

AIR CONDITIONER

**Wall mounted type**

# SERVICE MANUAL

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INDOOR



WHZ09WMA21S




WHZ12WMA21S

OUTDOOR



WHZ09SZA21S  
WHZ12SZA21S

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**Notices:**

- Product specifications and design are subject to change without notice for future improvement.
- For further details, please check with our authorized dealer.

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**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****When Wiring****WARNING**

**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.

**When Transporting**

Be careful when picking up and moving the indoor and outdoor units. Get a partner to help, and bend

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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 unit's 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**



△ 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.

### **NOTE:**

The figure, size and parameter of the product may not be identical with the service manual, please take the actual product as the standard.

# Specifications

| Type                              |                              |                   |               | Wall mounted                                  |   |
|-----------------------------------|------------------------------|-------------------|---------------|---|---|
|                                   |                              |                   |               | Inverter, Heat pump                           |   |
| Model name                        |                              |                   |               | WHZ09WMA21S                                   | WHZ12WMA21S                                     |
| Power supply                      |                              |                   |               | 208/230 V ~ 60 Hz                             |   |
| Power supply intake               |                              |                   |               | Outdoor unit                                  |   |
| Available voltage range           |                              |                   |               | 187—253 V                                     |   |
| Capacity                          | Cooling                      | Rated             | kW            | 2.64  | 3.52  |
|                                   |                              |                   | Btu/h         | 9,000   | 12,000  |
|                                   |                              | Min.—Max.         | kW            | 1.06—2.93                                     | 1.17—3.96                                       |
|                                   |                              |                   | Btu/h         | 3,600—10,000                                  | 4,000—13,500                                    |
|                                   | Heating                      | Rated             | kW            | 2.93  | 3.51  |
|                                   |                              |                   | Btu/h         | 10,000  | 12,000  |
|                                   |                              | Min.—Max.         | kW            | 1.05—3.07                                     | 1.17—4.10                                       |
|                                   |                              |                   | Btu/h         | 3,600—10,500                                  | 4,000—14,000                                    |
|                                   | Heating (17 °F) <sup>1</sup> | Rated             | kW            | 1.90  | 2.45  |
|                                   |                              |                   | Btu/h         | 6,500   | 8,345   |
| Heating (5 °F) <sup>2</sup>       | Max.                         | kW                | 2.71          | 3.52  |   |
|                                   |                              | Btu/h             | 9,250         | 12,030  |   |
| Input power                       | Cooling                      | Rated             | kW            | 0.580   | 0.780   |
|                                   |                              |                   |               | Min.—Max.                                     | 0.100—1.060                                     |
|                                   | Heating                      | Rated             | kW            | 0.780   | 0.855   |
|                                   |                              |                   |               | Min.—Max.                                     | 0.130—1.220                                     |
| Current                           | Cooling                      | Rated             | A             | 2.3   | 4.6   |
|                                   | Heating                      |                   |               | 3.4   | 4.8   |
| EER2                              | Cooling                      |                   | W/W           | 4.55  | 4.51  |
|                                   |                              |                   |               | Btu/hW  | 15.52   |
| COP2                              | Heating                      |                   | W/W           | 3.57  | 4.10  |
|                                   |                              |                   |               | Btu/hW  | 12.18   |
| SEER2                             | Cooling                      |                   | Btu/hW        | 27.5  | 23.5  |
| HSPF2                             | Heating                      |                   | Btu/hW        | 10.0  | 9.35  |
| Power factor                      | Cooling                      |                   | %             | 97  | 96  |
|                                   | Heating                      |                   | %             | 97  | 97  |
| Moisture removal                  |                              |                   | pints/h (L/h) | 1.9 (0.9)                                     | 2.5 (1.2)                                       |
| Maximum operating current*3       | Cooling                      |                   | A             | 6.5   | 7.0   |
|                                   | Heating                      |                   | A             | 6.5   | 7.0   |
| Fan                               | Airflow rate                 | Cooling           | HIGHER        | 394 (670)                                     | 618 (1,050)                                     |
|                                   |                              |                   | HIGH          | 365 (620)                                     | 559 (950)                                       |
|                                   |                              |                   | MED           | 294 (500)                                     | 483 (820)                                       |
|                                   |                              |                   | LOW           | 235 (400)                                     | 453 (770)                                       |
|                                   |                              |                   | LOWER         | 224 (380)                                     | 365 (620)                                       |
|                                   |                              | Heating           | HIGHER        | 394 (670)                                     | 618 (1,050)                                     |
|                                   |                              |                   | HIGH          | 365 (620)                                     | 559 (950)                                       |
|                                   |                              |                   | MED           | 294 (500)                                     | 483 (820)                                       |
|                                   |                              |                   | LOW           | 235 (400)                                     | 453 (770)                                       |
|                                   |                              |                   | LOWER         | 224 (380)                                     | 365 (620)                                       |
|                                   | Type × Qty                   | Crossflow fan × 1 |               |   |   |
|                                   | Motor output                 |                   |               | W   | 25  |
| Sound pressure level <sup>4</sup> | Cooling                      |                   | HIGHER        | 42  | 48  |
|                                   |                              |                   | HIGH          | 39  | 46  |
|                                   |                              |                   | MED           | 34  | 41  |
|                                   |                              |                   | LOW           | 31  | 37  |
|                                   |                              |                   | LOWER         | 28  | 30  |
|                                   | Heating                      |                   | HIGHER        | 42  | 48  |
|                                   |                              |                   | HIGH          | 39  | 46  |
|                                   |                              |                   | MED           | 34  | 41  |
|                                   |                              |                   | LOW           | 31  | 37  |
|                                   |                              |                   | LOWER         | 28  | 30  |
| Heat exchanger type               | Dimensions (H × W × D)       |                   | in (mm)       | 11-9/16 × 24-7/16 × 1-1/16 (294 × 620 × 27.2) | 14-7/8 × 27-3/4 × 1-1/16 (378 × 705 × 27.2)     |
|                                   | Fin pitch                    |                   | FPI           | 18  |   |
|                                   | Rows × Stages                |                   |               | 2 × 21  | 2 × 18  |
|                                   | Pipe type                    |                   |               | Copper  |   |
| Enclosure                         | Material                     |                   |               | Aluminum                                      |   |
|                                   | Color                        |                   |               | Polystyrene                                   |   |
| Dimensions (H × W × D)            | Net                          |                   | in (mm)       | 10-5/8 × 33-7/16 × 8-7/16 (270 × 850 × 215)   | 12-3/8 × 37-13/16 × 9-5/16 (315 × 960 × 236)    |
|                                   | Gross                        |                   |               | 13-3/16 × 37 × 10-7/16 (335 × 940 × 265)      | 15-3/8 × 40-15/16 × 12-7/16 (390 × 1,040 × 316) |
| Weight                            | Net                          |                   | lb (kg)       | 20 (9)  | 29 (13)   |
|                                   | Gross                        |                   |               | 24 (11)                                       | 33 (15)   |
| Connection pipe                   | Size                         | Liquid            | in (mm)       | Ø1/4 (Ø6.35)                                  |   |
|                                   |                              | Gas               |               | Ø3/8 (Ø9.52)                                  |   |
| Drain hose                        | Method                       |                   |               | Flare   |   |
|                                   | Material                     |                   |               | Polyvinyl chloride                            |   |
| Operation range                   | Cooling                      |                   | °F (°C)       | 61 to 86 (16 to 30)                           |   |
|                                   |                              |                   |               | %RH   | 80 or less                                      |
| Remote controller type            | Heating                      |                   | °F (°C)       | 61 to 86 (16 to 30)                           |   |
|                                   |                              |                   |               |   | Wireless (Wired [option])                       |

| Type   | Wall mounted        |             |
|--|---------------------|-------------|
|  | Inverter, Heat pump |             |
| Model name   | WHZ09WMA21S         | WHZ12WMA21S |
| <b>NOTES:</b>  |                     |             |
| <ul style="list-style-type: none"> <li>Specifications are based on the following conditions: <ul style="list-style-type: none"> <li>Cooling: Indoor temperature of 80°FDB (26.67°CDB)/67°F WB (19.44°CWB), and outdoor temperature of 95°FDB (35°CDB) / 75°F WB (23.9°CWB).</li> <li>Heating: Indoor temperature of 70°FDB (21.11°CDB) /59°F WB (15.56°CWB), and outdoor temperature of 47°FDB (8.33°CDB) /43°F WB (6.11°CWB).</li> <li>*1: Heating (17°F): Indoor temperature of 70°FDB (21.11°CDB) /60°F WB (15.56°CWB), and outdoor temperature of 17°FDB (-8.33°CDB) /15°F WB (-9.44°CWB).</li> <li>*2: Heating (5°F): Indoor temperature of 70°FDB (21.11°CDB) /60°F WB (15.56°CWB), and outdoor temperature of 5°FDB (-15.0°CDB) /4°F WB (-15.56°CWB).</li> <li>Test conditions are based on AHRI 210/240 2023.</li> <li>Pipe length: 25 ft (7.5 m), Height difference: 0 ft (0 m). (Between outdoor unit and indoor unit.)</li> </ul> </li> <li>Protective function might work when using it outside the operation range.</li> <li>*3: Maximum current is maximum value when operated within the operation range.</li> <li>*4: Sound pressure level: <ul style="list-style-type: none"> <li>Measured values in manufacturer's anechoic chamber.</li> <li>Because of the surrounding sound environment, the sound levels measured in actual installation conditions might be higher than the specified values here.</li> </ul> </li> </ul> |                     |             |

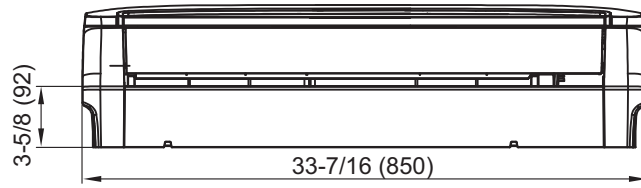
| M condition  |             |           |             |              |              |
|--|-------------|-----------|-------------|--------------|--------------|
| Model name   | WHZ09WMA21S |           | WHZ12WMA21S |              |              |
| Capacity   | Cooling     | Rated     | kW          | 2.64         | 3.52         |
|  |             |           | Btu/h       | 9,000        | 12,000       |
|  |             | Min.—Max. | kW          | 1.06—2.93    | 1.17—3.96    |
|  |             |           | Btu/h       | 3,600—10,000 | 4,000—13,500 |
|  | Heating     | Rated     | kW          | 3.08         | 3.81         |
|  |             |           | Btu/h       | 10,500       | 13,000       |
|  |             | Min.—Max. | kW          | 1.06—3.08    | 1.17—4.10    |
|  |             |           | Btu/h       | 3,600—10,500 | 4,000—14,000 |
| Input power  | Cooling     | kW        | Rated       | 0.560        | 0.780        |
|  |             |           | Min.—Max.   | 0.100—1.060  | 0.130—1.280  |
|  | Heating     |           | Rated       | 0.770        | 0.855        |
|  |             |           | Min.—Max.   | 0.130—1.220  | 0.170—1.430  |
| Current  | Cooling     | A         | Rated       | 2.3          | 4.6          |
|  | Heating     |           | 3.4         | 4.8          |              |
| EER  | Cooling     | W/W       | 4.71        | 4.51         |              |
|  |             | Btu/hW    | 16.07       | 15.40        |              |
| COP  | Heating     | W/W       | 4.00        | 4.45         |              |
|  |             | Btu/hW    | 13.64       | 15.20        |              |
| SEER   | Cooling     | Btu/hW    | 28.0        | 25.0         |              |
| HSPF   | Heating     | Btu/hW    | 12.5        | 12.0         |              |
| Power factor   | Cooling     | %         | 97          | 96           |              |
|  | Heating     |           | 97          | 97           |              |
| <b>NOTES:</b>  |             |           |             |              |              |
| Specifications are based on the following conditions:  |             |           |             |              |              |
| <ul style="list-style-type: none"> <li>Cooling: Indoor temperature of 80°FDB (26.67°CDB)/67°F WB (19.44°CWB), and outdoor temperature of 95°FDB (35°CDB)/75°F WB (23.9°CWB).</li> <li>Heating: Indoor temperature of 70°FDB (21.11°CDB)/59°F WB (15.56°CWB), and outdoor temperature of 47°FDB (8.33°CDB)/43°F WB (6.11°CWB).</li> <li>*: Heating (17°F): Indoor temperature of 70°FDB (21.11°CDB)/60°F WB (15.56°CWB), and outdoor temperature of 17°FDB (-8.33°CDB)/15°F WB (-9.44°CWB).</li> <li>Test conditions are based on AHRI 210/240 2017.</li> <li>Pipe length: 25 ft (7.5 m), Height difference: 0 ft (0 m). (Between outdoor unit and indoor unit.)</li> </ul> |             |           |             |              |              |

| Type   |   |                                      | Inverter heat pump   |  |
|--|---|--------------------------------------|--|--|
| Model name   |   |                                      | WHZ09SZA21S  | WHZ12SZA21S  |
| Power supply   |   |                                      | 208/230 V ~ 60 Hz  |  |
| Available voltage range  |   |                                      | 187—253 V  |  |
| Fan  | Airflow rate  | CFM (m <sup>3</sup> /h)              | 1,177 (2,000)  |  |
|  | Type × Q'ty   |                                      | Propeller fan × 1  |  |
|  | Motor output  | W                                    | 30   |  |
| Sound pressure level *1  |   |                                      | dB (A)   |  |
| Heat exchanger type  |   |                                      | 55   |  |
| Heat exchanger type  | Dimensions (H × W × D)  | in (mm)                              | 33-1/16 × 21-1/2 × 11/16 (840 × 546 × 18.19)<br>33-1/16 × 21-1/2 × 11/16 (840 × 546 × 18.19) | 33-1/16 × 21-1/2 × 11/16 (840 × 546 × 18.19)<br>33-1/16 × 21-1/2 × 11/16 (840 × 546 × 18.19)<br>19-11/16 × 16-9/16 × 11/16 (500 × 420 × 18.19) |
|  | Fin pitch   | FPI                                  | 18   |  |
|  | Rows × Stages   |                                      | 2 × 26   | 2.5 × 26   |
|  | Pipe type   |                                      | Copper   |  |
|  | Fin type  | Type (Material)<br>Surface treatment | Aluminum<br>Blue fin   |  |
| Compressor   | Type  |                                      | Rotary   |  |
| Refrigerant  | Type  |                                      | R410A  |  |
|  | Charge  | lb oz<br>g                           | 2 lb 7 oz<br>1,100   | 2 lb 14 oz<br>1,300  |
| Refrigerant oil  | Type  |                                      | VG74 (POE)   |  |
| Enclosure  | Material  |                                      | Steel sheet  |  |
|  | Color   |                                      | White  |  |
| Dimensions (H × W × D)   | Net   | in (mm)                              | 23-1/16 × 31-7/8 × 11 (585 × 810 × 280)  |  |
|  | Gross   |                                      | 25-3/16 × 37 × 15-3/16 (640 × 940 × 385)   |  |
| Weight   | Net   | lb (kg)                              | 75 (34)  | 84 (38)  |
|  | Gross   |                                      | 82 (37)  | 93 (42)  |
| Connection pipe  | Size  | Liquid                               | Ø1/4 (Ø6.35)   |  |
|  |   | Gas                                  | Ø3/8 (Ø9.52)   |  |
|  | Method  |                                      | Flare  |  |
|  | Pre-charge length   | ft (m)                               | 24.6 (7.5)   |  |
|  | Max. length   |                                      | 65 (20)  |  |
| Max. height difference   | Indoor unit higher than outdoor unit: 32 (10)<br>Outdoor unit higher than indoor unit: 16 (5) |                                      |  |  |
| Operation range  | Cooling   | °F (°C)                              | -0.4 to 115 (-18 to 46)  |  |
|  | Heating   |                                      | -13 to 75 (-25 to 24)  |  |
| <b>NOTES:</b>  |   |                                      |  |  |
| <ul style="list-style-type: none"> <li>• Specifications are based on the following conditions: <ul style="list-style-type: none"> <li>– Cooling: Indoor temperature of 80 °FDB (26.67 °CDB) / 67 °FWB (19.44 °CWB), and outdoor temperature of 95 °FDB (35 °CDB) / 75 °FWB (23.9 °CWB).</li> <li>– Heating: Indoor temperature of 70 °FDB (21.11 °CDB) / 59 °FWB (15 °CWB), and outdoor temperature of 47 °FDB (8.33 °CDB) / 43 °FWB (6.11 °CWB).</li> <li>– Pipe length: 24 ft 6 in (7.5 m), Height difference: 0 ft (0 m). (Between outdoor unit and indoor unit.)</li> </ul> </li> <li>• Protective function might work when using it outside the operation range.</li> <li>• *1: Sound pressure level <ul style="list-style-type: none"> <li>– Measured values in manufacturer's anechoic chamber.</li> <li>– Because of the surrounding sound environment, the sound levels measured in actual installation conditions might be higher than the specified values here.</li> </ul> </li> </ul> |   |                                      |  |  |

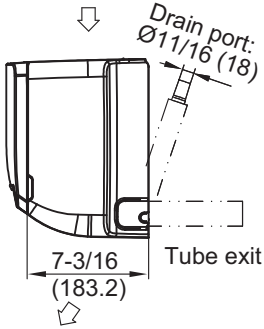
# Dimensions

## Model: WHZ09WMA21S

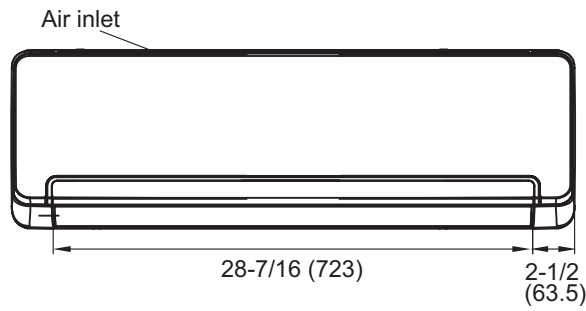
Unit: in (mm)



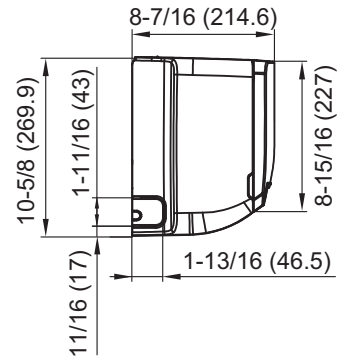
Bottom view



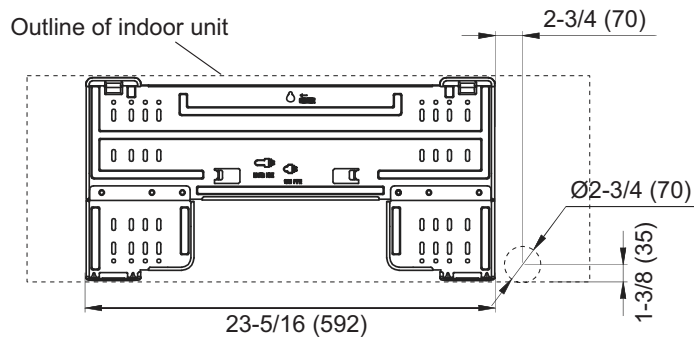
Side view



Front view

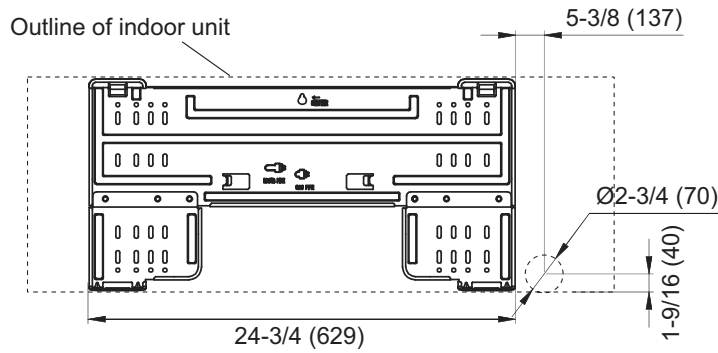
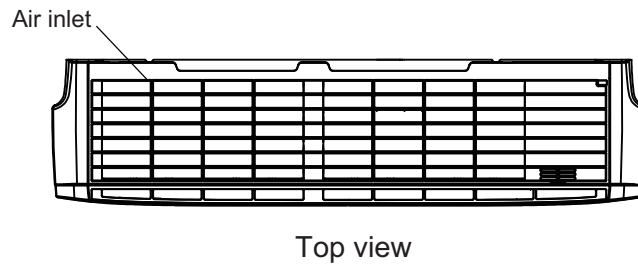
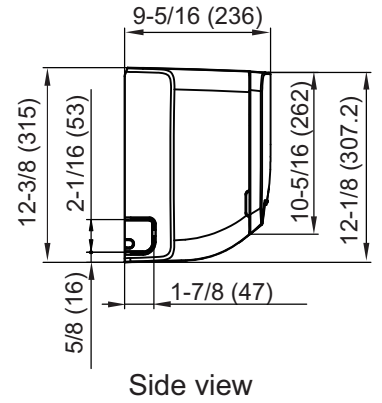
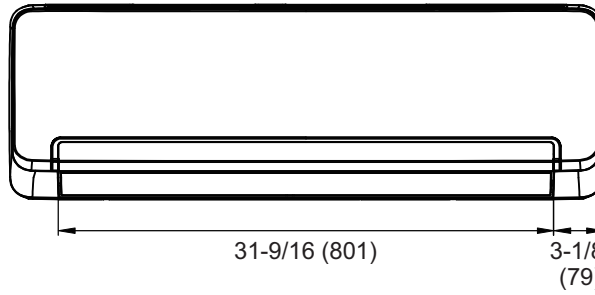
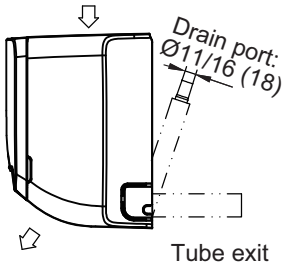
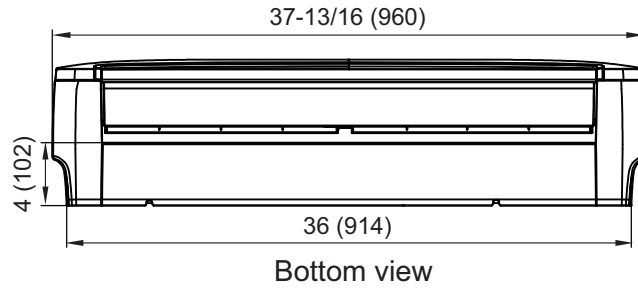


Side view



# Model: WHZ12WMA21S

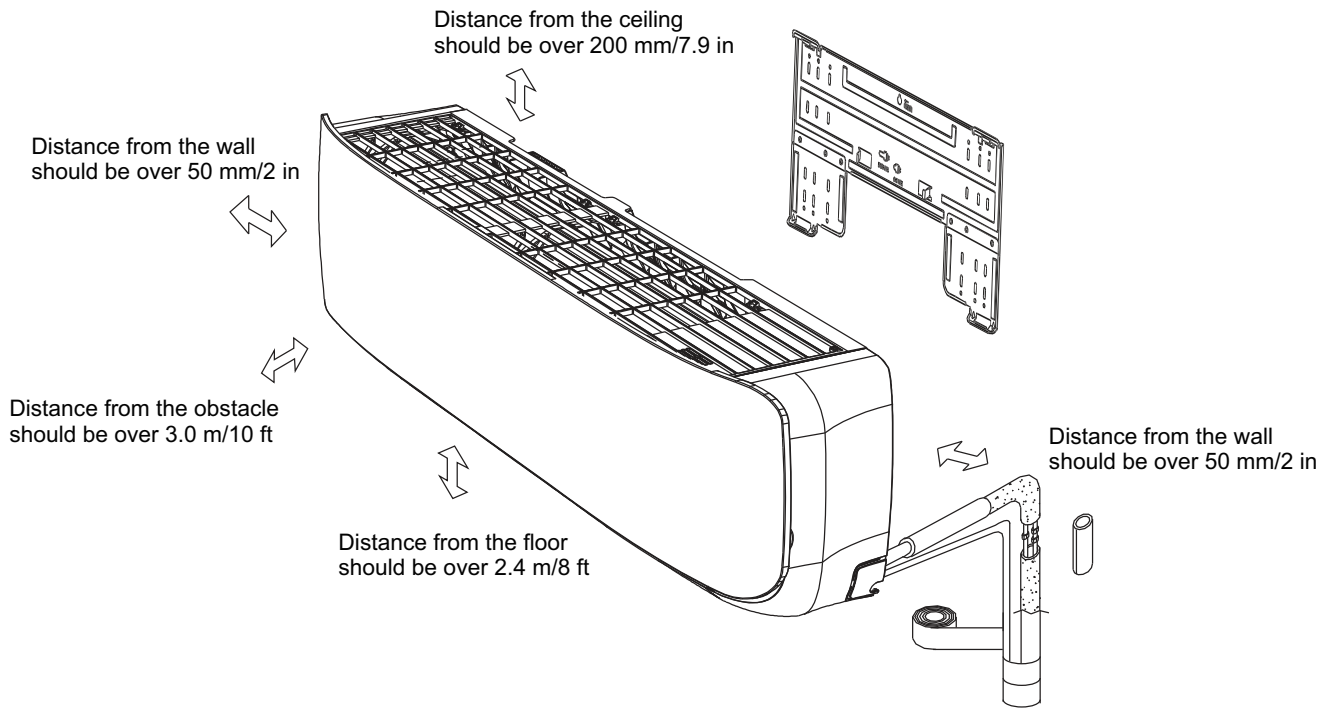
Unit: in (mm)





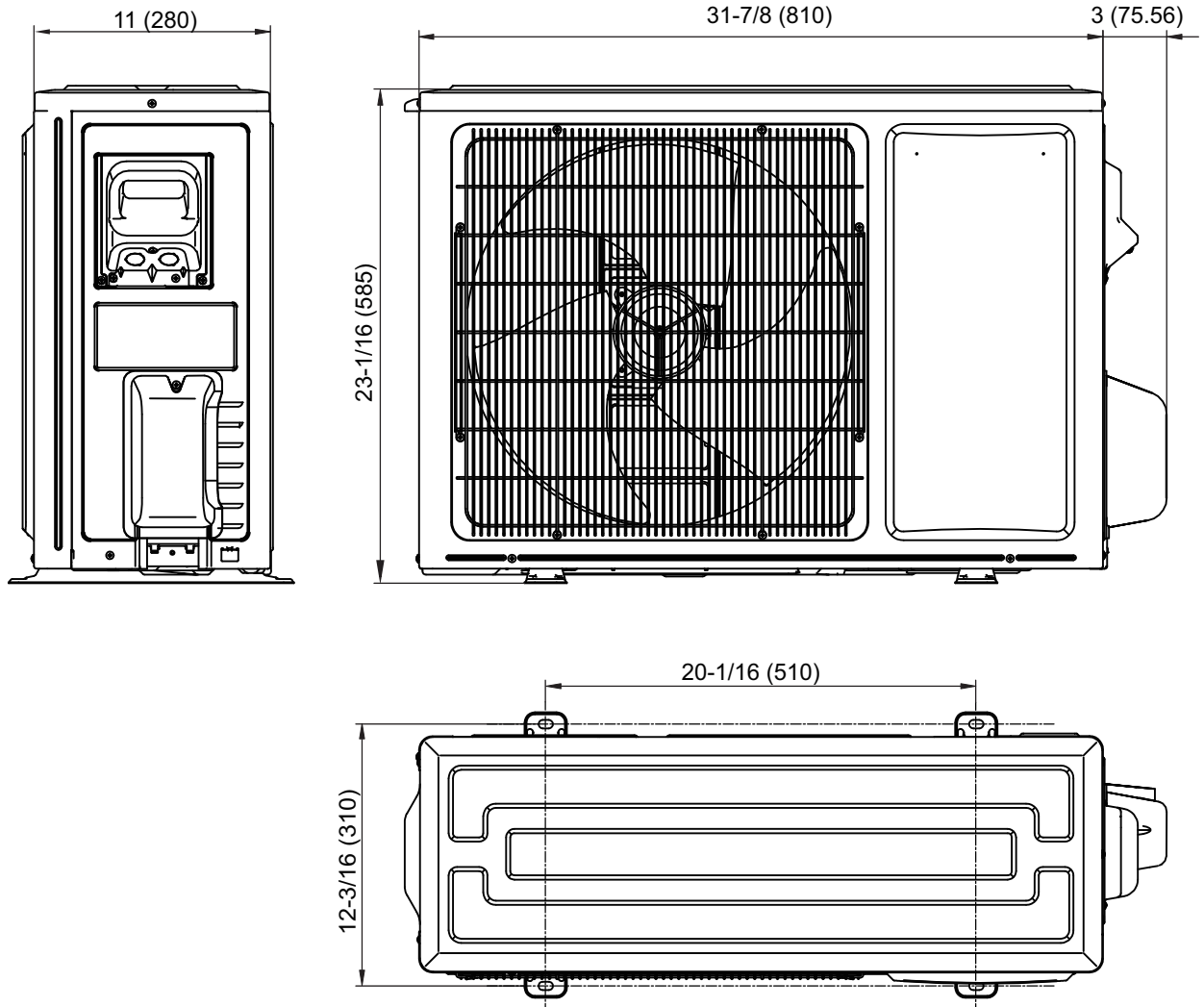
# Installation space requirement

Provide sufficient installation space for product safety.



# Models: WHZ09SZA21S and WHZ12SZA21S

Unit: in (mm)



# Installation space

## Models: WHZ09SZA21S and WHZ12SZA21S

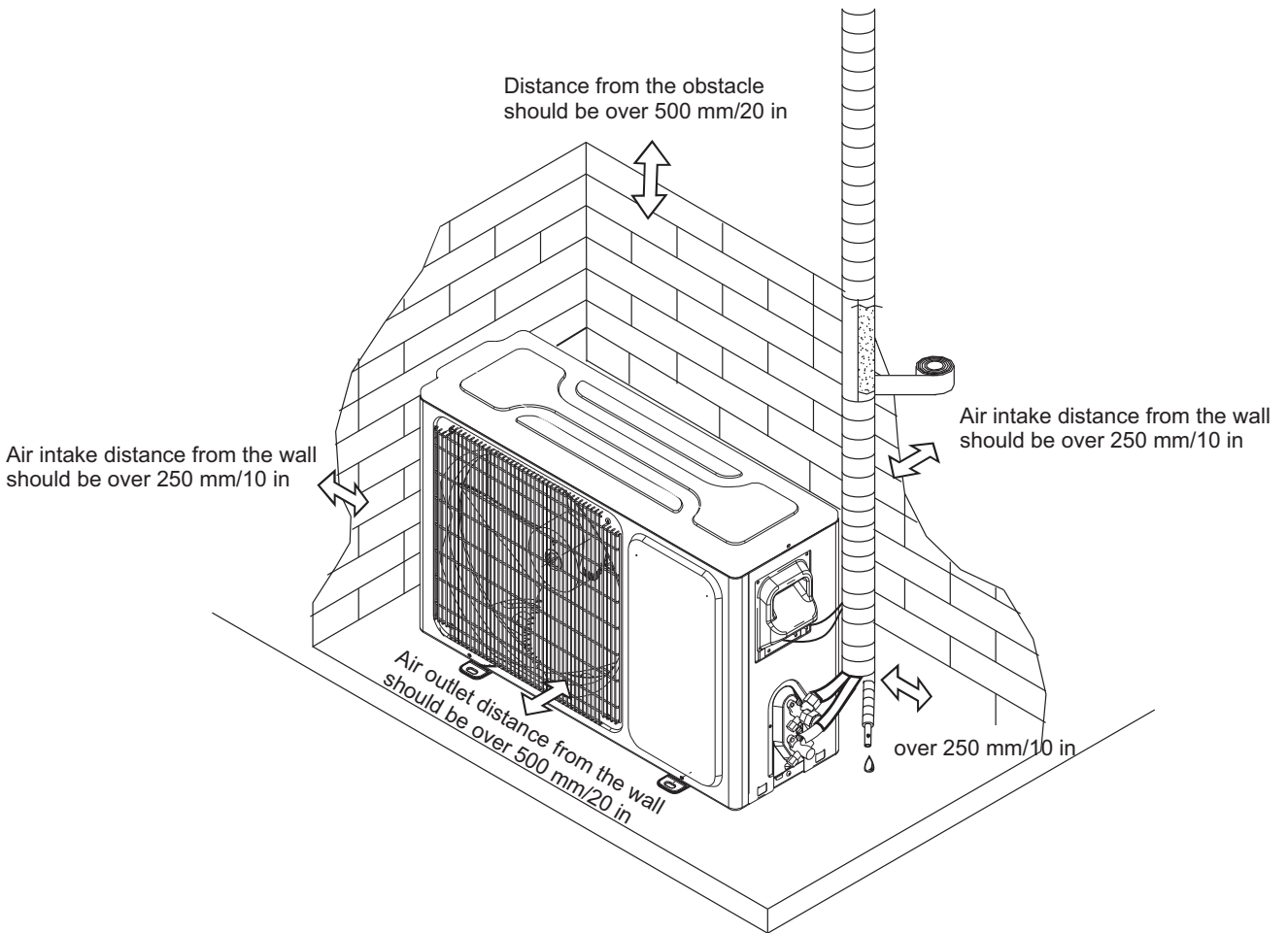
### ■ Space requirement

Provide sufficient installation space for product safety.

#### ⚠ CAUTION

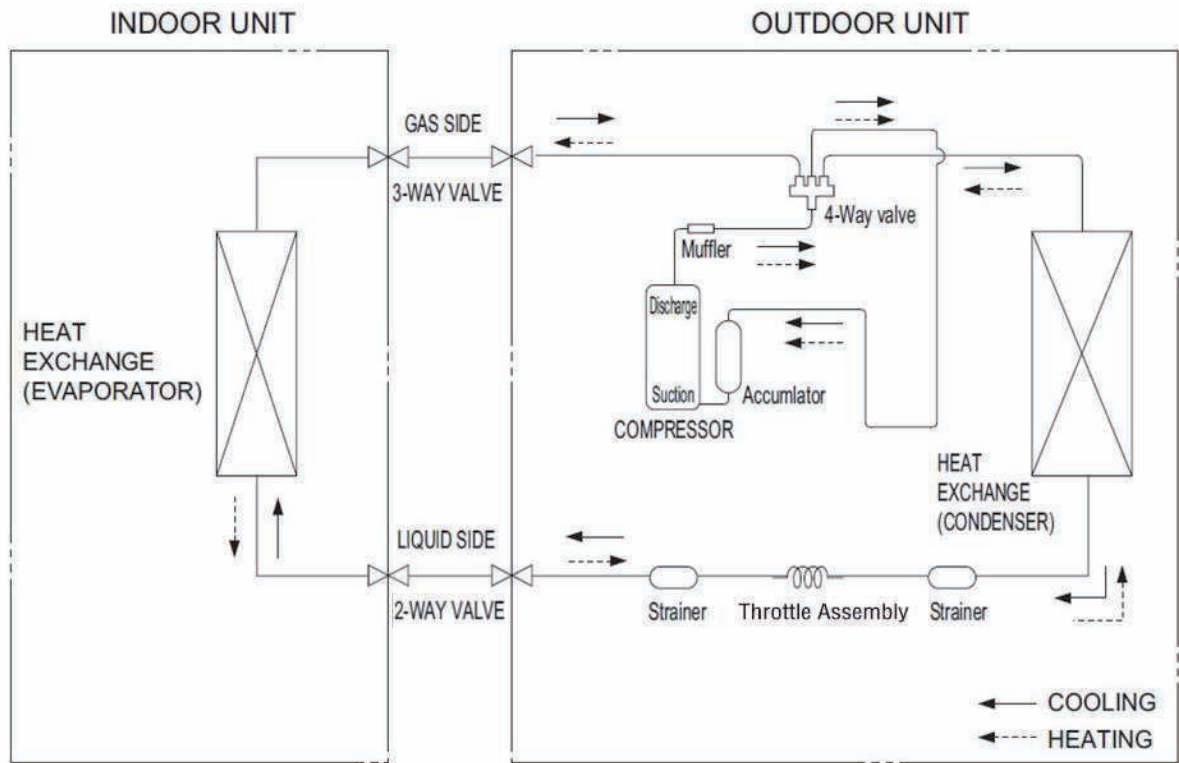
Keep the space shown in the installation examples.

If the installation is not performed accordingly, it could cause a short circuit and result in a lack of operating performance.



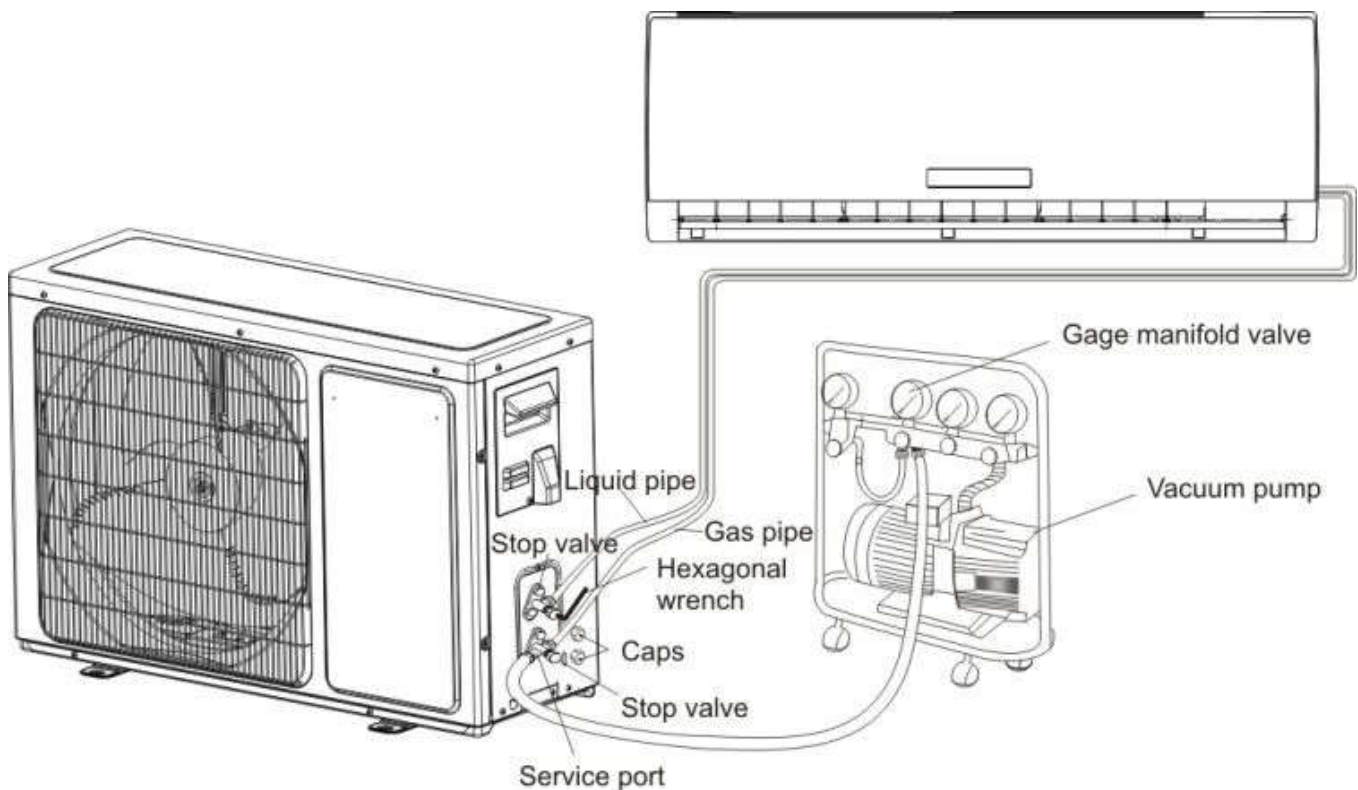
# Refrigerant circuit

## Models: WHZ09SZA21S and WHZ12SZA21S



## Air Purging and Leakage Test

1. Connect charging hose of manifold valve to charge end of low pressure valve (both high/low pressure valves must be tightly shut).
  2. Connect joint of charging hose to vacuum pump.
  3. Fully open the handle of Lo manifold valve.
  4. Open the vacuum pump to evacuate. At the beginning, slightly loosen joint nut of low pressure valve to check if there is air coming inside. (If noise of vacuum pump has been changed, the reading of multimeter is 0) Then tighten the nut.
  5. Keep evacuating for more than 15mins and make sure the reading of multi-meter is  $-1.0 \times 10^5$  pa (-76cmHg).
  6. Check the vacuum with the gage manifold valve, then close the gage manifold valve, and stop the vacuum pump.
  7. Leave it for one or two minutes. Make sure the pointer of the gage manifold valve remains in the same position.
  8. Remove the gage manifold valve quickly from the service port of the stop valve.
- After refrigerant pipes are connected and evacuated, fully open all stop valves on gas and liquid pipe sides.
9. Opening without fully opening lowers the performance and cause dangerous.
  10. Tighten the cap to the service port to obtain the initial status.
  11. Retighten the cap
  12. Leak test



# Test Running

## △ Check after Installation

| Items to be checked  | Possible malfunction                                     |
|--|--|
| Has it been fixed firmly?  | The unit may drop, shake or emit noise.                  |
| Have you done the refrigerant leakage test?                                    | It may cause insufficient cooling(heating)capacity       |
| Is heat insulation sufficient?   | It may cause condensation and dripping.                  |
| Is water drainage satisfactory?  | It may cause condensation and dripping.                  |
| Is the voltage in accordance with the rated voltage marked on the nameplate?   | It may cause electric malfunction or damage the product. |
| Is the electric wiring and piping connection installed correctly and securely? | It may cause electric malfunction or damage the part.    |
| Has the unit been connected to a secure earth connection?                      | It may cause electrical leakage.                         |
| Is the power cord specified?   | It may cause electric malfunction or damage the part.    |
| Are the inlet and outlet openings blocked?                                     | It may cause insufficient cooling(heating)capacity.      |
| Is the length of connection pipes and refrigerant capacity been recorded?      | The refrigerant capacity is not accurate.                |

## △ Operation Test

### 1. Before Operation Test

- (1) Do not switch on power before installation is finished completely.
- (2) Electric wiring must be connected correctly and securely.
- (3) Cut-off valves of the connection pipes should be opened.
- (4) All the impurities such as scraps and thrums must be cleared from the unit.

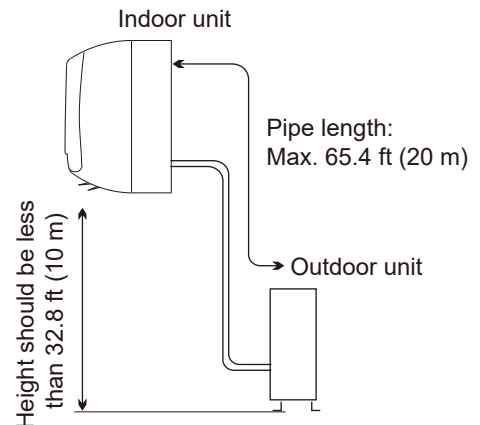
### 2. Operation Test Method

- (1) Switch on power and press "ON/OFF" button on the remote controller to start the operation.
- (2) Press MODE button to select the COOL, HEAT (Cooling only unit is not available), FAN to check whether the operation is normal or not.

# Piping work and refrigerant charge

## Site for installing the indoor unit

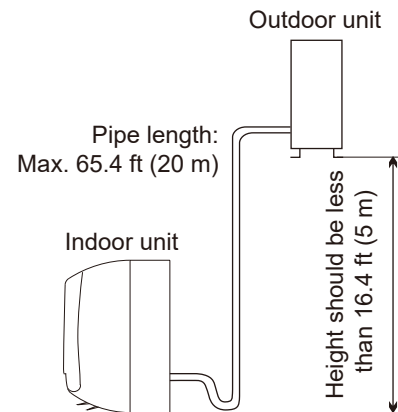
- Where there is no obstruction near the air outlet and air can be easily blown to every corner.
- Where piping and wall hole can be easily arranged.
- Keep the required space from the unit to the ceiling and wall according to the diagram on previous page.
- Where the air filter can be easily removed.
- Keep the unit and remote controller 3.28 ft (1 m) or more apart from television, radio etc.
- Keep as far as possible from fluorescent lamps.
- Do not put anything near the air inlet to obstruct it from air absorption.
- Install on a wall that is strong enough to bear the weight of the unit.
- Install in a place that will not increase operation noise and vibration.
- Keep away from direct sunlight and heating sources. Do not place flammable materials or combustion apparatuses on the top of the unit.



Indoor unit is higher than outdoor unit

## Site for installing the outdoor unit

- Where it is convenient to install and well ventilated.
- Avoid installing it where flammable gas could leak.
- Keep the required distance apart from the wall.
- Keep the outdoor unit away from greasy dirt, vulcanization gas exit.
- Avoid installing it by the roadside where there is a risk of muddy water.
- A fixed base where it is not subject to increased operation noise.
- Where there is not any blockage of the air outlet.
- Avoid installing under direct sunlight, in an aisle or side-way, or near heat sources and ventilation fans. Keep away from flammable materials, thick oil fog, and wet or uneven places.
- In case the pipe length is more than 24.6 ft (7.5 m), the refrigerant should be charged additionally, according to the table below.

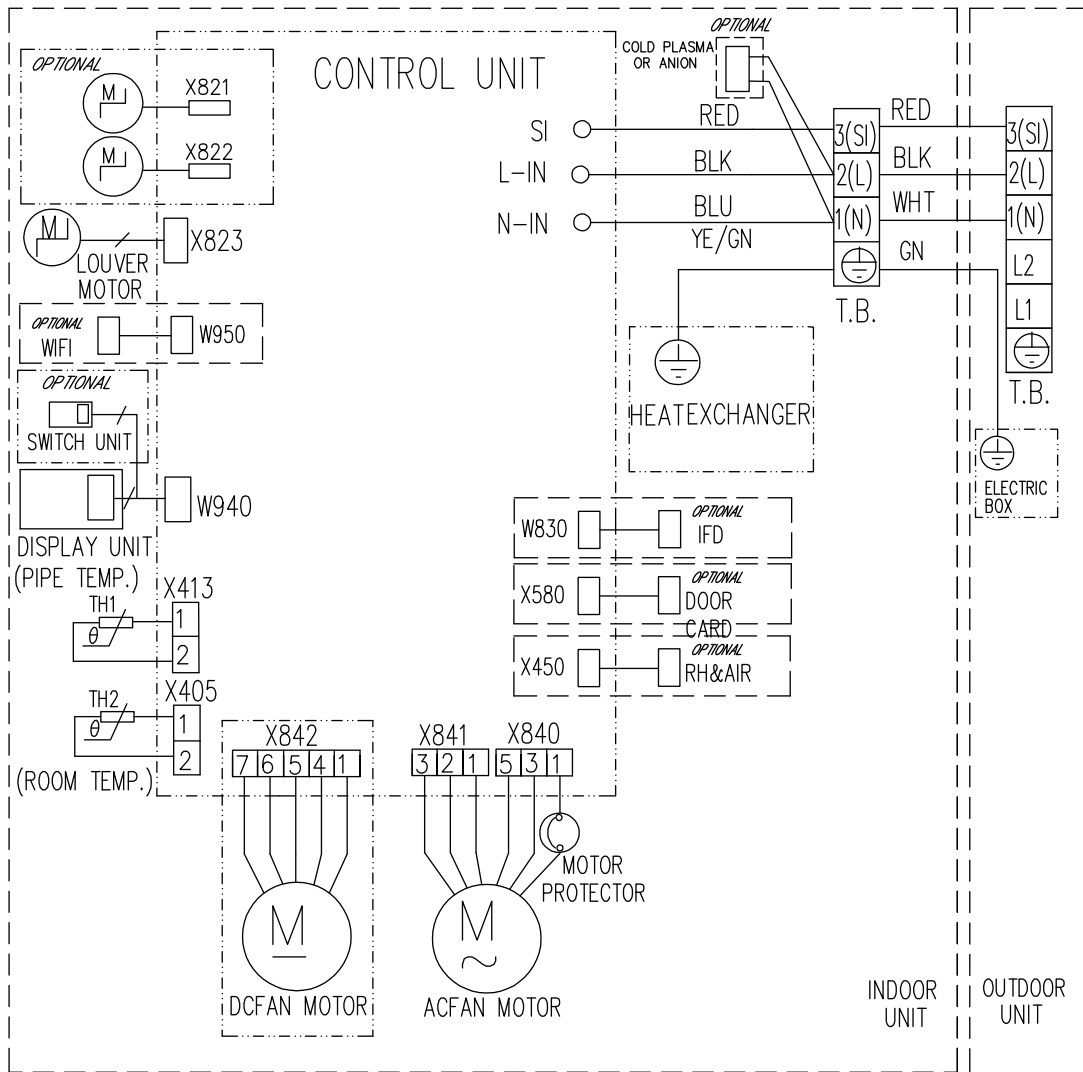


Outdoor unit is higher than indoor unit

| Model       | Required amount of additional refrigerant (g/m) |
|-------------|---|
| WHZ09SZA21S | 20  |
| WHZ12SZA21S |   |

# Wiring diagrams

## Models: WHZ09WMA21S and WHZ12WMA21S



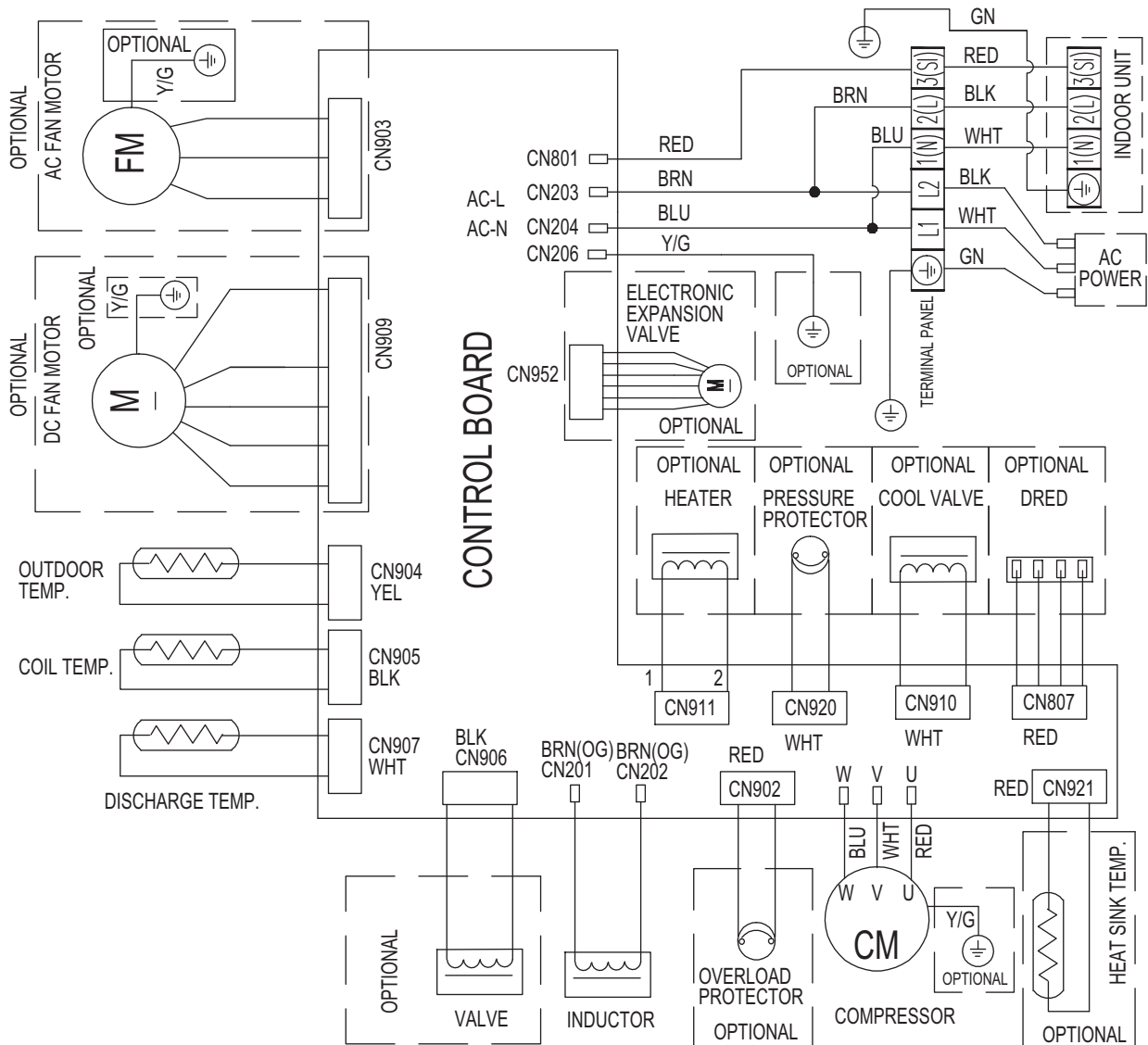
| Temperature                  | 0°C 32°F        | 20°C 68°F        | 30°C 86°F        |
|------------------------------|-----------------|------------------|------------------|
| Thermistor<br>( Pipe temp. ) | 15 k Ω<br>1.3 V | 6.5 k Ω<br>2.2 V | 4.5 k Ω<br>2.7 V |
| Thermistor<br>( Room temp. ) | 15 k Ω<br>1.3 V | 6.5 k Ω<br>2.2 V | 4.5 k Ω<br>2.7 V |

### Fan motor

| Pin No. | Terminal code | Function of terminal        | Lead wire color |
|---------|---------------|-----------------------------|-----------------|
| 1       | Vm            | Motor power voltage input   | Red             |
| 2       | —             | —                           | —               |
| 3       | —             | —                           | —               |
| 4       | GND           | GND                         | Black           |
| 5       | Vcc           | Control power voltage input | White           |
| 6       | FG            | Revolution pulse output     | Blue            |
| 7       | Vsp           | Speed control voltage input | Yellow          |



# 5-1. Models: WHZ09SZA21S and WHZ12SZA21S



Fan motor

| Pin No. | Terminal code | Function of terminal        | Lead wire color |
|---------|---------------|-----------------------------|-----------------|
| 1       | FG            | Revolution pulse output     | Blue            |
| 2       | Vsp           | Speed control voltage input | Yellow          |
| 3       | Vcc           | Control power voltage input | White           |
| 4       | GND           | GND                         | Black           |
| 5       | —             | —                           | —               |
| 6       | Vm            | Motor power voltage input   | Red             |

Compressor

09 model: 2.08 Ω  
 12 model: 1.82 Ω  
 (20°C 68°F)

| Temperature                  | 0°C 32°F          | 20°C 68°F          | 30°C 86°F          |
|------------------------------|-------------------|--------------------|--------------------|
| Thermistor (ODU temp.)       | 15 k Ω<br>1.3 V   | 6.5 k Ω<br>2.2 V   | 4.5 k Ω<br>2.7 V   |
| Thermistor (Pipe temp.)      | 15 k Ω<br>1.3 V   | 6.5 k Ω<br>2.2 V   | 4.5 k Ω<br>2.7 V   |
| Thermistor (Discharge temp.) | 187 k Ω<br>0.18 V | 72.1 k Ω<br>0.43 V | 46.5 k Ω<br>0.64 V |

# Troubleshooting

## Error Code Table

### 1. Indication on the outdoor unit:

When the unit has the following trouble and the compressor stops running, The LED of outdoor control board will show the error sequence automatically:

**NOTE:** ★ : LIGHT    ○ : FLASH    × : OFF

| Error code  | Outdoor Failure Description                                    | LED1 | LED2 | LED3 | the root cause may be one of the following   |
|---|--|------|------|------|--|
| <b>Mark description: the lights flash every second for the following faults</b> |  |      |      |      |  |
|   | Normal   | ×    | ×    | ×    |  |
|   | Outdoor coil temperature sensor in trouble                     | ★    | ×    | ★    | <ul style="list-style-type: none"> <li>a. The outdoor coil sensor connect loose;</li> <li>b. The outdoor coil temperature sensor is failure;</li> <li>c. The outdoor control board is failure</li> </ul>   |
|   | Compressor exhaust temperature sensor in trouble               | ★    | ×    | ×    | <ul style="list-style-type: none"> <li>a. The compressor exhaust temperature sensor connect loose;</li> <li>b. The compressor exhaust temperature sensor is failure;</li> <li>c. The outdoor control board is failure</li> </ul>   |
|   | Communication failure between the indoor unit and outdoor unit | ×    | ×    | ○    | <ul style="list-style-type: none"> <li>a. The communication cable connect loose;</li> <li>b. The communication cable is failure;</li> <li>c. The connection between the filter board and the outdoor control board is incorrect or loose;</li> <li>d. The connection between the filter board and the terminal is incorrect or loose;</li> <li>e. The indoor control board is failure;</li> <li>f. The PFC board is failure;</li> <li>g. The power board is failure; h. the outdoor control board is failure.</li> </ul> |
|   | Current overload protection                                    | ★    | ○    | ×    | <ul style="list-style-type: none"> <li>a. The fan motor run abnormally;</li> <li>b. The condenser or and evaporator is dirty;</li> <li>c. The air inlet and outlet is abnormally</li> </ul>  |
|   | Maximum current protection                                     | ★    | ○    | ★    | <ul style="list-style-type: none"> <li>a. The outdoor control board is short circuit;</li> <li>b. The drive board is short circuit;</li> <li>c. The other components is short circuit</li> </ul>   |
|   | Communication trouble between outdoor unit and driver          | ×    | ★    | ★    | <ul style="list-style-type: none"> <li>a. The connection wires connect loose</li> <li>b. The outdoor board or drive board is failure;</li> </ul>   |

|  |  |   |   |   |  |
|--|--|---|---|---|--|
|  | Outdoor EEPROM in trouble  | ★ | ★ | ★ | <p>a. The EEPROM chip is loose;</p> <p>b. The EEPROM chip inserted with opposite direction;</p> <p>c. The EEPROM chip is failure</p>   |
|  | Compressor exhaust temperature too high protection                                     | × | ○ | ★ | <p>a. The compressor exhaust temperature sensor is failure;</p> <p>b. The refrigerant of the unit is not enough</p>  |
|  | Outdoor ambient temperature sensor in trouble  | ★ | ★ | × | <p>a. The outdoor ambient temperature sensor connect loose;</p> <p>b. The outdoor ambient temperature sensor is failure;</p> <p>c. The outdoor control board is failure</p>  |
|  | Compressor shell temperature too high protection                                       | × | ★ | ○ | <p>a. The compressor exhaust temperature sensor connect loose</p> <p>b. The refrigerant of the unit is not enough</p>  |
|  | Anti-freeze protection with cooling or overload protection with heating in indoor unit | × | ○ | ○ | <p>a. The indoor coil temperature sensor connect loose;</p> <p>b. The indoor coil temperature sensor is failure;</p> <p>c. The indoor control board is failure</p> <p>d. The refrigerant system is abnormal.</p>   |
|  | Compressor drive in trouble  | ○ | × | ○ | <p>a. The outdoor drive board is failure;</p> <p>b. The compressor is failure</p> <p>c. The outdoor control board is failure</p>   |
|  | Outdoor fan motor locked rotor protection  | ○ | ○ | ★ | <p>a. The connection of the outdoor fan motor is loose;</p> <p>b. There are something block the outdoor fan;</p> <p>c. The fan motor is failure;</p> <p>d. The outdoor control board is failure</p>  |
|  | Outdoor coil anti-overload protection with cooling                                     | × | ★ | × | <p>a. The refrigerant is too much;</p> <p>b. The outdoor fan motor is failure;</p> <p>c. The outdoor fan is broken;</p> <p>d. The condenser is dirty;</p> <p>e. The air inlet and air outlet of the indoor unit and the outdoor unit is not normally</p> |

|  |  |   |   |   |   |
|--|--|---|---|---|---|
|  | IPM module protection                              | × | ○ | × | <p>a. The IPM board is failure;</p> <p>b. The outdoor fan is broken;</p> <p>c. The outdoor fan motor is failure;</p> <p>d. The outdoor fan has been blocked ;</p> <p>e. The condenser is dirty;</p> <p>f. The outdoor unit has been installed without standard.</p> |
|  | PFC protection                                     | ○ | × | × | <p>a. The PFC is failure;</p> <p>b. The outdoor drive board is failure</p>  |
|  | Compressor pre heating process                     | ○ | ★ | ○ | It is normal mode in cold weather   |
|  | Chip in outdoor board in trouble                   | ★ | × | ○ | <p>a. Using the wrong drive board;</p> <p>b. Using the wrong compressor.</p>  |
|  | AC voltage higher or lower protection              | ★ | ★ | ○ | <p>a. The supply voltage is higher or lower than normal;</p> <p>b. The inner supply voltage of the unit is higher or lower than normal</p>  |
|  | DC compressor start failure                        | ○ | ○ | × | <p>a. The outdoor drive board is failure;</p> <p>b. The compressor is failure</p>   |
|  | Outdoor ambient temperature too low protection     | ★ | ○ | ○ | a. Outdoor ambient temperature too low  |
| <b>Mark description: the lights flash every two seconds for the following faults</b> |  |   |   |   |   |
|  | Protection against overheated outdoor radiator     | ○ | × | × | <p>a. Radiator sensors fail</p> <p>b. Detection circuit of the sensor on the control panel fails</p>  |
|  | Protection of the system against too high pressure | ○ | ○ | × | <p>a. The pressure switch fails</p> <p>b. The pressure detection switch on the control panel fails</p> <p>c. The measured value of the system pressure exceeds the limit</p>  |

**When the compressor is in operation:**

| Mark description: ★ : Light ○ : Flash × : Off; the flash cycle is 1S |      |      |      |   |
|--|------|------|------|---|
| No.  | LED1 | LED2 | LED3 | Reasons for the current operating frequency of the compressor is limited  |
| 1  | ○    | ○    | ○    | Normal frequency rising and decreasing, no limitation   |
| 2  | ×    | ×    | ★    | Frequency decreasing or prohibition of frequency rising caused by over-current  |
| 3  | ×    | ★    | ★    | Frequency decreasing or prohibition of frequency rising caused by anti-freezing of refrigeration or anti-oveload in heating |

|    |   |   |   |  |
|----|---|---|---|--|
| 4  | ★ | × | ★ | Frequency decreasing or prohibition of frequency rising caused by too high compressor discharge temperature                                      |
| 5  |   |   |   | Limit to the max operating frequency caused by too low power voltage   |
| 6  | ★ | ★ | ★ | Operation at fixed frequency (in the case of capability measuring or compulsory operation at fixed frequency)                                    |
| 7  | ○ | × | × | Protective frequency decreasing against outdoor overload (overpower, over frequency conversion rate, over torque, detection of DC under-voltage) |
| 8  | ★ | × | × | Frequency decreasing caused by indoor and outdoor communication fault  |
| 9  | × | ★ | ○ | Frequency decreasing or prohibition of frequency rising protection against overload of outdoor coiled pipe                                       |
| 10 | × | ★ | × | Frequency decreasing or prohibition of frequency rising for power-saving when it is being used simultaneously with other appliances              |

## 2. Indication by the indoor unit:

2.1. The 7-segment tube of the indoor display board will show the error code automatically when the unit has the following trouble:

| Error code | Power | Timer | Running | Sleep | Remark : ★Light    ○ Flash    x OFF  |        |  |
|------------|-------|-------|---------|-------|--|--------|--|
|            | 1     | 2     | 3       | 4     | Content  | Remark | The root cause is may be one of the following  |
| EA         |       |       |         |       | The error code will display when the communication between display board and control board have in trouble |        | a. The connection between the display board and control board is loose;<br>b. The indoor control board is failure.<br>c. The wiring of the display board is failure. |

2.2. When the unit has the following trouble and the compressor stops running, press the sleep button on the remote controller for 10 times in ten seconds and the 7-segment tube of the display board will show the error code as the following, if two malfunction happened at the same time, it need press the sleep button for 10 times again, the LED will show the other error code.

Refer to the remote controller which the sleep key can set into 4 different combination ways, when using to check the error codes only takes effect for pressing the sleep key 10 times in ten seconds instead of 4 times.

NOTE: If the troubleshooting inquiry display by 7-segment tube, then the error code will be displayed, otherwise only the LED of the display board can show.

| Error code | Running | Timer | Sleep | Power | Remark : ★Light    ○ Flash    x OFF |        |   |
|------------|---------|-------|-------|-------|-------------------------------------|--------|---|
|            | 1       | 2     | 3     | 4     | Content                             | Remark | The root cause is may be one of the following |

|   |   |   |   |   |  |   |
|---|---|---|---|---|--|---|
| 0 |   |   |   |   | Normal   |   |
| 1 | x | O | x | x | The failure for temperature sensor of outdoor coil             | <ul style="list-style-type: none"> <li><b>a.</b> The outdoor temperature sensor loose;</li> <li><b>b.</b> The outdoor temperature sensor is failure;</li> <li><b>c.</b> The indoor control board is failure</li> </ul>  |
| 2 | × | O | ★ | × | Compressor exhaust temperature sensor in trouble               | <ul style="list-style-type: none"> <li><b>a.</b> The compressor exhaust temperature sensor connect loose;</li> <li><b>b.</b> The compressor exhaust temperature sensor is failure;</li> <li><b>c.</b> The outdoor control board is failure</li> </ul>   |
| 5 | ★ | O | × | × | IPM module protection  | <ul style="list-style-type: none"> <li><b>a.</b> The IPM board is failure;</li> <li><b>b.</b> The outdoor fan is broken;</li> <li><b>c.</b> The outdoor fan motor is failure;</li> <li><b>d.</b> The outdoor fan has been blocked ;</li> <li><b>e.</b> The condenser is dirty;</li> <li><b>f.</b> The outdoor unit has been installed without standard.</li> </ul>  |
| 6 | ★ | O | × | ★ | AC voltage higher or lower protection                          | <ul style="list-style-type: none"> <li><b>a.</b> The supply voltage is higher or lower than normal;</li> <li><b>b.</b> The inner supply voltage of the unit is higher or lower than normal</li> </ul>   |
| 7 | ★ | O | ★ | × | Communication failure between the indoor unit and outdoor unit | <ul style="list-style-type: none"> <li><b>a.</b> The communication cable connect loose;</li> <li><b>b.</b> The communication cable is failure;</li> <li><b>c.</b> The connection between the filter board and the outdoor control board is incorrect or loose;</li> <li><b>d.</b> The connection between the filter board and the terminal is incorrect or loose;</li> <li><b>e.</b> The indoor control board is failure;</li> <li><b>f.</b> The PFC board is failure;</li> <li><b>g.</b> The power board is failure;</li> <li><b>h.</b> The outdoor control board is failure.</li> </ul> |

|    |   |   |   |   |  |   |
|----|---|---|---|---|--|---|
| 8  | ★ | ○ | ★ | ★ | Current overload protection  | <ul style="list-style-type: none"> <li><b>a.</b> The fan motor run abnormally;</li> <li><b>b.</b> The condenser and evaporator is dirty;</li> <li><b>c.</b> The air inlet and outlet is abnormally</li> </ul>                                   |
| 9  | × | × | ○ | × | Maximum current protection   | <ul style="list-style-type: none"> <li><b>a.</b> The outdoor control board is short circuit;</li> <li><b>b.</b> The drive board is short circuit;</li> <li><b>c.</b> The other components is short circuit</li> </ul>                           |
| 10 | × | × | ○ | ★ | Communication trouble between outdoor unit and driver                      | <ul style="list-style-type: none"> <li><b>a.</b> The connection wires connect loose</li> <li><b>b.</b> The outdoor board or drive board is failure;</li> </ul>  |
| 11 | × | ★ | ○ | × | Outdoor EEPROM in trouble  | <ul style="list-style-type: none"> <li><b>a.</b> The EEPROM chip is loose;</li> <li><b>b.</b> The EEPROM chip inserted with opposite direction;</li> <li><b>c.</b> The EEPROM chip is failure</li> </ul>  |
| 12 | × | ★ | ○ | ★ | Outdoor ambient temperature too low protection                             | Outdoor ambient temperature too low   |
| 13 | ★ | × | ○ | × | Compressor exhaust temperature too high protection                         | <ul style="list-style-type: none"> <li><b>a.</b> The compressor exhaust temperature sensor is failure;</li> <li><b>b.</b> The refrigerant of the unit is not enough</li> </ul>  |
| 14 | ★ | × | ○ | ★ | Outdoor ambient temperature sensor in trouble                              | <ul style="list-style-type: none"> <li><b>a.</b> The outdoor ambient temperature sensor connect loose;</li> <li><b>b.</b> The outdoor ambient temperature sensor is failure;</li> <li><b>c.</b> The outdoor control board is failure</li> </ul> |
| 15 | ★ | ★ | ○ | × | Compressor shell temperature too high protection                           | <ul style="list-style-type: none"> <li><b>a.</b> The compressor exhaust temperature sensor connect loose</li> <li><b>b.</b> The refrigerant of the unit is not enough</li> </ul>  |
| 16 |   |   |   |   | Anti-freeze protection with cooling or overload protection with heating in | <ul style="list-style-type: none"> <li><b>a.</b> The indoor coil temperature sensor connect loose;</li> <li><b>b.</b> The indoor coil temperature sensor is failure;</li> <li><b>c.</b> The indoor control board is failure</li> </ul>          |

|    |   |   |   |   |  |  |  |
|----|---|---|---|---|--|--|--|
|    |   |   |   |   |  |  | <b>d.</b> The refrigerant system is abnormal.  |
| 17 |   |   |   |   | PFC protection                                     |  | <b>a.</b> The PFC is failure;<br><b>b.</b> The outdoor drive board is failure  |
| 18 |   |   |   |   | DC compressor start failure                        |  | <b>a.</b> The outdoor drive board is failure;<br><b>b.</b> The compressor is failure   |
| 19 | × | × | × | O | Compressor drive in trouble                        |  | <b>a.</b> The outdoor drive board is failure;<br><b>b.</b> The compressor is failure<br><b>c.</b> The outdoor control board is failure   |
| 20 | ★ | × | × | O | Outdoor fan motor locked rotor protection          |  | <b>a.</b> The connection of the outdoor fan motor is loose;<br><b>b.</b> There are something block the outdoor fan;<br><b>c.</b> The fan motor is failure;<br><b>d.</b> The outdoor control board is failure   |
| 21 |   |   |   |   | Outdoor coil anti-overload protection with cooling |  | <b>a.</b> The refrigerant is too much;<br><b>b.</b> The outdoor fan motor is failure;<br><b>c.</b> The outdoor fan is broken;<br><b>d.</b> The condenser is dirty;<br><b>e.</b> The air inlet and air outlet of the indoor unit and the outdoor unit is not normally |
| 22 |   |   |   |   | Compressor pre heating process                     |  | It is normal mode in cold weather  |
| 24 |   |   |   |   | Chip in outdoor board in trouble                   |  | <b>a.</b> Using the wrong drive board;<br><b>b.</b> Using the wrong compressor.  |
| 26 |   |   |   |   | Overheated outdoor radiator                        |  | <b>a.</b> Radiator sensor fails<br><b>b.</b> Detection circuit of the sensor on the control panel fails  |
| 27 |   |   |   |   | Protection against too high system pressure        |  | <b>a.</b> The pressure switch fails<br><b>b.</b> The pressure detection switch on the control panel fails<br><b>c.</b> The measured value of system pressure exceeds the limit   |



|    |   |   |   |   |  |  |  |
|----|---|---|---|---|--|--|--|
| 33 | O | x | x | ★ | The failure for temperature sensor of indoor room              |  | <p><b>a.</b> The indoor room temperature sensor loose;</p> <p><b>b.</b> The indoor room temperature sensor is failure;</p> <p><b>c.</b> The indoor control board is failure.</p>   |
| 34 | O | x | ★ | x | The failure for temperature sensor of indoor coil temperature  |  | <p><b>a.</b> The indoor coil temperature sensor loose;</p> <p><b>b.</b> The indoor coil temperature sensor is failure;</p> <p><b>c.</b> The indoor control board is failure.</p>   |
| 36 | O | ★ | × | ★ | Communication failure between the indoor unit and outdoor unit |  | <p><b>a.</b> The communication cable connect loose;</p> <p><b>b.</b> The communication cable is failure;</p> <p><b>c.</b> The connection between the filter board and the outdoor control board is incorrect or loose;</p> <p><b>d.</b> The connection between the filter board and the terminal is incorrect or loose;</p> <p><b>e.</b> The indoor control board is failure;</p> <p><b>f.</b> The PFC board is failure;</p> <p><b>g.</b> The power board is failure;</p> <p><b>h.</b> The outdoor control board is failure.</p> |
| 38 | O | ★ | ★ | ★ | Indoor EEPROM failure  |  | <p><b>a.</b> The EEPROM chip loose;</p> <p><b>b.</b> The indoor control board is failure</p>   |
| 39 | O | x | ★ | ★ | Indoor fan motor run abnormally                                |  | <p><b>a.</b> There are something block the indoor fan motor;</p> <p><b>b.</b> The fan motor cord connect loose;</p> <p><b>c.</b> The fan motor is failure;</p> <p><b>d.</b> The indoor control board is failure</p>  |
| 41 | ★ | ★ | O | ★ | The failure for Indoor grounding protective                    |  | The indoor control board is failure  |

## 2.2 LED display

| Error code | Sleep | Timer | Running |  | Remark : ★Light    O Flash    x OFF |        |   |
|------------|-------|-------|---------|--|-------------------------------------|--------|---|
|            | 1     | 2     | 3       |  | Content                             | Remark | The root cause is may be one of the following |

|   |   |   |   |  |  |   |
|---|---|---|---|--|--|---|
| 0 |   |   |   |  | <b>Normal</b>  |   |
| 1 | O | ★ | ★ |  | The failure for temperature sensor of outdoor coil             | <ul style="list-style-type: none"> <li><b>a.</b> The outdoor temperature sensor loose;</li> <li><b>b.</b> The outdoor temperature sensor is failure;</li> <li><b>c.</b> The indoor control board is failure</li> </ul>  |
| 2 | O | ★ | x |  | Compressor exhaust temperature sensor in trouble               | <ul style="list-style-type: none"> <li><b>a.</b> The compressor exhaust temperature sensor connect loose;</li> <li><b>b.</b> The compressor exhaust temperature sensor is failure;</li> <li><b>c.</b> The outdoor control board is failure</li> </ul>   |
| 5 | ★ | O | x |  | IPM module protection  | <ul style="list-style-type: none"> <li><b>a.</b> The IPM board is failure;</li> <li><b>b.</b> The outdoor fan is broken;</li> <li><b>c.</b> The outdoor fan motor is failure;</li> <li><b>d.</b> The outdoor fan has been blocked ;</li> <li><b>e.</b> The condenser is dirty;</li> <li><b>f.</b> The outdoor unit has been installed without standard.</li> </ul>  |
| 6 | x | O | x |  | AC voltage higher or lower protection                          | <ul style="list-style-type: none"> <li><b>a.</b> The supply voltage is higher or lower than normal;</li> <li><b>b.</b> The inner supply voltage of the unit is higher or lower than normal</li> </ul>   |
| 7 | ★ | ★ | x |  | Communication failure between the indoor unit and outdoor unit | <ul style="list-style-type: none"> <li><b>a.</b> The communication cable connect loose;</li> <li><b>b.</b> The communication cable is failure;</li> <li><b>c.</b> The connection between the filter board and the outdoor control board is incorrect or loose;</li> <li><b>d.</b> The connection between the filter board and the terminal is incorrect or loose;</li> <li><b>e.</b> The indoor control board is failure;</li> <li><b>f.</b> The PFC board is failure;</li> <li><b>g.</b> The power board is failure;</li> <li><b>h.</b> The outdoor control board is failure.</li> </ul> |
| 8 |   |   |   |  | Current overload protection                                    | <ul style="list-style-type: none"> <li><b>a.</b> The fan motor run abnormally;</li> <li><b>b.</b> The condenser and evaporator is dirty;</li> <li><b>c.</b> The air inlet and outlet is abnormally</li> </ul>   |

|    |   |   |   |  |  |  |  |
|----|---|---|---|--|--|--|--|
| 9  |   |   |   |  | Maximum current protection   |  | <p><b>a.</b> The outdoor control board is short circuit;</p> <p><b>b.</b> The drive board is short circuit;</p> <p><b>c.</b> The other components is short circuit</p>   |
| 10 | ★ | x | x |  | Communication trouble between outdoor unit and driver                      |  | <p><b>a.</b> The connection wires connect loose</p> <p><b>b.</b> The outdoor board or drive board is failure;</p>  |
| 11 | O | x | x |  | Outdoor EEPROM in trouble  |  | <p><b>a.</b> The EEPROM chip is loose;</p> <p><b>b.</b> The EEPROM chip inserted with opposite direction;</p> <p><b>c.</b> The EEPROM chip is failure</p>  |
| 12 |   |   |   |  | Outdoor ambient temperature too low protection                             |  | Outdoor ambient temperature too low  |
| 13 | O | x | ★ |  | Compressor exhaust temperature too high protection                         |  | <p><b>a.</b> The compressor exhaust temperature sensor is failure;</p> <p><b>b.</b> The refrigerant of the unit is not enough</p>  |
| 14 | ★ | ★ | O |  | Outdoor ambient temperature sensor in trouble                              |  | <p><b>a.</b> The outdoor ambient temperature sensor connect loose;</p> <p><b>b.</b> The outdoor ambient temperature sensor is failure;</p> <p><b>c.</b> The outdoor control board is failure</p>   |
| 15 | x | O | ★ |  | Compressor shell temperature too high protection                           |  | <p><b>a.</b> The compressor exhaust temperature sensor connect loose</p> <p><b>b.</b> The refrigerant of the unit is not enough</p>  |
| 16 | ★ | x | ★ |  | Anti-freeze protection with cooling or overload protection with heating in |  | <p><b>a.</b> The indoor coil temperature sensor connect loose;</p> <p><b>b.</b> The indoor coil temperature sensor is failure;</p> <p><b>c.</b> The indoor control board is failure</p> <p><b>d.</b> The refrigerant system is abnormal.</p> |
| 17 | x | ★ | x |  | PFC protection   |  | <p><b>a.</b> The PFC is failure;</p> <p><b>b.</b> The outdoor drive board is failure</p>   |
| 18 | x | ★ | ★ |  | DC compressor start failure  |  | <p><b>a.</b> The outdoor drive board is failure;</p> <p><b>b.</b> The compressor is failure</p>  |

|    |   |   |   |  |   |  |   |
|----|---|---|---|--|---|--|---|
| 19 | x | ★ | O |  | Compressor drive in trouble                                   |  | <p><b>a.</b> The outdoor drive board is failure;</p> <p><b>b.</b> The compressor is failure</p> <p><b>c.</b> The outdoor control board is failure</p>   |
| 20 | ★ | x | O |  | Outdoor fan motor locked rotor protection                     |  | <p><b>a.</b> The connection of the outdoor fan motor is loose;</p> <p><b>b.</b> There are something block the outdoor fan;</p> <p><b>c.</b> The fan motor is failure;</p> <p><b>d.</b> The outdoor control board is failure</p>   |
| 21 | x | x | O |  | Outdoor coil anti-overload protection with cooling            |  | <p><b>a.</b> The refrigerant is too much;</p> <p><b>b.</b> The outdoor fan motor is failure;</p> <p><b>c.</b> The outdoor fan is broken;</p> <p><b>d.</b> The condenser is dirty;</p> <p><b>e.</b> The air inlet and air outlet of the indoor unit and the outdoor unit is not normally</p> |
| 22 |   |   |   |  | Compressor pre heating process                                |  | It is normal mode in cold weather   |
| 24 |   |   |   |  | Chip in outdoor board in trouble                              |  | <p><b>a.</b> Using the wrong drive board;</p> <p><b>b.</b> Using the wrong compressor.</p>  |
| 26 |   |   |   |  | Overheated outdoor radiator                                   |  | <p><b>a.</b> Radiator sensor fails</p> <p><b>b.</b> Detection circuit of the sensor on the control panel fails</p>  |
| 27 |   |   |   |  | Protection against too high system pressure                   |  | <p><b>a.</b> The pressure switch fails</p> <p><b>b.</b> The pressure detection switch on the control panel fails</p> <p><b>c.</b> The measured value of system pressure exceeds the limit</p>   |
| 33 | ★ | O | O |  | The failure for temperature sensor of indoor room             |  | <p><b>d.</b> The indoor room temperature sensor loose;</p> <p><b>e.</b> The indoor room temperature sensor is failure;</p> <p><b>f.</b> The indoor control board is failure.</p>  |
| 34 | x | O | O |  | The failure for temperature sensor of indoor coil temperature |  | <p><b>d.</b> The indoor coil temperature sensor loose;</p> <p><b>e.</b> The indoor coil temperature sensor is failure;</p> <p><b>f.</b> The indoor control board is failure.</p>  |

|    |   |   |   |  |  |   |
|----|---|---|---|--|--|---|
| 36 | O | ★ | O |  | Communication failure between the indoor unit and outdoor unit | <ul style="list-style-type: none"> <li><b>a.</b> The communication cable connect loose;</li> <li><b>b.</b> The communication cable is failure;</li> <li><b>c.</b> The connection between the filter board and the outdoor control board is incorrect or loose;</li> <li><b>d.</b> The connection between the filter board and the terminal is incorrect or loose;</li> <li><b>e.</b> The indoor control board is failure;</li> <li><b>f.</b> The PFC board is failure;</li> <li><b>g.</b> The power board is failure;</li> <li><b>h.</b> The outdoor control board is failure.</li> </ul> |
| 38 | O | O | x |  | Indoor EEPROM failure  | <ul style="list-style-type: none"> <li><b>c.</b> The EEPROM chip loose;</li> <li><b>d.</b> The indoor control board is failure</li> </ul>   |
| 39 | O | O | ★ |  | Indoor fan motor run abnormally                                | <ul style="list-style-type: none"> <li><b>a.</b> There are something block the indoor fan motor;</li> <li><b>b.</b> The fan motor cord connect loose;</li> <li><b>c.</b> The fan motor is failure;</li> <li><b>d.</b> The indoor control board is failure</li> </ul>  |
| 41 | x | x | ★ |  | The failure for Indoor grounding protective                    | The indoor control board is failure   |

The failure is detected when the room temperature sensor broken or shorted over 5 sec.

The failure is detected when the temperature sensor of heater exchange broken or shorted over 5 sec.

The failure is detected when each setting data is not match after the EEPROM self-check two times.

The failure is occur when the grounding signal is not detected after the appliance power ON.

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## Test the jumper terminals

### Note:

When the whole machine is powered up, if the external unit does not work, to rule out the communications failures, adopt screening method such as short circuit on the jumper terminals to see if the external unit can be started normally or similar method.



There are two blue terminals on the outdoor control panel, as shown above.

Application: Short out the terminals, and power up the outdoor unit, then the outdoor unit may run independently. It can be determined that there is no internal and external communication faults.

## Trouble Diagnosis of Protection

### Protection diagnosis of the complete machine (all types of protection during operation, i.e. under-voltage, over-voltage and overcurrent protection)

**Note:**List all types of protection that may occur to the complete machine and describe the conditions and signs of the start, course and end of such protection.

#### Voltage protection

##### Protection against AC input over-voltage/under-voltage

###### 1.Conditions for protection against AC input over-voltage/under-voltage:

If the input AC voltage is greater than “protective over-voltage value” or less than “protective under-voltage value” for five seconds, over-voltage/under-voltage protection starts.

###### 2.Protection actions against AC input over-voltage/under-voltage

The system stops operation.

###### 3. Conditions for ending AC input over-voltage/under-voltage:

If the input AC voltage is lower than “the protective over-voltage value” -10V, or higher than “the protective under-voltage value” +10V, the over-voltage/under-voltage protection will be released.

#### Current protection:

##### 1.Protection against over-current

Conditions for over-current protection: if the current is equal to or greater than “current value for starting the refrigeration current protection (E2 value)” for six seconds, over-current protection starts.

Protection actions against over-current: indoor display screen and outdoor indicator give indications, the compressor and outdoor fan stop, but indoor fan runs normally.

Condition for ending over-current protection: when the current drops below “current value for releasing the refrigeration current protection (E2 value)”, over-current protection will be released.

##### 2.Frequency decreasing for over-current

Conditions for over-current **frequency decreasing**: if the current is equal to or greater than “current value

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for starting the refrigeration current protective frequency decreasing (E2 value)", over-current **frequency decreasing** starts.

Over-current **frequency decreasing** actions: the compressor will decrease frequency at rate of (E2 value)Hz/S. The indoor and outdoor fans run.

Conditions for ending over-current **frequency decreasing**: when the current drops below "current value for starting the refrigeration current protective prohibition of frequency rising (E2 value)", over-current under-clocking will be released.

### **3.Prohibition of frequency increasing of compressor exhausting**

Conditions for prohibition of frequency rising of compressor discharge

Condition 1: in the case of frequency decreasing of compressor discharge, the discharge temperature of the compressor drops below X4°C.

Condition 2: in normal operation, the discharge temperature of compressor reaches X5°C.

Either of the above two conditions is met, prohibition of frequency rising of compressor discharge begins.

Actions relates to prohibition of frequency rising of compressor discharge: the frequency of compressor maintains at the current level, which may decrease as the case requires while cannot rise. The indoor and outdoor fans run.

Condition for ending prohibition of frequency rising of compressor discharge: if the temperature of compressor discharge drops below X6°C, prohibition of frequency rising of compressor discharge will be released.

### **4. Prohibition of frequency for anti-overload of outdoor coiled pipe**

Condition for anti-overload prohibition of frequency of outdoor coiled pipe: in the case of anti-overload frequency decreasing of outdoor coiled pipe, anti-overload prohibition of frequency of the unit begins when the temperature of outdoor coiled pipe drops below "the anti-overload frequency decreasing temperature of outdoor coiled pipe".

Actions relates to anti-overload prohibition of frequency of outdoor coiled pipe: the frequency of compressor maintains at the current level, which may decrease as the case requires while cannot rise. The indoor and outdoor fans run.

Condition for ending anti-overload prohibition of frequency of outdoor coiled pipe: if the temperature of outdoor coiled pipe drops below "temperature to release the anti-overload state of outdoor coiled pipe", anti-overload prohibition of frequency of outdoor coiled pipe will be released.

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## **Trouble Diagnosis of Compressor**

Judging the connecting terminals of inverter compressor:

It is impossible to identify terminals U, V and W of inverter compressor with multi-meter. Just connect the terminals in the same way as the original unit when replacing the compressor. A wrong connection will lead to reverse and loud noise of the compressor.

Resistance of compressor coil:

Measure the resistance between any two terminals, which are about a few Ohms, three phases having the same resistance.

## **Trouble Diagnosis of Electric Filter Board**

Visual examination: as the circuit is simple, the connection may be checked visually to see whether any loose or poor connection.

Voltage test: the voltage at the input end shall be the same as the voltage at the output end.

## **Trouble Diagnosis of Electric Communication**

Step one: to determine whether the connecting cables and tether cables of indoor/outdoor units are correctly wired. If not, change wiring order and test connection.

Step two: to determine whether there is loose connection.

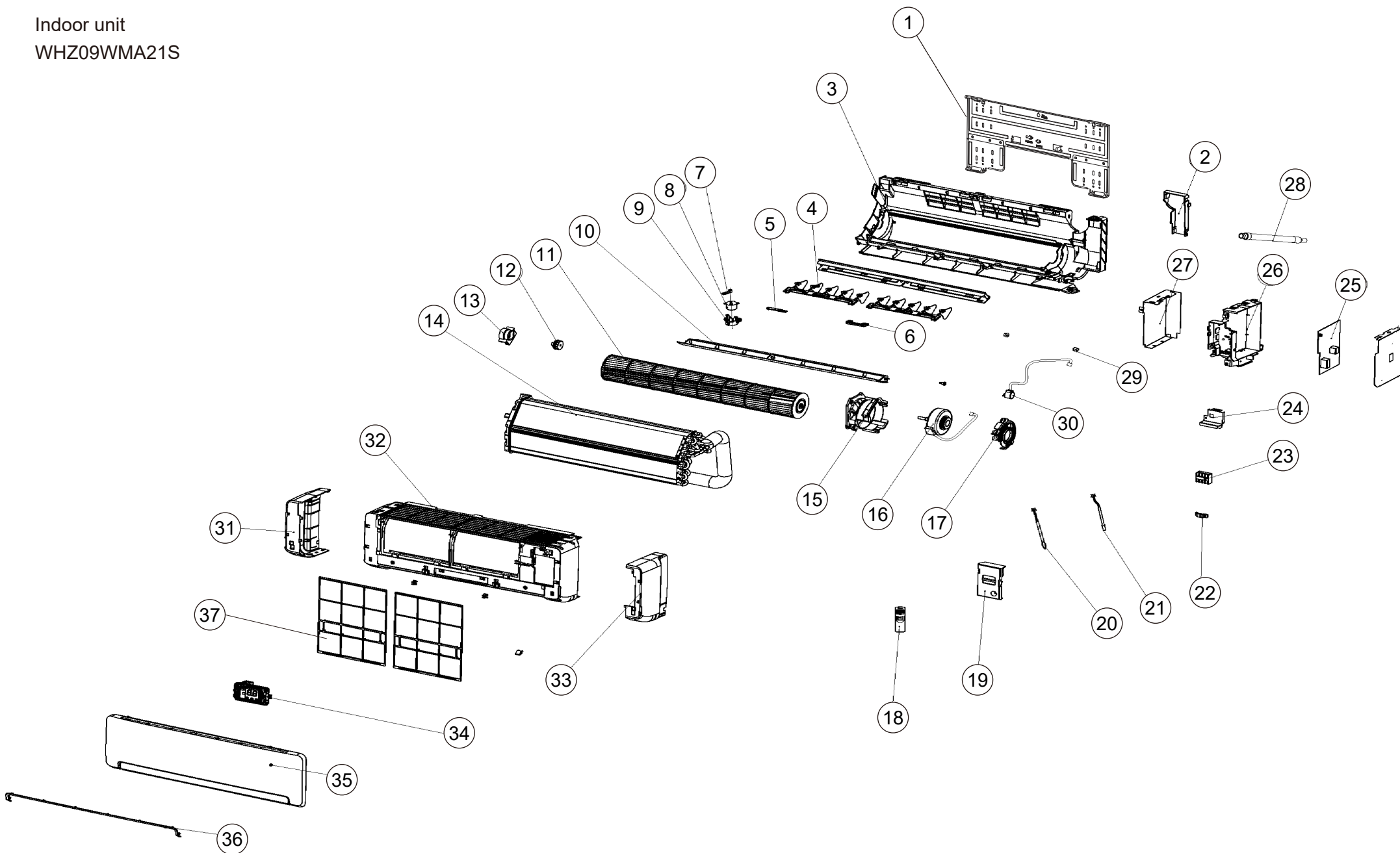
Fasten the connection in the case of loose connection and then conduct verification.

Step three: measure the voltage between SI and N with multi-meter and see whether the voltage fluctuates between 0V and 24V. Please directly replace indoor and outdoor control boards if there are not voltage fluctuations.



# Parts list

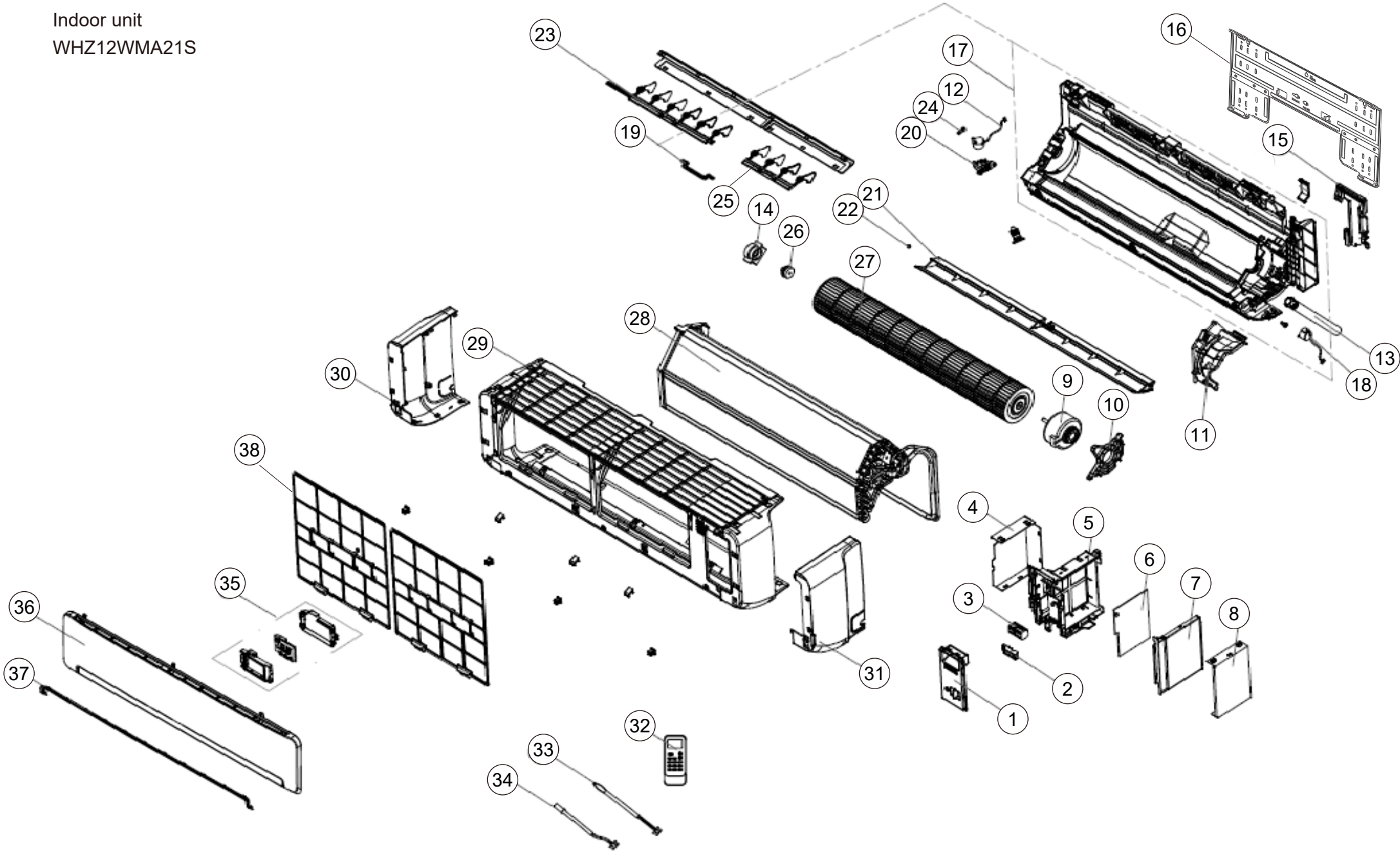
Indoor unit  
WHZ09WMA21S



Indoor unit  
WHZ09WMA21S

| No. | Part number | Description         |
|-----|-------------|---------------------|
| 1   | 1906600     | Bracket wall        |
| 2   | 1984201     | Baffle              |
| 3   | 1854439     | Base assembly       |
| 4   | 1555378     | Vertical louver     |
| 5   | 1555381     | Holder center       |
| 6   | 1555385     | Holder center       |
| 7   | 1555387     | Holder center       |
| 8   | 1260259     | Step motor          |
| 9   | 1555386     | Guard motor         |
| 10  | 1555374     | Louver              |
| 11  | 2092899     | Cross flow fan assy |
| 12  | 1223739     | Bearing             |
| 13  | 1465670     | Baffle              |
| 14  | 1902702     | Evaporator          |
| 15  | 2091423     | Guard motor         |
| 16  | 1838324     | DC motor            |
| 17  | 2091436     | Cover motor         |
| 18  | 4175260     | Remote control      |
| 19  | 1465763     | Cover wire          |
| 20  | 1387643     | Thermistor room     |
| 21  | 1471151     | Thermistor pipe     |
| 22  | 1839902     | Clamp cord          |
| 23  | 1852126     | Terminal            |
| 24  | 1840039     | Cover wire          |
| 25  | 2196727     | Controller PCB      |
| 26  | 1868909     | Electric box        |
| 27  | 1465761     | Electric box cover  |
| 27  | 1465762     | Electric box cover  |
| 28  | 1470426     | Drain hose          |
| 29  | 1222824     | Plug                |
| 30  | 1468408     | Step motor          |
| 31  | 1555390     | Ornamental part     |
| 32  | 2007198     | Front panel         |
| 33  | 1555391     | Ornamental part     |
| 34  | 1874771     | Display assembly    |
| 35  | 4151756     | Intake grille       |
| 36  | 1826563     | Ornamental part     |
| 37  | 1506312     | Air filter          |

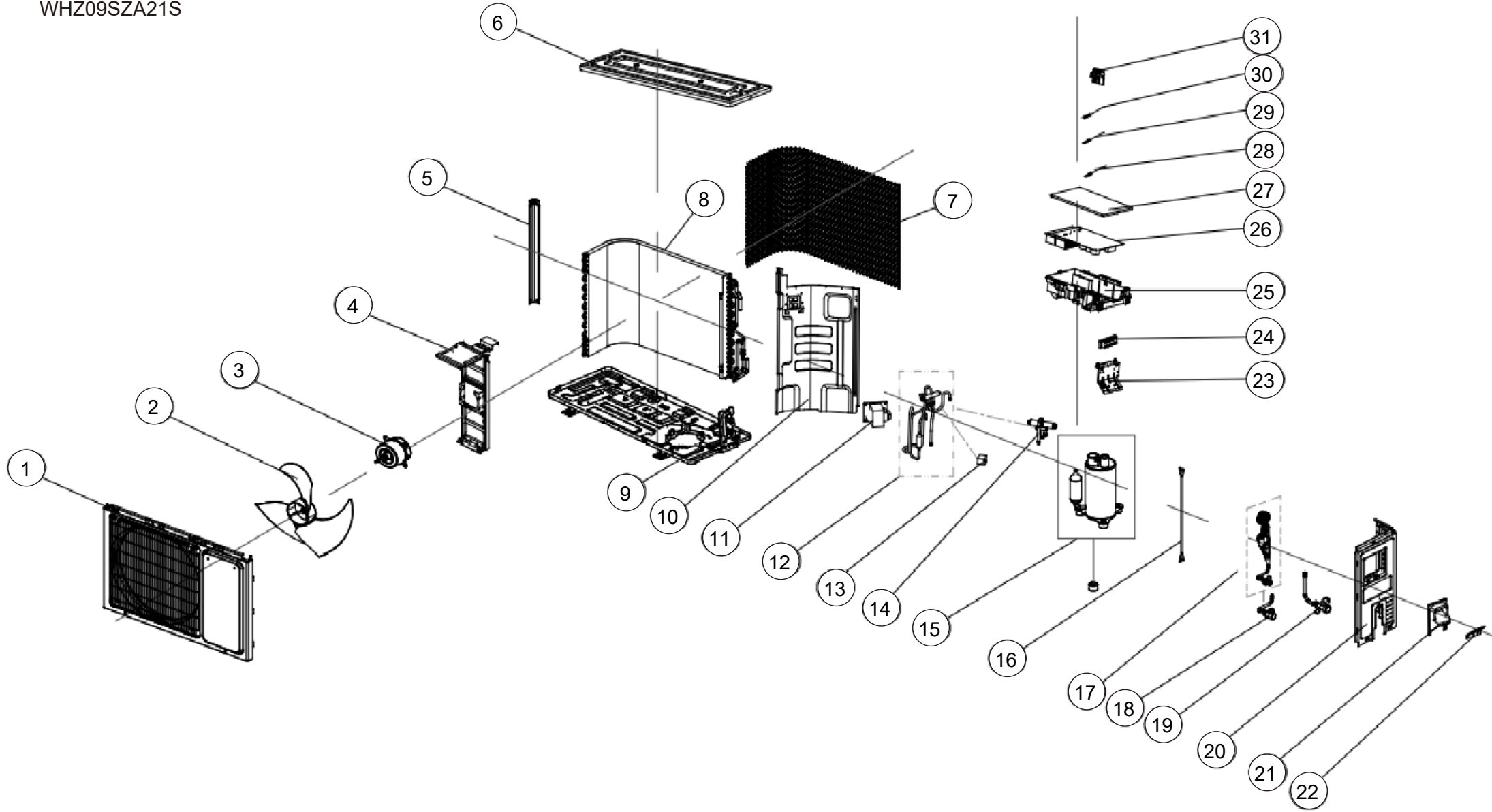
Indoor unit  
WHZ12WMA21S



Indoor unit  
WHZ12WMA21S

| No. | Part number | Description         |
|-----|-------------|---------------------|
| 1   | 1541379     | Cover display       |
| 2   | 1840141     | Clamp cord          |
| 3   | 1852126     | Terminal            |
| 4   | 1541500     | Electric box cover  |
| 5   | 1870720     | Electric box        |
| 6   | 2200403     | Controller PCB      |
| 7   | 1541507     | Cover wire          |
| 8   | 1837043     | Cover wire          |
| 9   | 1561454     | DC motor            |
| 10  | 1541374     | Cover motor         |
| 11  | 1541369     | Guard motor         |
| 12  | 1260311     | Step motor          |
| 13  | 1470426     | Drain hose          |
| 14  | 1465670     | Baffle              |
| 15  | 1541361     | Baffle              |
| 16  | 1907022     | Bracket wall        |
| 17  | 1953444     | Base assembly       |
| 18  | 1819726     | Step motor          |
| 19  | 1541366     | Holder center       |
| 20  | 1541375     | Guard motor         |
| 21  | 1541362     | Louver              |
| 22  | 1222824     | Plug                |
| 23  | 1541364     | Vertical louver     |
| 24  | 1541368     | Holder center       |
| 25  | 1550291     | Vertical louver     |
| 26  | 1223738     | Bearing             |
| 27  | 1541622     | Cross flow fan assy |
| 28  | 1917234     | Evaporator          |
| 29  | 1541381     | Front panel         |
| 30  | 1541388     | Ornamental part     |
| 31  | 1541389     | Ornamental part     |
| 32  | 4175260     | Remote control      |
| 33  | 1383891     | Thermistor pipe     |
| 34  | 1387643     | Thermistor room     |
| 35  | 1824935     | Display assembly    |
| 36  | 4227894     | Intake grille       |
| 37  | 1826043     | Ornamental part     |
| 38  | 1541386     | Air filter          |

Outdoor unit  
WHZ09SZA21S



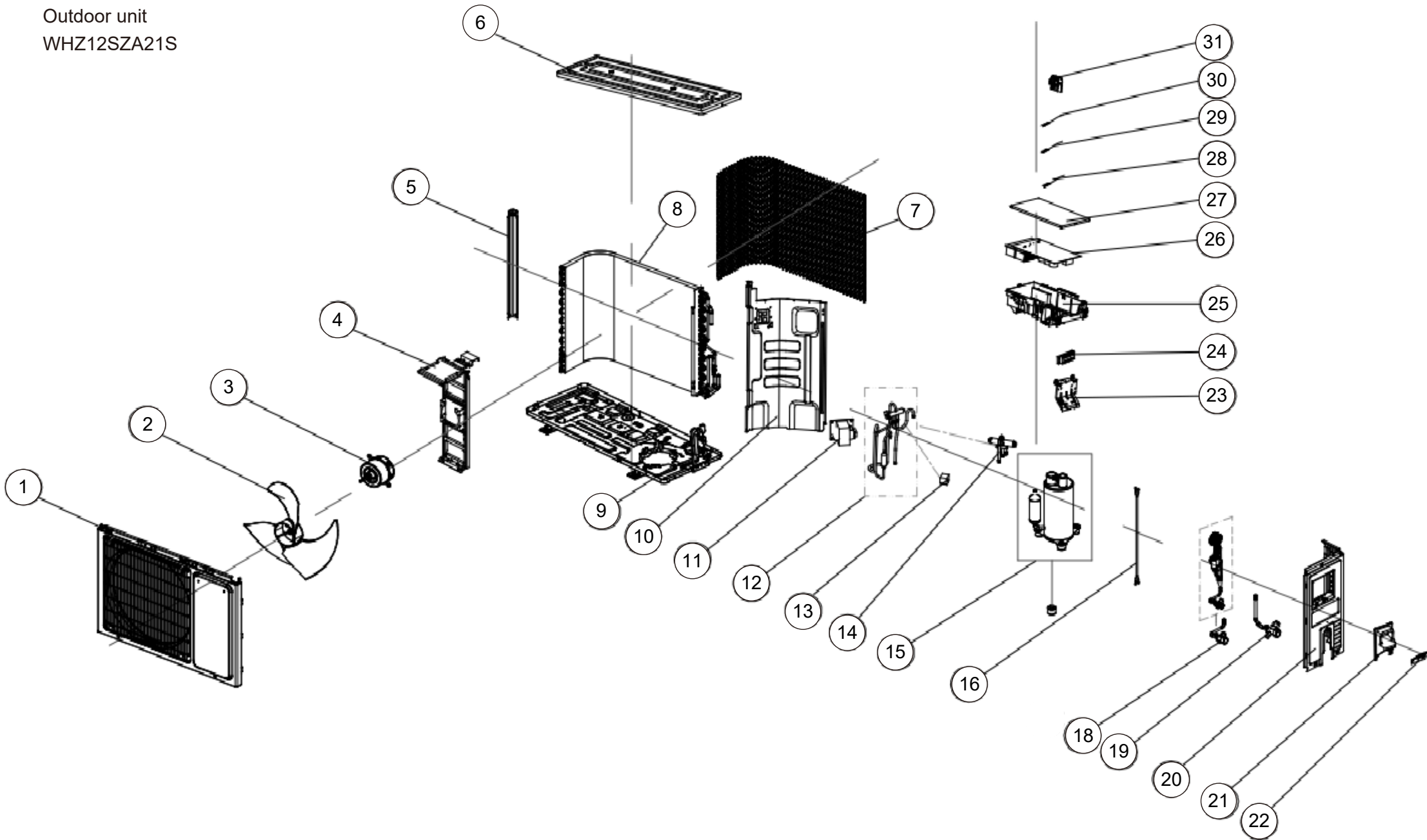
Outdoor unit  
WHZ09SZA21S

| No. | Part number | Description           |
|-----|-------------|-----------------------|
| 1   | 1902781     | Front panel w/ grille |
| 2   | 1556766     | Propeller fan blade   |
| 3   | 1902991     | Fan motor             |
| 4   | 2218087     | Motor bracket         |
| 5   | 1902529     | Mounting plate        |
| 6   | 1902528     | Top panel             |
| 7   | 1854579     | Protective net back   |
| 7   | 1854580     | Protective net left   |
| 8   | 1918085     | Condenser assembly    |
| 9   | 1851356     | Base assembly         |
| 10  | 1847982     | Separate wall         |
| 11  | 1893020     | Choke coil            |
| 12  | 1907925     | Valve 4 way TA        |
| 13  | 1511783     | Solenoid              |
| 14  | 1258654     | Valve 4 way           |
| 15  | 1907920     | Compressor            |
| 16  | 1938339     | Compressor wire       |
| 17  | 1864846     | EEV assembly          |
| 18  | 1405371     | Valve 2 way 1/4       |
| 19  | 1335015     | Valve 3 way 3/8       |
| 20  | 1902527     | Cabinet right         |
| 21  | 1902530     | Bracket conduit       |
| 22  | 1902438     | Plate cover           |
| 23  | 1842392     | Connecting board      |
| 24  | 1852124     | Wire terminal board   |
| 25  | 1948917     | Electric box          |
| 26  | 1917172     | Inverter control PCB  |
| 27  | 1948918     | Cover wire            |
| 28  | 1822633     | Thermistor pipe       |
| 29  | 1822634     | Thermistor discharge  |
| 30  | 1831029     | Thermistor outdoor    |
| 31  | 1546721     | Senser mount plate    |

w/: with

TA: total assembly

Outdoor unit  
WHZ12SZA21S



Outdoor unit  
WHZ12SZA21S

| No. | Part number | Description           |
|-----|-------------|-----------------------|
| 1   | 1902781     | Front panel w/ grille |
| 2   | 1556766     | Propeller fan blade   |
| 3   | 1902991     | Fan motor             |
| 4   | 1902996     | Motor bracket         |
| 5   | 1902529     | Mounting plate        |
| 6   | 1902528     | Top panel             |
| 7   | 1854579     | Protective net back   |
| 7   | 1854580     | Protective net left   |
| 8   | 1917128     | Condenser assembly    |
| 9   | 1895024     | Base assembly         |
| 10  | 1546680     | Separate wall         |
| 11  | 1893020     | Choke coil            |
| 12  | 1907666     | Valve 4 way TA        |
| 13  | 1511783     | Solenoid              |
| 14  | 1258654     | Valve 4 way           |
| 15  | 1907412     | Compressor            |
| 16  | 1495238     | Compressor wire       |
| 18  | 1405371     | Valve 2 way 1/4       |
| 19  | 1335015     | Valve 3 way 3/8       |
| 20  | 1902527     | Cabinet right         |
| 21  | 1902530     | Bracket conduit       |
| 22  | 1902438     | Plate cover           |
| 23  | 1842392     | Connecting board      |
| 24  | 1852124     | Wire terminal board   |
| 25  | 1948917     | Electric box          |
| 26  | 1917217     | Inverter control PCB  |
| 27  | 1948918     | Cover wire            |
| 28  | 1822633     | Thermistor pipe       |
| 29  | 1822634     | Thermistor discharge  |
| 30  | 1831029     | Thermistor outdoor    |
| 31  | 1546721     | Senser mount plate    |

w/: with

TA: total assembly



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## Accessories

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### Indoor unit

| Part name                         | Q'ty                       | Part name                      | Q'ty |
|-----------------------------------|----------------------------|--------------------------------|------|
| Remote controller instructions    | 1                          | Drain joint rubber seal        | 1    |
| Use and installation instructions | 1                          | Flare nuts                     | 4    |
| Remote controller                 | 1                          | Bag of wall anchors and screws | 1    |
| Remote controller holder          | 1                          | Screw for installations        | 6    |
| AAA battery                       | 2                          | Screw cover                    | 3    |
| Foam insulation                   | 09 model: 1<br>12 model: 2 | Warranty card                  | 1    |
| Drain joint                       | 1                          | Rubber plug                    | 6    |

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### Outdoor unit

| Part name                         | Q'ty | Part name  | Q'ty |
|-----------------------------------|------|------------|------|
| Use and installation instructions | 1    | Power wire | 1    |
| Bottom rubber for outdoor unit    | 4    |            |      |

