



PLATINUM LIGHT COMMERCIAL SERVICE MANUAL

Revision V1.0: 160516, Content updated.

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WARNING

- Installation MUST conform with local building codes or, in the absence of local codes, with the National Electrical Code NFPA70/ANSI C1-1993 or current edition and Canadian Electrical Code Part1 CSA C.22.1.
- The information contained in the manual is intended for use by a qualified service technician familiar with safety procedures and equipped with the proper tools and test instruments
- Installation or repairs made by unqualified persons can result in hazards to you and others.
- Failure to carefully read and follow all instructions in this manual can result in equipment malfunction, property damage, personal injury and/or death.
- This service is only for service engineer to use.



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1. Precaution

1.1 Safety Precaution

■ To prevent injury to the user or other people and property damage, the following instructions must be followed.

■ Incorrect operation due to ignoring instruction will cause harm or damage.

■ Before service the unit, be sure to read this service manual at first.

1.2 Warning

➤ Installation

■ Do not use a defective or underrated circuit breaker. Use this appliance on a dedicated circuit.

There is risk of fire or electric shock.

■ For electrical work, contact the dealer, seller, a qualified electrician, or an authorized service center.

Do not disassemble or repair the product, there is risk of fire or electric shock.

■ Always ground the product.

There is risk of fire or electric shock.

■ Install the panel and the cover of control box securely.

There is risk of fire or electric shock.

■ Always install a dedicated circuit and breaker.

Improper wiring or installation may cause electric shock.

■ Use the correctly rated breaker of fuse.

There is risk of fire or electric shock.

■ Do not modify or extend the power cable.

There is risk of fire or electric shock.

■ Do not install, remove, or reinstall the unit by yourself (customer).

There is risk of fire, electric shock, explosion, or injury.

■ Be caution when unpacking and installing the product.

Sharp edges could cause injury, be especially careful of the case edges and the fins on the condenser and evaporator.

■ For installation, always contact the dealer or an authorized service center.

■ Do not install the product on a defective installation stand.

■ Be sure the installation area does not deteriorate with age.

If the base collapses, the air conditioner could fall with it, causing property damage, product failure, and personal injury.

■ Do not let the air conditioner run for a long time when the humidity is very high and a door or a window is left open.

■ Take care to ensure that power cable could not be pulled out or damaged during operation.

There is risk of fire or electric shock.

■ Do not place anything on the power cable.

There is risk of fire or electric shock.

■ Do not plug or unplug the power supply plug during operation.

There is risk of fire or electric shock.

■ Do not touch (operation) the product with wet hands.

■ Do not place a heater or other appliance near the power cable.

There is risk of fire and electric shock.

■ Do not allow water to run into electrical parts.

It may cause fire, failure of the product, or electric shock.

■ Do not store or use flammable gas or combustible near the product.

There is risk of fire or failure of product.

■ Do not use the product in a tightly closed space for a long time.

Oxygen deficiency could occur.

■ When flammable gas leaks, turn off the gas and open a window for ventilation before turn the product on.

- **If strange sounds or smoke comes from product, turn the breaker off or disconnect the power supply cable.**

There is risk of electric shock or fire.

- **Stop operation and close the window in storm or hurricane. If possible, remove the product from the window before the hurricane arrives.**

There is risk of property damage, failure of product, or electric shock.

- **Do not open the inlet grill of the product during operation. (Do not touch the electrostatic filter, if the unit is so equipped.)**

There is risk of physical injury, electric shock, or product failure.

- **When the product is soaked, contact an authorized service center.**

There is risk of fire or electric shock.

- **Be caution that water could not enter the product.**

There is risk of fire, electric shock, or product damage.

- **Ventilate the product from time to time when operating it together with a stove etc.**

There is risk of fire or electric shock.

- **Turn the main power off when cleaning or maintaining the product.**

There is risk of electric shock.

- **When the product is not be used for a long time, disconnect the power supply plug or turn off the breaker.**

There is risk of product damage or failure, or unintended operation.

- **Take care to ensure that nobody could step on or fall onto the outdoor unit.**

This could result in personal injury and product damage.

➤ CAUTION

- **Always check for gas (refrigerant) leakage after installation or repair of product.**

Low refrigerant levels may cause failure of product.

- **Install the drain hose to ensure that water is drained away properly.**

A bad connection may cause water leakage.

- **Keep level even when installing the product.**

It can avoid vibration of water leakage.

- **Do not install the product where the noise or hot air from the outdoor unit could damage the neighborhoods.**

It may cause a problem for your neighbors.

- **Use two or more people to lift and transport the product.**

- **Do not install the product where it will be exposed to sea wind (salt spray) directly.**

It may cause corrosion on the product.

Corrosion, particularly on the condenser and evaporator fins, could cause product malfunction or inefficient operation.

➤ Operational

- **Do not expose the skin directly to cool air for long time. (Do not sit in the draft).**

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

There is risk of damage or loss of property.

- **Do not block the inlet or outlet of air flow.**

- **Use a soft cloth to clean. Do not use harsh detergents, solvents, etc.**

There is risk of fire, electric shock, or damage to the plastic parts of the product.

- **Do not touch the metal parts of the product when removing the air filter. They are very sharp.**

- **Do not step on or put anything on the product. (outdoor units)**

- **Always insert the filter securely. Clean the filter every two weeks or more often if necessary.**

A dirty filter reduces the efficiency of the air conditioner and could cause product malfunction or damage.

- **Do not insert hands or other objects through air inlet or outlet while the product is operated.**

- **Do not drink the water drained from the product.**

- **Use a firm stool or ladder when cleaning or maintaining the product.**

Be careful and avoid personal injury.

- **Replace the all batteries in the remote control with new ones of the same type. Do not mix old and new batteries or different types of batteries.**

There is risk of fire or explosion.

- **Do not recharge or disassemble the batteries. Do not dispose of batteries in a fire.**

They may burn or explode.

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

2. Part Names and Features

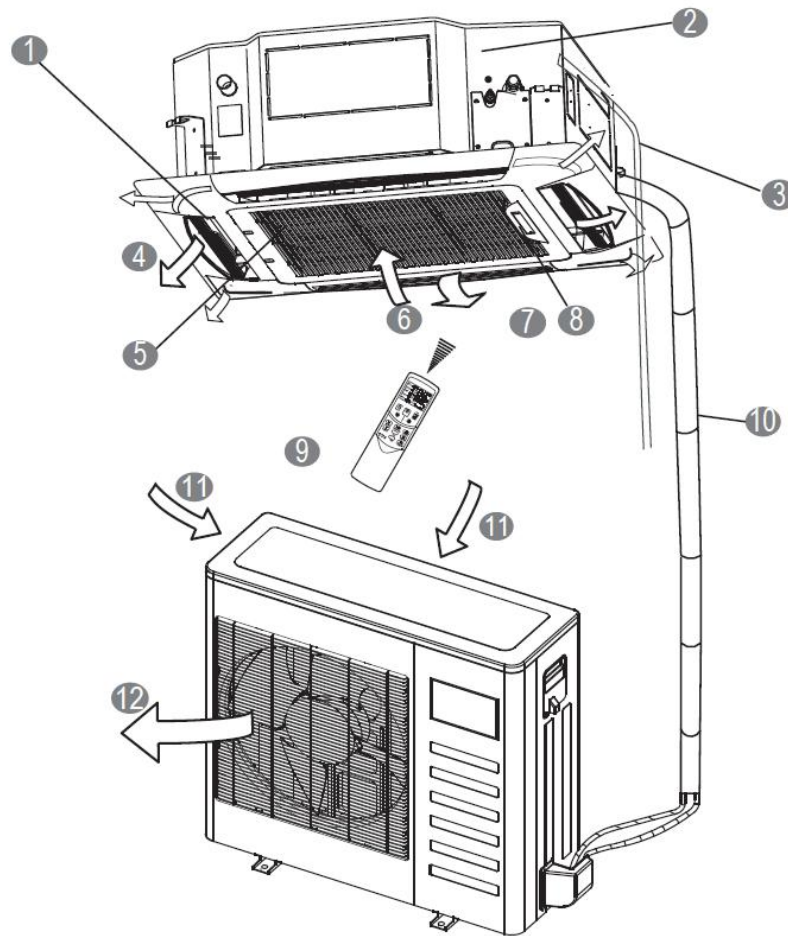
2.1 Model Names of Indoor/Outdoor units

| IDU model |
|-----------|
| CPA-09 |
| CPA-12 |
| CPA-18 |
| CPA-24 |
| CPA-36DU |
| CPA-48DU |
| FPA-18 |
| FPA-24 |
| FPA-36DU |
| FPA-48DU |
| TPA-09 |
| TPA-12 |
| TPA-18 |
| TPA-24 |
| TPA-36DU |
| TPA-48DU |

| ODU model |
|------------------|
| CPP009CD (O) |
| CPP012CD (O) |
| CPP018CD (O) |
| CPP024CD (O) |
| CPP036CD (O) -DU |
| CPP048CD (O) -DU |

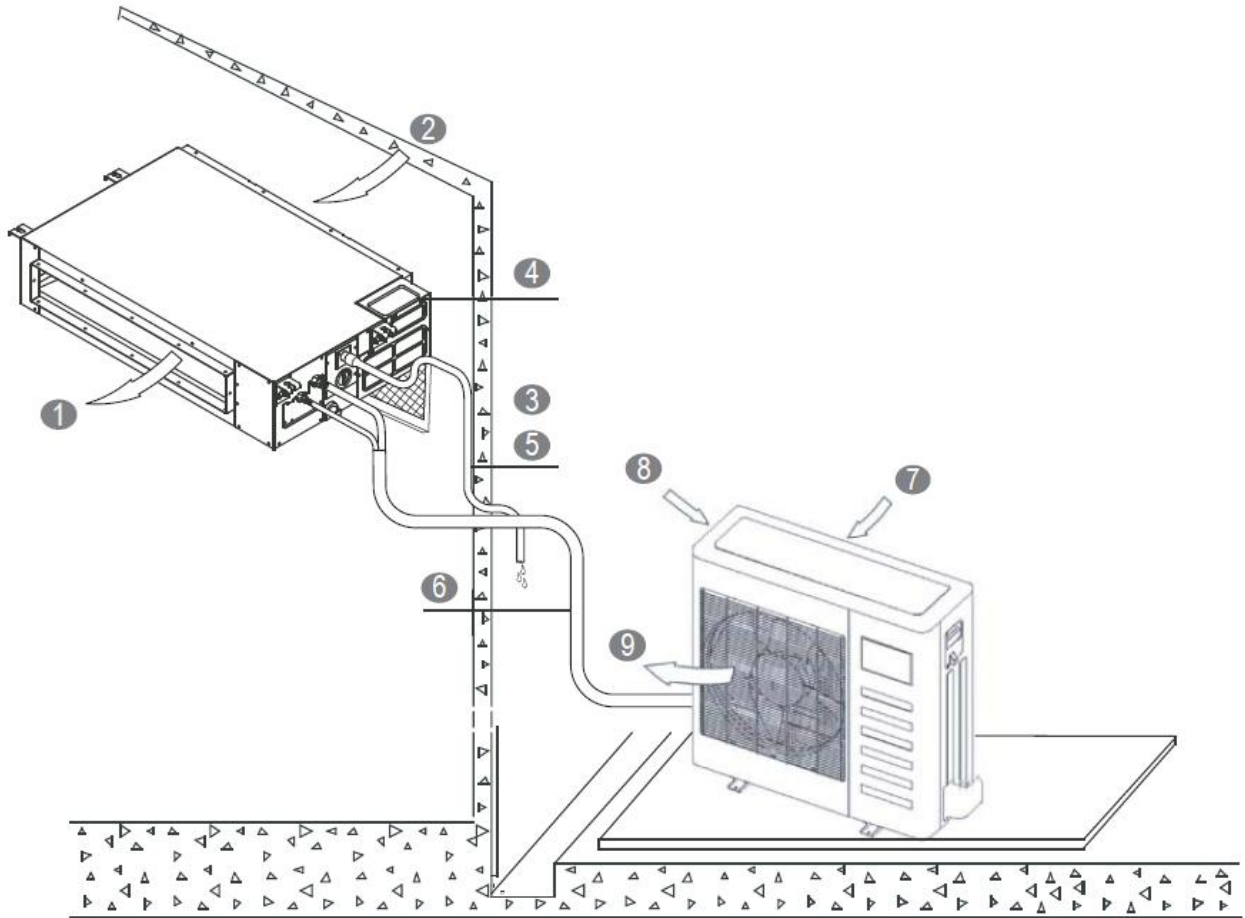
2.2 Part names of Indoor/Outdoor units

Cassette Unit



- | | | | |
|---|--|---|-------------------|
| ① | Air flow louver(at air outlet) | ⑦ | Air-in grill |
| ② | Drain pump(drain water from indoor unit) | ⑧ | Display panel |
| ③ | Drain pipe | ⑨ | Remote controller |
| ④ | Air outlet | ⑩ | Refrigerant pipe |
| ⑤ | Air filter(inside air-in grill) | ⑪ | Air inlet |
| ⑥ | Air inlet | ⑫ | Air outlet |

Duct Units



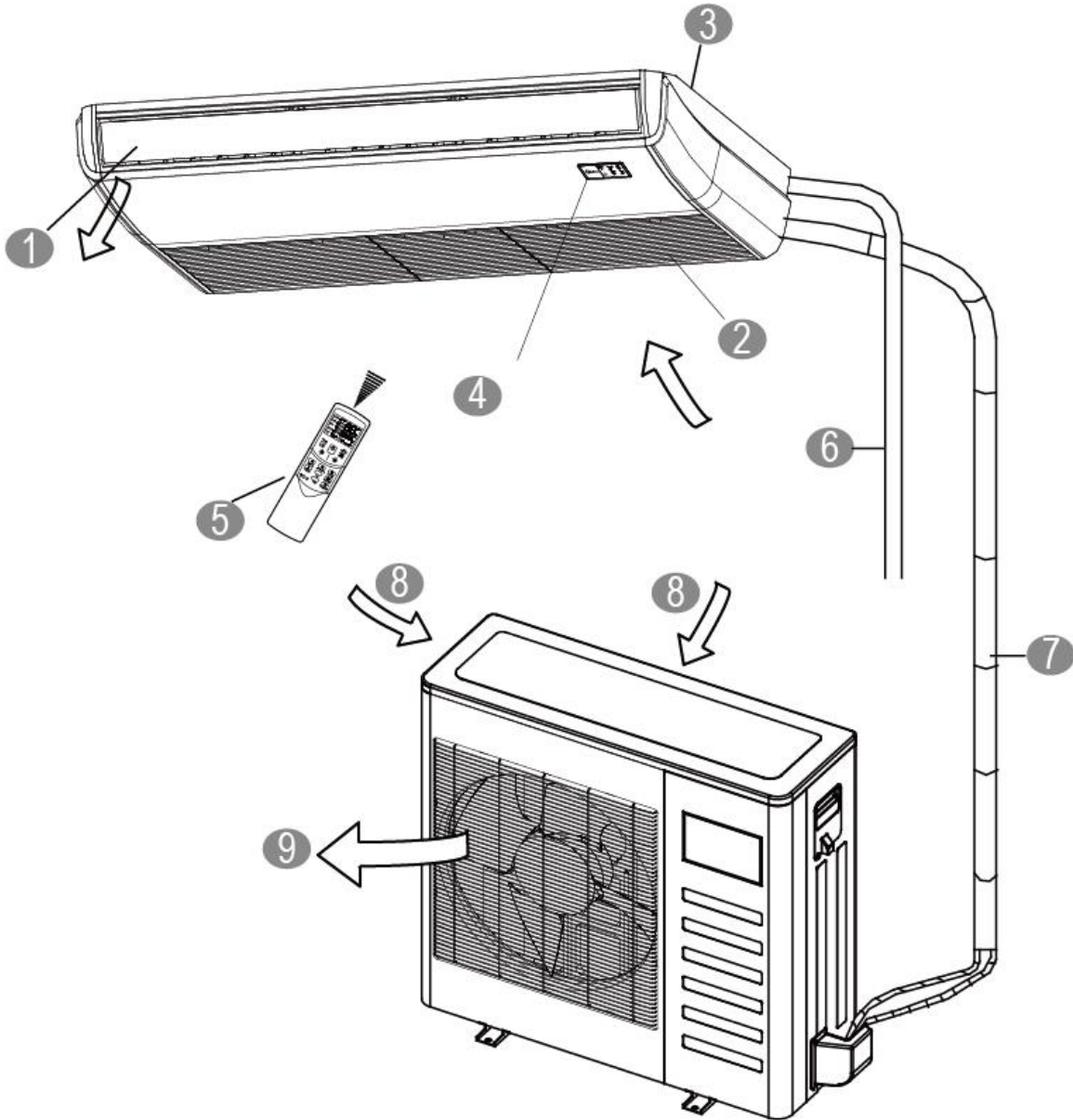
INDOOR UNIT

- ① Air outlet
- ② Air inlet
- ③ Air filter(on some models)
- ④ Electric control cabinet
- ⑤ Drain pipe

OUTDOOR UNIT

- ⑥ Connecting pipe
- ⑦ Air inlet
- ⑧ Air inlet(side and rear)
- ⑨ Air outlet

Ceiling-floor Units



INDOOR UNIT

- ① Air flow louver (at air outlet)
- ② Air inlet (with air filter in it)
- ③ Installation part
- ④ Display panel
- ⑤ Remote controller
- ⑥ Drain pipe

OUTDOOR UNIT

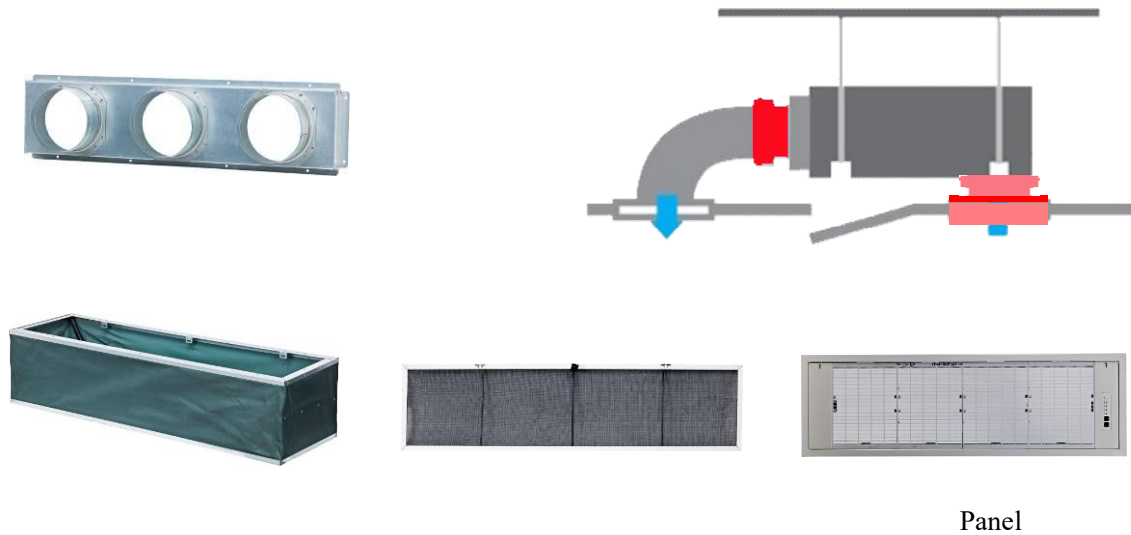
- ⑦ Connecting pipe
- ⑧ Air inlet
- ⑨ Air outlet

2.3 Features

2.3.1 Duct Units

2.3.1.1 Installation accessories: (Optional)

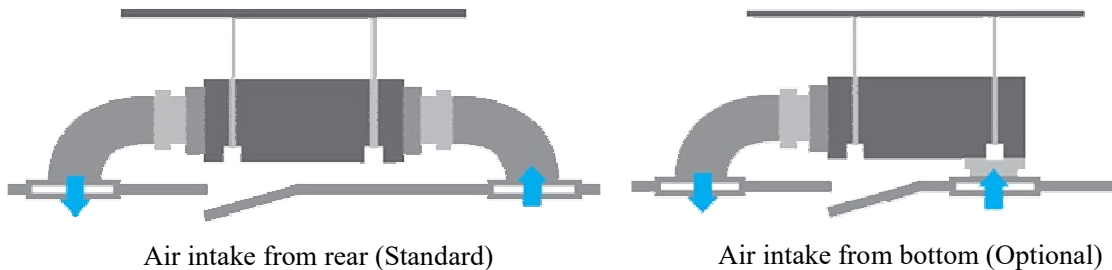
- Front Board, Canvas Air Passage, Filter, Panel, for easy installation



Panel

2.3.1.2 Easy Installation: Two air inlet styles (Bottom side or Rear side)

- Air inlet from rear is standard for all capacity; air inlet from bottom is optional.
- The size of air inlet frame from rear and bottom is same, it's very easy to move the cover from bottom to rear side, or from rear to the bottom, in order to matching the installation condition.

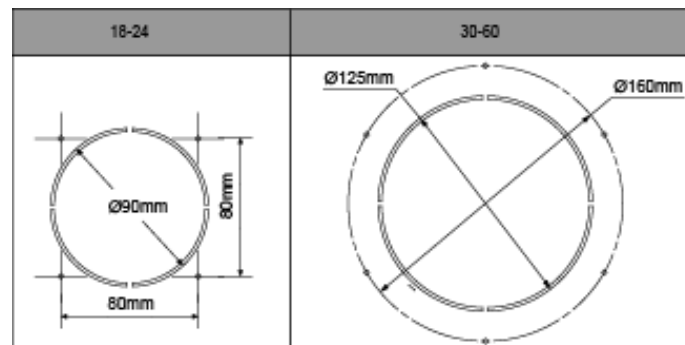


Air intake from rear (Standard)

Air intake from bottom (Optional)

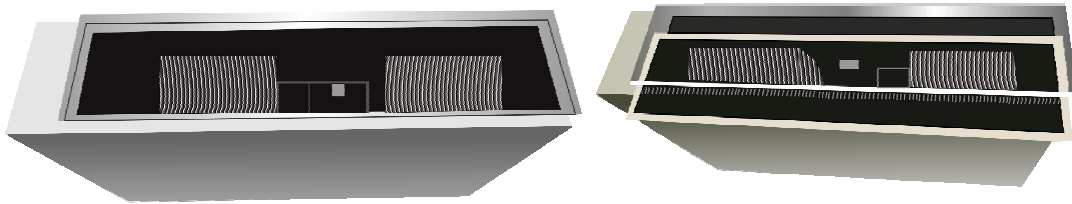
2.3.1.3 Fresh air intake function

- Install one duct from the reserved fresh-air intake to outdoor.
Continually inhale the fresh air to improve the quality of the indoor air, fulfills air quality more healthy and comfortable.

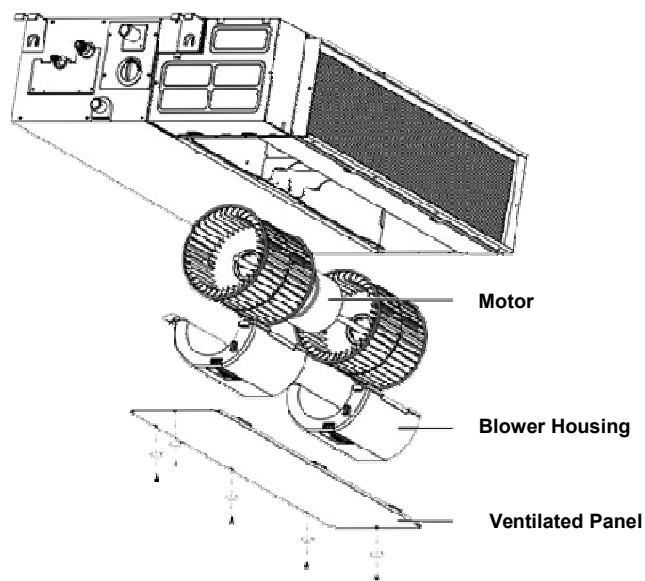


2.3.1.4 Easy maintenance

- Clean the filter (Optional, standard product without filter)
It is easy to draw out the filter from the indoor unit for cleaning, even the filter is installed in rear side or bottom side.

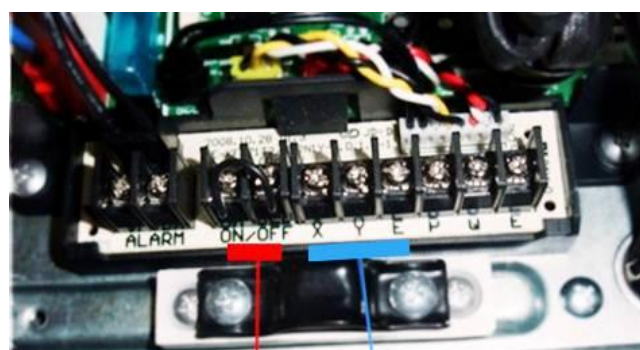


- Replace the motor or centrifugal fan
Remove the ventilated panel firstly. Remove a half of blower housing and take out the motor with centrifugal fan. Directly remove two bolts, and then replace the motor or centrifugal fan easily.



2.3.1.5 Reserved remote on-off and central control ports

- Reserved remote on-off ports and central control ports, can connect the cable of an on-off controller or a central controller to realize remote on-off control function or group control function.

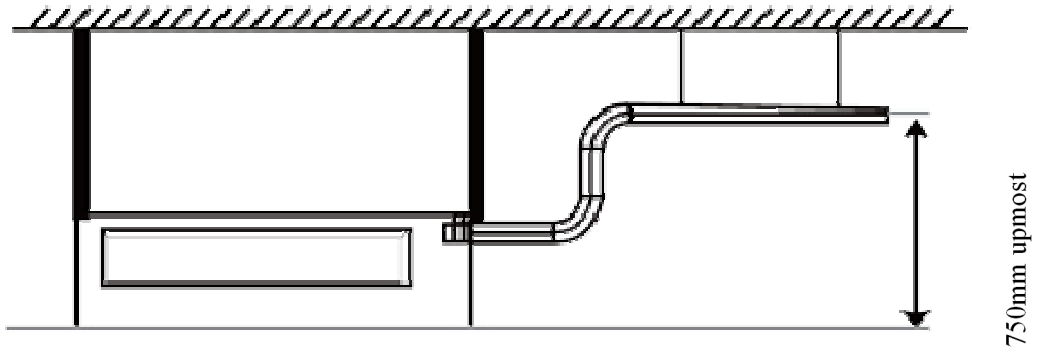


Remote on-off ports

Central control ports

2.3.1.6 Built-in drain pump (Optional):

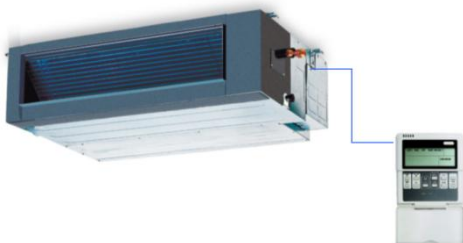
- Built-in drain pump can lift the water to 750mm upmost. It's convenient to install drainage piping under most space condition.



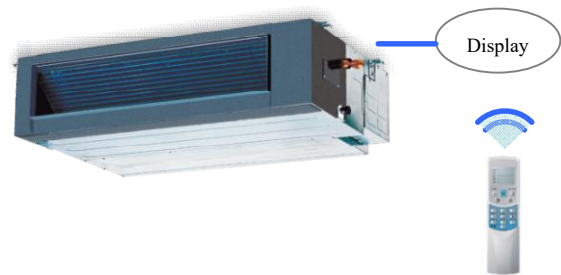
2.3.1.7 Built-in display board

- The standard indoor unit can be controlled by wired controller.
- There is a display board with a receiver in the E-box. Move out the display, and fix it in other place, even in the distance of 10m. The unit will realized remoter control.
- The wired controller and the display board can display the error code or production code when the chips detect some failure.

Wired Controller (Standard)



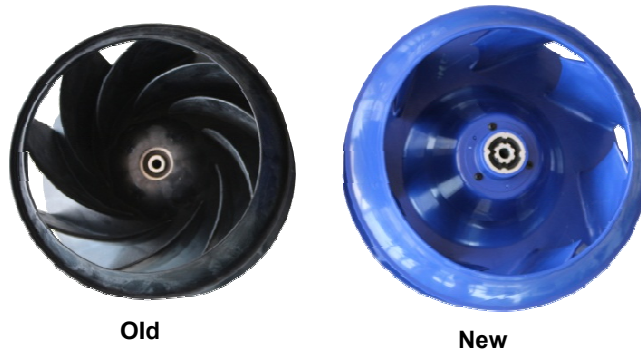
Remote Controller (Optional)



2.3.2 Cassette Unit

2.3.2.1 Lower Noise

- Optimize air channel system design to ensure the maximum quietness and comfort.
- Noise max down 6dB.



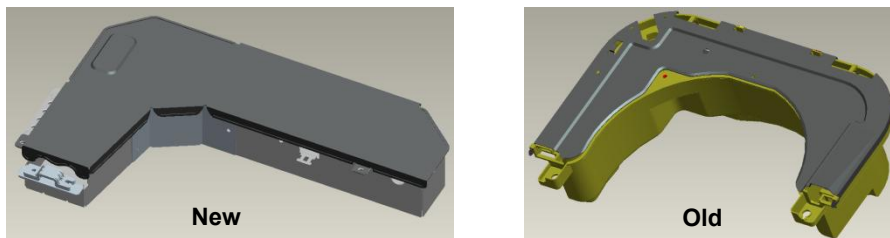
2.3.2.2 Turbo mode (Optional)

- Turbo function can boost cooling or heating speed in a short period, and makes the room cool down or heat up rapidly.



2.3.2.3 Fire-proof controller box

- Electrical control box adopts new design, which can meet higher fire safety requirements.



2.3.2.4 Fresh Air

- Fresh air intake function bring you fresh and comfortable air feeling.



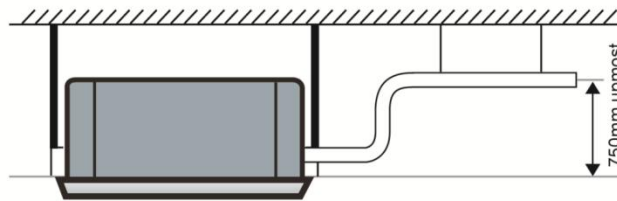
2.3.2.5 Wired controller (Optional)

- Compared with infrared remote controller, wired controller can be fixed on the wall and avoid mislaying. It's mainly used for commercial zone and makes air conditioner control more convenient.



2.3.2.6 Build-in Drain Pump

- The drain pump can lift the condensing water up to 750mm upmost.
- It's convenient to install drainage piping under most space condition.



2.3.2.7 Terminals for alarm lamp and long-distance on-off controller connection are standard

- Reserve terminals for the connection of alarm lamp and long-distance on-off controller, more human control.

2.3.1 Ceiling-floor Units

2.3.1.1 Two-way installation

- The rounded design of the ceiling and floor type air conditioner allows either ceiling or floor-level installation. Ceiling installation saves room space, while floor installation helps prevent the loss of warm air.



2.3.1.2 Brief design

- Brief design that is suitable for any interior will not only give you cooling and heating performance but also upgrade your lifestyle.



2.3.1.3 3D airflow

Vertical air flow and horizontal airflow can be adjusted by remote controller, the cooperation of the two airflow ways help to spread air comfortably throughout even a large room. With these functions, the whole room can be evenly air-conditioned for both floor-level and ceiling installation.



2.3.1.4 Optional drainage pipe connection

- Both right side and left side drainage holes are available to avoid the space limitation for drainage pipe installation. Make you more convenient during installation.



C Panel (LED display)

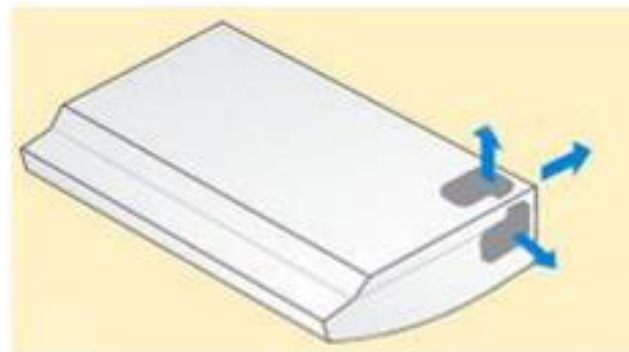
D Panel

2.3.1.5 Convenience operating and easy maintenance

- Remote controller as standard, wired controller for optional.
- The filter without screw fixed, can be took out easily.

2.3.1.6 Easy installation, save working time

- The pipes can be connected from bottom, back and right side, makes the installation more easily.
- The wiring works can be finished before installation.

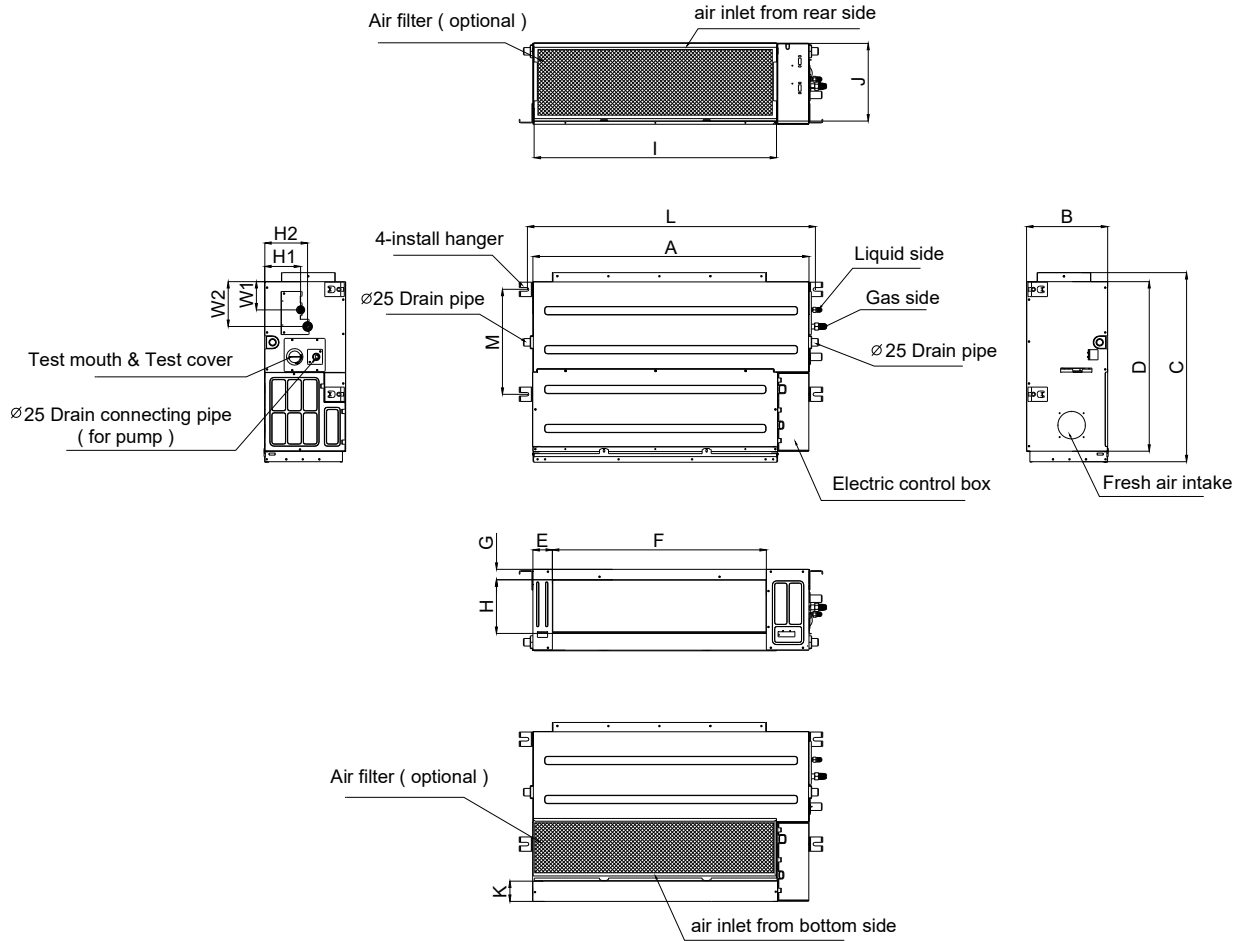


2.3.1.7 Outside water pump for optional when ceiling installation.

3. Dimension

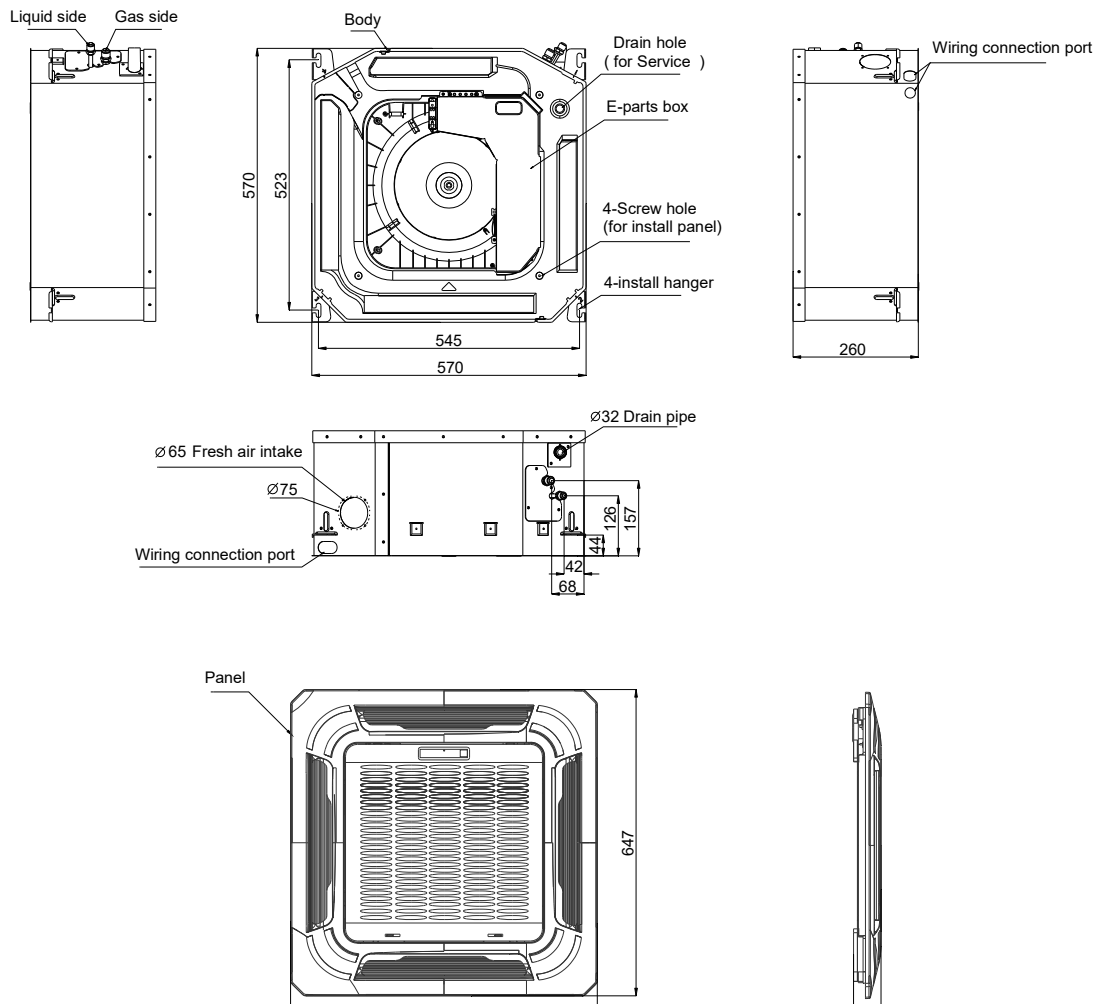
3.1 Indoor Unit

Duct Units

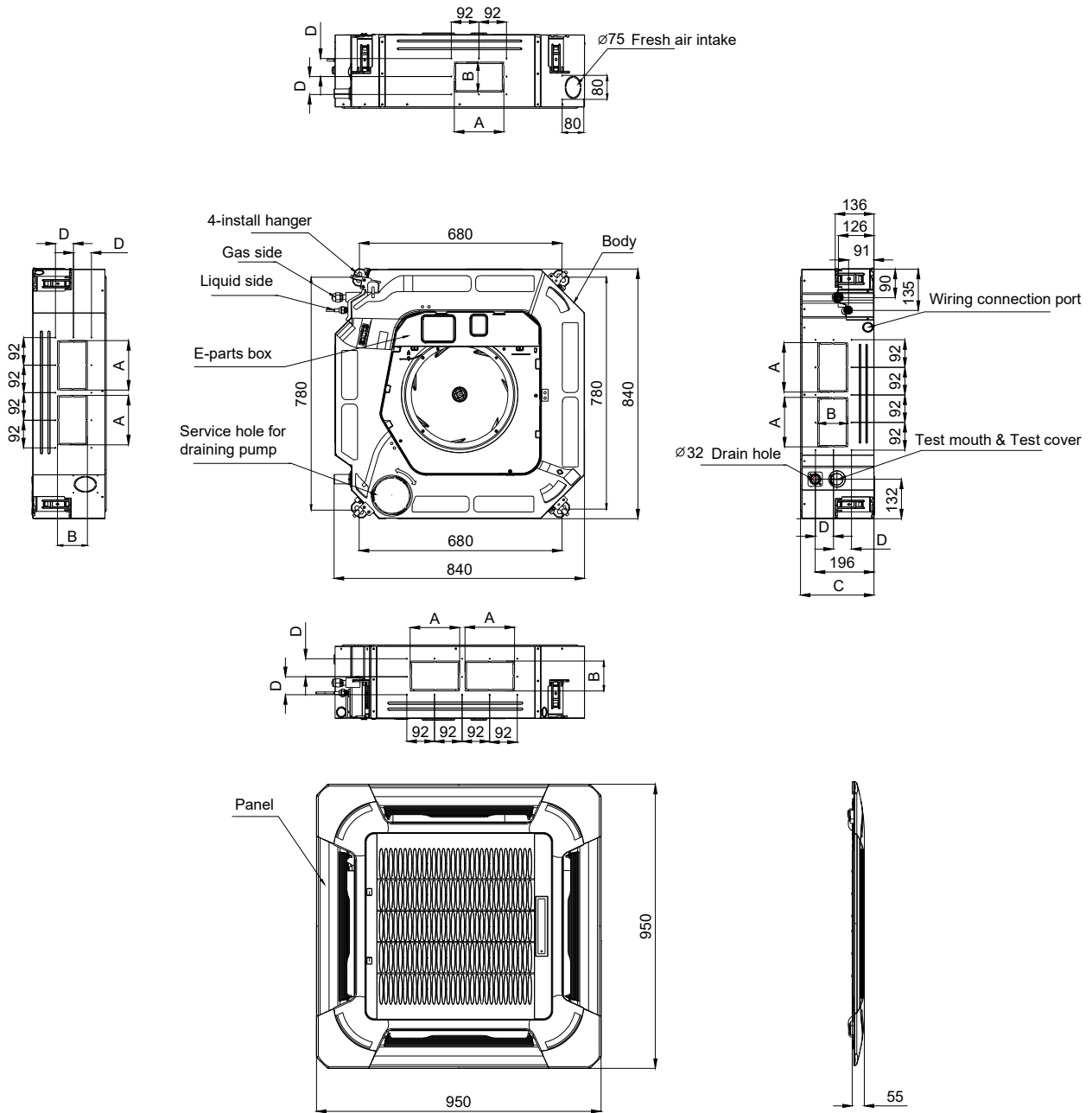


| Capacity (KBtu) | Outline dimension(mm) | | | | Air outlet opening size | | | | Air return opening size | | | Size of install hanger | | Size of refrigerant pipe | | | | |
|-----------------|-----------------------|-------|-------|-------|-------------------------|------|-------|------|-------------------------|-------|-------|------------------------|-------|--------------------------|------|------|------|------|
| | A | B | C | D | E | F | G | H | I | J | K | L | M | H1 | H2 | W1 | W2 | |
| 9 | mm | 700 | 210 | 635 | 570 | 65 | 493 | 35 | 119 | 595 | 200 | 80 | 740 | 350 | 120 | 143 | 95 | 150 |
| | in | 27.56 | 8.27 | 25 | 22.44 | 2.56 | 19.41 | 1.38 | 4.69 | 23.43 | 7.87 | 3.15 | 29.13 | 13.78 | 4.72 | 5.63 | 3.74 | 5.91 |
| 12 | mm | 700 | 210 | 635 | 570 | 65 | 493 | 35 | 119 | 595 | 200 | 80 | 740 | 350 | 120 | 143 | 95 | 150 |
| | in | 27.56 | 8.27 | 25 | 22.44 | 2.56 | 19.41 | 1.38 | 4.69 | 23.43 | 7.87 | 3.15 | 29.13 | 13.78 | 4.72 | 5.63 | 3.74 | 5.91 |
| 18 | mm | 920 | 210 | 635 | 570 | 65 | 713 | 35 | 119 | 815 | 200 | 80 | 960 | 350 | 120 | 143 | 95 | 150 |
| | in | 36.22 | 8.27 | 25.00 | 22.44 | 2.56 | 28.07 | 1.38 | 4.69 | 32.09 | 7.87 | 3.15 | 37.80 | 13.78 | 4.72 | 5.63 | 3.74 | 5.91 |
| 24 | mm | 920 | 210 | 635 | 570 | 65 | 713 | 35 | 119 | 815 | 200 | 80 | 960 | 350 | 120 | 143 | 95 | 150 |
| | in | 36.22 | 8.27 | 25.00 | 22.44 | 2.56 | 28.07 | 1.38 | 4.69 | 32.09 | 7.87 | 3.15 | 37.80 | 13.78 | 4.72 | 5.63 | 3.74 | 5.91 |
| 36 | mm | 1140 | 270 | 775 | 710 | 65 | 933 | 35 | 179 | 1035 | 260 | 45 | 1240 | 500 | 120 | 143 | 95 | 150 |
| | in | 44.88 | 10.63 | 30.51 | 27.95 | 2.56 | 36.73 | 1.38 | 7.05 | 40.75 | 10.24 | 1.77 | 48.82 | 19.69 | 4.72 | 5.63 | 3.74 | 5.91 |
| 48 | mm | 1200 | 300 | 865 | 800 | 80 | 968 | 40 | 204 | 1094 | 288 | 45 | 1240 | 500 | 175 | 198 | 155 | 210 |
| | in | 47.24 | 11.81 | 34.06 | 31.50 | 3.15 | 38.11 | 1.57 | 8.03 | 43.07 | 11.34 | 1.77 | 48.82 | 19.69 | 6.89 | 7.80 | 6.10 | 8.27 |

Cassette Units(9K, 12K, 18K)

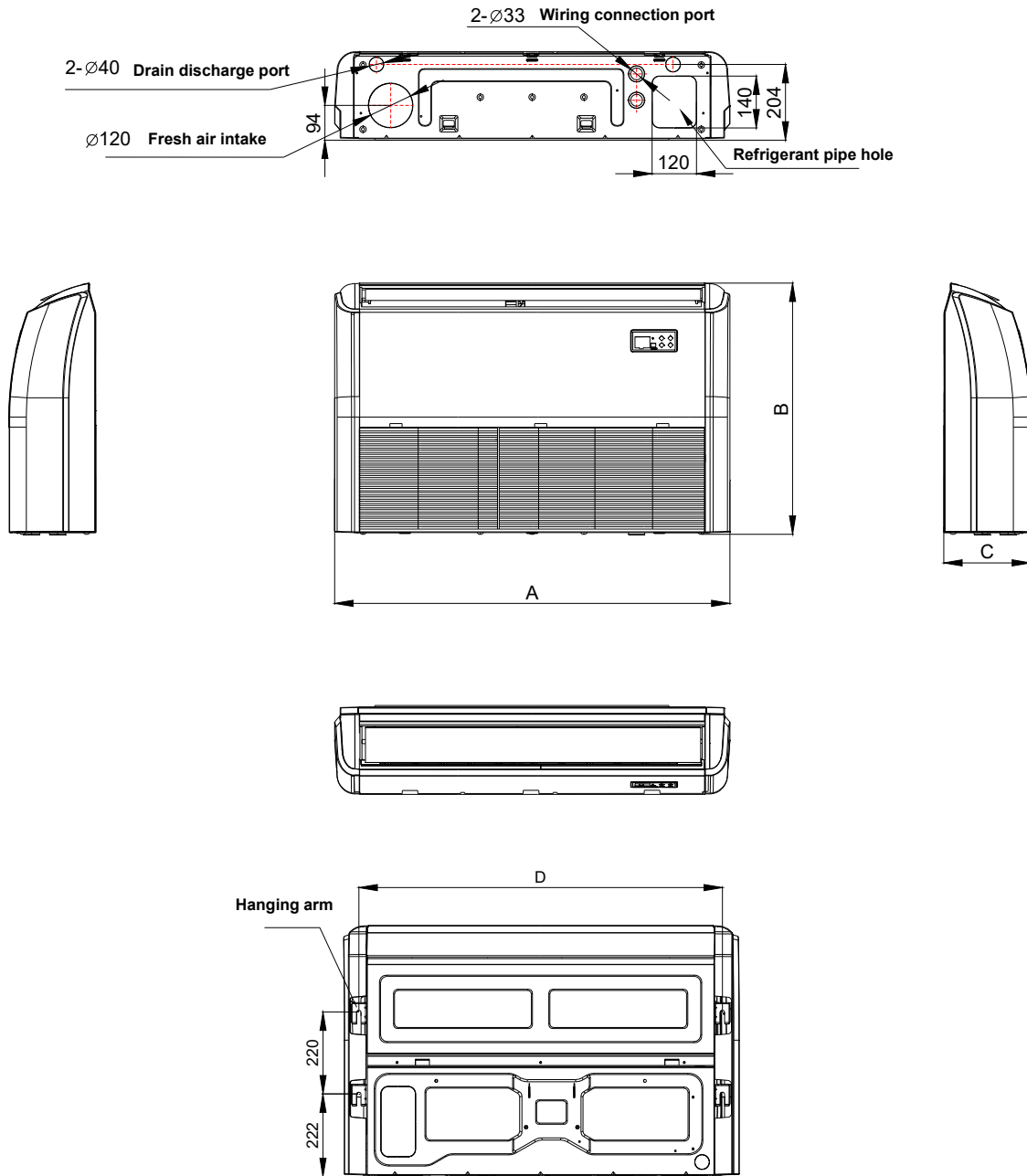


Cassette Units (24K, 36K, 48K)



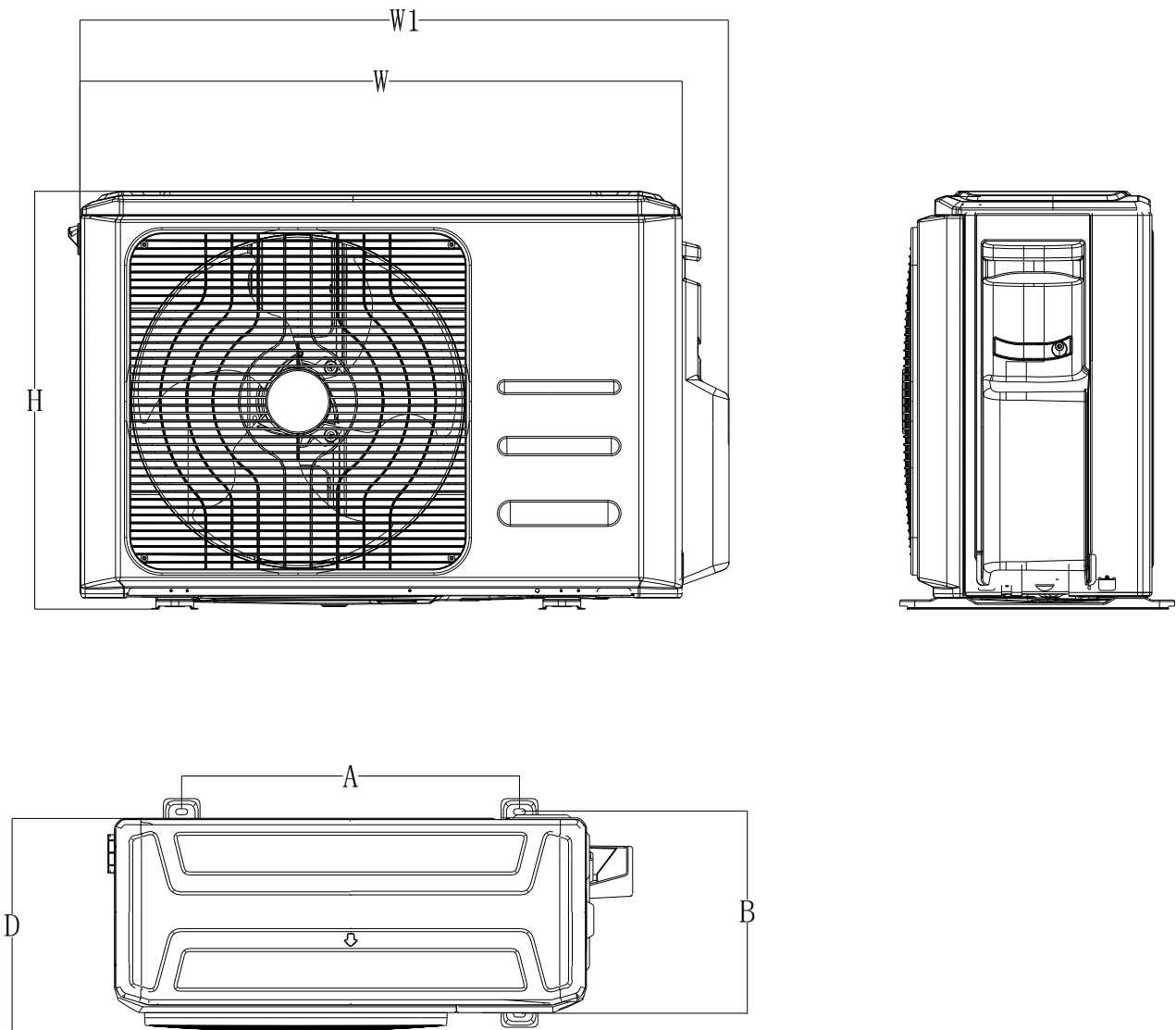
| Capacity (Btu/h) | | A | B | C | D |
|------------------|------|------|------|-------|------|
| 24K | mm | 160 | 75 | 205 | 50 |
| | inch | 6.30 | 2.95 | 8.07 | 1.97 |
| 36K | mm | 160 | 95 | 245 | 60 |
| | inch | 6.30 | 3.74 | 9.65 | 2.36 |
| 48K | mm | 160 | 95 | 287 | 60 |
| | inch | 6.30 | 3.74 | 11.30 | 2.36 |

Ceiling-floor Units (18K-48K)



| Capacity (Btu/h) | | A | B | C | D |
|------------------|------|-------|-------|------|-------|
| 18K / 24K | mm | 1068 | 675 | 235 | 983 |
| | inch | 42.05 | 26.57 | 9.25 | 38.70 |
| 36K | mm | 1285 | 675 | 235 | 1200 |
| | inch | 50.59 | 26.57 | 9.25 | 47.24 |
| 48K | mm | 1650 | 675 | 235 | 1565 |
| | inch | 64.96 | 26.57 | 9.25 | 61.61 |

3.2 Outdoor Unit



Note: The above drawing is only for reference. The appearance of your units may be different.

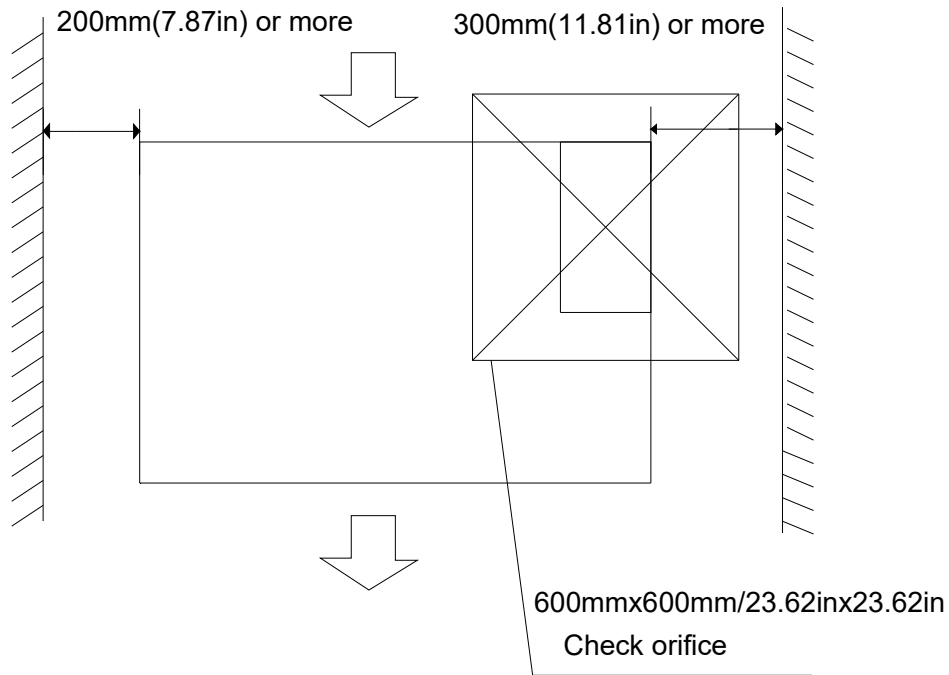
| Model | | W | D | H | W1 | A | B |
|----------------|------|------|------|------|------|------|------|
| CPP009CD(O) | mm | 770 | 300 | 555 | 840 | 487 | 298 |
| | inch | 30.3 | 11.8 | 21.9 | 33.1 | 19.2 | 11.7 |
| CPP012CD(O) | mm | 800 | 333 | 554 | 870 | 514 | 340 |
| | inch | 31.5 | 13.1 | 21.8 | 34.3 | 20.2 | 13.4 |
| CPP018CD(O) | mm | 845 | 363 | 702 | 914 | 540 | 350 |
| | inch | 33.3 | 14.3 | 27.6 | 36.0 | 21.3 | 13.8 |
| CPP024CD(O) | mm | 946 | 410 | 810 | 1030 | 673 | 403 |
| CPP036CD(O)-DU | inch | 37.2 | 16.1 | 31.9 | 40.6 | 26.5 | 15.9 |
| CPP048CD(O)-DU | mm | 952 | 415 | 1333 | 1045 | 634 | 404 |
| | inch | 37.5 | 16.3 | 52.5 | 41.1 | 25.0 | 15.9 |

4. Service Space

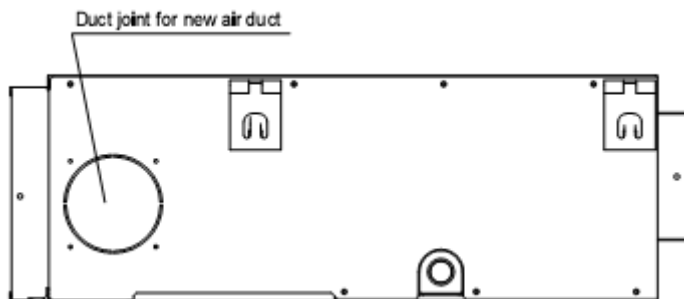
4.1 Indoor Unit

Duct Units

Ensure enough space required for installation and maintenance.

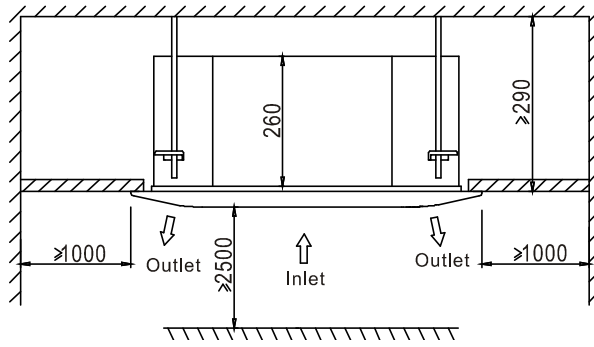


All the indoor units reserve the hole to connect the fresh air pipe. The hole size as following

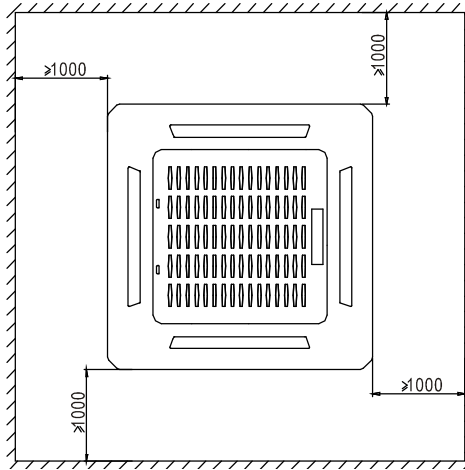


| MODEL | |
|-----------------------|--------------------------|
| 12-24 | 30-60 |
| <p>Ø90mm 80mm</p> | <p>Ø125mm Ø160mm</p> |

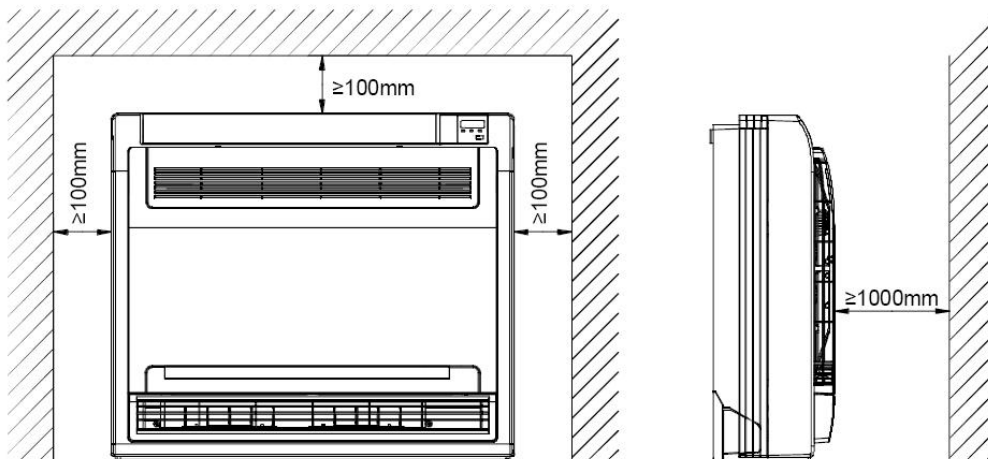
Cassette Units



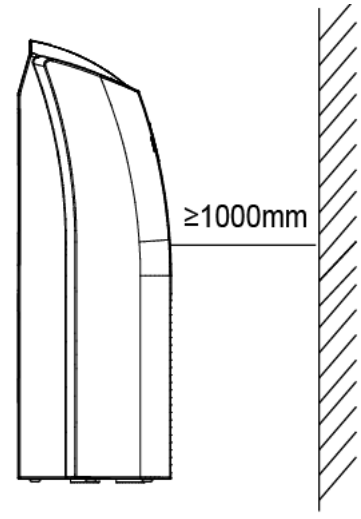
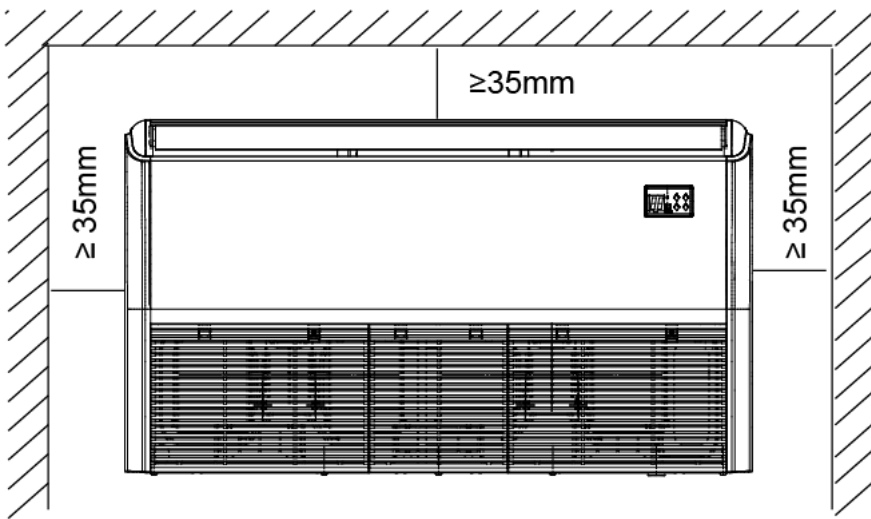
Unit: mm



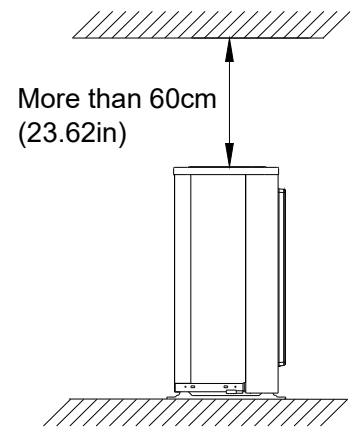
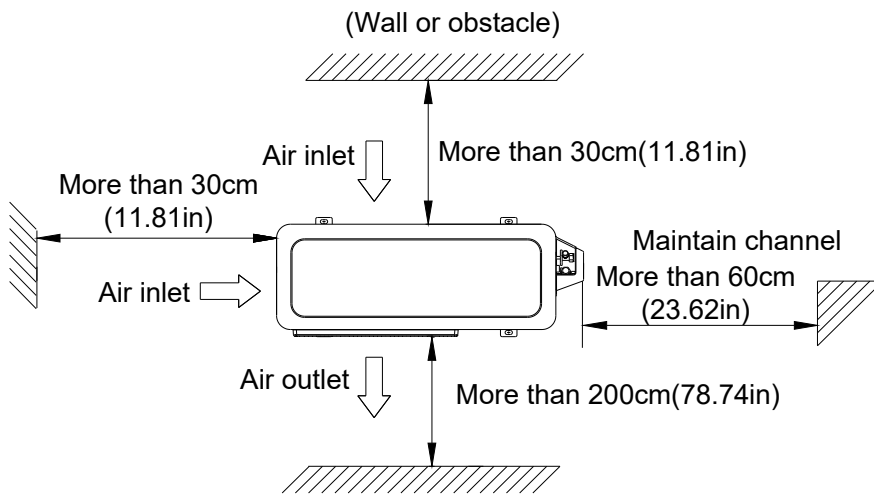
Console Unit



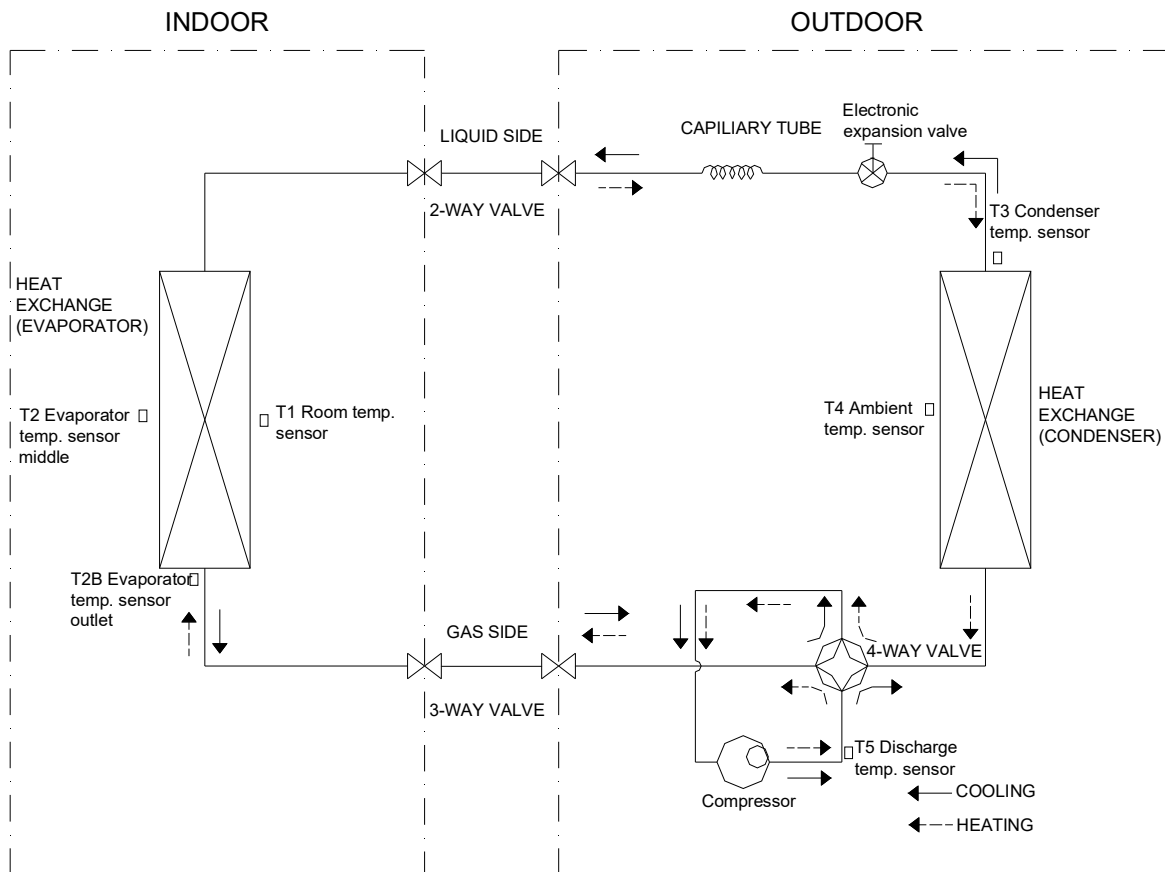
Ceiling-floor Units



4.2 Outdoor Unit



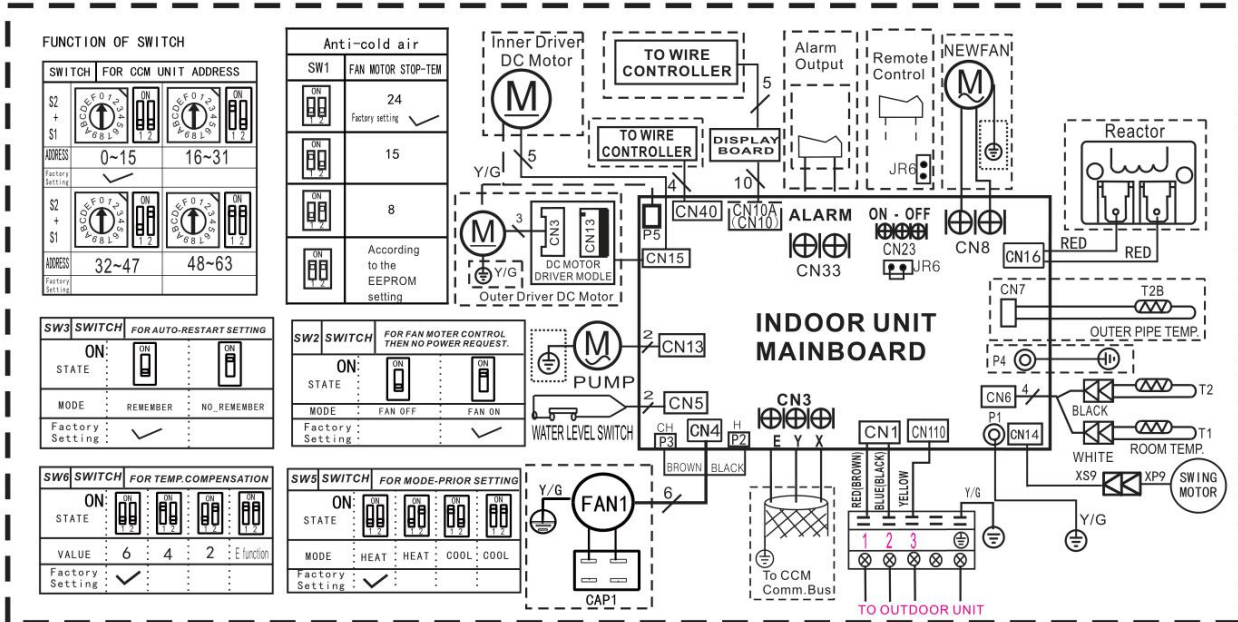
5. Refrigerant Cycle Diagram



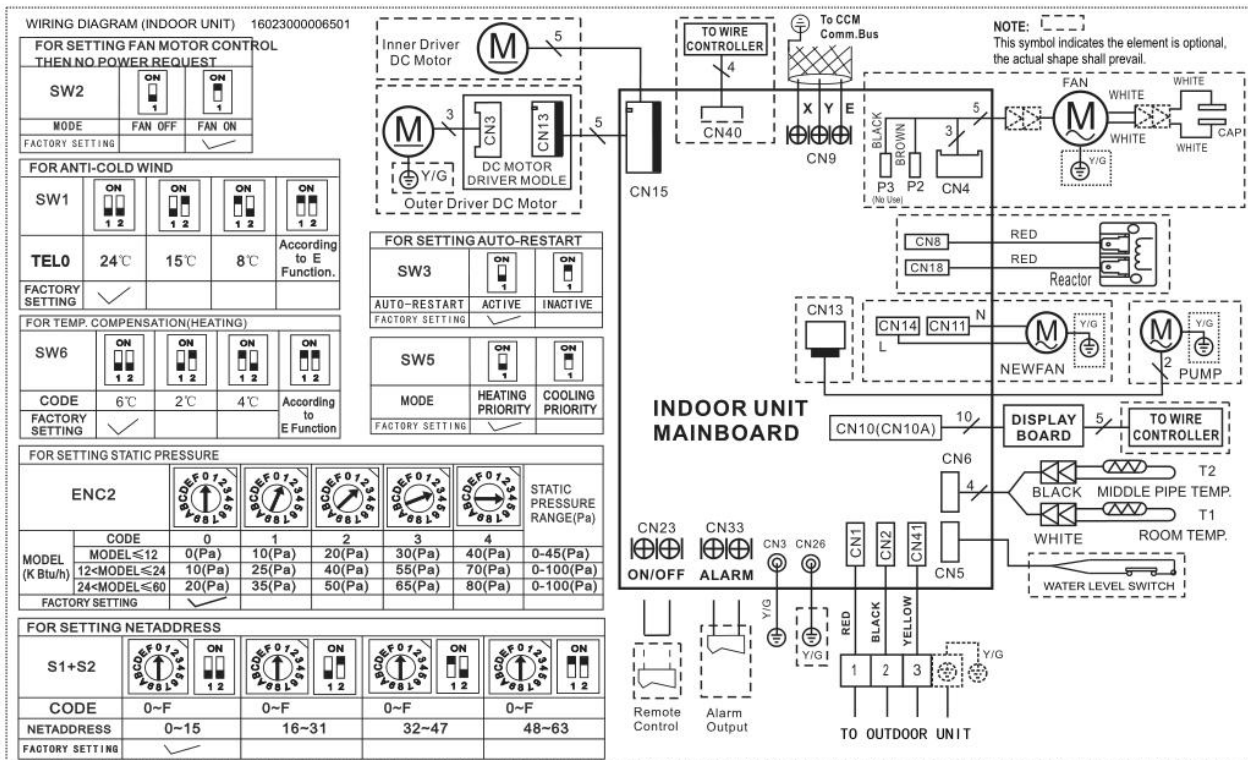
6. Wiring Diagram

6.1 Indoor Unit

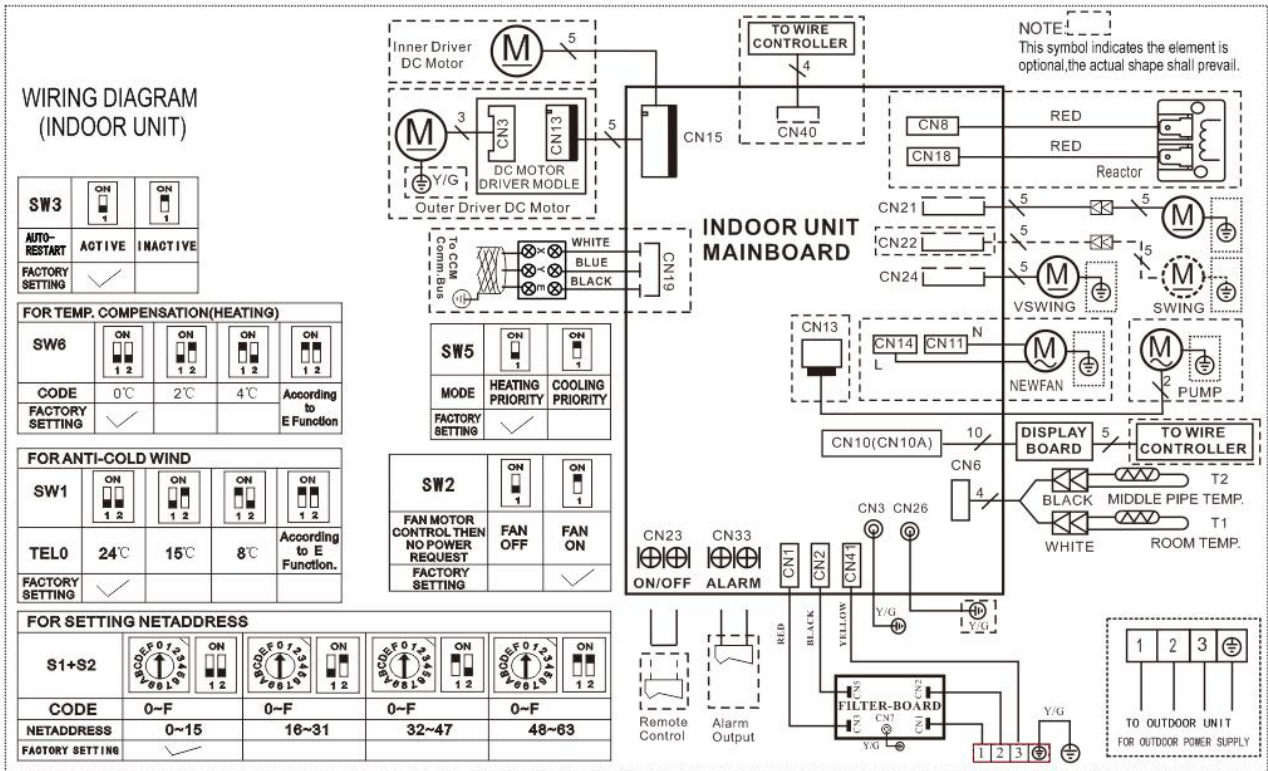
TPA-09, TPA-12, TPA-18,



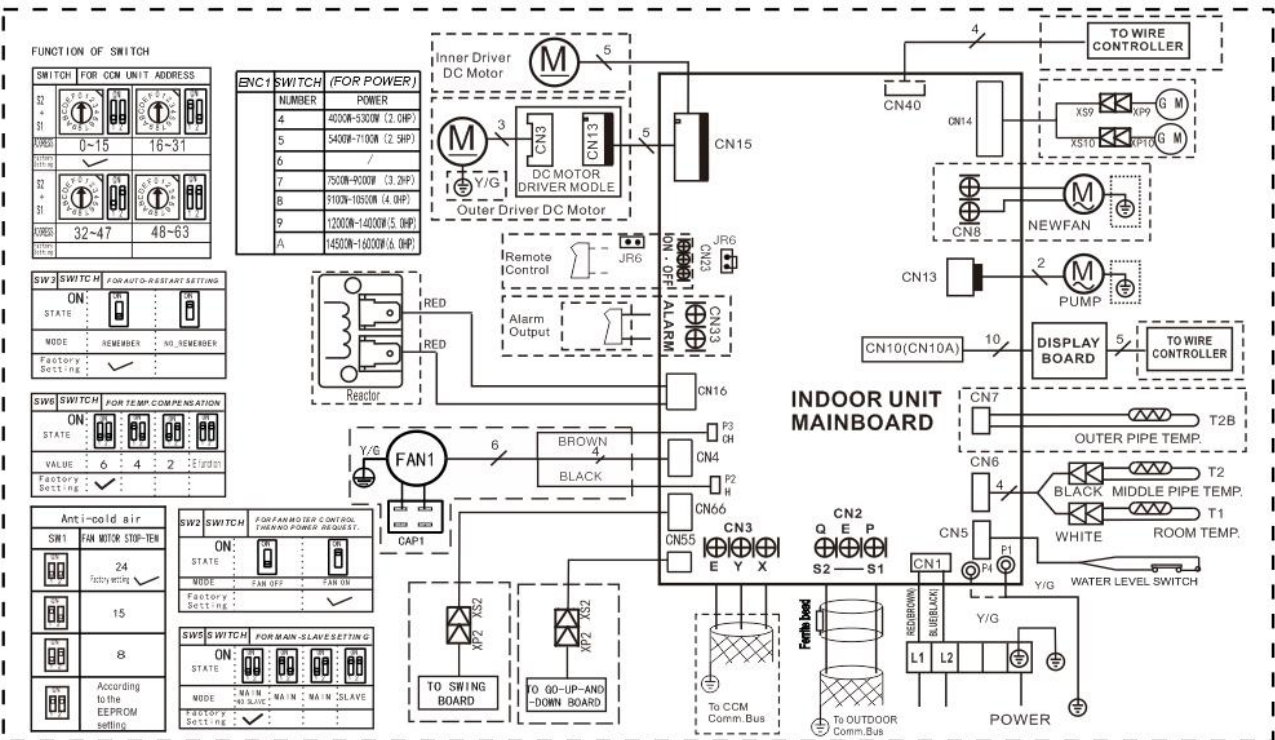
CPA-09, CPA-12, CPA-18, CPA-24



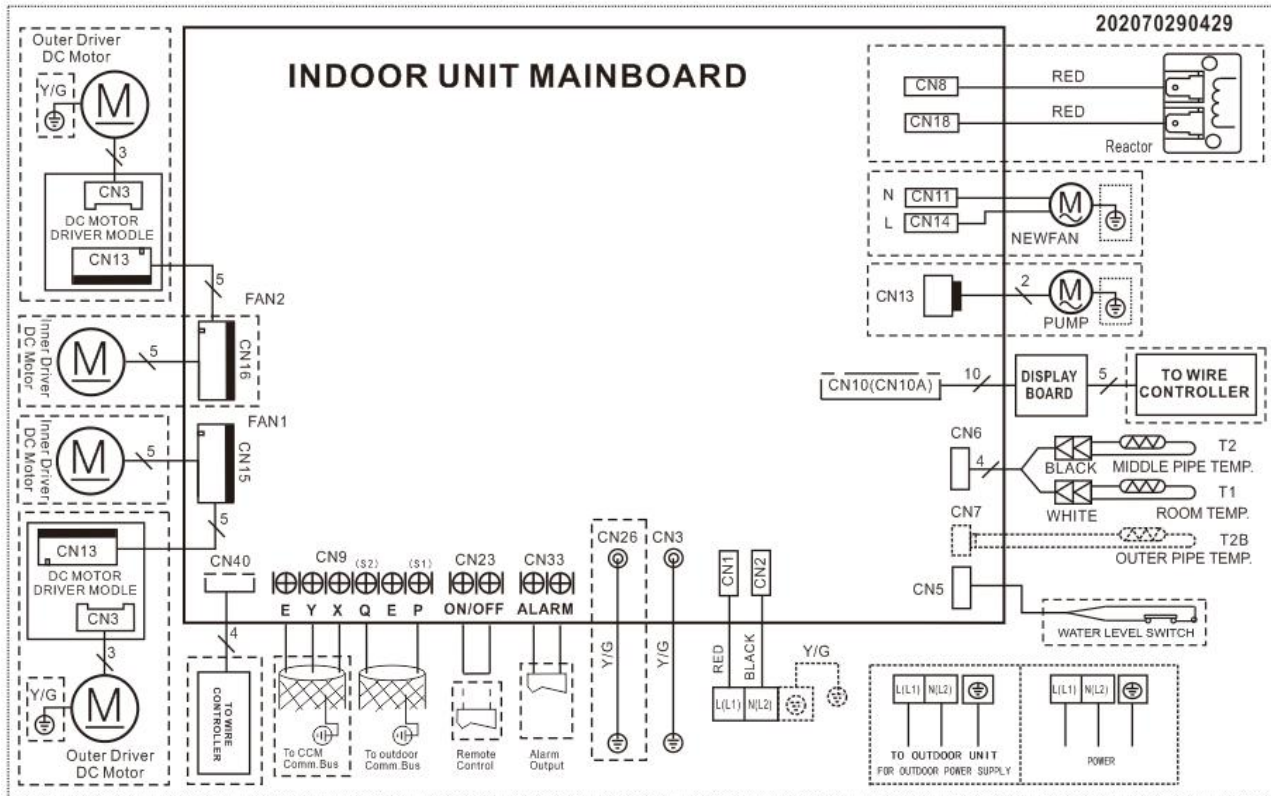
FPA-24



TPA-36DU, TPA-48DU



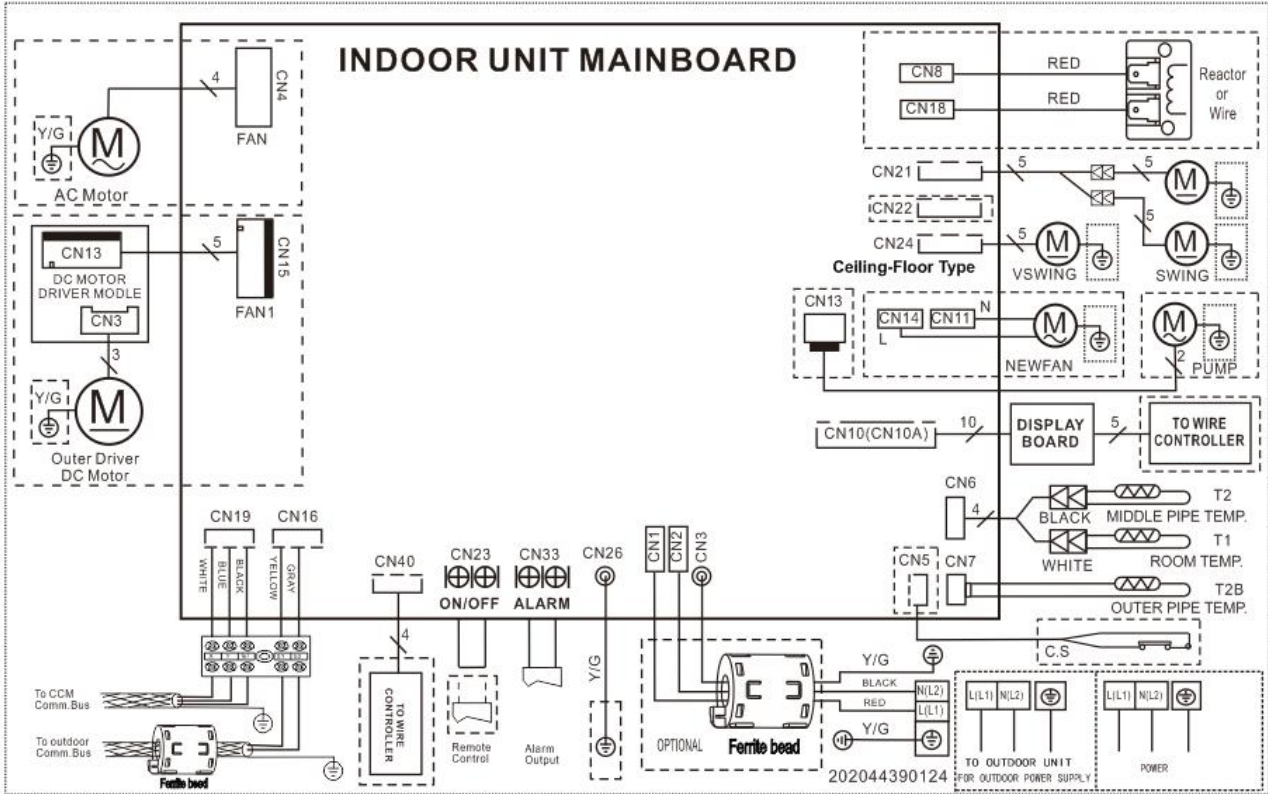
CPA-36DU, CPA-48DU



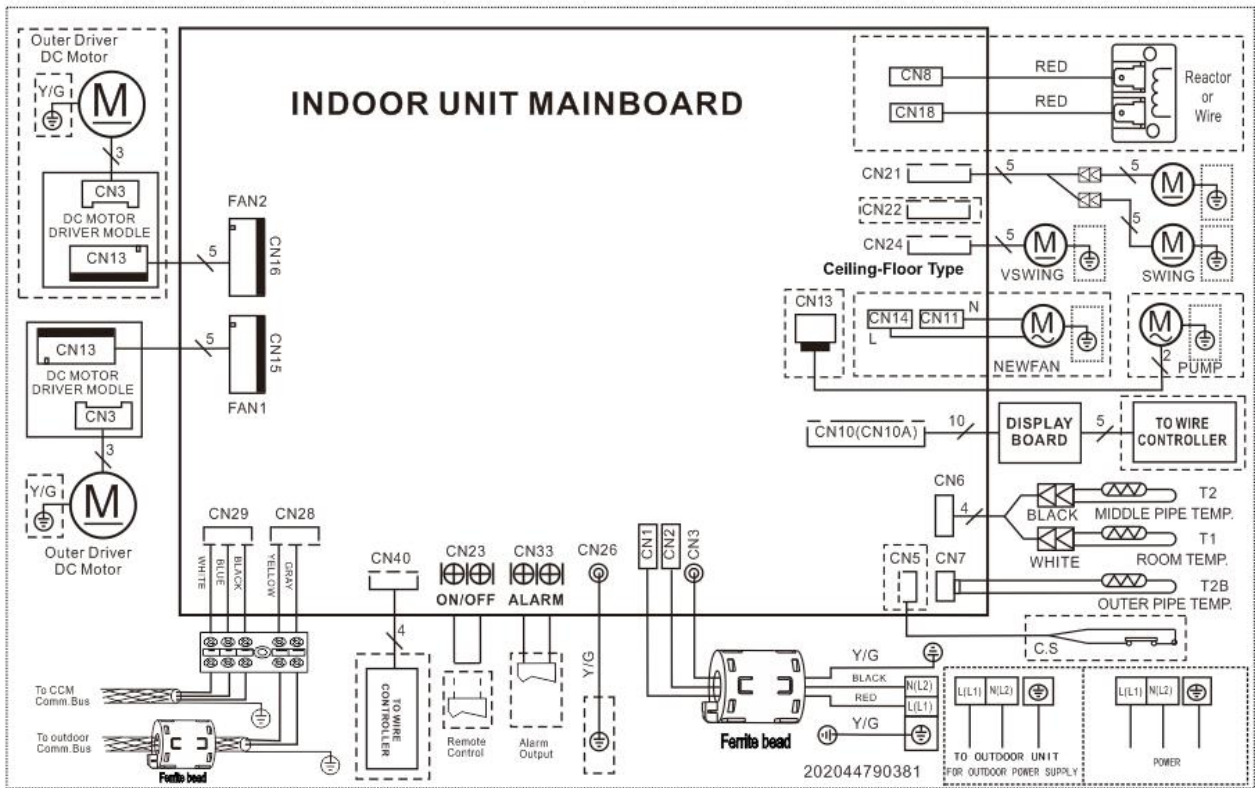
| FOR SETTING POWER | | | | | | | FOR ANTI-COLD WIND | | | | | |
|---|-----------------|-----------|--------|--------|---------|---------|---|-----------------|----------|--------------|--------|---|
| ENC1 | | | | | | | SW1 | | | | | |
| | CODE | 4 | 5 | 7 | 8 | 9 | A | B | TELO | 24°C | 15°C | Fan motor do not stop. According to the E Function. |
| POWER | ≤63 | 54~71 | 72~90 | 91~105 | 106~140 | 141~160 | ≥161 | FACTORY SETTING | ✓ | | | |
| FACTORY SETTING ACCORDING TO RELATED MODEL. | | | | | | | | | | | | |
| FOR SETTING NETADDRESS | | | | | | | FOR SETTING FAN MOTOR CONTROL THEN NO POWER REQUEST | | | | | |
| S1+S2 | | | | | | | SW2 | | | | | |
| | CODE | 0~F | 0~F | 0~F | 0~F | 0~F | 0~F | MODE | FAN OFF | FAN ON | | |
| NETADDRESS | 0~15 | 16~31 | 32~47 | 48~63 | | | FACTORY SETTING | ✓ | | | | |
| FACTORY SETTING ✓ | | | | | | | | | | | | |
| FOR SETTING STATIC PRESSURE | | | | | | | FOR SETTING AUTO-RESTART | | | | | |
| ENC2 | | | | | | | STATIC PRESSURE RANGE(Pa) | SW3 | | | | |
| | MODEL (K Btu/h) | MODEL ≤12 | 10(Pa) | 20(Pa) | 30(Pa) | 40(Pa) | | | 0-45(Pa) | AUTO-RESTART | ACTIVE | INACTIVE |
| MODEL | 12<MODEL ≤24 | 10(Pa) | 25(Pa) | 40(Pa) | 55(Pa) | 70(Pa) | 0-100(Pa) | FACTORY SETTING | ✓ | | | |
| MODEL | 24<MODEL ≤60 | 20(Pa) | 35(Pa) | 50(Pa) | 65(Pa) | 80(Pa) | 0-100(Pa) | | | | | |
| FACTORY SETTING ✓ | | | | | | | | | | | | |
| FOR TEMP. COMPENSATION | | | | | | | | | | | | |
| SW6 | | | | | | | | | | | | |
| | DUCT TYPE | 6°C | 2°C | 4°C | | | According to E Function. | | | | | |
| FACTORY SETTING | ✓ | | | | | | | | | | | |

FUNCTION SETTING INDICATION

FPA-36DU



FPA-48DU



FPA-36DU, FPA-48DU

| For Setting NETAddress | | | | |
|------------------------|-------------------------------------|--------|--------|--------|
| S1+S2 | | | | |
| Code | 0~F 00 | 0~F 01 | 0~F 10 | 0~F 11 |
| NETAddress | 0~15 | 16~31 | 32~47 | 48~63 |
| Factory Setting | <input checked="" type="checkbox"/> | | | |

| FOR ANTI-COLD WIND | | | |
|--------------------|-------------------------------------|-----|-------------------------------------|
| SW1 | | | |
| TELO | 24℃ | 15℃ | Fan motor do not stop. |
| FACTORY SETTING | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> |

| FOR SETTING POWER | | | | | | |
|-------------------|-----------------------------|-------|-------|--------|---------|---------|
| ENC1 | | | | | | |
| CODE | 4 | 5 | 7 | 8 | 9 | A |
| POWER | ≤53 | 54~71 | 72~90 | 91~105 | 106~140 | 141~160 |
| FACTORY SETTING | ACCORDING TO RELATED MODEL. | | | | | |

| FOR SETTING AUTO-RESTART | | | |
|--------------------------|-------------------------------------|----------|--|
| SW3 | | | |
| AUTO-RESTART | ACTIVE | INACTIVE | |
| FACTORY SETTING | <input checked="" type="checkbox"/> | | |

| For temp. compensation | | | |
|--|-------------------------------------|--------------|-------------------------|
| SW6 | | | |
| CEILING AND FLOOR TYPE | 0℃ | 2℃ | 4℃ |
| For Setting CEILING TYPE or FLOOR TYPE | FLOOR TYPE | CEILING TYPE | According to E Function |
| Factory Setting | <input checked="" type="checkbox"/> | | |

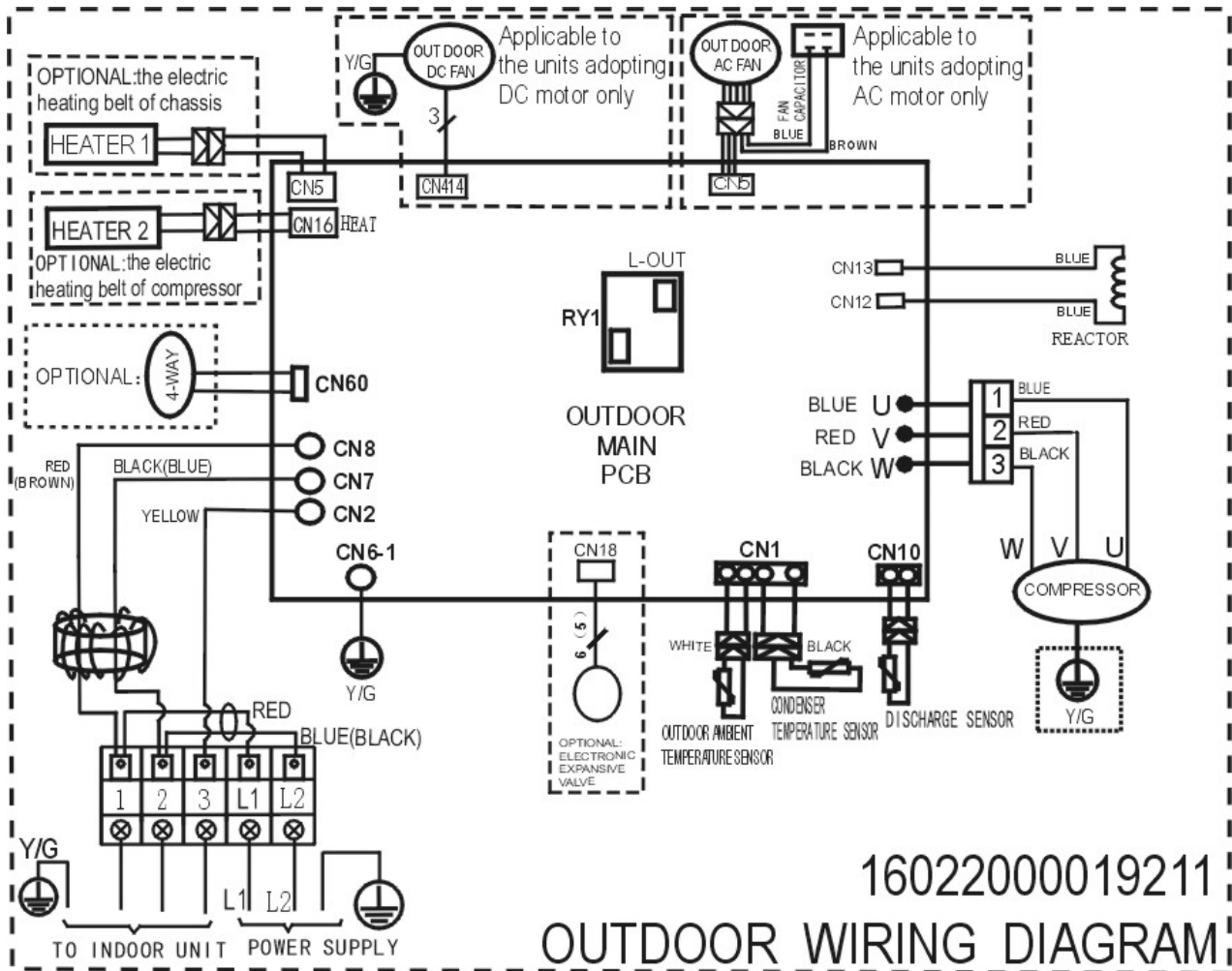
| For Setting Fan Quantity (optional) | | |
|-------------------------------------|------------|-------------------------------------|
| SW4 | | |
| Mode | Single Fan | Double Fan |
| Factory Setting | | <input checked="" type="checkbox"/> |

| For Setting Fan Motor Control then No Power Request | | |
|---|---------|-------------------------------------|
| SW2 | | |
| Mode | Fan OFF | Fan ON |
| Factory Setting | | <input checked="" type="checkbox"/> |

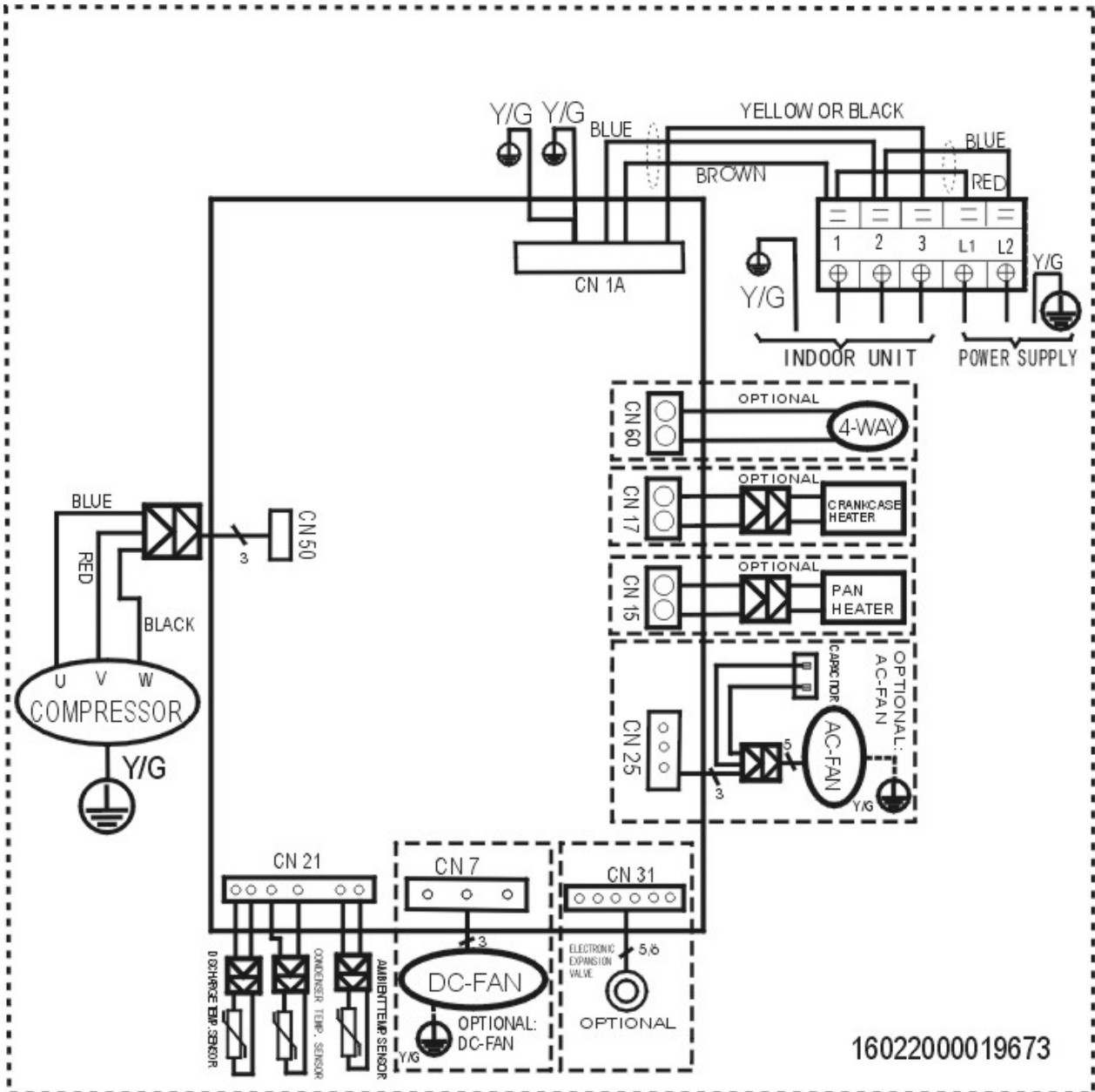
**FUNCTION SETTING
INDICATION
202044690388**

6.2 Outdoor Unit

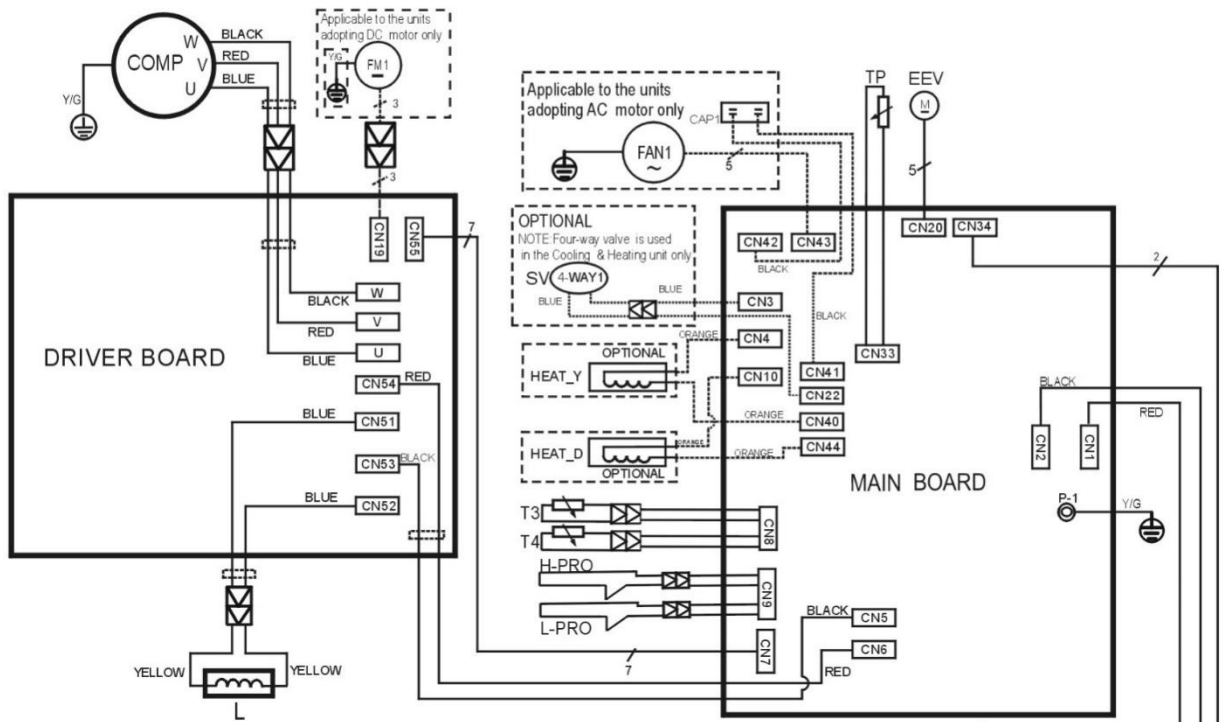
CPP018CD(O) , CPP024CD(O)



CPP009CD(O), CPP012CD(O)

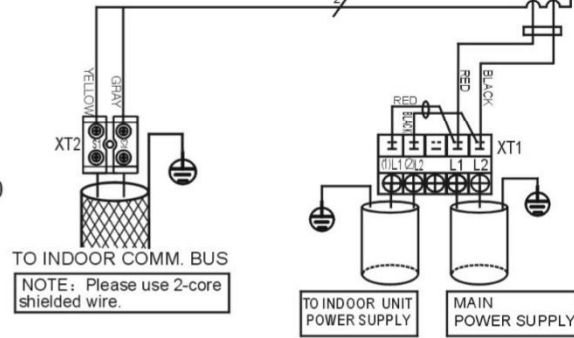


CPP036CD(O)-DU



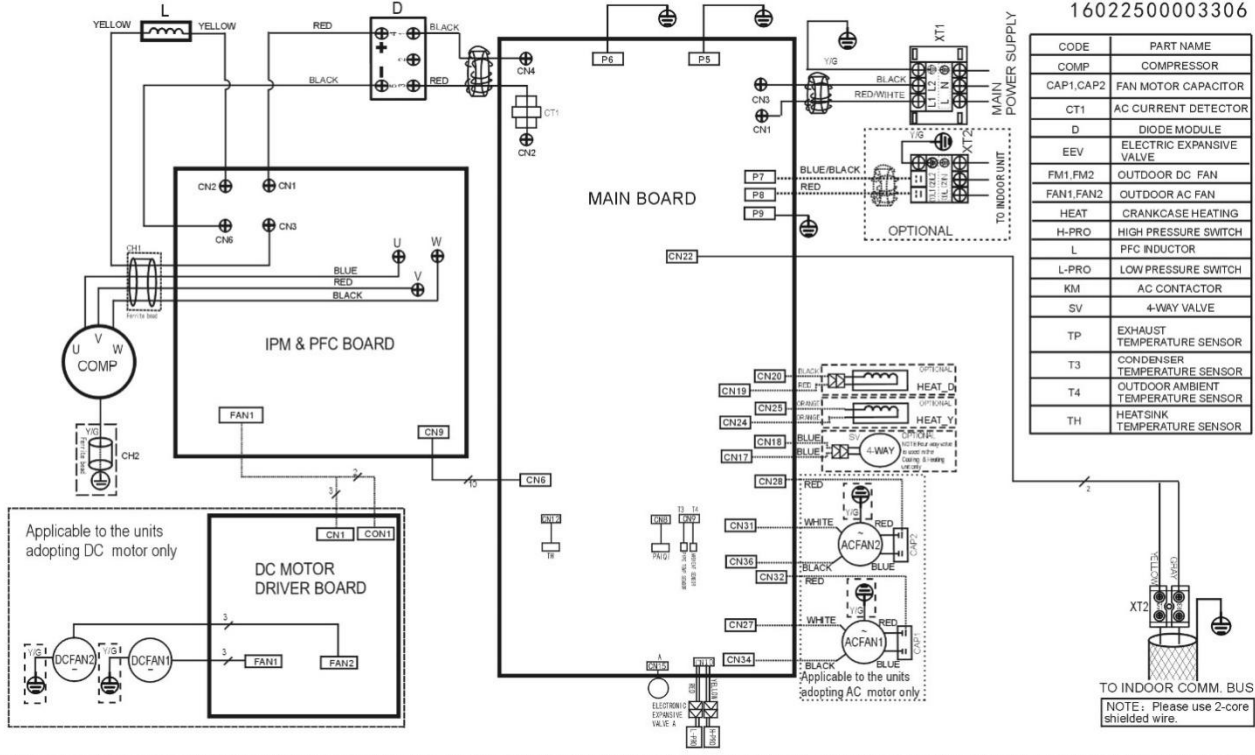
| CODE | PART NAME |
|-------|------------------------------------|
| COMP | COMPRESSOR |
| CAP1 | FAN MOTOR CAPACITOR |
| EEV | ELECTRIC EXPANSIVE VALVE |
| FM1 | OUTDOOR DC FAN |
| FAN1 | OUTDOOR AC FAN |
| HEAT | CRANKCASE HEATING |
| H-PRO | HIGH PRESSURE SWITCH |
| L | PFC INDUCTOR |
| L-PRO | LOW PRESSURE SWITCH |
| SV | 4-WAY VALVE |
| TP | EXHAUST TEMPERATURE SENSOR |
| T3 | CONDENSER TEMPERATURE SENSOR |
| T4 | OUTDOOR AMBIENT TEMPERATURE SENSOR |
| TH | HEATSINK TEMPERATURE SENSOR |

1602270000800








CPP048CD(O)-DU

WIRING DIAGRAM (OUTDOOR UNIT)
16022500003306

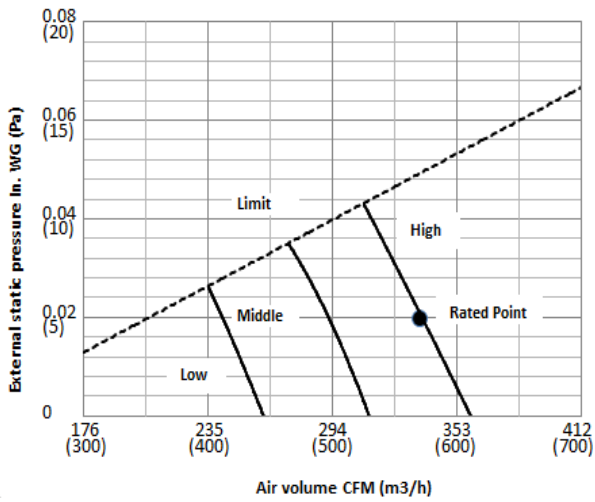


7. Fan Curves

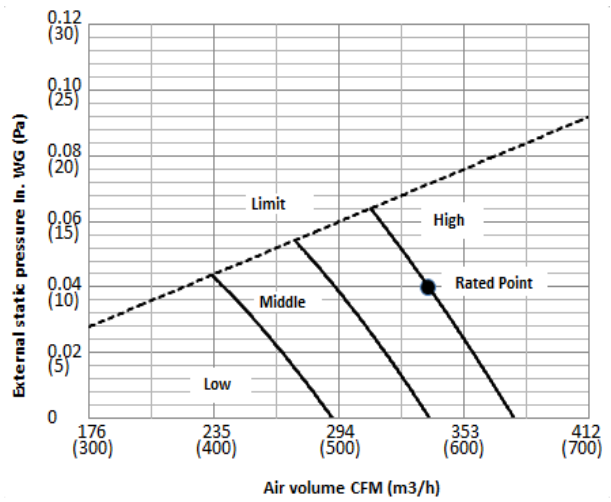
| ENC2 | |  |  |  |  |  | Static Pressure Range In. WG (Pa) |
|--------------------|-----------------|---|---|---|--|---|--------------------------------------|
| Model (K Btu/h) | Model | 0 | 1 | 2 | 3 | 4 | |
| | Model ≤ 12 | 0.02 (5) | 0.04 (10) | 0.08 (20) | 0.12 (30) | 0.16 (40) | 0-0.18 (0-45) |
| | Model = 18 | 0.04 (10) | 0.10 (25) | 0.14 (35) | 0.18 (45) | 0.22 (55) | 0-0.28 (0-70) |
| | 18 < Model ≤ 24 | 0.04 (10) | 0.10 (25) | 0.16 (40) | 0.22 (55) | 0.28 (70) | 0-0.40 (0-100) |
| | 24 < Model ≤ 60 | 0.08 (20) | 0.14 (35) | 0.20 (50) | 0.26 (65) | 0.32 (80) | 0-0.40 (0-100) |
| Factory Setting | | √ | | | | | |

CPA-09,

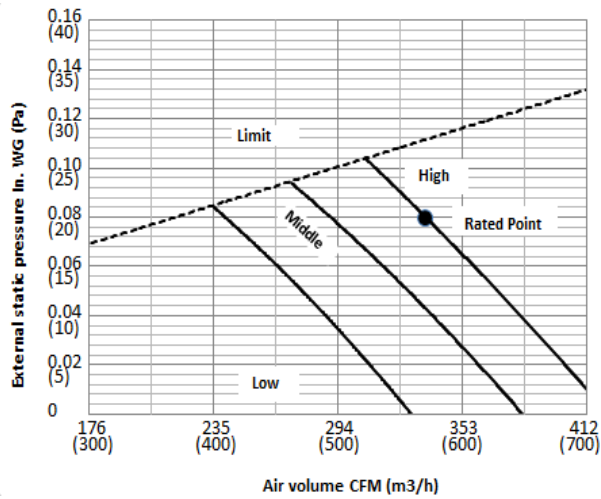
Code 0



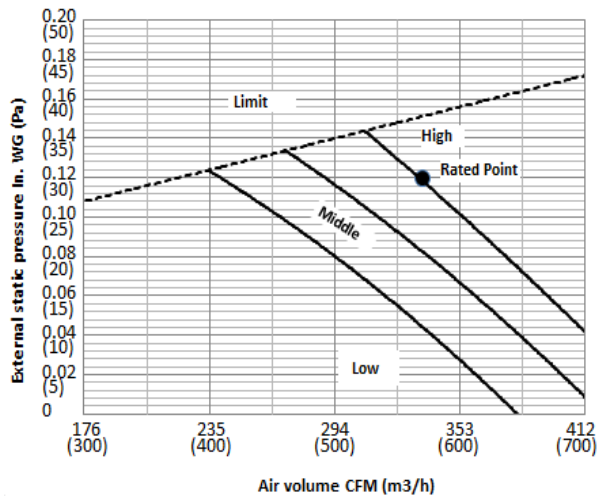
Code 1



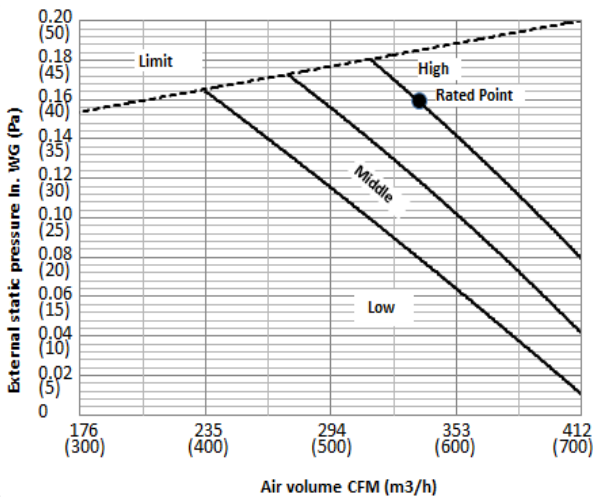
Code 2



Code 3

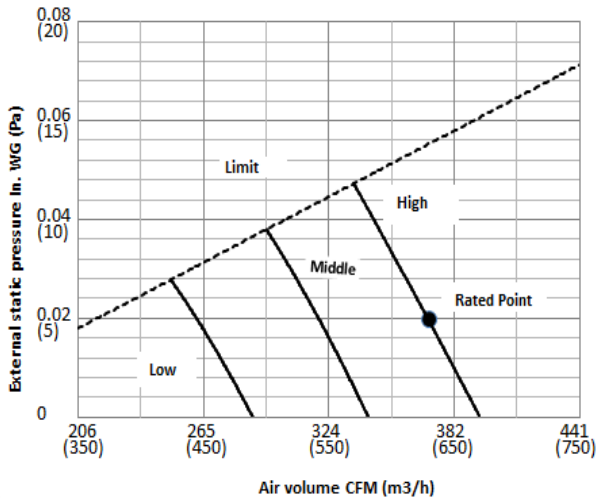


Code 4

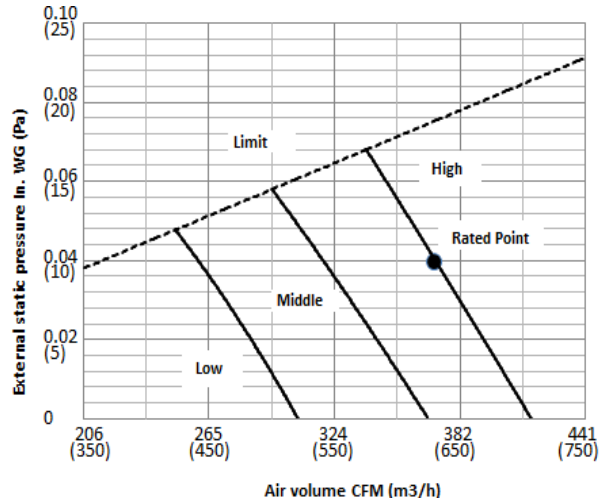


CPA-12

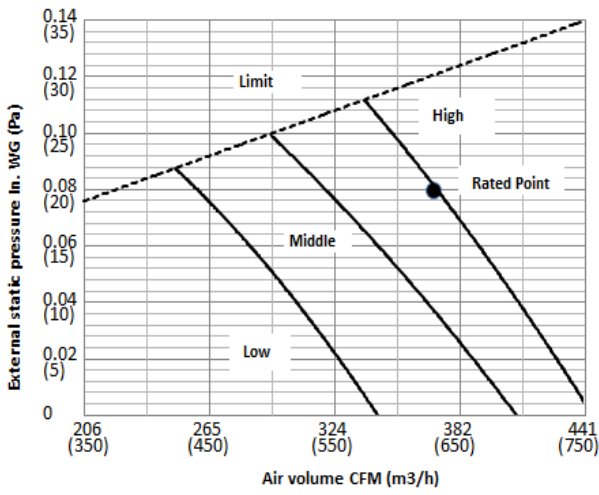
Code 0



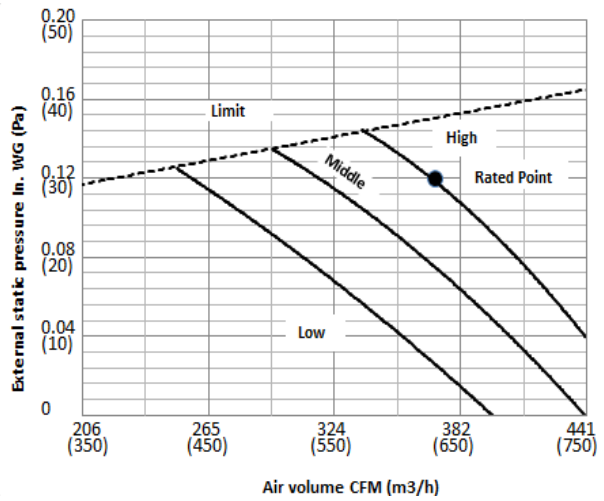
Code 1



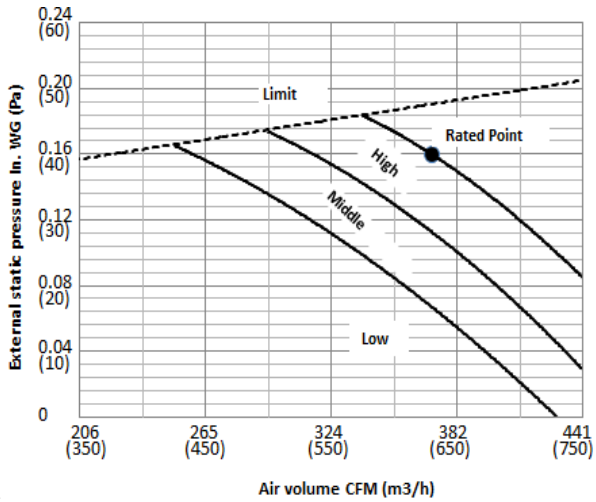
Code 2



Code 3

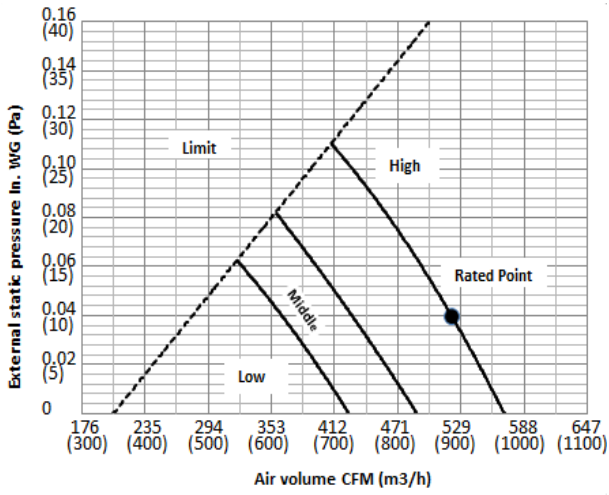


Code 4

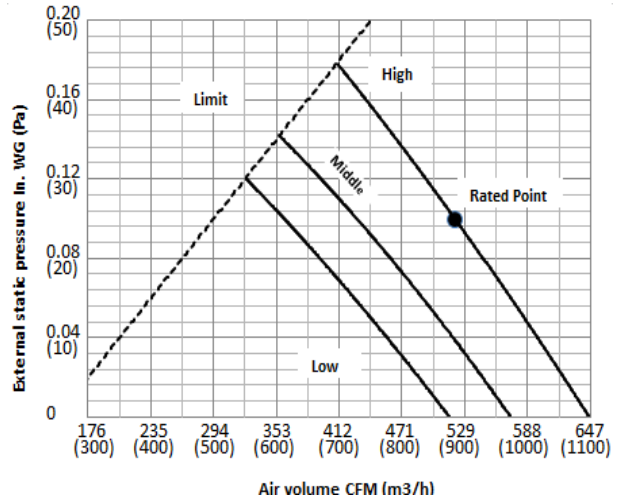


CPA-18

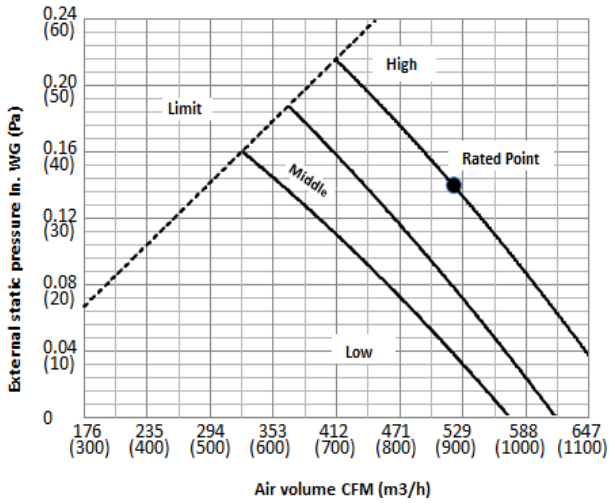
Code 0



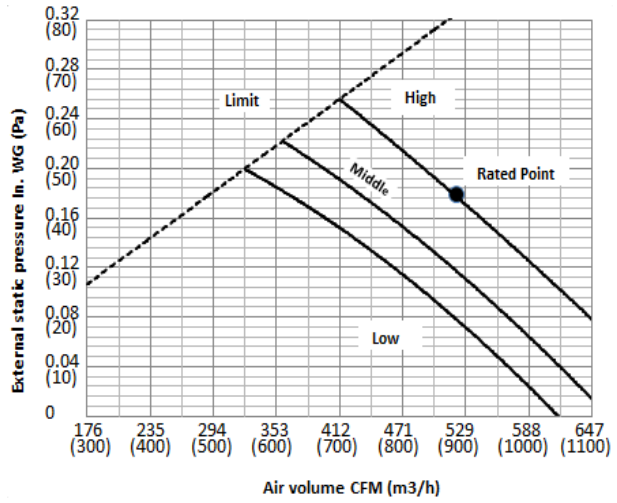
Code 1



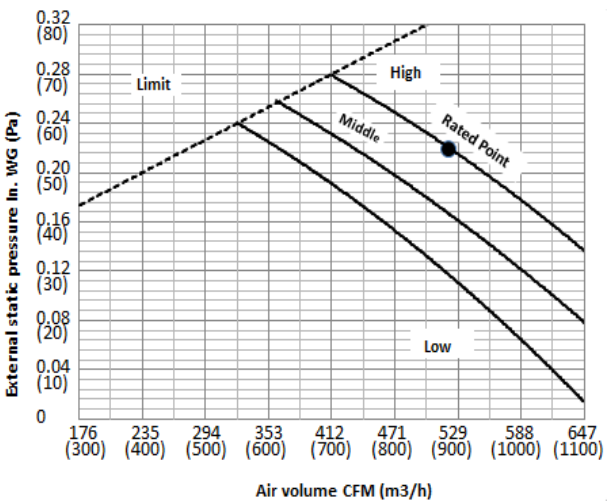
Code 2



Code 3

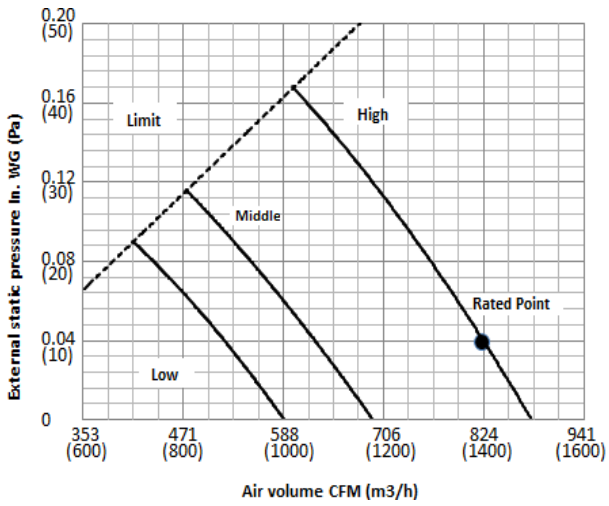


Code 4

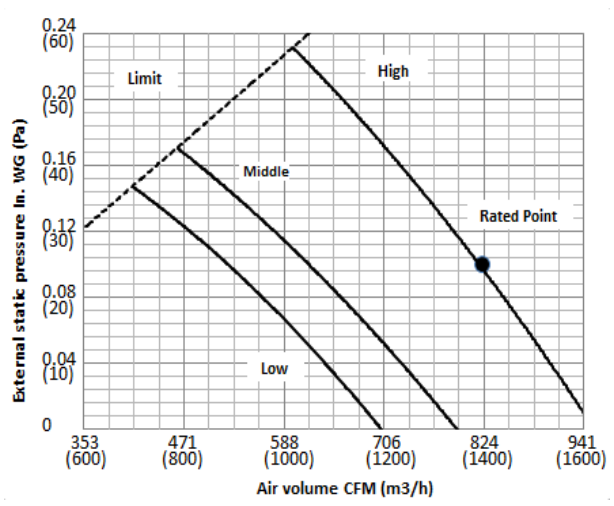


CPA-24

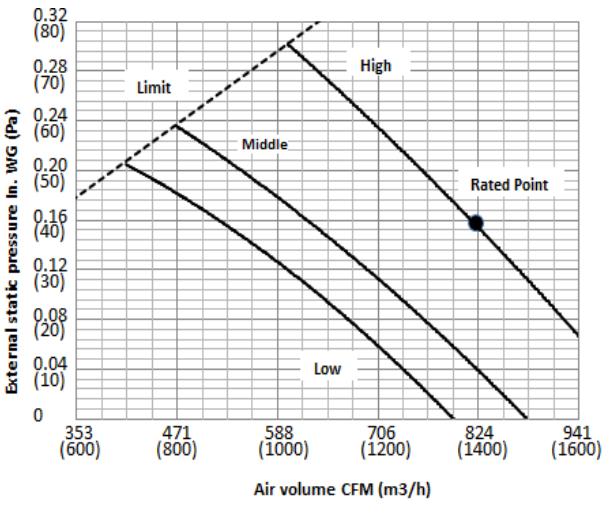
Code 0



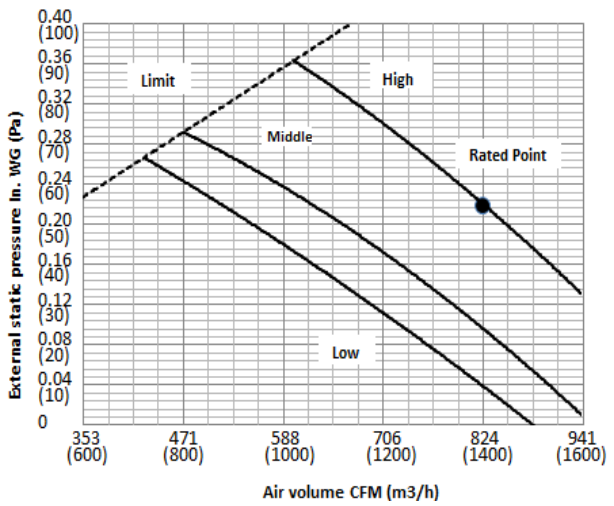
Code 1



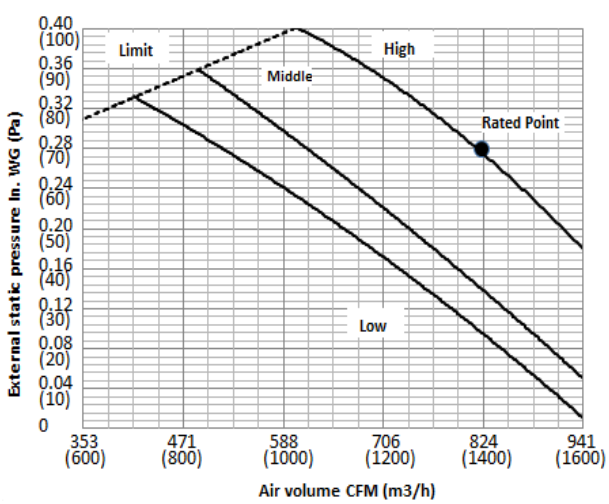
Code 2



Code 3

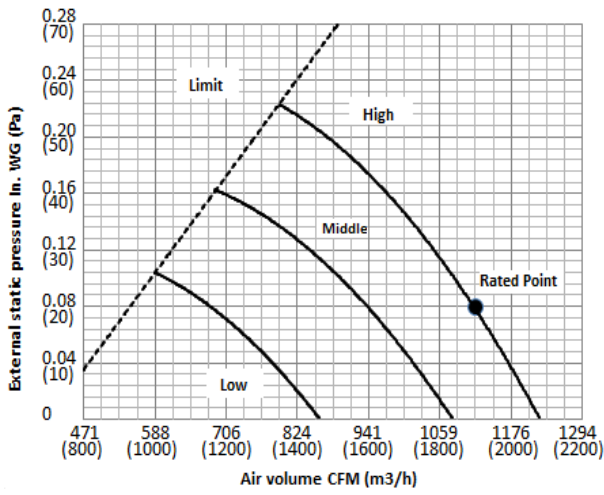


Code 4

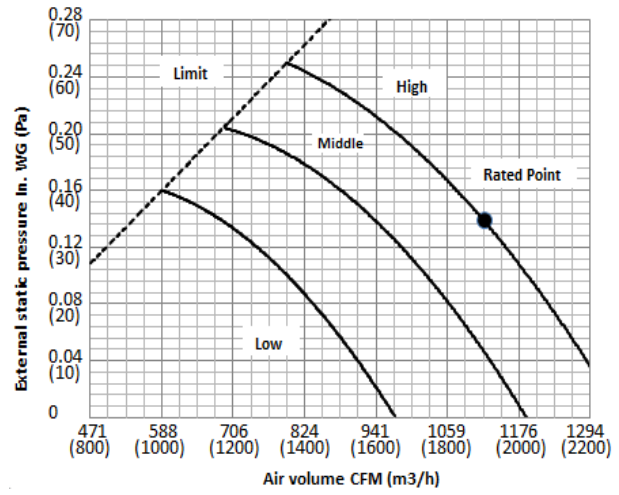


CPA-36DU

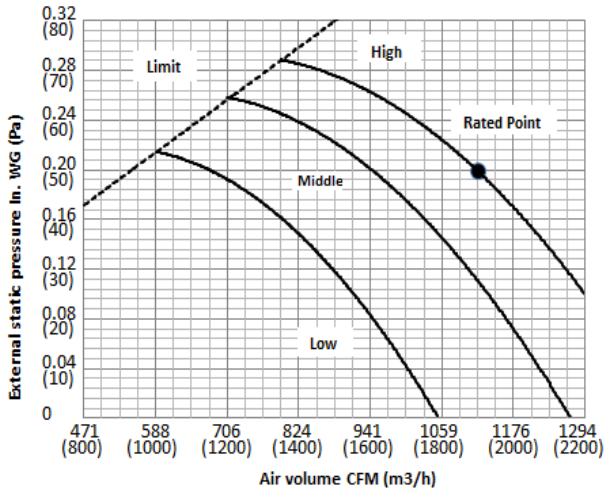
Code 0



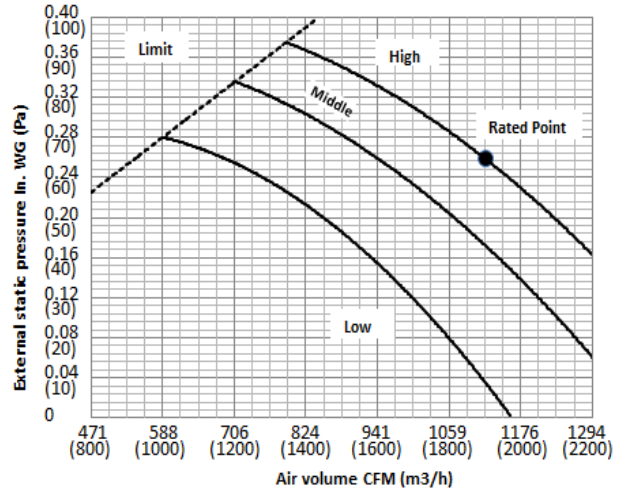
Code 1



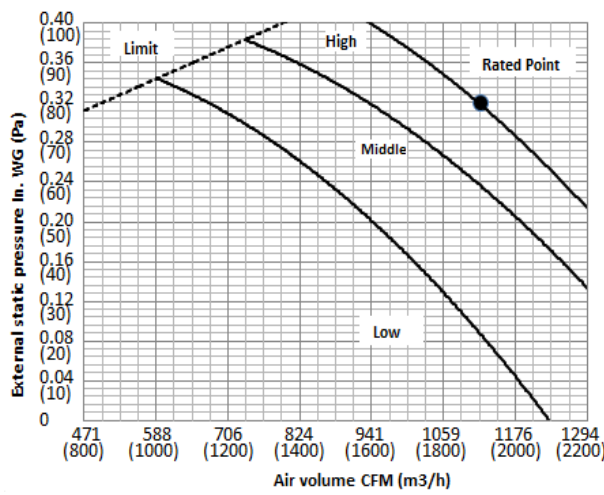
Code 2



Code 3

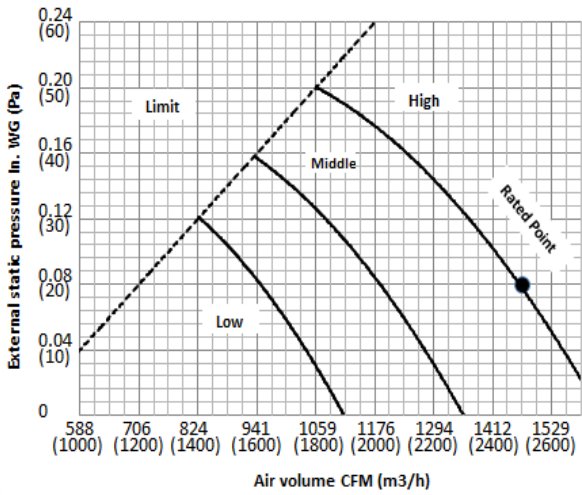


Code 4

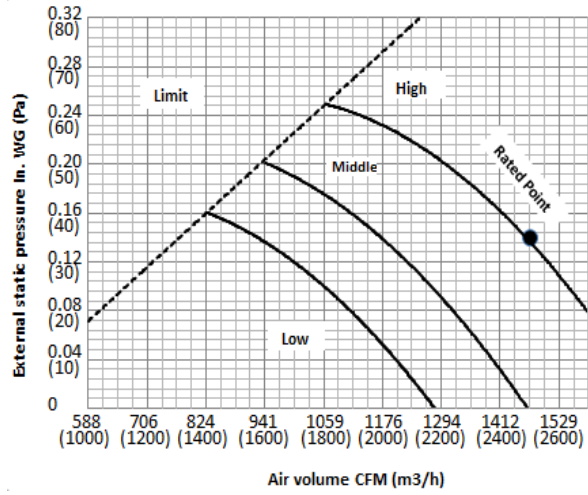


CPA-48DU

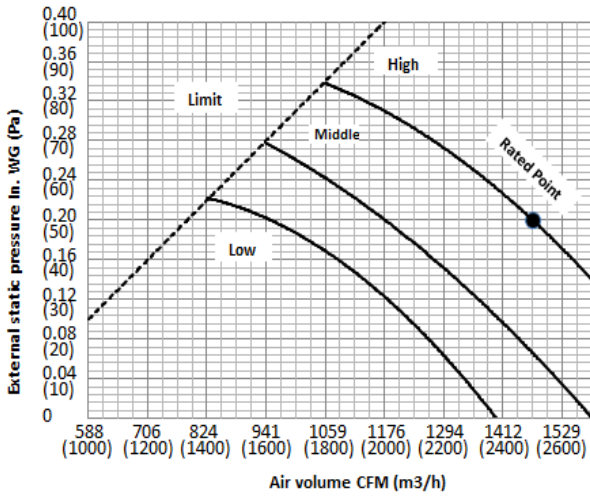
Code 0



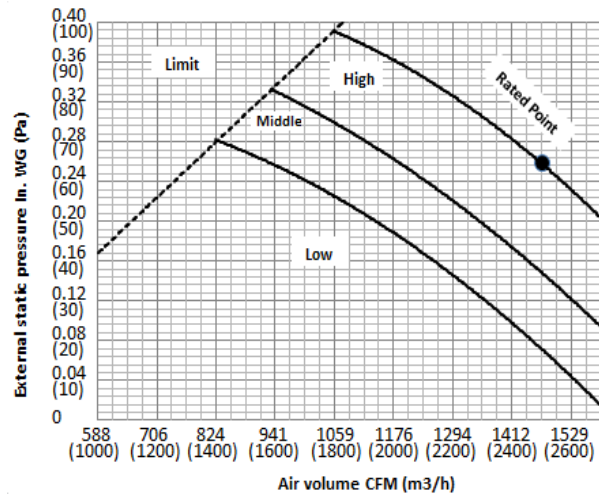
Code 1



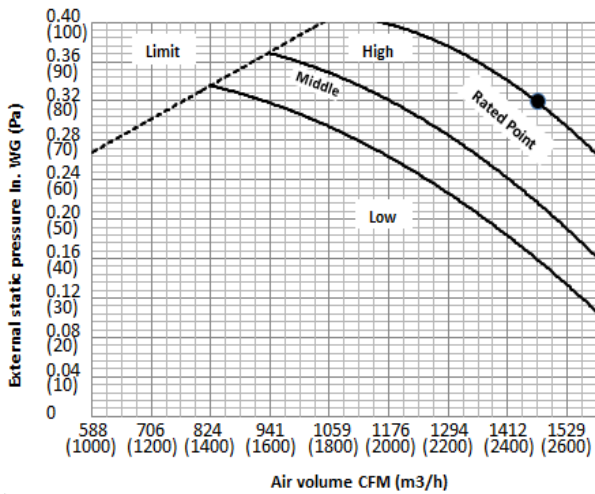
Code 2



Code 3



Code 4

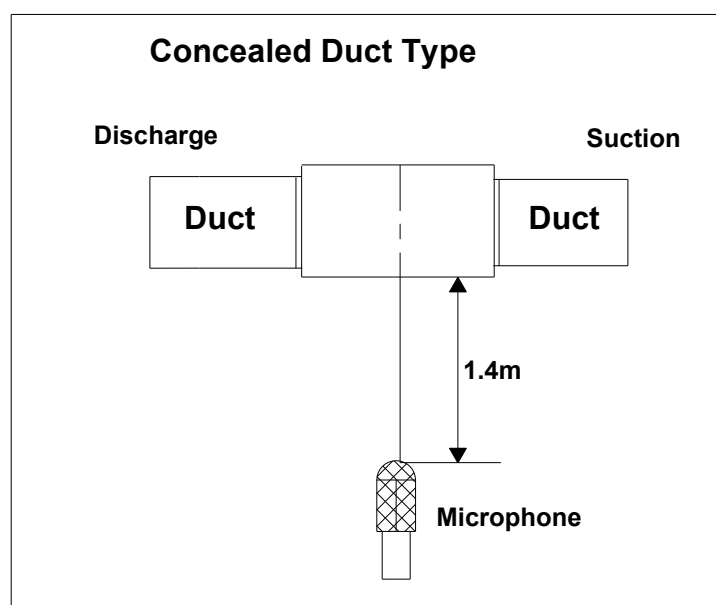


8 Electric Characteristics

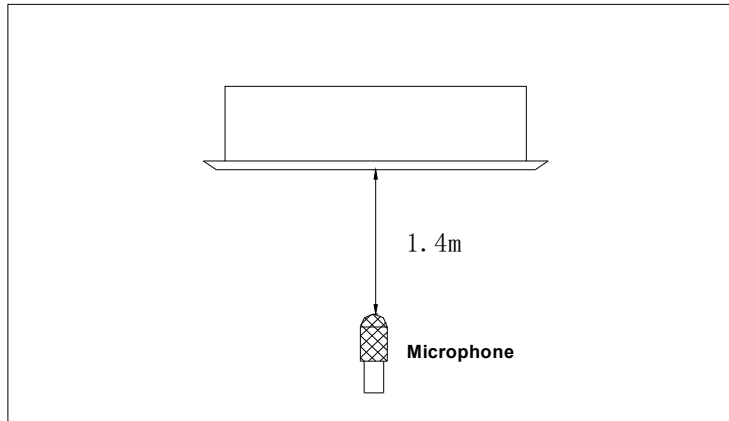
| Model | Indoor Unit | | | |
|----------|-------------|-------------------|------|------|
| | Hz | Voltage | Min. | Max. |
| TPA-09 | 60 | 208-230V | 187V | 253V |
| CPA-09 | 60 | 208-230V | 187V | 253V |
| TPA-12 | 60 | 208-230V | 187V | 253V |
| CPA-12 | 60 | 208-230V | 187V | 253V |
| FPA-24 | 60 | 208-230V | 187V | 253V |
| TPA-18 | 60 | 208-230V | 187V | 253V |
| CPA-18 | 60 | 208-230V | 187V | 253V |
| FPA-18 | 60 | 208-230V <td 187V | 253V | |
| CPA-24 | 60 | 208-230V | 187V | 253V |
| FPA-24 | 60 | 208-230V | 187V | 253V |
| TPA-36DU | 60 | 208-230V | 187V | 253V |
| CPA-36DU | 60 | 208-230V | 187V | 253V |
| FPA-36DU | 60 | 208-230V | 187V | 253V |
| TPA-48DU | 60 | 208-230V | 187V | 253V |
| CPA-48DU | 60 | 208-230V | 187V | 253V |
| FPA-48DU | 60 | 208-230V | 187V | 253V |

9 Sound Level

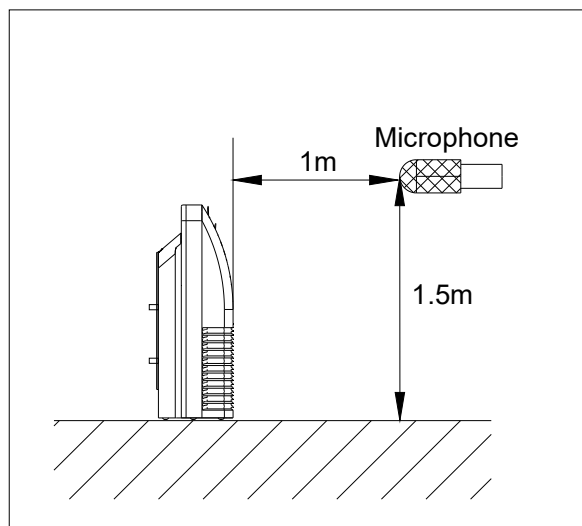
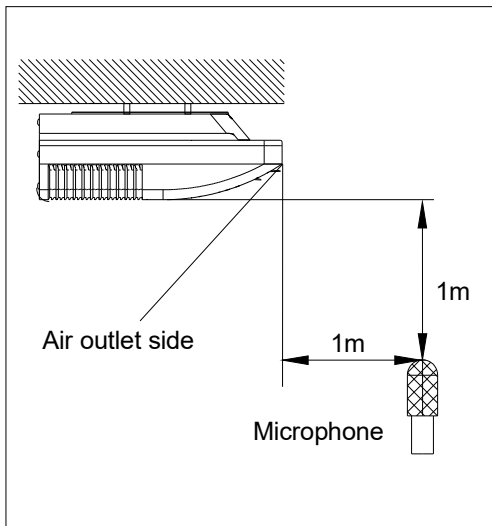
9.1 Indoor unit



| Model | Noise level dB(A) | | |
|----------|-------------------|----|----|
| | H | M | L |
| CPA-09 | 37 | 34 | 31 |
| CPA-12 | 39 | 36 | 32 |
| CPA-18 | 35 | 33 | 31 |
| CPA-24 | 50 | 47 | 45 |
| CPA-36DU | 53 | 49 | 45 |
| CPA-48DU | 44 | 47 | 41 |



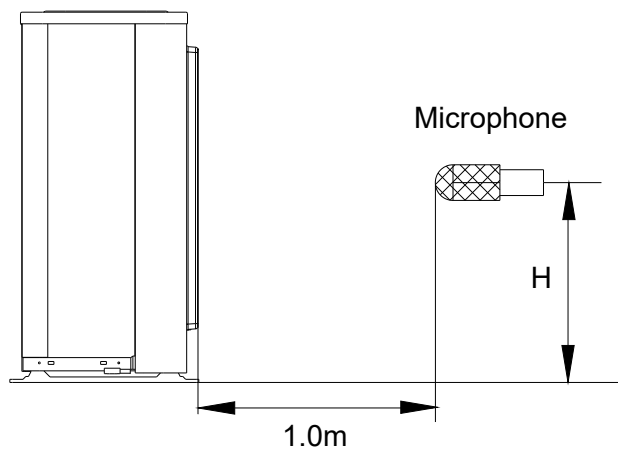
| Model | Noise level dB(A) | | |
|----------|-------------------|----|----|
| | H | M | L |
| TPA-09 | 41 | 39 | 37 |
| TPA-12 | 41 | 38 | 35 |
| TPA-18 | 46 | 43 | 41 |
| TPA-36DU | 52 | 47 | 44 |
| TPA-48DU | 53 | 49 | 45 |



| Model | Noise level dB(A) | | |
|----------|-------------------|----|----|
| | H | M | L |
| FPA-18 | 47 | 44 | 38 |
| FPA-24 | 53 | 49 | 45 |
| FPA-36DU | 55 | 48 | 41 |
| FPA-48DU | 57 | 54 | 52 |

9.2 Outdoor unit

Outdoor Unit




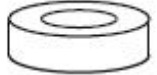






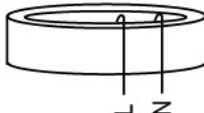
Note: $H = 0.5 \times \text{height of outdoor unit}$

| Model | Noise Level dB(A) |
|-------------|-------------------|
| CPP009CD(O) | 56 |
| CPP012CD(O) | 57 |
| CPP018CD(O) | 59 |
| CPP024CD(O) | 61 |

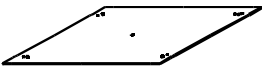






| | |
|----------------|----|
| CPP036CD(O)-DU | 65 |
| CPP048CD(O)-DU | 63 |







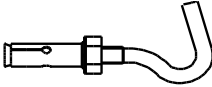

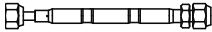
10 Accessories

Duct Units






| | Name | Shape | Quantity |
|---|--|---|----------|
| Tubing & Fittings | Soundproof / insulation sheath |  | 2 |
| | Binding tape |  | 1 |
| | Seal sponge |  | 1 |
| Drainpipe Fittings (for cooling & heating) | Drain joint |  | 1 |
| | Seal ring |  | 1 |
| Wired controller & Its Frame | Wired controller |  | 1 |
| Others | Owner' s manual |  | 1 |
| | Installation manual |  | 1 |
| EMS & It's fitting | Magnetic ring (twist the electric wires L and N around it to five circles) |  | 1 |

Cassette Units








| | Name | Shape | Quantity |
|---|--------------------------------|---|----------|
| Installation Fittings | Installation paper board |  | 1 |
| Tubing & Fittings | Soundproof / insulation sheath |  | 1 |
| Drainpipe Fittings | Out-let pipe sheath |  | 1 |
| | Out-let pipe clasp |  | 1 |
| | Drain joint |  | 1 |
| | Seal ring |  | 1 |
| Remote controller & Its Frame (The product you have might not be | Remote controller & Its Frame |  | 1 |

| | | | |
|---|------------------------------|---|---|
| provided the following accessories) | Remote controller holder |  | 1 |
| | Mounting screw(ST2.9×10-C-H) |  | 2 |
| | Remote controller manual |  | 1 |
| | Alkaline dry batteries (AM4) |  | 2 |
| Others | Owner's manual |  | 1 |
| | Installation manual |  | 1 |
| Installation accessory (The product you have might not be provided the following accessories | Expansible hook |  | 4 |
| | Installation hook |  | 4 |
| | Orifice |  | 1 |

Console Units

| | Name | Shape | Quantity |
|------------------------------|--|---|---|
| Installation fittings | Hook |  | 2 |
| | Remote controller & Its Frame | Remote controller |  |
| Frame | |  | 1 |
| Mounting screw(ST2.9×10-C-H) | |  | 2 |
| Alkaline dry batteries (AM4) | |  | 2 |
| Others | Installation manual | / | 1 |
| | Owner's manual | / | 1 |

Ceiling-floor Units

| | | | |
|--------------------------------|----------------------------------|---|---|
| Remote controller & Its holder | 1. Remote controller |  | 1 |
| | 2. Remote controller holder |  | 1 |
| | 3. Mounting screw (ST2.9×10-C-H) |  | 2 |
| | 4. Alkaline dry batteries (AM4) |  | 2 |
| Others | 5. Owner's manual |  | 1 |
| | 6. Installation manual |  | 1 |
| | 7. Remote controller manual |  | 1 |

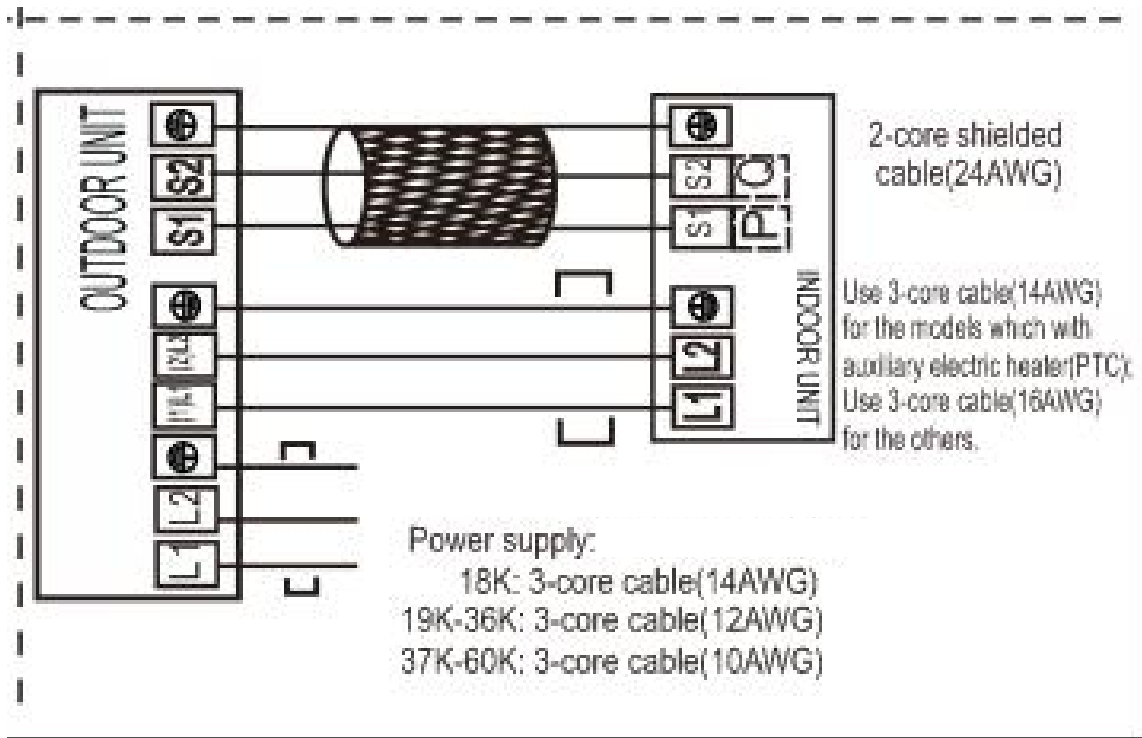
11 The Specification of Power

| Type | | 9K-18K | 24K |
|---|---------------------------|----------------|----------------|
| Power | Phase | 1-phase | 1-phase |
| | Frequency and Voltage | 208-230V, 60Hz | 208-230V, 60Hz |
| Circuit Breaker/ Fuse (A) | | 25/20 | 40/30 |
| Indoor Unit Power Wiring (mm ²) | | ————— | ————— |
| Indoor/Outdoor Connecting Wiring | Ground Wiring | 2.5 | 2.0 |
| | Outdoor Unit Power Wiring | 3×2.5 | 3×2.0 |
| | Strong Electric Signal | 4×1.0 | 4×1.5 |
| | Weak Electric Signal | ————— | ————— |

| Model | | 36K | 48K |
|---|---------------------------|----------------|----------------|
| Power | Phase | 1-phase | 1-phase |
| | Frequency and Voltage | 208-230V, 60Hz | 208-230V, 60Hz |
| Circuit Breaker/ Fuse (A) | | 60/40 | 70/55 |
| Indoor Unit Power Wiring (mm ²) | | ————— | ————— |
| Indoor/Outdoor Connecting Wiring | Ground Wiring | 4.0 | 4.0 |
| | Outdoor Unit Power Wiring | 3×4.0 | 3×4.0 |
| | Strong Electric Signal | 3×1.5 | 3×1.5 |
| | Weak Electric Signal | 3×0.5 | 3×0.5 |

12 Field Wiring

36K, 48K



12 Installation Details

12.1 Location selection

12.1.1 Indoor unit location selection

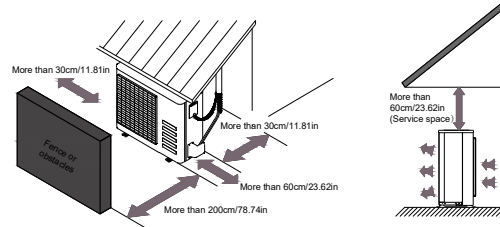
- The place shall easily support the indoor unit's weight.
- The place can ensure the indoor unit installation and inspection.
- The place can ensure the indoor unit horizontally installed.
- The place shall allow easy water drainage.
- The place shall easily connect with the outdoor unit.
- The place where air circulation in the room should be good.
- There should not be any heat source or steam near the unit.
- There should not be any oil gas near the unit
- There should not be any corrosive gas near the unit
- There should not be any salty air near the unit
- There should not be strong electromagnetic wave near the unit
- There should not be inflammable materials or gas near the unit
- There should not be strong voltage vibration.

12.1.2 Outdoor unit location selection

- The place shall easily support the outdoor unit's weight.
- Locate the outdoor unit as close to indoor unit as possible
- The piping length and height drop cannot exceed the allowable value.
- The place where the noise, vibration and outlet air do not disturb the neighbors.
- There is enough room for installation and maintenance.
- The air outlet and the air inlet are not impeded, and not face the strong wind.
- It is easy to install the connecting pipes and cables.
- There is no danger of fire due to leakage of inflammable gas.
- It should be a dry and well ventilation place
- The support should be flat and horizontal
- Do not install the outdoor unit in a dirty or severely polluted place, so as to avoid

blockage of the heat exchanger in the outdoor unit.

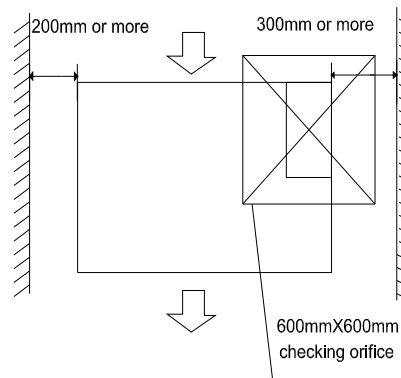
- If is built over the unit to prevent direct sunlight, rain exposure, direct strong wind, snow and other scraps accumulation, make sure that heat radiation from the condenser is not restricted.



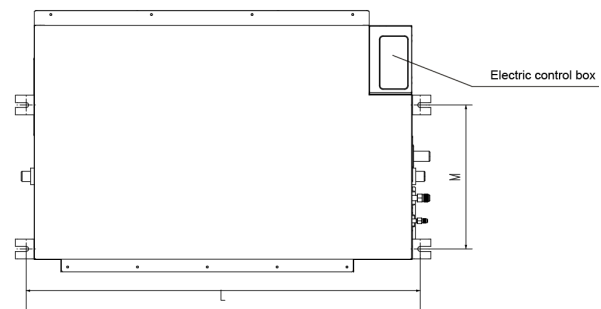
12.2 Indoor unit installation

12.2.1 A5 duct indoor unit installation

12.2.1.1 Service space for indoor unit



12.2.1.2 Bolt pitch



| Capacity(KBtu) | Size of outline dimension mounted plug | |
|----------------|--|-----|
| | L | M |
| 12 | 740 | 350 |

12.2.1.3 Install the pendant bolt

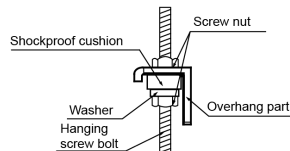
Select the position of installation hooks according to the hook holes positions showed in upper picture.

Drill four holes of Ø12mm, 45~50mm deep at the selected positions on the ceiling. Then embed the expansible hooks (fittings).



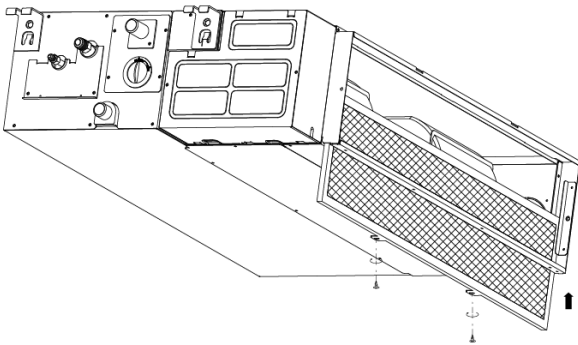
12.2.1.4 Install the main body

Make the 4 suspender through the 4 hanger of the main body to suspend it. Adjust the hexangular nuts on the four installation hooks evenly, to ensure the balance of the body. Use a leveling instrument to make sure the levelness of the main body is within $\pm 1^\circ$.



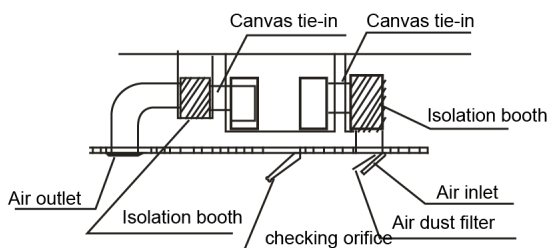
12.2.1.5 Install the air filter

Insert the air filter through the filter slot and fix it with 2 screws.



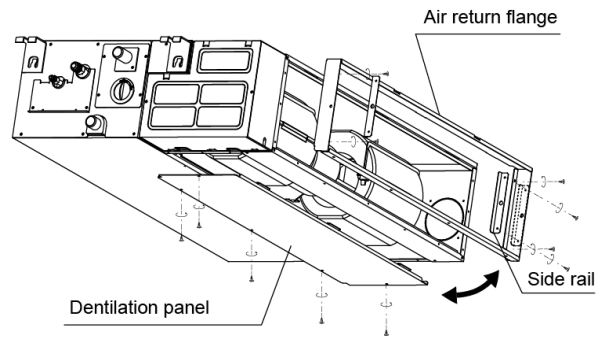
12.2.1.6 Install the air duct

Please design the air duct as below recommended picture

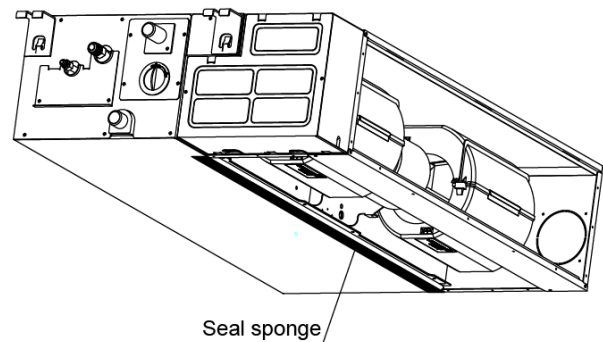


12.2.1.7 Change the air inlet direction

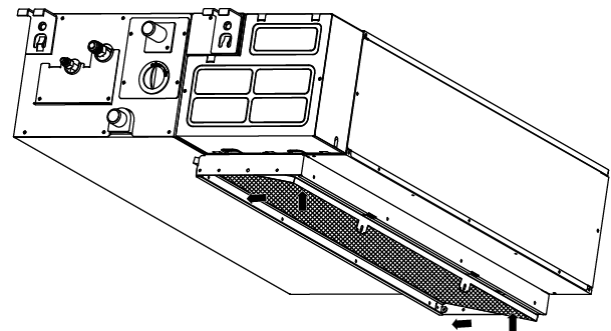
① Take off ventilation panel and flange, cut off the staples at side rail.



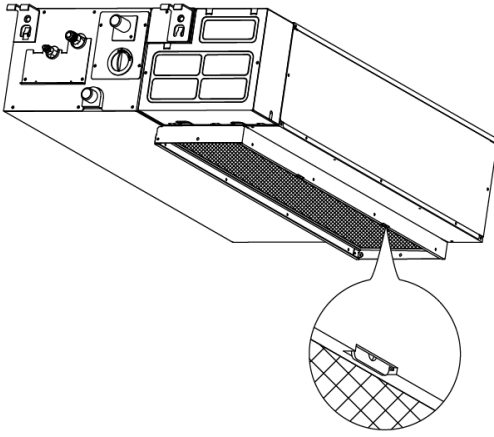
② Stick the attached seal sponge as per the indicating place in the following fig, and then change the mounting positions of air return panel and air return flange .



③ When install the filter mesh, please plug it into flange inclined from air return opening, and then push up.

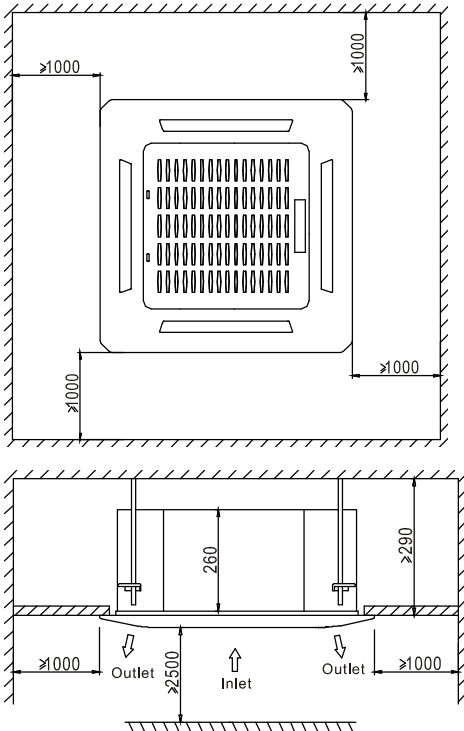


④ The installation has finish, upon filter mesh which fixing blocks have been insert to the flange positional holes.

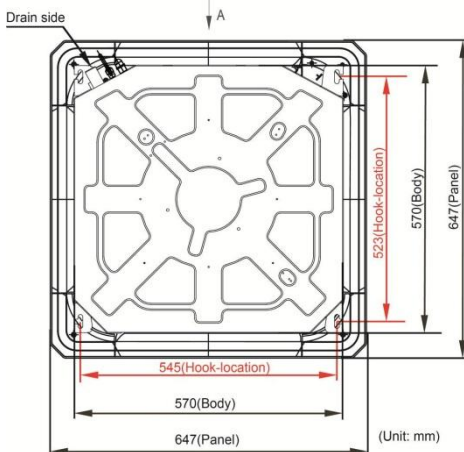


12.2.2 Cassette indoor unit installation

12.2.2.1 Service space for indoor unit



12.2.2.2 Bolt pitch



12.2.2.3 Install the pendant bolt

Select the position of installation hooks according to the hook holes positions showed in upper picture.

Drill four holes of $\varnothing 12\text{mm}$, 45~50mm deep at the selected positions on the ceiling. Then embed the expansible hooks (fittings).

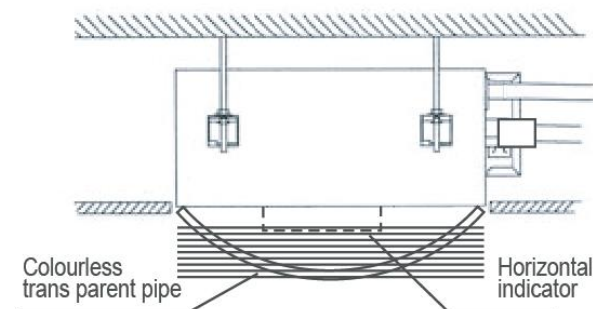


Face the concave side of the installation hooks toward the expansible hooks. Determine the length of the installation hooks from the height of ceiling, then cut off the unnecessary part.

If the ceiling is extremely high, please determine the length of the installation hook depending on the real situation.

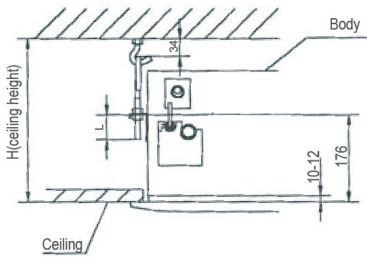
12.2.2.4 Install the main body

Make the 4 suspender through the 4 hanger of the main body to suspend it. Adjust the hexangular nuts on the four installation hooks evenly, to ensure the balance of the body. Use a leveling instrument to make sure the levelness of the main body is within $\pm 1^\circ$.



Adjust the position to ensure the gaps between the body and the four sides of ceiling are even.

The body's lower part should sink into the ceiling for 10~12 mm. In general, L is half of the screw length of the installation hook.

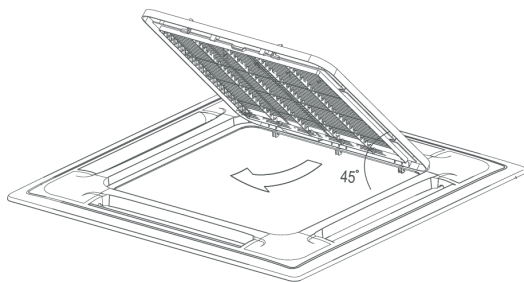
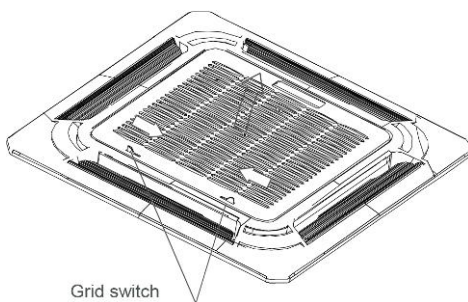


Locate the air conditioner firmly by wrenching the nuts after having adjusted the body's position well.

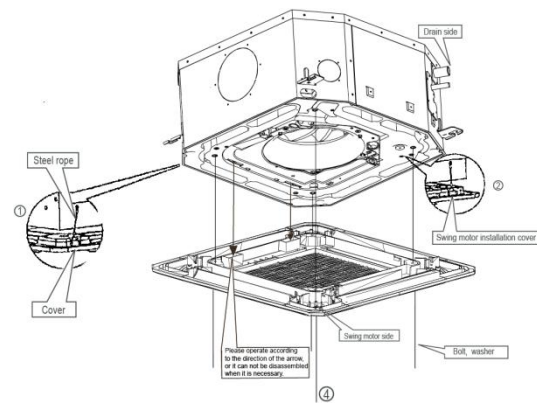


12.2.2.5 Install the panel

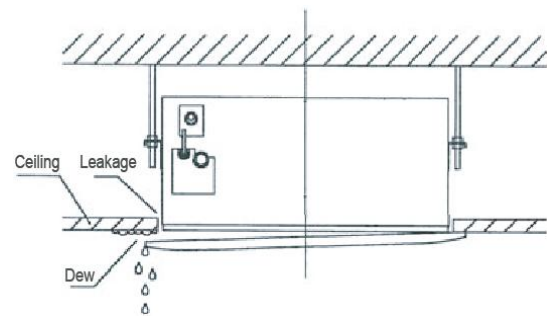
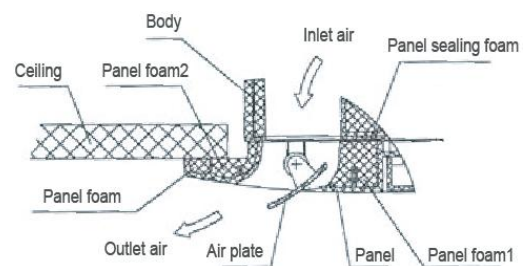
Remove the grille



Hang the panel to the hooks on the mainbody.



Tighten the screws under the panel hooks till the panel closely stick on the ceiling to avoid condensate water.

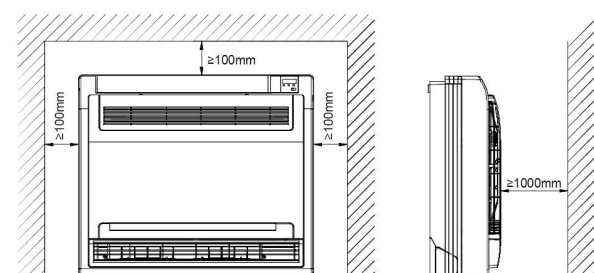


Hang the air-in grill to the panel, then connect the lead terminator of the swing motor and that of the control box with corresponding terminators on the body respectively.

Note: The panel shall be installed after the wiring connected.

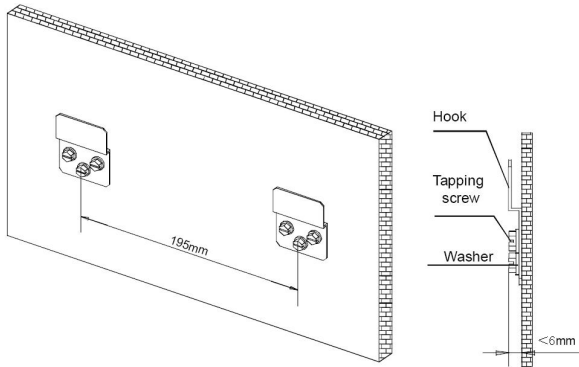
12.2.3 Console indoor unit installation

14.2.1.1 Service space for indoor unit

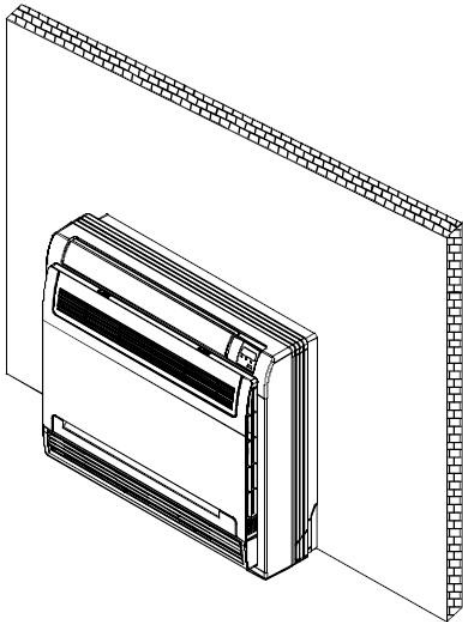


12.2.3.2 Install the main body

- Fix the hook with tapping screw onto the wall

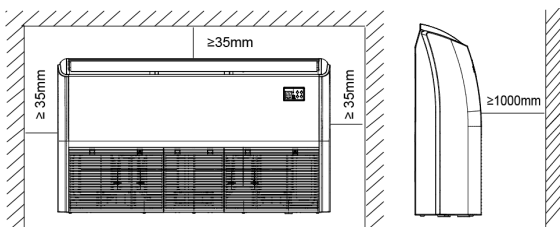


- Hang the indoor unit on the hook.
(The bottom of body can touch with floor or suspended, but the body must install vertically.)



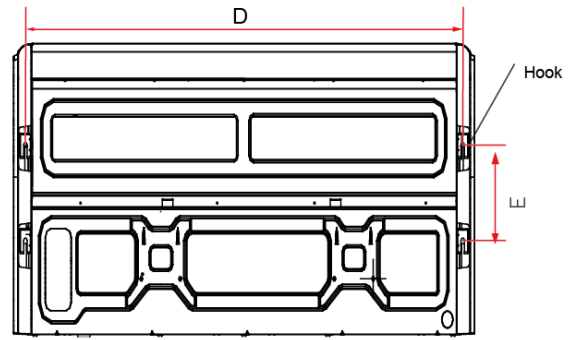
14.2.1 Ceiling-floor unit installation

14.2.1.1 Service space for indoor unit



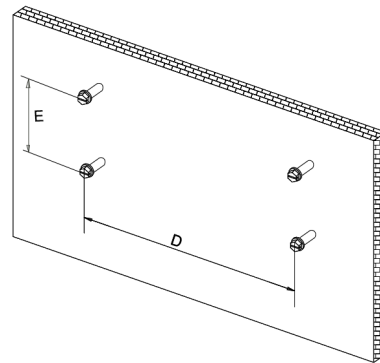
12.2.1.2 Bolt pitch

- ① Ceiling installation



| Capacity (Btu/h) | D | E |
|------------------|------|-----|
| 24K | 983 | 220 |
| 36K | 1200 | 220 |
| 48K | 1565 | 220 |

- ② Wall-mounted installation



3.4.1 Install the pendant bolt

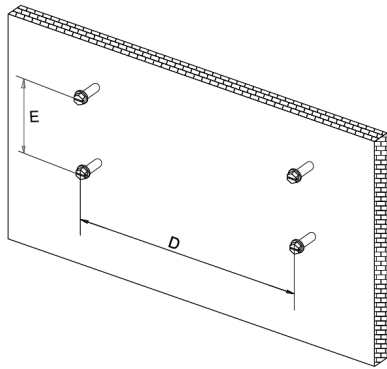
- ① Ceiling installation

Select the position of installation hooks according to the hook holes positions showed in upper picture. Drill four holes of $\text{Ø}12\text{mm}$, 45~50mm deep at the selected positions on the ceiling. Then embed the expansible hooks (fittings).



- ② Wall-mounted installation

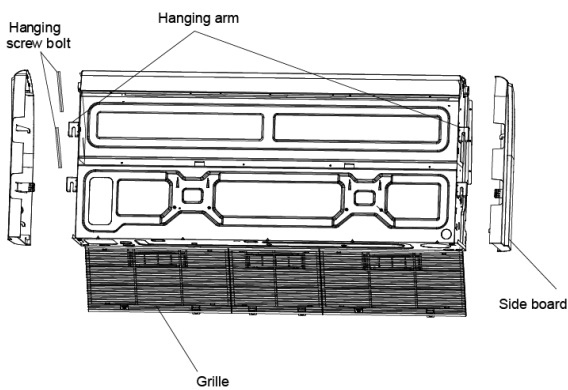
Install the tapping screws onto the wall. (Refer to picture below)



14.2.1.3 Install the main body

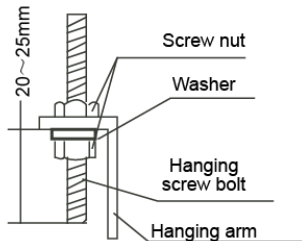
① Ceiling installation (The only installation method for the unit with drain pump)

Remove the side board and the grille.

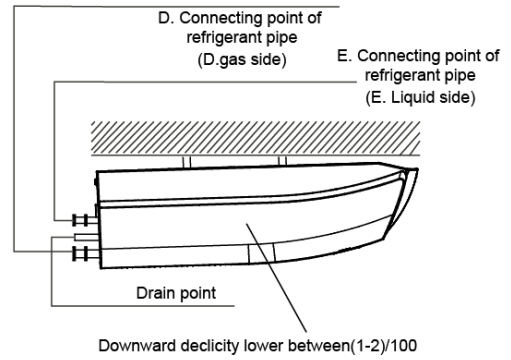
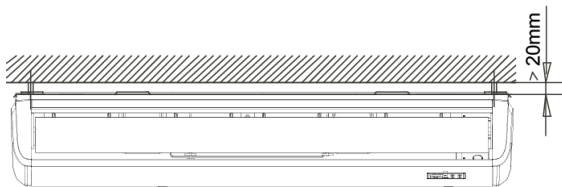


Locate the hanging arm on the hanging screw bolt.

Prepare the mounting bolts on the unit.

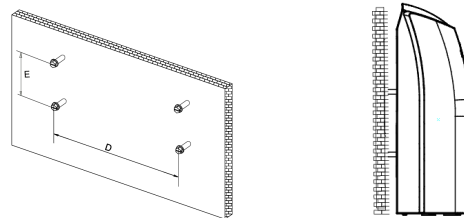


Put the side panels and grilles back.



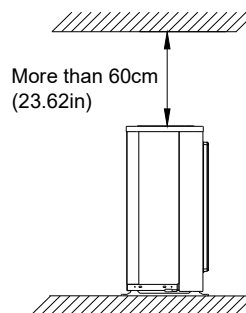
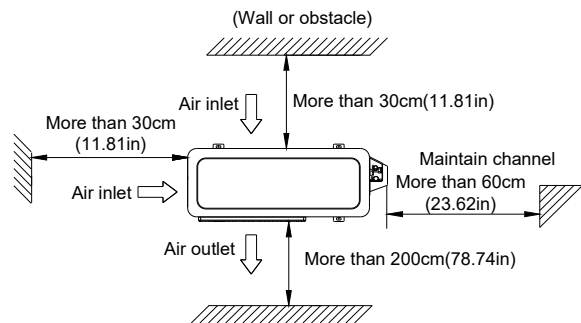
② Wall-mounted installation

Hang the indoor unit by insert the tapping screws into the hanging arms on the main unit. (The bottom of body can touch with floor or suspended, but the body must install vertically.)

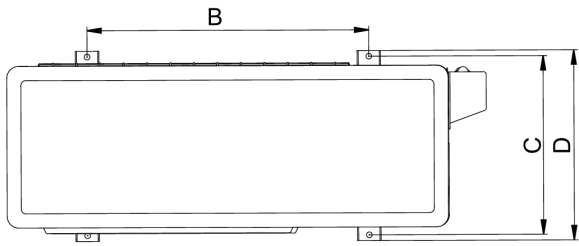


12.3 Outdoor unit installation

12.3.1 Service space for outdoor unit



12.3.2 Bolt pitch



| Model | B | | C | | D | |
|-------|-----|-------|-----|-------|-----|-------|
| | mm | inch | mm | inch | mm | inch |
| 9K | 549 | 21.61 | 325 | 12.80 | 350 | 13.78 |
| 12K | 549 | 21.61 | 325 | 12.80 | 350 | 13.78 |
| 18K | 560 | 22.05 | 335 | 13.19 | 360 | 14.17 |
| 24K | 640 | 25.20 | 405 | 15.94 | 448 | 17.64 |
| 36K | 640 | 25.20 | 405 | 15.94 | 448 | 17.64 |
| 48K | 634 | 24.96 | 404 | 15.91 | 448 | 17.64 |

14.3.3 Install the Unit

Since the gravity center of the unit is not at its physical center, so please be careful when lifting it with a sling.

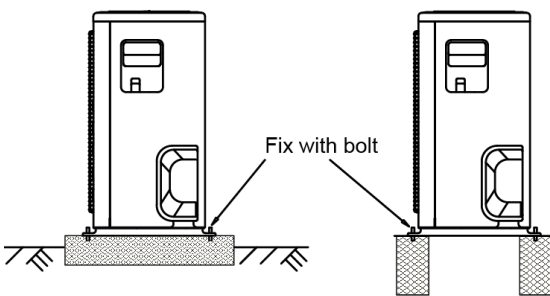
Never hold the inlet of the outdoor unit to prevent it from deforming.

Do not touch the fan with hands or other objects.

Do not lean it more than 45, and do not lay it sidelong.

Make concrete foundation according to the specifications of the outdoor units.

Fasten the feet of this unit with bolts firmly to prevent it from collapsing in case of earthquake or strong wind.



12.4 Refrigerant pipe installation

12.4.1 Maximum pipe length and height drop

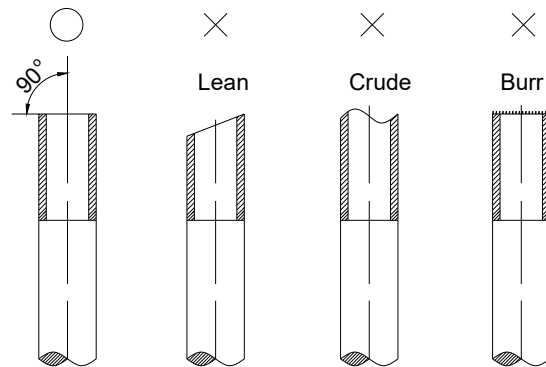
Considering the allowable pipe length and height drop to decide the installation position. Make sure the distance and height drop

between indoor and outdoor unit not exceeded the date in the following table.

| Model | Max. Length | | Max. Elevation | |
|-------------|-------------|-------|----------------|------|
| | m | Ft. | m | Ft. |
| 9,000Btu/h | 25 | 82.2 | 10 | 32.9 |
| 12,000Btu/h | 25 | 82.2 | 10 | 32.9 |
| 18,000Btu/h | 30 | 98.7 | 20 | 65.8 |
| 24,000Btu/h | 50 | 164.5 | 25 | 82.2 |
| 36,000Btu/h | 65 | 213.8 | 30 | 98.7 |
| 48,000Btu/h | 65 | 213.8 | 30 | 98.7 |

12.4.2 The procedure of connecting pipes

1. Choose the pipe size according to the specification table.
2. Confirm the cross way of the pipes.
3. Measure the necessary pipe length.
4. Cut the selected pipe with pipe cutter
 - Make the section flat and smooth.

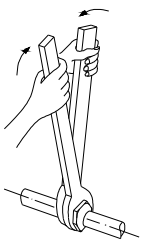


5. Insulate the copper pipe
 - Before test operation, the joint parts should not be heat insulated.
6. Flare the pipe
 - Insert a flare nut into the pipe before flaring the pipe
 - According to the following table to flare the pipe

| Pipe diameter | Flare dimension A (mm) | | Flare shape |
|----------------|------------------------|------|-------------|
| | Min | Max | |
| 1/4" (6.35) | 8.3 | 8.7 | |
| 3/8" (9.52) | 12.0 | 12.4 | |

| | | | |
|----------------|------|------|--|
| 1/2" (12.7) | 15.4 | 15.8 | |
| 5/8" (15.9) | 18.6 | 19.1 | |
| 3/4" (19) | 22.9 | 23.3 | |

- After flared the pipe, the opening part must be seal by end cover or adhesive tape to avoid duct or exogenous impurity come into the pipe.
- 7. Drill holes if the pipes need to pass the wall.
- 8. According to the field condition to bend the pipes so that it can pass the wall smoothly.
- 9. Bind and wrap the wire together with the insulated pipe if necessary.
- 10. Set the wall conduit
- 11. Set the supporter for the pipe.
- 12. Locate the pipe and fix it by supporter
- For horizontal refrigerant pipe, the distance between supporters should not be exceed 1m.
- For vertical refrigerant pipe, the distance between supporters should not be exceed 1.5m.
- 13. Connect the pipe to indoor unit and outdoor unit by using two spanners.
- Be sure to use two spanners and proper torque to fasten the nut, too large torque will damage the flare, and too small torque may cause leakage. Refer the following table for different pipe connection.

| Pipe Diameter | Torque | | Sketch map |
|---------------|----------|------------|---|
| | (kgf.cm) | (N.cm) | |
| 1/4" (6.35) | 144~176 | 1420~1720 |  |
| 3/8" (9.52) | 333~407 | 3270~3990 | |
| 1/2" (12.7) | 504~616 | 4950~6030 | |
| 5/8" (15.9) | 630~770 | 6180~7540 | |
| 3/4" (19) | 990~1210 | 9270~11860 | |

12.4.3 Installation for the first time

Air and moisture in the refrigerant system have undesirable effects as below:

- Pressure in the system rises.
- Operating current rises.
- Cooling or heating efficiency drops.

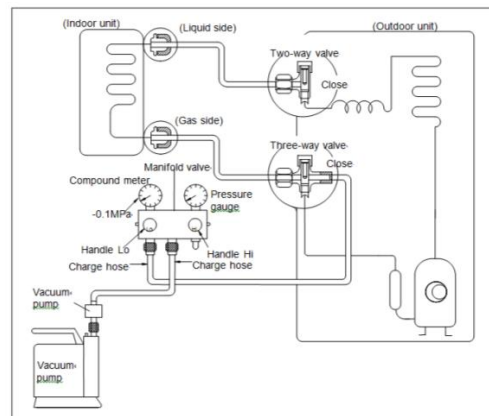
- Moisture in the refrigerant circuit may freeze and block capillary tubing.
- Water may lead to corrosion of parts in the refrigerant system.

Therefore, the indoor units and the pipes between indoor and outdoor units must be leak tested and evacuated to remove gas and moisture from the system.

Gas leak check (Soap water method):

Apply soap water or a liquid neutral detergent on the indoor unit connections or outdoor unit connections by a soft brush to check for leakage of the connecting points of the piping. If bubbles come out, the pipes have leakage.

1. Air purging with vacuum pump

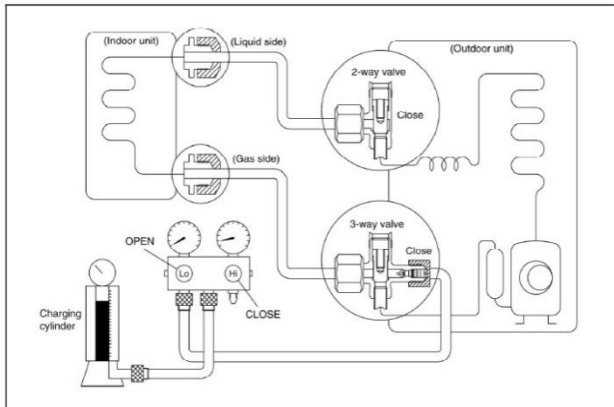


- 1) Completely tighten the flare nuts of the indoor and outdoor units, confirm that both the 2-way and 3-way valves are set to the closed position.
- 2) Connect the charge hose with the push pin of handle lo to the 3-way valves gas service port..
- 3) Connect the charge hose of handle hi connection to the vacuum pump.
- 4) Fully open the handle Lo of the manifold valve.
- 5) Operate the vacuum pump to evacuate.
- 6) Make evacuation for 30 minutes and check whether the compound meter indicates -0.1Mpa (14.5Psi). If the meter does not indicate -0.1Mpa (14.5Psi) after pumping 30 minutes, it should be pumped 20 minutes more. If the pressure can't achieve -0.1Mpa (14.5Psi) after pumping 50 minutes, please check if there are some leakage points. Fully close the handle Lo valve of the manifold valve and stop the operation of the

vacuum pump. Confirm that the gauge needle does not move (approximately 5 minutes after turning off the vacuum pump).

- 7) Turn the flare nut of the 3-way valves about 45° counterclockwise for 6 or 7 seconds after the gas coming out, then tighten the flare nut again. Make sure the pressure display in the pressure indicator is a little higher than the atmosphere pressure. Then remove the charge hose from the 3 way valve.
- 8) Fully open the 2 way valve and 3 way valve and securely tighten the cap of the 3 way valve.

2. Air purging by refrigerant



Procedure:

- 1). Confirm that both the 2-way and 3-way valves are set to the closed position.
- 2). Connect the charge set and a charging cylinder to the service port of the 3-way valve.
- 3). Air purging.
Open the valves on the charging cylinder and the charge set. Purge the air by loosening the flare nut on the 2-way valve approximately 45° for 3 seconds then closing it for 1 minute; repeat 3 times.
After purging the air, use a torque wrench to tighten the flare nut on the 2-way valve.
- 4). Check the gas leakage.
Check the flare connections for gas leakage.
- 5). Discharge the refrigerant.
Close the valve on the charging cylinder and discharge the refrigerant by loosening the flare nut on the 2-way valve approximately 45° until the gauge indicates 0.3Mpa (43.5Psi) to 0.5 Mpa (72.5Psi).

- 6). Disconnect the charge set and the charging cylinder, and set the 2-way and 3-way valves to the open position.

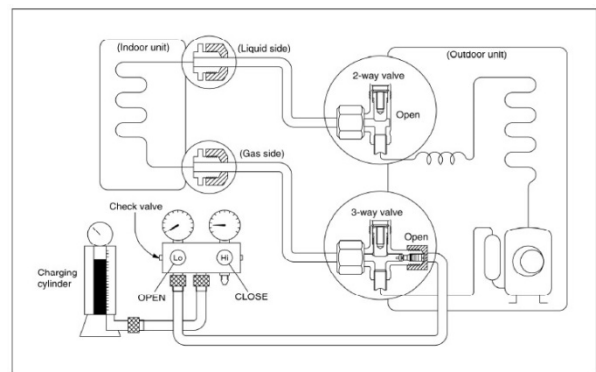
Be sure to use a hexagonal wrench to operate the valve stems.

- 7). Mount the valve stems nuts and the service port cap.

Be sure to use a torque wrench to tighten the service port cap to a torque 18N·m.

Be sure to check the gas leakage.

12.4.4 Adding the refrigerant after running the system for many years



Procedure

- 1). Connect the charge hose to the 3-way service port, open the 2-way valve and the 3-way valve.
Connect the charge hose to the valve at the bottom of the cylinder. If the refrigerant is R410A, make the cylinder bottom up to ensure liquid charge.
- 2). Purge the air from the charge hose.
Open the valve at the bottom of the cylinder and press the check valve on the charge set to purge the air (be careful of the liquid refrigerant).
- 3) Put the charging cylinder onto the electronic scale and record the weight.
- 4) Operate the air conditioner at the cooling mode.
- 5) Open the valves (Low side) on the charge set and charge the system with liquid refrigerant.
- 6).When the electronic scale displays the proper weight (refer to the gauge and the pressure of the low side), disconnect the charge hose from the 3-way valve's service port

immediately and turn off the air conditioner before disconnecting the hose.

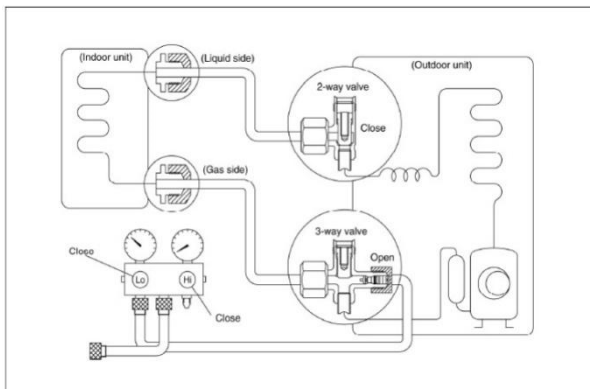
7). Mount the valve stem caps and the service port

Use torque wrench to tighten the service port cap to a torque of 18N.m.

Be sure to check for gas leakage.

12.4.5 Re-installation while the indoor unit need to be repaired

1. Collecting the refrigerant into the outdoor unit



Procedure

1). Confirm that both the 2-way and 3-way valves are set to the opened position

Remove the valve stem caps and confirm that the valve stems are in the opened position.

Be sure to use a hexagonal wrench to operate the valve stems.

2). Connect the charge hose with the push pin of handle Lo to the 3-way valves gas service port.

3). Air purging of the charge hose.

Open the handle Lo valve of the manifold valve slightly to purge air from the charge hose for 5 seconds and then close it quickly.

4). Set the 2-way valve to the close position.

5). Operate the air conditioner at the cooling cycle and stop it when the gauge indicates 0.1Mpa (14.5Psi).

6). Set the 3-way valve to the closed position immediately

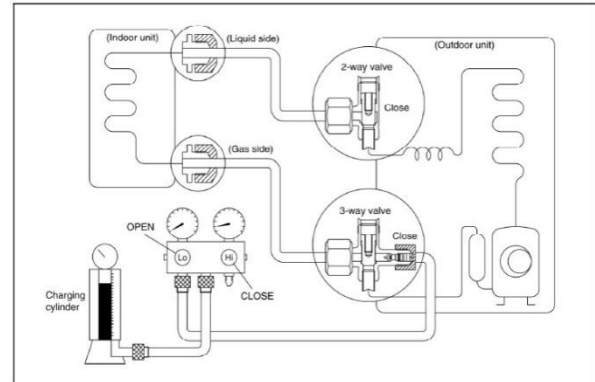
Do this quickly so that the gauge ends up indicating 0.3Mpa (43.5Psi) to 0.5 Mpa (72.5Psi).

Disconnect the charge set, and tighten the 2-way and 3-way valve's stem nuts.

Use a torque wrench to tighten the 3-way valves service port cap to a torque of 18N.m.

Be sure to check for gas leakage.

2. Air purging by the refrigerant



Procedure:

1). Confirm that both the 2-way and 3-way valves are set to the closed position.

2). Connect the charge set and a charging cylinder to the service port of the 3-way valve. Leave the valve on the charging cylinder closed.

3). Air purging.

Open the valves on the charging cylinder and the charge set. Purge the air by loosening the flare nut on the 2-way valve approximately 45' for 3 seconds then closing it for 1 minute; repeat 3 times.

After purging the air, use a torque wrench to tighten the flare nut on the 2-way valve.

4). Check the gas leakage

Check the flare connections for gas leakage.

5). Discharge the refrigerant.

Close the valve on the charging cylinder and discharge the refrigerant by loosening the flare nut on the 2-way valve approximately 45' until the gauge indicates 0.3Mpa (43.5Psi) to 0.5 Mpa (72.5Psi).

6). Disconnect the charge set and the charging cylinder, and set the 2-way and 3-way valves to the open position

Be sure to use a hexagonal wrench to operate the valve stems.

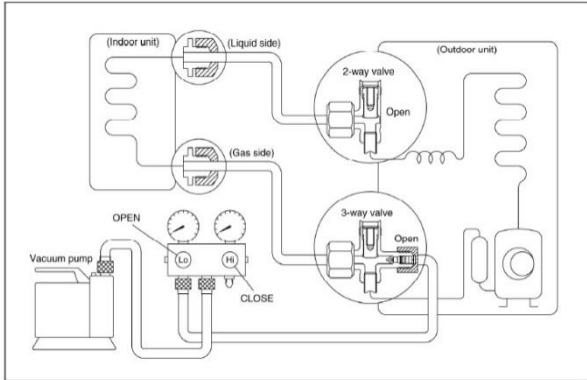
7). Mount the valve stems nuts and the service port cap

Be sure to use a torque wrench to tighten the service port cap to a torque 18N.m.

Be sure to check the gas leakage.

12.4.6 Re-installation while the outdoor unit need to be repaired

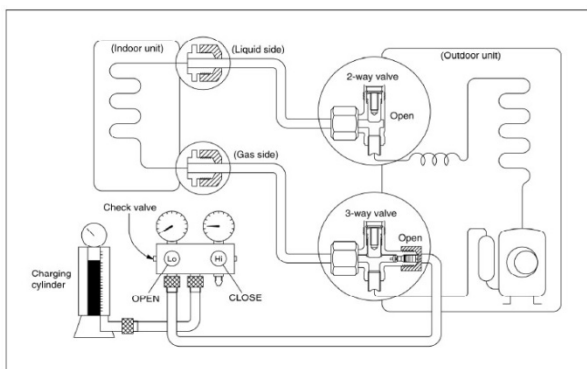
1. Evacuation for the whole system



Procedure:

- 1). Confirm that both the 2-way and 3-way valves are set to the opened position.
- 2). Connect the vacuum pump to 3-way valve's service port.
- 3). Evacuation for approximately one hour. Confirm that the compound meter indicates -0.1Mpa (14.5Psi).
- 4). Close the valve (Low side) on the charge set, turn off the vacuum pump, and confirm that the gauge needle does not move (approximately 5 minutes after turning off the vacuum pump).
- 5). Disconnect the charge hose from the vacuum pump.

2. Refrigerant charging



Procedure:

- 1). Connect the charge hose to the charging cylinder, open the 2-way valve and the 3-way valve

Connect the charge hose which you disconnected from the vacuum pump to the valve at the bottom of the cylinder. If the refrigerant is R410A, make the cylinder bottom up to ensure liquid charge.

- 2). Purge the air from the charge hose

Open the valve at the bottom of the cylinder and press the check valve on the charge set to purge the air (be careful of the liquid refrigerant).

- 3) Put the charging cylinder onto the electronic scale and record the weight.

4). Open the valves (Low side) on the charge set and charge the system with liquid refrigerant. If the system cannot be charge with the specified amount of refrigerant, or can be charged with a little at a time (approximately 150g each time) , operating the air conditioner in the cooling cycle; however, one time is not sufficient, wait approximately 1 minute and then repeat the procedure.

5).When the electronic scale displays the proper weight, disconnect the charge hose from the 3-way valve's service port immediately. If the system has been charged with liquid refrigerant while operating the air conditioner, turn off the air conditioner before disconnecting the hose.

6). Mounted the valve stem caps and the service port. Use torque wrench to tighten the service port cap to a torque of 18N.m. Be sure to check for gas leakage.

12.5 Drainage pipe installation

Install the drainage pipe as shown below and take measures against condensation. Improperly installation could lead to leakage and eventually wet furniture and belongings.

12.5.1 Installation principle

- Ensure at least 1/100 slope of the drainage pipe
- Adopt suitable pipe diameter
- Adopt nearby condensate water discharge

12.5.2 Key points of drainage water pipe installation

1. Considering the pipeline route and elevation

- Before installing condensate water pipeline, determine its route and elevation to avoid intersection with other pipelines and ensure slope is straight.

2. Drainage pipe selection

- The drainage pipe diameter shall not small than the drain hose of indoor unit
- According to the water flowrate and drainage pipe slope to choose the suitable pipe, the water flowrate is decided by the capacity of indoor unit.

Relationship between water flowrate and capacity of indoor unit

| Capacity (x1000Btu) | Water flowrate (l/h) |
|---------------------|----------------------|
| 12 | 2.4 |
| 18 | 4 |
| 24 | 6 |
| 30 | 7 |
| 36 | 8 |
| 42 | 10 |
| 48 | 12 |
| 60 | 14 |

According to the above table to calculate the total water flowrate for the confluence pipe selection.

For horizontal drainage pipe (The following table is for reference)

| PVC pipe | Reference value of inner diameter of pipe (mm) | Allowable maximum water flowrate (l/h) | | Remark |
|----------|--|--|-------------|-----------------------------------|
| | | Slope 1/50 | Slope 1/100 | |
| PVC25 | 20 | 39 | 27 | For branch pipe |
| PVC32 | 25 | 70 | 50 | |
| PVC40 | 31 | 125 | 88 | Could be used for confluence pipe |
| PVC50 | 40 | 247 | 175 | |
| PVC63 | 51 | 473 | 334 | |

Attention: Adopt PVC40 or bigger pipe to be the main pipe.

For Vertical drainage pipe (The following table is for reference)

| PVC | Reference | Allowable | Remark |
|-----|-----------|-----------|--------|
|-----|-----------|-----------|--------|

| pipe | value of inner diameter of pipe (mm) | maximum water flowrate (l/h) | |
|-------|--------------------------------------|------------------------------|-----------------------------------|
| PVC25 | 20 | 220 | For branch pipe |
| PVC32 | 25 | 410 | |
| PVC40 | 31 | 730 | Could be used for confluence pipe |
| PVC50 | 40 | 1440 | |
| PVC63 | 51 | 2760 | |
| PVC75 | 67 | 5710 | |
| PVC90 | 77 | 8280 | |

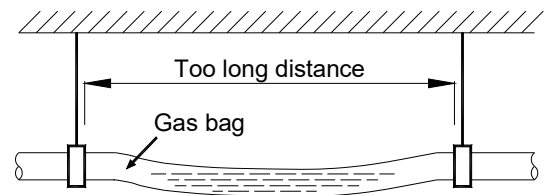
Attention: Adopt PVC40 or bigger pipe to be the main pipe.

3. Individual design of drainage pipe system

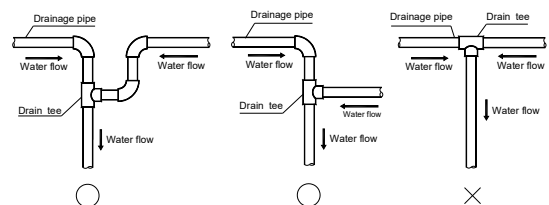
- The drainage pipe of air conditioner shall be installed separately with other sewage pipe, rainwater pipe and drainage pipe in building.
- The drainage pipe of the indoor unit with water pump should be apart from the one without water pump.

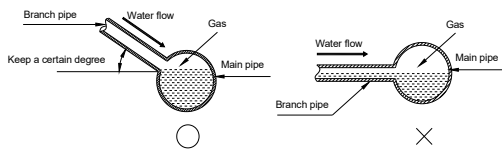
4. Supporter gap of drainage pipe

- In general, the supporter gap of the drainage pipe horizontal pipe and vertical pipe is respectively 1m~1.5m (3.28~4.92ft) and 1.5m~2.0m(4.95~6.56ft).
- Each vertical pipe shall be equipped with not less than two hangers.
- Overlarge hanger gap for horizontal pipe shall create bending, thus leading to air block.



5. The horizontal pipe layout should avoid converse flow or bad flow

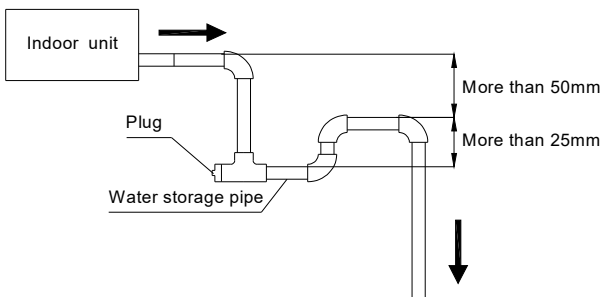




- The correct installation will not cause converse water flow and the slope of the branch pipes can be adjusted freely
- The false installation will cause converse water flow and the slope of the branch pipe cannot be adjusted.

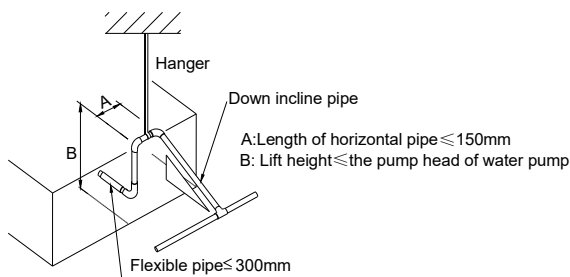
6. Water storage pipe setting

- If the indoor unit has high extra static pressure and without water pump to elevate the condensate water, such as high extra static pressure duct unit, the water storage pipe should be set to avoid converse flow or blow water phenomena.



7. Lifting pipe setting of indoor unit with water pump

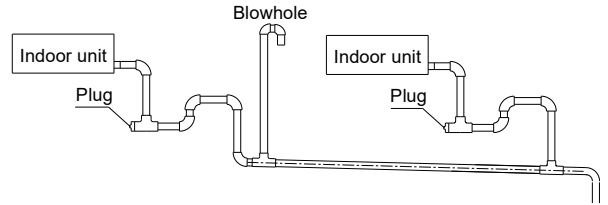
- The length of lifting pipe should not exceed the pump head of indoor unit water pump.
- The drainage pipe should be set down inclined after the lifting pipe immediately to avoid wrong operation of water level switch.
- Refer the following picture for installation reference.



8. Blowhole setting

- For the concentrated drainage pipe system, there should design a blowhole at the highest point of main pipe to ensure the condensate water discharge smoothly.

- The air outlet shall face down to prevent dirt entering pipe.
- Each indoor unit of the system should be installed it.
- The installation should be considering the convenience for future cleaning.



9. The end of drainage pipe shall not contact with ground directly.

12.5.3 Drainage test

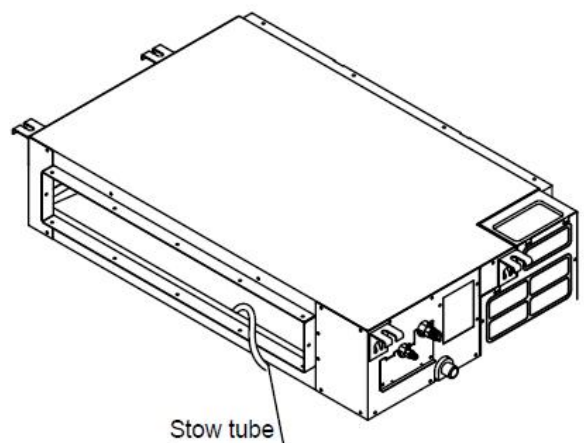
12.5.3.1. Water leakage test

After finishing the construction of drainage pipe system, fill the pipe with water and keep it for 24 hours to check whether there is leakage at joint section.

12.5.3.2. Water discharge test

1. Natural drainage mode(the indoor unit with outdoor drainage pump)

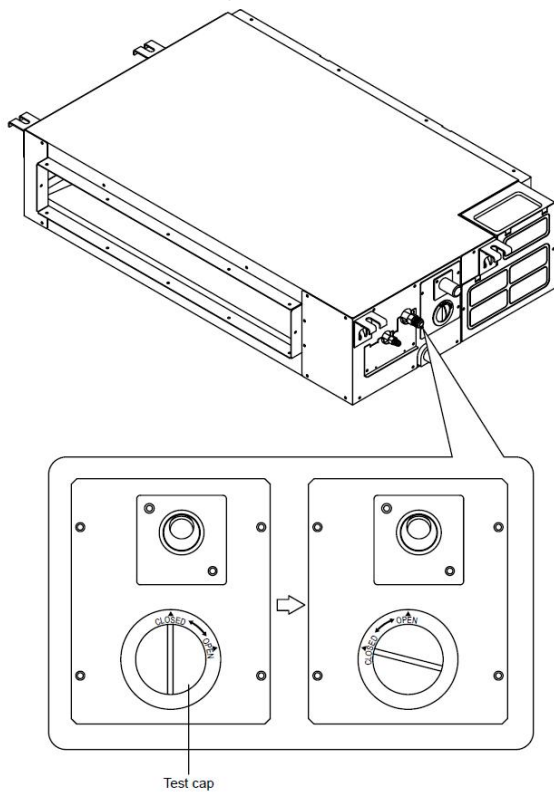
Infuse above 600ml water through water test hole slowly into the water collector, observe whether the water can discharge through the transparent hard pipe at drainage outlet.



2. Pump drainage mode

- 2.1 Disconnect the plug of water level switch, remove the cover of water test hole and slowly infuse about 2000ml water through the water

test hole, be sure that the water will not touch the motor of drainage pump.



2.2 Power on and let the air conditioner operate for cooling. Check operation status of drainage pump, and then connect the plug of water level switch, check the operation sound of water pump and observe whether the water can discharge through the transparent hard pipe at drainage outlet. (In light of the length of drainage pipe, water shall be discharged about 1 minute delayed)

2.3 Stop the operation of air conditioner, power off the power supply and put the cover of water test hole back to the original place.

a. After stopped the air conditioner 3 minutes, check whether there is anything abnormal. If drainage pipes have not been distributed properly, over back-flow water shall cause the flashing of alarm indicator at remote-controlled receiving board and

even water shall run over the water collector.

b. Continuously infusing water until water level alarmed, check whether the drainage pump could discharge water at once. If water level does not decline under warning water level 3 minutes later, it shall cause shutdown of unit. When this situation happens, the normal startup only can be recovered by turning down power supply and eliminating accumulated water.

Note: Drain plug at the main water-containing plate is used for eliminating accumulated water in water-containing plate when maintaining air conditioner fault. During normal operation, the plug shall be filled in to prevent leakage.

12.5.4 Insulation work of drainage pipe

Refer the introduction to the insulation engineering parts.

12.6 Vacuum Drying and Leakage Checking

12.6.1 Purpose of vacuum drying

- Eliminating moisture in system to prevent the phenomena of ice-blockage and copper oxidation.
Ice-blockage shall cause abnormal operation of system, while copper oxide shall damage compressor.
- Eliminating the non-condensable gas (air) in system to prevent the components oxidizing, pressure fluctuation and bad heat exchange during the operation of system.

12.6.2 Selection of vacuum pump

- The ultimate vacuum degree of vacuum pump shall be -756mmHg or above.
- Precision of vacuum pump shall reach 0.02mmHg or above.

12.6.3 Operation procedure for vacuum drying

Due to different construction environment, two kinds of vacuum drying ways could be chosen, namely ordinary vacuum drying and special vacuum drying.

1 Ordinary vacuum drying

- When conduct first vacuum drying, connect pressure gauge to the infusing mouth of gas pipe and liquid pipe, and keep vacuum pump running for 1hour (vacuum degree of vacuum pump shall be reached -755mmHg).
- If the vacuum degree of vacuum pump could not reach -755mmHg after 1 hour of drying, it indicates that there is moisture or leakage in pipeline system and need to go on with drying for half an hour.
- If the vacuum degree of vacuum pump still could not reach -755mmHg after 1.5 hours of drying, check whether there is leakage source.
- Leakage test: After the vacuum degree reaches -755mmHg, stop vacuum drying and keep the pressure for 1 hour. If the indicator of vacuum gauge does not go up, it is qualified. If going up, it indicates that there is moisture or leak source.

2 Special vacuum drying

The special vacuum drying method shall be adopted when:

- Finding moisture during flushing refrigerant pipe.
- Conducting construction on rainy day, because rain water might penetrated into pipeline.
- Construction period is long, and rain water might penetrated into pipeline.

- Rain water might penetrate into pipeline during construction.

Procedures of special vacuum drying are as follows:

- Vacuum drying for 1 hour.
- Vacuum damage, filling nitrogen to reach 0.5Kgf/cm² .
Because nitrogen is dry gas, vacuum damage could achieve the effect of vacuum drying, but this method could not achieve drying thoroughly when there is too much moisture. Therefore, special attention shall be drawn to prevent the entering of water and the formation of condensate water.
- Vacuum drying again for half an hour.
If the pressure reaches -755mmHg, start to pressure leakage test. If it cannot reach the value, repeat vacuum damage and vacuum drying again for 1 hour.
- Leakage test: After the vacuum degree reaches -755mmHg, stop vacuum drying and keep the pressure for 1 hour. If the indicator of vacuum gauge does not go up, it is qualified. If going up, it indicates that there is moisture or leak source.

12.7 Additional refrigerant charge

- After the vacuum drying process is carried out, the additional refrigerant charge process needs to be performed.
- The outdoor unit is factory charged with refrigerant. The additional refrigerant charge volume is decided by the diameter and length of the liquid pipe between indoor and outdoor unit. Refer the following formula to calculate the charge volume.

| | | |
|------------------------------|--------------------------|--------------------------|
| Diameter of liquid pipe (mm) | Φ6.35 | Φ9.52 |
| Formula | $V=15g/m \times (L-7.5)$ | $V=30g/m \times (L-7.5)$ |

V: Additional refrigerant charge volume (g).

L: The length of the liquid pipe (m).

Note:

- Refrigerant may only be charged after performed the vacuum drying process.
- Always use gloves and glasses to protect your hands and eyes during the charge work.
- Use electronic scale or fluid infusion apparatus to weight refrigerant to be recharged. Be sure to avoid extra refrigerant charged, it may cause liquid hammer of the compressor or protections.
- Use supplementing flexible pipe to connect refrigerant cylinder, pressure gauge and outdoor unit. And The refrigerant should be charged in liquid state. Before recharging, The air in the flexible pipe and manifold gauge should be exhausted.
- After finished refrigerant recharge process, check whether there is refrigerant leakage at the connection joint part. (Using gas leakage detector or soap water to detect).

12.8 Engineering of insulation

12.8.1 Insulation of refrigerant pipe

1 Operational procedure of refrigerant pipe insulation

Cut the suitable pipe → insulation (except joint section) → flare the pipe → piping layout and connection → vacuum drying → insulate the joint parts

2 Purpose of refrigerant pipe insulation

- During operation, temperature of gas pipe and liquid pipe shall be over-heating or over-cooling extremely. Therefore, it is necessary to carry out insulation; otherwise it shall debase the performance of unit and burn compressor.
- Gas pipe temperature is very low during cooling. If insulation is not enough, it shall form dew and cause leakage.
- Temperature of gas pipe is very high (generally 50-100 °C) during heating.

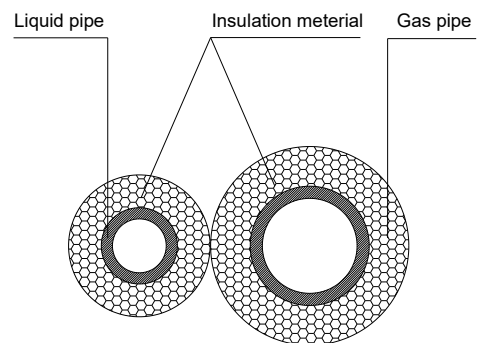
Insulation work must be carried out to prevent hurt by carelessness touching.

3 Insulation material selection for refrigerant pipe

- The burning performance should over 120°C
- According to the local law to choose insulation materials
- The thickness of insulation layer shall be above 10mm. If in hot or wet environment place, the layer of insulation should be thicker accordingly.

4 Installation highlights of insulation construction

- Gas pipe and liquid pipe shall be insulated separately, if the gas pipe and liquid pipe were insulated together; it will decrease the performance of air conditioner.



- The insulation material at the joint pipe shall be 5~10cm longer than the gap of the insulation material.
- The insulation material at the joint pipe shall be inserted into the gap of the insulation material.
- The insulation material at the joint pipe shall be banded to the gap pipe and liquid pipe tightly.
- The linking part should be use glue to paste together
- Be sure not bind the insulation material over-tight, it may extrude out the air in the material to cause bad insulation and cause easy aging of the material.

12.8.2 Insulation of drainage pipe

1 Operational procedure of refrigerant pipe insulation

Select the suitable pipe → insulation (except joint section) → piping layout and connection → drainage test → insulate the joint parts

2 Purpose of drainage pipe insulation

The temperature of condensate drainage water is very low. If insulation is not enough, it shall form dew and cause leakage to damage the house decoration.

3 Insulation material selection for drainage pipe

- The insulation material should be flame retardant material, the flame retardancy of the material should be selected according to the local law.
- Thickness of insulation layer is usually above 10mm.
- Use specific glue to paste the seam of insulation material, and then bind with adhesive tape. The width of tape shall not be less than 5cm. Make sure it is firm and avoid dew.

4 Installation and highlights of insulation construction

- The single pipe should be insulated before connecting to another pipe, the joint part should be insulated after the drainage test.
- There should be no insulation gap between the insulation material.

12.9 Engineering of electrical wiring

1 Highlights of electrical wiring installation

- All field wiring construction should be finished by qualified electrician.
- Air conditioning equipment should be grounded according to the local electrical regulations.
- Current leakage protection switch should be installed.
- Do not connect the power wire to the terminal of signal wire.
- When power wire is parallel with signal wire, put wires to their own wire tube and remain at least 300mm gap.

- According to table in indoor part named "the specification of the power" to choose the wiring, make sure the selected wiring not small than the date showing in the table.
- Select different colors for different wire according to relevant regulations.
- Do not use metal wire tube at the place with acid or alkali corrosion, adopt plastic wire tube to replace it.
- There must be not wire connect joint in the wire tube If joint is a must, set a connection box at the place.
- The wiring with different voltage should not be in one wire tube.
- Ensure that the color of the wires of outdoor and the terminal No. are same as those of indoor unit respectively.

12.10 Test operation

1 The test operation must be carried out after the entire installation has been completed.

2 Please confirm the following points before the test operation.

- The indoor unit and outdoor unit are installed properly.
- Tubing and wiring are correctly completed.
- The refrigerant pipe system is leakage-checked.
- The drainage is unimpeded.
- The ground wiring is connected correctly.
- The length of the tubing and the added stow capacity of the refrigerant have been recorded.
- The power voltage fits the rated voltage of the air conditioner.
- There is no obstacle at the outlet and inlet of the outdoor and indoor units.
- The gas-side and liquid-side stop valves are both opened.
- The air conditioner is pre-heated by turning on the power.

3 Test operation

Set the air conditioner under the mode of "COOLING" by remote controller, and check the following points.

Indoor unit

- Whether the switch on the remote controller works well.

- Whether the buttons on the remote controller works well.
- Whether the air flow louver moves normally.
- Whether the room temperature is adjusted well.
- Whether the indicator lights normally.
- Whether the temporary buttons works well.
- Whether the drainage is normal.
- Whether there is vibration or abnormal noise during operation.

Outdoor unit

- Whether there is vibration or abnormal noise during operation.
- Whether the generated wind, noise, or condensed of by the air conditioner have influenced your neighborhood.
- Whether any of the refrigerant is leaked.

13. Operation Characteristics

| Temperature Mode | Cooling operation | Heating operation | Drying operation |
|---------------------------------------|--|--------------------------------|------------------------------|
| Room temperature | 17°C ~ 32°C (62°F ~ 90°F) | 0°C ~ 30°C (32°F ~ 86°F) | 10°C ~ 32°C (50°F ~ 90°F) |
| Outdoor temperature (Entry level) | 0°C ~ 50°C (32°F ~ 122°F) (-15°C ~ 50°C(5°F ~ 122°F) : For the models with low temperature cooling system) | -15°C ~ 30°C (5°F ~ 86°F) | 0°C ~ 50°C (32°F ~ 122°F) |
| Outdoor temperature (E-Star level) | -25°C ~ 50°C(-13°F ~ 122°F) | -25°C ~ 30°C (-13°F ~ 86°F) | |

CAUTION:

1. If the air conditioner is used beyond the above conditions, certain safety protection features may come into operation and cause the unit to operate abnormally.
2. The room relative humidity should be less than 80%. If the air conditioner operates beyond this figure, the surface of the air conditioner may attract condensation. Please set the vertical air flow louver to its maximum angle (vertically to the floor), and set HIGH fan mode.
3. The optimum performance will be achieved during this operating temperature zone.

14. Electronic Function

14.1 Abbreviation

T1: Indoor room temperature

T2: Coil temperature of indoor heat exchanger middle.

T2B: Coil temperature of indoor heat exchanger outlet.

T3: Coil temperature of condenser

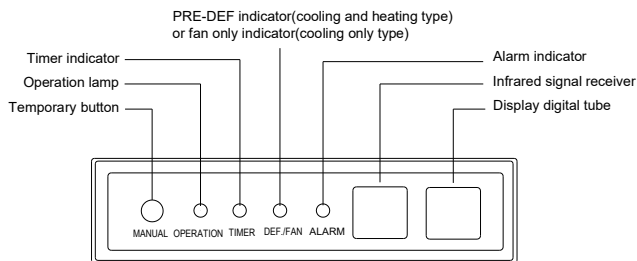
T4: Outdoor ambient temperature

T5: Compressor discharge temperature

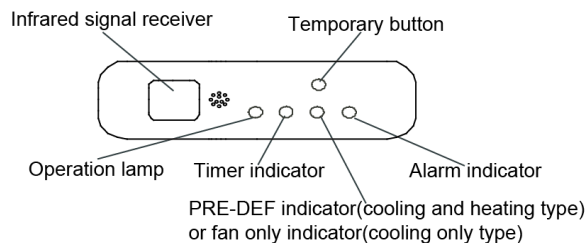
Td: Target temperature

14.2 Display function

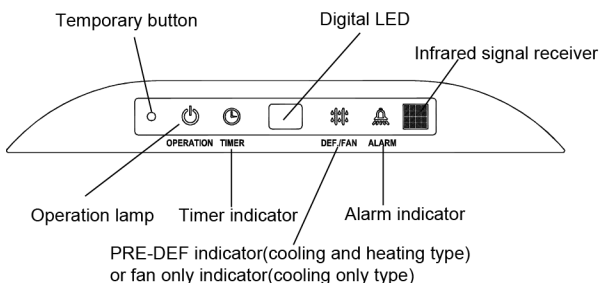
14.2.1 Icon explanation on indoor display board (A5 Duct)



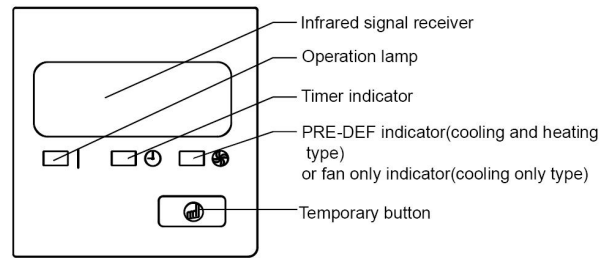
14.2.2 Icon explanation on indoor display board (Compact cassette).



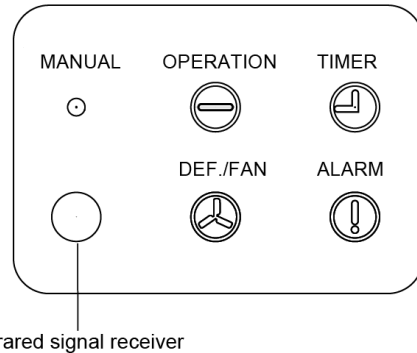
14.2.3 Icon explanation on indoor display board (slim Cassette).



14.2.3 Icon explanation on indoor display board (Console).



14.2.1 Icon explanation on indoor display board (Ceiling Floor)



14.3 Main Protection

14.3.1 Three minutes delay at restart for compressor

1 minute delay for the 1st time stand-up and 3 minutes delay for others.

14.3.2 Temperature protection of compressor top

The unit will stop working when the compressor top temp. protector cut off, and will restart after the compressor top temp. protector restart.

14.3.3 Temperature protection of compressor discharge

When the compressor discharge temp. is getting higher, the running frequency will be limited as below rules:

---Compressor discharge temp. $T_5 > 115\text{ }^\circ\text{C}$ (239°F) for 5s, compressor stops and restarts up till $T_5 < 90\text{ }^\circ\text{C}$ (194°F)

--- $110 < T_5 < 115\text{ }^\circ\text{C}$ (239°F), decrease the frequency to the lower level every 2 minutes.

--- $105(221^\circ\text{F}) < T_5 < 110\text{ }^\circ\text{C}$ (230°F), keep running at the current frequency.

---- $T_5 < 105\text{ }^\circ\text{C}$ (221°F), no limit for frequency.

14.3.4 Fan speed is out of control

When indoor fan speed keeps too low (lower than 300RPM) for 50s, the indoor fan will shut off and restart 30s later, if protection happened

3 times when fan motor restarts continuously, the unit will stop and the LED will display the failure.

When outdoor fan speed keeps too low (lower than 100RPM) or too high (higher than 1500RPM) for 60s, the unit will stop and the LED will display the failure. Malfunction is cleared 30s later.

14.3.5 Inverter module protection

The Inverter module has a protection function about current, voltage and temperature. If these protections happen, the corresponding code will display on indoor unit and the unit will stop working.

14.3.6 Indoor fan delayed open function

When the unit starts up, the louver will be active immediately and the indoor fan will open 10s later.

If the unit runs in heating mode, the indoor fan will be also controlled by anti-cold wind function.

14.3.7 Compressor preheating functions

Preheating permitting condition:

If $T_4 < 3^\circ\text{C}$ (37.4°F) and the machine connects to power supply newly within 5 seconds or if $T_4 < 3^\circ\text{C}$ (37.4°F) and compressor has stopped for over 3 hours, the compressor heating cable will work.

Preheating mode:

A weak current flow through the coil of compressor from the wiring terminal of the compressor, then the compressor is heated without operation.

Preheating release condition:

If $T_4 \geq 5^\circ\text{C}$ (41°F) or the compressor starts running, the preheating function will stop.

14.3.9 Condenser high temperature T3 protection

--- 55°C (131°F) $< T_3 < 60^\circ\text{C}$ (140°F), the compressor frequency will decrease to the lower level until to F1 and then runs at F1. If $T_3 < 54^\circ\text{C}$ (129.2°F), the compressor will keep running at the current frequency.

--- $T_3 < 52^\circ\text{C}$ (125.6°F), the compressor will not limit the frequency and resume to the former frequency.

--- $T_3 > 60^\circ\text{C}$ (140°F) for 5 seconds, the compressor will stop until $T_3 < 52^\circ\text{C}$ (125.6°F).

14.3.10 Evaporator low temperature T2 protection

--- $T_2 < 0^\circ\text{C}$ (32°F), the compressor will stop and restart when $T_2 \geq 5^\circ\text{C}$ (41°F).

--- 0°C (32°F) $\leq T_2 < 4^\circ\text{C}$ (39.2°F), the compressor frequency will be limited and decreased to the lower level

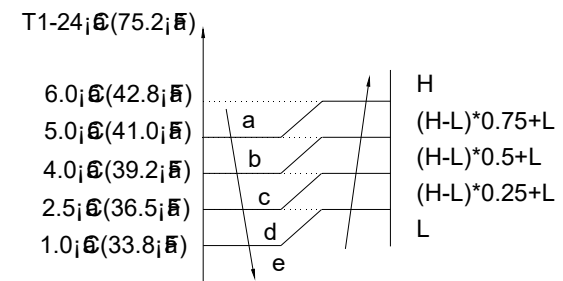
--- 4°C (39.2°F) $\leq T_2 \leq 7^\circ\text{C}$ (44.6°F), the compressor will keep the current frequency.

--- $T_2 > 7^\circ\text{C}$ (44.6°F), the compressor frequency will not be limited.

14.4 Operation Modes and Functions

14.4.1 Fan mode

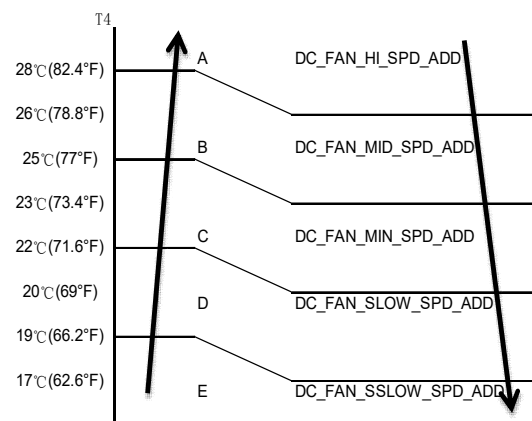
- (1) Outdoor fan and compressor stop.
- (2) Temperature setting function is disabled, and no setting temperature is displayed.
- (3) Indoor fan can be set to high/med/low/auto.
- (4) The louver operates same as in cooling mode.
- (5) Auto fan:



14.

4.2 Cooling Mode

14.4.2.1 Outdoor fan running rules



14.4.2.2 Indoor fan running rules

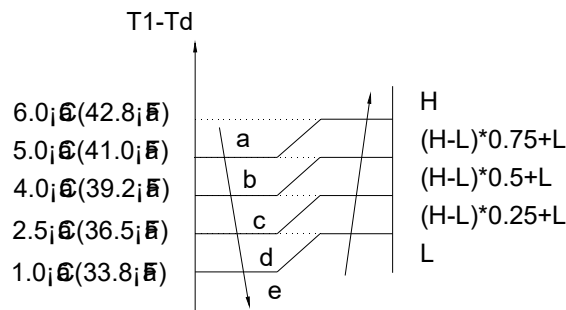
In cooling mode, indoor fan runs all the time and the speed can be selected as high, medium, low and auto.

The indoor fan is controlled as below:

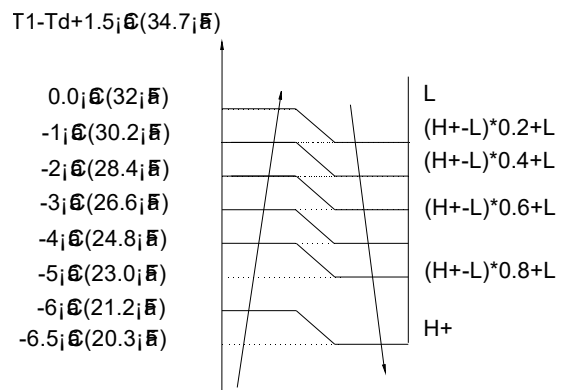
| Setting fan speed | T1-Td °C (°F) | Actual fan speed |
|-------------------|---------------|------------------|
| H | 4.5(40.1) | H+ (H+=H+G) |
| | 3.0(37.4) | H (=H) |
| | 1.5(34.7) | H- (H-=H-G) |
| M | 4.5(40.1) | M+ (M+=M+Z) |
| | 3.0(37.4) | M (M=M) |
| | 1.5(34.7) | M- (M-=M-Z) |
| L | 4.5(40.1) | L+ (L+=L+D) |
| | 3.0(37.4) | L (L=L) |
| | 1.5(34.7) | L- (L-=L-D) |

| Setting fan speed | T1-Td+1.5 °C (34.7°F) | Actual fan speed |
|-------------------|-----------------------|------------------|
| H | -1.5(29.3°F) | H- (H-=H-G) |
| | -3.0(26.6°F) | H (=H) |
| | -4.5(23.9°F) | H+ (H+=H+G) |
| M | -1.5(29.3°F) | M- (M-=M-Z) |
| | -3.0(26.6°F) | M (M=M) |
| | -4.5(23.9°F) | M+ (M+=M+Z) |
| L | -1.5(29.3°F) | L- (L-=L-D) |
| | -3.0(26.6°F) | L (L=L) |
| | -4.5(23.9°F) | L+ (L+=L+D) |

Auto fan in cooling mode acts as follow:



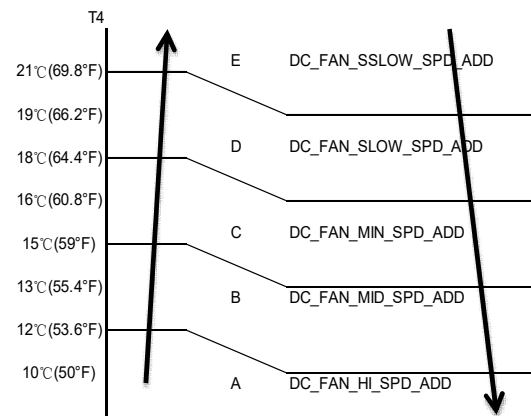
Auto fan action in heating mode:



14.

14.4.3 Heating Mode

14.4.3.1 Outdoor fan running rules



14.4.3.2 Indoor fan running rules

When the compressor is on, the indoor fan can be set to high/med/low/auto. And the anti-cold wind function has the priority.

The indoor fan is controlled as below:

4.3.3 Defrosting mode

If any one of the following items is satisfied, AC will enter the defrosting mode.

After the compressor starts up and keeps running, mark the minimum value of T3 from the 10th minutes to 15th minutes as T30.

1) If the compressor cumulate running time is up to 29 minutes and $T3 < TCDI1$, $T3 + T30SUBT3ONE \leq T30$.

2) If the compressor cumulate running time is up to 35 minutes and $T3 < TCDI2$, $T3 + T30SUBT3TWO \leq T30$.

3) If the compressor cumulate running time is up to 29 minutes and $T3 < TCDI3$ for 3 minutes.

4) If the compressor cumulate running time is up to 120 minutes and $T3 < -15^\circ\text{C} (5^\circ\text{F})$.

Condition of ending defrosting:

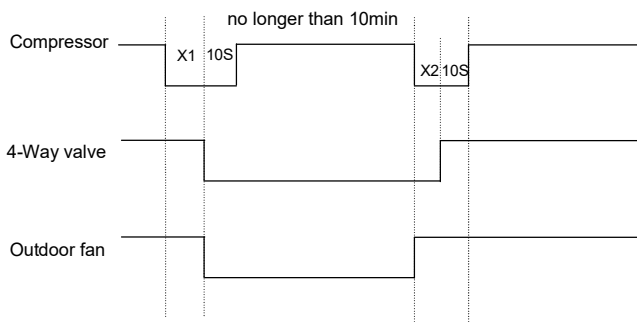
If any one of the following items is satisfied, the defrosting will finish and the machine will turn to normal heating mode.

----T3 rises to be higher than TCDE1.

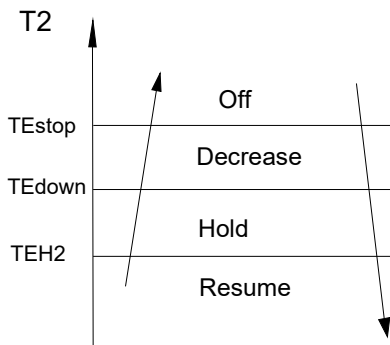
----T3 keeps to be higher than TCDE2 for 80 seconds.

----The machine has run for 10 minutes in defrosting mode.

Defrosting action:



14.4.3.5 Evaporator coil temperature protection



Off: Compressor stops.

Decrease: Decrease the running frequency to the lower level.

Hold: Keep the current frequency.

Resume: No limitation for frequency.

14.4.4 Auto-mode

This mode can be chosen with remote controller and the setting temperature can be changed between 17~30°C (62.6~86°F).

In auto mode, the machine will choose cooling, heating or fan-only mode according to ΔT ($\Delta T = T1 - Ts$).

| $\Delta T = T1 - Ts$ | Running mode |
|---|--------------|
| $\Delta T \geq 1^\circ\text{C}$ (33.8°F) | Cooling |
| -1°C (30.2°F) $< \Delta T < 1^\circ\text{C}$ (33.8°F) | Fan-only |
| $\Delta T \leq -1^\circ\text{C}$ (30.2°F) | Heating |

Indoor fan will run at auto fan of the relevant mode.

The louver operates same as in relevant mode. If the machine switches mode between heating and cooling, the compressor will keep stopping

for 15 minutes and then choose mode according to T1-Ts.

If the setting temperature is modified, the machine will choose running function again.

14.4.5 Drying mode

Drying mode works the same as cooling mode in low speed.

All protections are active and the same as that in cooling mode.

14.4.6 Timer function

14.4.6.1 Timing range is 24 hours.

14.4.6.2 Timer on. The machine will turn on automatically when reaching the setting time.

14.4.6.3 Timer off. The machine will turn off automatically when reaching the setting time.

14.4.6.4 Timer on/off. The machine will turn on automatically when reaching the setting "on" time, and then turn off automatically when reaching the setting "off" time.

14.4.6.5 Timer off/on. The machine will turn off automatically when reaching the setting "off" time, and then turn on automatically when reaching the setting "on" time.

14.4.6.6 The timer function 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 LED will be off and the AC running mode has not been changed.

14.4.6.7 The setting time is relative time.

14.4.7 Sleep function mode

14.4.7.1 The sleep function is available in cooling, heating or auto mode.

14.4.7.2. Operation process in sleep mode is as follow:

When cooling, the setting temperature rises 1°C (33.8°F) (be lower than 30°C (86°F)) every one hour, 2 hours later the setting temperature stops rising and the indoor fan is fixed at low speed.

When heating, the setting temperature decreases 1°C (33.8°F) (be higher than 17°C (62.6°F)) every one hour, 2 hours later the

setting temperature stops rising and indoor fan is fixed at low speed. (Anti-cold wind function has the priority).

14.4.7.3 Operation time in sleep mode is 7 hours. After 7 hours the AC quits this mode and turns off

14.4.7.4 Timer setting is available.

14.4.8 Auto-Restart function

The indoor unit is equipped with auto-restart function, which is carried out through an auto-restart module. In case of a sudden power failure, the module memorizes the setting conditions before the power failure. The unit will resume the previous operation setting (not including sleep function) automatically after 3 minutes when power returns.

14.4.9 Follow me

1) If the indoor PCB receives the signal which results from pressing the FOLLOW ME button on remote controller or wired remote controller, the buzzer will emit a sound and this indicates the follow me function is initiated. But when the indoor PCB receives signal which sent from remote controller every 3 minutes, the buzzer will not respond. When the unit is running with follow me function, the PCB will control the unit according to the temperature from follow me signal, and the temperature collection function of room temperature sensor will be shielded.

2) When the follow me function is available, the PCB will control the unit according to the room temperature from the remote controller and the setting temperature.

3) The PCB will take action to the mode change information from remote controller signal, but it will not be affected by the setting temperature.

4) When the unit is running with follow me function, if the PCB doesn't receive any signal from remote controller for 7 minutes or pressing FOLLOW ME button again, the follow me function will be turned off automatically, and the

temperature will control the unit according to the room temperature detected from its own room temperature sensor and setting temperature.

14.4.10 8°C Heating(optional)

In heating operation, the preset temperature of the air conditioner can be as low as 8 °C (46.4°F), which keeps the room temperature steady at 8 °C (46.4°F) and prevents household things freezing when the house is unoccupied for a long time in severe cold weather.

1.3.11 Drain pump control

Adopt the water-level switch to control the action of drain pump.

Main action under different condition :(every 5 seconds the system will check the water level one time)

1. When the A/C operates with cooling (including auto cooling), dehumidifying, and forced cooling mode, the pump will start running immediately and continuously, till stop cooling.

2. Once the water level increase and up to the control point, LED will alarm and the drain pump open and continue checking the water level. If the water level fall down and LED disarmed (drain pump delay close 1 minute) and operate with the last mode. Otherwise the entire system stop operating (including the pump) and LED remain alarming after 3 minutes,

Point check function

Press the LED DISPLAY or LED or MUTE button of the remote controller three times, and then press the AIR DIRECTION or SWING button three times in ten seconds, the buzzer will keep ring for two seconds. The air conditioner will enter into the information enquiry status. You can press the LED DISPLAY or AIR DIRECTION button to check the next or front item's information.

When the AC enter the "information enquiry" status, it will display the code name in 2 seconds, the details are as follows.

| Enquiry information | Displaying code | Meaning |
|------------------------------------|-----------------|------------------------------------|
| T1 | T1 | T1 temp. |
| T2 | T2 | T2 temp. |
| T3 | T3 | T3 temp. |
| T4 | T4 | T4 temp. |
| T2B | Tb | T2B temp. |
| TP | TP | TP temp. |
| TH | TH | TH temp. |
| Targeted Frequency | FT | Targeted Frequency |
| Actual Frequency | Fr | Actual Frequency |
| Indoor fan speed | IF | Indoor fan speed |
| Outdoor fan speed | OF | Outdoor fan speed |
| EXV opening angle | LA | EXV opening angle |
| Compressor continuous running time | CT | Compressor continuous running time |
| Causes of compressor stop. | ST | Causes of compressor stop. |
| Reserve | A0 | |
| Reserve | A1 | |
| Reserve | b0 | |
| Reserve | b1 | |
| Reserve | b2 | |
| Reserve | b3 | |
| Reserve | b4 | |
| Reserve | b5 | |
| Reserve | b6 | |
| Reserve | dL | |
| Reserve | Ac | |
| Reserve | Uo | |
| Reserve | Td | |

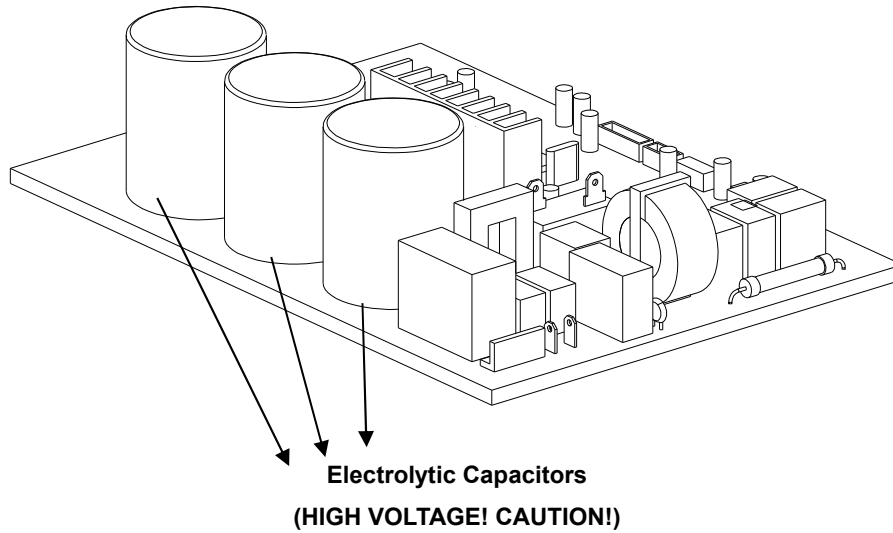
When the AC enter into the information enquiry status, it will display the code value in the next 25s, the details are as follows.

| Enquiry information | Display value | Meaning | Remark |
|---|-------------------------|--|--|
| T1,T2,T3,T4, T2B,TP,TH, Targeted Frequency, Actual Frequency | -1F,-1E,-1d,-1c,-1b,-1A | -25,-24,-23,-22,-21,-20 | 1. All the displaying temperature is actual value. 2. All the temperature is ° C no matter what kind of remote controller is used. 3. T1,T2,T3,T4,T2B display range:-25~70, TP display range:-20~130. 4. Frequency display range: 0~159HZ. 5. If the actual value exceeds the range, it will display the maximum value or minimum value. |
| | -19—99 | -19—99 | |
| | A0,A1,···A9 | 100,101,···109 | |
| | b0,b1,···b9 | 110,111,···119 | |
| | c0,c1,···c9 | 120,121,···129 | |
| | d0,d1,···d9 | 130,131,···139 | |
| | E0,E1,···E9 | 140,141,···149 | |
| | F0,F1,···F9 | 150,151,···159 | |
| Indoor fan speed /Outdoor fan speed | 0 | OFF | |
| | 1,2,3,4 | Low speed, Medium speed, High speed, Turbo | For some big capacity motors. |
| | 14-FF | Actual fan speed=Display value turns to decimal value and then multiply 10. The unit is RPM. | For some small capacity motors, display value is from 14-FF(hexadecimal), the corresponding fan speed range is from 200-2550RPM. |
| EXV opening angle | 0-FF | Actual EXV opening value=Display value turns to decimal value and then multiply 2. | |
| Compressor continuous running time | 0-FF | 0-255 minutes | If the actual value exceeds the range, it will display the maximum value or minimum value. |
| Causes of compressor stop. | 0-99 | For the detailed meaning, please consult with engineer | Decimal display |
| Reserve | 0-FF | | |

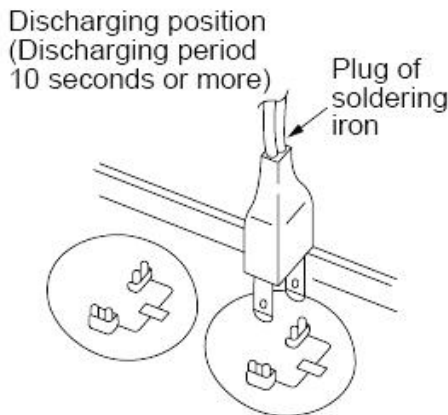
15. Troubleshooting

Safety

Electricity power is still kept in capacitors even the power supply is shut off. Do not forget to discharge the electricity power in capacitor.



For other models, please connect discharge resistance (approx.100Ω 40W) or soldering iron (plug) between +, - terminals of the electrolytic capacitor on the contrary side of the outdoor PCB.



Note: The picture above is only for reference. The plug of your side may be different.

16.1 Indoor Unit Error Display

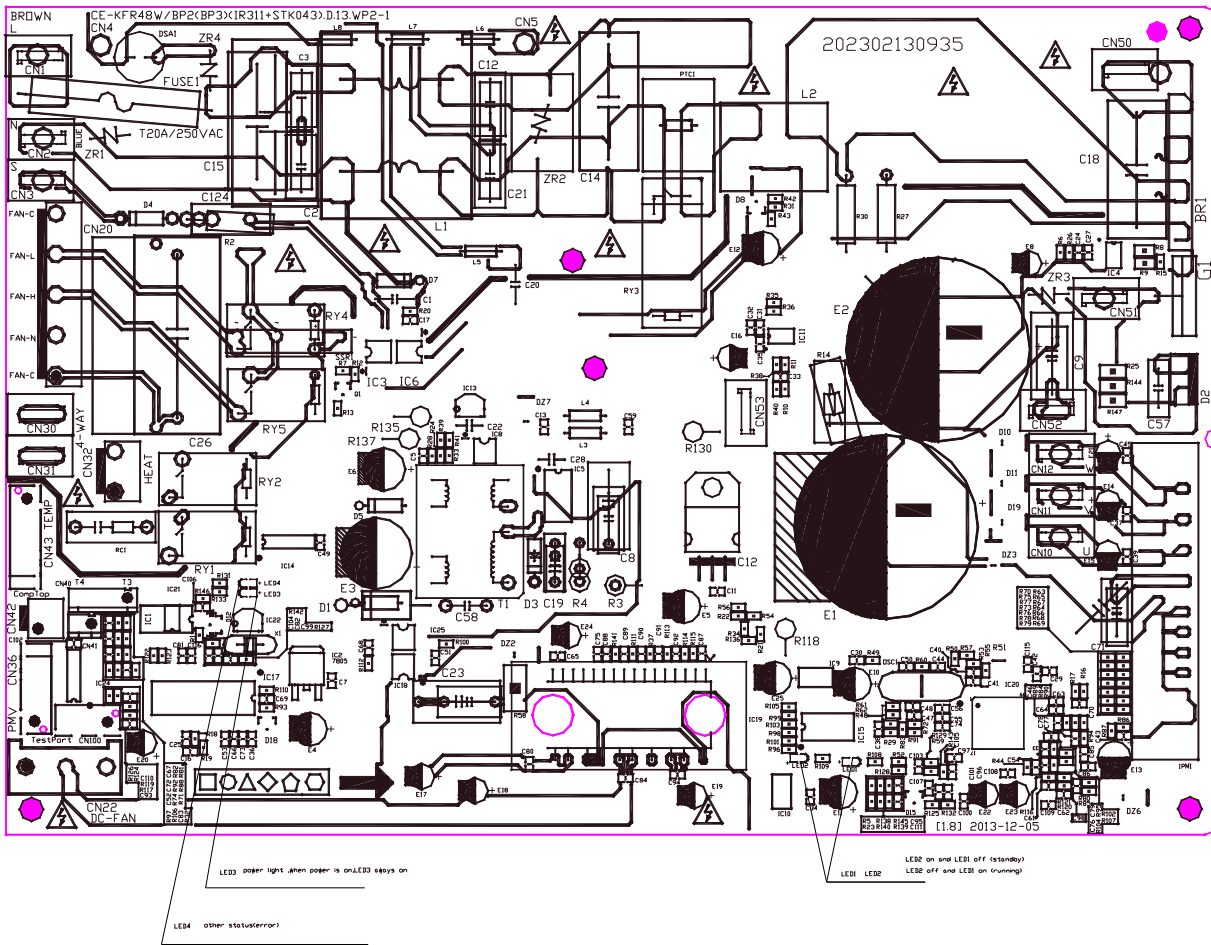
| Operation lamp | Timer lamp | Display | LED STATUS |
|----------------|------------|---------|---|
| ☆ 1 time | X | E0 | Indoor unit EEPROM error |
| ☆ 2 times | X | E1 | Communication malfunction between indoor and outdoor units. |
| ☆ 4 times | X | E3 | Indoor fan speed has been out of control |
| ☆ 5 times | X | E4 | Indoor room temperature sensor T1 open circuit or short circuit |
| ☆ 6 times | X | E5 | Evaporator coil temperature sensor T2 open circuit or short circuit |
| ☆ 7 times | X | EC | Refrigerant leakage detection |
| ☆ 8 times | X | EE | Water-level alarm malfunction |
| ☆ 1 time | O | F0 | Current overload protection |
| ☆ 2 times | O | F1 | Open circuit or short circuit of outdoor ambient temperature sensor T4 |
| ☆ 3 times | O | F2 | Open circuit or short circuit of condenser coil temperature sensor T3 |
| ☆ 4 times | O | F3 | Open circuit or short circuit of Compressor discharge temperature sensor T5 |
| ☆ 5 times | O | F4 | Outdoor unit EEPROM error |
| ☆ 6 times | O | F5 | Outdoor fan speed has been out of control |
| ☆ 7 times | O | F6 | T2B sensor error |
| ☆ 8 times | O | F7 | Lifting-panel communication error |
| ☆ 9 times | O | F8 | Lifting-panel malfunction |
| ☆ 10 times | O | F9 | Lifting-panel is not closed |
| ☆ 1 times | ☆ | P0 | IPM malfunction |
| ☆ 2 times | ☆ | P1 | Over voltage or over low voltage protection |
| ☆ 3 times | ☆ | P2 | High temperature protection of compressor top |
| ☆ 4 times | ☆ | P3 | Outdoor low temperature protection |
| ☆ 5 times | ☆ | P4 | Inverter compressor drive error |
| ☆ 6 times | ☆ | P5 | Mode conflict |
| ☆ 7 times | ☆ | P6 | Compressor low-pressure protection |
| ☆ 8 times | ☆ | P7 | Outdoor IGBT temperature sensor error |

O (light)

X (off)

☆ (flash)

16.2 Outdoor unit error display For 9K-24K outdoor unit:



| No. | Problems | LED2 (Green) | LED1 (Red) | IU display |
|-----|---|-----------------|---------------|------------|
| 1 | standby for normal | O | X | |
| 2 | Operation normally | X | O | |
| 3 | Compressor drive board EEPROM error | O | ☆ | E5 |
| 4 | IPM malfunction or IGBT over-strong current protection | ☆ | X | P0 |
| 5 | Over voltage or too low voltage protection | O | O | P1 |
| 6 | Inverter compressor drive error | X | ☆ | P4 |
| 7 | Inverter compressor drive error | ☆ | O | P4 |
| 8 | Communication malfunction between main control board and driver board | ☆ | ☆ | P4 |

For 36K-48K Outdoor Unit

| No | Problems | Error Code |
|----|---|------------|
| 1 | Communication malfunction between indoor and outdoor units. | E1 |
| 2 | Protection of over-current | F0 |
| 3 | Open circuit or short circuit of outdoor ambient temperature sensor T4 | F1 |
| 4 | Open circuit or short circuit of condenser coil temperature sensor T3 | F2 |
| 5 | Open circuit or short circuit of Compressor discharge temperature sensor T5 | F3 |
| 6 | Outdoor unit EEPROM error | F4 |
| 7 | Outdoor fan speed has been out of control | F5 |
| 8 | IPM malfunction | P0 |
| 9 | Over voltage or over low voltage protection | P1 |
| 10 | High temperature protection of compressor top | P2 |
| 11 | Outdoor low temperature protection | P3 |
| 12 | Inverter compressor drive error | P4 |
| 13 | High temperature protection of indoor coil in heating | J0 |
| 14 | Outdoor temperature protection of outdoor coil in cooling | J1 |
| 15 | Discharge temperature protection | J2 |
| 16 | Protection of active PFC module | J3 |
| 17 | Communication error between control board and IPM board | J4 |
| 18 | Hi-pressure switch protection | J5 |
| 19 | Low-pressure switch protection | J6 |
| 20 | Outdoor IGBT temperature sensor error | P7 |
| 21 | AC voltage protection | J8 |

Outdoor check function

| N | Display | Remark |
|----|--|---|
| 00 | Normal display | Display running frequency, running state or malfunction code |
| 01 | Indoor unit capacity demand code | Actual data*HP*10 If capacity demand code is higher than 99, the digital display tube will show single digit and tens digit. (For example, the digital display tube show "5.0",it means the capacity demand is 15. the digital display tube show "60",it means the capacity demand is 6.0) |
| 02 | Amendatory capacity demand code | |
| 03 | The frequency after the capacity requirement transfer | |
| 04 | The frequency after the frequency limit | |
| 05 | The frequency of sending to 341 chip | |
| 06 | Indoor unit evaporator outlet temp.(heating T2, cooling T2B) | If the temp. is lower than 0 degree, the digital display tube will show "0".If the temp. is higher than 70 degree, the digital display tube will show "70". |

| | | | | |
|------|--|--|---|--|
| 07 | Condenser pipe temp.(T3) | If the temp. is lower than -9 degree, the digital display tube will show "-9".If the temp. is higher than 70 degree, the digital display tube will show "70". If the indoor unit is not connected, the digital display tube will show: "——" | | |
| 08 | Outdoor ambient temp.(T4) | | | |
| 09 | Compressor discharge temp.(T5) | The display value is between 13~129 degree. If the temp. is lower than 13 degree, the digital display tube will show "13".If the temp. is higher than 99 degree, the digital display tube will show single digit and tens digit. (For example, the digital display tube show "0.5",it means the compressor discharge temp. is 105 degree. the digital display tube show "1.6",it means the compressor discharge temp. is 116 degree) | | |
| 10 | AD value of current | The display value is hex number. | | |
| 11 | AD value of voltage | | | |
| 12 | Indoor unit running mode code | Off:0, Fan only 1,Cooling:2, Heating:3 | | |
| 13 | Outdoor unit running mode code | Off:0, Fan only 1,Cooling:2, Heating:3, Forced cooling:4 | | |
| 14 | EXV open angle | Actual data/4. If the value is higher than 99, the digital display tube will show single digit and tens digit. For example, the digital display tube show "2.0",it means the EXV open angle is 120×4=480p.) | | |
| 15 | Frequency limit symbol | Bit7 | Frequency limit caused by IGBT radiator | The display value is hex number. For example, the digital display tube show 2A, then Bit5=1, Bit3=1, Bit1=1. It means frequency limit caused by T4, T3 and current. |
| | | Bit6 | Frequency limit caused by PFC | |
| | | Bit5 | Frequency limit caused by T4. | |
| | | Bit4 | Frequency limit caused by T2. | |
| | | Bit3 | Frequency limit caused by T3. | |
| | | Bit2 | Frequency limit caused by T5. | |
| | | Bit1 | Frequency limit caused by current | |
| Bit0 | Frequency limit caused by voltage | | | |
| 16 | DC fan motor speed | | | |
| 17 | IGBT radiator temp. | The display value is between 30~120 degree. If the temp. is lower than 30 degree, the digital display tube will show "30".If the temp. is higher than 99 degree, the digital display tube will show single digit and tens digit. (For example, the digital display tube show "0.5",it means the IGBT radiator temp. is 105 degree. the digital display tube show "1.6",it means the IGBT radiator temp. is 116 degree) | | |
| 18 | Indoor unit number | The indoor unit can communicate with outdoor unit well. General:1, Twins:2 | | |
| 19 | Evaporator pipe temp. T2 of 1# indoor unit | If the temp. is lower than 0 degree, the digital display tube will show "0".If the temp. is higher than 70 degree, the digital | | |
| 20 | Evaporator pipe temp. T2 of 2# indoor unit | | | |

| | | |
|----|---|--|
| 21 | Evaporator pipe temp. T2 of 3# indoor unit | display tube will show "70". If the indoor unit is not connected, the digital display tube will show: "——" |
| 22 | 1# Indoor unit capacity demand code | Actual data*HP*10 If capacity demand code is higher than 99, the digital display tube will show single digit and tens digit. (For example, the digital display tube show "5.0",it means the capacity demand is 15. the digital display tube show "60",it means the capacity demand is 6.0). If the indoor unit is not connected, the digital display tube will show: "——" |
| 23 | 2# Indoor unit capacity demand code | |
| 24 | 3# Indoor unit capacity demand code | |
| 25 | Room temp. T1 of 1# indoor unit | If the temp. is lower than 0 degree, the digital display tube will show "0".If the temp. is higher than 70 degree, the digital display tube will show "70". If the indoor unit is not connected, the digital display tube will show: "——" |
| 26 | Room temp. T1 of 2# indoor unit | |
| 27 | Average room temp. T1 | |
| 28 | Reason of stop | |
| 29 | Evaporator pipe temp. T2B of 1# indoor unit | If the temp. is lower than 0 degree, the digital display tube will show "0".If the temp. is higher than 70 degree, the digital display tube will show "70". If the indoor unit is not connected, the digital display tube will show: "——" |
| 30 | Evaporator pipe temp. T2B of 2# indoor unit | |

16.3 Diagnosis and Solution

16.3.1 EEPROM error diagnosis and solution (E0/F4)

| | |
|---------------------------------|---|
| Error Code | E0/F4 |
| Malfunction decision conditions | Indoor or outdoor PCB main chip does not receive feedback from EEPROM chip. |
| Supposed causes | <ul style="list-style-type: none">● Installation mistake● PCB faulty |

Trouble shooting:

Power off, then restart the unit 2 minutes later.

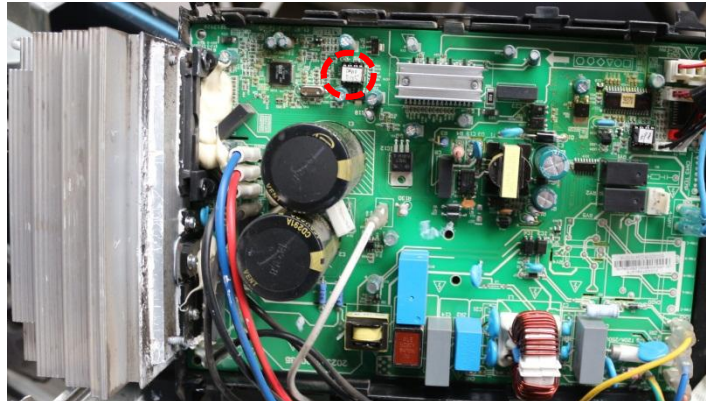
Yes

Replace the indoor/outdoor main PCB.

EEPROM: An electrically erasable programmable read-only memory whose contents can be erased and reprogrammed using a pulsed voltage.



Indoor PCB



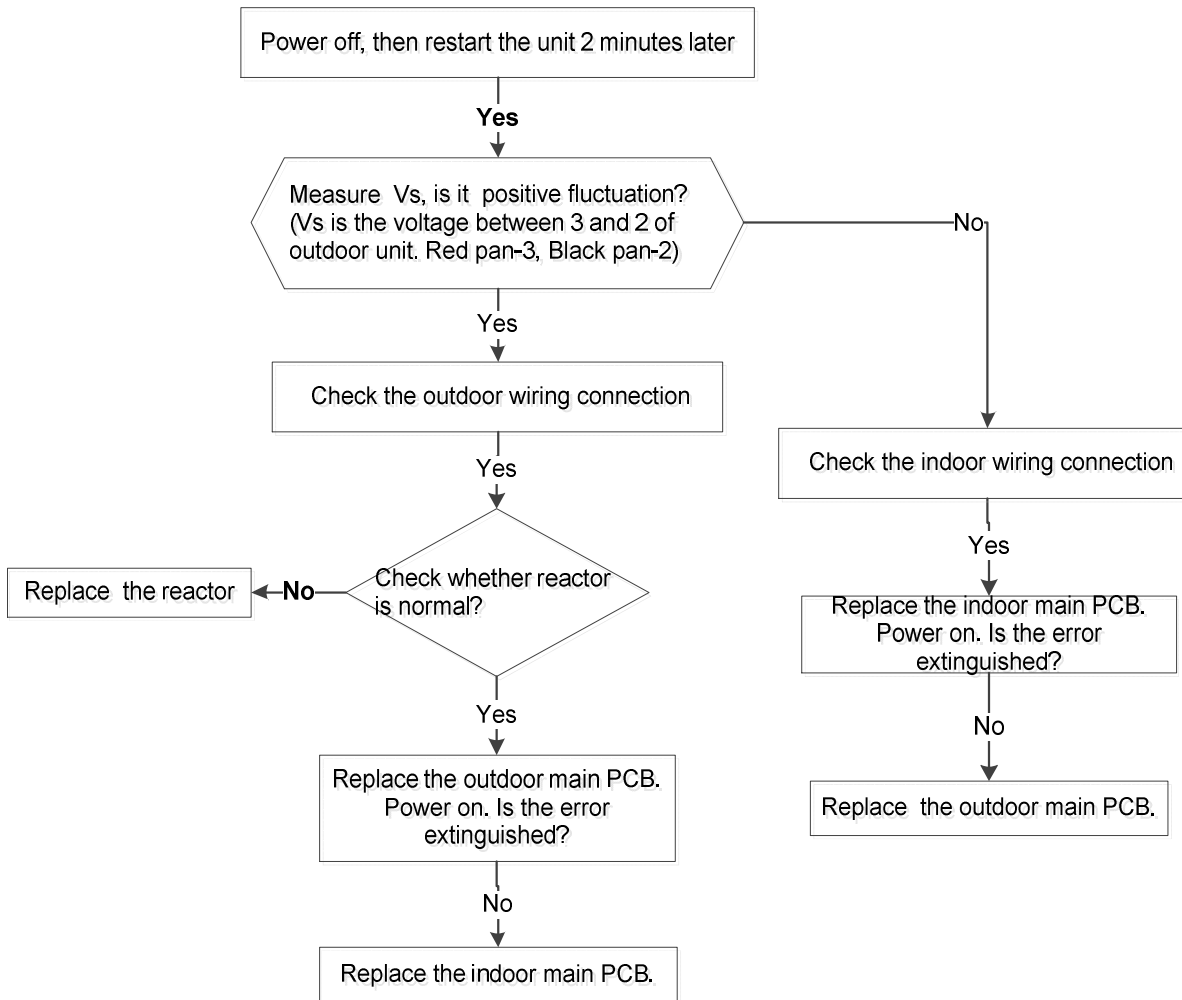
Outdoor PCB

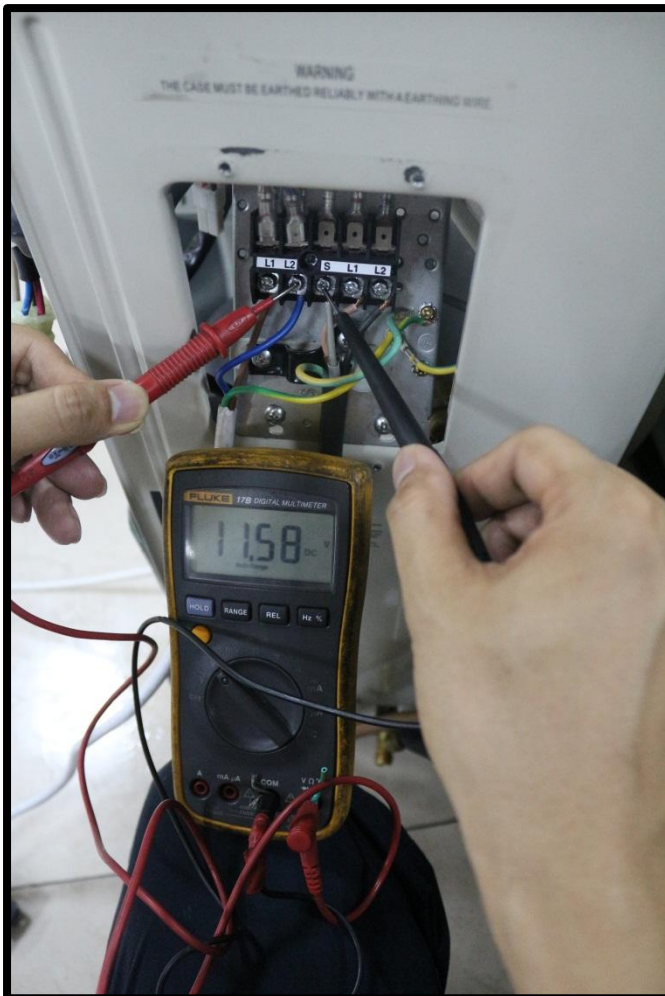
Note: The two photos above are only for reference, it's may be not same totally with the ones on your side.

16.3.2 Communication malfunction between indoor and outdoor units diagnosis and solution (E1)

| | |
|--|---|
| Error Code | E1 |
| Malfunction decision conditions | Indoor unit does not receive the feedback from outdoor unit during 110 seconds and this condition happens four times continuously. |
| Supposed causes | <ul style="list-style-type: none"> ● Wiring mistake ● Indoor or outdoor PCB faulty |

Trouble shooting:





Remark:

Use a multimeter to test the DC voltage between 2 port and 3 port of outdoor unit. The red pin of multimeter connects with 2 port while the black pin is for 3 port.

When AC is normal running, the voltage will move alternately between -50V to 50V.

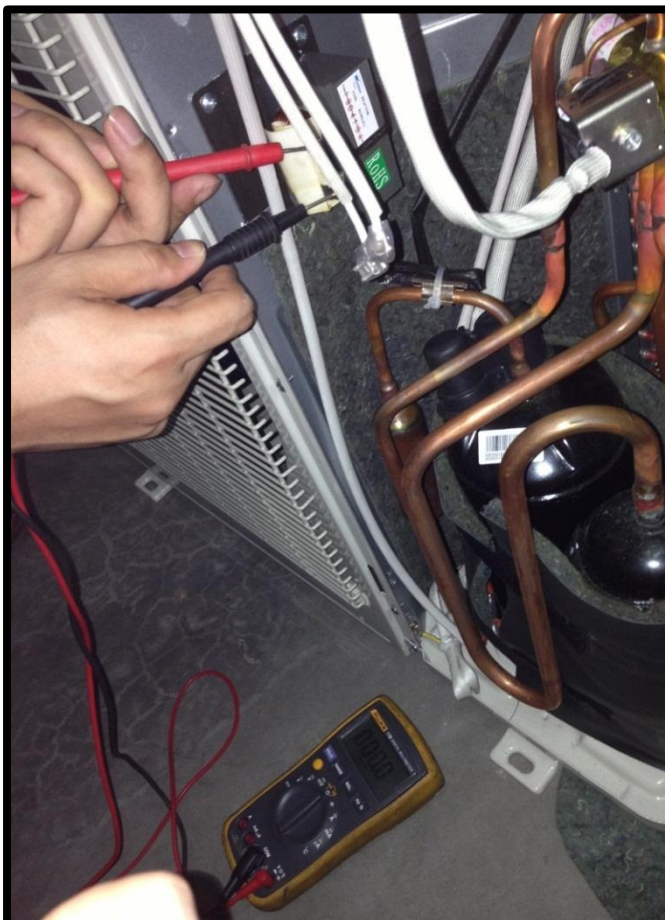
If the outdoor unit has malfunction, the voltage will move alternately with positive value.

While if the indoor unit has malfunction, the voltage will be a certain value.

Remark,

The old label is L1,L2,S, L1,L2

The new label is 1, 2, 3, L1,L2



Remark:

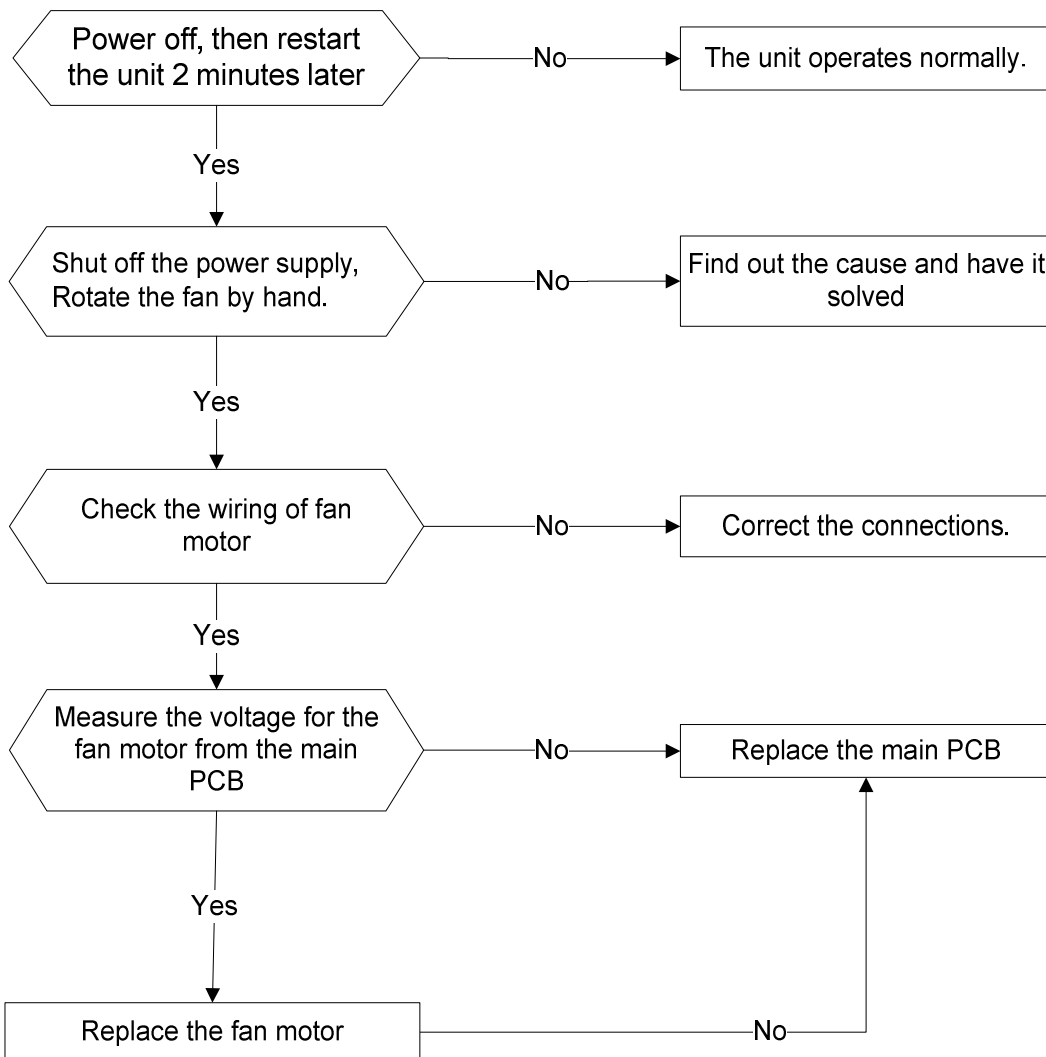
Use a multimeter to test the resistance of the reactor which does not connect with capacitor.

The normal value should be around zero ohm. Otherwise, the reactor must have malfunction and need to be replaced.

16.3.3 Fan speed has been out of control diagnosis and solution (E3)

| | |
|--|--|
| Error Code | E3 |
| Malfunction decision conditions | When indoor fan speed keeps too low (300RPM) for certain time, the unit will stop and the LED will display the failure. |
| Supposed causes | <ul style="list-style-type: none"> ● Wiring mistake ● Fan ass'y faulty ● Fan motor faulty ● PCB faulty |

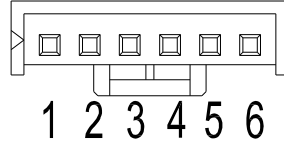
Trouble shooting:



Index 1:

1. Indoor DC fan motor(control chip is inside fan motor)

Power on and when the unit is in standby, measure the voltage of pin1-pin3, pin4-pin3 in fan motor connector. If the value of the voltage is not in the range showing in below table, the PCB must have problems and need to be replaced.



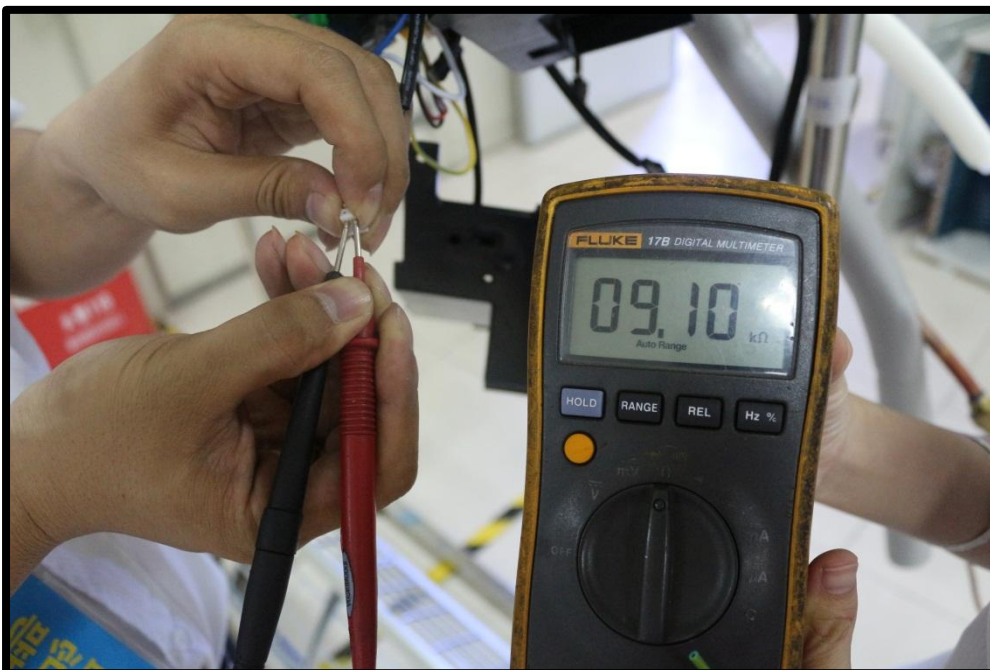
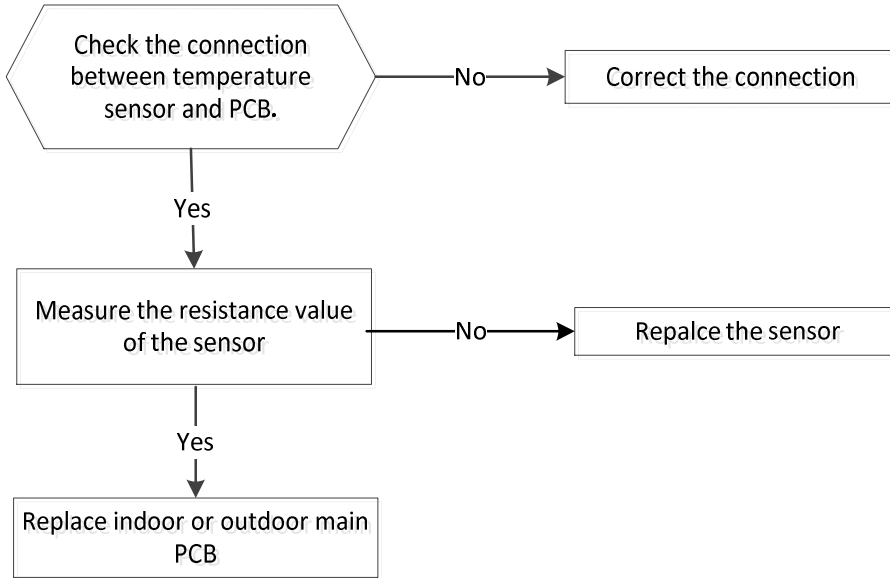
DC motor voltage input and output

| NO. | Color | Signal | Voltage |
|-----|--------|--------|------------|
| 1 | Red | Vs/Vm | 200~380V |
| 2 | --- | --- | --- |
| 3 | Black | GND | 0V |
| 4 | White | Vcc | 13.5~16.5V |
| 5 | Yellow | Vsp | 0~6.5V |
| 6 | Blue | FG | 13.5~16.5V |

16.3.4 Open circuit or short circuit of temperature sensor diagnosis and solution (E4/E5/F1/F2/F3)

| | |
|--|--|
| Error Code | E4/E5/F1/F2/F3 |
| Malfunction decision conditions | If the sampling voltage is lower than 0.06V or higher than 4.94V, the LED will display the failure. |
| Supposed causes | <ul style="list-style-type: none"> ● Wiring mistake ● Sensor faulty |

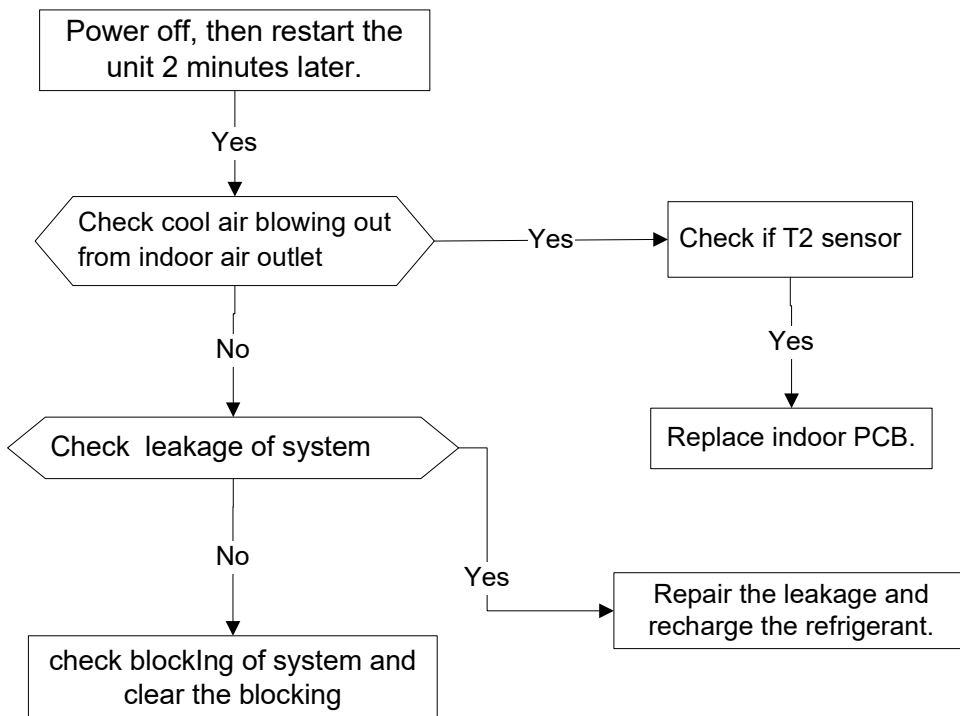
Trouble shooting:



16.3.5 Refrigerant Leakage Detection diagnosis and solution (EC)

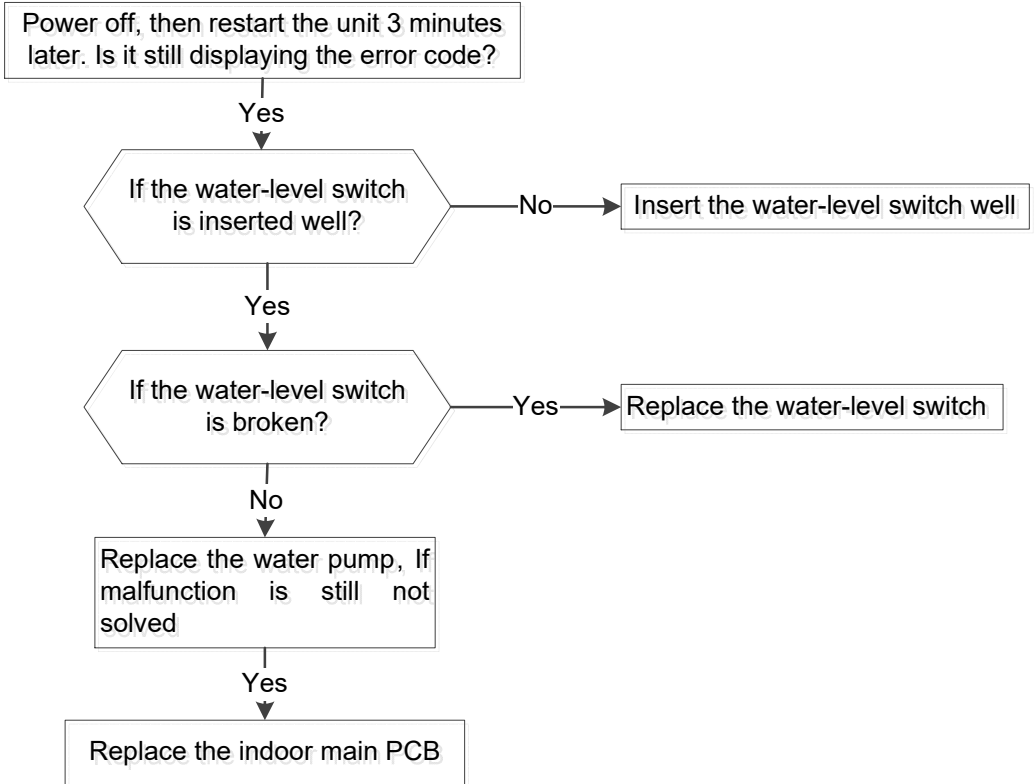
| | |
|--|---|
| Error Code | EC |
| Malfunction decision conditions | <p>Define the evaporator coil temp.T2 of the compressor just starts running as Tcool.</p> <p>In the beginning 5 minutes after the compressor starts up, if $T2 < T_{cool} - 2^{\circ}\text{C}$ does not keep continuous 4 seconds and this situation happens 3 times, the display area will show “EC” and AC will turn off.</p> |
| Supposed causes | <ul style="list-style-type: none"> ● T2 sensor faulty ● Indoor PCB faulty ● System problems, such as leakage or blocking. |

Trouble shooting:



16.3.6 Water-level alarm malfunction diagnosis and solution

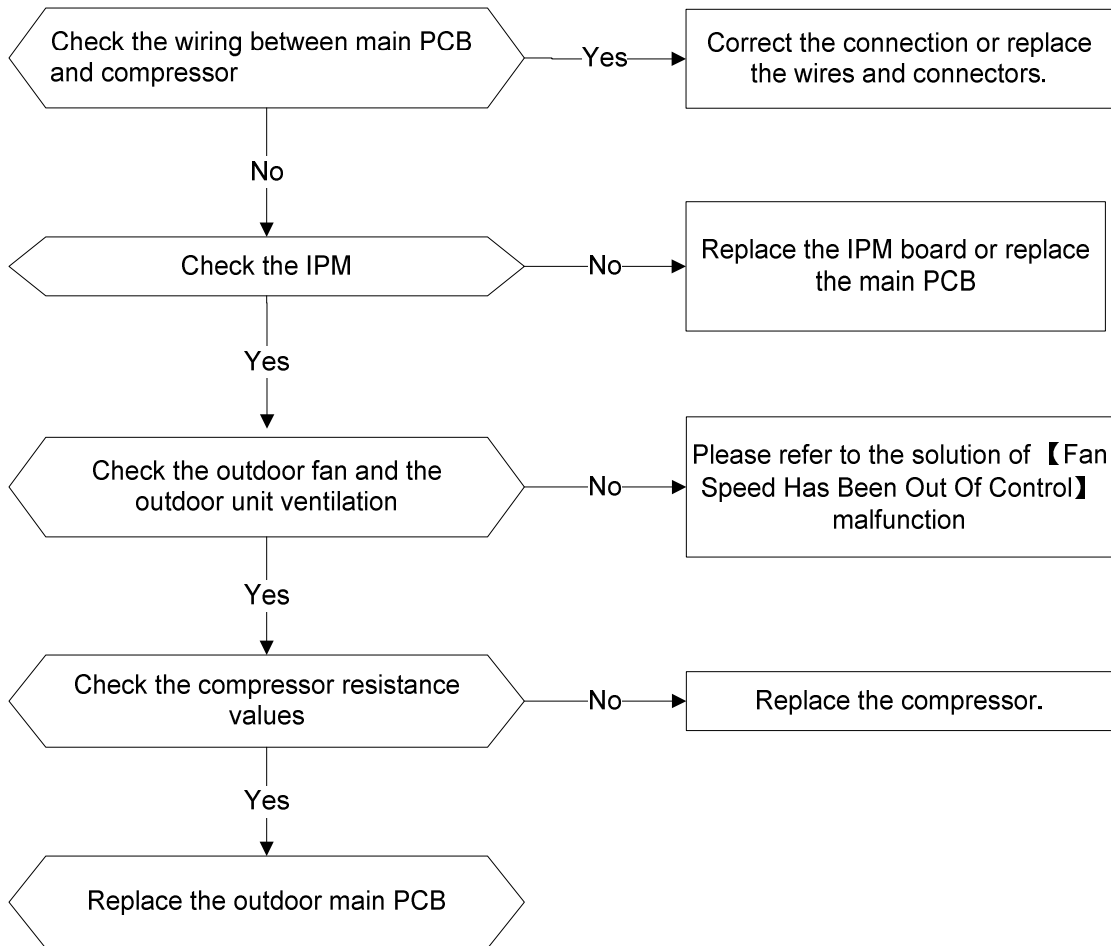
| | |
|--|---|
| Error Code | EE |
| Malfunction decision conditions | If the sampling voltage is not 5V, the LED will display the failure. |
| Supposed causes | <ul style="list-style-type: none"> ● Wiring mistake ● Water-level switch faulty ● Water pump faulty ● Indoor PCB faulty |

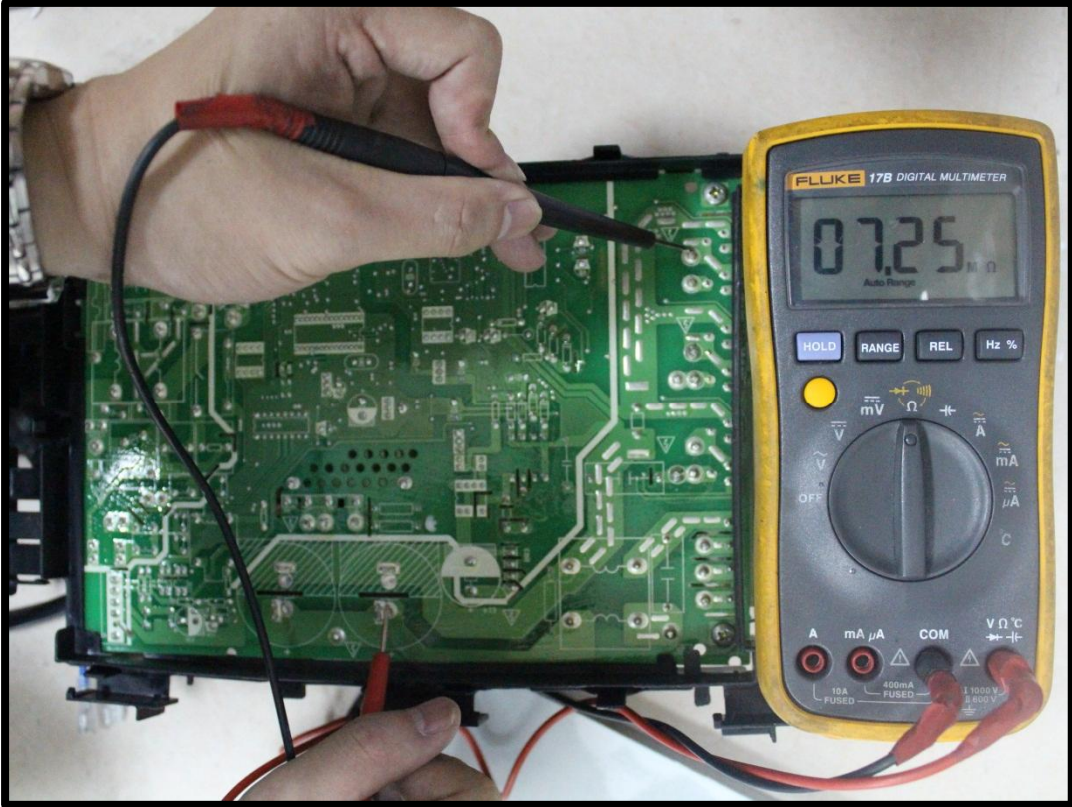


16.3.7 IPM malfunction or IGBT over-strong current protection diagnosis and solution (P0)

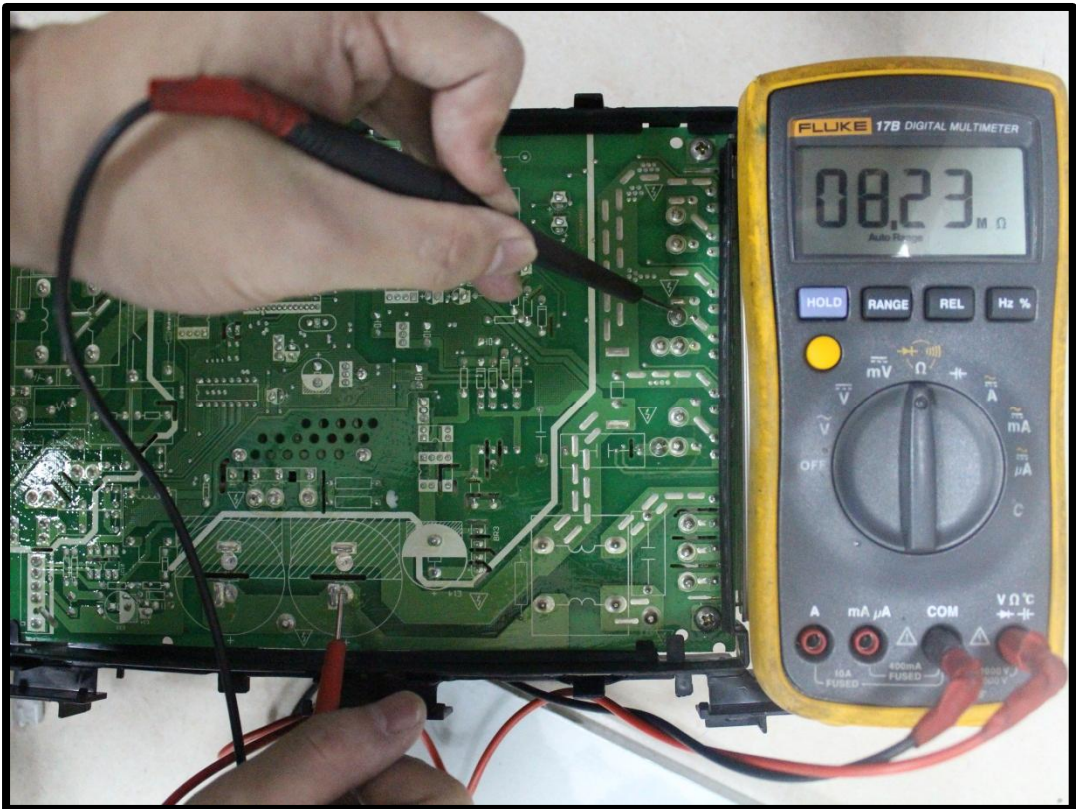
| | |
|--|--|
| Error Code | P0 |
| Malfunction decision conditions | When the voltage signal that IPM send to compressor drive chip is abnormal, the display LED will show “P0” and AC will turn off. |
| Supposed causes | Wiring mistake; IPM malfunction; Outdoor fan ass’y faulty Compressor malfunction; Outdoor PCB faulty |

Trouble shooting:

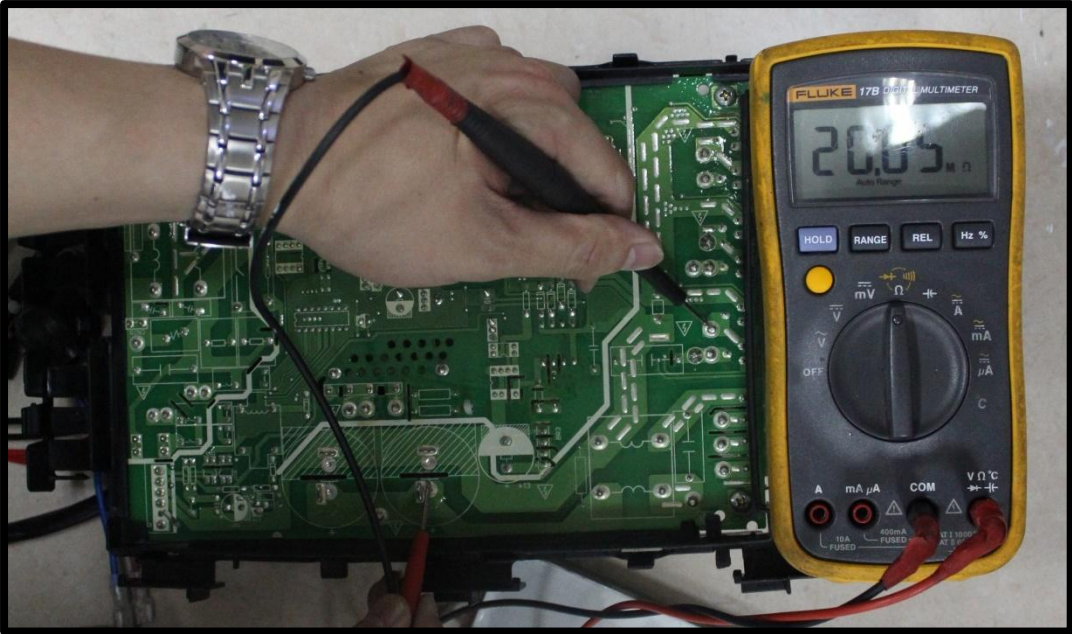




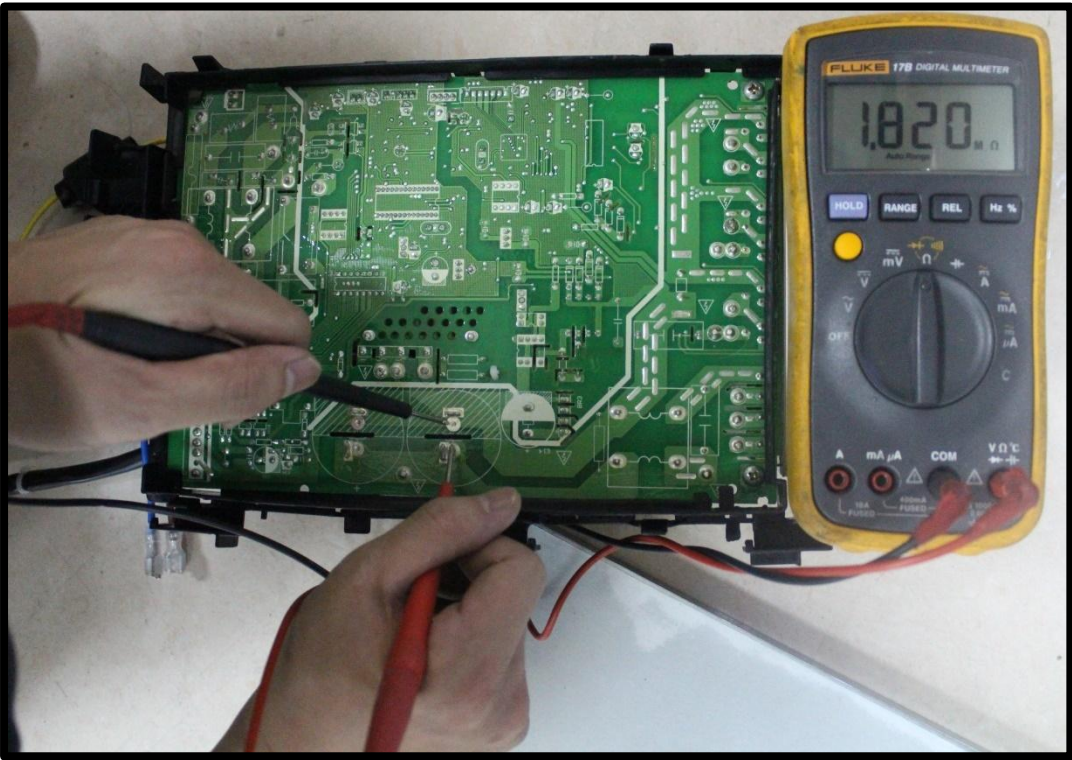
P-U



P-V



P-W

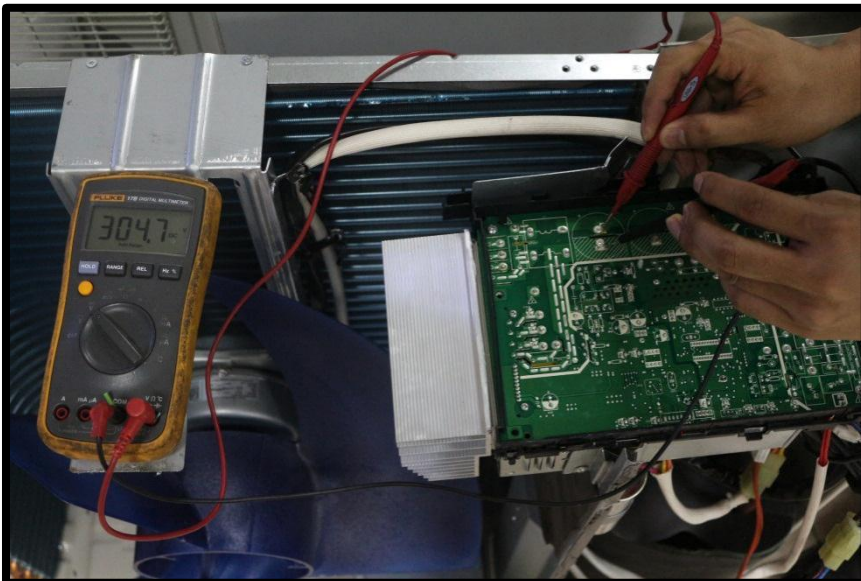
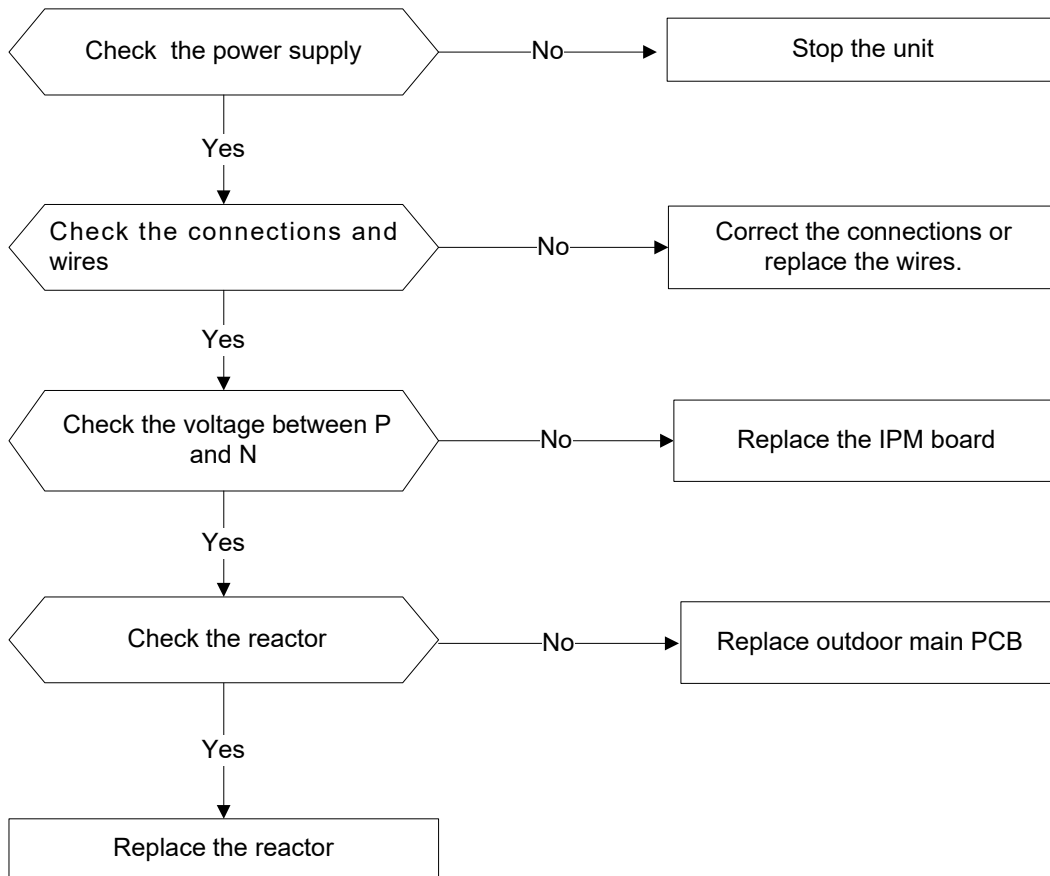


P-N

16.3.8 Over voltage or too low voltage protection diagnosis and solution (P1)

| | |
|--|---|
| Error Code | P1 |
| Malfunction decision conditions | An abnormal voltage rise or drop is detected by checking the specified voltage detection circuit. |
| Supposed causes | <ul style="list-style-type: none"> ● Power supply problems. ● System leakage or block ● PCB faulty |

Trouble shooting:

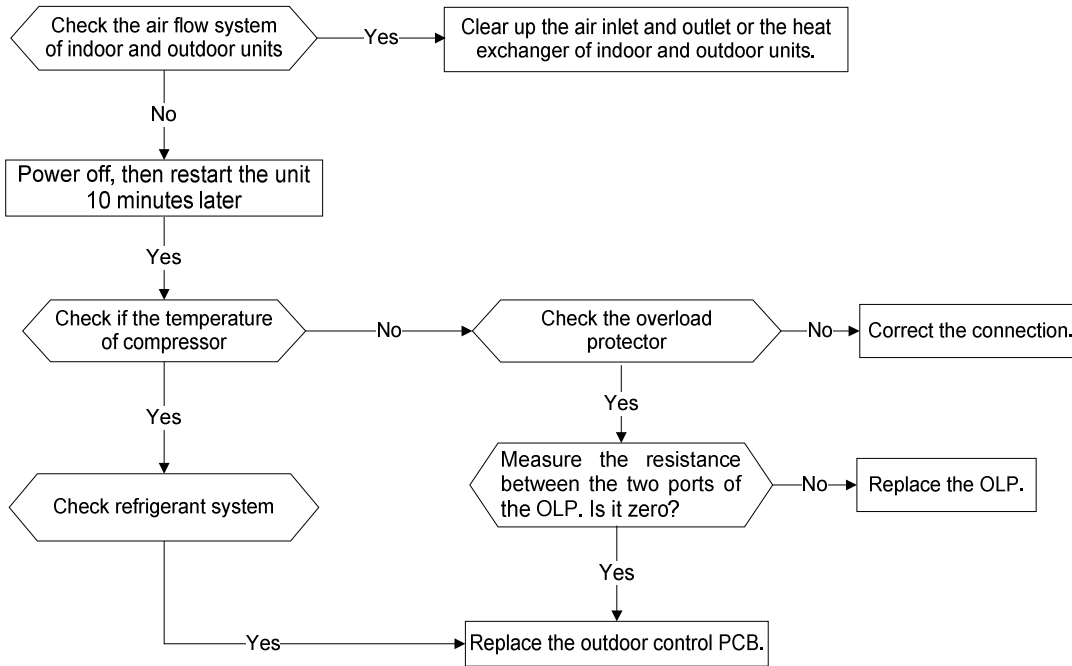


Remark:
 Measure the DC voltage between P and N port.
 The normal value should be around 310V.

16.3.9 High temperature protection of compressor top diagnosis and solution (P2)

| | |
|--|---|
| Error Code | P2 |
| Malfunction decision conditions | If the sampling voltage is not 5V, the LED will display the failure. |
| Supposed causes | <ul style="list-style-type: none"> ● Power supply problems. ● System leakage or block ● PCB faulty |

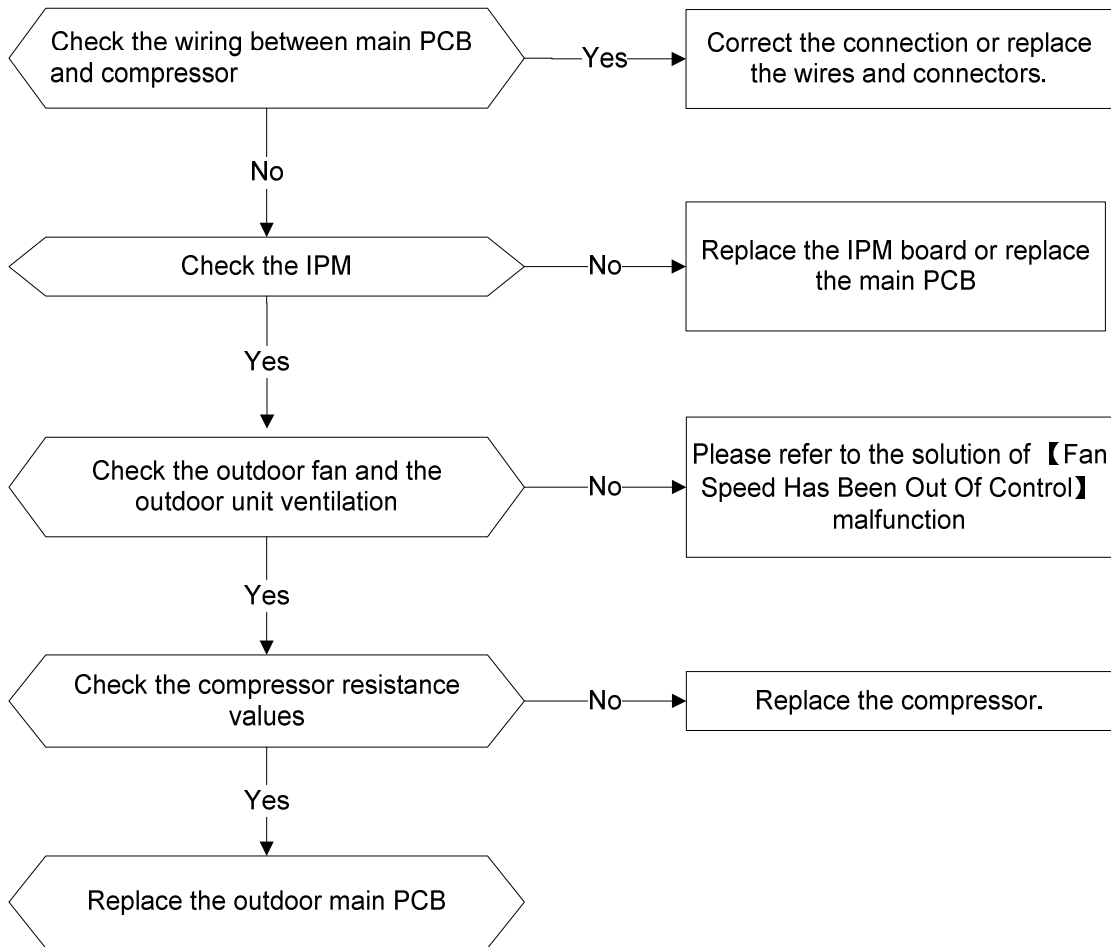
Trouble shooting:



16.3.10 Inverter compressor drive error diagnosis and solution(P4)

| | |
|--|---|
| Error Code | P4 |
| Malfunction decision conditions | An abnormal inverter compressor drive is detected by a special detection circuit, including communication signal detection, voltage detection, compressor rotation speed signal detection and so on. |
| Supposed causes | Wiring mistake; IPM malfunction; Outdoor fan ass'y faulty Compressor malfunction; Outdoor PCB faulty |

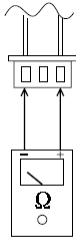
Trouble shooting:



16.4 Main parts check

1. Temperature sensor checking

Disconnect the temperature sensor from PCB, measure the resistance value with a tester.



Tester

Temperature Sensors.

Room temp.(T1) sensor,

Indoor coil temp.(T2) sensor,

Outdoor coil temp.(T3) sensor,

Outdoor ambient temp.(T4) sensor,

Compressor discharge temp.(T5) sensor.

Measure the resistance value of each winding by using the multi-meter.

Appendix 1 Temperature Sensor Resistance Value Table for T1,T2,T3,T4 (°C--K)

| °C | °F | K Ohm | °C | °F | K Ohm | °C | °F | K Ohm | °C | °F | K Ohm |
|-----|----|---------|----|-----|---------|----|-----|---------|-----|-----|---------|
| -20 | -4 | 115.266 | 20 | 68 | 12.6431 | 60 | 140 | 2.35774 | 100 | 212 | 0.62973 |
| -19 | -2 | 108.146 | 21 | 70 | 12.0561 | 61 | 142 | 2.27249 | 101 | 214 | 0.61148 |
| -18 | 0 | 101.517 | 22 | 72 | 11.5 | 62 | 144 | 2.19073 | 102 | 216 | 0.59386 |
| -17 | 1 | 96.3423 | 23 | 73 | 10.9731 | 63 | 145 | 2.11241 | 103 | 217 | 0.57683 |
| -16 | 3 | 89.5865 | 24 | 75 | 10.4736 | 64 | 147 | 2.03732 | 104 | 219 | 0.56038 |
| -15 | 5 | 84.219 | 25 | 77 | 10 | 65 | 149 | 1.96532 | 105 | 221 | 0.54448 |
| -14 | 7 | 79.311 | 26 | 79 | 9.55074 | 66 | 151 | 1.89627 | 106 | 223 | 0.52912 |
| -13 | 9 | 74.536 | 27 | 81 | 9.12445 | 67 | 153 | 1.83003 | 107 | 225 | 0.51426 |
| -12 | 10 | 70.1698 | 28 | 82 | 8.71983 | 68 | 154 | 1.76647 | 108 | 226 | 0.49989 |
| -11 | 12 | 66.0898 | 29 | 84 | 8.33566 | 69 | 156 | 1.70547 | 109 | 228 | 0.486 |
| -10 | 14 | 62.2756 | 30 | 86 | 7.97078 | 70 | 158 | 1.64691 | 110 | 230 | 0.47256 |
| -9 | 16 | 58.7079 | 31 | 88 | 7.62411 | 71 | 160 | 1.59068 | 111 | 232 | 0.45957 |
| -8 | 18 | 56.3694 | 32 | 90 | 7.29464 | 72 | 162 | 1.53668 | 112 | 234 | 0.44699 |
| -7 | 19 | 52.2438 | 33 | 91 | 6.98142 | 73 | 163 | 1.48481 | 113 | 235 | 0.43482 |
| -6 | 21 | 49.3161 | 34 | 93 | 6.68355 | 74 | 165 | 1.43498 | 114 | 237 | 0.42304 |
| -5 | 23 | 46.5725 | 35 | 95 | 6.40021 | 75 | 167 | 1.38703 | 115 | 239 | 0.41164 |
| -4 | 25 | 44 | 36 | 97 | 6.13059 | 76 | 169 | 1.34105 | 116 | 241 | 0.4006 |
| -3 | 27 | 41.5878 | 37 | 99 | 5.87359 | 77 | 171 | 1.29078 | 117 | 243 | 0.38991 |
| -2 | 28 | 39.8239 | 38 | 100 | 5.62961 | 78 | 172 | 1.25423 | 118 | 244 | 0.37956 |
| -1 | 30 | 37.1988 | 39 | 102 | 5.39689 | 79 | 174 | 1.2133 | 119 | 246 | 0.36954 |
| 0 | 32 | 35.2024 | 40 | 104 | 5.17519 | 80 | 176 | 1.17393 | 120 | 248 | 0.35982 |
| 1 | 34 | 33.3269 | 41 | 106 | 4.96392 | 81 | 178 | 1.13604 | 121 | 250 | 0.35042 |
| 2 | 36 | 31.5635 | 42 | 108 | 4.76253 | 82 | 180 | 1.09958 | 122 | 252 | 0.3413 |
| 3 | 37 | 29.9058 | 43 | 109 | 4.5705 | 83 | 181 | 1.06448 | 123 | 253 | 0.33246 |
| 4 | 39 | 28.3459 | 44 | 111 | 4.38736 | 84 | 183 | 1.03069 | 124 | 255 | 0.3239 |
| 5 | 41 | 26.8778 | 45 | 113 | 4.21263 | 85 | 185 | 0.99815 | 125 | 257 | 0.31559 |
| 6 | 43 | 25.4954 | 46 | 115 | 4.04589 | 86 | 187 | 0.96681 | 126 | 259 | 0.30754 |
| 7 | 45 | 24.1932 | 47 | 117 | 3.88673 | 87 | 189 | 0.93662 | 127 | 261 | 0.29974 |
| 8 | 46 | 22.5662 | 48 | 118 | 3.73476 | 88 | 190 | 0.90753 | 128 | 262 | 0.29216 |
| 9 | 48 | 21.8094 | 49 | 120 | 3.58962 | 89 | 192 | 0.8795 | 129 | 264 | 0.28482 |
| 10 | 50 | 20.7184 | 50 | 122 | 3.45097 | 90 | 194 | 0.85248 | 130 | 266 | 0.2777 |
| 11 | 52 | 19.6891 | 51 | 124 | 3.31847 | 91 | 196 | 0.82643 | 131 | 268 | 0.27078 |
| 12 | 54 | 18.7177 | 52 | 126 | 3.19183 | 92 | 198 | 0.80132 | 132 | 270 | 0.26408 |
| 13 | 55 | 17.8005 | 53 | 127 | 3.07075 | 93 | 199 | 0.77709 | 133 | 271 | 0.25757 |
| 14 | 57 | 16.9341 | 54 | 129 | 2.95896 | 94 | 201 | 0.75373 | 134 | 273 | 0.25125 |
| 15 | 59 | 16.1156 | 55 | 131 | 2.84421 | 95 | 203 | 0.73119 | 135 | 275 | 0.24512 |
| 16 | 61 | 15.3418 | 56 | 133 | 2.73823 | 96 | 205 | 0.70944 | 136 | 277 | 0.23916 |
| 17 | 63 | 14.6181 | 57 | 135 | 2.63682 | 97 | 207 | 0.68844 | 137 | 279 | 0.23338 |
| 18 | 64 | 13.918 | 58 | 136 | 2.53973 | 98 | 208 | 0.66818 | 138 | 280 | 0.22776 |
| 19 | 66 | 13.2631 | 59 | 138 | 2.44677 | 99 | 210 | 0.64862 | 139 | 282 | 0.22231 |

Appendix 2 Temperature Sensor Resistance Value Table for T5 (°C--K)

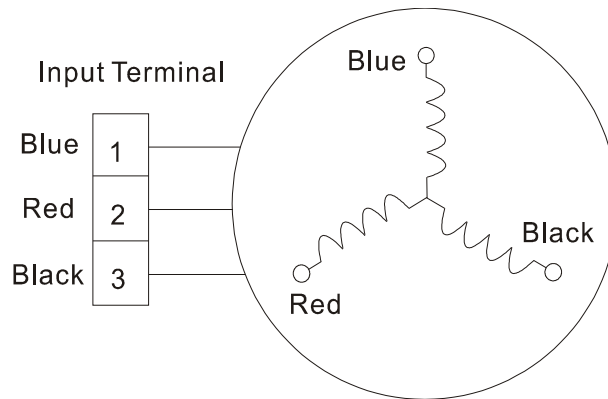
| °C | °F | K Ohm | °C | °F | K Ohm | °C | °F | K Ohm | °C | °F | K Ohm |
|-----|----|-------|----|-----|-------|----|-----|-------|-----|-----|-------|
| -20 | -4 | 542.7 | 20 | 68 | 68.66 | 60 | 140 | 13.59 | 100 | 212 | 3.702 |
| -19 | -2 | 511.9 | 21 | 70 | 65.62 | 61 | 142 | 13.11 | 101 | 214 | 3.595 |
| -18 | 0 | 483 | 22 | 72 | 62.73 | 62 | 144 | 12.65 | 102 | 216 | 3.492 |
| -17 | 1 | 455.9 | 23 | 73 | 59.98 | 63 | 145 | 12.21 | 103 | 217 | 3.392 |
| -16 | 3 | 430.5 | 24 | 75 | 57.37 | 64 | 147 | 11.79 | 104 | 219 | 3.296 |
| -15 | 5 | 406.7 | 25 | 77 | 54.89 | 65 | 149 | 11.38 | 105 | 221 | 3.203 |
| -14 | 7 | 384.3 | 26 | 79 | 52.53 | 66 | 151 | 10.99 | 106 | 223 | 3.113 |
| -13 | 9 | 363.3 | 27 | 81 | 50.28 | 67 | 153 | 10.61 | 107 | 225 | 3.025 |
| -12 | 10 | 343.6 | 28 | 82 | 48.14 | 68 | 154 | 10.25 | 108 | 226 | 2.941 |
| -11 | 12 | 325.1 | 29 | 84 | 46.11 | 69 | 156 | 9.902 | 109 | 228 | 2.86 |
| -10 | 14 | 307.7 | 30 | 86 | 44.17 | 70 | 158 | 9.569 | 110 | 230 | 2.781 |
| -9 | 16 | 291.3 | 31 | 88 | 42.33 | 71 | 160 | 9.248 | 111 | 232 | 2.704 |
| -8 | 18 | 275.9 | 32 | 90 | 40.57 | 72 | 162 | 8.94 | 112 | 234 | 2.63 |
| -7 | 19 | 261.4 | 33 | 91 | 38.89 | 73 | 163 | 8.643 | 113 | 235 | 2.559 |
| -6 | 21 | 247.8 | 34 | 93 | 37.3 | 74 | 165 | 8.358 | 114 | 237 | 2.489 |
| -5 | 23 | 234.9 | 35 | 95 | 35.78 | 75 | 167 | 8.084 | 115 | 239 | 2.422 |
| -4 | 25 | 222.8 | 36 | 97 | 34.32 | 76 | 169 | 7.82 | 116 | 241 | 2.357 |
| -3 | 27 | 211.4 | 37 | 99 | 32.94 | 77 | 171 | 7.566 | 117 | 243 | 2.294 |
| -2 | 28 | 200.7 | 38 | 100 | 31.62 | 78 | 172 | 7.321 | 118 | 244 | 2.233 |
| -1 | 30 | 190.5 | 39 | 102 | 30.36 | 79 | 174 | 7.086 | 119 | 246 | 2.174 |
| 0 | 32 | 180.9 | 40 | 104 | 29.15 | 80 | 176 | 6.859 | 120 | 248 | 2.117 |
| 1 | 34 | 171.9 | 41 | 106 | 28 | 81 | 178 | 6.641 | 121 | 250 | 2.061 |
| 2 | 36 | 163.3 | 42 | 108 | 26.9 | 82 | 180 | 6.43 | 122 | 252 | 2.007 |
| 3 | 37 | 155.2 | 43 | 109 | 25.86 | 83 | 181 | 6.228 | 123 | 253 | 1.955 |
| 4 | 39 | 147.6 | 44 | 111 | 24.85 | 84 | 183 | 6.033 | 124 | 255 | 1.905 |
| 5 | 41 | 140.4 | 45 | 113 | 23.89 | 85 | 185 | 5.844 | 125 | 257 | 1.856 |
| 6 | 43 | 133.5 | 46 | 115 | 22.89 | 86 | 187 | 5.663 | 126 | 259 | 1.808 |
| 7 | 45 | 127.1 | 47 | 117 | 22.1 | 87 | 189 | 5.488 | 127 | 261 | 1.762 |
| 8 | 46 | 121 | 48 | 118 | 21.26 | 88 | 190 | 5.32 | 128 | 262 | 1.717 |
| 9 | 48 | 115.2 | 49 | 120 | 20.46 | 89 | 192 | 5.157 | 129 | 264 | 1.674 |
| 10 | 50 | 109.8 | 50 | 122 | 19.69 | 90 | 194 | 5 | 130 | 266 | 1.632 |
| 11 | 52 | 104.6 | 51 | 124 | 18.96 | 91 | 196 | 4.849 | | | |
| 12 | 54 | 99.69 | 52 | 126 | 18.26 | 92 | 198 | 4.703 | | | |
| 13 | 55 | 95.05 | 53 | 127 | 17.58 | 93 | 199 | 4.562 | | | |
| 14 | 57 | 90.66 | 54 | 129 | 16.94 | 94 | 201 | 4.426 | | | |
| 15 | 59 | 86.49 | 55 | 131 | 16.32 | 95 | 203 | 4.294 | | | |
| 16 | 61 | 82.54 | 56 | 133 | 15.73 | 96 | 205 | 4.167 | | | |
| 17 | 63 | 78.79 | 57 | 135 | 15.16 | 97 | 207 | 4.045 | | | |
| 18 | 64 | 75.24 | 58 | 136 | 14.62 | 98 | 208 | 3.927 | | | |
| 19 | 66 | 71.86 | 59 | 138 | 14.09 | 99 | 210 | 3.812 | | | |

Appendix 3:

| | | | | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| °C | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| °F | 48 | 50 | 52 | 54 | 56 | 58 | 60 | 62 | 64 | 66 | 68 | 70 | 72 |
| °C | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 |
| °F | 74 | 76 | 78 | 80 | 82 | 84 | 86 | 88 | 90 | 92 | 94 | 96 | 98 |

2. Compressor checking

Measure the resistance value of each winding by using the tester.



Resistance @ 20 °C

| 9H47YOMI ASN98D22UFZ | 12H47YOMI ASN98D22UFZ | 12H47ZOMI ASN98D22UFZ | 18H47ZOMI ASM135D23UFZ | 24H46ZOMI ATF235D22UMT | 30H48ZOMI ATF250D22UMT | 36H46ZOMI ATF250D22UMT |
|-------------------------|--------------------------|--------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
|-------------------------|--------------------------|--------------------------|---------------------------|---------------------------|---------------------------|---------------------------|

| Position | Resistance Value | | | | | |
|--------------|------------------|--------------|--------------|--------------|--------------|-------------|
| | ASN98D22UFZ | ASM135D23UFZ | ATF235D22UMT | ATF250D22UMT | ATF310D43UMT | ATQ420D1UMU |
| Blue - Red | 1.57 Ω | 1.75 Ω | 0.75 Ω | 0.75 Ω | 0.65 Ω | 0.38 Ω |
| Blue - Black | | | | | | |
| Red - Blue | | | | | | |



3. IPM continuity check

Turn off the power, let the large capacity electrolytic capacitors discharge completely, and dismount the IPM. Use a digital tester to measure the resistance between P and UVWN; UVW and N.

| Digital tester | | Normal resistance value | Digital tester | | Normal resistance value |
|----------------|----------|-------------------------|----------------|----------|-------------------------|
| (+)Red | (-)Black | | (+)Red | (-)Black | |
| P | N | ∞ (Several MΩ) | U | N | ∞ (Several MΩ) |
| | U | | V | | |
| | V | | W | | |
| | W | | (+)Red | | |

4: Pressure on Service Port

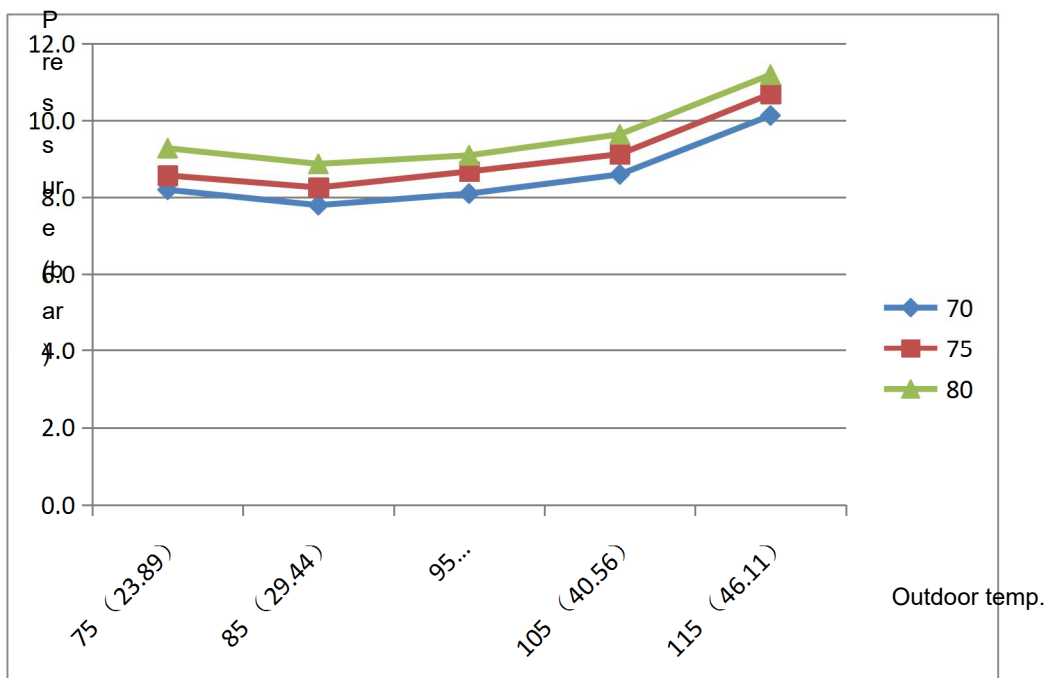
Cooling chart:

COOLING MODE

| °F (°C) | Indoor Temp. | Outdoor temp. | | | | |
|------------|--------------|---------------|---------------|------------|----------------|----------------|
| | | 75 (23.89) | 85 (29.44) | 95 (35) | 105 (40.56) | 115 (46.11) |
| BAR | 70 | 8.2 | 7.8 | 8.1 | 8.6 | 10.1 |
| BAR | 75 | 8.6 | 8.3 | 8.7 | 9.1 | 10.7 |
| BAR | 80 | 9.3 | 8.9 | 9.1 | 9.6 | 11.2 |

| | | | | | | |
|-----|----|-----|-----|-----|-----|-----|
| PSI | 70 | 119 | 113 | 117 | 125 | 147 |
| PSI | 75 | 124 | 120 | 126 | 132 | 155 |
| PSI | 80 | 135 | 129 | 132 | 140 | 162 |

| | | | | | | |
|-----|----|------|------|------|------|------|
| MPA | 70 | 0.82 | 0.78 | 0.81 | 0.86 | 1.01 |
| MPA | 75 | 0.86 | 0.83 | 0.87 | 0.91 | 1.07 |
| MPA | 80 | 0.93 | 0.89 | 0.91 | 0.96 | 1.12 |



Heating Chart:

HEATING MODE

| °F (°C) | Indoor Temp. | Outdoor temp. | | | | |
|------------|-----------------|---------------|-----------|-----------|---------------|---------------|
| | | 57 (13.89) | 47 (8.33) | 37 (2.78) | 27 (-2.78) | 17 (-8.33) |
| BAR | 55 | 30.3 | 28.5 | 25.3 | 22.8 | 20.8 |
| BAR | 65 | 32.5 | 30.0 | 26.6 | 25.4 | 23.3 |
| BAR | 75 | 33.8 | 31.5 | 27.8 | 26.3 | 24.9 |

| | | | | | | |
|-----|----|-----|-----|-----|-----|-----|
| PSI | 55 | 439 | 413 | 367 | 330 | 302 |
| PSI | 65 | 471 | 435 | 386 | 368 | 339 |
| PSI | 75 | 489 | 457 | 403 | 381 | 362 |

| | | | | | | |
|-----|----|------|------|------|------|------|
| MPA | 55 | 3.03 | 2.85 | 2.53 | 2.28 | 2.08 |
| MPA | 65 | 3.25 | 3.00 | 2.66 | 2.54 | 2.33 |
| MPA | 75 | 3.38 | 3.15 | 2.78 | 2.63 | 2.49 |

