

DAIKIN



INSTALLATION MANUAL

VRV System air conditioner

Installation manual
VSV System air conditioner

English

RSXYP5KJY1
RSXYP8KJY1
RSXYP10KJY1

CE - DECLARATION OF CONFORMITY
CE - KONFORMITÄTSEKTLÄRUNG
CE - DECLARATION DE CONFORMITE

CE - CONFORMITEITSVERKLARING
CE - DECLARACION DE CONFORMIDAD
CE - DICHIARAZIONE DI CONFORMITA'

CE - ΔΗΛΩΣΗ ΣΥΜΜΟΡΦΩΣΗΣ
CE - DECLARAÇÃO DE CONFORMIDADE
CE - OPFYLDELSESERKLÆRING

CE - FÖRSÄKRAN OM ÖVERENSTÄMMELSE
CE - ERKLÆRING OM SAMSVAR
CE - ILMOITUS YHDENMUKAISUUDESTA

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declares under its sole responsibility that the air conditioning models to which this declaration relates:
erklärt auf seine alleinige Verantwortung daß die Modelle der Klimageräte für die diese Erklärung bestimmt ist:
déclare sous sa seule responsabilité que les appareils d'air conditionné visés par la présente déclaration:

verklaart hierbij op eigen exclusieve verantwoordelijkheid dat de airconditioning units waarop deze verklaring betrekking heeft:
declara baja su única responsabilidad que los modelos de aire acondicionado a los cuales hace referencia la declaración:
dichiara sotto sua responsabilità che i condizionatori modello a cui è riferita questa dichiarazione:

δηλώνει με αποκλειστική της ευθύνη ότι τα μοντέλα των κλιματιστικών συσκευών στα οποία αναφέρεται η παρούσα δήλωση:
declara sob sua exclusiva responsabilidade que os modelos de ar condicionado a que esta declaração se refere:
erklærer under eneansvar, at klimaenlægsmodellene, som denne deklaration vedrører:

deklarerer i egenskap av huvudansvarig, att luftkonditioneringsmodellerna som berörs av denna deklaration innebär att:
erklærer et fullstendig ansvar for at de luftkondisjoneringsmodeller som berøres av denne deklarasjon innebærer at:
ilmoittaa yksinomaan omalla vastuullaan, että tämän ilmoituksen tarkoitamat ilmastointilaitteiden mallit:

FXYCP20KV1, FXYCP25KV1, FXYCP32KV1, FXYCP40KV1, FXYCP50KV1, FXYCP63KV1, FXYCP80KV1, FXYCP125KV1
FXYSP20KV1, FXYSP25KV1, FXYSP32KV1, FXYSP40KV1, FXYSP50KV1, FXYSP63KV1, FXYSP80KV1, FXYSP100KV1, FXYSP125KV1
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FXYHP32KV1, FXYHP63KV1, FXYHP100KV1, FXYAP25KV1, FXYAP32KV1, FXYAP40KV1, FXYAP50KV1, FXYAP63KV1
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FXYLM20KJVE, FXYLM25KJVE, FXYLM32KJVE, FXYLM40KJVE, FXYLM50KJVE, FXYLM63KJVE

are in conformity with the following standard(s) or other normative document(s), provided that these are used in accordance with our instructions:
der/den folgenden Norm(en) oder einem anderen Normdokument oder -dokumenten entspricht/entsprechen, unter der Voraussetzung, daß sie gemäß unseren Anweisungen eingesetzt werden:
sont conformes à la/aux norme(s) ou autre(s) document(s) normatif(s), pour autant qu'ils soient utilisés conformément à nos instructions:

conform de volgende norm(en) of één of meer andere bindende documenten zijn, op voorwaarde dat ze worden gebruikt overeenkomstig onze instructies:
están en conformidad con la(s) siguiente(s) norma(s) u otro(s) documento(s) normativo(s), siempre que sean utilizados de acuerdo con nuestras instrucciones:
sono conformi al(i) seguente(i) standard(s) o altro(i) documento(i) a carattere normativo, a patto che vengano usati in conformità alle nostre istruzioni:

είναι σύμφωνα με το(α) ακόλουθο(α) πρότυπο(α) ή άλλο έγγραφο(α) κανονισμών, υπό την προϋπόθεση ότι χρησιμοποιούνται σύμφωνα με τις οδηγίες μας:
estão em conformidade com a(s) seguinte(s) norma(s) ou outro(s) documento(s) normativo(s), desde que estes sejam utilizados de acordo com as nossas instruções:
overholder følgende standard(er) eller andet/andre retningsgivende dokument(er), forudsat at disse anvendes i henhold til vore instrukser:

respektive utrustning är utförd i överensstämmelse med och följer följande standard(er) eller andra normgivande dokument, under förutsättning att användning sker i överensstämmelse med våra instruktioner:
respektive utstyr er i overensstemmelse med følgende standard(er) eller andre normgivende dokument(er), under forutsetning av at disse brukes i henhold til våre instrukser:
vastaavat seuraavien standardien ja muiden ohjeellisten dokumenttien vaatimuksia edellyttäen, että niitä käytetään ohjeidemme mukaisesti:

EN60335-2-40,

following the provisions of:
gemäß den Vorschriften der:
conformément aux stipulations des:

overeenkomstig de bepalingen van:
siguiendo las disposiciones de:
secondo le prescrizioni per:

με τήρηση των διατάξεων των:
de acordo com o previsto em:
under iagttagelse af bestemmelserne i:

enligt villkoren i:
gitt i henhold til bestemmelsene i:
noudattaen määräyksiä:

Low Voltage 73/23/EEC
Machinery Safety 89/392/EEC
Electromagnetic Compatibility 89/336/EEC *

Directives, as amended.
Direktiven, gemäß Änderung.
Directives, telles que modifiées.

Richtlijnen, zoals geamendeerd.
Directivas, según lo enmendado.
Direttive, come da modifica.

Οδηγιών, όπως έχουν τροποποιηθεί.
Directivas, conforme alteração em.
Direktiver, med senere ændringer.

Direktiv, med foretagna ändringar.
Direktiver, med foretatte endringer.
Direktiivjä, sellaisina kuin ne ovat muutettuina.

* Note	as set out in the Technical Construction File DAIKIN.TCF.014 and judged positively by NMI according to the Certificate 9110074503 .
Hinweis	wie in der Technischen Konstruktionsakte DAIKIN.TCF.014 aufgeführt und von NMI positiv ausgezeichnet gemäß Zertifikat 9110074503 .
Remarque	tel que stipulé dans le Fichier de Construction Technique DAIKIN.TCF.014 et jugé positivement par NMI conformément au Certificat 9110074503 .
Bemerk	zoals vermeld in het Technisch Constructiedossier DAIKIN.TCF.014 en in orde bevonden door NMI overeenkomstig Certificaat 9110074503 .
Nota	tal como se expone en el Archivo de Construcción Técnica DAIKIN.TCF.014 y juzgado positivamente por NMI según el Certificado 9110074503 .
Nota	delineato nel File Tecnico di Costruzione DAIKIN.TCF.014 e giudicato positivamente da NMI secondo il Certificato 9110074503 .
Σημείωση	όπως προσδιορίζεται στο Αρχείο Τεχνικής Κατασκευής DAIKIN.TCF.014 και κρίνεται θετικά από το NMI σύμφωνα με το Πιστοποιητικό 9110074503 .
Nota	tal como estabelecido no Ficheiro Técnico de Construção DAIKIN.TCF.014 e com o parecer positivo de NMI de acordo com o Certificado 9110074503 .
Bemærk	som anført i den Tekniske Konstruktionsfil DAIKIN.TCF.014 og positivt vurderet af NMI i henhold til Certifikat 9110074503 .
Information	utrustningen är utförd i enlighet med den Tekniska Konstruktionsfilen DAIKIN.TCF.014 som positivt intygas av NMI vilket också framgår av Certifikat 9110074503 .
Merk	som det fremkommer i den Tekniske Konstruktionsfilen DAIKIN.TCF.014 og gennem positiv bedømmelse af NMI ifølge Sertifikat 9110074503 .
Huom	jotka on esitelty Teknisessä Asiakirjassa DAIKIN.TCF.014 ja jotka NMI on hyväksynyt Sertifikaatin 9110074503 mukaisesti.

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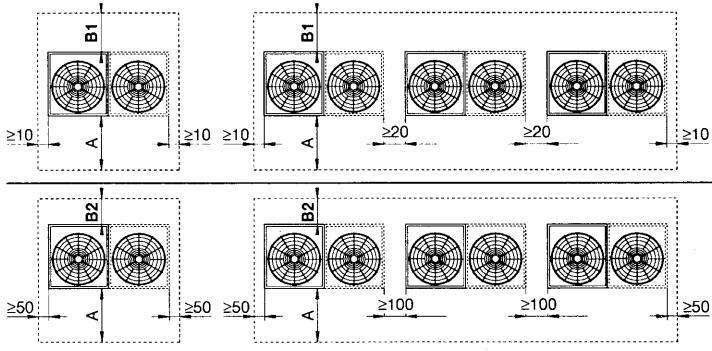
K. Shibutani

Kenzo Shibutani
Manager Quality Control Department
Sakai, 1st of March 1999

DAIKIN INDUSTRIES, LTD.

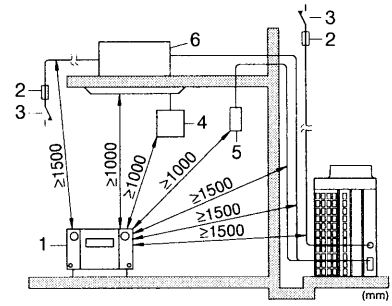
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Kita-ku, Osaka, 530-8323 Japan

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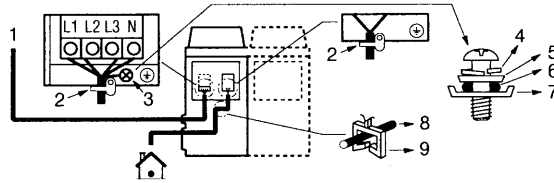
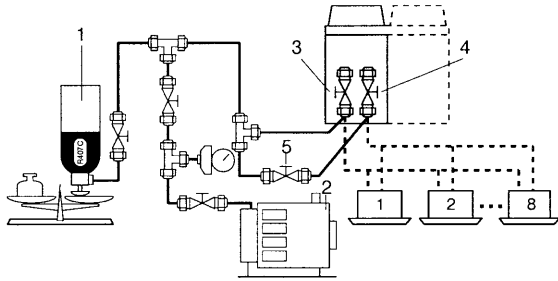
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$H \leq 1500 \Rightarrow A \geq 500$
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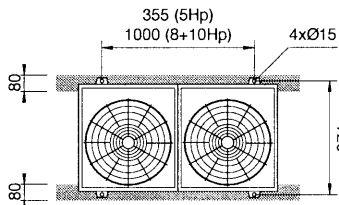
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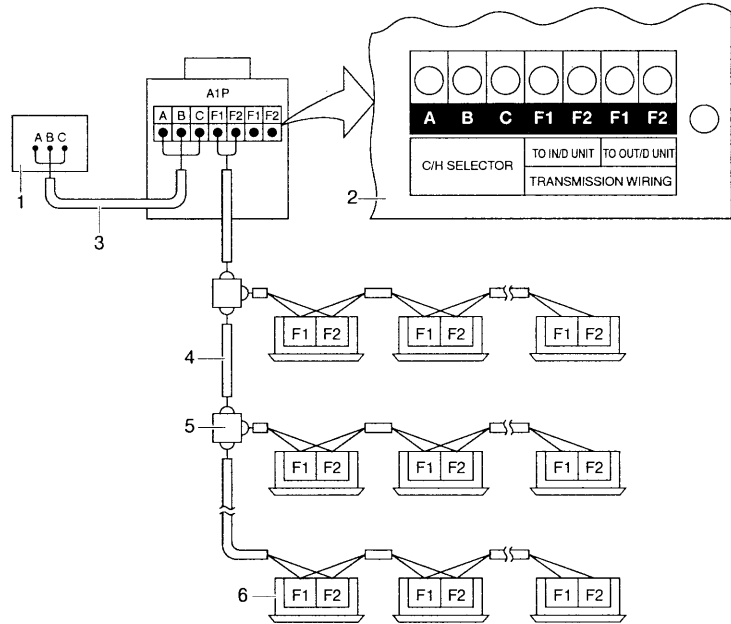


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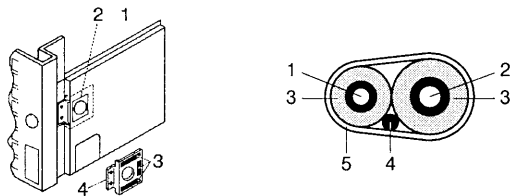


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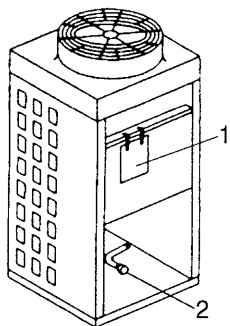
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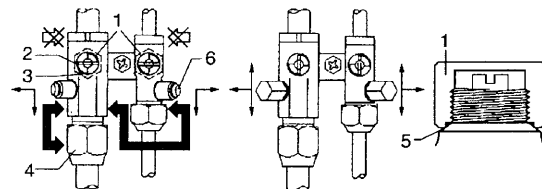


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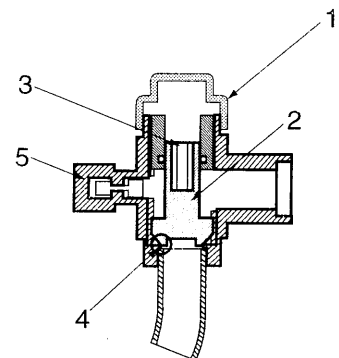
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- Since design pressure is 3.2MPa or 32bar (for R22 units: 2.8MPa or 28bar), pipes of larger wall thickness may be required.

- Since R407C 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.)

- The connected indoor units must be of the FXY--P--series, indoor units designed exclusively for R407C. If indoor units for R22 are connected, normal operation cannot be assured.

INTRODUCTION

This installation manual concerns VRV inverters of the Daikin RSXYP series. These units are designed for outdoor installation and used for cooling and heatpump applications. The units are available in 3 standard sizes with nominal cooling capacities ranging from 14.0 to 28.0kW and nominal heating capacities ranging from 16.0 to 31.5kW.

The RSXYP units can be combined with Daikin VRV series indoor units for air conditioning purposes.


The present installation manual describes the procedures for unpacking, installing and connecting the RSXYP units. Installation of the indoor units is not described in this manual. Always refer to the installation manual supplied with these units for their installation.

Combination


The combination with indoor units is as follows:

- The possible combination of the outdoor unit with indoor units is in function of the total capacity index of these indoor units and must be within the range as specified below:


RSXYP5	62.5~162.5
RSXYP8	100~260
RSXYP10	125~325
- Up to 8 indoor units can be connected to 1 outdoor unit RSXYP5.
Up to 13 indoor units can be connected to 1 outdoor unit RSXYP8.
Up to 16 indoor units can be connected to 1 outdoor unit RSXYP10.
- Make sure to connect indoor units designed exclusively for R407C.(FXY--P--series)
- Refer to the catalogue and/or engineering data book for model numbers of indoor units which can be connected.



READ THIS MANUAL ATTENTIVELY BEFORE STARTING UP THE UNIT. DO NOT THROW IT AWAY. KEEP IT IN YOUR FILES FOR FUTURE REFERENCE.



IMPROPER INSTALLATION OR ATTACHMENT OF EQUIPMENT OR ACCESSORIES COULD RESULT IN ELECTRIC SHOCK, SHORT-CIRCUIT, LEAKS, FIRE OR OTHER DAMAGE TO THE EQUIPMENT. BE SURE ONLY TO USE ACCESSORIES MADE BY DAIKIN WHICH ARE SPECIFICALLY DESIGNED FOR USE WITH THE EQUIPMENT AND HAVE THEM INSTALLED BY A PROFESSIONAL. IF UNSURE OF INSTALLATION PROCEDURES OR USE, ALWAYS CONTACT YOUR DAIKIN DEALER FOR ADVICE AND INFORMATION.



- The new refrigerant requires strict cautions for keeping the system clean, dry and tight.

A. Clean and dry
Foreign materials (including mineral oils such as SUNISO oil or moisture) should be prevented from getting mixed into the system.

B. Tight
R407C does not contain any chlorine, does not destroy the ozone layer, and does not reduce the earth's protection against harmful ultraviolet radiation.
R407C can contribute slightly to the greenhouse effect if it is released. Therefore we should take special attention to check the tightness of the installation.
Read the chapter 'Refrigerant piping work' carefully and follow these procedures correctly.

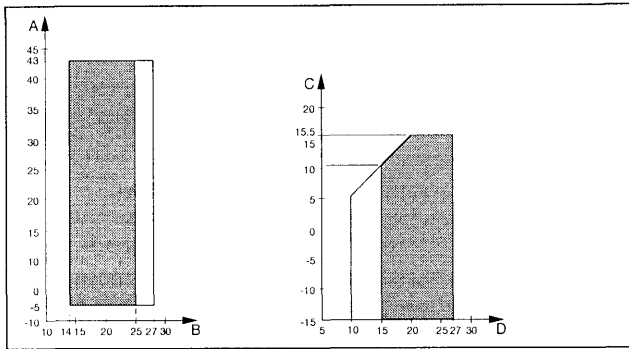
Standard operation limit

The figures below assume following operating conditions for indoor and outdoor units:

- Equivalent pipe length 10m
- Level difference 0m

Cooling

Heating



- A Outdoor temperature (°CDB)
- B Indoor temperature (°CWB)
- C Outdoor temperature (°CWB)
- D Indoor temperature (°CDB)
- Range for continuous operation
- Range for pull down operation
- Range for warming up operation

Standard supplied accessories (see figure10)

	RSXYP 5	RSXYP 8/10	
tie-wrap (1)	2	2	
gas side attached pipe (2)	1	1	
gas side attached pipe (2)	-	1	
liquid side attached pipe (2)	1	-	
installation manual (1)	1	1	
operation manual (1)	1	1	

Optional accessories

The outdoor unit requires purchasing the following refrigerant branch kits separately. Make sure to use exclusive parts for R407C.

	Refnet header	Refnet joint
RSXYP5	KHRP26K11H	KHRP26K11T
	KHRP26K17H	KHRP26K17T
RSXYP8/10	KHRP26K18H	KHRP26K18T
	KHRP26K37H	KHRP26K37T

Note

- Refer to the chapter "Example of connection" for selection of the refrigerant branch kits you need.

Technical specifications (1)

General	RSXYP5	RSXYP8	RSXYP10
Nominal cooling capacity (2)	(kW) 14.0	22.4	28.0
Nominal heating capacity (3)	(kW) 16.0	25.0	31.5
Nominal input cooling/heating (4)	(kW) 6.10/5.67	9.43/8.66	11.8/11.0
Dimensions HxWxD	(mm) 1440x635x690	1220x1280x690	1440x1280x690
Weight	(kg) 137	227	248
Connections (5)			
- refrigerant gas inlet	(inch) 3/4 OD	1 OD	1-1/8 OD
	(mm) 19.1	25.4	28.6
- refrigerant liquid outlet	(inch) 3/8 flare	1/2 flare	1/2 flare
	(mm) 9.5	12.7	12.7

(1) Refer to the engineering data book for the complete list of specifications.

(2) The nominal cooling capacity is based on: - indoor temperature: 27°CDB/19°CWB
- outdoor temperature: 35°CDB
- pipe length: 5m
- level difference: 0m

(3) The nominal heating capacity is based on: - indoor temperature: 20°CDB
- outdoor temperature: 7°CDB/6°CWB
- pipe length: 5m
- level difference: 0m

(4) The nominal input includes total input of the unit: compressor, fan motor and control circuit.

Compressor	RSXYP5	RSXYP8	RSXYP10
Model	JT100BEVYE	JT100BEVYE + JT100BETYE	JT100BEVYE + JT160BETYE
Oil type	DAPHNE FVC68D	DAPHNE FVC68D	DAPHNE FVC68D
Oil charge volume	(l) 1.2	1.5+1.4	1.5+1.7
Crankcase heater	(W) 33	33+33	33+33
Refrigerant type	R407C	R407C	R407C
Refrigerant charge	(kg) 6.3	9.6	11.2
Condenser	RSXYP5	RSXYP8	RSXYP10
Nominal air flow	(m ³ /min) 80	150	170
Fan motor output	(W) 190	140+230	190+230

Electrical specifications (1)

Model	RSXYP5	RSXYP8	RSXYP10
Power supply			
- Phase	3N~	3N~	3N~
- Frequency	(Hz) 50	50	50
- Voltage	(V) 380-415	380-415	380-415
- Voltage tolerance	(%) +6/-10	+6/-10	+6/-10
- Recommended fuses	(A) 20	35	35
Compressor			
- Phase	3~	3~	3~
- Frequency	(Hz) 50	50	50
- Voltage	(V) 380-415	380-415	380-415
- Nominal running current	(A) 10.6-10.1	17.0-15.9	18.2-16.9

Model	RSXYP5	RSXYP8	RSXYP10
Control and fan motor			
- Phase	1~	1~	1~
- Frequency	(Hz) 50	50	50
- Voltage	(V) 220-240	220-240	220-240
- Nominal running current	(A) 1.5	2.5	2.5

MAIN COMPONENTS

For main components and function of the main components, refer to the Engineering Data Book.

SELECTION OF LOCATION

This unit, both indoor and outdoor, is suitable for installation in a commercial and light industrial environment. If installed as a household appliance it could cause electromagnetic interference.

The inverter units should be installed in a location that meets the following requirements:

1. The foundation is strong enough to support the weight of the unit and the floor is flat to prevent vibration and noise generation.
2. The space around the unit is adequate for servicing and the minimum space for air inlet and air outlet is available. (refer to figure 1 and choose one of both possibilities)
3. There is no danger of fire due to leakage of inflammable gas.
4. Ensure that water cannot cause any damage to the location in case it drips out the unit (e.g. in case of a blocked drain pipe).
5. The piping length between the outdoor unit and the indoor unit may not exceed the allowable piping length. (see "Example of connection")
6. Select the location of the unit in such a way that neither the discharged air nor the sound generated by the unit disturb anyone.
7. Make sure that the air inlet and outlet of the unit are not positioned towards the main wind direction. Frontal wind will disturb the operation of the unit. If necessary, use a windscreen to block the wind.

Caution



1. An inverter air conditioner may cause electronic noise generated from AM broadcasting. Examine where to install the main air conditioner and electric wires, keeping proper distances away from stereo equipment, personal computers, etc. (refer to figure 2).
 - 1 personal computer or radio
 - 2 fuse
 - 3 earth leak detector
 - 4 remote controller
 - 5 cool/heat selector
 - 6 indoor unit
- If the electric wave of AM broadcasting is particularly weak, keep distances of 3m or more and use conduit tubes for power and transmission lines.
2. In heavy snowfall areas, select an installation site where snow will not affect operation of the unit.
 3. The refrigerant R407C 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. Refer to the chapter 'Caution for refrigerant leaks'.

INSPECTING AND HANDLING THE UNIT

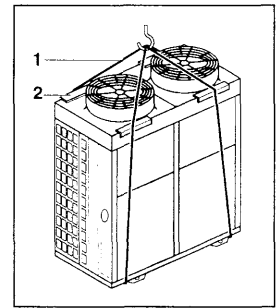
The units are packed in a wooden crate and attached on a wooden pallet.

At delivery, the package should be checked and any damage should be reported immediately to the carrier claims agent.

When handling the unit, take into account the following:


1.  Fragile, handle the unit with care.
-  Keep the unit upright in order to avoid compressor damage.

2. Lift the unit preferably with a crane and 2 belts(1) of at least 8m long.
3. When lifting the unit with a crane, always use protectors(2) to prevent belt damage and pay attention to the position of the unit's centre of gravity.
4. Bring the unit as close to its final installation position in its original package to prevent damage during transport.

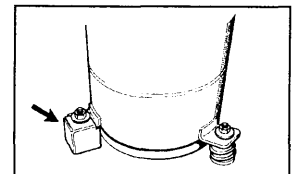


UNPACKING AND PLACING THE UNIT

1. Remove the wooden crate from the unit.
2. Remove the four screws fixing the unit to the pallet.
3. The unit must be installed on a solid longitudinal foundation (steelbeam frame or concrete) as indicated in figure 5.

Note  Maximum height of the foundation is 150mm.

4. Lift the unit from the pallet and place it on its installation position.
5. Fasten the unit in place using four anchor bolts M12.
6. Remove the upper and lower service plate.
7. When closing the service panels take care that the tightening torque does not exceed 4.1 Nm.
8. Remove the yellow shipping stays from the compressor support as shown in the figure (2 stays per single compressor).
Tighten the installation bolts firmly again afterwards.



Caution

1. Prepare a water drainage channel around the foundation to drain waste water from around the unit.
2. If the unit is to be installed on a roof, check the strength of the roof and its drainage facilities first.
3. If the unit is to be installed on a frame, install the waterproofing board within a distance of 150mm under the unit in order to prevent infiltration of water coming from under the unit.

REFRIGERANT PIPING



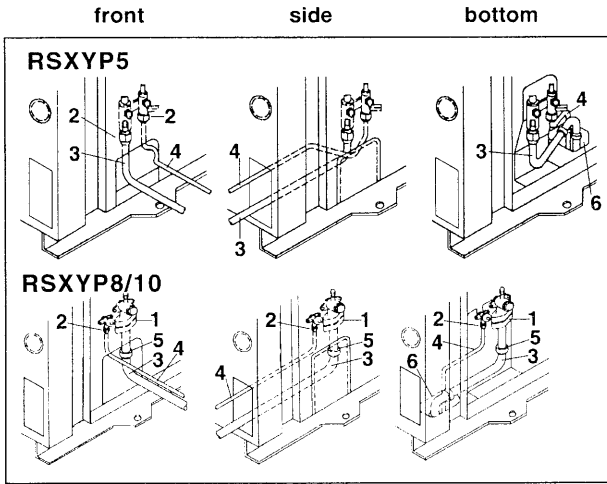
All field piping must be installed by a licensed refrigeration technician and must comply with relevant local and national regulations.

Note

- Use R407C only when adding refrigerant.
- Installation tools:
Make sure to use installation tools (gauge manifold charge hose, etc.) that are exclusively used for R407C installations to withstand the pressure and to prevent foreign materials (e.g. mineral oils such as SUNISO and moisture) from mixing into the system.
Vacuum pump (use a 2-stage vacuum pump with a non-return valve):
 1. Make sure the pump oil does not flow oppositely into the system while the pump is not working.
 2. Use a vacuum pump which can evacuate to -100.7 kPa (5Torr, -755mmHg).

Connecting the refrigerant piping

1. Installation of refrigerant piping is possible as front connection, side connection and bottom connection.



- 1 flange
- 2 flare nut
- 3 gas side attached pipe
- 4 liquid side attached pipe
- 5 brazing
- 6 knock out hole (use a hammer)

Note front connection

- Make sure to close the piping intake hole again after installation work.

Note side connection

- Cut out the inner part of the conduit hole with a cutter.

Note bottom connection

- Liquid side: Bend the liquid side accessory pipe and connect it to the stop valve. Take care not to allow it to touch the gas side pipe.



A = bending position for 5Hp

B = bending position for 8/10Hp

- Gas side: Cut the gas side accessory pipe and make connection using an elbow (field supply).



A = cutting position for 5Hp

B = cutting position 8/10Hp

2. Make sure to perform the piping installation within the range of the maximum allowable pipe length, allowable level difference and allowable length after branching as indicated in chapter "Example of connection".
3. For installation of the refrigerant branching kit, refer to the installation manual delivered with the kit.
4. Pipe connection
 - Apply ether or ester oil around the flare portions before connecting.
 - Make sure to flow nitrogen gas through the pipe when brazing.

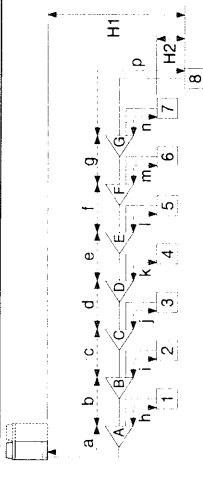
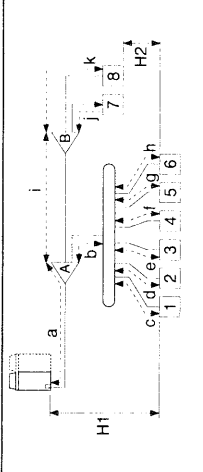
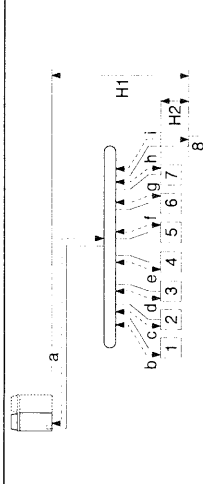
5. Protection against contamination when installing pipes
 - Take measures to prevent foreign materials like moisture and contamination from mixing into the system.

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	

- Great caution is needed when passing copper tubes through walls.

Selection of piping material

1. Foreign materials inside pipes (including oils for fabrication) must be 30mg/10m or less.
2. Use the following material specification for refrigerant piping:
 - construction material: Phosphoric acid deoxidized seamless copper for refrigerant.
 - size: Determine the proper size referring to chapter "Example of connection".
 - The wall thickness of the refrigerant piping should comply with relevant local and national regulations. For R407C the design pressure is 3.2 MPa.
3. Make sure to use the particular branches of piping that have been selected referring to chapter "Example of connection".

<p>Example of connection</p> <p>Use exclusive refrigerant branch kits for R407C. Connection of 8 indoor units</p>  <p>1 indoor unit A refnet joint O refnet header</p>	<p>Branch with refnet joint</p>	<p>Branch with refnet joint and refnet header</p> 	<p>Branch with refnet header</p> 																																				
<p>Maximum allowable length between outdoor and indoor units</p> <p>Actual pipe length Equivalent length</p> <p>Allowable height between outdoor and indoor units</p> <p>Difference in height</p> <p>Allowable height between adjacent indoor units</p> <p>Difference in height between adjacent indoor units (H1) ≤50m (≤40m if outdoor unit is located in a lower position)</p> <p>Difference in height between adjacent indoor units (H2) ≤15m</p> <p>Allowable length after the branch</p> <p>Actual pipe length</p>	<p>Pipe length between outdoor and indoor units ≤100m [Example] unit 8: a+b+h ≤100m; Δ: a+h ≤100m</p> <p>Equivalent pipe length between outdoor and indoor units ≤125m (Assume equivalent pipe length of refnet joint to be 0.5m and of the relent header to be 1.0m. (for calculation purposes))</p>	<p>Pipe length from first refrigerant branch kit (either refnet joint or refnet header) to indoor units ≤40m [Example] unit 6: b+h ≤40m, unit 7: i+k ≤40m</p> <p>How to select the refnet header</p> <ul style="list-style-type: none"> - When using a refnet joint at the first branch counted from the outdoor unit side, use KHRP26K17T (RSXYP5) or KHRP26K37T (RSXYP8/10). [Example: refnet joint A] - For refnet joints other than the first branch, select the proper branch kits based on the total capacity index (refer to chapter "Combination") of indoor units installed after the first branch, using the following table. <table border="1" data-bbox="726 862 837 1086"> <tr> <td>Total capacity index of indoor units</td> <td>Branch kit</td> </tr> <tr> <td>RSXYP5 <100</td> <td>KHRP26K11T</td> </tr> <tr> <td>>100</td> <td>KHRP26K17T</td> </tr> <tr> <td>RSXYP8+10 <160</td> <td>KHRP26K18T</td> </tr> <tr> <td>>160</td> <td>KHRP26K37T</td> </tr> </table>	Total capacity index of indoor units	Branch kit	RSXYP5 <100	KHRP26K11T	>100	KHRP26K17T	RSXYP8+10 <160	KHRP26K18T	>160	KHRP26K37T	<p>[Example] unit 8: a+h ≤100m</p>																										
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<p>Refrigerant branch kit selection</p> <p>Example of downstream indoor units</p> <p>Pipe size selection Pipe size = outer diameter x minimum wall thickness (unit: mm)</p>	<p>[Example] in case of refnet joint C; indoor units 3+4+5+6+7+8</p> <p>Between the outdoor unit and the uppermost stream refrigerant branch kit</p> <ul style="list-style-type: none"> - Match the pipe size to the pipe size of the outdoor unit <table border="1" data-bbox="1093 1120 1189 1601"> <tr> <th colspan="2">Pipe size connected to outdoor unit</th> </tr> <tr> <th>Gas</th> <th>Liquid</th> </tr> <tr> <td>RSXYP5</td> <td>019.1 x 1.0</td> <td>09.5 x 0.8</td> </tr> <tr> <td>RSXYP8</td> <td>025.4 x 1.2</td> <td>012.7 x 0.8</td> </tr> <tr> <td>RSXYP10</td> <td>028.6 x 1.2</td> <td>012.7 x 0.8</td> </tr> </table> <p>[Example] RSXYP5 a: 09.5 x 30m e: 09.5 x 3m i: 06.4 x 5m m: 06.4 x 5m b: 09.5 x 5m f: 09.5 x 2m j: 06.4 x 5m n: 06.4 x 5m c: 09.5 x 5m g: 09.5 x 5m k: 06.4 x 5m p: 06.4 x 5m d: 09.5 x 5m h: 06.4 x 5m l: 06.4 x 5m</p> <p>R = [55 x 0.06] + [40 x 0.023] = 4.22 ⇒ R = 4.2kg</p>	Pipe size connected to outdoor unit		Gas	Liquid	RSXYP5	019.1 x 1.0	09.5 x 0.8	RSXYP8	025.4 x 1.2	012.7 x 0.8	RSXYP10	028.6 x 1.2	012.7 x 0.8	<p>[Example] in case of refnet joint B; indoor units 7+8, in case of refnet header; indoor units 1+2+3+4+5+6</p> <p>Between two immediately adjacent refrigerant branch kits</p> <ul style="list-style-type: none"> - Select the proper pipe size based on the total capacity index (refer to chapter "Combination") of indoor units connected downstream, using the following table. <table border="1" data-bbox="1093 616 1189 1086"> <tr> <th colspan="2">Total capacity index</th> </tr> <tr> <th>Gas</th> <th>Liquid</th> </tr> <tr> <td><100</td> <td>015.9 x 1.0</td> <td>09.5 x 0.8</td> </tr> <tr> <td>100-160</td> <td>019.1 x 1.0</td> <td>09.5 x 0.8</td> </tr> <tr> <td>>160 (RSXYP8/10 only)</td> <td>025.4 x 1.2</td> <td>012.7 x 0.8</td> </tr> </table> <p>[Example] RXP8/10 a: 012.7 x 30m d: 06.4 x 10m g: 06.4 x 10m j: 09.5 x 10m b: 012.7 x 10m e: 06.4 x 10m h: 06.4 x 20m k: 06.4 x 9m c: 09.5 x 10m f: 06.4 x 10m i: 09.5 x 10m</p> <p>R = [40 x 0.12] + [30 x 0.06] + [69 x 0.023] = 8.187 ⇒ R = 8.2kg</p>	Total capacity index		Gas	Liquid	<100	015.9 x 1.0	09.5 x 0.8	100-160	019.1 x 1.0	09.5 x 0.8	>160 (RSXYP8/10 only)	025.4 x 1.2	012.7 x 0.8	<p>[Example] unit 8: a+h ≤100m</p> <p>How to select the refnet header</p> <ul style="list-style-type: none"> - Select the proper branch kit based on the total capacity index (refer to chapter "Combination") of indoor units installed after the header, using the following table. - Branching is impossible between refnet header and indoor unit. <table border="1" data-bbox="726 100 837 582"> <tr> <td>Total capacity index of indoor units</td> <td>Branch kit</td> </tr> <tr> <td>RSXYP5 <100</td> <td>KHRP26K11H (up to 4 branches)</td> </tr> <tr> <td>>100</td> <td>KHRP26K17H (up to 8 branches)</td> </tr> <tr> <td>RSXYP8/10 <160</td> <td>KHRP26K18H (up to 6 branches)</td> </tr> <tr> <td>>160</td> <td>KHRP26K37H (up to 8 branches)</td> </tr> </table>	Total capacity index of indoor units	Branch kit	RSXYP5 <100	KHRP26K11H (up to 4 branches)	>100	KHRP26K17H (up to 8 branches)	RSXYP8/10 <160	KHRP26K18H (up to 6 branches)	>160	KHRP26K37H (up to 8 branches)
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<p>Additional refrigerant to be charged Calculation of additional refrigerant to be charged R(kg) is in function of total length of liquid lines L and as follows: RSXYP5 R = [(L×0.5)×0.06] + [(L×0.4)×0.023] RSXYP8/10 R = [(L×12.7)×0.12] + [(L×0.5)×0.06] + [(L×0.4)×0.023]</p> <p>Note</p> <ul style="list-style-type: none"> - Round off R to 1 decimal place. - If R is ≤0, keep the unit in operation. 	<p>[Example] in case of refnet header; indoor units 1+2+3+4+5+6+7+8</p> <p>Between refrigerant branch kit and indoor unit</p> <ul style="list-style-type: none"> - Select the proper pipe size based on the total capacity index (refer to chapter "Combination") of indoor units connected downstream, using the following table. <p>(Pipe size for direct connection to indoor unit must be the same as the connection size of the indoor unit.)</p> <table border="1" data-bbox="1093 1120 1189 1601"> <tr> <th colspan="2">Connection pipe size of indoor unit</th> </tr> <tr> <th>Indoor unit capacity index</th> <th>Gas</th> <th>Liquid</th> </tr> <tr> <td>20-25-32-40</td> <td>012.7 x 0.8</td> <td>06.4 x 0.8</td> </tr> <tr> <td>50-63-80</td> <td>015.9 x 1.0</td> <td>09.5 x 0.8</td> </tr> <tr> <td>100-125</td> <td>019.1 x 1.0</td> <td>09.5 x 0.8</td> </tr> </table> <p>[Example] RSXYP8/10 a: 012.7 x 40m d: 06.4 x 10m g: 06.4 x 20m b: 09.5 x 20m e: 06.4 x 20m h: 06.4 x 20m c: 09.5 x 10m f: 06.4 x 23m i: 06.4 x 30m</p> <p>R = [40 x 0.12] + [30 x 0.06] + [23 x 0.023] = 9.429 ⇒ R = 9.4kg</p>	Connection pipe size of indoor unit		Indoor unit capacity index	Gas	Liquid	20-25-32-40	012.7 x 0.8	06.4 x 0.8	50-63-80	015.9 x 1.0	09.5 x 0.8	100-125	019.1 x 1.0	09.5 x 0.8	<p>[Example] unit 8: a+h ≤100m</p>																							
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100-125	019.1 x 1.0	09.5 x 0.8																																					

Leak test and vacuum drying

The units were checked for leaks by the manufacturer.

Confirm that the valves are firmly closed before pressure test or vacuuming.

Air tight test and vacuum drying

-Air tight test: Make sure to use nitrogen gas.

Pressurize the liquid and gas pipes to 3.2MPa (do not pressurize more than 3.2MPa). If the pressure does not drop within 24 hours, the system passes the test. If the pressure drops, check where the nitrogen leaks from.

- Vacuum drying: Use a vacuum pump which can evacuate to -100.7kPa (5Torr, -755mmHg).

1. Evacuate the system from the liquid and gas pipes by using a vacuum pump for more than 2 hours and bring the system to -100.7kPa. After keeping the system under that condition for more than 1 hour, check if the vacuum gauge rises or not. If it rises, the system may either contain moisture inside or have leaks.

2. Following should be executed if there is a possibility of moisture remaining inside the pipe (if piping work is carried out during the raining season or over a long period of time rainwater may enter the pipe during work).

After evacuating the system for 2 hours, pressurize the system to 0.05MPa (vacuum break) with nitrogen gas and evacuate the system again using the vacuum pump for 1 hour to -100.7kPa (vacuum drying). If the system cannot be evacuated to -100.7kPa within 2 hours, repeat the operation of vacuum break and vacuum drying.

Then, after leaving the system in vacuum for 1 hour, confirm that the vacuum gauge does not rise.

Pipe insulation

After finishing the leak test and vacuum drying, the piping must be insulated. Take into account the following points:

- Make sure to insulate the connection piping and refrigerant branch kits entirely.
- Make sure to insulate the gas side connection piping and refrigerant branch kits entirely against heat, and depending on operation conditions (e.g. when performing cooling operation with an outside air temperature of $\leq 15^{\circ}\text{C}$), consider to also make a heat insulation of the liquid side connection piping and refrigerant branch kits to prevent dewing.
- Use heat resistant polyethylene foam which can withstand a temperature of 70°C for liquid side piping and polyethylene foam which can withstand a temperature of 120°C for gas side piping.

Additional refrigerant charge



Refrigerant may only be charged after performing the leak test and the vacuum drying (see above).

When charging a system, care shall be taken that its maximum permissible charge is never exceeded, in view of the danger of liquid hammer.

Charging with an unsuitable substance may cause explosions and accidents, so always ensure that the appropriate refrigerant (R407C) is charged.

Refrigerant containers shall be opened slowly.

Always use protective gloves and protect your eyes when charging refrigerant.

- This outdoor unit is factory charged with refrigerant and depending on pipe sizes and pipe lengths some systems require additional charging of refrigerant.

- Charge the refrigerant to the liquid pipe in its liquid state. Since R407-C is a mixed refrigerant, its composition changes if charged in a state of gas and normal system operation would no longer be assured.

- Determine the weight of refrigerant to be charged additionally referring to the item "Additional refrigerant to be charged" in chapter "Example of connection". And fill in the amount in the 'Request for the indication of additional refrigerant charging amount and installation date' attached to the unit.

- After the vacuum drying is finished, charge the additional refrigerant in its liquid state through the liquid stop valve service port. Taking into account following instructions:

1. Check that gas and liquid stop valves are closed.
2. Stop the compressor and charge the specified weight of refrigerant.

- If the outdoor unit is not in operation and the total amount cannot be charged, follow the procedures for additional refrigerant charge shown below.

- Make sure to use installation tools you exclusively use on R407C installations to withstand the pressure and to prevent foreign materials from mixing into the system.

Note



Procedures for charging additional refrigerant

Refer to figure 3.

- 1 R407C refrigerant cylinder
- 2 vacuum pump
- 3 liquid stop valve with service port
- 4 gas stop valve with service port
- 5 valve A

1. Fully open the gas stop valve. The liquid stop valve and "valve A" shown below must be kept closed. Start the additional refrigerant charging operation.

2. Stop the additional refrigerant charging operation when the specified amount is charged.

3. Fully close the liquid side stop valve. For setting the additional refrigerant charging operation, see the "Caution on operation" label on the rear of the front panel (left) of the outdoor unit.



Caution

1. If the refrigerant cylinder is siphonal, set it upright while charging additional refrigerant.

2. Be sure to size up the main gas line in the connection piping of the suction gas piping if the equivalent length of piping between indoor units and outdoor unit exceeds 90m in order to minimize the reduction of capacity.

RSXYP5 $\phi 19.1 \rightarrow \phi 22.2$

RSXYP8 $\phi 25.4 \rightarrow \phi 28.6$

RSXYP10 $\phi 28.6 \rightarrow \phi 31.8$

FIELD WIRING



All field wiring and components must be installed by a licensed electrician and must comply with relevant local and national regulations.





The field wiring must be carried out in accordance with the wiring diagrams and the instructions given below.

Be sure to use a dedicated power circuit. Never use a power supply shared by another appliance.

Internal wiring - parts table

Refer to the wiring diagram sticker on the unit. The abbreviations used are listed below:

A1P	Printed circuit board
A2P	Printed circuit board (INV)
A3P	Printed circuit board
BS1-5	Push button switch (mode, set, return, wiring check, reset)
C1R-4R	Capacitor
F1S	Surge arrester
F2C	Over current relay (M2C)
F1U,2U	Fuse (250V, 10A)
F3U,4U,5U	Fuse (600V, 30A)
H1P-7P	Light emitting diode (service monitor - orange) (A1P)
H1P-4P	Light emitting diode (service monitor - red) (A2P)
HAP	Light emitting diode (service monitor - green) (A1P)
HAP	Light emitting diode (service monitor - green) (A2P)
HWL	Pilot lamp (alarm-white)
INV	Inverter
J1HC,2HC	Crankcase heater
K1M	Compressor contactor (M1C)
K2M	Compressor contactor (M2C)
K1R,2R	Magnetic relay (A2P)
K1R	Magnetic relay (K2M)
K2R,3R	Magnetic relay (M1F) (A1P)
K4R	Magnetic relay (M2F)
K5R	Magnetic relay (Y2S)
K6R	Magnetic relay (Y3S)
K7R	Magnetic relay (Y4S)
K9R	Magnetic relay (Y1R)
K10R	Magnetic relay (J1HC)
L1R	Reactor
M1C,2C	Motor (compressor)
MF1,F2	Motor (fan)
Q1M,2M	Thermal protector (M1F, M2F)
R1-4	Resistor
R1T	Thermistor (fin) (A2P)
R1T	Thermistor (air) (A1P)
R2T	Thermistor (coil)
R3-1T,2T	Thermistor (discharge)
R4T	Thermistor (suction)
R5T	Thermistor (oil)
R1V	Varistor
SENPH	Pressure sensor (high)
SENPL	Pressure sensor (low)
SS1	Selector switch (cool/heat selector)
S1PH,2PH	Pressure switch (high)
T1C	DC current transformer
T1R	Transformer (220-240V/22V)
V1TR	Solid state relay
X1M	Terminal strip
Y1E	Expansion valve (electronic type)
Y1R	4 way valve
Y2S	Solenoid valve (hotgas)
Y3S	Solenoid valve (injection M1C)
Y4S	Solenoid valve (injection M2C)
Z1F-3F	Noise filter
DM	Diode module
PC	Power circuit
PM	Power module
PRC	Phase reversal detect circuit
SD	Safety devices input

	Field wiring
L1,L2,L3	Live
N	Neutral
	Connector
	Wire clamp
	Protective earth (screw)
Colours	BLK : Black GRY : Gray RED : Red
	BLU : Blue ORG : Orange WHT : White
	BRN : Brown PNK : Pink YLW : Yellow

Optional parts cool/heat selector

SS1	Selector switch (fan, cool/heat)
SS2	Selector switch (cool/heat)

Note

- Use copper conductors only.
- When using the adaptor for sequential start, refer to chapter 'Examples'.
- For connection wiring to outdoor-outdoor transmission F1-F2, outdoor-indoor transmission F1-F2, refer to chapter 'Examples'.
- For connection wiring to the central remote controller, refer to the installation manual of the central remote controller.

Power circuit and cable requirements

A power circuit (see table below) 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 leak detector.

	Phase and frequency	Voltage	Recommended fuses	Transmission line section
RSXYP5	3N-50Hz	380-415V	20 A	0.75-1.25mm ²
RSXYP8	3N-50Hz	380-415V	35 A	0.75-1.25mm ²
RSXYP10	3N-50Hz	380-415V	35 A	0.75-1.25mm ²

Note

- Select the power supply cable in accordance with relevant local and national regulations.

General

- Up to 3 units can be connected by crossover power source wiring between outdoor units. However, units of smaller capacity must be connected downstream. For details, refer to the equipment design data and technical data.
- Make sure to connect the power source wire to the power source terminal block and to clamp it as shown in figure 4, chapter "Field line connection".
- As this unit is equipped with an inverter, installing a phase advancing capacitor not only will deteriorate power factor improvement effect, but also may cause capacitor abnormal heating accident due to high-frequency waves. Therefore, never install a phase advancing capacitor.
- Keep power imbalance within 2% of the supply rating.
 1. Large imbalance will shorten the life of the smoothing capacitor.
 2. As a protective measure, the product will stop operating and an error indication will be made, when power imbalance exceeds 4% of the supply rating.

Examples

System example (refer to figure 6)

- 1 field power supply
 - 2 main switch
 - 3 earth leak detector
 - 4 fuse
 - 5 cool/heat selector
 - 6 remote controller
- power supply wiring (sheathed cable)
— transmission wiring (sheathed cable)

Field line connection (refer to figure 4)

- 1 field power supply
- 2 clamp the wire
- 3 grounding screw
- 4 spring washer
- 5 flat washer
- 6 earth wire
- 7 C cup washer
- 8 transmission line
- 9 wire clamp

Example of performing cool/heat with cool/heat selector (heat pump unit only) (refer to figure 9)

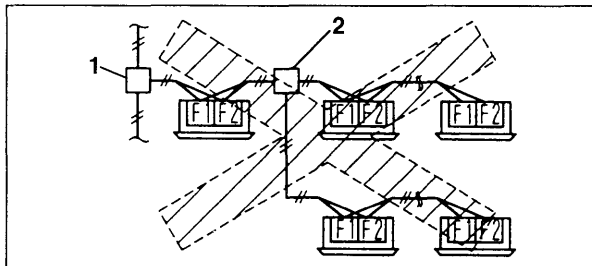
- 1 Cool/heat selector (optional for heat pump unit only)
- 2 Outdoor unit P.C. board (A1P)
- 3 Take care of the polarity
- 4 Use the conductor of sheathed wire (2 wire) (no polarity)
- 5 Terminal board (field supply)
- 6 Indoor unit

Example of performing cool/heat setting of two or more outdoor units in block with cool/heat selector (heat pump unit only)

- For the wiring shown in figure 8, be sure to use 0.75-1.25 mm² vinyl cords with sheath or cables (two-core). (Three-core cables can be used only for the cool/heat selector.)
- The wires shown in figure 8 are field supply.

Caution

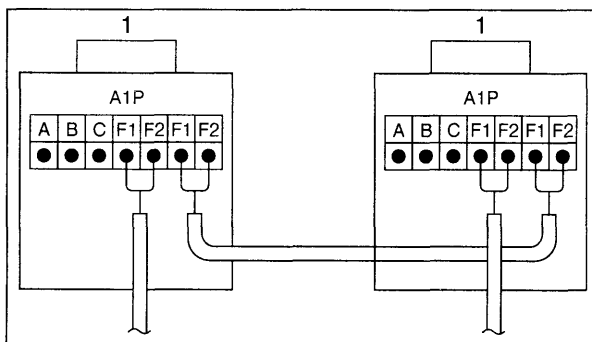
- Be sure to follow the limits below. If the unit-to-unit cables are beyond these limits, it may result in malfunction of transmission.
 - Maximum wiring length: 1000m
 - Total wiring length: 2000m
 - Max branches No. of branches: 16
- Up to 16 branches are possible for unit-to-unit cabling. No branching is allowed after branching.
 - 1 Branch
 - 2 Subbranching



- Never connect the power supply to unit-to-unit cabling terminal block. Otherwise the entire system may break down.

Sequential start

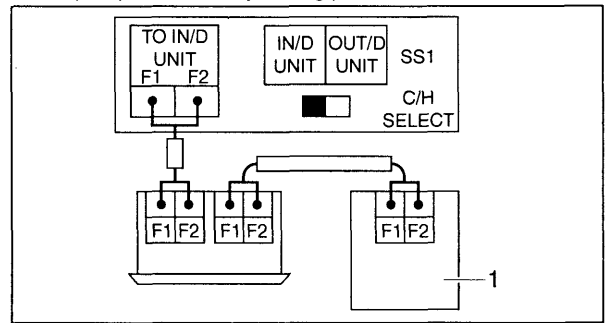
Make the outdoor unit cable connections shown below. The outdoor unit PC board (A1P) is factory set at 'Sequential start available'.



1 = Indoor unit

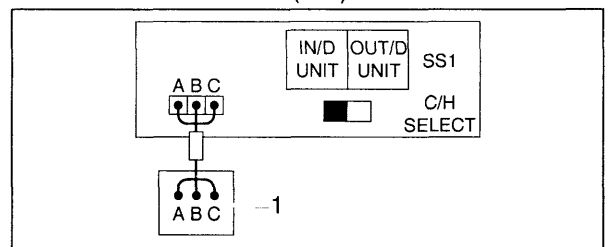
Setting the cool/heat operation (heat pump unit only)

- 1 Performing cool/heat setting with the remote controller connected to the indoor unit. Keep the cool/heat selector switch (SS1) on the outdoor unit PC board (A1P) at the factory setting position IN/D UNIT.



1 = Remote controller

- 2 Performing cool/heat setting with the cool/heat selector. Connect the cool/heat selector remote controller (optional) to the A/B/C terminals and set the cool/heat selector switch (SS1) on the outdoor unit PC board (A1P) to OUT/D UNIT.



1 Cool/heat selector

Caution

- For low-noise operation, it is necessary to get the optional 'External control adaptor for outdoor unit'. For details, see the installation manual attached to the adaptor.

Picking power line and transmission line

- Be sure to let the power line and the transmission line pass through a conduit hole.
- Pick the power line from the upper hole on the left side plate, from the front position of the main unit (through the conduit hole of the wiring mounting plate - optional parts) or from a knock out hole to be made in the unit's bottom plate.
- If you pick the power line from the front position of the unit, proceed as follows and refer to figure 7:
 - Remove the lower frontplate (1), punch a hole in the knock hole and cut the hole (2) all the way to the slit.
 - Attach the 3 sealing pads (optional parts) (3) on the wiring mounting plate (optional parts) (4) corresponding to the overlapped area of the front plate.
 - Install the wiring mounting plate to the front side of the side plate with the 2 delivered screws.
- Pick the transmission line from the middle positioned conduit hole on the left side plate, from the lower conduit hole on the right side plate or from the front position of the main unit (after binding it to the piping with finishing tape as in figure 8).

- 1 liquid side pipe
- 2 gas side pipe
- 3 pipe heat insulation
- 4 transmission line
- 5 finishing tape

Caution

- Be sure to keep the power line and transmission line apart from each other.
- Be careful about polarity of the transmission line.
- Make sure that the transmission line is clamped as shown in the figure in chapter "Field line connection".
- Check that wiring lines do not make contact with refrigerant piping.

BEFORE OPERATION

Checks before initial start-up



Make sure that the circuit breaker on the power supply panel of the installation is switched off.

After the installation, check the following before switching on the circuit breaker:

1. *The position of the switches that require an initial setting*

Make sure that switches are set according to your application needs before turning the power supply on.

2. *Power supply wiring and transmission wiring*

Use a designated power supply and transmission wiring and make sure that it has been carried out according to the instructions described in this manual, according to the wiring diagrams and according to local and national regulations.

3. *Pipe sizes and pipe insulation*

Make sure that correct pipe sizes are installed and that the insulation work is properly executed.

4. *Additional refrigerant charge*

Keep record of the additional refrigerant charged by filling it out on the sticker on the rear of the upper front panel.

5. *Insulation test of the main power circuit*

Using a megatester for 500V, check that the insulation resistance of 2MΩ or more is attained by applying a voltage of 500V DC between power terminals and earth. Never use the megatester for the transmission wiring.

6. *Installation date*

Be sure to keep record of the installation date on the sticker on the rear of the upper front panel according to EN60335-2-40.

Test run

Operation of stop valve

Keep all stop valves fully open. (refer to chapter "How to operate stop valves").

Power supply connection



In order to avoid compressor damage, it is necessary to switch on the crankcase heater for **at least six hours** before starting the compressor after a long period of standstill or for the first time.

- To switch on the crankcase heater, turn on the circuit breaker.
- Set the LED on the outdoor unit PC board after turning on the circuit breaker.
- Before switching on the indoor unit(s), refer to the operation manual of the corresponding unit(s) for more details.
- Turn on the switch to indoor unit(s).
- The test run must be performed starting with cooling operation. Start this operation about 8 minutes after turning on the indoor unit and outdoor unit power.

Note

- Do not try to get started with the remote controller just after turning on the power. The remote controller shows 'UH' and the system fails to start.
When the outdoor temperature is below -5°C, perform the testrun in heating mode.

Operation check - Temperature regulating operation check

1. Perform the cross wiring - cross piping check as described in "CAUTIONS ON OPERATION" attached on the rear of the upper front panel.
2. Set the unit to "★" mode using the cool/heat selector (heatpump units only) or the indoor remote controller.
3. Press the "TEST" button 4 times to set the unit to "TEST" mode operation. ("TEST" is displayed) Pressing the "TEST" button 5 times will make the unit return to its normal operation mode.
4. Within 10minutes after having set the unit to test mode, press the "⊕" button to start the test operation. Check if the indoor and outdoor units are operating normally. If, due to compressor liquid compression, a knocking noise is heard, stop the unit immediately and start it again after a while. The test run will be stopped automatically after 30 minutes.
5. Press the "⊕" button to stop the unit.
6. Perform normal operation. Refer to the operation manual of the corresponding indoor unit(s) for details.
 - Check that cool air (or hot, in case of heating operation of heatpump units) is blown from the indoor unit.
 - Operate each indoor unit individually and check whether the corresponding outdoor unit is running.



Caution

- Blinking of the remote controller operation lamp means that an error occurred. The error code is displayed in the liquid crystal display and the relation between error codes and their meaning is shown in "CAUTIONS IN SERVICING" attached to the indoor unit.
- The compressor is protected by a guard timer and will not restart, not even if the "⊕" button of a connected indoor unit is pressed, before the guard timer setting of 5 minutes elapsed.
- Pump down operation cannot be executed because this would result in serious compressor damage.

How to operate stop valves

RSXYP5 (refer to figure 11)

1. to open

Remove the cap(1) and turn the valve stem counterclockwise with a screwdriver until the pin(2) comes in contact with the stopper(3).

2. to close

Remove the cap and turn the valve stem clockwise with a screwdriver until the pin comes in contact with the stopper.

Note

- When removing the flare nut(4), be sure to use two spanners to the positions marked "➡". Tighten with a spanner and a torque wrench after completion of pipe connections. Do never apply a spanner or torque wrench on the positions marked "⊗".
- The refrigerant flow is indicated by "→".
- Refer to the table at the end of this chapter for tightening torques and dimensions of the flares.
- When connecting a flare nut, apply ether or ester oil on the flare area (both internal and external face), and screw it with your hand a few times first.
- Take care not to damage the cap sealing portion(5).
- Make sure to tighten the cap securely after valve operation. (tightening torque 1960~2450 Ncm)
- Use a charging hose with push rod when using the service port(6).
- Check for refrigerant gas leakage after tightening the cap.
- Make sure to tighten the service port cap securely after work. (tightening torque 980~1470 Ncm)
- Make sure to apply ether oil or ester oil around the flare portions (both inner and outer face) when connecting flare nuts, and give 3 turns by hand before applying spanners.
- Make sure to keep stop valves open during operation.

1. To open

1. Remove the cap (1) and turn the shaft (2) counterclockwise with hexagon socket screw keys (JIS B 4648 nominal size 6 mm and 10 mm).
2. Turn it all the way until the shaft stops.
3. Tighten the cap firmly.

2. To close

1. Remove the cap and turn the shaft clockwise.
2. Tighten the shaft firmly until it reaches the sealed area (4) of the body.
3. Tighten the cap firmly.

Note

- Refer to the table at the end of this chapter for tightening torques and dimensions of the flares.
- Be sure to use both, a spanner and a torque wrench, when connecting or disconnecting pipes to or from the unit.
- When connecting a flare nut, apply ether or ester oil on the flare area (both internal and external face), and screw it with your hand a few times first.
- Use a charging hose with push rod when using the service port(5).
- Check for refrigerant gas leakage after tightening the cap.
- Make sure to apply ether oil or ester oil around the flare portions (both inner and outer face) when connecting flare nuts, and give 3 turns by hand before applying spanners.
- Make sure to keep stop valve open during operation.

FLARE SHAPE and FLARENUT TIGHTENING TORQUE

pipe size	tightening torque (Ncm)	A (mm)	flare shape
Ø9.5	3270~3990	12.0~12.4	
Ø12.7	4950~6030	15.4~15.8	
Ø19.1	9720~11860	22.9~23.3	

Disposal requirements

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

CAUTION FOR REFRIGERANT LEAKS

(Points to note in connection with refrigerant leaks)

Introduction

The VRV System, like other air conditioning systems, uses R407C as refrigerant. R407C itself is an entirely safe non-toxic, non-combustible refrigerant. Nevertheless care must be taken to ensure that air conditioning facilities are installed in a room which is sufficiently large. This assures that the maximum concentration level of refrigerant gas is not exceeded, in the unlikely event of major leak in the system and this in accordance to the local applicable regulations and standards.

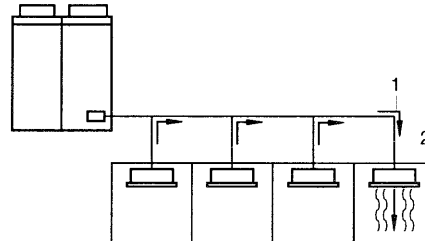
Maximum concentration level

The maximum charge of refrigerant and the calculation of the maximum concentration of refrigerant is directly related to the humanly occupied space in to which it could leak.

The unit of measurement of the concentration is kg/m³ (the weight in kg of the refrigerant gas in 1m³ volume of the occupied space).

Compliance to the local applicable regulations and standards for the maximum allowable concentration level is required.

In Japan the maximum allowed concentration level of refrigerant to a humanly space for R407C is limited to 0.3 kg/m³.



1. direction of the refrigerant flow
2. room where refrigerant leak has occurred (outflow of all the refrigerant from the system)

Procedure for checking maximum concentration

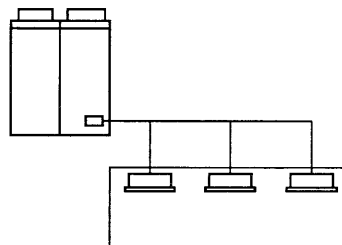
Check the maximum concentration level in accordance with steps 1 to 4 below and take whatever action is necessary to comply.

1. Calculate the amount of refrigerant (kg) charged to each system separately.

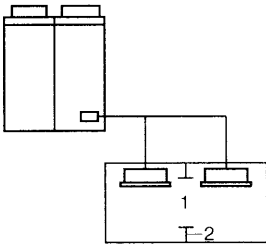
$$\begin{matrix} \text{amount of refrigerant} & + & \text{additional charging} & = & \text{total amount of re-} \\ \text{in a single unit sys-} & & \text{amount (amount of} & & \text{frigerant (kg) in the} \\ \text{tem (amount of re-} & & \text{refrigerant added lo-} & & \text{system} \\ \text{frigerant with which} & & \text{cally in accordance} & & \\ \text{the system is} & & \text{with the length or di-} & & \\ \text{charged before leav-} & & \text{ameter of the refrig-} & & \\ \text{ing the factory)} & & \text{erant piping)} & & \end{matrix}$$

Note

- Where a single refrigerant facility is divided into 2 entirely independent refrigerant systems then use the amount of refrigerant with which each separate system is charged.
- 2. Calculate the smallest room volume (m³)
In case like the following, calculate the volume of (A), (B) as a single room or as the smallest room.
A. Where there are no smaller room divisions



B. Where there is a room division but there is an opening between the rooms sufficiently large to permit a free flow of air back and forth.



1 opening between rooms

2 partition

(Where there is an opening without a door or where there are openings above and below the door which are each equivalent in size to 0.15% or more of the floor area.)

3. Calculating the refrigerant density using the results of the calculations in steps 1 and 2 above.

$$\frac{\text{total volume of refrigerant in the refrigerant system}}{\text{size (m}^3\text{) of smallest room in which there is an indoor unit installed}} \leq \text{maximum concentration level (kg/m}^3\text{)}$$

If the result of the above calculation exceeds the maximum concentration level then make similar calculations for the second then third smallest room and so until the result falls short of the maximum concentration.

4. Dealing with the situations where the result exceeds the maximum concentration level.

Where the installation of a facility results in a concentration in excess of the maximum concentration level then it will be necessary to revise the system.

Please consult your Daikin supplier.

NOTES

A large grid area for taking notes, consisting of a series of horizontal and vertical lines forming a grid pattern.

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