SA-128S5

WINDOW TYPE AIR CONDITIONER

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Product Code No.</th>
<th>Destination</th>
</tr>
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<tbody>
<tr>
<td>SA-128S5-A</td>
<td>1 851 004 09</td>
<td>General (50Hz) &amp; Europe</td>
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</table>

SA-128S5
IMPORTANT!
Please Read Before Starting
This air conditioner 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 the INSTRUCTION MANUAL and INSTALLATION INSTRUCTIONS attached to each air conditioner 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.

This symbol refers to a hazard or unsafe practice which can result in severe personal injury or death.

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.

SPECIAL PRECAUTIONS

When Wiring

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

• All wiring must conform to local electrical codes.

• Each unit must be properly grounded with a ground (or earth) wire or through the supply wiring.

• DO NOT, under any circumstances, cut or remove the third (ground) prong from the power cord plug.

• DO NOT use an adapter Plug or extension cord.

• DO NOT use a damaged power cord, plug, or wall outlet. Replace them immediately.

When Transporting

Be careful when picking up and moving the air conditioner. 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

Place of Installation

• If possible, install the unit in a shady location. If the site is exposed to the sun, you should provide a sun screen as shown in Fig. a.

• Install it at a spot where optimum cooling circulation can be obtained. No chairs or other obstructions are allowed in front of the air conditioner.

• The back of the air conditioner must extend outside. (Be sure the right and left intake vents are not obstructed by walls or windows.)

• Keep more than 50 cm from any outside obstruction (wall, bush, etc.).

• To provide water drainage, the unit must be tilted at a downward angle 0.5 to 1 cm to the outside.

• While installing the air conditioner, be sure to loosen the Fig. a

compressor locking nuts to avoid abnormal noise and vibration. (NOTE: Locking nuts are not provided on some models.)

• As a safety measure, it is recommended that two people install the unit: one to hold and balance the unit — the other to lower the window frame to secure the unit.

• Hold the unit securely, and be careful to not drop the cabinet or any parts if the air conditioner is being installed on an upper floor of a multistory building.

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 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 tools have been left inside the unit being serviced.

Others

• 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.
**HOW TO USE THIS MANUAL**

This manual is designed to help service personnel to understand basic functions, operation and possible troubles and their remedies on SANYO window type air conditioners. You can use this manual both as a reference to find specific information about the capacity, construction of the unit, and as a source of information to help you set up and maintain the air conditioner. Please use this manual to make your work easier, keep the air conditioner functioning well, and keep your customer satisfied.

Please read IMPORTANT ! precautional information on the previous page before you start actual work.

**SANYO WINDOW TYPE A/C NOMENCLATURE**

SANYO window type air conditioner is identified by a model number. Cooling or heating capacity, electrical information and special features included on the air conditioner are indicated on the model number.

<table>
<thead>
<tr>
<th>Example</th>
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<tr>
<td>SA – 12 8 S 5</td>
<td>Type: SA : SANYO window type A/C</td>
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<tr>
<td></td>
<td>Capacity: 12 : 12,000 BTU/h class</td>
</tr>
<tr>
<td></td>
<td>Design Number</td>
</tr>
<tr>
<td></td>
<td>Voltage / Frequency: 5 : 220-240V, 50Hz, Single phase</td>
</tr>
<tr>
<td></td>
<td>Special Features: S : Mechanical Control, Side Air Discharge</td>
</tr>
</tbody>
</table>

**NOTE**

To identify the correct model number of your air conditioner, you must find the nameplate.
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<table>
<thead>
<tr>
<th>Temperature</th>
<th>Indoor Air Intake Temp.</th>
<th>Outdoor Air Intake Temp.</th>
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<tbody>
<tr>
<td><strong>Cooling</strong></td>
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<tr>
<td>Maximum</td>
<td>32°C D.B. / 23°C W.B.</td>
<td>43°C D.B.</td>
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<tr>
<td>Minimum</td>
<td>19°C D.B. / 14°C W.B.</td>
<td>19°C D.B.</td>
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# 2. SPECIFICATIONS

## 2-1. Unit Specifications

**Model**  
SA–128S5

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<thead>
<tr>
<th>Power Source</th>
<th>220–240V Single phase 50Hz</th>
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<tbody>
<tr>
<td>Voltage rating</td>
<td>220 / 230 / 240 V</td>
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### Performance

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<th>Capacity kW</th>
<th>3.50 / 3.55 / 3.55</th>
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<td>BTU/h</td>
<td>11,900 / 12,100 / 12,100</td>
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<table>
<thead>
<tr>
<th>Air circulation (High) m³/h</th>
<th>620</th>
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</thead>
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<tr>
<td>Moisture removal (High) Liters/h</td>
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### Electrical Rating

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<th>Available voltage range V</th>
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<td>Running amperes A</td>
<td>6.3 / 6.2 / 6.2</td>
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<tr>
<td>Power input W</td>
<td>1,300 / 1,340 / 1,360</td>
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<td>Power factor %</td>
<td>94 / 94 / 91</td>
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<tr>
<td>C.O.P. W/W</td>
<td>2.69 / 2.65 / 2.61</td>
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<tr>
<td>Starting amperes A</td>
<td>34</td>
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### Features

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<th>Controls / Temperature control</th>
<th>Mechanical / Thermostat</th>
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<td>Control unit</td>
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<tr>
<td>Timer</td>
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<tr>
<td>Fan speeds</td>
<td>2</td>
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<td>Airflow direction (Indoor)</td>
<td>Horizontal / Manual</td>
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<tr>
<td>Compressor</td>
<td>Rotary (Hermetic)</td>
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<td>Refrigerant / Amount charged at shipment g</td>
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<tr>
<td>Refrigerant control</td>
<td>Capillary tube</td>
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<td>Operation sound Indoor : Hi / Lo dB-A</td>
<td>52 / 50</td>
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<td>Outdoor : Hi / Lo dB-A</td>
<td>56 / 52</td>
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<tr>
<td>Slide-out chassis</td>
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<td>Accessories</td>
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### Dimensions & Weight

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<td>Depth mm</td>
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<td>Depth mm</td>
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<tr>
<th>Weight</th>
<th>Net kg</th>
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<tr>
<td>Shipping kg</td>
<td>47.0</td>
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</table>

| Shipping volume m³ | 0.19 |

**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.
## 2-2. Major Component Specifications

**Model** SA–128S5

### Controller PCB

| Part No. | — |
| Controls | — |
| Control circuit fuse | — |

### Remote Control Unit

| — |

### Compressor

- **Type**: Rotary (Hermetic)
- **Compressor model**: C-R110HSH 80619445
- **Source**: 220–240V Single phase 50Hz
- **Nominal output**: W 1,100
- **Compressor oil Amount**: cc SUNISO 4GSD-T 550
- **Coil resistance (Ambient temp. 25°C)**: Ω C–R : 1.962
  
  C–S : 5.38
- **Safety devices** Type External protector
  
  Overload relay MRA98619-9200
  
  Operating temp. Open °C 150±5
  
  Close °C 69±11
  
  Operating amp. (Ambient temp. 25°C) Trip in 6 to 16 sec. at 22.5A
- **Run capacitor**: µF VAC 25.0 400

### Fan & Fan Motor

| Indoor | Outdoor |
| — | — |

- **Type**: Centrifugal Propeller
- **Dia. / Depth**: ø210 / D96 ø320 / D —
- **Fan motor model Q'ty**: YSK70-4A-661 1
- **Source**: 220–240V Single phase 50Hz
- **No. of poles rpm (230 V, High)**: 4 1,010
- **Nominal output**: W 20
- **Coil resistance (Ambient temp. 20°C)**: Ω WHT-BRN : 60.0
  
  WHT-YEL : 19.6
  
  YEL-ORG(PNK) : 62.7
- **Safety devices** Type Internal protector
  
  Operating temp. Open °C 130±5
  
  Close °C Automatic reclosing
- **Run capacitor**: µF VAC 3.5 440

### Heat Exch. Coil

| Coil | Evaporator | Condenser |
| — | — | — |

- **Rows**: 2 3
- **Fin pitch**: mm 1.4 1.6
- **Face area**: m² 0.095 0.155

### External Finish

| — |

Acrylic baked-on enamel finish

DATA SUBJECT TO CHANGE WITHOUT NOTICE.
2-3. Other Component Specification

Model SA–128S5

<table>
<thead>
<tr>
<th>Auto Deflector Motor</th>
<th>M16B</th>
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</thead>
<tbody>
<tr>
<td>Rating</td>
<td>AC 220-240V, 50/60Hz, 3 W, 4.2/5.0 rpm</td>
</tr>
<tr>
<td>Coil resistance</td>
<td>11.15 ± 5%</td>
</tr>
<tr>
<td>(at 25°C)</td>
<td></td>
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</tbody>
</table>
3. DIMENSIONAL DATA

Model SA–128S5

Unit: mm

NOTE
Dimension with “*” mark indicates the maximum allowable wall thickness required for ventilating the unit.
4. REFRIGERANT FLOW DIAGRAM

Model  SA–128S5
### 5. PERFORMANCE DATA

#### 5-1. Cooling Capacity

**Model**  
SA–128S5

240V Single Phase 50Hz

<table>
<thead>
<tr>
<th>RATING CAPACITY</th>
<th>3.55 kW</th>
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<tr>
<td>AIR FLOW RATE</td>
<td>620 m³/h</td>
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<table>
<thead>
<tr>
<th>EVAPORATOR</th>
<th>CONDENSER</th>
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<tbody>
<tr>
<td>ENT. TEMP. °C</td>
<td>OUTDOOR AMBIENT TEMP. °C</td>
</tr>
<tr>
<td>W.B.</td>
<td>D.B.</td>
</tr>
<tr>
<td>TC</td>
<td>CM</td>
</tr>
<tr>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>15</td>
<td>17</td>
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<table>
<thead>
<tr>
<th>W.B.</th>
<th>D.B.</th>
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<th>25</th>
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<td>2.32</td>
<td>2.24</td>
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<td>2.22</td>
<td>2.12</td>
<td>2.02</td>
</tr>
</tbody>
</table>

**TC**: Total Cooling Capacity (kW)  
**SHC**: Sensible Heat Capacity (kW)  
**CM**: Compressor Input (kW)  

Rating conditions (#Mark) are  
Outdoor Ambient Temp. 35°C D.B.  
Indoor Unit Entering Air Temp. 27°C D.B. / 19°C W.B.
# 6. ELECTRICAL DATA

## 6-1. Electrical Characteristics

**Model**   \( \text{SA–128S5} \)

<table>
<thead>
<tr>
<th>Performance at</th>
<th>Fan Motor</th>
<th>Compressor</th>
<th>Complete Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rating Conditions</strong></td>
<td>Running Amps. A</td>
<td>0.69 / 0.73</td>
<td>5.6 / 5.5</td>
</tr>
<tr>
<td></td>
<td>Power Input kW</td>
<td>0.152 / 0.173</td>
<td>1.15 / 1.19</td>
</tr>
<tr>
<td><strong>Full Load Conditions</strong></td>
<td>Running Amps. A</td>
<td>0.69 / 0.73</td>
<td>7.2 / 7.0</td>
</tr>
<tr>
<td></td>
<td>Power Input kW</td>
<td>0.152 / 0.173</td>
<td>1.52 / 1.55</td>
</tr>
</tbody>
</table>

**Rating Conditions**: Indoor Air Temperature 27°C D.B. / 19°C W.B.
Outdoor Air Temperature 35°C D.B.

**Full Load Conditions**: Indoor Air Temperature 32°C D.B. / 23°C W.B.
Outdoor Air Temperature 43°C D.B.
6-2. Electrical Wiring Diagrams

Model  SA-128S5

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

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

DATA SUBJECT TO CHANGE WITHOUT NOTICE.
7. TROUBLESHOOTING

7-1. Check before and after troubleshooting

7-1-1. Check power supply.
- Check that voltage is in specified range (±10% of the rating).
- Check that power is being supplied.

7-1-2. Check lead wires and connectors.
- Check that coating of lead wires is not damaged.
- Check that lead wires and connectors are firmly connected.
- Check that wiring is correct.

WARNING
Hazardous voltage can cause ELECTRIC SHOCK or DEATH. Disconnect power or turn off circuit breaker before you start checking or servicing.
7-2. Air conditioner does not operate.
7-2-1. 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”).

1. If any poorly insulated part is found, exclude that part from circuit with other parts properly connected, and then measure insulation resistance of entire air conditioner again to locate defective part.
2. Replace defective part with new one.

**WARNING**
* Set circuit breaker to OFF.

1. Pull the power plug out of the wall outlet.
   - Measure insulation resistance of unit.

   Insulation of unit is defective.
   - Measure insulation resistance of electrical parts.
     (Example) Compressor, Fan motor, Capacitor, Relay etc.

**NOTE**

1. If any poorly insulated part is found, exclude that part from circuit with other parts properly connected, and then measure insulation resistance of entire air conditioner again to locate defective part.
2. Replace defective part with new one.

![Diagram of Air Conditioner Wiring](attachment:image.png)
B. Circuit breaker trips in several minutes after turning the air conditioner on.

- There is a possibility of short circuit.

- Check capacity of circuit breaker.
  Capacity of circuit breaker is suitable.

- Measure resistance of fan motor winding.

- Measure resistance of compressor motor winding.

NO

Replace with suitable one (larger capacity).

7-2-2. Neither fan motor nor compressor motor runs.

A. Power is not supplied.

- Check power supply.
  Power is being supplied to the unit.

- Check that OPERATION SELECTOR switch is not set at "OFF".

- Measure resistance of fan motor winding.

- Measure resistance of compressor motor winding.

B. Check OPERATION SELECTOR switch on the control panel.

- If it is set at OFF.

- Set to "ON".

Circuit breaker is tripped.

Reset breaker.

Power failure.

Wait for recovery or contact power company.
7-3. Some part of air conditioner does not operate.

7-3-1. Only fan does not run.

- Check fan rotation. Turn fan gently once or twice by hand.

  Fan cannot be turned.

  - Check fan casing foreign matter on inside.
  - Fan motor burnout or foreign matter in bearings.

  Remove foreign matter or repair.

  - Repair or replace.

- Measure resistance of fan motor winding.

  OK

  - Check fan motor capacitor.

7-3-2. Auto deflector switch does not work.

- Measure resistance of auto deflector motor winding.
7-3-3. Only compressor does not run.

A. Check setting temperature.

Is room temperature too low?

NO

Try to lower setting temperature by thermostat knob COOLER.

B. Check compressor and electrical parts.

* Check compressor motor capacitor.

Overload relay is working.

YES

* Measure resistance of compressor motor winding.

Temperature of compressor is abnormally high.

YES

Refrigerant gas shortage.

YES

Charge refrigerant gas (R22).

NO

Rotor may be locked up.

* Measure power supply voltage. The voltage is too low.

CAUTION

- If the unit is turned off during cooling, DO NOT restart it immediately, as this can damage it. Wait at least three minutes before starting it again.
7-4. Air conditioner operates, but abnormalities are observed.

7-4-1. Poor cooling

- Measure temperature of suction and discharge air of air conditioner.
  - Temperature difference is small.
  - Possibility of gas shortage.
- Charge refrigerant gas (R22).
- Check for clogging of air filter.
- Air filter is clogged.
- Set temperature to higher value using thermostat on the control panel.
- Fan speed is set to LOW.
- YES
  - Set fan speed to HIGH.
- NO
  - Clean filter.
- Possibility of gas shortage.
- Temperature difference between suction and discharge air is large enough (approx. 10 deg. or more).
- Possibility of gas shortage.
- Charge refrigerant gas (R22).
- Check for clogging of air filter.
- Fan speed is set to LOW.
- YES
  - Set fan speed to HIGH.
- NO
  - Clean filter.
- Possibility of gas shortage.
- Temperature difference between suction and discharge air is large enough (approx. 10 deg. or more).
- Possibility of gas shortage.
- Charge refrigerant gas (R22).
- Check for clogging of air filter.

7-4-2. Excessive cooling

- Set temperature is suitable.
- NO
  - Set temperature to higher value using thermostat on the control panel.
- Review cooling load estimate, if performance of air conditioner is normal.
- Reduce cooling load or replace the air conditioner with larger capacity.
8. CHECKING ELECTRICAL COMPONENTS

8-1. Measurement of Insulation Resistance

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

8-1-1. Power Cord and Unit

Clamp the grounding prong of the power plug with a lead clip of the insulation resistance tester and measure the resistance by placing a probe on either of the two power blade. (Fig. 1)

Then, also measure the resistance between the grounding prong and other power blade. (Fig. 1)

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

8-1-2. Measurement of Insulation Resistance for Electrical Parts

Disconnect the lead wires of the desired electric part from terminal plate, switch, capacitor, etc. Similarly disconnect the connector. Then measure the insulation resistance. (Figs. 2 to 3)

Refer to Electric Wiring Diagram.

NOTE
- If the probe cannot enter the poles because the hole is too narrow then use a probe with a thinner pin.
8-2. Checking Motor Capacitor

Remove the lead wires from the capacitor terminals, and then place a probe on the capacitor terminals as shown in Fig. 4. 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.

8-3. Checking Fan Motor Winding

Referring to the electrical diagram, disconnect fan motor connectors, and measure the resistance between each lead wire with a tester. The tester should be set in the X1 range. If the fan motor is hot, allow a few minutes until it gets cooled down.

When the resistances between each lead wire are those listed in “2-2. Major Component Specifications” the fan motor should be normal.

8-4. Checking Compressor Motor Winding

Checking compressor motor winding can be done in the similar manner.

Remove the terminal cover of the compressor motor, set the resistance measuring range of the multimeter to “X1Ω” and check the continuity between each pair out of the 3 terminals as shown in Fig. 5.

Refer to “2-2. Major Component Specifications” for coil resistance.
9. DISASSEMBLY PROCEDURES

Model SA–128S5

**NOTE**
These illustrations are based on a typical view of a standard model. Consequently, the shape may differ from that of the air conditioner which you are servicing.

9-1. Removing Front Grille

(1) Pull out the filter.

(2) Remove the screw holding the grille in place. (Fig. 1)

(3) Slide the side of the grille to the left and right to disengage the tabs on the left and right sides of the grille from the slots.

(4) Pull the bottom portion of the grille toward you while paying attention to the ventilator lever. (Fig. 2 and 4)

**NOTE**
Pulling out too far on the bottom of the grille at this point could damage the tabs at the top. Do not pull the grille out more than 100 mm.

(5) After confirming that the ventilator lever has been disengaged from the grille vent, slide the grille upward to free the two tabs at the top of the grille from the rectangular holes in the top of the cabinet. (Fig. 3 and 4)
9-2. Removing Electrical Component Box

(1) Remove the front grille. (Fig. 5)
Refer to “9-1. Removing Front Grille”

(2) Remove screws securing the electrical component box. (Fig. 6)

9-3. Removing Cabinet

(1) Remove screws holding the unit. (Fig. 7)

(2) Remove the front grille.
Refer to “9-1. Removing Front Grille”

(3) Remove the stopper screw attached to the base pan of the unit (Fig. 8)

(4) While holding top of the cabinet with one hand, grasp the handle with another hand and pull the unit toward you. (Fig. 9)
9-4. Removing Evaporator

(1) Remove screws holding top plate of evaporator. (Fig. 10)

(2) Remove screws holding evaporator. (Fig. 10)

(3) Grasp lower portion of the evaporator with both hands and tilt it slightly and lift it carefully from the drain pan so as not to distort the copper tube.

9-5. Removing Blower Wheel

(1) Remove the evaporator. Refer to "9-4. Removing Evaporator"

(2) Loosen a nut holding blower wheel on motor shaft using hex wrench. (Fig. 11)

(3) Remove the housing of blower wheel.

(4) Extract the blower wheel from the motor shaft.
9-6. Removing Condenser

(1) Remove two splasher plates A and B on both side of condenser. (Fig. 12)
(2) Remove splasher plate C at the back of condenser. (Fig. 12)
(3) Remove other screws holding the condenser. (Fig. 12)
(4) Grasp lower portion of the condenser with both hands and tilt it slightly and lift it carefully from the base pan so as not to distort the copper tube.

9-7. Removing Propeller Fan

(1) Remove the condenser.
   Refer to "9-6. Removing Condenser"
(2) Loosen a nut holding propeller fan on motor shaft using hex. wrench. (Fig. 13)

   **NOTE**

   To loose the nut securing the propeller fan, hold the fan with one hand and turn the nut COUNTERCLOCKWISE with another hand.

(3) Extract the propeller fan from the motor shaft.

9-8. Removing Fan Motor

(1) Remove blower wheel.
   Refer to "9-5. Removing Blower Wheel"
(2) Remove propeller fan.
   Refer to "9-7. Removing Propeller Fan"
(3) Disconnect motor lead wires.
   Refer to "9-2. Removing Electrical Component Box"
(4) Remove 4 screws of the fan motor mounting plate with a philip screwdriver. (Fig. 14)
(5) Disengage the fan motor from the mounting plate.
If the unit is turned off during cooling, DO NOT restart it immediately, as this can damage it. Wait at least three minutes before starting it again.

Set the selector to TEST RUN only when performing a test cooling operation. Never leave the selector in this position. Otherwise, the evaporator coil may freeze up during cooling.