

# AIR CONDITIONER OUTDOOR UNIT

# INSTALLATION MANUAL

For authorized service personnel only.



PART No.9387693010

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## 1. SAFETY PRECAUTIONS

- Read carefully all of safety information written in this manual before you install or use the air conditioner.
- The warnings and precautions indicated in this manual contain important information pertaining to your safety. Be sure to observe them.
- Hand this manual, together with the operating manual, to the customer. Request the customer to keep them on hand for future use, such as for relocating or repairing the unit.

### ! WARNING

Indicates a potentially or imminently hazardous situation which, if not avoided, could result in death or serious injury.

### ! CAUTION

Indicates a potentially hazardous situation that may result in minor or moderate injury or damage to property.

### ! WARNING

To avoid getting an electric shock, never touch the electrical components soon after the power supply has been turned off. After turning off the power, always wait 10 minutes or more before you touch the electrical components.

Installation of this product must be done by experienced service technicians or professional installers only in accordance with this manual. Installation by non-professional or improper installation of the product might cause serious accidents such as injury, water leakage, electric shock, or fire. If the product is installed in disregard of the instructions in this manual, it will void the manufacturer's warranty.

Do not turn on the power until all work has been completed. Turning on the power before the work is completed can cause serious accidents such as an electric shock or a fire.

If refrigerant leaks when you are working, ventilate the area. If the leaking refrigerant is exposed to a direct flame, it may produce a toxic gas.

Installation must be performed in accordance with regulations, codes, or standards for electrical wiring and equipment in each country, region, or the installation place.

Do not use this equipment with air or any other unspecified refrigerant in the refrigerant lines. Excess pressure can cause a rupture.

During installation, make sure that the refrigerant pipe is attached firmly before you run the compressor. Do not operate the compressor under the condition of refrigerant piping not attached properly with 2-way or 3-way valve open. This may cause abnormal pressure in the refrigeration cycle that leads to rupture and even injury.

When installing or relocating the air conditioner, do not mix gases other than the specified refrigerant (R410A) to enter the refrigerant cycle.

If air or other gas enters the refrigerant cycle, the pressure inside the cycle will rise to an abnormally high value and cause rupture, injury, etc.

For appropriate working of the air conditioner, install it as written in this manual.

To connect indoor unit and outdoor unit, or indoor unit and branch box, use air conditioner piping and cables available through your local distributor. This manual describes proper connections using such installation set.

Do not modify power cable, use extension cable or branch wiring. Improper use may cause electric shock or fire by poor connection, insufficient insulation or over current.

Do not purge the air with refrigerants but use a vacuum pump to vacuum the installation.

There is no extra refrigerant in the outdoor unit for air purging.

Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.

The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater.)

Do not pierce or burn.

Be aware that refrigerants may not contain an odour.

Using the same vacuum pump for different refrigerants may damage the vacuum pump or the unit.

Use a clean gauge manifold, vacuum pump and charging hose for R410A exclusively.

### ! WARNING

Do not modify this unit, such as opening a hole in the cabinet.

During the pump-down operation, make sure that the compressor is turned off before you remove the refrigerant piping.

Do not remove the connection pipe while the compressor is in operation with 2 way or 3 way valve open. This may cause abnormal pressure in the refrigeration cycle that leads to rupture and even injury.

### ! CAUTION

This unit must be installed by qualified personnel with a capacity certification of handling refrigerant fluids. Refer to regulation and laws in use on installation place.

Install the unit by following local codes and regulations in force at the place of installation, and the instructions provided by the manufacturer.

This unit is part of a set constituting an air conditioner. The unit must not be installed alone or be installed with non-authorized device by the manufacturer.

When installing pipes shorter than 2 m, sound of the outdoor unit will be transferred to the indoor unit, which will cause large operating sound or some abnormal sound.

To protect the persons, earth( ground) the unit correctly, and use the power cable combined with a circuit breaker and an Earth Leakage Circuit Breaker (ELCB).

The units are not explosion proof, and therefore should not be installed in explosive atmosphere.

This unit contains no user-serviceable parts. Always consult experienced service technicians for repairing.

When moving or relocating the air conditioner, consult experienced service technicians for disconnection and reinstallation of the unit.

Do not touch the aluminum fins of heat exchanger built-in the indoor or outdoor unit to avoid personal injury when you install or maintain the unit.

Do not place any other electrical products or household belongings under indoor unit or outdoor unit. Condensation dripping from the unit might get them wet, and may cause damage or malfunction of your property.

## 2. ABOUT THIS PRODUCT

### 2.1. Special tools for R410A

Tool name	Change from R22 to R410A
Gauge manifold	Pressure is high and cannot be measured with a conventional (R22) gauge. To prevent erroneous mixing of other refrigerants, the diameter of each port has been changed. It is recommended to use gauge with seals -0.1 to 5.3 MPa (-1 to 53 bar) for high pressure. -0.1 to 3.8 MPa (-1 to 38 bar) for low pressure.
Charge hose	To increase pressure resistance, the hose material and base size were changed.(R410A)
Vacuum pump	A conventional vacuum pump can be used by installing a vacuum pump adapter. (Use of a vacuum pump with a series motor is prohibited.)
Gas leakage detector	Special gas leakage detector for HFC refrigerant R410A.

English

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## Copper pipes

It is necessary to use seamless copper pipes and it is desirable that the amount of residual oil is less than 40 mg/10 m. Do not use copper pipes having a collapsed, deformed or discolored portion (especially on the interior surface). Otherwise, the expansion value or capillary tube may become blocked with contaminants.

As an air conditioner using R410A incurs pressure higher than when using R22, it is necessary to choose adequate materials.

Thicknesses of copper pipes used with R410A are as shown in Table1. Never use copper pipes thinner than 0.8 mm even when it is available on the market.

### Thicknesses of Annealed Copper Pipes

Nominal diameter (in.)	Outer diameter (mm)	Thickness (mm)
1/4	6.35	0.80
3/8	9.52	0.80

### WARNING

To install a unit that uses R410A refrigerant, use dedicated tools and piping materials that have been manufactured specifically for R410A use. Because the pressure of R410A refrigerant is approximately 1.6 times higher than R22, failure to use dedicated piping material or improper installation can cause rupture or injury. Furthermore, it can cause serious accidents such as water leakage, electric shock, or fire.

## 2.2. Power

### WARNING

Always use a special branch circuit and install a special receptacle to supply power to the room air conditioner.

Use a circuit breaker and receptacle matched to the capacity of the air conditioner.

Install a leakage circuit breaker in accordance with the related laws and regulations and electric company standards.

The circuit breaker is installed in the permanent wiring. Always use a circuit that can trip all the poles of the wiring and has an isolation distance of at least 3 mm between the contacts of each pole.

### CAUTION

The power source capacity must be the sum of the air conditioner current and the current of other electrical appliances. When the current contracted capacity is insufficient, change the contracted capacity.

When the voltage is low and the air conditioner is difficult to start, contact the power company the voltage raised.

## 2.3. Electric requirement

### CAUTION

Be sure to install a breaker of the specified capacity.

Regulation of breaker differs from each locality, refer in accordance with local rules.

Voltage rating	1 Ø 220 V (50 Hz)
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Operating range	198-242 V
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Cable	Conductor size [mm <sup>2</sup> ]	Type	Remarks
Connection cable	1.5	Type 60245 IEC57	3cable + Earth (Ground)

Max. wire length: Set a length so that the voltage drop is less than 2%. Increase the wire diameter when the wire length is long.

Breaker	Specification <sup>1</sup>
Circuit breaker (over current)	Current : 15(A)
Earth Leakage Circuit Breaker	Leakage current : 30mA 0.1sec or less <sup>2</sup>

<sup>1</sup> Select the appropriate breaker of the described specification according to the national or regional standards.

<sup>2</sup> Select the breaker that enough load current can pass through it.

• Before starting work check that power is not being supplied to all poles of the indoor unit and outdoor unit.

• Install all electrical works in accordance to the national wiring regulations.

• Install the circuit breaker with a contact gap of at least 3 mm in all poles nearby the units.

• Install the circuit breaker nearby the units.

## 2.4. Pipe length

Pipe length	Maximum length	Maximum height (between indoor and outdoor)
	5 m	3 m

### CAUTION

If the units are further apart than the maximum length of the piping is specified, correct operation can not be guaranteed.

The outdoor unit with the refrigerant removed from the packaging is sealed. (Indoor unit, the refrigerant is not sealed.)

## 2.5. Additional charge

When the piping is longer than 2 m, additional charging is necessary.

For the additional amount, see the table below.

Pipe length	2 m	5 m	Rate
None	+30 g	10 g/m	

### CAUTION

When adding refrigerant, add the refrigerant from the charging port at the completion of work.

## 2.6. Operating range

	Cooling mode Dry mode	Heating mode
Outdoor temperature	21 to 43 °C	0 to 24 °C

## 2.7. Accessories

The following installation accessories are supplied.

Use them as required.

BRKT install A	1	BRKT install B	1	Drain pan	1	Hexagon head bolt (M6 × 12)	2
M8 Washer	2	Nut	2	Tapping screw (Fix drain pan)	1	Rub sheet (VIB PROOF)	4

One set of following parts are necessary installation of this product.

Name			
Connection pipe assembly	Decorative tape	Saddle	Tapping screws
Connection cable	Vinyl tape	Drain hose	Sealant
Wall pipe	Wall cap	Anchor bolt (M8) 4 pcs	Anchor nut (M8) 4 pcs

## 3. SELECTING THE MOUNTING POSITION

- Decide the mounting position with the customer as follows.
- Do not set to a place where there is oily smoke, oil is used in the factory, the unit can contact sea breeze, sulfide gases will be generated in the hot spring area, corrosive gases will be generated, animal may urine on the unit and ammonia will be generated and a dusty place.

### 3.1. Outdoor unit

- If possible, do not install the unit where it will be exposed to direct sunlight. (If necessary, Install a blind that does not interfere with the air flow.)
- Do not install the unit where a strong wind blows or where it is very dusty.
- Do not install in an area that has heat sources, vapors, or the risk of leakage or accumulation of flammable gas.
- Do not install the unit where people pass.
- Take you neighbors into consideration so that they are not disturbed by air blowing into their windows or by noise.
- Provide the space shown in figure so that the airflow is not blocked. Also for efficient operation, leave open three of the four directions front, rear, and both sides.
- Install the unit where keep away more than 3 m from the antenna of TV set and Radio.
- Outdoor unit should be set to a place where both drainage and itself will not be affected when heating.

### WARNING

Install at a place that can withstand the weight of the outdoor units and install positively so that the units will not topple or fall.

### CAUTION

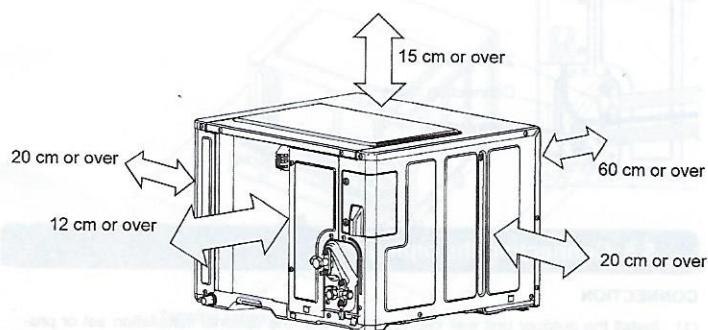
Do not install where there is the danger of combustible gas leakage.

Do not install near heat sources.

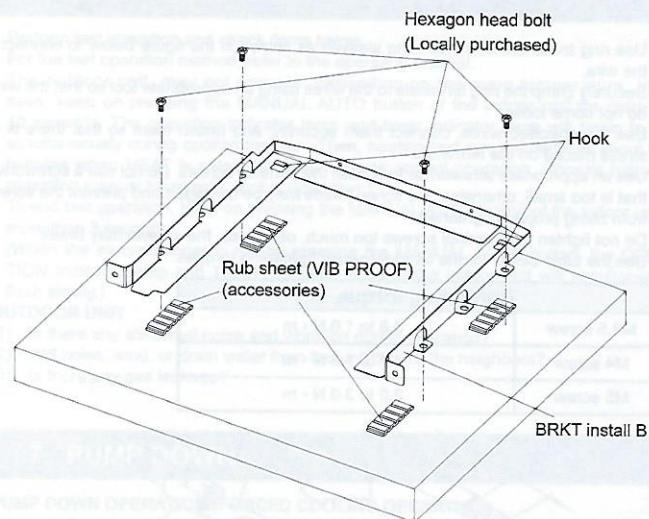
If children may approach the unit, take preventive measures so that they cannot reach the unit.

## 4. INSTALLATION DIAGRAM

Provide the space shown in the following figure so that the air flow is not blocked. Also for efficient operation, leave open three of the four directions front, rear, and both sides.



(2) Fasten BRKT install B with the anchor bolts.



## 5. INSTALLATION

### 5.1. Outdoor unit installation

- Set the unit on a strong stand such as thing made of concrete blocks to minimize shock and vibration.
- Do not set the unit directly on the ground because it will cause trouble.

#### WARNING

Install the unit where it will not be tilted by more than 5°.

When installing the outdoor unit where it may exposed to strong wind, fasten it securely.

Unit mounting a flat and horizontal place.

Check if the anchor bolt and anchor nut installation positions have a concrete compression strength of at least 200kg/cm<sup>2</sup>.

Do not use a position weaker than this.

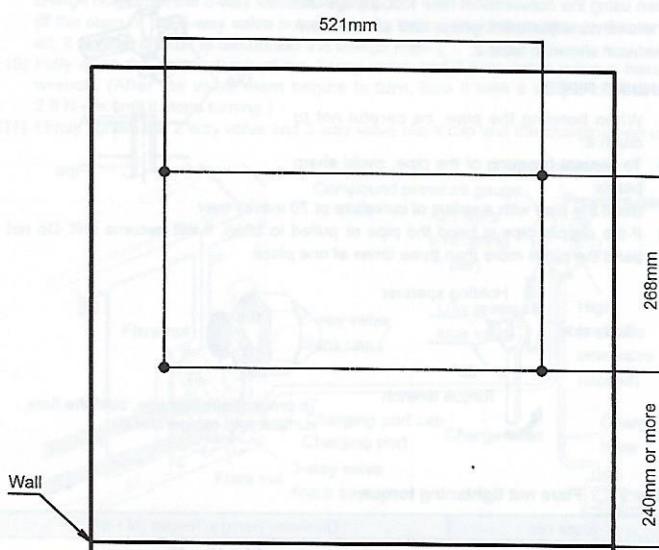
When installing the outdoor unit where it may exposed to strong wind, fasten it securely.

Do not set the unit directly on the ground because it will cause trouble.

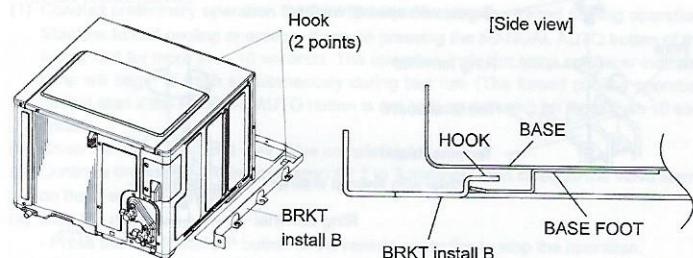
When installing the air condition near the coast, or where rust is easily generated, do not use the coupling parts supplied. Use all salt-resistant coupling parts.

When working at a high place, the unit, parts, tools, etc. may be dropped. Take counter-measures against dropping of such a articles.

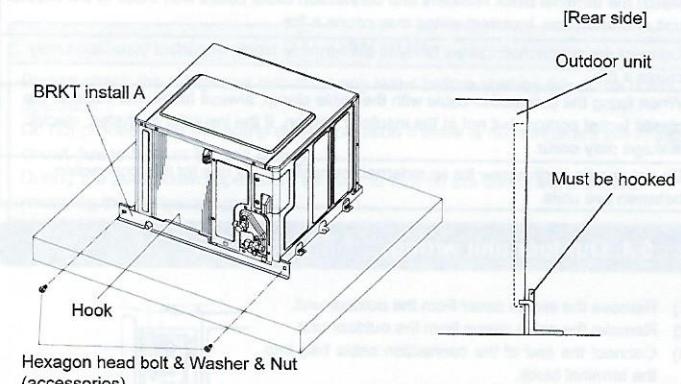
(1) Drill mounting holes for the anchor bolts and anchor nuts at a flat place. (If the unit is not installed at a flat place, drain will be difficult.)  
Insert the anchor bolts and anchor nuts into the holes.



(3) Install the outdoor unit. At this time, check that the outdoor unit is not floating at the BRKT install B hook.



(4) Fasten BRKT install A and BRKT install B with Hexagon head bolt and washer.



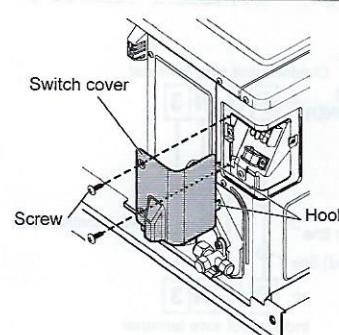
### 5.2. Switch cover removal

#### Switch cover removal

- (1) Remove the tapping screws(x2).
- (2) Pull forward the Switch cover.

#### Installing the Switch cover

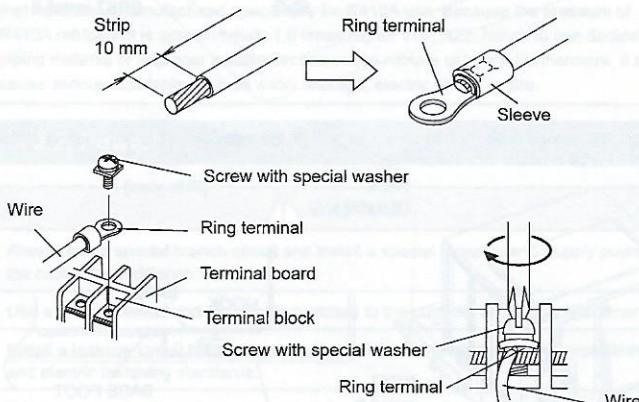
After inserting the two hooks of switch cover, and then tighten the tapping screw.



### 5.3. How to connect the wire to the terminals

- (1) Use ring terminals with insulating sleeves as shown in the figure below to connect to the wire.
- (2) Securely crimp the ring terminals to the wires using an appropriate tool so that the wires do not come loose.
- (3) Use the specified wires, connect them securely, and fasten them so that there is no stress placed on the terminals.
- (4) Use an appropriate screwdriver to tighten the terminal screws. Do not use a screwdriver that is too small, otherwise, the screw heads may be damaged and prevent the screws from being properly tightened.
- (5) Do not tighten the terminal screws too much, otherwise, the screws may break.
- (6) See the table below for the terminal screw tightening torques.

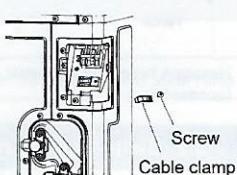
Tightening torque	
M3.5 screw	0.8 to 1.0 N·m
M4 screw	1.2 to 1.8 N·m
M5 screw	2.0 to 3.0 N·m



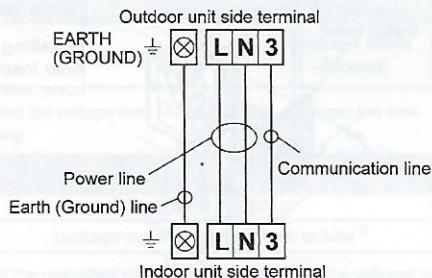
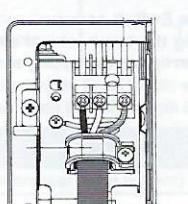
CAUTION	
Match the terminal block numbers and connection cable colors with those of the outdoor unit or branch box. Incorrect wiring may cause a fire.	
Connect the connection cables firmly to the terminal block. Imperfect installation may cause a fire.	
When fixing the connection cable with the cable clamp, always fasten the cable at the plastic jacket portion, but not at the insulator portion. If the insulator is chafed, electric leakage may occur.	
Do not use an earth screw for an external connector. Only use for interconnection between two units.	

### 5.4. Outdoor unit wiring

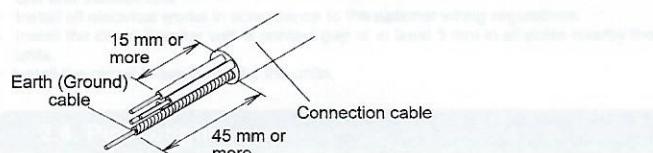
- (1) Remove the switch cover from the outdoor unit.
- (2) Remove the cable clamp from the outdoor unit.
- (3) Connect the end of the connection cable fully into the terminal block.
- (4) Fasten the sheath with a cable clamp.
- (5) Install the switch cover.



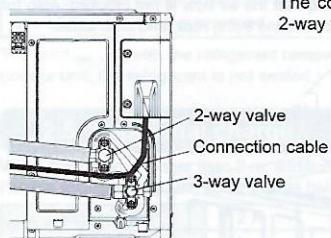
#### CONNECTION DIAGRAMS



#### CONNECTION CABLE PREPARATION



#### CONNECTION CABLE WIRING



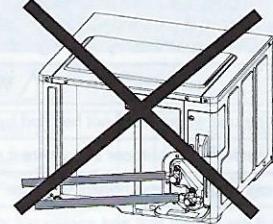
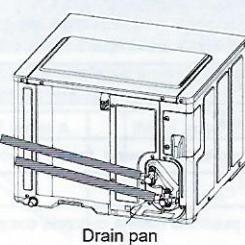
The connection cable should be wired between the 2-way valve and 3-way valve.

### 5.5. Connecting the piping

#### CONNECTION

- (1) Install the outdoor unit wall cap (supplied with the optional installation set or procured at the site) to the wall pipe.
- (2) Connect the outdoor unit and indoor unit piping.
- (3) After matching the center of the flare surface and tightening the nut hand tight, tighten the nut to the specified tightening torque with a torque wrench. (Table 1)

NOTES: Connection pipes should be attached diagonally upward (not parallel) to ensure that the drain water is collected in the drain pan.



#### FLARING

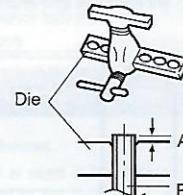
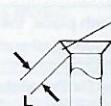
- (1) Cut the connection pipe to the necessary length with a pipe cutter.
- (2) Hold the pipe downward so that cuttings will not enter the pipe and remove the burrs.
- (3) Insert the flare nut onto the pipe and flare the pipe with a flaring tool.

Insert the flare nut (always use the flare nut attached to the indoor and outdoor units respectively) onto the pipe and perform the flare processing with a flare tool.

Use the special R410A flare tool, or the R22 flare tool.

When using the conventional flare tool, always use an allowance adjustment gauge and secure the A dimension shown in table 2.

Check if [L] is flared uniformly and is not cracked or scratched.



#### BENDING PIPES

- (1) When bending the pipe, be careful not to crush it.
- (2) To prevent breaking of the pipe, avoid sharp bends. Bend the pipe with a radius of curvature of 70 mm or over.
- (3) If the copper pipe is bent the pipe or pulled to often, it will become stiff. Do not bend the pipes more than three times at one place.

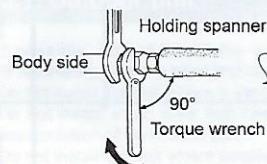


Table 1 Flare nut tightening torque

Flare nut	Diameter (mm) x Torque (N·m)
6.35 mm dia.	17 x 16 ~ 18
9.52 mm dia.	22 x 32 ~ 42

Table 2 Pipe outside diameter

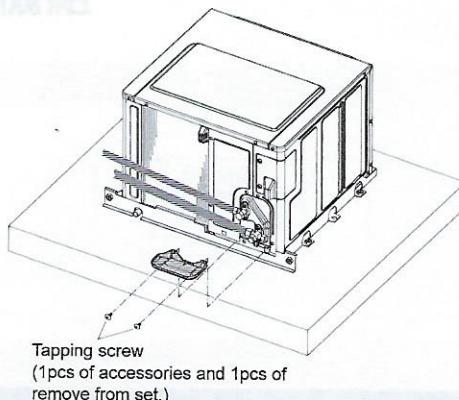
Pipe outside diameter	A (mm)		
	Flare tool for R410A, clutch type	R22 Flaring tool	
Φ 6.35 mm (1/4")	0 to 0.5	1.0 to 1.5	1.5 to 2.0
Φ 9.52 mm (3/8")	0 to 0.5	1.0 to 1.5	1.5 to 2.0

#### CAUTION

Fasten a flare nut with a torque wrench as instructed in this manual. If fastened too tight, the flare nut may be broken after a long period of time and cause a leakage of refrigerant.

## 5.6. Drain pan installation

(1) Install Drain pan with the tapping screw (x2).



## 5.7. Air purge

Always use a vacuum pump to purge the air.

Refrigerant for purging the air is not charged in the outdoor unit at the factory.

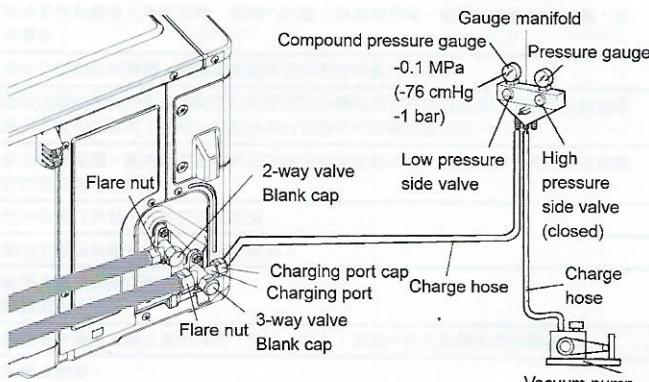
Close the high pressure side valve of the gauge manifold fully and do not operate it during the following work.

### CAUTION

Refrigerant must not be discharged into atmosphere.

After connecting the piping, check the joints for gas leakage with gas leak detector.

- (1) Check if the piping connections are secure.
- (2) Check that the stems of 2-way valve and 3-way valve are closed fully.
- (3) Connect the gauge manifold charge hose to the charging port of the 3-way valve (side with the projection for pushing in the valve core).
- (4) Open the low pressure side valve of the gauge manifold fully.
- (5) Operate the vacuum pump and start pump down.
- (6) Slowly loosen the flare nut of the 3-way valve and check if air enters, then retighten the flare nut.  
(When the flare nut is loosened the operating sound of the vacuum pump changes and the reading of the compound pressure gauge goes from minus to zero.)
- (7) Pump down the system for at least 15 minutes, then check if the compound pressure gauge reads -0.1 MPa (-76 cmHg, -1 bar).
- (8) At the end of pump down, close the low pressure side valve of the gauge manifold fully and stop the vacuum pump.
- (9) Slowly loosen the valve stem of the 3-way valve. When the compound pressure gauge reading reaches 0.1-0.2 MPa, retighten the valve stem and disconnect the charge hose from the 3-way valve charging port.  
(If the stem of the 3-way valve is opened fully before the charge hose is disconnected, it may be difficult to disconnect the charge hose.)
- (10) Fully open the valve stems of the 2-way valve and 3-way valve using a hexagon wrench. (After the valve stem begins to turn, turn it with a torque of less than 2.9 N·m until it stops turning.)
- (11) Firmly tighten the 2-way valve and 3-way valve blank cap and the charging port cap.



	Tightening torque
Blank cap (1/4 in.)	20.0 to 25.0 N·m
Blank cap (3/8 in.)	20.0 to 25.0 N·m
Charging port cap	12.5 to 16.0 N·m

## 6. TEST RUN

- Perform test operation and check items below.
- For the test operation method, refer to the operating manual.
- The outdoor unit, may not operate, depending on the room temperature. In this case, keep on pressing the MANUAL AUTO button of the indoor unit for more than 10 seconds. The operation indicator lamp and timer indicator lamp will begin to flash simultaneously during cooling test run. Then, heating test run will begin in about three minutes when HEAT is selected by the remote control operation. (Please follow the operating manual for remote control operation.)
- To end test operation, keep on pressing the MANUAL AUTO button of the indoor unit for more than 3 seconds.

(When the air conditioner is run by pressing the MANUAL AUTO button, the OPERATION indicator lamp and TIMER indicator lamp of the indoor unit will simultaneously flash slowly.)

### OUTDOOR UNIT

- (1) Is there any abnormal noise and vibration during operation?
- (2) Will noise, wind, or drain water from the unit disturb the neighbors?
- (3) Is there any gas leakage?

## 7. PUMP DOWN

### PUMP DOWN OPERATION (FORCED COOLING OPERATION)

To avoid discharging refrigerant into the atmosphere at the time of relocation or disposal, recover refrigerant by doing the forced cooling operation according to the following procedure.

- (1) Conduct preliminary operation for 5 to 10 minutes using the forced cooling operation. Start the forced cooling operation. Keep on pressing the MANUAL AUTO button of the indoor unit for more than 10 seconds. The operation indicator lamp and timer indicator lamp will begin to flash simultaneously during test run. (The forced cooling operation cannot start if the MANUAL AUTO button is not kept on pressing for more than 10 seconds.)
- (2) Close the valve stem of 2-way valve completely.
- (3) Continue the forced cooling operation for 2 to 3 minutes, then close all the valve stems on the 3-way valves
- (4) Stop the operation.
  - Press the START/STOP button of the remote controller to stop the operation.
  - Press the MANUAL AUTO button when stopping the operation from the indoor unit side.

(It is not necessary to press down for more than 10 seconds.)

### CAUTION

Please check the refrigerant circuit for any leaks before starting the pump down operation.

Do not proceed with the pump down operation if there is no refrigerant left in the circuit due to bent or broken piping.

During the pump down operation, be sure to turn off the compressor before removing the refrigerant piping.

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7. 抽氣	5

### 1. 安全注意事項

- 安裝或使用空調機之前，請仔細閱讀本說明書中記載的安全資訊。
- 本說明書指出的警告和注意事項包含與您的安全密切相關的重要資訊。請務必遵守這些資訊。
- 將本說明書和使用說明書交給用戶。請用戶妥善保管，以便日後移機或維修機組時參考使用。



表示如不避免 有可能導致死亡或嚴重人身傷害的潛在或即將發生的危險情況。



表示有可能導致輕度或中度人身傷害或財物受損的潛在危險情況。



為了避免觸電，當電源關閉後，切勿立即觸摸電氣零件。切記當電源關閉後，務必要經過 10 分鐘或以上才能觸摸電氣零件。

必須由有經驗的維修技術人員或專業安裝人員依照本說明書安裝本機組。由非專業人員安裝或安裝失當可能會導致嚴重事故，例如受傷、漏水、觸電或火災。如果沒有依照本說明書中的說明來安裝機組，則製造商不會保固。

所有工作完成之前，切勿開啟電源。在工作完成之前開啟電源可能會導致嚴重事故，例如觸電或火災。

若冷媒在工作進行中發生洩漏，該區域要馬上進行通風。若洩漏的冷媒與火燄互相接觸，會產生有毒氣體。

安裝作業必須遵守各國家、地區或安裝地點的電氣配線及設備法規、規範或標準。

請勿在冷媒管路有空氣或任何其他未指定冷媒的情況下使用本設備。壓力過大可能會導致破裂。

在安裝期間，請先確定冷媒管牢固連接，然後才運轉壓縮機。在冷媒管連接不當，而二通閥或三通閥打開的情況下，請勿操作壓縮機。這可能會使冷媒循環內產生異常壓力，導致機器破裂，甚至人身傷害。

當安裝或移動空調機時，請勿將指定的冷媒 (R410A) 以外之氣體混合至冷媒循環內。若空氣或其他氣體進入冷媒循環，循環內的壓力將異常升高，這樣會導致機器破裂，甚至人身傷害。

為了確保空調機順利運轉，請按照本說明書中的說明進行安裝。

利用當地經銷商提供的空調機配管和電纜將室內機組與室外機組或室內機組與分線盒連接起來。本說明書闡述了使用安裝組件進行安裝時的正確連接方法。

請勿修改電源電纜、使用延長電纜或在接線中使用任何分線。連接不當、絕緣不足或超過允許的電流會導致觸電或火災。

請勿用冷媒進行換氣，但可使用真空泵。

室外機組中並沒有額外的冷媒可用於換氣。

請勿使用非製造商指定的方式來  
加速除霜流程或清潔。

本設備應放在無連續點火源的房間（例如：明火、使用的瓦斯器具或加熱器）。

請勿拆解或燃燒。

請注意冷媒可能無味。

將同一台真空泵用於不同冷媒，可能會損壞真空泵或機組。

請使用 R410A 專用雙錶閥、真空泵和充填軟管。



請勿修改本機組，例如在殼體開孔。

抽氣操作過程中，請確定壓縮機已關閉，再拆下冷媒配管。

二通閥或三通閥打開時操作壓縮機，不要拆下連接配管。這可能會使冷媒循環內產生異常壓力，導致機器破裂，甚至人身傷害。



本機組須經由具有冷媒處理資格認證的合格人員進行安裝。請參閱安裝地區的現有規定和法令。

安裝工作必須遵守當地規定和法規以及製造商的安裝說明。

本機組是構成空調機的一部分。請勿獨立安裝本機組或與非製造商認可的裝置一起安裝。

空調的連接管線如果小於 2 m，室外機組所產生的自轉音或其他噪音會傳到室內。

機組必須正確接地，並且電源線必須配備不同的斷路器，以保護安裝人員。

本機組並非防爆機組，不應將其安裝於爆炸性環境中。

本機組內沒有配備用戶可自行維修的零件，請務必聯絡有經驗的維修技術人員進行維修。

移機時，請聯絡有經驗的維修技術人員拆卸及安裝本機組。

安裝或保養機組時，請勿接觸室內或室外機組內置熱交換器的鋁片，以防止受傷。

請勿將其他任何電器或家用物品放在室內機組或室外機組下方。機組滴水可能會把它們弄濕，而且可能造成財產損壞或故障。

## 2. 關於本機

### 2.1. R410A 的專用工具

工具名稱	R22 到 R410A 變更的內容
雙錶閥	由於壓力很高，不能用過去的 (R22) 壓力錶測量。為了防止與其他冷媒混淆，各個端口直徑都被改變。 建議將密封壓力為 -0.1 至 5.3 MPa (-1 至 53 bar) 的壓力錶用於高壓。 將壓力為 -0.1 至 3.8 MPa (-1 至 38 bar) 的壓力錶用於低壓。
充填軟管	為了增大抗壓強度，軟管材料和基礎尺寸都被改變。 (R410A)
真空泵	通過安裝真空泵轉接器，也可使用過去的真空泵。 (不要使用串聯馬達的真空泵。)
漏氣檢測器	HFC 冷媒 R410A 專用的漏氣檢測器。

## 銅管

必須使用無縫銅管，而且最後將殘油量控制在 40 mg/10 m 以下。請勿使用存在塌陷、變形或褪色（特別是內部表面）的銅管。否則，髒物可能會影響膨脹閥或毛細管。

由於使用 R410A 的空調機比使用 R22 的空調機承受更大的壓力，必須選擇適當的材料。

R410A 所使用的銅管厚度如表 1 所示。切勿使用比 0.8 mm 更薄的銅管，即使您可以在市場上買到。

## 退火銅管厚度

公稱直徑 (in.)	外徑 (mm)	厚度 (mm)
1/4	6.35	0.80
3/8	9.52	0.80

### 警告

要安裝使用 R410A 冷媒的機組，請使用專為 R410A 製造的專用工具和配管材料。由於 R410A 冷媒壓力比 R22 高於 1.6 倍左右，未能使用專用配管材料或安裝不當，可能會導致破裂或人身傷害。還會導致嚴重事故，例如漏水、觸電或火災。

## 2.2. 電源

### 警告

必須使用特殊分支電路，並安裝一個空調機專用插座，作為供應電源之用。

請使用與空調機容量相匹配的斷路器及插座。

請依據相關法令、規定及電力公司標準，安裝漏電斷路器。

漏電斷路器必須安裝在固定的接線上。請務必使用可以跳脫接線的所有電極之迴路，且每個電極接點之間必須要有至少 3 mm 的絕緣距離。

### 注意

電源容量必須為空調機電流與其他電器電流之和。若電流負載容量不夠，請改變負載容量。

當空調機因為電壓過低而難於啟動時，請聯絡電力公司提高電壓。

## 2.3. 電氣要求

### 注意

確保安裝指定容量的斷路器。

斷路器的法規因各地區而異。

電壓額定值 1 Ø 220 V (50 Hz)

操作範圍 198-242 V

電纜	導線規格 [mm <sup>2</sup> ]	線型	備註
連接電纜	1.5	Type 60245 IEC57	3 芯 + 地線，

最大電纜長度：將長度設定為壓降在 2% 以下。當電纜長度較長時，請增加線徑。

斷路器	規範 <sup>1</sup>
斷路器（過電流）	電流：15(A)
接地漏電斷路器	漏電電流：30mA 0.1 秒或以下 <sup>2</sup>

<sup>1</sup> 根據國家或地區標準選擇適當的指定規格的斷路器。

<sup>2</sup> 選擇過負載電流可通過其的斷路器。

- 在開始工作之前，檢查室內機組和室外機組的所有電極沒有接上電源。
- 請根據國家配線法規安裝所有電氣作業。
- 在機組附近安裝斷路器，所有電極中的接點間隙至少為 3 mm。
- 在機組附近安裝漏電斷路器。

## 2.4. 配管長度

配管長度	最大長度	最大高度（室內和室外之間）
	5m	3m

### 注意

若機組之間的距離超過指定的最大管長，則無法確保正常地運作。

室外機組的無包裝冷媒是密封的。  
( 室內機組的冷媒未密封。 )

## 2.5. 額外充填

當管長超過 2 m，就需要額外充填。

所需的額外充填量，請參閱下表所示。

配管長度	2 m	5 m	額定
	不需要	+30 g	10 g/m

### 注意

充填冷媒時，施工結束後在充填口充填冷媒。

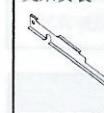
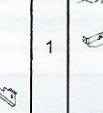
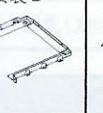
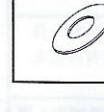
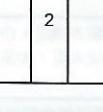
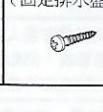
## 2.6. 操作範圍

	冷氣模式 除濕模式	製熱模式
室外溫度	21 至 43°C	0 至 24°C

## 2.7. 附件

以下乃隨機配備的安裝附件。

請依需要使用。

支架安裝 A		1	支架安裝 B		1	排水盤		1	六角頭螺栓 (M6 x 12)		2
M8 塗片		2	螺帽		2	自攻螺絲 (固定排水盤)		1	墊片 (抗振)		4

安裝本機組時，還需要一套如下附件。

名稱			
連接配管組件	裝飾帶	鞍板	自攻螺絲
連接電纜	膠帶	排水管	密封膠
牆管	牆孔蓋	固定螺栓 (M8) 4 顆	固定螺帽 (M8) 4 顆

## 3. 選擇安裝位置

與客戶商榷安裝位置，如下所示。

請勿安裝在會產生油煙、油污的工廠內、遭受海風吹襲的海邊、產生硫化氫等腐蝕性氣體的溫泉邊、動物便溺等產生氨氣及多塵的場所。

## 3.1. 室外機組

(1) 若有可能，儘量避免將機組安裝在陽光直射的場所。

( 根據需要，請安裝不妨礙氣流的遮簾。 )

(2) 請勿將機組安裝在強風吹到或灰塵多的場所。

(3) 請勿安裝在有熱源、蒸氣或易燃氣體洩漏或聚積的區域。

(4) 請勿將機組安裝在行人經過的場所。

(5) 要考慮周圍鄰居，不要讓氣流直接吹入他人窗戶或使其受到噪音干擾。

(6) 預留如圖所示的空間，避免氣流受到阻塞。另外，為了獲得高效運轉，請讓前後左右四個方向中的三個方向保持敞開狀態。

(7) 請將機組安裝在距離電視機或收音機天線 3 m 以上的場所。

(8) 在暖氣運轉時，排水會從室外機組流出。因此，請將室外機組安裝在排水不受阻礙之處。

### 警告

請安裝在可以承受室外機組重量的位置，並穩固安裝機組，使其不會翻倒或跌落。

### 注意

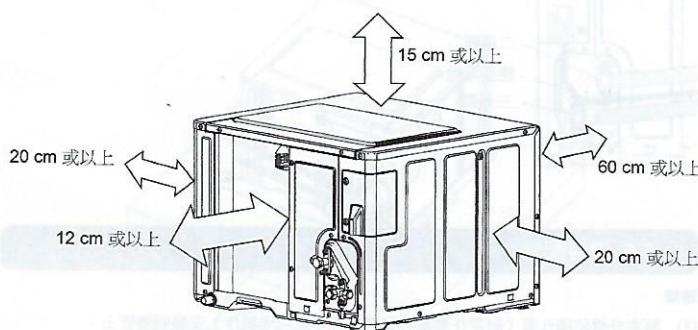
請勿安裝在易燃性氣體洩漏的區域。

請勿安裝在靠近熱源的區域。

若有孩童接近機組，請採取措施以防他們接觸機組。

## 4. 安裝示意圖

請預留下圖所示的空間以便氣流不受阻塞。為了確保有效運轉，前後左右四個方向的三個方向應保持開放。



## 5. 安裝

### 5.1. 安裝室外機組

- 請將機組安裝在混凝土地基等穩固的表面，以減少衝擊及振動。
- 請勿直接在地面上安裝，否則會導致故障。

#### 警告

將機組安裝在傾斜度不超過 5° 的位置。

安裝室外機組時，機組可能會處於強風吹到的場所，請將其確實固定。

將機組安裝於平坦、水平的位置。

檢查固定螺栓與固定螺帽安裝位置的混凝土是否有至少  $200\text{kg}/\text{cm}^2$  的抗壓強度。

請勿在未達此標準的位置安裝。

安裝室外機組時，機組可能會處於強風吹到的場所，請將其確實固定。

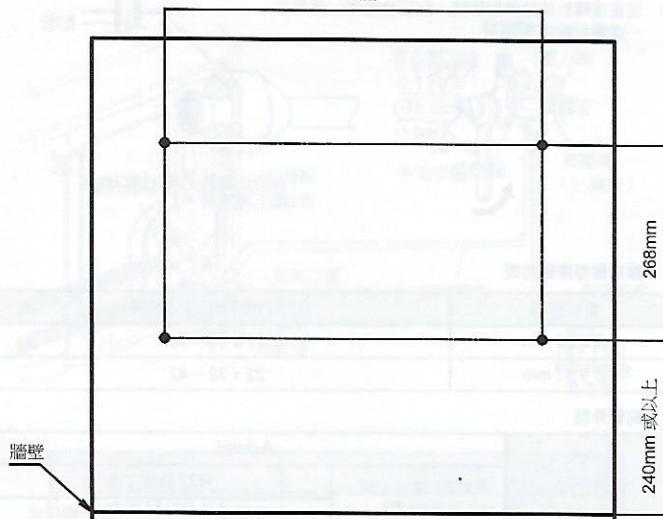
請勿直接在地面上安裝，否則會導致故障。

在靠近海岸或容易生銹的場所安裝冷氣機時，請勿使用隨附的耦合零件。請全部使用抗鹽腐蝕的耦合零件。

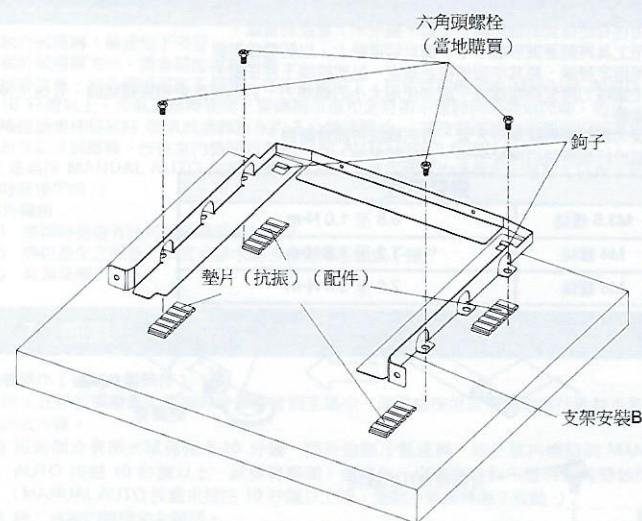
在高處作業時，機組、零件、工具等可能會掉落下來。請針對此類物品可能掉落下來的情況採取預防措施。

(1) 請在平坦的表面為固定螺栓與固定螺帽鑽安裝孔。（如果安裝在不平坦的表面，可能難以排水。）  
將固定螺栓與固定螺帽插入孔中。

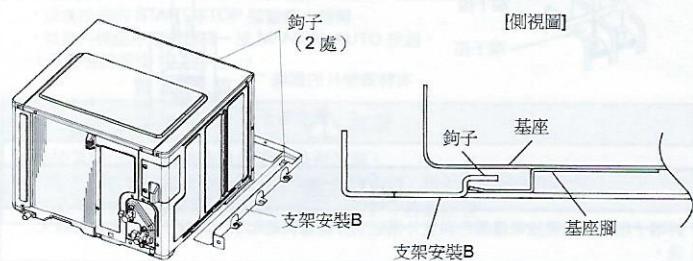
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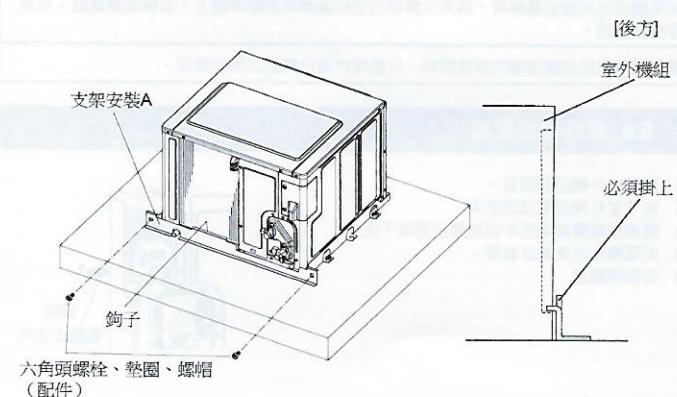
(2) 用固定螺栓鎖緊支架安裝 B。



(3) 安裝室外機組。此時，檢查支架安裝 B 掛鉤上的室外機組沒有晃動。



(4) 用六角頭螺栓與墊圈鎖緊支架安裝 A 與支架安裝 B。



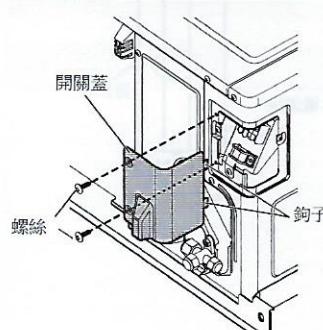
### 5.2. 拆卸開關蓋

#### 拆卸開關蓋

- 卸下自攻螺絲 (2 個)。
- 向前推開開關蓋。

#### 安裝開關蓋

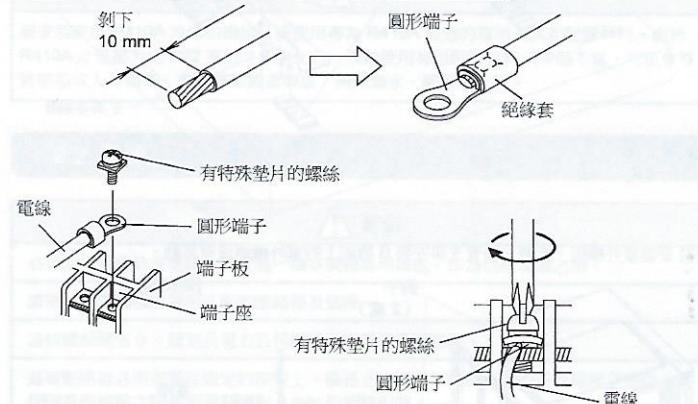
插入開關蓋的 2 個鉤子後，擰緊自攻螺絲。



### 5.3. 如何將電線連接到終端接頭上

- 用包有絕緣套的圓形端子（如下圖所示）連接到電線。
- 用工具將壓著圓形端子牢固定到電線上，以防電線鬆脫。
- 用指定接線，將其牢固連接並固定，以使終端不存在壓力。
- 用螺絲刀擰緊終端螺絲。請勿使用太小的螺絲刀，否則可能會損毀螺絲頭，且無法擰緊螺絲。
- 請勿將終端螺絲擰得太緊，否則螺絲可能會斷裂。
- 關於終端螺絲的擰緊扭矩，請參閱下表。

擰緊扭矩	
M3.5 螺絲	0.8 至 1.0 N·m
M4 螺絲	1.2 至 1.8 N·m
M5 螺絲	2.0 至 3.0 N·m



#### 注意

將端子座編號和連接電纜顏色與室外機組或分線盒對應起來。配線不當可能會導致火災。

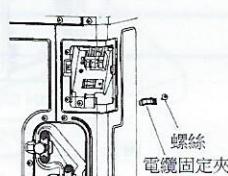
將連接電纜牢固地連接到端子座。不正確的安裝可能會導致火災。

用電纜固定夾固定纜線時，請夾住纜線的塑膠護套而非絕緣體上。若擦破絕緣層，可能會導致漏電。

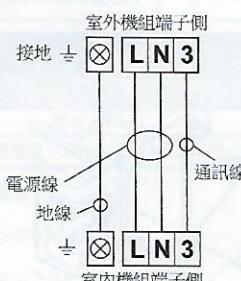
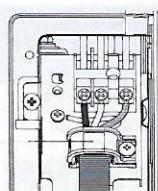
請勿使用用於外接插頭的接地螺絲。只能用於兩台機組之間的連接。

### 5.4. 室外機組配線

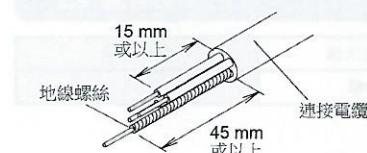
- 卸下室外機組開關蓋。
- 卸下室外機組電纜固定夾。
- 將連接電纜線端部牢固地連接到端子座。
- 用電纜固定夾固定套管。
- 安裝開關蓋。



#### 接線圖

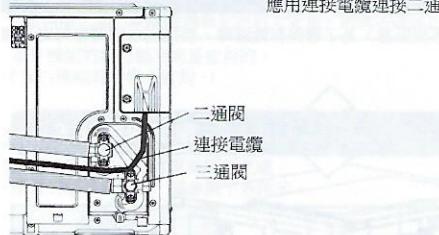


#### 連接電纜準備



### 連接電纜的接線

應用連接電纜連接二通閥與三通閥。

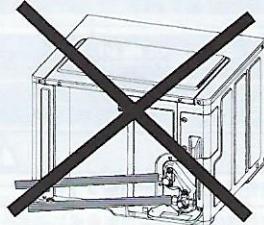
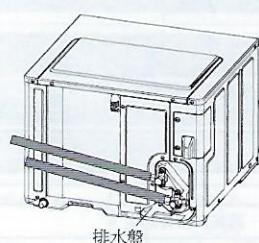


### 5.5. 連接配管

#### 連接

- 將室外機組牆孔蓋（附帶在選購的安裝套件中或現場製作）安裝到牆管上。
- 連接室外機組和室內機組的配管。
- 對準錐形面的中心，將螺母柄擰緊，然後用扭矩扳手將螺母擰緊到規定的扭矩。（表 1）

註：連接管應對角向上連接（非平行），以確保能在排水盤中收集排水。



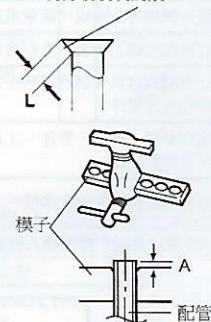
#### 錐形形成

- 用管鉗將連接管切成所需要的長度。
- 向下抓住管子以免切屑落入管內，並清除毛刺。
- 將錐形螺母插在配管上，用擴管工具將配管擴成錐形。

將錐形螺母（必須使用附在室內和室外機組的錐形螺母）插在配管上，然後使用擴管工具進行擴口處理。請使用 R410A 專用擴管工具或 R22 擴管工具。

使用過去的擴管工具時，請務必使用公差調節規，保證表 2 中所示的 A 尺寸。

檢查 [A] 是否已均勻地擴開和沒有破裂或刮痕。



#### 彎折配管

- 彎折配管時，小心不要使其變形。
- 為免將配管折斷，請避免銳角彎曲。以 70 mm 或以上的半徑彎折配管。
- 當重複彎折或拉伸配管時，配管會變硬。請勿在一處彎折超過三次。

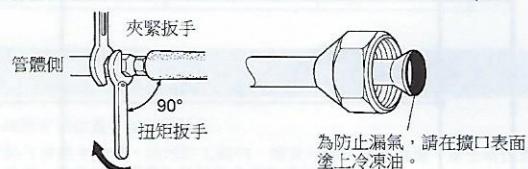


表 1 錐形螺母擰緊扭矩

錐形螺母	孔徑 (mm) x 扭矩 (N·m)
Ø 6.35 mm	17 x 16 ~ 18
Ø 9.52 mm	22 x 32 ~ 42

表 2 配管外徑

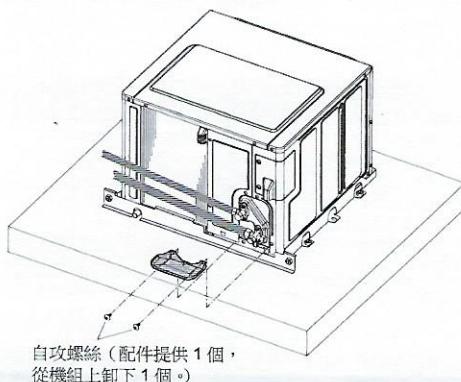
配管外徑	A (mm)		
	R410A 擴管工具，緊握式		R22 擴管工具
Ø 6.35 mm (1/4")	0 至 0.5	1.0 至 1.5	1.5 至 2.0
Ø 9.52 mm (3/8")	0 至 0.5	1.0 至 1.5	1.5 至 2.0

#### 注意

請按照本說明書中的指示使用扭矩扳手擰緊錐形螺母。錐形螺母不能擰得太緊，否則，時間一長容易斷裂、導致冷媒洩漏。

## 5.6. 排水盤的安裝

(1) 用自攻螺絲 (2 個) 安裝排水盤。



## 5.7. 氣洗

請使用真空泵來排除空氣。

在出廠前，室外機組沒有充填可供排除空氣的冷媒。

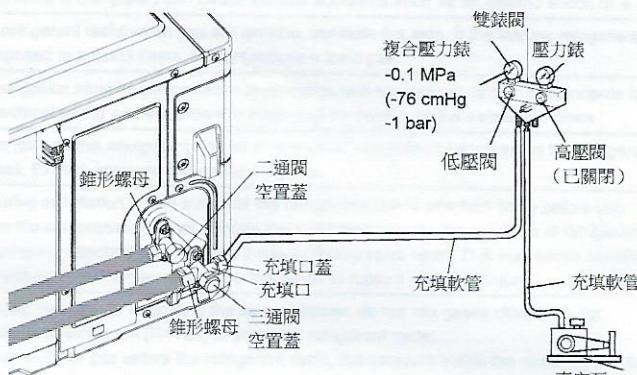
完全關閉雙錫閥的高壓閥，在進行下列作業期間不得操作該閥門。

### 注意

切勿將冷媒排放到空氣中。

連接配管後，用漏氣檢測器檢查接頭是否漏氣。

- (1) 檢查配管連接是否牢固。
- (2) 確認二通閥和三通閥的閥桿完全關閉。
- (3) 將雙錫閥充填軟管連接到三通閥的充填口（帶推向閥芯突爪的一側）。
- (4) 完全打開雙錫閥的低壓閥門。
- (5) 操作真空泵並開始抽氣。
- (6) 慢慢鬆開三通閥的錐形螺母，檢查空氣是否進入，然後重新擰緊錐形螺母。（當鬆開錐形螺母時，真空泵的運轉聲音將發生變化，複合壓力錶的讀數從負值變為 0。）
- (7) 給系統抽氣至少 15 分鐘，然後檢查複合壓力錶的讀數是否為 -0.1 MPa (-76 cmHg, -1 bar)。
- (8) 抽氣結束時，完全關閉雙錫閥的低壓閥門並停止真空泵。
- (9) 慢慢鬆開三通閥的閥桿。當複合壓力錶的讀數達到 0.1-0.2 MPa 時，重新擰緊閥桿，從三通閥充填口斷開充填軟管。（若斷開充填軟管之前錯過全打開三通閥桿，可能很難斷開充填軟管。）
- (10) 用六角扳手完全打開二通閥和三通閥的閥桿。（閥桿開始轉動時，請用 2.9 N·m 以下的扭矩轉動閥桿直到停止轉動為止。）
- (11) 牢固擰緊二通閥和三通閥空置蓋和充填口蓋。



	擰緊扭矩
空置蓋 (1/4 in.)	20.0 至 25.0 N·m
空置蓋 (3/8 in.)	20.0 至 25.0 N·m
充填口蓋	12.5 至 16.0 N·m

## 6. 試運轉

- 執行試運轉，檢查如下項目。
- 關於試運轉方法，請參閱使用說明書。
- 根據室溫，室外機組可能不運轉。在這種情況下，按住室內機組的 MANUAL AUTO 按鈕 10 秒鐘以上。冷氣試運轉期間，運轉指示燈和定時指示燈將同時開始閃爍。然後，操作遙控器選擇暖氣時，暖氣試運轉將在約 3 分鐘後開始。（請按照遙控器的使用說明書操作。）
- 若要結束試運轉，按住室內機組的 MANUAL AUTO 按鈕 3 秒鐘以上。（透過按 MANUAL AUTO 按鈕運轉空調機時，室內機組的運轉指示燈和定時指示燈將同時緩慢閃爍。）

### 室外機組

- (1) 運轉時是否有任何異常噪音和振動？
- (2) 機組產生之噪音、氣流或排水是否會對鄰居造成干擾？
- (3) 有漏氣嗎？

## 7. 抽氣

### 抽氣操作 (強制冷氣操作)

為防止在移動或廢棄空調機時冷媒排放到空氣中，請嚴格按照以下規定進行強制冷氣運轉以回收冷媒。

- (1) 用強制冷氣模式試運轉 5-10 分鐘。開始強制冷氣運轉。按住室內機組的 MANUAL AUTO 按鈕 10 秒鐘以上。試運轉期間，運轉指示燈和定時指示燈將同時開始閃爍。（MANUAL AUTO 按鈕未按住 10 秒鐘以上時，強制冷氣運轉無法啟動。）
- (2) 將二通閥的閥桿完全關閉。
- (3) 繼續強制冷氣運轉 2 至 3 分鐘，然後關閉三通閥的所有閥桿。
- (4) 停止運轉。
  - 按遙控器的 START/STOP 按鈕停止運轉。
  - 從室內機組停止運轉時，按 MANUAL AUTO 按鈕。（不需要持續按 10 秒以上。）

### 注意

啟動抽氣操作前，請檢查冷媒管路是否洩漏。

如因配管彎折或破損使得冷媒管路無冷媒殘留時，請勿啟動抽氣操作。

抽氣操作過程中，請確定壓縮機已關閉，再拆下冷媒配管。