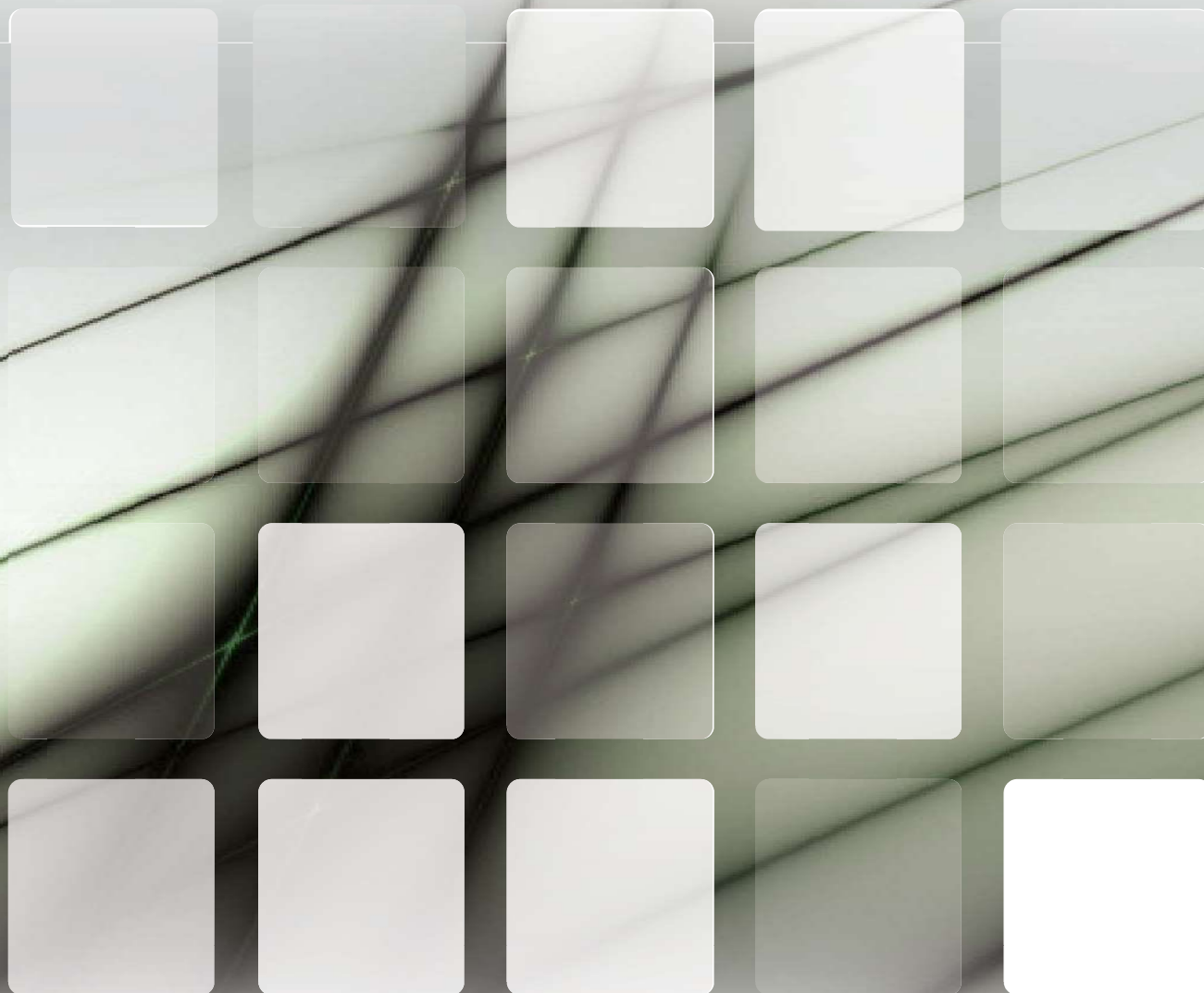


# IEWB/ICHB Series

## 19 SEER Certified Mini Split

### Technical Manual

**208~230V/1/60Hz**



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# 1. Safety Precautions

## Read Safety Precautions Before Installation

Incorrect installation due to ignoring instructions can cause serious damage or injury.

The seriousness of potential damage or injuries is classified as either a WARNING or CAUTION.



**Warning**

This symbol indicates that ignoring instructions may cause death or serious injury.



**Caution**

This symbol indicates that ignoring instructions may cause moderate injury to you or damage to your appliance or other property.



**Warning**

This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.

### I. Installation Warnings

- Ask an authorized dealer to install this air conditioner. Inappropriate installation may cause water leakage, electric shock, or fire.
- All repairs, maintenance and relocation of the unit must be performed by an authorized service technician. Inappropriate repairs can lead to serious injury or product failure.

### II. Warnings for product use

- If an abnormal situation arises (like a burning smell), immediately turn off the unit and pull the power plug.
- Call your dealer for instructions to avoid electric shock, fire or injury.
- Do not insert fingers, rods or other objects into the air inlet or outlet. This may cause injury, since the fan may be rotating at high speeds.
- Do not use flammable sprays such as hair spray, lacquer or paint near the unit. This may cause fire or combustion.
- Do not operate the air conditioner in places near or around combustible gases. Emitted gas may collect around the unit and cause explosion.
- Do not operate the air conditioner in a wet room (e.g., bath room or laundry room). This can cause electrical shock and cause the product to deteriorate.
- Do not expose your body directly to cool air for a prolonged period of time.

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### III. Electrical Warnings

- Only use the specified power cord. If the power cord is damaged, it must be replaced by the manufacturer or certified service agent.
- Keep power plug clean. Remove any dust or grime that accumulates on or around the plug. Dirty plugs can cause fire or electric shock.
- Do not pull power cord to unplug unit. Hold the plug firmly and pull it from the outlet. Pulling directly on the cord can damage it, which can lead to fire or electric shock.
- Do not use an extension cord, manually extend the power cord, or connect other appliances to the same outlet as the air conditioner. Poor electrical connections, poor insulation, and insufficient voltage can cause fire.

### IV. Cleaning and Maintenance Warnings

- Turn off the device and pull the plug before cleaning. Failure to do so can cause electrical shock.
- Do not clean the air conditioner with excessive amounts of water.
- Do not clean the air conditioner with combustible cleaning agents. Combustible cleaning agents can cause fire or deformation.



#### **Caution**

- If the air conditioner is used together with burners or other heating devices, thoroughly ventilate the room to avoid oxygen deficiency.
- Turn off the air conditioner and unplug the unit if you are not going to use it for a long time.
- Turn off and unplug the unit during storms.
- Make sure that water condensation can drain unhindered from the unit.
- Do not operate the air conditioner with wet hands. This may cause electric shock.
- Do not use device for any other purpose than its intended use.
- Do not climb onto or place objects on top of the outdoor unit.
- Do not allow the air conditioner to operate for long periods of time with doors or windows open, or if the humidity is very high.

---

## 2 Specifications

### 2.1 Model Reference

Refer to the following table to determine the specific indoor and outdoor unit model number of your purchased equipment.

#### Heat pump

| Indoor unit model    | Outdoor unit model   | Capacity (Btu/h) | Power supply      |
|----------------------|----------------------|------------------|-------------------|
| IEWB009J1A-CWJ026CWA | ICHB009J1A-CTJ026GFA | 9K               | 115V/60Hz/1Ph     |
| IEWB012J1A-CWJ035CWA | ICHB012J1A-CTJ035GFA | 12K              |                   |
| IEWB009J0A-CWJ026CWA | ICHB009J0A-CTJ026GFA | 9K               | 208~230V/60Hz/1Ph |
| IEWB012J0A-CWJ035CWA | ICHB012J0A-CTJ035GFA | 12K              |                   |
| IEWB018J2A-CWJ053CWA | ICHB018J0A-CTJ053GFA | 18K              |                   |
| IEWB024J0A-CWJ070CWA | ICHB024J0A-CTJ070GFA | 24K              |                   |

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## 2.2 Pipe length and drop height

The length of refrigerant piping will affect the performance and energy efficiency of the unit. Nominal efficiency is tested on units with a pipe length of 5 meters (16.5ft). A minimum pipe run of 3 meters is required to minimize vibration & excessive noise.

Refer to the table below for specifications on the maximum length and drop height of piping.

| Capacity (Btu/h) | Standard length | Max. pipe length | Max. high drop | Additional refrigerant |
|------------------|-----------------|------------------|----------------|------------------------|
| 9K               | 5m              | 25m              | 10m            | R410a, 15g/m           |
| 12K              | 5m              | 25m              | 10m            | R410a, 15g/m           |
| 18K              | 5m              | 30m              | 20m            | R410a, 15g/m           |
| 24K              | 5m              | 30m              | 20m            | R410a, 30g/m           |

Note: Oil trap should be set every 10m of vertical distance.

## 2.Specifications

### Heat Pump: 115V

| OMEGA MODEL  | Outdoor Unit         |        | Model                      | ICHB009J1A-CTJ026GFA | ICHB012J1A-CTJ035GFA |
|--|----------------------|--------|----------------------------|----------------------|----------------------|
|  | Indoor Unit          |        | Model                      | IEWB009J1A-CWJ026CWA | IEWB012J1A-CWJ035CWA |
| Indoor power supply                                    |                      |        | V/Ph/H                     | 115-1-60             |                      |
| Cooling  | Capacity             |        | Tons                       | 0.8                  | 1.0                  |
|  |                      |        | Btu/h                      | 9000                 | 11800                |
|  |                      |        | Btu/h                      | 3400~11300           | 3450~12800           |
|  | EER                  |        |                            | 11.00                | 10.60                |
| SEER   |                      |        | 19.0                       | 19.0                 |                      |
| Heating  | Capacity @ 47°F      | Btu/h  | 9000                       | 12000                |                      |
|  | Capacity @ 17°F      | Btu/h  | 7000                       | 9000                 |                      |
|  | Capacity MIN - MAX   | Btu/h  | 3000~11500                 | 3800~13500           |                      |
|  | COP @ 47°F           | W/W    | 3.30                       | 3.20                 |                      |
|  | HSPF                 |        | 10.0                       | 9.50                 |                      |
| Energy Star  |                      |        |                            | NO                   | NO                   |
| Minimum circuit ampacity (MCA)                         |                      |        | A                          | 11.0                 | 15.0                 |
| Maximum current rating of overcurrent protection (MOP) |                      |        | A                          | 15.0                 | 15.0                 |
| Max.fuse   |                      |        | A                          | 15.0                 | 15.0                 |
| Compressor   | Type                 |        | DC/Rotary                  |                      | DC/Rotary            |
|  | Model                |        | KSN98D22UFZ (801401400179) |                      | KSN98D22UFZ          |
|  | Brand                |        | GMCC                       |                      | GMCC                 |
|  | Capacity             | kW     | 3.095                      | 3.095                |                      |
|  | Power input          | W      | 790                        | 790                  |                      |
|  | Current input        | A      | 5.4                        | 5.4                  |                      |
| Outdoor fan motor                                      | Type                 |        | DC                         |                      | DC                   |
|  | Model                |        | DRN-310-34-8-1             |                      | DRN-310-34-8-1       |
|  | Brand                |        | Weiling                    |                      | Weiling              |
|  | Power input          | W      | 40                         | 50                   |                      |
|  | Current input        | A      | 0.8                        | 0.8                  |                      |
|  | Power output         | W      | 34                         | 34                   |                      |
|  | Capacitor            | μF     | -                          | -                    |                      |
|  | Speed                | r/min  | 800/650/500                | 900/650/500          |                      |
| Insulation class                                       |                      |        | E                          | E                    |                      |
| Outdoor coil   | Number of rows       |        | 1                          |                      | 1                    |
|  | Fin type             |        | Hydrophilic                |                      | Hydrophilic          |
|  | Tube type            |        | inner grooved              |                      | inner grooved        |
| Refrigerant  | Type                 |        | R410A                      |                      | R410A                |
|  | Charge               | g/oz   | 830/29.3                   | 830/29.3             |                      |
| Throttle part  |                      |        | Capillary                  |                      | Capillary            |
| Minimum circuit ampacity (MCA)                         |                      |        | A                          | 0.4                  | 0.4                  |
| Maximum current rating of overcurrent protection (MOP) |                      |        | A                          | 1                    | 1                    |
| Max.fuse   |                      |        | A                          | 5                    | 5                    |
| Indoor fan motor                                       | Model                |        | DR-310-13-8                |                      | DR-310-13-8          |
|  | Brand                |        | Weiling                    |                      | Weiling              |
|  | Power input          | W      | 30                         | 35                   |                      |
|  | Power input          | A      | 0.6                        | 0.6                  |                      |
|  | Power input          | W      | 13                         | 13                   |                      |
|  | Capacitor            | μF     | -                          | -                    |                      |
|  | Insulation class     |        | E                          |                      | E                    |
|  | RLA                  |        | 0.3                        |                      | 0.3                  |
|  | Speed (H/M/L)        | r/min  | 1180/1050/750              | 1220/1100/800        |                      |
|  | Speed (H/M/L)        | r/min  | 1180/1050/900              | 1220/1100/900        |                      |
| Indoor coil  | Number of Rows       |        | 2                          |                      | 2                    |
|  | Tube Type            |        | inner grooved              |                      | inner grooved        |
| Outdoor air flow                                       |                      |        | CFM                        | 1088                 | 1176                 |
| Indoor air flow  |                      |        | CFM                        | 300                  | 380                  |
| Outdoor noise  | power level          | dB(A)  | 51                         | 53                   |                      |
|  | pressure level       |        | 40                         | 42                   |                      |
| Indoor noise   | power level (H)      | dB(A)  | 39                         | 42                   |                      |
| Outdoor unit   | Dimension(W*H*D)     |        | mm                         | 805*495*305          | 805*495*305          |
|  |                      |        | in                         | 31.69×19.49×12.01    | 31.69×19.49×12.01    |
|  | Packing(W*H*D)       |        | mm                         | 850×550×350          | 850×550×350          |
|  |                      |        | in                         | 33.46×21.65×13.78    | 33.46×21.65×13.78    |
|  | Net/Gross weight     |        | kg                         | 25/28                | 25/28                |
|  |                      |        | lbs                        | 52.9/57.3            | 52.9/57.3            |
| Indoor unit  | Dimension(W*H*D)     |        | mm                         | 715×295×198          | 864×300×200          |
|  |                      |        | in                         | 28.15×11.61×7.8      | 34.02×11.81×7.87     |
|  | Packing(W*H*D)       |        | mm                         | 785×370×285          | 950×380×290          |
|  |                      |        | in                         | 31.5×14.96×11.42     | 37.4×14.96×11.42     |
|  | Net/Gross weight     |        | kg                         | 8.5/10.5             | 9.5/11.5             |
|  |                      | lbs    | 18.7/23.2                  | 20.9/25.4            |                      |
| Refrigerant piping                                     | Liquid side/Gas side |        | mm                         | Φ6.35-Φ9.52          | Φ6.35-Φ9.52          |
|  |                      |        | in                         | 1/4-3/8              | 1/4-3/8              |
|  | Max. pipe length     | ft (m) | 82 (25)                    | 82 (25)              |                      |
| Max. high drop   |                      | ft (m) | 33 (10)                    | 33 (10)              |                      |
| Ambient temperature                                    | Cooling              | °C     | 0~50                       | 0~50                 |                      |
|  |                      | °F     | 32~122                     | 32~122               |                      |
|  | Heating              | °C     | -15~30                     | -15~30               |                      |
|  |                      | °F     | 5~86                       | 5~86                 |                      |
| Operation temperature                                  | Cooling              | °C     | 16~32                      | 16~32                |                      |
|  |                      | °F     | 61~90                      | 61~90                |                      |
|  | Heating              | °C     | 15.5~32                    | 15.5~32              |                      |
|  |                      | °F     | 60~90                      | 60~90                |                      |

# 2 Specifications

## Heat Pump: 208~230V

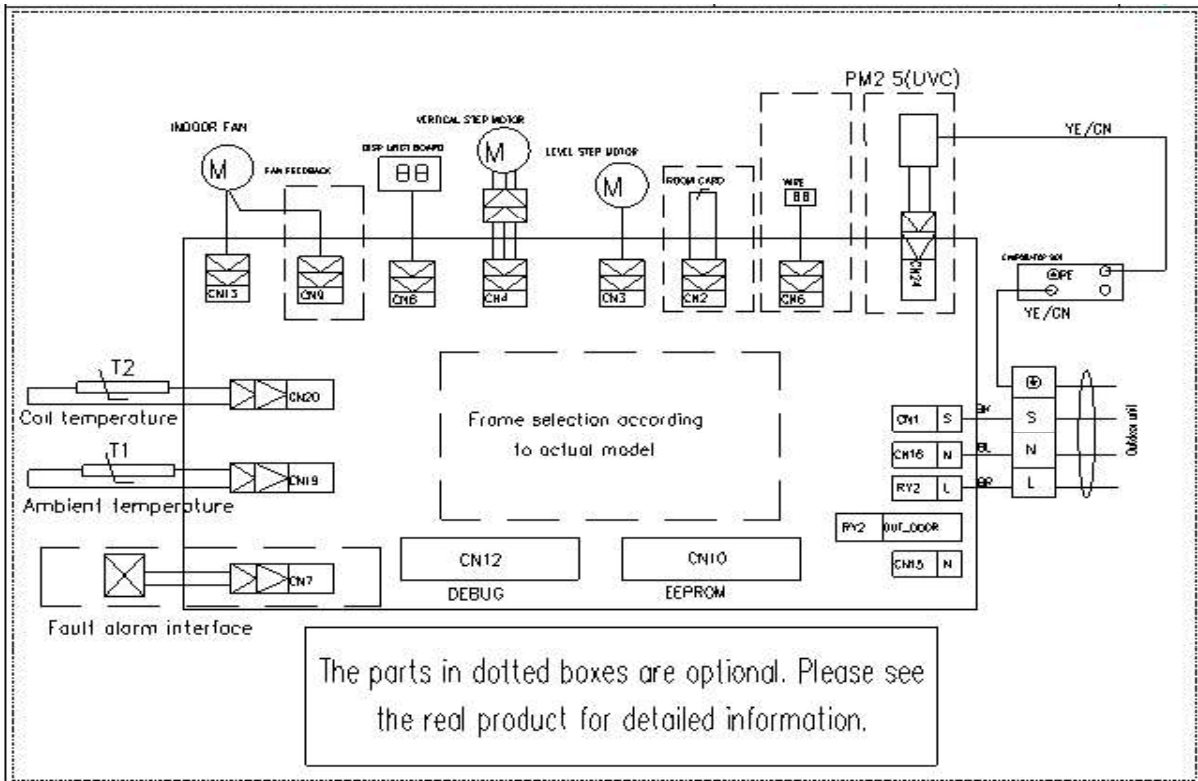
| OMEGA MODEL  | Outdoor Unit         | Model         | ICHB009J0A-CTJ026GFA       | ICHB012J0A-CTJ035GFA       | ICHB018J0A-CTJ053GFA        | ICHB024J0A-CTJ070GFA        |
|--|----------------------|---------------|----------------------------|----------------------------|-----------------------------|-----------------------------|
|  | Indoor Unit          | Model         | IEWB009J0A-CWJ026CWA       | IEWB012J0A-CWJ035CWA       | IEWB018J2A-CWJ053CWA        | IEWB024J0A-CWJ070CWA        |
| Indoor power supply                                    |                      | V/Ph/Hz       | 208/230-1-60               |                            |                             |                             |
| Cooling  | Capacity             | Tons          | 0.8                        | 1.0                        | 1.5                         | 2                           |
|  |                      | Btu/h         | 9000                       | 11800                      | 18000                       | 22000                       |
|  |                      | Btu/h         | 3400~11300                 | 3450~12800                 | 4260~19800                  | 4800~26000                  |
|  | EER                  | 11.20         | 10.60                      | 11.50                      | 10                          |                             |
| SEER   | 19.0                 | 19.0          | 18.0                       | 17.5                       |                             |                             |
| Heating  | Capacity @ 47°F      | Btu/h         | 9000                       | 12000                      | 18000                       | 22600                       |
|  | Capacity @ 17°F      | Btu/h         | 7000                       | 9000                       | 11500                       | 13500                       |
|  | Capacity MIN - MAX   | Btu/h         | 3000~11500                 | 3800~13500                 | 6200~19000                  | 8500~24500                  |
|  | COP @ 47°F           | W/W           | 3.30                       | 3.20                       | 3.30                        | 3.15                        |
|  | HSPF                 |               | 10.0                       | 9.50                       | 10.50                       | 9.5                         |
| Energy Star  |                      |               | NO                         | NO                         | NO                          | NO                          |
| Minimum circuit ampacity (MCA)                         |                      | A             | 6.0                        | 8.0                        | 12.0                        | 18.0                        |
| Maximum current rating of overcurrent protection (MOP) |                      | A             | 6.0                        | 10.0                       | 15.0                        | 25.0                        |
| Max.fuse   |                      | A             | 10.0                       | 10.0                       | 15.0                        | 25.0                        |
| Compressor   | Type                 |               | DC/Rotary                  | DC/Rotary                  | DC/Rotary                   | DC/Dual Rotary              |
|  | Model                |               | KSN98D22UFZ (801401400179) | KSN98D22UFZ (801401400179) | KSN140D21UFZ (801401400180) | KTM240D43UMT (801401400202) |
|  | Brand                |               | GMCC                       | GMCC                       | GMCC                        | GMCC                        |
|  | Capacity             | kW            | 3.095                      | 3.095                      | 4.370                       | 7.760                       |
|  | Power input          | W             | 790                        | 790                        | 1135                        | 2055                        |
|  | Current input        | A             | 5.4                        | 5.4                        | 7.5                         | 9.3                         |
| Outdoor fan motor                                      | Type                 |               | DC                         | DC                         | DC                          | DC                          |
|  | Model                |               | DRN-310-34-8-1             | DRN-310-34-8-1             | DRN-310-34-8-3              | DRN-310-75-8                |
|  | Brand                |               | Weiling                    | Weiling                    | Weiling                     | Weiling                     |
|  | Power input          | W             | 40                         | 50                         | 60                          | 110                         |
|  | Current input        | A             | 0.4                        | 0.4                        | 0.5                         | 0.7                         |
|  | Power output         | W             | 34                         | 34                         | 34                          | 75                          |
|  | Capacitor            | µF            | -                          | -                          | -                           | -                           |
|  | Speed                | r/min         | 800/650/500                | 900/650/500                | 900/650/520                 | 1050/750/620                |
| Insulation class                                       |                      |               | E                          | E                          | E                           | E                           |
| Outdoor coil   | Number of rows       |               | 1                          | 1                          | 2                           | 2                           |
|  | Fin type             |               | Hydrophilic                | Hydrophilic                | Hydrophilic                 | Hydrophilic                 |
|  | Tube type            |               | inner grooved              | inner grooved              | inner grooved               | inner grooved               |
| Refrigerant  | Type                 |               | R410A                      | R410A                      | R410A                       | R410A                       |
|  | Charge               | g/oz          | 830/29.3                   | 830/29.3                   | 1250/44.1                   | 1850/65.2                   |
| Throttle part  |                      |               | Capillary                  | Capillary                  | EXV                         | EXV                         |
| Minimum circuit ampacity (MCA)                         |                      | A             | 0.4                        | 0.4                        | 0.7                         | 0.7                         |
| Maximum current rating of overcurrent protection (MOP) |                      | A             | 1.0                        | 1.0                        | 1.0                         | 1.0                         |
| Max.fuse   |                      | A             | 5                          | 5                          | 5                           | 5                           |
| Indoor fan motor                                       | Model                |               | DR-310-13-8                | DR-310-13-8                | YDK-26-4P2                  | DR-310-58-8                 |
|  | Brand                |               | Weiling                    | Weiling                    | lvzhi                       | Weiling                     |
|  | Power input          | W             | 30                         | 35                         | 60                          | 110                         |
|  | Power input          | A             | 0.3                        | 0.3                        | 0.5                         | 0.6                         |
|  | Power input          | W             | 13                         | 13                         | 30                          | 58                          |
|  | Capacitor            | µF            | -                          | -                          | 2                           | -                           |
|  | Insulation class     |               | E                          | E                          | E                           | E                           |
|  | RLA                  |               | 0.3                        | 0.3                        | 0.5                         | 0.5                         |
| Speed (H/M/L)  | r/min                | 1180/1050/750 | 1220/1100/800              | 1180/1050/900              | 1300/1200/900               |                             |
| Speed (H/M/L)  | r/min                | 1180/1050/900 | 1220/1100/900              | 1180/1050/900              | 1300/1200/900               |                             |
| Indoor coil  | Number of Rows       |               | 2                          | 2                          | 2                           | 2                           |
|  | Tube Type            |               | inner grooved              | inner grooved              | inner grooved               | inner grooved               |
| Outdoor air flow                                       |                      | CFM           | 1088                       | 1176                       | 1653                        | 1853                        |
| Indoor air flow  |                      | CFM           | 300                        | 380                        | 530                         | 680                         |
| Outdoor noise  | power level          | dB(A)         | 51                         | 53                         | 55                          | 57                          |
|  | pressure level       |               | 40                         | 42                         | 44                          | 45                          |
| Indoor noise   | power level (H)      | dB(A)         | 39                         | 42                         | 45                          | 48                          |
|  |                      |               |                            |                            |                             |                             |
| Outdoor unit   | Dimension(W*H*D)     | mm            | 805*495*305                | 805*495*305                | 880*555*345                 | 935*705*395                 |
|  |                      | in            | 31.69*19.49*12.01          | 31.69*19.49*12.01          | 34.65*21.85*13.58           | 36.81*27.76*15.55           |
|  | Packing(W*H*D)       | mm            | 850*550*350                | 850*550*350                | 920*600*380                 | 975*770*435                 |
|  |                      | in            | 33.46*21.65*13.78          | 33.46*21.65*13.78          | 36.22*23.62*14.96           | 38.39*30.31*17.13           |
| Net/Gross weight                                       | kg                   | 25/28         | 25/28                      | 32/35                      | 42.5/45.5                   |                             |
|  | lbs                  | 52.9/57.3     | 52.9/57.3                  | 70.6/77.2                  | 93.9/100.5                  |                             |
| Indoor unit  | Dimension(W*H*D)     | mm            | 715*295*198                | 864*300*200                | 972*320*215                 | 1080*335*226                |
|  |                      | in            | 28.15*11.61*7.8            | 34.02*11.81*7.87           | 38.27*12.6*8.46             | 42.52*13.19*8.9             |
|  | Packing(W*H*D)       | mm            | 785*370*285                | 950*380*290                | 1070*410*310                | 1170*430*325                |
|  |                      | in            | 31.5*14.96*11.42           | 37.4*14.96*11.42           | 42.13*16.14*12.2            | 46x16.9x12.8                |
| Net/Gross weight                                       | kg                   | 8.5/10.5      | 9.5/12.5                   | 11.5/14.5                  | 14.5/17.5                   |                             |
|  | lbs                  | 18.7/23.2     | 20.9/27.6                  | 25.4/32                    | 32.0/38.6                   |                             |
| Refrigerant piping                                     | Liquid side/Gas side | mm            | Φ6.35-Φ9.52                | Φ6.35-Φ9.52                | Φ6.35-Φ12.7                 | Φ9.52-Φ15.88                |
|  |                      | in            | 1/4-3/8                    | 1/4-3/8                    | 1/4-1/2                     | 3/8-5/8                     |
|  | Max. pipe length     | ft (m)        | 82 (25)                    | 82 (25)                    | 98.5 (30)                   | 98.5 (30)                   |
| Max. high drop   | ft (m)               | 33 (10)       | 33 (10)                    | 66 (20)                    | 66 (20)                     |                             |
| Ambient temperature                                    | Cooling              | °C            | 0~50                       | 0~50                       | 0~50                        | 0~50                        |
|  |                      | °F            | 32-122                     | 32-122                     | 32-122                      | 32-122                      |
|  | Heating              | °C            | -15~30                     | -15~30                     | -15~30                      | -15~30                      |
|  |                      | °F            | 5-86                       | 5-86                       | 5-86                        | 5-86                        |
| Operation temperature                                  | Cooling              | °C            | 16~32                      | 16~32                      | 16~32                       | 16~32                       |
|  |                      | °F            | 61~90                      | 61~90                      | 61~90                       | 61~90                       |
|  | Heating              | °C            | 15.5~32                    | 15.5~32                    | 15.5~32                     | 15.5~32                     |
|  |                      | °F            | 60~90                      | 60~90                      | 60~90                       | 60~90                       |



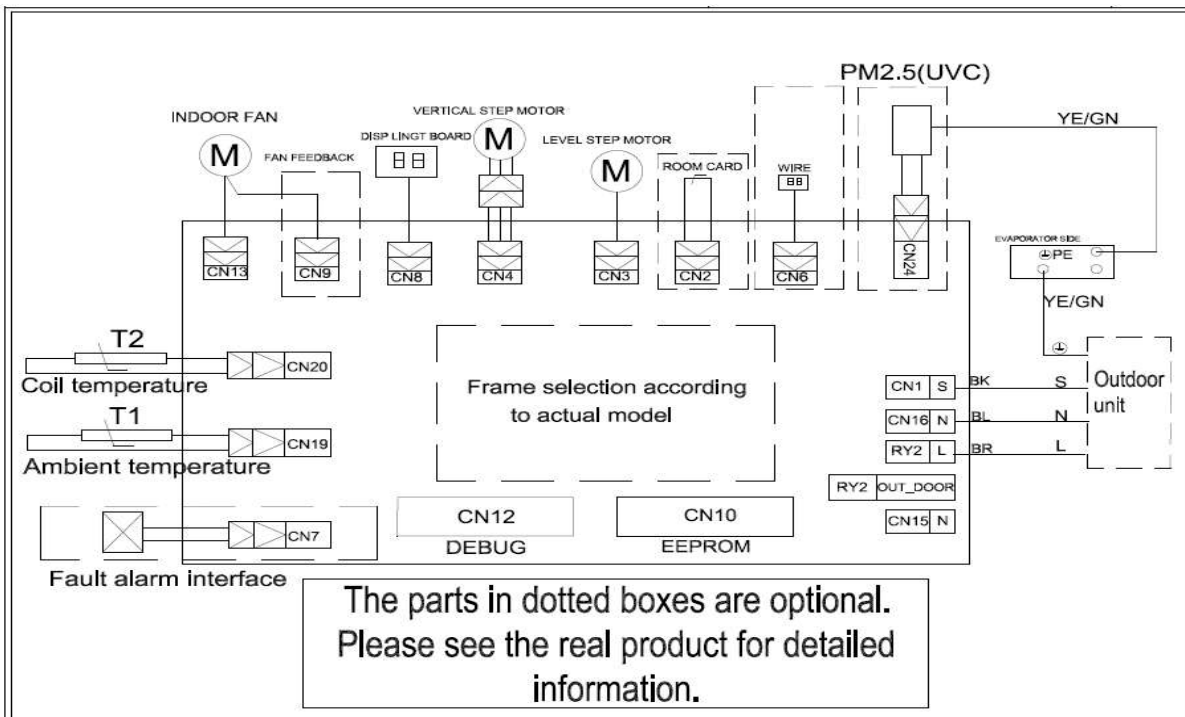
## 2.3 Electrical wiring diagram

### 2.3.1 Indoor unit

115V/9~12k

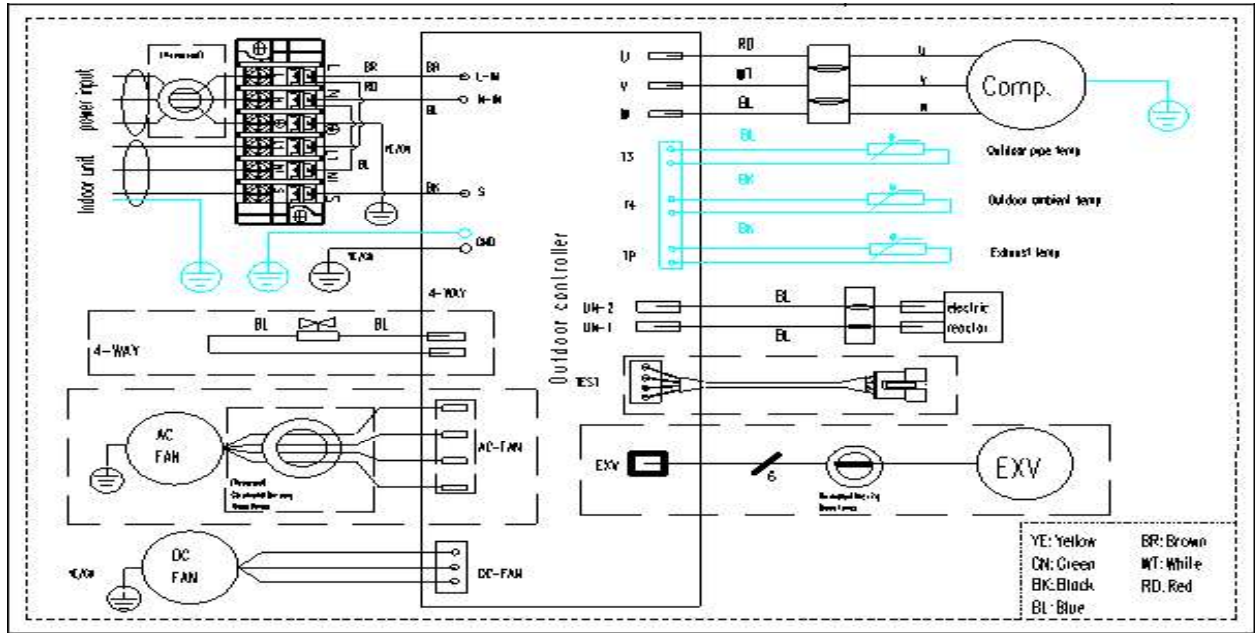


230V/9~24k

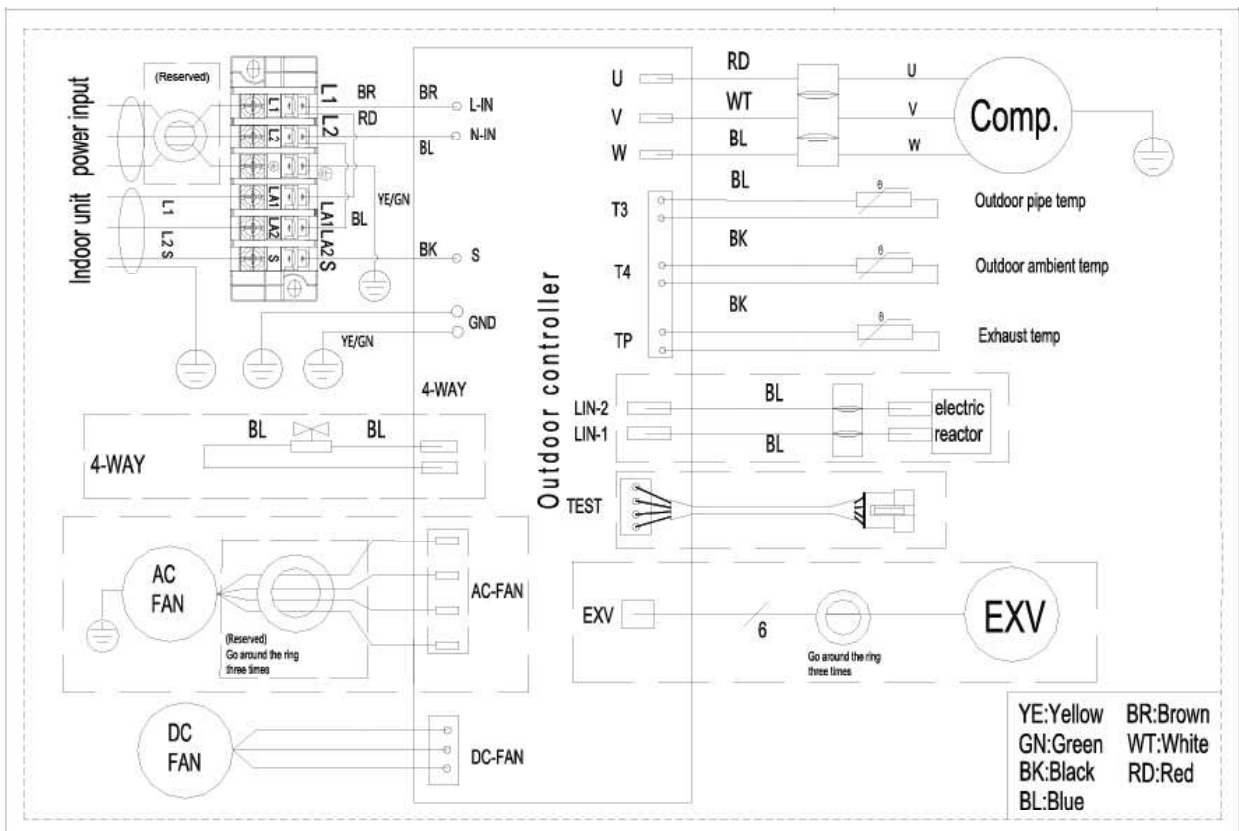


### 2.3.2 Outdoor unit

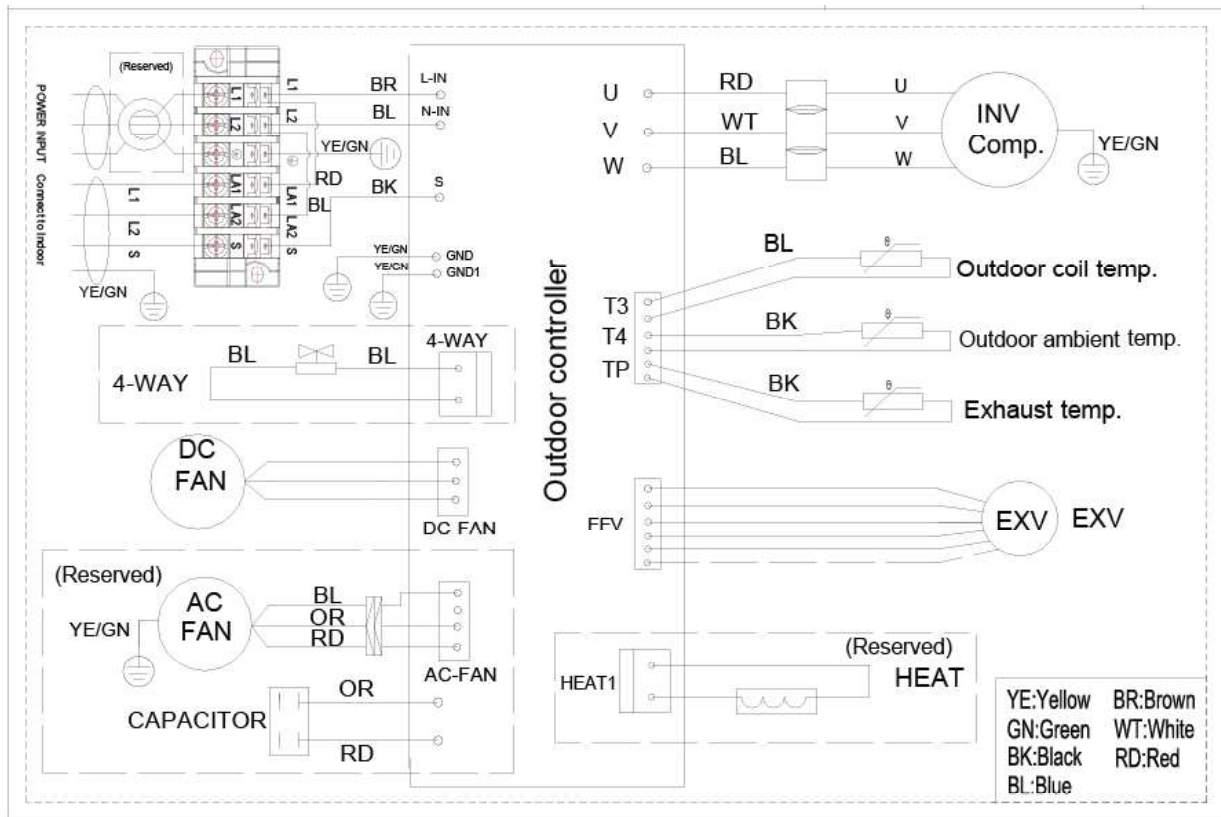
115V/9~12k



230V/9~18k







## 230V/24k



---

## 3 Product Features

### 3.1 Display function

| Display   | Function   |
|---|--|
|  | Showing the setting temperature when running;<br>Showing the room temperature in ventilation mode;<br>Showing error code |
|  | ECO function   |
|  | Wifi control (available for some units)  |
|  | Self-clean function  |

### 3.2 Safety features

- **Compressor three-minute delay start**
  - The compressor starts with a maximum delay of 30 seconds when the unit is started for the first time, and a maximum of 3 minutes when the subsequent unit restarts.
  - The outdoor fan motor and compressor start at the same time, but after the compressor stops, the outdoor fan motor will stop after a delay of 30 seconds.

- **Automatic shutoff based on discharge temperature**

If the compressor discharge temperature exceeds 115°C for 5 seconds, the compressor stop to work. After the discharge temperature is down to 90°C, the unit restart.

- **Inverter module protection**

The inverter module has an automatic shutoff mechanism based on the unit's current, voltage, and temperature. If automatic shutoff is initiated, the corresponding error code is displayed on the indoor unit and the unit stops operation.

- **Compressor preheating**

- Preheating is automatically activated when ambient temperature (T4) and discharge temperature (T5) is lower than 1°C and the compressor stop.
- When T4 or T5 is higher than 3°C, or the T4 and T5 temperature sensor are failed at the same time, or compressor runs, the unit will exit compressor preheating.

- A small current is introduced into the compressor from the terminal, so that the compressor can achieve a preheating effect due to the heating of the coil when the compressor is not rotating.
- **Sensor redundancy and automatic shutoff**
  - If one temperature sensor malfunctions, the air conditioner continues operation and displays the corresponding error code, allowing for emergency use.
  - When more than one temperature sensor is malfunctioning, the air conditioner ceases operation.
- **Automatic shutoff based on indoor fan speed**

If the indoor fan speed registers below 300RPM or over 2000RPM for an extended period of time, the unit stops operation and the corresponding error code is displayed on the indoor unit.

- **Indoor fan delayed operation**
  - When the unit starts, the louver is automatically activated and the indoor fan will operate after a period of setting time or the louver is in place.
  - If the unit is in heating mode, the indoor fan is regulated by the anti-cold wind function.

### 3.3 Basic functions

#### 3.3.1 Abbreviation

| Abbreviation | Element  |
|--------------|--|
| T1           | IDU room temperature                           |
| T2           | IDU evaporator coil temperature                |
| T3           | ODU condenser coil temperature                 |
| T4           | ODU ambient temperature                        |
| T5/TP        | Discharge temperature                          |
| Ts           | Setting temperature                            |
| Td           | Refer to heating controlled logic presentation |
| Tcomp        | Compensation temperature in heating mode       |

#### 3.3.2 Ventilation mode

- Compressor and outdoor unit fan motor stop to work.
- Temperature can't be set and room temperature is displayed.
- Can set turbo/high/middle/low/auto fan speed.
- The louver operation in ventilation mode is same as it in cooling mode.
- If set auto fan speed, the running speed is according to the temperature difference between room

temperature and 24°C. The temperature difference is bigger, the fan speed is higher.

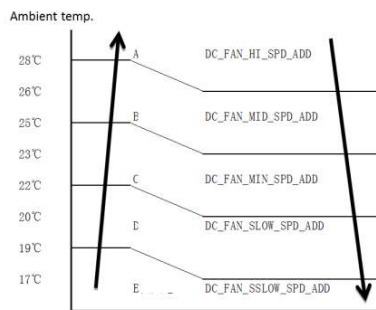
### 3.3.3 Cooling mode

- **Compressor frequency control**

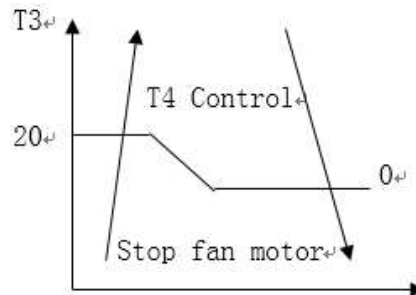
- The start and running frequency depends on the temperature difference between room and setting temperature.
- The running frequency will be limited by ambient temperature, indoor fan speed and outdoor unit current.

- **Outdoor fan motor control**

- The outdoor unit fan speed changing is according ambient temperature (T4). For different model outdoor unit, the fan speeds are different.



- When the ambient temperature is lower than 15°C, the unit will enter low ambient temperature cooling mode. The fan speed changing is according to picture below.



- When  $T4 > 15^\circ\text{C}$  and  $T3 \geq 20^\circ\text{C}$  for 1 min, exist low ambient temperature cooling mode.

- **Indoor fan motor control**

- The indoor fan motor will always run until ten seconds of shutdown. The purpose of delay stop is to prevent mildew.
- You can set turbo/high/middle/low/auto fan speed. The fan speed in auto fan mode is according to the temperature difference between room and setting temperature.
- Please note that, when first power on the unit, if you didn't set the fan speed, the unit will run at high fan speed for 30 minutes and then run at the speed showed in controller.

---

- **Evaporator anti-frost protection in cooling mode**

When the T2 (indoor coil sensor)  $<4^{\circ}\text{C}$ , decrease the compressor frequency until  $4^{\circ}\text{C} \leq T2 \leq 6^{\circ}\text{C}$ .

When  $T2 > 7^{\circ}\text{C}$ , exist the limitation. When  $T2 < 0^{\circ}\text{C}$ , stop the unit until  $T2 \geq 5^{\circ}\text{C}$ , restart the unit.

### 3.3.4 Dehumidification mode

- The fan speed is fixed on slim fan and can't be changed.
- If room temperature is lower than  $10^{\circ}\text{C}$ , the compressor will stop to work until the room temperature is higher than  $12^{\circ}\text{C}$ .

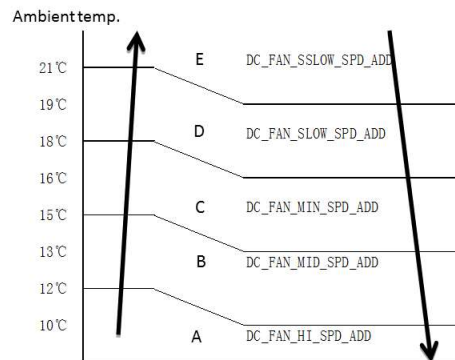
### 3.3.5 Heating mode

- **Compressor frequency control**

- The start and running frequency depends on the temperature difference between room and setting temperature.
- The running frequency will be limited by ambient temperature, indoor fan speed and outdoor unit current.

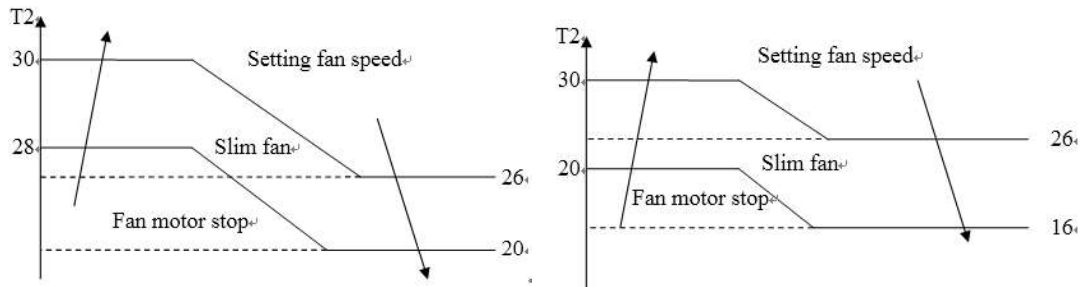
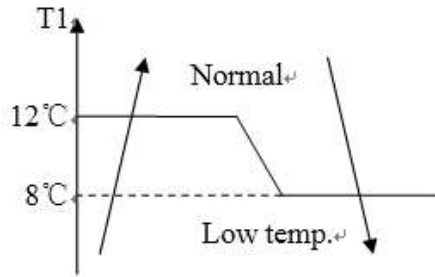
- **Outdoor fan motor control**

The outdoor unit fan speed changing is according ambient temperature (T4). For different model outdoor unit, the fan speeds are different.



- **Indoor fan motor control**

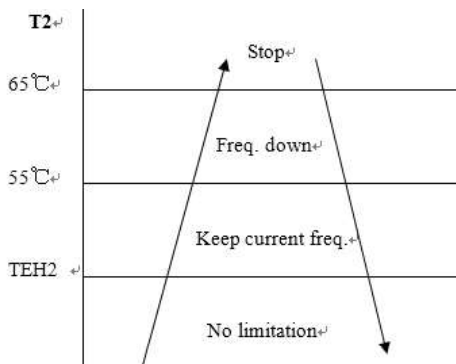
- Can set turbo/high/middle/low/auto fan speed. The fan speed in auto fan mode is according to the temperature difference between room and setting temperature.
- Anti-cold-wind protection: According to room temperature choose the anti-cold-wind plan.



Normal plan

Low temp. plan

- If switch off in heating mode, the fan motor will stop after ten seconds delay. But if  $T2 < 30^\circ\text{C}$ , the fan motor will stop immediately.
- **High evaporator temperature protection**



- **Defrosting mode**

- The unit enters defrosting mode according to T3, the running time of compressor.
- In defrosting mode, the compressor continues to run, the indoor and outdoor motor will stop, the 4-way valve is OFF, and the “dF” symbol is displayed in indoor unit.
- If any one of the following conditions is satisfied, defrosting ends and the machine switches to normal heating mode:
  - a. T3 rises above TCDE1°C.
  - b. T3 maintained above TCDE2°C for 80 seconds.
  - c. Unit runs for 10 minutes consecutively in defrosting mode.

(Note: for different models, TCDE1 and TCED2 data are different.)



- After defrosting mode, the unit may enter anti-cold-wind protection.

### 3.3.6 Auto mode

- This mode can be selected by remote controller and the temperature setting can be adjusted between 16~32°C
- In auto mode, the running mode depends on the temperature difference between room temperature (T1) and setting temperature (Ts).

| T1-Ts  | Running mode     |
|--|------------------|
| $T1-Ts > 2^{\circ}\text{C}$                          | Cooling mode     |
| $-3^{\circ}\text{C} < T1-TS \leq +2^{\circ}\text{C}$ | Ventilation mode |
| $T1-TS \leq -3^{\circ}\text{C}$                      | Heating mode     |

- The fan speed is according the setting in remote controller.
- In auto mode, when the cooling and heating modes are interchanged, the compressor must be stopped for 20 minutes before reselecting the mode according to the difference between the room temperature and the setting temperature. When the setting temperature changes or the fault is restored, select the running mode again.
- If the selected mode is ventilation mode, setting temperature is displayed in indoor unit.

### 3.3.7 Forced operation function

- Press the forced button, the unit switches forced mode in the following order: forced auto mode → forced cooling mode → OFF → forced auto mode.
- Forced auto mode  
Forced auto mode operates the same as normal auto mode with a preset temperature of 24°C.
- Forced cooling mode  
The compressor and outdoor fan continue to run at a fixed frequency and the indoor fan runs at rated speed. After running for 30 minutes, the AC will switch to auto mode with a preset temperature of 24°C.
- When the unit receive the signal of mode setting, fan speed changing and temperature setting from remote controller, the unit will exist forced operation mode.

### 3.3.8 Timer function

- Timing rang is 24 hours.

- 
- Press timer button to enter timer setting, and the timing time will be displayed in indoor unit for 15 seconds.
  - Timer ON: When reaching the setting time, AC will turn on automatically and the icon will disappear in remote controller.
  - Timer OFF: When reaching the setting time, AC will turn OFF automatically and the icon will disappear in remote controller.
  - The timer setting will not change the AC current operation mode. Suppose AC is off now, it will not start up firstly after setting the “timer off” function. And when reaching the setting time, the timer icon will disappear and the AC running mode has not been changed.

### **3.3.9 Sleep function**

- The sleep function is available in cooling mode and heating mode.
- Sleep function takes priority over TURBO functions.
- The operating time for sleep function is 8 hours.
- As long as AC receives the signal of sleep function, it will enter sleep function. If receiving a signal without sleep function (including mode and power on and off), AC will exit sleep operation function. Starting the shutdown will also cancel the sleep operation function (determined by the remote control).
- The operational process for sleep mode is as follows:
  - In cooling mode, the temperature rises 1°C (to not higher than 32C) every hour. After 2 hours, the temperature stops rising. The fan speed changes to slim fan speed automatically and the fan speed can be changed by remote controller. After 8 hours, it exits sleep function and the setting temperature will decrease 1°C automatically.
  - In heating mode, the temperature decreases 1°C (to not lower than 16°C) every hour. After 2 hours, the temperature stops decreasing. The fan speed changes to slim fan speed automatically and the fan speed can be changed by remote controller. Anti-cold wind function takes priority. After 8 hours, it exits sleep function and the setting temperature will rise 1°C automatically.

### **3.3.10 Louver position memory function**

When starting the unit again after shutting down, its louver will restore to the angle originally set by the user, but the precondition is that the angle must be within the allowable range, if it exceeds, it will memorize the maximum angle of the louver. During operation, if the power fails or the end user shuts down the unit in the turbo mode, the louver will restore to the default angle.

### **3.3.11 Self-clean function**

- Press “CLEAN” button in wireless controller to enter self-clean mode. “CL” will appear in indoor unit.
- If any one of the following conditions is satisfied, AC will exit self-clean mode.
  - a. press “CLEAN” button again in self-clean mode to exit.

b. press “ON/OFF” button to exit.

c. after finishing the self-cleaning function, it will automatically shut down and exit the self-clean.

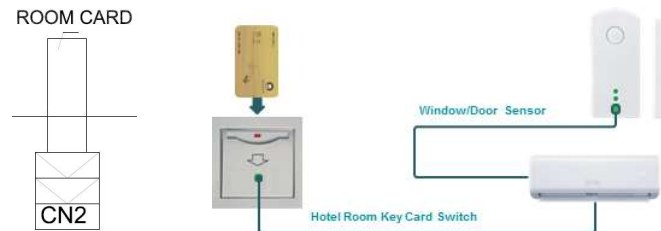
- In self-clean mode, AC will run at cooling mode for default time and the setting temperature is fixed to 26°C firstly. And then stop 3 minutes. Finally, the unit will run heating mode for default time and then stop.

### 3.3.12 ECO function

The setting temperature is set to 26°C.

### 3.3.13 Room card function

- There is a Remote ctrl port in indoor unit PCB.
- When this port is disconnected, the AC will stop and can't start again. If send the turn ON signal to unit, “HC” will be displayed in indoor unit for 10 seconds and then disappear.
- When this port is connected, the AC can be turned ON and OFF normally. All functions are available.
- If room card function is not needed, please add a short circuit in this port.

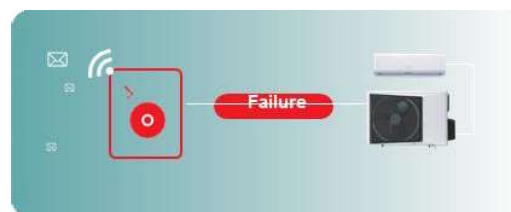


### 3.3.14 Alarm output function

When the AC has a fault, the remote alarm port will output a high level; when the fault disappears, the remote alarm port output a low level.

### 3.3.15 Auto restart function

- The AC automatically stores the current settings (including ON/OFF status, running mode, fan speed, setting temperature and swing).
- In the case of a sudden power failure, AC will restore those setting automatically within 5 seconds after power returns. If AC receive the control signal within 5 seconds, it will run according to new settings.



---

### **3.3.16 8°C heating**

Reserved.

### **3.3.17 I FEEL function(Optional)**

- This function is available when using NT-05D, NT-09 and NT-10 wireless controller. There is a temperature sensor in controller.
- Once press I FEEL button, the temperature (Tr) detected by wireless controller will appear in indoor unit. After 5 second, it will show setting temperature.
- Once active, the wireless control will send a signal with Tr information every 3 minutes, with no beeps. The unit automatically runs according to this temperature.
- If the unit does not receive a signal from wireless controller for 7 minutes or press IFEEL button again, this function turns off. The unit regulates temperature based on its own sensor and settings.

### **3.3.18 Ionize function (Optional)**

- Add an ionize generator in indoor unit.
- When the unit is ON, fan motor is running and without error, press ionize button to activate this function.

### **3.3.19 Wired controller (Optional)**

- Connect with wired controller, can set the ON/OFF, running mode, temperature, fan speed, swing, turbo, sleep mode and timer.
- If there is error, error code will also be showed in wired controller.

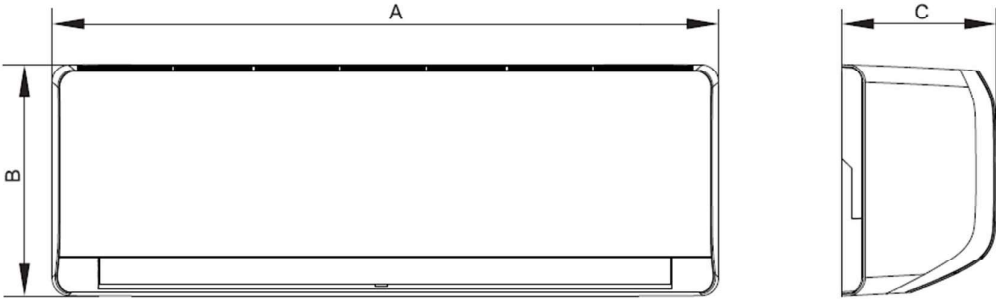
### **3.3.20 WIFI controller (Optional)**

- WIFI control allows customer to control AC using mobile phone.
- For the USB device access, replacement, maintenance operations must be carried out by professional staff.

# 4 Installation, maintenance and disassembly

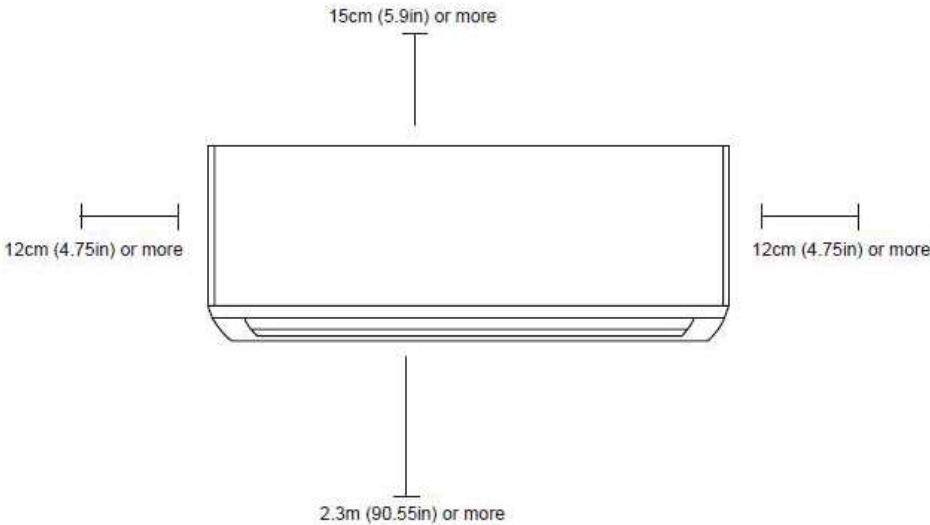
## 4.1 Indoor unit installation

### I. Dimension

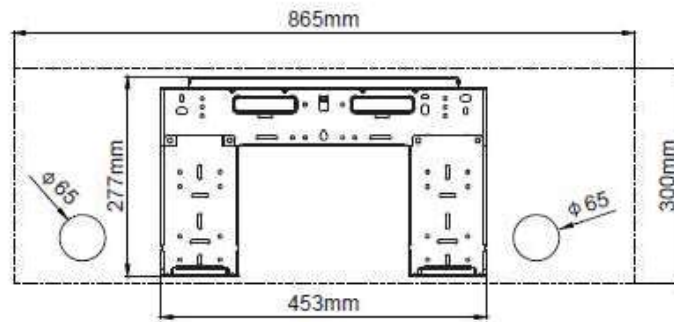


| Dimension | A(mm) | B(mm) | C(mm) |
|-----------|-------|-------|-------|
| 9K        | 715   | 295   | 198   |
| 12K       | 864   | 300   | 200   |
| 18K       | 972   | 320   | 215   |
| 24K       | 1080  | 335   | 226   |

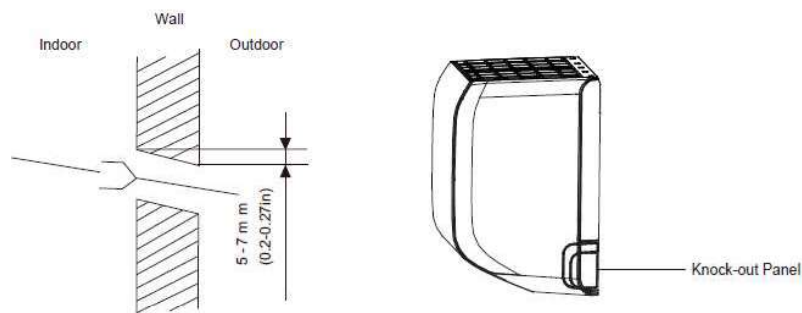
### II. Ensure proper distance from walls and ceiling



### III. Install wall mounted plate

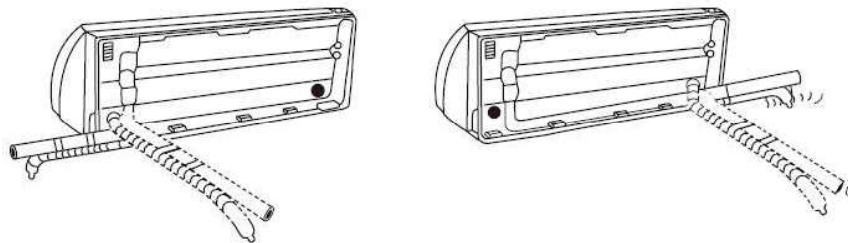


### IV. Drill wall hole for connecting pipe

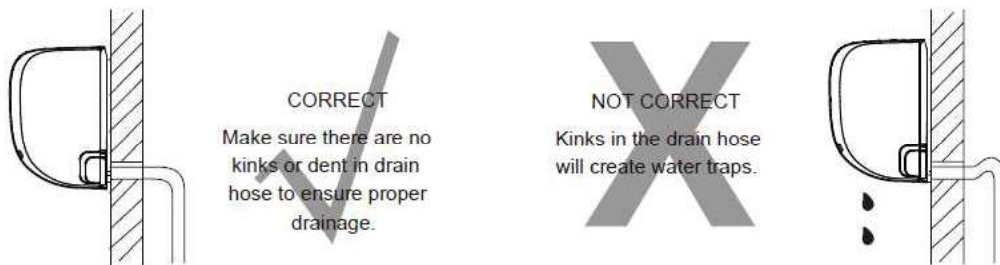


### V. Connect copper pipes

The pipes can be bent to different directions.



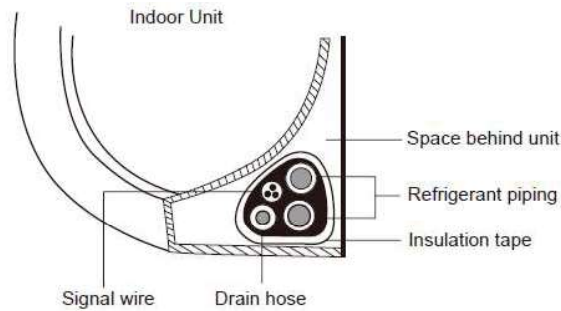
### VI. Connect drain hose





VII. Connect signal and power supply cable.

VIII. Wrap piping and cables.



*Note: Please check installation manual for detailed information.*

Before performing any electrical or wiring work, turn off the main power to the system.

The signal cable enables communication between the indoor and outdoor units. You must first choose the right cable size before preparing it for connection.

Cable Types

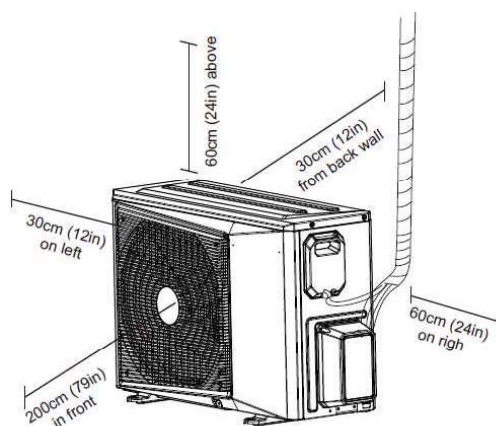
- 1) Indoor Power Cable (if applicable): H05VV-F or H05V2V2-F
- 2) Outdoor Power Cable: H07RN-F
- 3) Signal Cable: H07RN-F

Minimum Cross-Sectional Area of Power and Signal Cables

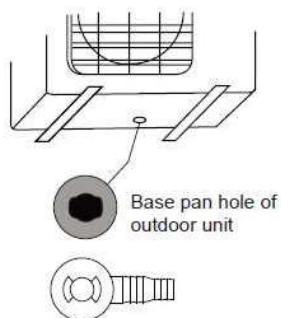
| Rated Current of Appliance (A) | Nominal Cross-Sectional Area (mm <sup>2</sup> ) |
|--------------------------------|---|
| > 3 and ≤ 6                    | 0.75  |
| > 6 and ≤ 10                   | 1   |
| > 10 and ≤ 16                  | 1.5   |
| > 16 and ≤ 25                  | 2.5   |
| > 25 and ≤ 32                  | 4   |
| > 32 and ≤ 40                  | 6   |

## 4.2 Outdoor unit installation

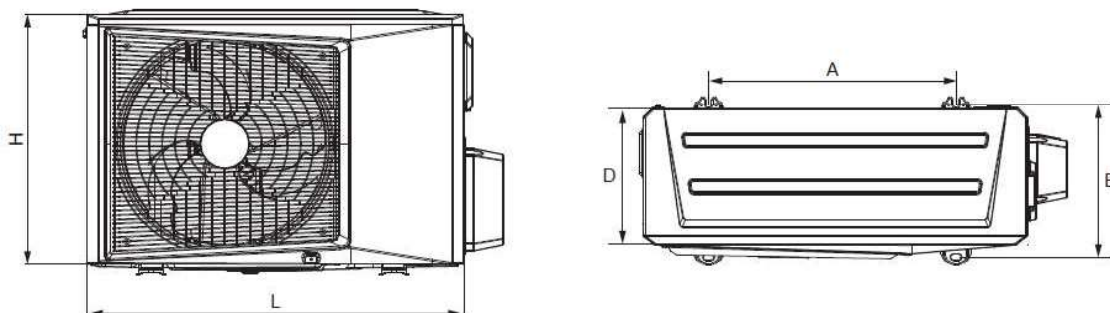
### I. Select a proper installation location



### II. Install drain joint



### III. The outdoor unit should be fixed on the ground or a wall mounted bracket.



| Model  | ODU dimension(mm)<br>L*H*D | Mounting dimension |     |
|--------|----------------------------|--------------------|-----|
|        |                            | A                  | B   |
| 9K/12K | 735×475×250                | 453                | 280 |
| 18K    | 790×520×280                | 508                | 314 |



|     |             |     |     |
|-----|-------------|-----|-----|
| 24K | 848×670×345 | 544 | 345 |
|-----|-------------|-----|-----|

#### IV. Connect signal and power cables

| Rated Current of Appliance (A) | Nominal Cross-Sectional Area (mm <sup>2</sup> ) |
|--------------------------------|---|
| >3 and =<6                     | 0.75  |
| >6 and =<10                    | 1   |
| >10 and =<16                   | 1.5   |
| >16 and =<25                   | 2.5   |
| >25 and =<32                   | 4   |
| >32 and =<40                   | 6   |

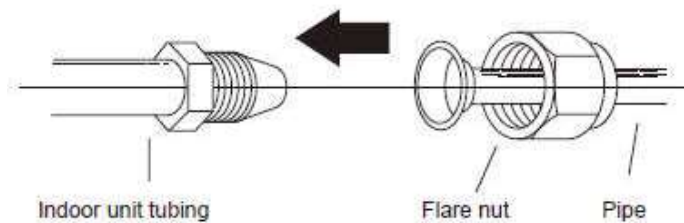
### 4.3 Refrigerant piping connection

#### 4.3.1 Longest pipe length

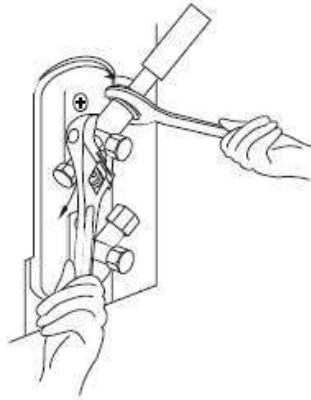
| Model        | Max. length (m) | Max. drop height (m) |
|--------------|-----------------|----------------------|
| 9K/12 KBtu/h | 25              | 10                   |
| 18 KBtu/h    | 30              | 20                   |
| 24 KBtu/h    | 30              | 20                   |

#### 4.3.2 Connect pipe to indoor unit

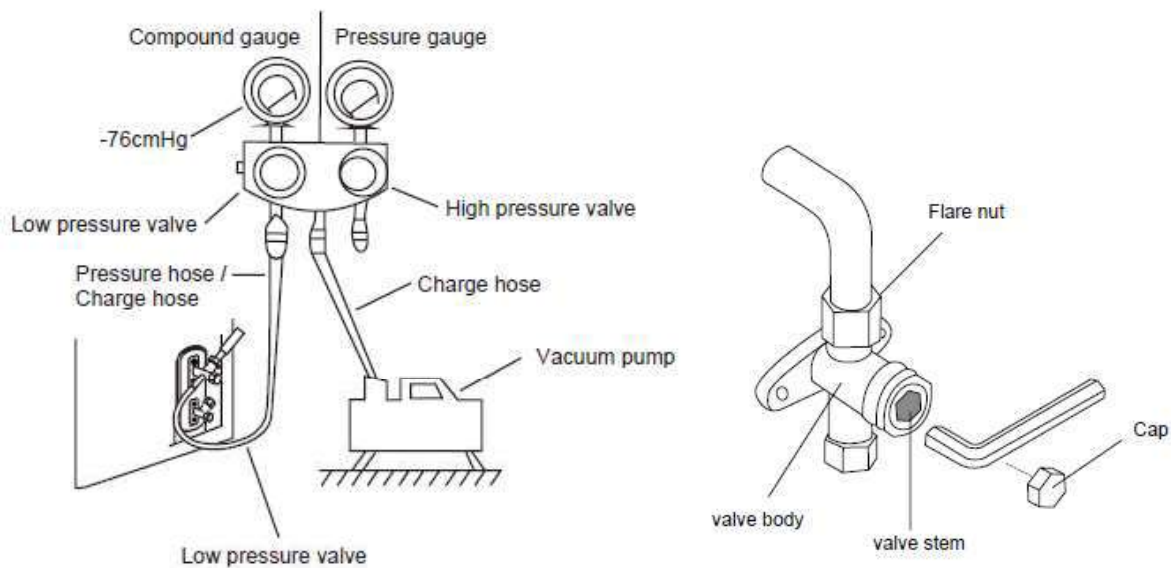
Align the center of the two pipes that you will connect.



#### 4.3.3 Connect to outdoor unit



#### 4.3.4 Air evacuation



1. Connect the charge hose of the manifold gauge to service port on the outdoor unit's low pressure valve.
2. Connect another charge hose from the manifold gauge to the vacuum pump.
3. Open the Low Pressure side of the manifold gauge. Keep the High Pressure side closed.
4. Turn on the vacuum pump to evacuate the system.
5. Run the vacuum for at least 15 minutes, or until the Compound Meter reads -76cmHG (-105 Pa).
6. Close the Low Pressure side of the manifold gauge, and turn off the vacuum pump.
7. Wait for 5 minutes, then check that there has been no change in system pressure.
8. If there is a change in system pressure, refer to Gas Leak Check section for information on how to check for leaks. If there is no change in system pressure, unscrew the cap from the packed valve (high pressure valve).
9. Insert hexagonal wrench into the packed valve (high pressure valve) and open the valve by turning the wrench in a 1/4 counterclockwise turn. Listen for gas to exit the system, then close the valve after

---

5 seconds.

10. Watch the Pressure Gauge for one minute to make sure that there is no change in pressure. The Pressure Gauge should read slightly higher than atmospheric pressure.

11. Remove the charge hose from the service port.

12. Using hexagonal wrench, fully open both the high pressure and low pressure valves.

13. Tighten valve caps on all three valves (service port, high pressure, low pressure) by hand. You may tighten it further using a torque wrench if needed.

#### **4.3.5 Additional refrigerant charging**

Some systems require additional charging depending on pipe lengths. The standard pipe length varies according to local regulations. The standard pipe length is 5m (16'). The additional refrigerant to be charged can be calculated using the following formula:

##### **Liquid pipe: $\Phi 6.35\text{mm}$**

Additional refrigerant charging = (Pipe length – standard length) \* 15g/m

##### **Liquid pipe: $\Phi 9.52\text{mm}$**

Additional refrigerant charging = (Pipe length – standard length) \* 30g/m

---

## 5 Troubleshooting

### 5.1 Safety caution



- Be sure to turn off all power supplies or disconnect all wires to avoid electric shock. While checking indoor/outdoor PCB, please equip oneself with antistatic gloves or wrist strap to avoid damage to the board.
- Electricity remains in capacitors even when the power supply is off.
- Ensure the capacitors are fully discharged before troubleshooting.

(Test the voltage between P and N on back of the main PCB with multimeter. If the voltage is lower than 36V, the capacitors are fully discharged.)

### 5.2 Error diagnosis and solution without error code

Some phenomena are easily thought as error, but actually not.

| Phenomena  | Reasons  |
|--|--|
| The unit can't be restarted just after shut down. (RUN lamp is ON)                                       | Restart stop for 3 minutes after shut down to protect the unit. Three minutes protection timer incorporated in the microcomputer actuates automatically. Except that power is connected, this function does not actuate. |
| Air is not blown out at starting of heating operation.   | Air blow is stopped to prevent blowing out cold air when the indoor heat exchanger is not warmed enough. (2 to 5 min)  |
| Air is not blown out for 6 to 12 min in heating mode   | When outdoor temperature is low and humidity is high, the unit sometimes performs defrosting mode automatically. Please wait. During defrosting mode, water or steam are raising from the outdoor unit.                  |
| The unit will not stop blowing out the air immediately after shut down at cooling operation (some model) | The drying function may be activated, please wait for the end of the operation or use the remote control to turn off the drying function. The louver will not close down until after 30 seconds.                         |
| Air is not blown out at dehumidification operation.  | Indoor fan is sometimes stopped to prevent moisture from evaporating and to save energy.   |

|                                      |   |
|--------------------------------------|---|
| Mist is blown out.                   | When the room humidity is relatively high, the cooling operation or heating operation defrosting ends, the air outlet may blow out water mist, which is a normal physical phenomenon.   |
| Water may on the air outlet grilles. | <ul style="list-style-type: none"> <li>• When the ambient humidity is relatively high, water droplets will be generated in the air outlet, panel and other parts, which is a normal physical phenomenon;</li> <li>• Long-term cooling operation in an open space will produce water droplets, please close the doors and windows.</li> <li>• If the panel is not tightly closed, causing air leakage, water droplets may be generated on the panel. Please close the panel securely.</li> </ul>       |
| Stop after some time running         | <ul style="list-style-type: none"> <li>• Reach setting temperature</li> <li>• In defrosting mode</li> <li>• Timer OFF is set</li> </ul>   |
| Strange sound in indoor unit         | <ul style="list-style-type: none"> <li>• The dust filter accumulates too much dust. Please clean the dust filter in time;</li> <li>• When the plastic parts of the indoor unit expand and contract with heat, it may produce frictional sound.</li> <li>• After the "TURBO" function is turned on, the wind noise is loud.</li> <li>• The indoor unit panel is not closed tightly or the air inlet is obstructed. Please close the panel again or remove the obstruction of the air inlet.</li> </ul> |
| Strange sound in outdoor unit        | <ul style="list-style-type: none"> <li>• The sound of refrigerant flowing when it is running or just stopped, which is a normal phenomenon.</li> <li>• After running for a period of time, a "puff" sound is made, which is the sound of the four-way valve reversing when the outdoor unit turns to defrosting mode, which is a normal phenomenon.</li> </ul>  |

## 5.3 Error code list

### 5.2.1 Indoor unit error code

| Definitions of malfunction                            | Error code |
|---|------------|
| Communication failure between indoor and outdoor unit | E1         |
| T1 room temperature sensor fault                      | E2         |
| T2 temperature sensor fault                           | E3         |
| T2B temperature sensor fault                          | E4         |
| Outdoor unit fault                                    | E5         |
| Zero-crossing detection fault                         | E6         |
| EEPROM error  | E7         |
| PG fan motor stall protection                         | E8         |
| Communication fault of wired controller               | E9         |
| Room card port disconnected port                      | HC         |

When it shows E5, press to show more error code.

| Definitions of malfunction                            | Error code |
|---|------------|
| Communication failure between indoor and outdoor unit | E2         |
| T4 ambient temperature sensor fault                   | E4         |
| T5 discharge temperature sensor fault                 | E5         |
| T3 condenser pipe temperature sensor fault            | E6         |
| Indoor unit EEPROM error                              | E7         |
| AC over-voltage / under-voltage protection            | E9         |
| Outdoor unit EEPROM error                             | E10        |
| Indoor unit fan motor fault                           | E11        |
| IPM temperature sensor fault                          | E12        |
| Outdoor unit fan motor fault                          | E2x        |
| Compressor fault                                      | H2x        |
| PFC fault   | H3x        |

|  |     |
|--|-----|
| Primary / secondary over-current protection            | P3  |
| High discharge temperature protection                  | P4  |
| High condenser temperature protection                  | P5  |
| IPM module fault                                       | P6  |
| IDU anti-frosting protection                           | P7  |
| High IPM temperature protection                        | P8  |
| Outdoor unit fan motor stall protection                | P9  |
| High evaporator temperature protection                 | P11 |
| DC bus low voltage protection                          | L1  |
| DC bus high voltage protection                         | L2  |
| MCE fault / sync / compressor start fault              | L4  |
| Zero speed protection                                  | L5  |
| Phase sequence error protection                        | L7  |
| Compressor stall fault                                 | L8  |
| Frequency limitation because of voltage                | LA  |
| Frequency limitation because of evaporator temperature | LB  |
| Frequency limitation because of condenser temperature  | LC  |
| Frequency limitation because of discharge temperature  | LD  |
| Frequency limitation because of high IPM temperature   | LE  |
| Frequency limitation because of current                | LF  |

## 5.4 Spot check

- Method 1: After powering on 5s, long press the button in indoor unit PCB for 5s, to enter spot check. And then short press this button to read more parameters.
- Method 2: After powering on, press “up & down swing” and “left & right swing” button alternately 5 times within 10 seconds to enter spot check. Press “up & down swing” and “left & right swing” button to read more parameters.
- Spot check table:

| No. | Content  |
|-----|--|
| 0-  | Setting temperature  |
| 1-  | Indoor temperature (T1),                                   |
| 2-  | Indoor unit evaporator temperature (T2 or T2B)             |
| 3-  | EEPROM code  |
| 4-  | Software code  |
| 5-  | Outdoor unit error code                                    |
| 6-  | Outdoor unit running frequency                             |
| 7-  | Outdoor unit condenser temperature (T3)                    |
| 8-  | Outdoor ambient temperature (T4)                           |
| 9-  | Indoor unit fan speed (f0 means 1500rpm, a1 means 1010rpm) |

## 5.4 Troubleshooting by error code

### Indoor unit error

#### 5.4.1 E1 (IDU) Communication failure between indoor and outdoor unit

**Description:** the indoor unit didn't receive feedback from outdoor unit within 1 minute.

**Possible reason:**

- Bad connection of communication wire
- Fault indoor or outdoor unit PCB

**Troubleshooting and repair:**

- Check if the wiring connection between outdoor and indoor unit is loose.
- Power off and then repower on the unit after 3 minutes. If error code disappear, problem is solved. If not, go to next step.
- Measure the DC voltage between P and N on back of the main PCB with multi meter.

#### 5.4.2 E2, E3, E4 (IDU) temperature sensor fault

**Description:** the sampling voltage is lower than 0.06V or higher than 4.94V.

**Possible reason:**

- Open circuit or short circuit of relevant port.
- Faulty temperature sensor



- 
- Faulty PCB

**Troubleshooting and repair:**

- a) Check the connection between temperature sensor and PCB.
- b) Measure the resistance of sensor, and compare it with appendix table.
- c) If above items are no problem, replace a new PCB.

### **5.4.3 E6 (IDU) Zero-crossing detection fault**

**Description:** When PCB does not receive zero crossing signal feedback for 4 minutes or the zero crossing signal time interval is abnormal.

**Possible reason:**

- Wrong connection
- Faulty PCB

**Troubleshooting and repair:**

- a) Check the wire connections one by one according to wiring diagram.
- b) Check power supply.
- c) Change a new indoor unit PCB.

### **5.4.4 E7 (IDU) EEPROM error**

**Description:** Indoor PCB main chip does not receive feedback from EEPROM chip.

**Possible reason:**

- Faulty indoor unit PCB

**Troubleshooting and repair:**

- a) Cut off the power supply and then repower on the unit after 3 minutes.
- b) If the error still occurs, change a new PCB.

### **5.4.5 E8 (IDU) PG fan motor stall protection**

**Description:** When the indoor fan speed is below 300rpm or over 2100rpm for 50s, the unit will stop and show E8 error.

**Possible reason:**

- Wrong wires connection
- Faulty fan assembly
- Faulty fan motor
- Faulty PCB

**Troubleshooting and repair:**

- a) Cut off the power supply and then repower on the unit after 3 minutes. If it still has problem, go to next step.

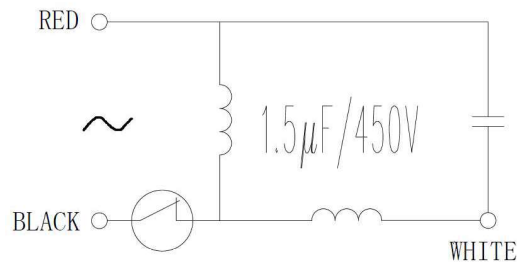
- b) Cut off the power supply and rotate the fan blade by hand. If it can't rotate smoothly, check if there is any block. Otherwise, go to next step.
- c) Check the wiring of fan motor.
- d) Measure the voltage of fan motor from PCB. If the parameters are normal, replace a new fan motor. If not, replace indoor unit PCB.

Note:

- DC fan motor voltage: Measure the voltage when the unit is in standby.

| No. | Color  | Signal | Voltage  |
|-----|--------|--------|----------|
| 1   | Red    | Vdc    | 150~340V |
| 2   | --     | --     |          |
| 3   | Black  | GND    | 0V       |
| 4   | White  | Vcc    | 14~17.5V |
| 5   | Yellow | Vsp    | 0~5.6V   |
| 6   | Blue   | FG     | 14~17.5V |

- AC fan motor voltage: Power on and set the unit running in fan mode at high fan speed. After running for 15 seconds, measure the voltage of red and black wire. If the value of the voltage is less than 100V (208~240V power supply), the PCB must has problems and need to be replaced.



#### 5.4.6 E9 (IDU) Communication fault of wired controller

**Troubleshooting and repair:**

- a) Check the connection between wired controller and indoor PCB.
- b) Change another wired controller.
- c) Change a new indoor PCB.

#### 5.4.7 HC Room card port disconnected port

**Possible reason:**

- Short circuit is not connected in CN2 port

- 
- Faulty problem

**Troubleshooting and repair:**

- a) Check if there is a short circuit in CN2 port.
- b) Change a new PCB.

**Outdoor unit error**

**5.4.8 E2 (ODU) Communication failure between indoor and outdoor unit**

Same as 5.4.1

**5.4.9 E4, E5, E6 (ODU) temperature sensor fault**

Same as 5.4.2

**5.4.10 E9 (ODU) AC over-voltage / under-voltage protection**

**Description:** Abnormal increases or decreases in voltage are detected by checking the specified voltage of detection circuit.

**Possible reason:**

- Power supply error
- Refrigerant system leakage or block
- Faulty outdoor unit PCB

**Troubleshooting and repair:**

- a) Check the power supply and measure the voltage.
- b) Repower on the unit and measure the voltage between P and N. When the unit is in standby, is the voltage between P and N about 310VDC, 340VDC or 380VDC? When start up the unit, is it in 220V~400V? If not, replace a new outdoor PCB. If yes, go to next step.
- c) Check the reactor.

**5.4.11 E10 (ODU) Outdoor unit EEPROM error**

Same as 5.4.4

**5.4.12 E11 (ODU) Indoor unit fan motor fault**

Please refer to 5.4.5

**5.4.13 E12 (ODU) IPM temperature sensor fault**

**Description:** the sampling voltage is not at 5V

**Possible reason:**

- Power supply error

- 
- Refrigerant system leakage or block
  - Faulty outdoor unit PCB
  - Connection problem

**Troubleshooting and repair:**

- a) Check the power supply.
- b) Check the fastening screws on the PCB and IPM radiator. If they are not fixed tightly, tighten the screws and apply silicon grease. Otherwise, go to next step.
- c) Change a new outdoor unit PCB.

#### **5.4.14 E2x Outdoor unit fan motor fault**

**Description:** When the chip detects the fan IPM overcurrent, it reports a fault

**Troubleshooting and repair:**

- a) Cut off power supply and then rotate the fan blade by hand, to check whether the fan is blocked or the screws are not tightened.
- b) Check the connection between fan motor and PCB
- c) Change a new PCB

#### **5.4.15 H2x Compressor fault**

**Description:** An abnormal inverter compressor drive is detected by a special detection circuit, including communication signal detection, voltage detection, current detection, compressor rotation speed signal detection and so on.

**Possible reason:**

- Wrong wiring connection
- IPM malfunction
- Compressor malfunction
- Faulty outdoor unit PCB
- Outdoor unit fan motor

**Troubleshooting and repair:**

- a) Check the wiring between PCB and compressor according to wiring diagram.
- b) Check the outdoor unit fan and outdoor unit ventilation.
- c) Check the compressor resistance
- d) If all are no problem, change the outdoor PCB.

#### **5.4.16 P3 Primary / secondary over-current protection**

**Description:** detected current is higher than setting value.

**Possible reason:**

- 
- Refrigerant is too much
  - Liquid side is block
  - Heat exchanging in outdoor unit is not good
  - Compressor malfunction

#### 5.4.17 P4 High discharge temperature protection

**Description:** discharge temperature is higher than 115°C.

**Possible reason:**

- Lack of refrigerant
- High ambient temperature or heat exchanging in condenser side is bad
- There is air or N2 or water in refrigerant system
- Block in low pressure side

**Troubleshooting and repair:**

- Check the refrigerant charging record and check if there is any leakage point.
- Whether it is too dirty in outdoor coil? Improve the ventilation condition.
- Check whether the fan motor can work normally.

#### 5.4.18 P5 High condenser temperature protection

**Description:** in cooling mode or dry mode, the T3 temperature is higher than setting value.

**Possible reason:**

- Bad ventilation
- Faulty temperature sensor
- Faulty PCB

**Troubleshooting and repair:**

- Check the heat exchange of outdoor unit condenser is good or not.
- Check the temperature sensor resistance.

#### 5.4.19 P6 IPM module fault

**Description:** Below table shows detailed error code about P6.

|   |    |
|---|----|
| DC bus low voltage protection             | L1 |
| DC bus high voltage protection            | L2 |
| MCE fault / sync / compressor start fault | L4 |
| Zero speed protection                     | L5 |

---

|                                 |    |
|---------------------------------|----|
| Phase sequence error protection | L7 |
| Compressor stall fault          | L8 |

**Possible reason:**

- Wrong wire connection
- IPM malfunction
- Compressor malfunction
- Faulty PCB

**Troubleshooting and repair:**

- a) Check the wiring between PCB and compressor.
- b) Check the outdoor unit fan and ventilation.
- c) Check the IPM in PCB.
- d) Check the resistance of compressor.
- e) If all are normal, change a new PCB.

#### **5.4.20 P7 IDU anti-frosting protection**

**Description:** indoor unit evaporator temperature T2 is lower than 0°C.

**Possible reason:**

- Filter or evaporator is dirty
- Indoor fan motor can't work normally or the flap is closed

**Troubleshooting and repair:**

- a) Clear the filter and evaporator
- b) Check the fan motor

#### **5.4.21 P8 High IPM temperature protection**

**Description:** the detected temperature of IPM is higher than 100°C.

**Possible reason:**

- Power supply issue
- System leakage or block
- Faulty outdoor unit PCB
- Connection problem

**Troubleshooting and repair:**

- d) Check the power supply.
- e) Check the fastening screws on the PCB and IPM radiator. If they are not fixed tightly, tighten the screws and apply silicon grease. Otherwise, go to next step.

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f) Change a new outdoor unit PCB.

#### **5.4.22 P9 Outdoor unit fan motor stall protection**

Please refer to 5.4.5

#### **5.4.23 P11 High evaporator temperature protection**

**Description:** Indoor unit evaporator temperature (T2) is higher than 65°C.

**Possible reason:**

- Abnormal T2 temperature sensor
- Faulty 4-way valve
- Bad ventilation
- Refrigerant is not enough

**Troubleshooting and repair:**

- a) Measure the resistance of T2 sensor
- b) Check the 4-way valve connection. If unit is in heating mode, there is a 220V output in 4-way valve port.
- c) Check if evaporator is too dirty.
- d) Confirm the refrigerant volume.

---

## Appendix

### I. Temperature sensor resistance value table for T1, T2, T3 and T4 (°C – K)

| Temperature<br>°C | Resistance<br>(kΩ) | Temperature<br>°C | Resistance<br>(kΩ) | Temperature<br>°C | Resistance<br>(kΩ) |
|-------------------|--------------------|-------------------|--------------------|-------------------|--------------------|
| -25               | 41.99              | 17                | 6.729              | 59                | 1.615              |
| -24               | 39.96              | 18                | 6.478              | 60                | 1.567              |
| -23               | 38.05              | 19                | 6.238              | 61                | 1.521              |
| -22               | 36.24              | 20                | 6.008              | 62                | 1.476              |
| -21               | 34.52              | 21                | 5.789              | 63                | 1.433              |
| -20               | 32.9               | 22                | 5.578              | 64                | 1.391              |
| -19               | 31.37              | 23                | 5.377              | 65                | 1.351              |
| -18               | 29.91              | 24                | 5.185              | 66                | 1.312              |
| -17               | 28.53              | 25                | 5                  | 67                | 1.274              |
| -16               | 27.22              | 26                | 4.821              | 68                | 1.237              |
| -15               | 25.98              | 27                | 4.649              | 69                | 1.202              |
| -14               | 24.52              | 28                | 4.485              | 70                | 1.168              |
| -13               | 23.43              | 29                | 4.327              | 71                | 1.135              |
| -12               | 22.39              | 30                | 4.176              | 72                | 1.103              |
| -11               | 21.41              | 31                | 4.031              | 73                | 1.072              |
| -10               | 20.48              | 32                | 3.892              | 74                | 1.043              |
| -9                | 19.59              | 33                | 3.759              | 75                | 1.019              |
| -8                | 18.74              | 34                | 3.631              | 76                | 0.9914             |
| -7                | 17.93              | 35                | 3.508              | 77                | 0.9642             |
| -6                | 17.16              | 36                | 3.389              | 78                | 0.9379             |
| -5                | 16.431             | 37                | 3.275              | 79                | 0.9124             |
| -4                | 15.739             | 38                | 3.165              | 80                | 0.8877             |
| -3                | 15.08              | 39                | 3.06               | 81                | 0.8638             |
| -2                | 14.454             | 40                | 2.959              | 82                | 0.8406             |
| -1                | 13.857             | 41                | 2.861              | 83                | 0.8181             |
| 0                 | 13.29              | 42                | 2.768              | 84                | 0.7963             |
| 1                 | 12.739             | 43                | 2.678              | 85                | 0.7752             |
| 2                 | 12.215             | 44                | 2.592              | 86                | 0.7547             |
| 3                 | 11.717             | 45                | 2.509              | 87                | 0.7348             |
| 4                 | 11.241             | 46                | 2.429              | 88                | 0.7155             |
| 5                 | 10.789             | 47                | 2.352              | 89                | 0.6968             |
| 6                 | 10.357             | 48                | 2.278              | 90                | 0.6786             |
| 7                 | 9.946              | 49                | 2.207              | 91                | 0.661              |
| 8                 | 9.554              | 50                | 2.138              | 92                | 0.6439             |
| 9                 | 9.18               | 51                | 2.071              | 93                | 0.6272             |
| 10                | 8.823              | 52                | 2.006              | 94                | 0.6111             |



---

|    |       |    |       |     |        |
|----|-------|----|-------|-----|--------|
| 11 | 8.482 | 53 | 1.944 | 95  | 0.5954 |
| 12 | 8.157 | 54 | 1.884 | 96  | 0.5802 |
| 13 | 7.846 | 55 | 1.826 | 97  | 0.5654 |
| 14 | 7.55  | 56 | 1.77  | 98  | 0.551  |
| 15 | 7.266 | 57 | 1.717 | 99  | 0.5371 |
| 16 | 6.991 | 58 | 1.665 | 100 | 0.5235 |

## II. Temperature sensor resistance value table for T5 (°C – K)

| Temperature<br>°C | Resistance<br>(kΩ) | Temperature<br>°C | Resistance<br>(kΩ) | Temperature<br>°C | Resistance<br>(kΩ) |
|-------------------|--------------------|-------------------|--------------------|-------------------|--------------------|
| 0                 | 162.8960           | 34                | 34.0197            | 68                | 9.2774             |
| 1                 | 154.8355           | 35                | 32.6330            | 69                | 8.9588             |
| 2                 | 147.2203           | 36                | 31.3098            | 70                | 8.6526             |
| 3                 | 140.0233           | 37                | 30.0471            | 71                | 8.3582             |
| 4                 | 133.2193           | 38                | 28.8416            | 72                | 8.0753             |
| 5                 | 126.7846           | 39                | 27.6906            | 73                | 7.8032             |
| 6                 | 120.6973           | 40                | 26.5914            | 74                | 7.5414             |
| 7                 | 114.9366           | 41                | 25.5413            | 75                | 7.2897             |
| 8                 | 109.4834           | 42                | 24.5379            | 76                | 7.0475             |
| 9                 | 104.3195           | 43                | 23.5789            | 77                | 6.8144             |
| 10                | 99.4280            | 44                | 22.6622            | 78                | 6.5901             |
| 11                | 94.7931            | 45                | 21.7857            | 79                | 6.3741             |
| 12                | 90.4000            | 46                | 20.9473            | 80                | 6.1662             |
| 13                | 86.2348            | 47                | 20.1454            | 81                | 5.9660             |
| 14                | 82.2845            | 48                | 19.3781            | 82                | 5.7732             |
| 15                | 78.5368            | 49                | 18.6438            | 83                | 5.5875             |
| 16                | 74.9803            | 50                | 17.9409            | 84                | 5.4086             |
| 17                | 71.6042            | 51                | 17.2679            | 85                | 5.2361             |

|    |         |    |         |     |        |
|----|---------|----|---------|-----|--------|
| 18 | 68.3985 | 52 | 16.6234 | 86  | 5.0700 |
| 19 | 65.3537 | 53 | 16.0061 | 87  | 4.9098 |
| 20 | 62.4608 | 54 | 15.4147 | 88  | 4.7554 |
| 21 | 59.7115 | 55 | 14.8480 | 89  | 4.6065 |
| 22 | 57.0980 | 56 | 14.3048 | 90  | 4.4629 |
| 23 | 54.6128 | 57 | 13.7840 | 91  | 4.3244 |
| 24 | 52.2490 | 58 | 13.2847 | 92  | 4.1908 |
| 25 | 50.0000 | 59 | 12.8059 | 93  | 4.0619 |
| 26 | 47.8597 | 60 | 12.3466 | 94  | 3.9376 |
| 27 | 45.8223 | 61 | 11.9059 | 95  | 3.8175 |
| 28 | 43.8823 | 62 | 11.4830 | 96  | 3.7017 |
| 29 | 42.0346 | 63 | 11.0771 | 97  | 3.5898 |
| 30 | 40.2743 | 64 | 10.6875 | 98  | 3.4818 |
| 31 | 38.5968 | 65 | 10.3133 | 99  | 3.3775 |
| 32 | 36.9979 | 66 | 9.9540  | 100 | 3.2768 |
| 33 | 35.4735 | 67 | 9.6089  | 101 | 3.1795 |



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