HITACHI

Installation & Maintenance Manual

AIR CONDITIONER
OUTDOOR UNIT



Basic Models:

RAS-8.0RNBCLQ
RAS-10RNBCLQ
RAS-12RNBCLQ
RAS-14RNBCLQ
RAS-16RNBCLQ
RAS-18RNBCLQ
RAS-20RNBCLQ
RAS-22RNBCLQ
RAS-24RNBCLQ

Combination Models:

RAS-26~96RNBCLQ

IMPORTANT:

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

P02486Q

Original Instructions

(EN) Declaration of Conformity (Manufacturer's Declaration)	(FR) Déclaration de conformité (Déclaration du fabricant)	(ES) Declaración De Conformidad (Declaración del Fabricante)	(IT) Dichiarazione di Conformità (Chiarazione del produttore)	(DE) Konformitätserklärung (Erklärung des Herstellers)
(PT) Declaração de conformidade (declaração do fabricante)	(NL) Conformiteitsverklaring (Fabrikanterklaring)	(PL) Deklaracja Zgodności（Deklaracja wytwórcy）	(TR) Uygunluk Beyanı (Üretici Beyanı)	(RO) Declarație de conformitate (Declarația producătorului)
(GR) ΔΗΛΩΣΗ ΣΥΜΜΟΡΦΩΣΗΣ (Δήλωση του κατασκευαστή)				

Qingdao Hisense Hitachi Air-conditioning Systems Co., Ltd. ,

01 (EN) declares under its sole responsibility that the equipment to which this declaration relates:
02 (FR) déclare sous sa seule responsabilité que l'équipement visé par la présente déclaration:
03 (ES) declara bajo su única responsabilidad que el equipo al que hace referencia la declaración:
04 (IT) dichiara sotto la propria responsabilità che gli apparecchi a cui è riferita questa dichiarazione:
05 (DE) erklärt auf seine alleinige Verantwortung daß die Ausrüstung für die diese Erklärung bestimmt ist:
06 (PT) declara sob sua exclusiva responsabilidade que os equipamentos a que esta declaração se refere:
07 (NL) verklaart hierbij op eigen exclusieve verantwoordelijkheid dat de apparatuur waarop deze verklaring betrekking heeft:
08 (PL) deklaruje na własną i wyłączną odpowiedzialność, że urządzenia, których ta deklaracja dotyczy:
09 (TR) tamamen kendi sorumluluğunda olmak üzere bu bildirinin ilgili olduğu donanımının aşağıdaki gibi olduğunu beyan eder:
10 (RO) declară pe proprie răspundere că echipamentele la care se referă această declaraţie:
11 (GR) δηλώνει με αποκλειστική της ευθύνη ότι ο εξοπλισμός στον οποίο αναφέρεται η παρούσα δήλωση:

RAS-8.0RNBCLQ, RAS-10RNBCLQ, RAS-12RNBCLQ, RAS-14RNBCLQ, RAS-16RNBCLQ, RAS-18RNBCLQ, RAS-20RNBCLQ, RAS-22RNBCLQ, RAS-24RNBCLQ

01 (EN) are in conformity with the following standard(s) or other normative document(s), provided that these are used in accordance with our instructions:
02 (FR) sont conformes à la/aux norme(s) ou autre(s) document(s) normatif(s), pour autant qu'ils soient utilisés conformément à nos instructions:
03 (ES) están en conformidad con la(s) siguiente(s) norma(s) u otro(s) documento(s) normativo(s), siempre que sean utilizados de acuerdo con nuestras instrucciones:
04 (IT) sono conformi al(i) seguente(i) standard(s) o altro(i) documento(i) a carattere normativo, a patto che vengano usati in conformità alle nostre istruzioni:
05 (DE) der/den folgenden Norm(en) oder einem anderen Normdokument oder -dokumenten entspricht/entsprechen, unter der Voraussetzung, daß sie gemäß unseren Anweisungen eingesetzt werden:
06 (PT) estão em conformidade com a(s) seguinte(s) norma(s) ou outro(s) documento(s) normativo(s), desde que estes sejam utilizados de acordo com as nossas instruções:
07 (NL) conform de volgende norm(en) of één of meer andere bindende documenten zijn, op voorwaarde dat ze worden gebruikt overeenkomstig onze instructies:
08 (PL) spełniają wymogi następujących norm i innych dokumentów normalizacyjnych, pod warunkiem że używane są zgodnie z naszymi instrukcjami:
09 (TR) ürünün, talimatlarımıza göre kullanılması koşuluyla aşağıdaki standartlar ve norm belirten belgelerle uyumludur:
10 (RO) sunt în conformitate cu următorul (următoarele) standard(e) sau alt(e) document(e) normativ(e), cu condiţia ca acestea să fie utilizate în conformitate cu instrucţiunile noastre:
11 (GR) είναι σύμφωνα με το(α) ακόλουθο(α) πρότυπο(α) ή άλλο έγγραφο(α) κανονισμών, υπό την προϋπόθεση ότι χρησιμοποιούνται σύμφωνα με τις οδηγίες μας:

EN IEC 55014-1:2021
EN 55014-1:2017+A11:2020
EN IEC 55014-2:2021
EN 55014-2:2015
EN IEC 61000-3-11:2019
EN 61000-3-12:2011

EN 60335-1:2012 + A11:2014 + A13:2017 + A1:2019 + A14:2019 + A2:2019 + A15:2021
EN 60335-2-40:2003 + A11:2004 + A12:2005 + A1:2006 + A2:2009 + A13:2012
EN 62233:2008

01 (EN) following the provisions of:
02 (FR) conformément aux stipulations des:
03 (ES) siguiendo las disposiciones de:
04 (IT) secondo le prescrizioni per:
05 (DE) gemäß den Vorschriften der:
06 (PT) de acordo com o previsto em:
07 (NL) overeenkomstig de bepalingen van:
08 (PL) zgodnie z postanowieniami Dyrektyw:
09 (TR) bunun koşullarına uygun olarak:
10 (RO) în urma prevederilor:
11 (GR) με τήρηση των διατάξεων των:

2014/30/EU
2012/19/EU
2011/65/EU
2014/68/EU
(EU) No 517/2014
(EC) No 1907/2006
2009/125/EC
(EU) 2017/1369
2006/42/EC
(EU) No 2016/2281
2014/35/EU
(EU) No 813/2013
(EU) No 811/2013

01 (EN) Directives, as amended.
02 (FR) Directives, telles que modifiées.
03 (ES) Directivas, según lo enmendado.
04 (IT) Direttive, come da modifica.
05 (DE) Direktiven, gemäß Änderung.
06 (PT) Directivas, conforme alteração em.
07 (NL) Richtlijnen, zoals geamendeerd.
08 (PL) z późniejszymi poprawkami.
09 (TR) Değiştirilmiş halleriyle Yönetmelikler.
10 (RO) Directivelor, cu amendamentele respective.
11 (GR) Οδηγιών, όπως έχουν τροποποιηθεί.

01 (EN) * and judged positively by:
02 (FR) * et approuvé par:
03 (ES) * y considerado favorablemente por:
04 (IT) * e valutato positivamente da:
05 (DE) * und positiv bewertet von:
06 (PT) * e considerado positivo por:
07 (NL) * en goedgekeurd door:
08 (PL) * i pozytywną opinią:
09 (TR) * ve şu kurum tarafından olumlu olarak değerlendirildiği üzere:
10 (RO) * și a fost apreciat pozitiv de:
11 (GR) * και εκτιμάται θετικά από:

NB0035
Conformity Assessment Procedure: module H
Category: II

Pressure Equipment Components	Category under 2014/68/EU	Assessment Procedure
Compressor	Category II	Module A2
Oil Separator	Art.4.3	---
Heat Exchanger(Fin and tube)	Art.4.3	---
Piping pressure accessories	Art.4.3	---
Accumulator	Category II	Module A2
Safety Pressure Switch	Category IV	Module B(Production type) +D

Refrigerant: R410A
Maximum allowable pressure(high pressure sides) : 4.15MPa
Maximum allowable pressure(low pressure sides) : 2.21MPa

01 (EN) * Manufacturing number and manufacturing year: refer to model Nameplate.
Note:This declaration becomes invalid, if technical or operational modifications are introduced without the manufacturer's consent.
02 (FR) * Numéro de fabrication et année de fabrication : se référer à la plaque signalétique du modèle.
Remarque : Cette déclaration devient invalide si des modifications techniques ou opérationnelles sont introduites sans le consentement du fabricant.
03 (ES) * Número de fabricación y año de fabricación: consulte la placa de identificación del modelo.
Nota: esta declaración deja de tener validez si se introducen modificaciones técnicas u operativas sin el consentimiento del fabricante.
04 (IT) * Numero di fabbricazione e anno di fabbricazione: fare riferimento alla targhetta del modello.
Nota: questa dichiarazione non è valida se vengono introdotte modifiche tecniche o operative senza il consenso del produttore.
05 (DE) * Herstellungsnummer und Herstellungsjahr: siehe Typenschild des Modells.
Hinweis: Diese Erklärung verliert ihre Gültigkeit, wenn ohne Zustimmung des Herstellers technische oder betriebliche Änderungen vorgenommen werden.
06 (PT) * Número de fabricação e ano de fabricação: consulte a placa de identificação do modelo.
Nota: Esta declaração torna-se inválida se modificações técnicas ou operacionais forem introduzidas sem o consentimento do fabricante.
07 (NL) * Fabricagenummer en fabricagejaar: zie het typeplaatje van het model.
Opmerking: Deze verklaring wordt ongeldig als technische of operationele wijzigingen worden aangebracht zonder toestemming van de fabrikant.
08 (PL) * Numer produkcyjny i rok produkcji: patrz tabliczka znamionowa modelu.
Uwaga: Niniejsza deklaracja traci ważność w przypadku wprowadzenia zmian technicznych lub eksploatacyjnych bez zgody producenta.
09 (TR) * Üretim numarası ve üretim yılı: model Etiketine bakın.
Not: Üreticinin izni olmadan teknik veya operasyonel değişiklikler yapılırsa bu beyan geçersiz olur.
10 (RO) * Numărul de fabricație și anul de fabricație: consultați plăcuța de identificare a modelului.
Notă: Această declarație devine nulă dacă sunt introduse modificări tehnice sau operaționale fără acordul producătorului.
11 (GR) * Αριθμός και έτος κατασκευής: δείτε στον πινακα χαρακτηριτικών μοντέλου.
Σημείωση: Η παρούσα δήλωση ακυρώνεται, αν πραγματοποιηθούν τεχνικές ή λειτουργικές τροποποιήσεις χωρίς τη συγκατάθεση του κατασκευαστή.

Johnson Controls Hitachi Air Conditioning Europe SAS
(Ad.:Rue de Lombardie,Parc Aktiland II - 69800 Saint Priest,France)

01 (EN) is authorised to Compile the Technical Construction File.
02 (FR) est autorisé à constituer le dossier technique de constructions.
03 (ES) está autorizado a compilar el expediente técnico de construcción.
04 (IT) è autorizzato a compilare il fascicolo tecnico della costruzione.
05 (DE) ist berechtigt die Technische Dokumentation zu erstellen.
06 (PT) está autorizada a compilar o arquivo técnico de construção.
07 (NL) is bevoegd om het Technisch Constructie Dossier samen te stellen.
08 (PL) jest upoważniona do opracowania Dokumentacja techniczno-konstrukcyjna.
09 (TR) Teknik Yapı Dosyasını Derlemeye yetkilidir.
10 (RO) este autorizat să întocmească Dosarul Tehnic de Construcție.
11 (GR) έχει την άδεια να συντάσσει τον Τεχνικό Φάκελο Κατασκευής.

HITACHI

Name, Surname : Song Zhenxing
Position/Title: Director
Date: Dec 25, 2024

Add.: No. 218, Qianwangang Road, Economic and Technological Development Zone, Qingdao, China

[B2B PRODUCTS ONLY]

Информация за опаковката (BG) / Packaging information(En)

Следните материали могат да се съдържат в този продукт/
The following materials may be contained in this product package

Включена опаковка / Packaging included	Вид материал / Material information	Включена опаковка / Packaging included	Вид материал / Material information
КАШОН кутия + защити / **CARTON** box + protections	20 PAP	**Аерофолио** / Bubbles **PLASTIC** bag	4 LDPE
Външна + Ръководство в **на йлонова** торба / External + manual **PLASTIC** bag	4 LDPE	**полиестерен** чембер / External **PLASTIC** strapping band/	5 PP
/ **пластмасова** тръбна защи та **PLASTIC** tubular protection /	4 LDPE	**Дървен** палет / **WOODEN** pallet	50 FOR
ПОЛИСТИРОЛ / POREXPAN	6 PS	Мека **пенополиетилен** защи та с висока плътност / Soft high-density protection **PLASTIC**	2 HDPE

IMPORTANT NOTICE

- HITACHI pursues a policy of continuing improvement in design and performance of products. The right is therefore reserved to vary specifications without notice
- HITACHI cannot anticipate every possible circumstance that might involve a potential hazard.
- This heat pump air conditioner is designed for standard air conditioning only. Do not use this heat pump air conditioner for other purpose such as drying clothes, refrigerating foods or for any other cooling or heating process.
- Do not install the unit in the following places. It may cause a fire, deformation, corrosion or failure.
  * Places where oil (including machinery oil).
  * Places where a lot of sulfide gas drifts such as a hot spring
  * Places where inflammable gas may generate or flow.
  * Places where strong salty wind blows such as coast regions.
  * Places with an atmosphere of acidity or alkalinity.
- Do not install the unit in the place where silicon gas drifts. If the silicon gas attaches to the surface of heat exchanger, the fin surface repels water. As a result, drain water splashes outside of the drain pan and splashed water runs inside of electrical box. In the end, water leakage or electrical devices failure may occur.
- Pay attention to the following points when the unit is installed in a hospital or other facilities where electromagnetic wave generates from medical equipment.
  * Do not install the unit in the place where the electromagnetic wave is directly radiated to the electrical box, remote control cable or remote control switch.
  * Install the unit at least 3 meters away from electromagnetic wave such as a radio.
- Do not install the unit in the place where the breeze directly catches the animals and plants. It could adversely affect the animals and plants.
- The installer and system specialist shall secure against leakage according to local regulations or standards.
- No part of this manual may be reproduced without written permission.
- It is assumed that this heat pump air conditioner will be operated and serviced by English speaking people. If this is not the case, the distributor should be add safety, caution and operating signs in the native language.
- If you have any questions, contact your distributor or dealer of HITACHI.
- This manual gives a common description and information for this heat pump air conditioner which you operate as well for other models.
- This heat pump air conditioner has been designed for the following temperatures. Operate the heat pump air conditioner within this range.

Temperature (ºC)

DX Indoor Unit		Maximum	Minimum
Cooling operation	Indoor	32DB/23WB	21DB/15WB
	Outdoor	55DB*	-10DB**
Heating operation	Indoor	27DB	15DB
	Outdoor	24DB/16.5WB	-25DB/-26WB

Water Module		Maximum	Minimum
Heating operation	Water Inlet	54DB	10DB
	Outdoor	43DB***	-25DB/-26WB

DB: Dry Bulb, WB: Wet Bulb

NOTE:

(*) 48ºC DB ~ 55ºC DB, Interval operation

(**) -10ºC DB ~ -5ºC DB, Interval operation.

(***) 43ºC DB ~ 48ºC DB, Heat recovery operation

- To protect the environment, do not discard the product at will, the company as per the relevant provisions of the country can provide recycling services, according to the national standards can provide replaceable components.

Note:

This manual should be considered as a permanent part of the unit and should remain with the unit.

CHECKING PRODUCT RECEIVED

- **Upon receiving this product, inspect it for any shipping damage.**
  Claims for damage, either apparent or concealed, should be filed immediately with the shipping company.
- **Check the model number, electrical characteristics (power supply, voltage and frequency) and accessories to determine if they are correct.**

The standard utilization of the unit shall be explained in these instructions.
Therefore, the utilization of the unit other than those indicated in these instructions is not recommended. Please contact your local agent as the occasion arises.

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

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1. Safety Instructions

<Signal Words>

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

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

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

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

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

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

⚠ DANGER

- Do not perform installation work, refrigerant piping work, drain pump, drain piping and electrical wiring connection without referring to our installation manual. If performed without following the instructions, it may result in a system leakage, electric shock or a fire.
- This appliance uses the new refrigerant R410A. The leak detection and airtight test prohibits the use of oxygen, acetylene, and flammable toxic gases. These gases are dangerous and may cause an explosion. It is recommended that this test should be carried out with compressed air, nitrogen gas, or with refrigerant.
- Do not pour water into the indoor or outdoor unit. These products are equipped with electrical parts. If poured, it will cause a serious electrical shock.
- Do not open the service cover and the PCB for the indoor and outdoor unit without turning OFF the main power supply, this may lead to serious safety accidents.
- Do not touch or adjust safety devices inside the indoor or outdoor units. If these devices are touched or readjusted, serious accidents may occur.
- Refrigerant R410A for this unit is incombustible, non-toxic and odorless; however if the refrigerant leaked and contacted with fire, toxic gas will generate. Also because the R410A is heavier than air, its accumulation near floor surface could lead to difficult breathing. Turn OFF the main switch, cut off the power, open the doors and windows for ventilation,extinguish any naked flames and contact your service contractor, if refrigerant leakage occurs.
- Make sure to perform air-tight testing.
  The refrigerant used in this product (fluorocarbon) is not flammable, non-toxic, and odourless. If there is refrigerant leakage, exposure to open flame produces toxic gases. Also, the refrigerant gas is heavier than air, if the ground is filled with refrigerant gas, it may cause suffocation to the persons in the vicinity.
- The refrigerant safety leakage standard for construction and operation systems are determined as per local regulations or standards.
- Use a high sensing speed above ELB (Earth Leakage Breaker with action time of 0.1 seconds or less). Otherwise, this may cause electric shock or fire.
- Do not install the product in places where there is high density of oil mist, flammable gas, salt spray, or toxic gases (such as sulphide), and so on.
- During installation, connect the refrigerant pipe firmly before the compressor starts running. For maintenance, stop the compressor before moving, handling and removing the refrigerant pipe.
- Do not short-circuit the protective devices (such as pressure switches and so on) during operation. Otherwise it may cause a fire or explosion.

⚠ WARNING

- Please do not use sprays such as pesticide, oil paint, hair spray or other flammable gases within 1 meter of the unit.
- If the circuit breaker acts or fuse acts frequently, please stop the system operation immediately and contact your local dealer or customer service.
- Ensure that the grounding wire is securely connected. If not, it may cause an electrical failure. Do not connect the grounding wire to the gas pipe, tap water pipe, lightning rod or telephone grounding wire.
- Use fuse of specified capacity.
- While you perform brazing, ensure that there are no combustible material around it. Please wear leather gloves while using refrigerant to prevent freezing.
- Prevent mice and other small animals damaging the wiring and the electrical components. If unprotected parts are bitten, it may lead to fire
- Securely connect and fix the wiring, do not apply external force on terminal blocks, this may cause the terminal to loosen and can cause a fire
- Ensure that the foundation is robust enough to install the unit. If not, the appliance can fall and break.
- Do not install the unit in the presence of large amounts of oil, steam, organic solvents and corrosive gases (ammonia, sulphide and acid, so on). Because corrosion may cause refrigerant leakage, electrical failure, performance degradation and unit damage.
- Please follow the installation manual and all the relevant provisions, standards for electrical, construction. Otherwise, electric failure of fire may occur due to insufficient capacity or mismatch of specification.
- Use specified wiring between the units and select the correct wiring between the appliances. Otherwise, will cause an electrical malfunction or fire.
- Make sure that the terminals are tightened with the specified torque. Otherwise it will cause a fire or electrical fault at the terminal block.
- The A-weighted emission sound pressure level at workstations does not exceed 70 dB(A).
- Before running the system, ensure that the outdoor unit is not covered by snow and ice.
- In case of fire, cut off the power immediately; do not touch the electrical parts by hand to avoid electric shock hazard.
- If the supply cord is damaged,it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.
- This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
- Children should be supervised to ensure that they do not play with the appliance.
- This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.
- The appliances are not intended to be operated by means of an external timer or separate remote-control system.
- Keep the appliance and its cord out of reach of children less than 8 years.

⚠ CAUTION

- Do not tread on the product or place sundries on the product.
- Do not place or put any material on the product or inside the product.
- Provide a strong and correct foundation so that:
  A. The outdoor unit is not on an incline.
  B. Abnormal sound does not occur.
  C. The outdoor unit will not fall down due to a strong wind or earthquake.

NOTE

- Please do not install indoor unit, outdoor unit, remote controller and wiring within 3m of strong electromagnetic radiation appliance (For example: medical device).
- After a long time shut down, if you want to restart the appliance, please power the crankcase heating band to work 12 hours prior to operation.
- Before switching on the unit, make sure that the outdoor unit is not covered by snow and ice.
- The heat pump air conditioner may not work properly if:
  * The power of the power supply transformer which supplies power is equal or less than the electric power of the air conditioner.
  * Power supply for high-power equipment is too close to the power wire of the air conditioner.

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

In the case mentioned above, the power wire of the air conditioner generates a large induced surge voltage due to the abrupt change in the power consumption of the power equipment and the switch action.

Therefore, to protect the power supply to the system, before performing electric construction, please carefully check the field installation specifications and standard

- It is recommended to ventilate the room once every 3 to 4 hours.
- Reduction in heat pump air conditioner heating capacity is observed due to the degradation of outdoor environmental temperature. Therefore, in some low temperature areas, it is recommended to use auxiliary heating device while installing heat pump air conditioner.
- Only a professional maintenance personnel can perform maintenance work for this air conditioner.

2. Structure

2.1 Outdoor Unit and Refrigerating System

Refer to the technical manual for the structure diagram and system cycle diagram.

2.2 Tools and Instruments Required for Installation

The designed pressure of the unit is 4.15MPa.

To avoid mixing of refrigerant with cooling oil or other refrigerants in the system, the size of the connecting device is changed.

Before installation, it is necessary to have the following tools:

No.	Tool	No.	Tool	No.	Tool	No.	Tool
1	Handsaw	6	Pipe Bender	11	Wrench	16	Leveller
2	Screwdriver	7	Vise	12	Charging Cylinder	17	Cutter for Wires
3	Vacuum pump	8	Pipe cutter	13	Manifold valve	18	Hoist (for indoor unit)
4	Charging hose	9	Brazing tools	14	Wire cutter	19	Ammeter
5	Megohmmeter	10	Hex wrench	15	Leakage detector	20	Voltage meter

NOTE:

Use tools and measuring instruments are for the new refrigerant R410A exclusively in case of direct contact with the refrigerant.

⚠ DANGER

The pressure of the new refrigerant R410A is 1.4 times that of the conventional refrigerant. Water, oxide, grease and other impurities can easily affect the performance of the refrigerant. Ensure that the moisture, dust, other refrigerants or refrigerating oil in the refrigerating system are removed.

Therefore, if you do not use the specified material and the tool, it may cause an explosion, injury, refrigerant leak, electrical failure or fire.

○: Interchangeability is available with current R22 ■: Only for Refrigerant R410A (No Interchangeability with R22)

×: Prohibited ●: Only for Refrigerant R407C (No Interchangeability with R22)

Measuring Instrument and Tool		Interchangeability with R22		Reason of Non-Interchangeability and Attention (★ : Strictly Required)	Use
		R407C	R410A		
Refrigerant Pipe	Pipe Cutter Chamfering Reamer	○	○	—	Cutting Pipe Removing Burrs
	Flaring Tool	○	○ ■	*R410A need high pressure piping, need a larger flaring processing. When the hardness of material used is 1/2H, it cannot be flared. (R410 special tools can be used directly for R407C).	Pipe flaring processin
	Extrusion Adjustment Gauge	—	■		Calibre management after pipe
	Pipe Bender	○	○	*When the hardness of the material is 1/2H, it cannot be bended, use elbow for bend and braze.	Pipe bending processing
	Expanding Tool	○	○	* If the hardness of the material is 1/2H, it cannot be expanded tube processing, use joint for connecting piping.	Piping expansion tube processing
	Torque wrench	○	■	*For R410A when flare nut size is Ø12. and Ø15.88 spanner size should be 2mm or above.	Connection of flare nu
			○	*Ø6.35, Ø9.52, Ø19.05 Can be generic.	
	Brazing equipment	○	○	*To ensure the correct brazing (adjustable flame, heating, can feed filler	The brazing connection of the refrigerant pipe
	Nitrogen Gas	○	○	*To prevent the pipe line is contaminated (brazing blowing nitrogen to prevent oxidation).	To prevent oxidation of air tightness test
	Lubricating oil (Applied to flaring surface	●	■	*Use the same lubricating oil as the refrigeration system *Oil is easy to absorb water.	Lubricate the flaring surface
Refrigerant charging vacuum drying	Refrigerant Cylinder	●	■	*Confirm the corresponding refrigerant the cylinder. ★ Non-azeotropic mixed refrigerant should be filled in liquid state	Refrigerant Charge
	Vacuum pump	○	○	★ Can use the existing vacuum pump, but the connector should be connected to prevent the mineral oil flow back when vacuum pump stopped.	Vacuum
	Vacuum pump connector (to prevent back flow	●	※■		
	Regulating valve	●	■	*Because the pressure is higher than the R22 standard, cannot be universal, the connection diameter is different: R410A: UNF1/2, R407C: UNF7 / 16 ★ It is forbidden to use the old components before, otherwise the attached mineral oil will accumulate and may cause the circuit blocked and the compressor to malfunction.	Vacuuming, keep vacuum to charge refrigerant, detect pressure
	Charging Hose	●	■		
	Charging Cylinder	×	×	*When the refrigerant is charged, it is used for the weight gauge.	Refrigerant charge
	Weighing instrument	○	○	—	Measure the amount of refrigerant charging
	Leakage detector	●	※■	*Leakage detector for R22 cannot be generally used due to different detecting method.	Check for gas leaks

※: Common for R407C

3. Prepare Before Installation

3.1 Outdoor Model Number

<Basic Module>

HP	8	10	12	14	16
Model	RAS-8.0RNBCLQ	RAS-10RNBCLQ	RAS-12RNBCLQ	RAS-14RNBCLQ	RAS-16RNBCLQ
HP	18	20	22	24	
Model	RAS-18RNBCLQ	RAS-20RNBCLQ	RAS-22RNBCLQ	RAS-24RNBCLQ	

<Combination Module> ※

HP	26	28	30	32	34
Model	RAS-26RNBCLQ	RAS-28RNBCLQ	RAS-30RNBCLQ	RAS-32RNBCLQ	RAS-34RNBCLQ
Combination	RAS-10RNBCLQ	RAS-12RNBCLQ	RAS-14RNBCLQ	RAS-16RNBCLQ	RAS-16RNBCLQ
	RAS-16RNBCLQ	RAS-16RNBCLQ	RAS-16RNBCLQ	RAS-16RNBCLQ	RAS-18RNBCLQ
HP	36	38	40	42	44
Model	RAS-36RNBCLQ	RAS-38RNBCLQ	RAS-40RNBCLQ	RAS-42RNBCLQ	RAS-44RNBCLQ
Combination	RAS-16RNBCLQ	RAS-16RNBCLQ	RAS-16RNBCLQ	RAS-18RNBCLQ	RAS-20RNBCLQ
	RAS-20RNBCLQ	RAS-22RNBCLQ	RAS-24RNBCLQ	RAS-24RNBCLQ	RAS-24RNBCLQ
HP	46	48	50	52	54
Model	RAS-46RNBCLQ	RAS-48RNBCLQ	RAS-50RNBCLQ	RAS-52RNBCLQ	RAS-54RNBCLQ
Combination	RAS-22RNBCLQ	RAS-24RNBCLQ	RAS-16RNBCLQ	RAS-16RNBCLQ	RAS-16RNBCLQ
	RAS-24RNBCLQ	RAS-24RNBCLQ	RAS-16RNBCLQ	RAS-16RNBCLQ	RAS-16RNBCLQ
	-	-	RAS-18RNBCLQ	RAS-20RNBCLQ	RAS-22RNBCLQ
HP	56	58	60	62	64
Model	RAS-56RNBCLQ	RAS-58RNBCLQ	RAS-60RNBCLQ	RAS-62RNBCLQ	RAS-64RNBCLQ
Combination	RAS-16RNBCLQ	RAS-16RNBCLQ	RAS-16RNBCLQ	RAS-16RNBCLQ	RAS-16RNBCLQ
	RAS-16RNBCLQ	RAS-18RNBCLQ	RAS-20RNBCLQ	RAS-22RNBCLQ	RAS-24RNBCLQ
	RAS-24RNBCLQ	RAS-24RNBCLQ	RAS-24RNBCLQ	RAS-24RNBCLQ	RAS-24RNBCLQ
HP	66	68	70	72	74
Model	RAS-66RNBCLQ	RAS-68RNBCLQ	RAS-70RNBCLQ	RAS-72RNBCLQ	RAS-74RNBCLQ
Combination	RAS-18RNBCLQ	RAS-20RNBCLQ	RAS-22RNBCLQ	RAS-24RNBCLQ	RAS-16RNBCLQ
	RAS-24RNBCLQ	RAS-24RNBCLQ	RAS-24RNBCLQ	RAS-24RNBCLQ	RAS-16RNBCLQ
	RAS-24RNBCLQ	RAS-24RNBCLQ	RAS-24RNBCLQ	RAS-24RNBCLQ	RAS-18RNBCLQ
	-	-	-	-	RAS-24RNBCLQ
HP	76	78	80	82	84
Model	RAS-76RNBCLQ	RAS-78RNBCLQ	RAS-80RNBCLQ	RAS-82RNBCLQ	RAS-84RNBCLQ
Combination	RAS-16RNBCLQ	RAS-16RNBCLQ	RAS-20RNBCLQ	RAS-20RNBCLQ	RAS-20RNBCLQ
	RAS-16RNBCLQ	RAS-16RNBCLQ	RAS-20RNBCLQ	RAS-20RNBCLQ	RAS-20RNBCLQ
	RAS-20RNBCLQ	RAS-22RNBCLQ	RAS-20RNBCLQ	RAS-20RNBCLQ	RAS-20RNBCLQ
	RAS-24RNBCLQ	RAS-24RNBCLQ	RAS-20RNBCLQ	RAS-22RNBCLQ	RAS-24RNBCLQ
HP	86	88	90	92	94
Model	RAS-86RNBCLQ	RAS-88RNBCLQ	RAS-90RNBCLQ	RAS-92RNBCLQ	RAS-94RNBCLQ
Combination	RAS-20RNBCLQ	RAS-20RNBCLQ	RAS-20RNBCLQ	RAS-20RNBCLQ	RAS-22RNBCLQ
	RAS-20RNBCLQ	RAS-20RNBCLQ	RAS-22RNBCLQ	RAS-24RNBCLQ	RAS-24RNBCLQ
	RAS-22RNBCLQ	RAS-24RNBCLQ	RAS-24RNBCLQ	RAS-24RNBCLQ	RAS-24RNBCLQ
	RAS-24RNBCLQ	RAS-24RNBCLQ	RAS-24RNBCLQ	RAS-24RNBCLQ	RAS-24RNBCLQ
HP	96				
Model	RAS-96RNBCLQ				
Combination	RAS-24RNBCLQ				
	RAS-24RNBCLQ				
	RAS-24RNBCLQ				
	RAS-24RNBCLQ				

※ Module combination are specified in above table. Do not use any other combinations beyond table

4. Transport and Handling

4.1 Transport

Transport the unit to a place as close as possible to the installation site before unpacking the unit. When handling with a hoist, follow the lifting instructions on the unit package.

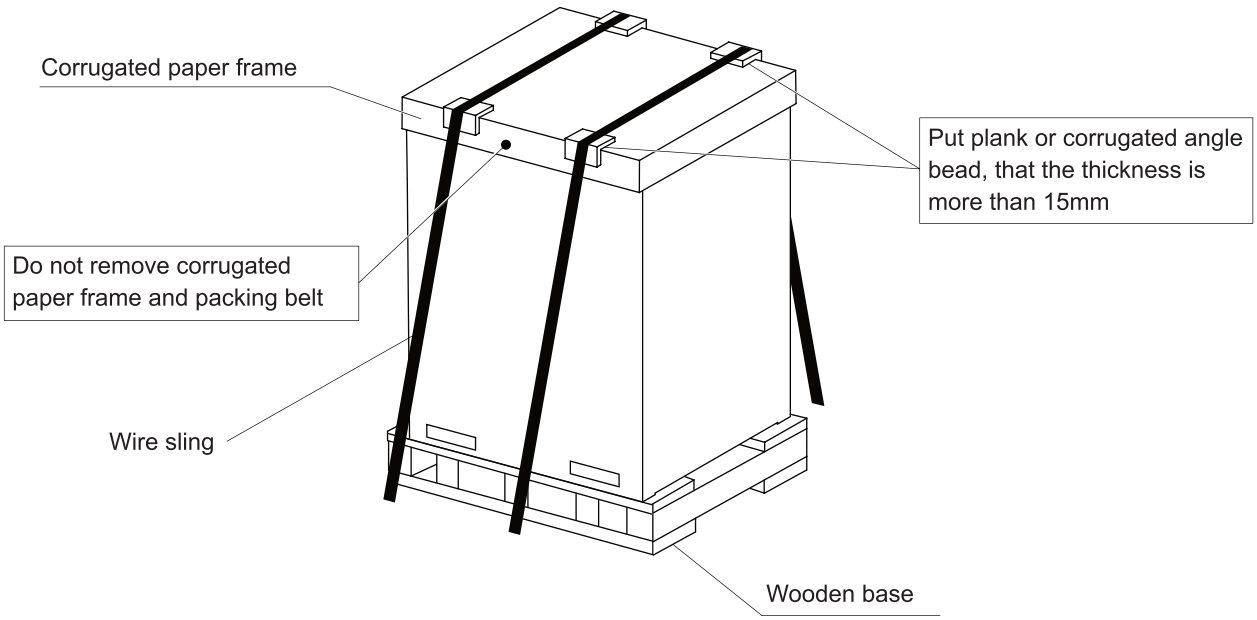
⚠ DANGER

When hanging, do not route the rope through the wooden base.



NOTICE

- **Transport and storage**
  Strength of unit packaging cardboard is limited, so please note the following:
- *** It is forbidden to tread on the unit packaging, it is strictly prohibited placing any material on the appliance.**
- *** When lifting with a crane, please use 2 slings for transporting and storing.**
- *** Do not store units which are stacked up.**
- **Transport and packing**
- *** To protect the unit, do not remove any packaging.**
- *** It is forbidden to stack up or place any material on the unit.**
- *** Unit is bundled at both sides as shown below:**



4.2 Lifting Method

When lifting the unit, ensure the balance of the unit, confirm the safety and then lift it smoothly.

1. It is strictly forbidden to remove any packing filler.
2. As shown in Figure 4.1, lift the unit with a bundle of two slings.

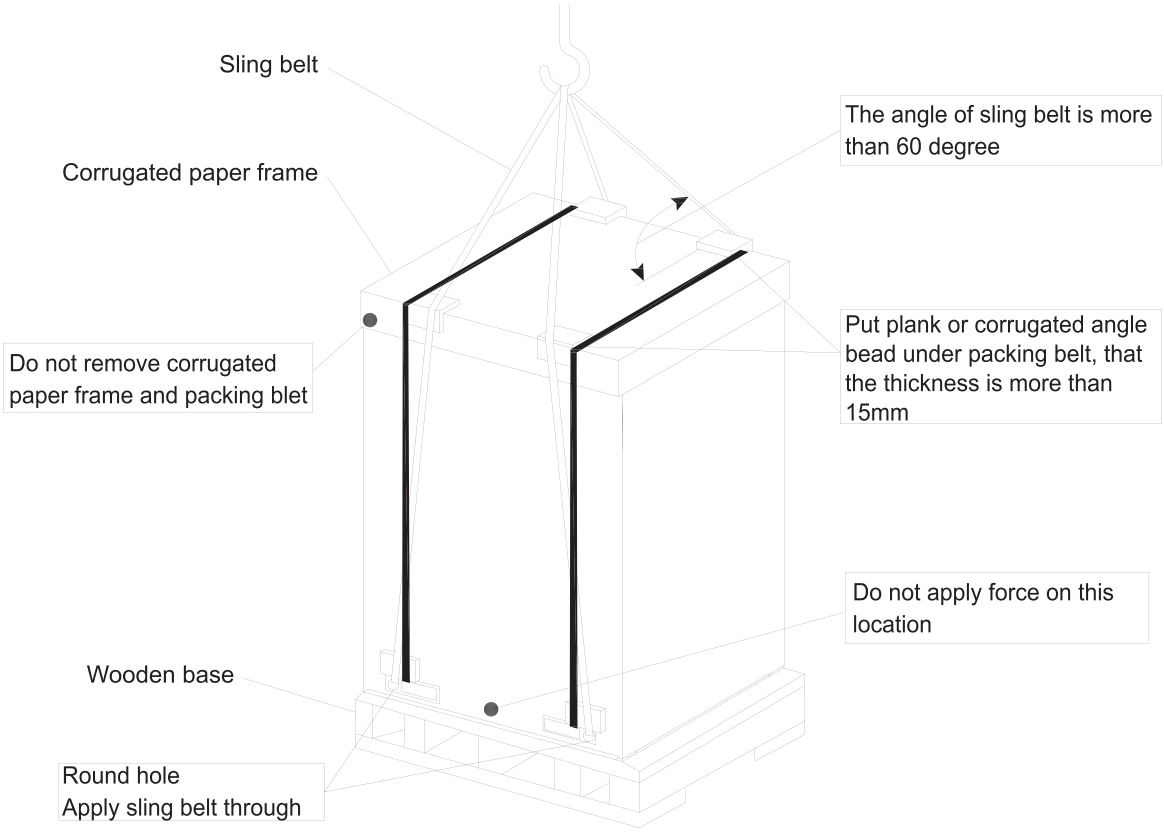


Figure 4.1 Lifting Diagram

3. Lifting/hoisting without wooden base, as shown in Figure 4.2.

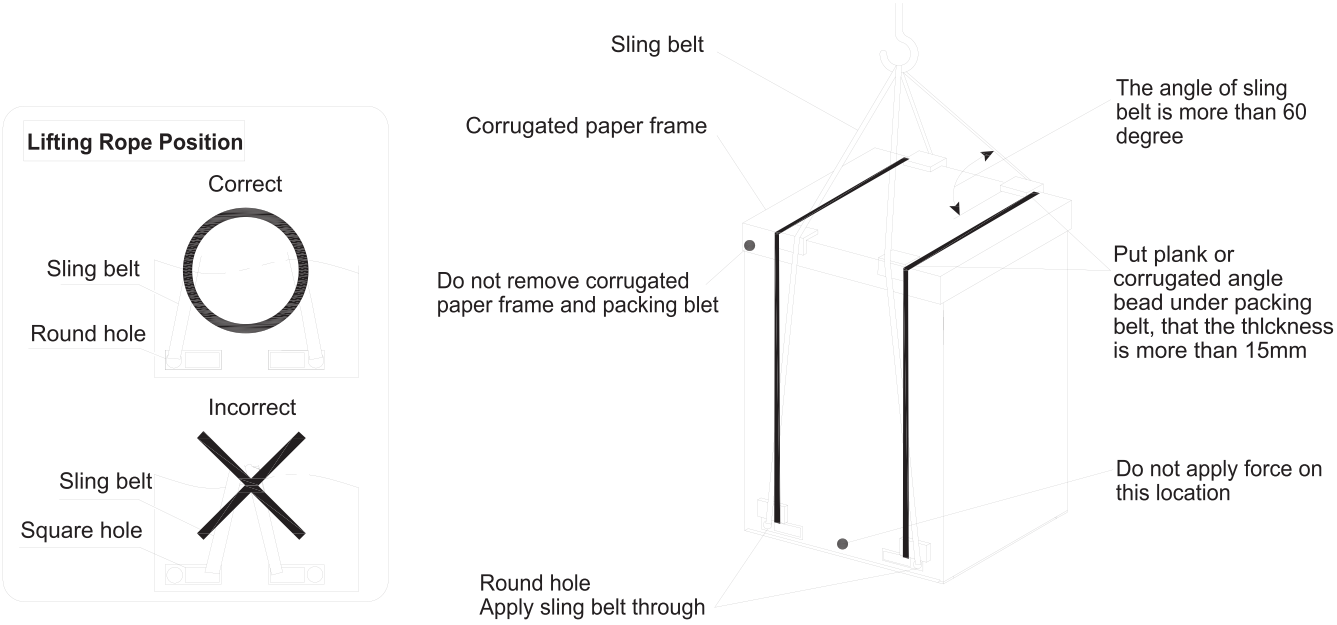
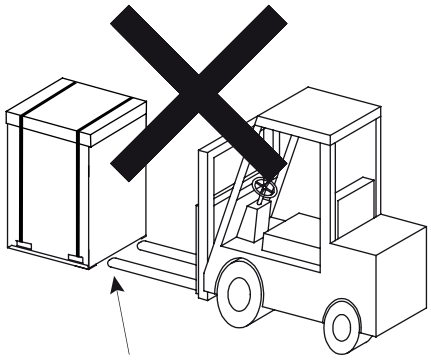


Figure 4.2 Lifting Diagram Without Wooden Base

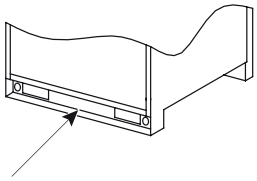
When handling the unit with a forklift, prohibit to fork the side panel of the unit with a forklift as this may damage the unit.



Fork

Prohibit to use the forklift or other tools to operate with excessive force to the square opening at the bottom of the unit. Otherwise, the bottom of the unit maybe deformed.

* Prohibit to use the forklift to push the bottom of the unit.
* Prohibit to use rollers and so on.



Do not apply force to
this location (front and rear)

NOTE

If you want to carry out transport handling after unpacking, please protect the unit with veneer, fabric and so on.

WARNING

Before installation and commissioning, do not place additional items inside the unit and ensure that no people is inside the unit. Otherwise, this may lead to fire, fault, injuries so on.

5. Installation of Outdoor Unit

5.1 Factory Accessories

Check for the following components which are outdoor unit accessories before installation:

Table 5.1 Factory Accessories

Accessory	8HP	10HP	12HP	14HP	16HP	18HP	20HP	22HP	24HP
Piping Accessories	1	1	1	1	1	1	1	1	1
Magnet Ring	2	3	3	3	3	3	3	3	3
Filter	2	2	2	2	2	2	2	2	2
Tie	2	4	5	5	5	5	8	8	8
IOM	1	1	1	1	1	1	1	1	1

NOTE

If the accessories are not shipped with the unit, please contact the dealer.

5.2 Installation

(1) Outdoor unit should be installed in a dry and well-ventilated environment.

(2) Outdoor units should be installed in a shaded place, or in a place not exposed to direct sunlight and high temperature heat radiation place.

(3) The outdoor unit should be installed in a place where the noise and the air flow discharge during operation will not affect the neighbors or the surrounding ventilation. The noise emitted on the rear, left and right sides is 6 to 7 dB (A) higher than the noise measured in the nominal front of the unit.

(4) The outdoor unit should be installed in the place where it is not allowed by the public people.

(5) Check that the foundation on which the unit is installed is a levelled surface and strong enough to hold the unit firmly.

(6) Do not install the outdoor unit in a place where dust or other debris can block the outdoor heat exchanger.

(7) When the outdoor unit is installed in a place where there is heavy snowfall, install the snow cover at the top of the outdoor unit and the inlet of the heat exchanger.

(8) When performing heating and defrosting operation, the outdoor unit discharges condensate. Provide a suitable drain around the foundation. If the outdoor unit installed on the roof, balcony or corridor and other places, prevent condensate from dropping to the people walking on the road. Otherwise during the winter condensates freezes to ice and can block the road. If the unit is installed in such place, provide an additional drain around the foundation.

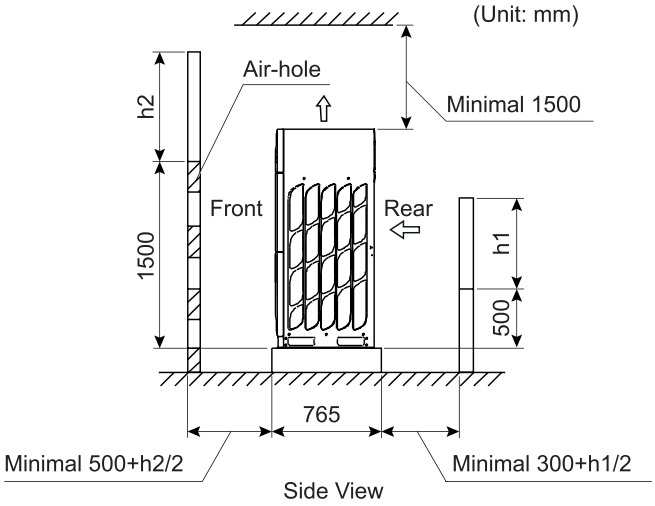
(9) Do not install the outdoor unit in a place where the rain falls directly on the outdoor unit heat exchanger or in the gap formed by the building space.

NOTE:

1. Do not install the outdoor unit in environments where there is high concentration of oil mist, corrosive gases, salt winds, and harmful gases (sulfur, acid, alkaline).
2. Do not install the outdoor unit in places where electromagnetic radiation can directly interfere with the electric box of the outdoor unit.
3. Outdoor installation should be as far as possible from the electromagnetic wave generating equipment, the distance between the unit and the equipment should be at least 3 meters.

5.3 Maintenance Space

When you install the outdoor unit, the maintenance space should be reserved as per the following requirements:

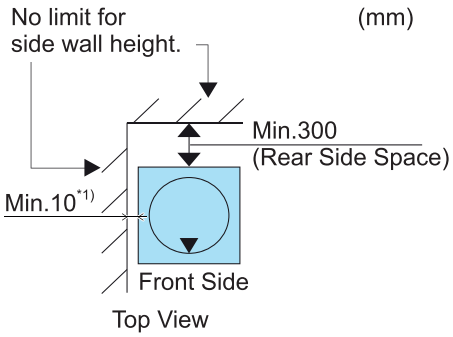


- If there is no wall in the rear and front, installation space requirements are as follows:
  * Front: 500mm or more.
  * Rear: more than 300mm.
  * Left and right: 10mm or more (If snow protection device is used or air outlet duct is installed, needs 50mm or more)
- If the front wall is more than 1.5 meters high, the front needs at least (500+h2/2) mm.
- If the rear wall is more than 0.5m high the rear requires at least (300+h1/2) mm.
- If the surrounding is not more than 2 walls, you must meet the above installation space.
- If the appliance is surrounded by more than 2 walls, ensure to meet the following installation space.
- When the upper obstacle and the unit is less than 1.5 meters or no space above the air outlet side of the air duct to prevent short circuit.
- When there is an obstacle above, in principle it is required that there is no any obstacle around the unit (Front, rear, left, right).

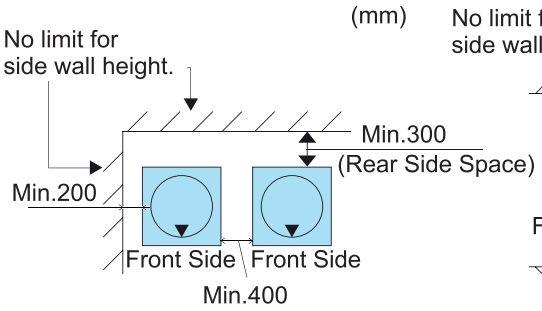
1) When both sides have walls:

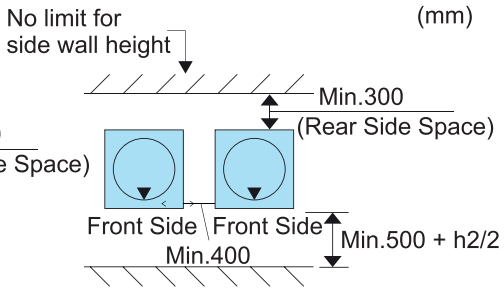
If the outdoor unit is installed adjacent to high building, and both sides without walls, the outdoor unit should be reserved for minimum 300mm maintenance space at rear side.

- Single Installation



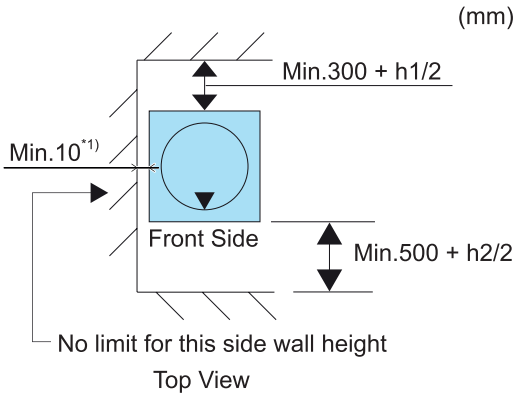
- Multiple / Serial Installation





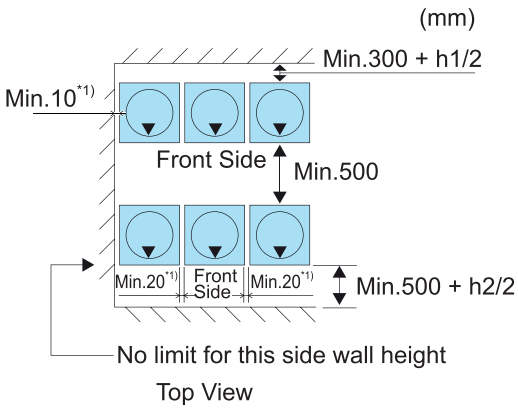
2) When the walls are on 3 sides:

- Single Installation

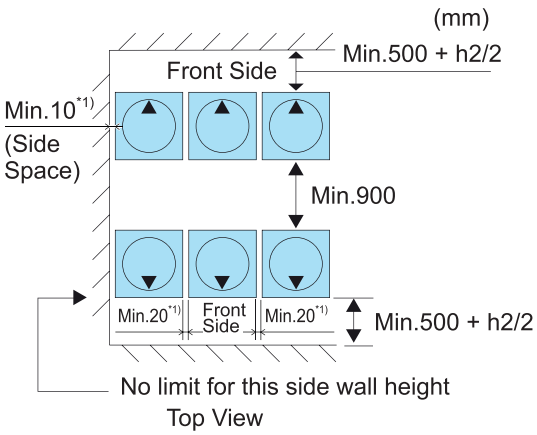


- Multiple / Serial Installation

<Installation in the Same Direction>

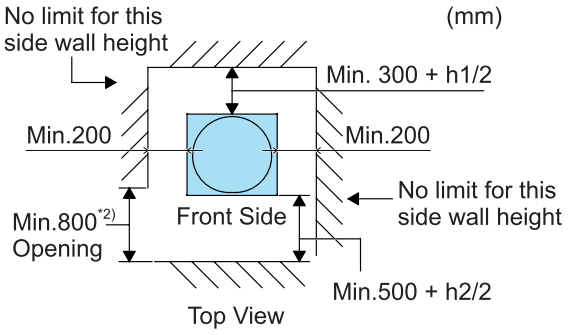


< Rear to Rear Installation>



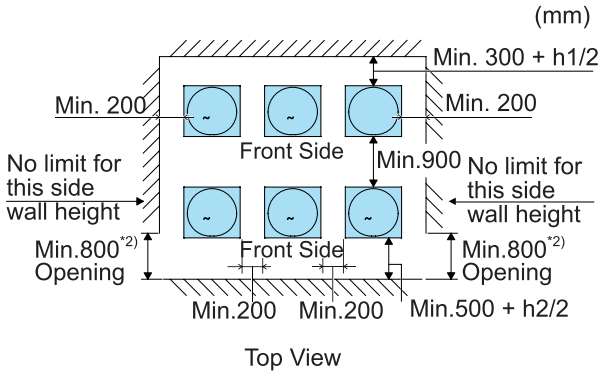
3) When surrounded by walls at 4 sides:

- Single Installation

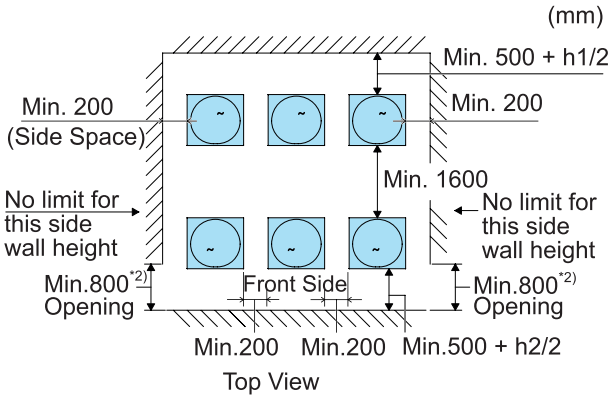


- Multiple / Serial Installation

<Installation in the Same Direction>



< Rear to Rear Installation>

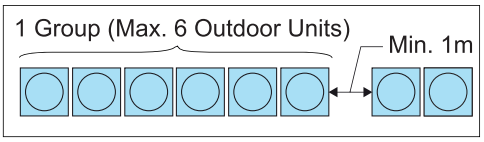


*1): In the case that the field-supplied snow protection hood or the air flow deflector duct is adopted, the space of minimum 50mm is required.

*2) Partly open a wall if the unit is surrounded by walls at four sides.

NOTE:

1. Keep the top of the outdoor unit without any obstacle to prevent short circuit due to supply air and return air of each outdoor unit.
2. The above chart provides sufficient operation and maintenance space for outdoor unit under standar operation conditions (operating mode: cooling, ambient temperature: 35 °C) If the outdoor unit ambient temperature is higher, and there is a return air short circuit, adjust the installation size depending on the actual installation conditions, and the calculation of outdoor unit return airflow.
3. When multiple outdoor units are installed in the same direction, you can install a maximum of six outdoor units. The minimum distance between two adjacent outdoor units should be at least 1m.



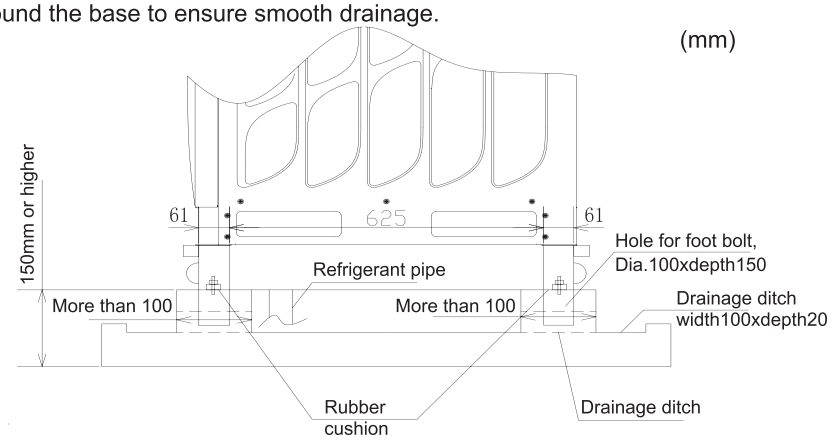
5.4 Foundation

- Concrete Foundation:

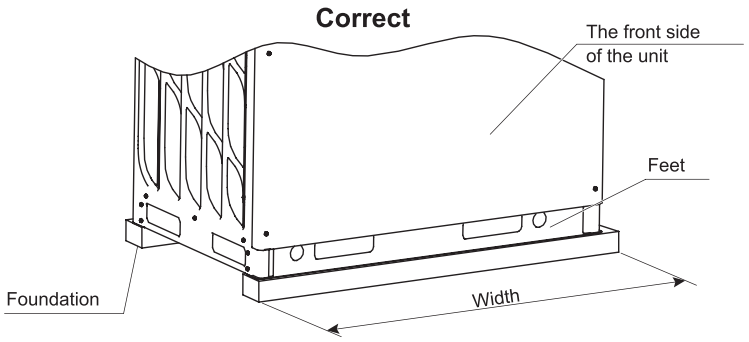
(1) The foundation should be 150 mm higher than the ground.

(2) Set the drain ditch around the base to ensure smooth drainage.

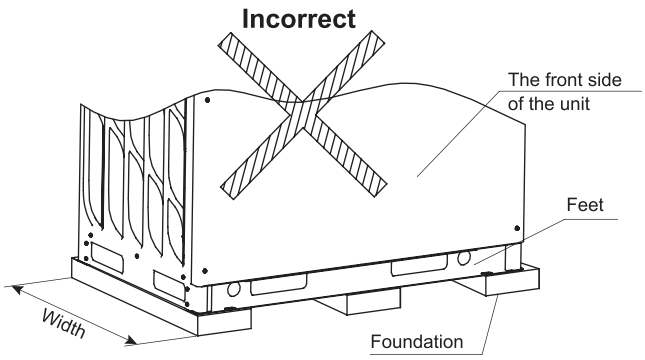
(mm)



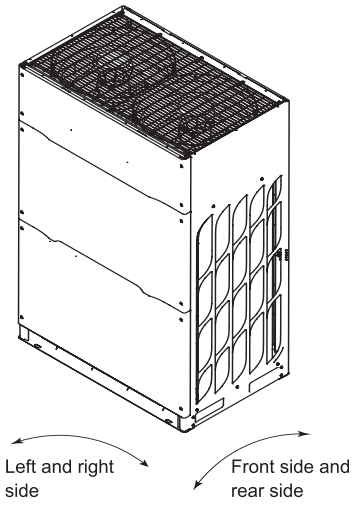
*Please set the concrete base as shown below:



*Do not setup the concrete foundation as shown below. Otherwise, the foot of the unit may be deformed:



(3) Install the outdoor unit horizontally in whole plane direction using level gauge to check that the slope in the four directions (front, rear, left, and right) tilt does not exceed 10mm.



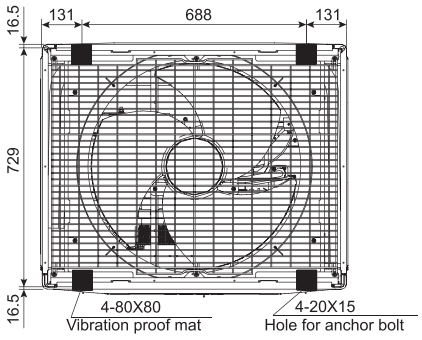
(4) Please provide a firm and correct foundation to ensure:

a. The outdoor unit is on a horizontal plane.

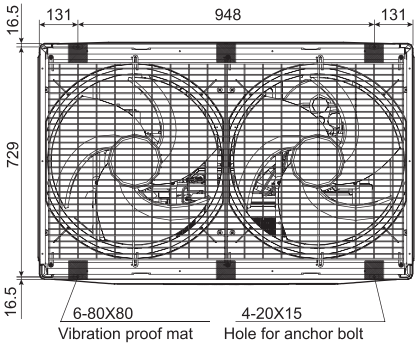
b. The outdoor unit does not make abnormal sound.

c. The outdoor unit does not get toppled by earthquake or strong winds.

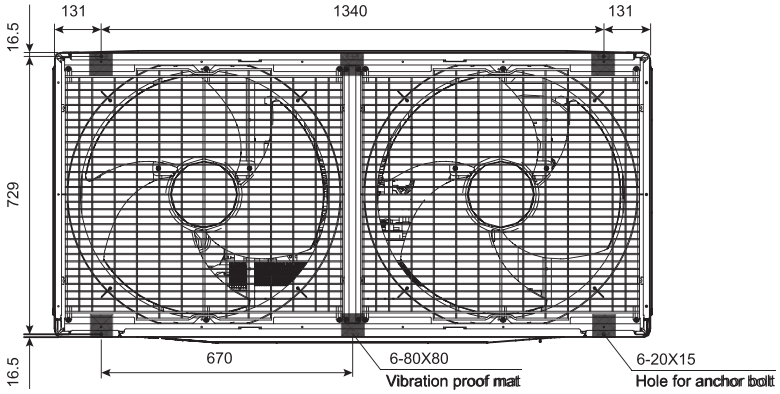
(5) When installing the outdoor unit, use the field-supplied anchor bolts to mount the unit. Refer to Figure 5.1 to confirm the position of mounting hole.



RAS-8.0~12RNBCLQ Unit: mm



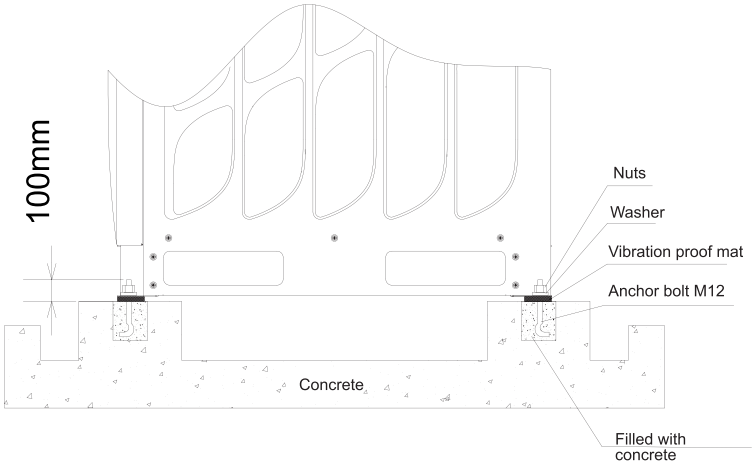
RAS-14~18RNBCLQ Unit: mm



RAS-20~24RNBCLQ Unit: mm

Figure 5.1 The Hole Position Diagram for Foot Bolt Fixing

Make sure that the outdoor foot bolts are securely tightened.



(6) When you install outdoor unit on the roof or the balcony, ice may easily accumulate around the drain ditch in the winter morning, hence do not drain the area where people often pass.

(7) When the outdoor unit needs a drain pipe, use a drain pipe joint device. In cold areas, do not use the drain pipe on the water tray as the condensed water may freeze inside the pipe resulting in drain pipe burst.

5.5 Condensation Water Treatment

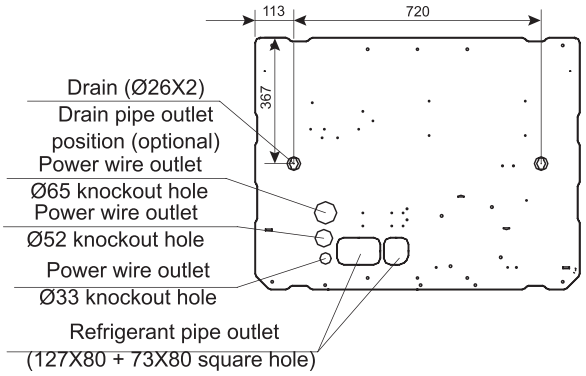
The outdoor unit discharges condensed water during heating and defrosting. (Rainwater can also be discharged through it)
Please pay attention to the following:

(1) Select a place where you can easily set up an effective drain pipe or drain.

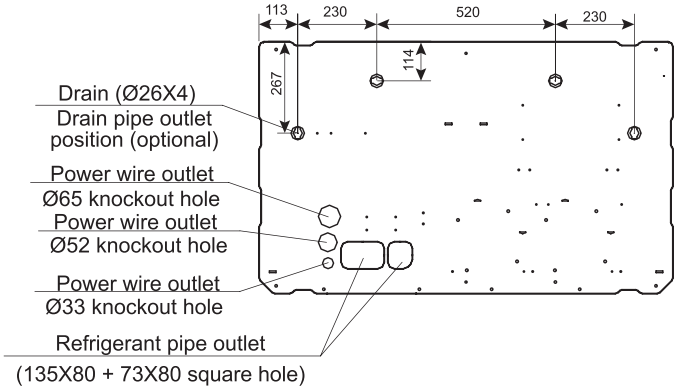
(2) Do not install the outdoor unit above the sidewalk, the condensed water may drip onto the pedestrian. Setup an additional water tray if you have to install it in such places.

(3) When the outdoor unit needs a drain pipe, use a drain pipe joint device. In cold areas, do not use the drain pipe on the water tray as the condensed water may freeze inside the pipe resulting in drain pipe burst.

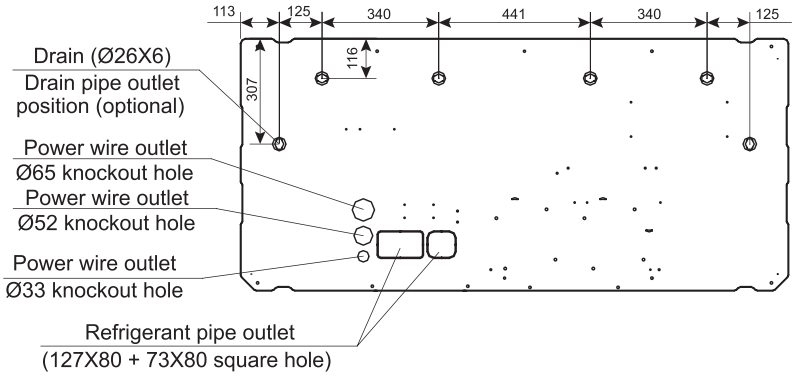
RAS-8.0~12RNBCLQ Unit: mm



RAS-14~18RNBCLQ Unit: mm

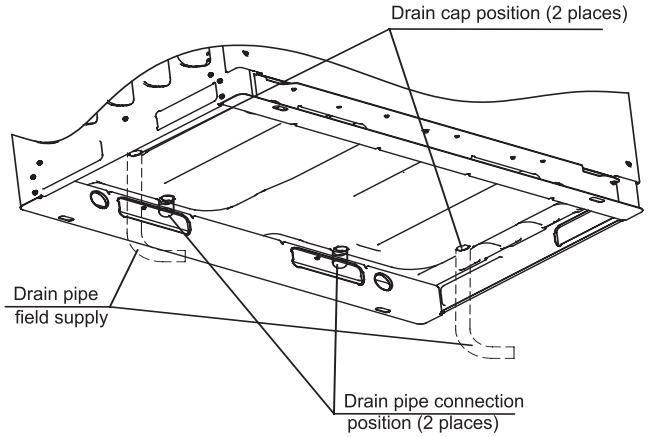


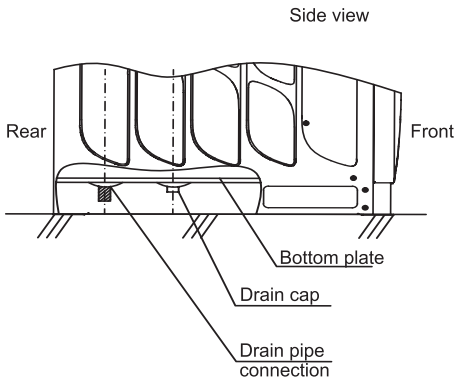
RAS-20~24RNBCLQ Unit: mm



Installation location

For example, RAS-14RNBCLQ models:





Drain cap position (2 places)

6. The Refrigerant Piping Construction

⚠ DANGER

- Refrigerant R410A is used in the refrigerant circulation system. Do not allow oxygen, acetylene or other flammable and toxic gases to fill the refrigerant pipe during leakage and air tightness test. These gases are very dangerous and may cause an explosion. It is recommended to use nitrogen.
- Ensure that there is no pressure inside the stop valve when removing the cap on the stop valve.

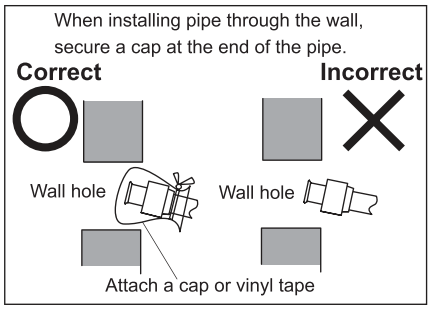
⚠ CAUTION

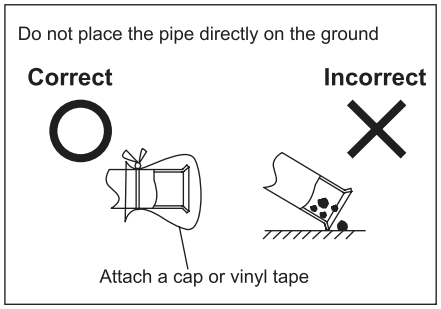
Make sure that the refrigerant piping is connected in the same refrigeration system.

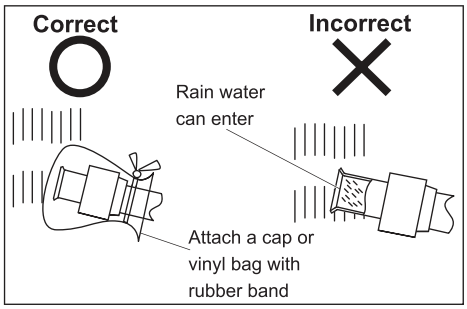
6.1 Piping Material

(1) Prepare copper pipe for on-site construction.
(2) Select the copper pipe specifications.
(3) Choose clean copper pipes. Make sure that there is no dust and moisture inside the copper pipe inner wall. Before performing piping connection, use dry air or nitrogen to blow the inside of the copper pipe to remove internal dust or impurities. Do not cut the copper pipe with tools such as saws and grinding wheels that can produce metal debris.

- Notice for piping end



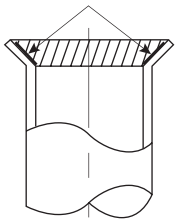




- Piping connection construction precautions.

(1) Connect the indoor unit and the outdoor unit with a refrigerant pipe. Pay attention to the pipeline do not touch the ceiling and other weakness places. (Otherwise, the you will hear sound of piping vibration).
(2) Apply a layer of refrigerant oil gently to the inner surface of the piping flaring area before performing flar piping connection.
Use specified torque value with a double wrench operation, to tighten the flare nut.
First tighten the flare nut for liquid pipe, and then tighten the flare nut for gas pip
After the job is completed, check for leakages.

Apply refrigerant oil

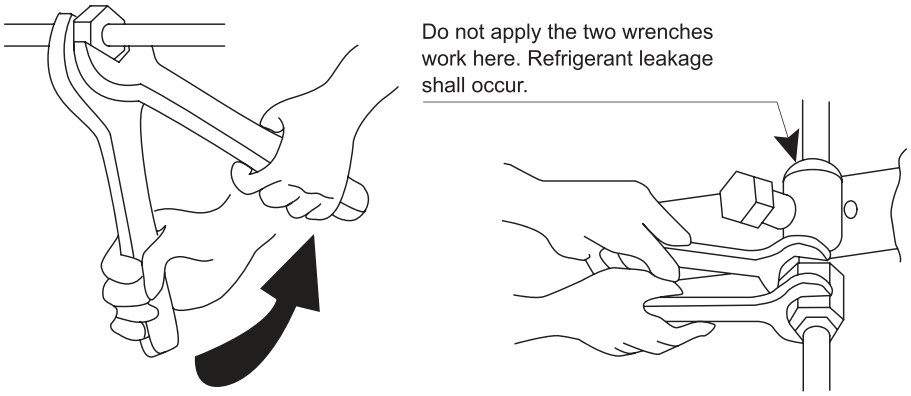


NOTE:

Refrigeration oil should be supplied on-site. [Model: FV68H].

(3) If the temperature and relative humidity inside the ceiling are more than 27°C / 80%, apply a layer of insulation pipe (about 10 mm in thickness) to the outer surface of the original insulation pipe. The insulation pipe attached to the refrigerant pipe to prevent the formation of condensed water on the surface of the refrigerant pipe. (Refrigerant pipe only).
(4) Apply a pressure of 4.15MPa to test the air tightness of the refrigerant pipe.
(5) Cover the refrigerant pipe junction, reducing pipe connection and all the outer surface of the refrigerant piping with the insulation tube, and then pack the insulation tube with teflon tape.

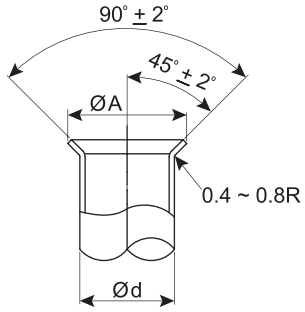
- Use double wrench while tightening the flare nut.



Tightening Work for Stop Valve of liquid pipe

6.2 Flare and Joints

- Flare size
  Flare as shown in the table below:



(mm)

Diameter (Ød)	$A^{+0}_{-0.4}$
	R410A
6.35	9.1
9.52	13.2
12.7	16.6
15.88	19.7
19.05	(*)

(*)It is impossible to perform the flaring work with 1/2H material. In this case, use an accessory pipe (with a flare)

- Joint selection

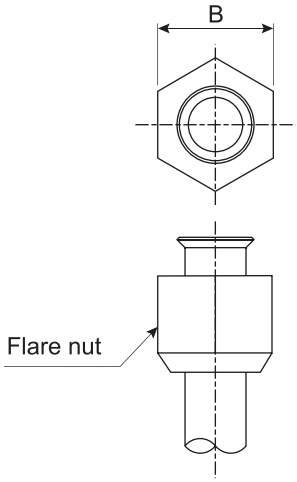
  If you use 1/2H material pipe, it cannot be flared. In this case, the joints shown in the table below can be used:

Minimum wall thickness of the joint (mm)

	R410A
Ø 6.35	0.5
Ø 9.52	0.6
Ø 12.7	0.7
Ø 15.88	0.8
Ø 19.05	0.8
Ø 22.2	0.9
Ø 25.4	0.95
Ø 28.58	1.0
Ø 31.75	1.1
Ø 38.1	1.35
Ø 41.3	1.45
Ø 44.5	1.55
Ø 50.8	2.0
Ø 53.98	2.0

Flare nut Size B (mm)

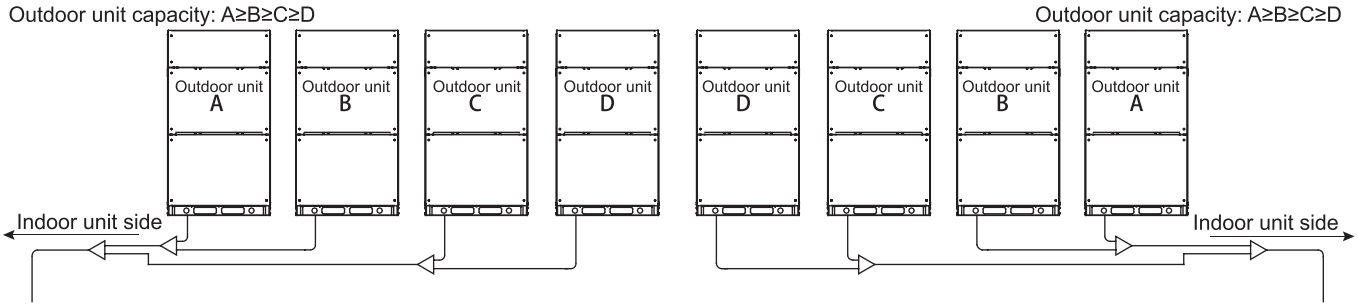
	R410A
Ø 6.35	17
Ø 9.52	22
Ø 12.7	26
Ø 15.88	29
Ø 19.05	36



6.3 Precautions for Installation of Outdoor Unit

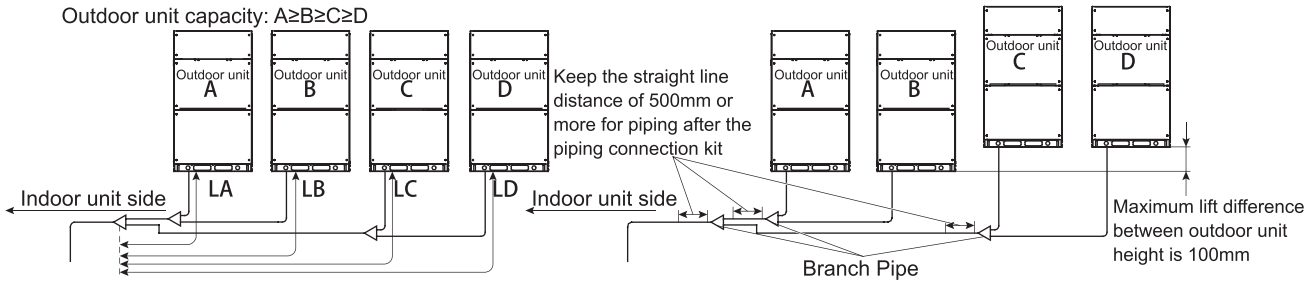
Outdoor unit arrangement

Take the 4-module combination as an example. The outdoor unit is arranged as per the order of A, B, C and D and the outdoor unit A should be installed near the indoor unit side.

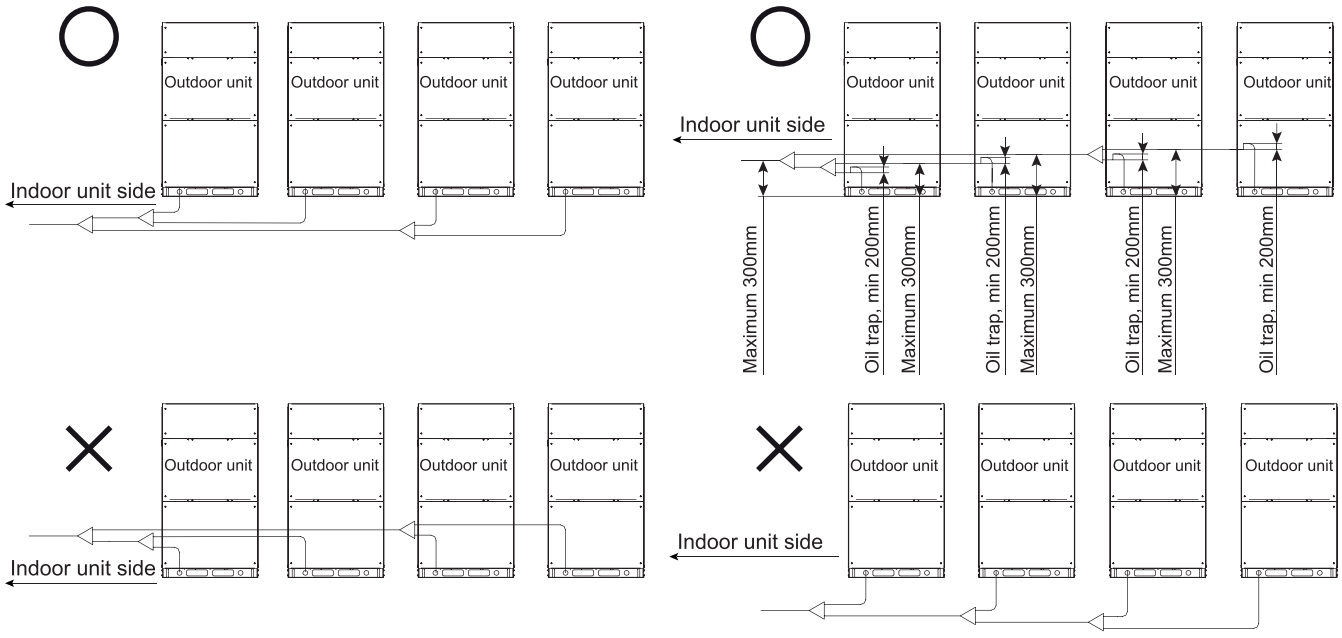


Piping construction between outdoor units

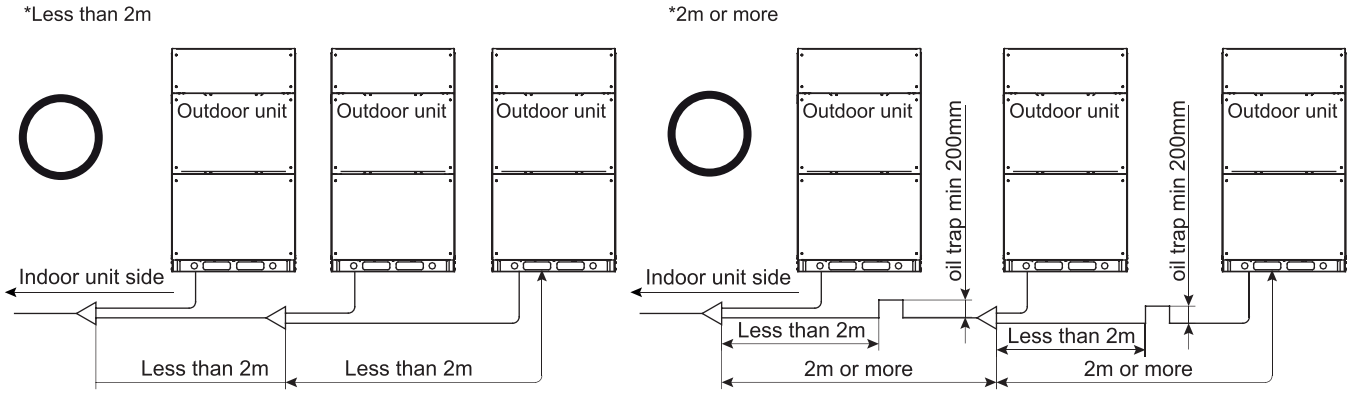
(1) The length of the piping between the outdoor unit side branch pipe and the outdoor unit shall be LA ≤ LB ≤ LC ≤ LD ≤ 10m.



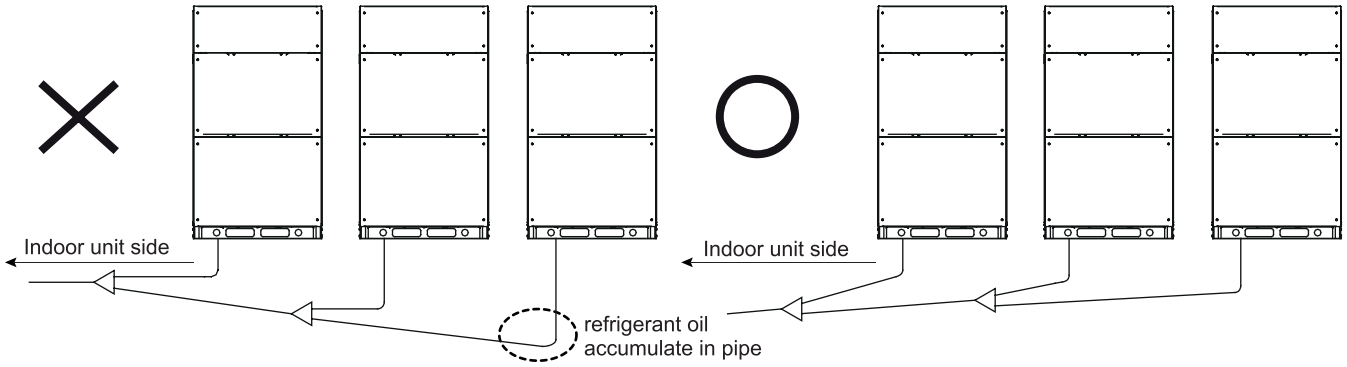
(2) Take 4-module combination of outdoor units as an example:
Installation position of branch pipe at outdoor unit side should be lower than the position of outdoor unit piping outlet. If the installation position of the branch pipe is higher than the position of outdoor unit piping outlet, distance from the branch pipe to the bottom of outdoor unit should be kept as no less than 300mm. Meanwhile, oil trap needs to be set between outdoor unit and branch pipe (Minimum 200mm).



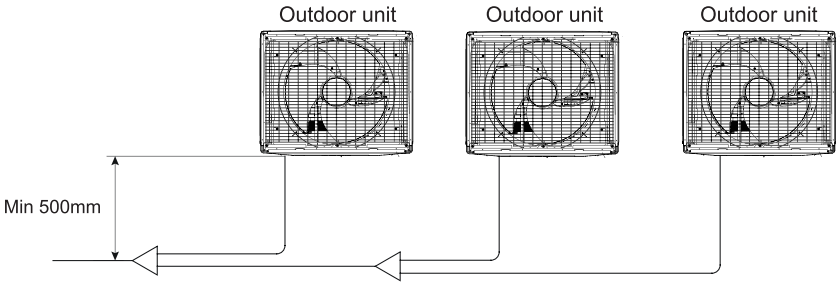
(3) Take the 3-module combination as an example. If the piping length between the outdoor unit is no less than 2m, set the oil pool so that oil pool can prevent the accumulation of cooling oil accumulation inside individual outdoor unit.



(4) Take the 3-module combination as an example. Install the outdoor unit piping in a horizontal plane, or with the indoor side of the pipe connected to the downward tilt state, otherwise, the system may accumulate cooling oil in the pipeline.

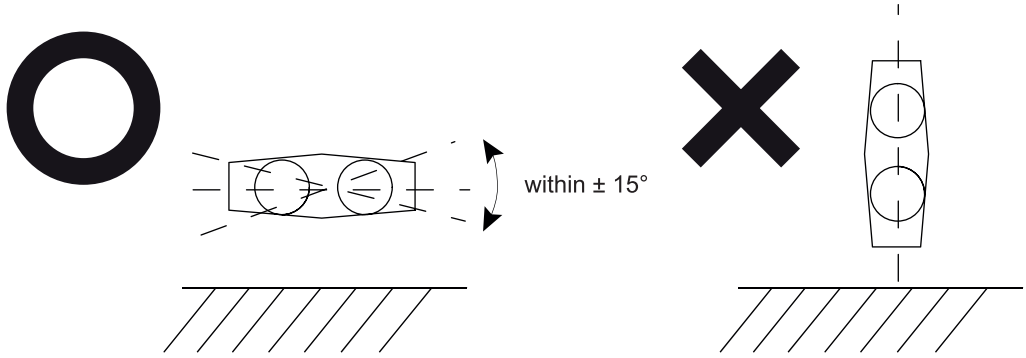


(5) Take the 3-module combination as an example. For maintenance, if the piping is installed in front of the outdoor unit, ensure that the minimum vertical distance between the outdoor unit and the branch pipe is 500mm. (During the replacement of the compressor, keep a minimum of 500mm maintenance space).



(6) Branch pipe direction

The direction of the branch pipe is as shown below, install the branch pipe closer to the ground (with an horizontal inclination angle ≤15 degrees):



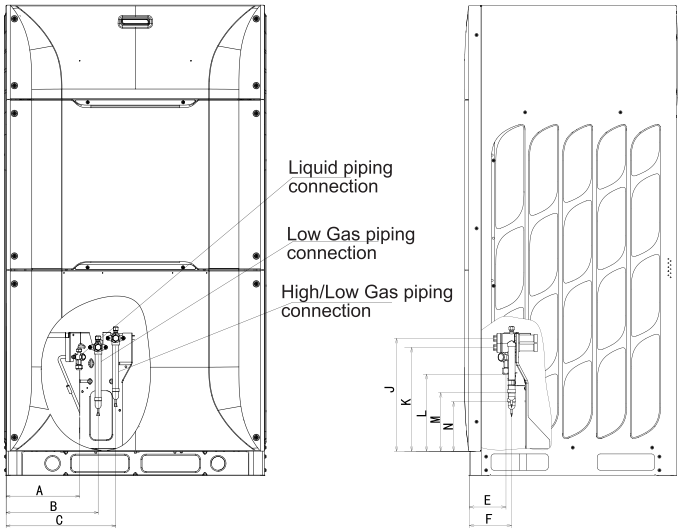
6.4 System Piping Connection

Piping connection must be carried out for each outdoor unit.

NOTE:

Verify that the refrigerant piping is connected in the same refrigerant circulation system.

- Site preparation for the use of refrigerant piping.
  Refer to the position as shown in Figure 6.1 when you connect the pipes



（mm）

Model	8HP	10HP	12HP	14HP	16HP	18HP	20HP	22HP	24HP
A	269	269	269	278	278	278	450	450	450
B	337	337	337	348	348	348	520	520	520
C	402	402	402	413	413	413	584	584	584
E	112	112	112	111	111	111	137	137	137
F	129	129	129	131	131	131	155	155	155
J	414	414	414	414	414	414	414	414	414
K	380	380	380	380	380	380	380	380	380
L	298	298	298	298	298	298	298	298	298
M	214	214	214	214	214	214	214	214	214
N	181	181	181	181	181	181	181	181	181

Figure 6.1 Refrigerant Piping Connection

- Refrigerant piping directions.
  Fix the refrigerant piping properly to avoid vibration and external force on the stop valve.

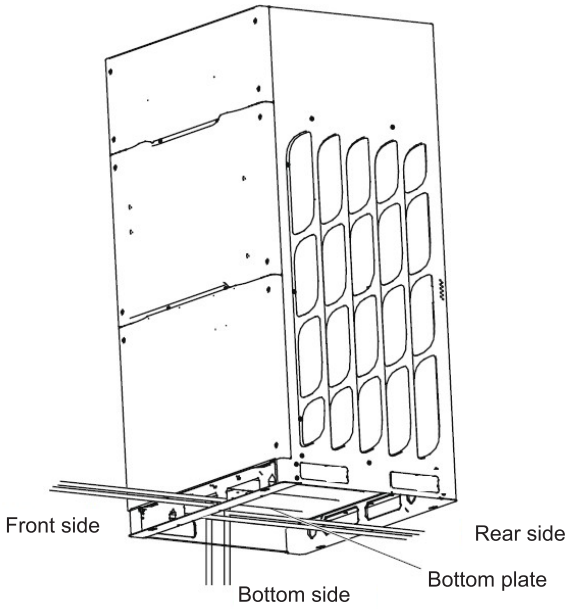
(1) Refrigerant piping can be connected in three directions of the outdoor unit:
Front: Connect the piping from the piping entrance at the unit bottom plate and then run it through the front opening of the bottom plate.
Bottom: Directly connect the piping from the piping entrance at the unit bottom plate.
Rear: Connect the piping from the piping entrance at the unit bottom plate and then run it through the rear opening of the bottom plate.

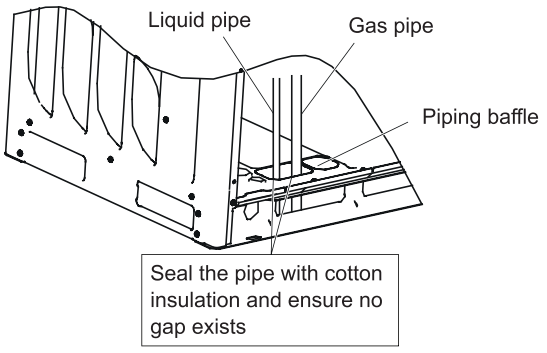
(2) Operate the stop valve as per Clause 6.4.9.

(3) Refer to section 6.4.10 for piping connection.

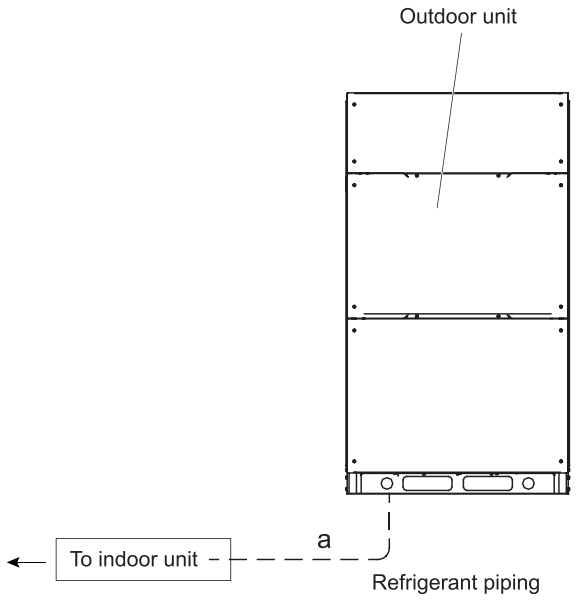
(4) If the piping is connected from the front side of the unit, the connection piping of the unit should be sealed completely with thermal insulation tube so as to prevent water or snow from entering into the unit.

(5) If the piping is connected from the bottom or rear side of the unit, need apply thermal insulation tube to the piping which is going through the bottom of the unit, so as to prevent water or snow from entering into the unit.





6.4.1 RAS-8.0RNBCLQ~RAS-24RNBCLQ Piping Specifications (3 pipes)



(Ømm)

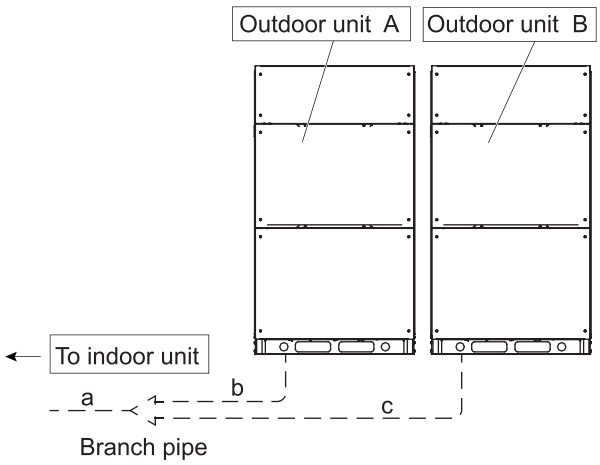
Model			RAS-8.0RNBCLQ	RAS-10RNBCLQ	RAS-12RNBCLQ	RAS-14RNBCLQ
Pipe size	a	Low Pressure Gas	19.05	22.2	25.4	25.4
		High/Low Pressure Gas	15.88	19.05	22.2	22.2
		Liquid	9.53	9.53	12.7	12.7

Model			RAS-16RNBCLQ	RAS-18RNBCLQ	RAS-20RNBCLQ	RAS-22HRNBCLQ
Pipe size	a	Low Pressure Gas	28.58	28.58	28.58	28.58
		High/Low Pressure Gas	22.2	22.2	22.2	25.4
		Liquid	12.7	15.88	15.88	15.88

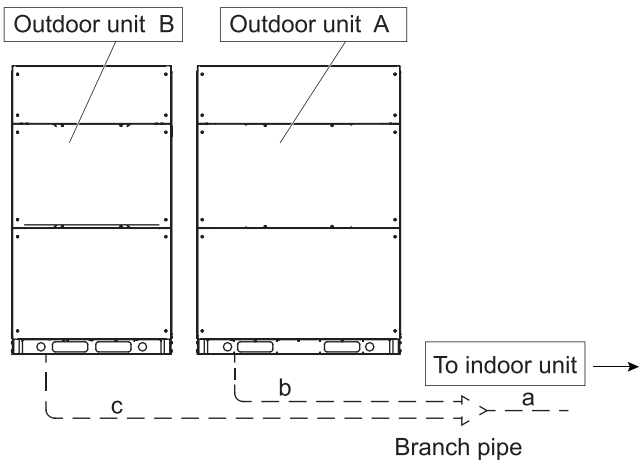
Model			RAS-24RNBCLQ
Pipe size	a	Low Pressure Gas	28.58
		High/Low Pressure Gas	25.4
		Liquid	15.88

6.4.2 RAS-26RNBCLQ~RAS-48RNBCLQ Piping Specifications (3 pipes)

(Indoor unit on the left)



(Indoor unit on the right)



2-Module Combination Table (Ømm)

Model			RAS-26 RNBCLQ	RAS-28 RNBCLQ	RAS-30 RNBCLQ	RAS-32 RNBCLQ	RAS-34 RNBCLQ	RAS-36 RNBCLQ
Combination Mode		The outdoor unit A	RAS-16 RNBCLQ	RAS-16 RNBCLQ	RAS-16 RNBCLQ	RAS-16 RNBCLQ	RAS-18 RNBCLQ	RAS-20 RNBCLQ
		The outdoor unit B	RAS-10 RNBCLQ	RAS-12 RNBCLQ	RAS-14 RNBCLQ	RAS-16 RNBCLQ	RAS-16 RNBCLQ	RAS-16 RNBCLQ
Branch Pipe			M-692XNQ					
Piping Size	a	Low Pressure Gas	31.75	31.75	31.75	31.75	31.75	38.1
		High/Low Pressure Gas	25.4	28.58	28.58	28.58	28.58	28.58
		Liquid	19.05	19.05	19.05	19.05	19.05	19.05
	b	Low Pressure Gas	28.58	28.58	28.58	28.58	28.58	28.58
		High/Low Pressure Gas	22.2	22.2	22.2	22.2	22.2	22.2
		Liquid	12.7	12.7	12.7	12.7	15.88	15.88
	c	Low Pressure Gas	22.2	25.4	25.4	28.58	28.58	28.58
		High/Low Pressure Gas	19.05	22.2	22.2	22.2	22.2	22.2
		Liquid	9.53	12.7	12.7	12.7	12.7	12.7

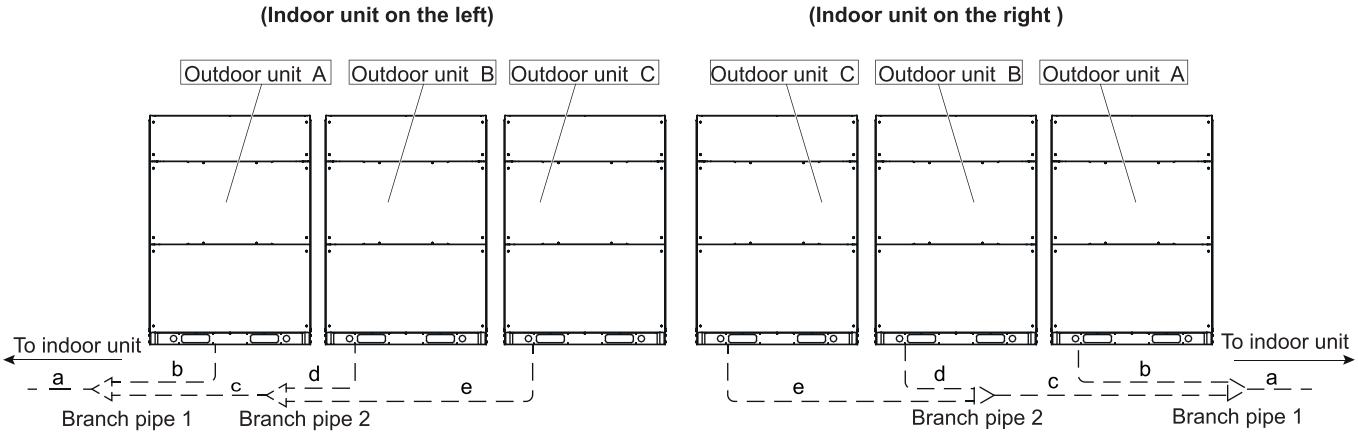
2-Module Combination Table (Ømm)

Model			RAS-38 RNBCLQ	RAS-40 RNBCLQ	RAS-42 RNBCLQ	RAS-44 RNBCLQ	RAS-46 RNBCLQ	RAS-48 RNBCLQ
Combination Mode		The outdoor unit A	RAS-22 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ
		The outdoor unit B	RAS-16 RNBCLQ	RAS-16 RNBCLQ	RAS-18 RNBCLQ	RAS-20 RNBCLQ	RAS-22 RNBCLQ	RAS-24 RNBCLQ
Branch Pipe			M-902XNQ					
Piping Size	a	Low Pressure Gas	38.1	38.1	38.1	38.1	38.1	38.1
		High/Low Pressure Gas	31.75	31.75	31.75	31.75	31.75	31.75
		Liquid	19.05	19.05	19.05	19.05	19.05	19.05
	b	Low Pressure Gas	28.58	28.58	28.58	28.58	28.58	28.58
		High/Low Pressure Gas	25.4	22.2	25.4	25.4	25.4	25.4
		Liquid	15.88	15.88	15.88	15.88	15.88	15.88
	c	Low Pressure Gas	28.58	28.58	28.58	28.58	28.58	28.58
		High/Low Pressure Gas	22.2	22.2	22.2	25.4	25.4	25.4
		Liquid	12.7	15.88	15.88	15.88	15.88	15.88

* Outdoor unit pipe constructing as per the requirements of the above table.

Refer to the table above for the outdoor model to select the Branch Pipe and pipe diameter.

6.4.3 RAS-50RNBCLQ~RAS-72RNBCLQ Piping Specifications (3 pipes)



3-Module Combination Table

(Ømm)

Model			RAS-50 RNBCLQ	RAS-52 RNBCLQ	RAS-54 RNBCLQ	RAS-56 RNBCLQ	RAS-58 RNBCLQ	RAS-60 RNBCLQ
Combination Mode		The outdoor unit A	RAS-18 RNBCLQ	RAS-20 RNBCLQ	RAS-22 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ
		The outdoor unit B	RAS-16 RNBCLQ	RAS-16 RNBCLQ	RAS-16 RNBCLQ	RAS-16 RNBCLQ	RAS-18 RNBCLQ	RAS-20 RNBCLQ
		The outdoor unit C	RAS-16 RNBCLQ	RAS-16 RNBCLQ	RAS-16 RNBCLQ	RAS-16 RNBCLQ	RAS-16 RNBCLQ	RAS-16 RNBCLQ
Branch Pipe 1			M-902XNQ			M-M462XF		
Branch Pipe 2			M-692XNQ			M-692XNQ		
Piping Size	a	Low Pressure Gas	38.1	38.1	38.1	41.3	44.45	44.45
		High/Low Pressure Gas	31.75	31.75	31.75	38.1	41.3	41.3
		Liquid	19.05	19.05	19.05	22.2	22.2	22.2
	b	Low Pressure Gas	28.58	28.58	28.58	28.58	28.58	28.58
		High/Low Pressure Gas	22.2	22.2	25.4	25.4	25.4	25.4
		Liquid pipe	15.88	15.88	15.88	15.88	15.88	15.88
	c	Low Pressure Gas	31.75	31.75	31.75	31.75	31.75	38.1
		High/Low Pressure Gas	28.58	28.58	28.58	28.58	28.58	28.58
		Liquid	19.05	19.05	19.05	19.05	19.05	19.05
	d	Low Pressure Gas	28.58	28.58	28.58	28.58	28.58	28.58
		High/Low Pressure Gas	22.2	22.2	22.2	22.2	22.2	22.2
		Liquid	12.7	12.7	12.7	12.7	15.88	15.88
	e	Low Pressure Gas	28.58	28.58	28.58	28.58	28.58	28.58
		High/Low Pressure Gas	22.2	22.2	22.2	22.2	22.2	22.2
		Liquid	12.7	12.7	12.7	12.7	12.7	12.7

3-Module Combination Table

(Ømm)

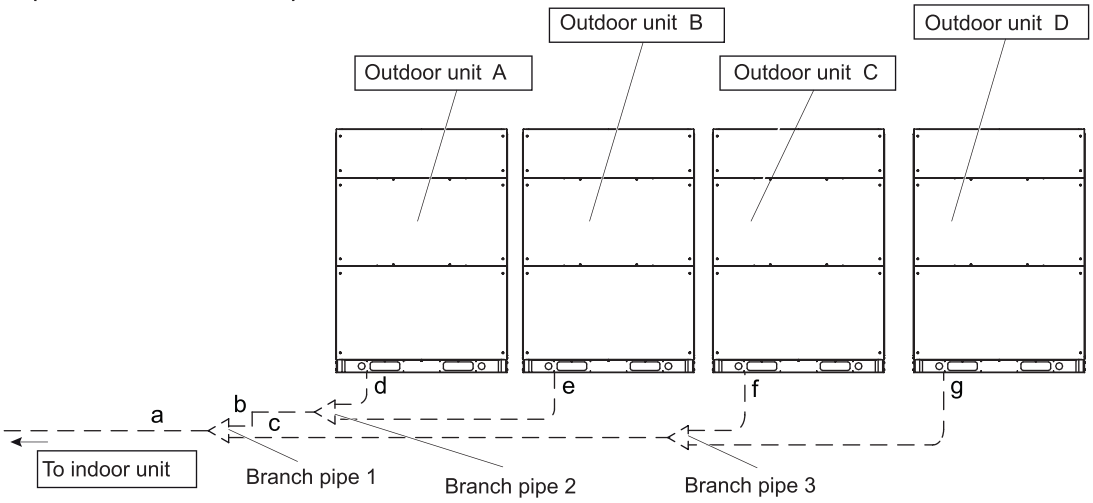
Model			RAS-62 RNBCLQ	RAS-64 RNBCLQ	RAS-66 RNBCLQ	RAS-68 RNBCLQ	RAS-70 RNBCLQ	RAS-72 RNBCLQ
Combination Mode		The outdoor unit A	RAS-24 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ
		The outdoor unit B	RAS-22 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ
		The outdoor unit C	RAS-16 RNBCLQ	RAS-16 RNBCLQ	RAS-18 RNBCLQ	RAS-20 RNBCLQ	RAS-22 RNBCLQ	RAS-24 RNBCLQ
Branch Pipe 1			M-M462XF			M-M682XF		
Branch Pipe 2			M-902XNQ			M-902XNQ		
Piping Size	a	Low Pressure Gas	44.45	44.45	44.45	50.8	50.8	50.8
		High/Low Pressure Gas	41.3	41.3	41.3	44.5	44.5	44.5
		Liquid	22.2	22.2	22.2	25.4	25.4	25.4
	b	Low Pressure Gas	28.58	28.58	28.58	28.58	28.58	28.58
		High/Low Pressure Gas	25.4	25.4	25.4	25.4	25.4	25.4
		Liquid	15.88	15.88	15.88	15.88	15.88	15.88
	c	Low Pressure Gas	38.1	38.1	38.1	38.1	38.1	38.1
		High/Low Pressure Gas	31.75	31.75	31.75	31.75	31.75	31.75
		Liquid	19.05	19.05	19.05	19.05	19.05	19.05
	d	Low Pressure Gas	28.58	28.58	28.58	28.58	28.58	28.58
		High/Low Pressure Gas	25.4	25.4	25.4	25.4	25.4	25.4
		Liquid	15.88	15.88	15.88	15.88	15.88	15.88
	e	Low Pressure Gas	28.58	28.58	28.58	28.58	28.58	28.58
		High/Low Pressure Gas	22.2	22.2	22.2	22.2	25.4	25.4
		Liquid	12.7	12.7	15.88	15.88	15.88	15.88

* Connect the pipes according to the above requirements of the outdoor unit.

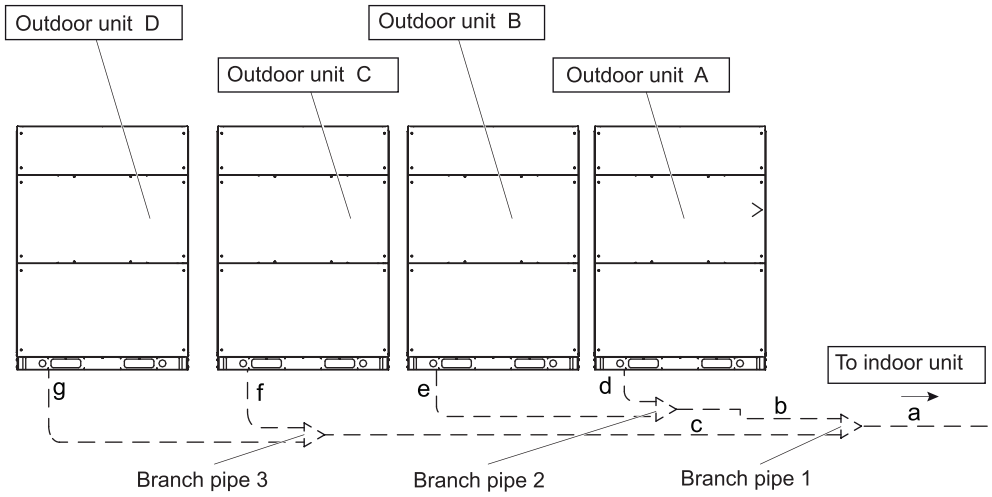
Refer to outdoor unit model that mentioned in above table, to select the Branch Pipe and piping diameter.

6.4.4 RAS-74RNBCLQ~RAS-96RNBCLQ Piping Specifications (3 pipes)

(Indoor unit on the left)



(Indoor unit on the right)



4-Module Combination Table

(Ømm)

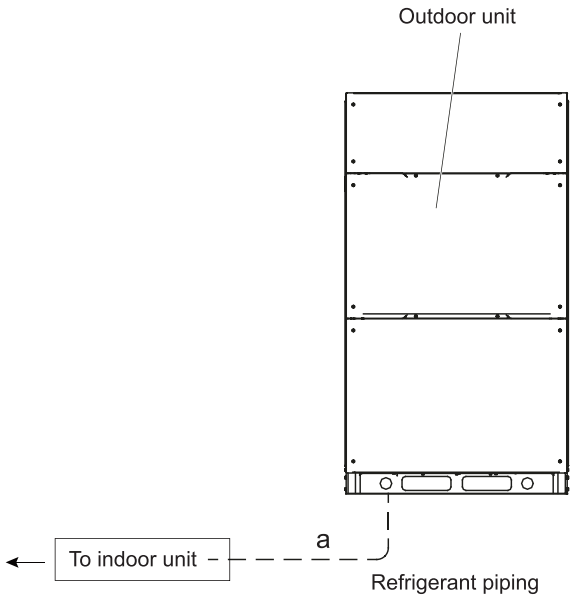
Model			RAS-74 RNBCLQ	RAS-76 RNBCLQ	RAS-78 RNBCLQ	RAS-80 RNBCLQ	RAS-82 RNBCLQ	RAS-84 RNBCLQ
Combination Mode	The outdoor unit A		RAS-24 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ	RAS-20 RNBCLQ	RAS-22 RNBCLQ	RAS-24 RNBCLQ
	The outdoor unit B		RAS-18 RNBCLQ	RAS-20 RNBCLQ	RAS-22 RNBCLQ	RAS-20 RNBCLQ	RAS-20 RNBCLQ	RAS-20 RNBCLQ
	The outdoor unit C		RAS-16 RNBCLQ	RAS-16 RNBCLQ	RAS-16 RNBCLQ	RAS-20 RNBCLQ	RAS-20 RNBCLQ	RAS-20 RNBCLQ
	The outdoor unit D		RAS-16 RNBCLQ	RAS-16 RNBCLQ	RAS-16 RNBCLQ	RAS-20 RNBCLQ	RAS-20 RNBCLQ	RAS-20 RNBCLQ
Branch Pipe 1			M-M682XF					
Branch Pipe 2			M-902XNQ					
Branch Pipe 3			M-692XNQ			M-902XNQ		
Piping Size	a	Low Pressure Gas pipe	50.8	50.8	50.8	50.8	50.8	50.8
		High/Low Pressure Gas	44.5	44.5	44.5	44.5	44.5	44.5
		Liquid	25.4	25.4	25.4	25.4	25.4	25.4
	b	Low Pressure Gas	38.1	38.1	38.1	38.1	38.1	38.1
		High/Low Pressure Gas	31.75	31.75	31.75	31.75	31.75	31.75
		Liquid	19.05	19.05	19.05	19.05	19.05	19.05
	c	Low Pressure Gas	31.75	31.75	31.75	38.1	38.1	38.1
		High/Low Pressure Gas	28.58	28.58	28.58	31.75	31.75	31.75
		Liquid	19.05	19.05	19.05	19.05	19.05	19.05
	d	Low Pressure Gas	28.58	28.58	28.58	28.58	28.58	28.58
		High/Low Pressure Gas	25.4	25.4	25.4	22.2	25.4	25.4
		Liquid	15.88	15.88	15.88	15.88	15.88	15.88
	e	Low Pressure Gas	28.58	28.58	28.58	28.58	28.58	28.58
		High/Low Pressure Gas	22.2	22.2	22.2	22.2	22.2	22.2
		Liquid	15.88	15.88	15.88	15.88	15.88	15.88
	f	Low Pressure Gas	28.58	28.58	28.58	28.58	28.58	28.58
		High/Low Pressure Gas	22.2	22.2	22.2	22.2	22.2	22.2
		Liquid	12.7	12.7	12.7	15.88	15.88	15.88
	g	Low Pressure Gas	28.58	28.58	28.58	28.58	28.58	28.58
		High/Low Pressure Gas	22.2	22.2	22.2	22.2	22.2	22.2
		Liquid	12.7	12.7	12.7	15.88	15.88	15.88

Model			RAS-86 RNBCLQ	RAS-88 RNBCLQ	RAS-90 RNBCLQ	RAS-92 RNBCLQ	RAS-94 RNBCLQ	RAS-96 RNBCLQ
Combination Mode	The outdoor unit A		RAS-24 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ
	The outdoor unit B		RAS-22 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ
	The outdoor unit C		RAS-20 RNBCLQ	RAS-20 RNBCLQ	RAS-22 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ	RAS-24 HRNBCLQ
	The outdoor unit D		RAS-20 RNBCLQ	RAS-20 RNBCLQ	RAS-20 RNBCLQ	RAS-20 RNBCLQ	RAS-22 RNBCLQ	RAS-24 RNBCLQ
Branch Pipe 1			M-M682XF					
Branch Pipe 2			M-902XNQ					
Branch Pipe 3			M-902XNQ					
Piping Size	a	Low Pressure Gas	50.8	50.8	50.8	50.8	50.8	50.8
		High/Low Pressure Gas	44.5	44.5	44.5	44.5	44.5	44.5
		Liquid pipe	25.4	25.4	25.4	25.4	25.4	25.4
	b	Low Pressure Gas	38.1	38.1	38.1	38.1	38.1	38.1
		High/Low Pressure Gas	31.75	31.75	31.75	31.75	31.75	31.75
		Liquid	19.05	19.05	19.05	19.05	19.05	19.05
	c	Low Pressure Gas pipe	38.1	38.1	38.1	38.1	38.1	38.1
		High/Low Pressure Gas	31.75	31.75	31.75	31.75	31.75	31.75
		Liquid	19.05	19.05	19.05	19.05	19.05	19.05
	d	Low Pressure Gas	28.58	28.58	28.58	28.58	28.58	28.58
		High/Low Pressure Gas	25.4	25.4	25.4	25.4	25.4	25.4
		Liquid	15.88	15.88	15.88	15.88	15.88	15.88
	e	Low Pressure Gas	28.58	28.58	28.58	28.58	28.58	28.58
		High/Low Pressure Gas	25.4	25.4	25.4	25.4	25.4	25.4
		Liquid	15.88	15.88	15.88	15.88	15.88	15.88
	f	Low Pressure Gas	28.58	28.58	28.58	28.58	28.58	28.58
		High/Low Pressure Gas	22.2	22.2	25.4	25.4	25.4	25.4
		Liquid	15.88	15.88	15.88	15.88	15.88	15.88
	g	Low Pressure Gas	28.58	28.58	28.58	28.58	28.58	28.58
		High/Low Pressure Gas	22.2	22.2	22.2	22.2	25.4	25.4
		Liquid	15.88	15.88	15.88	15.88	15.88	15.88

* Outdoor unit pipe constructing as per the requirements of the above table.

Refer to the table above for the outdoor model to select the Branch Pipe and pipe diameter.

6.4.5 RAS-8.0RNBCLQ~RAS-24RNBCLQ Piping Specifications (2 pipes)



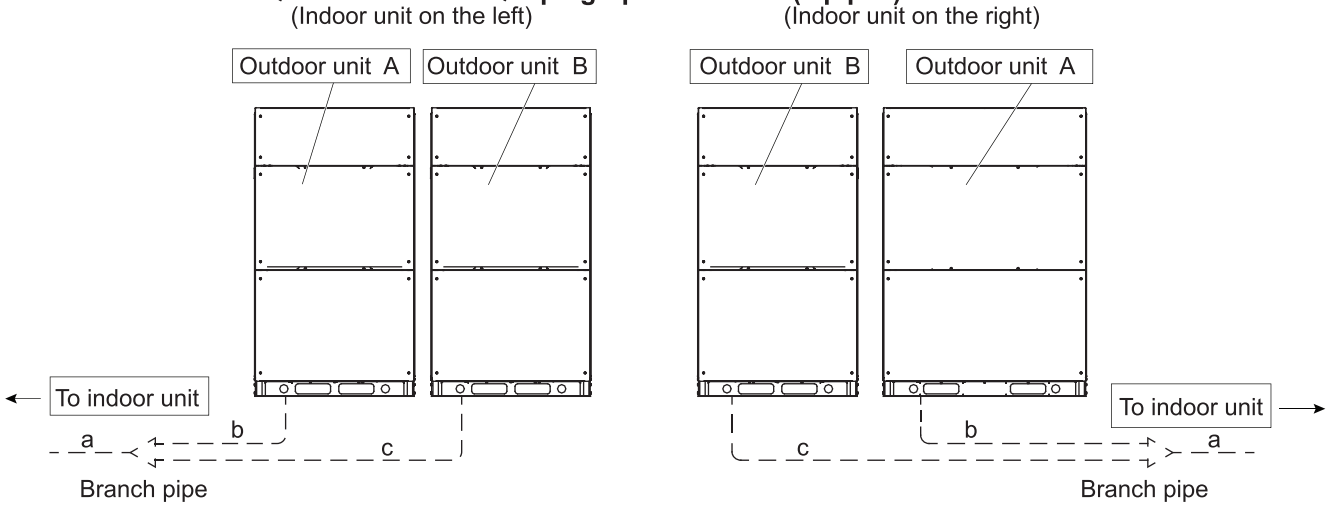
(Ømm)

Model			RAS-8.0RNBCLQ	RAS-10RNBCLQ	RAS-12RNBCLQ	RAS-14RNBCLQ
Pipe size	a	High/Low Pressure Gas	19.05	22.2	25.4	25.4
		Liquid	9.53	9.53	12.7	12.7

Model			RAS-16RNBCLQ	RAS-18RNBCLQ	RAS-20RNBCLQ	RAS-22HRNBCLQ
Pipe size	a	High/Low Pressure Gas	28.58	28.58	28.58	28.58
		Liquid	12.7	15.88	15.88	15.88

Model			RAS-24RNBCLQ
Pipe size	a	High/Low Pressure Gas	28.58
		Liquid	15.88

6.4.6 RAS-26RNBCLQ~RAS-48RNBCLQ Piping Specifications (2 pipes)



2-Module Combination Table (Ømm)

Model			RAS-26 RNBCLQ	RAS-28 RNBCLQ	RAS-30 RNBCLQ	RAS-32 RNBCLQ	RAS-34 RNBCLQ	RAS-36 RNBCLQ
Combination Mode		The outdoor unit A	RAS-16 RNBCLQ	RAS-16 RNBCLQ	RAS-16 RNBCLQ	RAS-16 RNBCLQ	RAS-18 RNBCLQ	RAS-20 RNBCLQ
		The outdoor unit B	RAS-10 RNBCLQ	RAS-12 RNBCLQ	RAS-14 RNBCLQ	RAS-16 RNBCLQ	RAS-16 RNBCLQ	RAS-16 RNBCLQ
Branch Pipe			M-30SNQ					M-46SNQ
Piping Size	a	High/Low Pressure Gas	31.75	31.75	31.75	31.75	31.75	38.1
		Liquid	19.05	19.05	19.05	19.05	19.05	19.05
	b	High/Low Pressure Gas	28.58	28.58	28.58	28.58	28.58	28.58
		Liquid	12.7	12.7	12.7	12.7	15.88	15.88
	c	High/Low Pressure Gas	22.2	25.4	25.4	28.58	28.58	28.58
		Liquid	9.53	12.7	12.7	12.7	12.7	12.7

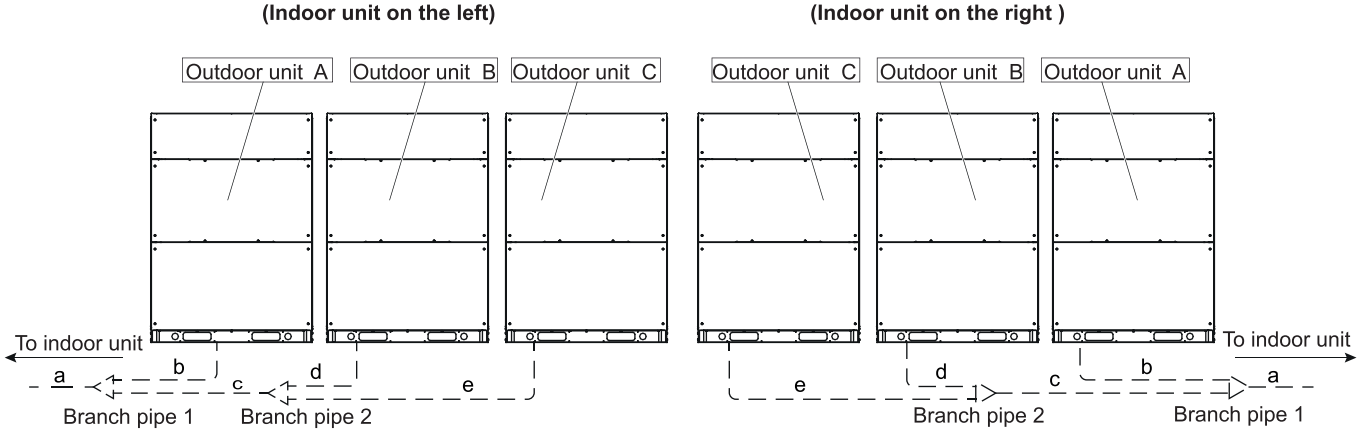
2-Module Combination Table (Ømm)

Model			RAS-38 RNBCLQ	RAS-40 RNBCLQ	RAS-42 RNBCLQ	RAS-44 RNBCLQ	RAS-46 RNBCLQ	RAS-48 RNBCLQ
Combination Mode		The outdoor unit A	RAS-22 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ
		The outdoor unit B	RAS-16 RNBCLQ	RAS-16 RNBCLQ	RAS-18 RNBCLQ	RAS-20 RNBCLQ	RAS-22 RNBCLQ	RAS-24 RNBCLQ
Branch Pipe			M-46SNQ					
Piping Size	a	High/Low Pressure Gas	38.1	38.1	38.1	38.1	38.1	38.1
		Liquid	19.05	19.05	19.05	19.05	19.05	19.05
	b	High/Low Pressure Gas	28.58	28.58	28.58	28.58	28.58	28.58
		Liquid	15.88	15.88	15.88	15.88	15.88	15.88
	c	High/Low Pressure Gas	28.58	28.58	28.58	28.58	28.58	28.58
		Liquid	12.7	15.88	15.88	15.88	15.88	15.88

* Outdoor unit pipe constructing as per the requirements of the above table.

Refer to the table above for the outdoor model to select the Branch Pipe and pipe diameter.

6.4.7 RAS-50RNBCLQ~RAS-72RNBCLQ Piping Specifications (2 pipes)



3-Module Combination Table

(Ømm)

Model			RAS-50 RNBCLQ	RAS-52 RNBCLQ	RAS-54 RNBCLQ	RAS-56 RNBCLQ	RAS-58 RNBCLQ	RAS-60 RNBCLQ
Combination Mode		The outdoor unit A	RAS-18 RNBCLQ	RAS-20 RNBCLQ	RAS-22 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ
		The outdoor unit B	RAS-16 RNBCLQ	RAS-16 RNBCLQ	RAS-16 RNBCLQ	RAS-16 RNBCLQ	RAS-18 RNBCLQ	RAS-20 RNBCLQ
		The outdoor unit C	RAS-16 RNBCLQ	RAS-16 RNBCLQ	RAS-16 RNBCLQ	RAS-16 RNBCLQ	RAS-16 RNBCLQ	RAS-16 RNBCLQ
Branch Pipe 1			M-46SNQ			M-68SNQ		
Branch Pipe 2			M-30SNQ			M-30SNQ		
Piping Size	a	High/Low Pressure Gas	38.1	38.1	38.1	44.5	44.5	44.5
		Liquid	19.05	19.05	19.05	19.05	19.05	19.05
	b	High/Low Pressure Gas	28.58	28.58	28.58	28.58	28.58	28.58
		Liquid	15.88	15.88	15.88	15.88	15.88	15.88
	c	High/Low Pressure Gas	31.75	31.75	31.75	31.75	31.75	38.1
		Liquid	19.05	19.05	19.05	19.05	19.05	19.05
	d	High/Low Pressure Gas	28.58	28.58	28.58	28.58	28.58	28.58
		Liquid	12.7	12.7	12.7	12.7	15.88	15.88
	e	High/Low Pressure Gas	28.58	28.58	28.58	28.58	28.58	28.58
		Liquid	12.7	12.7	12.7	12.7	12.7	12.7

3-Module Combination Table

(Ømm)

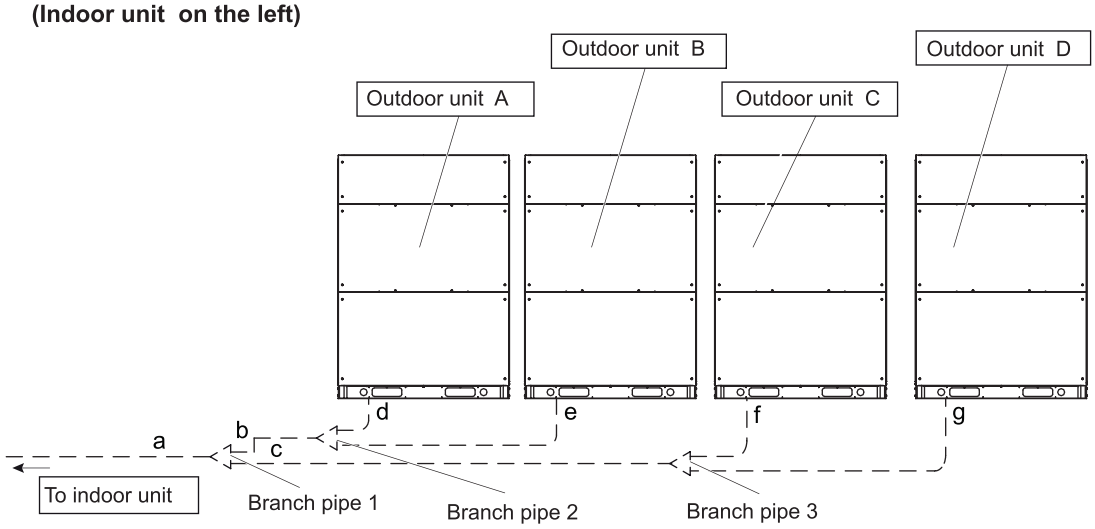
Model			RAS-62 RNBCLQ	RAS-64 RNBCLQ	RAS-66 RNBCLQ	RAS-68 RNBCLQ	RAS-70 RNBCLQ	RAS-72 RNBCLQ
Combination Mode		The outdoor unit A	RAS-24 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ
		The outdoor unit B	RAS-22 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ
		The outdoor unit C	RAS-16 RNBCLQ	RAS-16 RNBCLQ	RAS-18 RNBCLQ	RAS-20 RNBCLQ	RAS-22 RNBCLQ	RAS-24 RNBCLQ
Branch Pipe 1			M-68SNQ					
Branch Pipe 2			M-30SNQ					
Piping Size	a	High/Low Pressure Gas	44.5	44.5	44.5	44.5	44.5	44.5
		Liquid	19.05	19.05	19.05	22.2	22.2	22.2
	b	High/Low Pressure Gas	28.58	28.58	28.58	28.58	28.58	28.58
		Liquid	15.88	15.88	15.88	15.88	15.88	15.88
	c	High/Low Pressure Gas	38.1	38.1	38.1	38.1	38.1	38.1
		Liquid	19.05	19.05	19.05	19.05	19.05	19.05
	d	High/Low Pressure Gas	28.58	28.58	28.58	28.58	28.58	28.58
		Liquid	15.88	15.88	15.88	15.88	15.88	15.88
	e	High/Low Pressure Gas	28.58	28.58	28.58	28.58	28.58	28.58
		Liquid	12.7	12.7	15.88	15.88	15.88	15.88

* Connect the pipes according to the above requirements of the outdoor unit.

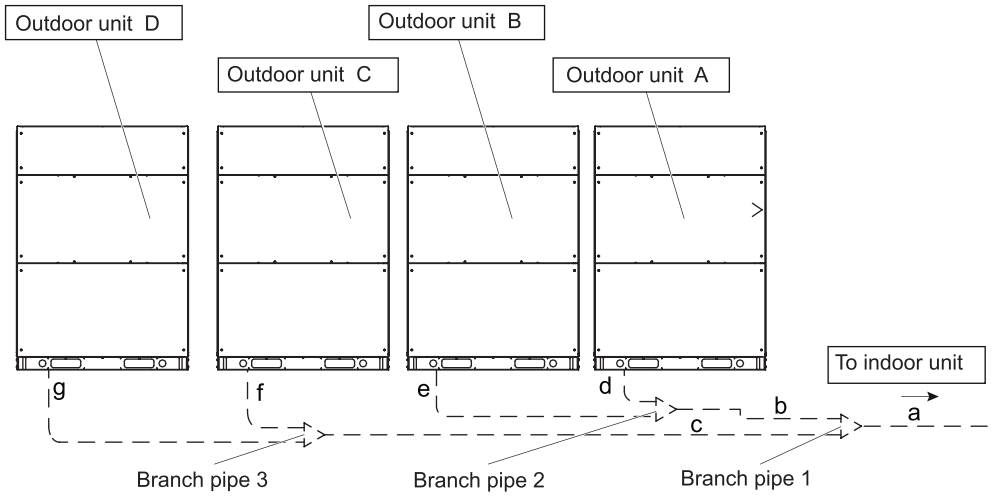
Refer to outdoor unit model that mentioned in above table, to select the Branch Pipe and piping diameter.

6.4.8 RAS-74RNBCLQ~RAS-96RNBCLQ Piping Specifications (2 pipes)

(Indoor unit on the left)



(Indoor unit on the right)



4-Module Combination Table

(Ømm)

Model			RAS-74 RNBCLQ	RAS-76 RNBCLQ	RAS-78 RNBCLQ	RAS-80 RNBCLQ	RAS-82 RNBCLQ	RAS-84 RNBCLQ
Combination Mode	The outdoor unit A		RAS-24 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ	RAS-20 RNBCLQ	RAS-22 RNBCLQ	RAS-24 RNBCLQ
	The outdoor unit B		RAS-18 RNBCLQ	RAS-20 RNBCLQ	RAS-22 RNBCLQ	RAS-20 RNBCLQ	RAS-20 RNBCLQ	RAS-20 RNBCLQ
	The outdoor unit C		RAS-16 RNBCLQ	RAS-16 RNBCLQ	RAS-16 RNBCLQ	RAS-20 RNBCLQ	RAS-20 RNBCLQ	RAS-20 RNBCLQ
	The outdoor unit D		RAS-16 RNBCLQ	RAS-16 RNBCLQ	RAS-16 RNBCLQ	RAS-20 RNBCLQ	RAS-20 RNBCLQ	RAS-20 RNBCLQ
Branch Pipe 1			M-68SNQ					
Branch Pipe 2			M-30SNQ					
Branch Pipe 3			M-30SNQ					
Piping Size	a	High/Low Pressure Gas	50.8	50.8	50.8	50.8	50.8	50.8
		Liquid	22.2	22.2	22.2	22.2	22.2	22.2
	b	High/Low Pressure Gas	38.1	38.1	38.1	38.1	38.1	38.1
		Liquid	19.05	19.05	19.05	19.05	19.05	19.05
	c	High/Low Pressure Gas	31.75	31.75	31.75	38.1	38.1	38.1
		Liquid	19.05	19.05	19.05	19.05	19.05	19.05
	d	High/Low Pressure Gas	28.58	28.58	28.58	28.58	28.58	28.58
		Liquid	15.88	15.88	15.88	15.88	15.88	15.88
	e	High/Low Pressure Gas	28.58	28.58	28.58	28.58	28.58	28.58
		Liquid	15.88	15.88	15.88	15.88	15.88	15.88
	f	High/Low Pressure Gas	28.58	28.58	28.58	28.58	28.58	28.58
		Liquid	12.7	12.7	12.7	15.88	15.88	15.88
	g	High/Low Pressure Gas	28.58	28.58	28.58	28.58	28.58	28.58
		Liquid	12.7	12.7	12.7	15.88	15.88	15.88

Model			RAS-86 RNBCLQ	RAS-88 RNBCLQ	RAS-90 RNBCLQ	RAS-92 RNBCLQ	RAS-94 RNBCLQ	RAS-96 RNBCLQ
Combination Mode	The outdoor unit A		RAS-24 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ
	The outdoor unit B		RAS-22 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ
	The outdoor unit C		RAS-20 RNBCLQ	RAS-20 RNBCLQ	RAS-22 RNBCLQ	RAS-24 RNBCLQ	RAS-24 RNBCLQ	RAS-24 HRNBCLQ
	The outdoor unit D		RAS-20 RNBCLQ	RAS-20 RNBCLQ	RAS-20 RNBCLQ	RAS-20 RNBCLQ	RAS-22 RNBCLQ	RAS-24 RNBCLQ
Branch Pipe 1			M-68SNQ					
Branch Pipe 2			M-30SNQ					
Branch Pipe 3			M-30SNQ					
Piping Size	a	High/Low Pressure Gas	50.8	50.8	50.8	50.8	50.8	50.8
		Liquid	22.2	22.2	25.4	25.4	25.4	25.4
	b	High/Low Pressure Gas	38.1	38.1	38.1	38.1	38.1	38.1
		Liquid	19.05	19.05	19.05	19.05	19.05	19.05
	c	High/Low Pressure Gas	38.1	38.1	38.1	38.1	38.1	38.1
		Liquid	19.05	19.05	19.05	19.05	19.05	19.05
	d	High/Low Pressure Gas	28.58	28.58	28.58	28.58	28.58	28.58
		Liquid	15.88	15.88	15.88	15.88	15.88	15.88
	e	High/Low Pressure Gas	28.58	28.58	28.58	28.58	28.58	28.58
		Liquid	15.88	15.88	15.88	15.88	15.88	15.88
	f	High/Low Pressure Gas	28.58	28.58	28.58	28.58	28.58	28.58
		Liquid	15.88	15.88	15.88	15.88	15.88	15.88
	g	High/Low Pressure Gas	28.58	28.58	28.58	28.58	28.58	28.58
		Liquid	15.88	15.88	15.88	15.88	15.88	15.88

* Outdoor unit pipe constructing as per the requirements of the above table.

Refer to the table above for the outdoor model to select the Branch Pipe and pipe diameter.

6.4.9 Stop Valve

(1) Ensure that the valve is completely closed.

(2) Connect the fluorine hose to stop the valve check joint, and release the refrigerant gas in the gas-side stop valve pipe.

(3) Cut off the thin (Ø6.35) at the end of stop valve cap to ensure no gas existed in the stop valve.

(4) Remove the stop valve cap with brazing at the brazing position of the stop valve cap, ensure that the flame does not touch valve body during brazing to prevent valve damage due to brazing sparks

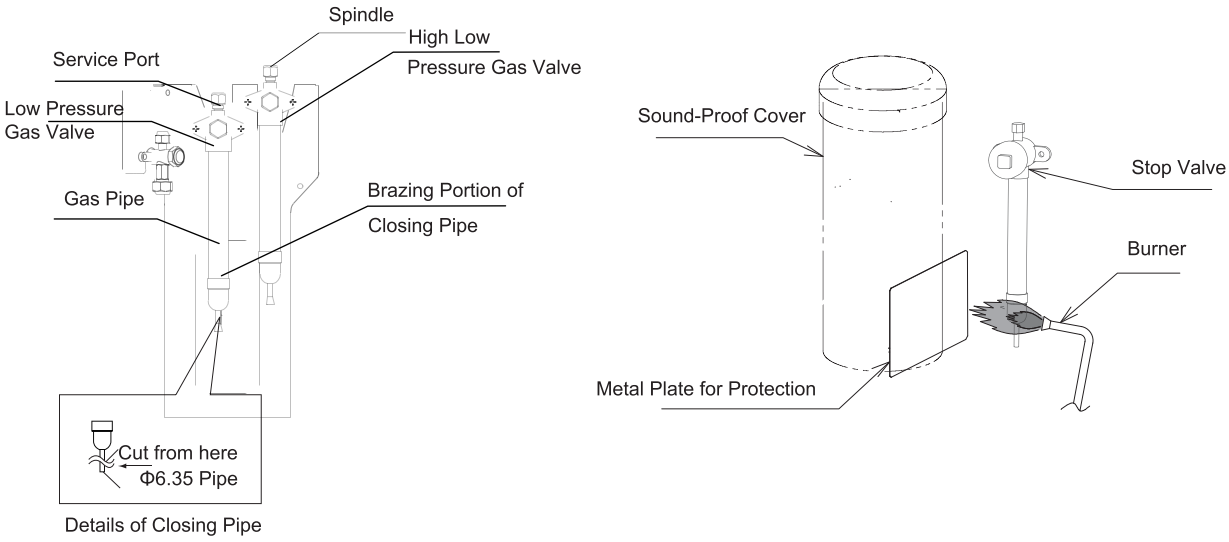
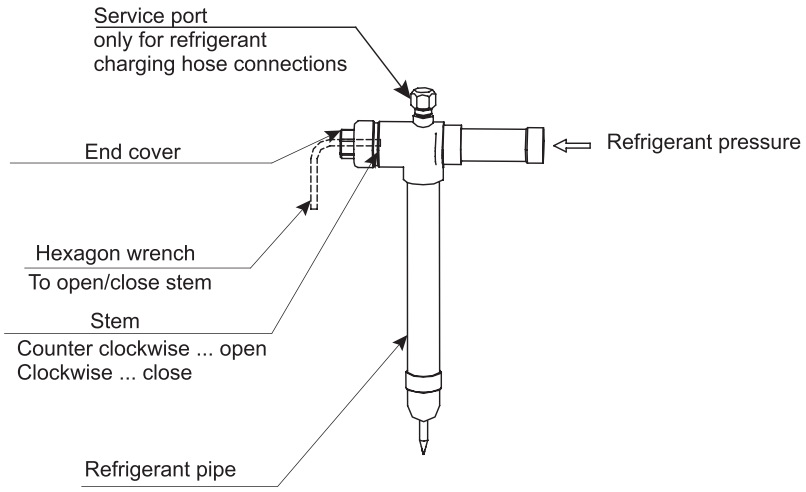


Figure 6.2 Gas Pipe Brazing

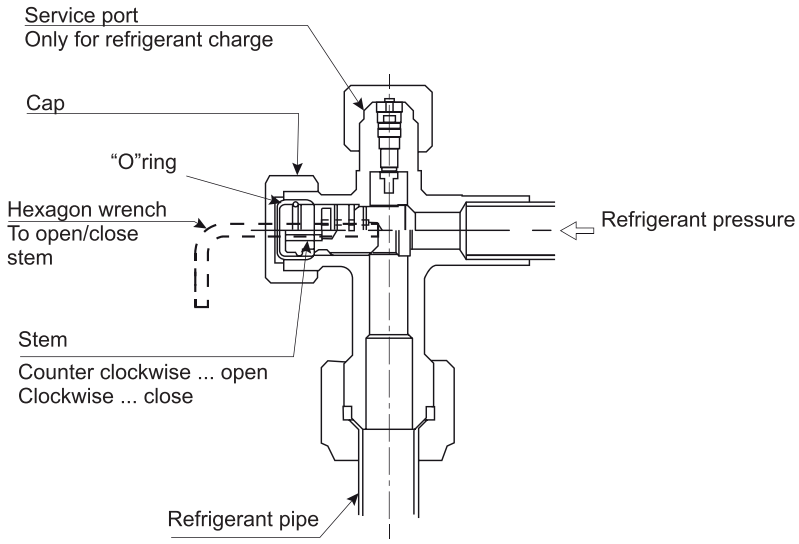
⚠ CAUTION

- Ensure that there is no gas inside the pipe when removing the closing pipe.
  Otherwise, the pipe may be blown out and it may lead to injury.
- Do not expose surrounding parts and the oil return pipe of the compressor to flames when torch is used. If the oil return piping is exposed to the fire, high temperature oil will spurt and cause a fire or injury.

Gas side stop valve



Liquid side stop valve



NOTICE

- After you fully open the stop valve, do not force the stem back again, otherwise it damages the stop valve.
- When you run the test, fully open the stem. If stem is not completely open, it may damage the unit.

6.4.10 Piping Connection

(1) Confirm that the stop valve is fully closed.

(2) As shown in Figure 6.2, when you braze the gas side pipe, use a metal plate to protect the compressor and the sound insulation cover of the compressor. The brazing sparks should not burn the valve body.

(3) Connect the indoor unit and the outdoor unit with the refrigerant piping and make sure the refrigerant piping does not contact with the weak parts of the facility (wall, false ceiling, etc.). Otherwise, you can hear a noise due to the vibration of the pipe.

(4) During the brazing operation, the pipe interiors should be filled with nitrogen for protection

(5) Apply thermal insulation to the gas & liquid pipes when performing assembling work.

(6) After connecting the pipes, install a pipe baffle on the unit. If not, snow, rain, and so on can damage the unit.

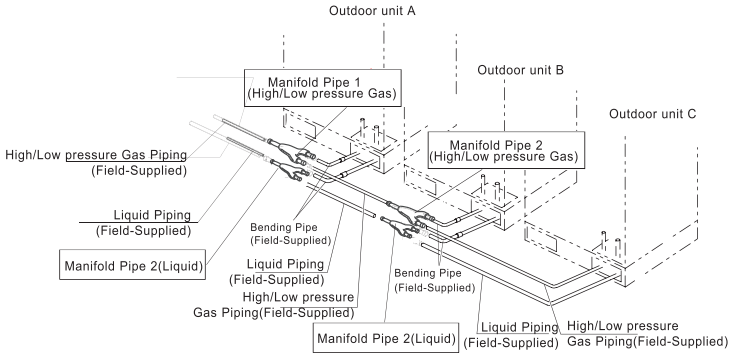
NOTE:

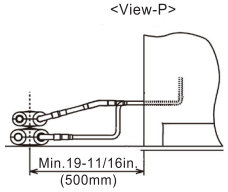
1.Ensure that the closing pipe of the gas stop valve(1 place) is removed firstly.

2.Refer to the item 6.2 for flaring work.

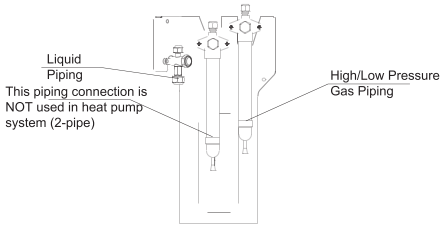
Construction Example

< Heat Pump System >(2 pipes).



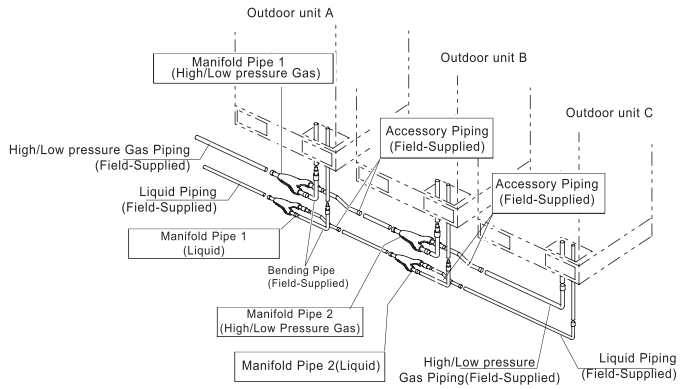


NOTE:



There are three piping connections in the outdoor units.
In case of heat pump system, use only two piping connections.
(liquid and high/low pressure gas)

< Front Side Piping Connection >



< Downward Piping Connection >

NOTE:

The figure shows the case that the refrigerant pipes are pulled out from the front side piping cover. They can be also pulled out from the bottom base hole.

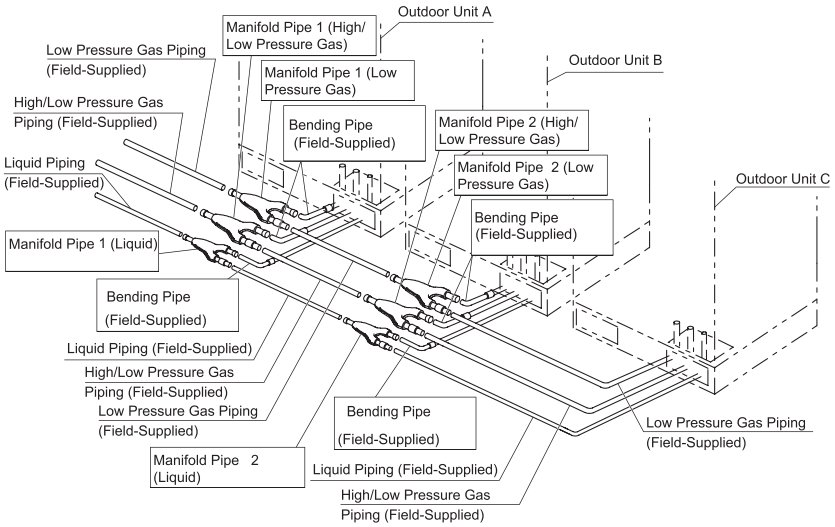
Construction Example

< Heat Pump System >(2 pipes).

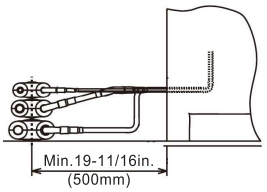
NOTE:

1. Ensure to remove the cap (1) of the high pressure gas stop valve.
2. Perform flare machining according to the sketch in section 6.2

< Heat Recovery System >(3 pipes)

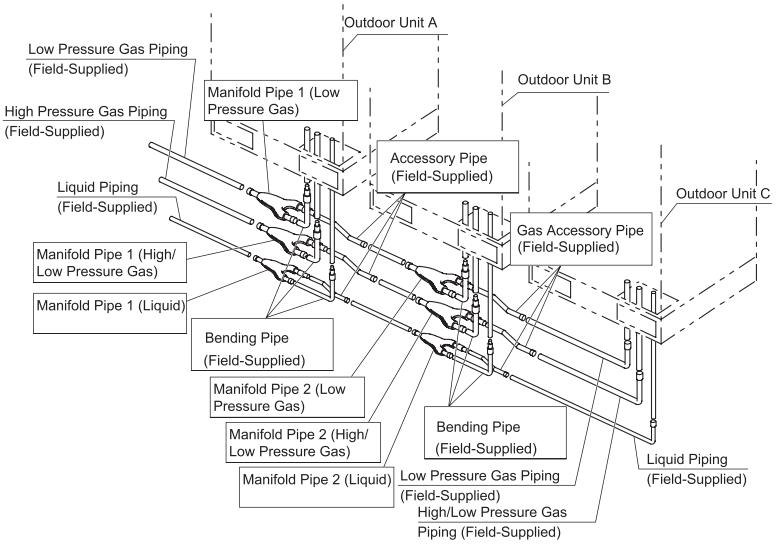


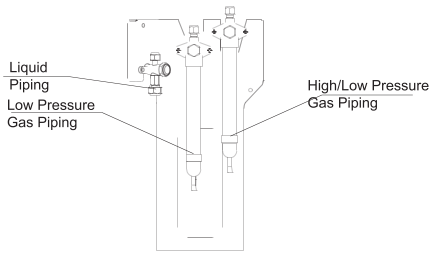
<View-P>



NOTE:

< Front Side Piping Connection >





There are three piping connections in outdoor units

< Downward Piping Connection >

NOTE:

The figure shows the case that the refrigerant pipes are pulled out from the front side piping cover. They can be also pulled out from the bottom base hole.

7. Electrical Wiring

WARNING

- Before performing wiring connection or regular check, turn off the main power supply of the indoor and outdoor units. Wait for at least ten minutes after shutting off the power supply.
- Before performing wiring connection or regular inspection, ensure that the indoor and outdoor fan is stopped.
- Protect wires, electrical components and so on in order to prevent mice or other small animals from destroying them. If not protected, the mouse may bite the unprotected components, which may cause fire.
- Avoid the wiring from touching the refrigerant pipes, sheet metal edges, and the electrical components inside the unit. This can damage the wires and can also cause fire.
- Use a high sensing speed type ELB (Earth Leakage Breaker, activation speed of 0.1 sec. or less). If not, it will lead to an electric shock or a fire.
- Fix the wires firmly, this may lead to fire incidents if the terminals is forced by outside.
- Do not use the air conditioner power supply terminal block to connect the power cord. Use the power distribution box inside the unit to extend the power supply wiring. Take care of the wiring capacity calculation. It may easily lead to fire, if the wiring capacity is too small.
- Fasten the screws according to the following torque:
  M4:1.0~1.3 N • m
  M5:2.0~2.4 N • m
  M6:4.0~5.0 N • m
  M8:9.0~11.0 N • m
  M10:18.0~23.0 N • m

7.1 General Check

(1) Ensure that the electrical components (main power, circuit breakers, wires, electrical conduit connections and terminals) used in the installation site are selected as per the requirements specified in technical manual. The specifications are compliant with national electrical code.

- Power on each outdoor unit. Each outdoor unit should use earth leakage circuit breakers, circuit breakers and main switches. Otherwise, may cause a fire or electric shock.
- Indoor unit and outdoor unit should be powered separately.
  For each indoor unit (connected to the same outdoor unit) connect a power wire.

(2) Check that the power supply voltage is within ±10% of the rated voltage. If the power supply voltage is too low, the system fails to start due to voltage drop.

(3) Check the wire specifications.

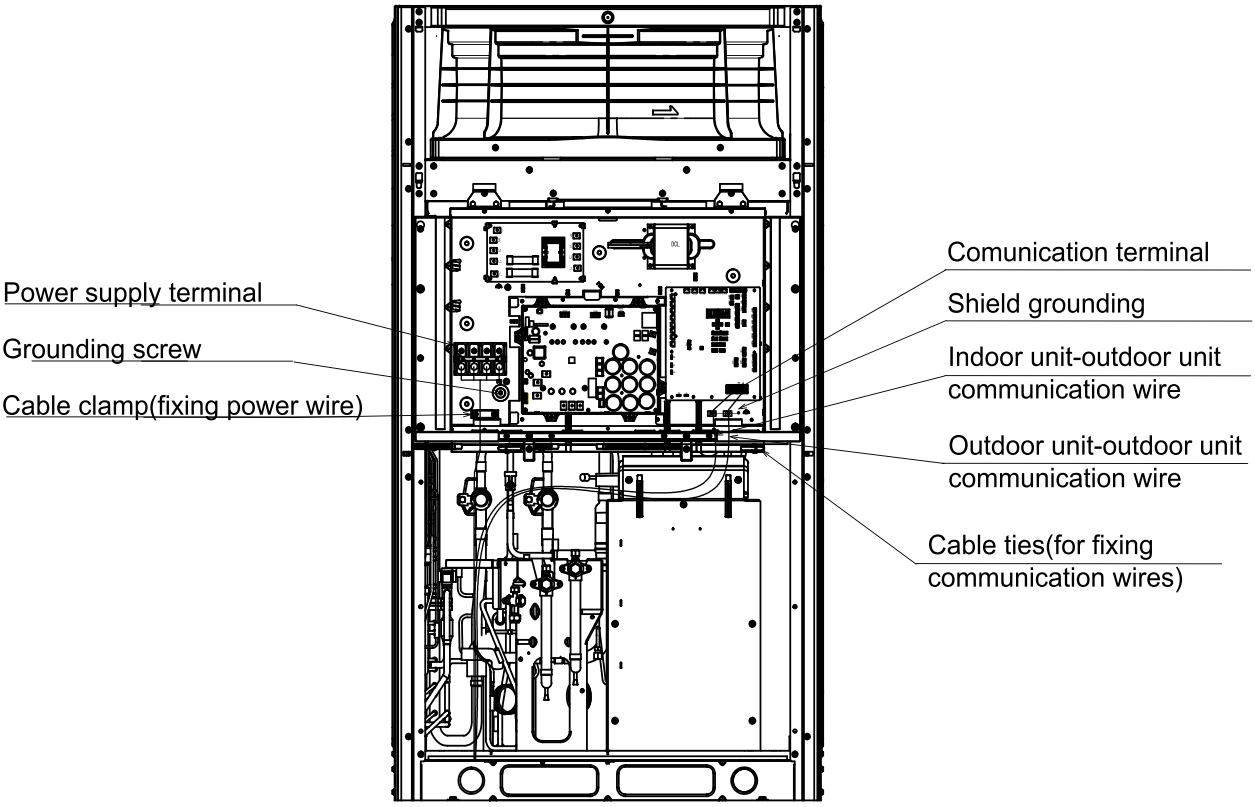
(4) The air conditioner may not work due to the following reasons in some scenarios:

- Air conditioner and some high power consuming equipment are powered by the same transformer *.
- The equipment * and air conditioner lines are too close to each other.

* (For example) elevators, container cranes, electric rectifiers, inverters, electric arc furnaces, electric furnaces and large induction motor and a large switch. In the cases mentioned above, due to the rapid changes in power consumption and switching devices, air conditioning power induction surge occurs. Therefore, to protect the air conditioner's power wires, electric pre-job inspection must be performed at the installation site specifications and standards.

(5) Check that the grounding wire is connected for both, outdoor and indoor unit.

〈8-12HP〉



〈14-16HP〉

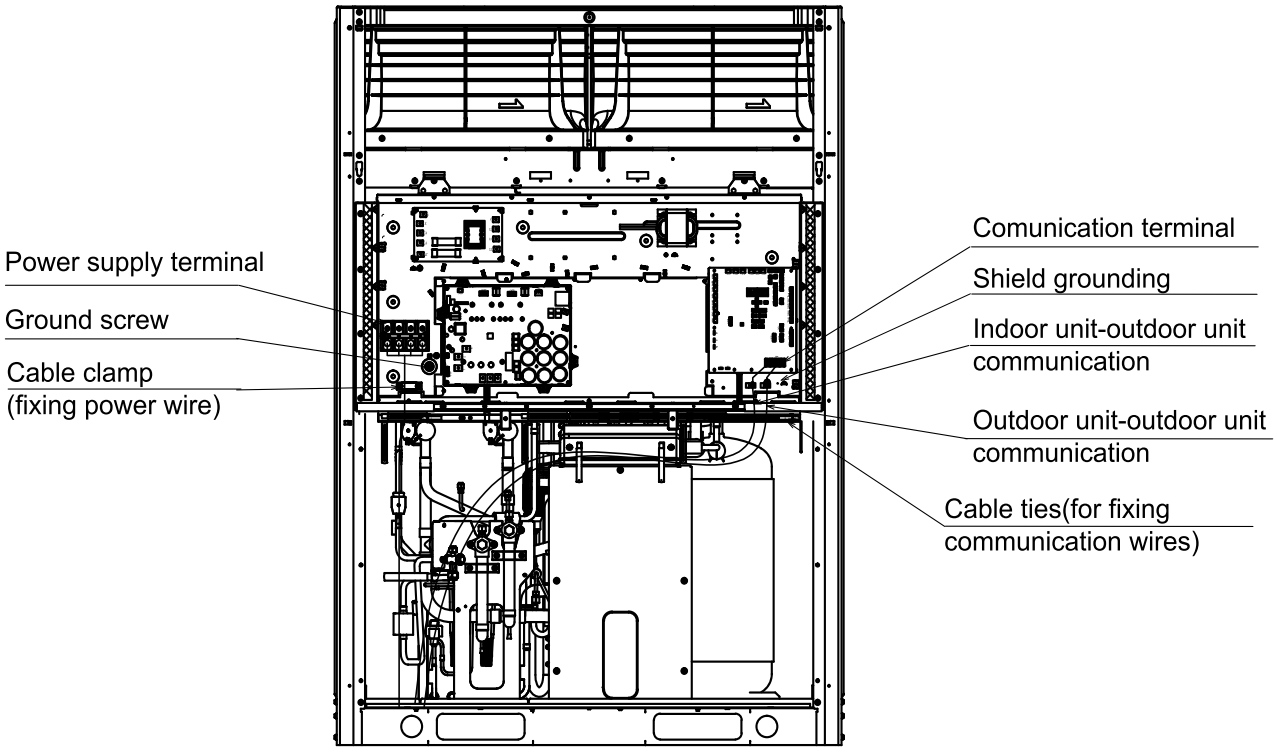
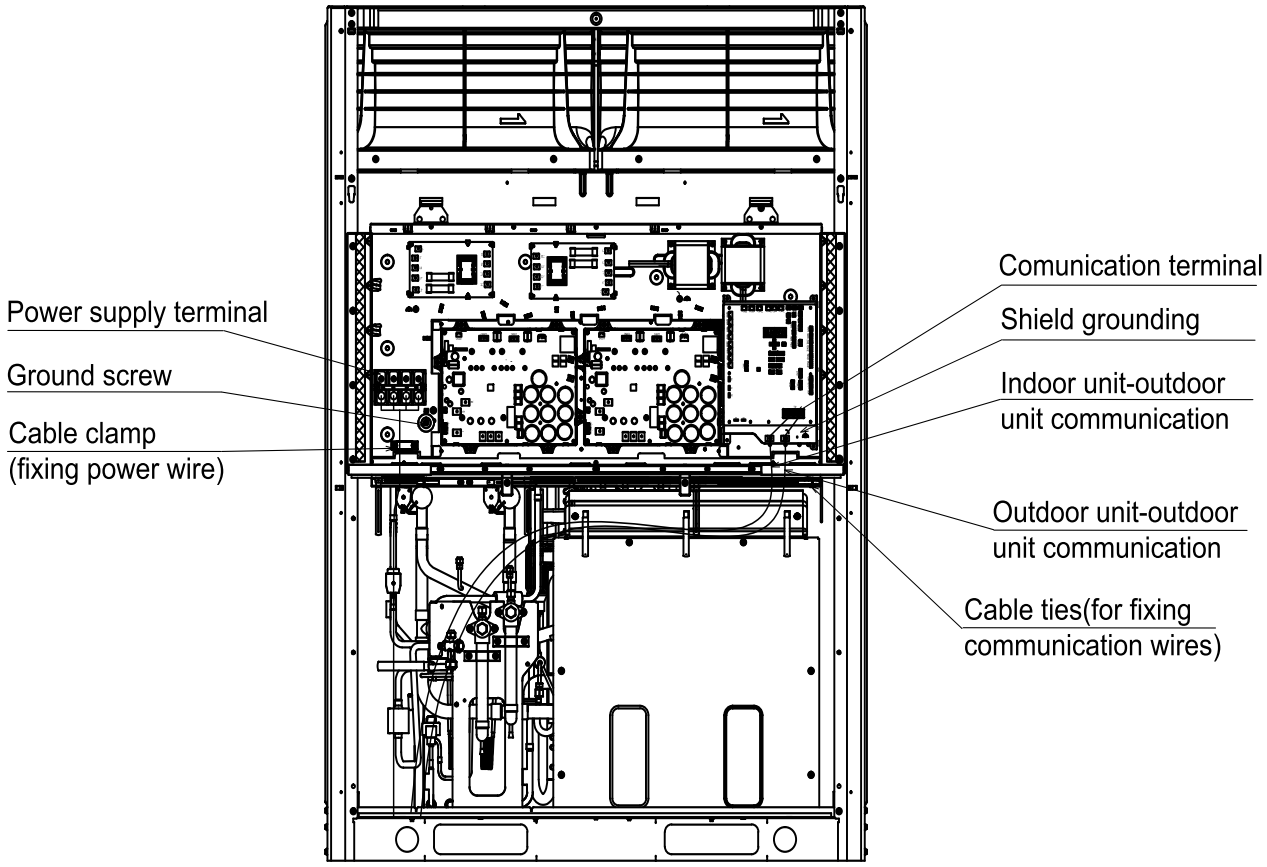


Figure 7.1 Electrical wiring（8-16HP）

〈18HP〉



〈20-24HP〉

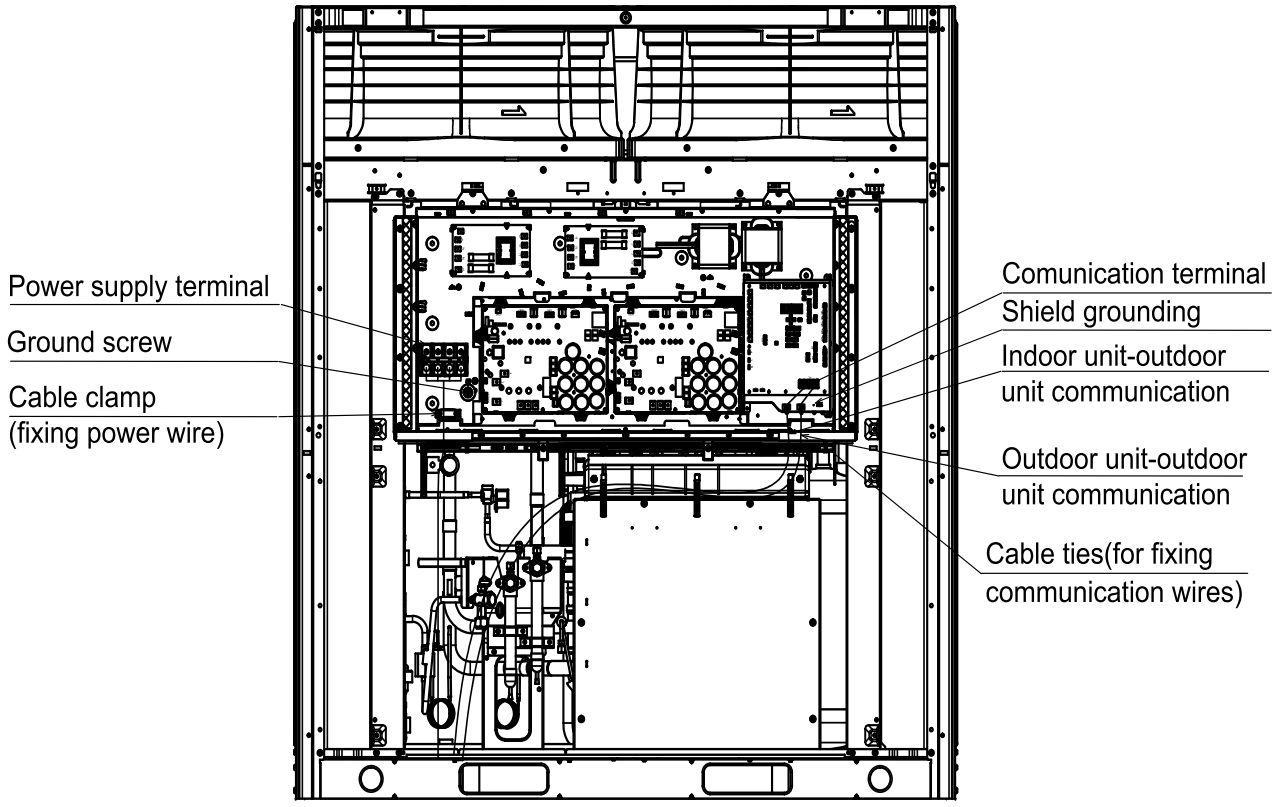


Figure7. 2 Electrical wiring (18-24HP)

7.2 Wiring

WARNING

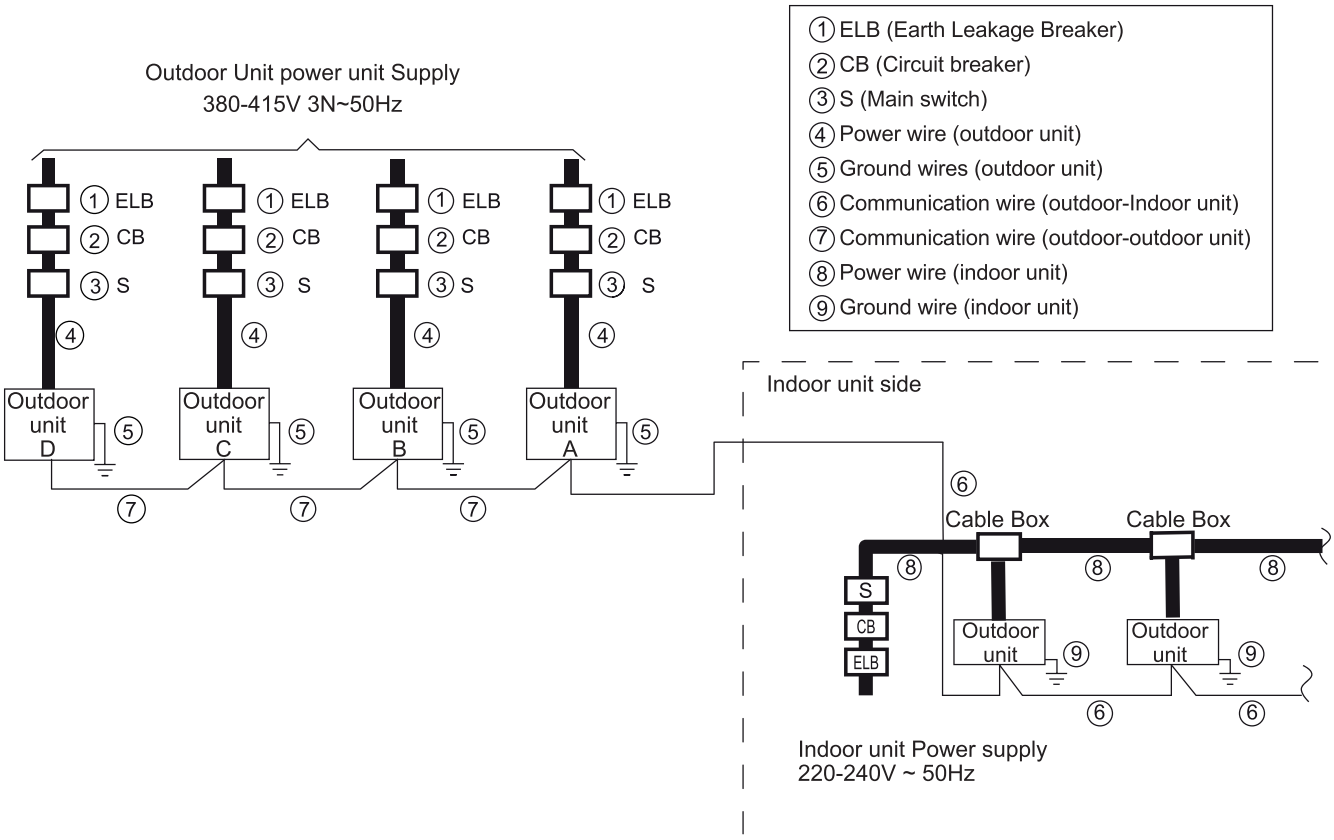
It is a must to connect ELB (Earth Leakage Breaker), CB (Circuit Breaker) and S (Main Switch) to each outdoor unit's power supply. Otherwise, it may cause electric shock or fire.

Remark:

Connect power wires to indoor unit and outdoor unit separately.

(1) Power wire

Separate power wires for each outdoor unit as per the following method (Don't connect power wire from other module):



(2) Recommended wire, ELB, and switching capacity is shown in Table 7.1

Table 7.1 Electrical Parameters And Recommendations Wires, ELB (Earth Leakage Breaker), capacity per outdoor unit

Model	Power Supply	Rated Current	Power Wire ④	Communication Wire ⑥⑦	ELB		Circuit Breaker ②	Ground Wire ⑤
					Rated Current	Current Sensitivity		
		(A)	(mm²)	(mm²)	(A)	(mA)	(A)	(mm²)
RAS-8.0RNBCLQ	380-415V 3N~50/60Hz	17.0	2.5	0.75	25	30	25	4
RAS-10RNBCLQ		21.2	2.5	0.75	25	30	25	4
RAS-12RNBCLQ		26.8	4	0.75	32	30	32	4
RAS-14RNBCLQ		31.3	4	0.75	40	30	40	6
RAS-16RNBCLQ		33.7	6	0.75	40	30	40	6
RAS-18RNBCLQ		41.5	10	0.75	50	30	50	10
RAS-20RNBCLQ		46.1	10	0.75	63	30	63	16
RAS-22RNBCLQ		49.2	10	0.75	63	30	63	16
RAS-24RNBCLQ		53.7	10	0.75	63	30	63	16

NOTE:

(1) Ensure that field wiring is as per provisions of local laws and regulations, and that a qualified or certified personnel performs all the wiring operations is must.

(2) Refer power cable dimensions specified in the above table must be according to relevant standards.

(3) If power wire is connected using a distribution box, sum up the current value and select the wires as per the below table specifications.

(4) As a minimum, the chosen wires shall not be lighter than the polychloroprene sheathed flexible wire (code designation 60245 IEC 57).Power cables shall be copper cables.

(5) The wiring specification of weak electricity communication circuit is not lower than RVV (S) P shielded wire or equivalent, the shield layer need to be grounded.

(6) The switch, that ensure all poles can disconnect, should be installed between the power supply and the air conditioner, the switch contact spacing should be not less than 3 mm.

(7) If the power wire is damaged, must contact the professional of dealer or the designated service for repairing and exchanging.

(8) When installing the power wire, the ground wire should be longer than the current-carrying wire.

Table 7.2 Power wire selection principle

Current (A)	Wire size (mm^2)
i≤6	2.5
6<i≤10	2.5
10<i≤16	2.5
16<i≤25	4
25<i≤32	6
32<i≤40	10
40<i≤63	16

⚠ CAUTION

To install multi-stage master switch between each phase, its phase distance is 3.5mm or more.

NOTE:

(1) When the power supply wire is too longer, select the minimum wiring size whose voltage drop is within 2%.

(2) The supply voltage must meet the following conditions:

Power supply voltage:	Voltage fluctuations within ±10
Starting voltage:	Voltage fluctuations within -15
Operating voltage:	Voltage fluctuations within ±10
Inter-phase imbalance rate:	Less than 3%

(3) Do not connect the ground wire to the gas pipe, water pipes and lightning rods.
Gas pipe: happens when a gas leak explosion and fire
Plumbing: when you use hard vinyl tubes ground is not valid.
Lightning rod: When the lightning rod is used, the earth potential increases abnormally.

7.3 Outdoor Unit Wiring

Perform the wiring connection as per the following:

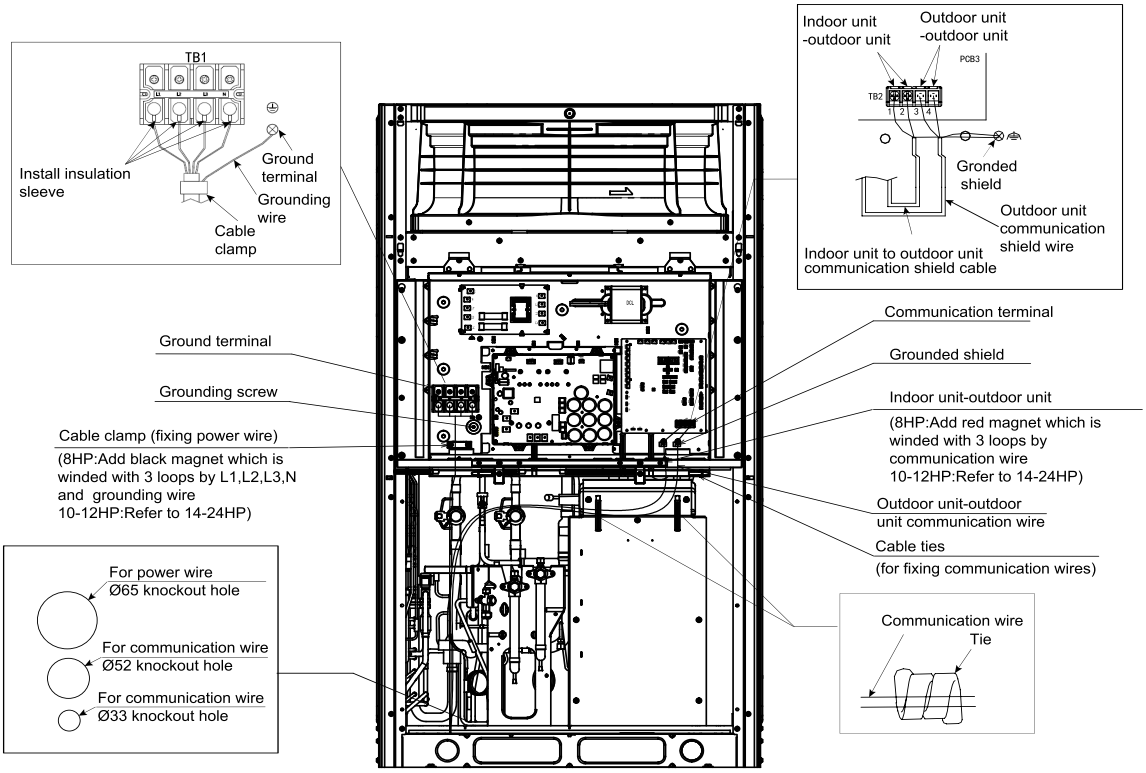
(1) Connect three-phase electric power wire to the terminal L1, L2, L3, and N (380V) of the block and connect the ground wire to the ground terminal in the electrical box.

(2) Connect the communication cable between the indoor and the outdoor unit to terminals 1 and 2 of the terminal block TB2 on the PCB3. The communication wires between the outdoor units of the same refrigerant system are connected to terminals 3 and 4 of the terminal block TB2 on the PCB3.

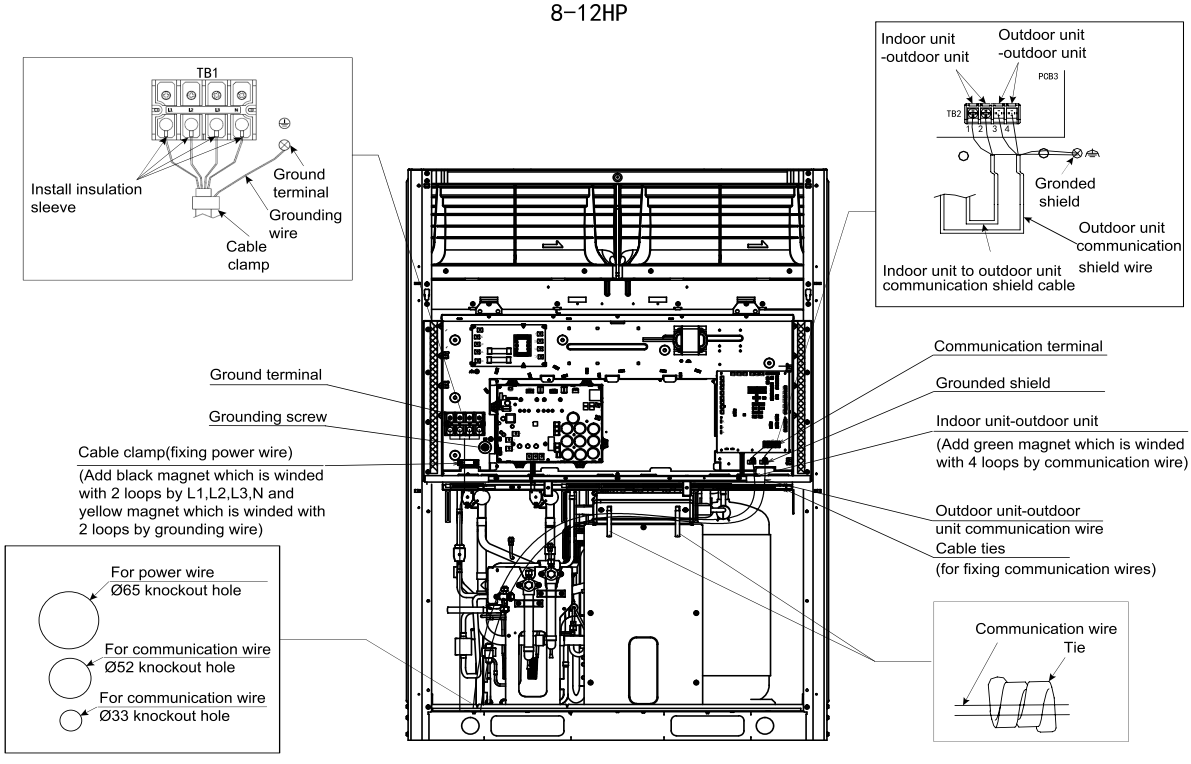
(3) Fasten the screws on the terminal block according to the following table:

Required Tightening Torque

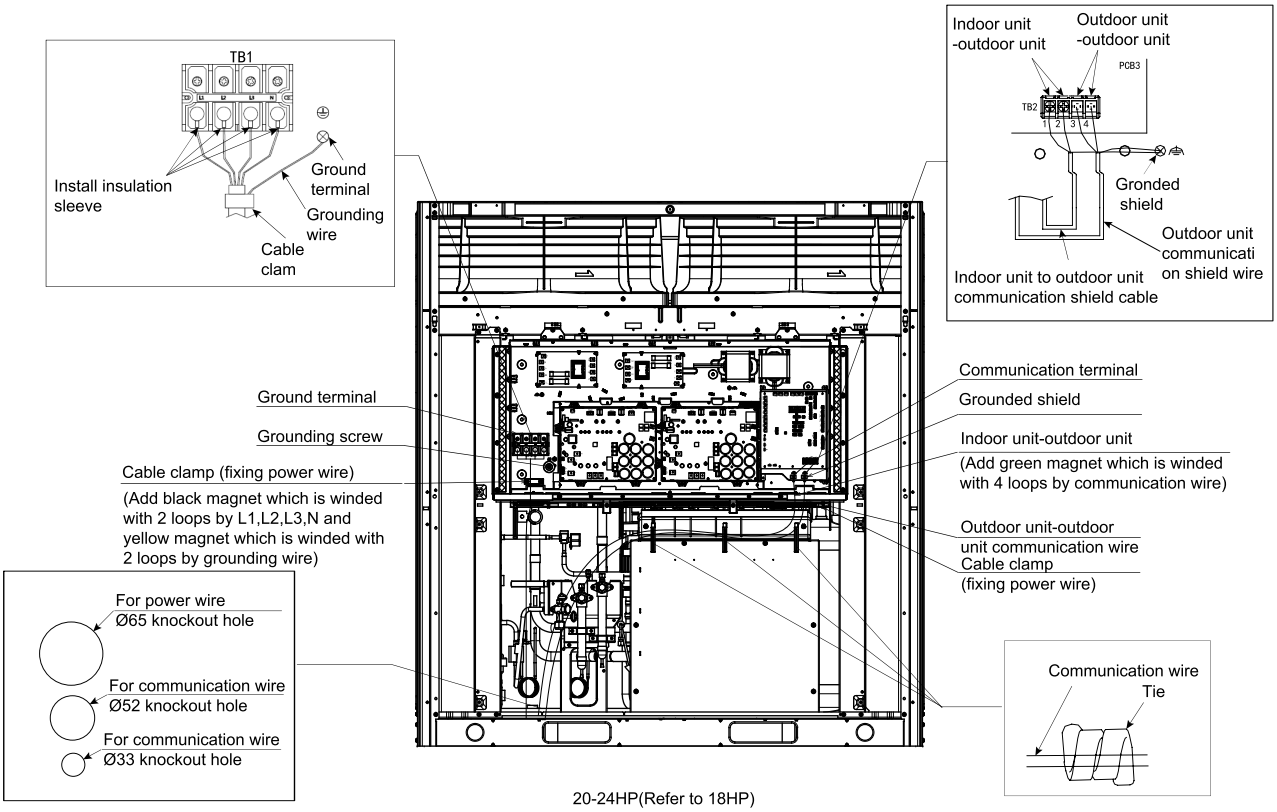
Size	Tightening Torque
M4	1.0 ~ 1.3 N ● m
M5	2.0 ~ 2.4 N ● m
M6	4.0 ~ 5.0 N ● m
M8	9.0 ~ 11.0 N ● m
M10	18.0 ~ 23.0 N ● m



8-12HP



14-16HP



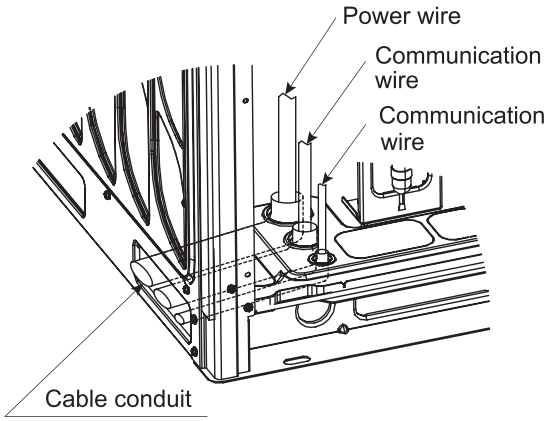
20-24HP(Refer to 18HP)

NOTICE

When running the cable at side of the unit, follow the procedure carefully to route the cable through the bottom of the unit using the conduit.

NOTE:

1. With a screwdriver and hammer, knock off the cover along with the dotted outline to give a knock-out hole in the bottom of the side panel, then polish the edge of the hole and install the insulation sleeve (provided on site) to protect the wire.
2. Do not put the power and communication cables in the same cable conduit. In addition, keep a distance of at least 5 cm between the power wires and communication wires.
3. Put the cable through the rubber rings and fix it to the entrance hole to protect the cable.
4. Avoid the wires to touch the pipes, metal sheet edges, and electrical components inside the unit.
5. Use sealing material to completely seal cable conduit to prevent rain water entering cable conduit.



⚠ CAUTION

Tighten the power wire with a clamp in the unit.

7.4 Electrical Wiring for Indoor and Outdoor Unit

(1) Connect the power cable to each of the outdoor unit. Each of the outdoor unit connection should consist of a ELB (Earth Leakage Breaker), circuit breaker, and the main switch (S).

(2) Connect the power wire to each group of the indoor units. Indoor units refer to all the indoor units connected to the same outdoor unit. Each group of indoor units is connected with a earth leakage breaker, circuit breaker and the main switch (S).

(3) As shown in the figure of chapter 7.4, connect the communication cable between indoor and outdoor unit.

(4) Connect the communication wire between the units in the same refrigerant system (connect the communication cable to the same indoor unit in the case where the refrigerant pipe of the indoor unit is connected to the outdoor unit). If you connect the refrigerant pipe and communication wires to different refrigerant circulation system, malfunction may be caused.

(5) Use 2-core cable communication wire such as shielded twisted pair. (Do not use 3-core or 3 more core wire).

(6) Use the same specifications provided in the H-LINK II system of the same refrigerant system.

(7) Separate the communication wire from the power cable. Maintain at least 5cm spacing between the communication wire and the power wire. Maintain at least 1.5m spacing between the communication wire and other electrical devices. If not, place the power wire in a metal conduit to isolate it from other wires.

(8) Connect the following communication wires to terminals 1 and 2 of the terminal block TB2 of the outdoor unit A (main unit):

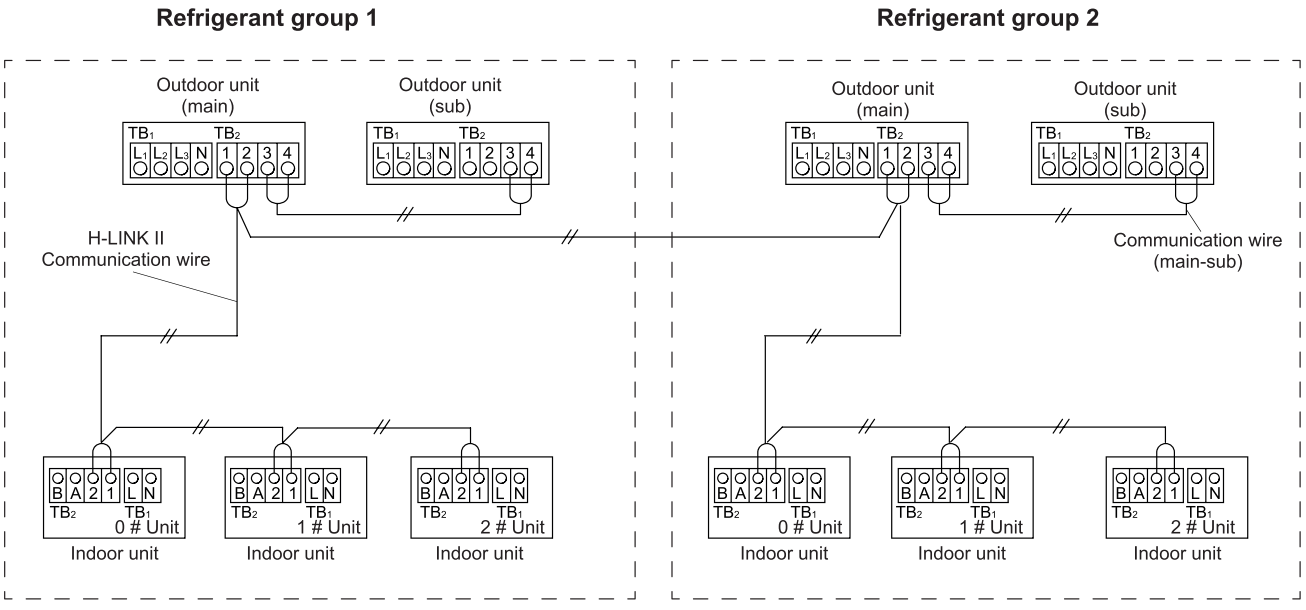
- Between the outdoor unit and indoor unit
- Between outdoor unit and indoor unit of other refrigerant system

(9) Do not connect the power wire to the communication terminal block TB2. This may damage the printed circuit board.

(10) Connect GRD wire to the outdoor/indoor unit. GRD wire with grounding resistance of 100Ω (Max) should be connected by qualified personnel.

(11) Communication wires between the outdoor units within the same refrigerant system will be connected to the terminal 3 and 4 of the terminal block TB2.

- Communication wire

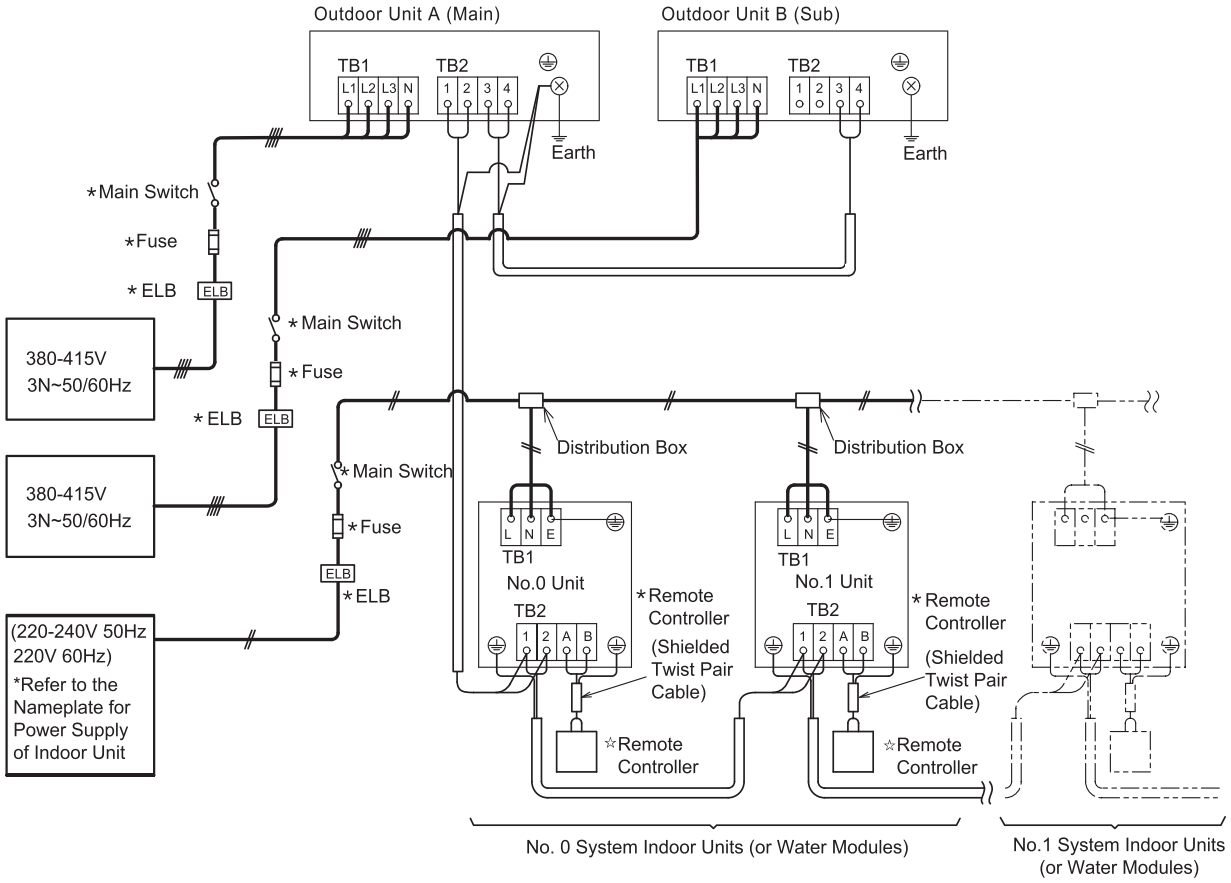


Remarks:

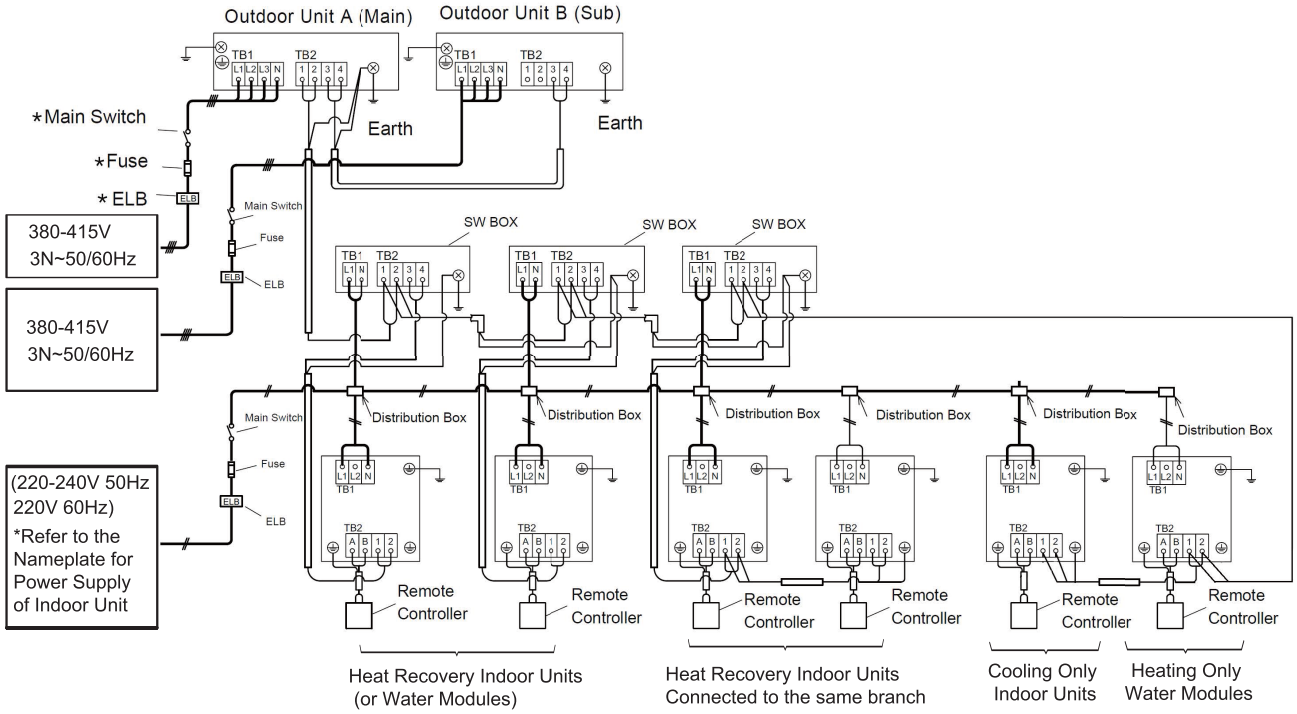
1. For modular combination units (26 HP ~ 96 HP), set the master-slave through DSW.
2. An alarm will appear if the communication wires between the outdoor units are connected to the terminal 1 and 2 of H-LINK II.
3. If there is an alarm on the LCD of the master outdoor unit, please go through spot check according to 7-segement code indication of the master outdoor unit.
4. Set the function for master outdoor unit.
5. Connectable a maximum of refrigerant groups with one central controller is 64 .
   For H- Link II Maximum number of indoor unit connectable is 160.
6. Wire specification

* Transmission Wire: 2-Wire
* Polarity of Transmission Wire: Non-Polar Wire
* Maximum Wiring Length: Total 1,000m
* Recommended Cable: Twist-Pair Cable with Shield, over 0.75mm^2
* Voltage: DC5V

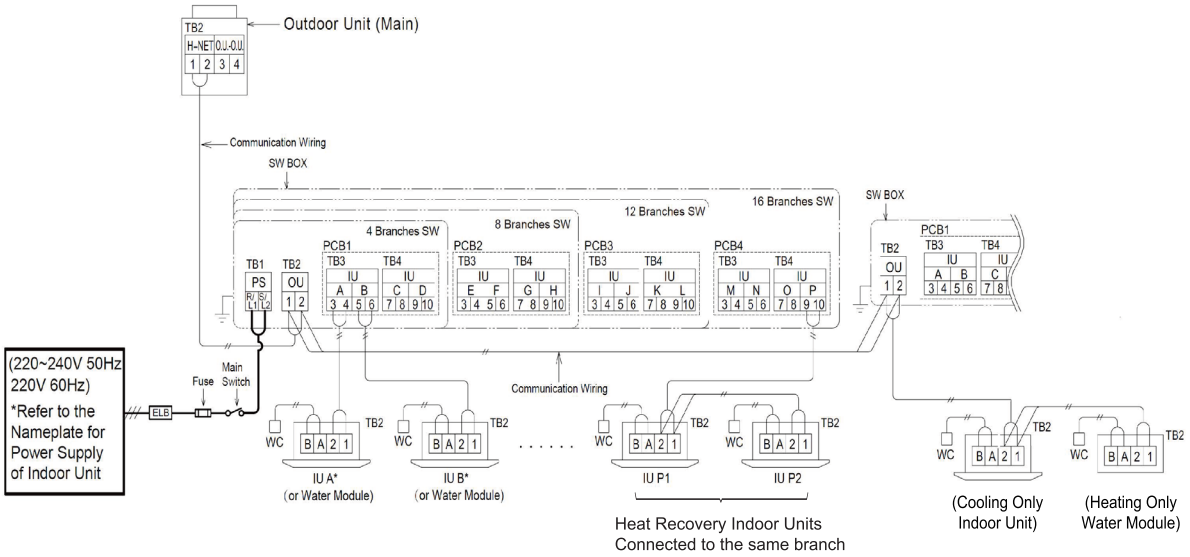
< Heat Pump System & Heat Recovery System Without Switch Box >



For Single Branch SW BOX



For Multi Branch SW BOX



NOTES:

- When multiple indoor units are connected to the same single SW BOX, they are controlled with the same operation mode.
- When multiple indoor units are connected to the same branch of the multi SW BOX, they are controlled with the same operation mode.
- Do not apply excessive voltage to the communication cable DC5V (non-polarity) between the outdoor unit and the SW BOX, between the SW BOX and the indoor unit or between SW BOXES.
- Use 2-Conductor shielded communication cable for the communication cable. (Do not use 3-Conductor cable or over.)
- Connect the communication cable for the outdoor unit to terminals “1” and “2” on TB2 in the SW BOX.
- Connect the communication cable for the cooling only indoor unit or heating only water module to the terminal “1” and “2” on TB2 in the SW BOX.
- For a SW BOX in the same refrigerant cycle, an electrical power supply can be supplied by one main switch.
- Do not connect the power supply line to the terminal block for transmission line.
- Connect the ground wiring for the outdoor/indoor units and SW BOX. When ground resistance is less than 100 ohms, ground wiring work should be performed by the qualified electrician.
- Do not run the communication cables along with power supply wirings in the SW BOX. Separate communication cables from the power supply wirings.
- Water module should be connected to an exclusive branch of the SW BOX.

7.5 Outdoor DIP Switch Setting

Turn off the electrical power supply to all units before setting the DIP switches. Otherwise DIP switch fails to work and the setting becomes invalid.

But the dip switch DSW4-No. 1, 2, 4 is valid when the power is turned ON under the status of power ON setting.

Symbol ■ indicates dip switch position. Refer to Figure 7.3 for setting dip switch settings and positions.

NOTICE

- 10-20 seconds after DIP setting on DSW4, the unit will be start or stop.
- Outdoor unit is numbered to distinguish it from other outdoor unit for repair and maintenance. Ensure to write a number in the box on the right.

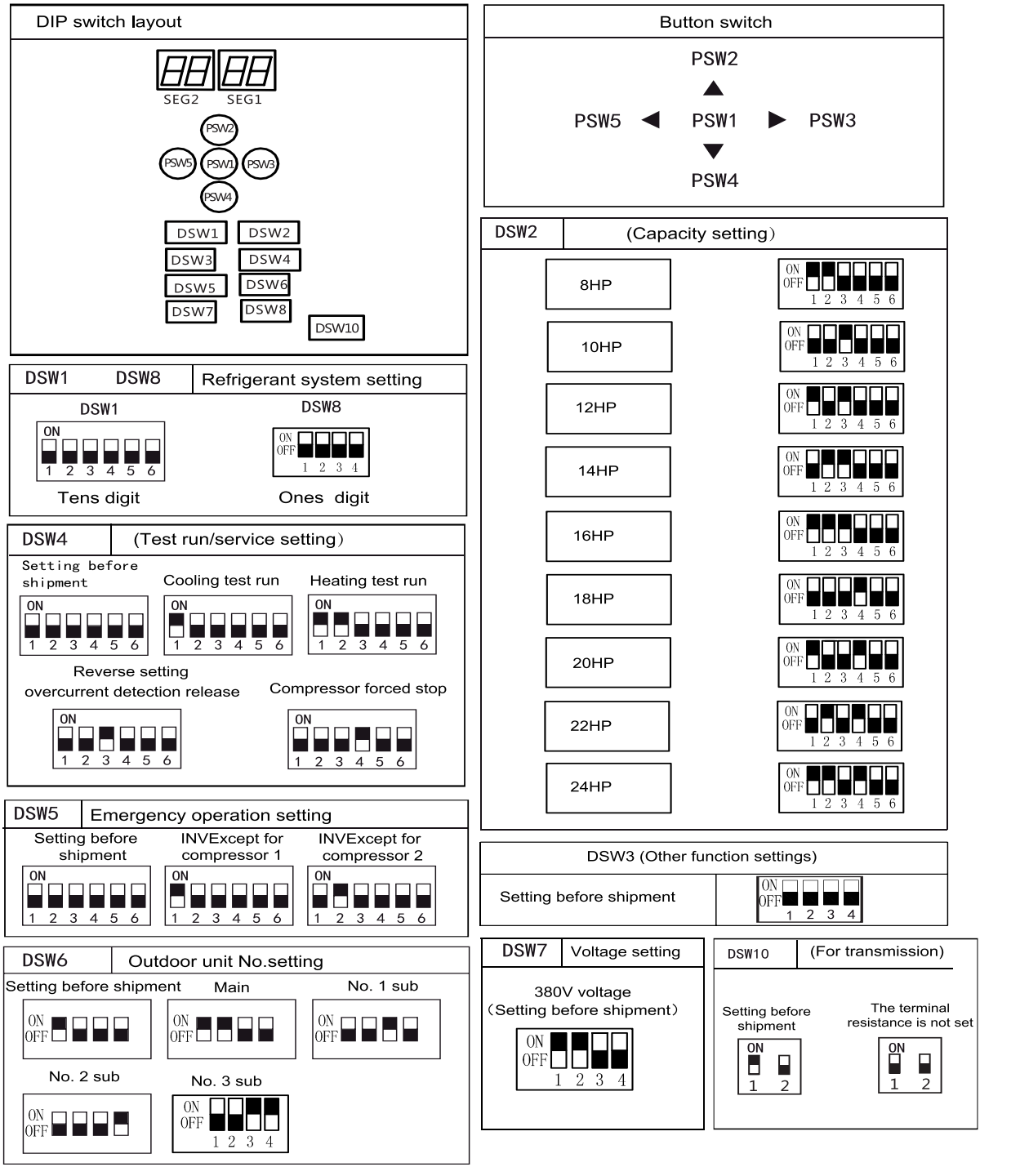
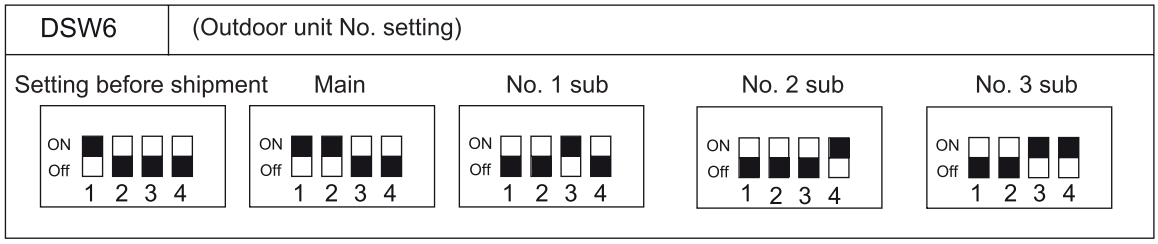


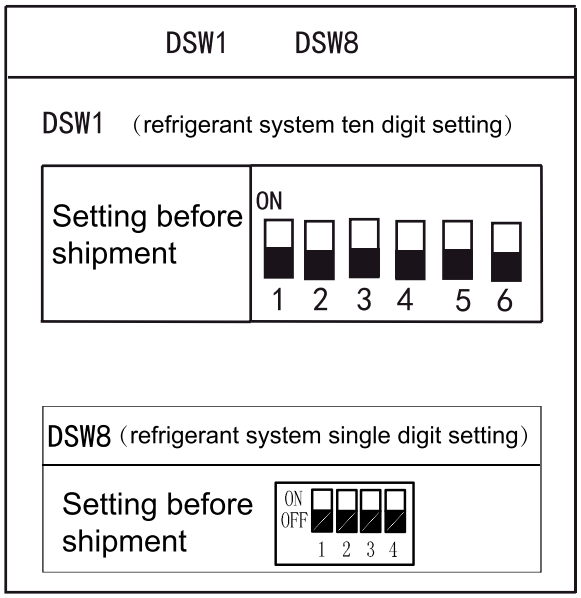
Figure 7.3 DIP Setting

- Communications settings:
  Set the outdoor unit number, the refrigerant system number, and the terminal resistance for the H-LINK or H-LINK II system.
- Outdoor number setting:
  When you combine base model module, set the DSW6 as shown below:



- Refrigerant system setting:
  Set the refrigerant system no. for the outdoor unit within the same refrigerant system, as shown in the figure:

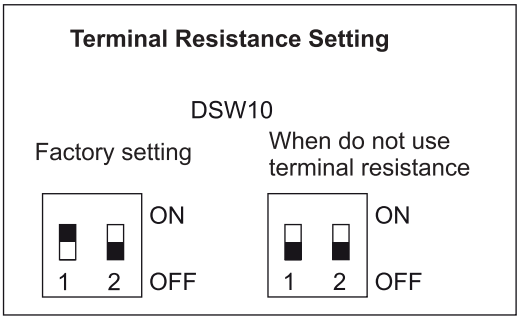
NOTE:
Within the same refrigerant system, refrigerant no. for the outdoor unit and indoor unit should be set to the same.

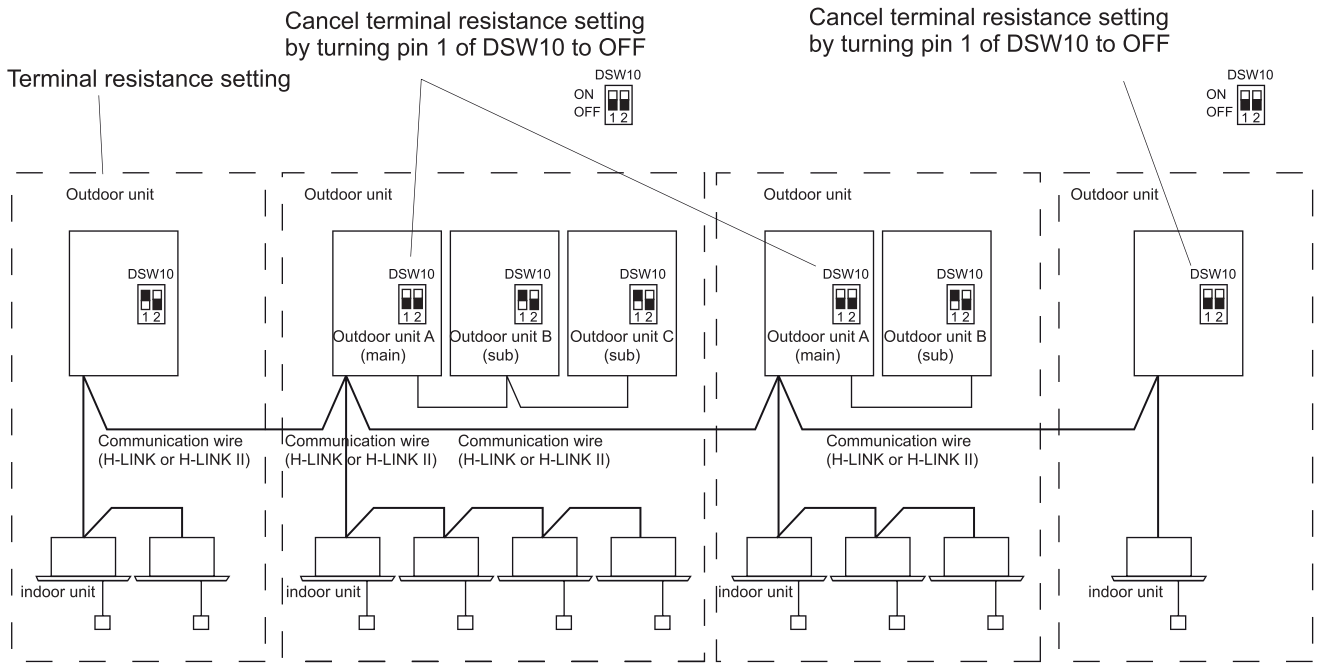


DSW1 and RSW1 factory set to the 0.

The maximum number of refrigerant system is set to 63.

- Terminal resistance setting:
  At the factory, position 1 of the DSW10 is set to ON. If the number of outdoor units in the same H-LINK or H-LINK II system is 2 or more, the position 1 of the DSW10 is set to OFF from the outdoor unit of the second refrigerant system. In this case, no need for setting if only one outdoor unit is used.





- Function Setting

1. External Input/Output and Function Setting

(1) External Input/Output and Function Setting Method:

1) Setting start

when unit is stopped, set DSW4-No.4 to ON and DSW4-No.6 to ON

2) Setting end

Set DSW4-No.6 to OFF and set DSW4-No.4 to OFF

(2) External Input/Output and Function Setting:

Press PSW3 (►) and PSW5 (◄) to select function. No. PSW4 (▼): forward

PSW2 (▲): backward

Item		SEG2	SEG1	Set
1	Input setting 1 CN17 [1-2pin]	i1	1	
2	Input setting 2 CN17 [2-3pin]	i2	2	
3	Input setting 3 CN18 [1-2pin]	i3	3	
4	Output setting 1 CN16 [1-2pin]	o1	1	
5	Output setting 2 CN16 [1-3pin]	o2	2	

Setting External Input/Output Function:

Function No.	Input	Output
1	Fixed Heating Mode	Operation Signal
2	Fixed Cooling Mode	Alarm Signal
3	Demand Stoppage	Compressor ON Signal
4	Outdoor Fan Motor Start/Stop	Defrost Signal
5	Forced Stoppage	-
6	Demand Current Control 40%	-
7	Demand Current Control 60%	-
8	Demand Current Control 70%	-
9	Demand Current Control 80%	-
10	Demand Current Control 100%	-
11	Low noise setting 1	-
12	Low noise setting 2	-
13	Low noise setting 3	-
0	No Setting	No setting

Same input/output function cannot be set to different input/output terminal. Otherwise, the larger function number setting will be invalid.

(3) Function Setting

By pressing the push-switches PSW3 (►) and PSW5 (◄) the setting can be changed. PSW4 (▼): forward, PSW2 (▲): backward

Refer to the Technical manual for more details.

Fill out the selected function No. in the space provided in the following table:

Item		SEG2	SEG1	SET	Item		SEG2	SEG1	SET
1	Circulator Function at Heating Thermo-Off	Fr	0		25	N/A	F1	0	
2	Switch to Night Mode (Low Noise)	n1	0		26	Crankcase Heating Band Control During Stoppage	F2	0	
3	Cancellation of Outdoor Ambient Temperature Limit	CS	0		27	Indoor Fan Warm Start Period Setting	F3	0	
4	Defrost in Cold Area (Change Of Defrost Condition)	Jo	0		28	Intermittent Operation of Outdoor Fan Motor	F4	0	
5	Gentle Fan Speed Defrost Setting	bJ	0		29	Indoor Expansion Valve Target Value Control for Cooling (Only For 4-Way Cassette Type)	F5	0	
6	Cancellation of Outdoor Unit warm Start	hr	0		30	Indoor Expansion Valve Minimum Opening Limit During Heating Switch-Off	F6	0	
7	Capacity Priority Mode	nU	0		31	N/A	F7	0	
8	Minimum Evaporating Temperature Setting for Cooling	Hc	0		32	Forced Defrosting After Forced Stoppage Of Defrosting Cycle	F8	0	
9	Compressor Frequency Target Value Control for Heating	Hh	0		33	Indoor Expansion Valve Control Change for Stoppage Indoor Unit in Heating Mode	F9	0	
10	Indoor Expansion Valve Target Value Control for Cooling	SC	0		34	Compressor Maximum Frequency Suppression	FC	0	
11	Indoor Expansion Valve Target Value Control for Heating	SH	0		35	Convert Unit in Checking Mode	Fd	0	
12	Indoor Expansion Valve Opening Control During Heating Operation Stoppage	S1	0		36	Indoor Fan ON/OFF Setting during Forced Stoppage	FE	0	
13	Indoor Expansion Valve Opening Control During Heating Thermo-Off	So	0		37	N/A	FF	0	
14	Indoor Expansion Valve Initial Opening Control During Heating Thermo-On	c1	0		38	High difference setting	FG	0	
15	Indoor Expansion Valve Initial Opening Control for Cooling	cb	0		39	N/A	FH	0	
16	Outdoor Expansion Valve Initial Opening Control for Heating	ch	0		40	Oil return control	F1	0	
17	Low Noise Setting*	db	0		41	Performance correction	FJ	0	
18	Demand Function Setting	dE	0		42	Outdoor temperature range	FL	0	
19	Wave Function Setting	UE	0		43	Cooling mode Start control 2 Hz change speed	Fn	0	
20	"Protection of Decrease in Outlet Temperature for Cooling"	Fb	0		44	Cooling mode Start control 2 Hz change speed	FP	0	
21	Outlet Temperature Control	Fr	0		45	Compressor Maximum Frequency Change during Defrosting Mode	Fr	0	
22	Adjustment of Fan Running (For Multiple Installation)	Fo	0		46	Oil return mode of indoor unit	FU	0	
23	N/A	Lr	0		47	N/A	F9	0	
24	Thermo-Off Setting for Outdoor Unit After Defrosting Operation	dS	0						

* when ambient temperature is higher than 44°C, silence and low noise setting mode is invalid.

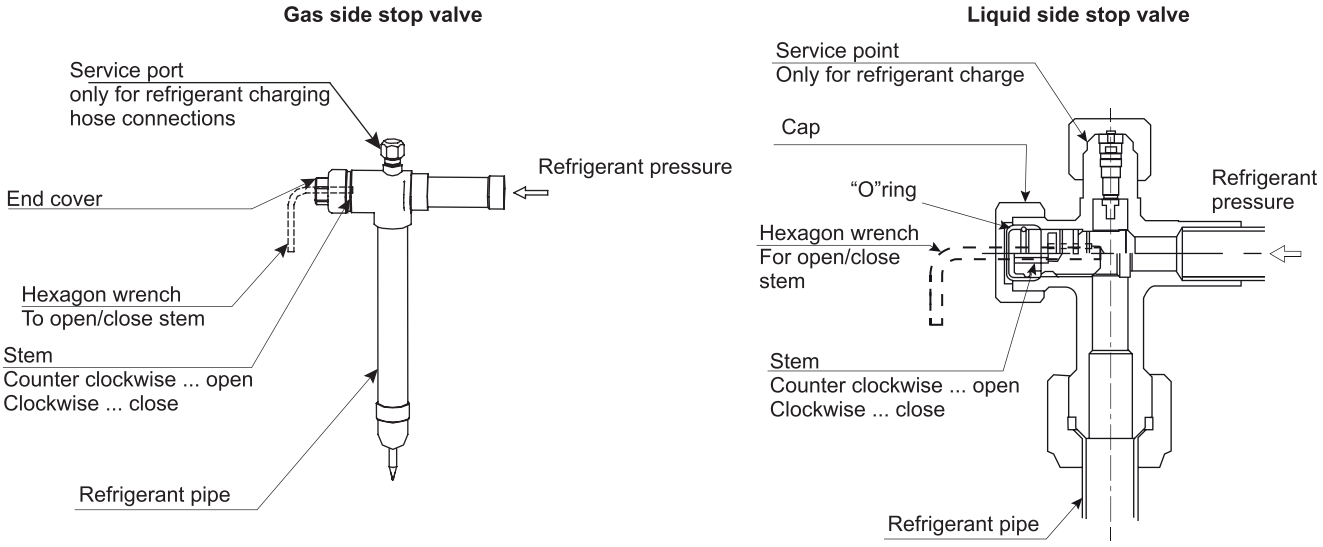
8. Additional Refrigerant Charge

8.1 Air Tightness Test

(1) Ensure that the stop valve is completely closed before airtight inspection.
<Air tightness detection>

(a) After you connect the liquid pipe, open the liquid side stop valve bonnet. Do not connect low pressure piping and gas side stop valve. Seal the low-pressure side of the pipe line by brazing with a filed supplied cap.

(b) After the above test is completed, carry out the air tightness detection.



(2) Connect the indoor and outdoor units with the refrigeration pipe provided on the site.
Provide support at regular intervals to prevent the cooling pipe touching the wall, ceiling of the building. (Piping vibrations cause abnormal sounds, hence pay much more attention when the piping length is shorter).

(3) Connect the regulating valve and the vacuum pump or the nitrogen tank specially to the test joint of the liquid valve. Conduct air tightness test. Connect the regulating valve to the check joint of the outdoor liquid side valve, and do not open the liquid side stop valve. Ensure that the nitrogen pressure is 4.15MPa.

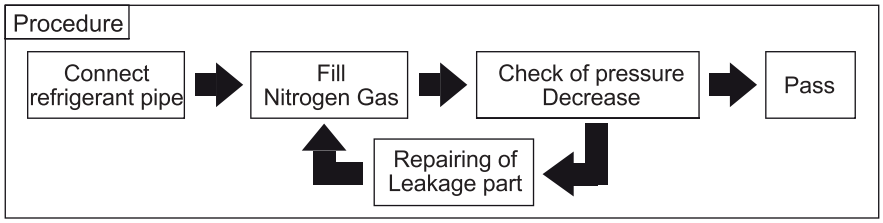
⚠ DANGER

Ensure that you carry out air tightness test only with nitrogen. If other gases such as oxygen, acetylene, or carbon hydrocarbon gas are used for airtight test, it can cause explosion or toxication.

(4) Use leakage detector or bubble to detect if there is leakage at the flare nut and brazing position

(5) After the airtight test, release the nitrogen, remove the low-pressure side pipe brazing sealing cap, and brazing then the gas side stop valve and low pressure side piping brazing.

(6) After completion of piping connection, install the pipe insulation material.



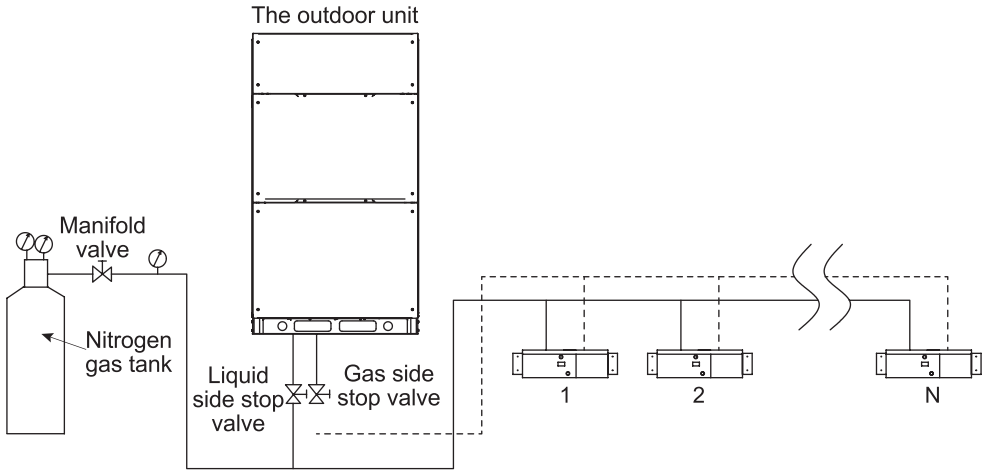


Figure 8.1 Air tightness test

⚠ CAUTION

- Isolate and protect the gas side stop valve, and do not directly charge to the gas side stop valve (see Figure 8.1).
- Before charging, ensure that the electronic expansion valve of the indoor unit is in the open state. Make sure that the piping is connected with the indoor unit.
- Gas side stop valve and low pressure pipe brazing joints cannot be detected by air tightness to confirm whether leakage occurs, pay attention to brazing quality during brazing operation.

8.2 Vacuum

(1) Connect the regulating valve and the vacuum pump to the liquid side stop valve detection joint.

(2) vacuuming for 1 or 2 hours to create vacuum space until the pressure reaches -0.1Mpa (-756 mm Hg) or less. After the vacuuming finished, close the valve of the regulating valve. Stop vacuuming and hold for 1 hour. Make sure that the pressure on the regulating valve does not go high.

(3) After vacuuming, tighten the inspection joint valve cap of liquid side stop valve torque: 14-18 N●m.

Prompt:

1. In case of direct touch with the new refrigerant R410A, use specified tools and instruments.
2. If the pressure for vacuum cannot reach - 0.1MPa (-756mm Hg), indicates that there may be leakage. In this case perform leakage detection. If there is no leakage, pump for 1 or 2 hours to create vacuum space.

NOTICE

- Apply thermal insulation to the refrigerant pipes as shown in Fig 8.2. After completion of piping connection, use field supplied insulation material to apply thermal insulation to the gas pipe, liquid pipe and check joint, connecting part such as connecting nut, etc., and use adhesive tap to wrap the exterior surface of them so as to prevent heat loss and condensation on the pipe surface.

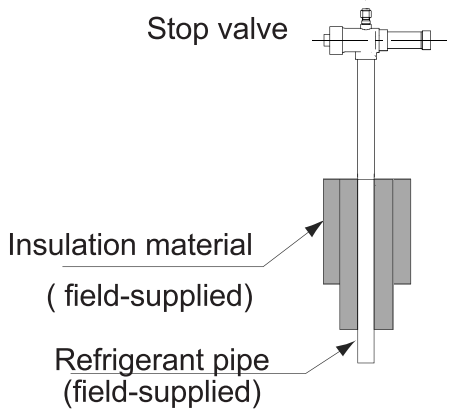


Figure 8.2

8.3 Charging

After vacuum pumping, check that the gas and liquid stop valve is fully closed.

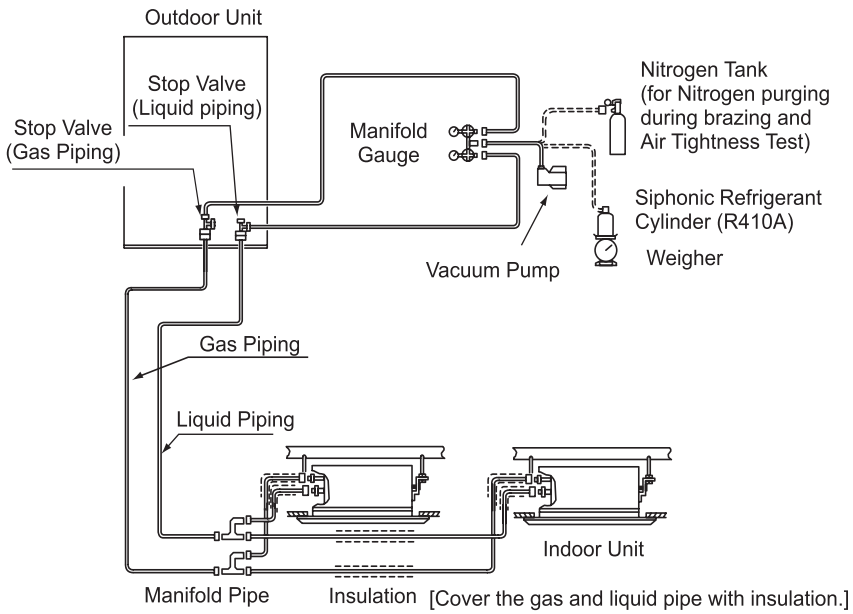
Charge the additional refrigerant from the check joint of liquid stop valve (charge tolerance: 0.5kg).

If the specified refrigerant quantity can not be charged, follow the procedure below.

(1) Fully open the stop valve for gas side.

(2) Operate the compressor at the cooling mode and charge the refrigerant from the check joint of the gas stop valve. At this time, the liquid stop valve is slightly opened (charge tolerance: 0.5kg).

(3) After refrigerant charging, fully open the stop valve for both liquid and gas sides.



Charge the correct refrigerant quantity.
If not, a compressor may be damaged due to an excess or insufficient refrigerant charge.

Refrigerant charge from check joint of gas stop valve may lead to compressor failure. Be sure to charge refrigerant from the check joint of liquid stop valve.

Insulate the liquid pipe and gas pipe completely to avoid decreasing of performance and dewing on the surface of the pipe.

Insulate the flare nut and union of the piping connection with insulation.

Check to ensure that there is no gas leakage. If a severe refrigerant leakage occurs, it will lead to difficult breathing or harmful gases would occur if a fire was lit up in the room.

- Special Attention Regarding Refrigerant Gas Leakage

Pay attention to the critical gas concentration to avoid accidental refrigerant gas leakage before installing air conditioning systems.

$$\frac{\text{R: Total Quantity of Charged Refrigerant (kg)}}{\text{V: Room Volume (m}^3\text{)}} \leq \text{C: Critical Concentration (0.42kg/m}^3\text{)}$$

* This value should be decided according to each country's regulation such as ISO5149, EN378 and ASHRAE Standard 15. In the case that the calculated critical concentration is higher than this value, take the following actions:

1) Provide a gas leakage detector and exhaust fan controlled by its gas leakage detector.
2) Provide effective opening in the wall or door for ventilation to next door so that the critical gas concentration can be maintained lower than the above value. (Provide an opening with area greater than 0.15% of the floor surface at the lower part of a door.)

⚠ CAUTION

1. Maximum Permissible Concentration of HFC GAS R410A
   The refrigerant R410A is an incombustible and non-toxic gas.
   However, if leakage occurs and gas fills a room, it may cause suffocation.
   Once leakage occurs, it is a must to take effective actions to make the concentration of R410A lower than 0.42 kg/m^3**.**
2. Calculation of Refrigerant Concentration
   (1) Calculate the total quantity of refrigerant R (kg) charged in the system connecting all the indoor units of target rooms.
   (2) Calculate the volume of the room installing this unit V (m^3).
3. Calculate the refrigerant concentration C (kg/m^3) of the room according to the equation on last page.

Please follow local codes or regulations, if any.

NOTE

Fill in the label attached to the unit with the amount of refrigerant charged and Tonnes of CO_2 equivalent of fluorinated greenhouse gases contained on the installation.

NOTE

- This equipment Contains fluorinated greenhouse gases.
- Refrigerant: R410A, global warming potential (GWP) value: 2088.
- Weight (kg) of Refrigerant charged before shipment: Reference to the nameplate [_ _ _] ① kg.
- Weight (kg) of Refrigerant charged additionally on site: Reference to the manual [_ _ _] ② kg.
- Weight (kg) of Refrigerant charged totally: ③=(①+②), [_ _ _] kg.
- Tonnes of CO_2 equivalent of fluorinated greenhouse gases contained: ③ x 2088/1000, [_ _ _] tCO_2eq.

H7D09278A

⚠ WARNING

- **Only use R410A as refrigerant. Other substances may cause explosions and accidents.**
- **R410A is fluorinated greenhouse gases. Its global warming potential (GWP) value is 2088. Do NOT vent these gases into the atmosphere.**
- **Tonnes of CO_2 equivalent of fluorinated greenhouse gases contained is calculated by GWP value of the refrigerant × Total refrigerant charge [kg]/1000 on the label.**

9. Test Run

Perform trial run according to Chapter 9.2. Record the values as per Table 9.1.

⚠ CAUTION

- Start the unit only when all the check points are checked and cleared.
  For indoor unit test run, refer to the installation manual and which is attached to the indoor unit.

9.1 Prerequisites for Test Run

1. Ensure that the indoor and outdoor refrigerant pipe and communication wires are connected to the same refrigeration system. Otherwise, it leads to abnormal and serious accidents. Check the refrigerant system no. for indoor/outdoor units (DSW1 and RSW1 [outdoor unit], DSW5 and RSW2 [indoor unit]) and indoor unit number (RSW). Make sure that the DIP switch on the base board of the indoor and outdoor unit is set correctly. In particular, pay attention to the indoor and outdoor unit height difference, refrigerant system number setting and terminal resistance setting. Refer to wiring diagram in chapter 7 for more details.
2. Ensure that the terminal resistance to ground exceeds 1MΩ, Otherwise, find out the earth leakage point and fix it before starting the system. Do not apply strong electricity to the communication terminals (outdoor unit: TB2 1.2.3.4 / indoor unit:TB2 1.2.A.B).
3. Ensure that the power wire L1, L2, L3 and N are connected correctly.
4. The power supply is connected for 12 hours or more to ensure that the crank case heating the compressor oil.
   After the power is turned on, if the compressor oil temperature is low, the units do not run immediately (stop code d1-22) .
   If starting operation within 2hours of power on, follow the steps below to lift the protection:
   1. Turn on the power to the outdoor unit.
   2. Wait for 30 seconds.
   3. Press and hold the PSW5 button on the outdoor unit for more than 3 seconds to release the protection code d1-22.

NOTICE

Insulation resistance precautions

If the total insulation resistance is lesser than 1MΩ, then the compressor insulation resistance can go low due to the refrigerant remaining in the compressor. This occurs when the unit idle for a long time.

1. Disconnect the compressor power wire. Measure the insulation resistance of the compressor body. If the resistance is higher than 1MΩ, the lower insulation resistance is caused by other electrical components.
2. If the compressor insulation resistance is lesser than 1MΩ,disconnect the inverter cable and then, turn on the compressor crankcase heating belt and turn on the power.
   After 3 hours of powering measure the insulation resistance of the compressor body again. (Duration of time should be longer to depending on outdoor weather conditions, piping length and refrigerant status.) Measure the insulation resistance and connect the compressor power wire.
   If the ELB acts, check and confirm if the ELB specification meets the recommended specification sh
   in table 7.1.

NOTICE

1. Ensure that the electrical components provided on the site (the main power switch, circuit breaker, wire, cable conduit connection, and terminal) are chosen as per the technical manual. Verify that the device complies with the national electrical code.
2. Use shielded wire (≥ 0.75 mm^2) for wiring connections to shield the electrical interference. (The total length of the shielded wire should be less than 1000m and the wire specification and size should b compliant with local regulations).
3. Ensure that the terminal block wiring is correct (Terminal L1 and N of the terminal block and voltage 380V). Wrong wiring connections damages the appliance and the associated components.

9.2 Test Run

(1) Ensure that the outdoor unit stop valve is completely open and then start the unit. (If there is a module combination, make sure that all stop valves that connect to the outdoor unit are fully open.)

(2) Turn on the indoor units one after other and ensure that refrigerant pipe setting and electric setting of the indoor unit is set in the same system. (If you start multiple indoor units at the same time, you cannot detect indoor unit and the corresponding outdoor unit .)

(3) Follow the steps below to perform the test run operation. Make sure that test run operation runs smoothly:

Prompt:

If the two-wired controller (Main and Auxiliary) first start through the main wired controlle .

(a) Holding down the run mode and up button on the remote control for more than 5 seconds enables the test mode.

- For other optional wired controllers (wireless remote contoller and micro controller), refer to the installation and operation manual attached to the wired controller.
- If a wired controller controls multiple indoor units operational at the same time, check the number of units connected to the indoor unit on the LCD screen.
- If the number of displays is incorrect, the address cannot be obtained automatically because the wrong connection. In such cases, disconnect the power wire and check for the following points and correct the wiring connection: (do not repeat the switch within 10 seconds of this action).
  * The power of the indoor unit is not connected or the connection is not correct.
  * The connection between the indoor unit cable is incorrect or the communication wire is incorrect
  * The rotary switch on indoor unit board and the DIP switch are not set correctly (set address repeat).

(b) Press the Run Mode button to set the operating mode.

(c) Press the Run/Stop button.

The run indicator lights turns on before the start of commissioning.

It is automatically set to 2 hours for test run, though the initial set of fan speed is Low, (This mode is the same as the normal mode) the set can be changed.

- Check the operation range according to “IMPORTANT NOTICE“.
- When the unit is running, note the following:
  *Do not touch the edges of any components of exhaust because the compressor and pipe in the exhaust end temperature up to 90°C or more.
  *Do not press the AC contractor button, it leads to serious accidents.
- Do not touch any electrical components within 10 minutes after disconnecting the main power supply.
- Through running of indoor unit one after the other, ensure that the refrigerant line and electrical wire are set in the same system.

(d) During the run, temperature control is invalid though the protection device is valid. If an alarm comes, please figure out the cause of the abnormality according to alarm code shown in table 9.2, and re-start the test run after the failure being solved. As per the spot check label attached on the back surface of the front panel of the outdoor unit, temperature, pressure, operation frequency and connection can be displayed with 7-segment code.

(e) To stop the test run, press Run/Stop button again or wait for two hours.

Table 9.1 Trial Run and Maintenance Record

Model:	Serial no.	Compressor no.
User name and address:		Date:

1. Is the indoor fan rotation direction correct? ☐
2. Is the outdoor fan rotation direction correct? ☐
3. Is there any abnormal sound from operation of compressor? ☐
4. If the system has been running for at least 20 minutes? ☐
5. Inspect indoor temperature:

Inlet:	No.1 DB /WB °C,	No.2 DB /WB °C,	No.3 DB /WB °C,	No. 4 DB /WB °C
Outlet:	DB /WB °C,	DB /WB °C,	DB /WB °C,	DB /WB °C
Inlet:	No.5 DB /WB °C,	No.6 DB /WB °C,	No.7 DB /WB °C,	No.8 DB /WB °C
Outlet:	DB /WB °C,	DB /WB °C,	DB /WB °C,	DB /WB °C

6. Inspect outdoor temperature:

Inlet:	DB °C,	WB °C
Outlet:	DB °C,	WB °C

7. Inspect refrigerant temperature:

Liquid pipe temperature:	°C
Exhaust temperature:	°C

8. Inspect pressure:

Exhaust pressure:	MPa
Intake pressure:	MPa

9. Inspect voltage:

Rated voltage:	V		
Operation voltage:	L1-L2 V,	L1-L3 V,	L2-L3 V
Start voltage	V		

Imbalance between phrases: $1-\frac{V}{Vm}=$

10. Inspect compressor input operation current:

Input power:	kW
Operation current:	A

11. Is the charge amount of refrigerant appropriate? ☐
12. Is the operation control device correct? ☐
13. Does the safety device act correctly? ☐
14. If the system refrigerant leakage detection has been conducted? ☐
15. If cleaning work has been done inside/outside the unit? ☐
16. If all the covers of the unit are being fixed securely ☐
17. If there is any abnormal sound from all the unit covers? ☐
18. Is the filter cleaned ☐
19. Is the heat exchange cleaned? ☐
20. Is the stop valve opened? ☐
21. Is the condensed water being drained smoothly through drain pipe? ☐
22. Do the components of the system change and replace? ☐

Table .9.2 Alarm Code

Code	Classification	Alarm Content	Main Reason
01	Indoor Unit	Indoor protection device action (float switch)	Water level is too high, drain, or float switch is abnormal.
02	The Outdoor Unit	Outdoor protection device action (high pressure switch)	Piping clogging, excessive refrigerant, non- condensable gas mixed
03	Communication	Communication between indoor and outdoor units is abnormal	Wrong wiring, loose terminal, disconnected, outdoor unit power off, outdoor fuse blown
04		Communication between the inverter board and the outdoor PCB is abnormal	Terminals loose, wire disconnected, outdoor unit powered off, outdoor unit fuse blows off.
04.		Communication between fan control board and outdoor PCB is abnormal	Terminals loose, broken, fuse blown
05	Power Supply	Power phase anomaly	Power supply error, power phase error, power wiring phase missing
06		Inverter voltage is abnormal	Outdoor unit voltage is too low, power capacity is not enough
06.		Fan control voltage is abnormal	Outdoor unit voltage is too low, power capacity is not enough
07	Circulatory System	Exhaust superheat TdSH is too low	Excessive refrigerant, expansion valve lock, wiring, piping connection error, thermistor fault, valve room - outdoor unit, refrigerant, electrical system connection error
08		Exhaust temperature Td (top of compressor) is too high	Insufficient refrigerant, expansion valve lock, wiring, piping connection error, thermistor fault, valve room - outdoor unit, refrigerant, electrical system connection error
0A	Communication	Communication abnormal between outdoor units	Communication wire connection error, wire disconnected, terminal loosening.
0b	The Outdoor Unit	The outdoor unit address is incorrect	The same system has two sets of the same set of outdoor unit (slave unit)
0C		The main outdoor unit is set incorrectly	There are 2 or more master units in the same system
11	Indoor Unit Sensor	Return air thermistor abnormal	Indoor thermistor wiring is wrong, broken, not connected or shorted.
12		Air supply thermistor error	
13		Heat exchanger liquid pipe (anti-freeze) thermistor abnormal (indoor unit)	
14		Ambient Thermistor Abnormal (Indoor)	
15		Ambient thermistor abnormality (indoor unit)	
16		Wired controller thermistor exception (fresh air treatment)	
17		Wired controller built-in thermistor abnormal (fresh air treatment)	
19	Fan Motor	Indoor fan protection device action	Indoor fan motor overheats or stuck

10. Safety And Control Device Setting

- Compressor Protection

High Pressure Switch:This switch cuts out the operation of the compressor when the discharge pressure exceed the setting

Outdoor unit model(kBtu/h)		RAS-8.0RNBCLQ	RAS-10RNBCLQ	RAS-12RNBCLQ	RAS-14RNBCLQ	RAS-16RNBCLQ
Pressure switch high pressure		Automatic Reset,Non-Adjustable				
Cut-Out	MPa	4.15	4.15	4.15	4.15	4.15
Cut-In	MPa	3.2	3.2	3.2	3.2	3.2
Fuse on Main Circuit	A	63	63	63	63	63
CCP Timer Set Time	minutes	3	3	3	3	3
Control Circuit Fuse	A	5	5	5	5	5

Outdoor unit model(kBtu/h)		RAS-18RNBCLQ	RAS-20RNBCLQ	RAS-22RNBCLQ	RAS-24RNBCLQ
Pressure switch high pressure		Automatic Reset,Non-Adjustable			
Cut-Out	MPa	4.15	4.15	4.15	4.15
Cut-In	MPa	3.2	3.2	3.2	3.2
Fuse on Main Circuit	A	80	80	80	80
CCP Timer Set Time	minutes	3	3	3	3
Control Circuit Fuse	A	5	5	5	5

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The Company is committed to continuous product improvement. We reserve the right, therefore, to alter the product information at any time and without prior announcement.

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