# TECHNICAL & SERVICE MANUAL

SANYO

**SAP–K186ST + SAP–C186ST**
**SAP–K256ST + SAP–C256ST**

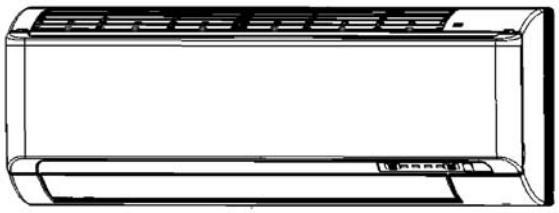
FILE NO.

# SPLIT SYSTEM AIR CONDITIONER

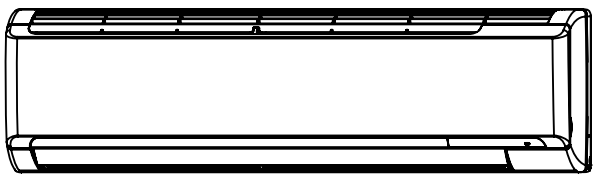
| Indoor Model No. | Product Code No. | Destination |
|---|---|---|
| SAP– K186ST | 1 852 347 24 | Asia / Russia (50Hz) |
| SAP– K256ST | 1 852 347 25 | Asia / Russia (50Hz) |

| Outdoor Model No. | Product Code No. | Destination |
|---|---|---|
| SAP–C186ST | 1 852 347 26 | Asia / Russia (50Hz) |
| SAP–C256ST | 1 852 347 27 | Asia / Russia (50Hz) |

Indoor Unit

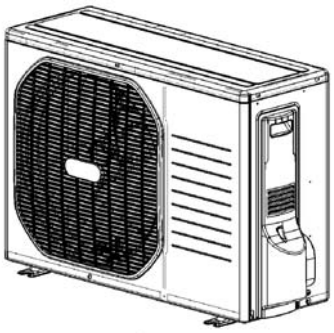


**SAP – K186ST**



**SAP – K256ST**

Outdoor Unit



**SAP – C186ST**
**SAP – C256ST**

REFERENCE NO. SMXXXXXX

# 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

### WARNING 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.
- Install a protective leakage breaker depending on the installation location (especially a damp or humid location.)

  If a leakage breaker is not installed, **electric shock can occar**

### When Transporting

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

### When Installing…

**…In a Ceiling or Wall**

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

**…In a Room**

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

**…In Moist or Uneven Locations**

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

**…In an Area with High Winds**

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

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

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

### When Connecting Refrigerant Tubing

- 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.

### When Servicing

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

### Others

**CAUTION**

- Ventilate any enclosed areas when installing or testing the refrigeration system. Escaped refrigerant gas, on contact with fire or heat, can produce dangerously toxic gas.
- Confirm upon completing installation that no refrigerant gas is leaking. If escaped gas comes in contact with a stove, gas water heater, electric room heater or other heat source, it can produce dangerously toxic gas.

# Table of Contents

# 1. OPERATING RANGE

**SAP – K186ST + SAP – C186ST**
**SAP – K256ST + SAP – C256ST**

| | Temperature | Indoor Air Intake Temp. | Outdoor Air Intake Temp. |
|---|---|---|---|
| Cooling | Maximum | 32℃ D.B. / 23℃ W.B. | 48℃ D.B. |
| | Minimum | 19℃ D.B. / 14℃ W.B. | 19℃ D.B. |

# 2. SPECIFICATIONS

## 2-1. Unit Specifications

Indoor Unit **SAP–K186ST**
Outdoor Unit **SAP–C256ST**

| | | | |
|---|---|---|---|
| **Power Source** | | | 220–240V Single phase **50Hz** |
| **Voltage rating** | | | 220/230/240 V |
| **Performance** | | | Cooling |
| Capacity | | kW | 5.30 |
| | | BTU / h | 18,100 |
| Air circulation (High) | | $m^3/h$ | – |
| Moisture removal (High) | | Liters/h | 2.3 |
| **Electrical Rating** | | | Cooling |
| Available voltage range | | V | 198 ~ 264 |
| Running amperes | | A | 8.9 / 9.3 / 10.1 |
| Power input | | W | 1,860 / 1,950 / 2,080 |
| Power factor | | % | 95 / 91 / 86 |
| C.O.P. | | W/W | 2.85 / 2.72 / 2.55 |
| Compressor locked rotor amperes | | A | 43.0 |
| **Features** | | | |
| Controls / Temperature control | | | Microprocessor / I.C. thermistor |
| Control unit | | | Wireless remote controller |
| Timer | | | 24-hours ON or OFF / 1-hour OFF |
| Fan speeds | | Indoor / Outdoor | 3 and Auto / 1 (Hi) |
| Airflow direction (Indoor) | | Horizontal | Manual |
| | | Vertical | Auto |
| Air filter | | | Washable, Anti-Mold |
| Compressor | | | Rotary (Hermetic) |
| Refrigerant / Amount charged at shipment | | g | R22 / 1,200 |
| Refrigerant control | | | Capillary tube |
| Operation sound | Indoor: Hi | dB-A | 43 |
| | Outdoor: Hi | dB-A | 55 |
| Refrigerant tubing connections | | | Flare type |
| Max. allowable tubing length at shipment | | m | 5 |
| Refrigerant | Narrow tube | mm (in.) | 6.35(1/4) |
| tube diameter | Wide tube | mm (in.) | 12.7(1/2) |
| Refrigerant tube kit / Accessories | | | Optional / Air Clean Filter |

| **Dimensions & Weight** | | | Indoor Unit | Outdoor Unit |
|---|---|---|---|---|
| Unit dimensions | Height | mm | 295 | 589 |
| | Width | mm | 799 | 790 |
| | Depth | mm | 227 | 285 |
| Package dimensions | Height | mm | 284 | 650 |
| | Width | mm | 871 | 920 |
| | Depth | mm | 343 | 385 |
| Weight | Net | kg | 10.0 | 46.0 |
| | Shipping | kg | 12.0 | 49.0 |
| Shipping volume | | $m^3$ | 0.08 | 0.23 |

DATA SUBJECT TO CHANGE WITHOUT NOTICE.

**Remarks:**

Rating conditions are:

Cooling : Indoor air temperature 27°C D.B. / 19°C W.B.
Outdoor air temperature 35°C D.B. / 24°C W.B.

Indoor Unit **SAP–K256ST**
Outdoor Unit **SAP–C256ST**

| | | | |
|---|---|---|---|
| **Power Source** | | | 220-240 V Single phase **50Hz** |
| **Voltage rating** | | | 220/230/240 V |
| **Performance** | | | Cooling |
| Capacity | | kW | 7.05 |
| | | BTU/h | 24,100 |
| Air circulation (High) | | $m^3/h$ | — |
| Moisture removal (High) | | Liters/h | 3.3 |
| **Electrical Rating** | | | Cooling |
| Available voltage range | | V | 198 ~ 264 |
| Running amperes | | A | 12.4 / 12.6 / 12.8 |
| Power input | | W | 2,600 / 2,660 / 2,730 |
| Power factor | | % | 95 / 92 / 89 |
| C.O.P. | | W/W | 2.71 / 2.65 / 2.58 |
| Compressor locked rotor amperes | | A | 66.0 |
| **Features** | | | |
| Controls / Temperature control | | | Microprocessor / I.C. thermister |
| Control unit | | | Wireless remote controller |
| Timer | | | 24-hours ON or OFF / 1-hour OFF |
| Fan speeds | | Indoor / Outdoor | 3 and Auto /1 (Hi) |
| Airflow direction (Indoor) | | Horizontal | Manual |
| | | Vertical | Auto |
| Air filter | | | Washable, Anti-Mold |
| Compressor | | | Rotary (Hermetic) |
| Refrigerant / Amount charged at shipment | | g | R22 / 1,550 |
| Refrigerant control | | | Capillary tube |
| Operation sound | Indoor: Hi | dB-A | 45 |
| | Outdoor: Hi | dB-A | 57 |
| Refrigerant tubing connections | | | Flare type |
| Max. allowable tubing length at shipment | | m | 7.5 |
| Refrigerant | Narrow tube | mm (in.) | 6.35(1/4) |
| tube diameter | Wide tube | mm (in.) | 15.88(5/8) |
| Refrigerant tube kit / Accessories | | | Optional / Air Clean Filter |

| **Dimensions & Weight** | | | Indoor Unit | Outdoor Unit |
|---|---|---|---|---|
| Unit dimensions | Height | mm | 298 | 569 |
| | Width | mm | 1,065 | 790 |
| | Depth | mm | 235 | 285 |
| Package dimensions | Height | mm | 302 | 635 |
| | Width | mm | 1,140 | 920 |
| | Depth | mm | 379 | 385 |
| Weight | Net | kg | 13.0 | 56.0 |
| | Shipping | kg | 16.0 | 59.0 |
| Shipping volume | | $m^3$ | 0.13 | 0.23 |

DATA SUBJECT TO CHANGE WITHOUT NOTICE.

**Remarks:**

Rating conditions are:

Cooling : Indoor air temperature 27℃ D.B. / 19℃ W.B.
Outdoor air temperature 35℃ D.B. / 24℃ W.B.

## 2-2. Major Component Specifications

### 2-2-1. Indoor Unit

Indoor Unit **SAP−K186ST**

| | | | | |
|---|---|---|---|---|
| **Controller PCB** | | | | |
| | Part No. | | | POW-K96S-A1 |
| | Controls | | | Microprocessor |
| | Control circuit fuse | | | 250 V 3.15 A |
| **Remote Control Unit** | | | | RCS-4MVPS4EX |
| **Fan & Fan Motor** | | | | |
| | Type | | | Cross-flow |
| | Q'ty ... Dia. and length | | mm | 1 ... ø100 / L637 |
| | Fan motor model ... Q'ty | | | SIC-37CVL-D847-2A ... 1 |
| | No. of poles ... Rough measure rpm | | | 8 ... 1260 |
| | Nominal output | | W | 47 |
| | Coil resistance (Ambient temp. 20℃) | | Ω | —<br>— |
| | Safety devices | Type | | Thermal fuse |
| | | Operating temp. | Open ℃ | 120 |
| | | | Close | — |
| | Run capacitor | | μF | — |
| | | | VAC | — |
| **Flap Motor** | | | | |
| | Type | | | Stepping motor |
| | Model | | | 24BYJ48-916 |
| | Rating | | | DC 12 V |
| | Coil resistance (Ambient temp. 25℃) | | Ω | Each pair of terminals : 200 ± 7% |
| **Heat Exch. Coil** | | | | |
| | Coil | | | Aluminum plate fin / Copper tube |
| | Rows | | | 2 |
| | Fin pitch | | mm | 1.3 |
| | Face area | | $m^2$ | 0.285 |

DATA SUBJECT TO CHANGE WITHOUT NOTICE.

Indoor Unit **SAP−K256ST**

| | | | | |
|---|---|---|---|---|
| **Controller PCB** | | | | |
| | Part No. | | | POW-K256M-A1 |
| | Controls | | | Microprocessor |
| | Control circuit fuse | | | 250 V 3.15 A |
| **Remote Control Unit** | | | | RCS-4MVPS4EX |
| **Fan & Fan Motor** | | | | |
| | Type | | | Cross-flow |
| | Q'ty ... Dia. and length | | mm | 1 ... ø94 / L845 |
| | Fan motor model ... Q'ty | | | SIC-39CVL-D847-2-A ... 1 |
| | No. of poles ... Rough measure rpm | | | 8 ... 1305 |
| | Nominal output | | W | 47 |
| | Coil resistance (Ambient temp. 20℃) | | Ω | —<br>— |
| | Safety devices | Type | | Internal controller |
| | | Operating temp. | Open ℃ | 120 |
| | | | Close | — |
| | Run capacitor | | μF | — |
| | | | VAC | — |
| **Flap Motor** | | | | |
| | Type | | | Stepping motor |
| | Model | | | MP24Z3 |
| | Rating | | | DC 12 V |
| | Coil resistance (Ambient temp. 25℃) | | Ω | Each pair of terminals : 400 ± 7% |
| **Heat Exch. Coil** | | | | |
| | Coil | | | Aluminum plate fin / Copper tube |
| | Rows | | | 2 |
| | Fin pitch | | mm | 1.3 |
| | Face area | | $m^2$ | 0.285 |

DATA SUBJECT TO CHANGE WITHOUT NOTICE.

## 2-2-2. Outdoor Unit

Outdoor Unit **SAP−C186ST**

| | | | | |
|---|---|---|---|---|
| **Controller PCB** | | | | — |
| **Compressor** | | | | |
| Type | | | | Rotary (Hermetic) |
| Compressor model | | | | 2V34S225AUA...85204526356 |
| Nominal output | | | W | 450 |
| Compressor oil ... Amount | | | cc | ATMOS NM56M, SUNISO 4GDID or equivalent ... 650 |
| Coil resistance (Ambient temp. 20℃) | | | Ω | C–R : 1.572<br>C–S : 2.637 |
| Safety devices | Type | | | Internal |
| | Overload relay | | | — |
| | Operating temp. | Open | ℃ | — |
| | | Close | ℃ | — |
| | Operating amp.(Ambient temp. 25℃) | | | Trip in 6 to 16 sec.at 15A |
| Run capacitor | | | μF | 50 |
| | | | VAC | 400 |
| Crank case heater | | | | — |
| **Fan & Fan Motor** | | | | |
| Type | | | | Propeller |
| Q'ty ... Dia. | | | | 1 ... ø420 |
| Fan motor model ... Q'ty | | | | KFG4-Z94A5P R... 1 |
| No. of poles ... Rough measure rpm (High) | | | | 4 ... 1,000 |
| Nominal output | | | W | 64.2 |
| Coil resistance (Ambient temp. 20℃) | | | Ω | WHT - BRN : 60.8<br>YEL - RED : 42.5 |
| Safety devices | Type | | | Thermal protector |
| | Operating temp. | Open | ℃ | 135±5 |
| | | Close | | Automatic reclosing |
| Run capacitor | | | μF | 4.0 |
| | | | VAC | 440 |
| **Heat Exch. Coil** | | | | |
| Coil | | | | Aluminum plate fin / Copper tube |
| Rows | | | | 2 |
| Fin pitch | | | mm | 1.4 |
| Face area | | | $m^2$ | 0.303 |
| **External Finish** | | | | Acrylic baked-on enamel finish |

DATA SUBJECT TO CHANGE WITHOUT NOTICE.

Outdoor Unit **SAP−C256ST**

| | | | | |
|---|---|---|---|---|
| **Controller PCB** | | | | — |
| **Compressor** | | | | |
| Type | | | | Rotary (Hermetic) |
| Compressor model | | | | PH460X3CS...85204526357 |
| Nominal output | | | W | 1,800 |
| Compressor oil ... Amount | | | cc | ATMOS NM56EP or SUNISO 4GSD ... 1,100 |
| Coil resistance (Ambient temp. 20℃) | | | Ω | C−R : 1.04±5%<br>C−S : 2.35±5% |
| Safety devices | Type | | | Internal protector |
| | Overload relay | | | — |
| | Operating temp. | Open | ℃ | Automatic opening |
| | | Close | ℃ | Automatic reclosing |
| | Operating amp.(Ambient temp. 25℃) | | | — |
| Run capacitor | | | μF | 55 |
| | | | VAC | 400 |
| Crank case heater | | | | — |
| **Fan & Fan Motor** | | | | |
| Type | | | | Propeller |
| Q'ty ... Dia. | | | | 1 ... ø420 |
| Fan motor model ... Q'ty | | | | KFG4-Z91A5P R ... 1 |
| No. of poles ... Rough measure rpm (High) | | | | 4 ... 1,100 |
| Nominal output | | | W | 70 |
| Coil resistance (Ambient temp. 20℃) | | | Ω | WHT - BRN : 60.8<br>WHT - PNK : 42.5<br>(RED) |
| Safety devices | Type | | | Thermal protector |
| | Operating temp. | Open | ℃ | 135±5 |
| | | Close | | Automatic reclosing |
| Run capacitor | | | μF | 4.0 |
| | | | VAC | 440 |
| **Heat Exch. Coil** | | | | |
| Coil | | | | Aluminum plate fin / Copper tube |
| Rows | | | | 2 |
| Fin pitch | | | mm | 1.4 |
| Face area | | | $m^2$ | 0.510 |
| **External Finish** | | | | Acrylic baked-on enamel finish |

DATA SUBJECT TO CHANGE WITHOUT NOTICE.

## 2-3. Other Component Specifications

**INDOOR UNIT**

**SAP–K186ST**

| Thermistor (Coil / Room sensor) | DTN-TKS342Y (Coil / Room) |
|---|---|
| Resistance kΩ | Coil 0°C 15.0 ± 2% / Room 25°C 5.0 ± 3% |

**SAP–K256ST**

| Thermistor (Coil sensor) | PBM-D41E-S1 (Coil / Room) |
|---|---|
| Resistance kΩ | Coil 0°C 15.0 ± 5% / Room 25°C 5.0 ± 4% |

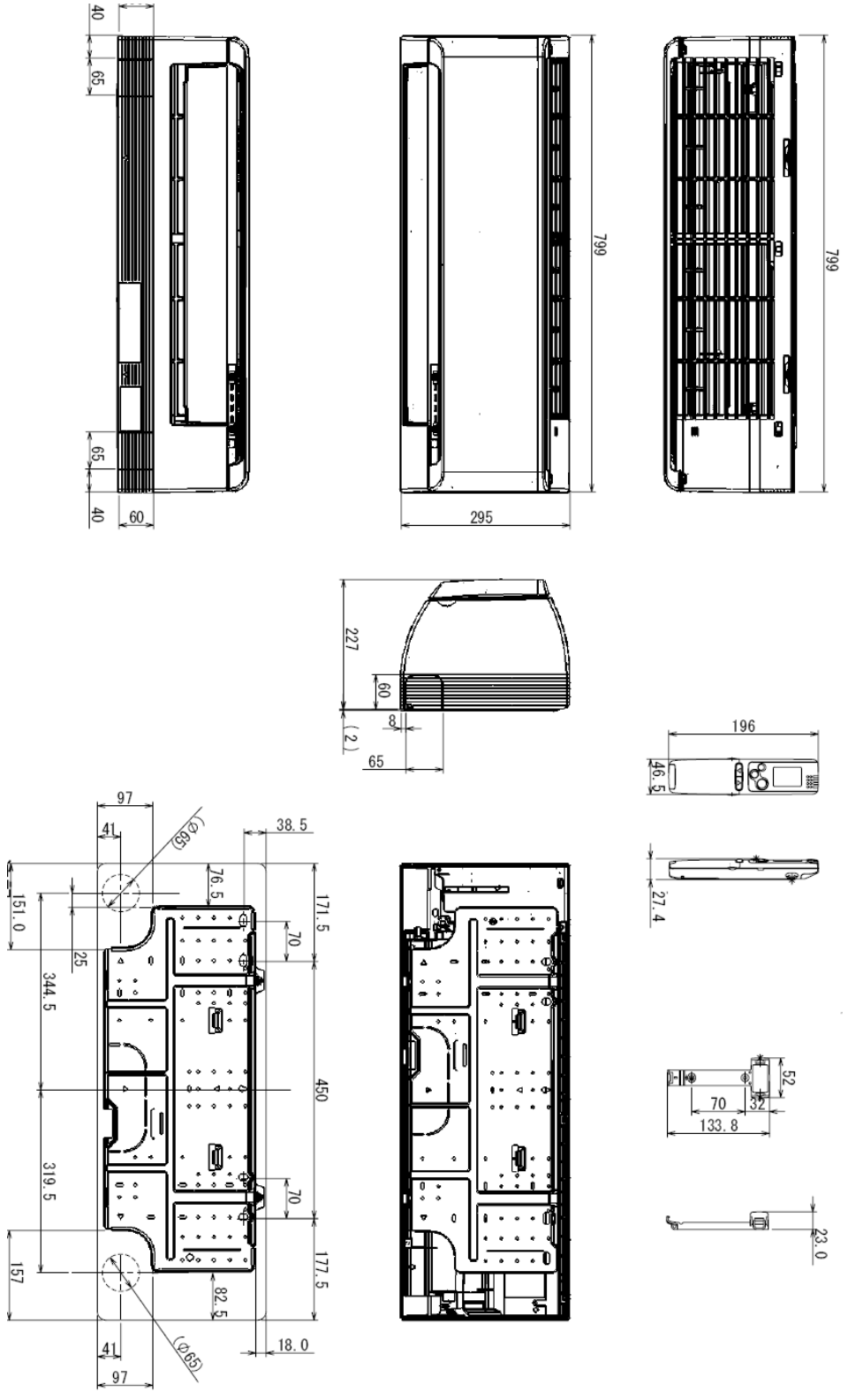
**OUTDOOR UNIT**

**SAP–C186/256ST**

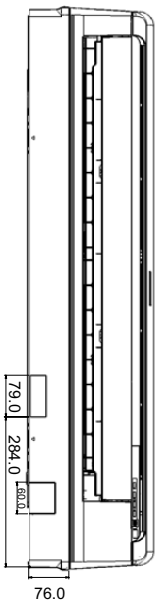
| Power Relay (PR) | EL1U |
|---|---|
| Coil rating | AC 200–240V, 50/60Hz |
| Contact rating | AC 277V,30A |

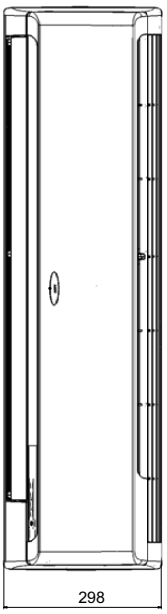
# 3. DIMENSIONAL DATA

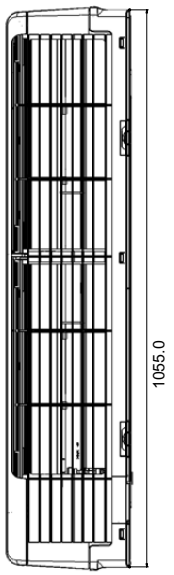
Indoor Unit **SAP–K186ST**

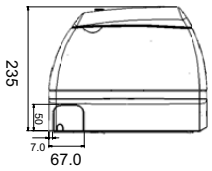


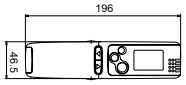
Indoor Unit **SAP–K256ST**

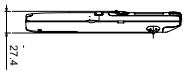


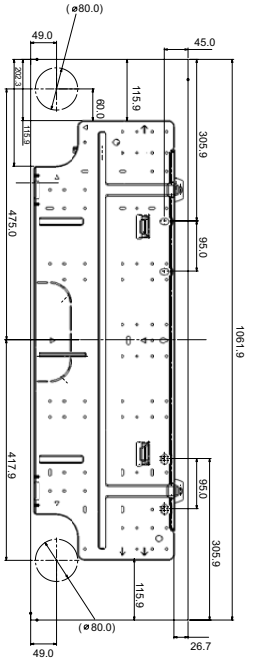



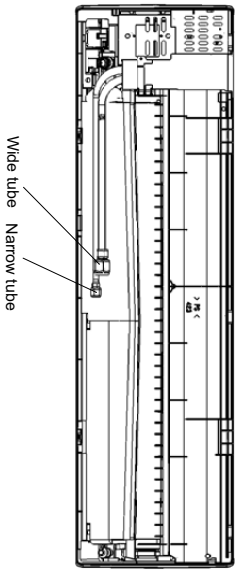



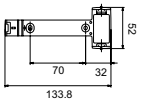



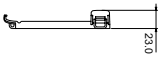



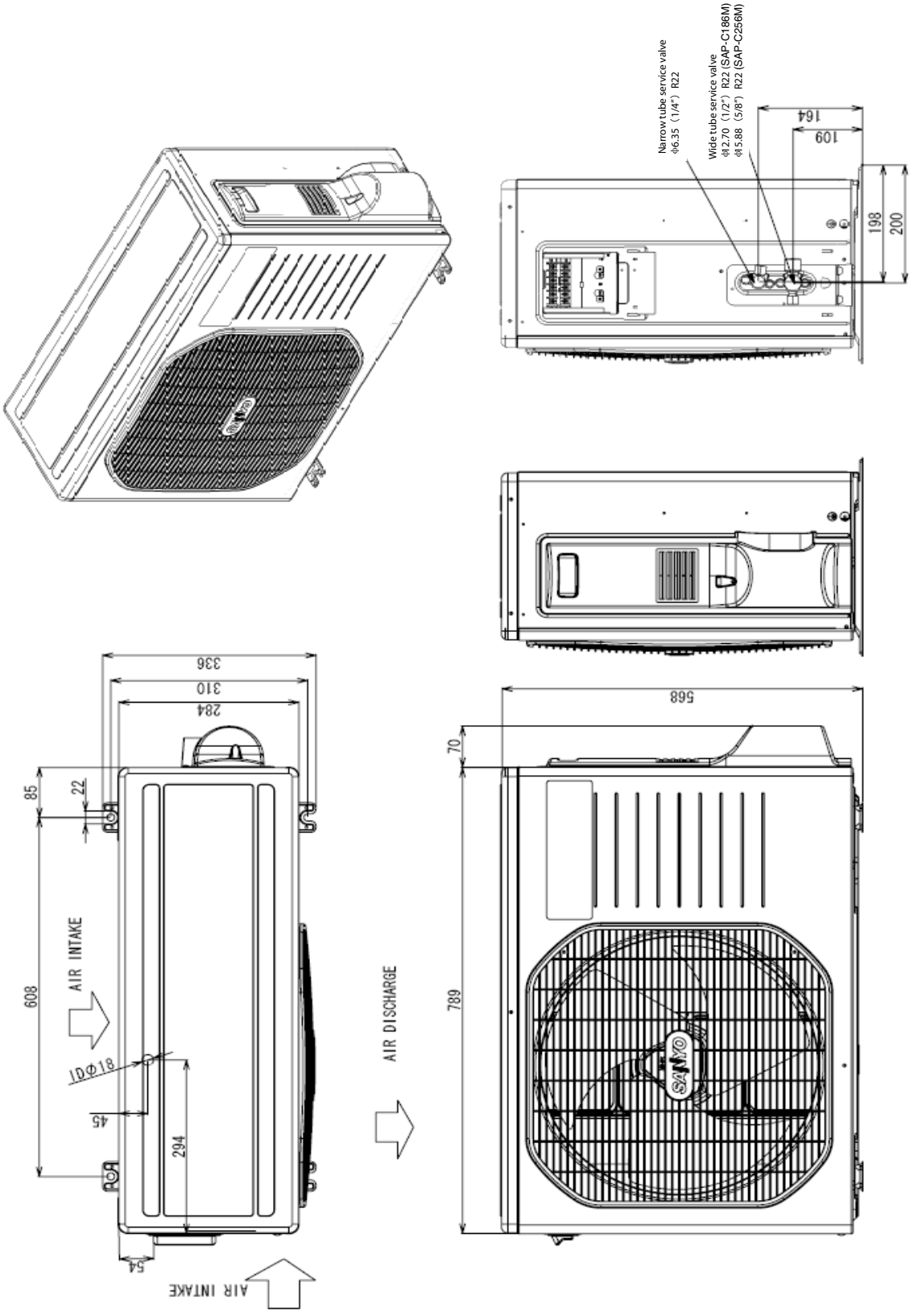



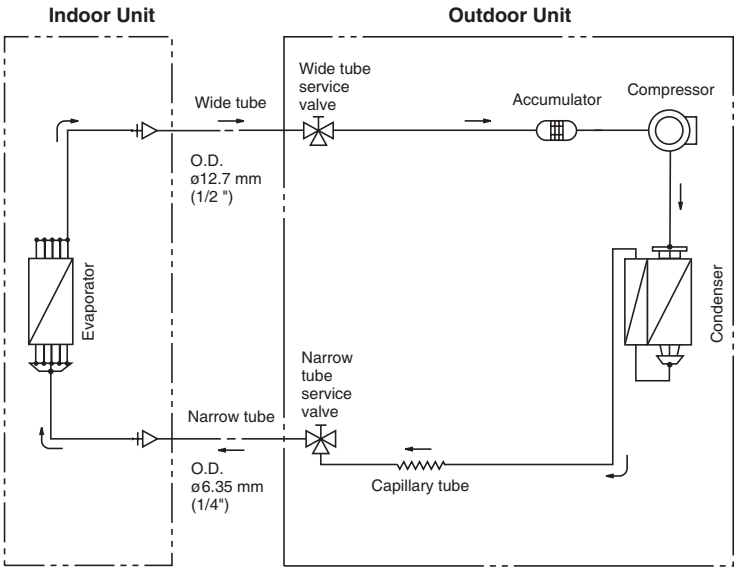



Outdoor Unit **SAP–C186ST**
**SAP–C256ST**

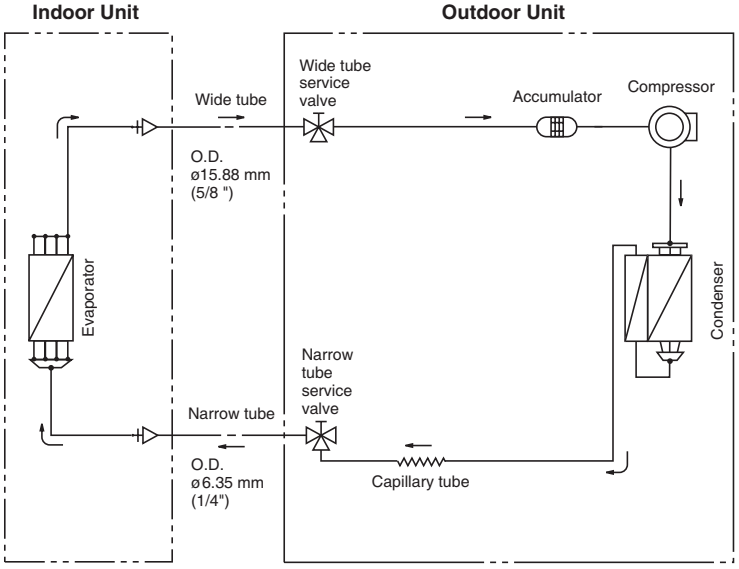


# 4. REFRIGERANT FLOW DIAGRAM

Indoor Unit **SAP–K186ST** Outdoor Unit **SAP–C186ST**



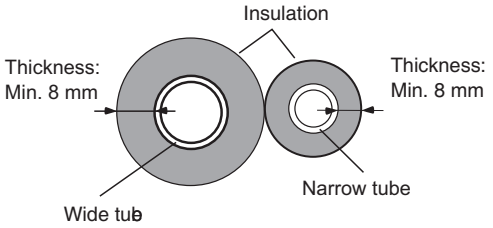

Indoor Unit **SAP–K256ST** Outdoor Unit **SAP–C256ST**




## Insulation of Refrigerant Tubing

**IMPORTANT**

Because capillary tubing is used in the outdoor unit, both the wide and narrow tubes of this air conditioner become cold. To prevent heat loss and wet floors due to dripping of condensation, **both tubes must be well insulated** with a proper insulation material. The thickness of the insulation should be a min. 8mm.




**CAUTION**

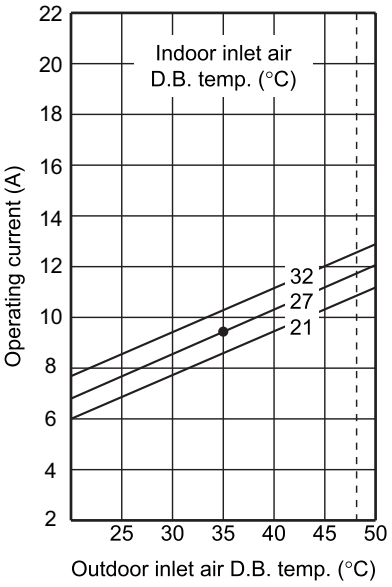
**After a tube has been insulated, never try to bend it into a narrow curve because it can cause the tube to break or crack.**

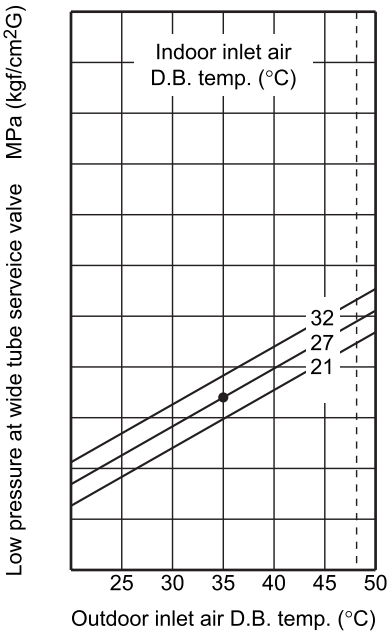
# 5. PERFORMANCE DATA

## 5-1. Performance charts

Indoor Unit **SAP−K186ST**
Outdoor Unit **SAP−C186ST**

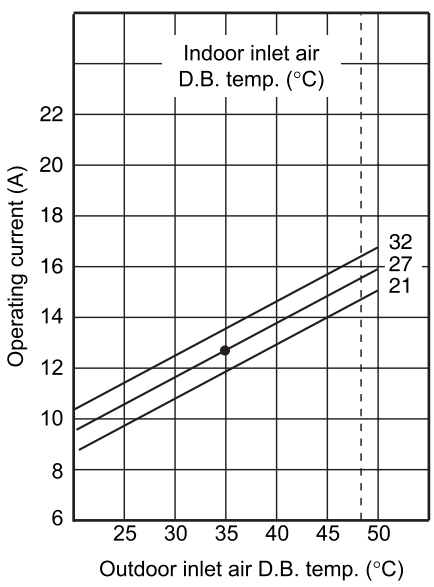
■ Cooling Characteristics

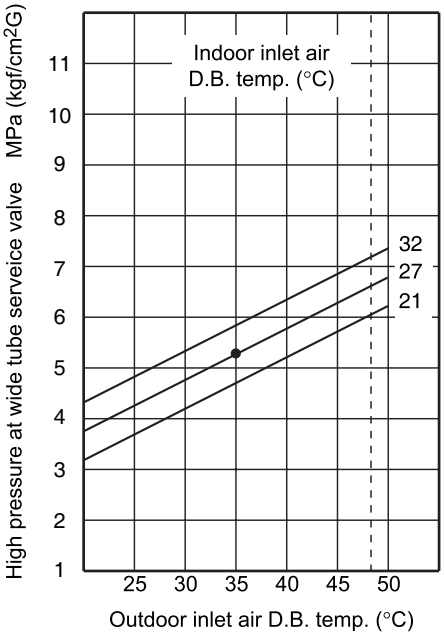



Indoor Unit **SAP−K256ST**
Outdoor Unit **SAP−C256ST**

■ Cooling Characteristics




**NOTE**

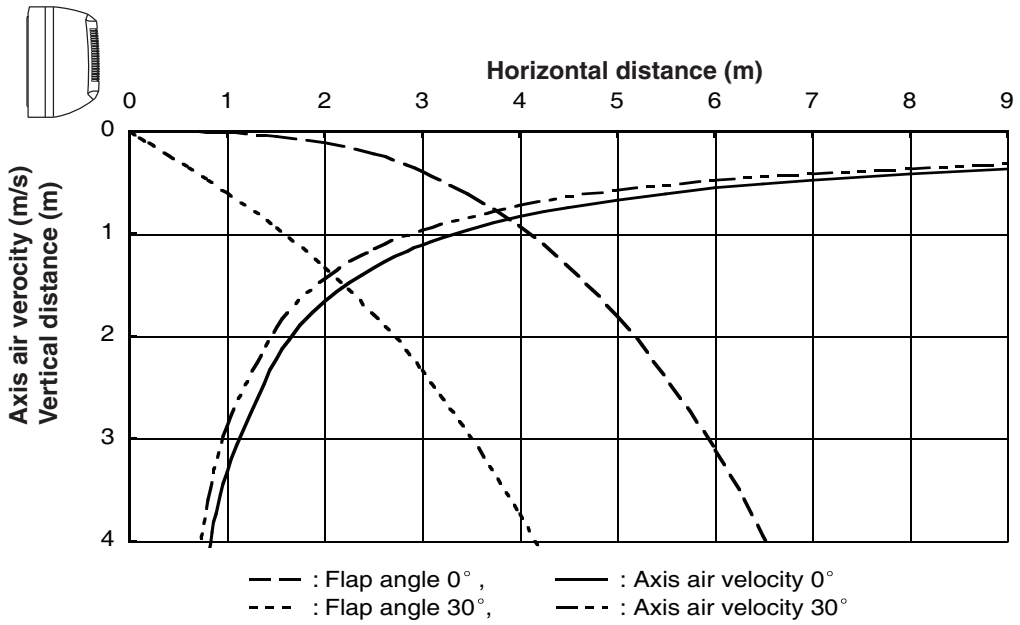
● ..... Points of Rating condition
Black dots in above charts indicate the following rating conditions.

Cooling: Indoor air temperature 27°C D.B./19°C W.B.
Outdoor air temperature 35°C D.B./24°C W.B.

## 5-2. Air Throw Distance Chart

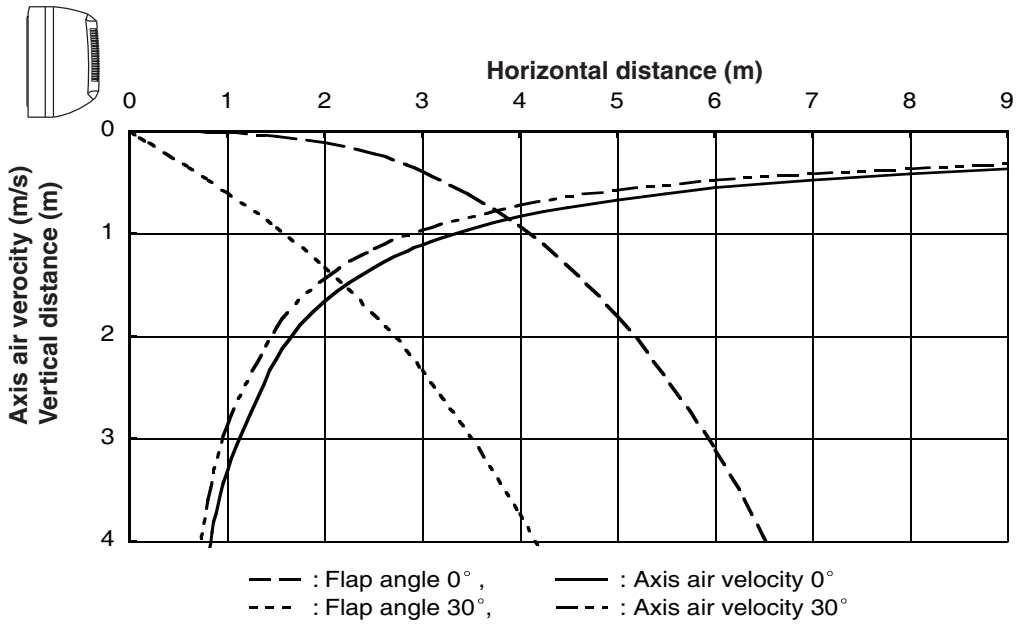
Indoor Unit **SAP−K186ST**

**Room air temp. : 27**℃
**Fan speed : High**




Indoor Unit **SAP−K256ST**

**Room air temp. : 27**℃
**Fan speed : High**



# 6. ELECTRICAL DATA

## 6-1. Electrical Characteristics

Indoor Unit **SAP-K186ST**
Outdoor Unit **SAP-C186ST**

| | | | Indoor Unit | Outdoor Unit | | Complete Unit |
|---|---|---|---|---|---|---|
| | | | Fan Motor | Fan Motor | Compressor | |
| Performance at | | | 220-240V Single phase **50Hz** | | | |
| Rating Conditions | Running Amps. | A | 0.17 / 0.17 / 0.17 | 0.65 / 0.66 / 0.66 | 8.30 / 8.05 / 7.96 | 9.12 / 8.88 / 8.79 |
| | Power Input | kW | 0.035 / 0.035 / 0.035 | 0.140 /0.149 / 0.156 | 1.814 / 1.832 / 1.877 | 1.989 / 2.016 / 2.068 |
| Full Load Conditions | Running Amps. | A | 0.17 / 0.17 / 0.17 | 0.65 / 0.66 / 0.66 | 12.60 / 10.29 / 9.93 | 13.42 / 11.12 / 10.76 |
| | Power Input | kW | 0.035 / 0.035 / 0.035 | 0.140 /0.149 / 0.156 | 2.461 / 2.348 / 2.509 | 2.636 / 2.532 / 2.700 |

Rating Conditions : Indoor Air Temperature 27 ℃D.B. / 19℃ W.B.
Outdoor Air Temperature 35℃ D.B.
Full Load Conditions : Indoor Air Temperature 32℃ D.B. / 23℃ W.B.
Outdoor Air Temperature 48℃ D.B.

Indoor Unit **SAP-K256ST**
Outdoor Unit **SAP-C256ST**

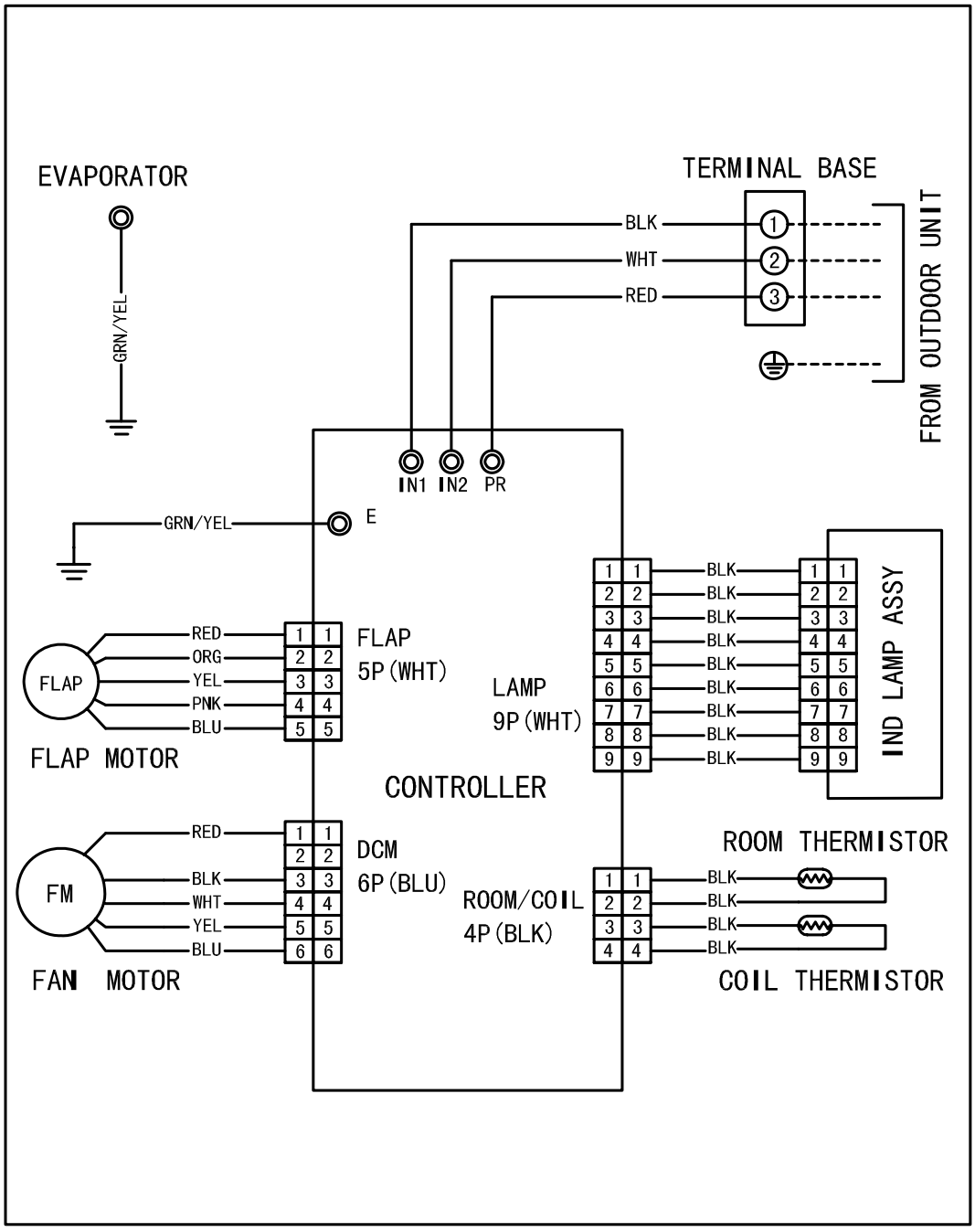
| | | | Indoor Unit | Outdoor Unit | | Complete Unit |
|---|---|---|---|---|---|---|
| | | | Fan Motor | Fan Motor | Compressor | |
| Performance at | | | 220-240V Single phase **50Hz** | | | |
| Rating Conditions | Running Amps. | A | 0.22 / 0.22 / 0.22 | 0.67 / 0.68 / 0.69 | 11.66 / 11.78 / 12.40 | 12.55 / 12.68 / 13.31 |
| | Power Input | kW | 0.045 / 0.045 / 0.045 | 0.147 / 0.155 / 0.162 | 2.446 / 2.496 / 2.587 | 2.638 / 2.696 / 2.794 |
| Full Load Conditions | Running Amps. | A | 0.22 / 0.22 / 0.22 | 0.67 / 0.68 / 0.69 | 17.31 / 14.80 / 17.42 | 18.20 / 15.70 / 18.33 |
| | Power Input | kW | 0.045 / 0.045 / 0.045 | 0.147 / 0.155 / 0.162 | 3.356 / 3.247 / 3.711 | 3.548 / 3.447 / 3.918 |

Rating Conditions : Indoor Air Temperature 27 ℃D.B. / 19℃ W.B.
Outdoor Air Temperature 35℃ D.B.
Full Load Conditions : Indoor Air Temperature 32℃ D.B. / 23℃ W.B.
Outdoor Air Temperature 48℃ D.B.

## 6-2. Electric Wiring Diagrams

Indoor Unit **SAP−K186ST**

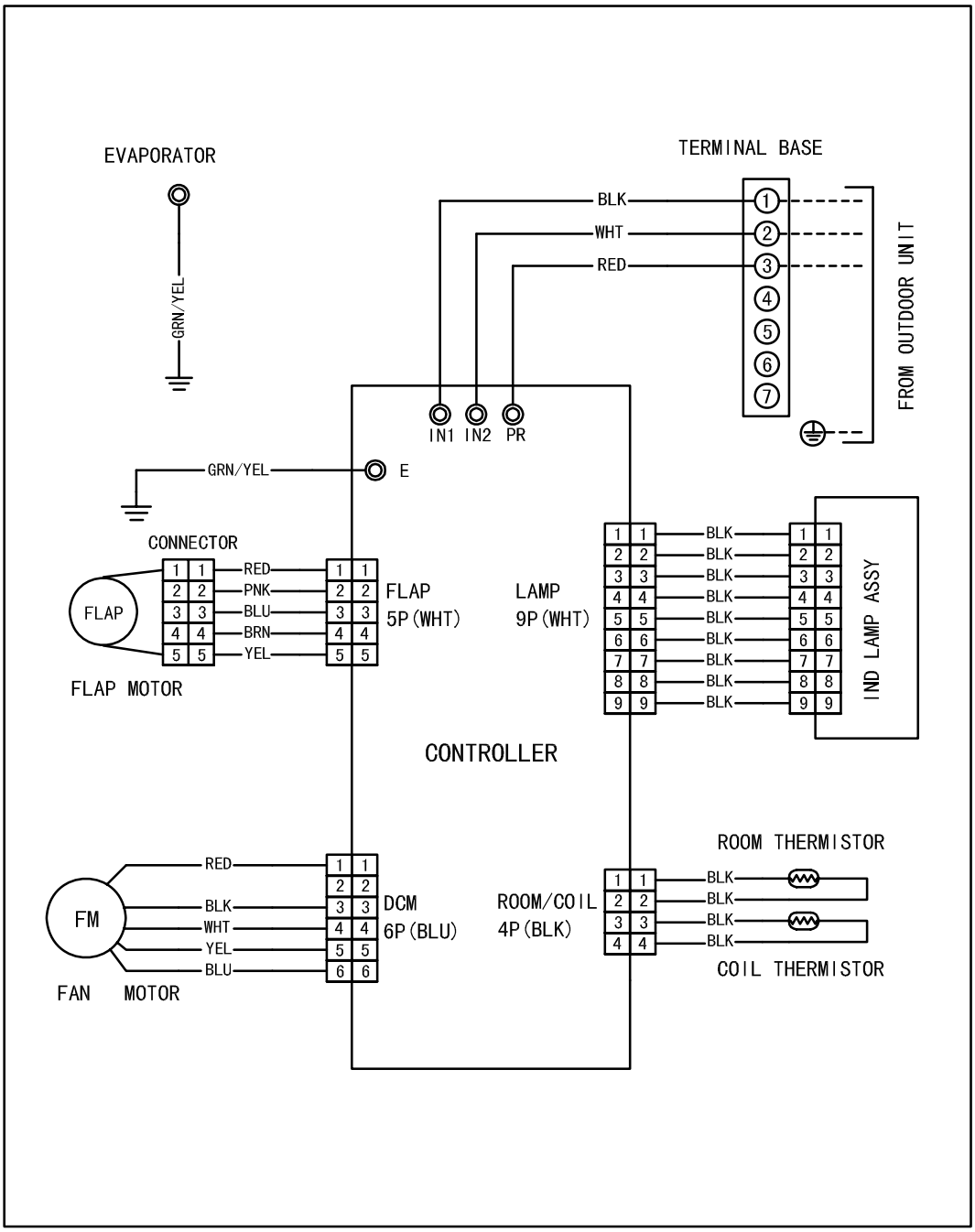
**WARNING** ***To avoid electrical shock hazard, be sure to disconnect power before checking, servicing and/or cleaning any electrical parts.***




8FA2-5250-24800-0

Indoor Unit **SAP−K256ST**

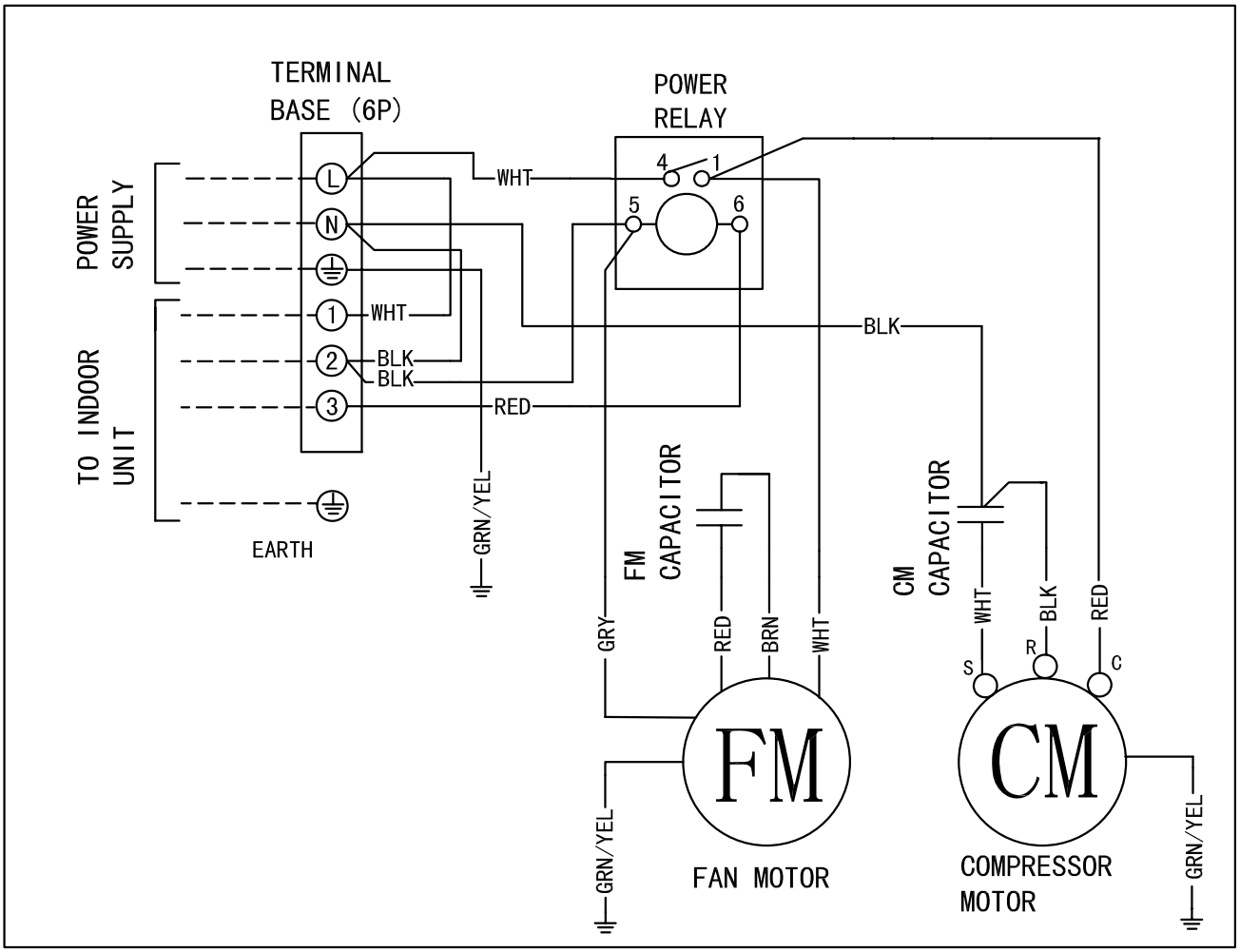
**WARNING** ***To avoid electrical shock hazard, be sure to disconnect power before checking, servicing and/or cleaning any electrical parts.***




8FA2-5250-26800-0

Outdoor Unit **SAP−C186ST**
**SAP−C256ST**

**WARNING** ***To avoid electrical shock hazard, be sure to disconnect power before checking, servicing and/or cleaning any electrical parts.***




8FA2-5250-25200-0

# 7. INSTALLATION INSTRUCTIONS

## 7-1. Installation Site Selection

● Wall-mounted Type

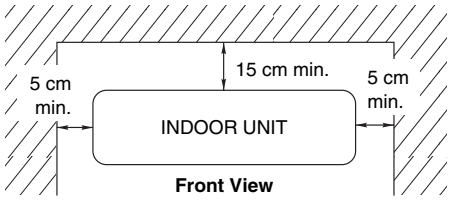



**Fig.1**

Indoor Unit

**WARNING**

**To prevent abnormal heat generation and the possibility of fire, don't place obstacles, enclosures and grilles in front of or surrounding the air conditioner in a way that may block air flow.**

**AVOID:**

- direct sunlight.
- nearby heat sources that may affect performance of the unit.
- areas where leakage of flammable gas may be expected.
- places where large amounts of oil mist exist.

**DO:**

- select an appropriate position from which every corner of the room can be uniformly air-conditioned. (High on a wall is best)
- select a location that will hold the weight of the unit.
- select a location where tubing and drain hose have the shortest run to the outside.
- allow room for operation and maintenance as well as unrestricted air flow around the unit. (Fig. 1)
- install the unit within the maximum elevation difference (H) above or below the outdoor unit and within a total tubing length (L) from the outdoor unit as detailed in Table 1 and Fig. 2a.

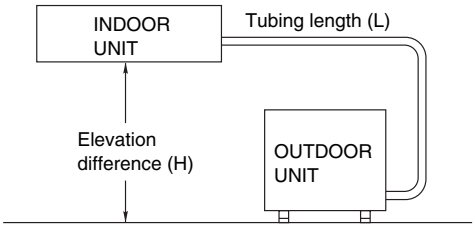



**Fig. 2a**

**CAUTION**

**For stable operation of the air conditioner, do not install wall-mounted type indoor units less than 1.5m from floor level.**

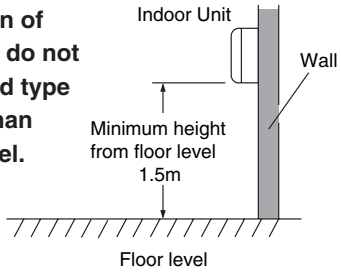



**Fig. 2b**

**Table 1**

| Model | Max. Allowable Tubing Length at Shipment (m) | Limit of Tubing Length (L) (m) | Limit of Elevation Difference (H) (m) | Required Amount of Additional Refrigerant (g/m)* |
|---|---|---|---|---|
| K186ST | 5 | 30 | 7 | 20 |
| K256ST | 7.5 | 30 | 7 | 25 |

* If total tubing length becomes 5 or 7.5 to 30m (max.), charge additional refrigerant (R22) by 20 g/m or 25 g/m. No additional charge of compressor oil is necessary.

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

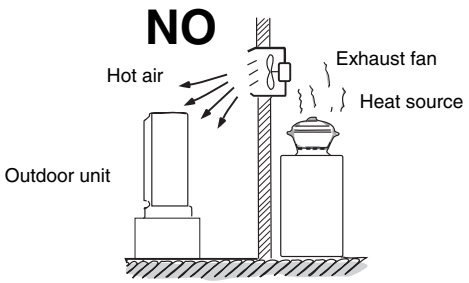
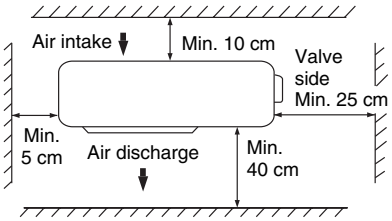


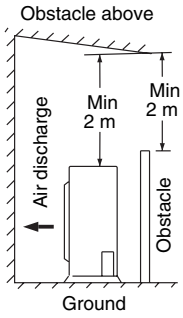

**Fig. 3**

**Required space around the unit.**




**Top View**

**Fig. 4a**




**Side View**

**Fig. 4b**

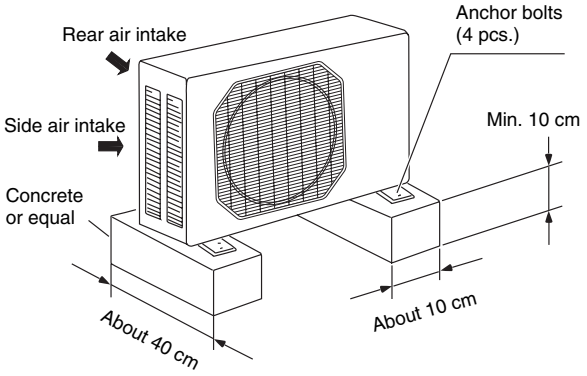



**Fig. 4c**

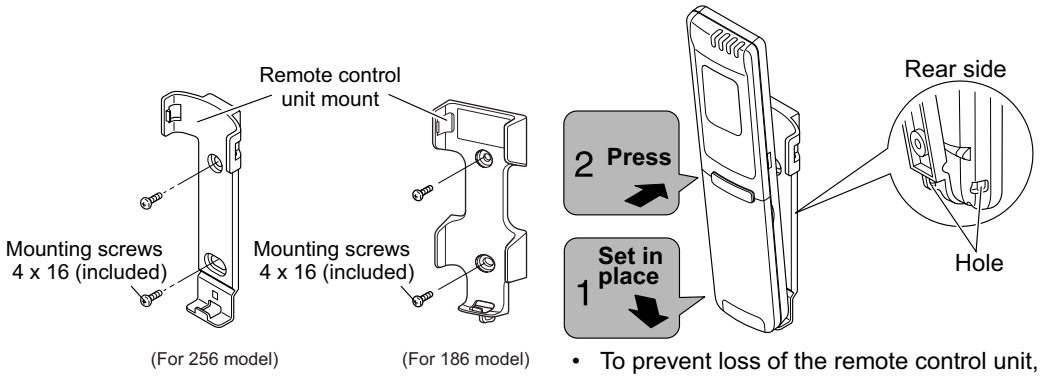
## 7-2. Remote Control Unit Installation Position

The remote control unit can be operated from either a non-fixed position or a wall-mounted position.
To ensure that the air conditioner operates correctly, do not install the remote control unit in the following places:

- In direct sunlight
- Behind a curtain or other place where it is covered
- More than 8 m away from the air conditioner
- In the path of the air conditioner's airstream
- Where it may become extremely hot or cold
- Where it may be subject to electrical or magnetic interference
- Where there is an obstacle between the remote control unit and air conditioner (since a check signal is sent from the remote control unit every 5 minutes)

**Attaching the remote control unit to wall**

Before mounting the remote control unit, press the ON/OFF operation button at the mounting location to make sure that the air conditioner operates from that location (Fig.5). The indoor unit should make a beeping sound to indicate that it has received the signal.




• To prevent loss of the remote control unit, you can connect the remote control unit to the mount by passing a string through the remote control unit and attachment hole.

**Fig.5**

## 7-3. Recommended Wire Length and Diameter

Regulations on wiring diameter differ from locality to locality. For field wiring requirements, please refer to your local electrical codes. Carefully observe these regulations when carrying out the installation.

Table 2 lists recommended wire lengths and cross section area for power supply systems.

**NOTE**

Refer to the WIRING SYSTEM DIAGRAM for the meaning of "A" "B", and "C" in Table 2.

**Table 2**

| Cross Sectional Area ($mm^2$) / Model | (A) + (B) (A) Power Supply Wiring Length (m) (B) Power Line Length (m) | | Fuse or Circuit Breaker Capacity |
|---|---|---|---|
| | 2 $mm^2$ | 3.5 $mm^2$ | |
| C186 | 27 | 41 | 15A |

| Cross Sectional Area ($mm^2$) / Model | (A) Power Supply Wiring Length (m) | | | | (C) Control Line Length (m) (B) Power Line Length (m) | Fuse or Circuit Breaker Capacity |
|---|---|---|---|---|---|---|
| | 3.5 $mm^2$ | 5.5 $mm^2$ | 8 $mm^2$ | 14 $mm^2$ | 2 $mm^2$ | |
| C256 | 18 | 32 | 48 | 77 | 30 | 30A |

**WARNING**

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

**WARNING**

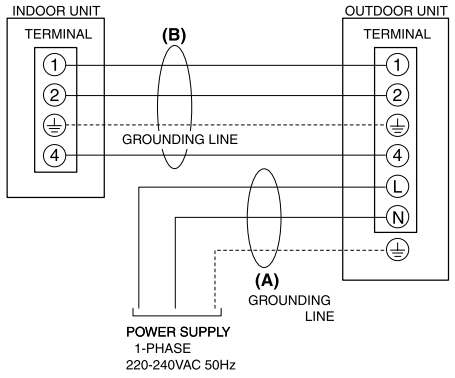
**To avoid the risk of electric shock, each air conditioner unit must be grounded.**

**CAUTION**

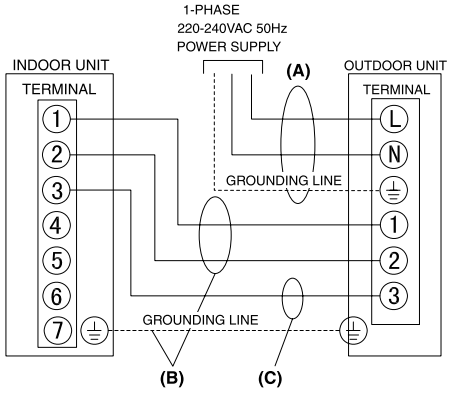
- **Be sure to connect the power supply line to the outdoor unit as shown in the wiring diagram. The indoor unit draws its power from the outdoor unit.**

### WIRING SYSTEM DIAGRAM

For **186ST** model:



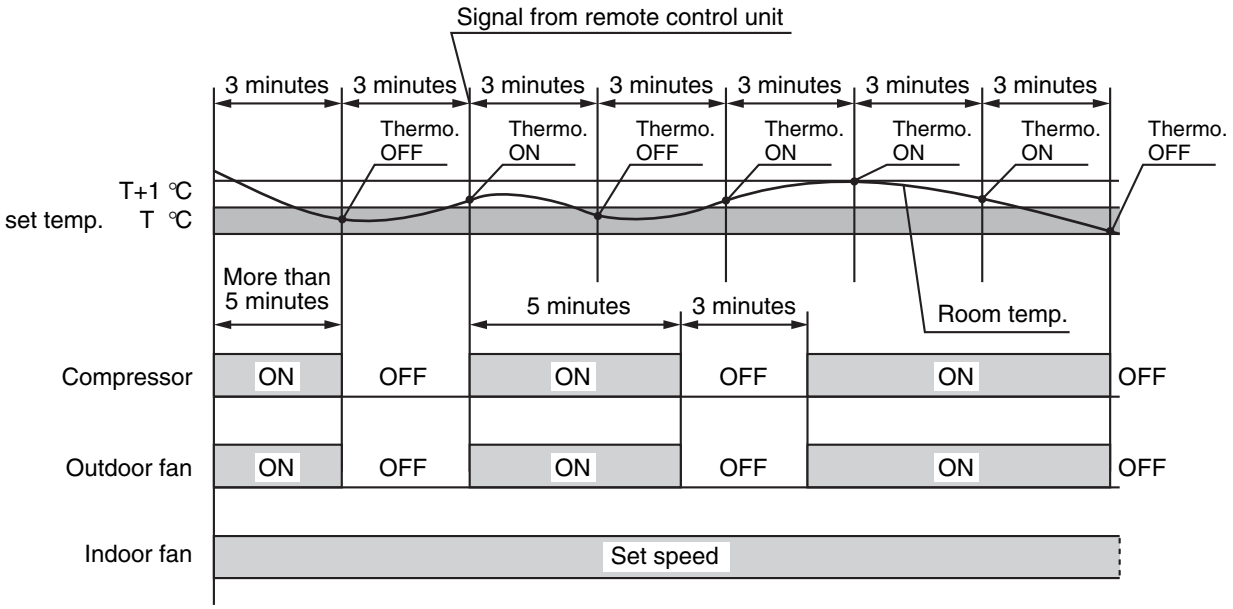

For **256ST** model:



# 8. FUNCTION

## 8-1. Room Temperature Control

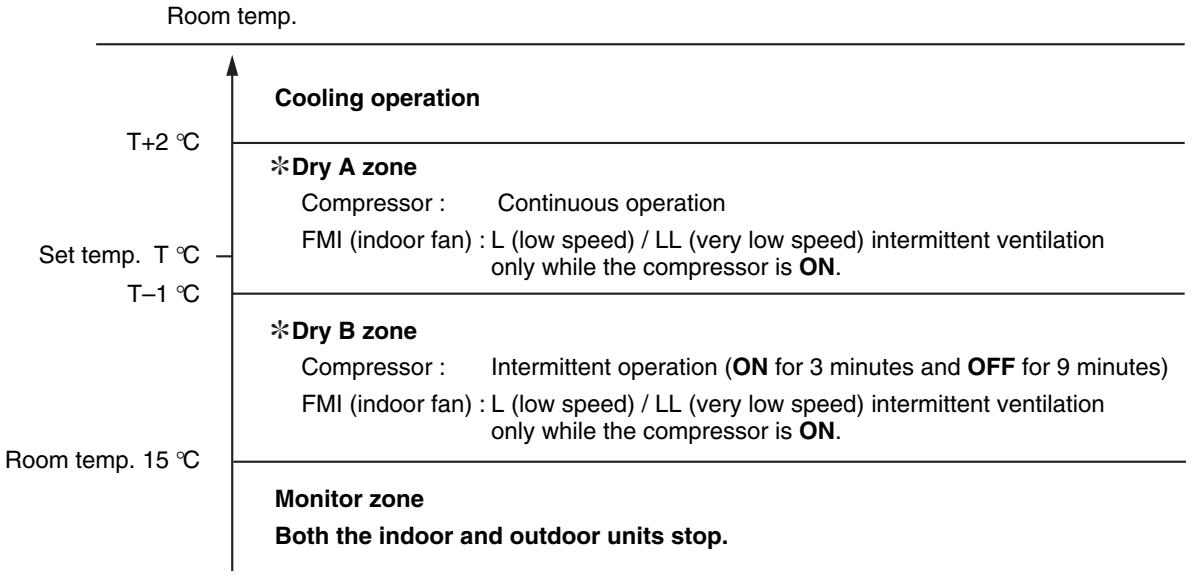
- Room temperature control is obtained by cycling the compressor ON and OFF under control of the room temperature sensor in the remote control unit.
- The room temperature (and other information) is transmitted every 3 minutes by the remote control unit to the controller in the indoor unit.




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

## 8-2. 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 cycle of turning ON and OFF automatically as shown in the chart below according to the room temperature.

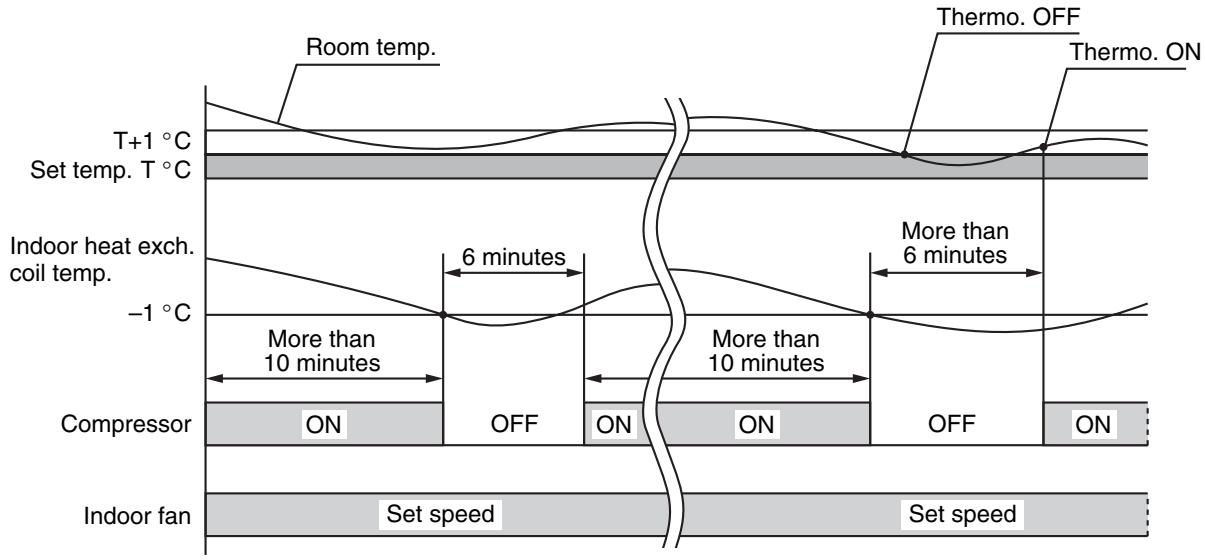



**NOTE**

- 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.

## 8-3. Freeze Prevention

- This function prevents freezing of the indoor heat exchange coil.
- When the compressor has been running for 10 minutes or more and the temperature of the indoor heat exchange coil falls below –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.



# 9. TROUBLESHOOTING

## 9-1. Check before and after troubleshooting

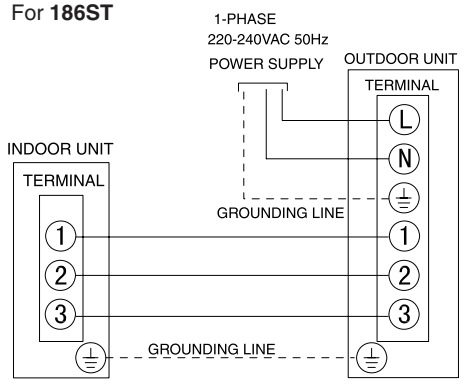
**WARNING**

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

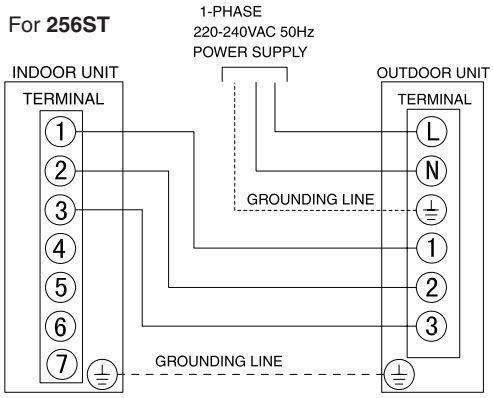
### 9-1-1. Check power supply wiring.

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

For **186ST**




For **256ST**




### 9-1-2. Check inter-unit wiring.

- Check that inter-unit wiring is correctly connected between indoor unit and outdoor unit.

### 9-1-3. Check power supply.

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

### 9-1-4. 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.

## 9-2. Air conditioner does not operate.

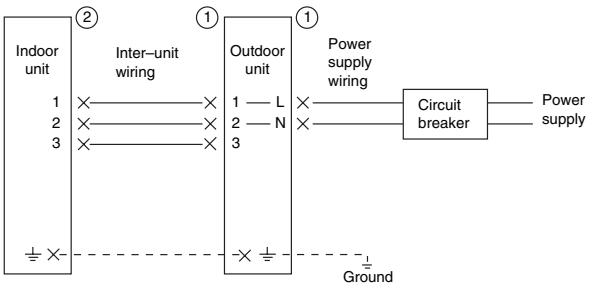
### 9-2-1. Circuit breaker trips (or fuse blows).

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

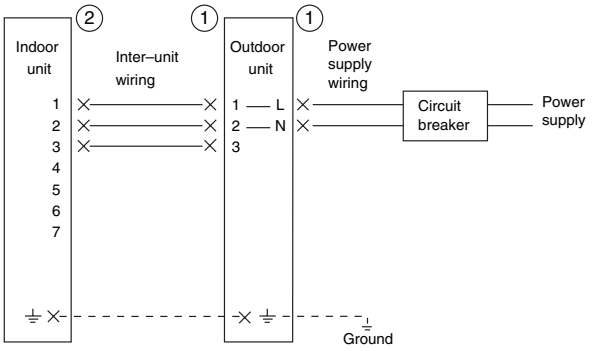
- There is a possibility of ground fault.
- Check insulation resistance.

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

For **186ST**




For **256ST**




**WARNING**

*Set circuit breaker to OFF.

① Remove both power supply wires and 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.

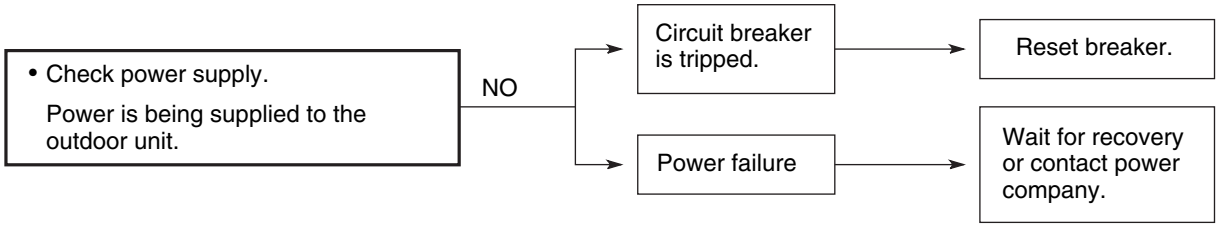
② Remove inter-unit wires from terminal plate in indoor unit.
- Measure insulation resistance of indoor unit.

NO → Insulation of indoor unit is defective.

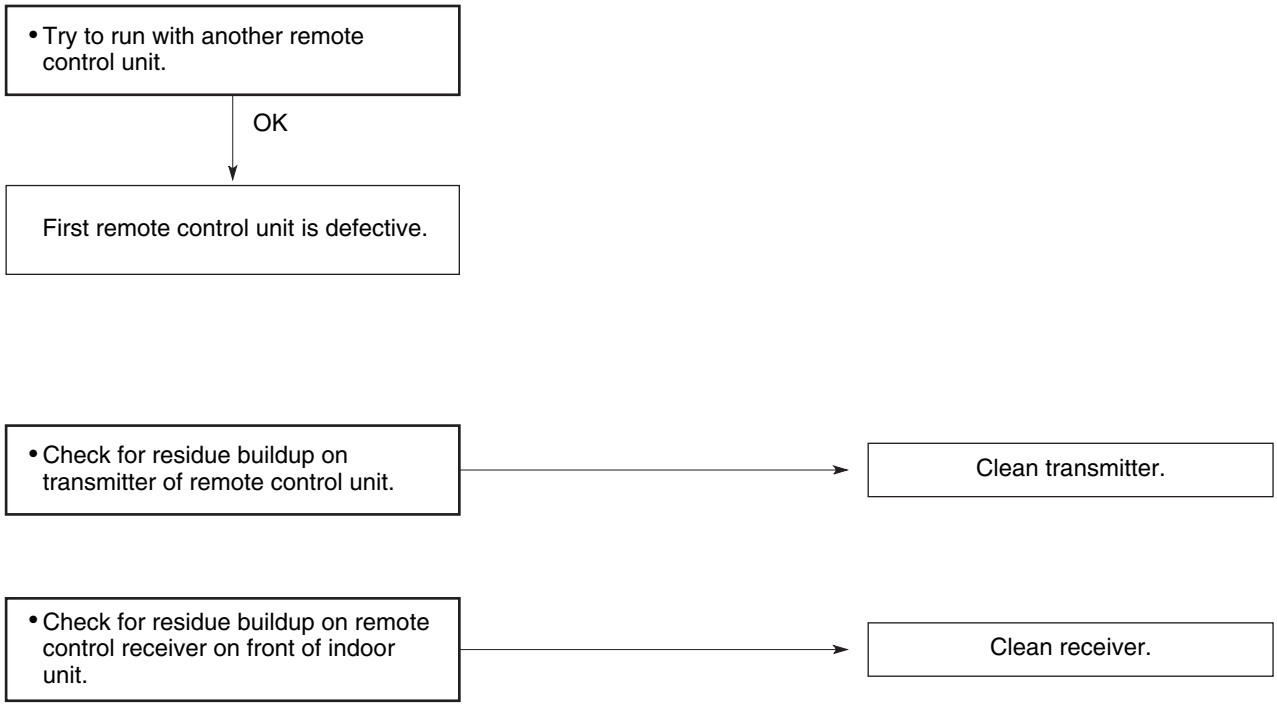
- Measure insulation resistance of electrical parts in indoor unit.

## 9-2-2. Neither indoor nor outdoor unit runs.

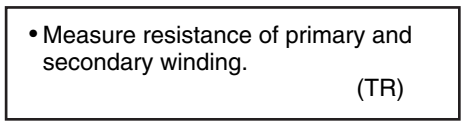
### A. Power is not supplied.



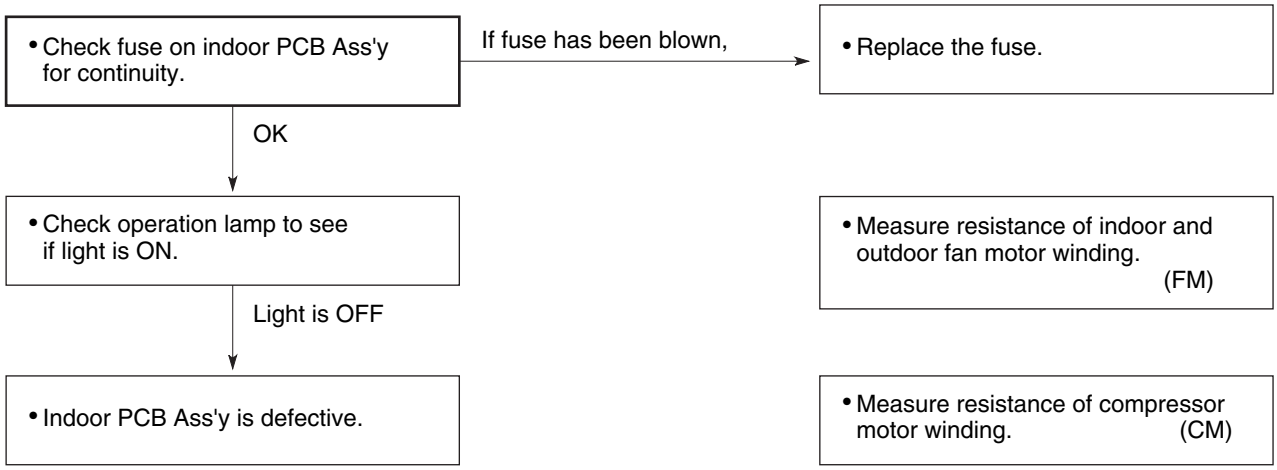

### B. Check remote control unit.




### C. Check transformer in the indoor unit.



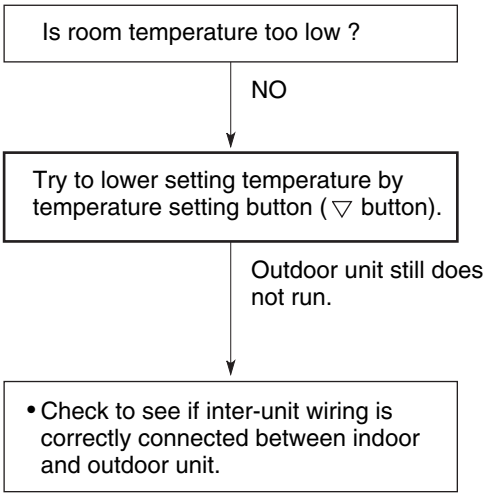
**D. Check fuse on the indoor PCB Ass'y.**



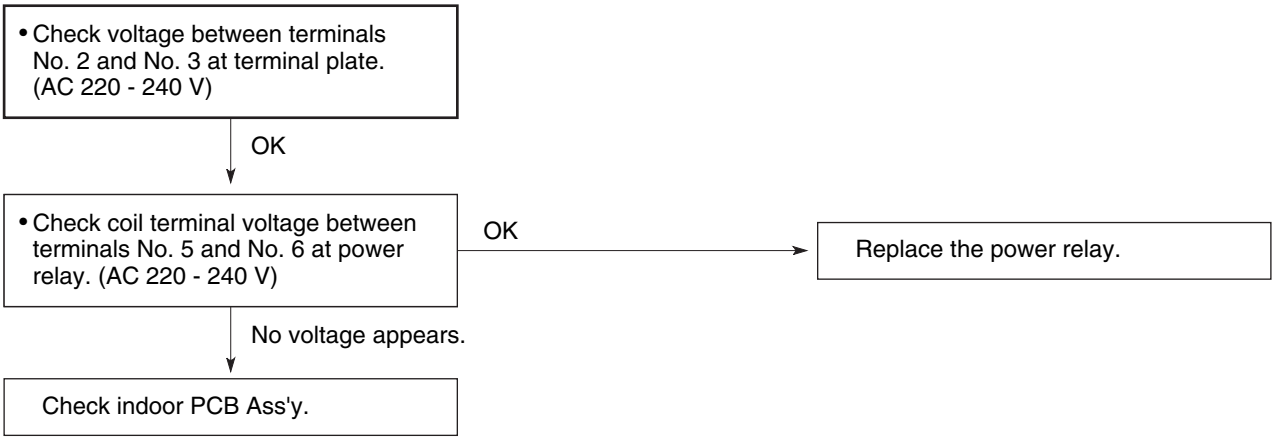

**E. Check TIMER on the remote control unit.**

## 9-2-3. Only outdoor unit does not run.

### A. Check setting temperature.

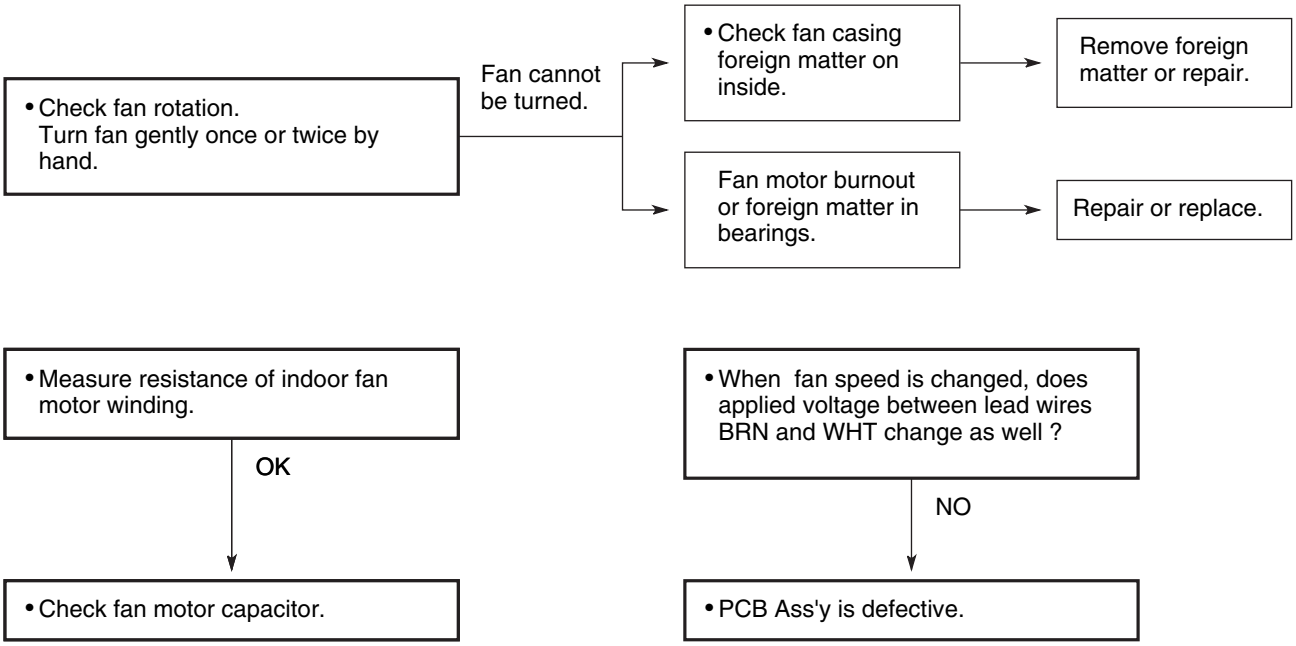



### B. Check power relay in outdoor unit.

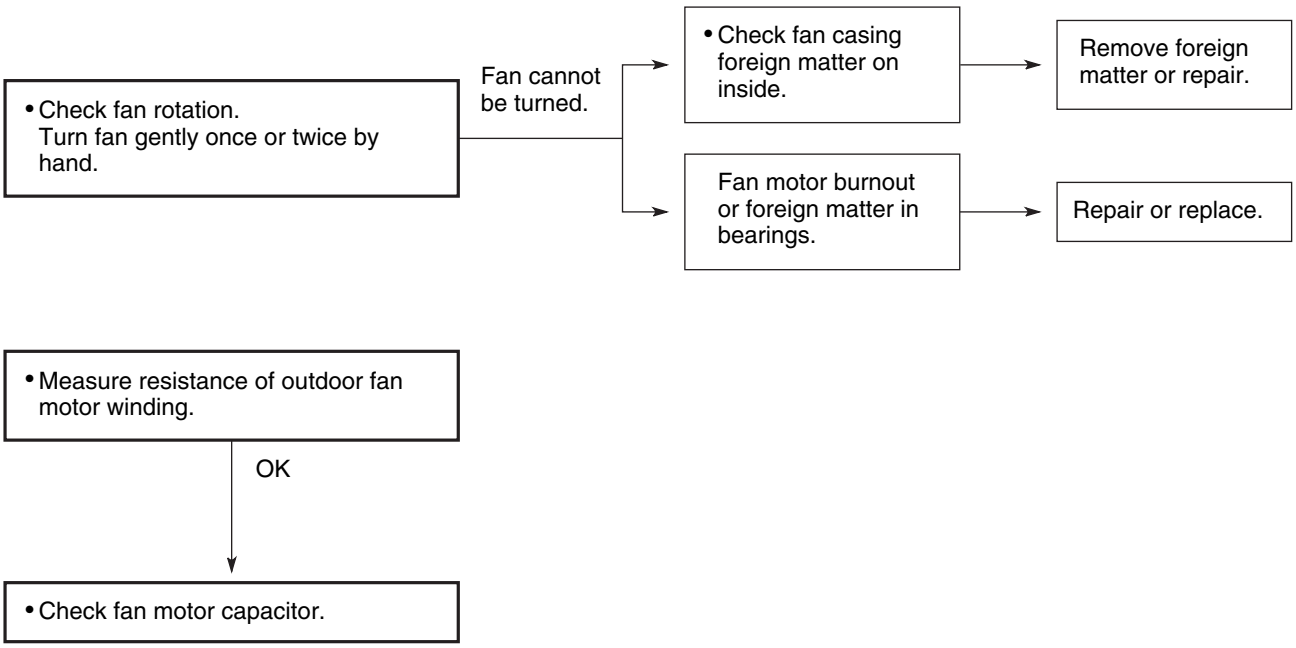


## 9-3. Some part of air conditioner does not operate.

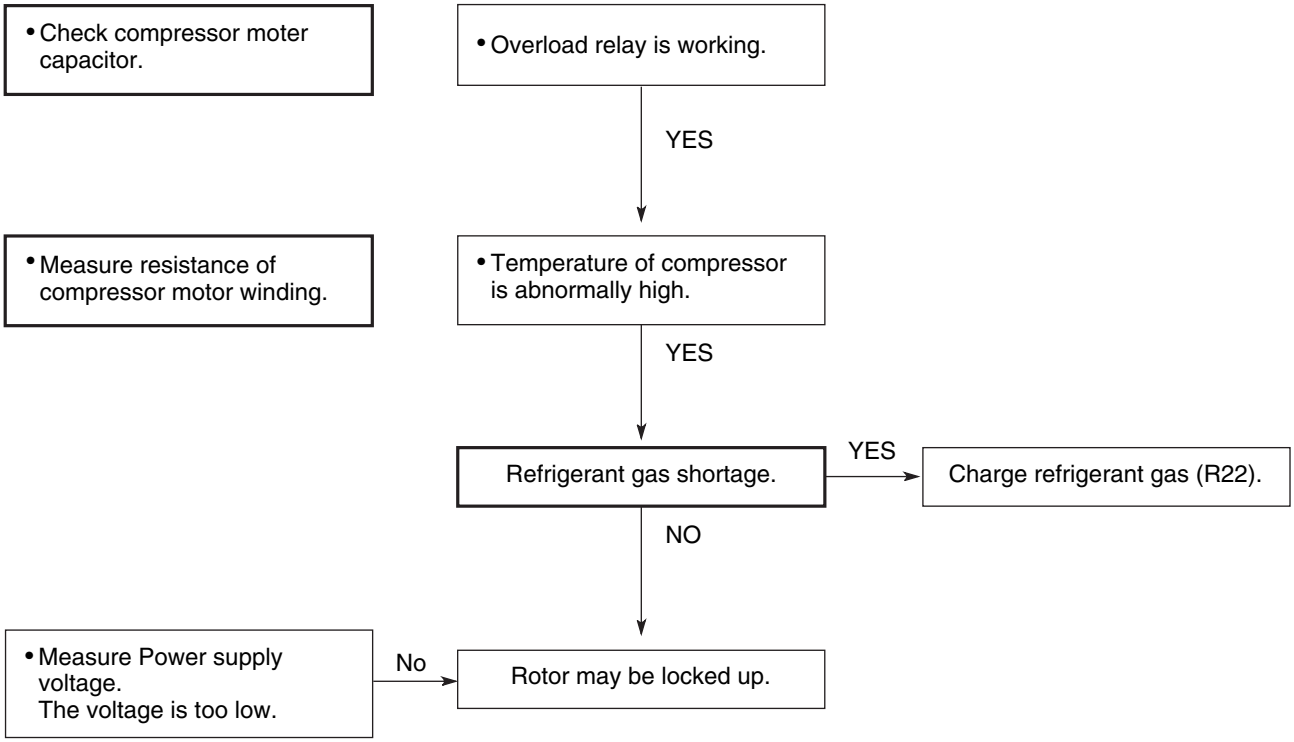
### 9-3-1. Only indoor fan does not run.



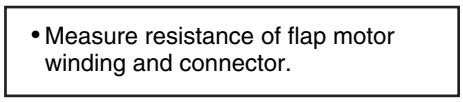

### 9-3-2. Only outdoor fan does not run.



## 9-3-3. Only compressor does not run.

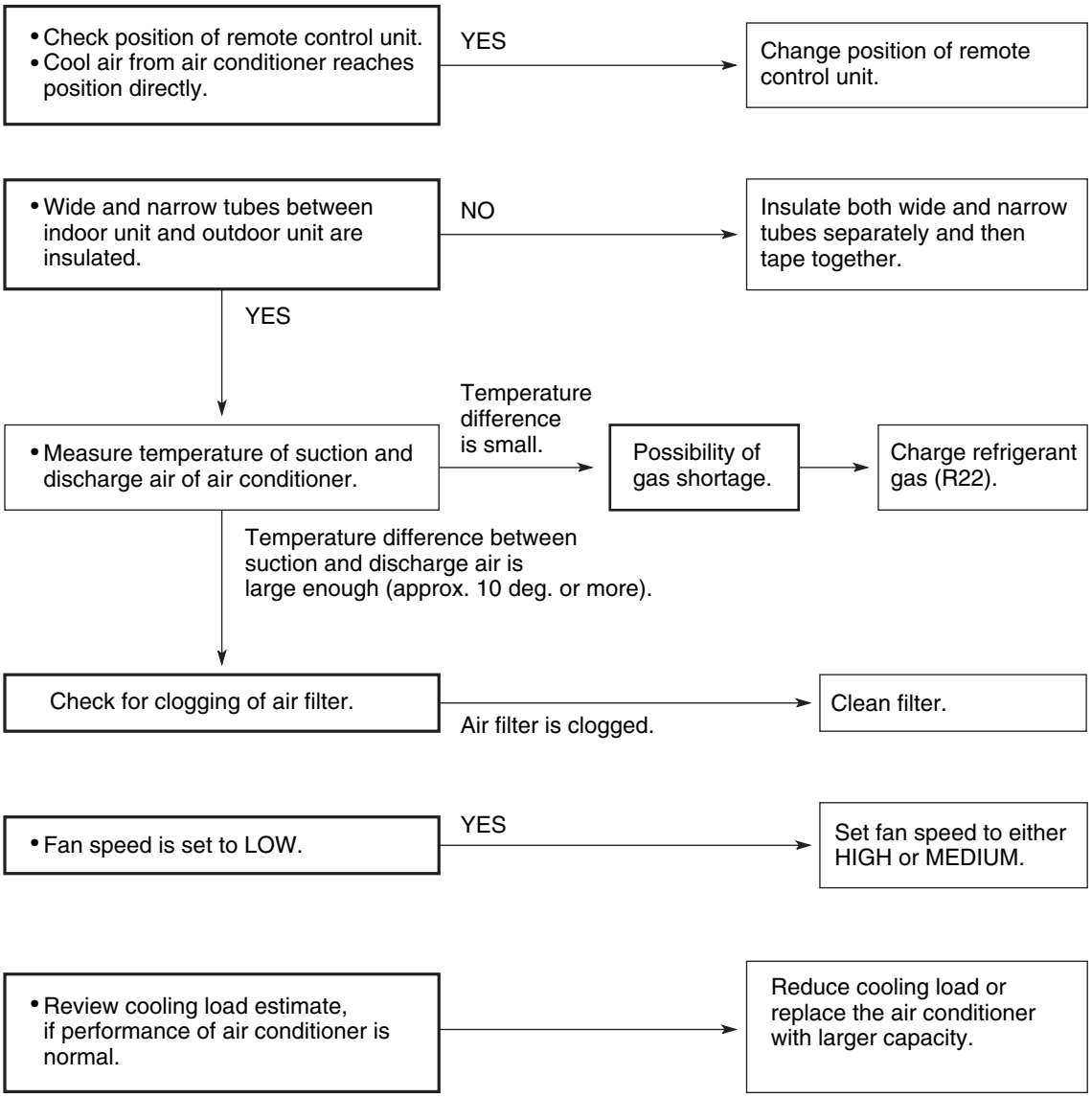



## 9-3-4. Only flap motor does not run.

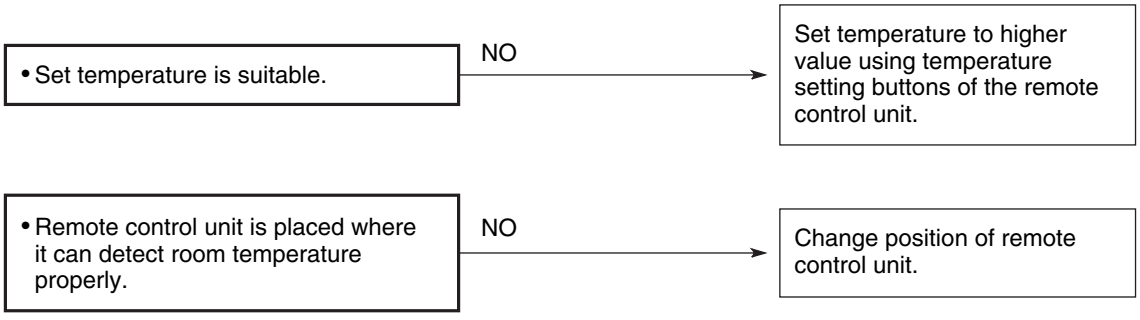


## 9-4. Air conditioner operates, but abnormalities are observed.

### 9-4-1. Poor cooling or heating.




### 9-4-2. Excessive cooling or heating.



# 10. CHECKING ELECTRICAL COMPONENTS

## 10-1. Measurement of Insulation Resistance

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

### 10-1-1. Power Supply Wires

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

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

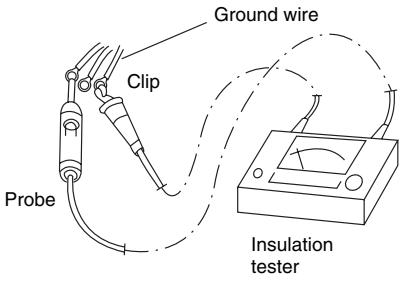



**Fig. 1**

### 10-1-2. Indoor Unit

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

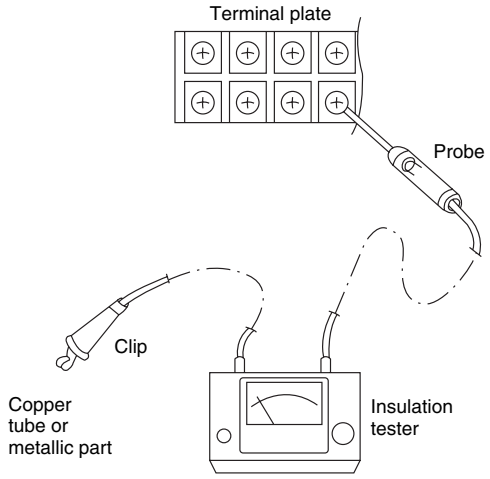



**Fig. 2**

### 10-1-3. Outdoor Unit

Clamp a metallic part of the unit with the lead clip of the insulation resistance tester and measure the resistance by placing a probe on each terminal screw where power supply lines are connected on the terminal plate. (Fig. 2)

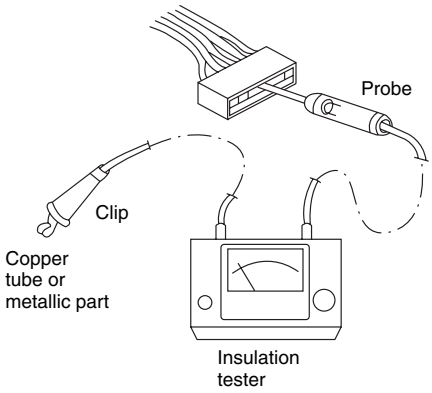



**Fig. 3**

### 10-1-4. 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)

**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.

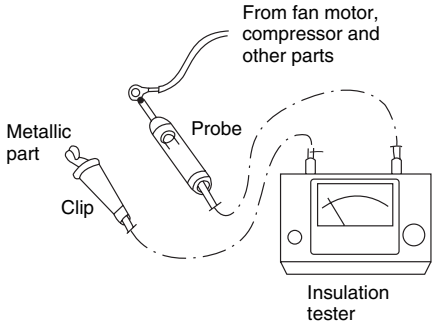



**Fig. 4**

## 10-2. 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.

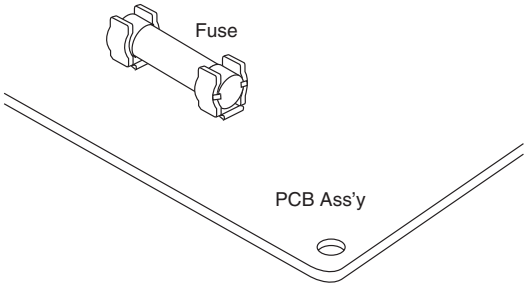



**Fig. 5**

## 10-3. 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.

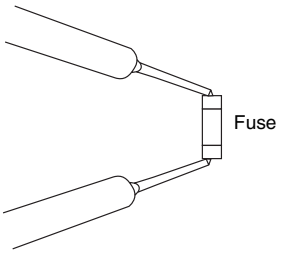



**Fig. 6**

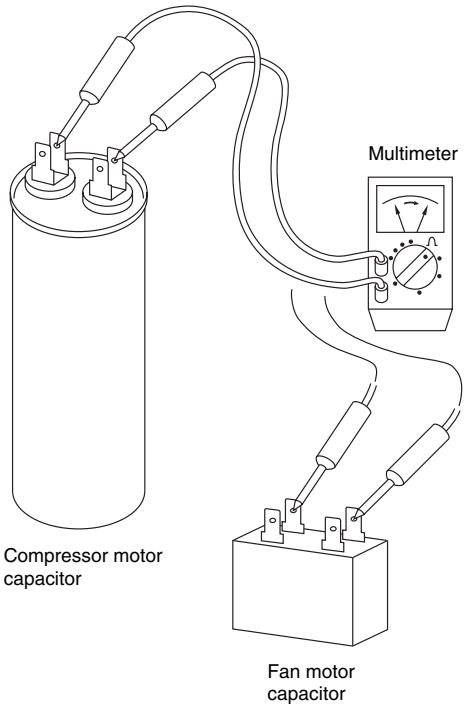



**Fig. 7**

# 11. MAINTENANCE

## 11-1. Address Setting of the Remote Control Unit

The address can be set in order to prevent interference between remote controllers when two indoor units are installed near each other. The address is normally set to “A.” To set a different address, it is necessary to change the address on the second remote controller.

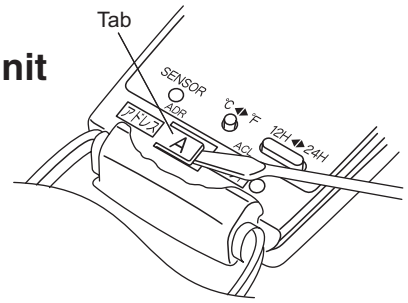



**Fig. 1**

**NOTE**

Once changed, you cannot restore the original address setting of the air conditioner.

(1) Switch on the power source.

(2) Break the address-setting tab marked “A” on the second remote controller to change the address (Fig. 1). When the tab is removed, the address is automatically set to B (Fig. 2).

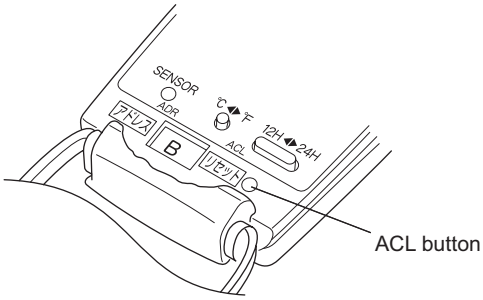



**Fig. 2**

(3) Press and hold the remote controller HIGH POWER button and 1 HR TIMER button. At the same time, press the ACL (reset) button. Use a thin object such as the tip of a pen to press the ACL button. When this has been done, “oP-1” (test run) appears, blinking, in the remote controller clock display area.

(4) Each time the 1 HR TIMER button is pressed, the display changes as shown below. Press this button once to change the display to “oP-7” (address setting). (Fig. 3)

oP-1 Test run mode

oP-7 Address setting mode

(5) “oP-7” has now been selected for address setting.

(6) Press the ON/OFF operation button on the remote controller. (Fig. 3) Check that the “beep” signal-received sound is heard from the second indoor unit (approximately 5 times). The sound you hear is the signal that the remote controller address has been changed.

(7) Finally press the remote controller ACL (reset) button to cancel the blinking “oP-7” display. (Fig. 3)

Changing of the second remote controller address is now completed.

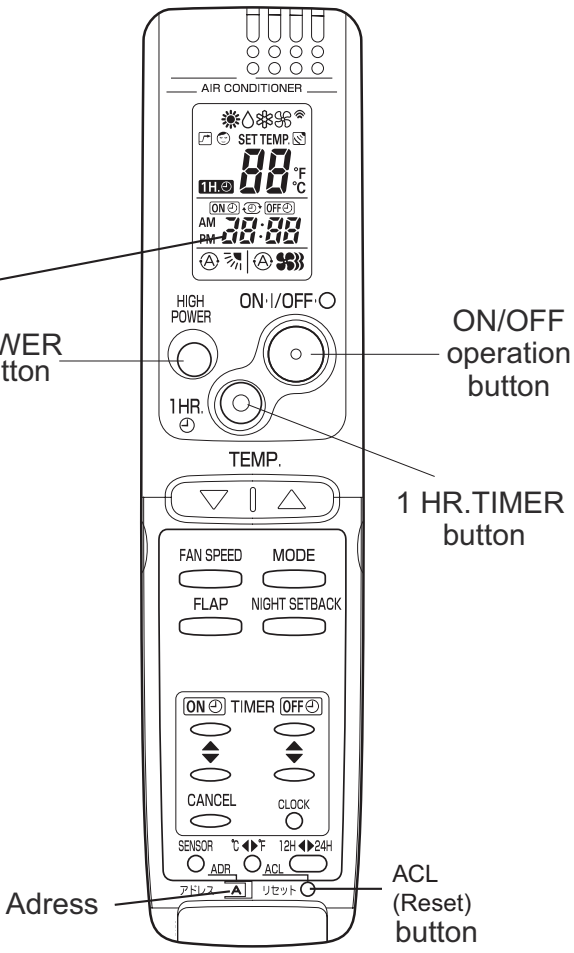
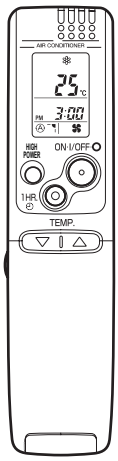


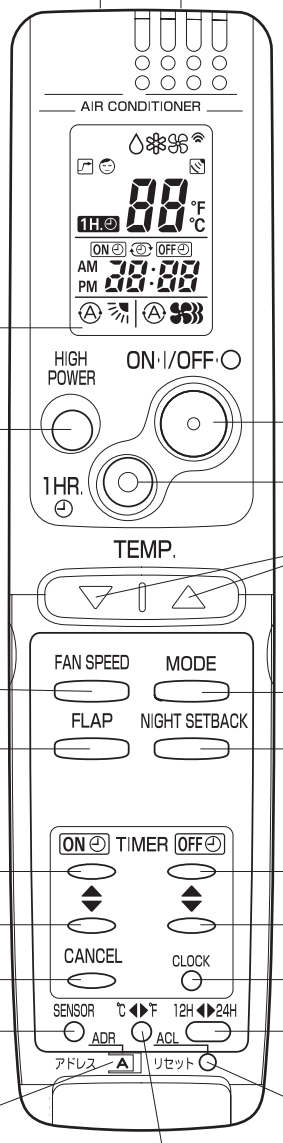

**Fig. 3**

# APPENDIX

## Remote Control Unit

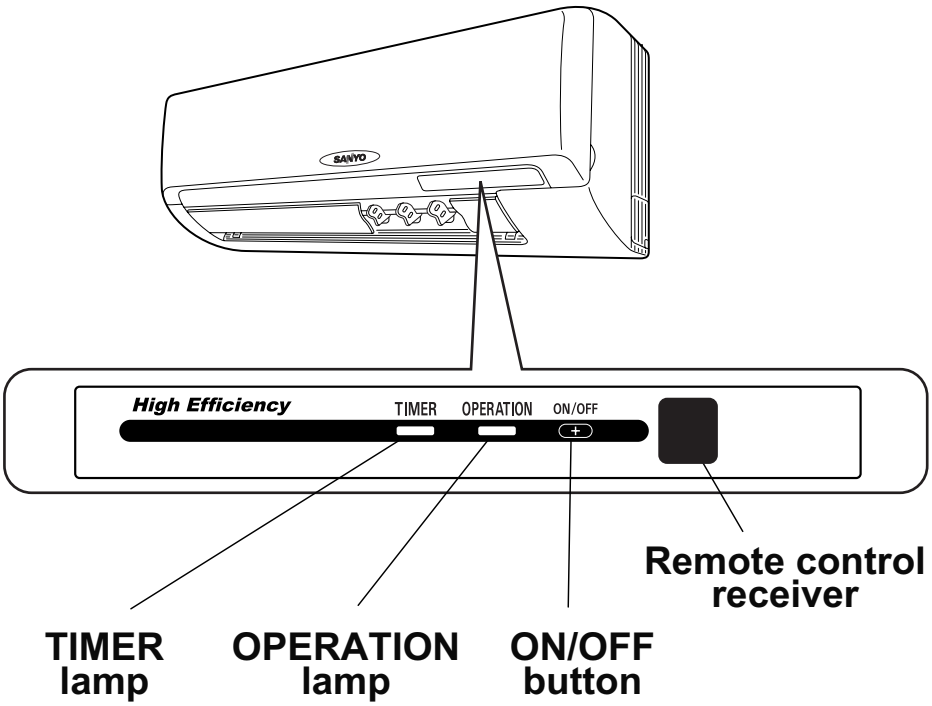


(Cover closed)

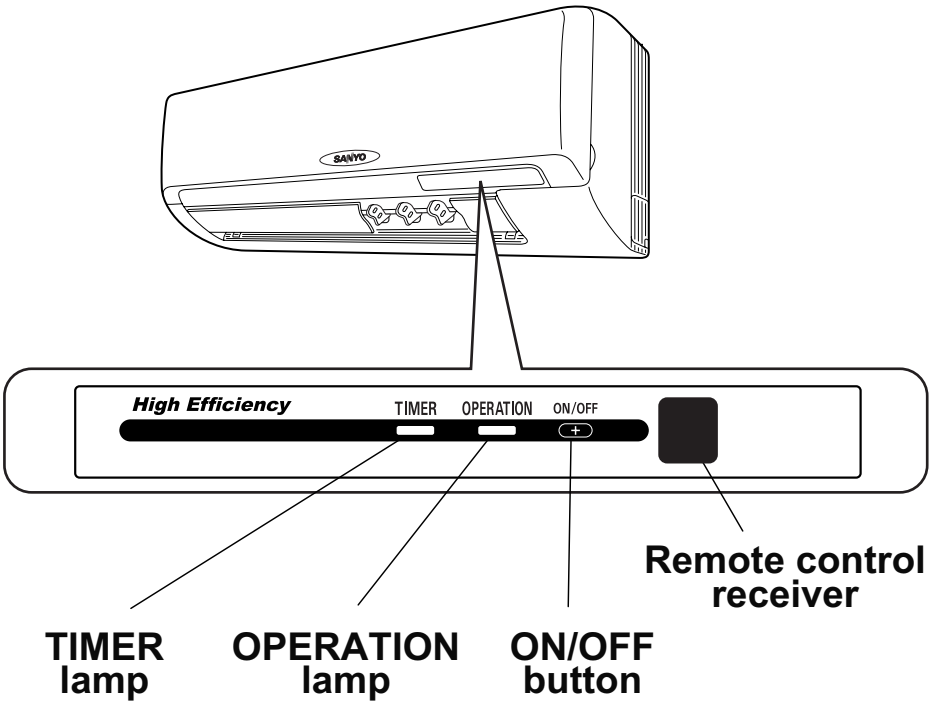


## Unit Display and Operation Button

**SAP-K186ST**




**SAP-K256ST**



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