Service Manual
Window WDF Series

Models:  
AWWR-WDF009-C11
AWWR-WDF012-C11

REFRIGERANT:  
R410A

Cooling only

JAN' - 2014

SM Window F4-A.1 GB
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1. Precaution

1.1 Safety Precaution.

- To prevent injury to the user or other people and property damage, the following instructions must be followed.
- Incorrect operation due to ignoring instruction will cause harm or damage. Before service unit, be sure to read this service manual at first.

1.2 Warning

**Installation**

- Do not use a defective or underrated circuit breaker. Use this appliance on a dedicated circuit. There is risk of fire or electric shock.
- For electrical work, contact the dealer, seller, a qualified electrician, or an Authorized service center. Do not disassemble or repair the product, there is risk of fire or electric shock.
- Always ground the product. There is risk of fire or electric shock.
- Install the panel and the cover of control box securely. There is risk of fire of electric shock.
- Always install a dedicated circuit and breaker. Improper wiring or installation may cause fore or electric shock.
- Use the correctly rated breaker of fuse. There is risk of fire or electric shock.
- Do not modify or extend the power cable. There is risk of fire or electric shock.
- Do not install, remove, or reinstall the unit by yourself(customer). There is risk of fire, electric shock, explosion, or injury.
- Be caution when unpacking and installing the product. Sharp edges could cause injury, be especially careful of the case edges and the fins on the condenser...
and evaporator.

- **For installation, always contact the dealer or an Authorized service center.**
  There is risk of fire, electric shock, explosion, or injury.

- **Do not install the product on a defective installation stand.**
  It may cause injury, accident, or damage to the product.

- **Be sure the installation area does not deteriorate with age.**
  If the base collapses, the air conditioner could fall with it, causing property damage, product failure, and personal injury.

- **Do not let the air conditioner run for a long time when the humidity is very high and a door or a window is left open.**
  Moisture may condense and wet or damage furniture.

- **Take care to ensure that power cable could not be pulled out or damaged during operation.**
  There is risk of fire or electric shock.

- **Do not place anything on the power cable.**
  There is risk of fire or electric shock.

- **Do not plug or unplug the power supply plug during operation.**
  There is risk of fire or electric shock.

- **Do not touch (operation) the product with wet hands.**
  There is risk of fire or electric shock.

- **Do not place a heater or other appliance near the power cable.**
  There is risk of fire and electric shock.

- **Do not allow water to run into electric parts.**
  It may cause fire, failure of the product, or electric shock.

- **Do not store or use flammable gas or combustible near the product.**
  There is risk of fire or failure of product.

- **Do not use the product in a tightly closed space for a long time.**
  Oxygen deficiency could occur.

- **When flammable gas leaks, turn off the gas and open a window for ventilation before turn the product on.**
  Do not use the telephone or turn switches on or off. There is risk of explosion or fire.

- **If strange sounds, or small or smoke comes from product. Turn the breaker off or disconnect**
the power supply cable.
There is risk of electric shock or fire.

- **Stop operation and close the window in storm or hurricane. If possible, remove the product from the window before the hurricane arrives.**
  There is risk of property damage, failure of product, or electric shock.

- **Do not open the inlet grill of the product during operation. (Do not touch the electrostatic filter, if the unit is so equipped.)**
  There is risk of physical injury, electric shock, or product failure.

- **When the product is soaked (flooded or submerged), contact an Authorized service center.**
  There is risk of fire or electric shock.

- **Be caution that water could not enter the product.**
  There is risk of fire, electric shock, or product damage.

- **Ventilate the product from time to time when operating it together with a stove, etc.**
  There is risk of fire or electric shock.

- **Turn the main power off when cleaning or maintaining the product.**
  There is risk of electric shock.

- **When the product is not be used for a long time, disconnect the power supply plug or turn off the breaker.**
  There is risk of product damage or failure, or unintended operation.

- **Take care to ensure that nobody could step on or fall onto the outdoor unit.**
  This could result in personal injury and product damage.

**CAUTION**

- **Always check for gas (refrigerant) leakage after installation or repair of product.**
  Low refrigerant levels may cause failure of product.

- **Install the drain hose to ensure that water is drained away properly.**
  A bad connection may cause water leakage.

- **Keep level even when installing the product.**
  To avoid vibration of water leakage.

- **Do not install the product where the noise or hot air from the outdoor unit could damage the neighborhoods.**
  It may cause a problem for your neighbors.
PRECAUTION

- Use two or more people to lift and transport the product.
  Avoid personal injury.

- Do not install the product where it will be exposed to sea wind (salt spray) directly.
  It may cause corrosion on the product. Corrosion, particularly on the condenser and evaporator fins,
  could cause product malfunction or inefficient operation.

Operational

- Do not expose the skin directly to cool air for long periods of time. (Do not sit in the draft).
  This could harm to your health.

- Do not use the product for special purposes, such as preserving foods, works of art, etc. It is a
  consumer air conditioner, not a precision refrigerant system
  There is risk of damage or loss of property.

- Do not block the inlet or outlet of air flow.
  It may cause product failure.

- Use a soft cloth to clean. Do not use harsh detergents, solvents, etc.
  There is risk of fire, electric shock, or damage to the plastic parts of the product.

- Do not touch the metal parts of the product when removing the air filter. They are very sharp.
  There is risk of personal injury.

- Do not step on or put anything on the product. (outdoor units)
  There is risk of personal injury and failure of product.

- Always insert the filter securely. Clean the filter every two weeks or more often if necessary.
  A dirty filter reduces the efficiency of the air conditioner and could cause product malfunction or
  damage.

- Do not insert hands or other object through air inlet or outlet while the product is operated.
  There are sharp and moving parts that could cause personal injury.

- Do not drink the water drained from the product.
  It is not sanitary could cause serious health issues.

- Use a firm stool or ladder when cleaning or maintaining the product.
  Be careful and avoid personal injury.

- Replace the all batteries in the remote control with new ones of the same type. Do not mix old
  and new batteries or different types of batteries.
There is risk of fire or explosion.

- **Do not recharge or disassemble the batteries. Do not dispose of batteries in a fire.**
  They may burn or explode.

- **If the liquid from the batteries gets onto your skin or clothes, wash it well with clean water. Do not use the remote of the batteries have leaked.**

  The chemical in batteries could cause burns or other health hazards.
2. Specification.

<table>
<thead>
<tr>
<th>Model</th>
<th>AWWR-WDF09-C11</th>
<th>AWWR-WDF012-C11</th>
</tr>
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<tbody>
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<td><strong>Characteristics</strong></td>
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<tr>
<td>Pdesign</td>
<td>kW</td>
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<td>Cross flow fan x1</td>
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<td>Sound pressure level (⁵)</td>
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<td>Moisture removal</td>
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<td>Condensate drain tube I.D</td>
<td>mm</td>
<td></td>
</tr>
</tbody>
</table>

| **Outdoor**                        |                |                |
| Refrigerant control                | Capillary      | Capillary      |
| Compressor type, model             | Rotary         | Rotary         |
| Air flow                           | m³/hr          | 600x380x560    | 660x428x680    |
| Sound power level (⁶)              | dB(A)          | 65             | 65             |
| Sound pressure level (⁷)           | dB(A)          | 58             | 58             |
| Dimensions WxHxD                   | mm             | 685x430x620    | 746x515x815    |
| Weight                             | kg             | 34             | 46             |
| Package dimensions WxHxD           | mm             | 685x430x620    | 746x515x815    |
| Packaged weight                    | kg             | 36,7           | 50             |
| Stacking height                    | units          | 5 levels       | 5 levels       |
| Refrigerant type                   | R410A          | R410A          |
| Refrigerant charge                 | kg             | 0,48           | 0,6            |
| Operation control type             | Remote control | Remote control |
3. Dimension.

<table>
<thead>
<tr>
<th>Model</th>
<th>Unit Dimension (W×H×D)mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>AWWR-WDF009-C11</td>
<td>600×380×560</td>
</tr>
<tr>
<td>AWWR-WDF012-C11</td>
<td>660×428×680</td>
</tr>
</tbody>
</table>
4. Function and control panel.

4.1 Function.

※ Operation mode: Cooling, Fan, Dry.
※ Fresh air switch.
※ LED display
※ Sleep mode
※ Swing function.
※ Self-diagnosis function
※ Timer function.
※ Anti-freezing control in cooling mode or drying mode. Prevent the water being freezed on evaporator by sensing the evaporator pipe temperature in cooling mode.
※ Time Delay Safety. Restarting is for approx. 3 minutes.
※ Auto-restart. When the power supply is interrupted and then restore, the air conditioners automatically restore the previous function setting.

4.2 Control panel.

1】ON/OFF OPERATION BUTTON
This button turns the air conditioner ON and OFF.
2】SWING BUTTON
Press the “SWING” keypad (for the models with swing feature only) to activate the automatic air swing feature.
To stop the air swing feature, press the “SWING” keypad again.
Press the “SWING” keypad for 2 seconds will activate the SLEEP mode which can reduce noise creating a comfortable sleeping.

3】TIMER BUTTON
Press the “TIMER” keypad to activate the “auto start/auto stop” timer function.
Auto Start/Stop programs can be from 0-12 hours. Each depression of the “TIMER” keypad will increase the selected time in 1 hour increments.

4】FAN SPEED BUTTON
Press the button to select the low, Middle and High FAN Speed.

5】TEMP BUTTON
Press the ▲ keypad to increase the set (operating) temperature of the unit and press the ▼ keypad to decrease the set (operating) temperature of the unit. The temperature setting range is from 16-31℃.

6】MODE BUTTON
Press the “MODE” keypad to select the appropriate operating mode. For the Cooling & Heating models, the mode selection will alternate between COOLING, FAN, DRY.

7】SIGNAL RECEIVER
5. Refrigerant Cycle Diagram.

The figure below is a brief description of the important components and their function in what is called the refrigeration system.

This will help to understand the refrigeration cycle and the flow of the refrigerant in the cooling cycle.
6. Wiring Diagram
7. Protection Function.

7.1 Proper symbols and their meaning

- T1: Indoor ambient temperature
- T2: Indoor evaporator temperature
- T3: Outdoor condenser temperature
- Ts: Setting temperature through the remote controller

7.2 Protection Function

7.2.1 Three minutes delay at restart for compressor.

7.2.2 Anti-freezing protection at cooling or dry mode.

Anti-freezing control according to T2 (Indoor evaporator temperature).

If the evaporator pipe temperature had been lower than 1 ℃ for 14 minutes, the evaporator anti-freezing protection will be activated. The compressor will keep off in the following 5 minutes. 5 minutes later, if the evaporator pipe temperature is still lower than 4 ℃, the compressor will stay off. Otherwise the compressor will be started and the function is cancelled.

Anti-freezing control according to TIME.

If the lasting time of compressor which is continuously running has got to 105 minutes with fan motor operating under Med or Low speed and the indoor ambient temperature lower than 26 ℃, the anti-freezing function will be activated. The compressor will keep off for 3 minutes.

Note: If the compressor stops operation, the time will be cleared.

7.2.3 Anti-frosting protection and defect at cooling or dry mode.

3 minutes later when compressor is running, if T2 has been less than -14 ℃ for subsequent 3 minutes, the anti-frosting protection is activated and compressor will stop in the following 6 minutes. After that, if the condition for de-frosting function is met again in the following 10 minutes while the compressor is operating, the unit will display ‘Ed’ to indicate that the unit is in the de-frost defect.
The compressor and fan motor will be OFF

Note:
The Defect display can be cancelled only by pressing the ON/OFF button on the unit or the remote controller.

### 7.2.4 Electronic function.

#### 7.2.4.1 Cooling mode

The speed of indoor fan can be optionally chosen as High/ Mid (optional)/Low

Compressor running rules:

- $T_1 > TS + 2^\circ F$, compressor on
- $T_1 \leq TS - 2^\circ F$, compressor off

#### 7.2.4.2 Auto mode

The machine will choose cooling, fan-only mode according to $\Delta T (\Delta T = T_1 - Ts)$. 

(T1-Ts)$^\circ F$ \hspace{1cm} compressor on
-2 \hspace{1cm} compressor off

Operation condition

<table>
<thead>
<tr>
<th>$\Delta T$</th>
<th>Compressor Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>$&gt; TS + 2^\circ F$</td>
<td>On</td>
</tr>
<tr>
<td>$\leq TS - 2^\circ F$</td>
<td>Off</td>
</tr>
</tbody>
</table>
The machine will choose actual running mode in auto mode in the below cases:
- Power on or change mode to auto mode or adjust temperature in auto mode, the machine will choose actual running mode again.
- A: In auto mode, if the compressor keeps not running for 15 minutes, judge condition B
  B: If $1 < \Delta T$ or $\Delta T < -4 \degree C$, the machine will choose actual running mode again according to $T1-Ts$ till the compressor stops.

### 7.2.4.3 Fan mode

1. Compressor stops.
2. Temperature setting function is disabled.
3. The speed of indoor fan can be optionally chosen as High/ Mid /Low.

### 7.3 Temperature sensor is open circuit or short circuit.

<table>
<thead>
<tr>
<th>Defect code</th>
<th>malfunction explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Er</td>
<td>Room temperature sensor error.</td>
</tr>
<tr>
<td>En</td>
<td>Evaporator temperature sensor error.</td>
</tr>
<tr>
<td>Eo</td>
<td>Condenser temperature sensor error.</td>
</tr>
<tr>
<td>Ed</td>
<td>Evaporator de-frosting defect.</td>
</tr>
</tbody>
</table>

Malfunction display:
When the malfunction happened at the same time, the priority is: Er > En > E0 > Ed
8 Installation details

8.1 Select the best location.

1. To avoid vibration and noise, make sure the unit is installed securely and firmly.
2. Install the unit where the sunlight does not shine directly on the unit. If the unit receives direct sunlight, build an awning to shade the cabinet.
3. There should be no obstacle, such as a fence or wall, within 500mm from the back of the ambient because it will prevent heat radiation of the condenser.
4. Restriction of outside air will greatly reduce the cooling and heating efficiency of the air Conditioner.
5. Install the unit on a slight angle so that an condensate formed will not enter the room (about 10mm or 1/4"bubble with level).
6. Install the unit with its bottom portion 75~1500mm above the floor level.
7. The power cord must be connected to an independent circuit. The yellow/green wire must be grounded.

CAUTION
All side louvres of the cabinet must remain exposed to the outside of the structure.
8.2 Check off installation.

- The setting conditions must be checked prior to initial starting. The under mentioned items are especially important checking points when the installation is finished.
- Grounding wire (yellow/Green) is provided in the power cord. The wire must be grounded.
- Ensure that the unit is connected to a suitably rated and dedicated circuit.
- To avoid vibration or noise, make sure the air conditioner is installed securely.
- Avoid placing furniture of draperies in front of the air inlet and outlet.

8.3 How to drain.

To get the maximum cooling efficiency, the air conditioner is designed to splash the condensation water on the condenser coil.

If the splashing sound annoys you, you can provide an outside drain by using the following procedure, which may however cause a small loss of performance.

1. Slide out the chassis from the cabinet.
2. Remove the rubber plug from the body base plate.
3. Install the drain pan to the corner of the cabinet with 2 screws.
4. Connect the drain hose to the outlet on the drain pan bottom.
5. Slide the chassis into its original place in the cabinet.
8.4 How to install.

1) Remove the sticker from the front panel.
2) Put the unit into the installation hole.
   - When installing the unit, it should be slanted down to the back to avoid the enlargement of noise or vibration. (Slant between 6-10mm.)
   - The installation place should be strong enough to avoid the enlargement of noise or vibration.
3) Fill up sews in the cabinet with sponge or foam.

- Use iron support
  The installation hole should be strong enough to support the air conditioner. If it cannot, iron support has to be used outdoors.
  Iron support should be fixed on the building.
- Use sunshade board
  Air conditioner should avoid anything to be dropped into it and avoid direct sunshine. If there is no cover on it, you should contact the seller for installing the sunshade board. When installing the sunshade board, don’t let it block the air at the side grille.
### 10 Characteristic of temperature sensor.

<table>
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</table>
11 Troubleshooting

In general, possible trouble is classified in three kinds. One is called Starting Failure which is caused from an electrical defect, another is ineffective Air Conditioning caused by a defect in the refrigeration circuit and improper application, and the other is called the Structure Damage.

- **Operation panel don't work.**
  - Check the power supply.
  - No
  - Press the "LED" button of remote controller several times and check whether the problem is settled down.
  - No
  - Check the wiring of display board.
  - Yes: Repair the wiring.
  - No
  - Replace the display board.
  - No
  - Replace the main control board.

- **Fan motor speed can't change.**
  - Check the wiring.
  - No
  - Check the capacitor of fan motor. Replace if failed.
  - No
  - Replace the PCB.
  - No
  - Check the resistance of fan motor and replace the motor if failed.
The air-con doesn't work.

Check the power supply.

No

Check the wiring.

No

Check whether the transformer is failed. Measure the output voltage of transformer and check whether it is the range from +5V to 12V. If not, replace the transformer.

No

Replace the PCB.
Display keeps showing "Ed".

Check whether the evaporator frosts.
  No

Check whether the indoor air inlet is blocked.
  No

Check whether the indoor ambient temperature is too low.
  No

Check whether the indoor dust filter is too dirty.
  No

Check whether there is too much water on the chassis.
  No

Check the wiring of pipe temperature sensor.
  No

Check the pipe temperature sensor.
  Yes  Replace the pipe temperature sensor.
  No

Replace the main control board.
Compressor doesn't work.

Check whether the indoor temperature is lower than 15° C or larger than 31° C.

No

Check the power supply.

No

Check whether the voltage is too high or too low.

No

Check the wiring.

No

Check whether the compressor is under overload protection.

No

Check the relay of compressor in PCB works normally.

No

Check whether the external protector works normally.

Yes

Remove the overload protector and cool to normal temperature. then check whether it is open circuit. replace if failed.

No

Comparing with compressor specification, check the resistance of compressor.

No

Replace the compressor.
Cooling mode don't work or cooling not enough.

Check the operation mode.
No

Check the setting temperature.
No

Check whether dust filter is too dirty.
No

Start the unit with cooling mode, check whether the temperature of the compressor's discharge pipe is smaller than 90 ℃, if no, recharge refrigerant.
No

Replace the capillary.

The air-con doesn't work.

Check the power supply.
No

Check the wiring.
No

Check whether the transformer is failed. Measure the output voltage of transformer and check whether it is the range from +5V to 12V. If not, replace the transformer.
No

Replace the PCB.
The compressor operates run-stop frequently.

Check whether the airflow passage is blocked.

No

Check whether the fan motor doesn't work.

No

Check whether capacitor of compressor work normally.

No

Check whether the relay of compressor on PCB works normally.

No

Replace the PCB.

No

Check whether the capillary is blocked.

No

Replace the capillary.

No

Replace the compressor.
Water drips from the unit.

Check whether the ambient humidity is too high.

No

Check whether the indoor outlet airflow foam is too wet, and louver drip.

No

Check whether the unit is correctly installed.

No

Check whether the air outlet foam install normally.

No

Check whether the foam of evaporator base is damaged.

No

Check whether the drain passage of evaporator is blocked. Replace if failed.
**Troubleshooting**

No/ineffective cooling
No/ineffective heating

1. Whether the display panel display one of the following signal? “Er En Eo Ed”
   - Yes
   - No

2. Whether the compressor can start in cooling/heating mode even if it soon stops?
   - Yes
   - No

3. Check whether the indoor outlet/inlet of the unit is blocked or the vent door is open
   - Yes
   - No

4. Check whether the indoor outlet/inlet of the unit is blocked or the vent is blocked
   - Yes
   - No

5. Check whether the Evap. is frosting and the compressor stops frequently
   - Yes
   - No

6. Check leakage
   - Leakage
   - Normal

7. Recycle refrigerant and braze the leakage point
8. Vacum and recharge
9. Check the drainage
   - Yes
   - No

10. Check whether the Cond. is frosting and the compressor stops frequently
    - Yes
    - No

11. Check the speed of motor
    - Normal
    - No

12. Check the control wire of the reverse valve
    - Yes
    - No

13. Check whether the temp. of suction pipe is above 7°C
    - In cooling
    - Normal

14. Replace the main PCB

15. Check compressor capacitor

16. Check the voltage between RY9 on main PCB and N on power cord

17. Replace the compressor

18. Replace the capillary tube

19. Replace the reverse valve

20. Replace the compressor

21. Recycle refrigerant and recharge

22. Check the speed of motor
    - Yes
    - No
12 Exploded view and part list

**AWWR-WDF009-C11**
Part list:

<table>
<thead>
<tr>
<th>No.</th>
<th>Part Name</th>
<th>No.</th>
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</tr>
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<tbody>
<tr>
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<td>Panel assembly</td>
<td>11</td>
<td>Chassis assembly</td>
</tr>
<tr>
<td>1.1</td>
<td>Front panel</td>
<td>12</td>
<td>Evaporator base</td>
</tr>
<tr>
<td>1.2</td>
<td>Air filter</td>
<td>13</td>
<td>Cabinet assembly</td>
</tr>
<tr>
<td>1.3</td>
<td>Panel frame</td>
<td>14</td>
<td>Ventilation ring</td>
</tr>
<tr>
<td>1.3.1</td>
<td>Panel frame</td>
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<td>Volute shell (below)</td>
</tr>
<tr>
<td>1.3.2</td>
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</tr>
<tr>
<td>2</td>
<td>Remote controller</td>
<td>18</td>
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</tr>
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<td>5</td>
<td>Display box assembly</td>
<td>19</td>
<td>Capillary assembly</td>
</tr>
<tr>
<td>6</td>
<td>Cover of control panel</td>
<td>20</td>
<td>Discharge pipe assembly</td>
</tr>
<tr>
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<td>Cover of electronic control box</td>
<td>21</td>
<td>Condenser assembly</td>
</tr>
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SERVICE MANUAL

Window WDF Series