

**B. Check "OPERATION selector" switch in the receiver**



**C. Check remote control unit.**




**D. Check fuse on the indoor PCB Ass'y.**

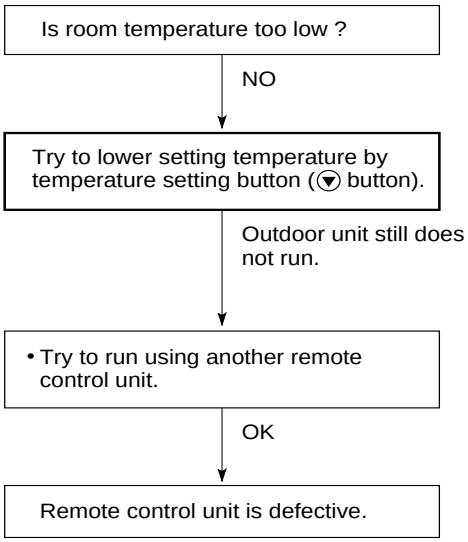



**E. Check TIMER on the remote control unit.**

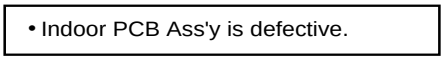
## 5-2-3. Only outdoor unit does not run.

**A. Check setting temperature.**

COOL

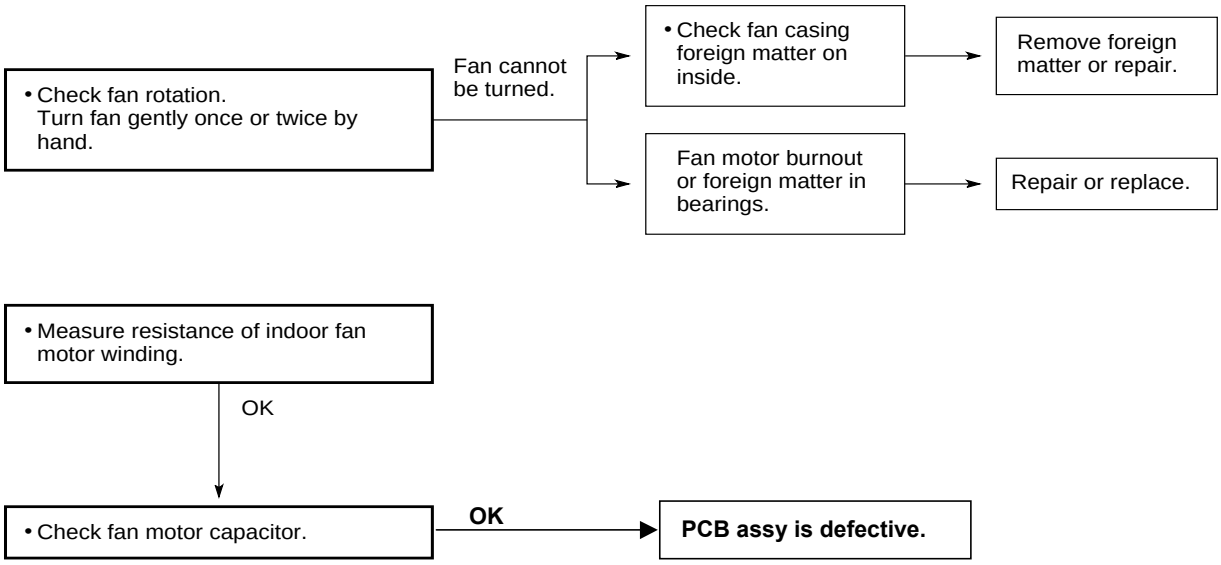



## 5-2-4. Only Indoor unit does not run.

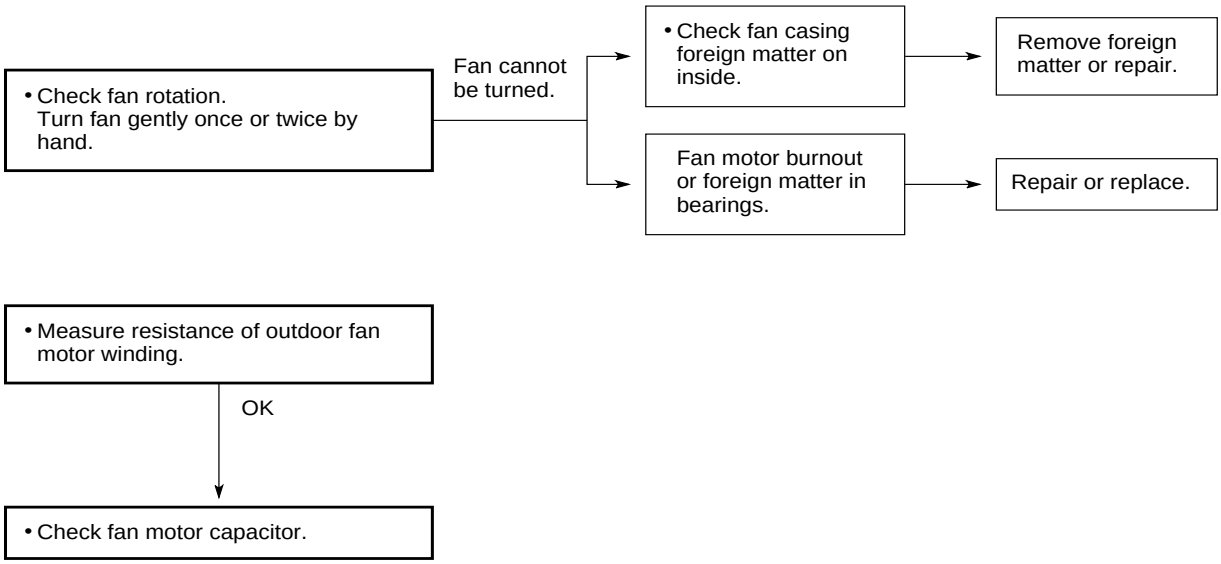


## 5-3. Some part of air conditioner does not operate.

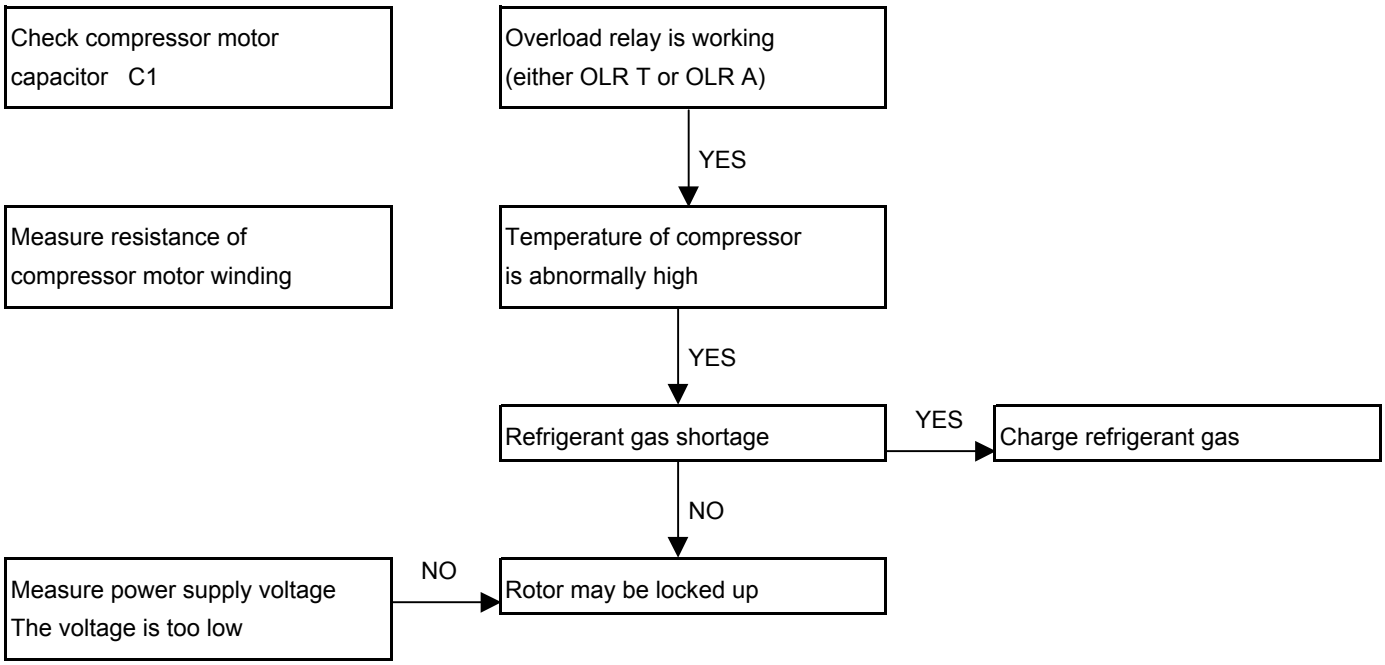
### 5-3-1. Only indoor fan does not run.



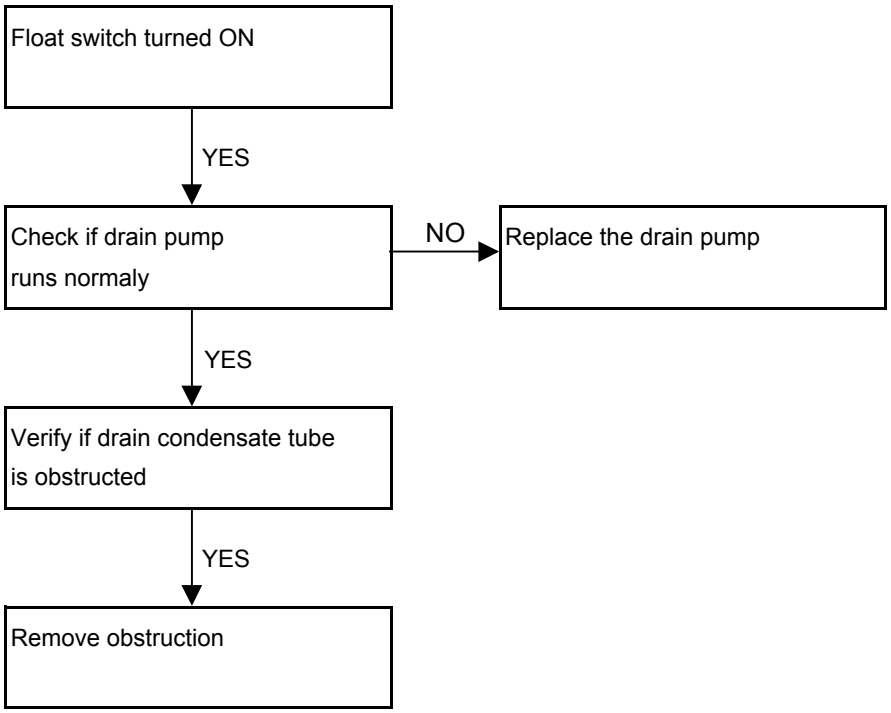

### 5-3-2 Only outdoor fan does not run.



### 5-3-3. Only compressor does not run

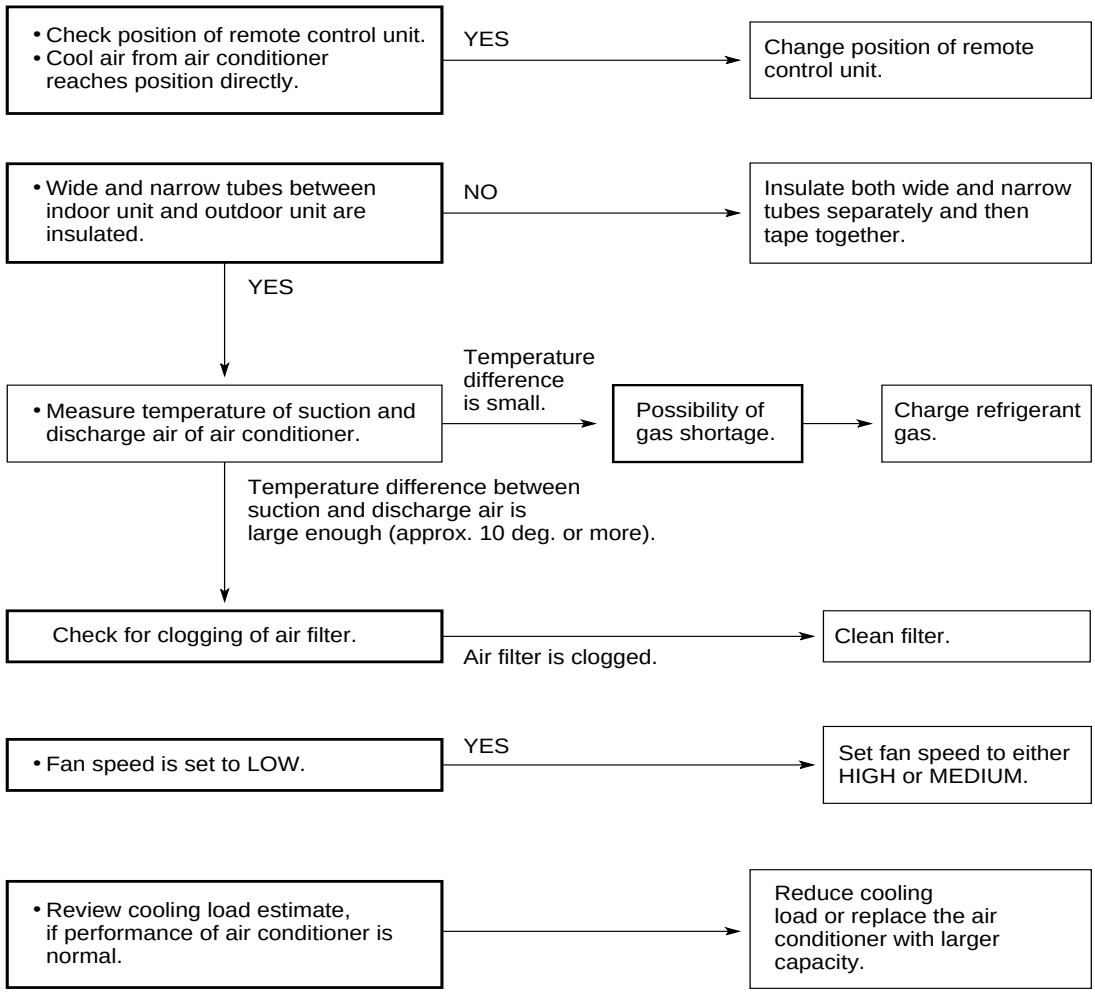



### 5-3-4. Compressor and outdoor fan do not run

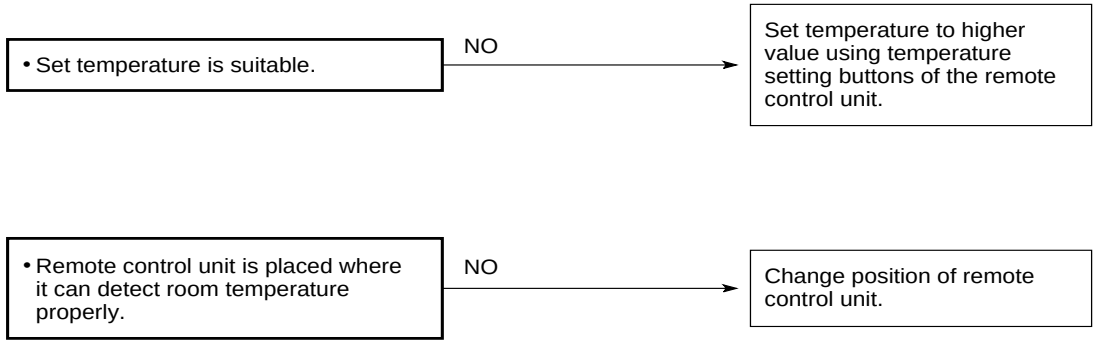


## 5-4. Air conditioner operates, but abnormalities are observed.

### 5-4-1. Poor cooling.

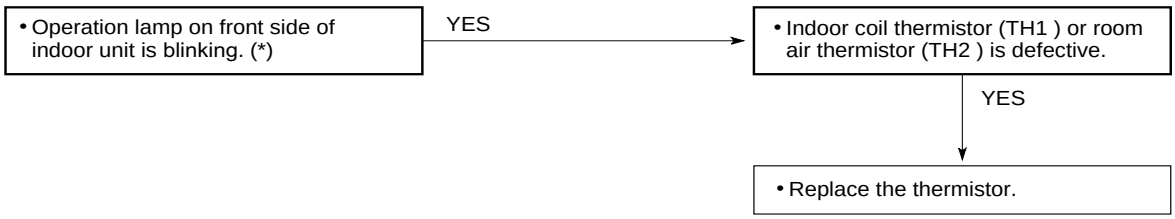



### 5-4-2. Excessive cooling.



## 5-5. If a sensor is defective.

### 5-5-1. Thermistor (TH1 or TH2) is defective.




**NOTE** **Alarm Signal (*)**

Operation lamp on the front side of the indoor unit will blink when either indoor coil thermistor or room air thermistor is defective. At the same time the outdoor unit will stop. Indoor unit will operate only for ventilation.

# 6. CHECKING ELECTRICAL COMPONENTS

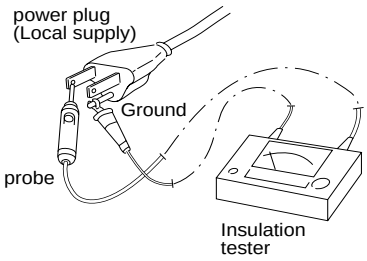
## 6-1. Measurement of Insulation Resistance

- The insulation is in good condition if the resistance exceeds 2MΩ.

### 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)




**NOTE**

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

**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)

### 6-1-3. Outdoor 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 each terminal screw on the terminal plate. (Fig. 2)
Note that the ground line terminal should be skipped for the check.

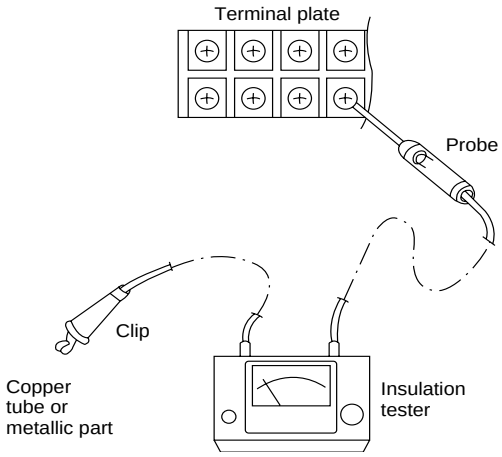



**Fig. 2**

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

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

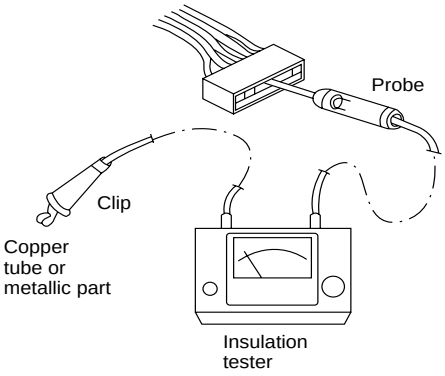



**Fig. 3**

**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.

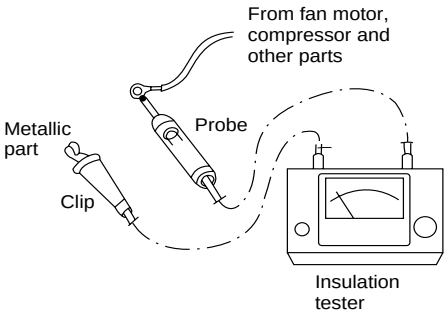



**Fig. 4**

## 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.

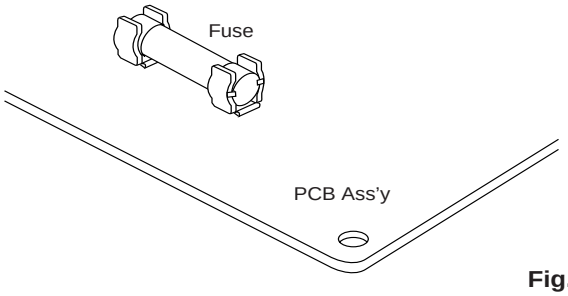



**Fig. 5**

## 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.

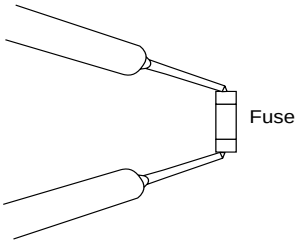



**Fig. 6**

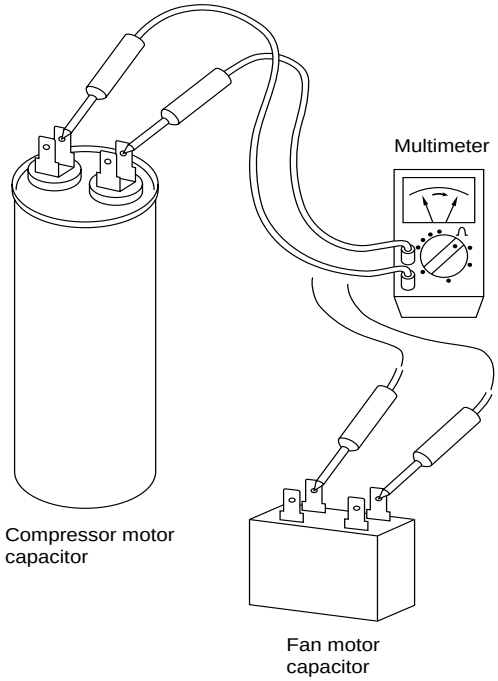



**Fig. 7**

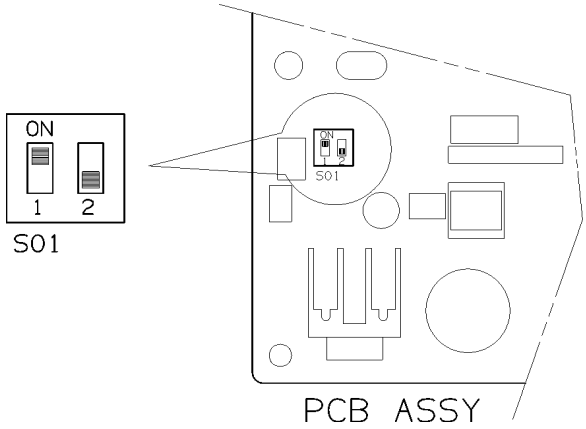
# 7. MAINTENANCE

## 7-1 Changing Address of Remote Control Unit in Indoor Unit

If you are installing more than 1 indoor unit (up to 2) in the same room, it is necessary for you to assign each unit its own address, so each can be operated by its own separate remote control unit. You assign the addresses by matching the remocon address on the PCB of each indoor unit with the switch positions of its remote control unit.

**To change address on PCB**

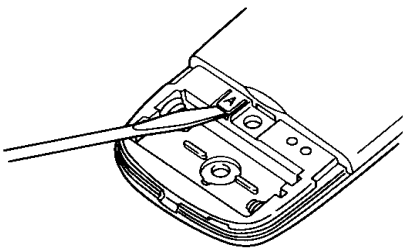
(1) Set the switch n.2 to "off" position on the address dip switch (S01)
(see detail on figure)

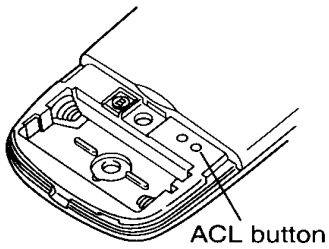



**To change address on Remote Control Unit**

**NB.:** Once changed, you cannot restore the original address

(1) Remove the batteries before changing the address
(2) Remove tab marked A to change the address of the remote control unit
(when is removed, the address is automatically set to B)
(3) After inserting the batteries, press ACL button



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