
Service Manual



Model:

Note: " ** " mean code of Front Panel

| | | |
|--------------------|--------------------|--------------------|
| HWDKT30S/HRDKT30AS | HWDKT36S/HRDKT36AS | HWDBT12S/HRDBT12AS |
| HWDBT18S/HRDBT18AS | HWDBT24S/HRDBT24AS | |
| | | |

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1. Safety Considerations

IMPORTANT!

Please Read Before Starting

This air conditioning system meets strict safety and operating standards. As the installer or service person, it is an important part of your job to install or service the system, so it operates safely and efficiently.

For safe installation and trouble-free operation, you must:

- Carefully read this instruction booklet before beginning.
- Follow each installation or repair step exactly as shown.
- Observe all local, state, and national electrical codes.
- Pay close attention to all warning and caution notices given in this manual.



WARNING

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



CAUTION

This symbol refers to a hazard or unsafe practice which can result in personal injury or product or property damage.

If Necessary, Get Help

These instructions are all you need for most installation sites and maintenance conditions. If you require help for a special problem, contact our sales/service outlet or your certified dealer for additional instructions.

In Case of Improper Installation

The manufacturer shall in no way be responsible for improper installation or maintenance service, including failure to follow the instructions in this document.

SPECIAL PRECAUTIONS

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 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.

2. Product Specifications

Note: " ** " mean code of Front Panel(See in 3-1 .Product Pictures).

| Model No. | | HWDKT30S/HRDKT30AS | HWDKT36S/HRDKT36AS |
|---|-----------------|--------------------|--------------------|
| Type | | T1, H/P, INVERTER | T1, H/P, INVERTER |
| Ratings | | | |
| Cooling Capacity | Btu/h | 30000 | 33000 |
| Heating Capacity | Btu/h | 31000 | 33400 |
| Rated Input-Cooling | W | 3000 | 3300 |
| Rated Input-Heating | W | 2840 | 3060 |
| Moisture Removal | L/h | 3.0 | 3.6 |
| Air Circulation | High m3/h | 1800 | 1800 |
| | Mid m3/h | / | / |
| | Low m3/h | / | / |
| EER for Cooling | W/W | 2.93 | 2.93 |
| COP for Heating | W/W | 3.2 | 3.2 |
| Energy Class | Cooling | SEER18.8 | SEER17.6 |
| Energy Class | Heatling | HSPF12.3 | HSPF9.6 |
| Refrigerant | | R410A | R410A |
| Refrigerant charge volume (5M) | g | 2070 | 2250 |
| Additional ref. Volume | g | 30 | 30 |
| Indoor Unit Noise Level | High(dB (A)) | 50 | 50 |
| | Mid(dB (A)) | / | / |
| | Low(dB (A)) | / | / |
| Outdoor Unit Noise Level | dB (A) | 60 | 60 |
| Power Supply | | | |
| Voltage, Frequency, Phase | V | 208/230V~,60Hz,1P | 208/230V~,60Hz,1P |
| Rated Current | Cooling (A) | 13.4 | 14.8 |
| | Heating (A) | 12.6 | 13.8 |
| LRA | A | / | |
| System pressures in cooling rated conditions | | | |
| Max suction pressure | PSIG | 240 | 240 |
| Max discharge pressure | PSIG | 550 | 550 |
| System | | | |
| Compressor | | | |
| Compressor type | | Rotary | Rotary |
| Compressor Model No. | | ATL253UDPC9AUL | ATL253UDPC9AUL |

| | | | |
|---|--------------|--------------|--------------|
| Compressor MFG | | HIGHLY | HIGHLY |
| Connecting Pipe Diameter | | | |
| Liquid Pipe | inch | 3/8 | 3/8 |
| Gas Pipe | inch | 5/8 | 5/8 |
| Features | | | |
| Display on Front Panel | | LED | LED |
| LCD Wireless Remote Controller | | Yes | Yes |
| Removable and washable Panel | | Yes | Yes |
| Washable PP Filter | | Yes | Yes |
| 24 Hours Timer | | Yes | Yes |
| 3 Speed and Auto Indoor Fan Control | | Yes | Yes |
| Vertical Auto Swing Louver | | Yes | Yes |
| Manual Adjustable Horizontal Swing Louver | | Yes | Yes |
| Sleep Operation | | Yes | Yes |
| Smart Function | | Yes | Yes |
| Super Function | | Yes | Yes |
| Auto Restart | | Yes | Yes |
| Dimmer | | Yes | Yes |
| Other | | | |
| Net Dimensions WxHxD (mm) | Indoor Unit | / | / |
| | Outdoor Unit | 884X365X793 | 884X365X793 |
| Net Weight (Kg) | Indoor Unit | / | / |
| | Outdoor Unit | 58 | 60 |
| Packing Dimensions WxHxD (mm) | Indoor Unit | / | / |
| | Outdoor Unit | 1050X500X910 | 1050X500X910 |
| Gross Weight (Kg) | Indoor Unit | / | / |
| | Outdoor Unit | 63 | 65 |

| | | |
|--|--------------|--------------------|
| Model No. | | HWDBT12S/HRDBT12AS |
| Type | | T1, CO, INVERTER |
| Ratings | | |
| Cooling Capacity | Btu/h | 12000 |
| Heating Capacity | Btu/h | / |
| Rated Input-Cooling | W | 920 |
| Rated Input-Heating | W | / |
| Moisture Removal | L/h | 1.2 |
| Air Circulation | High m3/h | 620 |
| | Mid m3/h | / |
| | Low m3/h | / |
| EER for Cooling | W/W | 3.82 |
| COP for Heating | W/W | / |
| Energy Class | Cooling | SEER20 |
| Energy Class | Heatling | / |
| Refrigerant | | R410A |
| Refrigerant charge volume (5M) | g | 1110 |
| Additional ref. Volume | g | 20 |
| Indoor Unit Noise Level | High(dB (A)) | 39 |
| | Mid(dB (A)) | / |
| | Low(dB (A)) | / |
| Outdoor Unit Noise Level | dB (A) | 53 |
| Power Supply | | |
| Voltage, Frequency, Phase | V | 208-230V~,60Hz,1P |
| Rated Current | Cooling (A) | 4.1 |
| | Heating (A) | / |
| LRA | A | / |
| System pressures in cooling rated conditions | | |
| Max suction pressure | PSIG | 240 |
| Max discharge pressure | PSIG | 550 |
| System | | |
| Compressor | | |
| Compressor type | | Rotary |
| Compressor Model No. | | ASN108D32UFZ |
| Compressor MFG | | GMCC |
| Connecting Pipe Diameter | | |
| Liquid Pipe | inch | 1/4 |
| Gas Pipe | inch | 3/8 |
| Features | | |
| Display on Front Panel | | LED |
| LCD Wireless Remote Controller | | Yes |
| Removable and washable Panel | | Yes |
| Washable PP Filter | | Yes |

| | | |
|---|--------------|-------------|
| 24 Hours Timer | | Yes |
| 3 Speed and Auto Indoor Fan Control | | Yes |
| Vertical Auto Swing Louver | | Yes |
| Manual Adjustable Horizontal Swing Louver | | Yes |
| Sleep Operation | | Yes |
| Smart Function | | Yes |
| Super Function | | Yes |
| Auto Restart | | Yes |
| Dimmer | | Yes |
| Other | | |
| Net Dimensions WxHxD (mm) | Indoor Unit | / |
| | Outdoor Unit | 810×280×585 |
| Net Weight (Kg) | Indoor Unit | / |
| | Outdoor Unit | 33 |
| Packing Dimensions WxHxD (mm) | Indoor Unit | / |
| | Outdoor Unit | 940×385×630 |
| Gross Weight (Kg) | Indoor Unit | / |
| | Outdoor Unit | 36 |

| | | |
|-----------------------------------|--------------|--------------------|
| Model No. | | HWDBT18S/HRDBT18AS |
| Type | | T1, CO, INVERTER |
| Ratings | | |
| Cooling Capacity | W | 5275 |
| Heating Capacity | W | / |
| Rated Input-Cooling | W | 1385 |
| Rated Input-Heating | W | / |
| Moisture Removal | L/h | / |
| Air Circulation | High m3/h | 1100 |
| | Mid m3/h | / |
| | Low m3/h | / |
| EER for Cooling | W/W | 3.81 |
| COP for Heating | W/W | / |
| Energy Class | Cooling | / |
| Energy Class | Heatling | / |
| Refrigerant | | R410A |
| Refrigerant charge volume (5M) | g | 1510 |
| Additional ref. Volume | g | 20 |
| Indoor Unit Noise Level | High(dB (A)) | 45 |
| | Mid(dB (A)) | 41 |

| | | |
|--|---------------|-------------------|
| | Low(dB (A)) | 37 |
| | Quiet(dB (A)) | 34 |
| Outdoor Unit Noise Level | dB (A) | 55 |
| Power Supply | | |
| Voltage, Frequency, Phase | V | 208-230V~,60Hz,1P |
| Rated Current | Cooling (A) | 6.3 |
| | Heating (A) | / |
| LRA | A | / |
| System pressures in cooling rated conditions | | |
| Max suction pressure | PSIG | 240 |
| Max discharge pressure | PSIG | 550 |
| System | | |
| Compressor | | |
| Compressor type | | Rotary |
| Compressor Model No. | | ATM150D43UFZ |
| Compressor MFG | | GMCC |
| Connecting Pipe Diameter | | |
| Liquid Pipe | inch | 1/4 |
| Gas Pipe | inch | 1/2 |
| Features | | |
| Display on Front Panel | | LED |
| LCD Wireless Remote Controller | | Yes |
| Removable and washable Panel | | Yes |
| Washable PP Filter | | Yes |
| 24 Hours Timer | | Yes |
| 3 Speed and Auto Indoor Fan Control | | No(4 Speed) |
| Vertical Auto Swing Louver | | Yes |
| Manual Adjustable Horizontal Swing Louver | | No(Auto) |
| Sleep Operation | | Yes |
| Smart Function | | Yes |
| Super Function | | Yes |
| Auto Restart | | Yes |
| Dimmer | | Yes |
| Other | | |
| Net Dimensions WxHxD (mm) | Indoor Unit | / |
| | Outdoor Unit | 860×650×310 |
| Net Weight (Kg) | Indoor Unit | / |
| | Outdoor Unit | 44 |
| Packing Dimensions WxHxD | Indoor Unit | / |

| | | |
|-------------------|--------------|-------------|
| (mm) | Outdoor Unit | 995×720×420 |
| Gross Weight (Kg) | Indoor Unit | / |
| | Outdoor Unit | 48 |


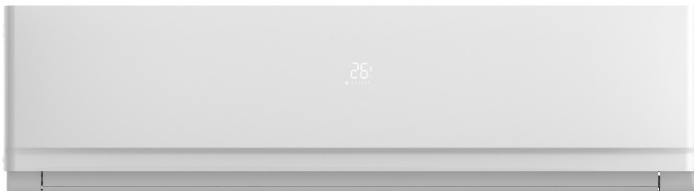
| | | |
|--------------------------------|-----------------|--------------------|
| Model No. | | HWDBT24S/HRDBT24AS |
| Type | | T1, CO, INVERTER |
| Ratings | | |
| Cooling Capacity | Btu/h | 24000 |
| Heating Capacity | W | / |
| Rated Input-Cooling | W | 1845 |
| Rated Input-Heating | W | / |
| Moisture Removal | L/h | 2.4 |
| Air Circulation | High m3/h | 1200 |
| | Mid m3/h | / |
| | Low m3/h | / |
| EER for Cooling | W/W | 3.81 |
| COP for Heating | W/W | / |
| Energy Class | Cooling | SEER20.9 |
| Energy Class | Heatling | / |
| Refrigerant | | R410A |
| Refrigerant charge volume (5M) | g | 1840 |
| Additional ref. Volume | g | 30 |
| Indoor Unit Noise Level | Super(dB (A)) | 49 |
| | High(dB (A)) | 47 |
| | Mid(dB (A)) | 45 |
| | Low(dB (A)) | 42 |
| | Mid-Low(dB (A)) | 40 |
| | Low(dB (A)) | 38 |
| | Quirt(dB (A)) | 34 |
| Outdoor Unit Noise Level | dB (A) | 58 |
| Power Supply | | |
| Voltage, Frequency, Phase | V | 230V~,60Hz,1P |
| Rated Current | Cooling (A) | 8.3 |
| | Heating (A) | / |

| | | |
|--|--------------|--------------|
| LRA | A | / |
| System pressures in cooling rated conditions | | |
| Max suction pressure | PSIG | 240 |
| Max discharge pressure | PSIG | 550 |
| System | | |
| Compressor | | |
| Compressor type | | Rotary |
| Compressor Model No. | | ATF235D22UMT |
| Compressor MFG | | GMCC |
| Connecting Pipe Diameter | | |
| Liquid Pipe | inch | 3/8 |
| Gas Pipe | inch | 1/2 |
| Features | | |
| Display on Front Panel | | LED |
| LCD Wireless Remote Controller | | Yes |
| Removable and washable Panel | | Yes |
| Washable PP Filter | | Yes |
| 24 Hours Timer | | Yes |
| 3 Speed and Auto Indoor Fan Control | | NO(7 Speed) |
| Vertical Auto Swing Louver | | Yes |
| Manual Adjustable Horizontal Swing Louver | | Yes |
| Sleep Operation | | Yes |
| Smart Function | | Yes |
| Super Function | | Yes |
| Auto Restart | | Yes |
| Dimmer | | Yes |
| Other | | |
| Net Dimensions WxHxD (mm) | Indoor Unit | / |
| | Outdoor Unit | 885×365×793 |
| Net Weight (Kg) | Indoor Unit | / |
| | Outdoor Unit | 54 |
| Packing Dimensions WxHxD (mm) | Indoor Unit | / |
| | Outdoor Unit | 1050×500×890 |
| Gross Weight (Kg) | Indoor Unit | / |
| | Outdoor Unit | 62 |

3. Product Picture and Drawing

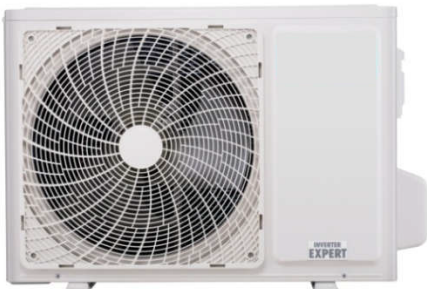
3-1. Product Pictures

Indoor units:

| Front Panel | DB |
|-------------|---|
| View |  |
| Front Panel | DK |
| View |  |

Note: " ** " mean one or more than one code of Front Panel , but maybe not mean that all the code .

Outdoor Units:

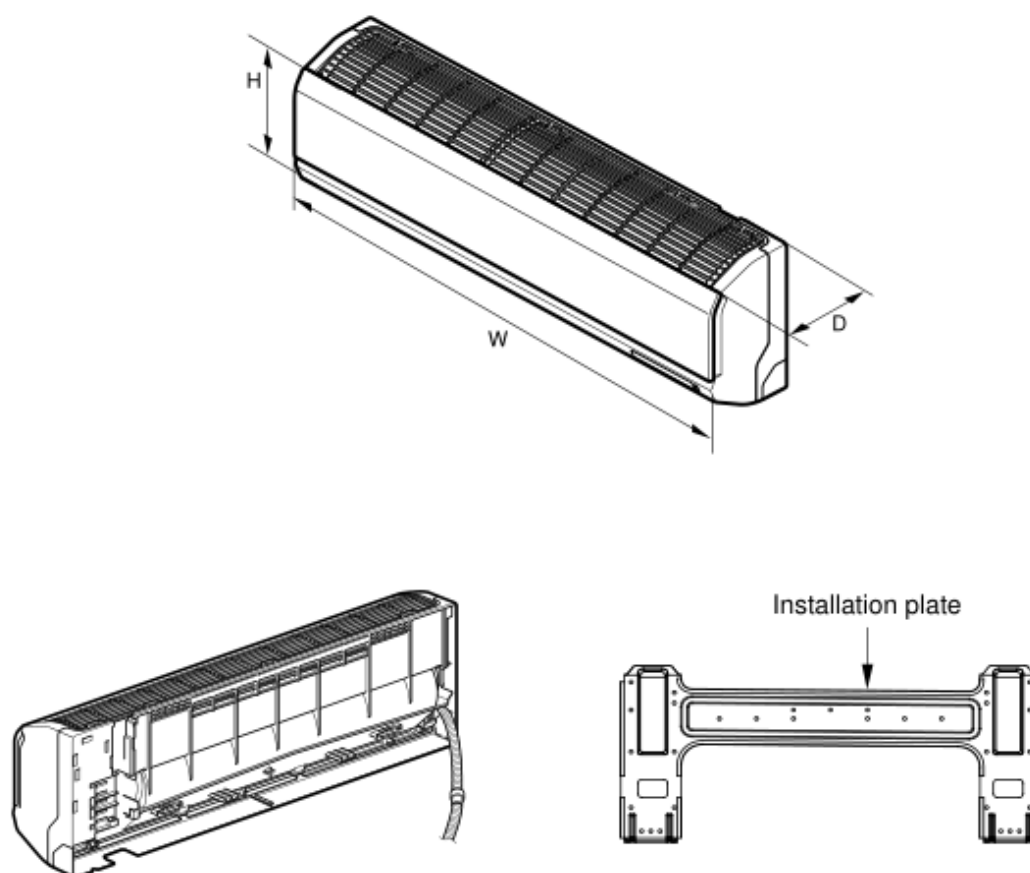
| Capacity (Btu) | X (W1T) | B (W2T) |
|----------------|---|---|
| View |  |  |

Remote controller:

| Model | L1-12 |
|-------|---|
| View |  |

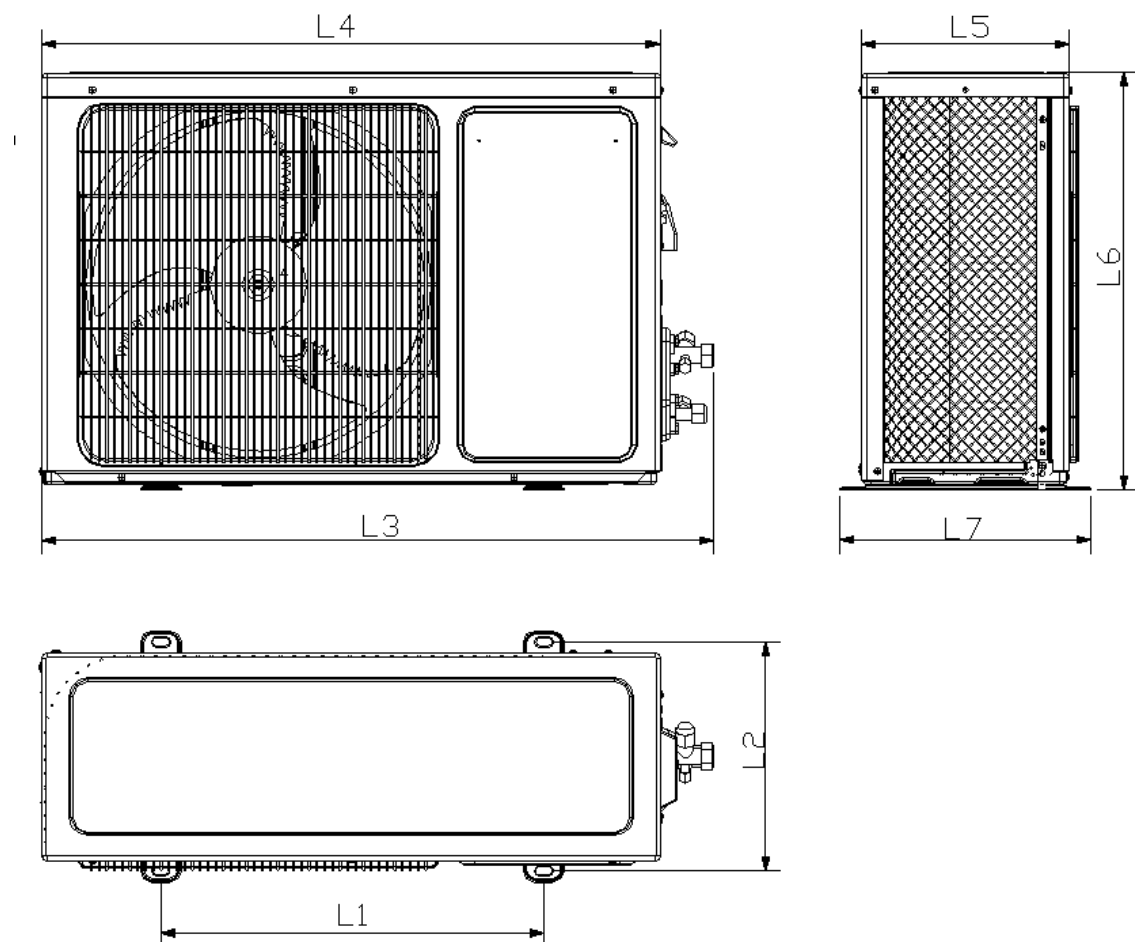
3-2. Product dimensions

Indoor units:



| Model | W (mm) | H (mm) | D (mm) |
|--------------------|--------|--------|--------|
| HWDBT12S/HRDBT12AS | 850 | 270 | 208 |
| HWDBT18S/HRDBT18AS | 1131 | 315 | 230 |
| HWDBT24S/HRDBT24AS | 1131 | 315 | 230 |
| HWDKT30S/HRDKT30AS | 1290 | 348 | 263 |
| HWDKT36S/HRDKT36AS | 1290 | 348 | 263 |

Outdoor units:



| Model | L1 (mm) | L2 (mm) | L3 (mm) | L4 (mm) | L5 (mm) | L6 (mm) | L7 (mm) |
|--------------------|------------|------------|------------|------------|------------|------------|------------|
| HWDBT12S/HRDBT12AS | 510 | 310 | 873 | 810 | 280 | 585 | 338 |
| HWDBT18S/HRDBT18AS | 542 | 341 | 935 | 860 | 310 | 667 | 368 |
| HWDKT30S/HRDKT30AS | 662 | 390 | 959 | 898 | 365.5 | 793 | 414 |
| HWDKT36S/HRDKT36AS | | | | | | | |
| HWDBT24S/HRDBT24AS | | | | | | | |

Note: " ** " mean code of Front Panel.

4. Installation Instruction



WARNING

To prevent abnormal heat generation and the possibility of fire, do not place obstacles, enclosures and grilles in front of or surrounding the air conditioner in a way that may block air flow. And, more than 1 meter away from any antenna or power lines or connecting wires used for TV, radio, telephone, security system, or intercom. Electrical noise from any of these sources may affect operation.

4-1. Installation Place and Condition

Indoor unit

Avoid:

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

Do:

- △ Select an appropriate position from which every corner of the room can be uniformly cooled.
- △ Select a location that will hold the weight of the unit.
- △ Select a location where tubing and drain hose have the shortest run to the outside. (See a)
- △ Allow room for operation and maintenance as well as unrestricted air flow around the unit. (See b)
- △ Install the unit within the maximum elevation difference (H) above or below the outdoor unit and within a total tubing length (L) from the outdoor unit as detailed (See table 1 and c)

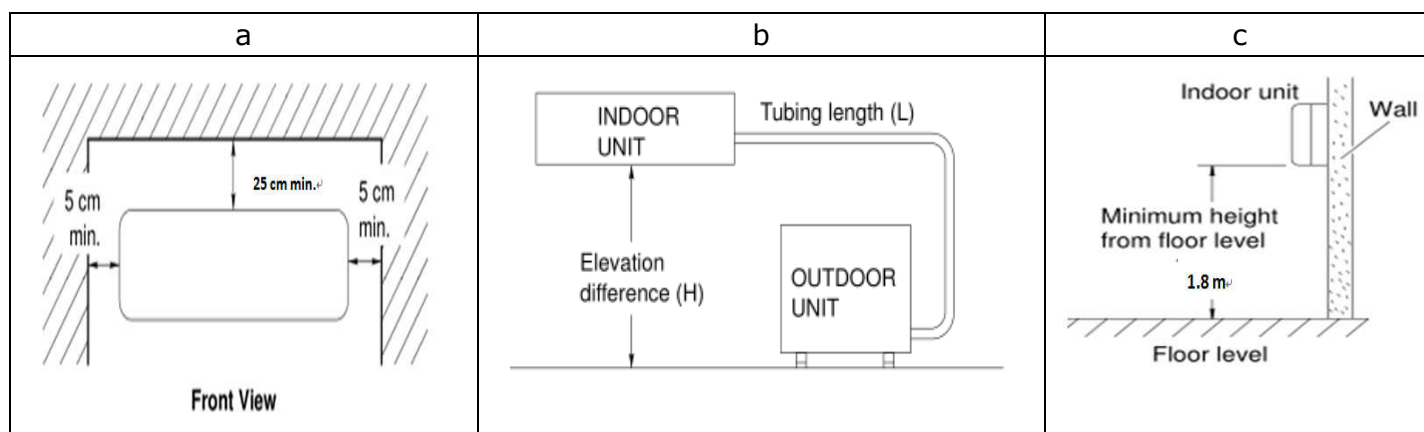


table 1

| Capacity (Btu/h) | Pipe Size | | Standard Length (m) | Max. Elevation B (m) | Max. Length A (m) | Additional Refrigerant (g/m) |
|---------------------|--------------|-------------|---------------------------|----------------------------|-------------------------|------------------------------------|
| | GAS | LIQUID | | | | |
| 5k~14k | 3/8"(Ø9.52) | 1/4"(Ø6.35) | 7.5 | 10 | 15 | 20 |
| | 1/2"(Ø12.7) | 1/4"(Ø6.35) | 7.5 | 10 | 15 | 20 |
| 18k~28k | 1/2"(Ø12.7) | 1/4"(Ø6.35) | 7.5 | 10 | 15 | 20 |
| | 5/8"(Ø15.88) | 1/4"(Ø6.35) | 7.5 | 10 | 15 | 20 |
| | 5/8"(Ø15.88) | 3/8"(Ø9.52) | 7.5 | 10 | 15 | 30 |
| 30k~38k | 5/8"(Ø15.88) | 3/8"(Ø9.52) | 7.5 | 10 | 15 | 30 |
| | 3/4"(Ø19.05) | 3/8"(Ø9.52) | 7.5 | 10 | 15 | 50 |

* If total tubing length becomes 7.5 to 15 m (max.), charge additional refrigerant as the table1 for reference. And no additional compressor oil is necessary.

Outdoor unit

Avoid:

- △ Heat sources, exhaust fans, etc.
- △ Damp, humid or uneven locations.

DO:

- △ Choose a place as cool as possible.
- △ Choose a place that is well ventilated.
- △ Allow enough room around the unit for air intake or exhaust and possible maintenance. (see a1, b1 & c1)
- △ Provide a solid base (level concrete pad, concrete block, 10 × 40 cm beams or equal), a minimum of 10 cm above ground level to reduce humidity and protect the unit against possible water damage and decreased service life.
- △ Install cushion rubber under unit's feet to reduce vibration and noise.
- △ Use lug bolts or equal to bolt down unit, reducing vibration and noise.

| a1 | b1 | c1 |
|----|----|----|
| | | |

Recommended Wire Diameter:

| Capacity size | Wire Diameter(mm ²) | Fuse or Circuit Breaker Capacity |
|---------------|------------------------------------|-------------------------------------|
| 5K~12k | 1.0(Power wire)/1.0 (Connect wire) | 3.15A or 5A (indoor) /15A (outdoor) |
| 18k | 2.5(Power wire)/1.5 (Connect wire) | 3.15A or 5A (indoor) /20A (outdoor) |

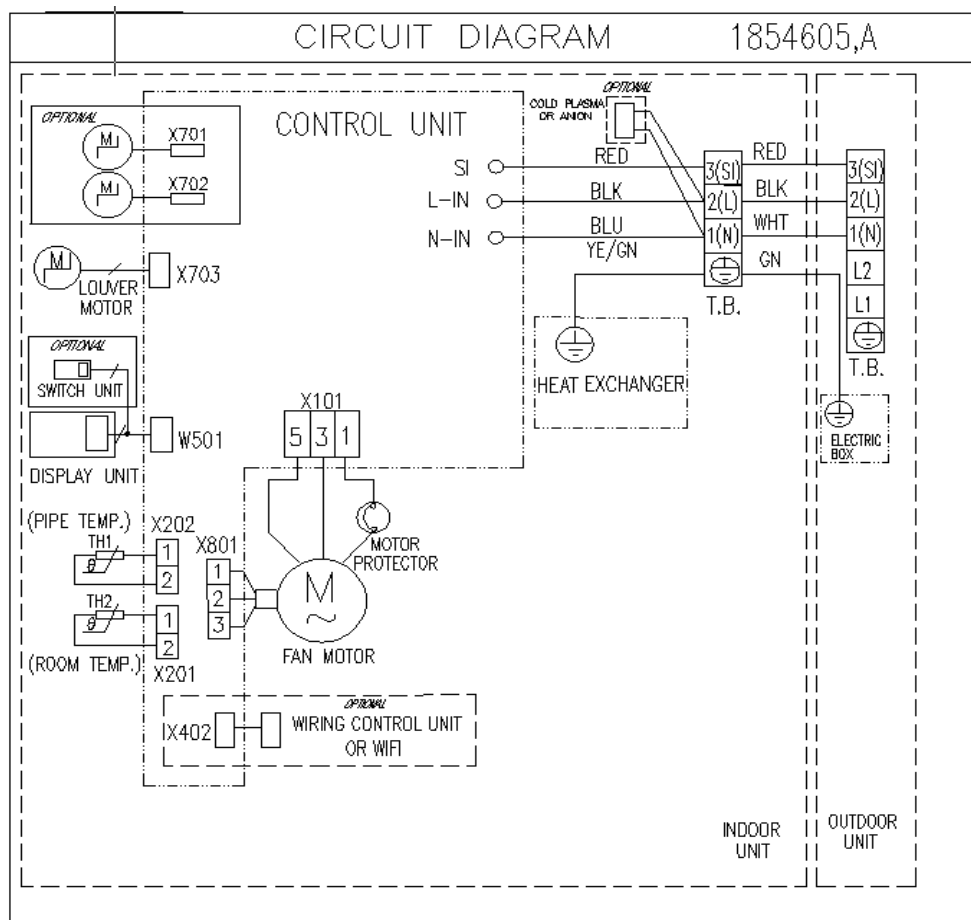
| | | |
|---------|------------------------------------|-------------------------------------|
| 22K~30K | 2.5(Power wire)/2.5 (Connect wire) | 3.15A or 5A (indoor) /30A (outdoor) |
|---------|------------------------------------|-------------------------------------|

4-2. Electric Wiring Diagram

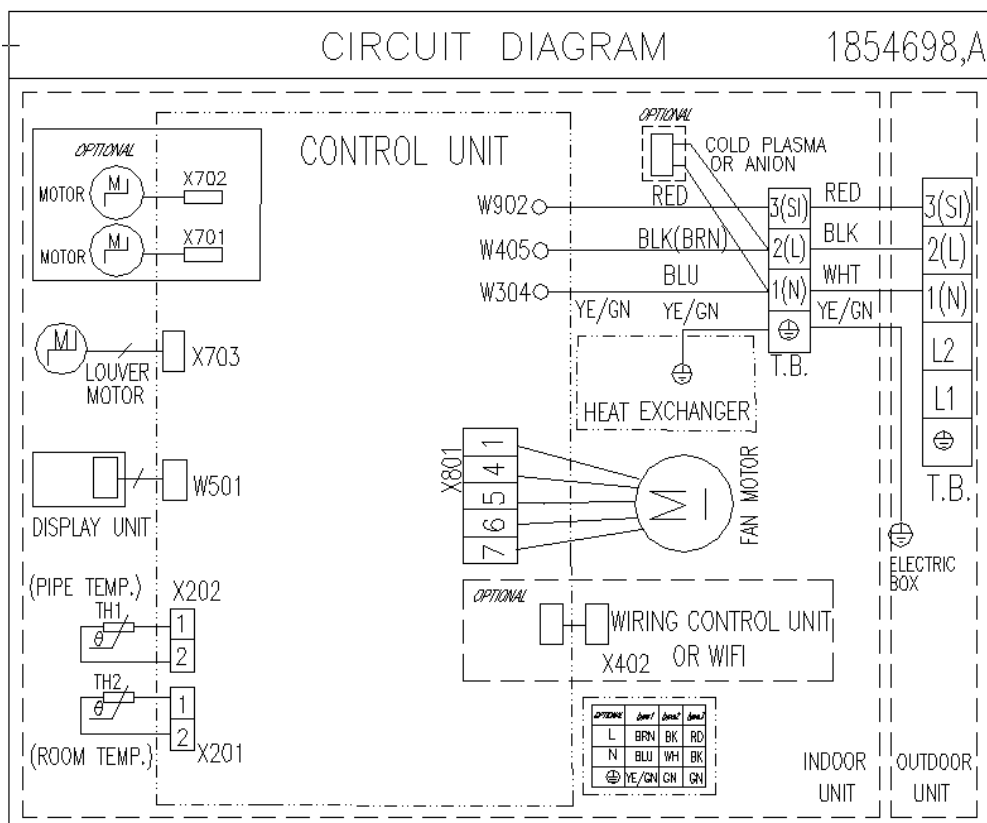
| Model | Indoor Unit DIAGRAM | Outdoor Unit DIAGRAM |
|--------------------|---------------------|----------------------|
| HWDKT30S/HRDKT30AS | 1852066 | 1854707 |
| HWDKT36S/HRDKT36AS | 1852066 | 1854707 |
| HWDBT12S/HRDBT12AS | 1854605 | 1854707 |
| HWDBT18S/HRDBT18AS | 1854698 | 1854707 |
| HWDBT24S/HRDBT24AS | 1854698 | 1854707 |

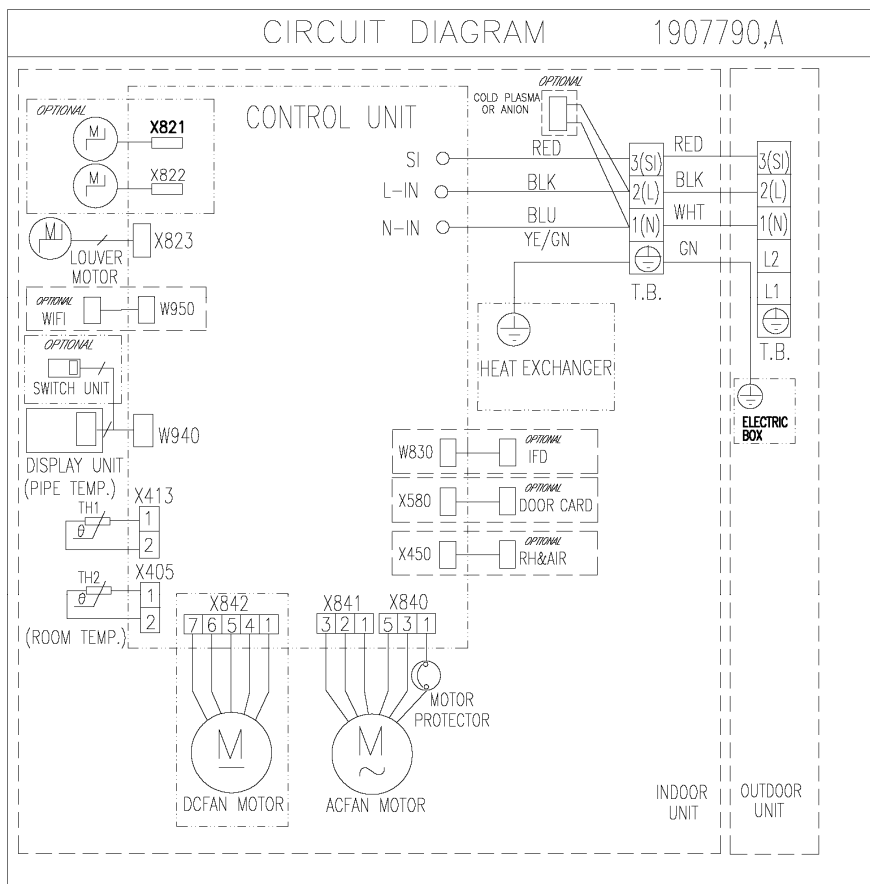
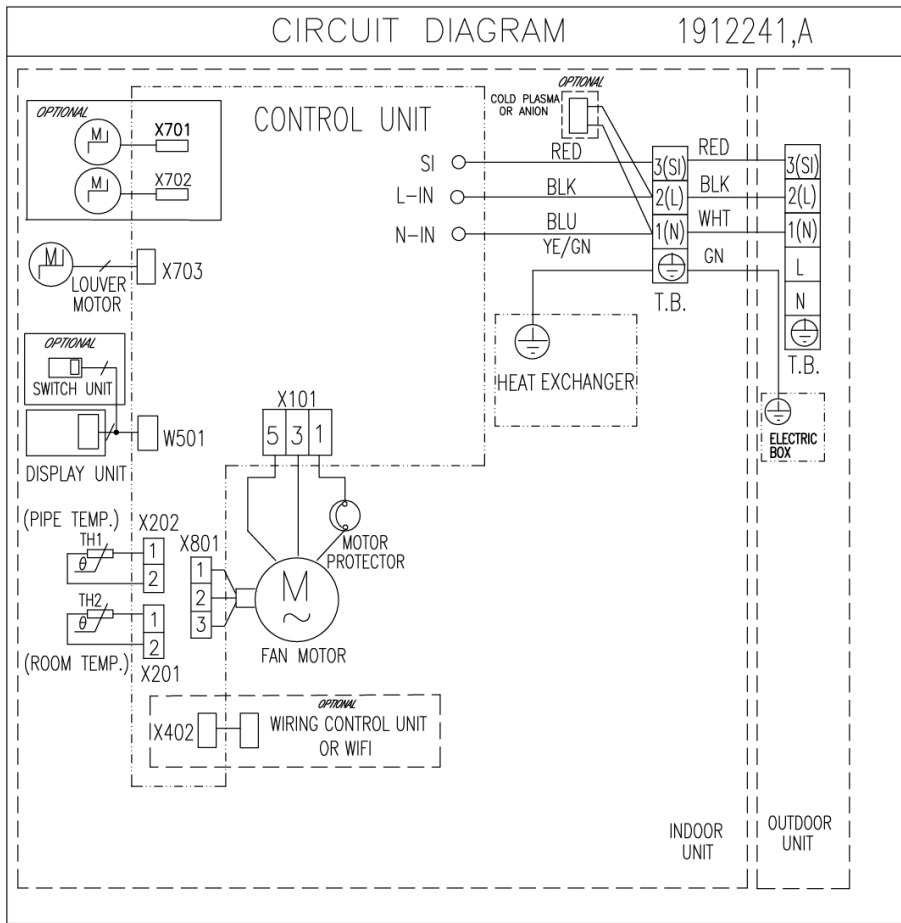
Note: " ** " mean code of Front Panel.

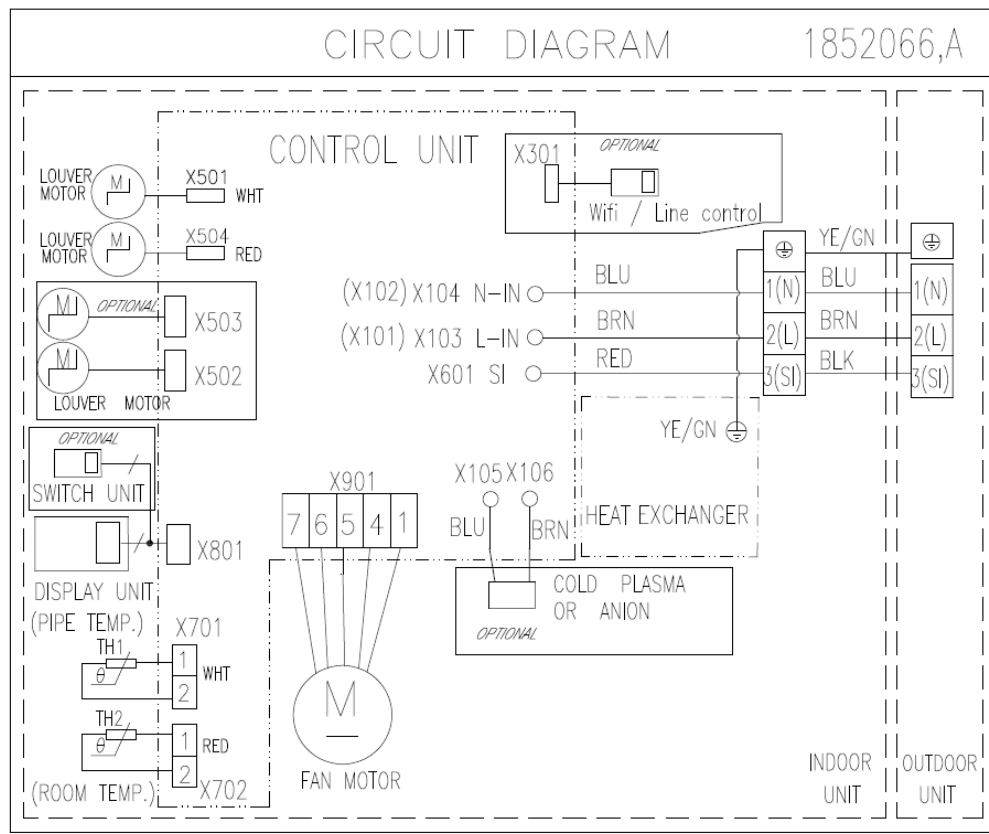
Indoor:
1854605



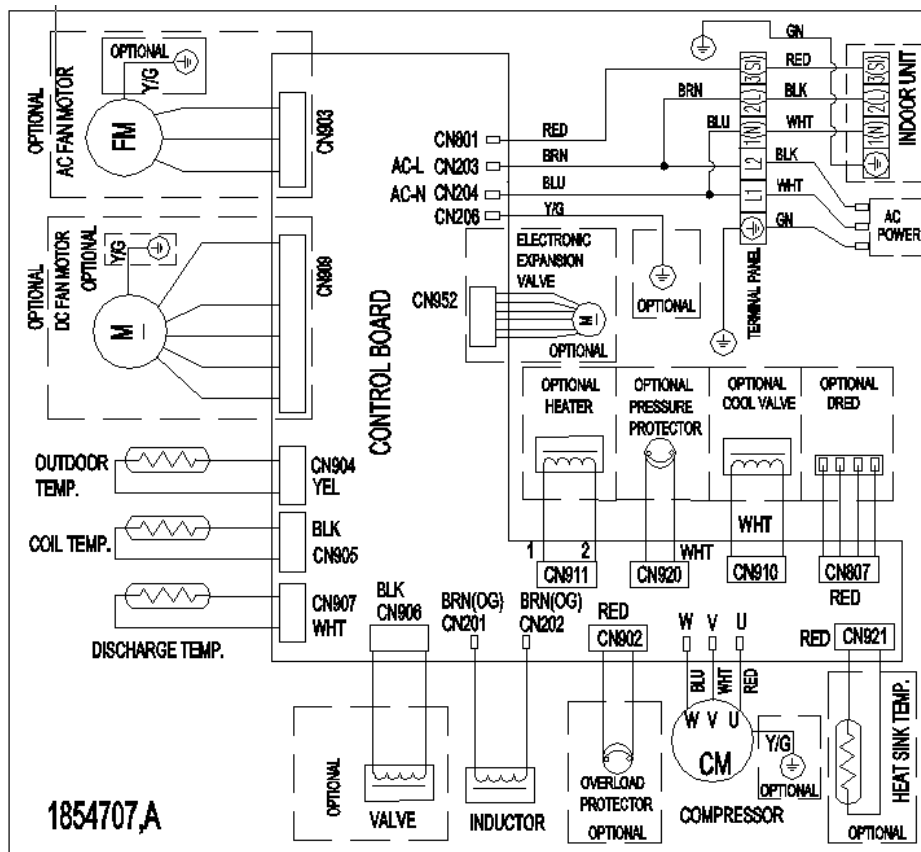
1854698



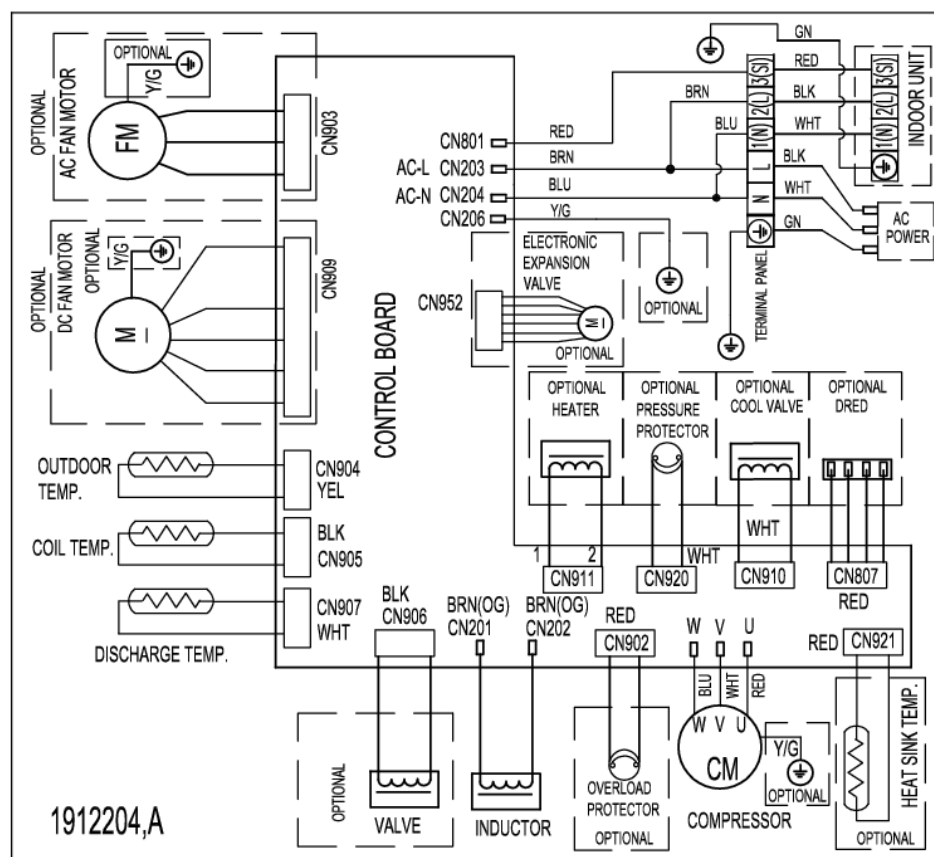




Outdoor:
1854707

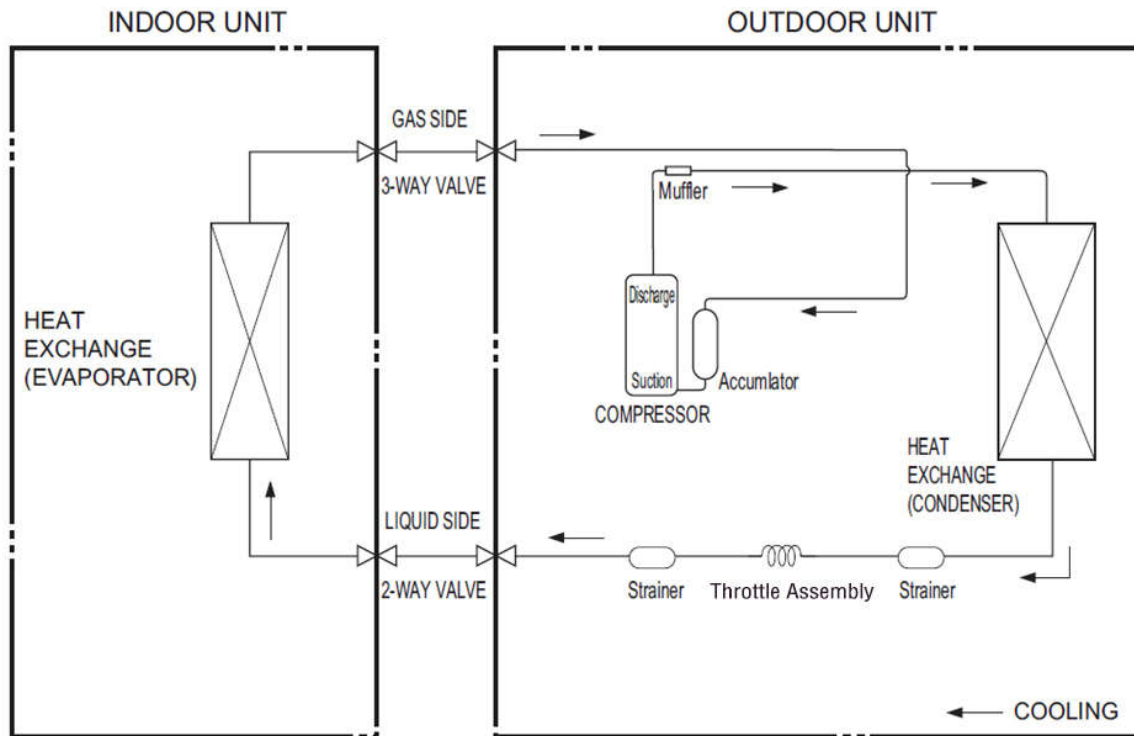


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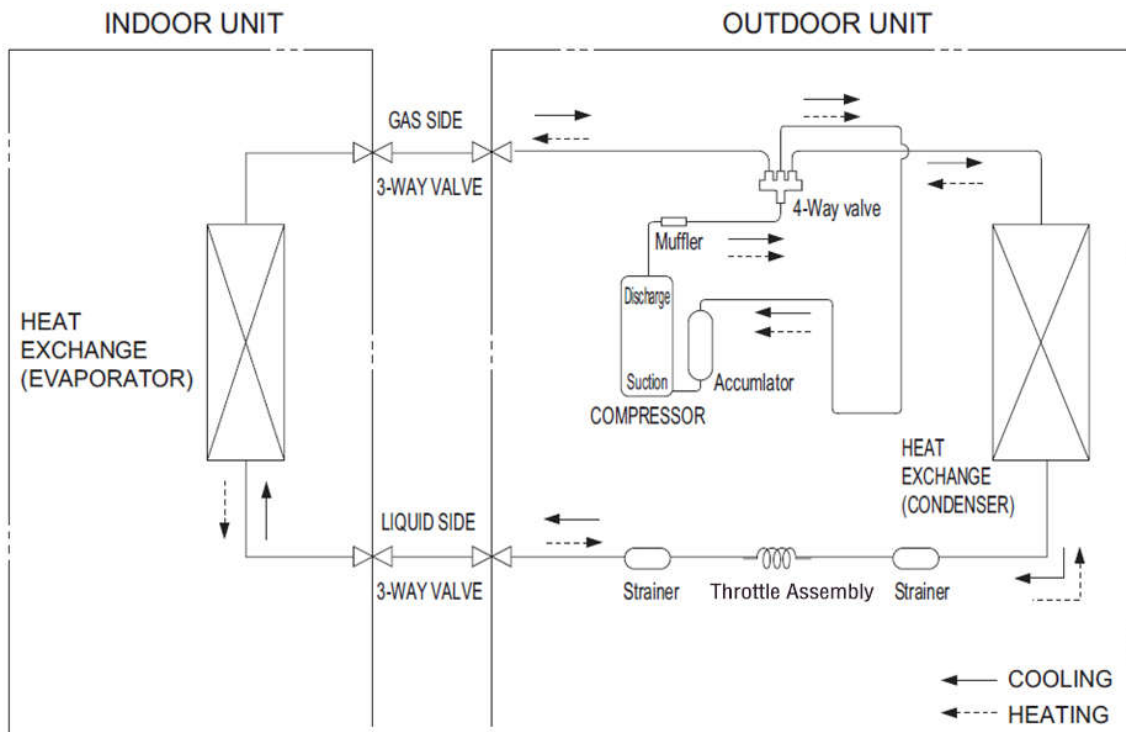


4-3. Refrigerant Flow System

(1) Cooling



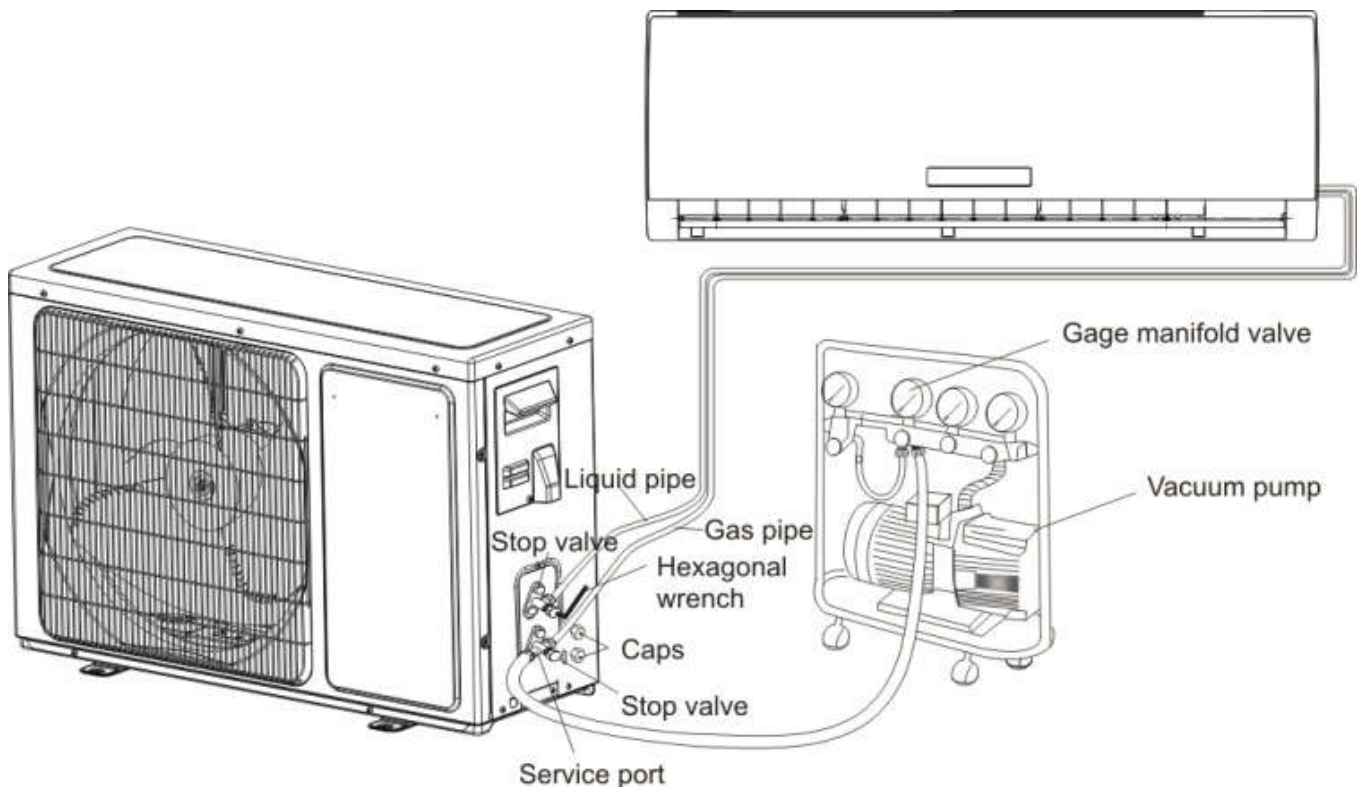
(2) Cooling&Heating



NOTE: In different models, the throttle assembly may be Capillary or Electronic expansion valve.

4-4. 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 -1.0×10^5 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



4-5. 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.

5. Function Operation

5-1. Operation Range (cooling and heating)

North America SEER 16 Model (9k-24k):

| | Temperature | Indoor Air Intake Temp. | Outdoor Air Intake Temp |
|---------|-------------|-------------------------|-------------------------|
| COOLING | Maximum | 30℃(86°F) | 46 ℃(115°F) |
| | Minimum | 16℃(61°F) | 21℃(70°F) |
| HEATING | Maximum | 30℃(86°F) | 24℃(75°F) |
| | Minimum | / | -15℃(-59°F) |

North America SEER 20 Model (9k-24k) & SEER16 Model (30k、36k):

| | Temperature | Indoor Air Intake Temp. | Outdoor Air Intake Temp |
|---------|-------------|-------------------------|-------------------------|
| COOLING | Maximum | 30℃(86°F) | 46 ℃(115°F) |
| | Minimum | 16℃ (61°F) | -15℃(-59°F) |
| HEATING | Maximum | 30℃ (86°F) | 24℃ (75°F) |
| | Minimum | / | -15℃ (-59°F) |

North America SEER 28 Model:

| | Temperature | Indoor Air Intake Temp. | Outdoor Air Intake Temp |
|---------|-------------|-------------------------|-------------------------|
| COOLING | Maximum | 30℃(86°F) | 46 ℃(115°F) |
| | Minimum | 16℃ (61°F) | -18℃(-64°F) |
| HEATING | Maximum | 30℃ (86°F) | 24℃ (75°F) |
| | Minimum | / | -25℃ (-77°F) |

5-2. Remote Controller Operation & Function

△Remote Controller Instruction

J1-72

Remote controller

Remote controller

The remote controller transmits signals to the system.

1 ON/OFF BUTTON

The appliance will be started when it is energized or will be stopped when it is in operation, if you press this button.

2 MODE BUTTON

Press this button to select the operation mode.

3 FAN BUTTON

Used to select fan speed in sequence auto, higher, high, medium, low or lower.

4 5 ROOM TEMPERATURE SETTING BUTTONS

Used to adjust the room temperature and the timer, also real time.

6 SMART BUTTON

Used to enter fuzzy logic operation directly, regardless of the unit is on or off.

7 SLEEP BUTTON

Used to set or cancel Sleep Mode operation.

8 ◆ SWING BUTTON

Used to stop or start vertical adjustment louver swinging and set the desired up/down airflow direction.

9 IFEEL BUTTON

Used to set IFEEL mode operation. Press it once, the IFEEL function will be started. Press it again, the IFEEL function will be shut off.

10 CLOCK BUTTON

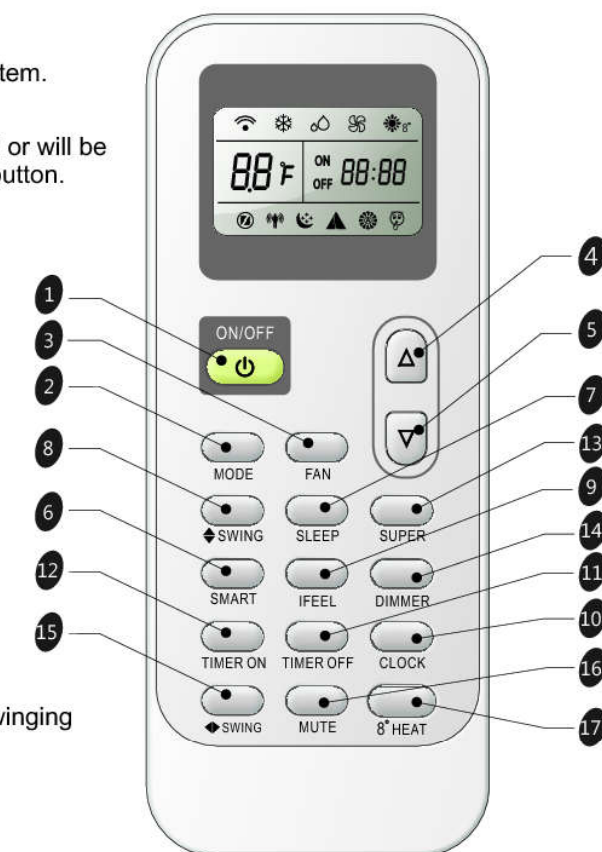
Used to set the current time.

11 12 TIMER ON/OFF BUTTON

Used to set or cancel the timer operation.

13 SUPER BUTTON

Used to start or stop the fast cooling/heating. (Fast cooling operates at high fan speed with 61°F(16°C) set temp automatically ; Fast heating operates at auto fan speed with 86°F(30°C) set temp automatically.)



14 DIMMER BUTTON

When you press this button, all the display of indoor unit will be closed. Press any button to resume display.

15 ◀▶ SWING BUTTON

Used to stop or start Horizontal adjustment louver swinging and set the desired left/right airflow direction.

16 MUTE BUTTON

Used to stop or start MUTE Mode operation. Fan speed is automatically set at lower fan speed.

17 8° HEAT BUTTON

Used to set 8° heating mode.

Indication symbols on LCD:

| | | | | |
|-------------------|--------------------------|--------------------|----------------------|---------------------------------|
| Cooling indicator | Dry indicator | Fan only indicator | 8° Heating indicator | Heating indicator |
| Auto fan speed | Higher fan speed | High fan speed | Medium fan speed | Low fan speed |
| Lower fan speed | Sleep 1 indicator | Sleep 2 indicator | Sleep 3 indicator | Sleep 4 indicator |
| Smart indicator | Super indicator | Mute indicator | Signal transmit | ON 88:88 Display set timer |
| Ifeel | 88°F Display temperature | | | OFF 88:88 Display current time |

Note: Each mode and relevant function will be further specified in following pages.

Remote controller

Remote controller

The remote controller transmits signals to the system.

SMART(invalid for multi system)

Used to enter fuzzy logic operation directly, regardless of the unit is on or off.

POWER

The appliance will be started when it is energized or will be stopped when it is in operation, if you press this button.

SUPER

Used to start or stop the fast cooling/heating. (Fast cooling operates at high fan speed with 16°C (61°F) set temp automatically ; Fast heating operates at auto fan speed with 30°C (86°F) set temp automatically)

IFEEL

Used to set IFEEL mode operation. Press it once, the IFEEL function will be started. Press it again, the IFEEL function will be shut off.

SWING

Used to stop or start vertical adjustment louver swinging and set the desired up/down airflow direction.

8 HEAT(optional)

Used to set 8 HEAT Mode.

QUIET

Used to set or cancel Quiet Mode operation.

TEMP + -

Used to adjust the room temperature and the timer, also real time.

MODE

Press this button to select the operation mode.

FAN

Used to select fan speed in sequence auto, higher, high, medium, low and lower.

SLEEP

Used to set or cancel Sleep Mode operation.



SWING

Used to stop or start Horizontal adjustment louver swinging and set the desired left/right airflow direction.

TIMER ON/CLOCK

Used to set or cancel the timer operation and used to set the current time.

TIMER OFF

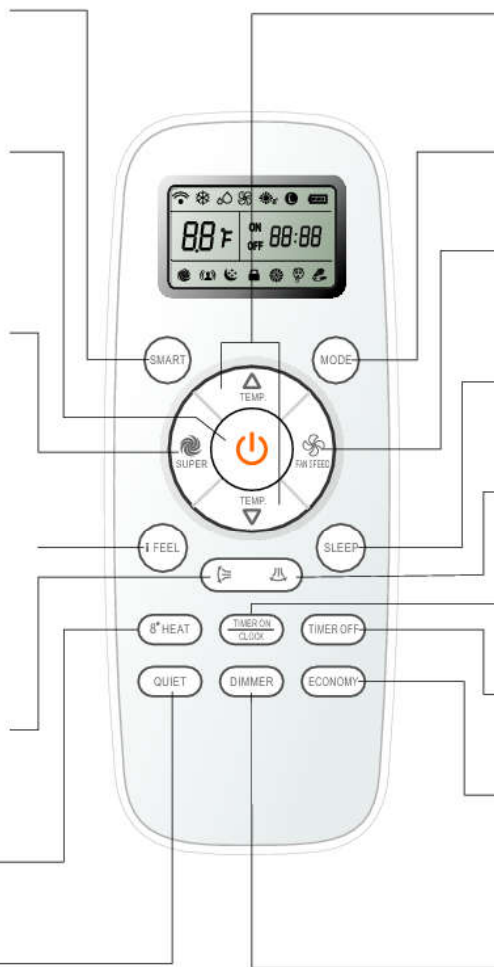
Used to set or cancel the timer operation.

ECONOMY

Used to set or cancel Economy Mode operation.

DIMMER

When you press this button, all the display of indoor unit will be closed. Press any button to resume display.



Indication symbols on LCD:

| | | | | |
|-------------------|-------------------|--------------------|--------------------------|-------------------------|
| Cooling indicator | Dry indicator | Fan only indicator | 8° Heating indicator | Heating indicator |
| Auto fan speed | Higher fan speed | High fan speed | Medium fan speed | Low fan speed |
| Lower fan speed | Sleep 1 indicator | Sleep 2 indicator | Sleep 3 indicator | Sleep 4 indicator |
| Smart indicator | Quiet indicator | Economy indicator | Super indicator | ON OFF |
| Signal transmit | Ifeel | Lock indicator | 88°F Display temperature | Display set timer |
| | | | | Display current time |
| | | | | Battery power indicator |

Note: Each mode and relevant function will be further specified in following pages.

ΔFunction Instruction

1. Major general technical parameters

1-1 Remote receiver distance (front of the air conditioner) : 8 m.

1-2 Remote receiver angle: Less than 60 degrees.

1-3 Temperature control accuracy: $\pm 1^{\circ}\text{C}$ (1°F).

1-4 Time error: Less than 1%.

2. Functions of the controller

2-1 Display panel

I. Control functions of the remote controller (See operating and installation manual)

II. Display of the indoor unit

Information on the screen:

Displaying Scheme:

7-segment tube: Display set temperature or indoor temperature , and display fault code in trouble indicating. An error code is displayed according to the signal from the indoor CPU. The error code will flash for 5 seconds while displayed.

Running LED: It is on during operation. It is flashing when the unit defrost.

TIMER LED: When the timer mode works, the LED will be lighted.

Sleep LED: When the sleep mode works, the LED will be lighted, and after 10s, the LED will be off.

Compressor LED: It lights up when compressor is running.

Remote control receiver: This section receives signals from the remote control.

3. Control function

3-1 Emergency switch

If the appliance under the Stand-by state, all the Operation Mode, Air volume, Temperature Setting , Forced Cooling function will be restored as the last time setting when you press on the "ON/OFF" button, but lost the Air flow direction setting.

If the appliance was connected to the power at first time, it would operate in the auto mode, It will keep in stand-by state if you press the "ON/OFF" button during the normal operation.

When the appliance under the Stand-by state, press and hold the emergency switch for 5 seconds, the buzzer rings for 1 times, and it will operate in cooling mode, and the indoor fan speed is set to high-speed, it running has nothing to do with the room temperature.

When press the emergency switch or receive the signal of the remote control, it will exit this mode, and it will operate with the corresponding order.

3-2 Operator-machine communication

If the unit has I feel function, when the I feel function is set by the remote control, the room temperature will depend on the remote control and it will be detected by the sensor of the remote control. Normally the remote control will automatically transmits a signal at an interval of 10 minutes (only for H1 remote control, it is 9 minutes) , but if the room temperature changed exceed 1°C in a short period of time, the remote control will transmits a signal within 2 minutes. If the indoor unit has not received a remote signal within 30 minutes, the room temperature will depend on the

room temperature sensor of indoor unit.

3-3 Timer function

Real time of Timer setting

- (1) The max Timer ranges is 24 hours.
- (2) Timer ON/OFF
- (3) Timer ON/OFF can be set available in turn.
- (4) The Timer accurate more than 97%
- (5) The Timer can be adjusted by 1 min increase.
- (6) The appliance can be set the ON-Timer and OFF-Timer in the same time, but no any timer setting indicated.

3-4 Sleep

- (1) The Sleep mode can only be set during Cool, Heat and Dry mode.
- (2) When the appliance run in the Sleep mode, it will stop after 8 hours operation, then it will cancel the Sleep setting. When the appliance operate under the OFF-Timer setting condition, if the OFF-Timer setting less than 8 hours, it will keep the Sleep mode till the OFF-Timer setting; if the OFF-Timer setting more than 8 hours, it will cancel the OFF-Timer setting after the Sleep mode OFF.
- (3) When the Sleep mode is select with Cooling mode, if the room temperature not less than 26°C(79°F), the setting temperature will not be adjusted, otherwise, the setting temperature will be raised by 1°C per hour, but the max setting temperature raise is 1°C.
- (4) When the Sleep mode is select with Heat mode, the setting temperature will be decreased by 1°C per hour during the successive 3 hour, but the max setting temperature decrease is 3°C.
- (5) When the appliance operate with Sleep mode, the indoor fan run in the LOW setting, and the air flow direction same as the last setting and the temperature and air flow direction can be adjusted by user. The Running indicator will be flashed 10 times per 1 Hz frequency, then all the indicators turn OFF except the Sleep light after 5 min elapse. Those indicators will be recovery when the temperature or Time setting is adjusted, after the setting, the indicators will be lit in 10 sec, then turn OFF.

3-5 Automatic run (SMART) mode

When the appliance operates at the smart, the air flow direction can be adjusted.

- (1) H/C appliance
 - a. When the setting temperature is 26°C(79°F), the appliance will be ran in the Cool if the room temperature exceeds 26°C(79°F).
 - b. When the room temperature exceeds 23°C(73°F), but below 26°C(79°F), it will be ran in the Dry mode(It will turn in Automatic setting After 3 min LOW air volume running.).
 - c. When the room temperature exceeds 21°C(70°F), but below 23°C(73°F), it will be operated in the Fan only, the air volume is set by LOW and the fan speed can be adjusted
 - d. When the room temperature is not more than 21°C(70°F), it will be operated in Heat mode, and the temperature is set to 22°C(72°F).
- (2) Cool only appliance
 - a. When the room temperature exceeds 26°C(79°F), it will be ran in Cool mode, and the temperature is set to 26°C(79°F).

b. When the room temperature exceeds 23°C(73°F), but not more than 26°C(79°F), it will be operated in the Dry mode.

c. When the room temperature is not more than 23°C(73°F), it will be operated in the Fan only, the air volume is set to LOW and the fan speed can be adjusted

After the appliance start the smart operation, the setting temperature can be adjusted 2°C or 7°C (based on the remote mode)(the min accuracy is 1°C) up and down base on the automatic temperature setting, also the presetting temperature of PCB circuit.

In case of the specific operation selected, it could be re-select the other modes after the compressor ceased for 5 min or the setting temperature changed.

3-6 Cooling-run mode

3-6-1 Outdoor Fan

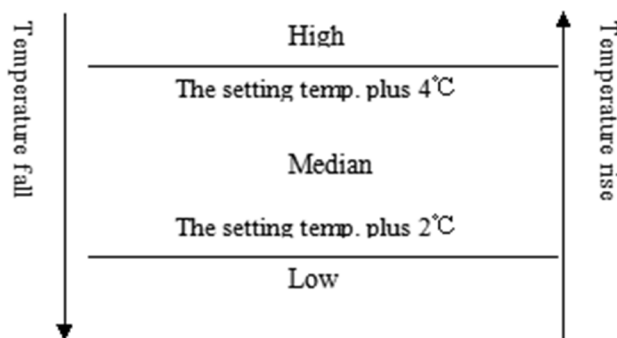
The outdoor fan's speeds except the single speed motor can be changed according to outdoor ambient temperatures.

When operating at a fixed frequency, the outdoor fan is forced to operate at the high speed.

3-6-2 Indoor fan operation

(1) When the indoor fan keep in running condition, this operation state could be controlled by the remote control with High, Median, Low and Automatic setting.

(2) When the appliance is set Automatic condition in the Cool mode for the first time, the fan speed will run at Low setting. After that, temperature and fan speed is shown as following.



When the difference between the setting temperature and the room temperature equal to 2°C or 4°C, the indoor fan speed will keep in current speed.

3-6-3 Air flow direction control

The louver is derived by a step motor, and it swings the horizontal louver automatically. Press the SWING button to swing or stop the louver.

During the louver swing in normal operation, the current position will be stored. When the appliance turn off and louver swing automatically to the default position, it will position at the close position plus 5°.

3-6-4 4-way valve

State: It is interrupted in cooling.

Switchover: When initially powered on for cooling, the 4-way valve is interrupted immediately. When the heating is changed to the cooling, it needs an interval of 50 seconds for the 4-way valve to change over from being activated to being interrupted.

3-7 Heating-run mode

3-7-1 Temperature compensation

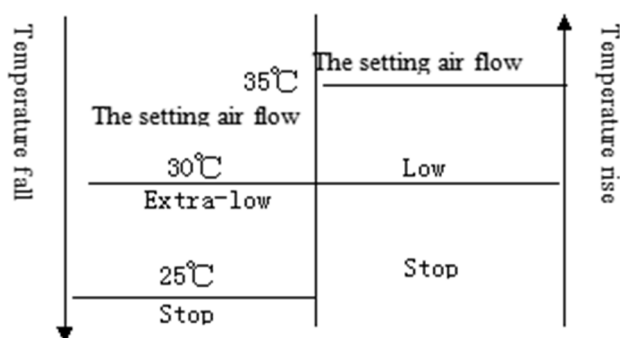
The temperature compensation is 5° in heating mode. For example, if the set temperature is 25°C(77°F) by the remote control, when the room temperature is detected with 31°C(88°F), the compressor will turn off. The main reason is that the hot air is condensed at the top of the house.

Note: The compensation is available only if the room temperature sensor of indoor unit is used and it is not available when it is subject to the sensor on the remote control.

3-7-2 Indoor fan motor operation

Anti-cold air system:

When the appliance run in Heat mode condition, the indoor fan motor operation is shown as following to prevent the cooling air come out during the appliance operation.

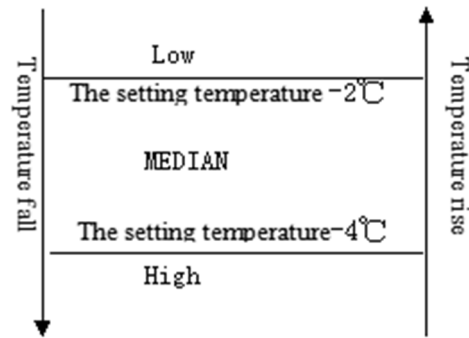


When the appliance turn in the anti-cold air system in the Extra-LOW (Tapped motor set in LOW, sic passim) during the compressor operation, the louver swang to the Cool air protection position, the louver recovers to the original position after the air volume change to LOW. When the room temperature reach to the setting temperature, the compressor will be turn off, and the air flow change to LOW, the louver swang to the Cool air protective position to prevent the air drop into human body directly; when the indoor pipe coil temperature drop continuously, it will turn in the Cooling air protective system in the Extra-LOW or stop the fan motor.

The indoor fan motor is only controlled by the signal of indoor pipe coil temperature, no matter the compressor turn ON/OFF, even the appliance turn in Heat mode at first time.

The indoor fan motor will operate according to the different setting(High, Median, Low and Automatic) by the remote control, but the anti-cold air system is prior.

When the appliance run in the Heat mode with the Automatic setting at first time, the fan speed will be in the LOW setting, and the operation diagram is shown as following



When the difference between the setting temperature and the room temperature equal to 2°C or 4°C, the indoor fan speed will keep in current speed.

3-7-3 Air flow direction control

The horizontal louver is controlled by a step motor, press the SWING button to swing or stop the louver.

During the louver run in normal operation, the current position will be stored. When the appliance turn off and louver swing automatically to the default position, it will position at the default position plus 5°.

4-3-8-4 Outdoor fan

The outdoor fan speeds except single speed motor can be changed according to outdoor ambient temperatures.

3-7-6 4-way valve

State: It is electrified in heating.

Switchover: When initially powered on for heating, the 4-way valve is activated immediately.

In the change from cooling to heating, it needs an interval of 50 seconds for the 4-way valve to change over from being interrupted to being activated.

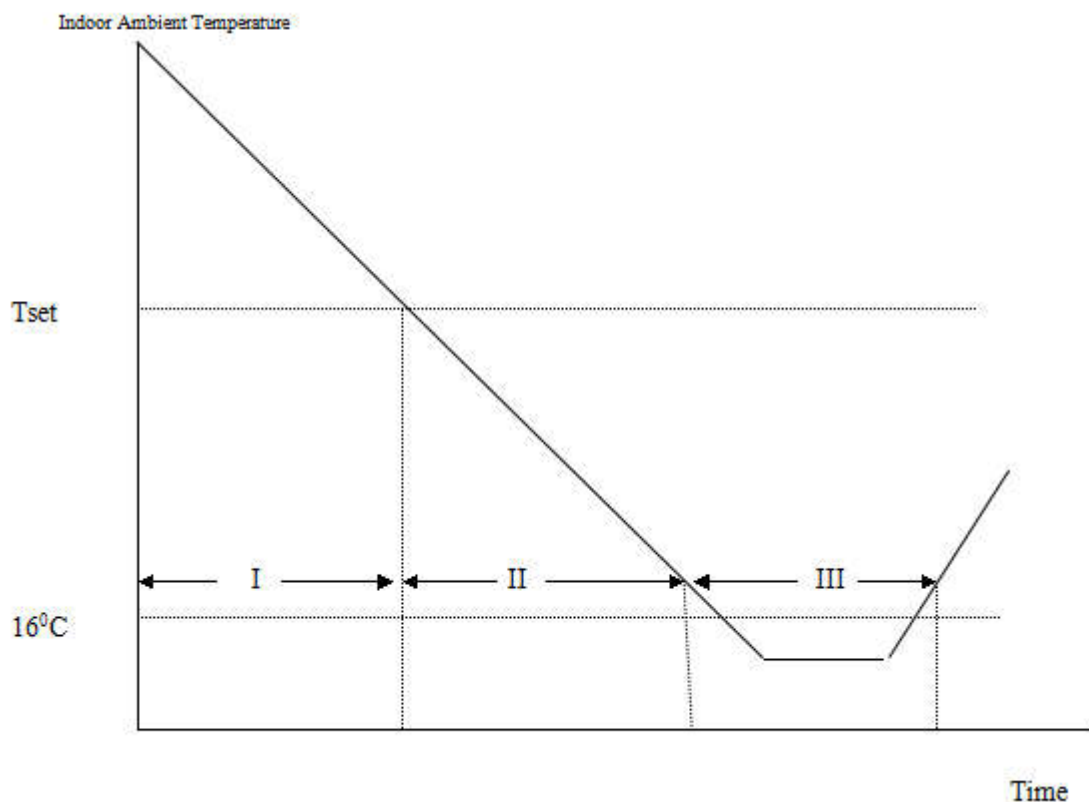
3-8 The super function (option)

In cooling mode, when you press the SUPER button by remote control, the unit will operate for 15 minutes with the following setting:

- The set temperature is 16°C(61°F);
- The fan speed with highest speed;
- The compressor runs with high frequency.

3-9 Dehumidifying mode

The dehumidifying mode is illustrated as follows:



Dehumidifying area I: Operation at the frequency in the range (30–60Hz) according to Dt ($T_{\text{indoor ambient}} - T_{\text{set}}$).

| $Dt(^{\circ}\text{C})$ | $f(\text{Hz})$ |
|------------------------|----------------|
| 0 | 30 |
| 0.5 | 30 |
| 1 | 40 |
| 1.5 | 50 |
| ≥ 2 | 60 |

Dehumidifying area II: The compressor stops for 5 minutes and operators for 5 minutes at the lowest frequency.

Dehumidifying area III: The compressor stops.

3-10 Fan Only Mode Operation

During the appliance run in this mode, the compressor and outdoor fan stop, the indoor fan operate under the pre-setting of air volume, and the louver swing, and the indoor fan speed same as the Heating Mode.

5-3. Special Function Fnstruction

Conditions of anti-freezing prohibition of frequency rising:

Condition 1: in the case of anti-freezing frequency decreasing, the temperature of indoor heat exchanger rises to

“anti-freezing frequency decreasing temperature”.

Condition 2: in normal operation, the temperature of indoor heat exchanger reaches “anti-freezing prohibition of frequency rising temperature”.

Either of the above two conditions is met, the product will enter anti-freezing prohibition of frequency rising state. Anti-freezing prohibition of frequency rising operation: the compressor is kept at the current frequency, which may decrease according to situations while cannot rise. The outdoor fan runs.

Condition for the end of anti-freezing prohibition of frequency rising state: when the temperature of indoor heat exchanger rises to “anti-freezing releasing temperature”, the state of anti-freezing prohibition of frequency rising is released.

Conditions for defrosting:

A: When the heating compressor consecutively runs for 40 minutes (EEPROM setting value at the current operating mode);

B: If the ambient temperature minus the temperature of coiled pipe is equal to or higher than six degrees centigrade (EEPROM setting value in the current operating mode);

C: If the temperature of coiled pipe is equal to or lower than minus two degrees centigrade (EEPROM setting value in the current operating mode);

If the above three conditions are met simultaneously, defrosting begins.

Defrosting actions:

The compressor stops, and the outdoor fan stops after delay of 30 seconds; in 50 seconds the four-way valve is power off; and in 10 seconds the compressor starts and runs at “defrosting frequency”.

Conditions for ending defrosting:

Defrosting is over if either of the below conditions is met.

A: The accumulated time of defrosting is longer than 12 minutes (EEPROM setting value in the current operating mode);

B: If the temperature of coiled pipe is equal to or higher than 14 degrees centigrade (EEPROM setting value in the current operating mode);

Actions of exiting the defrosting state:

The compressor stops, and 50 seconds later the four-way valve opens, and another 10 seconds later the compressor and outdoor fan restart and begin normal operation.

6. Electrical Characteristics

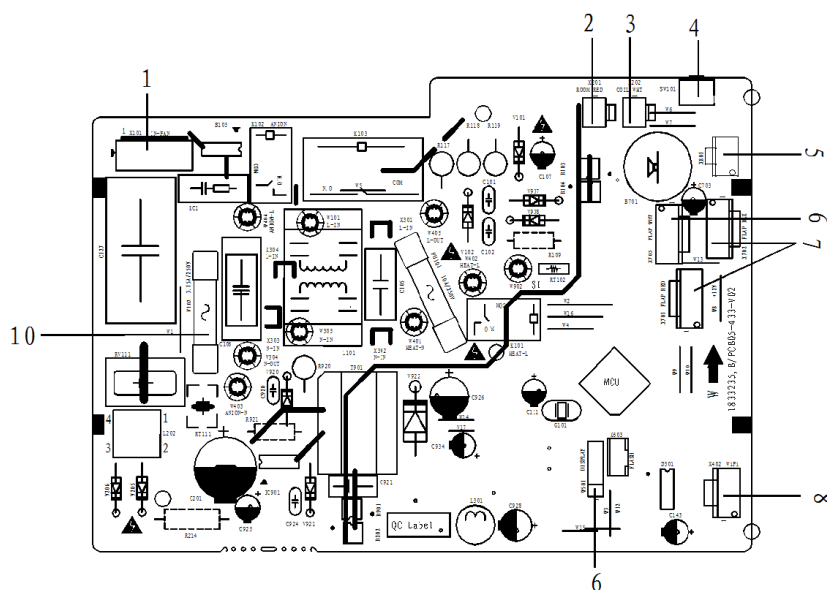
6-1. Print Circuit Board (Indoor & Outdoor)

| Model | Print Circuit Board of Indoor unit | Print Circuit Board of Indoor unit |
|--------------------|------------------------------------|------------------------------------|
| HWDKT30S/HRDKT30AS | 1836919 | 1846941 |
| HWDKT36S/HRDKT36AS | 1836919 | 1846941 |
| HWDBT12S/HRDBT12AS | 1833235 | OU-PCB-SYD/SVE |
| HWDBT18S/HRDBT18AS | 1841766 | 1841765 |
| HWDBT24S/HRDBT24AS | 1841766 | 1846941 |

Note: " ** " mean letter of Front Panel.

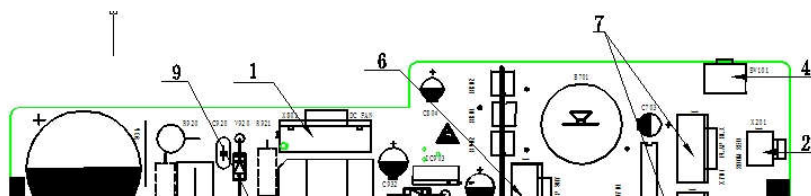
Model of indoor unit:

1833235



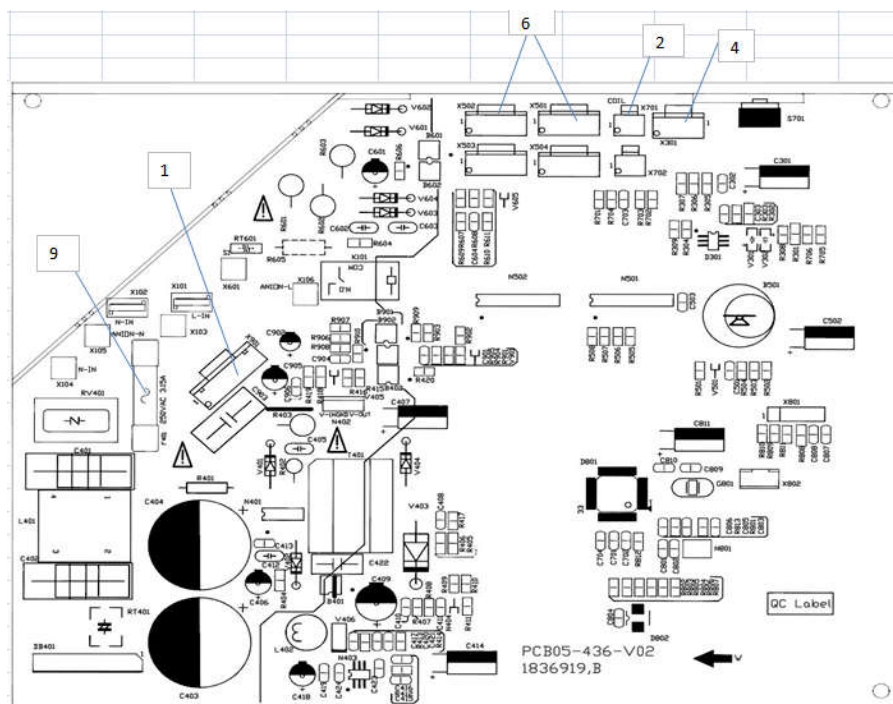
| | |
|----|----------------------------------|
| 1 | Interface of PG motor |
| 2 | Room temperature sensor |
| 3 | Pipe temperature sensor |
| 4 | Switch button |
| 5 | Feedback from PG motor |
| 6 | Up&down swing |
| 7 | Left&right swing |
| 8 | Wiring control or wifi interface |
| 9 | Display interface |
| 10 | Protective tube |

1841766/1898224



| | |
|---|-------------------------|
| 1 | Interface of PG motor |
| 2 | Room temperature sensor |
| 3 | Pipe temperature sensor |
| 4 | Switch button |
| 6 | Up&down swing |
| 7 | Left&right swing |
| 8 | Display interface |
| 9 | Protective tube |

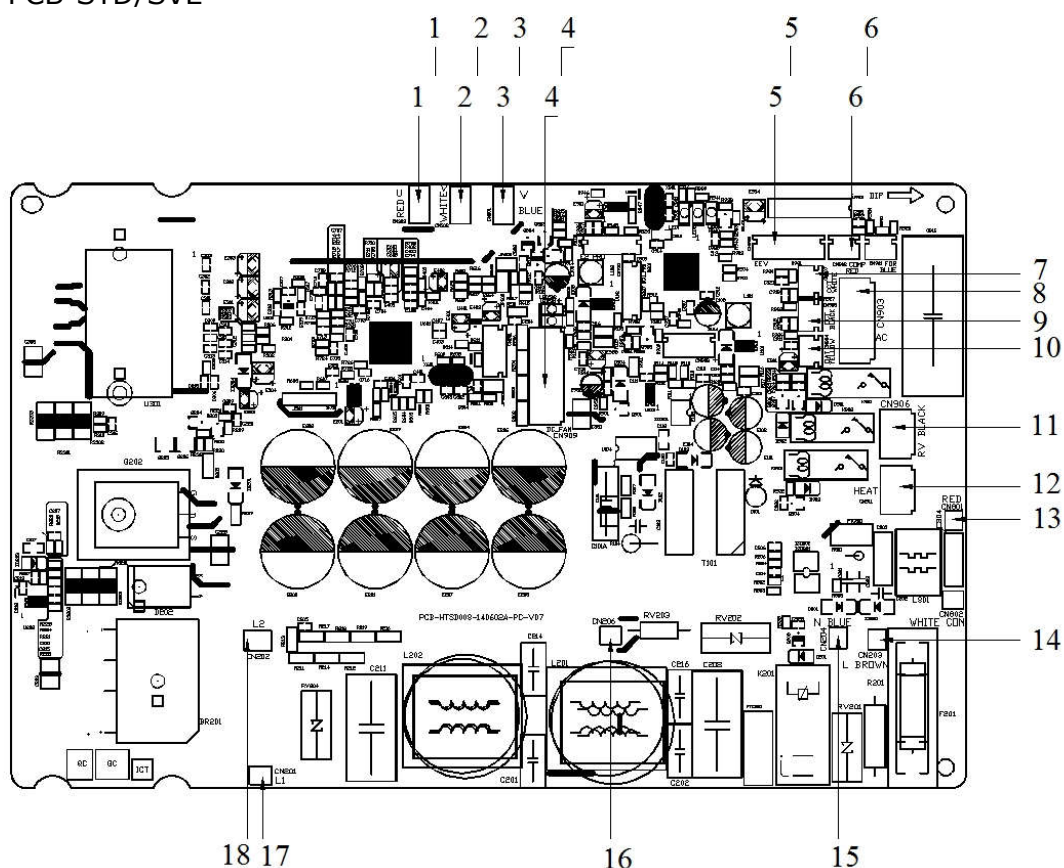
1836919



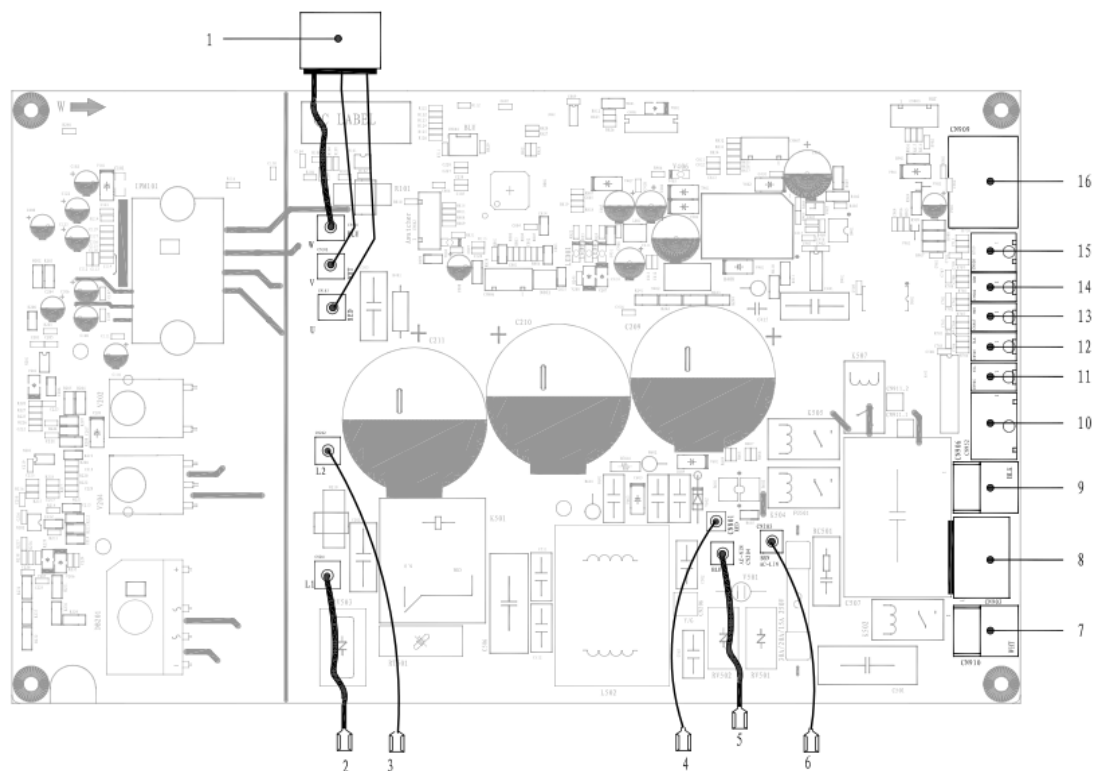
| | |
|---|----------------------------------|
| 1 | Interface of PG motor |
| 2 | Room/and Pipe temperature sensor |
| 4 | Switch button |
| 6 | swing |
| 9 | Protective tube |

Model of outdoor:

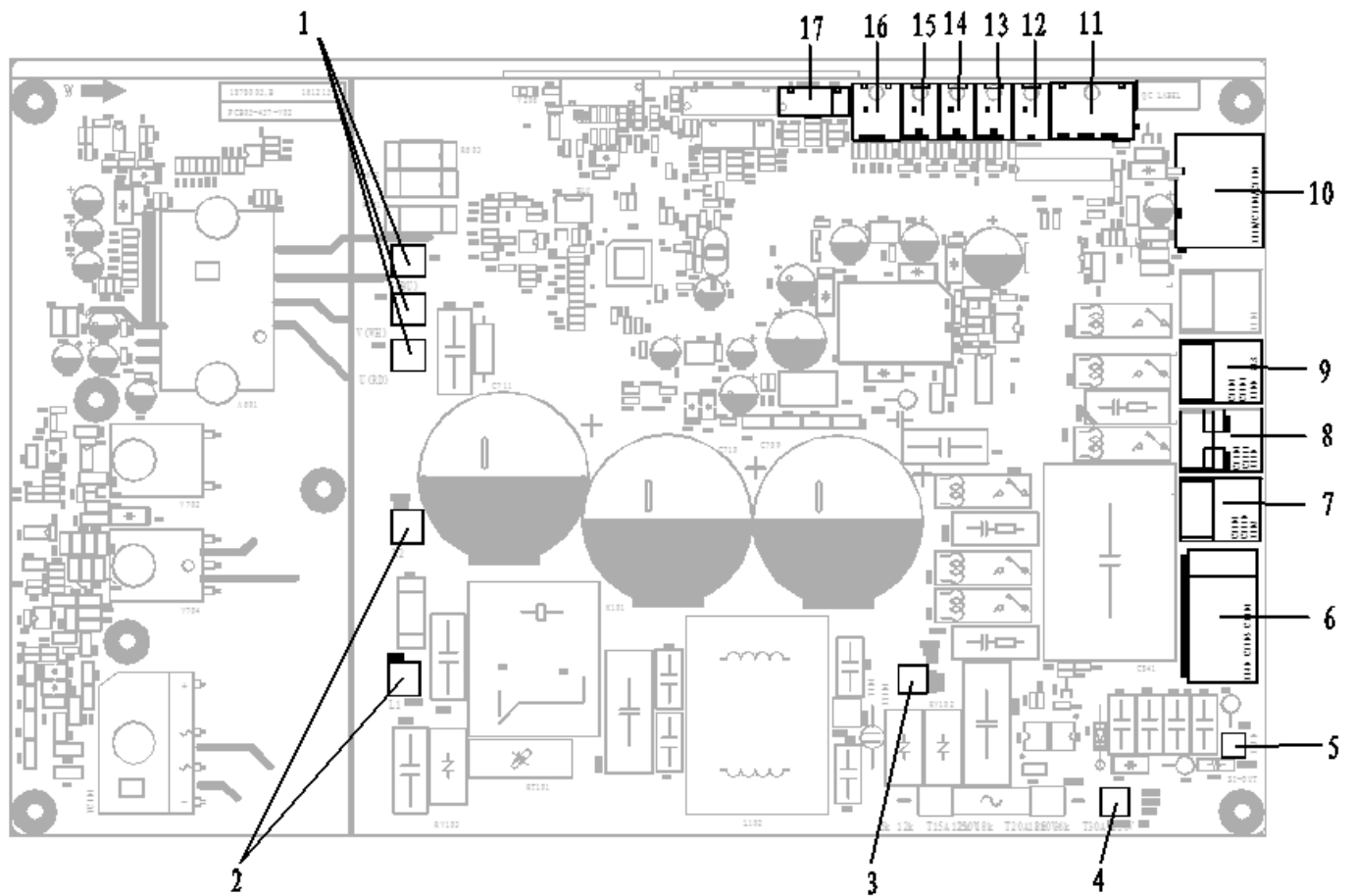
OU-PCB-SYD/SVE



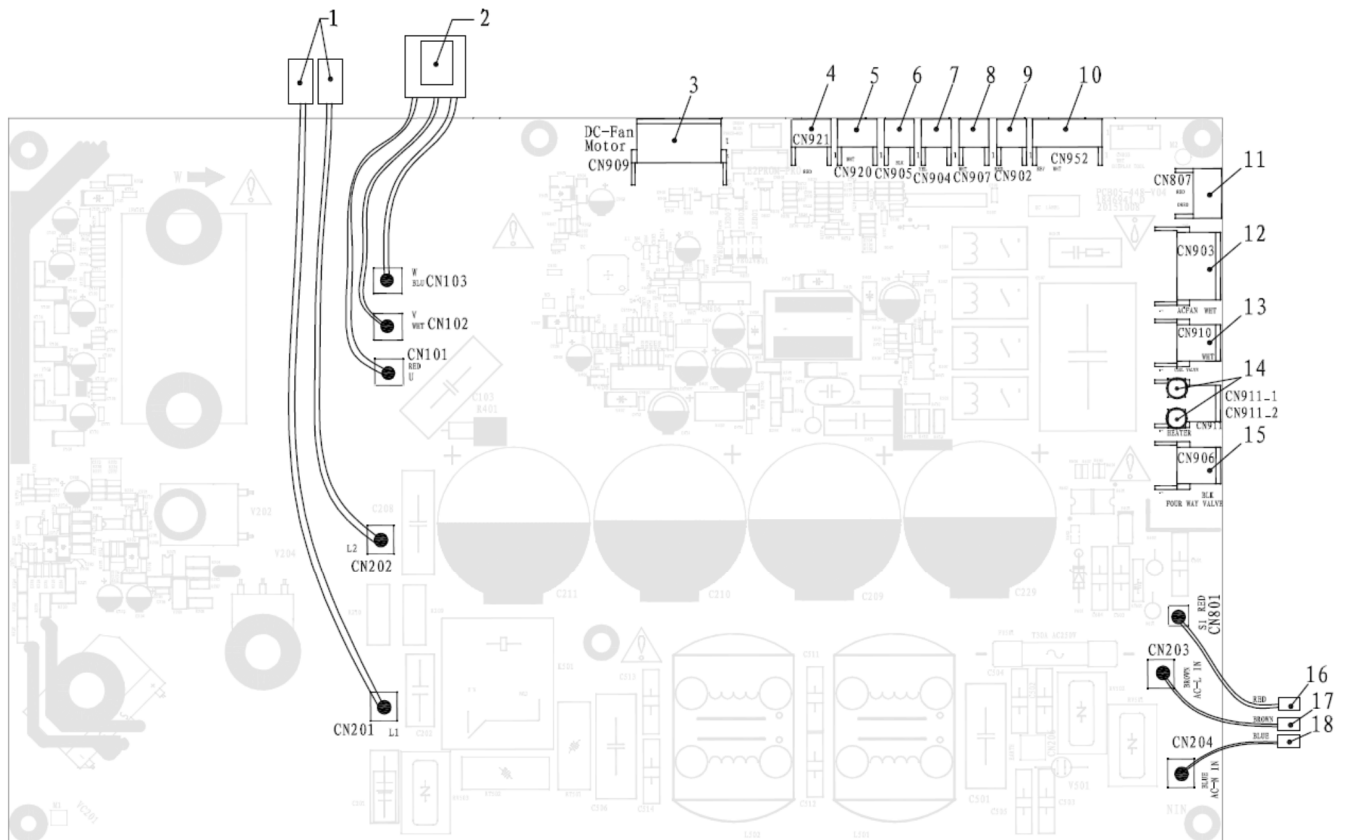
| | | | |
|---|---|----|--|
| 1 | Terminal of compressor U phase | 10 | Outdoor ambient temperature sensor |
| 2 | Terminal of compressor V phase | 11 | Terminal of 4-way valve |
| 3 | Terminal of compressor W phase | 12 | Terminal of heater |
| 4 | Terminal of DC fan | 13 | communication wire to terminal block |
| 5 | Terminal of electronic expansion valve | 14 | Terminal of nuetral wire to terminal block |
| 6 | Terminal of compressor overload protector | 15 | Terminal of live wire to terminal block |
| 7 | Compressor discharge temperaturesensor | 16 | Terminal of ground wire |
| 8 | Terminal of AC fan | 17 | Terminal of reactor |
| 9 | Outdoor pipe temperature sensor | 18 | Terminal of reactor |



| | | | | | | | |
|---|--|---|--|----|--|----|---|
| 1 | Terminal of compressor U/V/W phase | 5 | Terminal of neutral wire, connect to the terminal panel "1(N)" | 9 | 4-way valve terminal | 13 | Compressor discharge temperature sensor |
| 2 | Terminal of reactor | 6 | Terminal of live wire, connect to the terminal panel "2(L)" | 10 | Terminal of electronic expansion valve | 14 | Terminal of compressor overload protector |
| 3 | Terminal of reactor | 7 | cool valve terminal | 11 | Outdoor ambient temperature sensor | 15 | Over pressure sensor |
| 4 | Terminal of signal wire, connect to the terminal panel "3(SI)" | 8 | Terminal of AC fan | 12 | Outdoor pipe temperature sensor | 16 | Terminal of DC fan |



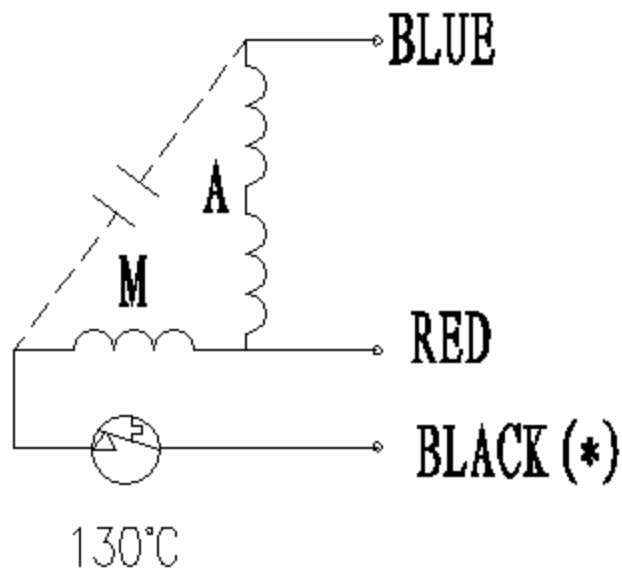
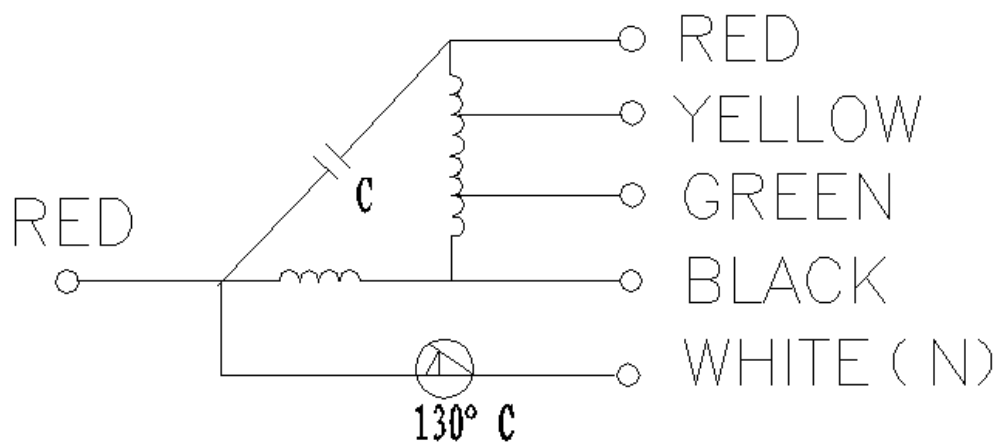
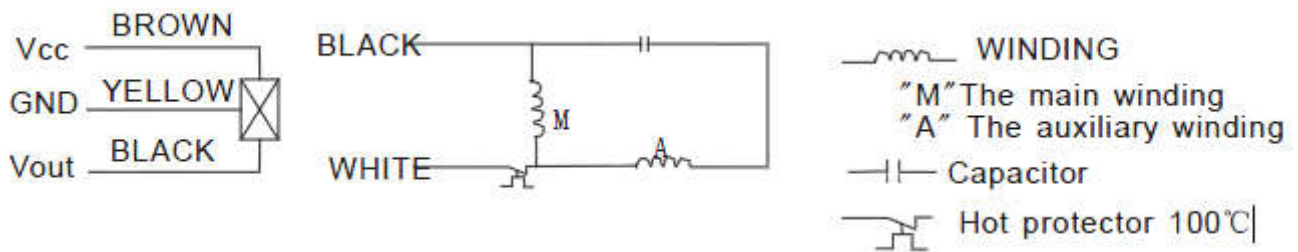
| | | | | | | | |
|---|---|----|--|----|---|----|----------------------|
| 1 | Terminal of compressor U/V/W phase | 6 | Terminal of AC fan cool valve terminal | 11 | Terminal of electronic expansion valve | 16 | Over pressure sensor |
| 2 | Terminal of reactor | 7 | Cool Valve terminal | 12 | Outdoor ambient temperature sensor | 17 | DRED Function |
| 3 | Terminal of neutral wire, connect to the terminal panel "1(N) " | 8 | Heater terminal | 13 | Outdoor pipe temperature sensor | 18 | |
| 4 | Terminal of live wire, connect to the terminal panel "2(L)" | 9 | 4-way valve terminal | 14 | Compressor discharge temperature sensor | 19 | |
| 5 | Terminal of signal wire, connect to the terminal panel "3(SI)" | 10 | Terminal of DC fan | 15 | Terminal of compressor overload protector | | |



| | | | | | | | |
|---|------------------------------|----|---|----|----------------------|----|--------------------------------|
| 1 | Terminal of reactor | 6 | Compressor discharge temperature sensor | 11 | DRED Function | 16 | Terminal of communication wire |
| 2 | Terminal of compressor | 7 | Outdoor ambient temperature sensor | 12 | Terminal of AC fan | 17 | Terminal of live wire |
| 3 | Terminal of DC fan | 8 | Outdoor pipe temperature sensor | 13 | Cool Valve terminal | 18 | Terminal of neutral |
| 4 | Heat Sink temperature sensor | 9 | Terminal of compressor overload protector | 14 | Heater terminal | | |
| 5 | PressureProtector | 10 | Terminal of electronic expansion valve | 15 | 4-way valve terminal | | |

6-2. Fan Motor

Drawings attached:



Test in resistance.

TOOL: Multimeter.

Test the resistance of the main winding. The indoor fan motor is fault if the resistance of main winding 0(short circuit)or ∞ (open circuit) .

Test in voltage

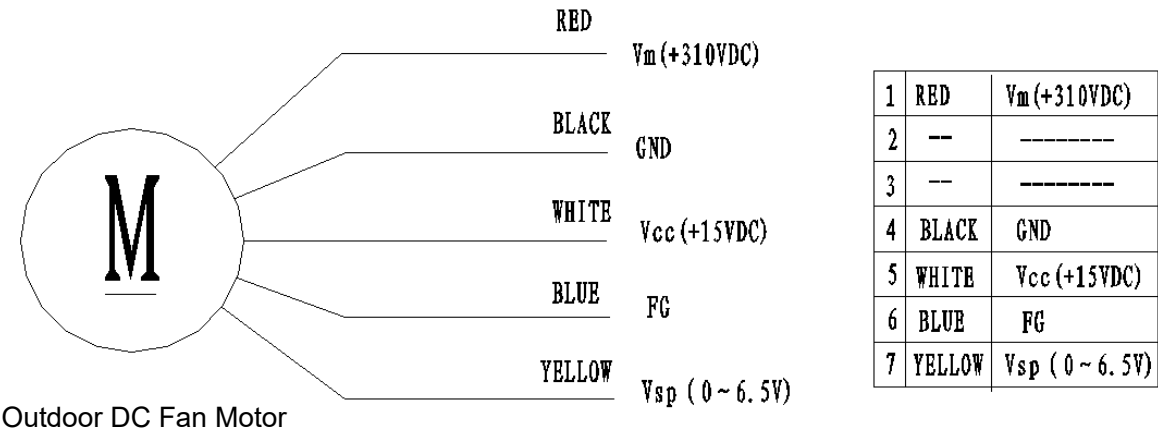
TOOL: Multimeter.

Insert screwdriver into to rotate indoor fan motor slowly for 1 revolution or over, and measure voltage “YELLOW” and “GND” on motor. The voltage repeat 0V DC and 5V DC.

Notes:

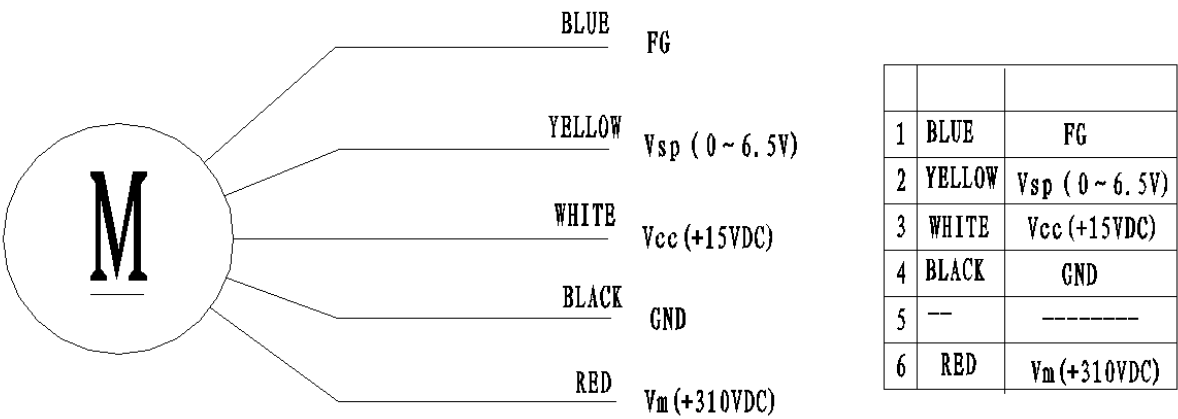
- 1) Please don't hold motor by lead wires.
- 2) Please don't plug IN/OUT the motor connecter while power ON.
- 3)Please don't drop hurl or dump motor against hard material. Malfunction may not be observed at early stage after such shock. But it may be found later, this type of mishandling void our warranty.

Indoor DC Fan Motor



Outdoor DC Fan Motor

Outdoor DC Fan Motor



6-3. Temperature Sensor

Parameter table attached:

1. THE PARAMETER OF THE INDOOR COIL AND INDOOR ROOM SENSOR ,THE PARAMETER OF THE OUTDOOR COIL AND OUTDOOR SENSOR:

(R(0)=15k B(0/100)=3450)

| Temperature(°C) | Resistance(k) | Voltage(V) | | Temperature(°C) | Resistance(k) | Voltage(V) |
|-----------------|---------------|------------|--|-----------------|---------------|-------------|
| -20 | 38.757 | 0.58143512 | | 31 | 4.292 | 2.715076661 |
| -19 | 36.844 | 0.60795346 | | 32 | 4.137 | 2.76063657 |
| -18 | 35.038 | 0.63530819 | | 33 | 3.989 | 2.805589174 |
| -17 | 33.331 | 0.66352684 | | 34 | 3.847 | 2.850117358 |
| -16 | 31.719 | 0.69257720 | | 35 | 3.711 | 2.894109636 |
| -15 | 30.196 | 0.72246147 | | 36 | 3.58 | 2.937788018 |
| -14 | 28.755 | 0.75321223 | | 37 | 3.455 | 2.980713033 |
| -13 | 27.392 | 0.78480857 | | 38 | 3.335 | 3.023117961 |
| -12 | 26.103 | 0.81722911 | | 39 | 3.219 | 3.065272268 |
| -11 | 24.882 | 0.85051031 | | 40 | 3.108 | 3.106725146 |
| -10 | 23.727 | 0.88458737 | | 41 | 3.001 | 3.147759536 |
| -9 | 22.632 | 0.91951536 | | 42 | 2.899 | 3.187898487 |
| -8 | 21.594 | 0.95527085 | | 43 | 2.801 | 3.227439565 |
| -7 | 20.611 | 0.99179340 | | 44 | 2.706 | 3.266717909 |
| -6 | 19.678 | 1.02913875 | | 45 | 2.615 | 3.305249514 |
| -5 | 18.794 | 1.06721353 | | 46 | 2.528 | 3.342947037 |
| -4 | 17.954 | 1.10609872 | | 47 | 2.444 | 3.380169671 |
| -3 | 17.158 | 1.14565549 | | 48 | 2.363 | 3.416856492 |
| -2 | 16.401 | 1.18599135 | | 49 | 2.286 | 3.45247766 |
| -1 | 15.683 | 1.22696435 | | 50 | 2.211 | 3.487894953 |
| 0 | 15 | 1.26865672 | | 51 | 2.139 | 3.522585993 |
| 1 | 14.351 | 1.31098658 | | 52 | 2.07 | 3.556485356 |
| 2 | 13.734 | 1.35393437 | | 53 | 2.003 | 3.590032381 |
| 3 | 13.148 | 1.39741342 | | 54 | 1.939 | 3.622673675 |
| 4 | 12.589 | 1.44157386 | | 55 | 1.877 | 3.654865988 |
| 5 | 12.058 | 1.48618720 | | 56 | 1.818 | 3.686036427 |
| 6 | 11.553 | 1.53125563 | | 57 | 1.76 | 3.717201166 |
| 7 | 11.071 | 1.57689691 | | 58 | 1.705 | 3.747244673 |
| 8 | 10.613 | 1.62286005 | | 59 | 1.652 | 3.776658768 |
| 9 | 10.176 | 1.66928515 | | 60 | 1.6 | 3.805970149 |
| 10 | 9.76 | 1.71601615 | | 61 | 1.551 | 3.834009923 |
| 11 | 9.363 | 1.76311968 | | 62 | 1.503 | 3.861880963 |
| 12 | 8.985 | 1.81043663 | | 63 | 1.457 | 3.888973616 |
| 13 | 8.624 | 1.85805887 | | 64 | 1.413 | 3.91524643 |
| 14 | 8.279 | 1.90597205 | | 65 | 1.37 | 3.941267388 |
| 15 | 7.951 | 1.95387327 | | 66 | 1.328 | 3.967019291 |
| 16 | 7.637 | 2.00204130 | | 67 | 1.289 | 3.991234935 |
| 17 | 7.337 | 2.05033368 | | 68 | 1.25 | 4.015748031 |

| | | | | | | |
|----|-------|------------|--|----|-------|-------------|
| 18 | 7.051 | 2.09859271 | | 69 | 1.213 | 4.039284017 |
| 19 | 6.778 | 2.14682606 | | 70 | 1.177 | 4.062450215 |
| 20 | 6.516 | 2.19524793 | | 71 | 1.142 | 4.085229093 |
| 21 | 6.267 | 2.24333597 | | 72 | 1.109 | 4.106941536 |
| 22 | 6.028 | 2.29151689 | | 73 | 1.076 | 4.12888601 |
| 23 | 5.8 | 2.33944954 | | 74 | 1.045 | 4.149715216 |
| 24 | 5.581 | 2.38741691 | | 75 | 1.015 | 4.17007359 |
| 25 | 5.372 | 2.43506494 | | 76 | 0.986 | 4.189944134 |
| 26 | 5.172 | 2.48247664 | | 77 | 0.957 | 4.210004953 |
| 27 | 4.981 | 2.52951096 | | 78 | 0.93 | 4.228855721 |
| 28 | 4.797 | 2.57653834 | | 79 | 0.904 | 4.247168554 |
| 29 | 4.622 | 2.62291710 | | 80 | 0.878 | 4.265640683 |
| 30 | 4.453 | 2.66931854 | | | | |

Note: the AD value in the table is calculated on the basis of the pull-down resistor is 5.1K.

2. THE PARAMETER OF OUTDOOR COMPRESSOR TEMPERATURE SENSOR:

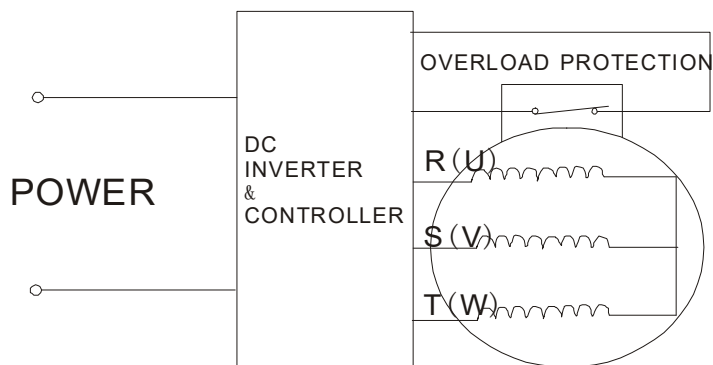
| R(0)=187.25k B(0100)=3979) | | | | | | |
|----------------------------|---------------|------------|--|---------------------|-------------------|-------------|
| Temperature (°C) | Resistance(k) | Voltage(V) | | Temperature (°C) | Resistance (k) | Voltage(V) |
| -20 | 542.867 | 0.06185563 | | 51 | 19.907 | 1.273074475 |
| -19 | 512.839 | 0.06543004 | | 52 | 19.148 | 1.310312934 |
| -18 | 484.672 | 0.06917993 | | 53 | 18.422 | 1.348029498 |
| -17 | 458.239 | 0.07311215 | | 54 | 17.728 | 1.386170907 |
| -16 | 433.423 | 0.07723358 | | 55 | 17.065 | 1.424680494 |
| -15 | 410.115 | 0.08155140 | | 56 | 16.43 | 1.463624623 |
| -14 | 388.213 | 0.08607312 | | 57 | 15.822 | 1.502961719 |
| -13 | 367.625 | 0.09080590 | | 58 | 15.241 | 1.542579738 |
| -12 | 348.264 | 0.09575738 | | 59 | 14.684 | 1.582573078 |
| -11 | 330.048 | 0.10093573 | | 60 | 14.151 | 1.622834232 |
| -10 | 312.904 | 0.10634837 | | 61 | 13.64 | 1.663405088 |
| -9 | 296.761 | 0.11200385 | | 62 | 13.151 | 1.704175229 |
| -8 | 281.556 | 0.11790981 | | 63 | 12.682 | 1.745200698 |
| -7 | 267.227 | 0.12407536 | | 64 | 12.233 | 1.78637104 |
| -6 | 253.72 | 0.13050821 | | 65 | 11.802 | 1.827760456 |
| -5 | 240.982 | 0.13721739 | | 66 | 11.388 | 1.869364416 |
| -4 | 228.965 | 0.14421140 | | 67 | 10.992 | 1.910971223 |
| -3 | 217.624 | 0.15149895 | | 68 | 10.611 | 1.952788467 |
| -2 | 206.917 | 0.15908889 | | 69 | 10.246 | 1.994602839 |
| -1 | 196.805 | 0.16699001 | | 70 | 9.896 | 2.036415908 |
| 0 | 187.25 | 0.17521257 | | 71 | 9.559 | 2.078366648 |
| 1 | 177.957 | 0.18402550 | | 72 | 9.236 | 2.120229484 |
| 2 | 169.186 | 0.19319719 | | 73 | 8.925 | 2.162162162 |
| 3 | 160.903 | 0.20273937 | | 74 | 8.627 | 2.203928178 |
| 4 | 153.179 | 0.21252789 | | 75 | 8.341 | 2.245558418 |
| 5 | 145.685 | 0.22297275 | | 76 | 8.065 | 2.287251934 |

| | | | | | | |
|----|---------|------------|--|-----|-------|-------------|
| 6 | 138.696 | 0.23368340 | | 77 | 7.8 | 2.328767123 |
| 7 | 132.086 | 0.24480509 | | 78 | 7.546 | 2.369998606 |
| 8 | 125.833 | 0.25634646 | | 79 | 7.301 | 2.411176512 |
| 9 | 119.916 | 0.26831655 | | 80 | 7.065 | 2.452217815 |
| 10 | 114.315 | 0.28072493 | | 81 | 6.843 | 2.492120501 |
| 11 | 109.01 | 0.29358432 | | 82 | 6.624 | 2.532777116 |
| 12 | 103.984 | 0.30690352 | | 83 | 6.414 | 2.573028606 |
| 13 | 99.222 | 0.32068816 | | 84 | 6.212 | 2.612972641 |
| 14 | 94.708 | 0.33494897 | | 85 | 6.017 | 2.652726847 |
| 15 | 90.427 | 0.34969710 | | 86 | 5.829 | 2.692216328 |
| 16 | 86.366 | 0.36494000 | | 87 | 5.648 | 2.731362468 |
| 17 | 82.512 | 0.38068793 | | 88 | 5.474 | 2.770083102 |
| 18 | 78.854 | 0.39694585 | | 89 | 5.306 | 2.808524698 |
| 19 | 75.381 | 0.41372093 | | 90 | 5.144 | 2.846617549 |
| 20 | 72.082 | 0.43102355 | | 91 | 4.988 | 2.884289108 |
| 21 | 68.948 | 0.44885674 | | 92 | 4.837 | 2.921715219 |
| 22 | 65.968 | 0.46723835 | | 93 | 4.692 | 2.958579882 |
| 23 | 63.136 | 0.48615877 | | 94 | 4.552 | 2.995066949 |
| 24 | 60.443 | 0.50562884 | | 95 | 4.417 | 3.031113488 |
| 25 | 57.88 | 0.52566481 | | 96 | 4.286 | 3.066931265 |
| 26 | 55.367 | 0.54691396 | | 97 | 4.161 | 3.10190676 |
| 27 | 52.978 | 0.56877112 | | 98 | 4.039 | 3.13682074 |
| 28 | 50.707 | 0.59123237 | | 99 | 3.922 | 3.171050177 |
| 29 | 48.547 | 0.61430611 | | 100 | 3.776 | 3.214826021 |
| 30 | 46.492 | 0.63799445 | | 101 | 3.703 | 3.237170332 |
| 31 | 44.537 | 0.66229036 | | 102 | 3.602 | 3.268602192 |
| 32 | 42.676 | 0.68720188 | | 103 | 3.501 | 3.300650422 |
| 33 | 40.904 | 0.71272849 | | 104 | 3.409 | 3.33039475 |
| 34 | 39.217 | 0.73885738 | | 105 | 3.317 | 3.360680043 |
| 35 | 37.609 | 0.76561057 | | 106 | 3.228 | 3.390506582 |
| 36 | 36.077 | 0.79296593 | | 107 | 3.141 | 3.420179056 |
| 37 | 34.616 | 0.82093877 | | 108 | 3.058 | 3.448975451 |
| 38 | 33.224 | 0.84949031 | | 109 | 2.977 | 3.477549351 |
| 39 | 31.895 | 0.87866649 | | 110 | 2.899 | 3.505516033 |
| 40 | 30.628 | 0.90841082 | | 111 | 2.823 | 3.533201704 |
| 41 | 29.419 | 0.93873381 | | 112 | 2.749 | 3.56058226 |
| 42 | 28.264 | 0.96965549 | | 113 | 2.678 | 3.587254695 |
| 43 | 27.162 | 1.00111890 | | 114 | 2.609 | 3.613561484 |
| 44 | 26.109 | 1.03315203 | | 115 | 2.542 | 3.639477628 |
| 45 | 25.103 | 1.06573050 | | 116 | 2.477 | 3.664977902 |
| 46 | 24.142 | 1.09883007 | | 117 | 2.414 | 3.6900369 |
| 47 | 23.223 | 1.13246511 | | 118 | 2.353 | 3.714629083 |
| 48 | 22.345 | 1.16658089 | | 119 | 2.294 | 3.738728832 |
| 49 | 21.505 | 1.20120120 | | 120 | 2.237 | 3.762310501 |
| 50 | 20.701 | 1.23631868 | | | | |

Note: the AD value in the table is calculated on the basis of the pull-down resistor is 6.8K.

6-4. Compressor

Drawings attached:



Test in resistance.

TOOL: Multimeter.

Test the resistance of the winding. The compressor is fault if the resistance of winding 0(short circuit) or ∞ (open circuit)

Familiar trouble: 1) Compressor motor lock. 2) Discharge pressure value approaches static pressure value. 3) Compressor motor winding abnormality.

Notes: 1) Don't put a compressor on its side or turn over.

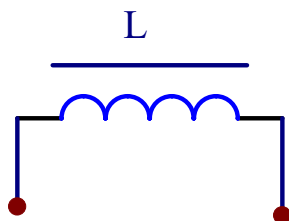
2) Please assembly the compressor in your air conditioner rapidly after removing the plugs. Don't place the comp. In air for along time.

3) Avoiding compressor running in reverse caused by connecting electrical wire incorrectly.

4) Warning! In case AC voltage is impressed to compressor, the compressor performance will belower because of its rotor magnetic force decreasing.

6-5. Electric Reactor

Drawings attached:



Familiar error:

- 1) Sound abnormality
- 2) Insulation resistance disqualification.

7.Trouble Shooting

7-1. 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* O: *FLASH* ×: *OFF*

| Error code | Outdoor Failure Description | LED1 | LED2 | LED3 | the root cause may be one of the following |
|---|--|------|------|------|---|
| Mark description: the lights flash every second for the following faults | | | | | |
| | Normal | × | × | × | |
| | Outdoor coil temperature sensor in trouble | ★ | × | ★ | a.the outdoor coil sensor connect loose; b.the outdoor coil temperature sensor is failure; c.the outdoor control board is failure |
| | Compressor exhaust temperature sensor in trouble | ★ | × | × | a.the compressor exhaust temperature sensor connect loose; b.the compressor exhaust temperature sensor is failure; c.the outdoor control board is failure |
| | Communication failure between the indoor unit and outdoor unit | × | × | O | a.the communication cable connect loose; b.the communication cable is failure; c.the connection between the filter board and the outdoor control board is incorrect or loose; d.the connection between the filter board and the terminal is incorrect or loose; e.the indoor control board is failure; f.the PFC board is failure; g.the power board is failure; h.the outdoor control board is failure. |
| | Current overload protection | ★ | O | × | a.the fan motor run abnormally; b.the condensor and evaporator is dirty; c.the air inlet and outlet is abnormally |
| | Maximum current protection | ★ | O | ★ | a.the outdoor control board is short circuit; b.the drive board is short circuit; c.the other components is short circuit |
| | Communication trouble between outdoor unit and driver | × | ★ | ★ | a. the connection wires connect loose b.the outdoor board or drive board is failure; |

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

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

When the compressor is in operation:

| Mark description: ★: Light O: Flash ×: Off; the flash cycle is 1S | | | | |
|---|------|------|------|--|
| No. | LED1 | LED2 | LED3 | Reasons for the current operating frequency of the compressor is limited |
| 1 | O | O | O | 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-overload 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 | O | × | × | 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 | × | ★ | O | 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 o 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; b. The indoor control board is failure. 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 (new design remote controller), 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 o 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 | | a. The outdoor temperature sensor loose; b. The outdoor temperature sensor is failure; c. The indoor control board is failure |
| 2 | × | O | ★ | × | Compressor exhaust temperature sensor in trouble | | a. the compressor exhaust temperature sensor connect loose; b. the compressor exhaust temperature sensor is failure; c. the outdoor control board is failure |
| 5 | ★ | O | × | × | IPM module protection | | a. The IPM board is failure; b. The outdoor fan is broken; c. The outdoor fan motor is failure; d. The outdoor fan has been blocked ; e. The condenser is dirty; f. The outdoor unit has been installed without standard. |
| 6 | ★ | O | × | ★ | AC voltage higher or lower protection | | a. the supply voltage is higher or lower than normal; b. the inner supply voltage of the unit is higher or lower than normal |
| 7 | ★ | O | ★ | × | Communication failure between the indoor unit and outdoor unit | | a. the communication cable connect loose; b. the communication cable is failure; c. the connection between the filter board and the outdoor control board is incorrect or loose; d. the connection between the filter board and the terminal is incorrect or loose; e. the indoor control board is failure; f. the PFC board is failure; g. the power board is failure; h. the outdoor control board is failure. |
| 8 | ★ | O | ★ | ★ | Current overload protection | | a. the fan motor run abnormally; b. the condensor and evaporator is dirty; c. the air inlet and outlet is |

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

| | | | | | | | |
|----|---|---|---|---|--|--|--|
| 17 | | | | | PFC protection | | a. the PFC is failure; b. the outdoor drive board is failure |
| 18 | | | | | DC compressor start failure | | a. the outdoor drive board is failure; b. the compressor is failure |
| 19 | × | × | × | O | Compressor drive in trouble | | a. the outdoor drive board is failure; b. the compressor is failure c. the outdoor control board is failure |
| 20 | ★ | × | × | O | Outdoor fan motor locked rotor protection | | a. the connection of the outdoor fan motor is loose; b. there are something block the outdoor fan; c. the fan motor is failure; d. the outdoor control board is failure |
| 21 | | | | | Outdoor coil anti-overload protection with cooling | | a. the refrigerant is too much; b. the outdoor fan motor is failure; c. the outdoor fan is broken; d. the condensor is dirty; e. 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 | | a. Using the wrong drive board; b.Using the wrong compressor. |
| 26 | | | | | Overheated outdoor radiator | | a. Radiator sensor fails b. Detection circuit of the sensor on the control panel fails |
| 27 | | | | | Protection against too high system pressure | | a. The pressure switch fails b. The pressure detection switch on the control panel fails c. The measured value of system pressure exceeds the limit |
| 33 | o | x | x | ★ | The failure for temperature sensor of indoor room | | a. The indoor room temperature sensor loose; b. The indoor room temperature sensor is |

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

| | | | | | | | |
|---|---|---|---|--|--|--|---|
| 1 | O | ★ | ★ | | The failure for temperature sensor of outdoor coil | | d. The outdoor temperature sensor loose; e. The outdoor temperature sensor is failure; f. The indoor control board is failure |
| 2 | O | ★ | x | | Compressor exhaust temperature sensor in trouble | | a.the compressor exhaust temperature sensor connect loose; b.the compressor exhaust temperature sensor is failure; c.the outdoor control board is failure |
| 5 | ★ | O | x | | IPM module protection | | a.The IPM board is failure; b.The outdoor fan is broken; c.The outdoor fan motor is failure; d.The outdoor fan has been blocked ; e.The condenser is dirty; f.The outdoor unit has been installed without standard. |
| 6 | x | O | x | | AC voltage higher or lower protection | | a.the supply voltage is higher or lower than normal; b.the inner supply voltage of the unit is higher or lower than normal |
| 7 | ★ | ★ | x | | Communication failure between the indoor unit and outdoor unit | | a.the communication cable connect loose; b.the communication cable is failure; c.the connection between the filter board and the outdoor control board is incorrect or loose; d.the connection between the filter board and the terminal is incorrect or loose; e.the indoor control board is failure; f.the PFC board is failure; g.the power board is failure; h.the outdoor control board is failure. |
| 8 | | | | | Current overload protection | | a.the fan motor run abnormally; b.the condensor and evaporator is dirty; c.the air inlet and outlet is abnormally |
| 9 | | | | | Maximum current protection | | a.the outdoor control board is short circuit; b.the drive board is short circuit; c.the other components is short |

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

| | | | | | | | |
|----|---|---|---|--|---|--|--|
| 19 | x | ★ | O | | Compressor drive in trouble | | a. the outdoor drive board is failure; b. the compressor is failure c. the outdoor control board is failure |
| 20 | ★ | x | O | | Outdoor fan motor locked rotor protection | | a. the connection of the outdoor fan motor is loose; b. there are something block the outdoor fan; c. the fan motor is failure; d. the outdoor control board is failure |
| 21 | x | x | O | | Outdoor coil anti-overload protection with cooling | | a. the refrigerant is too much; b. the outdoor fan motor is failure; c. the outdoor fan is broken; d. the condensor is dirty; e. 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 | | a. Using the wrong drive board; b.Using the wrong compressor. |
| 26 | | | | | Overheated outdoor radiator | | a. Radiator sensor fails b. Detection circuit of the sensor on the control panel fails |
| 27 | | | | | Protection against too high system pressure | | a. The pressure switch fails b. The pressure detection switch on the control panel fails c. The measured value of system pressure exceeds the limit |
| 33 | ★ | O | O | | The failure for temperature sensor of indoor room | | d. The indoor room temperature sensor loose; e. The indoor room temperature sensor is failure; f. The indoor control board is failure. |
| 34 | x | O | O | | The failure for temperature sensor of indoor coil temperature | | d. The indoor coil temperature sensor loose; e. The indoor coil temperature sensor is failure; f. The indoor control board is failure. |
| 36 | O | ★ | O | | Communication failure between | | a. the communication cable connect loose; |

| | | | | | | | |
|----|---|---|---|--|---|--|---|
| | | | | | the indoor unit and outdoor unit | | b. the communication cable is failure; c. the connection between the filter board and the outdoor control board is incorrect or loose; d. the connection between the filter board and the terminal is incorrect or loose; e. the indoor control board is failure; f. the PFC board is failure; g. the power board is failure; h. the outdoor control board is failure. |
| 38 | O | O | x | | Indoor EEPROM failure | | c. The EEPROM chip loose; d. The indoor control board is failure |
| 39 | O | O | ★ | | Indoor fan motor run abnormally | | b. There are something block the indoor fan motor; b. The fan motor cord connect loose; c. The fan motor is failure; d. The indoor control board is failure |
| 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.

7-2. 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.

7-3. 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

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-locking 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 $X4^{\circ}\text{C}$.

Condition 2: in normal operation, the discharge temperature of compressor reaches $X5^{\circ}\text{C}$.

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 $X6^{\circ}\text{C}$, 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.

7-4. 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.

7-5. 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.

7-6. 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.