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Hisense

Operation Installation & Maintenance Manual

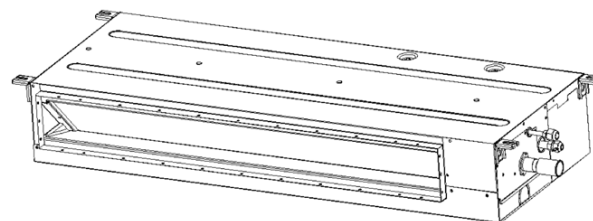
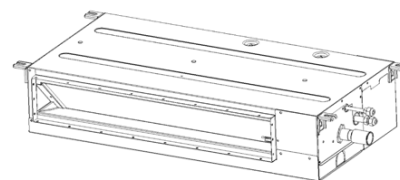
INVERTER-DRIVE MULTI-
SPLIT AIR-CONDITIONER
(HEAT PUMP)

- INDOOR UNIT -

Type	Model
LOW HEIGHT CEILING DUCTED TYPE	AVE-05HCFRL, AVE-07HCFRL AVE-09HCFRL, AVE-12HCFRL AVE-15HCFRL, AVE-17HCFRL AVE-19HCFRL, AVE-22HCFRL AVE-24HCFRL

IMPORTANT:

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



M00253Q

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-05HCFRL, AVE-07HCFRL, AVE-09HCFRL, AVE-12HCFRL
AVE-15HCFRL, AVE-17HCFRL, AVE-19HCFRL, AVE-22HCFRL, AVE-24HCFRL
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.
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Hisense

Name, Surname : Li Hu

Position/ Title : Director

Date : September 15, 2018

IMPORTANT NOTICE

Signal words (DANGER, WARNING, CAUTION, and NOTE) are used to indicate hazard seriousness. Definitions of the hazard levels are provided below with respective signal words.

▲ DANGER

: Immediate hazards which WILL result in severe personal injury or death.

▲ WARNING

: Hazards or unsafe practices which COULD result in severe personal injury or death.

▲ CAUTION

: Hazards or unsafe practices which COULD result in minor personal injury or product or property damage.

NOTE

: Useful information for operation and/or maintenance.

- This manual should be considered as a permanent part of the air conditioning equipment. Please keep it properly.
 - We pursue a policy of continuous improvement in design and performance of products. The right is therefore reserved to change specifications without notice.
 - Our company shall not be held responsible for any occasional damage to the air conditioner that arises during its operation in specific environment.
 - This air conditioner must be used as a general air conditioner, and shall not be used for drying clothes, freezing foods, cooling or heating and other purposes.
 - Please don't install the air conditioner in the following environments. Otherwise, fire, machine deformation or failure may arise.
 - *Places with spatter of oil (including machine oil).
 - *Places with sulfurated gases or silicon (e.g. hot spring, etc.).
 - *Places with inflammable gases.
 - *Coastal areas with much salt or the places exposed to strong acids or bases that may cause corrosion to machine.
 - Do not orient the air outlet immediately to animals and plants, since this may cause adverse effects thereon.
 - The installation and service engineering have to comply with local standards, laws and regulations.
 - As an "appliance inaccessible to the public", the installation height of indoor unit of the air conditioner shall be at least 2.5m.
 - This air conditioner can only be installed by dealers or professionals. The installation by user may lead to water leakage, electric shock or fire.
 - In case of any question, please consult the dealer or the service center designated by our company.
 - For environmental protection, please don't dispose of the product casually. Our company can provide recycling service based on relevant regulations of China, and provide replacement parts according to Chinese national standards.
- This heat pump air conditioner has been designed for the following temperatures. Be sure to operate the heat pump air conditioner within this range.

Temperature (°C)

		Maximum	Minimum
Cooling Operation	Indoor	32 DB/23 WB	21 DB/15 WB
	Outdoor	43 DB	-5 DB
Heating Operation	Indoor	27 DB	15 DB
	Outdoor	15 WB	-20 WB

DB: Dry Bulb, WB: Wet Bulb

▲ DANGER

- Please don't perform installation works such as refrigerant piping connection, drain pipe connection, and wiring connection. Violations may result in system leakage, electrical failure or fire.
- Do not pour water into the indoor or outdoor unit. This machine is an electric product that may develop serious electric failure when exposed to water.
- Do not open the service cover of indoor or outdoor units without turning OFF the main power supply; otherwise, this may bring about serious safety accident.
- Do not touch or adjust safety devices inside the indoor or outdoor units. If they are touched or readjusted, serious accident may arise.
- Refrigerant leakage may bring about oxygen deficit-induced respiratory difficulty. In case refrigerant leakage is detected, please turn off the main switch immediately, extinguish any naked flame, and contact service dealer.
- Make sure air tightness test is performed.

Refrigerant R410A is non-flammable, non-toxic, and odorless, and may produce toxic gases when exposed to open flame. Since this refrigerant gas is heavier than air, it may result in lack of oxygen, thereby leading to breathing difficulties when the area near the ground is filled with this gas. Performing leak detection and gas tightness test with oxygen, acetylene or other flammable and toxic gases may cause explosion, so nitrogen is recommended for this test.
- The standards for safe refrigerant leakage in construction and system operation are determined based on local regulations or standards.

- Use ELB with medium or higher sensing speed (ELB with an operating time of 0.1 seconds or less), or electric shock or fire may arise.
- For installation, the refrigerant piping must be firmly connected before the operation of compressor. For repair, the refrigerant piping must be moved, handled and removed after the stop of compressor.
- Please don't short-circuit the protective device (e.g., the pressure switch, etc.) during operation, since this may cause fire or explosion.

WARNING

- Do not use any sprays such as insecticide, lacquer, hair spray or other flammable gases within approximately 1 meter from the system.
- If the earth leakage breaker is frequently activated, please stop the system and contact your local dealer or customer services.
- Make sure the ground wire is securely connected. The improper grounding of machine may lead to electrical failure.
- Please don't connect the ground wire to gas pipes, tap water pipes, lightning rods or phone ground wires.
- Make sure there are no flammable materials around during brazing operation. Please wear leather gloves to prevent frostbite when filling refrigerant.
- Prevent rats or other small animals damaging the wiring and electrical components. Bitten unprotected parts may cause a fire.
- Firmly fix the connection wires. The external force of terminal may result in looseness of terminal that may cause a fire. Make sure the air conditioner is installed with enough strength of fixation; otherwise, the air conditioner may fall or topple over, which may bring about machine damage or personal injury.
- Please follow the installation instructions and related regulations and standards for electrical construction; otherwise, electrical failure or fire may occur due to inadequate capacity or inconsistent specifications.
- Never fail to use specified wiring and select correct wiring, since failure to do so may cause electrical failure or fire.
- Please make sure the outdoor unit is not covered with snow or ice before use.

CAUTION

- Do not stamp on the machine or place sundries thereon.
- Do not put extra materials on or in the machine.

Note:

- This air conditioner must be serviced by professional maintenance personnel.
- Rooms are recommended to be ventilated once every 3-4 hours.
- Heat pump air conditioners may malfunction under the following conditions:
 - * The power available from power transformer is less than or equal to the electrical power of air conditioner.
 - * The excessively short distance from the power cord of air conditioner to any high-power electrical equipment results in extremely high inductive surge voltage in the power cord of air conditioner.

CHECKING PRODUCT RECEIVED

- Upon receipt of this product, check 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 parameters (power supply, voltage, and frequency) and accessories to determine if they are correct. The standard operation method for the machine is described in the present manual. Please contact local dealer when problem arises.

Hisense Hitachi shall not be held responsible for any consequence of the modification to machine performed without its written consent.

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Section 1 Operation Manual

1. Safety Summary



DANGER

- Do not have the indoor unit or outdoor unit exposed to water. All these parts are designed with electronic components that may cause short circuit when exposed to water.
- 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.
- Do not use any sprays such as insecticide, lacquer, hair spray or other flammable gases within approximately 1 meter from the system.
- If the indoor switchboard or fuse is frequently cut off, please take the air-conditioning system out of service and contact our agency.
- This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.

Note

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

2. Unit Description

- This heat-pump type air conditioning unit can consist of one outdoor unit and several indoor units. Detailed configurations are stated in the corresponding installation & maintenance manual for outdoor unit. This heat-pump type air conditioner is applicable for refrigeration, heating, dehumidification and air supply, etc. These features are controlled with a remote control (option).

Table 2.1 Capacities of Indoor Units

Indoor Unit	Nominal Capacity (kBtu/h)			
	05	07	09	12
Ducted Type	○	○	○	○
	15	17	19	22
	○	○	○	○
	24			
	○			

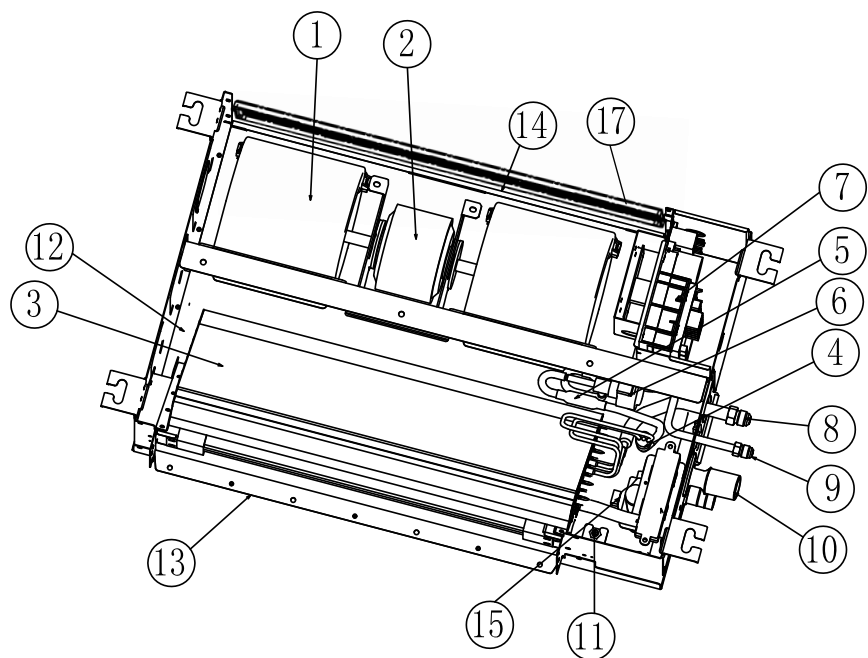
3. Part Name

3.1 Indoor Unit

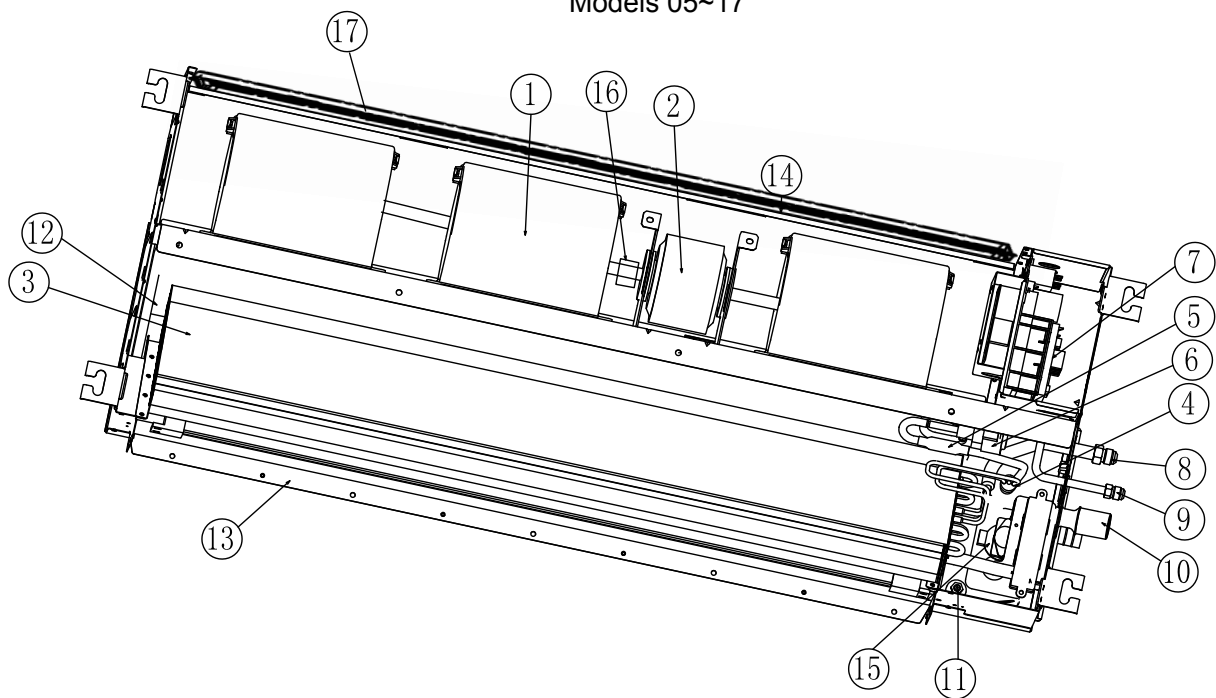
Refer to “3.1 Ducted Type Indoor Unit”

3.2 Wired Control

Refer to the control instruction manual for operation details.



Models 05~17



Models 19~24

No.	Name	No.	Name
1	Centrifugal Fan	10	Drain Piping Base
2	Motor	11	Float Switch
3	Heat Exchanger	12	Drain Pan
4	Shunt	13	Air Outlet
5	Filter	14	Air Inlet
6	Electronic Expansion Valve	15	Drain Pump
7	Electric Box	16	Coupling (Models 19~24)
8	Refrigerant Gas Pipe Connection(φa Flare)	17	Filter Screen
9	Refrigerant Liquid Pipe Connection(φb Flare)		

Fig. 3.1 Ducted Type Indoor Unit

4. Before Operation



CAUTION

- The units that have been left unused for a long period of time shall be electrified for more than 4 hours before startup. Do not start the machine immediately after power-on since this may cause damage to compressor due to inadequate warm-up of lubricating oil.
- Please check if the outdoor unit is covered with ice or snow. If yes, please remove the ice or snow with warm water. However, the water temperature shall not exceed 50°C since this may cause damage to plastic parts.
- Turn off the main power supply if the machine is expected to be left unused for more than 3 months, because the oil heater band consumes power even if the compressor is not in service. You are recommended to entrust maintenance personnel to check the unit before startup.
- Set the temperature properly. Set the temperature 2°C lower than expected for heating, and set it 2°C higher than expected for refrigeration so as to save resources.
- Do not open doors and windows frequently during the operation of air conditioner.
- Please make sure to clean the heater on a yearly basis prior to heating operation (heater operation)! Dust and other foreign matters in heater may result in smoke generation. (For models designed with electric heating)

5. Automatic Control

This system is designed with the following features.

Note

Please keep the main power supply ON unless the system is left unused for long. By doing so, the automatic drainage device starts to function when the level of accumulated water in machine exceeds the predefined level.

- **Three-Minute Stop Protection**
To protect the compressor, it is prevented for at least 3 minutes from functioning after its stop. The compressor automatically gets started in 3 minutes.
- **Three-Minute Operation Protection**
Ensure the compressor runs at least for 3 minutes (if the compressor runs for less than 3 minutes, it can't stop unless 3 minutes elapse even if all indoor temperatures reach the set values). However, the compressor that runs for less than 3 minutes can be brought out of service with the remote control.

- **Oil Return Operation**
When an indoor unit is out of service for more than 2 hours during refrigeration, it will run for a few minutes automatically to prevent the detention of refrigeration oil in the indoor unit in stopped state.
- **Freeze Protection during Refrigeration**
When the outlet air temperature of indoor unit is excessively low, refrigeration may be automatically switched to air supply mode, in which the unit runs for a period of time to avoid frosting on indoor heat exchanger.
- **Cold Air Prevention**
To prevent the output of cold air from indoor unit in heating mode, the fan runs at low speed. The fan speed is set based on outlet air temperature of indoor unit.
- **Control of Indoor Fan during Defrosting**
The indoor fan is out of service during automatic defrosting of outdoor unit.
- **Surplus Heat Output from Indoor Unit**
Upon completion of heating, the indoor fan will keep on running at low speed for approx. 2 minutes to reduce the temperature of machine body.
- **Automatic Defrosting**
Press "Run/Stop" key to stop heating. The outdoor unit can automatically detect frost and automatically perform defrosting for up to 10 minutes.
- **Overload Protection**
Heating stops when outdoor temperature is excessively high during heating. The heating resumes when the outdoor temperature drops to a certain level.

Note

If the unit stops due to power breakdown, the system will not automatically get into service even if power supply is restored. Please restart the unit from Step 1. The settings will not get lost in the case of extremely short power-off time (within 2 seconds). The system will come into operation automatically in approx. 3 minutes.

6. 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.

6.1 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

6.2 No Operation

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

6.3 Not Cooling or Heating Well

Check for obstruction of air flow of the outdoor or indoor units.

Check if too many heat sources exist 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.

6.4 This is Not Abnormal

- Smells from Indoor Unit
Smell adheres on indoor unit after a long period of time. Please clean the filter screen and air-inlet grille or keep the working space well ventilated.
- Sound from Deforming Parts
During system startup or stop, 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 steam generation.
- Refrigerant Flow Sound
While the system is being started or stopped, sound from the refrigerant flow may be heard.

Section 2 Installation & Maintenance Manual

1. Safety Summary



- Please don't perform installation works such as refrigerant piping connection, drain pipe connection, and electrical wiring connection.
- Check that the ground wire is securely connected.
- Connect a fuse of specified capacity.



Do not install the indoor unit, outdoor unit, wired control and cable within approx. 3m from strong electromagnetic wave radiators such as medical equipment.

2. Necessary Tools and Instrument for Installation

No.	Tool	No.	Tool
1	Phillips 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	Leveler
6	Spanner	15	Clamper for Solderless Terminals
7	Pipe Cutter	16	Hoist (for Indoor Unit)
8	Brazing Kit	17	Ammeter
9	Hexagon Wrench	18	Voltage Meter

Note: When in immediate contact with refrigerant, please use the installation tools and instruments dedicated to the new refrigerant.



Since the pressure of new refrigerant R410A is 1.4 times that of traditional refrigerant, its performance is susceptible to impurities like moisture, scale and grease, etc. It's essential to remove the moisture, dust, other refrigerants or refrigerant oils from the refrigeration system. Hence, the failure to use specified materials and tools may result in explosion, personal injury, refrigerant leakage, electrical failure or fire.

3. Transportation and Handling

3.1 Transportation

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



Do not put any material on the product.

3.2 Handling of Indoor Unit



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.



Be sure not to damage insulation materials of unit's surface during lifting operation.

4. Indoor Unit Installation

Install the indoor unit as per national standard.



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



- 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.



Please contact the dealer if the accessories are not delivered with machine.

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
Wire Clamp 	2	For Power Cord and Communication Cable
Accessory Bag for Magnetic Ring 	1	Arranged around the Power Cord of Outdoor Unit
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.

Models 05~24

mm

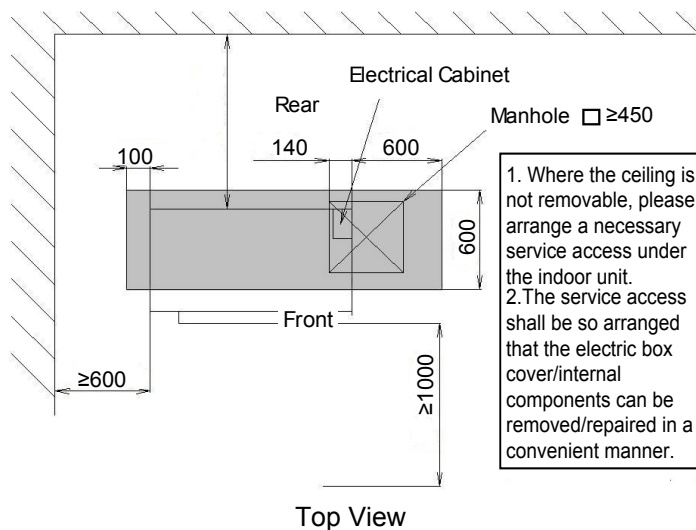


Fig. 4.1 Space Around Indoor Unit

- Indoor unit must be so positioned that the indoor temperature is distributed evenly.
- There should be no obstruction that blocks air flow indoors and at air vent.
- Do not install the indoor unit in a machinery 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, etc.:
 - (A) Do not install the indoor unit where the electromagnetic wave is directly radiated to the electric box, wired control cable or wired control.
 - (B) Install the indoor unit and components as far as practical or at least 3 meters from the electromagnetic wave radiator.
 - (C) Prepare a steel box and install the wired control in it. Prepare a steel conduit tube and wire the control cable in it. Then, connect the ground wire with the box and the tube.
 - (D) 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 and Repair of Filter Screen

4.3.1 Installation of Filter Screen

- (1) As shown in the figure below, remove the filter screen fastening screw;
- (2) Draw the filter screen down until the upper rib gets out of the slot;
- (3) Pull out the left and right ribs of filter screen out of the machine, and take out the filter screen;
- (4) Clean and reinstall the filter screen following the reverse steps of its removal.

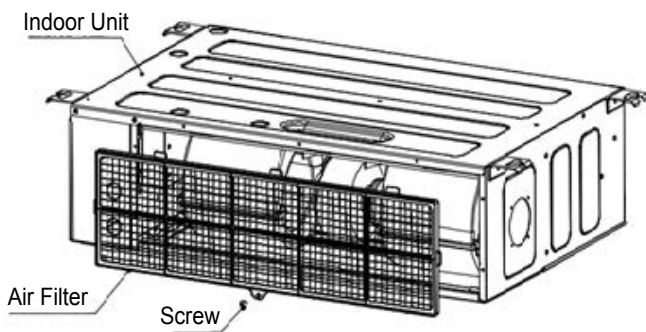


Fig. 4.2 Installation of Filter Screen

4.3.2 Maintenance and Servicing of Filter Screen

Take down the filter screen from the machine during maintenance, and remove the dust with dust collector or water. To remove stubborn dirt, please dissolve neutral detergent in cold water, and clean the screen therein. Take out the well cleaned filter screen, dry and reinstall it. Depending on local air quality, please clean the filter screen every 3 months operation of air conditioner.

4.4 Indoor Unit Installation

4.4.1 Suspension Bolts

- (1) Decide upon appropriate mounting position and orientation by carefully taking into consideration the piping, wiring and repair.
- (2) Fig. 4.3 shows how to install suspension bolts.

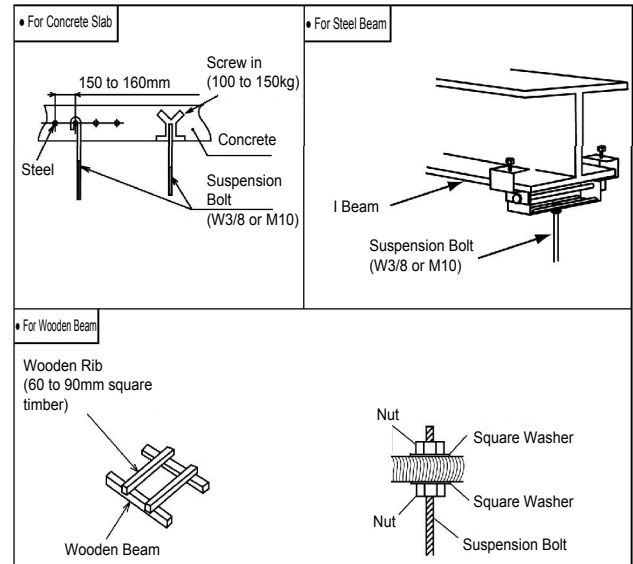
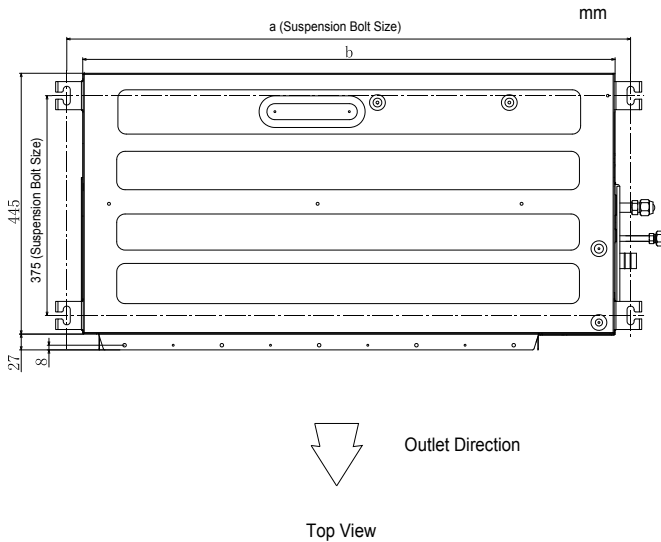


Fig. 4.3 Mounting the Suspension Bolts

4.4.2 Suspension Bolt and Pipe Connection Points

- (1) Indicate the location of suspension bolt, and the connection points of refrigerant pipe and drain pipe.
- (2) Installation dimensions are shown in Fig. 4.4.



Size		
Indoor Unit Capacity (kBTu/h)	a	b
05 ~ 12	751	695
15 ~ 17	962	906
19 ~ 24	1232	1176

Fig. 4.4 Suspension Bolt

4.4.3 Installation of Indoor Unit

Indoor unit is installed as shown in Fig. 4.5.
Installation of Field-Supplied Parts

Suspension Bolt	4-M10 or W3/8
Nut	8-M10 or W3/8
Washer	8-M10 or W3/8

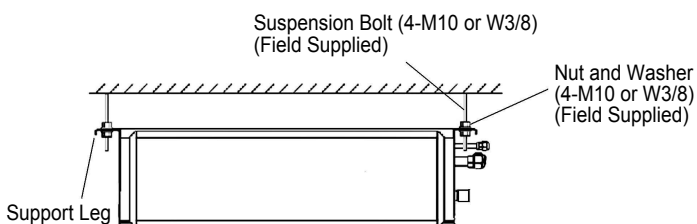


Fig. 4.5 Installation of Indoor Unit

- (1) How to Install Suspension Bolt and Nut
Mount nuts to the four bolts as shown in Fig. 4.6.

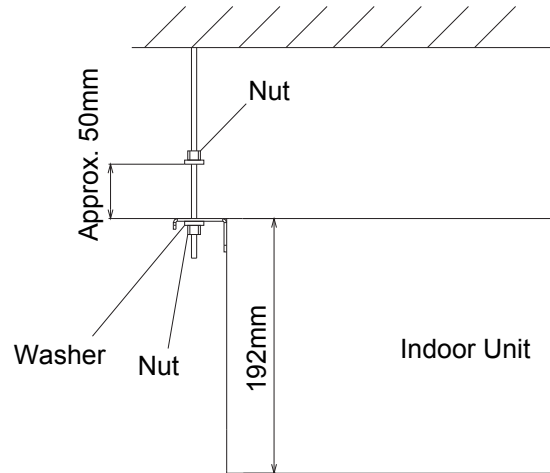


Fig. 4.6 Suspension Bolts and Nuts

- (2) Installation of Indoor Unit

- * Place the left bracket on the nut and washer of suspension bolt as shown in the figure below.
- * Make sure the left bracket is properly placed on the nut and washer, and put the right bracket of indoor unit on the nut and washer.

(The suspension bolt can be slightly shifted for the placement of indoor unit.)

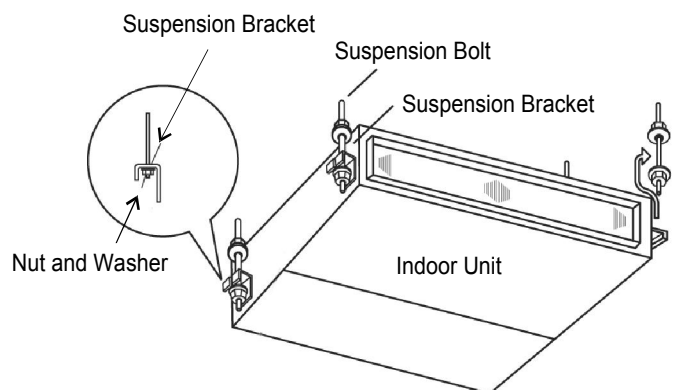


Fig. 4.7 Handling Method

4.4.4 Leveling of Indoor Unit

(1) Check to ensure the top surface is level, and measure the max. top surface inclination degree.

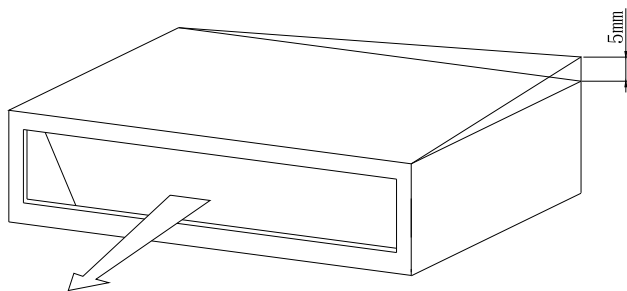


Fig. 4.8 Top Surface Inclination Degree

(2) As shown in Fig. 4.8, the rear part of indoor unit is slightly lower than its front part (by 0~5mm) so as to facilitate drainage.

(3) Tighten the suspension nut upon completion of adjustment. It's essential to apply thread locking agent to avoid nut looseness.



Please cover the machine with plastic cloth during installation so as to keep it clean.

4.4.5 Air Duct Connection

● Connection of Air Duct for Indoor Unit without Electric Heating

Air duct is connected to indoor unit via canvas hose to effectively isolate noise and vibration.

<Example>

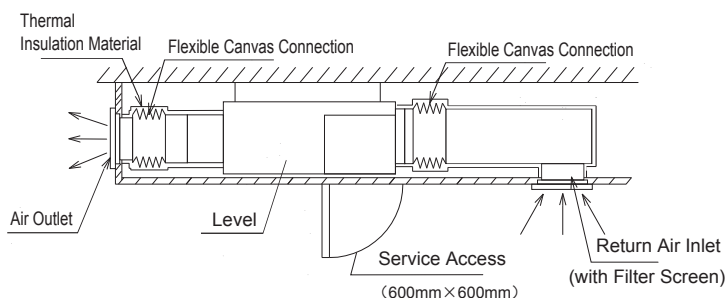


Fig. 4.9 Air Duct Connection

5. Refrigerant Piping Work



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 nitrogen be used for these tests.

5.1 Piping Materials

(1) Prepare field-supplied copper pipes.

(2) Select clean copper pipes. Make sure there is no dust and moisture inside. Blow the inside of the pipes with nitrogen or dry air, to remove any dust or foreign materials before connecting pipes.

(3) Select copper pipes based on Fig. 5.2.

5.2 Piping Connection

(1) Piping connection points are shown in Figs. 5.1 and 5.2.

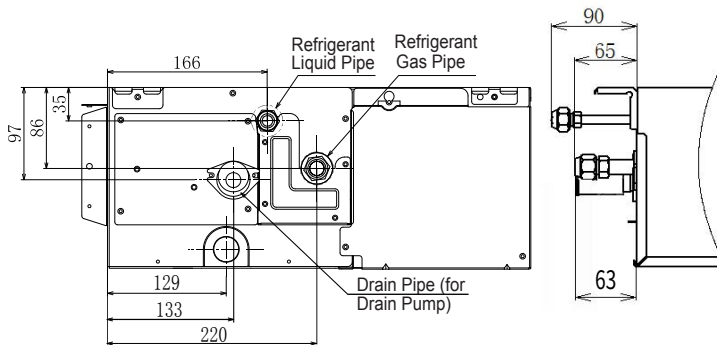
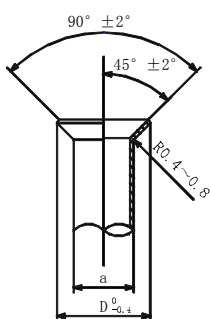


Fig. 5.1 Piping Connection Points

Indoor Unit Capacity (kBtu/h)	mm(in.)	
	Gas Pipe	Liquid Pipe
05~17	φ 12.7 (1/2) ※	φ 6.35 (1/4)
19	φ 15.88 (5/8) ※	φ 6.35 (1/4)
22, 24	φ 15.88 (5/8) ※	φ 9.53 (3/8)

Fig. 5.2 Pipe Size

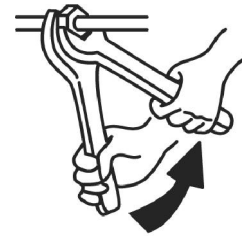
※ Since the nut cap connected at gas pipe is designed exclusively for R410A, the piping flaring connected for off-factory installation is adjusted as compared with R22 and R407C. Please perform the processing operation based on the dimensions shown below: (See Fig. 5.3)



		Unit: mm(in.)	
Outside Diameter of Piping (a)		φ 12.7 (1/2)	φ 15.88 (5/8)
Outside Diameter of Flaring (D)	R22 , R407C	16.2	19.4
	R410A	16.6	19.7

Fig. 5.3 Flaring

(2) As shown in Fig. 5.4, two spanners shall be used for tightening the nut.



Pipe Size (mm)	Tightening Torque (N·m)
φ 6.35	20
φ 9.53	40
φ 12.7	60
φ 15.88	80

Fig. 5.4 Nut Tightening Torque

(3) Insulate the refrigeration piping with field-supplied insulating pipe upon completion of refrigerant pipe connection. See Fig. 5.5.

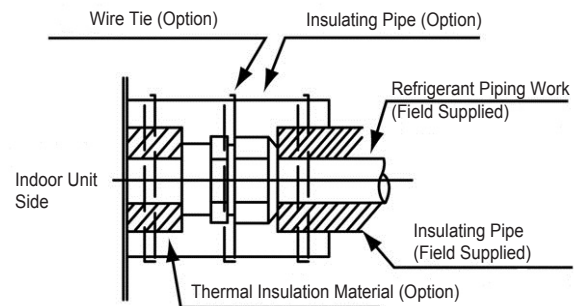
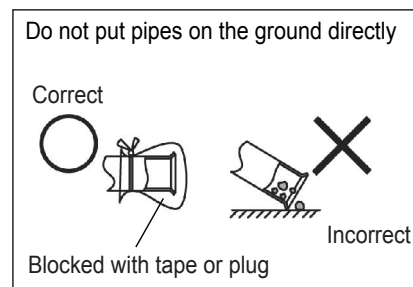


Fig. 5.5 Thermal Insulation of Pipes



- Cap the end of 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) Discharging and Charging Refrigerant
Follow the Installation & Maintenance Manual for outdoor unit.



Excessive and inadequate refrigerant is a leading cause of system anomaly. Please inject the right amount of refrigerant.

6. Drain Pipe

- (1) See Fig. 6.1 for connection point of drain pipe.
- (2) Find a PVC pipe with an outside diameter of 32mm.
- (3) Fix the PVC pipe to drain pipe through adhesive and factory-supplied clamp. The downward inclination of drain pipe is 1/25~1/100.
- (4) Make thermal insulation after the proper connection of drain pipe.

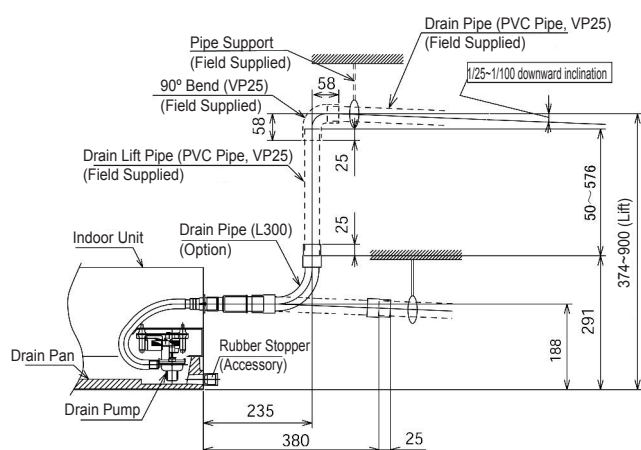


Fig. 6.1 Drain Pipe



Where the relative humidity of air inlet or ambient air exceeds 80%, an auxiliary drain pan shall be fabricated at installation site and placed under the indoor unit, as shown in Fig. 6.2.

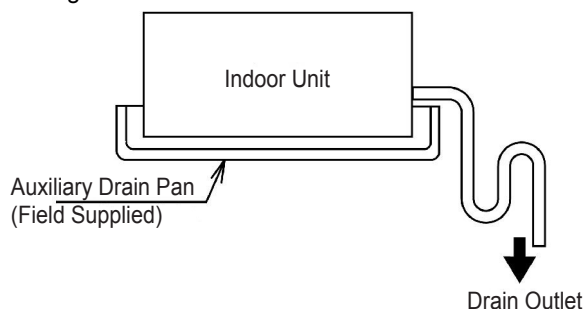


Fig. 6.2 Drain Pan



- (1) The drain pipe installed shall slope down; otherwise, the condensate may flow back and leak into the room when the indoor unit is turned off.
- (2) The drain pipe shall not be connected with sewage pipe or other drain pipes.
- (3) Where the main drain is connected to other indoor units, each indoor unit must be higher than the main. Select drain pipes in ample size depending on the refrigerating capacity and quantity of indoor units.
- (4) Check if water flows without obstruction following the procedure shown below after the proper connection of wires and drain pipes.
 - a. Turn on the power
 - b. Fill the drain pan with 2L or 2.5L of water.
 - c. Check and ensure the water flows without obstruction and no leakage exists. Pour 2L of water if no water flows out of pipe end.

7. Electrical Wiring

WARNING

- Turn OFF the main power switch to the indoor unit and the outdoor unit and wait for at least 3 minutes before electrical wiring work or a periodical check is performed.
- Check to ensure that the indoor and outdoor fans have stopped before electrical wiring or a periodical check.
- Protect the wires, drain pipe, electrical parts, etc. from rats or other small animals. If no protection is arranged, rats may gnaw at unprotected parts and at the worst, a fire will arise.
- Avoid the contact of wires with the refrigerant piping, sheet metal edges and electrical components in unit. Otherwise, the wire may be damaged or even cause fire.
- Use ELB with medium sensing rate (earth leakage breaker with action time being equal to 0.1 seconds or less). The failure to do so may result in electric shock or fire.
- The wires must be firmly secured. External force applied to terminals may cause a fire.
- Never connect the power terminal block for air conditioner to power cord. At the indoor unit side of air conditioner, power wiring can be extended through a power distribution box. Be sure to calculate the wiring capacity carefully, since excessively low wiring capacity may frequently cause fire.
- Do not start the system before all check points are thoroughly checked.

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 or insects.
- Tightly secure the wires with the cord clamp inside the indoor unit.
- Secure the cable of wired control using the cord clamp inside the electric box.
- Tighten screws to the following torques.

M4:	1.0~1.3	N·m
M5:	2.0~2.4	N·m
M6:	4.0~5.0	N·m
M8:	9.0~11.0	N·m
M10:	18.0~23.0	N·m

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 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.

7.2 Electrical Wiring Connection

The electrical wiring connection for the indoor unit is shown in Fig. 7.3.

- (1) Fix the wire clamp body and its nuts to the wiring hole of electric box using a torque of 1.0~1.2N.m.
- (2) Connect the cable of wired control to the connectors on the printed circuit board in electric box through the wire clamp and wiring hole.
- (3) Connect power cord and the communication cables of indoor and outdoor units to corresponding terminals of electric box in the same way.
- (4) Upon completion of electrical wiring, the wire clamp nut shall be manually tightened to block condensate and insects.
- (5) The external static pressure of the indoor unit is 10Pa, while the 10Pa plug (white) of motor is connected to base board PCBN18 terminal at delivery. To set the external static pressure to 30Pa, please connect the 30Pa plug (red) of motor to the base board PCBN18 terminal. See Figs. 7.1 and 7.2.

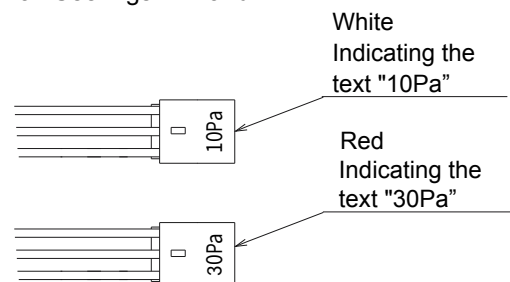


Fig. 7.1 Switching between external static pressures of 10Pa and 30Pa

Enlarged view of  part in Fig. 7.3

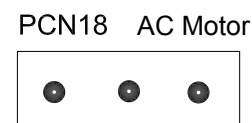


Fig. 7.2 Motor terminal location diagram

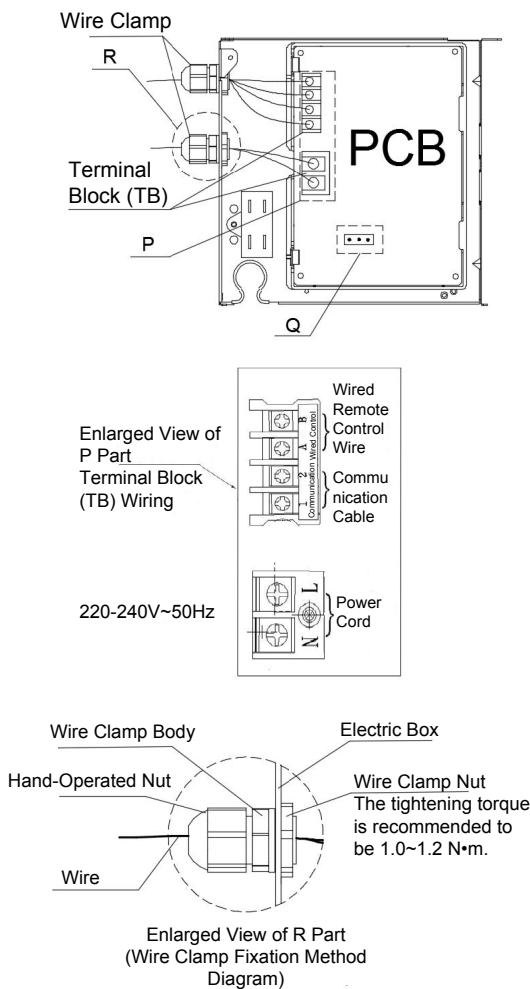


Fig. 7.3 Wiring Connection

8. Test Run

The debugging shall be performed as per the Installation & Maintenance Manual.



- The machine can't be started unless all check points are checked and ascertained.
 - (A) Check to make sure the terminal resistance to ground exceeds $1M\Omega$; otherwise, the electrical leakage point must be identified and repaired before startup.
 - (B) The shutoff valve of outdoor unit must be checked and fully opened before the startup of unit.
 - (C) Make sure the main power supply has been kept ON for over 4h so that the heater can heat the lubricating oil of compressor.
- Pay attention to the following precautions during system operation.
 - (A) Do not touch any part at exhaust end, Because the temperatures of case and pipeline at exhaust end of compressor may reach 90°C or more during operation.
 - (B) Don't press the AC contactor button, since this may lead to serious accident.

9. Protection and Control Devices

Indoor Unit

Indoor Unit Capacity (kBtu/h)			05~24
Temperature Controller on Fan Motor of Indoor Unit	Cut-out Cut-in	$^{\circ}\text{C}$ $^{\circ}\text{C}$	130 ± 5 83 ± 15
Capacity of Fuse on Indoor Unit Control Circuit		A	5
Freeze Protection Temperature	Cut-out Cut-in	$^{\circ}\text{C}$ $^{\circ}\text{C}$	0 14
Set Temperature Difference		$^{\circ}\text{C}$	2

10. Field Operation

10.1 Specifications of Field Connected Power Cord

Electrical Parameters and Power Cord Size of Indoor Unit

Indoor Unit Capacity (kBtu/h)	Power Supply	Max. Current	Power Cord Specifications	Signal Wire Specifications
05~07 09~12 15~17 19 22~24	220-240V~50Hz	0.46A 0.65A 0.70A 0.85A 1.05A	2.5mm ²	0.75mm ²
Total Current (A)		Cable for Permanent Wiring (mm ²)		※1 DO NOT connect wires in series when the current exceeds 63A.
I ≤ 6		2.5		
6<I ≤ 10		2.5		
10<I ≤ 16		2.5		
16<I ≤ 25		4		
25<I ≤ 32		6		
32<I ≤ 40		10		
40<I ≤ 63		16		
63<I		※1		

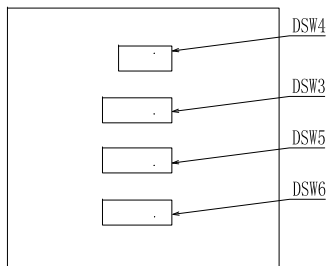
Note:

- (1) Field wiring shall be in conformity to local laws and regulations, and all wiring operations must be performed by qualified professionals.
- (2) Refer to relevant standards for above-noted power cord size.
- (3) Where power cord is connected through junction box, be sure to determine the total current and choose wires based on the table above.
- (4) As a minimum, the chosen power cord shall be compliant with requirements on neoprene sheathed wire #57 as stated in IEC60245-1, while the power cord shall be made from copper conductor.
- (5) The wiring specifications for weak-current communication circuit shall not be lower than that for RVV(S)P shielded wires or equivalent, and the shielding layer shall be grounded.
- (6) A switch that guarantees all-pole disconnection shall be installed between power supply and air conditioning unit. The contact spacing of such switch shall not be less than 3mm.
- (7) Once the power cord is damaged, the dealer or the professionals from designated maintenance department must be contacted in a timely manner for repair and replacement.
- (8) For the installation of power cord, the ground wire must be longer than the current-carrying conductor.

10.2 Setting of DIP Switch

(1) DIP switch must be set with power sources of the indoor and outdoor units in OFF state. Otherwise, the settings are invalid.

(2) The location of DIP switch is shown in the figure below



(3) The PCB of indoor unit is furnished with 4 DIP switches that must be set based on the following requirements before test run. The system must not be started before the completion of DIP setup.

- (a) All indoor units must be numbered (DSW6) as shown in the figure below. The outdoor unit numbering must start with "0".

Setting Method 1	DSW6 (Setting 0~63)	Ex.) Set machine No. 16
	Note: 8421 coding method	No. 5 is ON

DSW6 is set to "0" before delivery; up to 64 indoor units can be connected with.

- (b) Capacity Code Setting (DSW3)
No setup is required.
The code is set before delivery. This switch is used to set the capacity of indoor unit.
- (c) Model Code Setting (DSW4)
No setup is required.
For the models that are not installed or set up for DSW4, the software is set to "1&4 ON" by default.

- (d) Cooling System Code No. Setting (DSW5)
The setup is needed. All are set to OFF before delivery.

Refrigerant System Setting

Setting Method 1	DSW5 (Setting 0~63)	Ex.) Set system No. 5
	Note: 8421 coding method	

DSW5 is set to "0" before delivery; up to 64 indoor units can be connected with.

Note:

Symbol "■" indicates the location of DIP switch.
The position indicated in the diagram is in the factory-set state.



The power supply shall be turned off before the setup of DIP switch. Otherwise, the settings will be invalid.



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