



# Hisense

## Operation Installation & Maintenance Manual

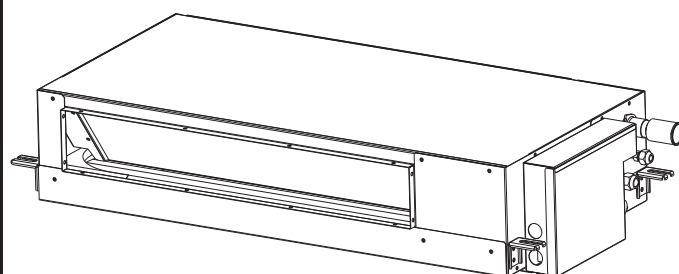
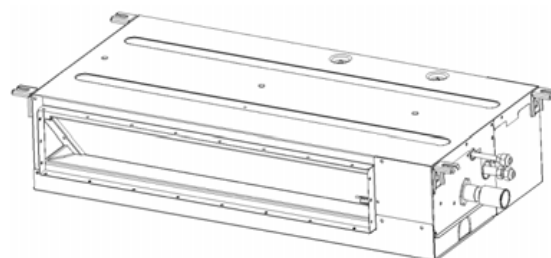
*INVERTER-DRIVEN  
MULTI-SPLIT  
AIR-CONDITIONER  
(HEAT PUMP)*

**- INDOOR UNIT -**

| Type                                    | Model                                                                                                                                |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| LOW-HEIGHT<br>CEILING<br>DUCTED<br>TYPE | AVE-05UXCSAL, AVE-07UXCSAL<br>AVE-09UXCSAL, AVE-12UXCSAL<br>AVE-14UXCSAL, AVE-17UXCSBL<br>AVE-18UXCSBL, AVE-22UXCSBL<br>AVE-24UXCSBL |

### **IMPORTANT:**

*READ AND UNDERSTAND  
THIS MANUAL BEFORE  
USING THIS HEAT-PUMP  
AIR CONDITIONERS.  
KEEP THIS MANUAL FOR  
FUTURE REFERENCE.*



P00399Q

ORIGINAL INSTRUCTIONS





## Declaration of Conformity (Manufacturer's Declaration)



Qingdao Hisense Hitachi Air-conditioning Systems Co., Ltd. ,  
218, Qianwangang Road, Economic & Technical Development Zone, Qingdao, P.R. China  
declares under its sole responsibility that the air conditioning models to  
which this declaration relates:

AVE-05UXCSAL, AVE-07UXCSAL, AVE-09UXCSAL, AVE-12UXCSAL, AVE-14UXCSAL,  
AVE-17UXCSBL, AVE-18UXCSBL, AVE-22UXCSBL, AVE-24UXCSBL,  
are in conformity with the following standard(s) or other normative document(s), provided that these  
are used in accordance with our instructions:

EN 60335-1  
EN 60335-2-40  
EN 62233  
EN 55014-1  
EN 61000-3-2  
EN 61000-3-3  
EN 55014-2

following the provisions of:

2006/42/EC  
2004/108/EC  
2012/19/EU  
2011/65/EU

Directives, as amended.

Manufacturing number and manufacturing year: refer to model Nameplate.

Notes:

This declaration becomes invalid, if technical or operational modifications are introduced  
without the manufacturers consent.

Hisense Italia S.r.l. is authorised to Compile the Technical Construction File.  
Ad. : Via Montefeltro 6A, 20156 Milano.

**Hisense**

Name, Surname

Chen Lin

Position/ Title

: Director

Date

: August 15, 2016



## **IMPORTANT NOTICE**

- Hisense pursues a policy of continuing improvement in design and performance of products. The right is therefore reserved to vary specifications without notice.
- Hisense cannot anticipate every possible circumstance that might involve a potential hazard.
- This heat pump air conditioner is designed for standard air conditioning only. Do not use this heat pump air conditioner for other purposes such as drying clothes, refrigerating foods or for any other cooling or heating process.
- The installer and system specialist shall secure safety against leakage according to local regulations or standards. The following standards may be applicable if local regulations are not available. British Standard, BS4434 or Japan Standard, KHKS0010.
- No part of this manual may be reproduced without written permission.
- Signal words (DANGER, WARNING and CAUTION) are used to identify levels of hazard seriousness. Definitions for identifying hazard levels are provided below with their respective signal words.

|                  |   |                                                                                                        |
|------------------|---|--------------------------------------------------------------------------------------------------------|
| <b>▲ DANGER</b>  | : | Immediate hazards which WILL result in severe personal injury or death.                                |
| <b>▲ WARNING</b> | : | Hazards or unsafe practices which COULD result in severe personal injury or death.                     |
| <b>▲ CAUTION</b> | : | Hazards or unsafe practices which COULD result in minor personal injury or product or property damage. |
| <b>NOTE</b>      | : | Useful information for operation and/or maintenance.                                                   |

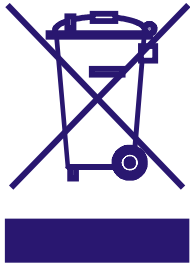
- It is assumed that this heat pump air conditioner will be operated and serviced by English speaking people. If this is not the case, the customer should add safety, caution and operating signs in the native language.
- If you have any questions, contact your distributor or dealer of Hisense .
- This manual gives a common description and information for this heat pump air conditioner which you operate as well as for other models.
- This heat pump air conditioner has been designed for the following temperatures. Operate the heat pump air conditioner within this range.

| Temperature          |         | (°C)      |             |
|----------------------|---------|-----------|-------------|
|                      |         | Maximum   | Minimum     |
| Cooling<br>Operation | Indoor  | 32DB/23WB | 21 DB/15 WB |
|                      | Outdoor | 43 DB     | -5 DB       |
| Heating<br>Operation | Indoor  | 27 DB     | 15 DB       |
|                      | Outdoor | 15 WB     | - 20WB      |

DB: Dry Bulb, WB: Wet Bulb

This manual should be considered as a permanent part of the air conditioning equipment and should remain with the air conditioning equipment.

## **IMPORTANT NOTICE**



### **Correct Disposal of this product**

This marking indicates that this product should not be disposed with other household wastes. To prevent possible harm to the environment or human health from uncontrolled waste disposal, recycle it responsibly to promote the sustainable reuse of material resources. To return your used device, please use the return and collection systems or contact the retailer where the product was purchased. They can take this product for environmental safe recycling.

## **CHECKING PRODUCT RECEIVED**

- Upon receiving this product, inspect it for any shipping damage.  
Claims for damage, either apparent or concealed, should be filed immediately with the shipping company.
- Check the model number, electrical characteristics (power supply, voltage and frequency) and accessories to determine if they are correct.

The standard utilization of the unit shall be explained in these instructions.

Therefore, the utilization of the unit other than those indicated in these instructions is not recommended.

Please contact your local agent, as the occasion arises.

Hisense's liability shall not cover defects arising from the alteration performed by a customer without Hisense's consent in a written form.

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# Section1 Operation Manual

## 1. Safety Summary

### DANGER

- Do not pour water into the indoor or outdoor unit. These products are equipped with electrical parts. If poured, it will cause a serious electrical shock.
- Do not touch or adjust safety devices inside the indoor or outdoor units. If these devices are touched or readjusted, it may cause a serious accident.
- Do not open the service cover or access the indoor or outdoor units without turning OFF the main power supply.

### WARNING

- Refrigerant leakage can cause difficulty with breathing due to insufficient air.  
If leakage occurs, turn OFF the main switch, put out fire at once and contact your service contractor.
- Do not use any sprays such as insecticide, lacquer, hair spray or other flammable gases within approximately one (1) meter from the system.
- If earth leakage breaker (ELB) or fuse is often activated, stop the system and contact your service contractor.

### CAUTION

- The appliance is not to be used by children or person with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
- Children should be supervised that they do not play with the appliance.
- The appliance should not be installed in the laundry.

### NOTE

- It is recommended that the room be ventilated every 3 to 4 hours.

## 2. System Description

A maximum total capacity of 130% and a minimum total capacity of 50% can be chosen by combination of the indoor units (Table 2.1).

The heat pump air conditioner is designed to offer cooling, heating, dry and fan operations. These operation modes are controlled by the remote control switch (optional).

Table 2.1 Indoor Unit Type List

| Indoor Unit Type               | Nominal Capacity (10 <sup>3</sup> Btu/h) |    |    |    |    |    |    |    |    |
|--------------------------------|------------------------------------------|----|----|----|----|----|----|----|----|
|                                | 05                                       | 07 | 09 | 12 | 14 | 17 | 18 | 22 | 24 |
| LOW-HEIGHT CEILING DUCTED TYPE | ○                                        | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  |

○ : Available

### 3.Unit Drawing & Function Key Definition

#### **CAUTION**

Press switches only with fingers. Do not press switches by any other item, as it may break switches.

Do not touch the CHECK switch. This switch is only for servicing. If touched, press the CHECK switch again to reset.

#### ● Temperature Setting

When the TEMP switch is pressed, temperature increases by 1 degree. The minimum setting indication is 17°C and the maximum setting indication is 30°C.

#### ● Set and Actual Temperature

The set temperature is for the air temperature at the sensor (thermistor) of the indoor unit. The actual room temperature may be different

from the air temperature of the sensor due to the difference of the sensing location.

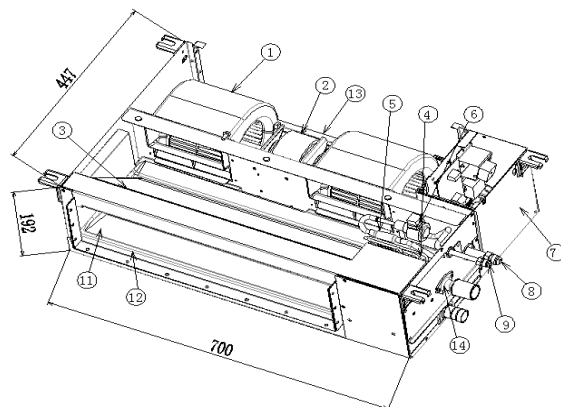
#### ● Touching Type Switches

This control switch is of touching type. Slightly press the switch by finger. The operation can be checked by the display of the liquid crystal.

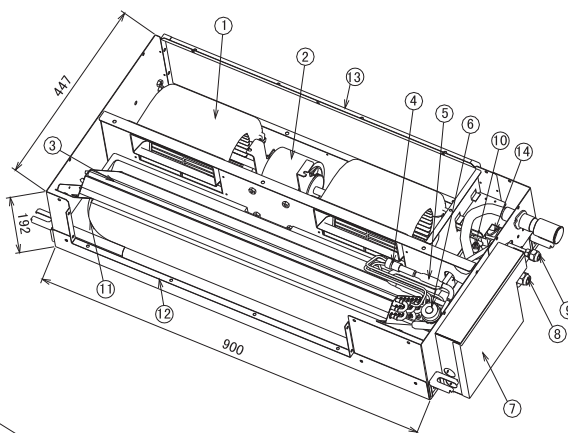
#### ● Multiple-Unit Control

16 indoor units, as a maximum number, can be controlled by one remote control switch. Refer to the Installation Manual for Remote Control Switch.

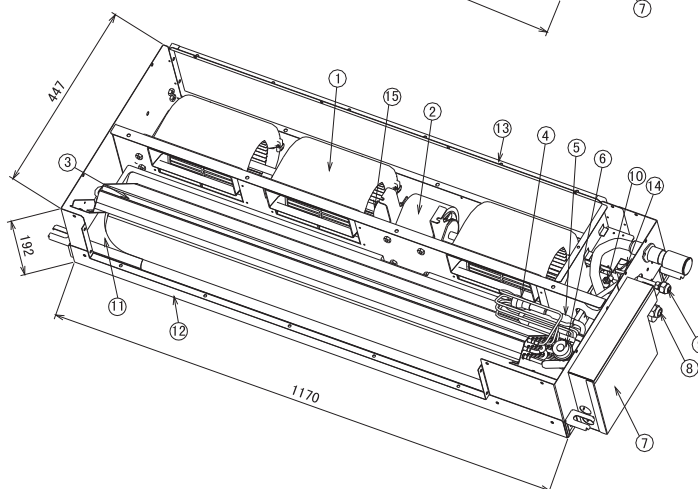
Model: 05



Model: 07-14



Model: 17-24



| No. | Part Name                              | No. | Part Name                               |
|-----|----------------------------------------|-----|-----------------------------------------|
| 1   | Fan                                    | 9   | Refrigerant Liquid Pipe Connection (Φb) |
| 2   | Fan Motor                              | 10  | Float Switch                            |
| 3   | Heat Exchanger                         | 11  | Drain Pan                               |
| 4   | Distributor                            | 12  | Air Outlet                              |
| 5   | Strainer                               | 13  | Air Inlet                               |
| 6   | Micro-Computer Control Expansion Valve | 14  | Drain Discharge Mechanism               |
| 7   | Electrical Control Box                 | 15  | Shift Joint (17-24)                     |
| 8   | Refrigerant Gas Pipe Connection (Φa)   |     |                                         |

Fig.3.1 LOW-HEIGHT CEILING DUCTED TYPE

## 4. Before Operation

### CAUTION

- Supply electrical power to the system for approximately 12 hours before start-up after long shutdown. Do not start the system immediately after power supply, it may cause a compressor failure, because the compressor is not heated well.
- Make sure that the outdoor unit is not covered with snow or ice. If covered, remove it by using hot water (less than 50°C). If the water temperature is higher than 50°C, it will cause damage to plastic parts.
- When the system is started after a shutdown longer than approximately 3 months, it is recommended that the system be checked by your service contractor.

## 5. Operation Method

- Regarding the instructions of Wired Remote Control Switch or Wireless Remote Control Switch, read the operation manual attached to the control switch.

## 6. Automatic Control

The system is equipped with the following functions.

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### NOTE

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Except for a long period of shutdown, keep the main power switch ON. The drain discharge mechanism is operated if the drain level is higher than the setting.

- **Three Minute Guard (Enforced Stoppage)**  
The compressor remains off for at least 3 minutes once it has stopped. If the system is started within approximately 3 minutes after it has stopped, the RUN indicator is activated. However, the cooling operation or the heating operation remains off and does not start until after 3 minutes has elapsed.
- **Three Minute Guard (Enforced Operation)**  
If all indoor units of the system are Thermo-OFF within approximately 3 minutes after compressor has started, compressor is operated during 3 minutes continuously. However, if all indoor units of the system are stopped by remote control switch, compressor is stopped.
- **Oil Return Operation**  
If an indoor unit is stopped more than 2 hours continuously, this function is operated during a few minutes.  
It has this function to prevent to accumulate in the heat exchanger of stoppage indoor unit at cooling operation.

### ● **Frost Prevention During Cooling Operation**

When the indoor unit is operated at low discharge air temperature, the cooling operation may be changed to fan operation for a while to avoid frost formation on the indoor heat exchanger.

### ● **Hot Start During Heating Operation**

To prevent cold air discharge in the room, the fan speed is controlled from the slow position and the low position and then to the set position according to the discharge air temperature. At this time the louver is fixed horizontally.

### ● **Slow Air Control During Defrosting Operation**

When the outdoor unit is performing the automatic defrosting operation, the indoor fan is stopped and the louver is fixed horizontally.

### ● **Cooling of Indoor Unit**

When the heating operation is stopped, the indoor fan operation is maintained at the slow position for the maximum of 2 minutes to lower temperature of the inside unit.

### ● **Automatic Defrosting Cycle**

When the heating operation is stopped by pressing RUN/STOP switch, frosting on the outdoor unit is checked and the defrosting operation may be performed for the maximum of 10 minutes.

### ● **Prevention of Overload Operation**

When the outdoor temperature is high during heating operation, heating operation is stopped due to activation of the outdoor thermistor until the temperature becomes low.

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### NOTE

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If the system is stopped due to a power failure, it will not automatically start again although power is restored.

Repeat the start-up procedure from Step 1 to start the system. In the event of a very brief power failure (2 seconds maximum), the settings are memorized.

Therefore, the system starts automatically after approximately 3 minutes.

---

## 7. Troubleshooting

### CAUTION

**When overflow of drain water from the indoor unit occurs, stop the operation and contact your contractor.**

**When you smell or see white smoke coming from the unit, turn OFF the main power supply and contact your contractor.**

---

#### 7.1 If Trouble Still Remains ...

If the trouble still remains even after checking the following, contact your contractor and inform them of the following items.

- (1) Unit Model Name
- (2) Content of Trouble
- (3) Alarm Code No. on Liquid Crystal Display

#### 7.2 No Operation

Check whether the SET TEMP is set at the correct temperature.

#### 7.3 Not Cooling or Heating Well

- Check for obstruction of air flow of the outside or inside units.
- Check if too much heat source exists in the room.
- Check if the air filter is clogged with dust.
- Check to see if the doors or windows are opened or not.
- Check if the temperature condition is not within the operation range.

#### 7.4 This is Not Abnormal

##### ● Smells from Indoor Unit

Smell adheres on indoor unit after a long period of time. Clean the air filter and panels or allow a good ventilation.

##### ● Sound from Deforming Parts

During system starting or stopping, an abrading sound might be heard. However, this is due to thermal deformation of plastic parts. It is not abnormal.

##### ● Steam from Outdoor Heat Exchanger

During defrosting operation, ice on the outdoor heat exchanger is melted, resulting in making steam.

##### ● Refrigerant Flow Sound

While the system is being started or stopped, sound from the refrigerant flow may be heard.

# Section2 Installation & Maintenance Manual

## 1. Safety Summary

### **WARNING**

- Do not perform installation work, refrigerant piping work, drain piping and electrical wiring connection without referring to the installation manual.
- Check that the ground wire is securely connected.
- Connect a fuse of specified capacity.

### **CAUTION**

Do not install the indoor unit, outdoor unit, remote control switch and cable within approximately 3 meters from strong electromagnetic wave radiators such as medical equipment.

## 2 Necessary Tools and Instrument List for Installation

| No. | Tool                 | No. | Tool                             |
|-----|----------------------|-----|----------------------------------|
| 1   | Screwdriver          | 10  | Charging Cylinder                |
| 2   | Vacuum Pump          | 11  | Gauge Manifold                   |
| 3   | Refrigerant Gas Hose | 12  | Cutter for Wires                 |
| 4   | Megohmmeter          | 13  | Gas Leak Detector                |
| 5   | Copper Pipe Bender   | 14  | Leveller                         |
| 6   | Pipe Cutter          | 15  | Clamper for Solderless Terminals |
| 7   | Brazing Kit          | 16  | Hoist (for Indoor Unit)          |
| 8   | Hexagon Wrench       | 17  | Ammeter                          |
| 9   | Spanner              | 18  | Voltage Meter                    |

### **NOTE**

About vacuum pump, gas hose, charging cylinder, gauge manifold, please use suitable equipments for R410A respectively. Do not mix other refrigerant.

### 3. Transportation and Handling

#### 3.1 Transportation

Transport the product as close to the installation location as practical before unpacking.

#### CAUTION

Do not put any material on the product.

#### 3.2 Handling of Indoor Unit

#### WARNING

Do not put any foreign material into the indoor unit and check to ensure that none exists in the indoor unit before the installation and test run. Otherwise, a fire or failure, etc. may occur.

#### CAUTION

Be careful not to damage on insulation materials of unit's surface when lifting.

### 4. Indoor Unit Installation

#### DANGER

Do not install the indoor unit in a flammable environment to avoid fire or an explosion.

#### WARNING

- Check to ensure that the ceiling slab is strong enough. If not strong enough, the indoor unit may fall down on you.
- Do not install the indoor unit outdoors. If installed outdoors, an electric hazard or electric leakage will occur.

It is recommended that indoor units be installed higher than 2.5 meters from the floor level.

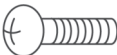
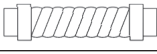
#### 4.1 Factory-Supplied Accessories

Check to ensure that the following accessories are packed with the indoor unit.

#### NOTE

If any of these accessories are not packed with the unit, please contact your contractor.

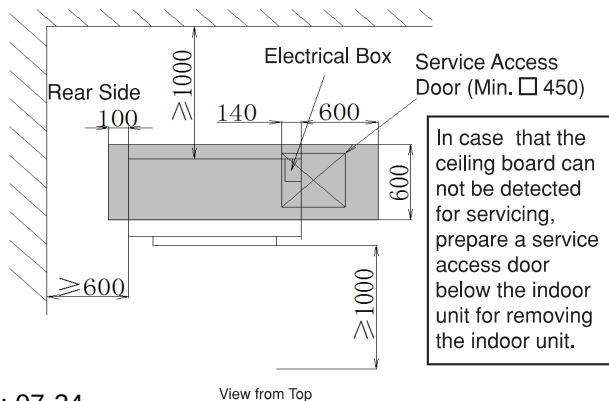
Table 4.1 Factory-Supplied Accessories

| Accessory                                                                                      | Q'ty | Purpose                     |
|------------------------------------------------------------------------------------------------|------|-----------------------------|
| Washer      | 8    | For Unit Suspension         |
| Screw       | 8    | For Fixing Flanges          |
| Hose Clamp  | 1    | For Drain Hose Connection   |
| Flange      | 1    | For Air Outlet (Only 07-24) |
| Flange      | 1    | For Air Inlet (Only 07-24)  |
| Drain Pipe  | 1    | For Drain Hose Connection   |

## 4.2 Initial Check

- Install the indoor unit with a proper clearance around it for operation and maintenance working space, as shown in Fig. 4.1.

Model: 05



Model: 07-24

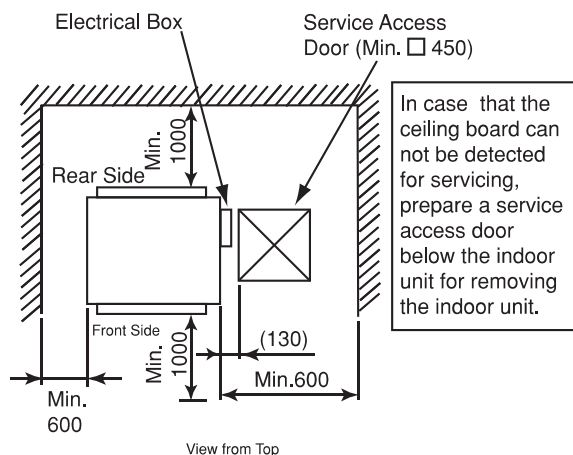


Fig. 4.1 Operation and Installation Space

- Consider the air distribution from the indoor unit to the space of the room, and select a suitable location so that uniform air temperature in the room can be obtained.
- Do not install flammable parts in the service space for the indoor unit.
- Avoid obstacles which may hamper the air intake or the air discharge flow.
- Do not install the indoor unit in a machine shop or kitchen where vapor from oil or its mist flows to the indoor unit.

The oil will deposit on the heat exchanger, thereby reducing the indoor unit performance, and may deform and in the worst case, break the plastic parts of the indoor unit.

- Pay attention to the following points when the indoor unit is installed in a hospital or other facilities where there are electronic waves from medical equipment.

- Do not install the indoor unit where the electromagnetic wave is directly radiated to the electrical box, remote control cable or remote control switch.
- Install the indoor unit and components as far as practical or at least 3 meters from the electromagnetic wave radiator.
- Prepare a steel box and install the remote control switch in it. Prepare a steel conduit tube and wire the remote control cable in it. Then, connect the ground wire with the box and the tube.
- Install a noise filter when the power supply emits harmful noises

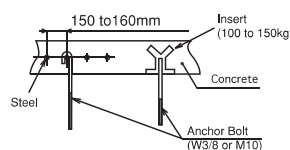
- To avoid any corrosive action to the heat exchangers, do not install the indoor unit in an acid or alkaline environment.

## 4.3 Installation

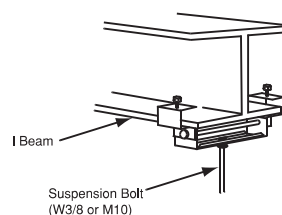
### 4.3.1 Suspension Bolts

- **Step 1**  
Select final location and installation direction of the indoor unit paying careful attention to the space for the piping, wiring and maintenance.
- **Step 2**  
Mount suspension bolts, as shown in Fig. 4.2

For Concrete Slab



• For Steel Beam



For Wooden Beam Suspension

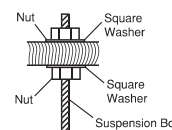
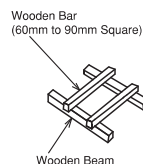


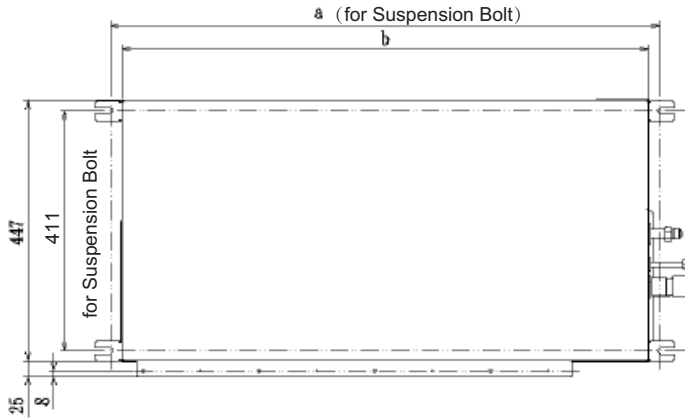
Fig. 4.2 Mounting of Suspension Bolts



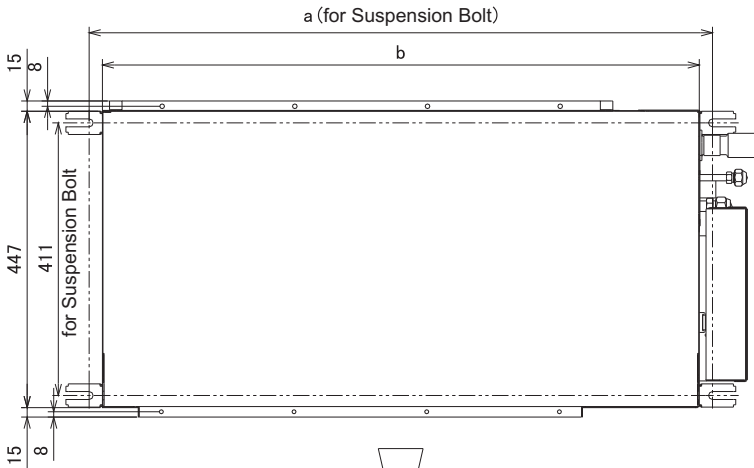
#### 4.3.2 Marking of the Positions of the Sling Bolts and Piping Connections

- (1) Mark the positions of the sling bolts, refrigerant piping connections and drain connection.
- (2) Installation dimensions are shown in Fig. 4.3.

Model: 05



Model: 07-24



| Model | a    | b    |
|-------|------|------|
| 05    | 740  | 700  |
| 07~14 | 940  | 900  |
| 17~24 | 1210 | 1170 |

Fig. 4.3 Suspension Bolts

#### 4.3.3 Mounting the Indoor Unit

Hang the indoor unit as shown in Fig. 4.4.

##### Field-Supplied Parts

- \*Sling Bolts 4-M10 or W3/8
- \*Nut 8-M10 or W3/8
- \*Washer 8-M10 or W3/8

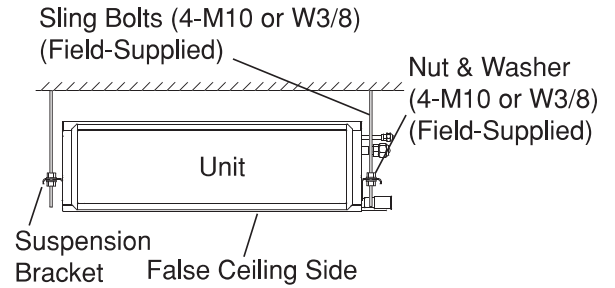


Fig. 4.4 Hanging Indoor Unit

- (1) How to put Nuts or Sling Bolts

Put nuts on each of the four hanging bolts, as shown in Fig. 4.5

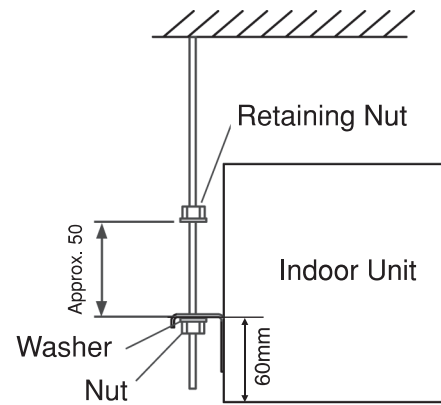


Fig. 4.5 Sling Bolts and Nut



## (2) Hanging the Indoor Unit

- \* Hook suspension bracket to the nut and washer of each hanging bolt, as shown, starting at the opposite side to service cover side.
- \* After checking that the nut and washer are correctly fixed by the retainers of the suspension bracket, hook the suspension bracket of the service cover side to the nut and washer.

(Put the sling bolts away from the unit when hooking.)

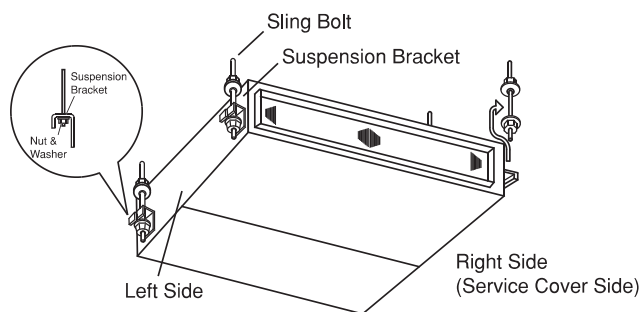


Fig. 4.6 Hanging Indoor Unit

## 4.3.4 Adjusting of the Unit Level

- (1) Check to ensure that the foundation is flat, taking into account the maximum foundation gradient.

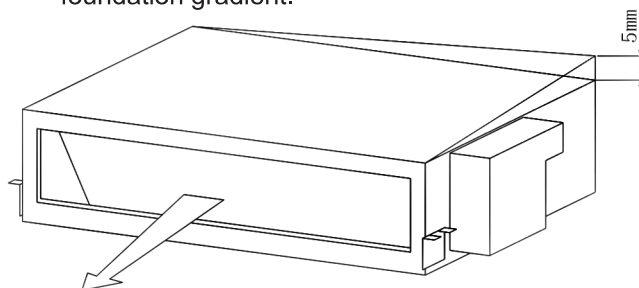


Fig. 4.7 Foundation Gradient

- (2) The unit should be installed so that the rear side of the unit is slightly (0mm~5mm) lower than the front side, in order to avoid the incorrect position of the drain discharge.
- (3) Tighten the bolts of the sling nuts with the suspension brackets after adjustment is completed.  
Special plastic paint must be applied to the bolts in order to prevent them from loosening.

## NOTE

Keep the unit as well as relevant equipment covered with the vinyl cover during installation work.

## 4.3.5 Connecting Supply Duct

The supply duct should be connected with the indoor unit through canvas ducts, in order to avoid abnormal sound vibration (Refer to Fig. 4.8). The unit is equipped with a pre-drilled duct flange for the supply duct connection.

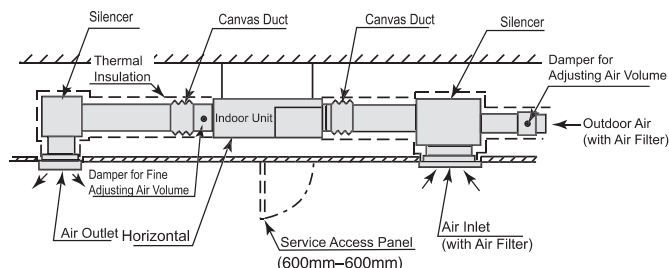


Fig. 4.8 Duct Connection

## 5. Refrigerant Piping Work

### ⚠ DANGER

**Use refrigerant R410A in the refrigerant cycle. Do not charge oxygen, acetylene or other flammable and poisonous gases into the refrigerant cycle when performing a leakage test or an air-tight test. These types of gases are extremely dangerous and can cause an explosion. It is recommended that compressed air, nitrogen or refrigerant be used for these types of tests.**

### 5.1 Piping Materials

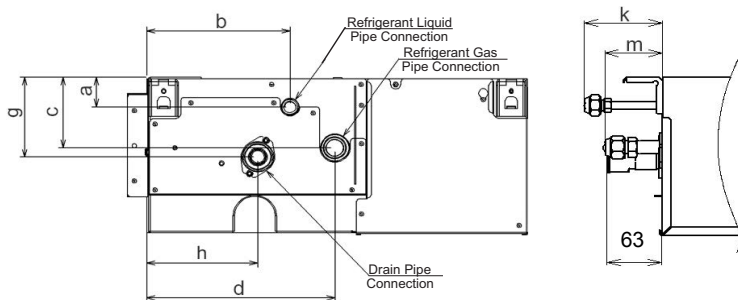
- (1) Prepare locally-supplied copper pipes.
- (2) Select clean copper tubes making sure there is no dust and moisture inside the tubes.

Before connecting pipes, blow the inside of the tubes with nitrogen or dry air, to remove any dust or foreign materials.

## 5.2 Piping Connection

- (1) Position of piping connection is shown below.

Model: 05



Model: 07-24

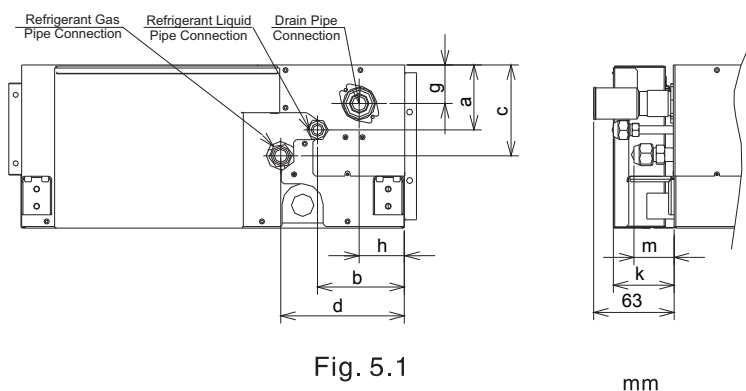


Fig. 5.1

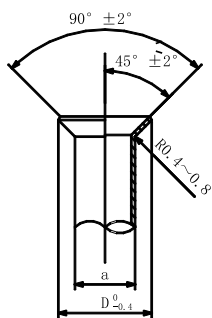
| Model | a  | b   | c   | d   | g  | h   | k  | m  |
|-------|----|-----|-----|-----|----|-----|----|----|
| 05    | 35 | 166 | 86  | 220 | 97 | 129 | 90 | 65 |
| 07~24 | 76 | 101 | 106 | 144 | 45 | 53  | 71 | 47 |

mm(in.)

| Model | Gas Piping        | Liquid Piping    |
|-------|-------------------|------------------|
| 05~14 | $\phi 12.7(1/2)$  | $\phi 6.35(1/4)$ |
| 17~18 | $\phi 15.88(5/8)$ | $\phi 6.35(1/4)$ |
| 22~24 | $\phi 15.88(5/8)$ | $\phi 9.53(3/8)$ |

### ※ Flaring Dimension

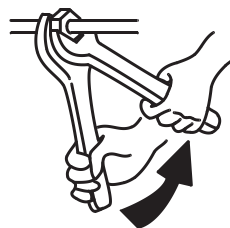
Perform the flaring work as shown below.



| $\Phi a$ | $\Phi D$ |       |
|----------|----------|-------|
|          | R410A    | R407C |
| 6.35     | 9.1      | 9.0   |
| 9.53     | 13.2     | 13.0  |
| 12.7     | 16.6     | 16.2  |
| 15.88    | 19.7     | 19.4  |
| 19.05    | (*)      | 23.3  |

(\*) It is impossible to perform the flaring work with 1/2H material. In this case, use an accessory pipe (with a flare).

- (2) When tightening the flare nut, use two spanners as shown in Fig. 5.2.



| Pipe Size             | Tightening Torque (N.m) |
|-----------------------|-------------------------|
| $\phi 6.35\text{mm}$  | 20                      |
| $\phi 9.53\text{mm}$  | 40                      |
| $\phi 15.88\text{mm}$ | 80                      |
| $\phi 19.05\text{mm}$ | 100                     |

Fig. 5.2 Tightening Work of Flare Nut

- (3) After connecting the refrigerant piping, seal the refrigerant pipes by using the field-supplied insulation material as shown in Fig 5.3.

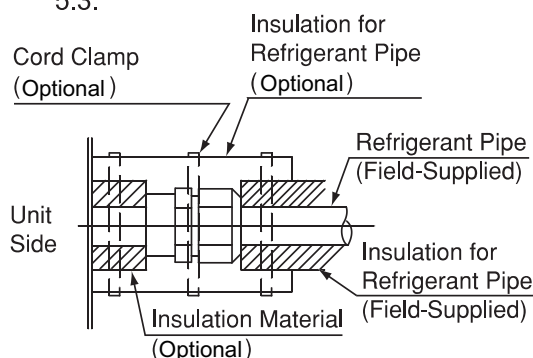
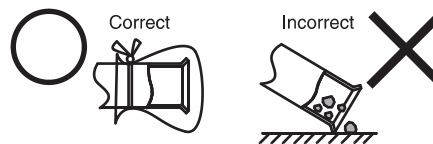


Fig. 5.3 Insulation on Pipes

## ⚠ CAUTION

- Cap the end of the pipe when the pipe is to be inserted through a hole.
- Do not put pipes on the ground directly without a cap or vinyl tape at the end of the pipe.



- (4) Evacuation and refrigerant charging procedures should be performed according to installation & Maintenance Manual of the outdoor unit.  
In relation to the additional refrigerant quantity, refer to Common.

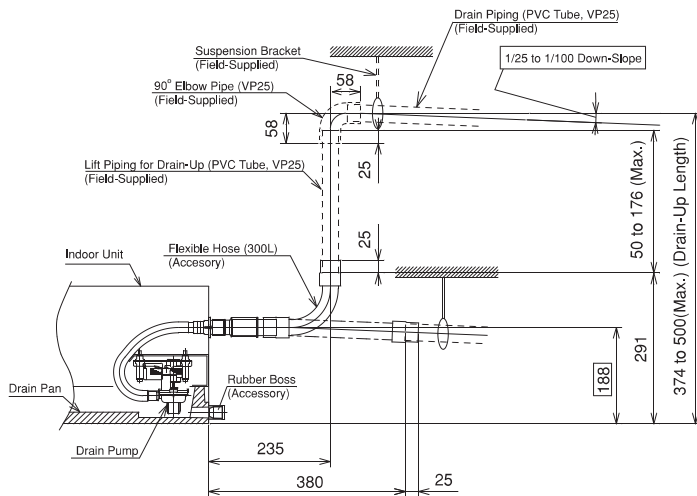
## ⚠ CAUTION

- An excess or a shortage of refrigerant is the main cause of trouble to the units.  
Charge the correct refrigerant quantity.

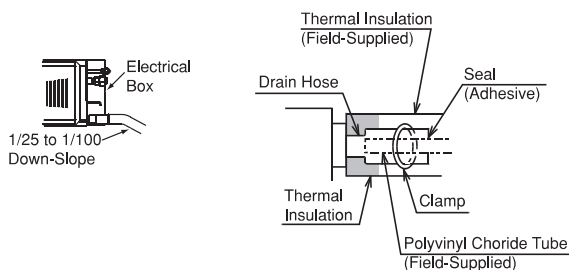
## 6. Drain Piping

- (1) The position of the drain piping connection is shown in Fig. 6.1.
- (2) Prepare polyvinyl chloride pipe with a 32mm outer diameter.
- (3) Fasten the tube to the drain hose with the adhesive agent and the factory-supplied clamp. The drain piping must be performed with a DOWN-SLOPE pitch of 1/25 to 1/100.
- (4) Insulate the drain pipe after connecting the drain hose.

### Drain Pump(optional)



### Standard



### Common

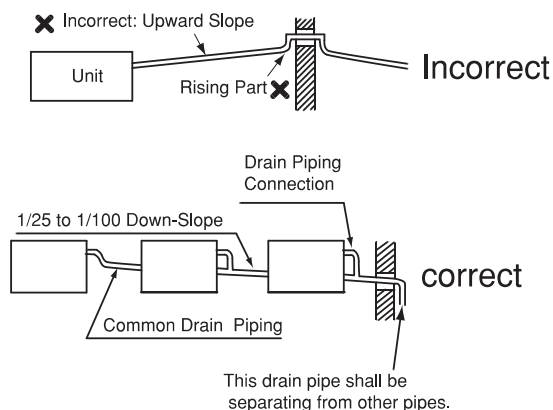


Fig. 6.1 Drain Piping

## NOTE

When the relative humidity of inlet or ambient air exceeds 80%, apply an (field-supplied) auxiliary drain pan beneath the indoor unit as shown in Fig. 6.2.

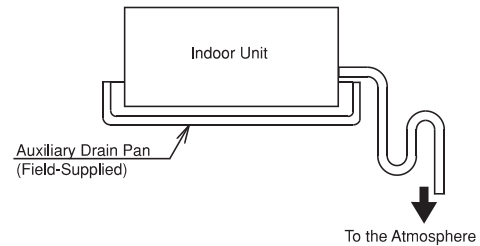


Fig. 6.2 Auxiliary Drain Pan

## NOTE

- (1) Do not create an upper-slope or rise for the drain piping, since drain water can flow back to the unit and leakage to the room will occur when the unit operation is stopped.
- (2) Do not connect the drain pipe with sanitary or sewage piping or any other drainage piping.
- (3) When the common drain piping is connected with other indoor units, the connected position of each indoor unit must be higher than the common piping. The pipe size of the common drain pipe must be large enough according to the unit size and number of units.
- (4) After performing drain piping work and electrical wiring, check to ensure that water flows smoothly as in the following procedure.  
**Checking with the Float Switch**
  - a. Switch ON the power supply.
  - b. Pour 2 or 2.5 liters of water into the drain pan.
  - c. Check to ensure that the water flows smoothly or whether no water leakage occurs. When water cannot be found at the end of the drain piping, pour another 2 liters of water into the drain.

## 7. Electrical Wiring

### **! WARNING**

- Turn OFF the main power switch to the indoor unit and the outdoor unit before electrical wiring work or a periodical check is performed.
- Check to ensure that the indoor fan and the outdoor fan have stopped before electrical wiring work or a periodical check is performed.
- Protect the wires, drain pipe, electrical parts, etc. from rats or other small animals. If not protected, rats may gnaw at unprotected parts and at the worst, a fire will occur.

### **! CAUTION**

- Wrap the accessory packing around the wires, and plug the wiring connection hole with the seal material to protect the product from any condensate water or insects.
- Tightly secure the wires with the cord clamp inside the indoor unit.
- Secure the cable of the remote control switch using the cord clamp inside the electrical box.

#### 7.1 General Check

- (1) Make sure that the field-selected electrical components (main power switches, circuit breakers, wires, conduit connectors and wire terminals) have been properly selected according to the electrical data given in "Technical Catalog I". Make sure that the components comply with National Electrical Code (NEC).
- (2) Check to ensure that the power supply voltage is within  $\pm 10\%$  of the rated voltage.
- (3) Check the capacity of the electrical wires.  
If the power source capacity is too low, the system cannot be started due to the voltage drop.
- (4) Check to ensure that the ground wire is connected.
- (5) Power Source Main Switch

Install a multi-pole main switch with a space of 3.5mm or more between each phase.

#### 7.2 Electrical Wiring Connection

The electrical wiring connection for the indoor unit is shown in Fig. 7.2.

- (1) Connect the cable of an optional remote control switch or an optional extension cable to the connectors on the printed circuit board inside the electrical box through the connecting hole in the cabinet.
- (2) Connect the power supply and earth wires to the terminals in the electrical box.
- (3) Connect the wires between the indoor unit and the outdoor unit to the terminals in the electrical box.
- (4) Tightly clamp the wires using the cord clamp inside the electrical box.
- (5) After the connection, plug the wiring connection hole with the seal material (with cover) to protect the product from any condensate water or insects.
- (6) Setting of the external static pressure
  - a) Model: 05  
Setting the external static pressure for the Remote Controller.  
Please refer to the operation inatallation and maintenance manual of the Remote Controller.

| Static Pressure | Setting of Remote Controller |
|-----------------|------------------------------|
| 0Pa             | 02                           |
| 10Pa            | 00                           |
| 30Pa            | 01                           |

#### b) Model: 07-24

The exworks setting of the external static pressure of this indoor unit is 10Pa, the 10Pa plug (white) from the motor is connected to "FAN" slot. If the external static pressure needs to be changed to 30Pa, please change the 30Pa plug (red) to "FAN" slot. Shown in Fig. 7.1.

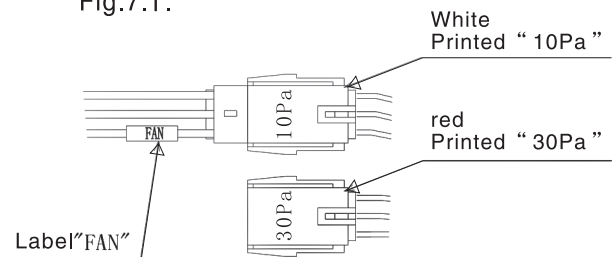
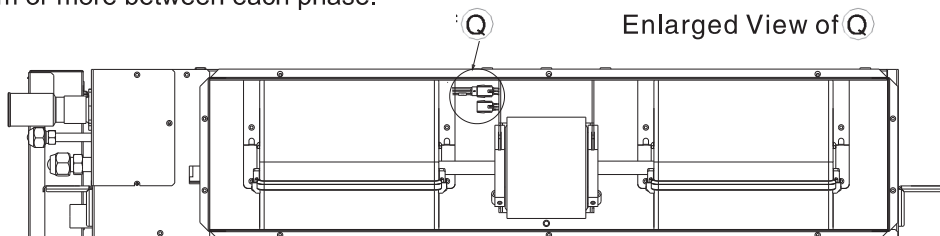
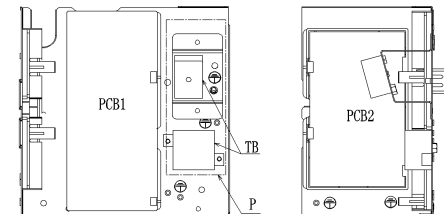
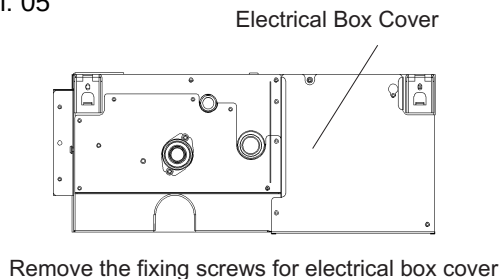


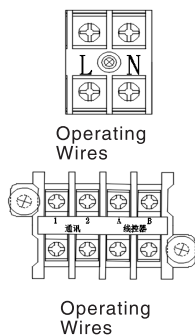
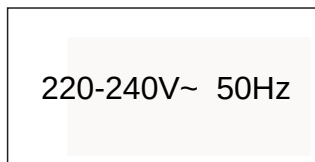
Fig. 7. 1 10Pa or 30Pa Static Pressure of Change  
Enlarged View of ①



Model: 05



Wiring Connection Terminal Board(TB)Enlarged View of P



Wiring Connection Terminal Board(TB)Enlarged View of P

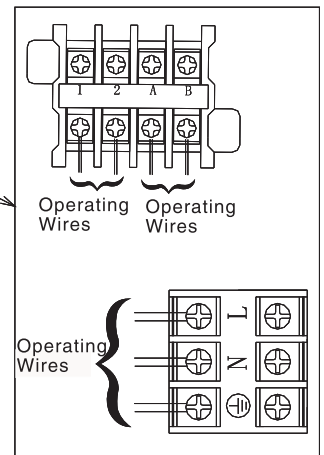
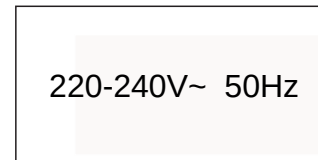
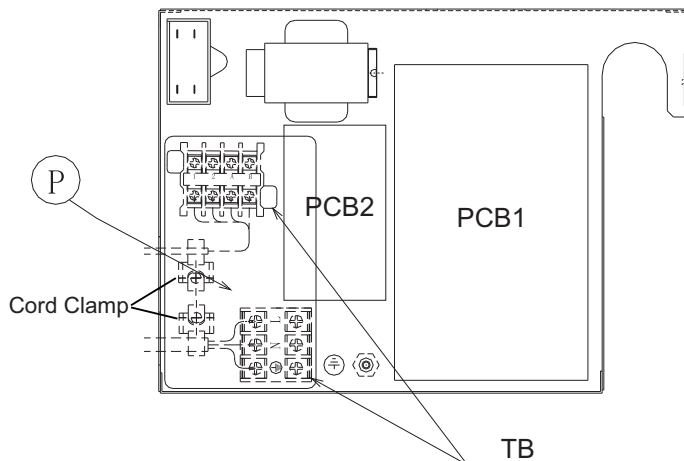
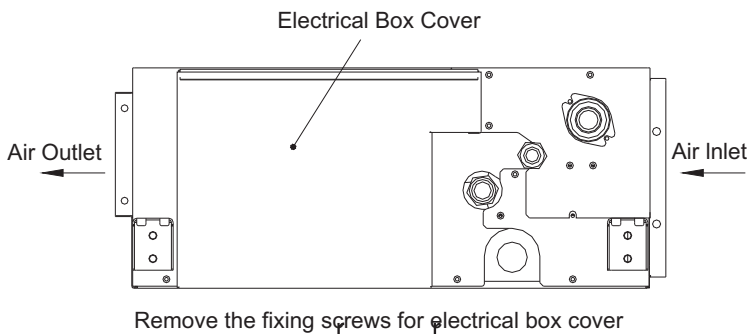


Fig 7.2 Electrical Wiring Connection

Model: 07-24



## 8. Test Run

Test run should be performed according to "Installation & Maintenance Manual" of the outdoor unit.

### ! WARNING

- Do not operate the system until all the check points have been cleared.
  - (A) Check to ensure that the electrical resistance is more than 1 megohm, by measuring the resistance between ground and the terminal of the electrical parts. If not, do not operate the system until the electrical leakage is found and repaired.
  - (B) Check to ensure that the stop valves of the outdoor unit are fully opened, and then start the system.
  - (C) Check to ensure that the switch on the main power source has been ON for more than 12 hours, to warm the compressor oil by the crankcase heater.
- Pay attention to the following items while the system is running.
  - (A) Do not touch any of the parts by hand at the discharge gas side, since the compressor chamber and the pipes at the discharge side are heated higher than 90°C.
  - (B) DO NOT PUSH THE BUTTON OF THE MAGNETIC SWITCH(ES). It will cause a serious accident.

## 9. Safety and Control Device Setting

Indoor Unit

| Model                                  |         |    | 05~24   |
|----------------------------------------|---------|----|---------|
| For Evaporator Fan Motor<br>Thermostat | Cut-Out | °C | 130 ± 5 |
|                                        | Cut-In  | °C | 83 ± 15 |
| For Control Circuit<br>Fuse Capacity   |         | A  | 5       |
| Freeze Protection<br>Thermostat        | Cut-Out | °C | 0       |
|                                        | Cut-In  | °C | 14      |
| Thermostat<br>Differential             |         | °C | 2       |

## 10. Common

### 10.1 Field Minimum Wire Sizes for Power Source

#### WARNING

- Use an ELB (Electric Leakage Breaker). If not used, it will cause an electric shock or a fire.
- Run through the cables using conduit tube, and Completely seal the end of conduit tube with sealing materials.

#### Field Minimum Wire Sizes for Power Source

| Model | Power Source   | Maximum Current | Power Source Cable Size | Transmitting Cable Size |
|-------|----------------|-----------------|-------------------------|-------------------------|
|       |                |                 | EN60 335-1<br>※1        | EN60 335-1<br>※1        |
| 05    | 220~240V~ 50Hz | 0.26A           | 2.5 mm <sup>2</sup>     | 0.75mm <sup>2</sup>     |
| 07~09 |                | 0.6A            |                         |                         |
| 12~14 |                | 0.8A            |                         |                         |
| 17~18 |                | 1.0A            |                         |                         |
| 22~24 |                | 1.1A            |                         |                         |

#### NOTES:

- 1) Follow local codes and regulations when selecting field wires.
- 2) The wire sizes marked with \*1 in the above table are selected at the maximum current of the unit according to the European Standard, EN60335-1. Use the wires which are not lighter than the ordinary polyvinyl chloride sheathed flexible cord (code designation H05VV-F).
- 3) Use a shielded cable for the transmitting circuit and connect it to ground.
- 4) In the case that power cables are connected in series, add each unit maximum current and select wires below.

| According to EN60 335-1 |                             |
|-------------------------|-----------------------------|
| Current(A)              | Wire Size(mm <sup>2</sup> ) |
| $i \leq 6$              | 2.5                         |
| $6 < i \leq 10$         | 2.5                         |
| $10 < i \leq 16$        | 2.5                         |
| $16 < i \leq 25$        | 4                           |
| $25 < i \leq 32$        | 6                           |
| $32 < i \leq 40$        | 10                          |
| $40 < i \leq 63$        | 16                          |
| $63 < i$                | ※1                          |

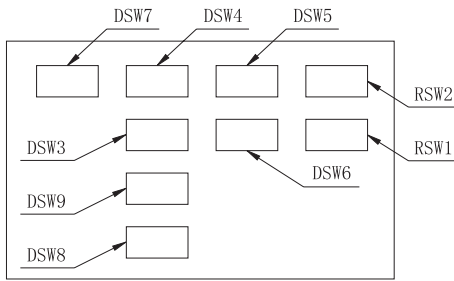
\*3: In the case that current exceeds 63A, do not connect cables in series.



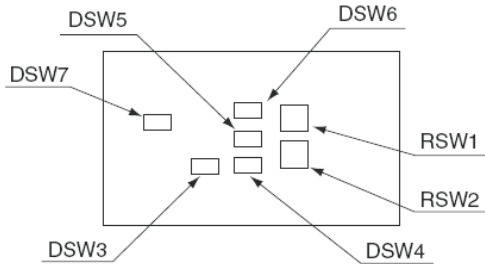
## 10.2 Setting of Dip Switches

- (1) Turn OFF all the power supply to the indoor and the outdoor units before Dip Switch setting. If not, the setting is invalid.
- (2) The Dip Switch positions are as follows.

Model: 05



Model: 07-24



- (3) The PCB in the indoor unit is equipped with rotary switches and dip switches. Before testing unit, set these dip switches according to the following instructions. Unless these dip switches are set in the field, the unit can not be operated.

- (a) Unit No. Setting (RSW1&DSW6)  
Setting is required. Set the unit No. of all indoor units respectively and serially by following setting position shown in the table below.

| Unit No. Setting                                                                                                                                                                                                                                  |                    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| DSW6 (Tens Digit)                                                                                                                                                                                                                                 | RSW1 (Units Digit) |
|                                                                                                                                                                                                                                                   |                    |
| Before shipment. DSW6 and RSW1 are set to "0".<br>Max. 64 units are available to set when all the equipment to be connected are corresponding to Hi-NET.<br>Max. 16 units when the units corresponding/ non-corresponding to Hi-NET are combined. |                    |
| Ex.) Set at No.16 Unit DSW6<br>Set No.1 Pin ON<br>Set at "6"                                                                                                                                                                                      |                    |

- (b) Capacity Code Setting (DSW3)  
No setting is required, due to setting before shipment. This switch is utilized for setting the capacity code which corresponds to the Horse Power of the indoor unit.

| Capacity         | 07 | 09 | 12 | 14 | 17 |
|------------------|----|----|----|----|----|
| Setting Position |    |    |    |    |    |
| Capacity         | 18 | 22 | 24 |    |    |
| Setting Position |    |    |    |    |    |

|                  |    |
|------------------|----|
| Capacity         | 05 |
| Setting Position |    |

- (c) Unit Model Code Setting(DSW4)  
No setting is required.  
Setting the model code of the indoor unit

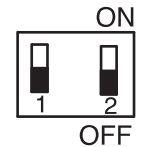


- (d) Refrigerant Cycle No. Setting (RSW2&DSW5)  
Setting is required. Setting positions before shipment are all OFF.

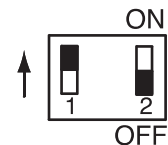
Refrigerant Cycle No. Setting

| DSW5 (Tens Digit)                                                                                                                                                                                                                                   | RSW2 (Units Digit) | Ex.) Set at No.5 Cycle         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------------------|
|                                                                                                                                                                                                                                                     |                    |                                |
| Before shipment. DSW5 and RSW2 are set to "0".<br>Max. 64 cycles are available to set when all the equipment to be connected are corresponding to Hi-NET.<br>Max. 16 cycles when the units corresponding/ non-corresponding to Hi-NET are combined. |                    | Set All Pins OFF<br>Set at "5" |

- (e) Fuse Recover (DSW7)  
\* Factory Setting



\*In the case of applying high voltage to the terminal 1,2 of TB2, the fuse(0.5A) on the PCB, is cut.  
In such a case, firstly connect the wiring to TB2, and then turn on No. 1 pin.



- (f) Humidity Sensor Setting(DSW8)

No setting is required.  
Setting position before shipment are all have.



### NOTE

- The "■" mark indicates position of dip switches. Figures show setting before shipment.

## CAUTION

Before setting dip switches, firstly turn OFF power source and set the position of the dip switches. If the switches are set without turning OFF the power source, the switches can not function.

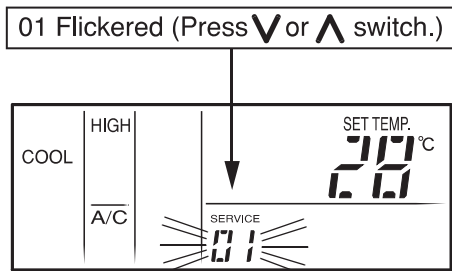
### 10.3 Setting the Filter Indication Interval

The FILTER interval indication on the remote control switch can be set to approximately 100, 1,200 or 2,500 hours (factory setting: 1,200 hours). If 100 or 2,500 hours interval is required, follow the instruction below.

#### Step 1

##### Changing to Optional Setting Mode

Press the CHECK switch and the RESET switch together more than 3 seconds while the unit is stopped. The operation mode is changed to the field setting mode, "SERVICE" is indicated and "01" flickers. When "01" is not indicated, press the  $\nabla$  or  $\Delta$  switch and set "01". In this condition, press the CHECK switch and the mode is changed to the optional setting mode.



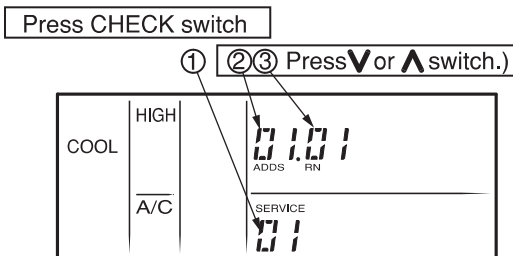
#### Step 2

##### Selection of Indoor Unit for Optional Setting

When the mode is changed to the optional setting mode, the indication on the liquid crystal display is as shown below.

- ① The flickering indication of "01" stops.
- ② The address of the indoor unit for optional setting is indicated.
- ③ The address of the refrigerant system for optional setting is indicated.

Select the indoor unit to set by pressing the  $\nabla$  or  $\Delta$  switch and indicate the address of the indoor unit. In this condition, press the CHECK switch (or leave this condition for 7 seconds) and the indication is changed to the indication of optional setting.



#### NOTE

- A. In case that the both indications of the ADDS. (Address) and RN. (Refrigerant Cycle Number) show "AA", the same setting is performed to all the indoor units.
- B. The indoor units not connected are not indicated.

#### Step 3

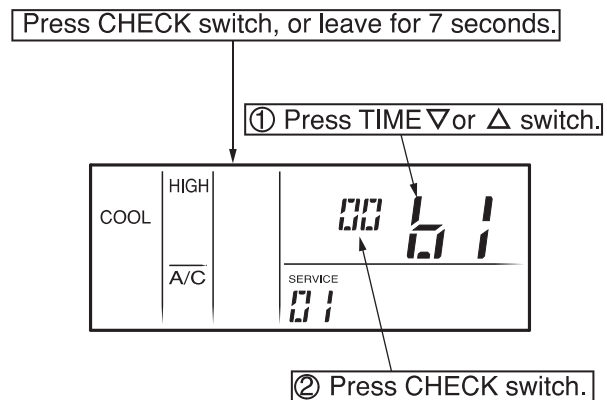
##### Optional Setting Items and Changing Setting Conditions

The indication of optional setting is as shown below.

- ① The code of optional setting is as shown below.
- ② The indications of ADDS. and RN. are turned OFF and the optional setting condition is indicated.

The item code of optional setting is changed by pressing the TIME  $\Delta$  or  $\nabla$  switch. The optional setting condition is changed by pressing the CHECK switch. Set the item code to "b4".

In case of setting other indoor unit, press the  $\nabla$  or  $\Delta$  switch and the indication is changed to the condition of the item "Step 2 Selection of Indoor Unit for Optional Setting".



The relation between the indication and the interval is shown in the table below.

| FILTER Indication Interval |                   |                   |               |
|----------------------------|-------------------|-------------------|---------------|
| Approx. 100 hr.            | Approx. 1,200 hr. | Approx. 2,500 hr. | No Indication |
| b4 01                      | b4 02<br>b4 00(*) | b4 03             | b4 04         |

(\*): Standard

#### Step 4

##### Canceling Optional Setting Mode

Press the RESET switch in the condition of Step 2 or Step 3, the condition is changed to the standard condition.

#### NOTE

The label for checking the contents of the setting is attached to the holding bracket. Write down the contents of the setting on the label.





1030615

**Qingdao Hisense Hitachi Air-conditioning Systems Co., Ltd.**

Add: 218, Qianwangang Road, Economic & Technical Development Zone, Qingdao, P.R. China

<http://www.hisense-vrf.com> E-mail: [export@hisensehitachi.com](mailto:export@hisensehitachi.com)