

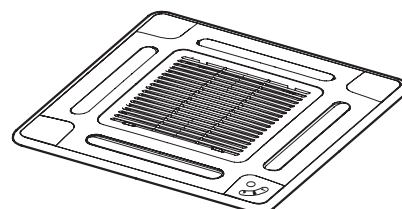
# TOSHIBA

**INSTALLATION MANUAL  
MANUEL D'INSTALLATION  
G-INSTALLATIONS-HANDBUCH  
MANUALE DI INSTALLAZIONE  
MANUAL DE INSTALACIÓN  
ΕΓΧΕΙΡΙΔΙΟ ΕΓΚΑΤΑΣΤΑΣΗΣ  
MANUAL DE INSTALAÇÃO  
РУКОВОДСТВО ПО УСТАНОВКЕ  
INSTALLATIONSHANDBO**

Not accessible to the general public  
Vente interdite au grand public  
Kein öffentlicher Zugang  
Non accessibile a clienti generici  
No destinado al público en general  
Μη προσβάσιμο από το γενικό κοινό  
Não acessível ao público em geral  
Ограничено для доступа широкой общественности  
Inte tillgänglig för allmänheten

**AIR CONDITIONER (SPLIT TYPE)  
CLIMATISEUR (TYPE SPLIT)  
KLIMAGERÄT (SPLIT-TYP)  
CONDIZIONATORE D'ARIA (TIPO SPLIT)  
AIRE ACONDICIONADO (TIPO SPLIT)  
ΚΛΙΜΑΤΙΣΤΙΚΟ (ΔΙΑΙΡΟΥΜΕΝΟΥ ΤΥΠΟΥ)  
AR ACONDICIONADO (TIPO SPLIT)  
ΚΟΝΔΙЦИОНЕР (СОСТАВНОЙ)  
LUFTKONDITIONERINGSAPPARAT (SPLIT TYP)**

**<4-Way Air Discharge Cassette Type>  
<Type cassette à 4 voies de soufflage>  
<4-Wege-Belüftungskassette>  
<Tipo a cassetta con scarico d'aria a 4 vie>  
<Modelo de casete de distribución de aire de 4 vías>  
<Εκροή αέρα 4-Διευθύνσεων Τύπου Κασέτας>  
<Descarga de ar tipo casete de 4 vías>  
<4-направленная кассета выпуска воздуха>  
<Apparat med 4-vägars luftutsläpp>**



## **Indoor Unit**

**Unité intérieure/Raumeinheit/Unità interna/Unidad interior**

**Εσωτερική Μονάδα/Unidade interior/Внутренний блок/Inomhusenhet**

**Heat Pump Model  
Modèle à thermopompe  
Geräte mit Heizung  
Modello con pompa di riscaldamento  
Modelo con bomba de calor  
Μοντέλο με Αντλία Θερμότητας  
Modelo de bomba térmica  
Модель теплового насоса  
Värmepumpsmodell**

**RAS-M10SMUV-E  
RAS-M13SMUV-E  
RAS-M16SMUV-E**

**Cooling Only Model  
Modèle à froid seul  
Geräte nur zur Kühlung  
Modello solo per raffreddamento  
Modelo de refrigeración únicamente  
Μοντέλο Ψύξης αποκλειστικά  
Modelo Apenas para Refrigeração  
Модель только с охлаждением  
Modell endast för avkyllning**

**RAS-M10SMUCV-E RB-B11MC(W)E  
RAS-M13SMUCV-E  
RAS-M16SMUCV-E**

### ADOPTION OF NEW REFRIGERANT

This Air Conditioner is a new type which adopts the new refrigerant HFC (R410A) instead of the conventional refrigerant R22. R410A is an ozone friendly refrigerant.

Please read this Installation Manual carefully before installing the Air Conditioner.

- This Manual describes the installation method of the indoor unit.
- For installation of the outdoor unit, follow the Installation Manual attached to the outdoor unit.

### UTILISATION DU NOUVEAU REFRIGERANT

Ce nouveau type de climatiseur utilise le nouveau réfrigérant HFC (R410A) au lieu du traditionnel R22. Le R410A est un réfrigérant qui respecte la couche d'ozone.

Veuillez lire attentivement ce Manuel d'installation avant d'installer le climatiseur.

- Ce manuel décrit la procédure d'installation de l'unité intérieure.
- Pour installer l'unité extérieure, reportez-vous au Manuel d'installation fourni avec l'unité extérieure.

### EINFÜHRUNG EINES NEUEN KÜHLMITTELS

Dies ist ein neuartiges Klimagerät. Anstatt des herkömmlichen Kältemittels R22 verwendet es das neue HFC Kältemittel R410A. R410A schont die Ozonschicht.

Bitte lesen Sie dieses Handbuch sorgfältig, bevor Sie mit der Installation des Klimagerätes beginnen.

- In diesem Handbuch wird die Installation der Inneneinheit beschrieben.
- Um die Außeneinheit zu installieren, folgen Sie den Anweisungen des Handbuchs, das der Außeneinheit beiliegt.

### ADOZIONE DI UN NUOVO REFRIGERANTE

Questo condizionatore d'aria è di tipo nuovo e impiega il nuovo refrigerante HFC (R410A) invece del R22, tradizionalmente usato. R410A è un refrigerante ecologicamente rispettoso dello strato d'ozono.

Prima di eseguire l'installazione del condizionatore d'aria, leggere attentamente il Manuale d'installazione.

- Questo manuale il metodo d'installazione dell'unità interna.
- Per l'installazione dell'unità esterna, fare riferimento al Manuale d'installazione fornito con l'unità esterna.

### ADOPCIÓN DE NUEVO REFRIGERANTE

Este acondicionador de aire es un tipo Nuevo que adopta el refrigerante nuevo HFC (R410A) en vez del refrigerante convencional R22. El R410A es un refrigerante que no daña la capa de ozono.

Lea atentamente este Manual de instalación antes de proceder a la instalación del aparato de aire acondicionado.

- Este manual describe el método de instalación de la unidad interior.
- Para la instalación de la unidad exterior, consulte el Manual de instalación que acompaña a la unidad exterior.

### ΥΙΟΘΕΤΗΣΗ ΝΕΟΥ ΨΥΚΤΙΚΟΥ

Το παρόν Κλιματιστικό είναι νέου τύπου και υιοθετεί το νέο ψυκτικό HFC (R410A) αντί για το συμβατικό ψυκτικό R22. Το R410A είναι ένα ψυκτικό φιλικό ως προς το όζον.

Παρακαλώ διαβάστε προσεκτικά το Εγχειρίδιο Εγκατάστασης πριν από την εγκατάσταση του Κλιματιστικού.

- Το παρόν Εγχειρίδιο περιγράφει τη μέθοδο εγκατάστασης της εσωτερικής μονάδας.
- Για την εγκατάσταση της εξωτερικής μονάδας, συμβουλευτείτε το Εγχειρίδιο Εγκατάστασης που συνοδεύει την εξωτερική μονάδα.

### ADOPÇÃO DO NOVO REFRIGERANTE

O presente aparelho de ar condicionado é um novo tipo que adopta o novo refrigerante HFC (R410A) em vez do refrigerante convencional R22. O R410A é um refrigerante que não prejudica o ozono.

Leia atentamente o presente Manual de Instalação antes de instalar o Ar Condicionado.

- O presente manual descreve o método de instalar a unidade interior.
- Para a instalação de uma unidade exterior, siga o Manual de Instalação que acompanha a unidade exterior.

### ВНЕДРЕНИЕ НОВОГО ХЛАДАГЕНТА

Данный кондиционер является кондиционером нового типа, в котором предусмотрено использование нового хладагента HFC (R410A) вместо традиционного R22. R410A – хладагент, не разрушающий озоновый слой.

Внимательно прочитайте данное Руководство перед установкой кондиционера.

- В данном Руководстве описывается метод установки внутреннего блока.
- Для установки наружного блока следуйте инструкциям Руководства по установке, прилагаемого к наружному блоку.

### ANVÄNDANDE AV NY KYLVÄTSKA

Denna luftkonditioneringsapparat är en ny typ som använder den nya kylvätskan HFC (R410A) i stället för den vanliga kylvätskan R22. R410A är en kylvätska som inte är skadlig för ozonskiktet.

Vänligen läs denna Installationshandbok noga innan du installerar luftkonditioneringsapparaten.

- Denna handbok beskriver hur inomhusenheten ska installeras.
- För installation av utomhusenheten, följ Installationshandboken som är ansluten till utomhusenheten.

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ENGLISH

FRANÇAIS

DEUTSCH

ITALIANO

ESPAÑOL

ΕΛΛΗΝΙΚΑ















PORTUGUÊS

РУССКИЙ


SVENSKA

# Accessory parts and Parts to be procured locally

## □ Accessory parts

| Part name  | Q'ty | Shape   | Usage   |
|--|------|---|---|
| Installation Manual  | 1    | This manual   | (Be sure to hand over to customers)                                       |
| Wireless remote controller   | 1    |    | —   |
| Remote controller holder   | 1    |    | —   |
| Mounting screws for remote controller holder<br>3.1 mm (diam.) × 16 mm | 1    |    | —   |
| Batteries (Manganese)  | 2    |    | —   |
| Heat insulating pipe   | 2    |    | For heat insulation of pipe connecting section                            |
| Installation pattern   | 1    |    | For confirmation of ceiling opening and main unit position                |
| Installation gauge   | 2    |    | For positioning of ceiling position<br>(united with installation pattern) |
| Pattern fixing screw   | 4    | M5 × 16L  | For attach the installation pattern                                       |
| Heat insulator   | 1    |    | For heat insulation of drain connecting section                           |
| Washer   | 8    |   | For hanging-down unit   |
| Hose band  | 1    |  | For connecting drain pipe   |
| Flexible hose  | 1    |  | For adjusting core-out of drain pipe                                      |
| Heat insulator A   | 1    |  | For sealing of wire connecting port                                       |
| Heat insulator B   | 1    |  | For sealing of wire connecting port                                       |
| Owner's Manual   | 1    |  | (Be sure to hand over to customers)                                       |

## <Separate sold parts>

| Part name     | Q'ty | Shape   | Usage                       |
|---------------|------|---|-----------------------------|
| Ceiling panel | 1    |  | Model : <b>RB-B11MC(W)E</b> |

## □ Parts to be procured locally

|   |  |
|---|--|
| Connecting pipe (Liquid side)<br>(6.4 mm (diam.), Nominal (diam.) 1/4" thick 0.8 mm)  | Connecting wire<br>H07RN-F or 60245IEC66 (1.0 mm <sup>2</sup> )                                  |
| Connecting pipe (Gas side)<br>(9.5 mm (diam.), Nominal (diam.) 3/8" thick 0.8 mm)<br>RAS-M10SMUV-E, RAS-M10SMUCV-E,<br>RAS-M13SMUV-E, RAS-M13SMUCV-E<br>(12.7 mm (diam.), Nominal (diam.) 1/2" thick 0.8 mm)<br>RAS-M16SMUV-E, RAS-M16SMUCV-E | Thermal insulation for refrigerant pipe<br>(10 mm or more, thermal insulating foam polyethylene) |
| Power supply cord<br>2.5 mm <sup>2</sup> (H07RN-F or 60245IEC66)  | Thermal insulation for drain pipe<br>(10 mm or more, foam polyethylene)                          |
|   | Drain pipe (Outer 26 mm (diam.))   |
|   | Tapes  |
|   | Grounding wire (1.6 mm (diam.) or more)  |

# 1 PRECAUTIONS FOR SAFETY

ENGLISH

- Ensure that all Local, National and International regulations are satisfied.
- Read this "PRECAUTIONS FOR SAFETY" carefully before Installation.
- The precautions described below include the important items regarding safety. Observe them without fail.
- After the installation work, perform a trial operation to check for any problem.  
Follow the Owner's Manual to explain how to use and maintain the unit to the customer.
- Turn off the main power supply switch (or breaker) before the unit maintenance.
- Ask the customer to keep the Installation Manual together with the Owner's Manual.

## CAUTION

### New Refrigerant Air Conditioner Installation

- **THIS AIR CONDITIONER FEATURES A NEW HFC REFRIGERANT (R410A) WHICH DOES NOT DEplete OZONE LAYER.**

The pressure of R410A is 1.6 times higher than that of former refrigerant R22.

The refrigerating oil has also been changed. Therefore be sure that any former refrigerant, refrigerant oil or any other contaminants do not enter the refrigerating cycle of the air conditioner, during either installation or service work. If incorrect tools or operating procedures are used, there is a possibility of a serious accident.

Use only tools and materials that have been designed to operate with R410A.

To prevent the risk of charging with an incorrect refrigerant, the dimensions of the charging port connections are different to those used for conventional refrigerant.

Therefore only tools designed to operate with R410A can be used.

For connecting pipes, use piping specifically designed for R410A.

During installation, ensure pipes are clean and ensure contaminants do not enter the pipes as the system is affected by impurities such as water, oxide scales, dirt, oil, etc. Do not use existing pipe work from previous installation as this will cause problems due to pressure resistances and impurities within the pipe.

## CAUTION

### To Disconnect the Appliance from Main Power Supply.

A switch or circuit breaker that can disconnect all poles must be included in the fixed wiring.

Be sure to use an approved circuit breaker or switch.

**The installation fuse must be used for the power supply line of this conditioner.**

## ⚠ WARNING

- **Ask an authorized dealer or qualified installation professional to install/maintain the air conditioner.**

Inappropriate installation may result in water leakage, electric shock or fire.

- **Turn off the main power supply switch or breaker before attempting any electrical work.**

Make sure all power switches are off. Failure to do so may cause an electric shock.

- **Connect all of the installation wiring correctly.**

If the installation wiring is incorrect electrical parts may be damaged.

- **During the transportation and installation of the air conditioning unit, ensure that gaseous matter other than the specified refrigerant does not enter into the refrigeration cycle.**

If a refrigerant becomes contaminated with foreign gases, the gas pressure within the refrigerant cycle will become abnormally high and may result in the fracture of pipework and possible human injury.

- **Do not modify this unit by removing any of the safety guards or by overriding any of the safety interlock switches.**

- **Exposure of the unit to water or other forms of moisture before installation may cause a short-circuit of the electrical parts.**

Do not store it in a wet basement or expose to rain or water.

# 1 PRECAUTIONS FOR SAFETY

- **After unpacking the unit, examine for possible damage.**
- **Do not install in a place that might increase the vibration of the unit.**
- **To avoid personal injury (with sharp edges), be careful when handling parts.**
- **Perform installation work properly according to the Installation Manual.**  
Incorrect installation may result in water leakage, electric shock or a fire.
- **When the air conditioner is installed in a small room, provide appropriate measures to ensure that in the event of a refrigerant leak the rooms does not exceed the critical level.**
- **Install the air conditioner securely in a location where the base can sustain the weight of the unit adequately.**
- **Perform the specified installation work to guard against an earthquake.**  
If the air conditioner is not installed appropriately, accidents may occur due to the unit falling.
- **If refrigerant gas has leaked during the installation work, ventilate the room immediately.**  
If the leaked refrigerant gas comes in contact with fire, noxious gases may be generated.
- **After the installation work, confirm that refrigerant gas does not leak.**  
If refrigerant gas leaks into the room and flows near a fire source, such as a cooking range, noxious gases maybe generated.
- **Electrical work must be performed by a qualified electrician in accordance with the Installation Manual. Ensure the power supply to the air conditioner is exclusive to that unit only.**  
An insufficient power supply capacity or inappropriate installation may cause fire.
- **Use only the specified wiring during the unit installation. Ensure that all terminals are securely fixed, so preventing any external forces having a negative effect on the terminals.**
- **Be sure to provide grounding.**  
Do not connect ground wires to gas pipes, water pipes, lightning rods or ground wires for telephone cables.
- **Conform to the regulations of the local electric authority when wiring the power supply.**  
Inappropriate grounding may cause an electric shock.
- **Do not install the air conditioner in a location that maybe subjected to a risk of exposure to a combustible gas.**  
If a combustible gas leaks and becomes concentrated around the unit, a fire may occur.

## 2 SELECTION OF INSTALLATION PLACE

### ⚠ WARNING

- **The air conditioner must be installed in a location that can support the weight of the unit effectively.**  
If the unit is not installed on a foundation that can support its weight effectively, the unit may fall down, resulting in possible human injury.
- **Where required ensure that the units installation is sufficient enough to withstand against an earthquake.**  
An insufficient installation could result in the unit falling, causing possible human injury.
- **Install the air conditioner at a minimum height of 2.5 m from the floor.**  
Do not insert your hands or others into the unit while the air conditioner is operating.

### CAUTION

**Do not install the air conditioner in a location subject to a risk of exposure to a combustible gas.**

- If a combustible gas leaks and stays around the unit, a fire may occur.

**Upon approval of the customer, install the air conditioner in a place that satisfies the following conditions.**

- Place where the unit can be installed horizontally.
- Place where a sufficient servicing space can be ensured for safety maintenance and check.
- Place where drained water will not cause any problem.

**Avoid installing in the following places.**

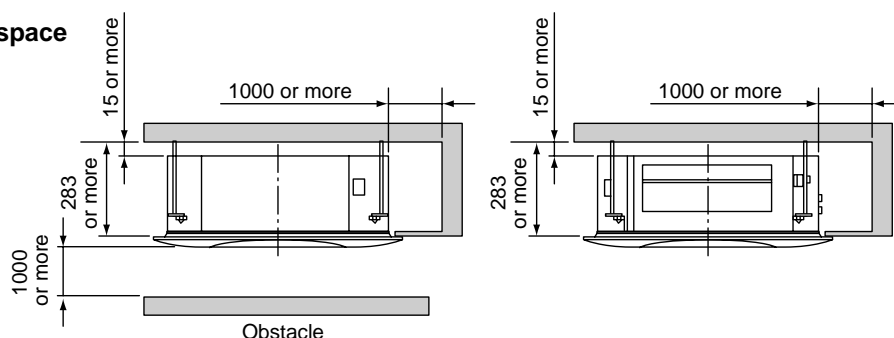
- Place exposed to air with high salt content (seaside area), or place exposed to large quantities of sulfide gas (hot spring). (Should the unit be used in these places, special protective measures are needed.)
- Place exposed to oil, vapor, oil smoke or corrosive gas.
- Place where organic solvent is used nearby.
- Place close to a machine generating high frequency.
- Place where the discharged air blows directly into the window of the neighboring house. (For outdoor unit)
- Place where noise of the outdoor unit is easily transmitted. (When installing the air conditioner on the boundary with the neighbor, pay due attention to the level of noise.)
- Place with poor ventilation.  
(Before air ducting work, check whether value of air volume, static pressure and duct resistance are correct.)

### Installation space

**Secure the specified space in the figure for installation and servicing.**

Ensure there is sufficient space to install the unit and to perform maintenance work as and when required.  
Keep 15 mm or more for clearance between top plate of the indoor unit and the ceiling surface.

#### Installation space



## 2 SELECTION OF INSTALLATION PLACE

### Selection of installation place

In case of continued operation of the indoor unit under high-humidity conditions as described below, dew may condense and water may drop.

Especially, high-humidity atmosphere (dew point temperature : 23°C or more) may generate dew inside the ceiling.

1. Unit is installed inside the ceiling with slated roof.
2. Unit is installed at a location using inside of the ceiling as fresh air intake path.
3. Kitchen

When installing a unit at such place, put insulating material (glass wool, etc.) additionally on all the positions of the indoor unit, which contact with high-humidity atmosphere.

### Advice

Set a service check opening panel at right side of the unit (size: 450 × 450 mm or more) for piping, maintenance, and servicing.

### Ceiling height

| Model RAS-                                   | Possible installed ceiling height |
|--|-----------------------------------|
| M10SMUV-E, M10SMUCV-E, M13SMUV-E, M13SMUCV-E | Up to 2.7 m                       |
| M16SMUV-E, M16SMUCV-E                        | Up to 3.5 m                       |

When the height of the ceiling exceeds the distance of the item Standard in Table below, the hot air is difficult to reach the floor.

Therefore, it is necessary to change the setup value of the high ceiling switch.

(RAS-M16SMUV-E and M16SMUCV-E only)

When changing the setting of the ceiling height in the models, RAS-M10SMUV-E, M10SMUCV-E, M13SMUV-E and M13SMUCV-E, if it is set over 2.7 m, the hot air is difficult to reach the floor.

### How to set the High ceiling switch

- Remove the cover of the electric parts box by taking off the mounting screws (3 positions) and pushing the hooking section. (The cover of the electric parts box remains hanged to the hinge.)
- There are the selector switches (SW02) on the P.C. board of the electric parts box.

No.1 and No.2 of the selector switches (SW02) are provided to select the height of the ceiling.

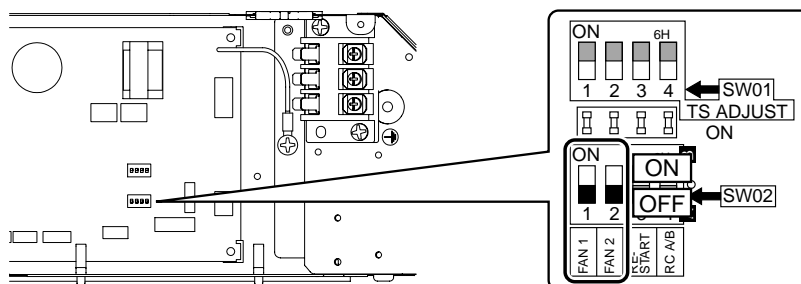
According to the ceiling height in the following table, select No.1 or No.2 of the selector switches (SW02).

### REMARKS

- When using the high ceiling (1) or (2), cold air may be felt due to the temperature drop of discharge air.

### Height list of ceiling possible to be installed

| Model RAS-                 | M10SMUV-E<br>M10SMUCV-E | M13SMUV-E<br>M13SMUCV-E | M16SMUV-E<br>M16SMUCV-E | SW02 |      |
|----------------------------|-------------------------|-------------------------|-------------------------|------|------|
|                            |                         |                         |                         | No.1 | No.2 |
| Standard (Factory setting) | 2.5 to 2.7 m            | 2.5 to 2.7 m            | 2.5 to 2.9 m            | OFF  | OFF  |
| High ceiling (1)           | —                       | —                       | 2.9 to 3.2 m            | ON   | OFF  |
| High ceiling (2)           | —                       | —                       | 3.2 to 3.5 m            | ON   | ON   |



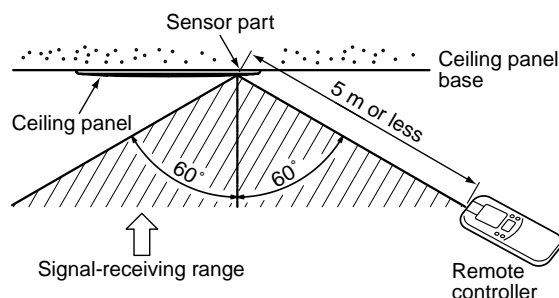


## ⚠ WARNING

Install the air conditioner certainly to sufficiently withstand the weight.  
If the strength is insufficient, the unit may fall down resulting in human injury.  
Perform a specified installation work to guard against an earthquake.  
An incomplete installation can cause accidents by the units falling and dropping.

### Remote controller

- Should be placed where there are no obstacles, such as curtains, that may block the signal
- Do not install the remote controller in a place exposed to direct sunlight or close to a heating source such as a stove.
- Keep the remote controller at least 1m away from the nearest TV set or stereo equipment. (This is necessary to prevent image disturbance or noise interference.)
- The location of the remote controller should be determined as shown below.

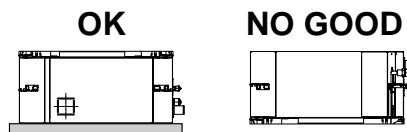


## 3 INSTALLATION OF INDOOR UNIT

## ⚠ WARNING

The installation of the air conditioning unit must be positioned in a location that can sufficiently support its weight and give protection against adverse environmental conditions.  
Failure to do so may result in unit damage and possible human injury.  
Any incomplete installation may also cause possible risk of human injury.

- Unpack the package, take out the product and then place it on the floor so that the same surface directs underneath as it is placed in the package.
- Never put the products in a pile or put weight on them, which are taken out from the packing box; otherwise there is a possibility to damage electric parts, fan parts, draining mechanism, and etc.  
If the both sides are turned over, a deformation of mounting metal of the ceiling panel which is sold separately, etc. may be caused.  
Accordingly the product may be damaged and the installation becomes impossible in some cases.



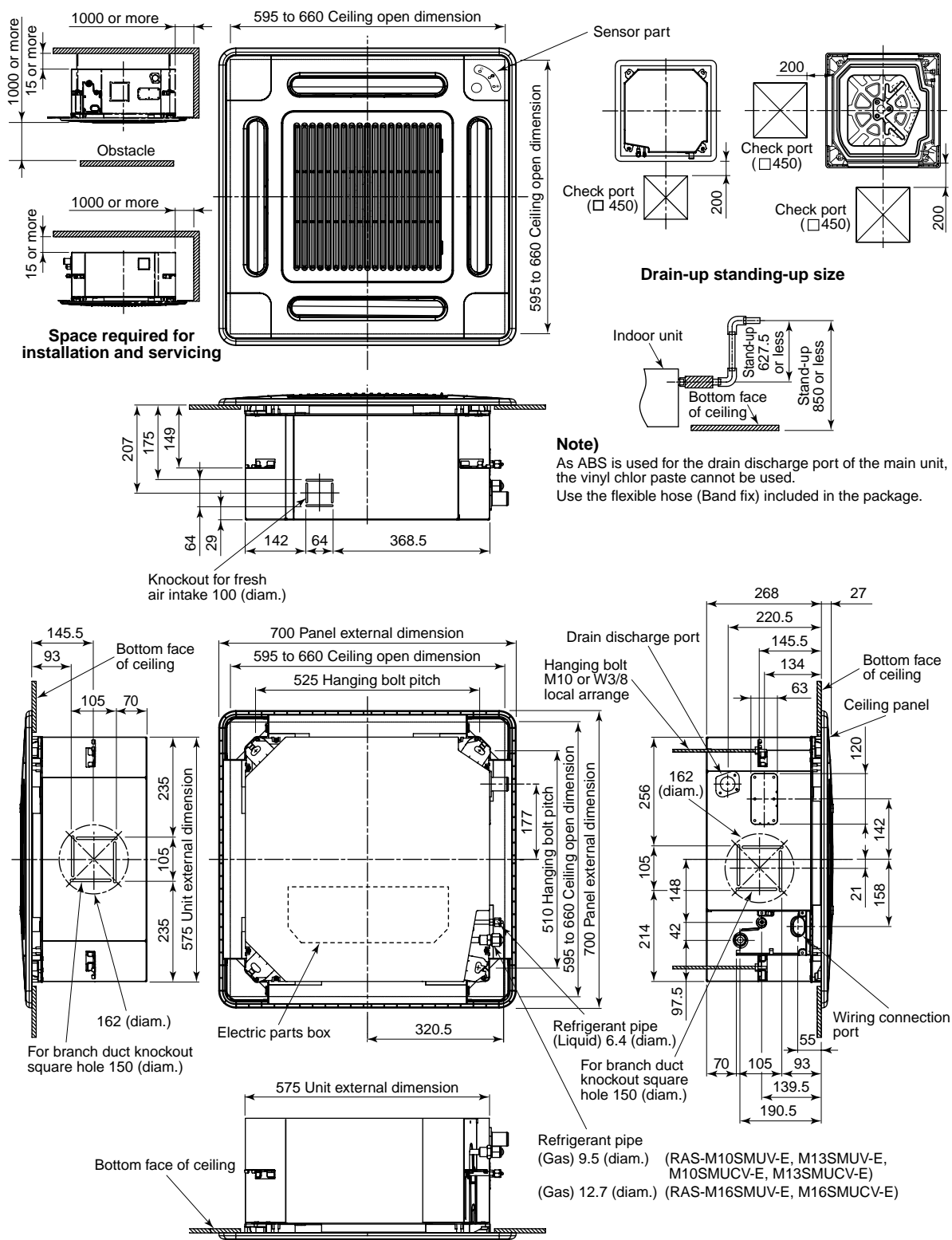
## REQUIREMENT

Strictly comply to the following rules to prevent damage of the indoor units and human injury.

- Do not place heavy objects on the indoor unit. (Even when units are still packaged)
- Always carry the unit as packaged from the factory wherever possible.  
If carrying in the indoor unit unpacked by necessity, be sure to use buffering cloth, etc. to prevent damaging the unit.
- To move the indoor unit, hold the hanging brackets (4 positions) only.  
Do not apply force to other parts (refrigerant pipe, drain pan, foamed parts, or resin parts etc.).
- To be carried by two or more people. Do not strap the unit in positions other than stated.

### 3 INSTALLATION OF INDOOR UNIT

#### Dimensional view



## Ceiling opening and installation of hanging bolts

- Evaluate and determine the piping and wiring requirements inside the ceiling prior to the hanging of the unit.
- After installation place of the indoor unit has been determined, create opening in ceiling and install the hanging bolts.
- For the ceiling opening size and pitch for hanging bolts refer to the dimensional drawing and the supplied installation pattern.
- Once the ceiling void has been created, ensure that the drain pipe, refrigerant pipes, inter-connecting wires and all control wires are in place prior to installing the actual indoor unit.

Please procure the hanging bolts and nuts for installation of the indoor unit at local site.

|              |             |           |
|--------------|-------------|-----------|
| Hanging bolt | M10 or W3/8 | 4 pieces  |
| Nut          | M10 or W3/8 | 12 pieces |

## How to use the supplied installation pattern

The installation pattern is enclosed within the packaging of the air conditioner.

### Existing ceiling void

Use the pattern to determine the position and size of the opening and location of the hanging bolts.

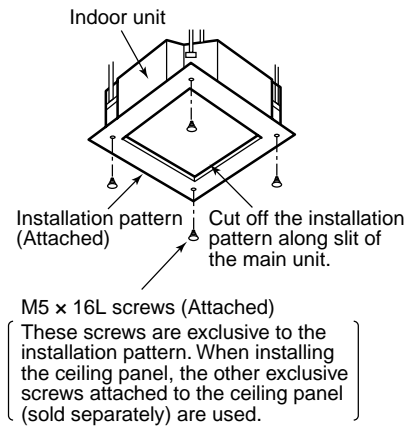
### New ceiling void

Use the pattern to determine the position of the new ceiling opening.

Cut off slit section of the main unit of the installation pattern.

Cut off the outside of the pattern according to size of the ceiling opening. (There is a slit on the standard opening size section.)

- Install the indoor unit after installation of the hanging bolts.
- Using the supplied pattern attach it to the indoor unit using the supplied fixing screws (M5 × 16L 4 off). (Screw pattern to the ceiling panel hanging brackets of the indoor unit)
- When creating the opening ensure it is as per the outer dimensions of the supplied pattern.



## Opening a ceiling and installation of hanging bolts

### Treatment of ceiling

The ceiling differs according to the structure of the building. For details, consult your architect.

In the process after the ceiling panels have been removed, it is important to reinforce the ceiling construction and ensure the ceiling remains in a horizontal position. This is to prevent possible vibration of the ceiling panels.

1. Cut and remove the ceiling material.
2. Reinforce the cut surface of the ceiling construction and add support for fixing the end of ceiling panel.

### Installation of hanging bolt

Use M10 hanging bolts (4 off, locally procured).

When mounting the unit, set the pitch of the hanging bolts according to the size of the unit as detailed on the dimensional drawing.

| New concrete slab  | Steel frame structure  | Existing concrete slab   |
|--|--|--|
| <p>Install the bolts with insert brackets or anchor bolts.</p> <p>(Blade type bracket) (Slide type bracket) (Pipe hanging anchor bolt)</p> | <p>Use existing angles or install new support angles.</p> <p>Hanging bolt Hanging bolt Support angle</p> | <p>Use a hole-in anchors, hole-in plugs, or a hole-in bolts.</p> |

### 3 INSTALLATION OF INDOOR UNIT

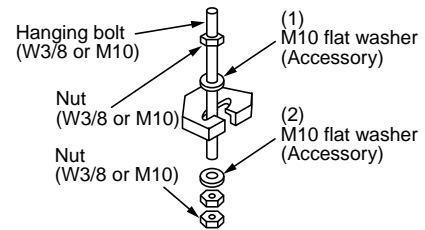
#### Installation of indoor unit

- Attach the nut (M10 or W3/8: Procured locally) and washer (34 mm (diam.)) to the hanging bolt.
- Put washers at either side of the T-groove on the hanging bracket of the indoor unit in order to hang the unit.
- Using a spirit level, check that all four sides are horizontal. (Horizontal positioned within 5 mm)
- Cut off the installation gauge from the installation pattern.
- Using the installation gauge check and adjust clearance between the indoor unit and the ceiling opening (1) (10 to 42 mm on each side).

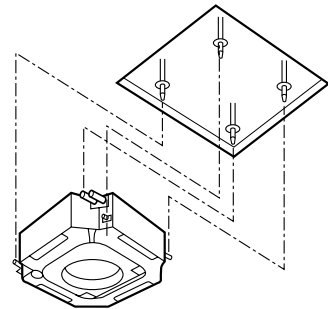
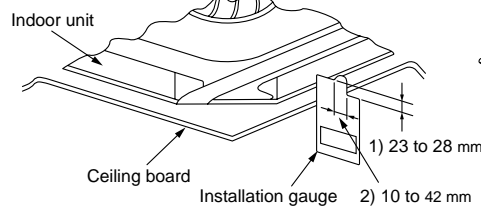
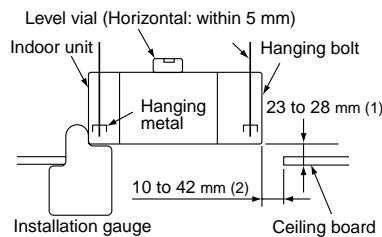
Ensure that the unit is level to the ceiling and within a distance of (2) 23 mm to 28 mm below.

The installation gauge has details of how to use printed on it.

**Note)** Install the indoor unit so that the end part of opening does not come into contact with the drain socket piping.



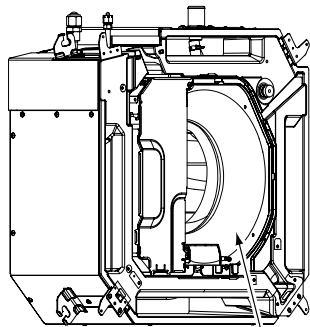
- (1) M10 washer supplied, all other material must be procured locally.
- (2) To ensure that the unit is mounted safely, the hanging bolt must be positioned just below the hanging bracket as shown in the diagram.



#### REQUIREMENT

Before installation of the indoor unit be sure to remove the transportation cushion found between the fan and the bell mouth.

Running the unit without removing the cushion may damage the fan motor.



Be sure to remove the cushion for transportation between the fan and the bell mouth.

#### Installation of ceiling panel (Sold separately)

Install the ceiling panel after completion of the installation of the indoor unit, including all piping and wiring.

Install the ceiling panel as per the supplied Installation Manual.

Check the installation dimensions of the indoor unit and the ceiling opening are correct and then install.

#### REQUIREMENT

Ensure the ceiling panel is mated to the ceiling surface or the indoor unit.

If the panel and unit are not mated together this may result in the formation of dew condensation causing a possible water leak.

First remove the 4 corner caps from the ceiling panel and fit to the indoor unit.

# 4 DRAIN PIPING WORK

## CAUTION

- Install the drain piping so that the water drains effectively.
- Apply heat insulation to prevent dew condensation from forming.
- Incorrectly installed pipework may result in a water leak.

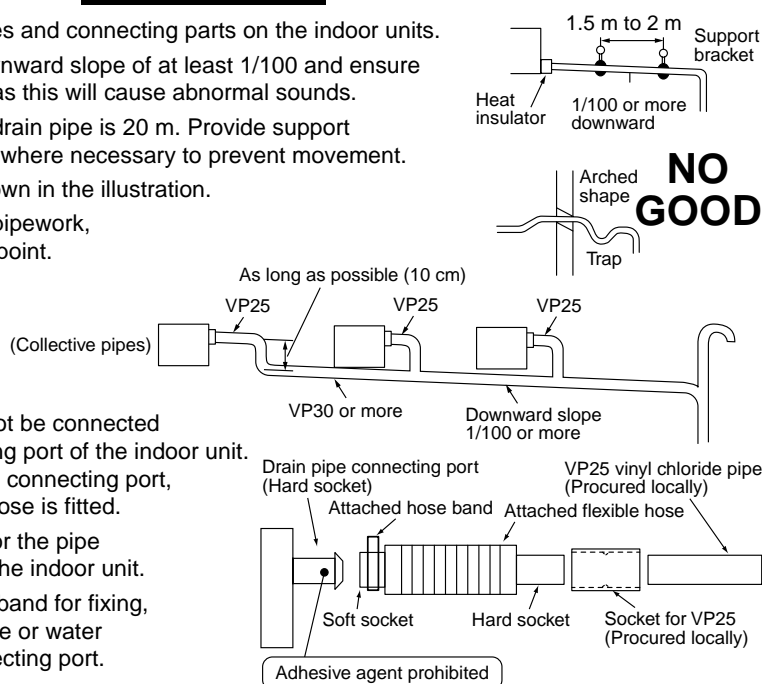
## Pipe material / Insulator and size

The following materials for piping work and insulation are to be procured locally.

|               |  |
|---------------|--|
| Pipe material | Hard vinyl chloride pipe socket for VP25                     |
|               | Hard vinyl chloride pipe VP25 (Outer diameter 32 mm (diam.)) |
| Insulator     | Foamed polyethylene foam, thickness: 10 mm or more           |

## REQUIREMENT

- Ensure insulating of the drain pipes and connecting parts on the indoor units.
- The drain pipe should have a downward slope of at least 1/100 and ensure there are no swells or blockages as this will cause abnormal sounds.
- The maximum traverse length of drain pipe is 20 m. Provide support brackets at intervals of 1.5 to 2 m where necessary to prevent movement.
- Install the combined piping as shown in the illustration.
- Do not create an air purge in the pipework, as the water would leak from this point.

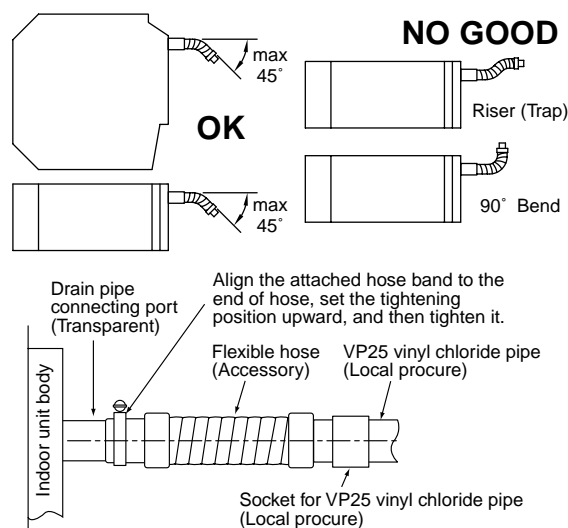


## Connection of flexible hose

- Insert the soft socket of the supplied flexible hose into the connecting port of the drain pipe.
- Align the supplied hose band to the pipe connecting port end, and tighten.

## REQUIREMENT

- Fix the soft socket with the supplied hose band, tighten at the upper position of the unit.
- The supplied flexible hose can bend up to a maximum of 45°



## 4 DRAIN PIPING WORK

### Connection of drain pipe

- Connect the hard socket (Procured locally) to the hard socket side of the supplied flexible hose which has been installed.
- Connect the drain pipes (Procured locally) in turn to the connected hard sockets.

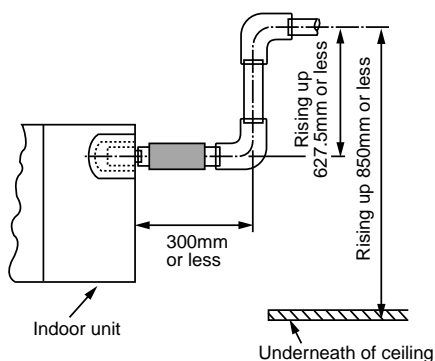
### REQUIREMENT

- Using an adhesive agent for vinyl chloride, connect the hard vinyl chloride pipes so that water does not leak.
- Allow sufficient time for the adhesive to set and harden.  
(Refer to the instructions of the adhesive.)

### Drain up

When it is not possible to achieve a natural downward slope on the drain pipe, you can create a vertical lift (Drain up) on the pipe.

- Set the height of the drain pipe within 850 mm from the bottom surface of the ceiling.
- The drain pipe should be piped from the drain pipe connecting port horizontally for a maximum of 300 mm and then piped vertically.
- After piping the vertical lift, ensure the pipework is set to a downward gradient.



### Check the draining

After completion of drain piping, Check water drains away and that no water leaks from any of the connecting parts. At the same time check for any abnormal sounds from the drain pump. Ensure drainage is checked during cooling mode.

### When the electric work has finished:

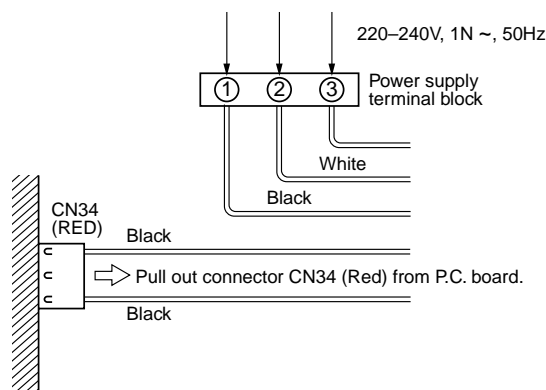
- Before installing the ceiling panel, pour water as shown in the following figure, check water drains from the drain pipe connecting port (Transparent) in COOL mode and then check there are no water leaks from the drain pipes.

### When the electric work has not finished:

- Pull out the float switch connector (3P: Red) from P.C. board connector (CN34: Red) of the electric parts box. (Ensure the power is turned off.)
- Connect the single-phase 220-240V, 1N, 50 Hz power to the terminal blocks (1) and (2).
- Pour water referring to the figure.  
(Amount: 1500 cc to 2000 cc)
- When the power is turned on, the drain pump motor drives automatically.

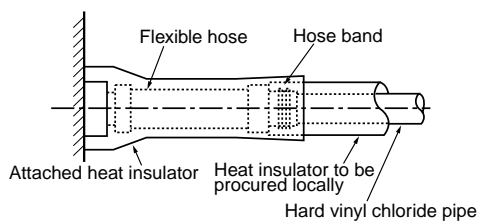
Check water is drained from the drain pipe connecting port (Transparent), and then check there is no water leak from the drain pipes.

- After checking for water leaks on the drain, turn off the power supply, and re-attach the float switch connector to the original position (CN34) on the P.C. board and refit the electric parts box.



### Thermal insulating process

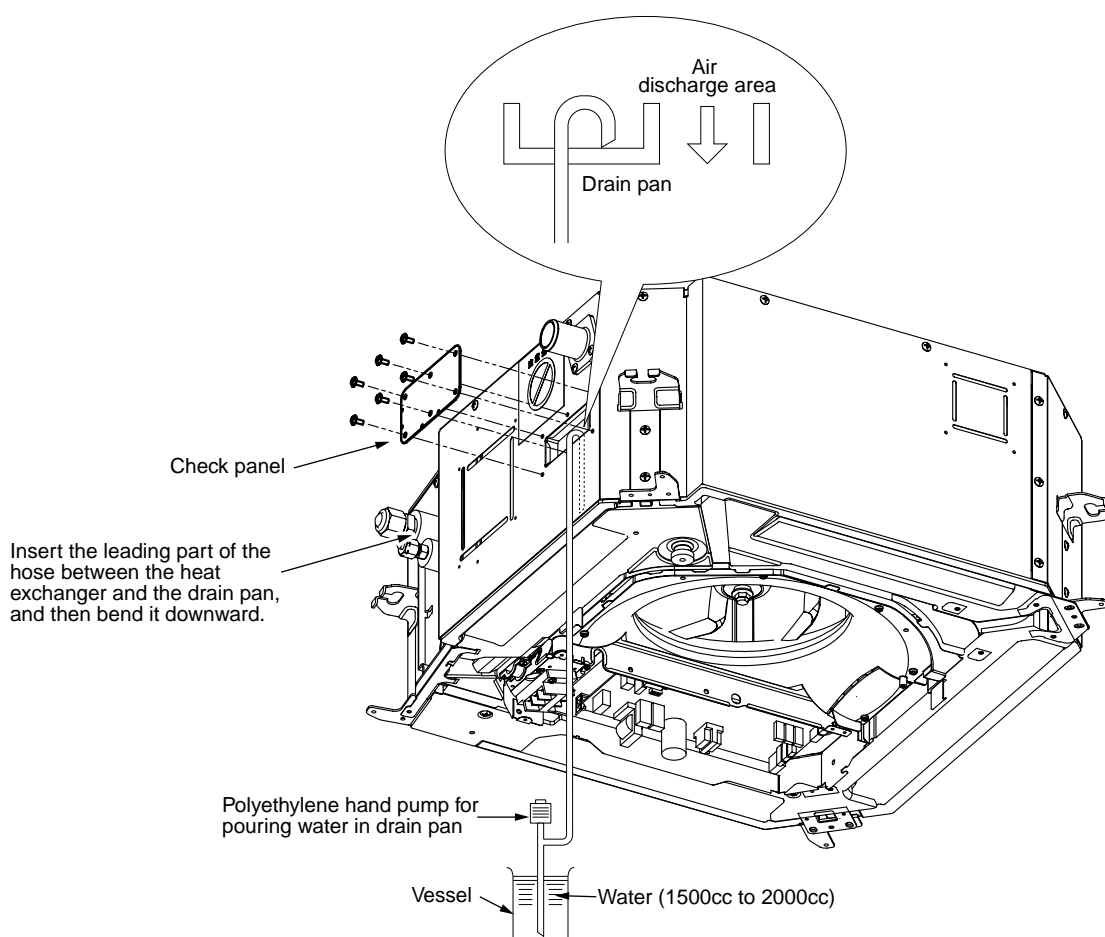
- After checking the draining, wrap the supplied thermal insulation material for the drain connecting part around the flexible hose leaving no clearance from the root of the drain pipe connecting port of the indoor unit.
- Wrap the thermal insulation material (procured locally) around the drain pipe so that it piles up on the supplied the thermal insulation material for the drain connecting part, leaving no clearance.



### CAUTION

**Ensure water is poured slowly.**

If water is poured vigorously, it is scattered inside of the indoor unit resulting in a cause of unit trouble.



# 5 REFRIGERANT PIPING AND EVACUATING

## Refrigerant piping

1. If the outdoor units are to be mounted on a wall, make sure that the supporting platform is sufficiently strong. The platform should be designed and manufactured to maintain its strength over a long period of time, and sufficient consideration should be given to ensuring that the outdoor unit will not fall.
2. Use copper pipe with 0.8 mm or more thickness.
3. Flare nut and flare works are different from those of the conventional refrigerant. Take out the flare nut attached to the main unit of the air conditioner, and use it.

## CAUTION

### IMPORTANT 4 POINTS FOR PIPING WORK

1. Remove dust and moisture from the inside of the connecting pipes.
2. Tight connection (between pipes and unit)
3. Evacuate the air in the connecting pipes using VACUUM PUMP.
4. Check the gas leakage. (Connected points)

## Permissible piping length and heat

They vary according to the outdoor unit.  
For details, refer to the Installation Manual attached to the outdoor unit.

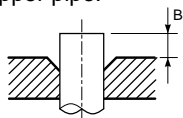
## Flaring

Insert a flare nut into the pipe, and flare the pipe.

As the flaring sizes of R410A differ from those of refrigerant R22, the flare tools newly manufactured for R410A are recommended.

However, the conventional tools can be used by adjusting projection margin of the copper pipe.

- Projection margin in flaring :  
B (Unit : mm)



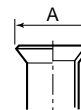
Rigid (Clutch type)

| Outer diam. of copper pipe | R410A tool used |                | Conventional tool used |            |
|----------------------------|-----------------|----------------|------------------------|------------|
|                            | R410A           | R22            | R410A                  | R22        |
| 6.4                        | 0 to 0.5        | (Same as left) | 1.0 to 1.5             | 0.5 to 1.0 |
| 9.5                        | 0 to 0.5        | (Same as left) | 1.0 to 1.5             | 0.5 to 1.0 |
| 12.7                       | 0 to 0.5        | (Same as left) | 1.0 to 1.5             | 0.5 to 1.0 |

Imperial (Wing nut type)

| Outer diam. of copper pipe | R410A      | R22        |
|----------------------------|------------|------------|
| 6.4                        | 1.5 to 2.0 | 1.0 to 1.5 |
| 9.5                        | 1.5 to 2.0 | 1.0 to 1.5 |
| 12.7                       | 2.0 to 2.5 | 1.5 to 2.0 |

- Flaring diam. meter size :  
A (Unit : mm)



| Outer diam. of copper pipe | A <sup>+0</sup> / <sub>-0.4</sub> |      |
|----------------------------|-----------------------------------|------|
|                            | R410A                             | R22  |
| 6.4                        | 9.1                               | 9.0  |
| 9.5                        | 13.2                              | 13.0 |
| 12.7                       | 16.6                              | 16.2 |

- \* In case of flaring for R410A with the conventional flare tool, pull it out approx. 0.5 mm more than that for R22 to adjust to the specified flare size. The copper pipe gauge is useful for adjusting projection margin size.

## Tightening connection

## CAUTION

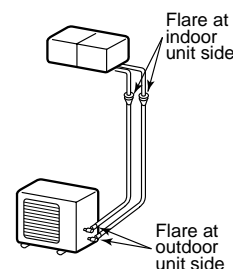
- Do not apply excessive torque. Otherwise, the nut may crack depending on the conditions.

(Unit : N•m)

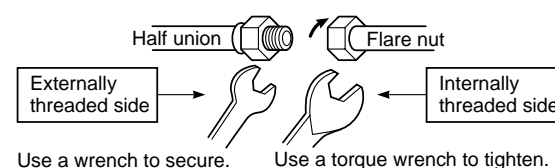
| Outer diam. of copper pipe | Tightening torque           |
|----------------------------|-----------------------------|
| 6.4 mm (diam.)             | 14 to 18 (1.4 to 1.8 kgf•m) |
| 9.5 mm (diam.)             | 33 to 42 (3.3 to 4.2 kgf•m) |
| 12.7 mm (diam.)            | 50 to 62 (5.0 to 6.2 kgf•m) |

- Tightening torque of flare pipe connections  
Pressure of R410A is higher than that of R22.  
(Approx. 1.6 times)

Therefore, using a torque wrench, tighten the flare pipe connecting sections which connect the indoor and outdoor units of the specified tightening torque. Incorrect connections may cause not only a gas leak, but also a trouble of the refrigeration cycle.



Align the centers of the connecting pipes and tighten the flare nut as far as possible with your fingers. Then tighten the nut with a spanner and torque wrench as shown in the figure.





# 6 EVACUATING

## AIR PURGE

Evacuate the air in the connecting pipes and in the indoor unit using vacuum pump.

Do not use the refrigerant in the outdoor unit.

For details, see the manual of vacuum pump.

## Use a vacuum pump

Be sure to use a vacuum pump with counter-flow prevention function so that inside oil of the pump does not flow backward into pipes of the air conditioner when the pump stops.

1. Connect the charge hose from the manifold valve to the service port of the gas side packed valve.
2. Connect the charge hose to the port of vacuum pump.
3. Open fully the low pressure side handle of the gauge manifold valve.
4. Operate the vacuum pump to start for evacuating.

Perform evacuating for about 35 minutes if the piping length is total 70 meters.

(25 minutes for total 50 meters)

(assuming a pump capacity of 27 liters per minute.)

Then confirm that the compound pressure gauge reading is  $-101 \text{ kPa}$  ( $-76 \text{ cmHg}$ ).

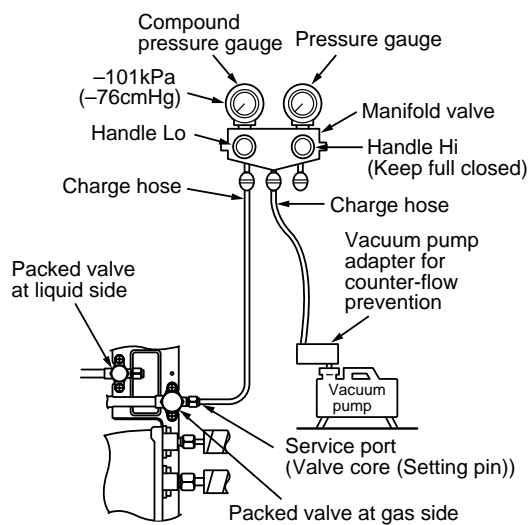
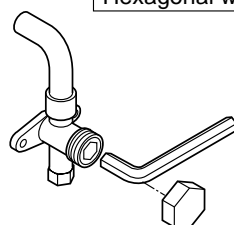
5. Close the low pressure side valve handle of gauge manifold.
6. Open fully the valve stem of the packed valves (both sides of Gas and Liquid).
7. Remove the charging hose from the service port.
8. Securely tighten the caps on the packed valves.

## Packed valve handling precautions

- Open the valve stem until it touches the stopper. Once it is in contact with the stopper, refrain from applying any more force than is necessary.
- Securely tighten the valve stem cap in torque as follows:

|                              |                                 |
|------------------------------|---------------------------------|
| Gas side (12.7 mm (diam.))   | 50 to 62 N•m (5.0 to 6.2 kgf•m) |
| Gas side (9.5 mm (diam.))    | 33 to 42 N•m (3.3 to 4.2 kgf•m) |
| Liquid side (6.4 mm (diam.)) | 14 to 18 N•m (1.4 to 1.8 kgf•m) |
| Service port                 | 14 to 18 N•m (1.4 to 1.8 kgf•m) |

Hexagonal wrench is required.



# 7 ELECTRICAL WORK

## ⚠ WARNING

1. **Using the specified wires, ensure to connect the wires, and fix wires securely so that the external tension to the wires do not affect the connecting part of the terminals.**

Incomplete connection or fixation may cause a fire, etc.

2. **Be sure to connect earth wire. (Grounding work)**

Do not connect the earth wire to gas pipe, city water pipe, lightning rod, or the earth wire of telephone. Incomplete grounding causes an electric shock.

3. **For electric work, strictly follow the Local Regulation in each country and the Installation Manual, and use an exclusive circuit.**

Capacity shortage of power circuit or incomplete installation may cause an electric shock or a fire.

## CAUTIONS

- This indoor unit has no power cord.
- If incorrect/incomplete wiring is carried out, it will cause an electrical fire or smoke.
- Be sure to install an earth leakage breaker that is not tripped by shock waves.  
If an earth leakage breaker is not installed, an electric shock may be caused.
- Be sure to use the cord clamps attached to the product.
- Do not damage or scratch the conductive core and inner insulator of power and inter-connecting wires when peeling them.
- Be sure to comply with local regulations on running the wire from outdoor unit to indoor unit (size of wire and wiring method etc.)
- Use the power cord and Inter-connecting cable of specified thickness, type, and protective devices required.

## REQUIREMENT

- Appliance shall be installed in accordance with national wiring regulations.
- For wiring of power supply of the outdoor units, follow the Installation Manual of each outdoor unit.
- Perform the electric wiring so that it does not come to contact with the high-temperature part of the pipe.  
The coating may melt resulting in an accident.
- After connecting wires to the terminal blocks, provide a trap and fix wires with the cord clamp.
- Run the refrigerant piping line and control wiring line in the same line.
- Do not turn on the power of the indoor unit until vacuuming of the refrigerant pipes completes.

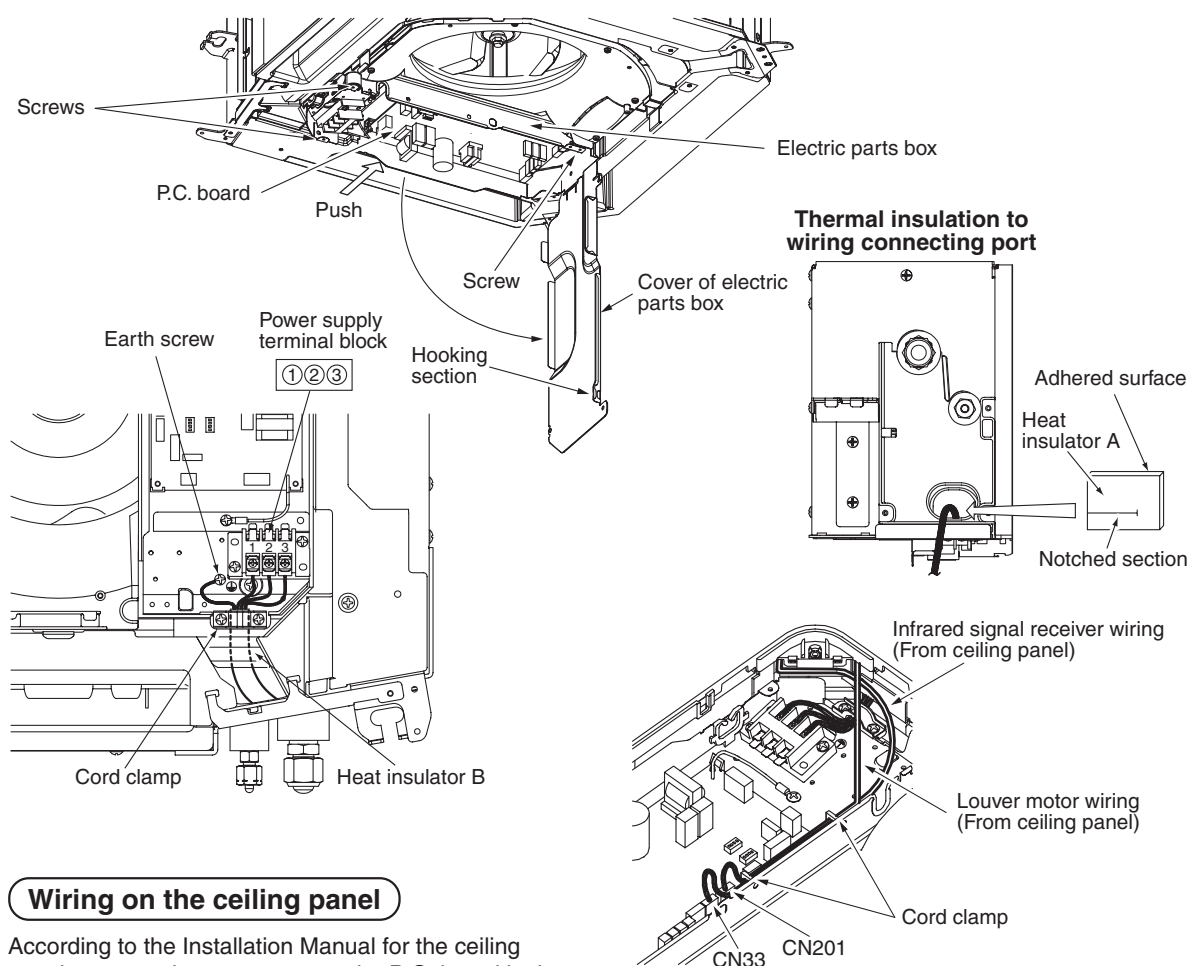
### How to wire

1. Connect the connecting wire to the terminal as identified with their respective numbers on the terminal block of indoor and outdoor unit. H07 RN-F or 60245 IEC 66 (1.0 mm<sup>2</sup>)
2. Insulate the unsheathed redundant cords (conductors) with electrical insulation tape.  
Process them so that they do not touch any electrical or metal parts.
3. For inter-unit wiring, do not use a wire jointed to another on the way.

## Wire connection

### REQUIREMENT

- Be sure to connect the wires matching the terminal numbers. Incorrect connection causes a trouble.
  - Be sure to pass the cables through the bushing of wiring connection port of the indoor unit.
  - Keep a margin (Approx. 100mm) on a wire to hang down the electric parts box at servicing, etc.
- Remove the cover of the electric parts box by taking off the mounting screws (3 positions) and pushing the hooking section. (The cover of the electric parts box remains hanged to the hinge.)
  - Connect the indoor/outdoor connection wires to the terminal block of the electric parts box. (Do not apply tension to the connecting section of the terminal block.)
  - Tighten the screws of the terminal block, and fix the wires with cord clamp attached to the electric parts box.
  - Using the attached thermal insulation material, seal the pipe connecting port. Otherwise, dewing may be caused.
  - Mount the cover of the electric parts box without pinching wires. (Mount the cover after cabling on the ceiling panel.)



## Wiring on the ceiling panel

According to the Installation Manual for the ceiling panel, connect the connectors to the P.C. board in the electric parts box.

Connect the sensor connector to CN201 (Blue), and the louver motor wiring connector to CN33 (White) on the P.C. board, respectively.

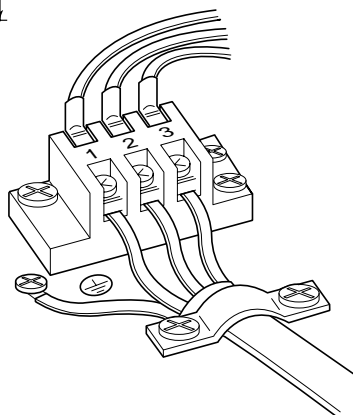
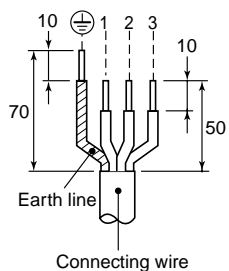
Draw and pass the sensor lead wire upper the louver motor wiring, and then close cover of the electric parts box. Perform the wiring work so that the electric parts box does not pinch the sensor lead wire.

## 7 ELECTRICAL WORK

### Wiring

1. Remove a screw and then remove cover of the electric parts box.
2. Strip wire ends (10 mm).
3. Match wire colors with terminal numbers on indoor and outdoor units' terminal blocks and firmly screw wires to the corresponding terminals.
4. Connect the ground wires to the corresponding terminals.
5. Fix the wires with cord clamp.
6. Fix cover of the parts box and the terminal block surely with the fixing screws.

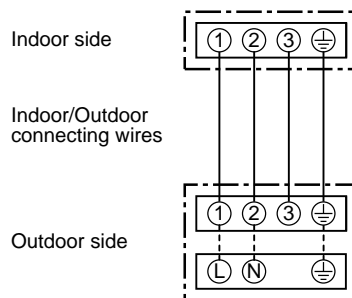
**Make a loop on the wire for margin of the length so that the electric parts box can be taken out during servicing.**



### NOTE

Wire type: H07RN-F or 60245IEC66 (1.0 mm<sup>2</sup>)

### Wiring diagram



# 8 APPLICABLE CONTROLS

## Remote controller selector switch setting

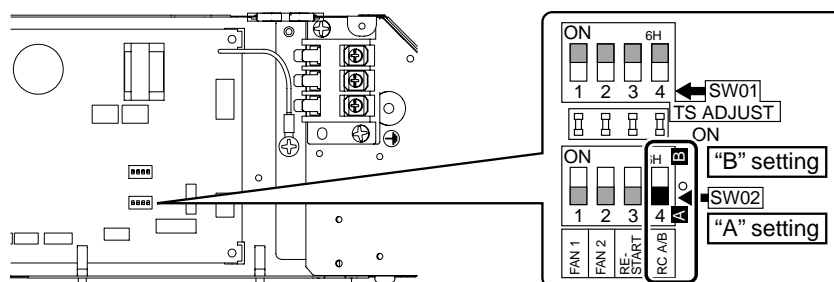
- If two indoor units are installed in the same room or adjoining rooms, when the user tries to operate only one unit, both units may receive the same remote controller signal and operate. This can be prevented by changing one of the indoor units and remote controllers to setting "B" (The default setting for both units is "A").
- If the indoor unit and remote controller settings are different, the remote controller signal will not be accepted.

### 1. Setting the remote controller

- Remove the cover, and insert the batteries.
- Push the "CHECK" point and "MODE" button at once, for changing remote controller setting from "A" to "B". (Priority is given to "A" setting.)

### 2. Setting the unit

- Remove the cover of the electric parts box by taking off the mounting screws (3 positions) and pushing the hooking section. (The cover of the electric parts box remains hanged to the hinge.)
- There are the selector switches (SW02) on the P.C. board of the electric parts box. No.4 of the selector switches (SW02) is provided to select the switch of the remote controller. Select ON of No.4 of the selector switches (SW02). (OFF: A setting, ON: B setting)



- Check whether the changed remote controller can operate the indoor unit or not.

## Auto restart setting

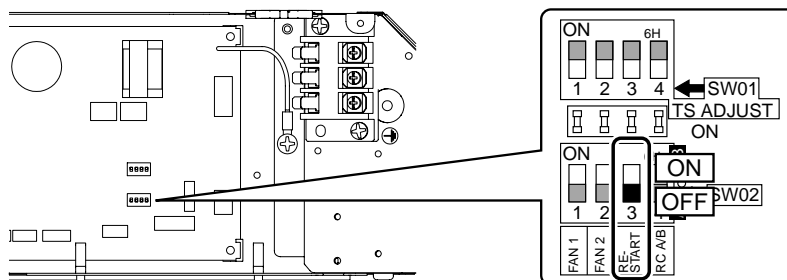
This product is designed so that, after a power failure, it can restart automatically in the same operating mode as before the power failure.

## INFORMATION

The product was shipped with Auto Restart function in the OFF position. Turn it ON as required.

### How to set the Auto Restart

- Remove the cover of the electric parts box by taking off the mounting screws (3 positions) and pushing the hooking section. (The cover of the electric parts box remains hanged to the hinge.)
- There are the selector switches (SW02) on the P.C. board of the electric parts box. No.3 of the selector switches (SW02) is provided for the selector switch. Select ON of No.3 of the selector switches (SW02). (OFF: setting without Auto Restart, ON: setting with Auto Restart)



## 8 APPLICABLE CONTROLS

### To improve Cooling/Heating effect

When only poor cooling/heating effect is obtained due to installation place of the indoor unit or construction of the room, the detection temperature of cooling/heating can be changed.

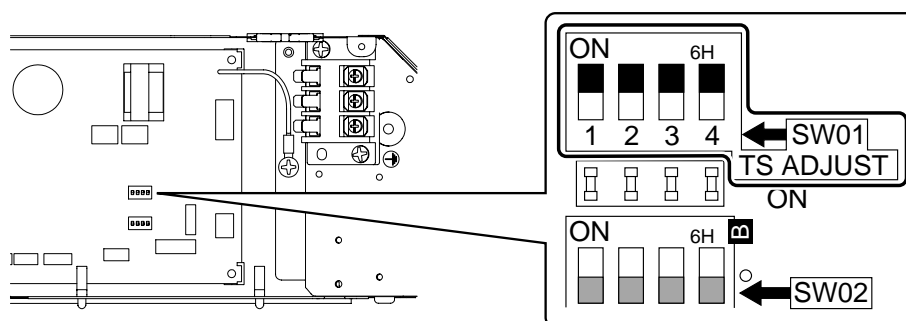
- Remove the cover of the electric parts box by taking off the mounting screws (3 positions) and pushing the hooking section. (The cover of the electric parts box remains hanged to the hinge.)
- There are the selector switches (SW01) on the P.C. board of the electric parts box.

The setting of the detection temperature can be changed by combining No.1 to No.4 switches of the selector switches (SW01). Adjust the setting of the detection temperature according to the right table.

| No.1 | No.2 | No.3 | No.4 | COOL/DRY<br>(°C) | HEAT<br>(°C) |
|------|------|------|------|------------------|--------------|
| OFF  | OFF  | OFF  | OFF  | -2               | -2           |
| ON   | OFF  | OFF  | OFF  | -2               | +4           |
| OFF  | ON   | OFF  | OFF  | -2               | +2           |
| ON   | ON   | OFF  | OFF  | -2               | 0            |
| OFF  | OFF  | ON   | OFF  | +4               | -2           |
| ON   | OFF  | ON   | OFF  | +4               | +4           |
| OFF  | ON   | ON   | OFF  | +4               | +2           |
| ON   | ON   | ON   | OFF  | +4               | 0            |
| OFF  | OFF  | OFF  | ON   | +2               | -2           |
| ON   | OFF  | OFF  | ON   | +2               | +4           |
| OFF  | ON   | OFF  | ON   | +2               | +2           |
| ON   | ON   | OFF  | ON   | +2               | 0            |
| OFF  | OFF  | ON   | ON   | 0                | -2           |
| ON   | OFF  | ON   | ON   | 0                | +4           |
| OFF  | ON   | ON   | ON   | 0                | +2           |
| ON   | ON   | ON   | ON   | 0                | 0            |

← Factory setting

### Setting at shipment

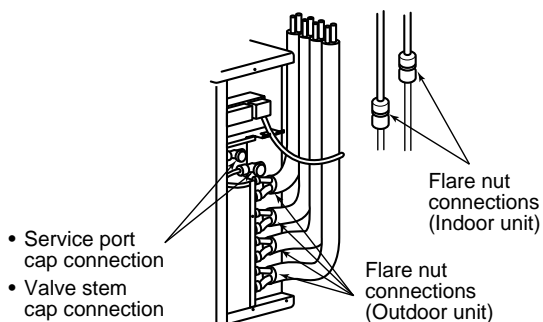


# 9 TEST OPERATION

## Check and Test operation

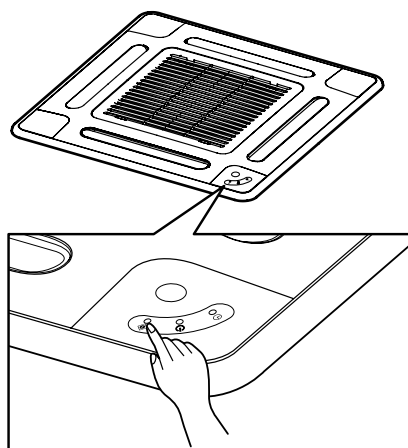
Be sure to test the piping connections for gas leak.

- Check the flare nut connections, valve stem cap connections and service port cap connections for gas leak with a leak detector or soap water.










## Test operation

- To test the system, push and hold RESET button for 10 sec. (There will be one short beep.)



# 10 INSTALLATION / SERVICING TOOLS

## Tools

| Tools                                       | Applicable to R22 model  |   | Tools                           | Applicable to R22 model  |   |
|---|--------------------------|---|---------------------------------|--------------------------|---|
| Gauge manifold                              | <input type="checkbox"/> |  | Flare tool (clutch type)        | <input type="radio"/>    |  |
| Charge hose                                 | <input type="checkbox"/> |  | Gauge for projection adjustment | —                        | —   |
| Electronic balance for refrigerant charging | <input type="radio"/>    |  | Vacuum pump adapter             | <input type="radio"/>    |  |
| Torque wrench (nominal diam. 1/2, 5/8)      | <input type="checkbox"/> |  | Gas leakage detector            | <input type="checkbox"/> |  |

☐ : Newly prepared (They are special requirements for R410A, separated from those for R22.)

☐ : Existing tools are available.

For the details of the tools, refer to the Installation manual of the outdoor unit.

# 11 MAINTENANCE

Prior to maintenance, ensure the power supply is turned off.



## WARNING

Cleaning of the air filter and other parts of the air filter involves dangerous work in high places, so be sure to have a qualified service person do it. Do not attempt it yourself.

## CAUTION

Do not handle the buttons with wet hands as this will cause the risk of electric shock.

### Cleaning of air filter

Clean the air filters every 3 months.

The performance of the air conditioner will degrade if the air filters are covered with dust.

Clean the air filters as often as possible.

#### 1 Open the air inlet grille.

- Slide the air inlet grille buttons to detach the air inlet grille from the main ceiling panel. Lower the grille slowly whilst holding.

#### 2 Take out the air filter.

- Push the extrusion of the air filter away from the grille and remove.

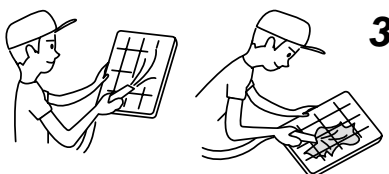
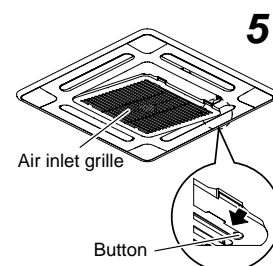
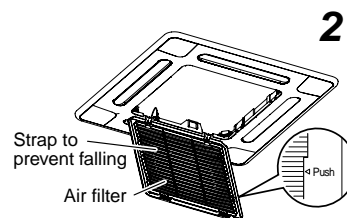
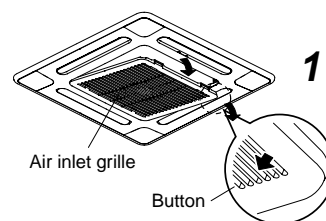
#### 3 Cleaning with water or vacuum cleaner

- If dirt is heavy, clean the air filter using tepid water with a neutral detergent or just water.
- After cleaning with water, dry the air filter sufficiently in a shaded place.

#### 4 Mount the air filter.

#### 5 Close the air inlet grille.

- Close the air inlet grille, slide the button to locate into the ceiling panel fixing securely.



### Cleaning of air outlet louver

The air outlet louver can be removed to clean if necessary.

#### 1 Remove the air outlet louver.

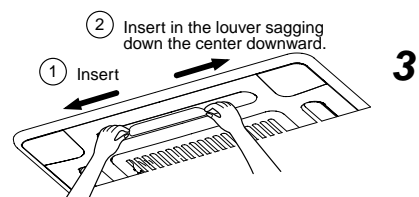
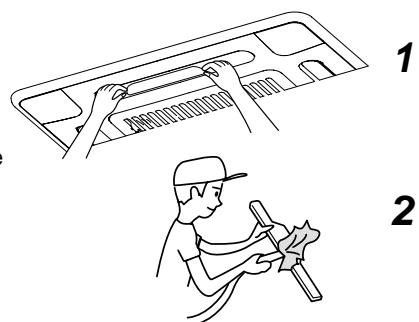
- Holding both ends of the air outlet louver, remove it by sagging the center downwards.

#### 2 Clean the air outlet louver with water.

- If dirt is heavy, clean the air outlet louver using tepid water with neutral detergent or just water.

#### 3 Mount the air outlet louver.

- First push in the one side, and insert the opposite side by sagging the center downwards.



**Be careful to insert the louver in the correct direction.**

Insert the louver with the printed mark facing upwards, and the arrow on the louver pointing in the outward direction.