



INSTALLATION MANUAL

Air cooled refrigeration condensing unit

LREQ5B7Y1
LREQ6B7Y1
LREQ8B7Y1
LREQ10B7Y1
LREQ12B7Y1
LREQ15B7Y1
LREQ20B7Y1

CE - DECLARATION OF CONFORMITY
CE - KONFORMITÄTSSERKLÄRUNG
CE - DECLARATION DE CONFORMITE
CE - CONFORMITEITSVERKLARING

CE - DECLARAÇÃO-DE-CONFORMIDADE
CE - DICHIARAZIONE-DI-CONFORMITA
CE - ΔΗΛΩΣΗ ΣΥΜΜΟΡΦΩΣΗΣ

CE - DECLARAÇÃO-DE-CONFORMIDADE
CE - ЗАЯВЛЕНИЕ О-СОБЛЕТВІИИ
CE - OVERENSSTEMMELSESERKLERING
CE - FÖRSÄKRAN OM ÖVERENSSTÄMMELSE

CE - ZJAWA O USKLABENOSTI
CE - ILMOUTUS-YHDENMUKAISUDESTA
CE - DEKLARACJA ZGODNOSCI
CE - DECLARAȚIE DE CONFORMITATE

CE - ZJAWA O SKLADNOSTI
CE - VASTAVUSEDEKLARATSIOON
CE - ДЕКЛАРАЦІЯ-ЗА-СЬОБВЕТСТВІЕ
CE - UYUMLULUK BEYAN

CE - ATTIKITIES-DEKLARACIA
CE - ATBILSTĪBAS-DEKLARACIJA
CE - VYHLÁSENIE-ZHODY
CE - UYUMLULUK BEYAN

Daikin Europe N.V.

01 (66) declares under its sole responsibility that the air conditioning models to which this declaration relates:

02 (C) erklärt auf seine alleinige Verantwortung, dass die Modelle der Klimaanlage für die diese Erklärung bestimmt ist:

03 (E) déclare sous sa seule responsabilité, que les appareils d'air conditionné visés par la présente déclaration:

04 (NL) verklaart hierbij op eigen exclusieve verantwoordelijkheid dat de airconditioning units waarop deze verklaring betrekking heeft:

05 (E) declara bajo su única responsabilidad que los modelos de aire acondicionado a los cuales hace referencia la declaración:

06 (C) dichiara sotto sua responsabilità che i condizionatori modello a cui è riferita questa dichiarazione:

07 (66) δηλώνει με αποκλειστική της ευθύνη ότι τα προϊόντα των κλιματιστικών μονοκλών στο οποίο αναφέρεται η παρούσα δήλωση:

08 (E) declara sous sa exclusive responsabilité que os modelos de ar condicionado a que esta declaração se refere:

LREQ05B7Y1*, LREQ06B7Y1*, LREQ08B7Y1*, LREQ10B7Y1*, LREQ12B7Y1*, LREQ15B7Y1*, LREQ20B7Y1R*,
LREQ15B7Y1R*, LREQ20B7Y1R*,

* = , 1, 2, 3, ..., 9, A, B, C, ... Z

01 are in conformity with the following standard(s) or other normative document(s), provided that these are used in accordance with our instructions:

02 eriden följenden Norm(en) oder einem anderen Normdokument oder -dokumenten entsprechnissprechen, unter der Voraussetzung, dass Sie gemäß unseren Anweisungen eingesetzt werden:

03 sont conformes à la(ux) norme(s) ou autre(s) document(s) normatifs, pour autant qu'ils soient utilisés conformément à nos instructions:

04 conform de volgen de norm(en) of één of meer andere bindende documenten zijn, op voorwaarde dat ze worden gebruikt overeenkomstig onze instructies:

EN60335-2-40,

01 following the provisions of:

02 gemäß den Vorschriften of:

03 conformément aux stipulations des:

04 overeenkomstig de bepalingen van:

05 siguiendo las disposiciones de:

06 secondo le disposizioni per:

07 je типови или кориснички тив:

08 de acordo com o previsto em:

09 в соответствии с положениями:

01 * as set out in <A> and judged positively by according to the Certificate <C>:

02 * as set out in the Technical Construction File <A> and judged positively by (Applied module <F>): Risk category <G>:

Also refer to next page.

02 * wie in der Technischen Konstruktionsakte <A> aufgeführt und von positiv beurteilt gemäß Zertifikat <C>:

03 * wie in der Technischen Konstruktionsakte <A> aufgeführt und von positiv beurteilt gemäß Zertifikat <C>:

04 * wie in der Technischen Konstruktionsakte <A> aufgeführt und von positiv beurteilt gemäß Zertifikat <C>:

05 * wie in der Technischen Konstruktionsakte <A> aufgeführt und von positiv beurteilt gemäß Zertifikat <C>:

06 * wie in der Technischen Konstruktionsakte <A> aufgeführt und von positiv beurteilt gemäß Zertifikat <C>:

07 * wie in der Technischen Konstruktionsakte <A> aufgeführt und von positiv beurteilt gemäß Zertifikat <C>:

08 * wie in der Technischen Konstruktionsakte <A> aufgeführt und von positiv beurteilt gemäß Zertifikat <C>:

09 * wie in der Technischen Konstruktionsakte <A> aufgeführt und von positiv beurteilt gemäß Zertifikat <C>:

10 * wie in der Technischen Konstruktionsakte <A> aufgeführt und von positiv beurteilt gemäß Zertifikat <C>:

11 * wie in der Technischen Konstruktionsakte <A> aufgeführt und von positiv beurteilt gemäß Zertifikat <C>:

12 * wie in der Technischen Konstruktionsakte <A> aufgeführt und von positiv beurteilt gemäß Zertifikat <C>:

13 * wie in der Technischen Konstruktionsakte <A> aufgeführt und von positiv beurteilt gemäß Zertifikat <C>:

14 * wie in der Technischen Konstruktionsakte <A> aufgeführt und von positiv beurteilt gemäß Zertifikat <C>:

15 * wie in der Technischen Konstruktionsakte <A> aufgeführt und von positiv beurteilt gemäß Zertifikat <C>:

16 * wie in der Technischen Konstruktionsakte <A> aufgeführt und von positiv beurteilt gemäß Zertifikat <C>:

17 * wie in der Technischen Konstruktionsakte <A> aufgeführt und von positiv beurteilt gemäß Zertifikat <C>:

18 * wie in der Technischen Konstruktionsakte <A> aufgeführt und von positiv beurteilt gemäß Zertifikat <C>:

19 * wie in der Technischen Konstruktionsakte <A> aufgeführt und von positiv beurteilt gemäß Zertifikat <C>:

20 * wie in der Technischen Konstruktionsakte <A> aufgeführt und von positiv beurteilt gemäß Zertifikat <C>:

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22 * wie in der Technischen Konstruktionsakte <A> aufgeführt und von positiv beurteilt gemäß Zertifikat <C>:

23 * wie in der Technischen Konstruktionsakte <A> aufgeführt und von positiv beurteilt gemäß Zertifikat <C>:

24 * wie in der Technischen Konstruktionsakte <A> aufgeführt und von positiv beurteilt gemäß Zertifikat <C>:

25 * wie in der Technischen Konstruktionsakte <A> aufgeführt und von positiv beurteilt gemäß Zertifikat <C>:

01 **** Daikin Europe N.V. is authorised to compile the Technical Construction File.

02 **** Daikin Europe N.V. hat die Berechtigung der Technische Konstruktionsakte zusammenzustellen.

03 **** Daikin Europe N.V. est autorisée à compiler le Dossier de Construction Technique.

04 **** Daikin Europe N.V. is bevoegd om het Technische Constructiedossier samen te stellen.

05 **** Daikin Europe N.V. está autorizado a compilar el Archivo de Construcción Técnica.

06 **** Daikin Europe N.V. è autorizzata a redigere i File Tecnico di Costruzione.

07 **** H Daikin Europe N.V. avari õiguspõhjalny va õigustatud koostada tehnikafaili.

08 **** A Daikin Europe N.V. está autorizada a compilar a documentação técnica de fabrico.

09 **** Компания Daikin Europe N.V. уполномочена составлять Кошмник техничево коэу, поэуменатия.

10 **** Daikin Europe N.V. er autoriseret til at udarbejde tekniske konstruktionsdata.

11 **** Daikin Europe N.V. är beymågått att sammanställa den tekniska konstruktionsfilen.

12 **** Daikin Europe N.V. har tillåtelse til å kompilere den tekniske konstruktionsfilen.

13 **** Daikin Europe N.V. on valtuutettu laatimaan Teknisen asiakirjan.

14 **** Společnost Daikin Europe N.V. má oprávnění ke kompilaci souboru technické konstrukce.

15 **** A Daikin Europe N.V. is ovlahten za izradu Datoteke o tehničkoj konstrukciji.

16 **** Daikin Europe N.V. je pooblaščen za sestavo tehniške dokumentacije.

17 **** Daikin Europe N.V. is autorizēsad tehnisko dokumentāciju.

18 **** Spoločnosť Daikin Europe N.V. je oprávnená vyvíor súbor technické konstrukcie.

19 **** Daikin Europe N.V. je pooblaščen za sestavo datoteke s tehnično mapo.

20 **** Daikin Europe N.V. on valtuutettu laatimaan teknistä dokumentaatiota.

21 **** Daikin Europe N.V. er autoriseret til at udarbejde tekniske konstruktionsdata.

22 **** Daikin Europe N.V. is bevoegd om het Technische Constructiedossier samen te stellen.

23 **** Daikin Europe N.V. está autorizado a compilar el Archivo de Construcción Técnica.

24 **** Daikin Europe N.V. è autorizzata a redigere i File Tecnico di Costruzione.

19 **** Daikin Europe N.V. is authorised to compile the Technical Construction File.

20 **** Daikin Europe N.V. hat die Berechtigung der Technische Konstruktionsakte zusammenzustellen.

21 **** Daikin Europe N.V. est autorisée à compiler le Dossier de Construction Technique.

22 **** Daikin Europe N.V. is bevoegd om het Technische Constructiedossier samen te stellen.

23 **** Daikin Europe N.V. está autorizado a compilar el Archivo de Construcción Técnica.

24 **** Daikin Europe N.V. è autorizzata a redigere i File Tecnico di Costruzione.

09 (66) заявляет, исключительно под свою ответственность, что модели кондиционеров воздуха, к которым относится настоящее заявление:

10 (DE) erklert under enersvar, at klimaanlægsmødelene, som denne deklaration vedrører:

11 (S) deklarerar i egenskap av huvudsansvarig, att luftkonditioneringsmodellerna som berörs av denna deklaration innebär att:

12 (N) erklærer et fulstændigt ansvar for at de luftkonditioneringsmodeller som berøres af denne deklaration, innebærer at:

13 (RU) ilmoittaa yksinomaan omalla vastuullaan, että laittain ilmoitukseen tarkoitettuihin ilmasoitteitten nimitt:

14 (CZ) prohlašuje ve své plné odpovědnosti, že modely klimatizace, k nimž se toto prohlášení vztahuje:

15 (BG) изъяснява под изключително vlastno отговорност, че са модели клима уреда на које се ова зјава односи:

16 (H) teljes felelősséggel tudatában kijelentem, hogy a klímaberendezés modellek, melyekre a nyilatkozati vonatkozik:

LREQ05B7Y1*, LREQ06B7Y1*, LREQ08B7Y1*, LREQ10B7Y1*, LREQ12B7Y1*, LREQ15B7Y1*, LREQ20B7Y1*,

LREQ15B7Y1R*, LREQ20B7Y1R*,

* = , 1, 2, 3, ..., 9, A, B, C, ... Z

05 están en conformidad con la(s) siguiente(s) norma(s) u otro(s) documento(s) normativos), siempre que sean utilizados de acuerdo con nuestras instrucciones:

06 sono conformi all(elle) seguente(s) standard(s) o altro(i) documento(i) a carattere normativo, a patto che vengano usati in conformità alle nostre istruzioni:

07 ава оуповује ме то(ј) околно(ј) (п)роуто(ј) (ј)ако појер, јојлајде стандард(е) или ander и нормиране документ, под издустително одговорност, да нимз се ово проглашен, взилајује:

08 estão em conformidade com a(s) seguinte(s) norma(s) u outro(s) documento(s) normativos), desde que estes sejam utilizados de acordo com as nossas instruções:

09 в соответствии с требованиями:

10 under följande bestämmelser i:

11 enligt villkoren i:

12 gemäß den Vorschriften:

13 noudatteen määräykset:

14 takaitis noudatett, patiekaitis:

15 seuraavien määräysten mukaisesti:

16 följande bestämmelser i:

17 enligt villkoren i:

18 gemäß den Vorschriften:

19 under följande bestämmelser i:

20 enligt villkoren i:

21 enligt villkoren i:

22 enligt villkoren i:

23 enligt villkoren i:

24 enligt villkoren i:

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55 enligt villkoren i:

[illegible]

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The English text is the original instruction. Other languages are translations of the original instructions.

1. INTRODUCTION

- This document is an installation manual for the Daikin Air Cooled Refrigeration Condensing Unit. Before installing the unit, read this manual thoroughly, and following the instructions contained in it. After installation, do a test run to make sure the unit runs properly, and then explain how to operate and take care of the unit to the customer, using the operation manual.
- Lastly, make sure the customer keeps this manual, along with the operation manual, in a safe place.
- This manual does not describe how to install the indoor unit. Refer to the installation manual included with the indoor unit for that.

1-1 Safety precautions

Please read these "Safety precautions" carefully before installing condensing unit and be sure to install it correctly.

Meaning of WARNING and CAUTION notices

Both are important notices for safety. Be sure to follow them.



WARNING Failure to follow these instructions properly may result in personal injury or loss of life.



CAUTION Failure to observe these instructions properly may result in property damage or personal injury, which may be serious depending on the circumstances.

After completing installation, conduct a test operation to confirm that the equipment operates without any problems. Then, explain to the customer how to operate the equipment and take care of it following the operation manual.

Ask the customer to store the installation manual along with the operation manual for future reference.



WARNING

- Ask your dealer or qualified personnel to carry out installation work. Do not attempt to install the condensing unit yourself. Improper installation may result in water leakage, electric shocks or fire.
- Install the condensing unit in accordance with the instructions in this installation manual. Improper installation may result in water leakage, electric shocks or fire.
- When installing the unit in a small room, take measures so that the refrigerant may not exceed the limiting concentration in the event of refrigerant leakage. Contact your dealer for further information. If the refrigerant leaks and exceeds the limiting concentration, it may lead to oxygen deficiency.
- Be sure to use only the specified accessories and parts for installation work. Failure to use the specified parts may result in the unit falling, water leakage, electric shocks or fire.
- Install the condensing unit on a foundation strong enough to withstand the weight of the unit. If a foundation does not have sufficient strength, the equipment may fall and cause injury.
- Carry out the required installation work in consideration of strong winds, typhoons or earthquakes. If the installation work is not properly carried out, the unit may fall down and cause accidents.
- The electrical work must be carried out by the qualified electrician in accordance with the local laws and regulations and this installation manual. Make sure to provide a dedicated power supply circuit and never connect additional wiring to the existing circuit. An insufficient power supply capacity or improper electrical work may lead to electric shocks or fire.
- Be sure to earth the condensing unit. Do not earth the unit to a utility pipe, lightning conductor or telephone earth lead. Imperfect earthing may result in electric shocks or fire. A high surge current from lightning or other sources may cause damage to the condensing unit.
- Be sure to install an earth leakage breaker. Failure to install an earth leakage breaker may result in electric shocks or fire.
- Be sure to switch off the unit before touching any electrical parts. Touching a live part may result in electric shock.
- For wiring, use the specified wires and connect and fasten them firmly so that no external force from the wires may be applied to the terminal connections. If the wires are not firmly connected and fastened, it may cause heating, fire or the like.
- When wiring the power supply and connecting transmission wiring, position the wires so that the control box lid can be securely fastened. Improper positioning of the control box lid may result in electric shocks, fire or the terminals overheating.
- If refrigerant gas leaks during installation, ventilate the area immediately. Toxic gas may be produced if the refrigerant comes into contact with fire.
- After completing installation, check for refrigerant gas leakage. Toxic gas may be produced if the refrigerant gas leaks into the room and comes into contact with a source of fire, such as a fan heater, stove or cooker.
- Do not directly touch refrigerant that has leaked from refrigerant pipes or other areas, as there is a danger of frostbite.
- Do not allow children to climb on the outside unit and avoid placing objects on the unit. Injury may result if the unit becomes loose and falls.
- Tear apart and throw away plastic packaging bags so that nobody, especially children, can play with them. Possible risk: suffocation.



- Do not touch the refrigerant piping, water piping or internal parts during and immediately after operation. It could be too hot or too cold. Give it time to return to normal temperature. If you must touch it, wear protective gloves.
 - Works executed on the outdoor unit are best done under dry weather conditions to avoid water ingress.
 - In accordance with the applicable legislation, it might be necessary to provide a logbook with the product containing at least: information on maintenance, repair work, results of tests, stand-by periods,...
- Also, at least, following information must be provided at an accessible place at the product:
- Instructions for shutting down the system in case of an emergency
 - Name and address of fire department, police and hospital
 - Name, address and day and night telephone numbers for obtaining service
 - In Europe, EN378 provides the necessary guidance for this logbook.

CAUTION

- Carry out drain piping properly following this installation manual and insulate the pipe to prevent condensation. Improper drain piping may result in indoor water leakage and property damage.
- Install the indoor and outdoor units, power cord and connecting wires at least 1 meter away from televisions or radios to prevent picture interference and noise. (Depending on the incoming signal strength, a distance of 1 meter may not be sufficient to eliminate noise.)
- Do not install the condensing unit in the following locations:
 1. Where there is a high concentration of mineral oil spray or vapour (e.g. a kitchen).
Plastic parts may deteriorate and cause parts to fall off or water to leak.
 2. Where corrosive gas, such as sulphurous acid gas, is produced. Corrosion of copper pipes or brazed parts may occur and cause refrigerant leakage.
 3. Where there is a machine that generates electromagnetic wave and where voltage fluctuation often occurs such as a factory. Control system may malfunction and as a result the unit may not properly operate.
 4. Where flammable gas may leak, where carbon fibre or ignitable dust is suspensions in the air, or where volatile flammables such as paint thinner or gasoline are handled.
Operating the unit in such conditions may result in fire.
 5. Vehicles, ships, or other places that generate vibration or cause the condensing unit to move.
The condensing unit may malfunction or cause oxygen deficiency accidents as a result of refrigerant leakage.
 6. Places with excessive voltage fluctuations.
The condensing unit may malfunction.
 7. Places where fallen leaves accumulate or weeds grow thick.
 8. Places that become small animals' shelter.
Small animals coming in contact with electrical parts can cause malfunctions, smoke, or ignition.
- The condensing unit is not intended for use in a potentially explosive atmosphere.

1-2 Special notice of product

This condensing unit comes under the term "appliances not accessible to the general public".

[CLASSIFICATION]

This condensing unit comes under the term "appliances not accessible to the general public".

Refer to the connected indoor unit to know the climate class (EN60335-2-89).

[EMC CHARACTERISTICS]

This system is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

[REFRIGERANT]

This System use R410A refrigerant.

CAUTION

This unit is already filled with a certain amount of R410A. Never open liquid and gas shutoff valve until the step specified in **"9. CHECKS AFTER WORK COMPLETION"** on page 16.

- The refrigerant R410A requires that strict precautions be observed for keeping the system clean, dry and tightly sealed. Read the chapter **"6. REFRIGERANT PIPING"** on page 6 carefully and follow these procedures correctly.
 - A. Clean and dry
Strict measures must be taken to keep impurities (including SUNISO oil and other mineral oils as well as moisture) out of the system.
 - B. Tightly sealed
Take care to keep the system tight when installing. R410A contains no chlorine, does not destroy the ozone layer and so does not reduce the earth's protection against harmful ultraviolet radiation. R410A will contribute only slightly to the greenhouse effect if released into the atmosphere.
- Since R410A is a mixed refrigerant, the required additional refrigerant must be charged in its liquid state. If the refrigerant is charged in a state of gas, its composition changes and the system will not work properly.

Be sure to perform refrigerant replenishment.

Refer to **"9. CHECKS AFTER WORK COMPLETION"** on page 16, the label of instructions on refrigerant replenishment on the cover surface of the control box, and **"12-1 Calculation method"** on page 19.

Important information regarding the refrigerant used

This product contains fluorinated greenhouse gases. Do not vent gases into the atmosphere.

Refrigerant type: R410A

Global warming potential (GWP) value: 2087.5

To fix the fluorinated greenhouse gases label

1. Fill in the label as follows:

The diagram shows a label with the following fields:

- 1: Contains fluorinated greenhouse gases
- 2: RXXX (unit name)
- 3: GWP: XXX
- 4: ① = [] kg
- 5: ② = [] kg
- 6: ① + ② = [] kg
- 7: GWP × kg / 1000 = [] tCO₂eq

- 1 If a multilingual fluorinated greenhouse gases label is delivered with the unit (see accessories), peel off the applicable language and stick it on top of 1.
- 2 Factory refrigerant charge: see unit name plate
- 3 Additional refrigerant amount charged
- 4 Total refrigerant charge
- 5 **Greenhouse gas emissions** of the total refrigerant charge expressed as tonnes CO₂-equivalent
- 6 GWP = Global warming potential

CAUTION

In Europe, the **greenhouse gas emissions** of the total refrigerant charge in the system (expressed as tonnes CO₂-equivalent) is used to determine the maintenance intervals. Follow the applicable legislation.

Formula to calculate the greenhouse gas emissions: GWP value of the refrigerant × Total refrigerant charge [in kg] / 1000

2. Fix the label on the inside of the outdoor unit near the gas and liquid stop valves.

[DESIGN PRESSURE]

Since design pressure is 3.8 MPa or 38 bar (for R407C units : 3.3 MPa or 33 bar), the wall thickness of pipes should be more carefully selected in accordance with the relevant local and national regulations.

1-3 Disposal requirements

Dismantling of the unit, treatment of the refrigerant, of oil and of other parts must be done in accordance with relevant local and national legislation.

2. BEFORE INSTALLATION

CAUTION

- When installing the indoor unit, refer to the installation manual provided for the indoor unit.
- Optional accessories are required for the installation of the product. Refer to the information on optional accessory.

2-1 Standard supplied accessories

The following accessories are included. The storage location of the accessories is shown in the figure.

Note

Do not throw away any of the accessories until installation is complete.

Name	Clamp (1)	Clamp (2)	Gas side accessory pipe (1)	Gas side accessory pipe (2)
Quantity	9 pcs.	2 pcs.	1 pc.	1 pc.
Shape	 Small			

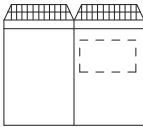
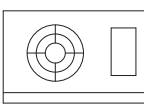
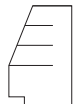
Name	Liquid side accessory pipe (1)	Liquid side accessory pipe (2)	Operation manual
Quantity	1 pc.	1 pc.	1 pc.
Shape		 Thin	

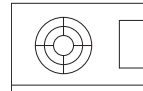
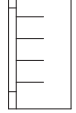
Name	Installation manual	Fluorinated greenhouse gases label	Multilingual fluorinated greenhouse gases label
Quantity	1 pc.	1 pc.	1 pc.
Shape			

2-2 Model series

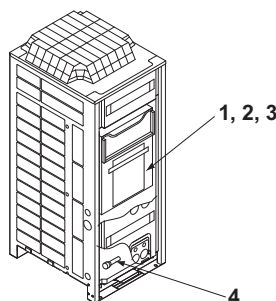
LREQ5~20

2-3 Example of system configuration

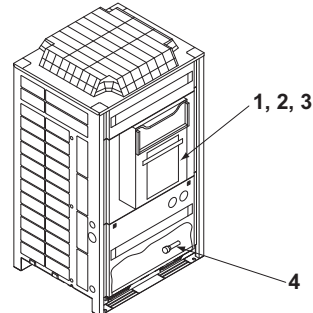
Name	Outdoor unit	Indoor unit	
		Unit cooler	Showcase
Shape			

Name	Indoor unit		Control panel (Defrost)	Warning panel
	Unit cooler	Showcase		
Shape				

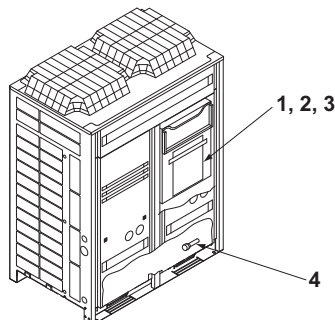
LREQ5, LREQ6



LREQ8, LREQ10, LREQ12



LREQ15, LREQ20



- 1 Operation manual
- 2 Installation manual
- 3 Clamps
- 4 Accessory pipes (Installed on bottom frame)

2-4 Indoor unit constraints

- Install an R410A mechanical thermostatic expansion valve on each indoor unit.
- Insulate the feeler block of the mechanical thermostatic expansion valve.
- Install an R410A solenoid valve (Max. operating differential pressure of 3.5 MPa [35 bars] or over) on the primary side of the mechanical thermostatic expansion valve described above for each indoor unit.
- Install a filter on the primary side of the solenoid valve described above for each indoor unit. Determine the filter mesh count based on the size specified by the solenoid valve and mechanical thermostatic expansion valve being used.
- Route the path to the indoor unit heat exchanger so that the flow of refrigerant is from top to bottom.
- When installing a number of indoor units, be sure to install them at the same level.
- Use either off-cycle defrosting or electric heater defrosting as the defrosting type. Hot-gas defrosting models cannot be used.
- Set the total value of the internal volume for the evaporator (Refrigerator/Freezer) to connect and the amount of refrigerant inside the evaporator that can be recovered in the condensing unit by closing the liquid solenoid valve installed on the refrigeration-side to the below amount or lower.
LREQ5, 6: 22 l or lower
LREQ8, 10, 12: 33 l or lower
LREQ15, 20: 42 l or lower

3. SELECTION OF LOCATION

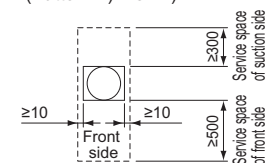
Select a location for installation that meets the following conditions.
Get the customer's permission.

1. There is no danger of fire due to leakage of inflammable gas.
2. Select the location of the unit in such a way that neither the discharged air nor the sound generated by the unit disturb anyone.
3. The foundation is strong enough to support the weight of the unit and the floor is flat to prevent vibration and noise generation.
4. The piping length between the outdoor unit and the indoor unit may not exceed the allowable piping length.
(Refer to "6. REFRIGERANT PIPING" on page 6)
5. Locations where the unit's suction vent and outlet vent do not generally face the wind.
Wind blowing directly into the suction or outlet vents will interfere with the unit's operation.
If necessary, install some kind of obstruction to block the wind.
6. The space around the unit is adequate for servicing and the minimum space for air inlet and air outlet is available.
(See the "Installation Space Examples" on page 4 for the minimum space requirements.)

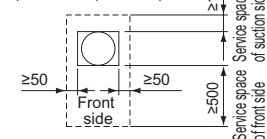
Installation Space Examples

- The installation space requirement shown in the following figure is a reference for cooling operation when the outdoor temperature is 32°C.
If the design outdoor temperature exceeds 32°C or the heat load exceeds maximum capacity in all the outdoor unit, take an even large space on the intake shown in the following figure.
- During installation, install the units using the most appropriate of the patterns shown in the following figure for the location in question, taking into consideration human traffic and wind.
- If the number of units installed is more than that shown in the pattern in the following figure, install the units so there are no short circuits.
- As regards space in front of the unit, consider the space needed for the local refrigerant piping when installing the units.
- If the work conditions in the following figure do not apply, contact your dealer or Daikin directly.

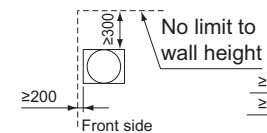
< If installed as a single unit >
(Pattern 1) NOTE



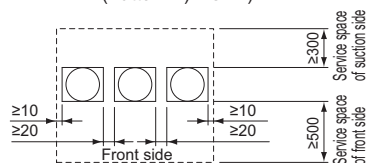
(Pattern 2) NOTE



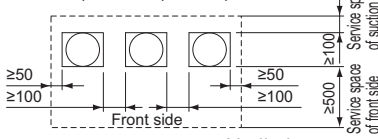
(Pattern 3)



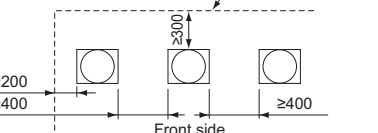
< When installed in serial >
(Pattern 1) NOTE



(Pattern 2) NOTE

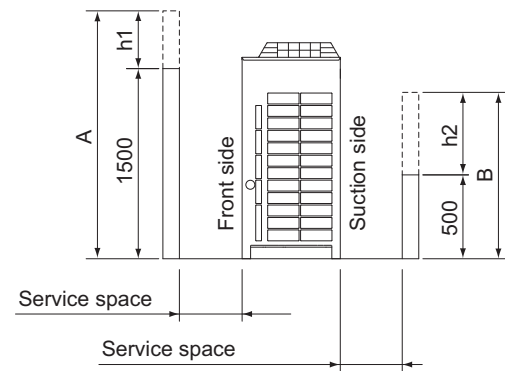


(Pattern 3)



NOTE) For patterns 1 and 2

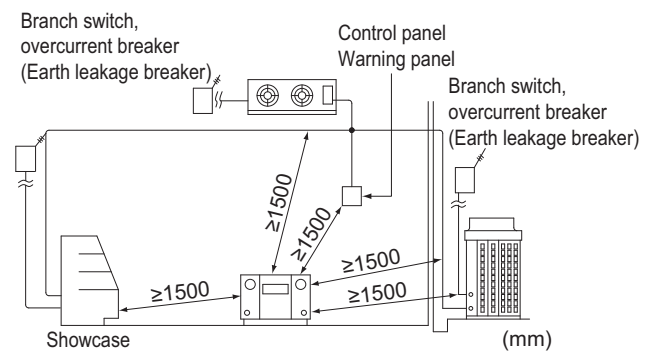
- Wall height for front side no higher than 1500 mm.
- Wall height on the suction side no higher than 500 mm.
- Wall height for sides – no limit
- If the height is exceeded the above, calculate h1 and h2 shown in the figure below, and add h1/2 to the service space of front side and h2/2 to the service space of suction side.



$$\begin{aligned} h1 &= A \text{ (Actual height)} - 1500 \\ h2 &= B \text{ (Actual height)} - 500 \\ X &= 500 + h1/2 \text{ or over} \\ Y &= 300 + h2/2 \text{ or over} \\ (Y &= 100 + h2/2 \text{ or over}) \end{aligned}$$

[Values in parentheses are for pattern 2]

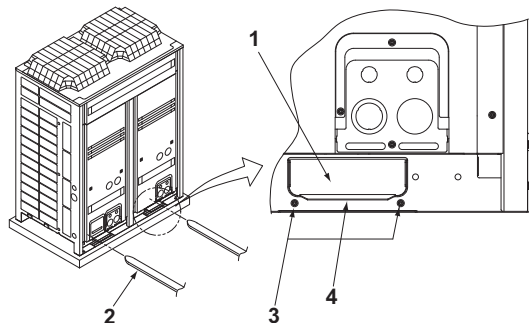
CAUTION



1. An inverter condensing unit may cause electronic noise generated from AM broadcasting. Examine where to install the main condensing unit and electric wires, keeping proper distances away from stereo equipment, personal computers, etc.
Particularly for locations with weak reception, ensure there is a distance of at least 3 meters for indoor remote controllers, place power wiring and transmission wiring in conduits, and ground the conduits.
2. When installing in a locations where there is heavy snowfall, implement the following snow measures.
 - Ensure the base is high enough that intakes are not clogged by snow.
 - Mount a snow protection hood (optional accessory)
 - Remove the rear intake grille to prevent snow from accumulating on the fins.
3. If condensate may drip on downstairs (or walkway) depending on the floor condition, take a measure such as the installation of central drain pan kit (sold separately).
4. The refrigerant R410A itself is nontoxic, nonflammable and is safe. If the refrigerant should leak however, its concentration may exceed the allowable limit depending on room size. Due to this it could be necessary to take measures against leakage.
See "Engineering Data" for details.

4. HANDLING THE UNIT

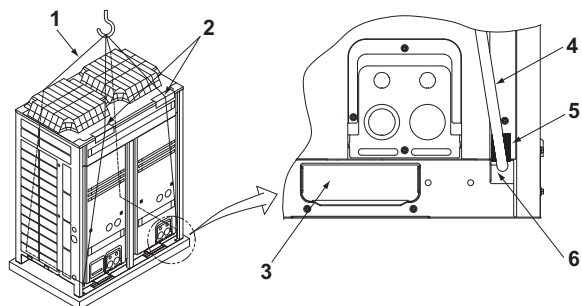
1. Decide on the transportation route.
2. If a forklift is to be used, pass the forklift arms through the large openings on the bottom of the unit.



- 1 Opening (large)
- 2 Fork
- 3 Fixed screws of transportation clasp
- 4 Transportation clasp (yellow)

If hanging the unit, use a cloth sling to prevent damaging the unit. Keeping the following points in mind, hang the unit following the procedure shown in the following figure.

- Use a sling sufficiently strong to hold the mass of the unit.
- Use 2 belts of at least 8m long.
- Place extra cloth in the locations where the casing comes in contact with the sling to prevent damage.
- Hoist the unit making sure it is being lifted at its center of gravity.



- 1 Belt sling
- 2 Patch cloth
- 3 Opening (large): Used for LREQ5 or LREQ6
- 4 Belt sling
- 5 Patch cloth
- 6 Opening (small): Used for LREQ8~20

3. After installation, remove the transportation clasp (yellow) attached to the large openings.

Note

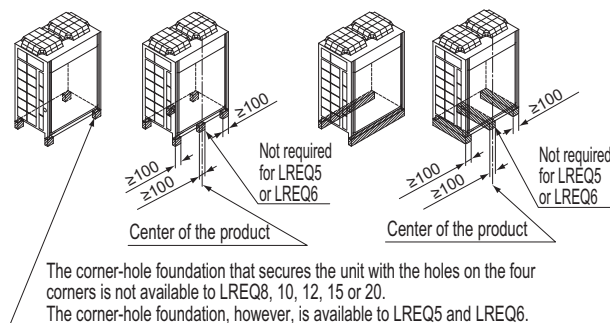
Apply a filler cloth on a fork to prevent coating of the bottom frame from coming off and rust from occurring when bringing in the unit with anti-corrosion treatment type using a forklift.

5. PLACING THE UNIT

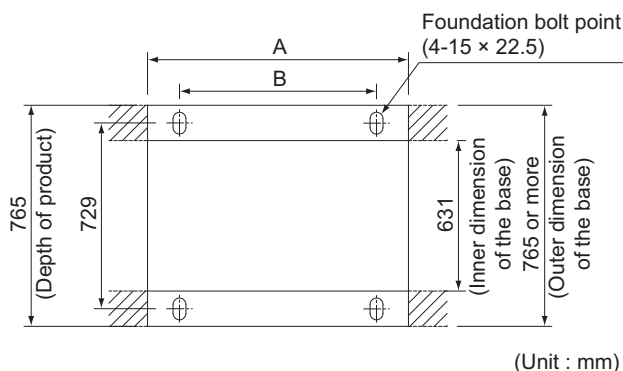
- Make sure the unit is installed level on a sufficiently strong base to prevent vibration and noise.
- The base should be bigger around than the width of the unit's legs (66 mm), and should support the unit.
If protective rubber is to be attached, attach it to the whole face of the base.
- The height of the base should be at least 150 mm from the floor.
- Secure the unit to its base using foundation bolts. (Use four commercially available M12-type foundation bolts, nuts, and washers.)
- The foundation bolts should be inserted 20 mm.



- ✕ Corner-hole foundation
- Independent foundation
- Beam foundation (horizontal)
- Beam foundation (vertical)



Base form



Model	A	B
LREQ5, LREQ6	635	497
LREQ8, LREQ10, LREQ12	930	792
LREQ15, LREQ20	1240	1102

Base width and base bolt positions

Note

- When installing on a roof, make sure the roof floor is strong enough and be sure to water-proof all work.
- Make sure the area around the machine drains properly by setting up drainage grooves around the foundation.
Drain water is sometimes discharged from the outdoor unit when it is running.
- If the condensing unit is of brine damage resistant or heavy brine damage resistant type, use nuts provided with resin washers to secure the product to the foundation bolts (see the illustration on the right-hand side).
The rustproof effect of the nut will be lost if the coatings on the tightening portions of the nuts come off.



6. REFRIGERANT PIPING

To Piping Work Contractors

- Never open the shutoff valve until the steps specified in "7. FIELD WIRING" on page 11 and "8-3 Checking of device and installation conditions" on page 16 of piping.
- Do not use flux at the time of brazing and connecting refrigerant pipes. Use phosphorous copper brazing filler metal (BCuP-2), which does not require flux. Chlorine-based flux causes piping corrosion. Furthermore, if fluoride is contained, the flux will have adverse influences on the refrigerant piping line, such as the deterioration of refrigerating machine oil.



CAUTION

- All field piping must be installed by a licensed refrigeration technician and must comply with relevant local and national regulations.

[Precautions for reuse of existing refrigerant piping/heat exchangers]

Keep the following points in mind for the reuse of existing refrigerant piping / heat exchangers.

A malfunction may result if there is deficiency.

- Do not use the existing piping in the following cases. Perform new piping instead.
- The piping is different in size.
- The strength of the piping is insufficient.
- The compressor of the condensing unit previously used caused a malfunction.
An adverse influence of residual substances, such as the oxidation of refrigerant oil and the generation of scale, is considered.
- If the indoor unit or outdoor unit is disconnected from the piping for a long time.
The intrusion of water and dust into the piping is considered.
- The copper pipe is corroded.
- The refrigerant of the condensing unit previously used was other than R410A (e.g., R404A / R507 or R407C).
The contamination of the refrigerant with heterogeneity is considered.
- If there are welded connections midway on the local piping, make gas leakage checks on the welded connections.
- Be sure to insulate the connection piping.
The liquid and gas pipe temperatures are as follows:
Liquid pipe arrival minimum temperature: 0°C
Gas pipe arrival minimum temperature: -45°C
In the case of thickness insufficiency, add additional insulation material or renew the existing insulation material.
- Renew the insulation material if the insulation material is degraded.

Keep the following points in mind for the reuse of existing heat exchangers

- Units with insufficient design pressure (since this product is an R410A unit) require a lower-stage design pressure of 2.5 MPa [25 bars].
 - Units for which the path to the heat exchanger has been routed so that the flow of refrigerant is from bottom to top
 - Units with copper tubing or fan corrosion
 - Units that may be contaminated with foreign matter such as rubbish or other dirt
-

6-1 Selection of piping material

- Make sure that the inner side and outer side of the piping used is clean and free of contaminants, such as sulphur, oxide, dust, chips, oil and fat, and water. It is desirable that the maximum oil adhesion in the piping is 30 mg per 10 m.
- Use the following type of refrigerant piping.
Material: Seamless phosphorus deoxidized copper tube (C1220T-O for a maximum outer diameter of 15.9 mm and C1220T-1/2H for a minimum outer diameter of 19.1 mm)

Refrigerant piping size and wall thickness: Decide the size and thickness from the following table.

(This product uses R410A. The withstand pressure of O type may be insufficient if it is used for piping with a minimum diameter of 19.1 mm. Therefore, be sure to use 1/2 H type with a minimum thickness of 1.0 mm.

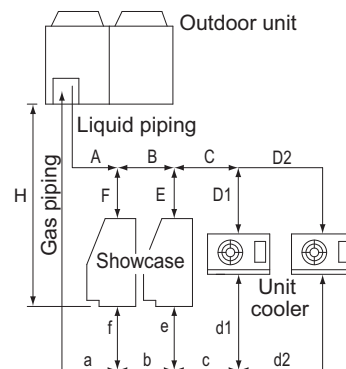
If O type is used for piping with a minimum diameter of 19.1 mm, a minimum thickness of 1.2 mm will be required. In that case, be sure to perform the blazing of each joint.)

- Be sure to perform piping work within the range specified in the following table

Refrigerant piping length

Max. permissible one-way piping length (equivalent length)	LREQ5~20	$T_e = -20 \sim +10^\circ\text{C}$ $a + b + c + d \leq 130 \text{ m}$ (d is d1 or d2 whichever is longer) $T_e = -45 \sim -20^\circ\text{C}$ $a + b + c + d \leq 100 \text{ m}$ (d is d1 or d2 whichever is longer)
Max. branch piping length (actual length)		$b + c + d \leq 30 \text{ m}$ (d is d1 or d2 whichever is longer)
Max. difference in height between indoor and outdoor units	unit below outdoor unit	$H \leq 35 \text{ m}$ (Note)
	unit above outdoor unit	$H \leq 10 \text{ m}$

Note: A trap is required at 5 m intervals from outdoor unit.



Refrigerant piping size

(Unit: mm)

Outdoor unit side	Piping size		Gas pipe
	Liquid pipe		
	50 m or less	50~130 m	
LREQ5, LREQ6	Ø9.5 x 0.8 (O type)		Ø22.2 x 1.0 (1/2 H type or H type)
LREQ8, LREQ10	Ø9.5 x 0.8 (O type)	Ø12.7 x 0.8 (O type)	Ø28.6 x 1.0 (1/2 H type or H type)
LREQ12	Ø12.7 x 0.8 (O type)		Ø28.6 x 1.0 (1/2 H type or H type)
LREQ15, LREQ20	Ø12.7 x 0.8 (O type)		Ø34.9 x 1.2 (1/2 H type or H type)
Piping between branching areas (B, b, C, c)	Select the piping from the following table in accordance with the total capacity of indoor units connected downstream		
	Total capacity of indoor units after branching		Liquid pipe size
	less than 4.0 kW		Ø6.4 x 0.8 (O type)
	4.0 kW over and less than 14.0 kW		Ø9.5 x 0.8 (O type)
	14.0 kW or over		Ø12.7 x 0.8 (O type)
	Total capacity of indoor units after branching		Gas pipe size
	Medium temperature (not less than -20°C)	Low temperature (-20°C or less)	
	less than 1.0 kW	—	Ø9.5 x 0.8 (O type)
	1.0 kW over and less than 6.0 kW	less than 2.3 kW	Ø12.7 x 0.8 (O type)
	6.0 kW over and less than 9.9 kW	2.3 kW over and less than 4.4 kW	Ø15.9 x 1.0 (O type)
	9.9 kW over and less than 14.5 kW	4.4 kW over and less than 6.4 kW	Ø19.1 x 1.0 (O type)
	14.5 kW over and less than 25.0 kW	6.4 kW over and less than 10.8 kW	Ø22.2 x 1.0 (O type)
	25.0 kW over and less than 31.0 kW	10.8 kW over and less than 13.4 kW	Ø28.6 x 1.0 (O type)
	31.0 kW or over	13.4 kW or over	Ø34.9 x 1.2 (O type)
No size after branching can exceed the size of any upstream piping.			
Piping between branching areas and each unit	Adjust the size of the piping so that it will coincide with the size of piping connecting to the indoor unit		

6-2 Protection against contamination when installing pipes

Protect the piping to prevent moisture, dirt, dust, etc. from entering the piping.

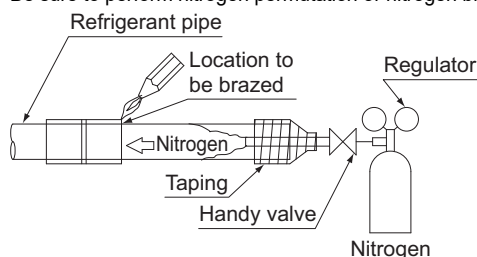
Place	Installation period	Protection method
Outdoor	More than a month	Pinch the pipe
	Less than a month	Pinch or tape the pipe
Indoor	Regardless of the period	

Note

Exercise special caution to prevent dirt or dust when passing piping through holes in walls and when passing pipe edges to the exterior.

6-3 Pipe connection

- Be sure to perform nitrogen permutation or nitrogen blow when brazing.



Brazing without performing nitrogen permutation or nitrogen blow into the piping will create large quantities of oxidized film on the inside of the pipes, adversely affecting valves and compressors in the refrigerating system and preventing normal operation.

- The pressure regulator for the nitrogen released when doing the brazing should be set to 0.02 MPa (about 0.2 kg/cm²: Enough to feel a slight breeze on your cheek).

Note

Do not use anti-oxidants when brazing the pipe joints. Residue can clog pipes and break equipment.

6-4 Drier installation

CAUTION

This product requires that a drier be installed on liquid piping on site. (Operating the unit without a drier installed may result in equipment failure.)

Select a drier from the following chart:

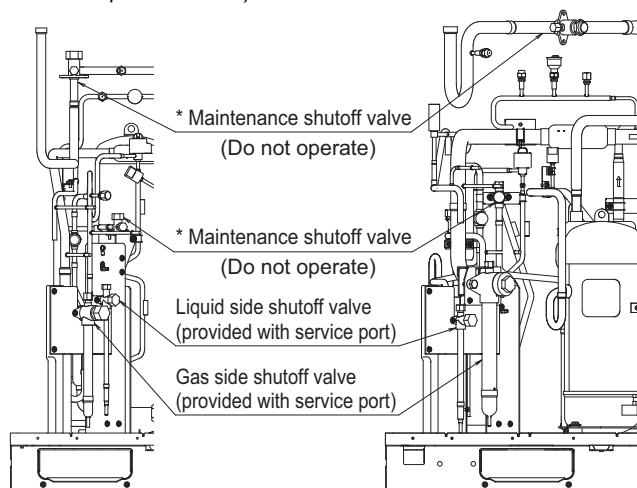
Model	Required dryer core (recommended type)
LREQ5 LREQ6	80 g (100% molecular sieve equivalent) (DML083/DML083S : Danfoss made)
LREQ8 LREQ10 LREQ12	160 g (100% molecular sieve equivalent) (DML163/DML163S : Danfoss made)
LREQ15 LREQ20	160 g (100% molecular sieve equivalent) (DML164/DML164S : Danfoss made)

- Install the drier in a horizontal orientation wherever possible.
- Install the drier as close to the outdoor unit as possible.
- Remove the drier cap immediately before brazing (to prevent absorption of airborne moisture).
- Follow instructions in the drier instruction manual concerning drier brazing.
- Repair any burning of drier paint that occurs during drier brazing. Contact the manufacturer for more information about paint for repair use.
- Flow direction is specified for some type of the dryer. Set the flow direction according to the operation manual of the dryer.

6-5 Connecting the refrigerant piping

CAUTION

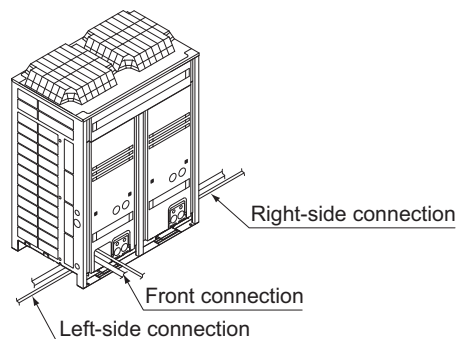
- In addition to gas and liquid shutoff valves, this unit has a maintenance shutoff valve (see diagram below).
- Do not operate the maintenance shutoff valve*. (The factory setting for the maintenance shutoff valve is "open." During operation, always leave this valve in the open position. Operating the unit with the valve in the closed position may cause the compressor to fail.)



1. Directions to bring out the pipes

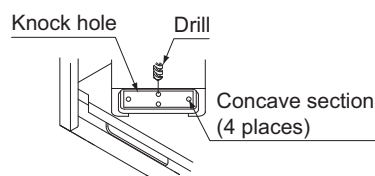
The local interunit piping can be connected either forward or to the sides (taken out through the bottom) as shown in the following figure.

When passing out through the bottom, use the knock hole in the bottom frame.



Precautions when knocking out knock holes

- Open knock hole in the base frame by drilling the 4 concave around it with a 6 mm bit.



- Be sure to avoid damaging the casing
- After knocking out the holes, we recommend you remove any burrs and paint them using the repair paint to prevent rusting.
- When passing electrical wiring through the knock holes, protect the wiring with a conduit or bushings, making sure not to damage the wiring.

2. Removing Pinch Piping

⚠ WARNING

Never remove the pinched piping by brazing.

Failure to observe the instructions in procedure below properly may result in property damage or personal injury, which may be serious depending on the circumstances.

⚠ CAUTION

Use the following procedure to remove the pinched piping:

- 1 Remove the valve lid and make sure that the stop valves are fully closed.



- 2 Connect a charge hose to service ports of all stop valves.
- 3 Recover gas and oil from the pinched piping by using a recovery unit.

⚠ CAUTION

Do not vent gases into the atmosphere.

- 4 When all gas and oil is recovered from the pinched piping, disconnect the charge hose and close the service ports.
- 5 In case the pinched piping lower part looks like detail **A** in the figure below, follow instructions as per procedure steps 7+8.

In case the pinched piping lower part looks like detail **B** in the figure below, follow instructions as per procedure steps 6+7+8.

- 6 Cut off the lower part of the smaller pinched piping with an appropriate tool (e.g. a pipe cutter, a pair of nippers, ...) so that a cross-section is open, allowing remaining oil to drip out in case the recovery was not complete.
Wait until all oil is dripped out.
- 7 Cut the pinched piping off with a pipe cutter just above the brazing point or just above the marking in case there is no brazing point.

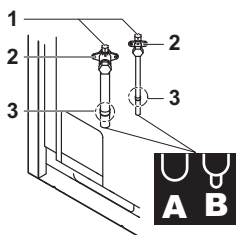


⚠ CAUTION

Never remove the pinched piping by brazing.



- 8 Wait until all oil is dripped out in case the recovery was not complete, and only then proceed with connection of the field piping.

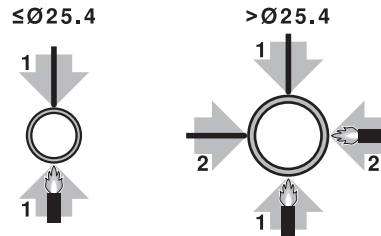


- 1 Service port
 - 2 Stop valve
 - 3 Point of pipe cutting just above brazing point or above marking
- A Pinched piping U
- B Pinched piping Y

⚠ CAUTION

Precautions when connecting field piping.

- Perform brazing at the gas stop valve before brazing at the liquid stop valve.
- Add brazing material as shown in the figure.



⚠ CAUTION

- Be sure to use the supplied accessory pipes when carrying out piping work in the field.
- Be sure that the field installed piping does not touch other pipes, the bottom panel or side panel. Especially for the bottom and side connection, be sure to protect the piping with suitable insulation, to prevent it from coming into contact with the casing.
- Make sure the field piping and connections are not subjected to stress.

Operation Method of Shutoff Valves

Follow the instructions below when operating each shutoff valve.

⚠ CAUTION

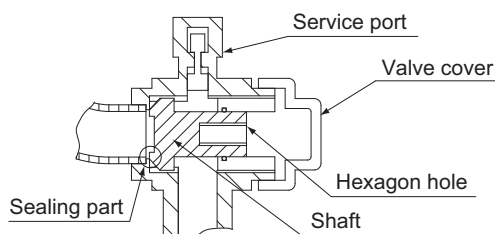
- Do not open the shutoff valve until the steps specified in "8-3 Checking of device and installation conditions" is completed.
Do not leave the shutoff valve opened without turning the power on, otherwise refrigerant may be condensed in the compressor and the insulation of the main power supply circuit may be degraded.
- Be sure to use an exclusive tool to handle the shutoff valve. The shutoff valve is not of back sheet type. Excessive force imposed may break the valve.
- Use a charge hose when using the service port.
- Make sure that there is no refrigerant gas leakage after the valve cover and cap are securely tightened.

Tightening torque

Check with the following table the sizes of shutoff valves incorporated by each model and the tightening torque values of the respective shutoff valves.

Shutoff valve sizes

	LREQ						
	5	6	8	10	12	15	20
Liquid side shutoff valve	Ø9.5					Ø12.7	
Gas side shutoff valve	Ø19.1		Ø25.4			Ø31.8	



Shutoff valve sizes	Tightening torque N•m (closes clockwise)			
	Shaft (valve body)		Valve cover	Service port
Ø9.5	5.4~6.5	Hexagon wrench: 4mm	13.5~16.5	11.5~13.9
Ø12.7	8.1~9.9		18.0~22.0	
Ø19.1	27.0~33.0	Hexagon wrench: 8 mm	22.5~27.5	
Ø25.4				
Ø31.8	26.5~29.4	Hexagon wrench: 10 mm	44.1~53.9	

Opening method

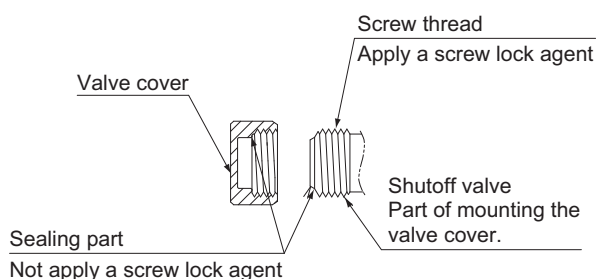
1. Remove the valve cover and turn the shaft anticlockwise with a hexagon wrench.
- (1) Turn the shaft until the shaft stops.
- (2) Tighten the valve cover securely. Refer to the above table for the tightening torque according to the size.

Closing method

1. Remove the valve cover and turn the shaft clockwise with a hexagon wrench.
- (3) Tighten the shaft until the shaft comes in contact with the sealing part of the valve.
- (4) Tighten the valve cover securely. Refer to the above table for the tightening torque according to the size.

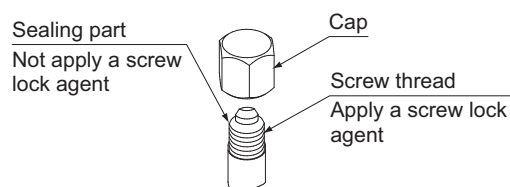
Handling precautions for valve cover

- Be careful not to damage the sealing part.
- At the time of mounting the valve cover, apply a screw lock agent to the screw thread.
- Do not apply a screw lock agent (for flare nut use) to the sealing part.
- Be sure to tighten the valve cover securely after operating the valve. Refer to "Operation Method of Shutoff Valves" on page 9 for the tightening torque of the valve.



Handling Precautions for Service Port

- Work on the service port with a charge hose provided with a pushing rod.
- At the time of mounting the cap, apply a screw lock agent to the screw thread.
- Do not apply a screw lock agent (for flare nut use) to the sealing part.
- Be sure to tighten the cap securely after the work. Refer to "Operation Method of Shutoff Valves" on page 9 for the tightening torque of the cap.



CAUTION

Apply a screw lock agent to the valve cover mount and the screw thread of the service port.

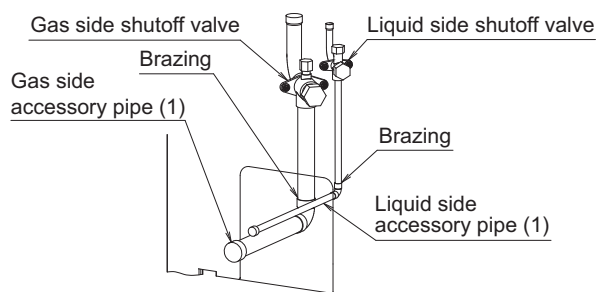
Otherwise, dew condensation water will intrude inside and freeze. Therefore, refrigerant gas leakage or a compressor malfunction may result from the cap deformation or damage.

3. Connecting refrigerant piping to outdoor units

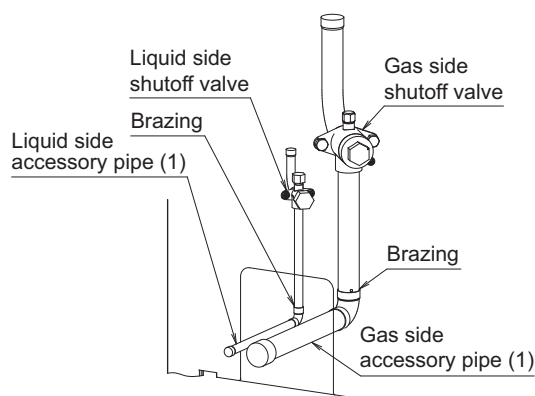
If connected to the front

Remove the shutoff valve cover to connect.

LREQ5~12



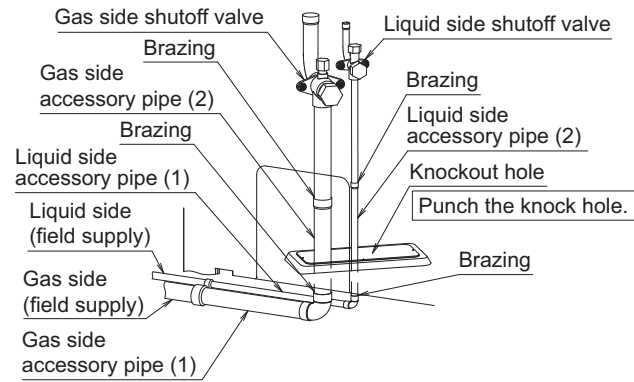
LREQ15, LREQ20



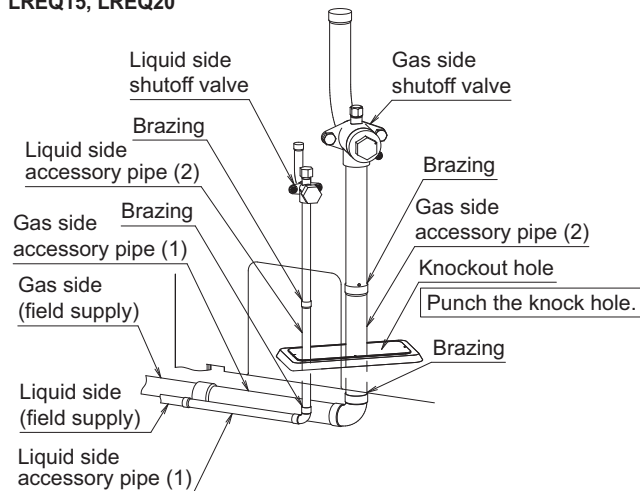
When connected at lateral side (bottom)

Remove the knock hole on the bottom frame and route the piping under the bottom frame.

LREQ5~12



LREQ15, LREQ20



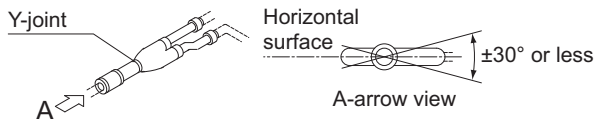
CAUTION

- Check that the on-site piping does not come in contact with other piping, the bottom frame, or side plate of the product.

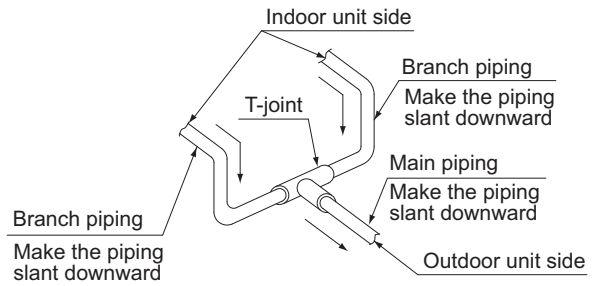
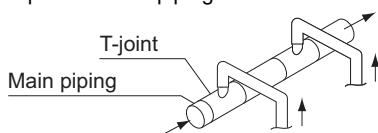
Precautions for Piping

Perform piping branching with the following conditions kept in mind.

- At the time of branching the liquid piping, use a T-joint or Y-joint and branch it horizontally. This will prevent an uneven flow of refrigerant.
- At the time of branching gas piping, use a T-joint and branch it so that the branched piping will be located above the main piping (see the illustration below). This will prevent the stay of refrigerant oil in the indoor unit not in operation.
- Use a Y-joint for the liquid refrigerant branch and have the piping branch horizontally.



- Use a T-joint for the gas refrigerant branch and connect from the top of the main piping.



- Make sure that the horizontal portion of the gas piping slants downward to the outdoor unit (see the illustration above).
- If the outdoor unit is located above, make a trap on the gas pipe at 5 m intervals from outdoor unit. This will ensure the smooth returning of oil in the piping slanting upward.

7. FIELD WIRING

To electric engineering contractors

- Be sure to install an earth leakage breaker. The product incorporates inverter equipment. In order to prevent the malfunctioning of the earth leakage breaker, make sure that the earth leakage breaker withstands harmonic interference.
- Do not operate the condensing unit until refrigerant piping work is completed, or otherwise the compressor will malfunction.
- Do not remove any electrical components such as thermistors or sensors when connecting power supply wires or transmission wires. The compressor may malfunction if the condensing unit is operated with such electrical components removed.

CAUTION

- All field wiring and components must be installed by a licensed electrician and must comply with relevant local and national regulations.
- Be sure to use a dedicated power circuit. Never use a power supply shared by another appliance.
- Never install a phase advancing capacitor. As this unit is equipped with an inverter, installing a phase advancing capacitor will not only deteriorate power factor improvement effect, but also may cause capacitor abnormal heating accident due to high-frequency waves.
- Only proceed with wiring work after blocking off all power.
- Always ground wires in accordance with relevant local and national regulations.
- This machine includes an inverter device. Connect earth and leave charge to eliminate the impact on other devices by reducing noise generated from the inverter device and to prevent leaked current from being charged in the outer hull of the product.
- Do not connect the ground wire to gas pipes, sewage pipes, lightning rods, or telephone ground wires.

Gas pipes: can explode or catch fire if there is a gas leak.

Sewage pipes: no grounding effect is possible if hard plastic piping is used.

Telephone ground wires and lightning rods: dangerous when struck by lightning due to abnormal rise in electrical potential in the grounding.

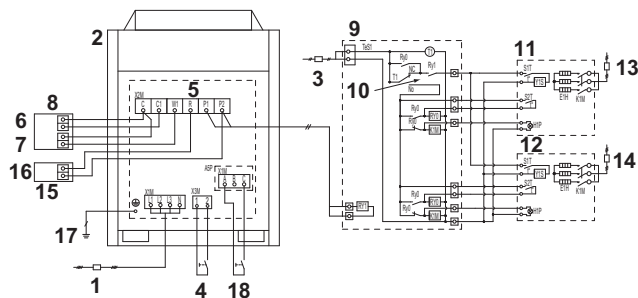
- Be sure to install an earth leakage circuit breaker. This unit uses an inverter, so install the earth leakage circuit breaker that be capable of handling high harmonics in order to prevent malfunctioning of the earth leakage circuit breaker itself.
- Earth leakage circuit breaker which are especially for protecting ground-faults should be used in conjunction with main switch or fuse for use with wiring.
- Disconnect the power supply for more than 1 minute, and measure the voltage at the terminals of main circuit capacitors or electrical components before servicing. The voltage must be less than 50 V DC before you can touch electrical components. For the location of the terminals, see the wiring diagram.
- Do not touch electrical components with wet hands.
- Do not leave the unit unattended when the service cover is removed.

- If not factory installed, a main switch or other means for disconnection, having a contact separation in all poles providing full disconnection under overvoltage category III condition, shall be installed in the fixed wiring.

- Electrical wiring must be done in accordance with the wiring diagrams and the description herein.
- Do not operate until refrigerant piping work is completed. (If operated before complete the piping work, the compressor may be broken down.)
- Never remove thermistor, sensor or etc. when connecting power wiring and transmission wiring. (If operated with thermistor, sensor or etc. removed, the compressor may be broken down.)
- This product have reversed phase protection detector that only works when the power is turned on. If there exists black out or the power goes on and off which the product is operating, attach a reversed phase protection circuit. Running the product in reversed phase may break the compressor and other parts.
- Attach the power wire securely. Introducing power with a missing N-phase or with a mistaken N-phase will break the unit.
- Never connect the power supply in reversed phase. The unit can not operate normally in reversed phase. If you connect in reversed phase, replace two of the three phases.
- Make sure the electrical unbalance ratio is no greater than 2%. If it is larger than this, the unit's lifespan will be reduced. If the ratio exceeds 4%, the unit will shut down and an malfunction code will be displayed on the indoor remote controller.
- Connect the wire securely using designated wire and fix it with attached clamp without applying external pressure on the terminal parts (terminal for power wiring, terminal for transmission wiring and earth terminal).
- Install a switch that allows you to switch OFF all poles from the main power supply.

7-1 Example of wiring entire system

T1	Timer
Ry0, Ry1	Relay
K1M	Electromagnetic contactor (Defrosting heater)
E1H	Defrosting heater
S1T	Thermostat for inner temperature adjustment
S2T	Defrost completion thermostat
Y1S	Solenoid valve
H1P	Defrost lamp



Note: 1. In case of used remote switch, use non-voltage contact for microcurrent (not more than 1mA, 12VDC).

Note: 2. Total capacity for caution, warning : 0.5A or less at AC 220 to 240V.
Capacity for operation output run output : 0.5A or less at AC 220 to 240V.

- 1 3 phase 50 Hz 380~415 V
Earth leakage circuit breaker (high-frequency type) (for earth fault, overload, and short-circuit protection)
- 2 Outdoor units
- 3 Earth leakage circuit breaker (for earth fault, overload, and short-circuit protection)
- 4 Remote switch (See Note 1.)
- 5 High-voltage AC 220~240 V (See Note 2.)
Warning output
Caution output
Operation output
Run output

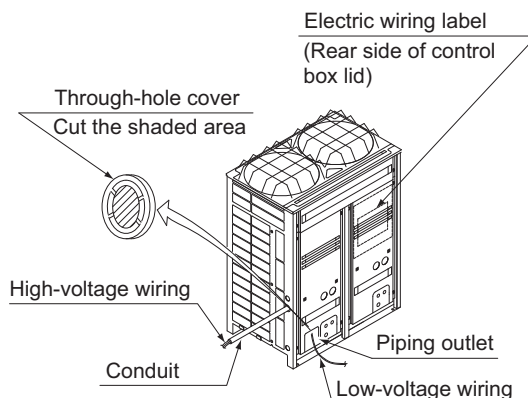
- 6 Caution input
- 7 Warning input
- 8 Alarm panel
- 9 Control board (field supply)
- 10 Timer
- 11 Indoor unit
- 12 Indoor unit
- 13 Earth leakage circuit breaker
- 14 Earth leakage circuit breaker
- 15 Panel
- 16 Run input
- 17 Earth
- 18 OFF: Normal mode
ON : Low noise mode

Note

- Use conduit for power supply wiring.
- Make sure the weak electric wiring (i.e. for the remote controller, between units, etc.) and the power wiring do not pass near each other, keeping them at least 50 mm apart. Proximity may cause electrical interference, malfunctions, and breakage.
- Be sure to connect the power wiring to the power wiring terminal block and secure it as described in "7-2 Procedure for incoming wiring" on page 12.
- Do not connect the power supply to the terminal block for the transmission wiring for warning, alarm, operation output, and remote operation switch. Otherwise the entire system will be damaged.
- Transmission wiring should be secured as described in "7-3 Procedure for power supply wiring" on page 13.
- Secure wiring with clamp such as insulation lock ties to avoid contact with piping.
- Shape the wires to prevent the structure such as the control box lid deforming. And close the cover firmly.

7-2 Procedure for incoming wiring

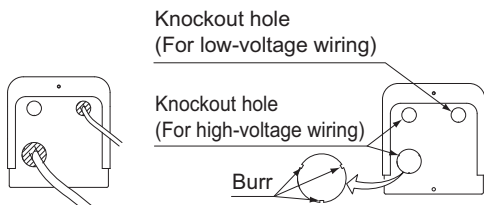
- Route high-voltage wiring (power supply wiring, earth wires, and warning/alarm/operation wiring) through wiring openings located on the side or front of the unit (knock holes) or on the bottom frame (knock holes).
- Route low-voltage wiring (for remote operating switches) through wiring openings (knock holes) located on the front of the unit or through wiring intakes.



Note

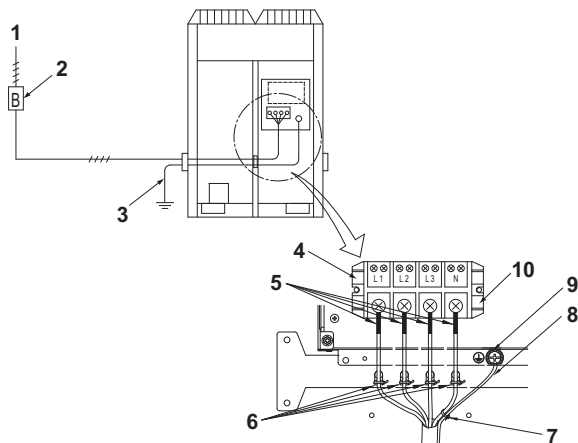
- Open the knock holes with a hammer or the like.
- After knocking out the holes, we recommend you remove any burrs and paint them using the repair paint to prevent rusting.
- When passing electrical wiring through the knock holes, protect the wiring with a conduit or bushings, making sure not to damage the wiring.

- If small animals might enter the unit, block off any gaps (hatching parts) with material (field supply).

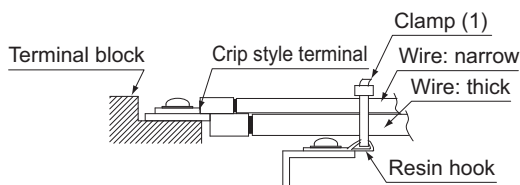


7-3 Procedure for power supply wiring

Procedure for Power Supply Wiring



- 1 Power supply (3 phase 50 Hz 380~415)
- 2 Overcurrent circuit breaker (earth leakage circuit breaker) all pole disconnection switch
- 3 Earth wire
- 4 Power supply terminal block
- 5 Mount insulation sleeves
- 6 Fix the power supply wiring for phases L1, L2, L3, and N, respectively, with the provided clamp (1) to the resin clamp.
- 7 Fix the earth wire to the power supply wire (phase N) with the provided clamp (1).
- 8 Earth wire
Perform wiring so that the earth wire will not come in contact with lead wires of the compressor. Otherwise, noise generated may have a bad influence on other equipment.
- 9 Earth terminal
- 10 • When two wires are connected to a single terminal, connect them so that the rear sides of the crimp contacts face each other.
• Also, make sure the thinner wire is on top, securing the two wires simultaneously to the resin hook using the accessory clamp (1).



Power circuit, safety device, and cable requirements

- A power circuit (see the following table) must be provided for connection of the unit. This circuit must be protected with the required safety devices, i.e. a main switch, a slow blow fuse on each phase and an earth leakage circuit breaker.
- When using residual current operated circuit breakers, be sure to use a high-speed type (1 second or less) 200 mA rated residual operating current.
- Use copper conductors only.
- Use insulated wire for the power cord.
- Select the power supply cable type and size in accordance with relevant local and national regulations.
- Specifications for local wiring are in compliance with IEC60245.
- Use wire type H05VV when protected pipes are used.
- Use wire type H07RN-F when protected pipes are not used.

	Phase and frequency	Voltage	Minimum circuit amp.	Recommended fuses
LREQ5	3~ 50Hz	380-415V	12.8A	15A
LREQ6	3~ 50Hz	380-415V	13.7A	15A
LREQ8	3~ 50Hz	380-415V	19.3A	25A
LREQ10	3~ 50Hz	380-415V	22.0A	25A
LREQ12	3~ 50Hz	380-415V	24.0A	25A
LREQ15	3~ 50Hz	380-415V	31.4A	40A
LREQ20	3~ 50Hz	380-415V	35.0A	40A

Point for attention regarding quality of the public electric power supply

This equipment complies with respectively:

- EN/IEC61000-3-11⁽¹⁾ provided that the system impedance Z_{sys} is less than or equal to Z_{max} and
- EN/IEC61000-3-12⁽²⁾ provided that the short-circuit power S_{sc} is greater than or equal to the minimum S_{sc} value

at the interface point between the user's supply and the public system. It is the responsibility of the installer or user of the equipment to ensure, by consultation with the distribution network operator if necessary, that the equipment is connected only to a supply with respectively:

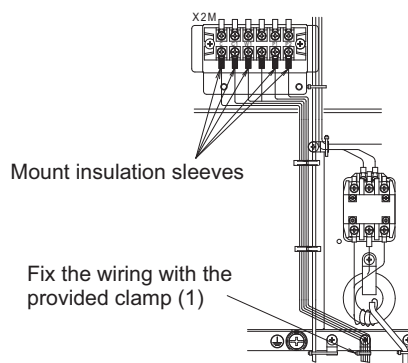
- Z_{sys} less than or equal to Z_{max} and
- S_{sc} greater than or equal to the minimum S_{sc} value.

	Z_{max} (Ω)	minimum S_{sc} value
LREQ5	—	—
LREQ6	—	—
LREQ8	0.27	655 kVA
LREQ10	0.27	899 kVA
LREQ12	0.27	1097 kVA
LREQ15	0.24	761 kVA
LREQ20	0.24	945 kVA

- (1) European/International Technical Standard setting the limits for voltage changes, voltage fluctuations and flicker in public low-voltage supply systems for equipment with rated current ≤ 75 A
- (2) European/International Technical Standard setting the limits for harmonic currents produced by equipment connected to public low-voltage systems with input current >16 A and ≤ 75 A per phase.

Warning, alarm, and operation output wiring connections

- Connect warning, alarm, and operation output wiring to the X2M terminal block and clamp as indicated by the following diagram:



X2M wire specifications

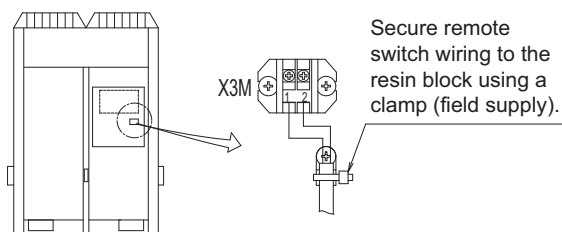
Electric wire thickness	0.75~1.25 mm ²
Max. wiring length	130 m

Note: Be sure to insulate the connecting equipment.

- Refer to the "7-1 Example of wiring entire system" on page 12 by all means when connecting the operation output wiring. A compressor failure may result if the operating output wiring is not connected.

Remote switch wiring connections

- When installing a remote switch, clamp as indicated by the following diagram:

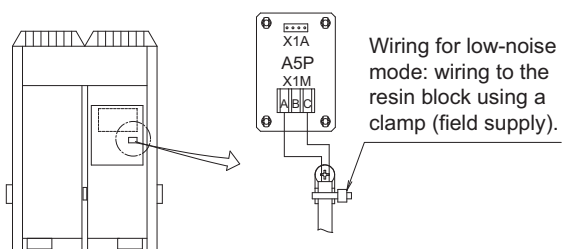


X3M wire specifications

Electric wire thickness	0.75~1.25 mm ²
Max. wiring length	130 m

Wiring connection for low-noise mode

- Wiring connection for low-noise mode: clamp as indicated by the following diagram:



X1M (A5P) wire specifications

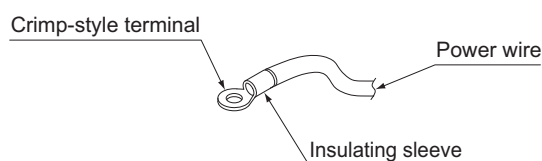
Electric wire thickness	0.75~1.25 mm ²
Max. wiring length	130 m

CAUTION

- For Remote switch, use non-voltage contact for microcurrent (not more than 1 mA, 12 V DC)
- If the remote switch will be used to start and stop the unit, set the operating switch to "REMOTE".

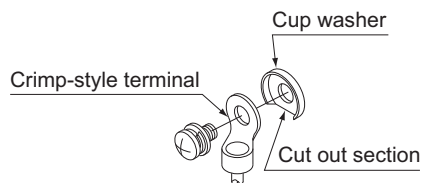
Precautions for terminal connections

- Be sure to use ring-type crimp-style terminals provided with insulation sleeves.
- Use specified electric wires for the wiring and secure the wiring so that external force will not be imposed on the terminal block.



- Use an appropriate screwdriver to tighten the terminal screws. Small-sized screwdriver will damage the screw heads and cannot tighten the screws properly.
- Do not tighten the terminal screws in excess, otherwise the screws may be damaged.
- Refer to the following table for the tightening torque values of the terminal screws.
- Take out the earth wire from the notch of the cup washer and lay the wire carefully so that other wires will not be caught by the washer. Otherwise, the earth wire may not contact sufficiently and the earthing effect of the wire may be lost.

- Do not finish strand wire with solder.

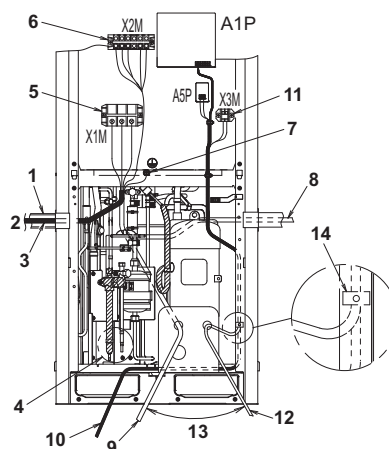


Screw size	Tightening torque (N•m)
M8 (Power supply terminal block)	5.5 - 7.3
M8 (Earth)	
M4 (X2M)	2.39 - 2.91
M3.5 (X3M)	0.79 - 0.97

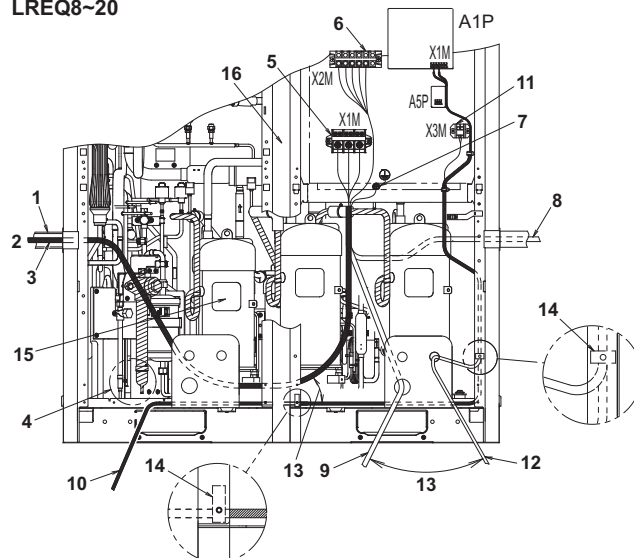
7-4 Procedure for wiring inside units

- Referring to the following figure, secure and wire the power and transmission wiring using the accessory clamp (1), (2).
- Lay the ground wire so that it will not come in contact with the lead wires of the compressor. Other equipment will be adversely affected if the ground wire comes in contact with the lead wires of the compressor.
- Make sure all wiring do not contact to the pipes (hatching parts in the figure).
- The transmission wiring must be at least 50 mm away from the power wiring.
- After wiring work is completed, check to make sure there are no loose connections among the electrical parts in the control box.

LREQ5, LREQ6



LREQ8~20



- 1 Conduit
- 2 Perform wiring carefully so that the wiring will not come in contact with the port and  part.
- 3 When routing high-voltage wiring (power supply wiring, earth wires, and warning/caution/run input, operation output wiring) from the left side
- 4 Connecting local piping
- 5 Power supply terminal block (X1M)
- 6 X2M terminal block for warning, caution, run input, and operation output
- 7 Earth terminal block
- 8 When routing high-voltage wiring (power supply wiring, earth wires, and warning/caution/run input, operation output wiring) from the right side
- 9 When routing high-voltage wiring (power supply wiring, earth wires, and warning/caution/run input, operation output wiring) from the front
- 10 When routing remote operating switch wiring from the front.
- 11 Remote switch terminal block (X3M)
- 12 When routing remote switch wiring through a wiring opening
- 13 Separate by at least 50 mm
- 14 Fixed to the rear side of the support with the provided clamp (2)
- 15 Perform wiring carefully so that the sound insulation of the compressor will not come off
- 16 Support

CAUTION

On completion of electrical work, check that there are no disconnected connectors or terminals of any electrical parts in the control box.

8. INSPECTION AND PIPE INSULATION



For piping work contractor, electrical work contractor, and trial run workers

- Never open the shutoff valve until the insulation measurement of the main power supply circuit is finished. The measured insulation value will become lower if the measurement is made with the shutoff valve opened.
- On completion of inspection and refrigerant charging, open the shutoff valve. The compressor will malfunction if the condensing unit is operated with the shutoff valve closed.

8-1 Airtight test/vacuum drying



Refrigerant is enclosed in the unit.

Be sure to keep both liquid and gas shutoff valves closed at the time of an airtight test or vacuum drying of the local piping.

[For piping work contractor]

On completion of piping work, make the following inspection precisely.

- To ensure that the condensing unit withstand pressure properly and prevent the penetration of foreign substances, be sure to use R410A-dedicated tools.

Gauge manifold Charge hose	To ensure that the condensing unit withstand pressure properly and prevent the penetration of foreign substances (water, dirt, and dust), use an R410A-dedicated gage manifold and charge hose. R410A-dedicated tools and R407C-dedicated tools are different in screw specification.
Vacuum pump	- Pay the utmost attention so that the pump oil will not flow backward into the system while the pump is not in operation. - Use a vacuum pump that can vacuum down to -100.7 kPa (5 Torr or -755 mmHg).
Gas for airtight test use	Nitrogen gas

Airtight

Pressurize the high-pressure section of the system (liquid piping) to 3.8 MPa (38 bar) and the low-pressure section of the system (gas piping) to the design pressure (*1) of the indoor unit (field supply) from the service port (*2) (do not exceed the design pressure). The system is considered to have passed if there is no decrease in the pressure over a period of 24 hours.

If there is a decrease in the pressure, check for and repair leaks.

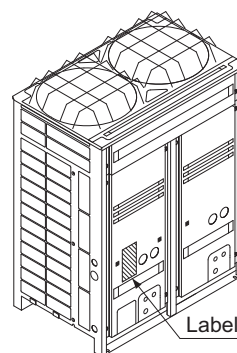
Vacuum drying

Operate the vacuum pump for more than three hours from the service port of both the liquid pipe and the gas pipe (*2) to evacuate to -100.7 kPa or less. After that, (1) pressurize the outdoor unit with nitrogen gas to 0.2 MPa or more, and after leaving the outdoor unit for 10 minutes, (2) operate the vacuum pump for more than one hour to evacuate to -100.7 kPa or less. (Repeat the steps (1) and (2) three or more times.)

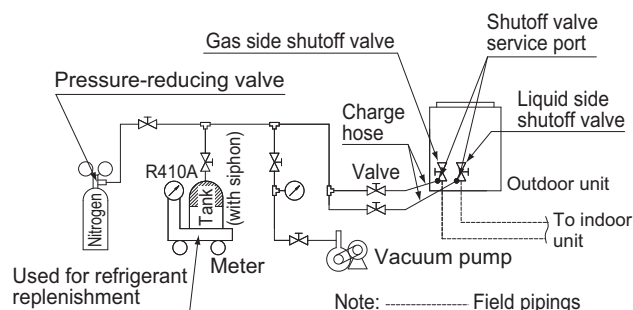
After the operations are completed, leave the outdoor unit for one hour and then check that the reading on the vacuum gauge is not rising. (If the reading on the vacuum gauge is rising, water may be remaining in the system or leakage may be occurring. In that case, perform necessary repair and then conduct the air-tightness test again.)

*1 The design pressure of the indoor unit (locally procured) needs to be 2.5 MPa or more. Contact the manufacturer in advance for information on the design pressure.

*2 Refer to the instruction label on the front panel of the outdoor unit (below) for the position of the service port.



Position of instruction label



Connection procedure for gauge manifold and vacuum pump

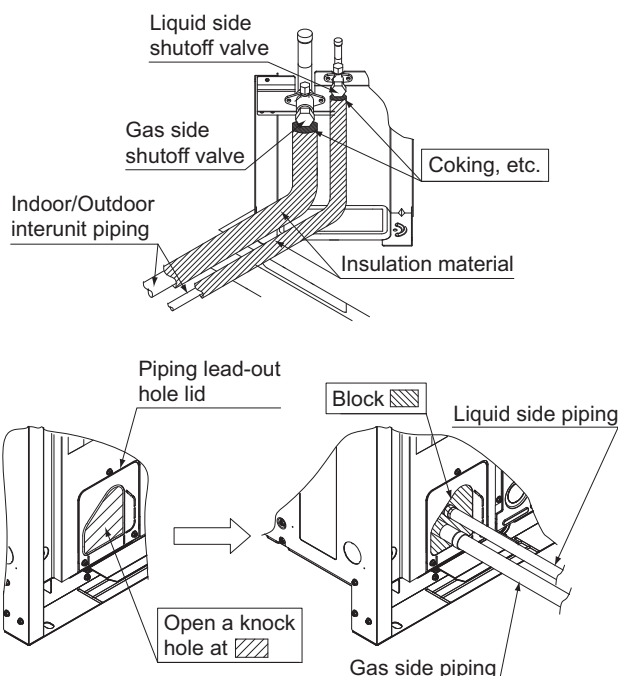
CAUTION

- Conduct an airtight test and vacuum drying precisely through the service ports of both liquid and gas shutoff valves.
- Use charge hoses (provided with a pushing rod each) when using the service ports.

8-2 Thermal insulation work

- Be sure to perform thermal insulation of the piping after the airtight test and vacuum drying.
- Be sure to perform the thermal insulation of the liquid and gas pipes in the connecting piping. Otherwise, water leakage may result.
- Be sure to insulate liquid and gas connection piping. Failure to do so may result in water leakage. Consult the following chart as a general guide when selecting the insulation thickness.

- Liquid pipe arrival minimum temperature 0°C
Gas pipe arrival minimum temperature -45°C
- Reinforce the insulation material for the refrigerant piping according to the environment of thermal installation. Otherwise, the surface of the insulation material may result in dew condensation.
- If the dew condensation water on the shutoff valves is likely to flow to the indoor unit side through the clearance between the insulation material and piping because the outdoor unit is installed above the indoor unit or for some other reasons, perform appropriate treatment such as the caulking of the joints (see the illustrations below).
- Attach the cover of the piping outlet with a knock hole opened. If there is a feature of small animals intruding through the piping outlet, cover the piping outlet with a blocking material (field supply) on completion of the steps of "10. REFRIGERANT REPLENISHMENT" on page 16 (see the illustrations below). Use the piping outlet for jobs required during the steps of "10. REFRIGERANT REPLENISHMENT" on page 16 (e.g., a job of taking in the charge hose).



Note

- After knocking out the holes, we recommend you remove burrs in the knock holes and paint the edges and areas around the edges using the repair paint.

8-3 Checking of device and installation conditions

Be sure to check the followings.

For those doing electrical work

See "7-2 Procedure for incoming wiring" on page 12.

1. Make sure there is no faulty power wiring or loosening of a nut.
See "7-3 Procedure for power supply wiring" on page 13.
2. Has the insulation of the main power circuit deteriorated?
Measure the insulation and check the insulation is above regular value in accordance with relevant local and national regulations.

For those doing pipe work

1. Make sure piping size is correct.
See "6-1 Selection of piping material" on page 7.
2. Make sure insulation work is done.
See "8-2 Thermal insulation work" on page 15.
3. Make sure there is no faulty refrigerant piping.
See "6. REFRIGERANT PIPING" on page 6.

9. CHECKS AFTER WORK COMPLETION

- Make sure the following works are complete in accordance with the installation manual.
 - ⊗ Piping work
 - ⊗ Wiring work
 - ⊗ Air tight test/vacuum drying
 - ⊗ Installation work for indoor unit

10. REFRIGERANT REPLENISHMENT



For refrigerant filling contractor

Use R410A for refrigerant replenishment.

The R410A refrigerant cylinder is painted with a pink belt.



Warning



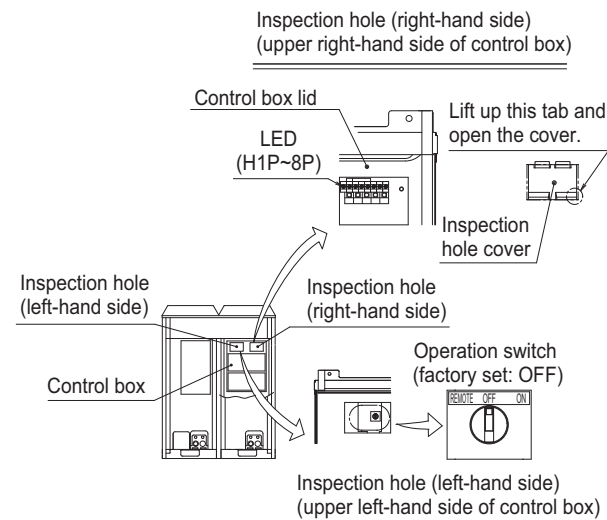
Electric Shock Warning

- Securely close the control box lid before turning power on.
- Before turning power on, check through the inspection hole (on the left-hand side) of the control box lid that the operation switch is set to OFF.

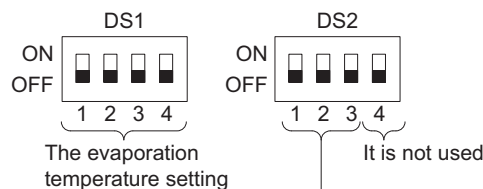
If the operation switch is set to ON, the fan may rotate.

- Check the LED indicators on the PCB (A1P) of the outdoor unit through the inspection hole (on the right-hand side) of the control box lid after the outdoor unit is turned on (see the illustration). (The compressor will not operate for approximately 2 minutes after the outdoor unit is turned on.

H2P blinks for the first five seconds when the power supply is turned on. If the equipment is normal, H2P will be turned off in five seconds. H2P lights for abnormality.)



Setting by dip switches



Setting of spare parts

(For details please refer to the INSTRUCTION FOR REPAIR WITH SPARE PARTS)

[The evaporation temperature setting]

Refer to the following table for the evaporation temperature.

- The evaporation temperature is set up by dip switches (DS1).

The evaporation temperature setting			ON OFF	the position of switches
DS1	DS1	DS1		
10°C (Factory Set)	0°C	40°C		
20°C	5°C	35°C		
15°C	10°C	30°C		
5°C	45°C	25°C		
1 2 3 4	1 2 3 4	1 2 3 4		

WARNING

- Use protective gear (e.g., protective gloves and glasses) at the time of refrigerant filling.
- Pay attention to the rotation of the fan whenever the front panel is opened while working.
The fan can rotate continuously for a while after the outdoor unit stops operating.
- Make sure there is no oxygen in the system. Refrigerant may only be charged after performing the leak test and the vacuum drying.

[Refrigerant replenishment work]

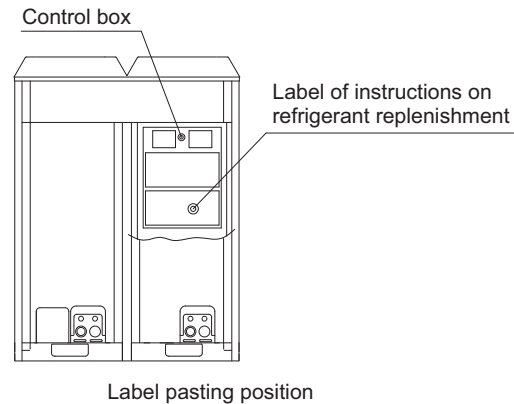
CAUTION

- Refer to the "Operation Method of Shutoff Valves" on page 9 for the control method of the shutoff valves.
 - Never replenish liquid refrigerant directly from a gas line. Liquid compression may cause the compressor to fail.
 - When the refrigerant charging procedure is done or when pausing, close the valve of the refrigerant tank immediately. If the valve is not closed immediately, remaining pressure might charge additional refrigerant. **Possible consequence:** Incorrect refrigerant amount.
- The refrigerant must be noted for this product. Calculate the amount of refrigerant replenishment according to the label for the calculation of the amount of refrigerant replenishment or according to the "12. ADDITIONAL REFRIGERANT AMOUNT" on page 19.
In case re-charge is required, refer to the nameplate of the unit. It states the type of refrigerant and necessary amount.
 - Take the following procedure for refrigerant replenishment.
Refer to "8-1 Airtight test/vacuum drying" on page 15 for the connection of the refrigerant cylinder.
 - Turn on the indoor unit and control panel.
Do not turn on the outdoor unit.
 - Replenish refrigerant from the service port of the shutoff valve on the liquid side.
 - If the calculated amount of refrigerant cannot be filled, take the following steps to operate the system and continue refrigerant replenishment.
 - Open the gas shutoff valve all the way and adjust the opening of the liquid shutoff valve (*1).
 - [Warning/electric shock warning]**
Turn on the outdoor unit.
 - [Warning/electric shock warning]**
Turn on the operation switch of the outdoor unit and replenish refrigerant while the outdoor unit is in operation.

- Turn off the operation switch of the outdoor unit after the specified amount of refrigerant is replenished. (To prevent liquid compression)

e.[Caution]

Fully open the shutoff valves on the gas and liquid sides promptly. Otherwise, a piping explosion may result from liquid sealing.



*1The cylinder's internal pressure will drop when there is little refrigerant remaining in the cylinder, making it impossible to charge the unit, even if the liquid shutoff valve opening is adjusted. In this situation, replace the cylinder with one that has more refrigerant remaining.

Additionally, if the piping length is long, replenishing while the liquid shutoff valve is fully closed may lead to activation of the protection system, causing the unit to stop operation.

- After the work is completed, apply a screw lock agent (for flare nuts) to the screws of the shutoff valves and service ports. Refer to the "Handling precautions for valve cover" on page 10 and "Handling Precautions for Service Port" on page 10 in "6-5 Connecting the refrigerant piping" on page 8 for the handling of the valve covers and service ports.
- After the refrigerant replenishment is completed, fill out the item "total amount of refrigerant replenishment" on the label of instructions on refrigerant replenishment of the outdoor unit with the actual amount of refrigerant replenishment.
Refer to the illustration of the label pasting position for instructions on refrigerant replenishment (see the illustration on the above).

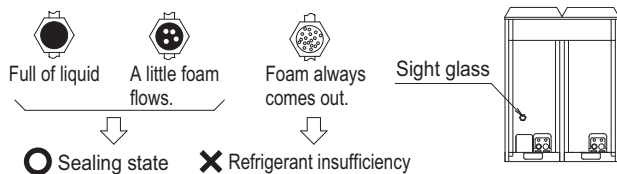
[Precautions for refrigerant cylinder]

At the time of refrigerant filling, check whether the siphon tube is provided. Then locate the cylinder so that the refrigerant will be filled in the state of liquid (see table below).

R410A is a mixed refrigerant, the composition of which may change and the normal operation of the system may not be possible if the refrigerant is filled in the state of gas.

Cylinder provided with siphon tube.	
	Stand the cylinder upright and fill the refrigerant. (There is a siphon tube inside, which makes it possible to replenish the refrigerant in the state of liquid without setting the cylinder upside down.)
Other cylinders	
	Stand the cylinder upside down and fill the refrigerant. (Pay attention so that the cylinder will not topple down.)

[Check through sight glass]



○ Sealing state ✕ Refrigerant insufficiency

CAUTION

- Fully open the shutoff valves on the liquid and gas sides after the refrigerant replenishment is finished. The compressor will malfunction if the system is operated with the shutoff valves closed.
- Apply a screw lock agent to the screws of the valve cover mounting parts and service ports.** (Otherwise, dew condensation water will intrude and freeze inside and cause cap deformation or damage, which may result in refrigerant gas leakage or compressor malfunctions.)
- Always recover the refrigerant. Do not release them directly into the environment. Use a vacuum pump to evacuate the installation.

11. TEST RUN

For test run operators

Do not operate the outdoor unit alone on a trial basis.

Test run procedure

Use the following procedure to perform a test run after installation work is complete for the entire system:

- Fully open the shutoff valves on the gas and liquid sides of the outdoor unit.
- Set the operation switch of the outdoor unit to ON.
Note: Before turning power on, check that the piping cover and control box lid of the outdoor unit are closed.
- Check the sealing condition of the outdoor unit through the sight glass. Make sure that the amount of refrigerant is sufficient.
- Make sure that cold air blows from the indoor unit.
Check that the internal temperature is dropping.
(Check that the temperature will drop and reach the set temperature in the indoor unit. It will take approximately 40 minutes for the interior temperature of the indoor unit to reach -20°C.)
Check that the indoor unit (for refrigeration or freezing) goes into defrosting operation.
- Turn power off with the operation switch of the outdoor unit set to OFF. (Stopping unit operation by disconnecting the power supply directly is dangerous. When the unit is stopped in this manner, its power outage compensation function may cause it to resume operation as soon as the power supply is reactivated. Additionally, stopping the unit in this manner may cause the compressor to fail).

Error diagnosis

- If the system cannot operate normal at the time of test run (i.e., the H2P indicator is lit), check with malfunction code on the system with the pushbutton switches on the PCB of the outdoor unit, and take the following steps.
- Make checks on other malfunction codes and pushbutton switches by referring to the provided Technical Guide.

Display

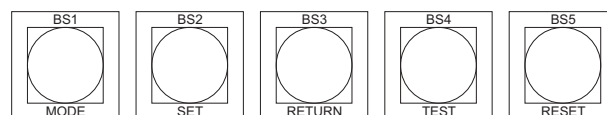
The contents of a LED (H2P) display are as follows.

LED (H2P) display	OFF.....Normal Blinking.....to be prepared	ON.....error
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How to check malfunction code

By operating the pushbutton switches on the PCB, malfunction code items can be displayed on the condensing unit.

- Make sure that the LED "H1P" is off.
(If the LED is on, press the MODE button (BS1) once.)
- Press the MODE button (BS1) once. The LED (H1P) starts blinking.
- Press the RETURN button (BS3) to display the first digit of the malfunction code on the LED.
- Press the SET button (BS2) to display the second digit of the malfunction code on the LED.
- Press the MODE button (BS1) to restore the LED to the original state.



LED indication		Installation failure	Remedy
(BS3 switch pressed once)	(BS2 switch pressed once)		
H1P H2P H3P H4P H5P H6P H7P	H1P H2P H3P H4P H5P H6P H7P		
● ● ● ● ● ● ●	● ● ● ● ● ● ●	The shutoff valves were left closed.	Fully open the shutoff valves.
● ● ● ● ● ● ●	● ● ● ● ● ● ●	Excessive refrigerant charging	Adjust the amount of the refrigerant to an appropriate level.
● ● ● ● ● ● ●	● ● ● ● ● ● ●	The shutoff valves were left closed.	Fully open the shutoff valves.
● ● ● ● ● ● ●	● ● ● ● ● ● ●	Refrigerant shortage	Charge additional refrigerant.
● ● ● ● ● ● ●	● ● ● ● ● ● ●	Over frost formation. Miss selection of expansion valves. (wet alarm)	Check the indoor unit.
● ● ● ● ● ● ●	● ● ● ● ● ● ●	The passage of air is blocked.	Remove obstacles that block the passage of air.
● ● ● ● ● ● ●	● ● ● ● ● ● ●	Reverse-phase wiring of power supply	Exchange two wires out of the three power supply wires.
● ● ● ● ● ● ●	● ● ● ● ● ● ●	Voltage drop	Make a voltage drop check.
● ● ● ● ● ● ●	● ● ● ● ● ● ●	Electric leak	See *1 below.
● ● ● ● ● ● ●	● ● ● ● ● ● ●	Open L2 phase	Verify power supply wiring connections.
Normal monitor (HAP) LED off.		Open L1 phase	

● OFF ✕ ON ✨ BLINK

*1

Set the operation switch to the OFF position to reset the power supply and then return the operation switch to the ON position to restart the unit. If the problem persists, refer to the Service Manual.

CAUTION

- Do not disconnect the power supply for 1 minute after setting the operation switch to ON.
Electric leak detection is performed for several seconds after the operation switch is set to ON and each compressor starts operating, so disconnecting the power supply during that time will result in a false detection.

For dealers

- After the test run is finished, check that the piping cover and front panel are mounted.
- At the time of delivery to the customer, use the operation manual and fully explain the handling of the equipment.
- For precautions at the time of delivery, refer to the provided installation manual for each unit as well.
- Note that during the first running period of the unit, required power input may be higher. This phenomenon originates from the compressor that requires a 50 hour run elapse before reaching smooth operation and stable power consumption. Reason is that the scroll is made out of iron and that it takes some time to smooth the surfaces that make contact.

12. ADDITIONAL REFRIGERANT AMOUNT

12-1 Calculation method

This product must fill the refrigerant in the field.

Calculate the amount of refrigerant replenishment according to the following points and note the amount of the refrigerant in the list shown below.

- The amount of the refrigerant for the liquid piping is calculated from the liquid piping size and the piping length of the system.
(Calculate the refrigerant additional charging quantity by rounding off to the number in 0.1 kg.)
- Total each piping size amount of the refrigerant.---(1)
- The amount of the refrigerant for the indoor unit of the refrigeration is calculated from the capacity of the connected showcase as below table 1).
 - Total all the refrigeration showcase capacities.
 - Total all the freezer showcase capacities.
 - Total all the blower coil capacities.
 - Calculate the amount of the refrigerant by the total capacities and the table 1 below of each indoor unit.
- Total each indoor unit amount of the refrigerant.---(2)
- Add a constant amount depending on outdoor unit capacity class (see table 2).---(3)
- Total the amount of the refrigerant of table below(1), (2), and (3).---(4)
- Check sealing conditions through the sight glass at the time of test run(see Figure 1).
If the sight glass has not been sealed yet (due to the shortage of refrigerant), charge additional refrigerant.---(5)

Note

The upper limit quantity of refrigerant adjustment at the time of the test run assumes 0.1 times of the quantity of refrigerant calculated based on piping length(1), on indoor unit capacity(2) and outdoor unit capacity class (3).

$$(5) \leq (4) \times 0.1$$

- Calculate the total additional charging amount.---(6)
- Determine the factory charge (see table 3).---(7)
- Calculate the amount of all refrigerant in this system.---(8)

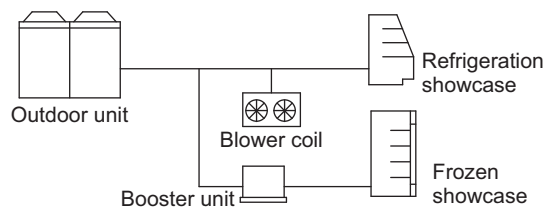


Table 1: Capacity and amount of refrigerant of the indoor unit (Showcase and Blower coil)

Total capacity of showcase or blower coil (*Note.)	Amount of refrigerant (kg)		
	Showcase		Blower coil
	Refrigeration	Frozen	
Less than 5kW	1.1	1.4	0.6
From 5kW to less than 10kW	2.3	3.2	1.2
From 10kW to less than 15kW	3.4	5.2	1.7
From 15kW to less than 20kW	4.6	—	2.3
From 20kW to less than 25kW	5.9	—	3.0
From 25kW to less than 30kW	7.0	—	3.5
From 30kW to less than 35kW	8.2	—	4.1
From 35kW to less than 40kW	9.7	—	4.9
40kW or more	11.0	—	5.5

Note

- Case of showcase, the condition of capacity (evaporating temperature).
Refrigeration:-10°C
Frozen:-35°C
- Case of blower coil, the condition of capacity is 10°C (Td).

Table 2: Additional refrigerant amount based on outdoor unit capacity class

Outdoor unit	Amount of refrigerant (kg)
LREQ(5/6)B7Y1	1.0
LREQ(8/10/12)B7Y1	3.0
LREQ(15/20)B7Y1	3.5

Figure 1

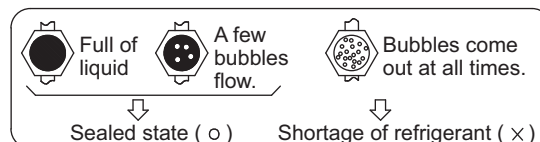
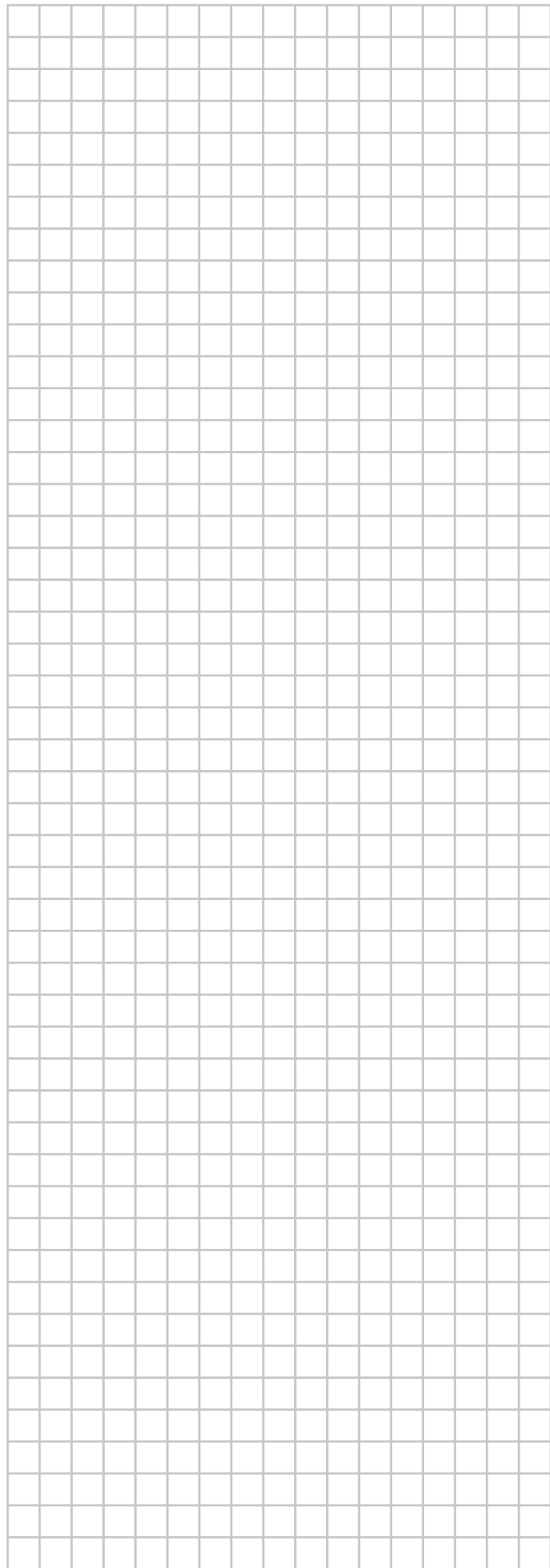
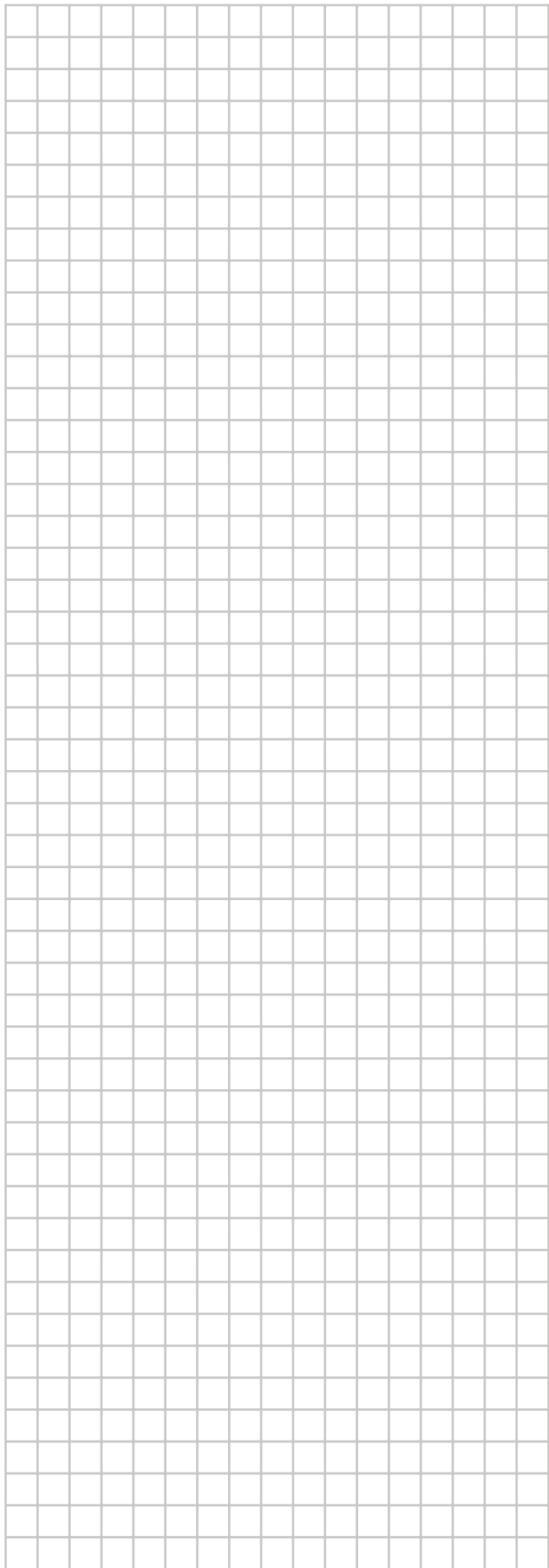


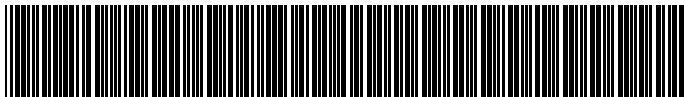
Table 3: Factory charge

Outdoor unit	Factory charge (kg)
LREQ(5/6)B7Y1	5.2
LREQ(8/10/12)B7Y1	7.9
LREQ(15/20)B7Y1	11.5

Inch piping		Metric piping		Pipe length (m)	Total amount of refrigerant (kg)
Liquid pipe size	Refrigerant amount	Liquid pipe size	Refrigerant amount		
Ø6.4	0.02	Ø6.0	0.018		(a)
Ø9.5	0.06	Ø10.0	0.066		(b)
Ø12.7	0.12	Ø12.0	0.097		(c)
Ø15.9	0.19	Ø16.0	0.19		(d)
(1) Subtotal [(a)+(b)+(c)+(d)]					
Indoor unit				Total capacity (kW)	Amount of refrigerant (Refer to table 1)
Refrigeration showcase					(A)
Frozen showcase					(B)
Blower coil					(C)
(2) Subtotal [(A)+(B)+(C)]					
(3) Constant amount based on outdoor unit capacity class (table 2)					
(4) Total of the amount of refrigerant replenishment [(1)+(2)+(3)]					
(5) Amount of refrigerant replenishment at the time of test run.					
(6) Total additional charging amount [(4)+(5)]					
(7) Factory charge (table 3)					
(8) Total amount of refrigerant [(6)+(7)]					



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