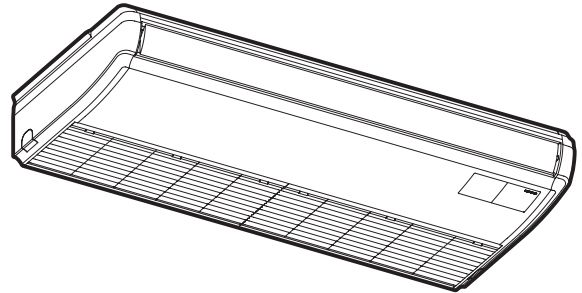


## ***Installation & Maintenance Manual***

***INVERTER-DRIVEN  
MULTI-SPLIT SYSTEM  
HEAT PUMP  
AIR CONDITIONERS***



Type	Model
Ceiling	RPC-1.5FSR
	RPC-2.0FSR
	RPC-2.5FSR
	RPC-3.0FSR
	RPC-4.0FSR
	RPC-5.0FSR
	RPC-6.0FSR

### **IMPORTANT:**

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



## **IMPORTANT NOTICE**

- HITACHI pursues a policy of continuing improvement in design and performance of products. The right is therefore reserved to vary specifications without notice.
- HITACHI 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 purpose such as drying clothes, refrigerating foods or for any other cooling or heating process.
- Do not install the unit in the following places. It may cause a fire, deformation, corrosion or failure.
  - \* Places where a fire, oil, steam or powder may enter directly to the unit such as right above a kitchen, etc.
  - \* Places where oil (including machinery oil) may be present in quantities.
  - \* Places where a lot of sulfide gas drifts such as in a hot spring.
  - \* Places where inflammable gas may generate or flow.
  - \* Places where strong salty wind blows such as coast regions.
  - \* Places with an atmosphere of acidity or alkalinity.
  - \* Places where gas from festering trash, etc. may generate.
- Do not install the unit in the place where silicon gas drifts. If the silicon gas attaches to the surface of heat exchanger, the fin surface repels water. As a result, drain water splashes outside of the drain pan and splashed water runs inside of electrical box. In the end, water leakage or electrical devices failure may occur.
- Pay attention to the following points when the unit is installed in a hospital or other facilities where an electromagnetic wave generates from a medical equipment.
  - \* Do not install the unit in the place where an electromagnetic wave is directly radiated to the electrical box, controller cable or controller.
  - \* Install the unit at least 3 meters away from an electromagnetic wave such as a radio.
- Do not install the unit in the place where the breeze directly catches animals and plants. It could adversely affect animals and plants.
- The installer and system specialist shall secure safety against the refrigerant leakage according to local regulations or standards. The following standards may be applicable, if local regulations are not available. International Organization for Standardization, ISO5149 or European Standard, EN378 or Japan Standard, KHS0010.
- This unit RPC-(1.5~6.0)FSR is a partial unit air conditioner, complying with partial unit requirements of International Standard IEC 60335-2-40, and must only be connected to other units that have been confirmed as complying to corresponding partial unit requirements of this International Standard.
- No part of this manual may be reproduced without written permission.
- 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 be add safety, caution and operating signs in the native language.
- If you have any questions, contact your distributor or dealer of HITACHI.
- This manual provides common descriptions, basic and advanced information to maintain and service this heat pump air conditioning unit which you operate as well for other models.
- This product is designed for standard air conditioning only. DO NOT use this product for specific purposes, such as restoring foods, animals & plants, precision devices, art objects, etc.

- DO NOT install the lower cover with motion sensor in the following places.  
It may cause misdetection, undetectable of motion or the deterioration of the motion sensor.
  - \* Places where ambient temperature changes drastically.
  - \* Places where excessive force or vibration is applied to the motion sensor.
  - \* Places where static electricity or electromagnetic waves may generate.
  - \* Places where is interference for infrared light such as glasses or mist in a detecting area.
  - \* Places where the lens for motion sensor is exposed in high temperature and humidity for a long time.
  - \* Places where fluid and corrosive gas exist.
  - \* Places where direct lights such as sunlight or headlight affect the motion sensor.
  - \* Places where hot air from a heater, etc. affects directly the motion sensor.
  - \* Places where the air flow returns to the motion sensor by hitting obstacles such as shelf, locker, etc.
  - \* Places where the blower devices such as ceiling fan, ventilating fan, etc. affect the air flow from the indoor unit.
  - \* Places where weather affects directly the surface of the motion sensor.
  - \* Places where the lens surface may smudge or be damaged such as a dusty environment.  
Pay attention that the detecting function will be decreased if the lens for motion sensor smudges.  
In this case, wipe off smudges by a cotton swab soaked alcohol (Isopropyl alcohol is recommended.) or a soft cloth.  
(When wiping off smudges on the lens for motion sensor, do not apply excessive force.  
If excessive force is applied, the resin lens may be damaged so that may cause malfunctions such as misdetection or undetectable of the motion.)
- 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 Operation	Indoor	30 DB	21.5 DB
	Outdoor	43 DB *	-5 DB *
Heating Operation	Indoor	25 DB	17 DB
	Outdoor	15.5 WB *	-10 WB *

DB: Dry Bulb, WB: Wet Bulb

\* The temperature may change depending on the outdoor unit.

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

## **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.

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

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## 1. Safety Summary

< Signal Words >

- Signal words are used to identify levels of hazard seriousness. Definitions for identifying hazard levels are provided below with their respective signal words.



: DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.



: WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.



: CAUTION, used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

**NOTICE**

: NOTICE is used to address practices not related to personal injury.

**NOTE**

: NOTE is useful information for operation and/or maintenance.

## DANGER

- Do not perform the installation work, refrigerant piping work, drain pump, drain piping and electrical wiring connection without referring to our installation manual. If the instructions are not followed, it may result in a water leakage, electric shock or a fire.
- Use the specified refrigerant (R410A or R32) to the outdoor unit in the refrigerant cycle. Do not charge material other than R410A or R32 into the unit such as hydrocarbon refrigerants (propane or etc.), oxygen, flammable gases (acetylene or etc.) or poisonous gases when installing, maintaining and moving. These flammables are extremely dangerous and may cause an explosion, a fire, and injury.
- Do not pour water into the indoor unit. These products are equipped with electrical parts. If poured, it will cause a serious electrical shock.
- Do not open the service cover for the indoor or outdoor unit without turning OFF the main power supply.
- Do not touch or adjust safety devices inside the indoor unit or outdoor unit. If these devices are touched or readjusted, it may cause a serious accident.
- Refrigerant leakage can cause difficulty with breathing due to insufficient air. Turn OFF the main switch, extinguish any naked flames and contact your service contractor, if refrigerant leakage occurs.
- Make sure that a refrigerant leak test has been performed. Refrigerant (Fluorocarbon or Difluoromethane) for this unit is non-toxic, and odorless. If the refrigerant should somehow escape and come into contact with flame, toxic gas will form. This gas is heavier than air and will settle near floor areas and spread where it can cause suffocation to those nearby. In addition, difluoromethane is flammable and can cause fire.
- The installer and system specialist shall secure safety against refrigerant leakage according to local regulations or standards.
- Use an ELB (Earth Leakage Breaker).  
In the event of fault, there is danger of an electric shock or a fire if it is not used.
- Do not install the outdoor unit where there is high level of oil mist, flammable gases, salty air or harmful gases such as sulfur.
- For installation, firmly connect the refrigerant pipe before the compressor starts operating. For maintenance, relocation and disposal, remove the refrigerant pipe after the compressor stops.
- Do not perform a short-circuit of the protection device such as the pressure switch when operating. It may cause a fire and explosion.
- Do not alter the product and the electrical wiring. It will cause a serious accident.
- Do not install the indoor unit in flammable environment to avoid fire or ab explosion.
- As the new refrigerant (R410A or R32) is adopted, the refrigerant oil has been also changed, which tends to be affected by foreign matters such as moisture, oxide film, fat. Perform the installation work with care not to enter moisture, dust or old refrigerant into the refrigerant cycle, otherwise the parts such as expansion valve bite foreign matter and the operation may be unavailable.
- Do not insert the drain pipe to the drainage trench where corrosive gases occur. Poisonous gases flow into the room, so that may cause the poisoning.
- Cleaning inside Existing Refrigerant Pipe
  - \* Non-flammable and nontoxic detergent shall be used to clean the pipe. If not, it may cause a fire.
  - \* Ventilate well, otherwise cleaning the pipe in the sealed room may cause suffocation. Additionally, if the detergent contacts a fire and is under high temperature, it may cause generation of toxic gas.
  - \* The detergent after cleaning shall be recovered. It is prohibited to emit fluorocarbons to the atmosphere without permission.



## WARNING

- The installation work shall be performed by the specialist installer.  
If it is not completed, it may cause a water leakage, an electric shock, a fire or falling down the unit.
- Perform the electrical work according to Installation Manual and all the relevant regulation and standards.  
If the instructions are not followed, an electrical shock and fire may occur due to insufficient capacity and inadequate performance.
- The electrical wiring work must be performed by authorized installers.  
If not performing the electrical work completely or a capacity shortage of the power circuit, it may cause an electric shock or a fire.  
Additionally, if the earth wire is disconnected, it may cause an electric shock.  
Contact the authorized installer and connect the earth wiring.
- If the circuit breaker or fuse is often activated, stop the system and contact your service contractor.
- Check that the ground wire is securely connected. If the unit is not correctly grounded, it lead electric shock. Do not connect the ground wiring to a gas piping, water piping, lighting conductor or ground wiring for telephone.
- Use specified cables between units and choose the cables correctly. If not, an electrical shock or fire may occur.
- Ensure that the wiring terminals are tightened securely with the specified torques. If not, generating fire or an electrical shock at the terminal connection part may occur.
- Connect a fuse of specified capacity.
- Protect the wires, electrical parts, etc. from rats or other small animals.  
If not protected, rats may gnaw at unprotected parts and which may lead to a fire.
- Fix the cables securely. External forces on the terminals could lead to a fire.
- Provide a sufficiently strong foundation. If not, the unit may fall down and it may lead to injuries.
- If the indoor unit is installed in a small room and the refrigerant gas leakage occurs, the leaked refrigerant gas fills the room and it may cause suffocation.  
Do not exceed the maximum permissible concentration of the refrigerant gas in the room.  
Consult with distributor for countermeasure such a ventilation system, etc.
- Before performing any brazing work, check to ensure that there is no flammable material around.  
When using the refrigerant be sure to wear leather gloves to prevent cold injuries.
- Do not install the unit in a place where oil, vapor, organic solvent and corrosive gas (ammonia, sulfur compound and acid) may be present in quantities.  
It may cause refrigerant leakage due to corrosion, electrical shock, deteriorated performance and breakage.
- Do not insert a finger or stick into the air outlet and the air inlet.  
It could cause injury due to touch the rotating fan or electrical devices.
- Do not control the wired controller by wet hand.  
It may cause failure of the wired controller or an electric shock.
- Do not use any sprays such as an insecticide, lacquer, hair spray or other flammable gases within approximately one (1) meter from the system. It may generate a fire.
- Do not install the indoor unit in a place where the air flow blows directly to heating appliances.  
It may cause incomplete combustion of the heating appliances.
- When the indoor unit is operated with heating appliances, ventilate a room sufficiently.  
If not, it may cause suffocation.
- Turn OFF the main power source immediately if the protection device is frequently activated or the main power source switch does not work.  
If not, it may cause an electric shock, a fire or explosion because there are possibilities of the electrical leakage or overcurrent, etc. Contact your distributor or contractor.

- If abnormality (burnt odor, etc.) occurs, stop the operation and turn OFF the main power source immediately. If not, it may cause breakage of the product, an electric shock or a fire. Contact your distributor or contractor.
- Do not operate the indoor unit without the electrical box cover and the air inlet grille. It is unusually dangerous that the indoor fan and electrical parts are exposed. In addition, it may cause an electric shock due to touch the electrical parts.
- When the air conditioner is necessary to be repaired or relocated, contact your distributor or contractor. If the repair and the installation are not completed, it may cause an electric shock or a fire.
- Do not perform the installation work, the refrigerant piping work, the drain pump, the drain piping and electrical wiring connection without turning OFF the main power source. It may cause an electric shock or injury.
- Perform the maintenance work with stable footing. If not, it may cause falling or injury.
- Do not spray water or detergent to the indoor unit when performing the maintenance work. It may cause an electric shock or a fire by electrical short-circuit.
- Protect securely the electrical parts and connectors not to splash water when performing the maintenance work. If not, it may cause an electric shock or a fire by electrical short-circuit.
- The inside piping charged refrigerant is high pressure. Perform securely the refrigerant piping work by the authorized installer. If not, it may cause a serious accident.





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## NOTE

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**Additional safety information for R32 refrigerant air conditioner and heat pump according to IEC 60335-2-40: 2018.**

Explanation of symbols displayed on the indoor unit or outdoor unit.

	<b>WARNING</b>	This symbol shows that this equipment uses a flammable refrigerant (A2L). If the refrigerant is leaked, together with an external ignition source, there is a possibility of ignition.
	<b>CAUTION</b>	This symbol shows that the Operation Manual should be read carefully.
	<b>CAUTION</b>	This symbol shows that a service personnel should be handling this equipment with reference to the Installation Manual.
	<b>CAUTION</b>	This symbol shows that there is information included in the Operation Manual and/or Installation Manual.

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## RISK OF EXPLOSION

The compressor must be stopped before removing the refrigerant pipes.  
All service valves must be fully closed after pumping down operation.

- Make sure that unit installation and refrigerant piping installation comply with applicable legislation in each country. Also, in Europe, EN 378 must be complied, as it is the applicable standard.
- Please read the manual carefully before starting to work on the installation of the heat pump air conditioner system. Failure to observe the instructions for installation, use and operation described in this documentation may result in operating failure including potentially serious faults, or even the destruction of the heat pump air conditioner system.
- Verify that all the information required for the correct installation of the system is correct according to the manuals bundled with outdoor and indoor units. Contact your distributor if it is not the case.

## **⚠ CAUTION**

- Do not step or put any material on the product.
- Do not put any foreign material on the unit or inside the unit.
- Do not turn OFF the main power source of the indoor unit during the season of heating and cooling. The water can not be discharged forcedly so that overflows from the drain pan. As the result, the floor and the ceiling surface are smudged.
- Hold the air filter and the air inlet grille by hand when attaching (removing). If not, it may cause falling or injury.
- Do not blow cold air to a person for a long time or overcool. It may cause deterioration of physical condition and health impairment.
- Do not handle the unit by one person. Although the unit may be packed by polypropylene band, do not use it for transportation. If the unit is handled by hand, the fin surface of heat exchanger causes a cut.

## **NOTICE**

- Do not install the indoor unit, outdoor unit, wired controller and cable within approximately 3 meters from strong electromagnetic wave radiators such as medical equipments.
- Supply electrical power to the system to energize the oil heater for 12 hours before startup after a long shutdown.
- Make sure that the outdoor unit is not covered with snow or ice, before operation.
- In some cases, the packaged air conditioner may not be operated normally under the following cases.
  - \* In case that electrical power for the packaged air conditioner is supplied from the same power transformer as the device\*.
  - \* In case that the power source wires for the device\* and the packaged air conditioner are located close to each other.

Device\*: (Ex) Lift, container crane, rectifier for electric railway, inverter power device, arc furnace, electric furnace, large-sized induction motor and large-sized switch.  
It consumes a large quantity of electrical power.

Regarding the cases mentioned above, surge voltage may be inducted in the power supply wiring for the packaged air conditioner due to a rapid change in power consumption of the device and an activation of switch.

Therefore, check the field regulations and standards before performing electrical work in order to protect the power supply for the packaged air conditioner.

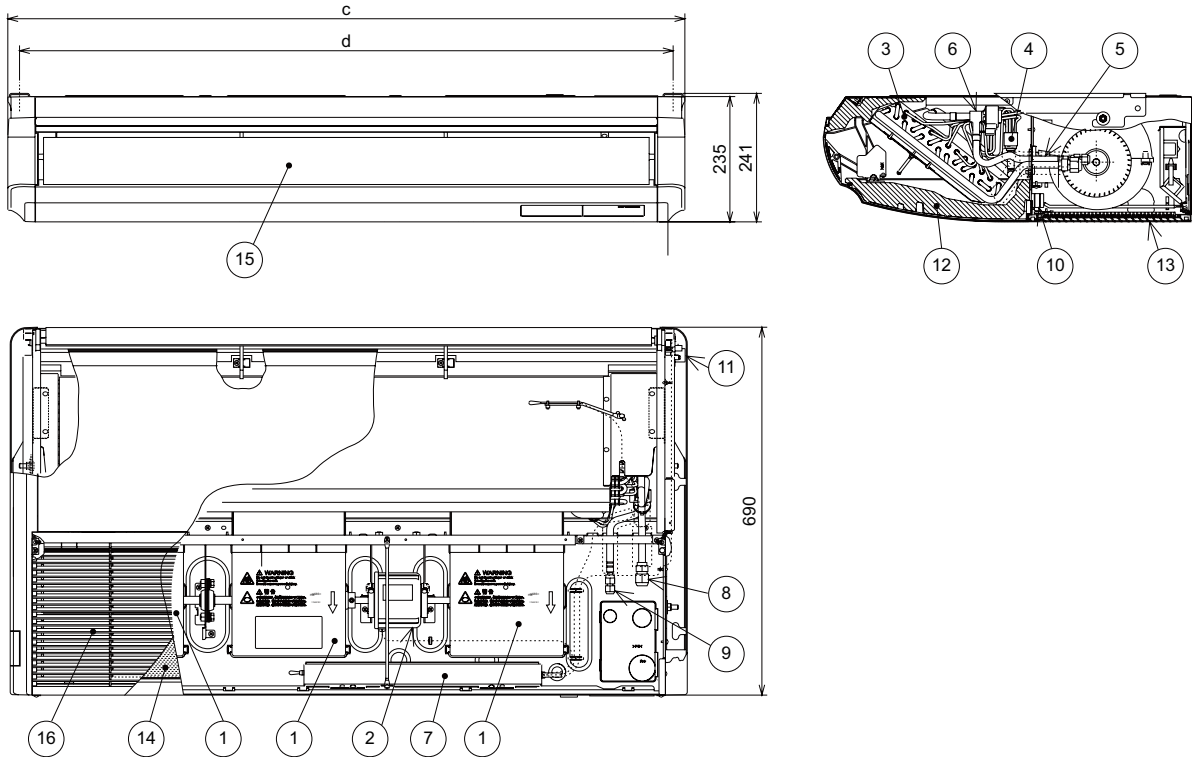
- Do not install the unit in the place where the air flow directly catches to animals or plants. It could be the cause of adverse affect to animals or plants.
- Do not create an upper-slope or rise for the drain piping since drain water can flow back to the indoor unit and leakage into the room will occur.
- Do not apply excessive force to the flare nut when tightening. If it is applied, the flare nut may crack due to aged degradation and refrigerant leakage may occur. Use the specified tightening torque.

## **NOTE**

- It is recommended that the room will be ventilated every 3 to 4 hours.
- The heating capacity of the heat pump unit is decreased according to the outdoor air temperature. Therefore, it is recommended that auxiliary heating equipment be used in the field when the units is installed in a low temperature region.

## 2. Structure

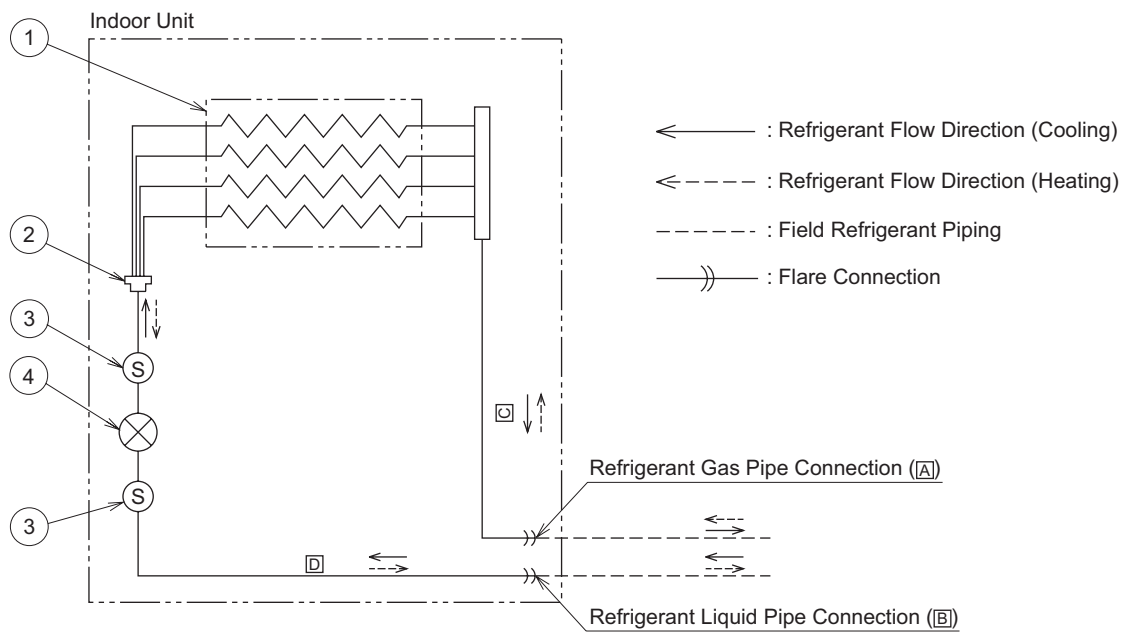
### 2.1 Name of Parts



No.	Part Name	Remarks
1	Fan	
2	Fan Motor	
3	Heat Exchanger	
4	Distributor	
5	Strainer	
6	Micro-Computer Control Expansion Valve	
7	Electrical Control Box	
8	Refrigerant Gas Pipe Connection	with $\phi a$ Flare Nut
9	Refrigerant Liquid Pipe Connection	with $\phi b$ Flare Nut
10	Drain Pipe	
11	Auto Louver Motor	
12	Drain Pan	
13	Air Inlet Grille	
14	Air Filter	
15	Air Outlet	
16	Air Inlet	

Model	a	b	c	d
RPC-1.5FSR	12.7	6.35	960	916
RPC-2.0FSR	12.7	6.35	960	916
RPC-2.5FSR	15.88	9.52	1270	1226
RPC-3.0FSR	15.88	9.52	1270	1226
RPC-4.0FSR	15.88	9.52	1580	1536
RPC-5.0FSR	15.88	9.52	1580	1536
RPC-6.0FSR	15.88	9.52	1580	1536

## 2.2 Refrigerant Cycle



Mark	Part Name
1	Heat Exchanger
2	Distributor
3	Strainer
4	Micro-Computer Control Expansion Valve

HP	1.5 and 2.0	2.5 to 6.0
A (Gas Pipe Connection)	φ12.7 x 0.8	φ15.88 x 1.0
B (Liquid Pipe Connection)	φ6.35 x 0.8	φ9.52 x 0.8
C (OD x T)	φ12.7 x 0.8	φ15.88 x 1.0
D (OD x T)	φ12.7 x 0.8	φ12.7 x 0.8

## 2.3 Necessary Tools and Instrument List for Installation

No.	Tool	No.	Tool	No.	Tool
1	Handsaw	8	Plier	16	Cutter for Wires
2	Phillips Screwdriver	9	Pipe Cutter	17	Gas Leak Detector
3	Vacuum Pump	10	Brazing Kit	18	Leveller
4	Refrigerant Gas Hose	11	Hexagon Wrench	19	Clamper for Solderless Terminals
5	Megohmmeter	12	Spanner	20	Hoist (for Indoor Unit)
6	Copper Pipe Bender	13	Weigher	21	Ammeter
7	Manual Water Pump (for Indoor Unit)	14	Charging Cylinder	22	Voltage Meter
		15	Gauge Manifold	23	Wrench

### NOTE

Use tools and measuring instruments (vacuum pump, gas hose, charging cylinder, gauge manifold, etc.) exclusively for the refrigerant R410A or refrigerant R32.

### 3. Before Installation

#### 3.1 Combination of Outdoor Unit and Indoor Unit

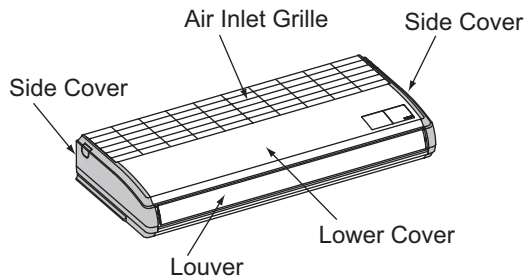
The combination capacity of indoor unit against the outdoor unit is selected by the outdoor unit capacity. Refer to the installation manual of outdoor unit and select the indoor unit and the outdoor unit to be satisfied the combination unit number and the combination unit capacity.

#### 3.2 Transportation and Handling

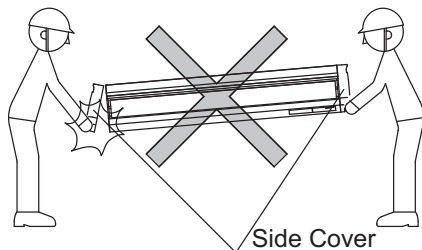
## CAUTION

**Do not put any material on the product. Do not step on the product.**

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



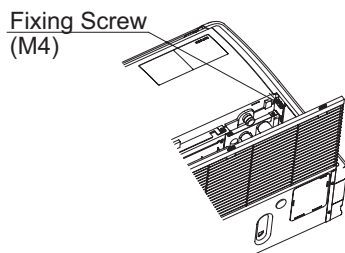
Do not handle the side cover.



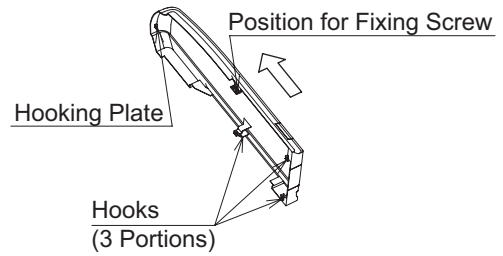
- Do not put any material on the indoor unit.
- Remove the side cover when the indoor unit is moved after unpacking. If not, the side cover may be damaged so that may cause injury.

< Removing Side Cover >

- (1) Open the air inlet grille.
- (2) Remove the fixing screw (M4).



- (3) Push the side cover forward to remove the hooks and the hooking plate.



- (4) Remove the side cover to lift upward.

- When the indoor unit is unpacked, moved and installed, do not take the air inlet grille, louver and lower cover. Additionally, do not apply an excessive force to them. The air inlet grille, louver and lower cover are deformed or damaged.

## WARNING

**Do not put any foreign material into the indoor unit and check to ensure that no foreign material exists in the indoor unit before the installation and the test run. Otherwise, a fire or failure, etc. may occur.**

## CAUTION

- The indoor unit covers are resin made. Do not apply an excessive force to the resin covers or make it fall.
- Do not move the louver by hand. If moved, the louver mechanism will be damaged.

## NOTICE

To avoid damage to the resin covers, before lifting or moving the indoor unit, put a cloth on the resin covers.

## 4. Indoor Unit Installation

### **! DANGER**

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

### **! 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 the test run. Otherwise, a fire or failure, etc. may occur.
- Check to ensure that the ceiling is strong enough. If not strong enough, the indoor unit may fall down on you.
- Do not install the indoor unit to outdoors. If installed, an electric hazard or electric leakage will occur.

### 4.1 Factory-Supplied Accessories

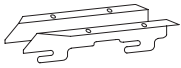

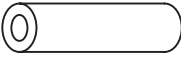
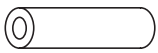
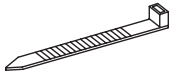

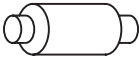


Check to ensure that the following accessories are packed with the indoor unit.

The hose clamp, screws, washers and cord clamps are put in the pipe insulation.

### NOTE

- If any of these accessories are not packed with the unit, please contact your contractor.
- The wired controller and the branch pipes are optional accessories which are not included with the indoor unit.

Table 4.1 Factory-Supplied Accessories

Accessory	Q'ty	Purpose	Usage
Suspension Bracket 	2	For Mounting Indoor Unit	Refer to the item 4.3.3.
Washer 	8	For Suspension Bracket	
Pipe Insulation (Large) 	1	For Refrigerant Piping Connection	Refer to the item 5.2.2.
Pipe Insulation (Small) 	1		
Cord Clamp (Large) 	6	For Fixing Insulation	
Cord Clamp (Small) 	1	For Fixing Plug	
Drain Hose 	1	For Connecting Drain Pipe	Refer to the item 6.
Hose Clamp 	2	For Connecting Drain Hose	
Insulation 	2	For Drain Hose Connection	

## 4.2 Initial Check

### **⚠ WARNING**

- Check to ensure that the number of below is within  $0.3\text{kg/m}^3$ . Otherwise it may cause danger situation if the refrigerant in the Outdoor Unit leaks into the room where this Indoor Unit is installed.

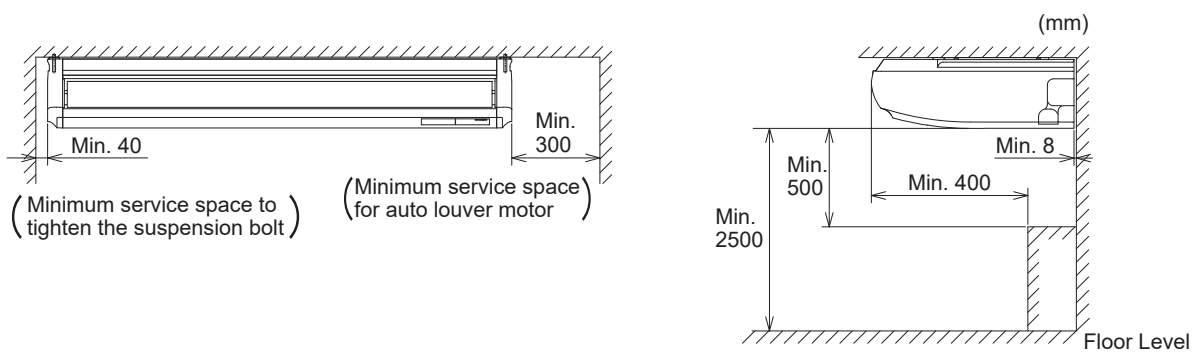
$$\frac{\text{(Total Refrigerant Quantity per one Outdoor Unit)}}{\text{(Volume of the room where this Indoor Unit is installed)}} \leq 0.3\text{kg/m}^3$$

In detail, refer to the Installation Manual for outdoor unit.

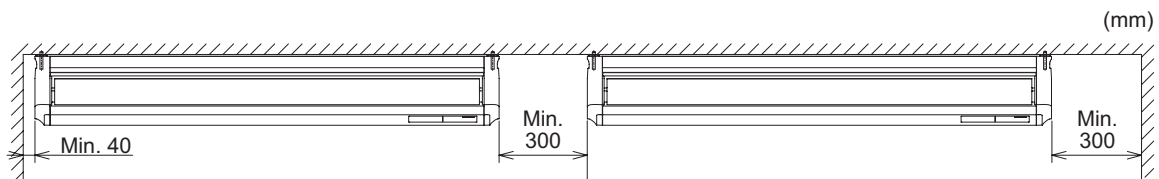
- Make sure that a refrigerant leak test has been performed. Refrigerant (Fluorocarbon or Difluoromethane) for this unit is non-toxic, and odorless. If the refrigerant should somehow escape and come into contact with flame, toxic gas will form. This gas is heavier than air and will settle near floor areas and spread where it can cause suffocation to those nearby. In addition, difluoromethane is flammable and can cause fire.

- Install the indoor unit with a proper clearance around it for operation and maintenance working space, as shown in Fig. 4.1.
- Do not install flammable parts in the service space for the indoor unit.
- Install the indoor unit higher than 2.4 meters from the floor level.

- 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.
- Avoid obstacles such as electric light, partition which may hamper the air inlet or the air outlet flow.
- Check to ensure that the ceiling has a sufficient strength to hang the indoor unit.
- Do not install the indoor unit in a machinery shop or kitchen where vapor from oil or its mist flows to the indoor unit.  
An oil will deposit on the heat exchanger, thereby reducing the indoor unit performance and the plastic parts may deform, and in the worst case, break due to splash oil at operation.
- Avoid the installation place where the indoor unit may contact high humidity.
- The warmed air may stay at the high ceiling space during the heating operation. Thus, the parallel installing of a circulator is recommended.
- The indoor unit can be installed up to 3.5 meters (for 1.5 to 3HP) and 4.3 meters (for 4 to 6HP) from the floor level.
- Avoid installing the air conditioning where the direct airflow blows from the air outlet to the temperature detecting devices such an alarm device or a control device. It may cause a failure of an alarm device or a control device.



< For Single Installation >



< For Parallel Installation >

#### NOTE:

If there is a cornice on the ceiling, measure the dimension from the front or undersurface.

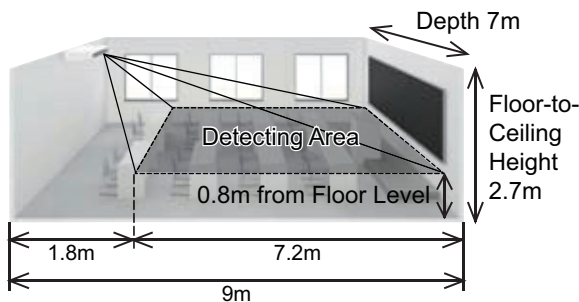
Fig. 4.1 Space around Indoor Unit



- For the indoor unit with motion sensor, the detecting area for the motion sensor is shown in the figure below.

< Detecting Area >

Example for 1.5 to 6HP indoor units



- Multiple Combinations

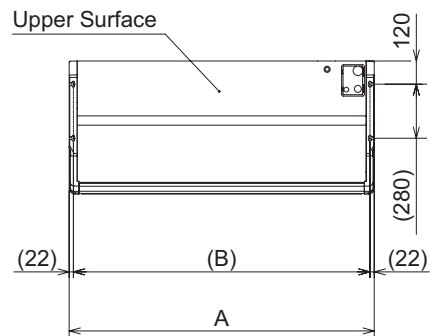
The twin combination, the triple combination and the quad combination for simultaneous operation of indoor units are installed in a same room and required to operate with equal conditions. In the case of these combination indoor unit types, if each indoor unit is partitioned by a wall, furniture or a curtain, etc, it may cause an operation failure. In addition, in the case of rearranging furniture or remodeling an interior after the installation, pay attention to effects for indoor units combination operation.

- To avoid any corrosive action to the heat exchangers, do not install the indoor unit in an acid or alkaline environment.
- The temperature and humidity inside the ceiling have the potential to exceed 30°C/RH (Relative Humidity) 80%. Thus, apply additional insulation materials to the indoor unit external surface to avoid dew condensation.
- 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 electrical box, controller cable or wired controller.
  - (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 controller in it. Prepare a steel conduit tube and wire the controller 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.

## 4.3 Installation

### 4.3.1 Position of Suspension Bolts

- (1) Determine the final location and installation direction of indoor unit with care to the space for piping and wiring.
- (2) After the position of indoor unit is determined, make holes in the ceiling to install the suspension bolts.
- (3) The position of suspension bolts is shown below.



( ): Dimension for Suspension Bolt

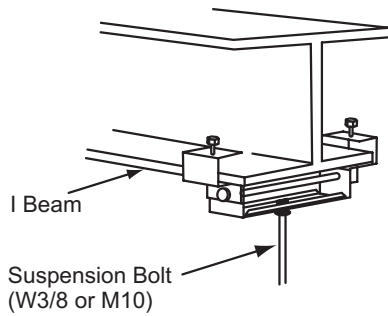
HP	A	B
1.5, 2	960	916
2.5, 3	1270	1226
4 ~ 6	1580	1536

- (4) Ceiling Work: It is different depending on the building structure. Consult with an architect or an interior finish worker for more information.
  - Do not install electric light units and the indoor unit to the same furring for ceiling. If installed, electric lights may flicker or vibrate by the indoor unit operation. When installing the indoor unit and electric lights, a furring for ceiling must be separated for each.

### 4.3.2 Installation of Suspension Bolts

- (1) The structure of suspending part shall be strong enough. The ductor facilitates suspending work.
- (2) Strengthen suspension bolts with support plates for the earthquake resistant depending on the needs of the quakeproof. Apply M10 of suspension bolts and support plates for the earthquake resistant. (Field-Supplied)

< For Steel Beam >



#### NOTES:

To hang the indoor unit, a strong square lumber shall be utilized.

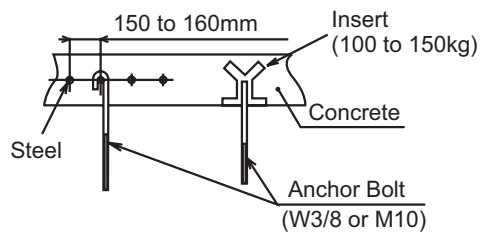
Span ≤ 90cm:

Square Lumber larger than 6cm

Span ≤ 180cm:

Square Lumber larger than 9cm

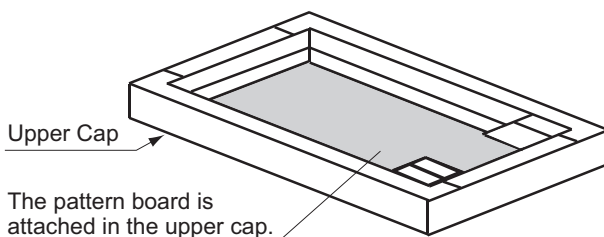
< For Concrete Slab >



### 4.3.3 Mounting Indoor Unit

#### (1) Pattern Board for Installation

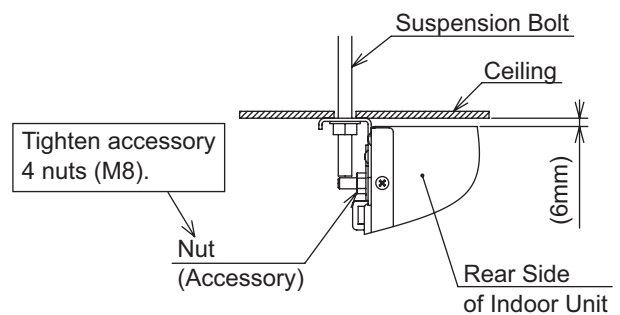
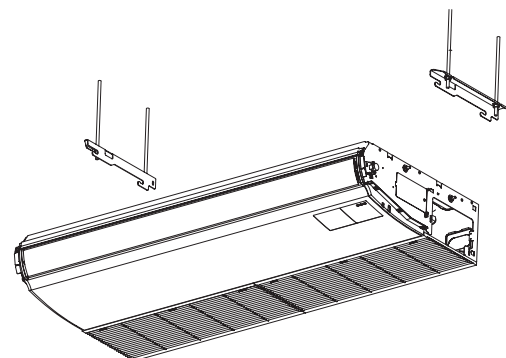
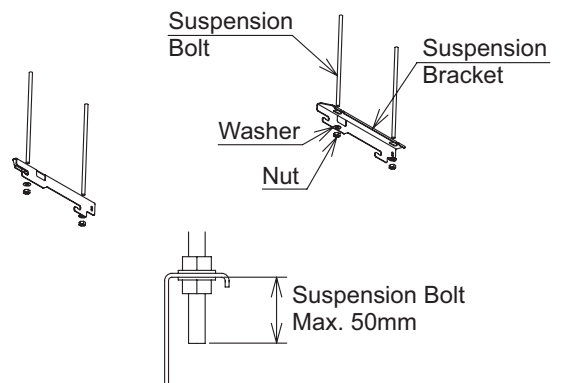
The pattern board for the installation is printed on the packing. When making holes in wall and ceiling, the pattern board which hole positions for suspension, refrigerant pipe and drain pipe are printed shall be used.



#### (2) Hanging Indoor Unit

##### < A. Hanging Indoor Unit with Suspension Bracket >

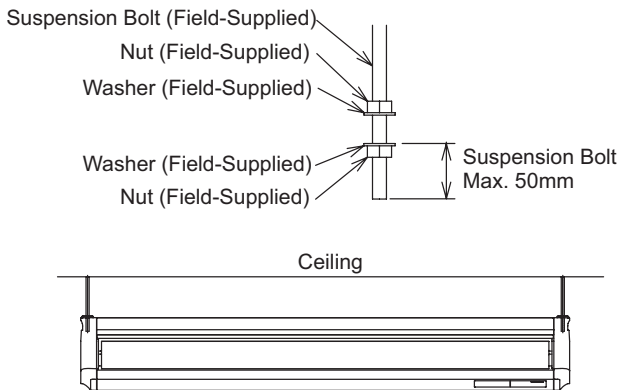
- (a) Make holes in the ceiling for suspension bolts.
- (b) Remove the side cover.  
To remove the side cover, refer to the "Handling of Indoor Unit".
- (c) Remove the suspension brackets attached to the indoor unit.
- (d) Fix the suspension brackets to the suspension bolts. (4 portions)
- (e) Mount the indoor unit to the suspension brackets.
- (f) Tighten the 4 nuts and the fixing screw for suspension bracket.



**< B. Hanging Indoor Unit  
without Suspension Bracket >**

(If there is not enough service space between the ceiling and the indoor unit, hang the indoor unit by method A.)

- (a) Determine the position to install the suspension bolt.
- (b) Fix the washer and nut to the suspension bolt.
- (c) Mount the indoor unit to the suspension bolts.

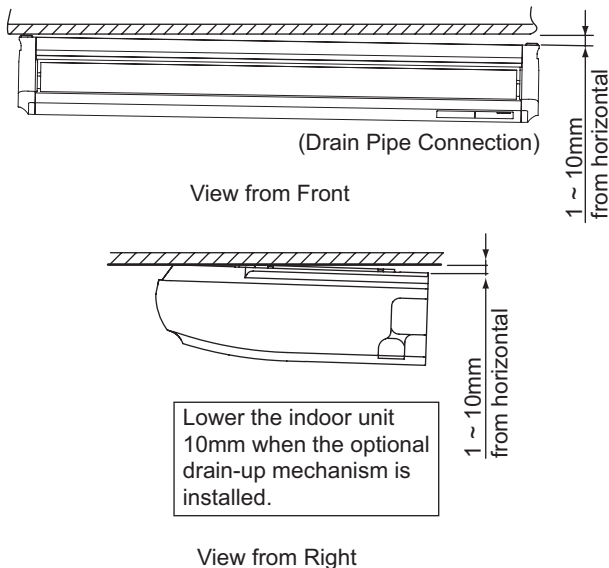


- (4) Attach the side cover and the supporting string.
- (5) Remove the protection film attached to the louver surface.
- (6) Remove the protection tape attached to the air inlet filter.

**4.3.4 Installation of Wired Controller**

The installation of wired controller shall be performed according to the installation manual of itself.

- (3) When the indoor unit is mounted, create down-slope toward drain pipe connection to be well drainage. The right figure shows the right drain pipe connection. (Before shipment) For the left drain pipe connection, create down-slope toward left.



**NOTE:**

The ceiling surface may not be horizontal. When the indoor unit is mounted, check the levelness by a level to be the drain pipe connection down-slope. If the indoor unit is mounted with incorrect suspending position, it may deform and the abnormal vibration may occur.

## 5. Refrigerant Piping Work

# ⚠ DANGER

This machine uses refrigerant R410A or refrigerant R32.

The type of enclosed refrigerant is described in the specification nameplate and caution nameplate attached to the outdoor unit. When installing, repairing, or relocating, do not mix substances other than the refrigerant described on the specification nameplate or caution nameplate attached to the outdoor unit. Also, do not mix refrigerant R410A and refrigerant R32. Entering non-designated refrigerants, air, oxygen, flammable substances such as propane or alcohol may cause explosion, fire or injury.

For the refrigerant piping work, vacuum pump and refrigerant charge, the details shall be referred to "Installation & Maintenance Manual" of the outdoor unit.

### 5.1 Piping Materials

- (1) The tolerance of refrigerant piping length differs depending on the combination with the outdoor unit. The details shall be referred to "Installation & Maintenance Manual" of the outdoor unit.
- (2) Select the piping size from the following table.

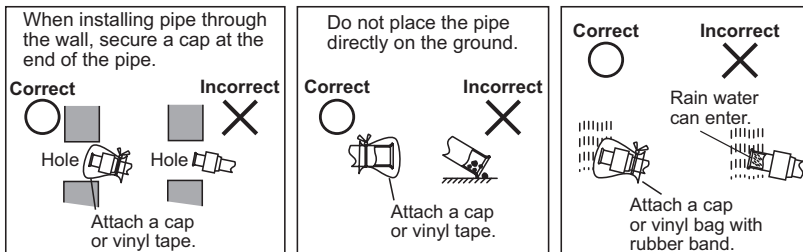
mm (in.)

Model	Gas Piping	Liquid Piping
RPC-1.5FSR RPC-2.0FSR	φ12.7 (1/2)	φ6.35 (1/4)
RPC-2.5FSR RPC-3.0FSR RPC-4.0FSR RPC-5.0FSR RPC-6.0FSR	φ15.88 (5/8)	φ9.52 (3/8)

- (3) Prepare field-supplied copper pipes.
- (4) Select clean copper pipes. Make sure there is no dust and moisture inside.
- (5) The refrigerant lubricating oil used in these units is Polyvinylether (PVE), a chemically stable, resilient, synthetic lubricant that, when combined with refrigerant R410A or refrigerant R32, maintains its compatibility, lubricity, and viscosity over extended periods of time and is impervious to heat, oxidation, moisture absorption and breakdown as long as it remains in a sealed system. Its chemical properties will remain intact only so long as moisture is not introduced into the system.

The gaseous element, PVE is a moisture magnet that, once exposed to open air and can quickly become saturated with moisture, lose its lubricity, and become useless. Minimize exposure to the open air, over the summer months, and in southern or tropical climates.

- (6) Use a pipe cutter to avoid a grind swarf generation for the pipe cutting work. (Do not use a saw or a grind stone to cut pipes.) Blow the inside of the pipes with nitrogen or dry air, to remove any dust or foreign materials before connecting pipes.

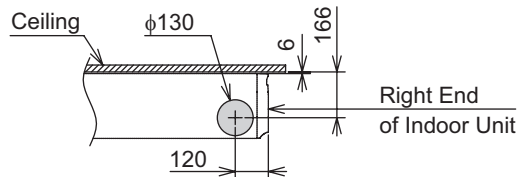


## 5.2 Piping Connection

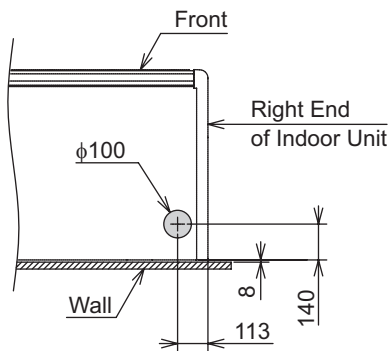
### 5.2.1 Position of Pipe Connection

The piping connection is performed inside the indoor unit. The pipe connection can be performed from 3 directions, rear, right and upper. For rear and upper pipe connection, the plastic cap is attached at knockout hole for the refrigerant pipe and the drain pipe. Cut out the knockout hole of cap for piping and attach the cap again after running the refrigerant pipe through the cap.

#### < Hole Position and Size >



View from Front

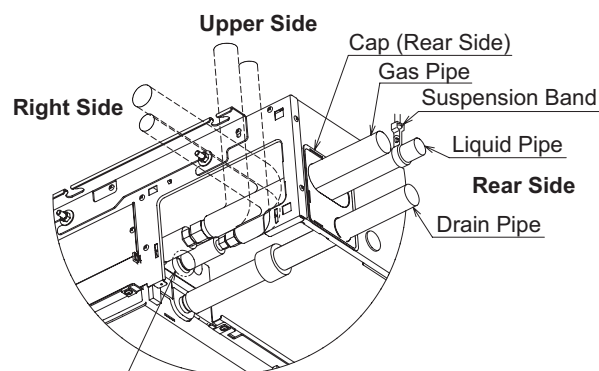


View from Bottom

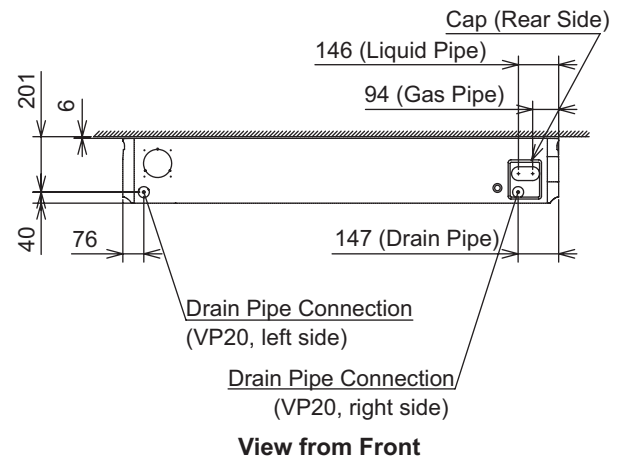
#### NOTE:

When the optional drain-up mechanism is attached, refer to the installation manual of itself.

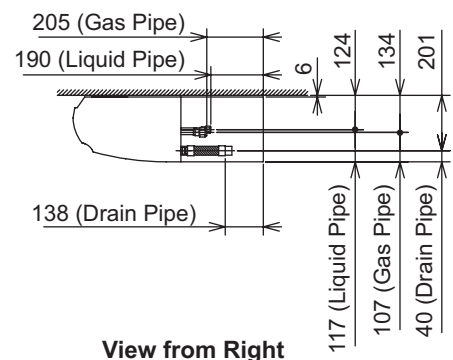
#### < Position of Pipe Connection >



If the liquid pipe contacts strongly to the plate, noise caused by refrigerant flowing may increase. Suspend the local liquid pipe by suspension band to prevent dangling.

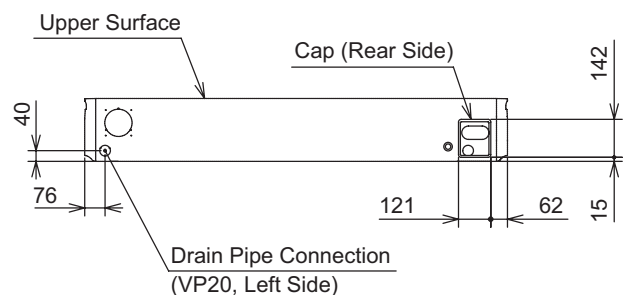


View from Front



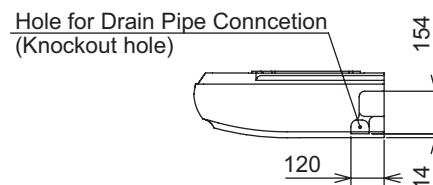
View from Right

#### ● Piping from Rear Side



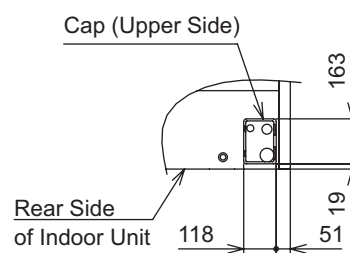
View from Front

#### ● Piping from Right Side



View from Right

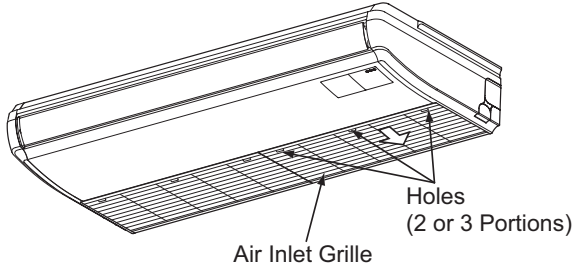
#### ● Piping from Upper Side



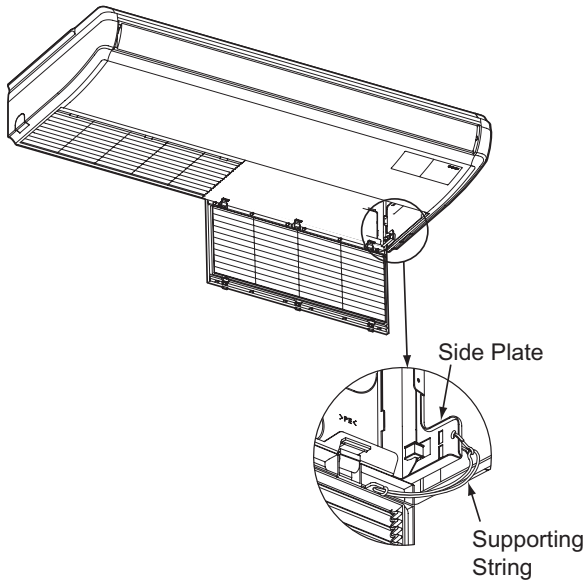
View from Bottom

### 5.2.2 Piping Connection

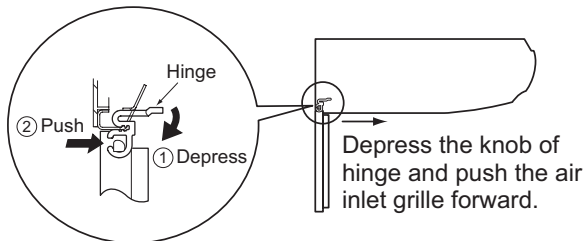
- (1) Open the air inlet grille and perform the connecting work from lower side.
  - (a) Press and slide the cover of the air inlet grille in the direction of the arrow with fingers in the holes on the cover.



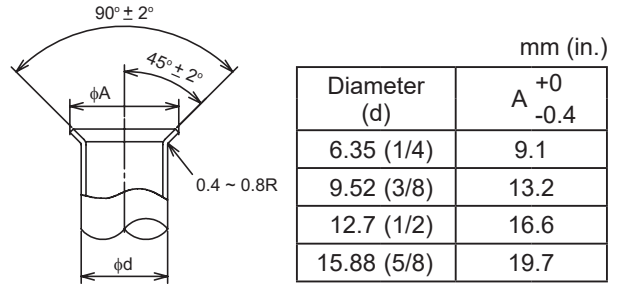
- (b) Remove the supporting string from the side plate.



- (c) While the air inlet grille is being opened, depress the knobs of hinge (①), push the air inlet grille toward arrow direction (②) and remove the air inlet grille.



- (2) Perform the flaring work as shown below.



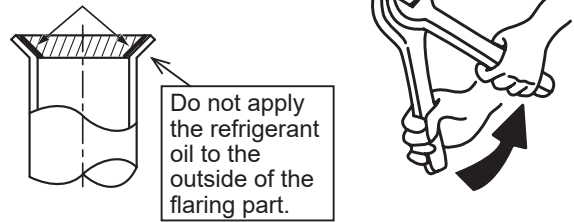
- (3) Use specific flare nut.
- (4) Check that there are no scratch, chip, deformation, gap or at the flaring part.
- (5) Apply the refrigerant oil in a thin layer to the inside of the flaring part of the pipe before tightening the flare nut. And the flare nut must be tightened using two spanners according to the tightening torque as shown in the figure below. The tightening work will be easier if tightening the flare pipe in order of the liquid pipe, the gas pipe. Check the leakage of the refrigerant after the tightening work.

\* If the refrigerant oil attaches to the service cover, it may cause a crack. Pay attention not to attach.

#### NOTE:

Refrigerant oil is field-supplied.  
[Ethereal Oil FVC50K, FVC68D, FW68H  
(Idemitsu Kousan Co. Ltd.)]

Apply Refrigerant Oil.



Required Tightening Torque (JIS B8607)

Pipe Size	Tightening Torque
$\phi 6.35$ mm (1/4)	14 - 18 (N-m)
$\phi 9.52$ mm (3/8)	34 - 42 (N-m)
$\phi 12.7$ mm (1/2)	49 - 61 (N-m)
$\phi 15.88$ mm (5/8)	68 - 82 (N-m)

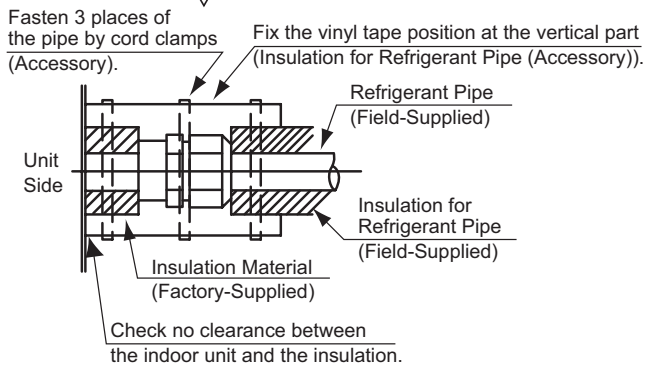
Fig. 5.1 Tightening Work of Flare Nut

## CAUTION

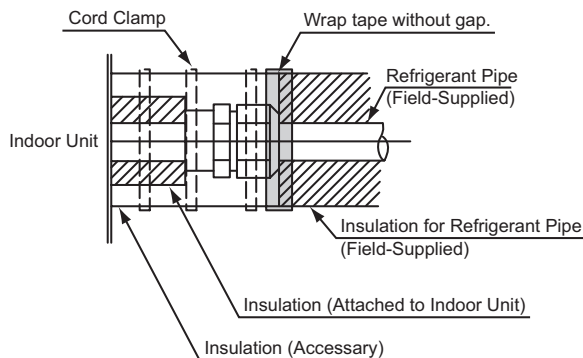
**Tighten the flare nuts according to the specified torque. If not, it may cause the refrigerant leakage.**

- (6) When on-site piping with joint such as elbow, socket is buried, provide a service access door to facilitate the check for connecting part.
- (7) Perform to support for earthquake resistant to the pipes in order not to damage by an external force.
- (8) Do not clamp tightly the refrigerant pipe when supporting for prevention of heat stress.
- (9) Do not touch the refrigerant pipes to low strength portions of walls or ceilings. If not, it may cause abnormal sound or vibration.
- (10) Perform the air tight test. The air tight procedures should be performed according to "Installation & Maintenance Manual" of the outdoor unit.
- (11) Insulate each flare connection without gap to prevent of dew condensation by using the accessory insulations, and insulate each refrigerant pipe also.

Fasten securely cord clamps and the vinyl tape in order to prevent the pipe from dew condensation



- (12) When the thickness of insulation for gas piping is 20mm, attach the insulation moving to the indoor unit side as shown in the right figure. When attaching, wrap the insulation without gap between the insulation and local piping insulation.



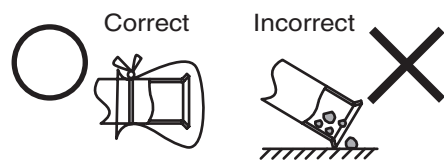
## CAUTION

- Do not apply excessive force to the flare nut when tightening. If applied, the flare nut may crack due to aged degradation and refrigerant leakage may occur. Use the specified tightening torque.
- Make sure that a refrigerant leak test has been performed. Refrigerant (Fluorocarbon or Difluoromethane) for this unit is non-toxic, and odorless. If the refrigerant should somehow escape and come into contact with flame, toxic gas will form. This gas is heavier than air and will settle near floor areas and spread where it can cause suffocation to those nearby. In addition, difluoromethane is flammable and can cause fire.

- (13) If using a forming agent (recommended Gupoflex) after installing the air inlet grille, avoid touching the forming agent to the air inlet grille. If the forming agent is touched to the air inlet grille, it may cause the breakage and the falling of the air inlet grille. In this case, completely wipe off the touched forming agent.

## NOTICE

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



- (14) Evacuation and refrigerant charging procedures should be performed according to "Installation & Maintenance Manual" of the outdoor unit.

### 5.2.3 Refrigerant Piping for R32

(1) Refrigerant piping length between indoor unit and outdoor unit

The unit installation and refrigerant piping should comply with the relevant local and national regulations for the designed refrigerant.

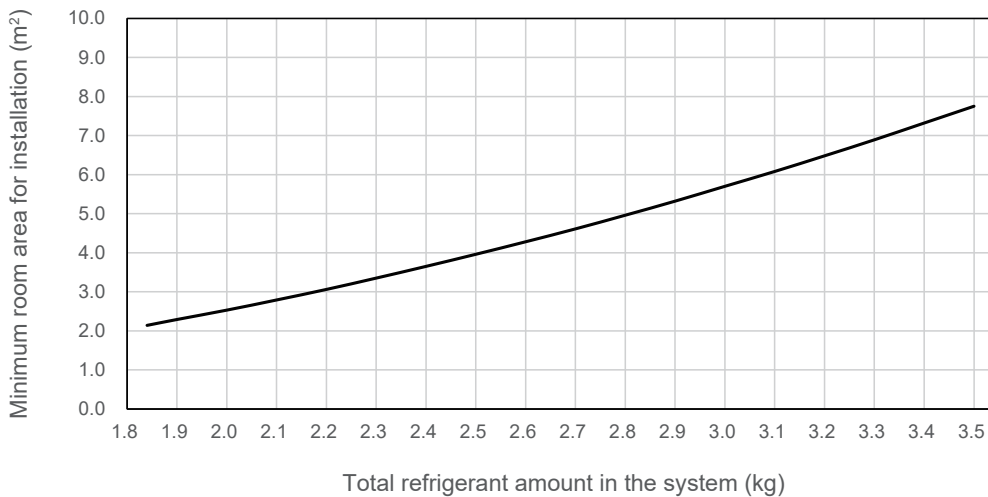
Due to R32 refrigerant and depending on final refrigerant charge amount, a minimum floor area for installation must be considered.

- If total refrigerant charge amount < 1.84kg, there are no additional minimum floor area requirements.
- If total refrigerant charge amount ≥ 1.84kg, there are additional minimum floor area requirements to be checked.

Refrigerant Amount (kg)	Minimum Area (m <sup>2</sup> )
1.84	2.14
1.9	2.29
2.0	2.53
2.1	2.79
2.2	3.06
2.3	3.35
2.4	3.65
2.5	3.96
2.6	4.28
2.7	4.61
2.8	4.96
2.9	5.32
3.0	5.70
3.1	6.08
3.2	6.48
3.3	6.89
3.4	7.32
3.5	7.75

(2) Minimum area requirements

In case of total refrigerant amount ≥ 1.84kg, the unit should be installed, operated and stored in a room with a floor area larger than the minimum criteria. Use following graphic and table to determine these minimum criteria.



**NOTE:**

In case of not achieving the minimum floor area, contact with your dealer.



## 6. Drain Piping

Perform the drain piping work after connecting the refrigerant pipes and attaching insulations.

### **WARNING**

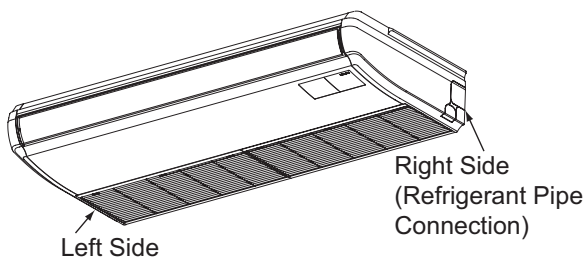
Do not insert the drain pipe for the indoor unit to the drainage trench where corrosive gases occur. Poisonous gases flow into the room, so that may cause the poisoning.

### **NOTICE**

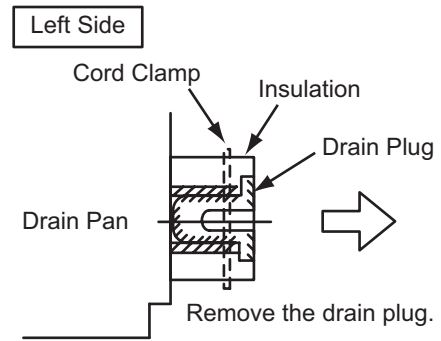
- Do not create an upper-slope or rise for the drain piping, since drain water can flow back to the indoor unit and leakage into the room will occur when the system operation is stopped.
- Do not connect the drain pipe with sanitary or sewage piping or any other drainage piping.
- When the common drain 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.
- After performing drain piping work and electrical wiring, check to ensure that water flows smoothly as in the following procedure.

#### (1) Connecting Direction of Drain Pipe

The standard direction of drain piping connection is right side as viewed from front. However, it can be performed from the left side when it is required due to building construction.

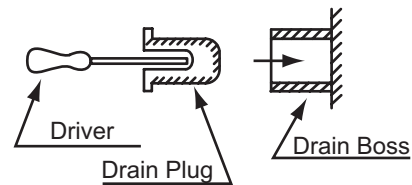


< For Left Side Drain Piping >

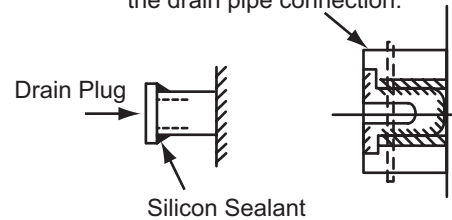


Right Side

Insert the drain plug into the drain boss by using a driver.



Wrap the insulation around the drain pipe connection.



#### (2) Connecting Drain Hose

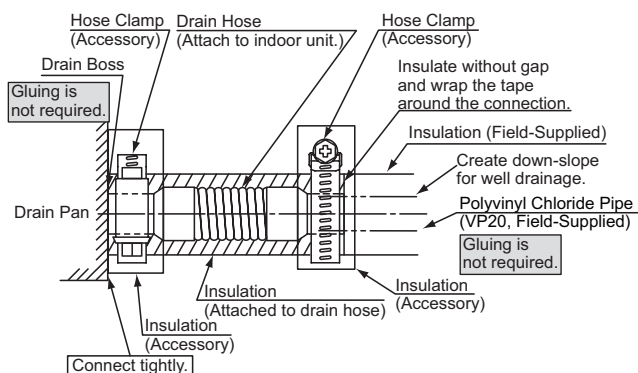
- Insert the hose into the hose clamp.
- Push the drain hose onto the drain boss until the hose reaches the end of drain pan. (If the drain hose is not inserted completely, it causes water leakage.)
- Tighten the screw for hose clamp to face the screw part downward as shown in the figure below to prevent dew drop.
- Wrap the insulation (accessory) around the hose clamp to cover drain hose, drain pan, hose clamp without gap. (If there is gap, dew drop may occur.)

### (3) Connecting Drain Piping

- (a) Prepare a polyvinyl chloride pipe with a 26mm outer diameter. (VP20 (based on JIS K6741) is recommended.)
- (b) When the drain hose is used, do not create rising part or twist.
- (c) Insulate surely the polyvinyl chloride pipe after connecting.
- (d) Tighten the hose clamp after surely inserting the polyvinyl chloride pipe.
- (e) The drain pipe must be performed with a down-slope pitch of 1/25 to 1/100.
- (f) Wrap the insulation (accessory) around the hose clamp to cover drain hose, drain pan, hose clamp without gap.

#### NOTES:

- \* Do not connect the drain pipe with sanitary or sewage piping or any other drainage piping.
- \* Do not tighten the drain pipe and the refrigerant pipe together by the hose clamp.



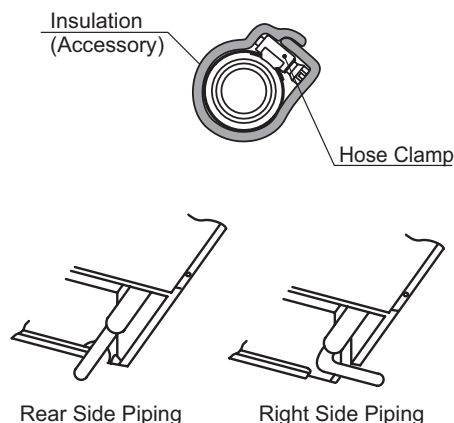
#### NOTES:

- Connect the field-supplied drain pipe to the drain hose by the polyvinyl chloride adhesive. Perform firmly cleaning the connection surface, applying the adhesive, inserting the pipe, retaining and curing according to the adhesive manufacturer information. The adhesive Eslon No.73 (Sekisui Chemical Co. Ltd) is recommended.
- Insert the drain hose completely. If not, or twisted, it will cause water leakage.
- Attach the hose clamp to be the screw part upward not to touch the screw part to the air filter.
- If the polyvinyl chloride adhesive is used to the drain boss which is ABS resin made, a crack and water leakage may occur.
- The tightening torque for hose clamp shall be 3.0 to 3.5N-m.

- (4) After the drain piping work is completed, check that water flows smoothly by pouring water into the drain pan by hose.

#### NOTE:

The optional drain-up mechanism is required when the drain piping is connected from the upper surface of indoor unit. The details shall be referred to Installation & Maintenance Manual of the drain-up mechanism.



⚠ WARNING

Pay attention not to splash water to the electrical parts such as the fan motor, the float switch or thermistors.

## 7. Electrical Wiring

### **WARNING**

- The electrical wiring work must be performed by authorized installers. If not, it may cause an electric shock or a fire.
- Perform the electrical work according to each regulation of region and “Installation & Maintenance Manual”, and the dedicated electrical circuit must be used. If not performing the electrical wiring work completely or a capacity shortage of the power circuit, it will cause an electric shock or a fire.
- Use the specified cables for wiring between the outdoor unit and indoor units. Selecting incorrect cables will cause an electric shock or a fire.
- Install an ELB (Earth Leakage Breaker) in the power source. If not used, it will cause an electric shock or a fire.
- Turn OFF the main power switch of the indoor unit and the outdoor unit before an electrical wiring work or a periodical check is performed. If not, it will cause an electric shock or a fire.
- 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.
- Tighten screws according to the following torque.
  - M3.5: 1.2 N-m
  - M4: 1.0 to 1.3 N-m
- Connect earth wires for the outdoor / indoor unit to prevent an electrical shock or an unexpected accident. The earth resistance must be less than 1 megohm. The earth work must be performed by authorized installers.
- Turn completely OFF the power source to prevent an electrical shock when opening the service cover to perform the electrical work or the maintenance.
- Pay attention not to bite electrical wirings when attaching the service cover. It may cause an electrical shock or fire.

### **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.
- Lead the wires through the knockout hole in the side cover when using conduit.
- Secure the cable of the wired controller using the cord clamp inside the electrical box.

### **NOTICE**

The procedure of the wiring work shall be performed according to this manual and “Installation & Maintenance Manual” of the outdoor unit.

#### 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”. Make sure that the components comply with National Electrical Code (NEC).
- (2) Use the shielded twist pair cable for the control cable between the outdoor unit and the indoor unit, the control cable between indoor units and the controller cable of PC-ARF1.
- (3) Check to ensure that the power supply voltage is within  $\pm 10\%$  of the rated voltage.
- (4) 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.
- (5) Check to ensure that the earth wire is connected.

## 7.2 Electrical Wiring Capacity

### 7.2.1 Field Minimum Wire Sizes for Power Source

- Use an ELB (Earth Leakage Breaker).  
If not used, it will cause an electric shock or a fire.
- 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.
- 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.

Model	Power Source	Maximum Current	Power Source Cable Size		Transmitting Cable Size	
			IEC 60335-1 *1	MLFC *2	IEC 60335-1 *1	MLFC *2
RPC-1.5FSR RPC-2.0FSR RPC-2.5FSR RPC-3.0FSR RPC-4.0FSR RPC-5.0FSR RPC-6.0FSR	220-240V/1φ/50Hz 220V/1φ/60Hz	5A	0.75mm <sup>2</sup>	0.5mm <sup>2</sup>	0.75mm <sup>2</sup>	0.5mm <sup>2</sup>

#### 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, IEC 60335-1. Use the wires which are not lighter than the ordinary tough rubber sheathed flexible cord (code designation H05RN-F) or ordinary polychloroprene sheathed flexible cord (code designation H05RN-F).
- 3) The wire sizes marked with \*2 in the above table are selected at the maximum current of the unit according to the wire, MLFC (Flame Retardant Polyflex Wire) manufactured by Hitachi Cable Ltd., Japan.
- 4) Use a shielded cable for the transmitting circuit and connect it to ground.
- 5) In the case that power cables are connected in series, add each unit maximum current and select wires below.

#### Selection According to IEC 60335-1

Current i (A)	Wire Size (mm <sup>2</sup> )
$i \leq 6$	0.75
$6 < i \leq 10$	1
$10 < i \leq 16$	1.5
$16 < i \leq 25$	2.5
$25 < i \leq 32$	4
$32 < i \leq 40$	6
$40 < i \leq 63$	10
$63 < i$	*3

#### Selection According to MLFC (at Cable Temperature of 60°C)

Current i (A)	Wire Size (mm <sup>2</sup> )
$i \leq 15$	0.5
$15 < i \leq 18$	0.75
$18 < i \leq 24$	1.25
$24 < i \leq 34$	2
$34 < i \leq 47$	3.5
$47 < i \leq 62$	5.5
$62 < i \leq 78$	8
$78 < i \leq 112$	14
$112 < i \leq 147$	22

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

### 7.2.2 Details of Electrical Wiring Connection

The electrical wiring capacity of the outdoor unit should be referred according to “Installation & Maintenance Manual” of the outdoor unit. Setting Dip Switch may be required depending on the combination with the outdoor unit.

**NOTE:**

When installing the unit in Australia, connect the both ends of shielded twist pair cable (controller cable and control cable) to the earth. (Refer to the item 7.3 (8) for details.)

(1) For UTOPIA Series

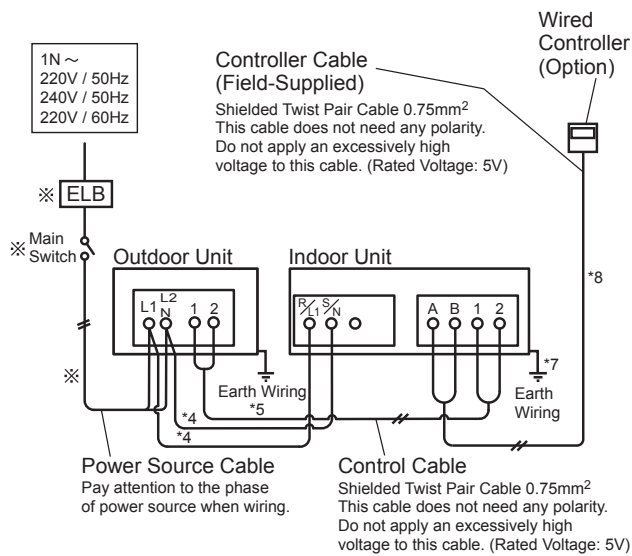
Select wiring capacity according to the table 7.1. Install the ELB and the main switch to each as shown in the following figures.

Use CASE B method wiring for Australia.

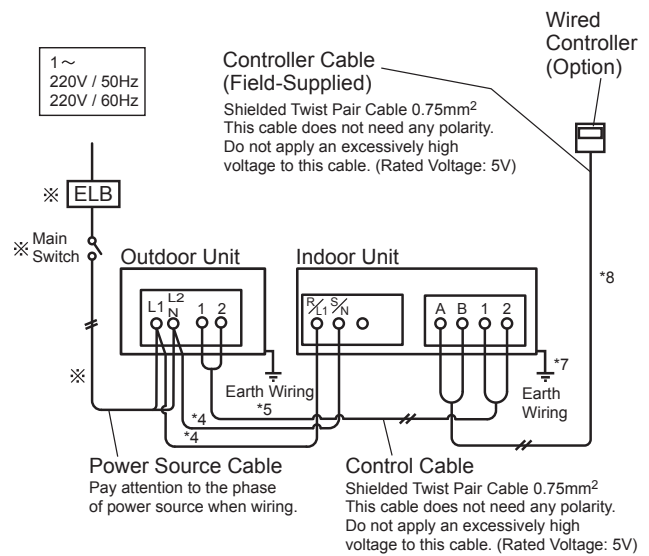
The control cable length between the outdoor unit and the indoor unit shall be less than 75m.

**< Case A >**

Power Source Type: 3 Phase 4 Wires



Power Source Type: 3 Phase 3 Wires



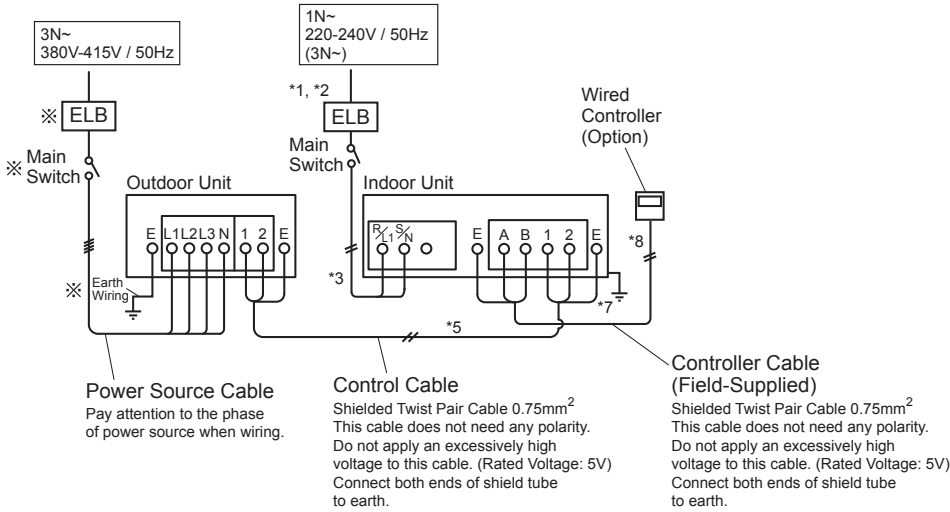
※ Refer to “Installation & Maintenance Manual” of connected outdoor unit for details of wire, ELB and main switch.

< Case B >

• Wiring Connection (Single Indoor Unit)

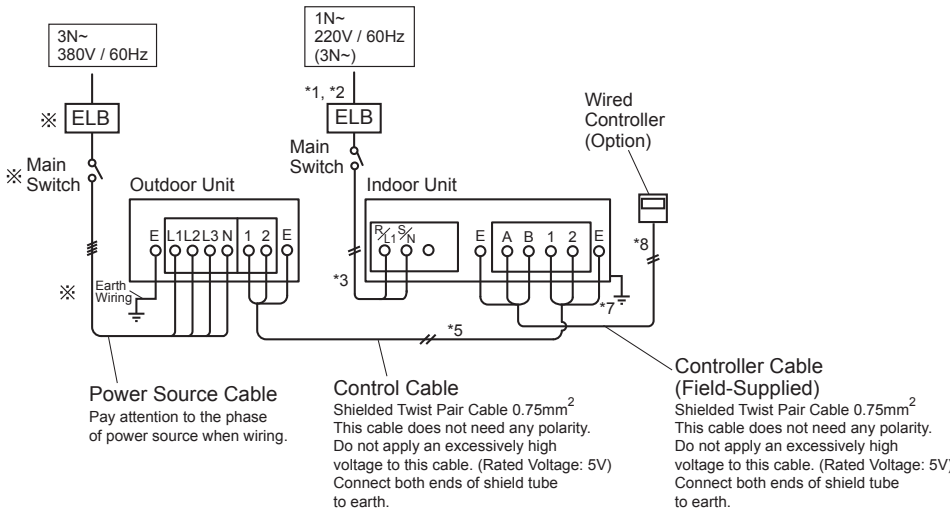
Power Source Type: 3 Phase 4 Wires

< 3φ 380-415V/50Hz >



※ Refer to "Installation & Maintenance Manual" of connected outdoor unit for details of wire, ELB and main switch.

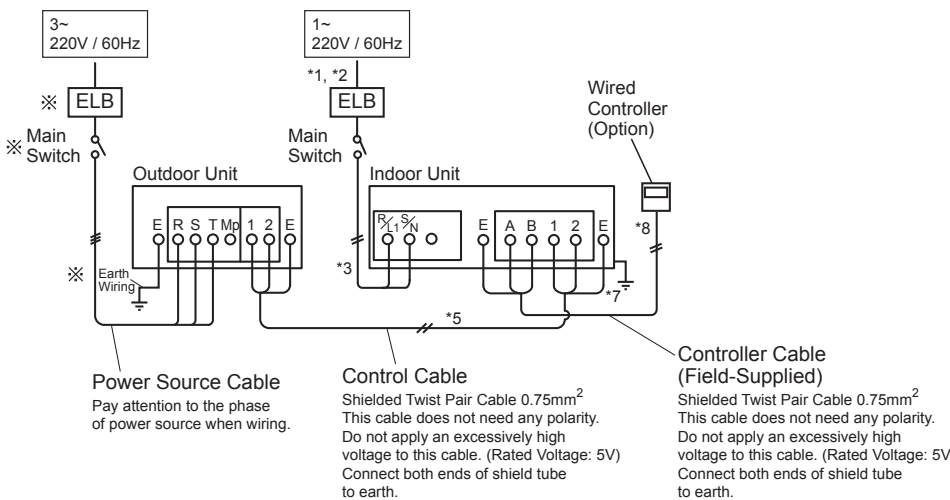
< 3φ 380V/60Hz >



※ Refer to "Installation & Maintenance Manual" of connected outdoor unit for details of wire, ELB and main switch.

Power Source Type: 3 Phase 3 Wires

< 3φ 220V/60Hz >



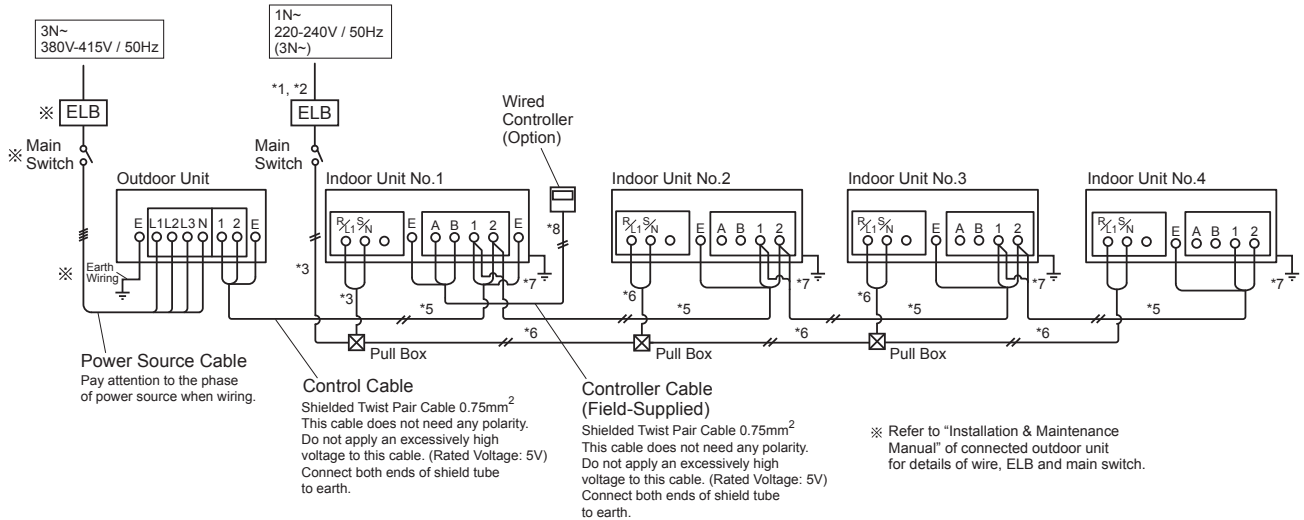
※ Refer to "Installation & Maintenance Manual" of connected outdoor unit for details of wire, ELB and main switch.

● Wiring Connection (Twin, Triple and Quad Combinations for Simultaneous Operation)

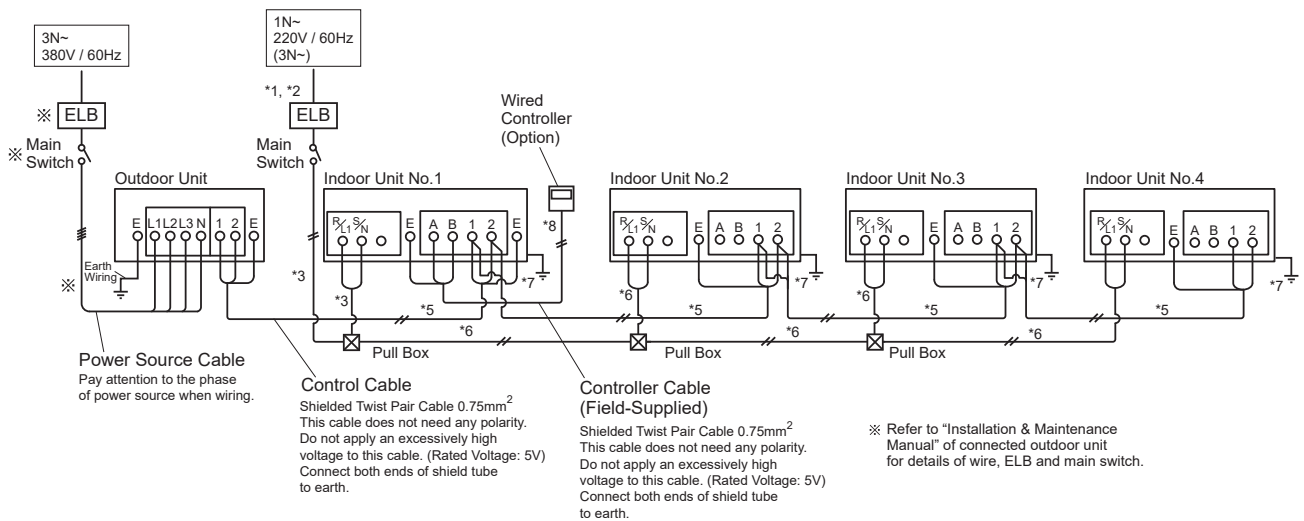
For following wiring connection, turn OFF No.1 pin at DSW6. Refer to "Installation & Maintenance Manual" of outdoor unit for details.

Power Source Type: 3 Phase 4 Wires

< 3φ 380-415V/50Hz >

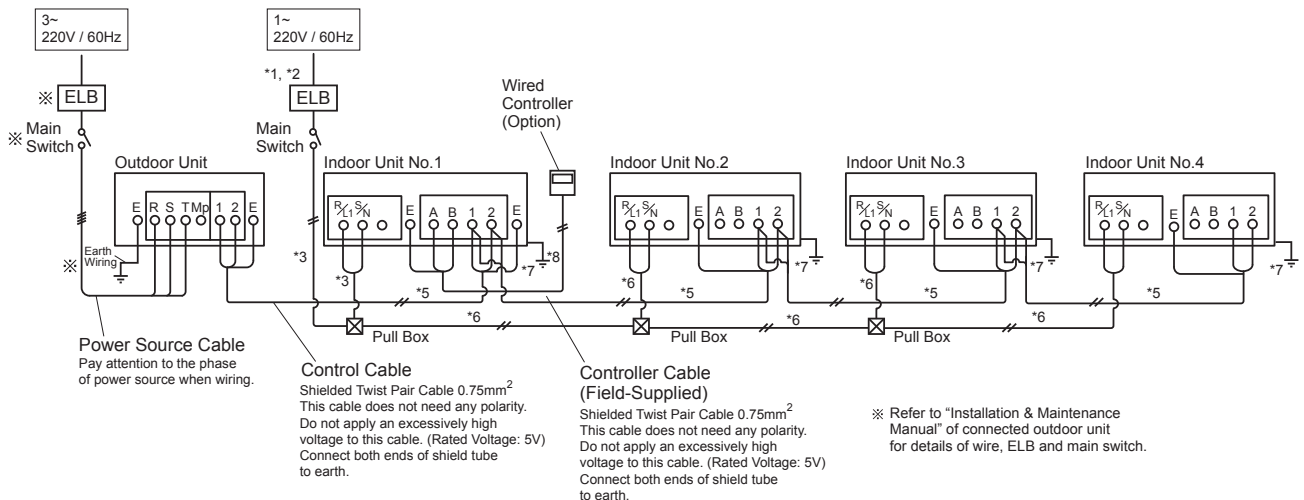


< 3φ 380V/60Hz >



Power Source Type: 3 Phase 3 Wires

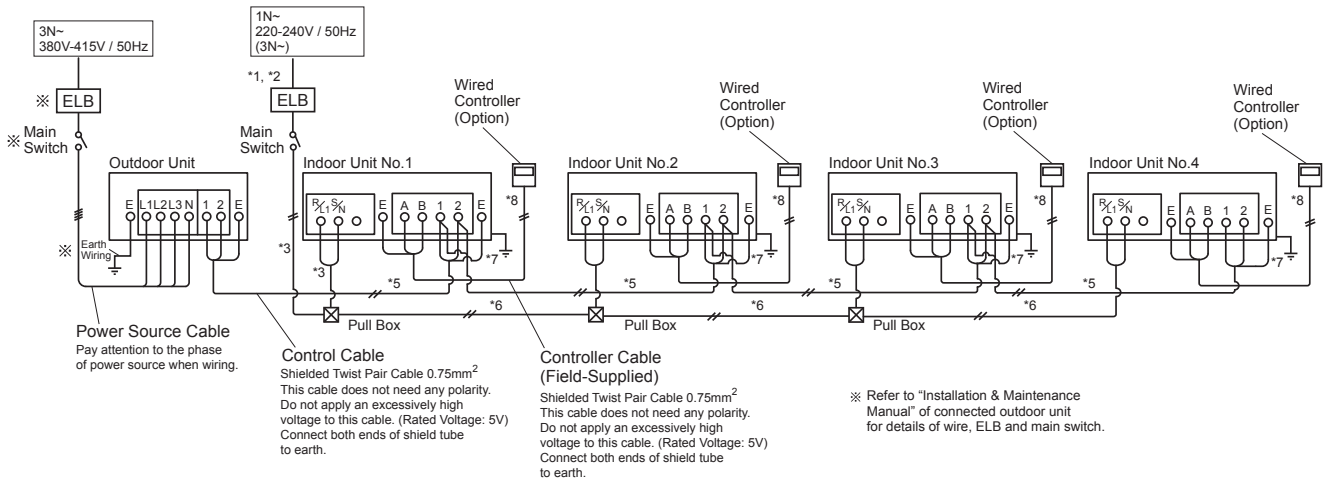
< 3φ 220V/60Hz >



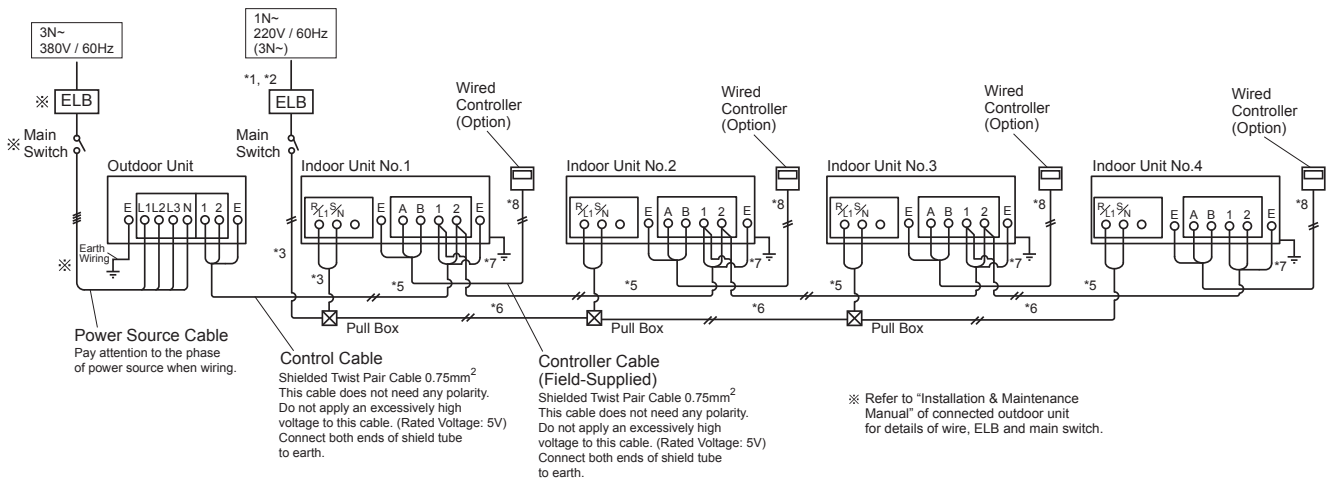
• Wiring Connection (Twin, Triple and Quad Combinations for Individual Operation)

**Power Source Type: 3 Phase 4 Wires**

< 3φ 380-415V/50Hz >



< 3φ 380V/60Hz >



**Power Source Type: 3 Phase 3 Wires**

< 3φ 220V/60Hz >

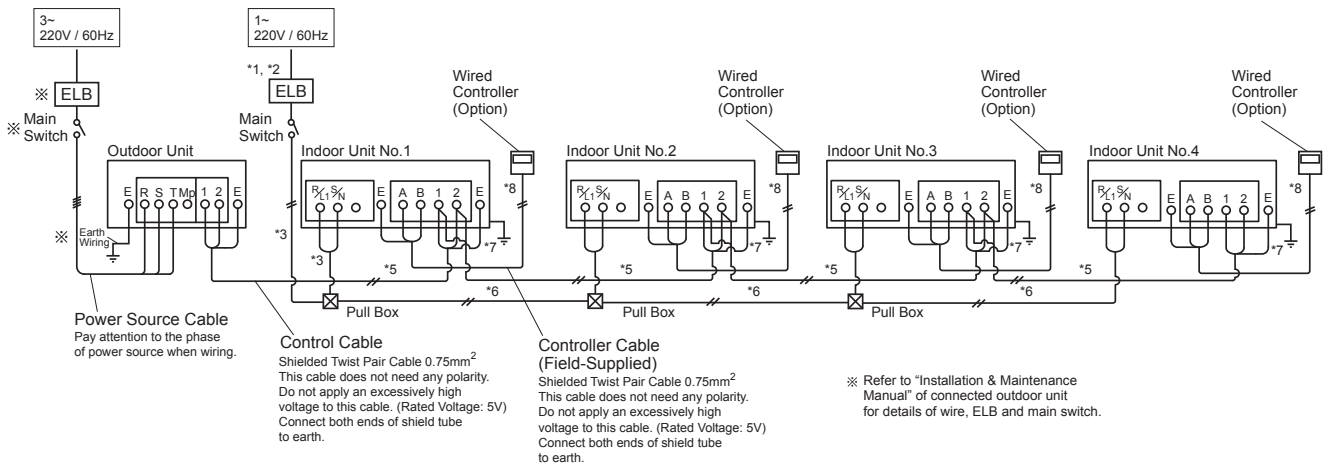




Table 7.1 Recommended Wiring Capacity and Size for UTOPIA Series

Model	ELB	Main Switch		Wiring Capacity (mm <sup>2</sup> )								
				Rated Current (A)	Rated Current (A)	Fuse Capacity (A)	Power Source Cable	Transition Wiring between O.U. and I.U.		Transition Wiring between Indoor Units	Earth Wiring	Controller Cable
								Power Supply	Control Circuit			
Combination	Indoor *1	Indoor *2	Indoor *2	Indoor *3	< 20m *4	*5	*6	*7	*8			
Single Type	5	5	5	1.0	1.0	0.75	-	2.0	0.75			
Twin, Triple, Quad							0.75	3.5				

ELB: Earth Leakage Breaker

I.U.: Indoor Unit

O.U.: Outdoor Unit

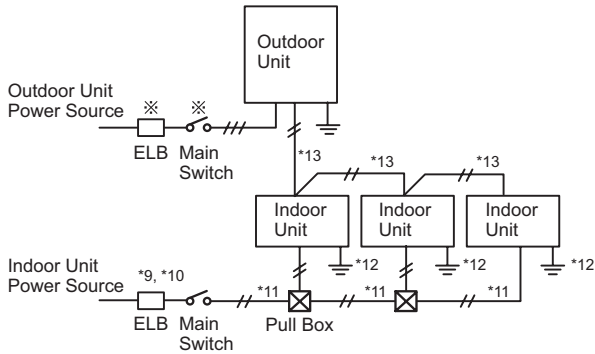
**NOTE:**

For the total wiring length more than 20m, refer to "Installation & Maintenance Manual" of the outdoor unit.

(2) For SET FREE Series

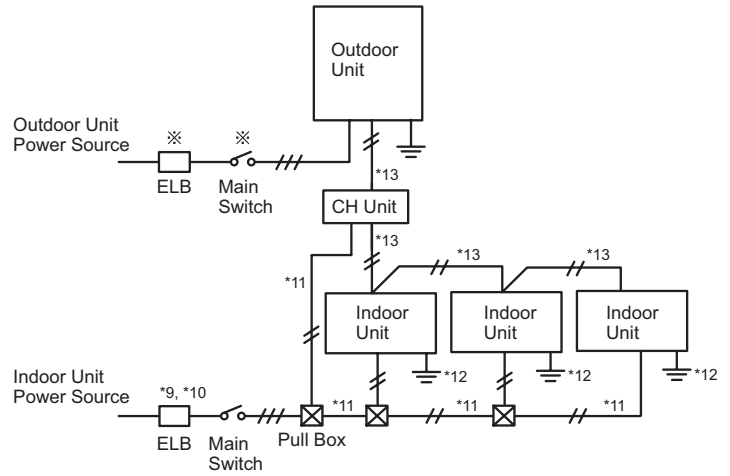
Select wiring capacity according to the following table. Install the ELB and the main switch to each as shown in the figures below.

< Heat Pump System >



※ Refer to "Installation & Maintenance Manual" of connected outdoor unit for details of wire, ELB and main switch for outdoor unit.

< Heat Recovery System >



※ Refer to "Installation & Maintenance Manual" of connected outdoor unit for details of wire, ELB and main switch for outdoor unit.

Table 7.2 Recommended Wiring Capacity and Size for SET FREE Series

Total Indoor Unit Capacity	Power Source				Earth Wire Size (mm <sup>2</sup> )	Transition Wire Size for Control Circuit (mm <sup>2</sup> )	Controller Cable (mm <sup>2</sup> )
	ELB	Main Switch		Wiring Line Length (m) <sup>*1</sup>			
		Rated Current (A) *9	Switch Capacity (A) *10				
≤ 7A	15	30	15	2.5	30	3.5 2 Core Cable 0.75 ~ 1.25	0.75
≤ 10A	20	30	20	4.0	34		
≤ 15A	30	30	30	6.0	34		

ELB: Earth Leakage Breaker

\*1): The above wiring line length shows the case that the indoor units are connected in series. (The voltage drop is within 2%.) When the power source wiring is longer than the above value, select the minimum wiring size which the voltage drop is within 2%.

## NOTICE

- Check the recommended size of the ELB shown in Table. Select high-sensitive high speed ELB when the rated sensitive current is less than 30mA. (The motion time should be within 0.1 second.)
- Use 2 core cable (equivalent to following cables: VCTF, VCT, CVV, MVVS, VVR or VVF, size: 0.75mm<sup>2</sup> to 1.25mm<sup>2</sup> (manufactured by HITACHI Cable Co. Ltd.)) or 2 core twist pair cable (equivalent to following cables: KPEV or KPEV-S (manufactured by HITACHI Cable Co. Ltd.)) for the control cable between the outdoor unit and the indoor unit. The total cable length should be less than 1000m.
- Use 2 core twist pair cable (equivalent to following cables: KPEV or KPEV-S) for the controller cable and the control cable between indoor units. The total cable length should be less than 500m. If the total length of the cable is less than 30m, other cables can be used (the cable size is 0.3mm<sup>2</sup>).
- Select the wiring size, ELB (Earth Leakage Breaker) and isolating switch according to each regulation of region and "Installation & Maintenance Manual", and the dedicated electrical circuit must be used.
- On the outside indoor unit, the power source cable, control cable and controller cable shall be installed separately as possible.

### 7.3 Position of Electrical Wiring Connection

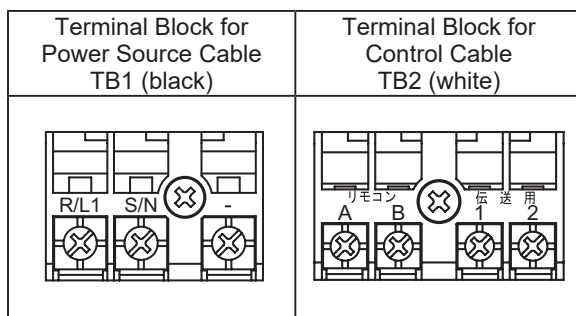
## WARNING

- **Tightly secure wirings to the terminal block according to the specified torque. If tightening the terminals is not completed, heat generation, an electric shock or a fire will occur at the terminal connection.**
- **Make sure that the wires are securely fixed in order not to apply an external force to the terminal connection of the wirings. If fixing is not completed, heat generation or a fire will occur.**

- The electrical wiring connection for the indoor unit is shown in the item 7.2.2.
- The connection at the terminal block for the indoor unit is shown in the figure below. Check the outdoor unit for the combination before the wiring work. The screws at the terminal block should be performed according to the tightening torque as shown in the table below.

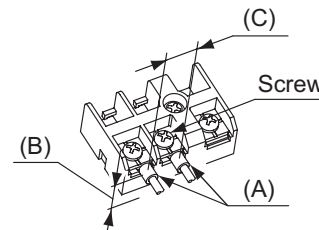
Tightening Torque for Terminals

	Tightening Torque
M4	1.0 - 1.3 (N-m)

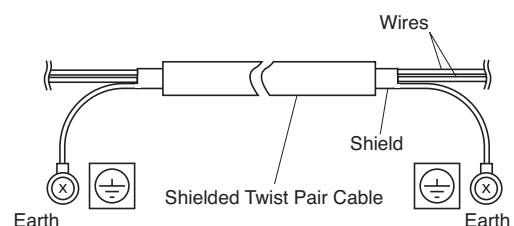


## NOTICE

- Do not connect the main power source cables to the control line (Terminals A, B, 1 and 2 of TB2). If connected, the printed circuit board (PCB) will be broken.
- Pay attention to followings when wires are connected to terminal block.
  - (A) Attach an insulation tape or a sleeve to each terminal.
  - (B) Maintain the distance between the electrical box and the terminals to prevent a short circuit.
  - (C) Maintain the distance between the terminals.



- (1) Connect the cable for the optional wired controller or the optional extension cable to the terminals inside the electrical box through the connecting hole in the cabinet.
- (2) Connect the power supply and the 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) Connect cables correctly to match the terminal No. and the mark band.
- (5) Connect the transition wires between indoor units connected to the same outdoor unit.
- (6) Do not connect the main power source cables to the control line (Terminals A, B, 1 and 2 of TB2). If connected, the printed circuit board (PCB) will be broken.
- (7) Tightly clamp the wires using the cord clamp inside the electrical box.
- (8) Standard compliance when installing the unit in Australia.
  - (a) Connect the both ends of shielded twist pair cable (controller cable and control cable) to the earth as shown bellow.



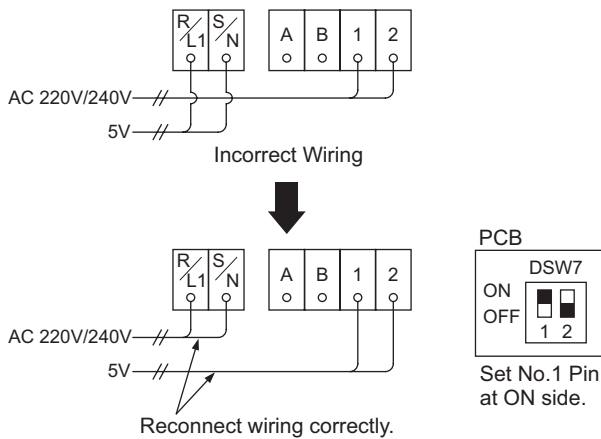
- (b) A lockable isolator shall be mounted adjacent to but not on the unit and will disconnect all active conductors to the unit from the supply circuit.

(9) The wiring work for the indoor unit should be performed according to the electrical wiring diagram and "Installation & Maintenance Manual" of the outdoor unit.

(10) In Case that Power Source (220V / 240V) Is Applied to Control Line  
 If 220V / 240V is applied to the control line (Terminal 1 and 2 of TB2) due to mistake, the fuse on the PCB for the control line will blow out. In this case, perform the recovery work as shown in the below.

- (a) Reconnect the wirings correctly.
- (b) Set No.1 pin of DSW7 (on PCB) at ON side.

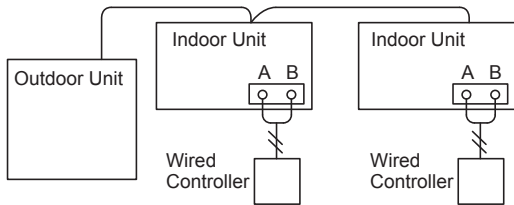
PCB is recovered from the fuse blowing out. However, if 220V / 240V is applied to the control line again, PCB will break and not be able to recover.



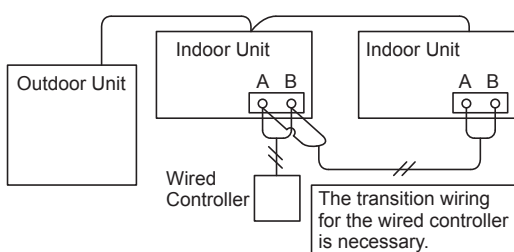
(11) Wired Controller Connection

- For UTOPIA Series

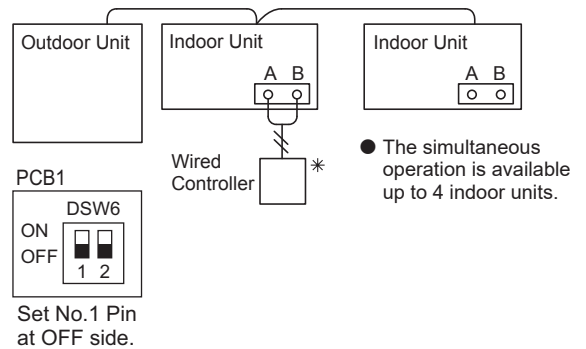
(a) Installing Wired Controller to each Unit with Individual Operation Setting



(b) Installing One Wired Controller with Individual Operation Setting

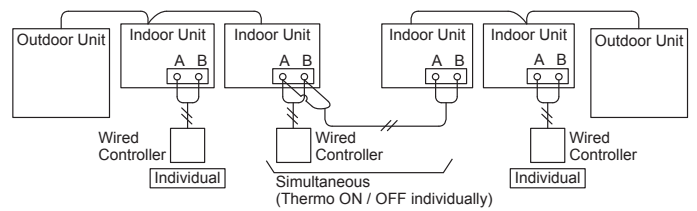


(c) Simultaneous Operation  
 (The indoor unit is H-LINK II model.)



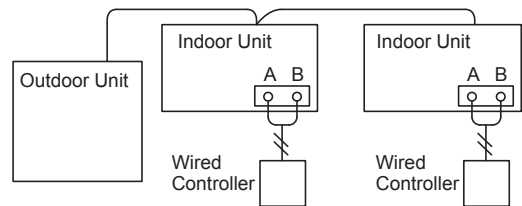
\* This indoor unit is adopted four (4) steps of fan speed (HIGH 2, HIGH, MED and LOW). When installing this indoor unit with three (3) steps of fan speed type, connect the wired controller to four (4) steps of fan speed type. If not, "HIGH 2" will not be indicated and can not be selected.

(d) Connecting Wired Controller in Case of Connecting between Refrigerant Cycles

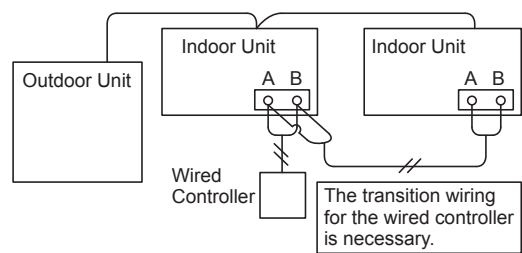


- For SET FREE Series

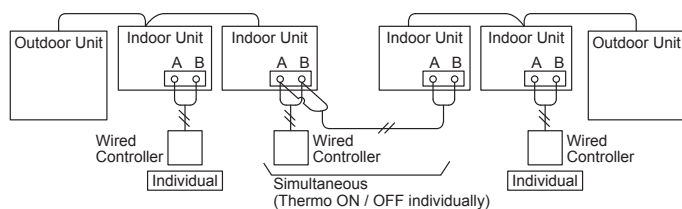
(a) Wired Controllers to each Unit for Individual Operation Setting



(b) One Wired Controller for Individual Operation Setting



(c) Connecting Wired Controller in Case of Connecting between Refrigerant Cycles

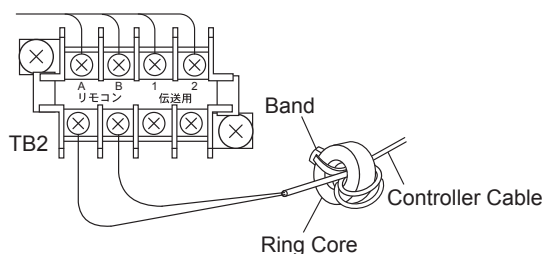


(12) Attach the ring core (black) (accessory) when installing PC-ARF1 wired controller.

[Procedure]

Insert the controller cable into the ring core 2 turns as shown in the below figure before connecting to the terminal block.

Fix the cable by using the band (accessory).



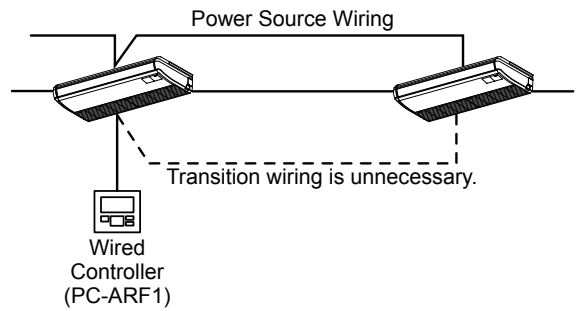
## NOTICE

- The Dip Switches setting in the outdoor unit should be performed according to "Installation & Maintenance Manual" of the outdoor unit.
- Pay attention that the transition wiring for the wired controller is required in the following cases.
  - a) The following functions are set to the sub unit which is not installed the wired controller.
    - \* "Remote ON/OFF function, 1, 2 and 3" (External Input / Output Function)
    - \* "Power supply ON/OFF function, 1 and 2" (Function Selection)
    - \* "Prohibiting remote control after manual stoppage" (External Input / Output Function)
    - \* "Group setting by the centralized controller"
  - b) The combination of twin, triple or quad is controlled by one wired controller.
  - c) The address of the indoor unit is changed from the wired controller.
  - d) The multiple indoor units with the motion sensor are controlled by one wired controller.

## 7.4 Transition Wiring for Wired Controller

In the twin, triple, and quad combination of indoor units, the transition wiring for the wired controller is not required. However, when connecting indoor units without transition wiring for wired controller, the followings are limited.

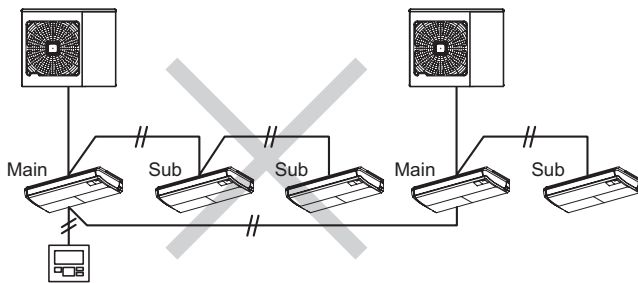
- (1) The following functions are available to set only to the main unit with the wired controller PC-ARF1.
  - \* "Remote ON/OFF function, 1 and 2"
  - \* "Power supply ON/OFF function, 1 and 2"
  - \* "Prohibiting operation by wired controller"



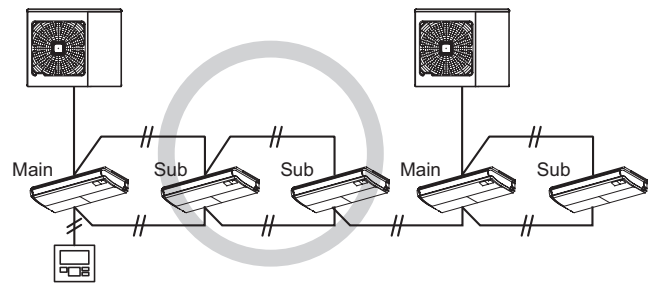
- (2) The following connection is NOT available.

### (a) Connection between Main Units without Transition Wiring

When the indoor units in multiple refrigerant cycles are controlled by one wired controller, all the indoor units are required to be connected with the transition wirings.



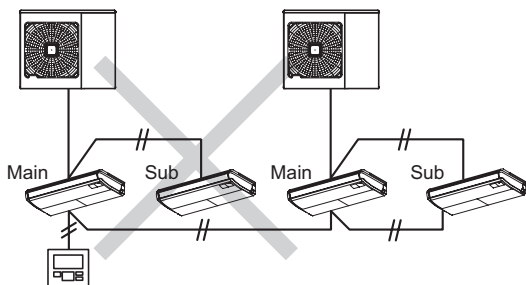
Incorrect



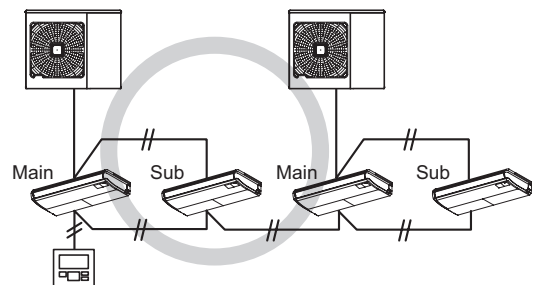
Correct

### (b) Connection between Main Unit without Transition Wiring and Unit with Transition Wiring

When the indoor units in multiple refrigerant cycles are controlled by one wired controller, all the indoor units are required to be connected with the transition wirings.



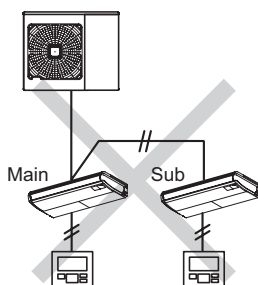
Incorrect



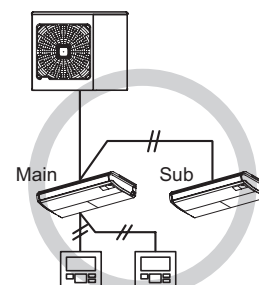
Correct

### (c) Connecting Wired Controller to Sub unit without Transition Wiring

When the indoor units are controlled by 2 wired controllers, the sub wired controller shall be connected to the main unit.



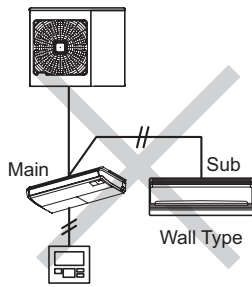
Incorrect



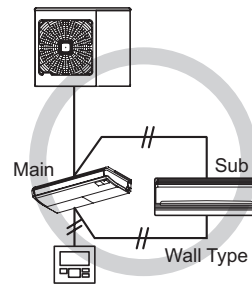
Correct

(d) Connecting to Wall Type Indoor Unit with Receiver

The transition wiring is required when the wall type indoor unit (with receiver) is connected.



Incorrect



Correct

- (3) The address of indoor unit can not be changed from the wired controller.
- (4) This indoor unit is adopted four (4) steps of fan speed (HIGH 2, HIGH, MED and LOW). When it is installed with three (3) steps of fan speed type, connect the wired controller to four (4) steps of fan speed type. If not, "HIGH 2" will not be indicated and can not be selected. The wired controller PC-ARF1 or PC-AWR with PC-ALHP1 must be used.
- (5) In the case of connecting the centralized controller, the followings are limited. If they are utilized without following limitations, the operation is not run correctly.

Name	Model	Restrictions
Central Station	PSC-A64S	②
	PSC-5S	②
	PSC-A64GT	②
	PSC-A32MN	②
Central Station DX	PSC-A128WX2	③
Centralized ON/OFF Controller	PSC-A16RS	①
Central Station NT	PSC-A128WEB3	③
Central Station EX	PSC-A128EX	③
HARC70-P1	HARC70-P1	③
HARC-BX	HARC-BX	When the condition of the indoor unit which is not connected to the wired controller is checked on the centralized controller, the indication is always "Prohibiting Operation by Wired Controller" for all items.

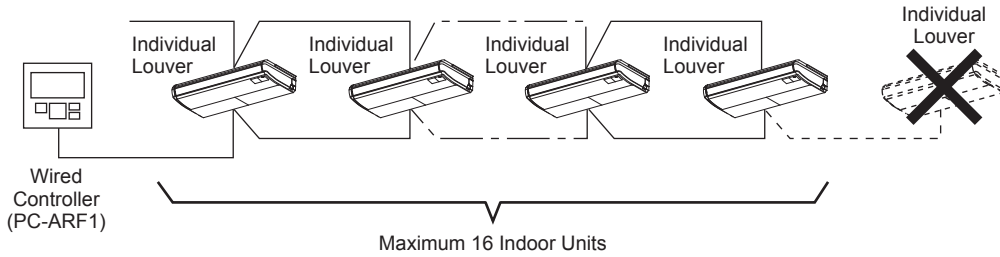
**NOTES:**

1. The centralized controllers cannot be used together.
2. "HIGH 2" cannot be set from the centralized controller.

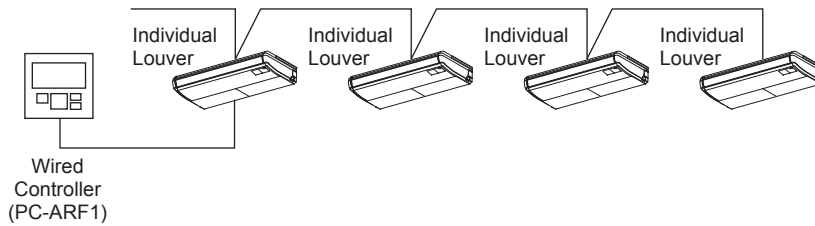
- ① There is no restriction. However, for the indoor unit without wired controller or receiver kit, when the condition is checked on the centralized controller, the indication is always "Prohibiting Operation by Wired Controller" for all items.
- ② The indoor unit with wired controller or receiver kit is required to be set as the main unit in the group. If the setting is wrong, the centralized controller cannot control the indoor units in the group.
- ③ The transition wiring is required because the centralized controller cannot recognize the indoor units without the wired controller. If the indoor unit is not connected to the wired controller by the transition wiring, either of the followings occurs.
  - a. The centralized controller cannot recognize the indoor units not connected to the wired controller or receiver kit.
  - b. The centralized controller cannot control the indoor unit group supposed to be remote-controlled by it.

### 7.4.1 Cautions for Individual Louver Setting

- (1) The individual louver setting is available up to 16 indoor units by one wired controller. The connection more than 17 indoor units are not available.



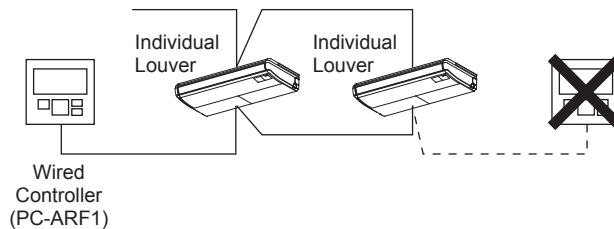
- (2) The individual louver setting in the same refrigerant cycle are available up to 4 indoor units without the transition wiring for the wired controller.



**NOTE:**

When the individual louver is set, the indoor unit shall be seen from the place of the wired controller. In the case of connecting the multiple indoor units, pay attention to the positional relationship between wired controller and the indoor units.

- (3) This “Individual Louver Setting” is NOT available with 2 (two) wired controllers.



- (4) The individual louver function is not for blocking the air outlet. If the air outlet is blocked, 3-Way Outlet Parts Set shall be used.

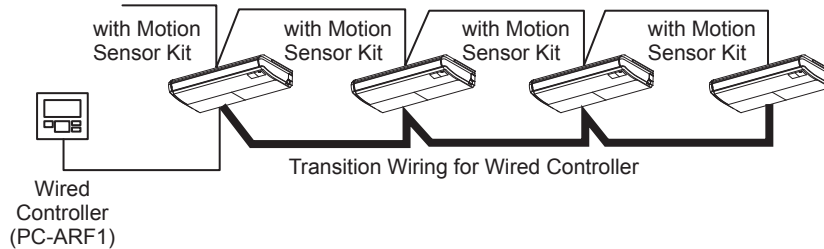
**NOTE:**

The air outlets can not be closed individually by the individual louver setting.

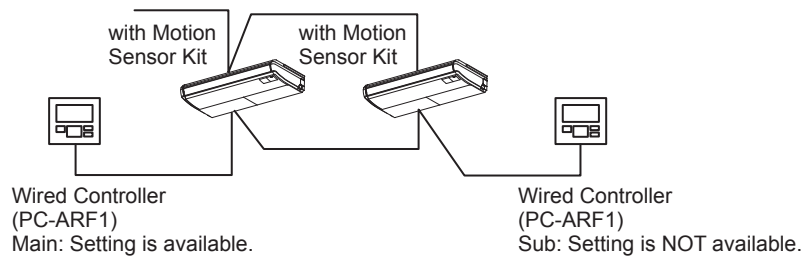


#### 7.4.2 Cautions for Motion Sensor Kit (SOR-NEP)

- (1) The motion sensor can be connected up to 16 indoor units by one wired controller (PC-ARF1). The motion sensor will be activated even if it is installed without motion sensor.
- (2) When the multiple indoor units with motion sensor are controlled by one wired controller (PC-ARF1), the transition wiring for wired controller is required to all the indoor units. If not, the indoor units with motion sensor will not be activated.



- (3) In the case that 2 wired controllers are connected, the motion sensor can be set on only the main wired controller. The sub wired controller is for the indication only.



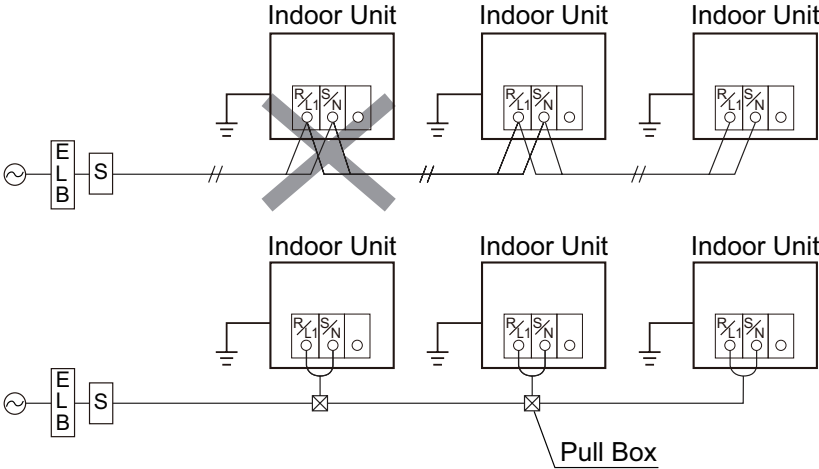
- (4) The outdoor unit model can be controlled by means of a motion sensor kit.
- (5) The wired controller PC-ARF1 must be utilized. Others are not available to set the motion sensor.
- (6) The motion sensor function is NOT corresponding the indoor unit without wired controller.
- (7) The motion sensor can not be set from the centralized stations.
- (8) The motion sensor can not be used when it is connected to the same wired controller with an indoor unit in other refrigerant cycle which is set as the simultaneous operation.
- (9) The room thermostat function is not available.

< Use Conditions and Precaution Statements >

- (1) The motion sensor detects the change of the infrared light. Therefore, it may detect the moving objects such as small animals which are difference in temperature against atmosphere. Additionally, it may detect as absence in the case of staying for long time with a bit motion or a rapid motion. DO NOT install the motion sensor (SOR-NEP) in the following places. It may cause misdetection, undetectable of motion or the deterioration of the motion sensor.
  - \* Places where ambient temperature changes drastically.
  - \* Places where excessive force or vibration is applied to the motion sensor.
  - \* Places where static electricity or electromagnetic waves may generate.
  - \* Places where is interference for infrared light such as glasses or mist in a detecting area.
  - \* Places where the lens for motion sensor is exposed in high temperature and humidity for a long time.
  - \* Places where fluid and corrosive gas exist.
  - \* Places where direct lights such as sunlight or headlight affect the motion sensor.
  - \* Places where hot air from a heater, etc. affects directly the motion sensor.
  - \* Places where the air flow returns to the motion sensor by hitting obstacles such as shelf, locker, etc.
  - \* Places where the blower devices such as ceiling fan, ventilating fan, etc. affect the air flow from the indoor unit.
  - \* Places where weather affects directly the surface of the motion sensor.
  - \* Places where the lens surface may smudge or be damaged such as a dusty environment.Pay attention that the detecting function will be decreased if the lens for motion sensor smudges. In this case, wipe off smudges by a cotton swab soaked alcohol (Isopropyl alcohol is recommended.) or a soft cloth.  
(When wiping off smudges on the lens for motion sensor, do not apply excessive force. If excessive force is applied, the resin lens may be damaged so that may cause malfunctions such as misdetection or undetectable of the motion.)
- (2) Do not run the wiring for motion sensor and the power source wiring in parallel.
- (3) The motion sensor detects the human activity. Therefore, if the human activity is small, the detecting area becomes smaller. Additionally, it may detect as absence even if some is in a room.
- (4) The motion sensor may detect as human activity if the indoor unit with the motion sensor is installed near a moving object (ex. Swing operation of a heating appliance) which is difference in temperature against atmosphere.
- (5) The motion sensor may detect as absence in the case that the indoor unit with the motion sensor is installed to a high ceiling (higher than 4m) even if someone is in a room.
- (6) The motion sensor may detect when a person turns away from the motion sensor or the skin is not exposed much.

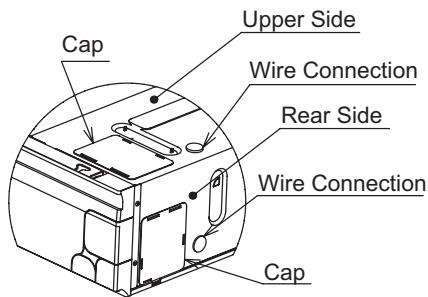
7.4.3 Caution for Electrical Wiring

Do not fix the power source wire and the control wire to one terminal together.  
The pull box is required when the transition wiring is required.



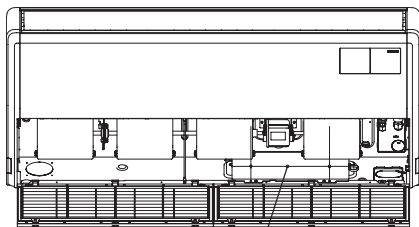
## 7.5 Wiring Connection

- (1) The wiring connection for the indoor unit is shown in the figure below.

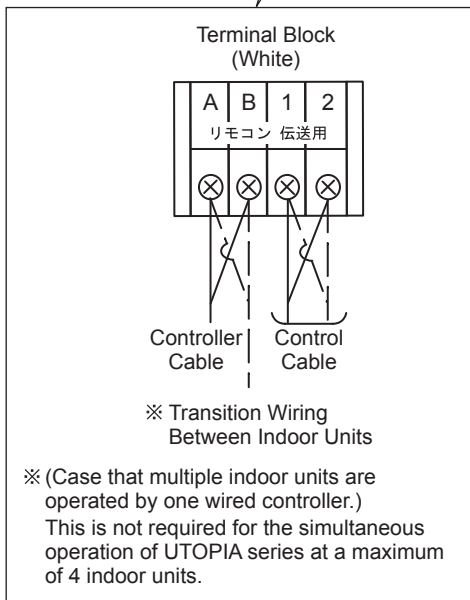
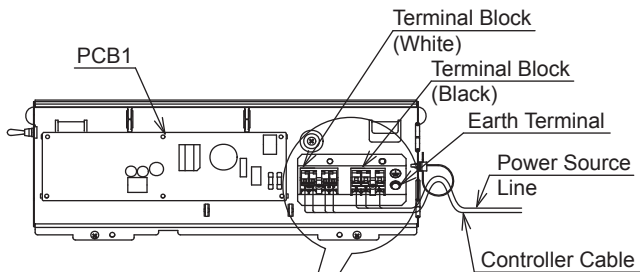


- (2) The wiring connection for electrical box is as follows.

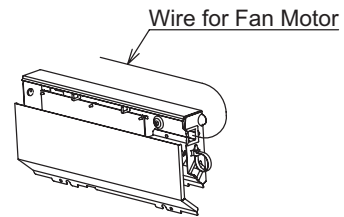
- Open the air inlet grille.
- Remove the electrical box cover.
- Connect the control cable, power source cable and controller cable.



Electrical Box



- (d) After the wiring is completed, attach the electrical box cover again with care in order not to bite wires.

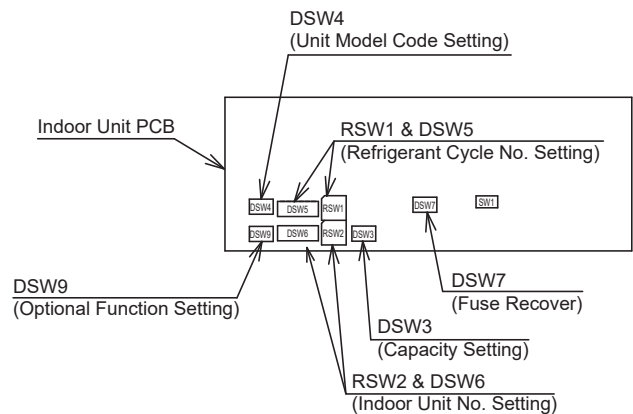


## WARNING

**Tightly clamp wires by the cord clamp after the wiring is completed to the terminal block. If not completed, it may cause a fire by biting wires.**

## 7.6 Dip Switches Setting

- Turn OFF all the power supply of the indoor unit and the outdoor unit before Dip Switch setting. If not, the setting is invalid.
- The positions of Dip Switches on PCB are shown in the figure below.



- Unit No. Setting (RSW2 & DSW6)  
The indoor unit No. of all indoor units are not required. The indoor unit numbers are set by the auto-address function. If the indoor unit number setting is required, set the unit No. of all indoor units respectively and serially by following setting position. It is recommended that the unit number setting start from "1".

### Unit No. Setting

DSW6 (Tens Digit)	RSW2 (Units Digit)	Ex.) Set at No.16 Unit
	Setting Position Set by inserting slotted screwdriver into the groove.	Set No.1 Pin at ON side
Before shipment, DSW6 and RSW2 are set at "0". (a) for Units Supporting H-LINK II The unit Nos. can be set for Max. 64 indoor units (No.0~63). (b) for Units Supporting H-LINK The unit Nos. can be set for Max. 16 indoor units (No.0~15).		Set at "6"

- (4) 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.

Horsepower	1.5	2.0	2.5	3.0
Setting Position				
Horsepower	4.0	5.0	6.0	
Setting Position				

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



- (6) Refrigerant Cycle No. Setting (RSW1 & DSW5)  
Setting is required. Setting positions before shipment are all OFF.

Refrigerant Cycle No. Setting

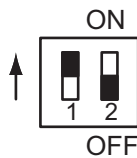
DSW5 (Tens Digit)	RSW1 (Units Digit)	Ex.) Set at No.5 Cycle
	Setting Position  Set by inserting slotted screwdriver into the groove.	 Set All Pins OFF  Set at "5"
<p>Before shipment, DSW5 and RSW1 are set at "0".            (a) for Units Supporting H-LINK II            The ref. cycle Nos. can be set for Max. 64 cycles. (No. 0~63)            (b) for Units Supporting H-LINK            The ref. cycle Nos. can be set for Max. 16 cycles. (No. 0~15)</p>		

- (7) Fuse Recover (DSW7)

- Factory Setting



- In the case of applying high voltage to the terminal 1 and 2 of TB2, the fuse (0.5A) on the PCB is cut.  
In such a case, firstly reconnect the wirings correctly to TB2, and then turn on No.1 pin.



- (8) Optional Function Setting (DSW9)

- Factory Setting



## NOTE

- The "■" mark indicates position of dip switches. Figures show setting before shipment.
- When the unit number and the refrigerant cycle are set, record the unit number and refrigerant cycle to facilitate maintenance and servicing activities thereafter.

## NOTICE

Turn OFF all the power supply of the indoor unit and the outdoor unit before Dip Switch setting. If not, the setting is invalid.

### 7.7 Function Selection by Wired Controller

Each function can be selected from the wired controller (PC-ARF1).

The detail should be referred to "Installation & Maintenance Manual" for the wired controller and "Technical Catalog".

- (1) Circulator Function at Heating Thermo-OFF  
This function maintains the fan operation by the set air flow volume at the heating Thermo-OFF. It is for improvement of temperature distribution at high height ceiling site.
- (2) Cooling/Heating Auto Changeover Dual Setpoint Control  
In case dual setpoint is selected in automatic heating/cooling operation, during auto mode both cooling setpoint and heating setpoint can be selected.
- (3) Setback Operation

Setback operation is mainly to sustain a comfort room air temperature while occupants are out of the room. If the setback operation is enabled, the setpoint is adjusted for setback.

## 8. Test Run

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

Do not operate the system until all the check points have been cleared.

### **WARNING**

- 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.
- Do not touch any of the parts at the discharge gas side by hand while the system is running, since the compressor chamber and the pipes at the discharge side are heated higher than 90°C.

### **NOTICE**

- Check to ensure that the stop valves of the outdoor unit are fully opened, and then start the system.
- 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.

### 8.1 Before Test Run

Recheck that there is not any problems to the installation, and do not perform the test run until all the following checking points have been cleared.

- (1) Check to ensure that the refrigerant piping and the transition wiring are connected to the same refrigerant cycle system. If not, it will cause an abnormal operation and breakage of instruments.
- (2) 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. Do not apply the high voltage to the terminals for the transmission (TB2 (A, B, 1 and 2)).

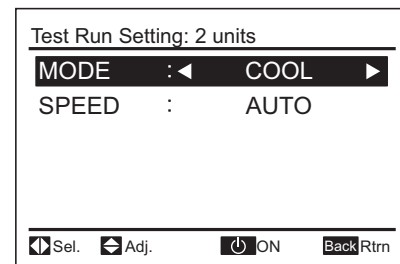
- (3) Check to ensure that each wire is correctly connected at the power source. If incorrectly connected, the unit will not operate and the wired controller will indicate the alarm code "05". In this case, check the phase of the primary power source according to the attached attention label on the rear side of the service cover. Then, perform the reconnection work correctly with turning OFF the power supply.
- (4) Check to ensure that the main power source has been turned ON for more than 12 hours, to warm the compressor oil by the crankcase heater.

### 8.2 Test Run

After the installation work is completed, test run should be performed.

- (1) Check to ensure that stop valves (gas and liquid) of the outdoor unit are fully opened.
- (2) In the case that indoor units are connected to the VRF system, perform the test run of the indoor unit one by one sequentially and then check accordance of the refrigerant piping system and the electrical wiring system. (If the multiple indoor units are operated simultaneously, the system can not be inspected the system accordance.)
- (3) Perform the test run according to the following procedure. Ensure that the test run is carried out without any problem.
  - (a) Press and hold "Menu" and "Back/Help" simultaneously for at least 3 seconds. The test run menu will be displayed.
    - 1) The test run menu will be displayed.

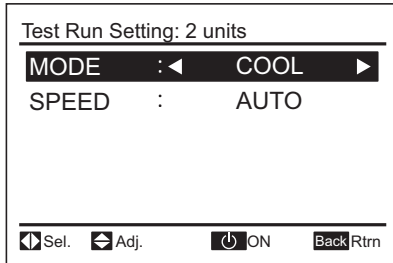
#### Test Run Screen



#### **NOTE**

When "00 unit" is indicated, the auto-address function may be performing. Cancel "Test Run" mode and set it again.

- 2) The total number of the indoor units connected is indicated on the LCD (Liquid crystal display). The case of the twin combination (one (1) set with two (2) indoor units) is indicated "2 units", and the triple combination (one (1) set with three (3) indoor units) is indicated "3 units".

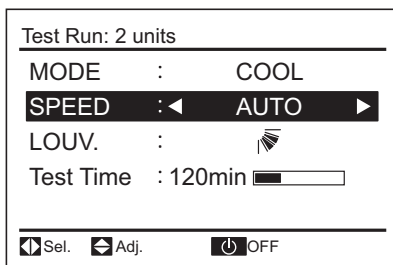


- 3) If the indicated number is not equal to the actual connected number of indoor units, the auto-address function is not performed correctly due to incorrect wiring, electric noise, etc. Turn OFF the power supply, and correct the wiring after checking the following points; (Do not repeat turning ON and OFF within 10 seconds.)

- \* Power Supply for Indoor Unit is Not Turned ON or Incorrect Wiring.
- \* Incorrect Connection of Connecting Cable between Indoor Units or Incorrect Connection of Controller Cable
- \* Incorrect Setting of Rotary Switch and Dip Switch (The setting is overlapped.) on the Indoor Units PCB

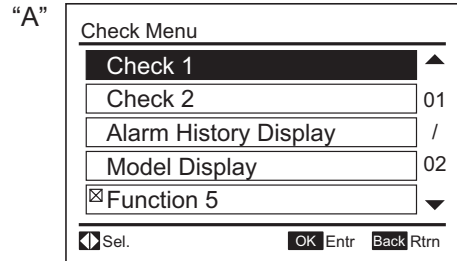
- 4) Press "On/Off" to start the test run.  
5) Press "Δ ▽ ◀ ▷" and set each item.

- (b) Press "On/Off". Start the test run when indicating the air flow volume "HIGH" (default setting) and light the operation lamp. At this time, 2-hour OFF timer will be set automatically.

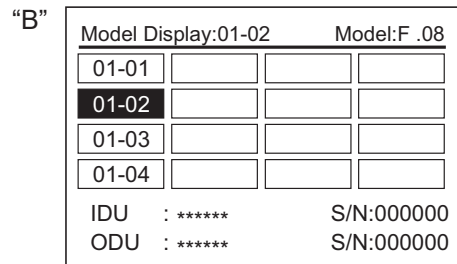


- (c) Check to ensure that the motion sensor is operated correctly as following procedures (in the case of the lower cover with the motion sensor).

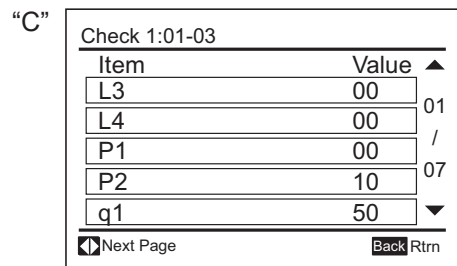
- 1) Press and hold "Menu" and "Back/Help" simultaneously for at least 3 seconds during the test run mode. The check menu screen "A" is displayed.



- 2) Select "Check 1" at the check menu and press "OK". (screen "B" will be displayed.)  
(This screen is NOT displayed when the number of indoor unit connected with the wired controller is 1(one). In this case, screen "C" will be displayed.)

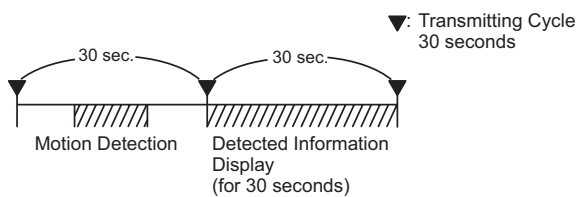


- 3) Select the indoor unit by pressing "Δ ▽ ◀ ▷" and press "OK". The check data screen "C" will be displayed.



- 4) Press “△ ▽” to change the screen until indicating the check screen “q1”.
- 5) Perform the motion detection (waving a hand, etc) under the motion sensor of the indoor unit selected with for approx. 10 to 15 seconds.
- 6) Check the value of “q1” after 30\*<sup>1</sup> seconds from starting the motion detection at item 5). The detecting information of the motion sensor against the motion detection is indicated with the range of 0% to 100%.

\*1: The transmission between the indoor unit and the wired controller is 30 seconds cycle. The timing of the motion detection and the detected information display is shown in the figure below.

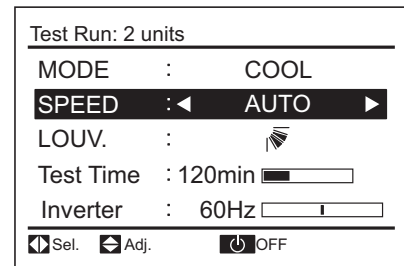


**NOTE:**

Refer to “Operation Manual” of indoor unit for the setting method of motion sensor. (“Motion Sensor Setting”, “If Absent” and “Check Interval” can be set.)

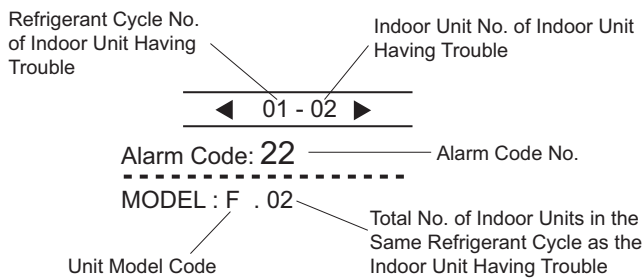
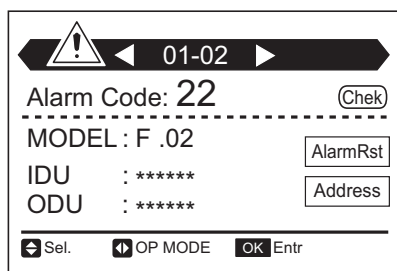
- 7) Check that the value of “q1” is neither 0% nor 100%.  
If the value is indicated 0% or 100%, reperform the procedure from item 5).  
If the same value is indicated again, it may be a malfunction of the motion sensor.
- 8) Press “Back/Help” and return to the display.

- (d) The temperature detections by the thermistors are invalid though the protection devices are valid during the test run.
- (e) SET FREE Series:  
According to the label “Checking of Outdoor Unit by 7-Segment Display on PCB1” attached to the rear side of the front cover of the outdoor unit, check temperature, pressure and the operation frequency, and connected indoor unit numbers by 7-segment displays.
- (f) To finish the test run, press “⏻ On/Off” again or pass over the set test run time. When changing the test run time, press “△” or “▽” to select “Test Time”. Then, set the test run time (30 to 600 minutes) by pressing “◀” or “▶”.





- The run indicator on the wired controller flashes when some abnormalities such as protection devices activated, etc occur during the test run. In addition, the alarm code, the unit model code and connected number of indoor units will be displayed as shown in the figure below. If flashing RUN indicator for 2 seconds, it may be a failure in the transmission between the indoor unit and the wired controller (loose connector, disconnecting wiring or breaking wire, etc). In this case, Check the alarm (abnormality) code table shown in the next page and perform for troubleshooting. Consult to authorized service engineers if abnormality can not be recovered.



< Unit Model Code >

The relation between the unit model code and the unit model is shown in the table below.

Indication	Unit Model
F	Multi-Split (Heat Pump Operation/Heat Recovery)
b	DC Inverter UTOPIA
E	Except Above Models

Alarm (Troubleshooting) Code Table

Code No.	Category	Nature of Problem	Likely Cause
01	Indoor Unit	Activation of a protection device (Float switch)	Activation of the float switch; (High water level present in the drain pan.) A problem exists in the piping.
02	Outdoor Unit	Activation of protection device; (Except for Alarm Code: 41, 42)	High Pressure Cut; (R410A: (4.15MPa)), fan motor lockup during the outdoor unit cooling operation.
03	Communication	Communication failure between indoor and outdoor units	Incorrect wiring, loose terminals, disconnected wiring or a blown fuse.
04-09	Problem with the outdoor unit; (Refer to the "Installation and Maintenance Manual" for outdoor units.)		
11	Sensor on Indoor Unit	Inlet Air Thermistor failure	Loosely connected, disconnected, or a severed connection.
12		Outlet Air Thermistor failure	
13		Freeze Protection Thermistor failure	
14		Gas Piping Thermistor failure	
19	Fan Motor	Problem with Indoor Fan	Fan motor lockup, fan motor protection control device for indoor unit activated.
20-29	Problem with the outdoor unit; (Refer to the "Installation and Maintenance Manual" for outdoor units.)		
31	System	Incorrect capacity setting for indoor and outdoor units.	Incorrect capacity code setting for combination, excessive or insufficient total indoor unit capacity code.
32		Incorrect setting of other indoor unit number	Problem with a different Indoor Unit in the same refrigerant cycle; (Failure at the power supply, defective PCB).
35		Incorrect setting of indoor	Indoor unit number duplicated in same refrigerant group.
36		Incorrect indoor unit combination	Indoor unit is designed for other refrigerant; (R22 or R407C).
38-59	Problem with the outdoor unit; (Refer to the "Installation and Maintenance Manual" for the outdoor unit.)		
b0	System	Incorrect setting for unit capacity	Incorrect setting for unit capacity
b1		Incorrect setting of unit and refrigerant cycle number	Unit number or refrigerant cycle $\geq 64$
b5		Incorrect setting of indoor unit number for H-LINK type	Interconnected indoor units are not supporting H-LINK II $\geq 17$
EE	Compressor	Compressor protection alarm	This alarm code displays when the alarms such as damage to the compressor occur three times within a six hour period.

- When the indicator “ $\text{\textcircled{1}}$ ” flashes every four seconds, there is a communication failure between the indoor unit and the wired controller (loose connector, disconnected or incorrect wiring, or a severed connection).
- The indication of the alarm code “EE” means serious abnormality to burn out the compressor.
- In the case of the incorrect transmission wiring between indoor units for the twin and the triple combination, the following failure will occur during the test run. Recheck the connection of the transmission between indoor units and reconnect wirings correctly.

Failure: The transmission error is NOT indicated on the wired controller. No.1 indoor unit will be operated. However, other indoor units (No.2 and No.3) will NOT be operated.

Refer to “Installation & Maintenance Manual” of the outdoor unit connected to the indoor unit.

For UTOPIA Series: In the case of the twin, triple and quad combination, check the air flow temperature of each indoor unit. If there is a large difference in the air flow temperature between the main unit and sub unit(s) (cooling: more than approx. 10deg., heating: more than approx. 20deg.), there may be a failure in the refrigerant piping work. Thus, recheck the refrigerant piping.

## NOTICE

Do NOT operate the air conditioning just to run checks on electrical wiring until preparations for the Test Run phase is completed.

All the installation work of the air conditioning is completed.  
Handover this information to the building owner and request to maintain all the equipment manuals and warranty.

**Refrigerant Leak Check**

Conduct a periodic refrigerant leak check to maintain product performance and secure storage of refrigerant. After completing installation, record the following results into this "Installation and Maintenance Manual":

1. Results of a test for air-tight integrity
2. Total refrigerant charge volume dispensed (including a trim charge added following the installation)
3. Result of the refrigerant leak check

Then hand it over to users and ask them to retain for reference.

All periodic service and maintenance procedures must be conducted only by authorized and trained personnel.

**9. Safety and Control Device Setting**

Indoor Unit

Model			RPC-1.5FSR, RPC-2.0FSR, RPC-2.5FSR, RPC-3.0FSR, RPC-4.0FSR, RPC-5.0FSR, RPC-6.0FSR
For Evaporator Fan Motor			
Thermostat	Cut-Out	°C	100 <sup>+15</sup> -10
	Cut-In	°C	95 <sup>+15</sup> -10
For Control Circuit			
Fuse Capacity		A	5
Freeze Protection			
Thermostat	Cut-Out	°C	0
	Cut-In	°C	11
Thermostat	Differential		°C
			2

All the installation work of the air conditioning is completed.  
Deliver and describe to keep this "Installation & Maintenance Manual" to a user.

