

TOSHIBA

INSTALLATION MANUAL
MANUEL D'INSTALLATION
INSTALLATIONS-HANDBUCH
MANUALE D'INSTALLAZIONE
MANUAL DE INSTALACIÓN
MANUAL DE INSTALAÇÃO
INSTALLATIEHANDLEIDING
ΕΓΧΕΙΡΙΔΙΟ ΕΓΚΑΤΑΣΤΑΣΗΣ

AIR CONDITIONER (SPLIT TYPE)
CLIMATISEUR (TYPE SPLIT)
KLIMAGERÄT (SPLIT-SYSTEM)
CONDIZIONATORE D'ARIA (TIPO SCOMPONIBILE)
APARATO DE AIRE ACONDICIONADO (TIPO SPLIT)
AR CONDICIONADO (TIPO SPLIT)
AIRCONDITIONER (GESPLITST TYPE)
ΚΛΙΜΑΤΙΣΤΙΚΟ ΜΗΧΑΝΗΜΑ (ΔΙΑΙΡΟΫΜΕΝΟΣ ΤΥΠΟΣ)

<Under Ceiling/Console Type>/<Type Sous Plafond/Console>
<Unterdecken-/Konsolenmodell>/<Tipo a Soffitto/Console>
<Tipo Instalación en Techo/Consola>/<Sob Tecto/tipo de Consola>
<Plafond-/Consoletype>/<Τυπος Για Τοποθετηση Κατω Απο Την Οροφη/Κονσολα>

Heat Pump Model/Modèle à thermopompe
Geräte mit Heizung/Modello con pompa di riscaldamento
Modelo con bomba de calor/Modelo de bomba térmica
Model met warmtepomp/Μοντέλο με Αντλία Θερμότητας

Indoor Unit/Unité intérieure
Raumeinheit/Unità interna
Unidad interior/Unidade interior
Binnenunit/Εσωτερική Μονάδα

RAV-SM562XT-E
RAV-SM802XT-E

Outdoor Unit/Unité extérieure
Außengerät/Unità esterna
Unidad exterior/Unidade exterior
Buitenunit/Εξωτερική Μονάδα

RAV-SM562AT-E
RAV-SM802AT-E



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.

Veillez 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.

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

- In diesem Handbuch wird die Installation der Raumeinheit beschrieben.
- Um die Außeneinheit zu installieren, folgen Sie den Anweisungen in dem Handbuch, das der Außeneinheit beiliegt.

Prima di installare il condizionatore d'aria, leggere con attenzione questo manuale d'installazione.

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

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.

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.

Lees deze installatiehandleiding zorgvuldig door voordat u de airconditioner gaat installeren.

- Deze installatiemethode beschrijft de installatiemethode van de binnenunit.
- Zie voor de installatie van de buitenunit, de installatiehandleiding bij de buitenunit.

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

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



ADOPTION OF NEW REFRIGERANT

- This Air Conditioner is a new type which adopts a new refrigerant HFC (R410A) instead of the conventional refrigerant R22 in order to prevent destruction of the ozone layer.
 - Discharge of refrigerant to atmosphere is illegal and may lead to prosecution.
-

UTILISATION DU NOUVEAU REFRIGERANT

- Ce climatiseur est d'un type inédit qui utilise le nouveau réfrigérant HFC (R410A) au lieu du réfrigérant traditionnel R22, afin d'éviter la destruction de la couche d'ozone.
 - L'élimination du réfrigérant dans l'atmosphère est illégale et sujette à poursuites.
-

EINFÜHRUNG EINES NEUEN KÜHLMITTELS

- Dies ist ein neuartiges Klimagerät. Anstatt des herkömmlichen Kühlmittels R22 verwendet es das neue ozonschicht-schonende HFC Kühlmittel R410A.
 - Das Freisetzen von Kühlmittel in die Atmosphäre ist gesetzlich verboten und wird strafrechtlich verfolgt.
-

ADOZIONE DI UN NUOVO REFRIGERANTE

- Questo condizionatore d'aria è di un tipo nuovo che adotta un nuovo refrigerante HFC (R410A) al posto del refrigerante convenzionale R22, per prevenire la distruzione dello strato di ozono dell'atmosfera terrestre.
 - Il rilascio del refrigerante nell'atmosfera è illegale e può essere punito dalla legge.
-

ADOPCIÓN DE NUEVO REFRIGERANTE

- Este aparato de aire acondicionado es un modelo reciente que incorpora el nuevo refrigerante HFC (R410A) en lugar del refrigerante convencional R22 para así evitar daños en la capa de ozono.
 - La emisión de refrigerante a la atmósfera es ilegal y puede ser causa de acciones judiciales.
-

ADOÇÃO DO NOVO REFRIGERANTE

- Este ar condicionado é um modelo novo que adota um novo refrigerante HFC (R410A) em vez do refrigerante convencional R22 para evitar a destruição da camada de ozono.
 - A descarga do refrigerante para a atmosfera é ilegal, sendo punível por lei.
-

TOEPASSING VAN EEN NIEUW KOELMIDDEL

- Deze airconditioner is een nieuwe type dat werkt met een nieuw koelmiddel HFC (R410A) in plaats van met het conventionele koelmiddel R22, als bijdrage om de aantasting van de ozonlaag te reduceren.
 - Het laten ontsnappen van koelmiddel in de atmosfeer is verboden en kan leiden tot strafrechtelijke vervolging.
-

ΥΙΟΘΕΤΗΣΗ ΝΕΟΥ ΨΥΚΤΙΚΟΥ

- Το παρόν Κλιματιστικό είναι νέος τύπος που υιοθετεί νέο ψυκτικό HFC (R410A) στη θέση του συμβατικού ψυκτικού R22 προκειμένου να βοηθήσει στην προστασία του όζοντος.
- Η εκροή του ψυκτικού στην ατμόσφαιρα είναι παράνομη και υπόκειται σε ποινική δίωξη.

CONTENTS

Accessory parts and Parts to be procured locally	1	6 REFRIGERANT PIPING	11
1 PRECAUTIONS FOR SAFETY	2	7 EVACUATING	13
2 INSTALLATION PROCEDURE	4	8 ELECTRICAL WORK	16
3 SELECTION OF INSTALLATION PLACE	5	9 FINAL INSTALLATION CHECKS	17
4 INSTALLATION OF INDOOR UNIT	5	10 ENVIRONMENT	19
5 DRAIN PIPING WORK	10		

SOMMAIRE

Pièces accessoires et pièces non fournies	21	6 TUYAUX DE REFRIGERANT	31
1 MESURES DE SECURITE	22	7 EVACUATION DE L'AIR	33
2 PROCEDURE D'INSTALLATION	24	8 INSTALLATION ELECTRIQUE	36
3 SELECTION DU LIEU D'INSTALLATION	25	9 DERNIERES VERIFICATIONS DE L'INSTALLATION	37
4 INSTALLATION DE L'UNITE INTERIEURE	25	10 ENVIRONNEMENT	39
5 INSTALLATION DES TUYAUX D'EVACUATION	30		

INHALT

Zubehör und bauseits bereitzustellende Teile	41	6 KÜHLMITTELLLEITUNGEN	51
1 SICHERHEITSVORKEHRUNGEN	42	7 ENTLÜFTEN DER ROHRLEITUNGEN	53
2 INSTALLATIONSABLAUF	44	8 ELEKTROINSTALLATION	56
3 AUSWAHL DES AUFSTELLUNGORTES	45	9 ÜBERPRÜFUNGEN NACH DER INSTALLATION	57
4 INSTALLATION DER RAUMEINHEIT	45	10 UMWELT	59
5 INSTALLATION DER ABLAUFROHRE	50		

INDICE

Accessori e parti da acquistare sul posto	61	6 TUBAZIONI DEL REFRIGERANTE	71
1 PRECAUZIONI PER LA SICUREZZA	62	7 SVUOTAMENTO	73
2 PROCEDURA D'INSTALLAZIONE	64	8 RETE DEI COLLEGAMENTI ELETTRICI	76
3 SCELTA DEL POSTO D'INSTALLAZIONE	65	9 CONTRROLLI DI FINE INSTALLAZIONE	77
4 INSTALLAZIONE DELL'UNITÀ INTERNA	65	10 AMBIENTE	79
5 LAVORO PER TUBAZIONE DI SCARICO	70		

CONTENIDO

Componentes accesorios y componentes de obtención local ...	81	6 TUBERÍA DE REGRIGERANTE	91
1 PRECAUCIONES PARA SU SEGURIDAD	82	7 EVACUACIÓN	93
2 PROCEDIMIENTO DE INSTALACIÓN	84	8 TRABAJOS EN EL SISTEMA ELÉCTRICO	96
3 SELECCIÓN DEL LUGAR DE INSTALACIÓN	85	9 COMPROBACIONES FINALES	97
4 INSTALACIÓN DE LA UNIDAD INTERIOR	85	10 MEDIO AMBIENTE	99
5 TRABAJOS DE CANALIZACIÓN DE DESAGÜE	90		

ÍNDICE

Acessórios e peças adquiridas localmente	101	6 TUBAGEM DE REFRIGERANTE	111
1 PRECAUÇÕES DE SEGURANÇA	102	7 EVACUAÇÃO	113
2 PROCEDIMENTO DE INSTALAÇÃO	104	8 LIGAÇÕES ELÉTRICAS	116
3 SELECÇÃO DO LOCAL DE INSTALAÇÃO	105	9 VERIFICAÇÕES DE INSTALAÇÃO FINAIS	117
4 INSTALAÇÃO DA UNIDADE INTERIOR	105	10 AMBIENTE	119
5 INSTALAÇÃO DA TUBAGEM DE DRENAGEM	110		

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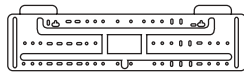



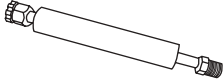


Accessoires en niet meegeleverde onderdelen	121	6 KOELMIDDELLEIDINGEN	131
1 VOORZORGSMAATREGELEN VOOR UW VEILIGHEID ..	122	7 ONTLUCHTEN	133
2 INSTALLATIEPROCEDURE	124	8 ELEKTRISCH GEDEELTE	136
3 KEUZE VAN DE LOCATIE VOOR DE INSTALLATIE	125	9 LAATSTE CONTROLES VAN DE INSTALLATIE	137
4 INSTALLATIE VAN DE BINNENUNIT	125	10 MILIEU	139
5 AFVOERLEIDINGEN	130		




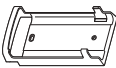

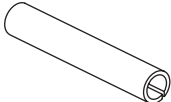

ΠΕΡΙΕΧΟΜΕΝΑ

Παρελκόμενα ανταλλακτικά και Εξαρτήματα από την τοπική αγορά	141	6 ΣΩΛΗΝΩΣΕΙΣ ΨΥΚΤΙΚΟΥ	151
1 ΠΡΟΦΥΛΑΞΕΙΣ ΑΣΦΑΛΕΙΑΣ	142	7 ΕΚΚΕΝΩΣΗ	153
2 ΔΙΑΔΙΚΑΣΙΑ ΕΓΚΑΤΑΣΤΑΣΗΣ	144	8 ΗΛΕΚΤΡΟΛΟΓΙΚΑ	156
3 ΕΠΙΛΟΓΗ ΤΟΥ ΧΩΡΟΥ ΕΓΚΑΤΑΣΤΑΣΗΣ	145	9 ΤΕΛΙΚΟΙ ΕΛΕΓΧΟΙ ΕΓΚΑΤΑΣΤΑΣΗΣ	157
4 ΕΓΚΑΤΑΣΤΑΣΗ ΤΗΣ ΕΣΩΤΕΡΙΚΗΣ ΜΟΝΑΔΑΣ	145	10 ΠΕΡΙΒΑΛΛΟΝ	159
5 ΕΓΚΑΤΑΣΤΑΣΗ ΣΩΛΗΝΩΣΕΩΝ ΑΠΟΣΤΡΑΓΓΙΣΗΣ	150		

Accessory parts and Parts to be procured locally

□ Accessory parts

Part No	Part name	Q'ty	Shape
(1)	Installation plate	1	
(2)	Installation Manual	1	
(3)	Owner's Manual	1	
(4)	Mounting screw Ø4 x 25 ℓ	8	
(5)	Flexible pipe	1	
(6)	Drain nipple (Packaged with the outdoor unit)	1	
(7)	Sasa-Zeolite plus filter	1	

Part No	Part name	Q'ty	Shape
(8)	Bio-enzyme & Gingko filter	1	
(9)	Filter frame	2	
(10)	Battery	2	
(11)	Remote controller holder	1	
(12)	Pan head wood screw Ø3.1 x 16 ℓ	2	
(13)	Pipe shield	1	
(14)	Wireless remote controller	1	

□ Parts to be procured locally

Connecting pipe (Liquid side) (6.35 mm (diam.), Nominal (diam.) 1/4" thick 0.8 mm) RAV-SM562XT-E, RAV-SM562AT-E (9.52 mm (diam.), Nominal (diam.) 3/8" thick 0.8 mm) RAV-SM802XT-E, RAV-SM802AT-E
Connecting pipe (Gas side) (12.7 mm (diam.), Nominal (diam.) 1/2" thick 0.8 mm) RAV-SM562XT-E, RAV-SM562AT-E (15.9 mm (diam.), Nominal (diam.) 5/8" thick 1.0 mm) RAV-SM802XT-E, RAV-SM802AT-E
Power supply cord 2.5 mm ² (H07RN-F or 245IEC66) or 3.5 mm ² (AWG-12)

Connecting cable H07RN-F or 245IEC66 (1.5 mm ² or more)
Thermal insulation for refrigerant pipe (10 mm or more, thermal insulating foam polyethylene)
Thermal insulation for drain pipe (10 mm or more, foam polyethylene)
Drain pipe (Outer 26 mm (diam.))
Tapes
Grounding cable (2.0 mm (diam.) or more)

1 PRECAUTIONS FOR SAFETY

- 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 adopts the new HFC refrigerant (R410A) which does not destroy ozone layer.**

The characteristics of R410A refrigerant are ; easy to absorb water, oxidizing membrane or oil, and its pressure is approx. 1.6 times higher than that of refrigerant R22. Accompanied with the new refrigerant, refrigerating oil has also been changed. Therefore, during installation work, be sure that water, dust, former refrigerant, or refrigerating oil does not enter the refrigerating cycle.

To prevent charging an incorrect refrigerant and refrigerating oil, the sizes of connecting sections of charging port of the main unit and installation tools are charged from those for the conventional refrigerant.

Accordingly the exclusive tools are required for the new refrigerant (R410A).

For connecting pipes, use new and clean piping designed for R410A, and please care so that water or dust does not enter. Moreover, do not use the existing piping because there are problems with pressure-resistance force and impurity in it.

CAUTION

To Disconnect the Appliance from Main Power Supply

This appliance must be connected to the main power supply by means of a switch with a contact separation of at least 3 mm.

The installation fuse (25A D type ) 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 electric shock.
- **Connect the connecting cable correctly.**
If the connecting cable is connected in a wrong way, electric parts may be damaged.
- **When moving the air conditioner for the installation into another place, be very careful not to enter any gaseous matter other than the specified refrigerant into the refrigeration cycle.**
If air or any other gas is mixed in the refrigerant, the gas pressure in the refrigeration cycle becomes abnormally high and it may resultingly causes pipe burst and injuries on persons.
- **Do not modify this unit by removing any of the safety guards or by by-passing any of the safety interlock switches.**
- **Exposure of unit to water or other moisture before installation may cause a short-circuit of electrical parts.**
Do not store it in a wet basement or expose to rain or water.

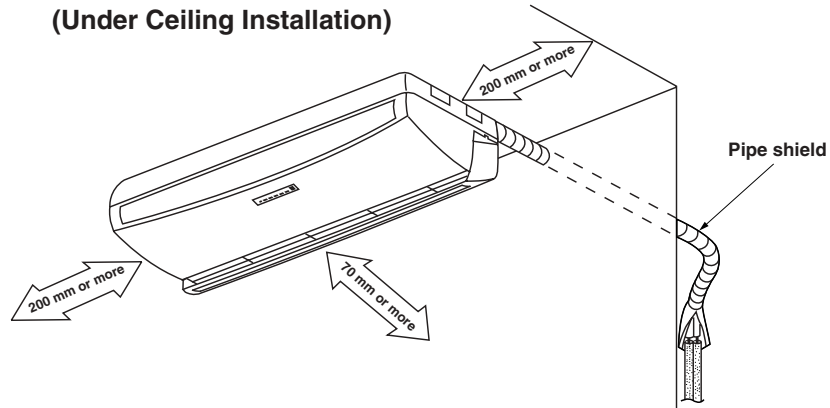
1 PRECAUTIONS FOR SAFETY

- **After unpacking the unit, examine it carefully if there are 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.**
Inappropriate installation may result in water leakage, electric shock or fire.
- **When the air conditioner is installed in a small room, provide appropriate measures to ensure that the concentration of refrigerant leakage occur in the room does not exceed the critical level.**
- **Install the air conditioner securely in a location where the base can sustain the weight 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 falling unit.
- **If refrigerant gas has leaked during the installation work, ventilate the room immediately.**
If the leaked refrigerant gas comes in contact with fire, noxious gas may generate.
- **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 gas might generate.
- **Electrical work must be performed by a qualified electrician in accordance with the Installation Manual. Make sure the air conditioner uses an exclusive power supply.**
An insufficient power supply capacity or inappropriate installation may cause fire.
- **Use the specified wires for wiring connect the terminals securely fix. To prevent external forces applied to the terminals from affecting the terminals.**
- **Be sure to provide grounding.**
Do not connect ground wires to gas pipes, water pipes, lightning rods or ground wires for telephone wires.
- **Conform to the regulations of the local electric company when wiring the power supply.**
Inappropriate grounding may cause electric shock.
- **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.

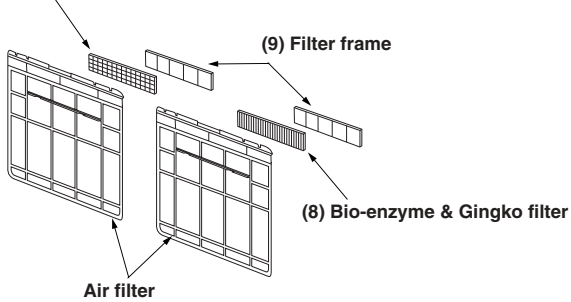
2 INSTALLATION PROCEDURE

Installation Diagram of Indoor and Outdoor Units

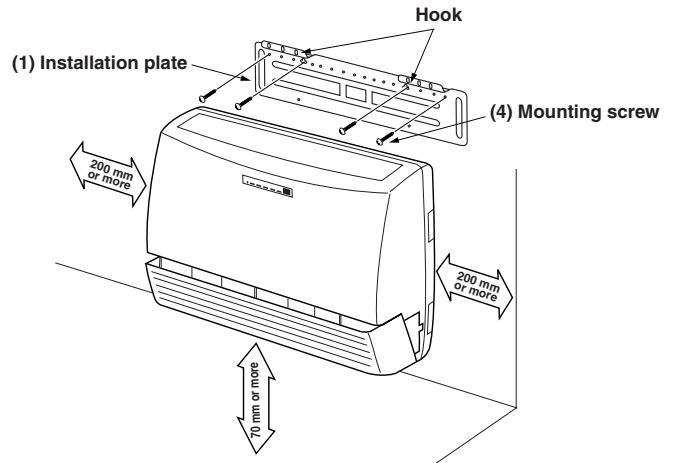
(Under Ceiling Installation)



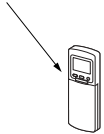
(7) Sasa-Zeolite plus filter



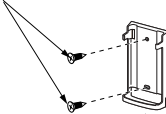
(Console Installation)



(14) Wireless remote controller



(12) Pan head wood screw

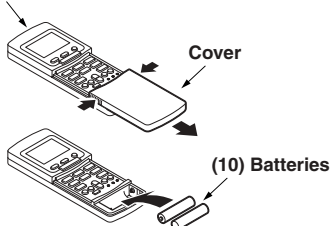


(11) Remote controller holder

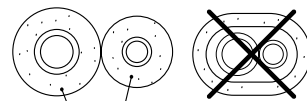
Before install the wireless remote controller

- With the remote controller cover open, load the batteries supplied correctly, observing their polarity.

(14) Wireless remote controller



Insulate the refrigerant pipes separately with insulation, not together.



Min 6 mm thick heat resisting polyethylene foam

3 SELECTION OF INSTALLATION PLACE

⚠ WARNING

- **Install the air conditioner where there is sufficient strength to withstand the weight of the unit.**
If the strength is not sufficient, the unit may fall down resulting in injury.

CAUTION

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 safe 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 noise of the outdoor unit is easy to transmit.
(When installing the air conditioner on the boundary with the neighbor, pay due attention to the level of noise.)
- Place with poor ventilation.
- An allowable height level is up to 8 m.
- Where the floor/wall/ceiling structure is unable to support the weight of the unit.

4 INSTALLATION OF INDOOR UNIT

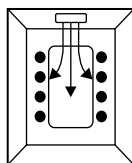
⚠ WARNING

- **Install the air conditioner certainly at a place 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.

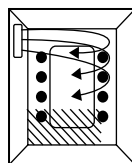
Locate the unit so as to provide uniform circulation of chilled air.

Avoid locating the unit as shown in the bad-marked figures below:

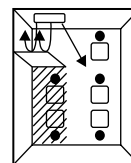
Good location
Evenly hot or cooled



Bad location
Shaded area well hot or cooled



Bad location
Shaded area well hot or cooled



If a good location is not possible, use a fan to circulate the air evenly throughout the room.

4 INSTALLATION OF INDOOR UNIT

Installation Place

- A place which provides the spaces around the indoor unit as shown in the above diagram.
- A place where there is no obstacle near the air inlet and outlet.
- A place that allows easy installation of the piping to the outdoor unit.
- A place which allows the Front panel to be opened.

CAUTION

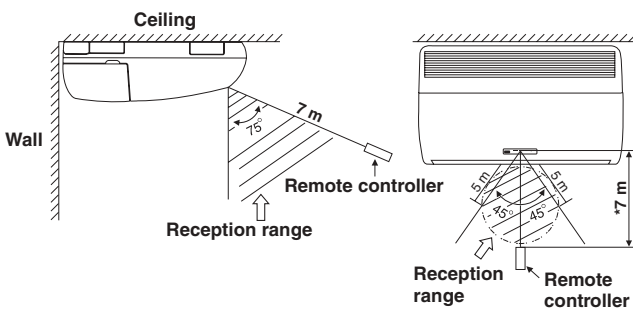
- Direct sunlight or fluorescent light to the indoor unit's wireless receiver should be avoided.
- The microprocessor in the indoor unit should not be too close to RF noise sources. (For details, see the owner's manual.)

Remote controller

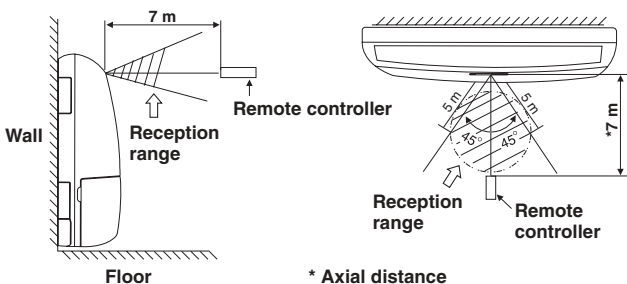
- A place where there are no obstacles such as a curtain that may block the signal from the indoor unit.
- Do not install the remote controller in a place exposed to direct sunlight or close to a heating source, such as a stove.
- Keep the remote controller at least 1 m apart from the nearest TV set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

Remote controller usage

- Under Ceiling Installation



- Console Installation



* Axial distance

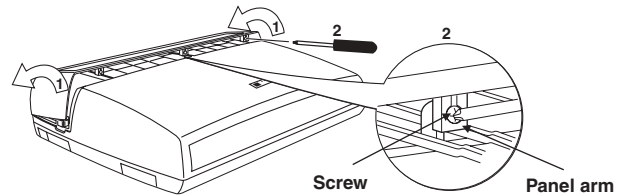
NOTICE

The Paper pattern is inside the package box cover. Do not bend and dispose of it before installing.

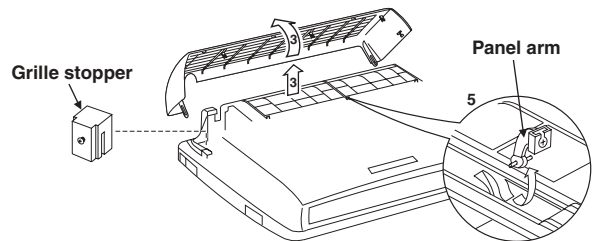
Before Installation

Remove the Air inlet grille

1. Open the Air inlet grille by both hands.
2. Loosen three screws for fixing the Panel arm. Do not remove the screws at this time.



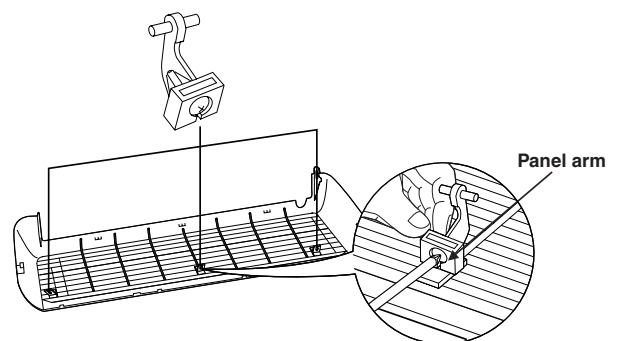
3. First, move the Air inlet grille upward, then turn it backwards.
4. Remove the Grille stopper from the axis of the Front panel. After that, remove the Air inlet grille.
5. Remove the Panel arms from the Front panel.



After Installation

Install the Air inlet grille

1. Insert the three Panel Arms on the Air inlet grille and fix each securely by screws.

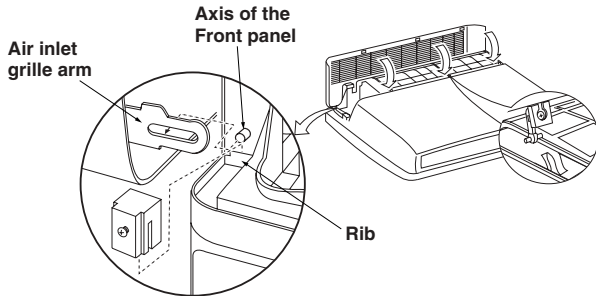


CAUTION

- The screws that fixed with Panel Arms must not be loose.

4 INSTALLATION OF INDOOR UNIT

2. Set the Air inlet grille arm to the axis of the Front panel.
3. Insert the Grille stopper to the correct position and fix it securely with screws.
4. Push the Air inlet grille to the correct position.

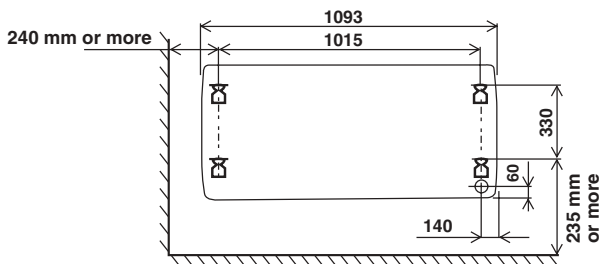


Under Ceiling Installation

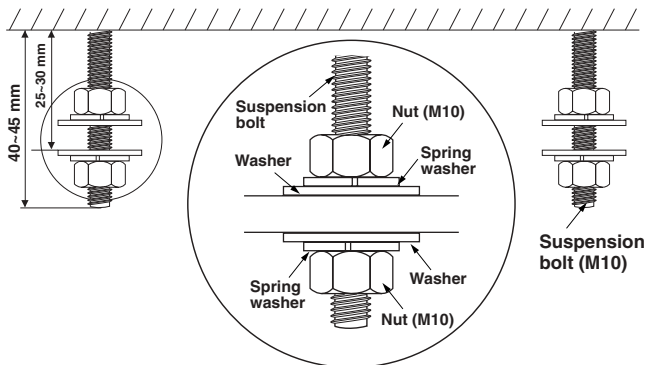
For the installation of the indoor unit use the Paper pattern, which is inside the package box cover.

Install the Suspension bolts

- Install the Suspension bolts so that it can support the indoor unit.

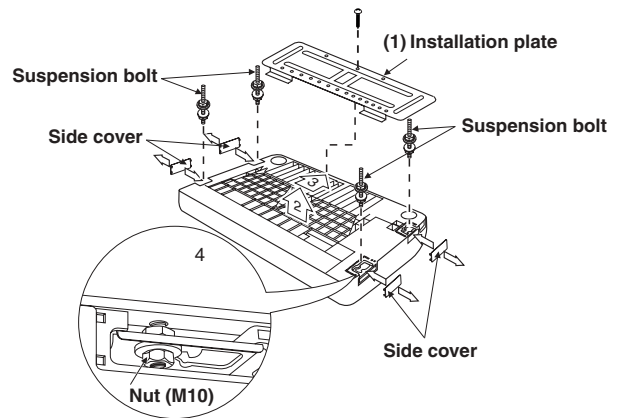


- Adjust distance to ceiling before installation.



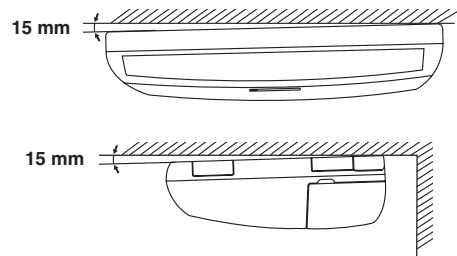
Install the indoor unit

1. Remove the Side covers and the Installation plate (1).
2. Insert the Suspension bolts into the metal fittings of the indoor unit.
3. Set to nuts, spring washers and washers on both sides of the metal fittings and then move the indoor unit backward.
4. Secure it with the M10 Nuts. (4 pcs.)
5. Attach the Side covers to the unit.



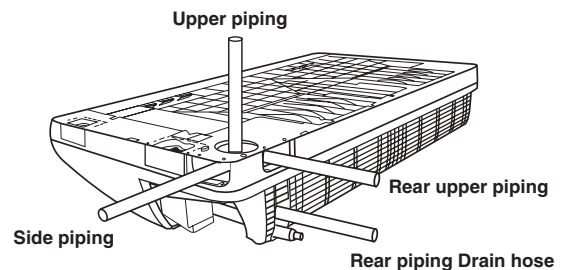
Condition for Installation

- The unit must not decline more than 15 mm in either axis.



Piping and Drain Hose Installation

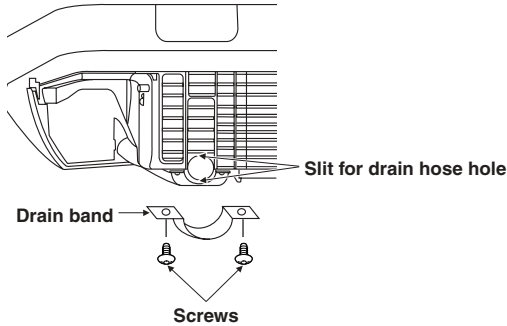
- The piping direction can be 4 ways as illustrated.
- The Drain hose is only one way.



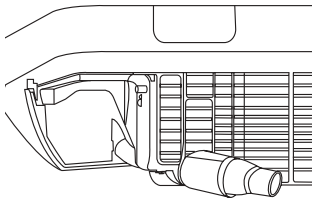
4 INSTALLATION OF INDOOR UNIT

- How to install the Drain hose.

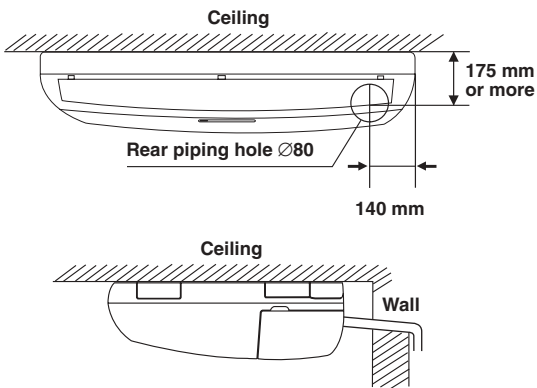
1. Remove the two screws and the Drain band.
2. Cut a slit for the drain hose hole.



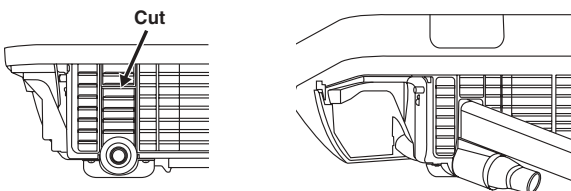
3. Place the Drain hose on the U-shape space and secure it with the Drain band and two screws.



- Rear side piping with Drain hose. (Recommended direction)

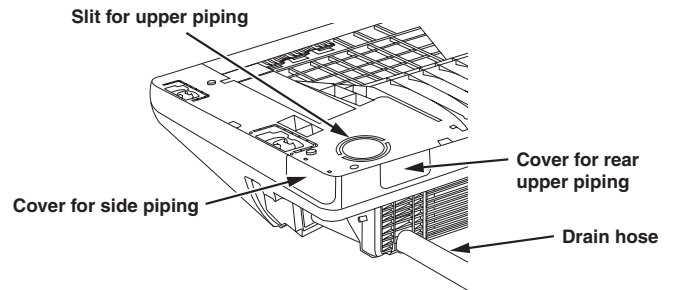


1. Cut or remove the determined direction slit or cover.
2. Pipes and the Drain hose should be fixed together by the Drain band with two screws.

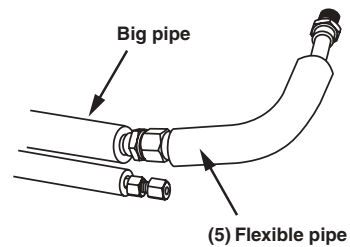


- Other direction piping.

1. Cut the slit of connecting only upper direction.



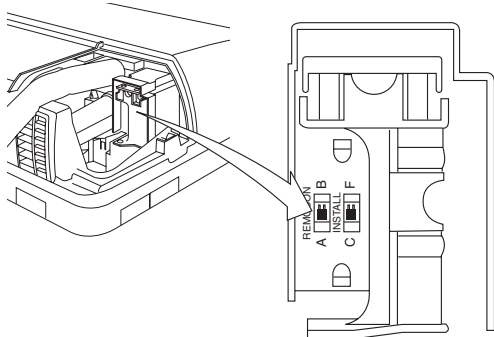
2. Connect the Flexible pipe (5) to the large pipe (Gas side).



4 INSTALLATION OF INDOOR UNIT

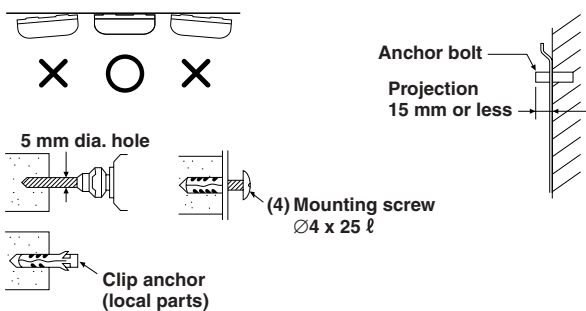
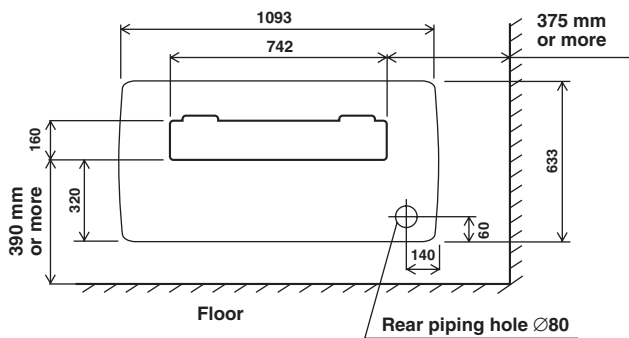
Console Installation

- Select the terminal of Selector-SW from [C position] to [F position].



Cutting a hole and mounting the Installation plate

- When installing the rear piping, determine the pipe hole position, drill the pipe hole (Ø80 mm) at a slight downward slant to the outdoor side.
- For mounting of the Installation plate (1), use the Paper pattern, which is inside the package box cover.



CAUTION

Failure to firmly install the unit may result in personal injury and property damage if the unit falls.

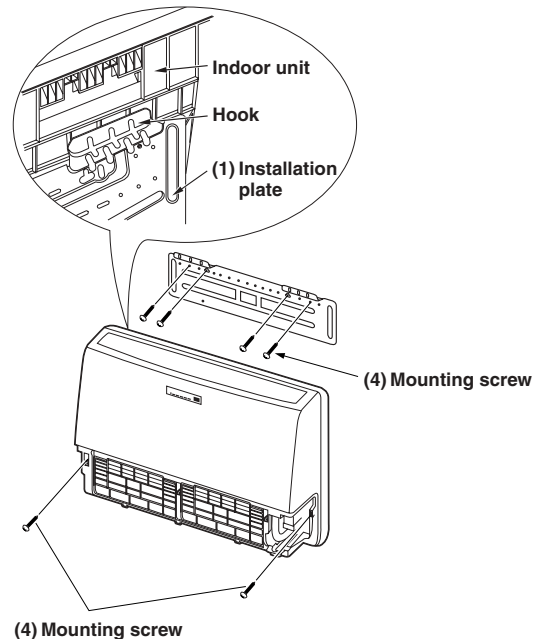
- In case of block, brick, concrete or similar type walls, make 5 mm dia. holes in the wall.
- Insert clip anchors for appropriate Mounting screws (4).

NOTE :

- Secure four corners and lower parts of the Installation plate (1) with 6 to 8 mounting screws to install it.

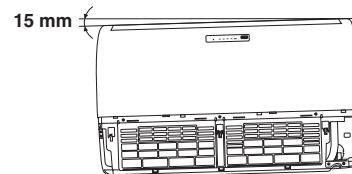
Install the indoor unit

- Install the Installation plate (1) at the wall according to the Paper pattern.
- Hang the indoor unit on the hooks of the Installation plate (1).
- Fix the lower portion of the indoor unit with Mounting screws (4) (2 places).



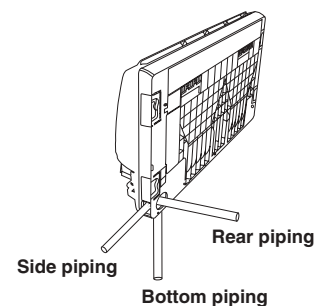
Condition for installation

- The unit must not decline more than 15 mm in either axis.

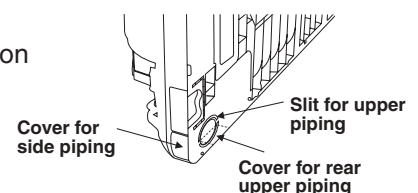


Piping and Drain Hose Installation

- The piping direction can be the following 3 ways with the Drain hose.
- Each piping direction should be connected with the Flexible pipe (5).



- Cut or remove the determined direction slit or cover.



5 DRAIN PIPING WORK

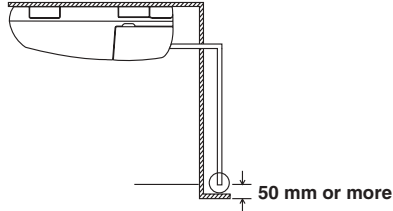
Drainage

1. Run the Drain hose sloping downward.

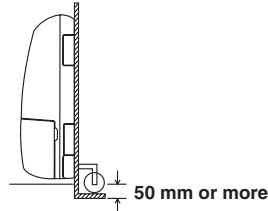
NOTE :

- The hole should be made at a slight downward slant on the outdoor side.

Under Ceiling Installation



Console Installation



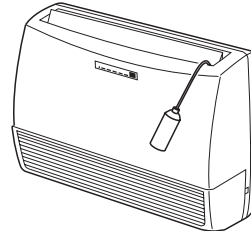
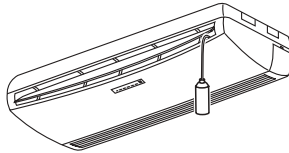
NOTICE

In case of upward drainage from the unit, (Under Ceiling Installation), it is necessary to use the Drain pump kit of separately sold optional part.

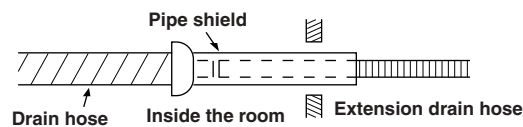
CAUTION

1. Do not raise the Drain hose.
2. Do not put the Drain hose into water.
3. Do not form the Drain hose into a wave shape.
4. Do not put the Drain hose end in the drainage ditch.

2. Open the louver manually and put some water into it.
Then check the flow of water from the Drain hose.



3. When connecting the Extension drain hose; insulate the connecting part of Extension drain hose with the Pipe shield.



CAUTION

Arrange the drain pipe for proper drainage from the unit.
Improper drainage can result in dew-dropping. (Provide by customer)

6 REFRIGERANT PIPING

Refrigerant Piping

1. If the outdoor units are to be mounted on a wall, make sure that the platform supporting 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 also 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. Take away 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 Head

The maximum piping length from the outdoor to indoor unit		The maximum height difference outdoor/indoor unit	
30 m (Without charge 20 m) (RAV-SM562AT-E)	50 m (Without charge 20 m) (RAV-SM802AT-E)	Outdoor unit is above	Outdoor unit is below
		30 m	15 m

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.

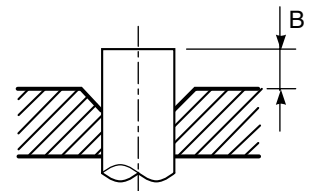
• Projection margin in flaring : B (Unit : mm)

Rigid (Clutch type)

Outer diam. of copper pipe	R410A tool used		Conventional tools used	
	R410A	R22	R410A	R22
6.35/9.52	0 to 0.5	(Same as left)	1.0 to 1.5	0.5 to 1.0
12.7/15.9	0 to 0.5	(Same as left)	1.0 to 1.5	0.5 to 1.0

• Flaring dia meter size : A (Unit : mm)

Outer diam. of copper pipe	A ⁺⁰ _{-0.4}	
	R410A	R22
6.35	9.1	9.0
12.7/15.9	16.6	16.2

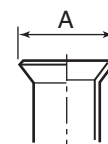


Imperial (Wing nut type)

Outer diam. of copper pipe	R410A	R22
6.35/9.52	1.5 to 2.0	1.0 to 1.5
12.7/15.9	2.0 to 2.5	1.5 to 2.0

* In the case of the flaring for R410A with the conventional flare tool, pull out it 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.



6 REFRIGERANT PIPING

Tightening connection

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.

CAUTION

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

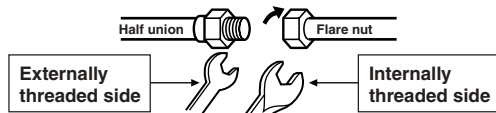
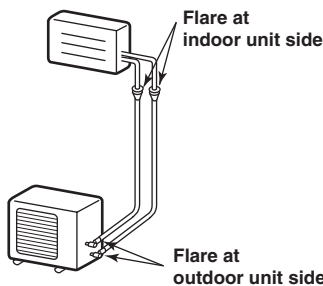
(Unit : N•m)

Outer diam. of copper pipe	Tightening torque
6.35 mm (diam.)	14 to 18 (1.4 to 1.8 kgf•m)
9.52 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)
15.9 mm (diam.)	63 to 77 (6.3 to 7.7 kgf•m)

Tightening torque of flare pipe connections

Pressure of R410A becomes higher than that of R22. (Approx. 1.6 times) Therefore, using a torque wrench, tighten firmly the flare pipe connecting sections which connect the indoor and outdoor units up to the specified tightening torque.

Incorrect connections may cause not only a gas leakage, but also a trouble of the refrigeration cycle or compressor damage.



Use a wrench to secure.

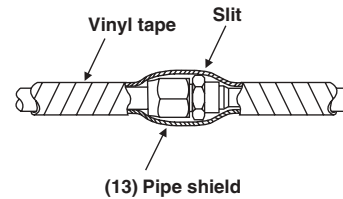
Use a torque wrench to tighten.

Pipe Shield for Flare Nut Connection

Joints in liquid and gas pipes of the indoor unit should be insulated with an attached Pipe shield (13).

How to install the pipe shield

- Cut the Pipe shield (13) to appropriate length.
- Set the Pipe shield (13).
- In case of a ceiling installation, orient the slit at the top of the pipe.
- Fix the Pipe shield (13) with vinyl tape.



7 EVACUATING

AIR PURGE

Evacuate the air in the connecting pipe 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 pipe 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 30 meters for model SM562 and 50 meters for model SM802. (assuming a pump capacity of 27 liters per minute.) Then confirm that the compound pressure gauge reading is -101 kPa (-76 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.

NOTE :

- Use the vacuum pump, vacuum pump adapters, and gauge manifold referring to the manuals attached to each tool before using them.
For the vacuum pump, check oil is filled up to the specified line of the oil gauge.
- While the air is purged, check again that the connecting port of charge hose, which has a projection to push the valve core, is firmly connected to the charge port.

Valve handling precautions

- Open the valve stem or the handle until it strikes the stopper. It is unnecessary to apply further force.
- Securely tighten the cap with a torque wrench.

Cap tightening torque

Valve size	Ø6.4	14 to 18 N•m (1.4 to 1.8 kgf•m)
	Ø9.5	33 to 42 N•m (3.3 to 4.2 kgf•m)
	Ø12.7	33 to 42 N•m (3.3 to 4.2 kgf•m)
	Ø15.9	20 to 25 N•m (2.0 to 2.5 kgf•m)
Charge port		14 to 18 N•m (1.4 to 1.8 kgf•m)

Additional refrigerant

1. The amount of refrigerant put into the outdoor unit at the factory is sufficient to fill up to 20 m of refrigerant piping work.
2. If the length of the refrigerant piping work is 20 m or less, addition of refrigerant at the installation site is unnecessary.
3. If the length of the piping work exceeds 20 m, extra refrigerant must be added. Refer to the outdoor installation manual for details of the extra amounts.
4. Overcharge or undercharge of refrigerant in the outdoor unit may cause malfunction of the compressor.

Add Only R410A Refrigerant to These Units

7 EVACUATING

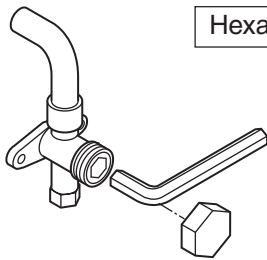
Heat insulation

1. Provide heat insulation on the refrigerant piping on both the liquid side and gas side separately, and ensure that all joints in the insulation are completely sealed (without gap).
2. Since the temperature of the piping on the gas side increases during heating operations, the heat insulating material used must be able to withstand temperatures of more than 120°C.
3. Use the pipe insulation supplied in the accessory pack to insulate the piping connecting section on the indoor unit side.

Packed v valve handling precautions

- Open the valve stem all the way out; do not try to open it beyond the stopper.
- 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)
Liquid side (9.52 mm (diam.))	33 to 42 N•m (3.3 to 4.2 kgf•m)
Liquid side (6.35 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)

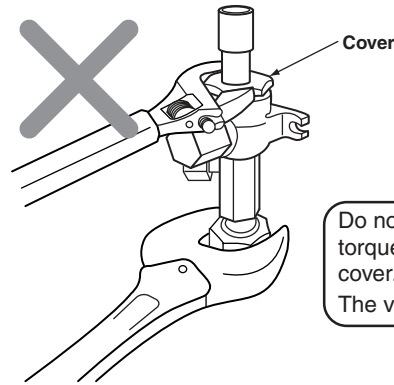
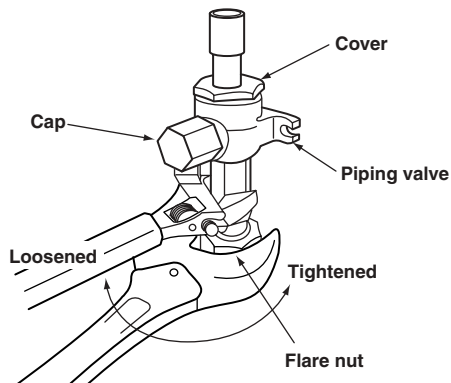


Hexagonal wrench is required.

<For RAV-SM802A T-E model>

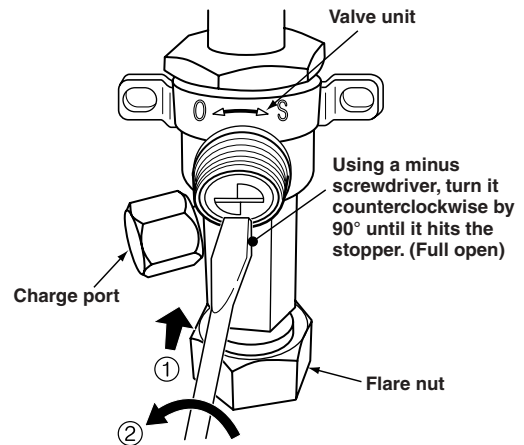
- As shown in the figure, be sure to use a double spanner to loosen or tighten the flare nut of the valve at gas side. If using a single spanner, the nut cannot be tightened with necessary tightening torque.

SM802 type v valve at gas side

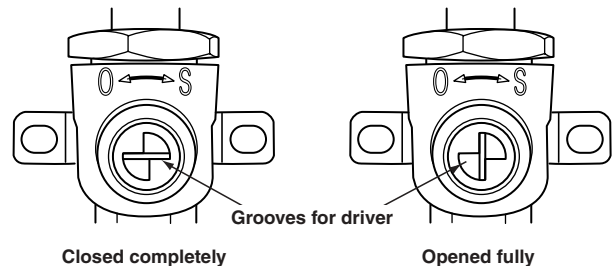


Do not put the spanner or torque wrench, etc. on the cover.
The valve may be broken.

- On the contrary, use a single spanner to loosen or tighten the flare nut of the valve at liquid side.

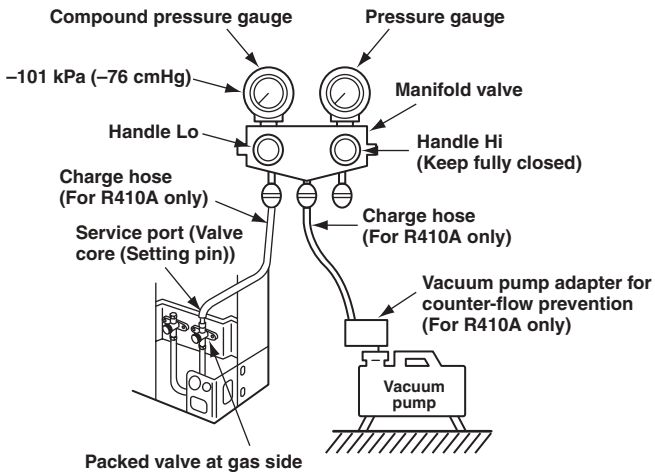


Position of grooves for driver

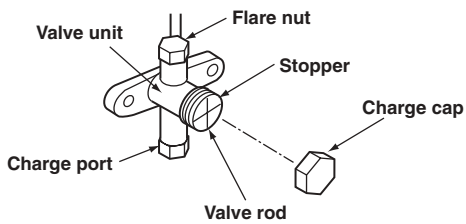
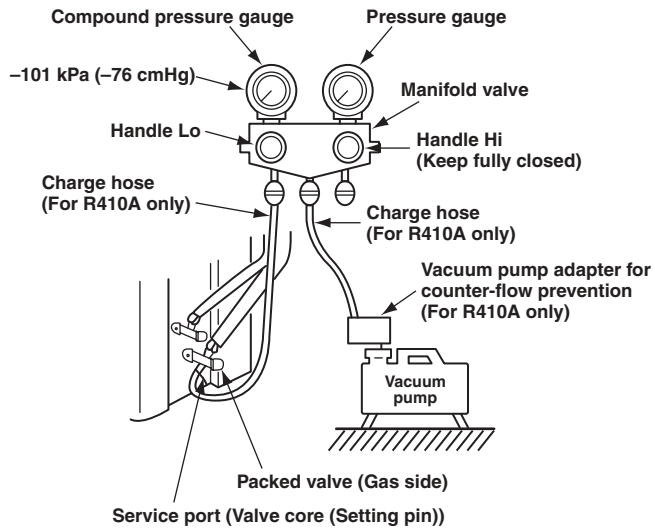


- *1. When opened fully, do not apply an excessive torque after the screwdriver hit the stopper; otherwise a trouble may be caused on the valve. (5 N•m or less)

7 EVACUATING



<For RAV-SM562A T-E model>



8 ELECTRICAL WORK

For the air conditioner that has no power cord.

NOTE :

For selection and connection method of the power supply cords, refer to the details in the Installation Manual of the outdoor unit.

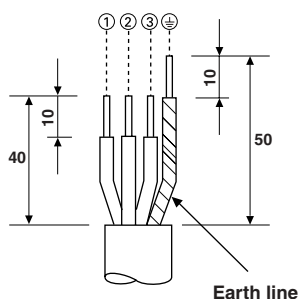
CAUTION

- If incorrect/incomplete wiring is carried out, it may cause an electrical fire or smoke.
- Prepare the power supply for exclusive use with the air conditioner.
- Be sure to use the cord clamps specified positions with 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 cords 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 with specified thickness, specified type, and protective devices specified.

How to wire

1. Connect the connecting wire to the terminal as identified with their respective matched numbers on the terminal block of indoor and outdoor unit.
H07RN-F or 245IEC66 (1.5 mm² or more)
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 cut wire jointed to another on the way.

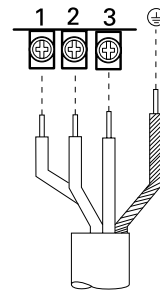
Stripping length of connecting cable



NOTE :

Use stranded wire only.

- Wire type : More than 1.5 mm² (H07RN-F or 245IEC66) or 1.3 mm² (AWG-16)



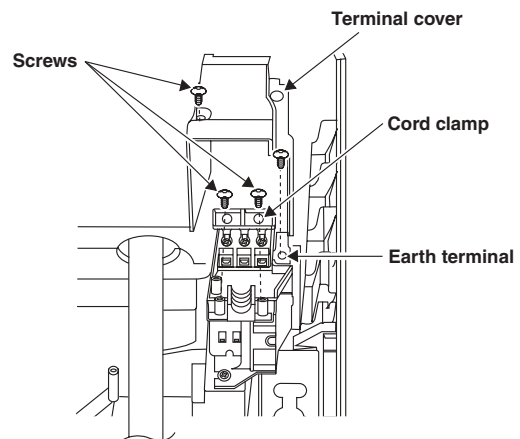
NOTE :

Connect the earth line to the metallic part (⊕ mark) located at the side of 3P terminal.

Wiring between units

1. Connect the wires between the units correctly.
Errors made in the connections can result in the unit malfunctioning.
2. Connect the control wires between the outdoor unit and indoor unit as shown in the figure below:

Wiring Connections



1. Remove the Terminal cover and the Cord clamp.
2. Insert the connecting cable into the pipe hole on the wall.
3. Insert the connecting cable fully into the terminal block and secure it tightly with the screw.
Tightening Torque: 1.2 N•m (0.12 kgf•m)
4. Fix the connecting cable by the Cord clamp with two screws.
5. Fix the Terminal cover.

9 FINAL INSTALLATION CHECKS

Precautions

1. Ensure that the electrical cable used for power supply and control of the system is unable to come into contact with either service valves or piping work which are not insulated.

Electrical wiring

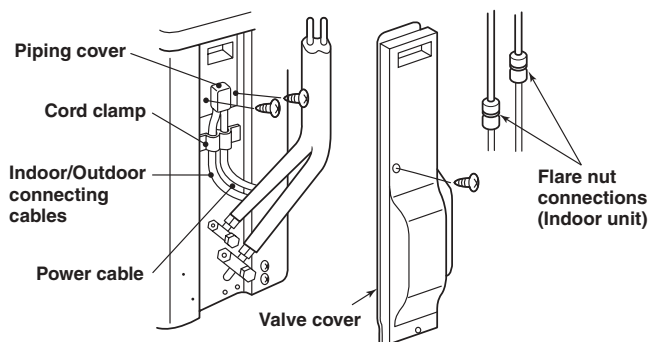
1. When installation is complete, check that all power supply and interconnecting wiring has been appropriately protected.

Refrigerant piping

1. When refrigerant and drain piping have been completed. Ensure that all pipework is fully insulated and apply finishing tape to seal the insulation.

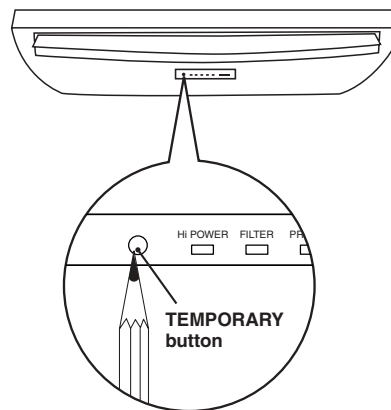
Check and Test Operation

- Pressure of R410A is approx. 1.6 times of that of R22. If installation work is incompletely finished, a gas leakage may occur at the cases such as pressure rise during operation. Therefore, be sure to test the piping connections for leakage.
- Check the flare nut connections, valve stem cap connections and service port cap fittings for gas leak with a leak detector or soap water.



Test Operation

To switch the TEST RUN (COOL) mode, push TEMPORARY button for 10 sec.
(The beeper will make a short beep.)



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

- Press and hold the TEMPORARY button for about 3 seconds. After 3 seconds, the electronic beeper makes three short beeps to tell you the Auto Restart has been selected.
- To cancel the Auto Restart, follow the steps described in the section Auto Restart Function of the Owner's Manual.

9 FINAL INSTALLATION CHECKS

Useful Functions (SM802AT-E only)

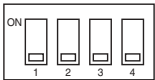
Self-Diagnosis by LED Indication

In addition to the code checking by remote controller of the indoor unit, troubles of the outdoor unit can be diagnosed by LED indications on the cycle control P.C. board of the outdoor unit. Utilize them for various checks.

For the check by remote controller of the indoor unit, refer to the installation Manual of the indoor unit.

Before a check, confirm each bit of the DIP switch is set to OFF position.

LED indication and code checking

DIP switch SW802	Cycle control P.C. board				Cause
	LED indication				
	D800	D801	D802	D803	
	○	●	●	●	Heat exchanger sensor (TE) error
	●	●	○	●	Suction sensor (TS) error
	○	○	●	●	Discharge sensor (TD) error
	●	○	●	○	High-pressure protection error
	●	○	●	●	Outdoor temperature sensor (TO) error
	○	○	○	●	DC outside fan error
	○	●	●	○	Communication error between IPDU
	●	○	○	●	Discharge temp. error
	○	○	●	○	EEPROM error
	●	●	○	○	Communication error between IPDU
	◎	●	●	●	G-Tr short-circuit protection
	●	◎	●	●	Detect circuit error
	◎	◎	●	●	Current sensor error
	●	●	◎	●	Comp. lock error
	◎	●	◎	●	Comp. break down
	●	●	●	◎	Phase missing detection, Detection of coming-off of CT current sensor
	●	○	●	○	Serial communication error by thermo. operation of Comp. case

LED indication

○ : Red

○ : Yellow

○ : Yellow

○ : Yellow

◎ : Rapid flash

● : Go off

○ : Go on








Installation/Service Tools

Changes in the product and components

In the case of an air conditioner using R410A, in order to prevent any other refrigerant from being charged accidentally, the service port diameter of the outdoor unit control valve (3 way valve) has been changed. (1/2 UNF 20 threads per inch)

- In order to increase the pressure resisting strength of the refrigerant piping, flare processing diameter and size of opposite side of flare nuts has been changed. (for copper pipes with nominal dimensions 1/2 and 5/8)

New tools for R410A

New tools for R410A	Applicable to R22 model	Changes
Gauge manifold	×	 As pressure is high, it is impossible to measure by means of conventional gauge. In order to prevent any other refrigerant from being charged, each port diameter is changed.
Charge hose	×	 In order to increase pressure resisting strength, hose materials and port size are changed (to 1/2 UNF 20 threads per inch). When purchasing a charge hose, be sure to check the port size.
Electronic balance for refrigerant charging	○	 As pressure is high and gasification speed is fast, it is difficult to read the indicated value by means of charging cylinder, as air bubbles occur.
Torque wrench (nominal diam. 1/2, 5/8)	×	 The size of opposite sides of flare nuts have been increased. Incidentally, a common wrench is used for nominal diameters 1/4 and 3/8.
Flare tool (clutch type)	○	 By increasing the clamp bar's receiving hole, strength of spring in the tool has been improved.
Gauge for projection adjustment	—	— Used when flare is made with using conventional flare tool.
Vacuum pump adapter	○	 Connected to the conventional vacuum pump. It is necessary to use an adapter to prevent vacuum pump oil from flowing back to the charge hose. The charge hose connecting part has two ports-one for conventional refrigerant (7/16 UNF 20 threads per inch) and one for R410A. If the vacuum pump oil (mineral) mixes with R410A a sludge may occur and damage the equipment.
Gas leakage detector	×	 Exclusive for HFC refrigerant.

- Incidentally, the "refrigerant cylinder" comes with the refrigerant designation (R410A) and protector coating in the U. S.'s ARI specified rose color (ARI color code: PMS 507).
- Also, the "charge port and packing for refrigerant cylinder" require 1/2 UNF 20 threads per inch corresponding to the charge hose's port size.

10 ENVIRONMENT

Environmental Issues

Product maintenance

1. To minimize the chances of environmental damage and to ensure the efficient operation of the unit, it is recommended to have the air conditioner periodically checked and serviced by a qualified engineer.

Product disposal

1. Please dispose of the air conditioner unit in an environmentally responsible manner.
Recycling is the preferred disposal method.
2. When disposing of an air conditioner system, contact either the manufacture, your local environmental control authority or a local waste disposal company for advice.
3. Ensure all packing material is either recycled or disposed of in accordance with local regulations.
4. The refrigerant gas within the unit should only be removed by an authorized company.

WARNING

Discharge of refrigerant to atmosphere is illegal and may lead to prosecution.

MEMO
