

# INSTALLATION MANUAL

## **VRV** *System air conditioner*

### MODEL

REYA72AATJ*	REYA72AAYD*	RXYA72AATJ*	RXYA72AAYD*
REYA96AATJ*	REYA96AAYD*	RXYA96AATJ*	RXYA96AAYD*
REYA120AATJ*	REYA120AAYD*	RXYA120AATJ*	RXYA120AAYD*
REYA144AATJ*	REYA144AAYD*	RXYA144AATJ*	RXYA144AAYD*
REYA168AATJ*	REYA168AAYD*	RXYA168AATJ*	RXYA168AAYD*
REYA192AATJ*	REYA192AAYD*	RXYA192AATJ*	RXYA192AAYD*
REYA216AATJ*	REYA216AAYD*	RXYA216AATJ*	RXYA216AAYD*
REYA240AATJ*	REYA240AAYD*	RXYA240AATJ*	RXYA240AAYD*
REYA264AATJ*	REYA264AAYD*	RXYA264AATJ*	RXYA264AAYD*
REYA288AATJ*	REYA288AAYD*	RXYA288AATJ*	RXYA288AAYD*
REYA312AATJ*	REYA312AAYD*	RXYA312AATJ*	RXYA312AAYD*
REYA336AATJ*	REYA336AAYD*	RXYA336AATJ*	RXYA336AAYD*
REYA360AATJ*	REYA360AAYD*	RXYA360AATJ*	RXYA360AAYD*
REYA384AATJ*	REYA384AAYD*	RXYA384AATJ*	RXYA384AAYD*
REYA408AATJ*	REYA408AAYD*	RXYA408AATJ*	RXYA408AAYD*
REYA432AATJ*	REYA432AAYD*	RXYA432AATJ*	RXYA432AAYD*
REYA456AATJ*	REYA456AAYD*	RXYA456AATJ*	RXYA456AAYD*
REYA480AATJ*	REYA480AAYD*	RXYA480AATJ*	RXYA480AAYD*

English

Please visit <http://www.daikinac.com/content/resources/manuals> for the most current version of installation instructions and service manual. In the event of conflicting information, the online contents are to be used.

Veillez visiter <http://www.daikinac.com/content/resources/manuals> pour obtenir la version la plus récente des instructions d'installation et du manuel de service. En cas de conflit d'informations, le contenu en ligne est à privilégier.

Visite <http://www.daikinac.com/content/resources/manuals> para obtener la versión en español de las instrucciones de instalación y del manual de servicio. En caso de información contradictoria, se utilizarán los contenidos en línea.

## Safety considerations

Refer also to the General Safety Considerations in the separate booklet.

	<b>Read the precautions in this manual carefully before operating the unit.</b>
	<b>This appliance is filled with R32.</b>

Read these Safety considerations for Installation carefully before installing an air conditioner or heat pump. After completing the installation, make sure that the unit operates properly during the startup operation.

Instruct the customer on how to operate and maintain the unit. Inform customers that they should store this Installation Manual with the Operation Manual and General Safety Considerations for future reference.

Always use a licensed installer or contractor to install this unit. Improper installation can result in water or refrigerant leakage, electrical shock, fire, or explosion.

Meanings of **DANGER**, **WARNING**, **CAUTION**, **NOTE** and **INFORMATION** symbols:

 **DANGER** . . . . . Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

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

 **CAUTION** . . . . . Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

 **NOTE** . . . . . Indicates situations that may result in equipment or property damage accidents only.

 **INFORMATION** . . . This symbol identifies useful tips or additional information.

### **DANGER**

- Refrigerant gas is heavier than air and replaces oxygen. A massive leak can lead to oxygen depletion, especially in basements, and an asphyxiation hazard could occur leading to serious injury or death.
- Do not ground units to water pipes, gas pipes, telephone wires, or lightning rods as incomplete grounding can cause a severe shock hazard resulting in severe injury or death. Additionally, grounding to gas pipes could cause a gas leak and potential explosion causing severe injury or death.
- If refrigerant gas leaks during installation, ventilate the area immediately. Refrigerant gas may produce toxic gas if it comes in contact with fire. Exposure to this gas could cause severe injury or death.
- After completing the installation work, check that the refrigerant gas does not leak throughout the system.
- Do not install unit in an area where flammable materials are present due to risk of explosions that can cause serious injury or death.
- Safely dispose of all packing and transportation materials in accordance with federal/state/local laws or ordinances. Packing materials such as nails and other metal or wood parts, including plastic packing materials used for transportation may cause injury or death by suffocation.

### **WARNING**

- Only personnel that have been trained to install, adjust, service, maintenance or repair (hereinafter, “service”) the equipment specified in this manual should service the equipment.
- This equipment is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
- Children should be supervised to ensure that they do not play with the equipment.
- The manufacturer will not be responsible for any injury or property damage arising from improper supervision, service or service procedures.
- If you service this unit, you assume responsibility for any injury or property damage which may result. In addition, in jurisdictions that require one or more licenses to service the equipment specified in this manual, only licensed personnel should service the equipment.
- Improper supervision, installation, adjustment, servicing, maintenance or repair of the equipment specified in this manual, or attempting to install, adjust, service or repair the equipment specified in this manual without proper supervision or training may result in product damage, property damage, personal injury or death.
- Do not bypass safety devices.
- Only qualified personnel must carry out the installation work. Installation must be done in accordance with this installation manual. Improper installation may result in water leakage, electric shock or fire.
- When installing the unit in a small room, take measures to keep the refrigerant concentration from exceeding allowable safety limits. Excessive refrigerant leaks, in the event of an accident in a closed ambient space, can lead to oxygen deficiency.
- Use only specified accessories and parts for installation work. Failure to use specified parts may result in water leakage, electric shock, fire or the unit falling.
- Install the air conditioner or heat pump on a foundation strong enough that it can withstand the weight of the unit. A foundation of insufficient strength may result in the unit falling and causing injury.
- Take into account strong winds, hurricanes, or earthquakes when installing. Improper installation may result in the unit falling and causing accidents.
- Make sure that a separate power supply circuit is provided for this unit and that all electrical work is carried out by qualified personnel according to local, state and national regulations. An insufficient power supply capacity or improper electrical construction may lead to electric shock or fire.
- Make sure that all wiring is secured, that specified wires are used, and that no external forces act on the terminal connections or wires. Improper connections or installation may result in fire.
- When wiring, position the wires so that the control box cover can be securely fastened. Improper positioning of the control box cover may result in electric shock, fire or the terminals overheating.
- Before touching electrical parts, turn off the unit.
- Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.
- The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater).
- Do not pierce or burn.
- Be aware that refrigerants may not contain an odor.
- Comply with national gas regulations.

- This equipment can be installed with a Ground-Fault Circuit Interrupter (GFCI). Although this is a recognized measure for additional protection, with the grounding system in North America, a dedicated GFCI is not necessary.
- Securely fasten the unit terminal cover (panel). If the terminal cover/panel is not installed properly, dust or water may enter the outdoor unit and could result in fire or electric shock.
- When installing or relocating the system, keep the refrigerant circuit free from substances other than the specified refrigerant (R32) such as air. Any presence of air or other foreign substance in the refrigerant circuit can cause an abnormal pressure rise or rupture, resulting in injury.
- Do not change the setting of the protection devices. If the pressure switch, thermal switch, or other protection device is shorted and operated forcibly, or parts other than those specified by Daikin are used, fire or explosion may occur.
- That pipe-work including piping material, pipe routing, and installation shall include protection from physical damage in operation and service, and be in compliance with national and local codes and standards, such as ASHRAE 15, ASHRAE 15.2, IAPMO Uniform Mechanical Code, ICC International Mechanical Code, or CSA B52. All field joints shall be accessible for inspection prior to being covered or enclosed.
- Do not install in a wet room such as a bathroom or laundry room due to a risk of fire or electric shock.
- The indoor unit is for R32. See the catalog for indoor models that can be connected. Normal operation is not possible when connected to other units.
- Indoor units are for indoor installation only. Outdoor units are for outdoor installation only. When installing outdoor units indoors, be sure to equip them with the refrigerant sensor kit options and to provide the required ventilation in accordance with ASHRAE 15 and local standards and building codes.
- Do not install the air conditioner or heat pump in the following locations:
  - (a) Where a mineral oil mist or oil spray or vapor is produced, for example, in a kitchen.  
Plastic parts may deteriorate and fall off or result in water leakage.
  - (b) Where corrosive gas, such as sulfurous acid gas, is produced.  
Corroding copper pipes or soldered parts may result in refrigerant leakage.
  - (c) Near machinery emitting electromagnetic waves.  
Electromagnetic waves may disturb the operation of the control system and cause the unit to malfunction.
  - (d) Where flammable gas may leak, where there is carbon fiber, or ignitable dust suspension in the air, or where volatile flammables such as thinner or gasoline are handled.  
Operating the unit in such conditions may result in a fire.
- Take adequate measures to prevent the outdoor unit from being used as a shelter by small animals. Small animals making contact with electrical parts may result in malfunctions, smoke, or fire. Instruct the customer to keep the area around the unit clean.
- This product is designed for installation at a max altitude of 10500 ft. (3200 m) above sea level or a min altitude of -184 ft. (-56 m) below sea level.

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### **⚠ CAUTION**

- Do not touch the switch with wet fingers. Touching a switch with wet fingers can cause electric shock.
- Do not allow children to play on or around the unit to prevent injury.
- Do not touch the refrigerant pipes during and immediately after operation as the refrigerant pipes may be hot or cold, depending on the condition of the refrigerant flowing through the refrigerant piping, compressor, and other refrigerant cycle parts. Your hands may suffer burns or frostbite if you touch the refrigerant pipes. To avoid injury, give the pipes time to return to normal temperature or, if you must touch them, be sure to wear proper gloves.
- Heat exchanger fins are sharp enough to cut. To avoid injury wear gloves or cover the fins when working around them.
- Close the front panels when charging refrigerant or during operation as the fusible plug may blow off, spewing refrigerant.
- Install drain piping to proper drainage. Improper drain piping may result in water leakage and property damage.
- Insulate piping to prevent condensation.
- Be careful when transporting the unit.
- Do not turn off the power supply immediately after stopping operation. Always wait for at least 5 minutes before turning off the power supply. Otherwise, water leakage may occur.
- Do not use a charging cylinder. Using a charging cylinder may cause the refrigerant to deteriorate.
- Refrigerant R32 in the system must be kept clean, dry, and tight.
  - (a) Clean and Dry - Foreign materials (including mineral oils such as SUNISO oil or moisture) should be prevented from getting into the system.
  - (b) Tight - R32 does not contain any chlorine, does not destroy the ozone layer, and does not reduce the earth's protection against harmful ultraviolet radiation. R32 can contribute to the greenhouse effect if it is released. Therefore take proper measures to check for the tightness of the refrigerant piping installation. Read the chapter Refrigerant Piping and follow the procedures.

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### **⚠ NOTE**

- Install the power supply and transmission wires for the indoor and outdoor units at least 3.5 ft. (1 m) away from televisions or radios to prevent image interference or noise. Depending on the radio waves, a distance of 3.5 ft. (1 m) may not be sufficient to eliminate the noise.
- Dismantling the unit, treatment of the refrigerant, oil and additional parts must be done in accordance with the relevant local, state, and national regulations.
- Do not use the following tools that are used with other refrigerants: gauge manifold, charge hose, gas leak detector, reverse flow check valve, refrigerant charge base, vacuum gauge, or refrigerant recovery equipment.
- If the other refrigerant and refrigerator oil are mixed in R32, the refrigerant may deteriorate.
- This air conditioner or heat pump is an appliance that should be installed such that it is not accessible to general public.
- As maximum allowable pressure is 580 psi (4.0 MPa), the wall thickness of field-installed pipes should be selected in accordance with the relevant local, state, and national regulations.

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## **Codes and Regulations**

This product is designed and manufactured to comply with national codes. Installation in accordance with such codes and/or prevailing local codes/regulations is the responsibility of the installer. The manufacturer assumes no responsibility for equipment installed in violation of any codes or regulations. Rated performance is achieved after 72 hours of operation.

Make sure to use a DAIKIN specified checker while measuring sub cooling. Do not use the check valve or the other port to measure it.

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The original instructions are written in English.  
All other languages are translations of the original instructions.

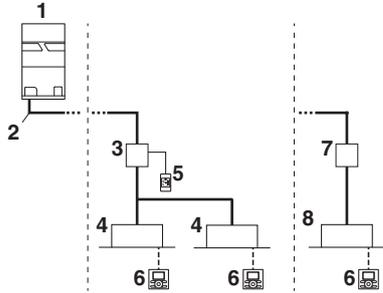
# 1. Introduction

## 1.1. General information

This installation manual concerns the VRV REYA-A/RXYA-A series, full inverter driven, heat pump system.

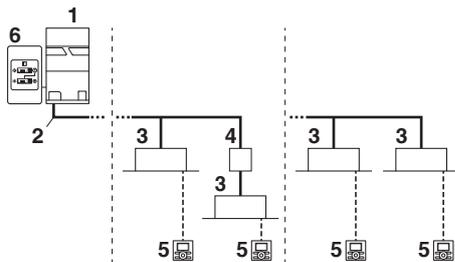
Model	Description
REYA72-480	Heat recovery system for single or multi-use
RXYA72-480	Heat pump system for single or multi-use

### Heat recovery system: REYA-A series



- 1 Outdoor unit
- 2 Refrigerant piping
- 3 Branch Selector unit
- 4 VRV indoor unit
- 5 Cool/Heat selector (single Branch Selector unit only)
- 6 User interface (dedicated depending on indoor unit type)
- 7 Safety shut-off valve unit\*
- 8 VRV indoor unit (cooling only)

### Heat pump system: RXYA-A series



- 1 Outdoor unit
- 2 Refrigerant piping
- 3 VRV indoor unit
- 4 Safety shut-off valve unit\*
- 5 User interface (dedicated depending on indoor unit type)
- 6 Cool/Heat selector

\* Necessity of safety shut-off valve unit is determined based on the system refrigerant amount, the room floor space, and other technical elements. For details, refer to the General Safety Considerations in the separate booklet.

### INFORMATION

Not all combinations of indoor units are allowed. For guidance, see 1.2. Combinations and options.

### NOTE

When the outdoor unit is connected to the AHU(Air Handling Unit) Integration kit, refer to its installation manual and Engineering data for detailed information. For any content not covered in those manuals, please refer to this installation manual.

## 1.2. Combinations and options

The VRV REYA-A/RXYA-A series can be combined with several types of indoor units and is intended for R32 use only.

For an overview which units are available, please consult the product catalogue for VRV REYA-A/RXYA-A series.

### NOTE

To ensure that the system set up will work, consult the latest Engineering Data Book for REYA-A/RXYA-A series.

An overview is given indicating the allowed combinations of indoor units and outdoor units. Not all combinations are allowed. They are subject to rules (combination between outdoor-indoor, single outdoor unit use, multiple outdoor units use, combinations between indoor units, etc.) mentioned in the Engineering Data Book.

### NOTE

The Branch Selector units that combined with REYA-A units for changing the refrigerant flow to indoor units are A type (BSA-A\*, BSF-A54A\*\*) only. Do not use T types in the system as it will cause malfunction.

### 1.2.1. Indoor units combinations

In general following type of indoor units can be connected to a VRV REYA-A/RXYA-A series. The list is non-exhaustive and depends on both outdoor unit model and indoor unit model combinations.

#### REYA-A/RXYA-A series

- VRV indoor units
- Third-party AHU\*

\* AHU Integration kit is required. See latest Engineering Data Book for more details.

### 1.2.2. Outdoor units combinations

Combination for REYA-A/RXYA-A units are as indicated in tables right, where REYA/RXYA 264-480 consists of multiple REYA/RXYA 120-240 single modules as indicated.

#### Heat recovery system: REYA-A series

	72	96	120	144	168	192	216	240
REYA72AATJ*/AAYD*	1							
REYA96AATJ*/AAYD*		1						
REYA120AATJ*/AAYD*			1					
REYA144AATJ*/AAYD*				1				
REYA168AATJ*/AAYD*					1			
REYA192AATJ*/AAYD*						1		
REYA216AATJ*/AAYD*							1	
REYA240AATJ*/AAYD*								1
REYA264AATJ*/AAYD*			1	1				
REYA288AATJ*/AAYD*				2				
REYA312AATJ*/AAYD*				1	1			
REYA336AATJ*/AAYD*					2			
REYA360AATJ*/AAYD*					1	1		
REYA384AATJ*/AAYD*						2		
REYA408AATJ*/AAYD*						1	1	
REYA432AATJ*/AAYD*							2	
REYA456AATJ*/AAYD*							1	1
REYA480AATJ*/AAYD*								2

#### Heat pump system: RXYA-A series

	72	96	120	144	168	192	216	240
RXYA72AATJ*/AAYD*	1							
RXYA96AATJ*/AAYD*		1						
RXYA120AATJ*/AAYD*			1					
RXYA144AATJ*/AAYD*				1				
RXYA168AATJ*/AAYD*					1			
RXYA192AATJ*/AAYD*						1		
RXYA216AATJ*/AAYD*							1	
RXYA240AATJ*/AAYD*								1
RXYA264AATJ*/AAYD*			1	1				
RXYA288AATJ*/AAYD*				2				
RXYA312AATJ*/AAYD*				1	1			
RXYA336AATJ*/AAYD*					2			
RXYA360AATJ*/AAYD*					1	1		
RXYA384AATJ*/AAYD*						2		
RXYA408AATJ*/AAYD*						1	1	
RXYA432AATJ*/AAYD*							2	
RXYA456AATJ*/AAYD*							1	1
RXYA480AATJ*/AAYD*								2

To install the outdoor unit, the following accessory parts are also required.

**1 Refrigerant branch kit**

Description	Model name	
	(for 3 pipes)	(for 2 pipes)
REFNET header	—	KHRA26M22HA
	KHRA25M33HA	KHRA26M33HA
	KHRA25M72HA	KHRA26M72HA
	KHRA25M73HA	KHRA26M73HA
REFNET joint	KHRA25A22TA	KHRA26A22TA
	KHRA25A33TA	KHRA26A33TA
	KHRA25M72TA	KHRA26M72TA
	KHRA25M73TA	KHRA26M73TA

For the selection of the optimal branch kit, refer to 7.4. Selection of refrigerant branch kits on page 13.

- 2 Outdoor unit multi connection piping kit**
  - BHFA26P100UA (In case of heat recovery system)
  - BHFA22P100UA (In case of heat pump system)
- 3 Reducer piping kit**
  - KHFA26P100UA
- 4 In order to control the cooling or heating operation from a central location, the following option can be connected:**
  - Cool/Heat selector: KRC19-26A
  - With optional fixing box for the switch: KJB111A
  - Centralized control devices (e.g., intelligent Touch Manager)\*

\* D3 to D4 conversion unit (BRD72A-L) is required when using the centralized control device.
- 5 To instruct specific operation with an external input coming from a central control the external control adaptor (DTA104A62) can be used. Instructions (group or individual) can be instructed for low noise operation and power consumption limitation operation.**
- 6 For REYA-A/RXYA-A units it is also possible to make several commissioning field settings through a personal computer interface. For this operation, an optional cable is required which is a dedicated cable to communicate with the outdoor unit. The software for the user interface program can be obtained from your local Daikin sales office.**

**i INFORMATION**  
Refer to the Engineering Data Book for the latest option names.

**1.3. Indoor capacity range**

**1.3.1. Connection Ratio**

Connection Ratio = Total capacity index of the indoor units / Capacity index of the outdoor units

Type	Min. connection ratio	
	Types of connected outdoor units	
	REYA-A/RXYA-A type	
Single outdoor unit	6 - 14 ton	50%
	16 - 20 ton	
Double outdoor units		

Type	Max. connection ratio *2			
	Types of connected indoor units			
	When using only FXDA, FXAA07-24, FXSA07	When using at least one FXFA07/09, FXAA05, FXZA05, FXSA05	When using at least one FXTA	When using other indoor unit models
Single outdoor unit	6 - 14 ton	180% *1,*3	130%	200% *1,*3
	16 - 20 ton	200% *1	180% *1,*3	130%
Double outdoor units		160% *1,*3	130%	160% *1,*3

**Notes:** \*1. If the operational capacity of indoor units is more than 130%, low airflow operation is enforced in all the indoor units. This limitation can be abolished through field setting. See [2-34]= Indoor unit fan tap setting on page 42.

- \*2. For indoor units used for cooling only (do not connect to Branch selector unit when using for heat recovery), total capacity index of cooling only indoor units must be 50% or less than the total capacity index of the indoor units.
  - \*3. Simultaneous operation of over 130% ID units (\*) is not allowed. (If it happens, all ID fans go to L-tap and the airflow decrease automatically. Also, as cold draft problem might happen due to shortage of capacity, limit ID unit connection ratio to 130% or less if the simultaneous operation capacity can not be controlled.) See [2-34]= Indoor unit fan tap setting on page 42.
- (\*) Cooling thermo-on capacity or Heating thermo-on capacity. With field setting, the above limitation can be abolished.

**1.3.2. Outdoor Unit Combinations**

Total capacity of indoor units needs to be within the specified range.

REYA-A/RXYA-A type	<Outdoor unit>	<Total capacity index of indoor units>
REYA72A/RXYA72A	.....	36-93
REYA96A/RXYA96A	.....	48-124
REYA120A/RXYA120A	.....	60-156
REYA144A/RXYA144A	.....	72-187
REYA168A/RXYA168A	.....	84-218
REYA192A/RXYA192A	.....	96-249
REYA216A/RXYA216A	.....	108-280
REYA240A/RXYA240A	.....	120-312
REYA264A/RXYA264A	.....	132-343
REYA288A/RXYA288A	.....	144-374
REYA312A/RXYA312A	.....	156-405
REYA336A/RXYA336A	.....	168-436
REYA360A/RXYA360A	.....	180-468
REYA384A/RXYA384A	.....	192-499
REYA408A/RXYA408A	.....	204-530
REYA432A/RXYA432A	.....	216-561
REYA456A/RXYA456A	.....	228-592
REYA480A/RXYA480A	.....	240-624

**! NOTE**  
Higher capacity than the above table can be selected, this may affect heating and cooling capacity. For additional information see the Engineering Data Book.

**1.4. Scope of the manual**

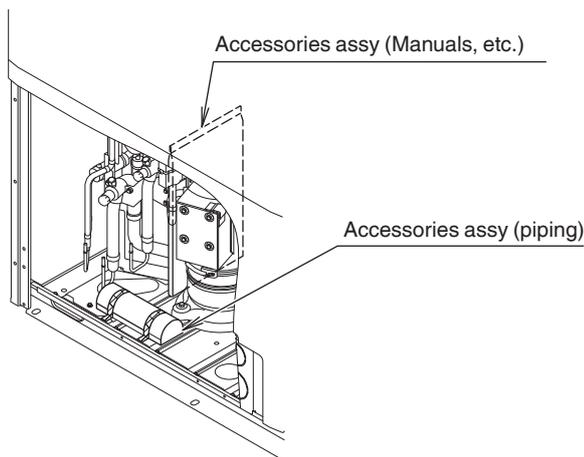
This manual describes the procedures for handling, installing and connecting the VRV REYA-A/RXYA-A series outdoor units. This manual has been prepared to ensure adequate maintenance of the unit, and it will provide help in case problems occur.

**i INFORMATION**  
The installation of the indoor unit(s) is described in the indoor unit installation manual provided with the indoor unit(s).

## 2. Accessories

### 2.1. Accessories supplied with this unit

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



#### NOTE

Do not throw away any of the accessories until installation is complete. They are needed for installation work.

For Heat recovery (REYA-A series) and Heat pump (RXYA-A series) system:

Name	Clamp	Manuals, etc.	L type accessory joint
Quantity	7 pcs.	1 pc. each	1 pc.
Shape		<ul style="list-style-type: none"> <li>• Operation Manual</li> <li>• General Safety Considerations</li> <li>• Installation Manual</li> <li>• Additional Refr. Charge Label (Installation records)</li> <li>• Caution Label</li> <li>• Operation Manual (Regarding copyright) (1)</li> <li>• Operation Manual (Regarding copyright) (2)</li> </ul>	

For Heat recovery (REYA-A series) and Heat pump (RXYA-A series) system:

Name	Liquid side accessory pipe (1)	Liquid side accessory pipe (2)
Quantity	1 pc.	1 pc.
Shape		 96A 192, 216A

Heat recovery system (REYA-A series) only:

Name	High/low gas side accessory pipe (1)	High/low gas side accessory pipe (2)	Gas side accessory pipe (1)	Gas side accessory pipe (2)
Quantity	1 pc.	1 pc.	1 pc.	1 pc.
Shape		 72,96,168-240A 144A	 72A 92-120A 144-240A	 72A 96A-120A

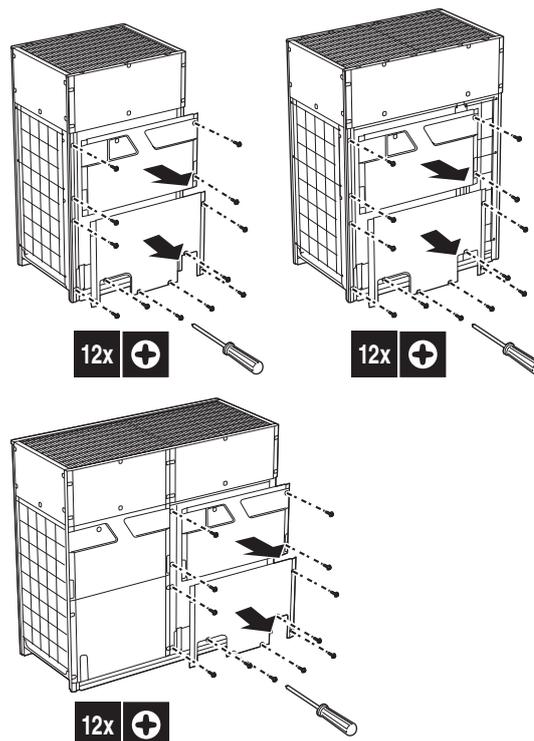
Heat pump system (RXYA-A series) only:

Name	High/low gas side accessory pipe (1)	High/low gas side accessory pipe (2)
Quantity	1 pc.	1 pc.
Shape		 96,120A 144-240A

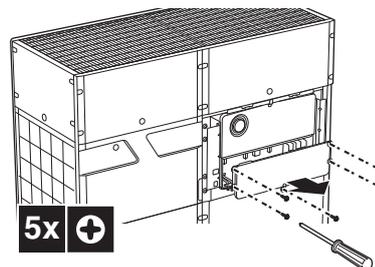
## 3. Overview of unit

### 3.1. Opening the unit

To gain access to the unit, front panels need to be opened as follows:



Once the front panel open, the control box can be accessed by removing the control box cover as follows.



For service purposes, the push buttons on the main printed circuit board need to be accessed. To access these push buttons, the control box cover does not need to be opened. See 13. Making field settings on page 31.

#### ⚠ DANGER: ELECTRICAL SHOCK

See Safety considerations on page i.

#### ⚠ DANGER: DO NOT TOUCH PIPING AND INTERNAL PARTS

See Safety considerations on page i.

### 3.2. Technical and Electrical specifications

Refer to the Engineering Data Book for the complete list of specifications.

### 3.3. Main components

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

## 4. Selecting an installation location

### ⚠ WARNING

Be sure to provide for adequate measures in order to prevent that the unit is used as a shelter by small animals.  
Small animals making contact with electrical parts can cause malfunctions, smoke or fire. Please instruct the customer to keep the area around the unit clean and clear.  
In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

### ⚠ CAUTION

Appliance not accessible to the general public, install it in a secured area, protected from easy access.  
This unit, both indoor and outdoor, is suitable for installation in a commercial and light industrial environment.

### 4.1. General precautions on installation

Select an installation site that meets the following requirements:

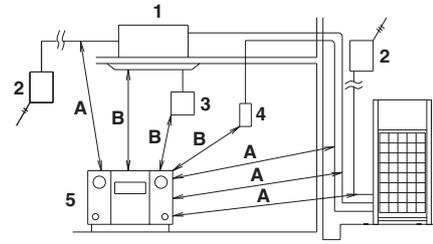
- The foundation must be strong enough to support the weight of the unit.
- Installation location is flat to prevent vibrations and noise generation and to have sufficient stability.
- The space around the unit is adequate for maintenance and servicing (refer to 5.2. Service space on page 8).
- The space around the unit allows for sufficient air circulation. This is because there is a risk of fire due to leakage of slightly combustible gas.
- The equipment is not intended for use in a potentially explosive atmosphere.
- Select the location of the unit in such a way that the sound generated by the unit does not disturb anyone, and the location is selected according the applicable legislation.
- All piping lengths and distances have been taken into consideration (refer to 7.5. System piping (length) limitations on page 14).
- Take care that in the event of a water leak, water cannot cause any damage to the installation space and surroundings.
- When installing the unit in a small room, take measures in order to keep the refrigerant concentration from exceeding allowable safety limits in the event of a refrigerant leak, refer to 18. Caution for refrigerant leaks on page 55 and the General Safety Considerations in the separate booklet.

### ⚠ CAUTION

Excessive refrigerant concentrations in a closed room can lead to oxygen deficiency and fire.

### ⚠ NOTE

The equipment described in this manual may cause electronic noise generated from radio-frequency energy. The equipment complies to specifications that are designed to provide reasonable protection against such interference. However, there is no guarantee that interference will not occur in a particular installation.  
It is therefore recommended to install the equipment and electric wires keeping proper distances away from stereo equipment, personal computers, etc.  
Take necessary measure to minimize harmonic interference as needed.



- 1 Indoor unit
  - 2 Branch switch, overcurrent breaker
  - 3 Remote controller
  - 4 Cool/Heat selector
  - 5 Personal computer or radio
- A  $\geq 60$  in. (1500 mm)  
B  $\geq 40$  in. (1000 mm)

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.

Particularly for locations with weak reception, ensure there is a distance of at least 10 ft. (3 m) for indoor remote controllers, place power wiring and transmission wiring in conduits, and ground the conduits.

- The refrigerant R32 itself is nontoxic and safe but mildly flammable. If the refrigerant should leak, 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 18. Caution for refrigerant leaks on page 55.
- Do not install in the following locations:
  - Locations where sulfurous acids and other corrosive gases may be present in the atmosphere. Copper piping and soldered joints may corrode, causing refrigerant to leak.
  - Locations where a mineral oil mist, spray or vapor may be present in the atmosphere. Plastic parts may deteriorate and fall off or cause water leakage.
  - Locations where equipment that produces electromagnetic waves is found. The electromagnetic waves may cause the control system to malfunction, preventing normal operation.
  - Locations where flammable gases may leak, where thinner, gasoline and other volatile substances are handled, or where carbon dust and other incendiary substances are found in the atmosphere. Leaked gas may accumulate around the unit, causing an explosion.
- When installing, take strong winds, hurricanes or earthquakes into account, improper installation may result in the unit turning over.

### 4.2. Weather related precautions

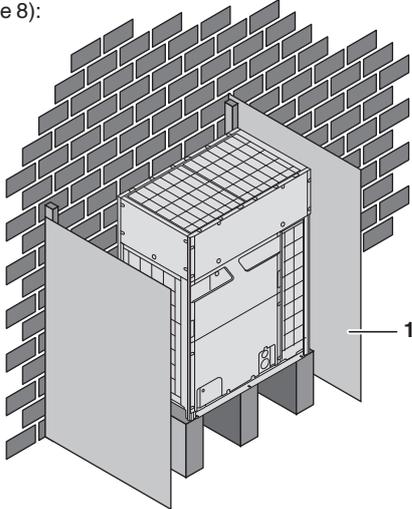
- Be sure that the air inlet of the unit is not positioned towards the main wind direction. Frontal wind will disturb the operation of the unit. If necessary, use a screen to block the wind.
- Ensure that water cannot cause any damage to the location by adding water drains to the foundation and prevent water traps in the construction.
- When installing in areas where air contains high levels of salt such as near the ocean; Contact your Daikin sales representative for additional precautions.

### 4.3. Selecting a location in cold climates

**NOTE**

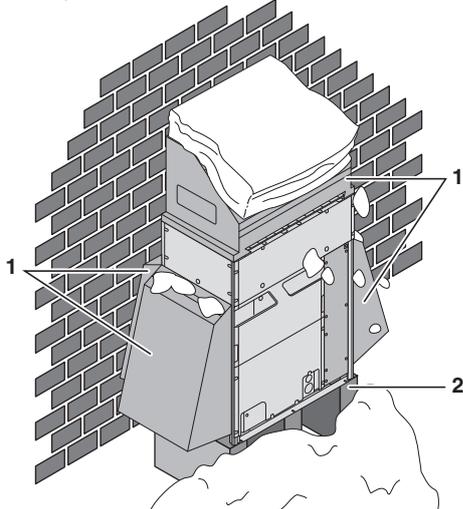
- When operating the unit in a low outdoor ambient temperature, be sure to follow the instructions described below.
- The following images are for reference only. For more details contact your local dealer.

To minimize exposure to wind and snow, install baffle plates on the air side of the outdoor unit (see 5.2. Service space for space requirement on page 8):



1 Baffle plates

In heavy snowfall areas it is very important to select an installation site where the snow will not affect the unit. When installing the unit in a location where there is heavy snowfall, remove the coil guards to prevent snow from accumulating on the fins, and install the snow/wind hood kit (optional accessory) or/and a top canopy (field supply). When installing a canopy, be careful not to create a short circuit and to leave enough space between the canopy and top of the unit for proper air discharge. If lateral snowfall is possible, make sure that the heat exchanger coil is not affected by the snow (if necessary construct a lateral canopy). Install the outdoor unit so that the bottom frame is at least 19-11/16 in. (500 mm) above predicted snowfall levels.



1 Snow/wind hood kit  
2 Pedestal

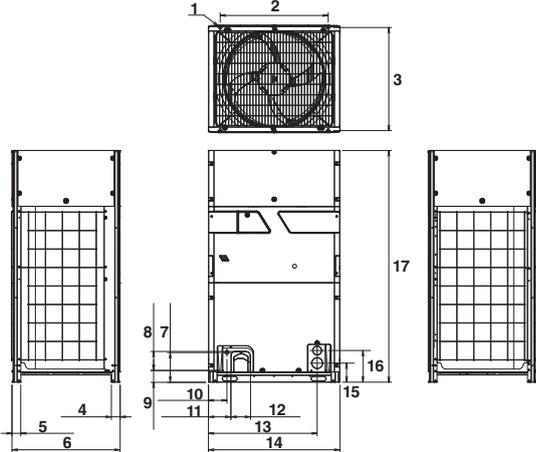
**NOTE**

When operating the unit in a low outdoor ambient temperature with high humidity conditions, make sure to take precautions to keep the drain holes of the unit free.

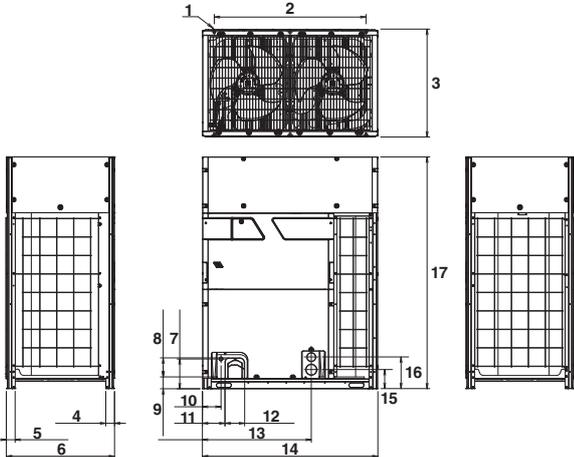
5. Dimensions and service space

5.1. Dimensions of outdoor unit

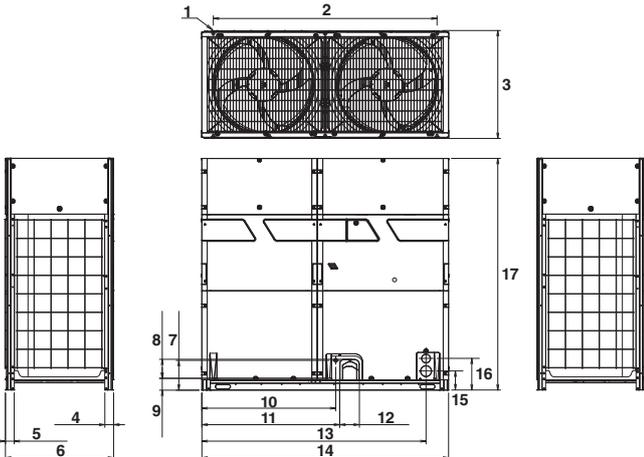
REYA72A type  
RXYA72A type



REYA96-168A type  
RXYA96-168A type



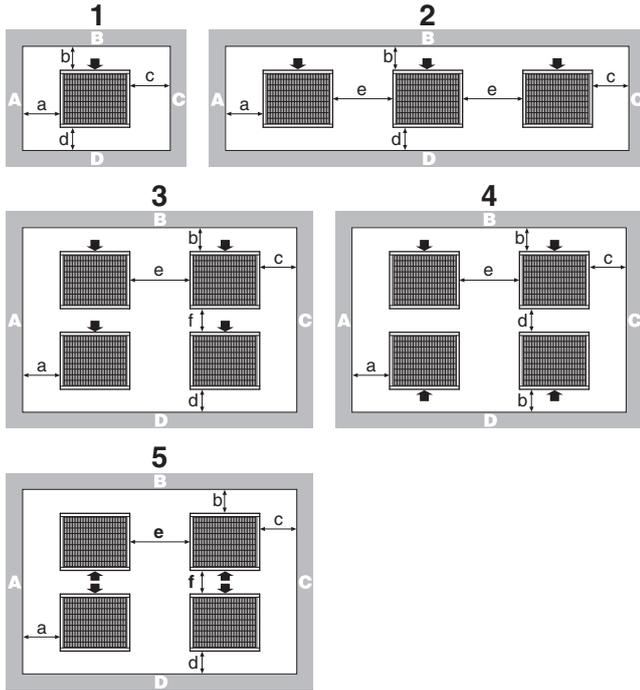
REYA192-240A type  
RXYA192-240A type



	REYA72A RXYA72A	REYA96-168A RXYA96-168A	REYA192-240A RXYA192-240A
1	Foundation bolt holes 9/16 (15) × 7/8 (22.5) oblong holes×4		
2	Pitch of foundation bolt holes 30-3/16 (766)      42-3/8 (1076)      62-7/16 (1586)		
3	Pitch of foundation bolt holes 28-7/16~29 (722~737)		
4	2-7/16 (62)		
5	2-7/16 (62)		
6	30-1/8 (765)		
7	8-3/8 (213)		
8	5-3/8 (136)		
9	3-3/8 (85)		
10	5-3/16 (131)		37-7/16 (951)
11	6-1/4 (159)		38-9/16 (979)
12	5-1/2 (140)		
13	30-3/8 (771)		62-5/8 (1591)
14	36-5/8 (930)	48-13/16 (1240)	68-7/8 (1750)
15	5-3/8 (136)		
16	8-7/8 (226)		
17	65-3/8 (1660)		

## 5.2. Service space

The space around the unit is adequate for servicing and the minimum space for air inlet and air outlet is available (refer to the figure below and choose one of the possibilities).

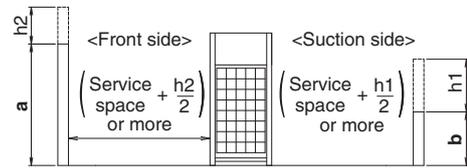


**ABCD** Sides along the installation site with obstacles  
 ➔ Suction side (Back side of unit)

The figure above applies to all types.

	A+B+C+D		A+B
<b>1</b>	a ≥ 3/8 (10) b ≥ 11-13/16 (300) c ≥ 3/8 (10) d ≥ 19-11/16 (500)*1	a ≥ 1-15/16 (50) b ≥ 3-15/16 (100) c ≥ 1-15/16 (50) d ≥ 19-11/16 (500)*1	a ≥ 7-7/8 (200) b ≥ 11-13/16 (300)
<b>2</b>	a ≥ 3/8 (10) b ≥ 11-13/16 (300) c ≥ 3/8 (10) d ≥ 19-11/16 (500)*1 e ≥ 13/16 (20)	a ≥ 1-15/16 (50) b ≥ 3-15/16 (100) c ≥ 1-15/16 (50) d ≥ 19-11/16 (500)*1 e ≥ 3-15/16 (100)	a ≥ 7-7/8 (200) b ≥ 11-13/16 (300) e ≥ 15-3/4 (400)
<b>3</b>	a ≥ 3/8 (10) b ≥ 11-13/16 (300) c ≥ 3/8 (10) d ≥ 19-11/16 (500)*1 e ≥ 13/16 (20) f ≥ 23-5/8 (600)*1	a ≥ 1-15/16 (50) b ≥ 3-15/16 (100) c ≥ 1-15/16 (50) d ≥ 19-11/16 (500)*1 e ≥ 3-15/16 (100) f ≥ 19-11/16 (500)*1	Unit: in.(mm)
<b>4</b>	a ≥ 3/8 (10) b ≥ 11-13/16 (300) c ≥ 3/8 (10) d ≥ 19-11/16 (500)*1 e ≥ 13/16 (20)	a ≥ 1-15/16 (50) b ≥ 3-15/16 (100) c ≥ 1-15/16 (50) d ≥ 19-11/16 (500)*1 e ≥ 3-15/16 (100)	
<b>5</b>	a ≥ 3/8 (10) b ≥ 19-11/16 (500)*1 c ≥ 3/8 (10) d ≥ 19-11/16 (500)*1 e ≥ 13/16 (20) f ≥ 35-7/16 (900)	a ≥ 1-15/16 (50) b ≥ 19-11/16 (500)*1 c ≥ 1-15/16 (50) d ≥ 19-11/16 (500)*1 e ≥ 3-15/16 (100) f ≥ 23-5/8 (600)	

\*1 It is not mandatory but recommended to leave 28 in. (710 mm) distance in front of the equipment if enough working space is needed for service work.



- a 59-1/16 in. (1500 mm)
- b 19-11/16 in. (500 mm)

- In case of an installation site where sides A+B+C+D have obstacles, the wall heights of sides A+C have no impact on service space dimensions. Refer to the foregoing figure for impact of wall heights of sides B+D on service space dimensions.
- In case of an installation site where only the sides A+B have obstacles, the wall heights have no influence on any indicated service space dimensions.

### **i** INFORMATION

- Please secure enough space in front of the outdoor unit for on-site installation of the refrigerant piping.
- The service space dimensions in above figure are based on cooling operation at 95°F (35°C) ambient temperature (standard conditions).
- If the design outdoor temperature exceeds 95°F (35°C) or the heat load exceeds maximum capacity in all the outdoor unit, take an even large space on the intake shown in figure 5.2. Service space.
- If installing snow guard (optional accessory), please incorporate the dimensions of the snow guard into the unit's outer dimensions in order to calculate the necessary amount of space.
- In places with low winter temperatures that may freeze the waste water created by defrosting during heating operation, please leave enough space between the bottom frame of the outdoor unit and its base. (19-11/16 in. (500 mm) to 39-3/8 in. (1000 mm) of space is recommended.)

### **i** INFORMATION

Further specifications can be found in the Engineering Data Book.

## 6. Inspecting, handling and unpacking the unit

### 6.1. Inspection

At delivery, the unit must be checked and any damage must be reported immediately to the carrier's claims agent.

### 6.2. Handling

1 When handling the unit, take into account the following:



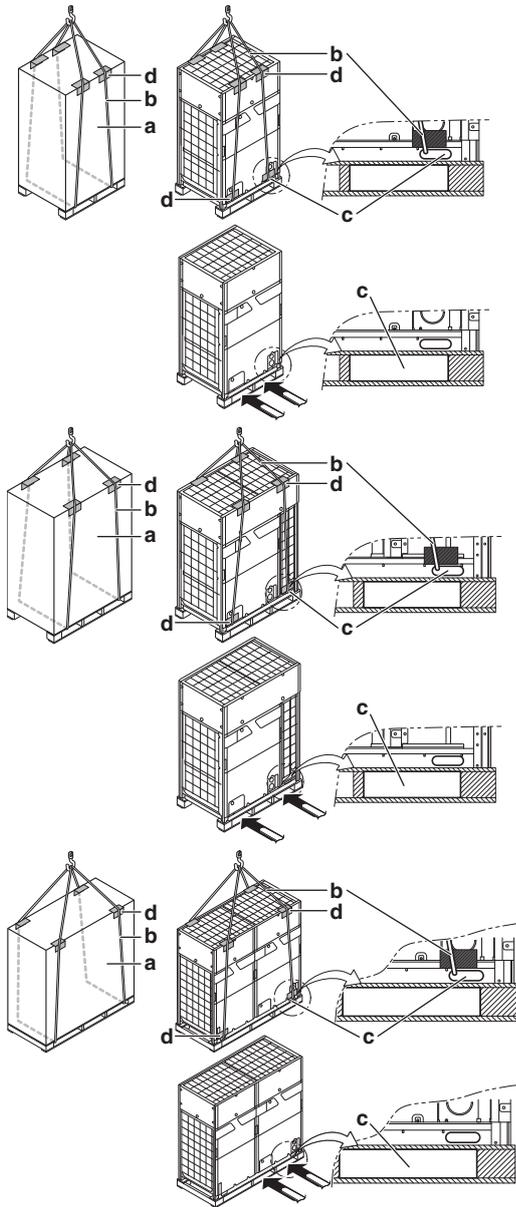
Fragile, handle the unit with care.



Keep the unit upright in order to avoid compressor damage.

2 Choose beforehand the path along which the unit is to be brought in.

3 Bring the unit as close as possible to its final installation position in its original package to prevent damage during transport.



- a Packaging material
- b Belt sling
- c Opening
- d Protector

- 4 Lift the unit preferably with a crane and 2 belts of at least 27 ft. (8 m) long as shown in the figure in step 3.  
Always use protectors to prevent belt damage and pay attention to the position of the unit's center of gravity.

#### NOTE

Use a belt sling of  $\leq 13/16$  in. (20 mm) wide that adequately bears the weight of the unit.

#### CAUTION

- Lift the unit with caution as the unit's center of gravity is slightly to the right side of center when seen from the front (especially, REYA192-240A/RXYA192-240A).
- A forklift can only be used for transport as long as the unit remains on its pallet as shown above.

### 6.3. Unpacking

#### CAUTION

To avoid injury, do not touch the air inlet or aluminum fins of the unit.

#### WARNING

Tear apart and throw away plastic packaging bags so that children will not play with them. Children playing with plastic bags face danger of death by suffocation.

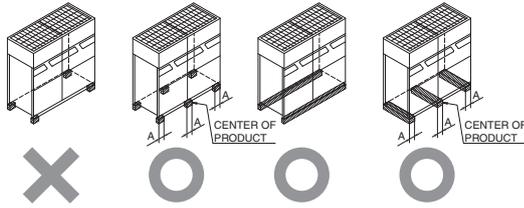
- 1 Remove the unit from its packing material.  
Take care not to damage the unit when unpacking.
- 2 Remove the 4 bolts fixing the unit to its pallet.
- 3 Make sure that all accessories as mentioned in 2.1. Accessories supplied with this unit on page 4 are available in the unit.

### 6.4. Installing the unit

Make sure the unit is installed level on a sufficiently strong base to prevent vibration and noise.

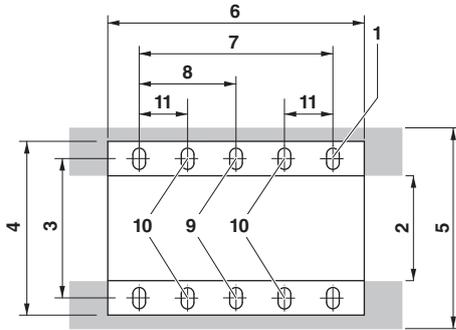
**NOTE**

When the installation height of the unit needs to be increased, do not use stands to only support the corners.



- A ≥3-15/16 in. (100 mm)
- X Not allowed
- O Allowed

- The height of the foundation must be at least 5-7/8 in. (150 mm) from the floor.  
In heavy snowfall areas, this height should be increased, depending on the installation place and condition.
- The unit must be installed on a solid longitudinal foundation (steel beam frame or concrete) and make sure the base under the unit is larger than the gray marked area.



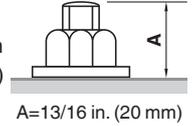
Dimensions for above figure

1	Hole for foundation bolt	9/16 in. (15 mm) × 7/8 in. (22.5 mm) oblong hole: 4 positions
2	Inner dimension of the base	≤25-1/4 in. (641 mm)
3	Distance between foundation bolt holes	29 in. (729 mm)
4	Width of unit	30-1/8 in. (765 mm)
5	Outer dimension of the base	≥30-1/8 in. (765 mm)
6	Longitudinal foundation dimension	REYA/RXYA72 type: 36-5/8 in. (930 mm) REYA/RXYA96-168 type: 48-13/16 in. (1240 mm) REYA/RXYA192-240 type: 68-7/8 in. (1750 mm)
7	Distance between foundation bolt holes	REYA/RXYA72 type: 30-3/16 in. (766 mm) REYA/RXYA96-168 type: 42-3/8 in. (1076 mm) REYA/RXYA192-240 type: 62-7/16 in. (1586 mm)
8	Distance between foundation bolt holes	REYA/RXYA72 type: 15-1/16 in. (383 mm) REYA/RXYA96-168 type: 21-3/16 in. (538 mm) REYA/RXYA192-240 type: 31-1/4 in. (793 mm)

9*1	Hole for foundation bolt	9/16 in. (15 mm) × 7/8 in. (22.5 mm) oblong hole: 2 positions
10*1	Hole for foundation bolt	9/16 in. (15 mm) × 7/8 in. (22.5 mm) oblong hole: 4 positions REYA/RXYA192-240 type only
11	Distance between foundation bolt holes	REYA/RXYA192-240 type only : 15-5/8 in. (397 mm)

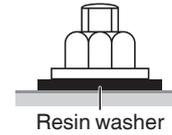
\*1 In areas where compliance with the FL Building Code is required, fix at 9 and 10 with foundation bolts.

- Fasten the unit in place using 4 foundation bolts 1/2 in. (M12). It is best to screw in the foundation bolts until their length remains 13/16 in. (20 mm) above the foundation surface.



**NOTE**

- There are restrictions on the refrigerant pipe connecting order between outdoor units in the case of the multi system. See 1.2.2. Outdoor units combinations on page 2 for detail.
- When installing on a roof, make sure the roof floor is strong enough and be sure to waterproof 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.
- For anti-corrosion type, use nuts with resin washers. If the paint on nut connections comes off, the anti-corrosion effect may decrease.



## 7. Refrigerant pipe size and allowable pipe length

### 7.1. General information

#### NOTE

When the outdoor unit is connected to the AHU(Air Handling Unit) Integration kit, refer to its installation manual and Engineering data for detailed information. For any content not covered in those manuals, please refer to this installation manual.

#### NOTE

The refrigerant R32 requires strict cautions for keeping the system clean, dry and tight.

- Clean and dry: foreign materials (including mineral oils or moisture) should be prevented from getting mixed into the system.
- Tight: R32 does not contain any chlorine, does not destroy the ozone layer, and does not reduce earth's protection against harmful ultraviolet radiation. R32 can contribute slightly to the greenhouse effect if it is released. Therefore we should take special attention to check the tightness of the installation.

### 7.2. Selection of piping material

#### NOTE

Piping and other pressure containing parts shall comply with the applicable legislation and shall be suitable for refrigerant. Use phosphoric acid deoxidized seamless copper for refrigerant.

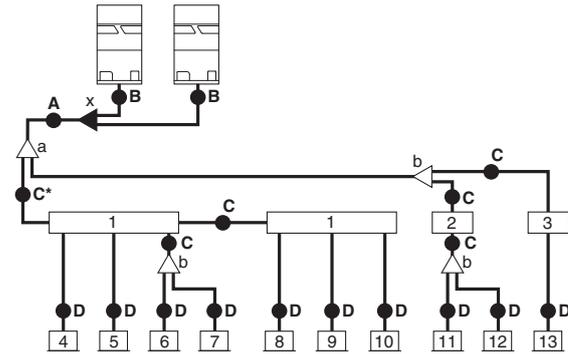
#### NOTE

- All field piping must be installed by a licensed refrigeration technician and must comply with relevant local and national regulations.
  - After piping work is complete, do not under any circumstances open the stop valve until 11. Field wiring on page 25 and 12. Checking of device and installation conditions on page 31 are complete.
  - Do not use flux when brazing the refrigerant piping. Use the phosphor copper brazing filler metal (B-Cu93P-710/795 : ISO 3677) which does not require flux. Flux has extremely negative effect on refrigerant piping systems. For instance, if the chlorine based flux is used, it will cause pipe corrosion or, in particular, if the flux contains fluorine, it will damage the refrigerant oil.
- 
- Use only pipes which are clean inside and outside and which do not accumulate harmful sulfur, oxidants, dirt, cutting oils, moisture, or other contamination. (Foreign materials inside pipes including oils for fabrication must be 0.14 gr/10 ft. (30 mg/10 m) or less.)
  - Use the following items for the refrigerant piping.
    - Material** : Jointless phosphor-deoxidized copper pipe.
    - Size** : See 7.3. Selection of piping size to determine the correct size.
    - Thickness** : Select a thickness for the refrigerant piping which complies with national and local laws.
  - For piping work, follow the maximum tolerated length, difference in height, and length after a branch indicated in the 7.5. System piping (length) limitations on page 14.
  - Outdoor unit multi connection piping kit and refrigerant branch kit (sold separately) are needed for connection of piping between outdoor units (in case of multi system) and piping branches.
  - Use only separately sold items selected specifically according to the outdoor unit multi connection piping kit, the refrigerant branch kit selection in the 7.4. Selection of refrigerant branch kits on page 13.

### 7.3. Selection of piping size

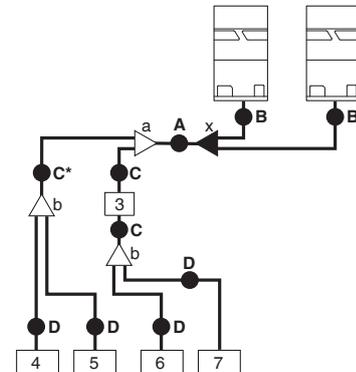
Determine the proper size referring to following tables and reference figure (only for indication).

#### In case of heat recovery system



- 1 Multi Branch Selector units
- 2 Single Branch Selector unit
- 3 Safety shut-off valve unit
- 4-13 VRV indoor units
- a, b Refrigerant branch kits
- x Outdoor unit multi connection piping kit

#### In case of heat pump system



- 3 Safety shut-off valve unit
- 4-7 VRV indoor unit
- a, b Refrigerant branching kit
- x Outdoor unit multi connection piping kit

### 7.3.1. Piping between outdoor units and (first) refrigerant branch kit: A, B

Choose from the following table in accordance with the outdoor unit total capacity type, connected downstream.

#### In case of heat recovery system

Outdoor unit capacity type	Piping outer diameter size		
	Suction gas pipe	High/low pressure gas pipe	Liquid pipe
REYA72A type	3/4 in. (19.1 mm)	5/8 in. (15.9 mm)	3/8 in. (9.5 mm)
REYA96A type	7/8 in. (22.2 mm)		
REYA120A type		1-1/8 in. (28.6 mm)	3/4 in. (19.1 mm)
REYA144A type			
REYA168A type	7/8 in. (22.2 mm)		
REYA192A type			
REYA216A type			
REYA240A type			
REYA264A type	1-3/8 in. (34.9 mm)	1-1/8 in. (28.6 mm)	5/8 in. (15.9 mm)
REYA288A type			
REYA312A type			
REYA336A type			
REYA360A type			
REYA384A type			
REYA408A type	1-5/8 in. (41.3 mm)		3/4 in. (19.1 mm)
REYA432A type			
REYA456A type			
REYA480A type			

#### In case of heat pump system

Outdoor unit capacity type	Piping outer diameter size	
	Gas pipe	Liquid pipe
RXYA72A type	3/4 in. (19.1 mm)	3/8 in. (9.5 mm)
RXYA96A type	7/8 in. (22.2 mm)	
RXYA120A type		1-1/8 in. (28.6 mm)
RXYA144A type		
RXYA168A type		
RXYA192A type		
RXYA216A type		
RXYA240A type		
RXYA264A type	1-3/8 in. (34.9 mm)	5/8 in. (15.9 mm)
RXYA288A type		
RXYA312A type		
RXYA336A type		
RXYA360A type		
RXYA384A type		
RXYA408A type	1-5/8 in. (41.3 mm)	3/4 in. (19.1 mm)
RXYA432A type		
RXYA456A type		
RXYA480A type		

### 7.3.2. Piping between refrigerant branch kits, Branch Selector units, Safety shut-off valve units or refrigerant branch kits and Branch Selector units or Safety shut-off valve units: C

Choose from the following table in accordance with the indoor unit total capacity, connected downstream. Do not let the connection piping exceed the refrigerant piping size chosen by the general system model name. When selecting 2 pipes line (gas pipe and liquid pipe), use Suction gas pipe column for gas pipe and Liquid pipe column for liquid pipe.

#### In case of heat recovery system

Indoor unit capacity index	Piping outer diameter size		
	Suction gas pipe	High/low pressure gas pipe	Liquid pipe
<54	5/8 in. (15.9 mm)	1/2 in. (12.7 mm)	3/8 in. (9.5 mm)
54 ≤ x < 72	3/4 in. (19.1 mm)	5/8 in. (15.9 mm)	
72 ≤ x < 96	7/8 in. (22.2 mm)		3/4 in. (19.1 mm)
96 ≤ x < 120	1-1/8 in. (28.6 mm)	7/8 in. (22.2 mm)	
120 ≤ x < 144			
144 ≤ x < 216		5/8 in. (15.9 mm)	
216 ≤ x < 240			
240 ≤ x < 260	1-3/8 in. (34.9 mm)	1-1/8 in. (28.6 mm)	5/8 in. (15.9 mm)
260 ≤ x < 380			
≥380	1-5/8 in. (41.3 mm)		3/4 in. (19.1 mm)

#### Example:

Downstream capacity for C\* = capacity index of (unit 3 + unit 4 + unit 5 + unit 6 + unit 7 + unit 8 + unit 9)

#### In case of heat pump system

Indoor unit capacity index	Piping outer diameter size	
	Gas pipe	Liquid pipe
< 54	5/8 in. (15.9 mm)	3/8 in. (9.5 mm)
54 ≤ x < 72	3/4 in. (19.1 mm)	
72 ≤ x < 96	7/8 in. (22.2 mm)	1/2 in. (12.7 mm)
96 ≤ x < 120		
120 ≤ x < 216	1-1/8 in. (28.6 mm)	5/8 in. (15.9 mm)
216 ≤ x < 260		
260 ≤ x < 380	1-3/8 in. (34.9 mm)	3/4 in. (19.1 mm)
≥380	1-5/8 in. (41.3 mm)	

#### Example:

Downstream capacity for C\* = capacity index of unit 1 + capacity index of unit 2

### 7.3.3. Piping between refrigerant branch kits or Branch Selector units or Safety shut-off valve units and indoor units: D

Pipe size for direct connection to indoor units must be the same as the connection size of the VRV indoor units.

Indoor unit capacity index	Piping outer diameter size	
	Gas pipe	Liquid pipe
05, 07, 09, 12, 15, 18	1/2 in. (12.7 mm)	1/4 in. (6.4 mm)
24, 30, 36, 42, 48, 54	5/8 in. (15.9 mm)	3/8 in. (9.5 mm)
72	3/4 in. (19.1 mm)	
96	7/8 in. (22.2 mm)	

#### 7.4. Selection of refrigerant branch kits

For piping example, refer to 7.3. Selection of piping size on page 11.

- When using REFNET joints at the first branch from the outdoor units, choose from the following table in accordance with the capacity of the outdoor unit (example: REFNET joint a - see 7.3. Selection of piping size).

Outdoor unit capacity type	Kit name
REYA/RXYA72, 120A type	KHRA25A33TA
REYA/RXYA144-264A type	KHRA25M72TA
REYA/RXYA288-480A type	KHRA25M73TA

- For REFNET joints other than the first branch (example REFNET joint b - see 7.3. Selection of piping size), select the proper branch kit model based on the total capacity of all indoor units connected after the refrigerant branch.

Indoor unit capacity index	Kit name	
	(for 3 pipes)	(for 2 pipes)
<72	KHRA25A22TA	KHRA26A22TA
72 ≤ x < 111	KHRA25A33TA	KHRA26A33TA
111 ≤ x < 246	KHRA25M72TA	KHRA26M72TA
≥ 246	KHRA25M73TA	KHRA26M73TA

- Concerning REFNET headers, choose from the following table in accordance with the total capacity of all the indoor units connected after the REFNET header.

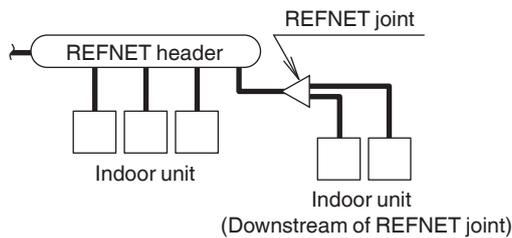
Indoor unit capacity index	Kit name	
	(for 3 pipes)	(for 2 pipes)
<72	KHRA25M33HA	KHRA26M22HA: maximum 4 indoor units or KHRA26M33HA: maximum 8 indoor units
72 ≤ x < 111		KHRA26M33HA
111 ≤ x < 230	KHRA25M72HA	KHRA26M72HA
≥ 230	KHRA25M73HA	KHRA26M73HA

#### **i** INFORMATION

Maximum 8 branches can be connected to a header.

#### **i** INFORMATION

The piping branch by REFNET joints is possible in the downstream of REFNET headers. Indoor unit total capacity at REFNET joints according to the REFNET header are as follows.



REFNET Header		Indoor unit total capacity at REFNET joint
(for 3 pipes)	(for 2 pipes)	
–	KHRA26M22HA	<18
KHRA25M33HA	KHRA26M33HA	
KHRA25M72HA	KHRA26M72HA	
KHRA25M73HA	KHRA26M73HA	≤54

- If the outdoor unit capacity type is 264 or more, an outdoor multi connection piping kit and reducer piping kit are always required.

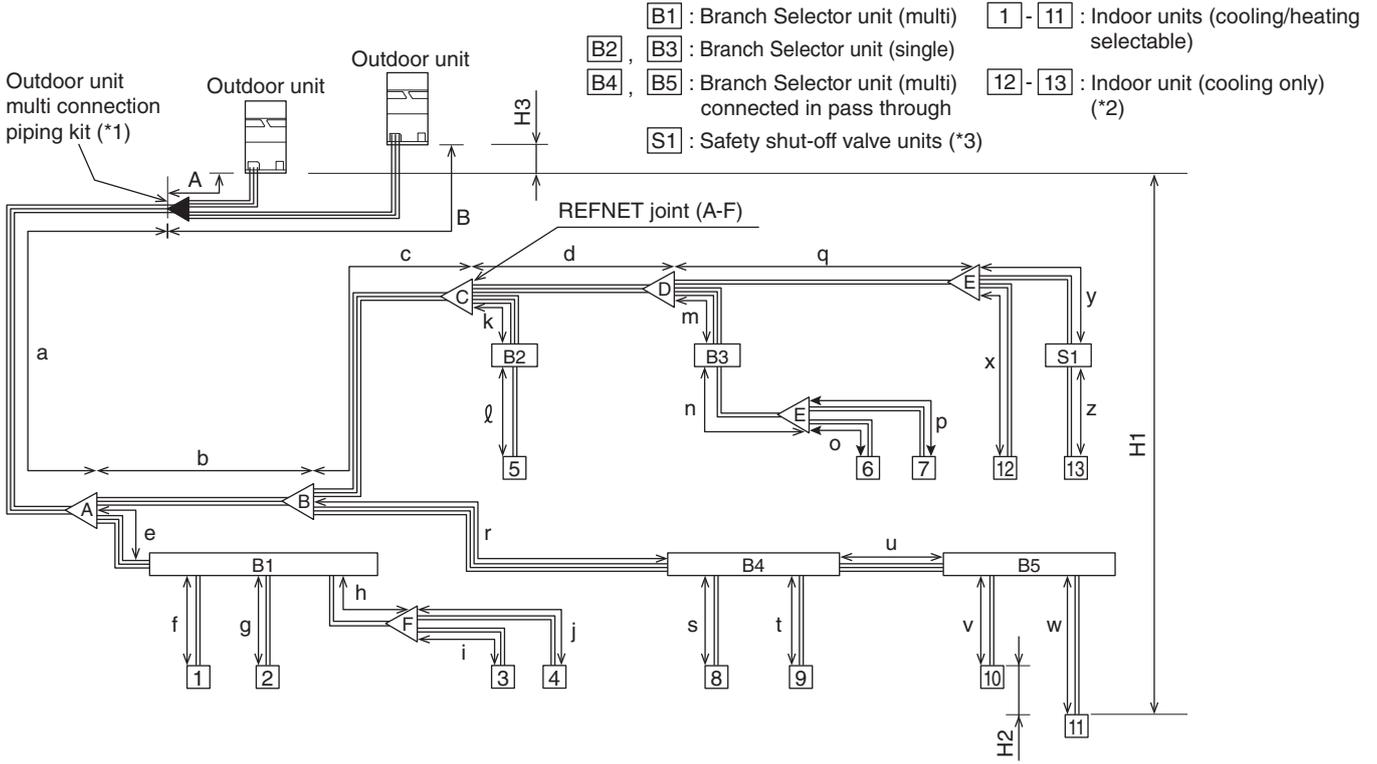
In case of heat recovery system	
Description	Model name
Outdoor unit multi connection piping kit	BHFA26P100UA
Reducer piping kit	KHFA26P100UA

In case of heat pump system	
Description	Model name
Outdoor unit multi connection piping kit	BHFA22P100UA
Reducer piping kit	KHFA26P100UA

### 7.5. System piping (length) limitations

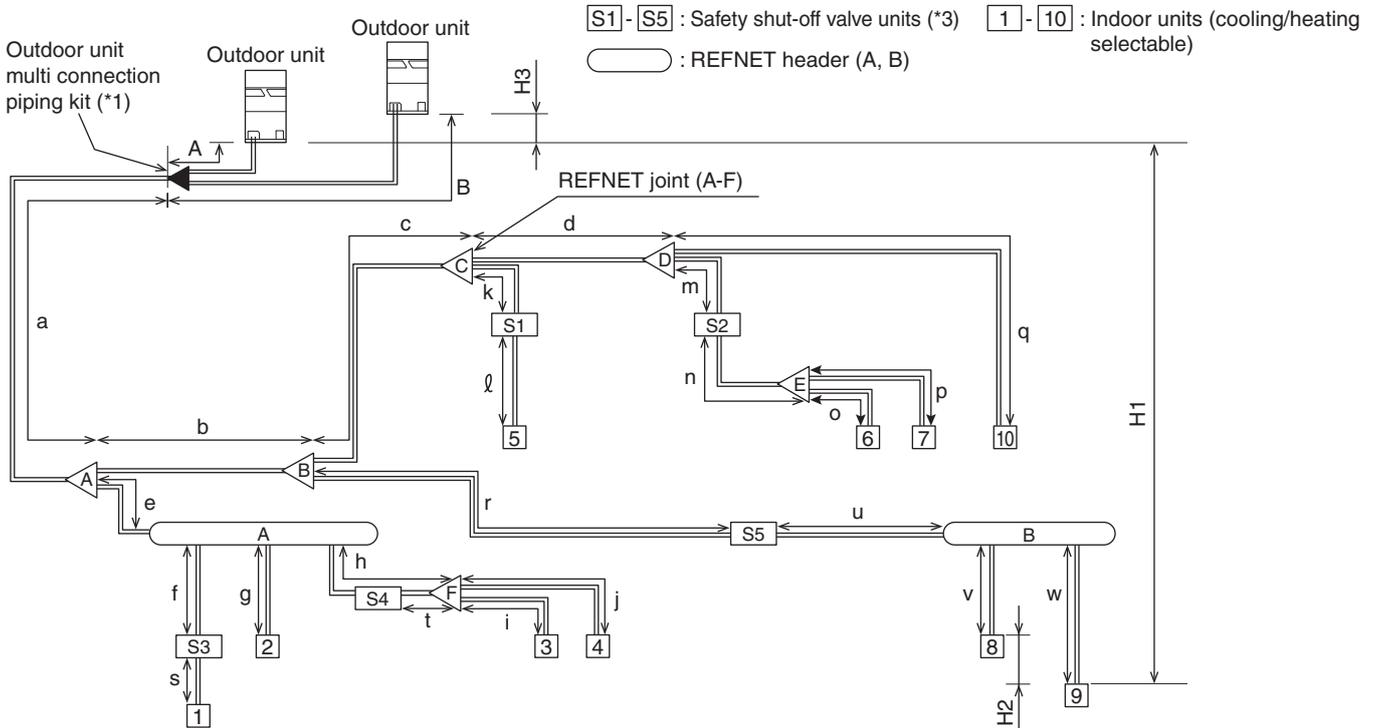
#### In case of heat recovery system

<Example of refrigerant piping (13 indoor units are connected)>



#### In case of heat pump system

<Example of refrigerant piping (10 indoor units are connected)>



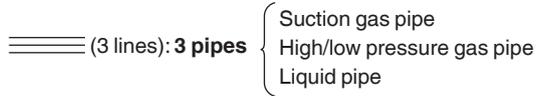
(\*1) “≡” represents an outdoor unit multi connection piping kit.

The outdoor unit multi connection piping kit must always be installed horizontally, paying attention to the installation restrictions indicated in **8. Precautions on refrigerant piping** on page 19.

<Example of connection>



**(1) Piping from outdoor units to Branch Selector units, and between Branch Selector units**



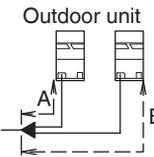
**(2) Piping from Branch Selector units to the indoor units, and from refrigerant branch kits to the cooling-only indoor units (\*4)**



(\*2) Total capacity index of cooling only indoor units must be 50% or less than the total capacity index of the indoor units.

(\*3) Necessity of Safety shut-off valve unit is determined based on the system refrigerant amount, the room floor space, and other technical elements.  
For details, refer to the General Safety Considerations in the separate booklet.

(\*4) The 2-line gas pipe that is branched from the 3-line pipe and goes to the cooling-only indoor units should be connected to the suction gas pipe.

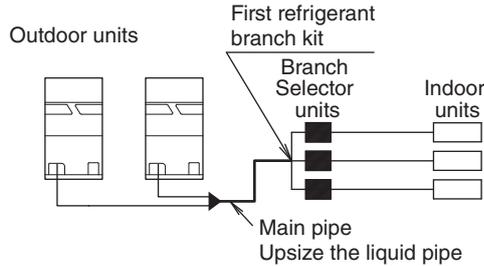
Maximum allowable length	From outdoor unit (*5) to indoor unit	Actual piping length	Actual piping length from the outdoor unit (*5) to the indoor unit: ≤540 ft. (165 m) In case of heat recovery system (Example) [4]: a+e+h+j≤540 ft. (165 m), [7]: a+b+c+d+m+n+p≤540 ft. (165 m), [11]: a+b+r+u+w≤540 ft. (165 m), [12]: a+b+c+d+q+x≤540 ft. (165 m) In case of heat pump system (Example) [4]: a+e+h+j≤540 ft. (165 m), [7]: a+b+c+d+m+n+p≤540 ft. (165 m), [9]: a+b+r+u+w≤540 ft. (165 m), [10]: a+b+c+d+q≤540 ft. (165 m)																															
		Equivalent length	Equivalent piping length from the outdoor unit (*5) to the indoor unit: ≤623 ft. (190 m) (*7) (*9) (Calculate the equivalent piping length for the REFNET joint as 1.6 ft. (0.5 m), REFNET header as 3.3 ft. (1.0 m), BSA36-60A* as 13 ft. (4.0 m), BSA96A* as 19 ft. (6.0 m), SVA60A* as 13 ft. (4.0 m) and SVA96A* as 19 ft. (6.0 m).) For the equivalent length of BSF-A54A*, refer to the table below based on the total capacity of the indoor units to be connected downstream. Also add 14 ft. (4.3 m) to the below length when calculating an equivalent length to each indoor unit connected to BSF-A54A*.																															
			<table border="1"> <thead> <tr> <th rowspan="2">Total capacity of the indoor units to be connected downstream</th> <th colspan="3">Equivalent length</th> </tr> <tr> <th>BSF4A54A*</th> <th>BSF6A54A*</th> <th>BSF8A54A*</th> </tr> </thead> <tbody> <tr> <td>&lt; 54</td> <td>1 ft. (0.4 m)</td> <td>1 ft. (0.4 m)</td> <td>1 ft. (0.4 m)</td> </tr> <tr> <td>54 ≤ x &lt; 72</td> <td>1 ft. (0.4 m)</td> <td>1 ft. (0.4 m)</td> <td>1 ft. (0.4 m)</td> </tr> <tr> <td>72 ≤ x &lt; 111</td> <td>2 ft. (0.7 m)</td> <td>2 ft. (0.7 m)</td> <td>2 ft. (0.7 m)</td> </tr> <tr> <td>111 ≤ x &lt; 162</td> <td>5 ft. (1.6 m)</td> <td>7 ft. (2.2 m)</td> <td>7 ft. (2.2 m)</td> </tr> <tr> <td>162 ≤ x &lt; 230</td> <td>7 ft. (2.2 m)</td> <td>11 ft. (3.4 m)</td> <td>11 ft. (3.4 m)</td> </tr> <tr> <td>230 ≤ x ≤ 290</td> <td>14 ft. (4.3 m)</td> <td>19 ft. (5.8 m)</td> <td>19 ft. (5.8 m)</td> </tr> </tbody> </table>		Total capacity of the indoor units to be connected downstream	Equivalent length			BSF4A54A*	BSF6A54A*	BSF8A54A*	< 54	1 ft. (0.4 m)	1 ft. (0.4 m)	1 ft. (0.4 m)	54 ≤ x < 72	1 ft. (0.4 m)	1 ft. (0.4 m)	1 ft. (0.4 m)	72 ≤ x < 111	2 ft. (0.7 m)	2 ft. (0.7 m)	2 ft. (0.7 m)	111 ≤ x < 162	5 ft. (1.6 m)	7 ft. (2.2 m)	7 ft. (2.2 m)	162 ≤ x < 230	7 ft. (2.2 m)	11 ft. (3.4 m)	11 ft. (3.4 m)	230 ≤ x ≤ 290	14 ft. (4.3 m)	19 ft. (5.8 m)
	Total capacity of the indoor units to be connected downstream	Equivalent length																																
BSF4A54A*		BSF6A54A*	BSF8A54A*																															
< 54	1 ft. (0.4 m)	1 ft. (0.4 m)	1 ft. (0.4 m)																															
54 ≤ x < 72	1 ft. (0.4 m)	1 ft. (0.4 m)	1 ft. (0.4 m)																															
72 ≤ x < 111	2 ft. (0.7 m)	2 ft. (0.7 m)	2 ft. (0.7 m)																															
111 ≤ x < 162	5 ft. (1.6 m)	7 ft. (2.2 m)	7 ft. (2.2 m)																															
162 ≤ x < 230	7 ft. (2.2 m)	11 ft. (3.4 m)	11 ft. (3.4 m)																															
230 ≤ x ≤ 290	14 ft. (4.3 m)	19 ft. (5.8 m)	19 ft. (5.8 m)																															
Total extension	Total actual piping length from the outdoor unit (*5) to all indoor units: ≤3280 ft. (1000 m)																																	
From outdoor unit multi connection piping kit to outdoor unit (in a multi system)	Actual piping length	Actual piping length from the outdoor unit multi connection piping kit to the outdoor unit: ≤33 ft. (10 m)																																
	Equivalent length	Equivalent piping length from the outdoor unit multi connection piping kit to the outdoor unit: ≤43 ft. (13 m)																																
		 <p>A ≤ 33 ft. (10 m) (equivalent length ≤ 43 ft. (13 m)) B ≤ 33 ft. (10 m) (equivalent length ≤ 43 ft. (13 m))</p>																																
Allowable height difference	From outdoor unit to indoor unit	Height difference	Height difference between outdoor unit and indoor unit (H1): ≤164 ft. (50 m) (if outdoor unit is lower than indoor unit, ≤130 ft. (40 m)) (*8) (*9)																															
	From indoor unit to indoor unit	Height difference	<table border="1"> <thead> <tr> <th>Actual piping length X</th> <th>Height difference between indoor units (H2)</th> </tr> </thead> <tbody> <tr> <td>X ≤ 540 ft. (165 m)</td> <td>≤ 49 ft. (15 m)</td> </tr> <tr> <td>X ≤ 390 ft. (120 m)</td> <td>≤ 98 ft. (30 m)</td> </tr> </tbody> </table>		Actual piping length X	Height difference between indoor units (H2)	X ≤ 540 ft. (165 m)	≤ 49 ft. (15 m)	X ≤ 390 ft. (120 m)	≤ 98 ft. (30 m)																								
	Actual piping length X	Height difference between indoor units (H2)																																
X ≤ 540 ft. (165 m)	≤ 49 ft. (15 m)																																	
X ≤ 390 ft. (120 m)	≤ 98 ft. (30 m)																																	
From outdoor unit to outdoor unit	Height difference	Height difference between outdoor units (H3): ≤16 ft. (5 m)																																
Allowable length after branch (*6)	From branch to indoor unit via 1 Branch Selector unit	Actual piping length	Actual piping length from the first REFNET joint or REFNET header to indoor unit: ≤130 ft. (40 m) (*11) (Example) [4]: e+h+j≤130 ft. (40 m), [7]: b+c+d+m+n+p≤130 ft. (40 m)																															
	From branch to indoor unit via Branch Selector units connected in pass through		Actual piping length from the first REFNET joint or REFNET header to indoor unit: ≤130 ft. (40 m) (*10) (*11)																															
			In case of heat recovery system (Example) [11]: b+r+u+w≤130 ft. (40 m) In case of heat pump system (Example) [9]: b+r+u+w≤130 ft. (40 m)																															

(\*5) In the case of an outdoor units multi system, "outdoor unit" should be read as the "outdoor unit multi connection piping kit".

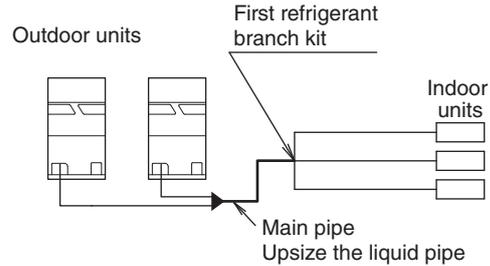
(\*6) A multi Branch Selector unit is to be considered as a branch (a single Branch Selector unit is not), so in the case where only 1 multi Branch Selector unit is included in the system, the actual piping length from each branch port of the multi Branch Selector unit to each indoor units should be ≤130 ft. (40 m).

(\*7) In the case where the equivalent piping length from outdoor units to indoor units  $\geq 295$  ft. (90 m), make sure to upsize the liquid pipe of the main pipe (see the figure below), referring to the table below. In case of RXYA-A series, make sure to upsize the gas pipe as well. (In case of REYA-A series, do not upsize the high/low pressure gas pipe and the suction gas pipe.)

<REYA-A series>



<RXYA-A series>



Outdoor unit capacity type	Liquid pipe
REYA72A type	$\phi 3/8$ in. (9.5 mm) → $\phi 1/2$ in. (12.7 mm)
REYA96A type	
REYA120A type	$\phi 1/2$ in. (12.7 mm) → $\phi 5/8$ in. (15.9 mm)
REYA144A type	
REYA168A type	
REYA192A type	
REYA216A type	
REYA240A type	$\phi 5/8$ in. (15.9 mm) → $\phi 3/4$ in. (19.1 mm)
REYA264A type	
REYA288A type	
REYA312A type	
REYA336A type	
REYA360A type	$\phi 3/4$ in. (19.1 mm) → $\phi 7/8$ in. (22.2 mm)
REYA384A type	
REYA408A type	
REYA432A type	
REYA456A type	
REYA480A type	

- Between outdoor branch and outdoor unit (in case of multi outdoor units). (only in case  $\geq 264$  type)

Outdoor unit capacity type	Gas pipe	Liquid pipe
RXYA72A type	$\phi 3/4$ in. (19.1 mm) → $\phi 7/8$ in. (22.2 mm)	$\phi 3/8$ in. (9.5 mm) → $\phi 1/2$ in. (12.7 mm)
RXYA96A type		
RXYA120A type	$\phi 7/8$ in. (22.2 mm) → $\phi 1$ in. (25.4 mm)*1	$\phi 1/2$ in. (12.7 mm) → $\phi 5/8$ in. (15.9 mm)
RXYA144A type	$\phi 1-1/8$ in. (28.6 mm) → $\phi 1-1/4$ in. (31.8 mm)*1	
RXYA168A type		
RXYA192A type		
RXYA216A type		
RXYA240A type		
RXYA264A type	$\phi 1-3/8$ in. (34.9 mm) → $\phi 1-1/2$ in. (38.1 mm)*1	$\phi 5/8$ in. (15.9 mm) → $\phi 3/4$ in. (19.1 mm)
RXYA288A type		
RXYA312A type		
RXYA336A type		
RXYA360A type		
RXYA384A type	Increase is NOT allowed	$\phi 3/4$ in. (19.1 mm) → $\phi 7/8$ in. (22.2 mm)
RXYA408A type		
RXYA432A type		
RXYA456A type		
RXYA480A type		

\*1 If size is NOT available, increase is NOT allowed.

(\*8) Vertical height difference between outdoor units and indoor units can be extended to  $\leq 361$  ft. (110 m) with liquid piping of main pipe upsize (see the figure and table above). See [2-49]=Height difference setting on page 42.

In cases where the system includes at least one AHU Integration kit, the vertical height difference is limited as follows. Same requirements of upsizing main liquid piping and change of [2-49]=Height difference setting are applied.

- Up to 295 ft. (90 m) when the outdoor unit is above the AHUs.
- Up to 195 ft. (60 m) when the outdoor unit is below the AHUs.

(\*9) In the case where the equivalent piping length from outdoor units to indoor units  $\geq 295$  ft. (90 m) and Height difference between outdoor unit and indoor unit (H1):  $>295$  ft. (90 m), make sure to double upsize the liquid pipe of the main pipe (see the figure above), referring to the table A below. (In this case, system additional refrigerant amount (R)\* must not exceed the values provided in the table C below and Height difference between outdoor unit and indoor unit (H1) must be less than 361 ft. (110 m). Do not upsize the high/low pressure gas pipe and the suction gas pipe).

\* As for (R), see 14.2. Calculating the additional refrigerant charge on page 34.

**Table A**

Double upsizing

Outdoor unit capacity type	Liquid pipe
REYA/RXYA72, 96A type	$\phi 3/8$ in. (9.5 mm) → $\phi 5/8$ in. (15.9 mm)
REYA/RXYA120-216A type	$\phi 1/2$ in. (12.7 mm) → $\phi 3/4$ in. (19.1 mm)
REYA/RXYA240-384A type	$\phi 5/8$ in. (15.9 mm) → $\phi 7/8$ in. (22.2 mm)
REYA/RXYA408-480A type	$\phi 3/4$ in. (19.1 mm) → Not applicable

Please refer to table B below to see pipe length limits for single and double upsize scenarios. Refrigerant charge limits in Table C must be followed.

**Table B**

Max height difference table - Outdoor unit installed above indoor units

Outdoor unit capacity type	Main liquid pipe size	295<H1<361 Outdoor unit to Indoor unit vertical height difference	Indoor unit to Indoor unit height difference	Actual Outdoor unit to Indoor unit piping length
REYA72-240A type	Single upsize	328 ft. (100 m)	66 ft. (20 m)	394 ft. (120 m)
			49 ft. (15 m)	540 ft. (165 m)
			98 ft. (30 m)	394 ft. (120 m)
	Double upsize	361 ft. (110 m)	66 ft. (20 m)	492 ft. (150 m)
			49 ft. (15 m)	540 ft. (165 m)
			33 ft. (10 m)	540 ft. (165 m)
REYA264-480A type	Single upsize	361 ft. (110 m)	66 ft. (20 m)	394 ft. (120 m)
			49 ft. (15 m)	492 ft. (150 m)
			33 ft. (10 m)	540 ft. (165 m)

See [2-35]=Height difference setting on page 42, [2-49]=Height difference setting on page 42.

**Table C**

Refrigerant charge limits when 295<H1<361

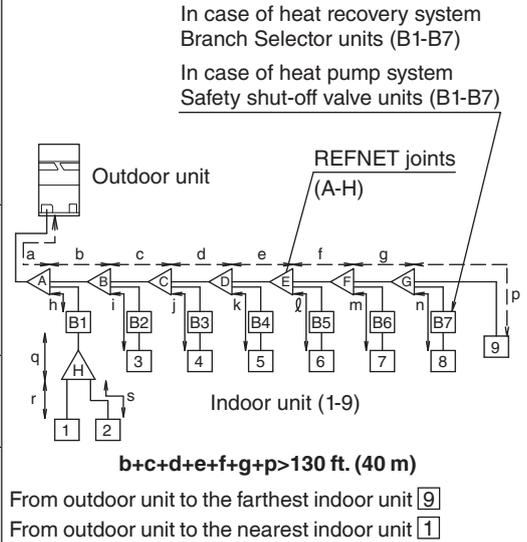
Outdoor unit capacity type	Additional refrigerant amount
REYA/RXYA72A type	59.3 lbs. (26.9 kg)
REYA/RXYA96A type	65.9 lbs. (29.9 kg)
REYA/RXYA120A type	82.9 lbs. (37.6 kg)
REYA/RXYA144A type	91.9 lbs. (41.7 kg)
REYA/RXYA168A type	100.8 lbs. (45.7 kg)
REYA/RXYA192A type	109.3 lbs. (49.6 kg)
REYA/RXYA216A type	118.2 lbs. (53.6 kg)
REYA/RXYA240A type	147.3 lbs. (66.8 kg)
REYA/RXYA264A type	123.9 lbs. (56.2 kg)
REYA/RXYA288A type	123.9 lbs. (56.2 kg)
REYA/RXYA312A type	123.9 lbs. (56.2 kg)
REYA/RXYA336A type	123.9 lbs. (56.2 kg)
REYA/RXYA360A type	123.9 lbs. (56.2 kg)
REYA/RXYA384A type	123.9 lbs. (56.2 kg)
REYA/RXYA408A type	123.9 lbs. (56.2 kg)
REYA/RXYA432A type	123.9 lbs. (56.2 kg)
REYA/RXYA456A type	123.9 lbs. (56.2 kg)
REYA/RXYA480A type	123.9 lbs. (56.2 kg)

(\*10)For Branch Selector unit connected in pass through installation, all three conditions below must be satisfied.

1. Maximum capacity index of connectable indoor units for BSF6, 8A54A\* is  $\leq 162$  per Branch Selector unit.
2. Maximum capacity index of connectable indoor units under Branch Selector units connected in pass through is  $\leq 230$ .
3. Total number of ports of Branch Selector units connected in pass through is  $\leq 12$ .

(\*11)When conditions listed in the table below are all satisfied, the allowable length restrictions after branch is  $\leq 295$  ft. (90 m). For Branch Selector unit connected in pass through installation, also (\*10) must be satisfied.

Necessary conditions	Example: Only the allowable length after branch for the indoor unit 9 exceeds 130 ft. (40 m) in the figure in the lower right
1. Upsize the liquid pipe from the first refrigerant branch kit to the final refrigerant branch kit for the indoor unit beyond 130 ft. (40 m). <ul style="list-style-type: none"> <li>• If upsizing is impossible, the conditions are not satisfied.</li> <li>• If the upsized line would become larger than the main pipe, then the main pipe should also be upsized.</li> </ul>	Upsize the liquid pipes b, c, d, e, f and g in the figure in the right. The upsizing specifications should be as follows: $\phi 3/8$ in. (9.5 mm) $\rightarrow \phi 1/2$ in. (12.7 mm) $\phi 1/2$ in. (12.7 mm) $\rightarrow \phi 5/8$ in. (15.9 mm) $\phi 5/8$ in. (15.9 mm) $\rightarrow \phi 3/4$ in. (19.1 mm) $\phi 3/4$ in. (19.1 mm) $\rightarrow \phi 7/8$ in. (22.2 mm)
2. The total piping length, calculated by doubling the piping length as upsized in 1 above, is $\leq 3280$ ft. (1000 m). (The main pipe, and lines that are not upsized, should not be doubled.)	$a + b \times 2 + c \times 2 + d \times 2 + e \times 2 + f \times 2 + g \times 2$ $+ h + i + j + k + l + m + n + p + q + r + s$ $\leq 3280$ ft. (1000 m)
3. The actual piping length from each indoor units to the nearest refrigerant branch kit are all $\leq 130$ ft. (40 m).	<ul style="list-style-type: none"> <li>• <math>i, j, \dots, p \leq 130</math> ft. (40 m)</li> <li>• <math>h + q + r \leq 130</math> ft. (40 m)</li> <li>• <math>h + q + s \leq 130</math> ft. (40 m)</li> </ul>
4. The difference between the actual piping length from the outdoor unit to the farthest indoor unit, and the actual piping length from the outdoor unit to the nearest indoor unit, is $\leq 130$ ft. (40 m).	Actual piping length of 9    Actual piping length of 1 $(a + b + c + d + e + f + g + p) - (a + h + q + r)$ $\leq 130$ ft. (40 m)



In the case of a multi Branch Selector unit, if a junction pipe kit (separately sold) is used for combining 2 lines, the actual piping length between the multi Branch Selector unit and the indoor units should be  $\leq 65$  ft. (20 m).

This limitation can be extended beyond 65 ft. (20 m), if all of the three conditions below are satisfied.

1. Upsize the liquid line between the joined 2 branches and the indoor unit.
2. Actual pipe length between the multi branch selector box and the indoor unit needs to be  $\leq 130$  ft. (40 m).
3. Double the pipe length of upsized line between joined 2 branches and the indoor unit, when calculating the overall total piping length.

## 8. Precautions on refrigerant piping

- Do not allow anything other than the designated refrigerant to get mixed into the refrigerant cycle, such as air, nitrogen, etc. If any refrigerant gas leaks while working on the unit, ventilate the room thoroughly right away.
- Use R32 only when adding refrigerant.
- Installation tools:  
Make sure to use installation tools (gauge manifold, charge hose, etc.) that are exclusively used for R32 installations to withstand the pressure and to prevent foreign materials (e.g., mineral oils and moisture) from mixing into the system.
- Vacuum pump:
  - Use a 2-stage vacuum pump with a non-return valve.
  - Make sure the pump oil does not flow oppositely into the system while the pump is not working.
  - Use a vacuum pump which can evacuate to 500 microns (66.5 Pa).
- In areas where compliance with the Chicago Mechanical Code is required, install a relief valve connection kit (DPRK04). For installation of the relief valve connection kit, refer to the installation manual delivered with the kit.
- For installations with field applied joints which are exposed in the occupied space, the joints shall be:
  - joints in compliance with ISO 14903
  - joints in enclosures which vent to the unit where a leak would be detected or to the outside.

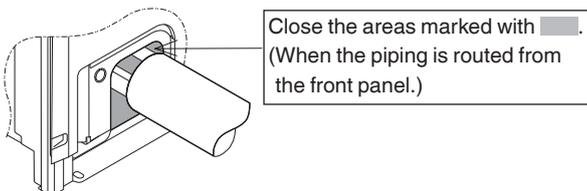
### Protection against contamination when installing pipes

Take measures to prevent foreign materials like moisture and contamination from mixing into the system.

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

Block all gaps in the holes for passing out piping and wiring using sealing material (field supply) (the capacity of the unit will drop and small animals may enter the machine).

**Example:** passing piping out through the front.



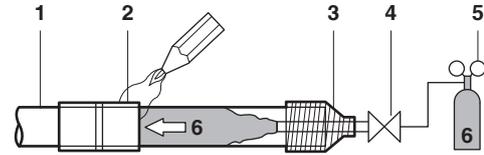
- Use clean pipes only.
- Hold the pipe end downwards when removing burrs.
- Cover the pipe end when inserting it through a wall so that no dust or dirt enters the pipe.

### NOTE

- After all the piping has been connected, make sure there is no gas leak. Use Dry Nitrogen to perform a gas leak detection.
- After cutting the slit holes, it is recommended to remove burrs in the slit holes and paint the edges and areas around the edges using the repair paint to prevent rusting.

## 8.1. Caution for brazing

- Make sure to blow through with Dry Nitrogen when brazing. Blowing through with Dry Nitrogen prevents the creation of large quantities of oxidized film on the inside of the piping. An oxidized film adversely affects valves and compressors in the refrigerating system and prevents proper operation.
- The Dry Nitrogen pressure should be set to 2.9 psi (0.02 MPa (i.e., just enough so it can be felt on the skin)) with a gauge manifold.



- 1 Refrigerant piping
- 2 Part to be brazed
- 3 Taping
- 4 Hand valve
- 5 Gauge manifold
- 6 Dry Nitrogen

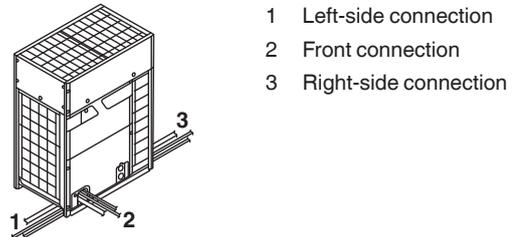
Do not use anti-oxidants when brazing the pipe joints. Residue can clog pipes and break equipment:

- Do not use flux when brazing copper-to-copper refrigerant piping. Use phosphor copper brazing filler alloy (BCuP) which does not require flux.
- Flux has an extremely harmful influence on refrigerant piping systems. For instance, if chlorine based flux is used, it will cause pipe corrosion or, in particular, if the flux contains fluorine, it will deteriorate the refrigerant oil.

## 8.2. Connecting the refrigerant piping

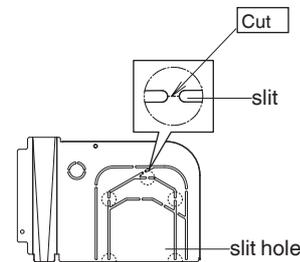
### 8.2.1. Decide front or side (bottom) connection

Installation of refrigerant piping is possible as front connection or side connection (when taken out from the bottom) as shown in the figure below.



### Front connection

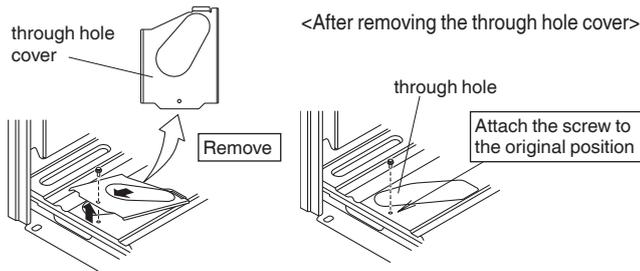
Remove the slit hole of the piping intake and lead out piping to the piping intake.



### Side (bottom) connection

In case of heat recovery system:

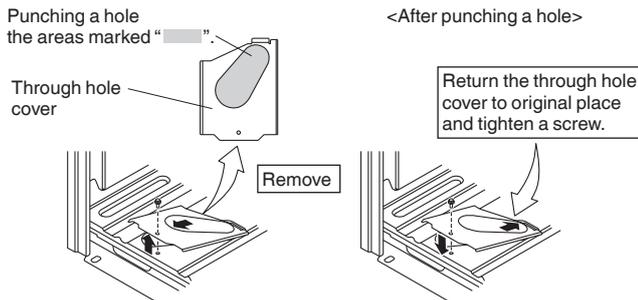
Remove the through hole cover on the bottom frame and lead out the piping from the bottom frame.



In case of heat pump system:

Remove the through hole cover for punching a hole and return the through hole cover to original place and tighten a screw after punching a hole.

Lead out the piping from the bottom frame.



### NOTE

Precautions when cutting the slit holes and removing the through hole cover:

- Open the slit holes with a cutting nippers or similar tool.
- After cutting the slit holes, it is recommended to remove burrs in the slit holes and paint the edges and areas around the edges using the repair paint to prevent rusting.
- When passing electrical wiring through the slit holes, protect the wiring with a conduit or bushings, making sure not to damage the wiring.

### 8.2.2. Remove the pinched pipes

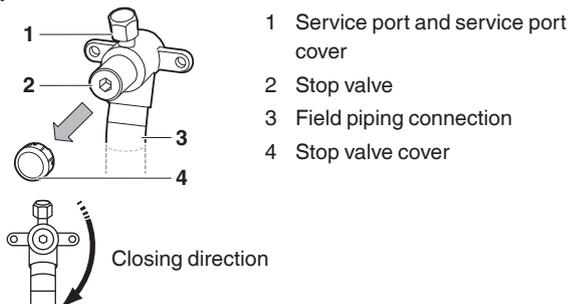
#### WARNING

Any gas or oil remaining inside the stop valve may blow off the pinched piping.

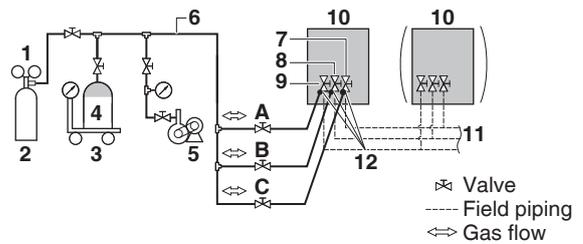
Failure to observe the instructions in procedure below properly may result in property damage or personal injury, which may be serious depending on the circumstances.

Use the following procedure to remove the pinched piping:

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



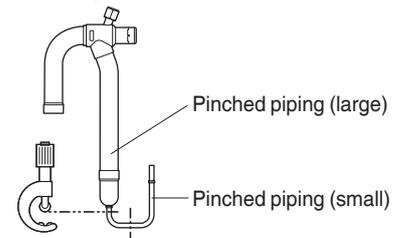
- 2 Connect the vacuuming/recovery unit to service ports of all stop valves.



- 3 Recover gas and oil from the pinched piping by using a recovery unit.
- 4 When all gas and oil is recovered from the pinched piping, disconnect the charge hose and close the service ports.
  - 5 Cut off the lower part of the smaller pinched piping with an appropriate tool such as pipe cutters. Let the remaining oil drip out in case the recovery was not complete.

#### CAUTION

Do not vent gases into the atmosphere.



Wait until all oil is dripped out.

- 6 Cut the pinched piping (large) off with a pipe cutter just above the brazing point or marking if there is no brazing point.

#### WARNING

Never remove the pinched piping by brazing.

Any gas or oil remaining inside the stop valve may blow off the pinched piping.

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.

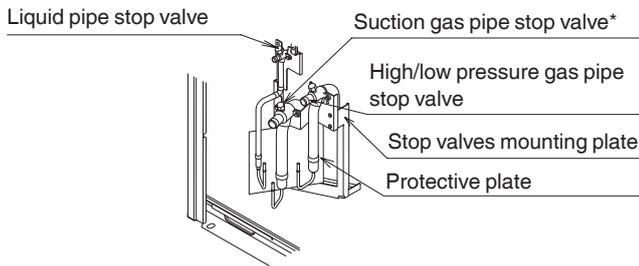
- 7 Wait until all oil is dripped out before continuing with the connection of the field piping in case the recovery was not complete.

### 8.2.3. Connecting refrigerant piping to the outdoor unit

- All piping for gas and liquid over from the field connection piping kit are field supplied.

#### ⚠ WARNING

When brazing at the proximity of the stop valves, be sure to protect the stop valves mounting plate with a protective plate to prevent from contacting with the burner flame.



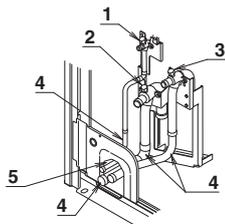
\* Only use for the heat recovery system.

#### ⚠ NOTE

For heat pump systems, do not use a suction gas pipe stop valve. Do not cut and connect the suction gas pipe stop valve, and always keep the valve fully closed.

#### Front connection

Remove the slit hole of the piping intake and connect piping to the piping intake.

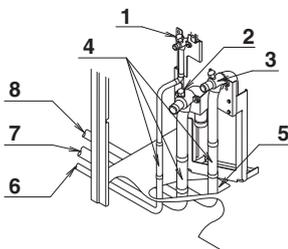


- 1 Liquid pipe stop valve
- 2 Suction gas pipe stop valve \*1
- 3 High/low pressure gas pipe stop valve
- 4 Filed connection piping kit (accessory)
- 5 Slit hole \*2

\*1 Only use for the heat recovery system  
\*2 Open the slit hole

#### Side (bottom) connection

Remove the through hole cover on the bottom frame and lead out the piping from the bottom frame.



- 1 Liquid pipe stop valve
- 2 Suction gas pipe stop valve \*1
- 3 High/low pressure gas pipe stop valve
- 4 Filed connection piping kit (accessory) \*2
- 5 Through hole
- 6 Liquid side piping (field supply)
- 7 Suction gas side piping (field supply)
- 8 High/low pressure gas side piping (field supply)

\*1 Only use for the heat recovery system

\*2 There are models without this accessory.

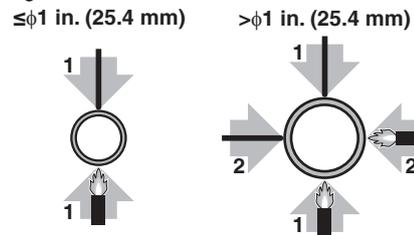
- REYA144-240, RXYA72-240 without suction gas pipe
- REYA120, RXYA72 without High/low pressure gas pipe
- REYA/RXYA72, 120-168, 240 without liquid pipe

#### ⓘ INFORMATION

All local inter unit piping are field supplied except the accessory pipes.

#### ⚠ NOTE

Precautions when connecting field piping. Add brazing material as shown in the figure.



#### ⚠ NOTE

- 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 generated.

Connection from the stop valves to the field piping can be done by using accessory pipes supplied as accessory.

#### ⚠ NOTE

Make sure that the onsite piping does not come in contact with other piping, the bottom frame or side panels of the unit.

The connections to the branch kits are the responsibility of the installer (field piping).

### 8.2.4. Precautions when connecting piping between outdoor units (multiple outdoor unit systems)

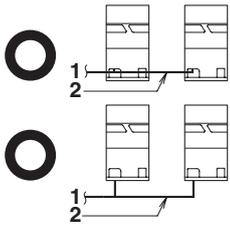
- To connect the piping between outdoor units, an optional multi connection piping kit\* and reducer piping kit (KHFA26P100UA) are always required. When installing the piping, follow the instructions in the installation manual that comes with the kit.
- Only proceed with piping work after considering the limitations on installing listed here and in the chapter 8.2. Connecting the refrigerant piping on page 19 always referring to the installation manual delivered with the kit.

\* BHFA26P100UA: In case of heat recovery system  
BHFA22P100UA: In case of heat pump system

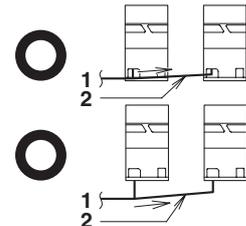
### 8.2.5. Possible installation patterns and configurations

- The piping between the outdoor units must be routed level or slightly upward to avoid the risk of oil retention into the piping.

#### Pattern 1

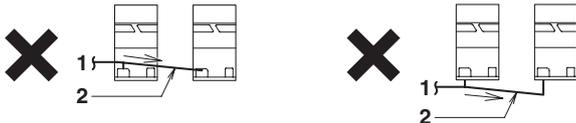


#### Pattern 2



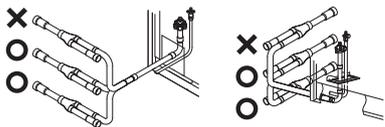
- To indoor units
- Piping between outdoor units

#### Prohibited patterns: change to pattern 1 or 2

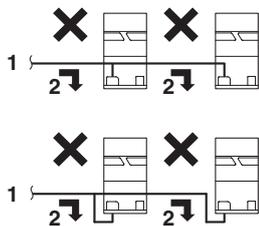


- To indoor units
- Piping between outdoor units

- To avoid the risk of oil retention to the stopped outdoor unit, always connect the stop valve and the piping between outdoor units as shown in the 4 correct possibilities of the figure below.

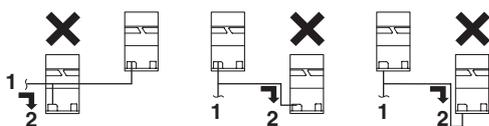


#### Prohibited patterns: change to pattern 1 or 2



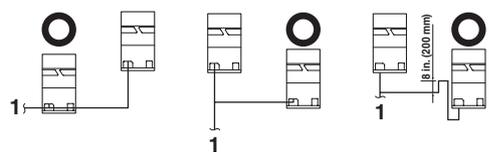
- To indoor units
- Oil collects to the outmost outdoor units

#### Change to configuration as in figure below



- To indoor the units
- Oil collects to the outmost outdoor units

#### Correct configuration

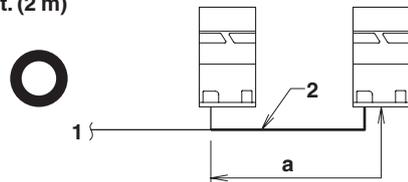


- To indoor units

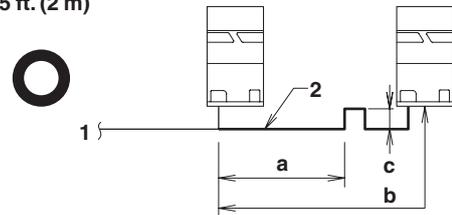
- If the piping length between the outdoor units exceeds 6.5 ft. (2 m), create a rise of 8 in. (200 mm) or more in the gas line\* within a length of 6.5 ft. (2 m) from the outdoor unit multi connection piping kit.

- \* In case of heat recovery system, the suction gas and high/low pressure gas line  
In case of heat pump system, the high/low pressure gas line only

If  $\leq 6.5$  ft. (2 m)



If  $> 6.5$  ft. (2 m)



- To indoor units
  - Piping between outdoor units (bold line)
- a  $\leq 6.5$  ft. (2 m)  
b  $> 6.5$  ft. (2 m)  
c  $\geq 8$  in. (200 mm)

### 8.2.6. Branching the refrigerant piping

The following optional kit is required for multiple connections of indoor and outdoor units. When installing the unit, observe the following restrictions and follow the installation instructions provided with the kit.

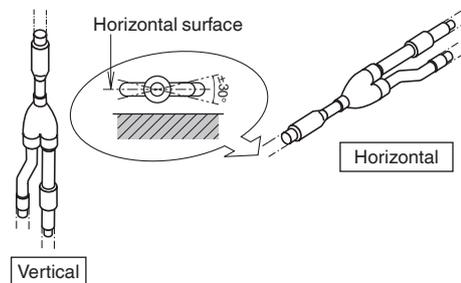
#### NOTE

If the kit is not installed correctly, functional failure or outdoor unit failure may occur due to uneven flow of refrigerant and refrigerator oil.

- Connecting the refrigerant branch kit (REFNET joint or REFNET header) for multiple connections of indoor units, Branch Selector units\* and others. (other than outdoor units)  
\* Only for the heat recovery system

#### REFNET joint

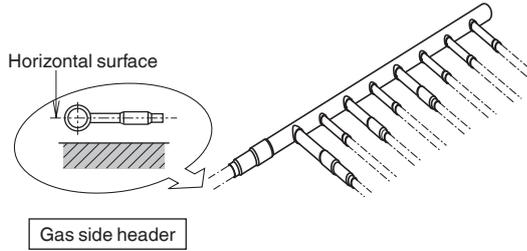
Mount the REFNET joint so that it branches either horizontally (within  $\pm 30^\circ$ ) or vertically.



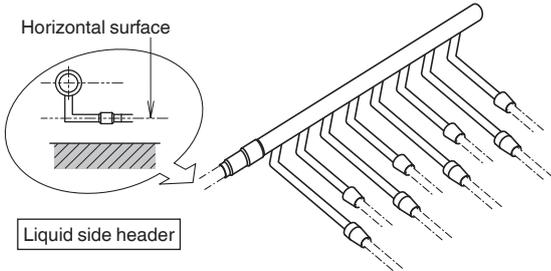
### REFNET header

Mount the REFNET header so that it branches horizontally.

- Be sure to install it horizontally.

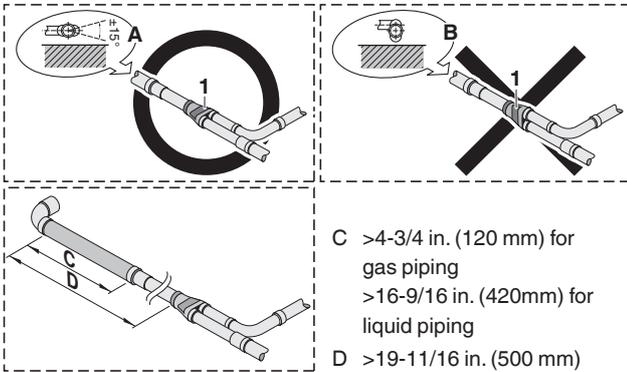


Mount the REFNET header so that the branch pipes are on the underside and branch horizontally.



### 2 Connecting the outdoor unit multi connection piping kit for multiple outdoor unit systems

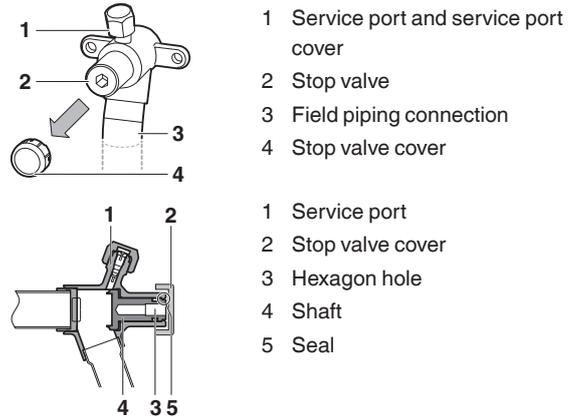
- Install the joints horizontally, so that the caution label (1) attached to the joint comes to the top.
  - Do not tilt the joint more than 15° (see view A).
  - Do not install the joint vertically (see view B).
- Make sure that the total length of the piping connected to the joint is absolute straight for more than 19-11/16 in. (500 mm). Only if a straight field gas piping of more than 4-3/4 in. (120 mm) and liquid piping of more than 16-9/16 in. (420mm) is connected, more than 19-11/16 in. (500 mm) of straight section can be ensured.
- Improper installation may lead to malfunction of the outdoor unit.



### 8.3. Guidelines for handling stop valve

#### 8.3.1. Cautions on handling the stop valve

- Make sure to keep all stop valves open during operation.
- The figure below shows the name of each part required in handling the stop valve.
- The stop valves are factory closed.



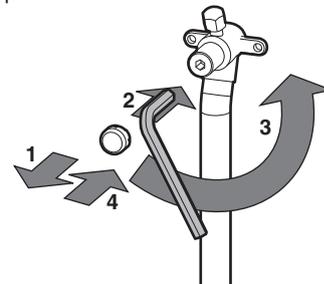
#### 8.3.2. How to use the stop valve

##### Tightening torques

Stop valve size	Tightening torque (Turn clockwise to close)		Service port
	Shaft (valve body)		
$\phi 3/8$	3.7-5.1 ft·lbf (5.0-7.0 N·m)	Hexagonal wrench 4.0 mm	7.9-10.8 ft·lbf (10.7-14.7 N·m)
$\phi 1/2$	6.0-7.3 ft·lbf (8.0-10.0 N·m)	Hexagonal wrench 6.0 mm	
$\phi 5/8$	10.4 - 11.8 ft·lbf (14.0-16.0 N·m)	Hexagonal wrench 8.0 mm	
$\phi 3/4$	14.1-15.4 ft·lbf (19.0-21.0 N·m)	Hexagonal wrench 10.0 mm	
$\phi 1$			
$\phi 1-1/8$	20.0 - 24.3 ft·lbf (27.0-33.0 N·m)	Hexagonal wrench 10.0 mm	

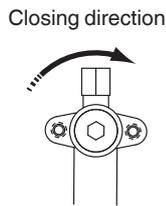
##### Opening the stop valve

- 1 Remove the stop valve cover.
- 2 Insert a hexagon wrench into the stop valve and turn the stop valve counterclockwise.
- 3 When the stop valve cannot be turned any further, stop turning. The valve is now open.
  - Turn the stop valve until the shaft stops and the designated torque is achieved.
- 4 Attach the stop valve cover.



### Closing the stop valve

- 1 Remove the stop valve cover.
- 2 Insert a hexagon wrench into the stop valve and turn the stop valve clockwise.
- 3 Turn until the shaft stops by applying the designated torque. The valve is now closed.
- 4 Attach the stop valve cover.



### 8.3.3. Cautions on handling the service port

- Always use a charge hose equipped with a valve depressor pin, since the service port is a Schrader type valve.
- After handling the service port, make sure to tighten the service port cover securely. For the tightening torque, refer to 8.3.2. How to use the stop valve.
- Check for refrigerant leaks after tightening the service port cover.

## 9. Air tight test and vacuum drying

- After finished piping work, carry out air tight test and vacuum drying.

### NOTE

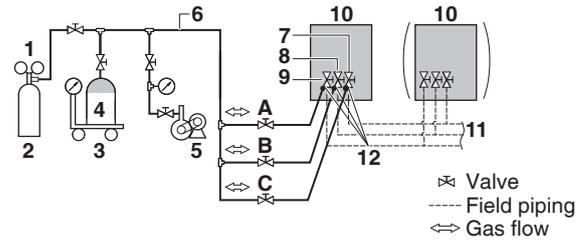
- Always use nitrogen gas for the air tightness test.
- Absolutely do not open the stop valve until the main power circuit insulation measurement has been completed. (Measuring after the stop valve is opened will cause the insulation value to drop.)
- Please perform an air tightness test and vacuuming before turning on the power. When power is turned on, do not turn off the power until the air tightness test and vacuuming are completed. When the power is turned on and turned off, the valve of Branch Selector units or Safety shut-off valve units will be fully closed, and air tightness test and vacuuming between the valve of Branch Selector units or Safety shut-off valve units and indoor units will not be possible. In the case that the power supply is turned on and off, the refrigerant recovery mode should be enabled to fully open the all valves. See [2-21]= Refrigerant recovery/vacuuming mode on page 40.

### <Needed tools>

Gauge manifold	• To prevent entry of any impurities and insure sufficient pressure resistance, always use the special tools dedicated for R32.
Charge hose	
Valve	• Use charge hose that have pushing stick for connecting to service port of stop valves.
Vacuum pump	• The vacuum pump for vacuum drying should be able to lower the pressure to 500 microns (66.5 Pa). • Take care the pump oil never flow backward into the refrigerant pipe during the pump stops.

### <The system for airtight test and vacuum drying>

- Referring to the figure below, connect a nitrogen tank, refrigerant tank, and a vacuum pump to the outdoor unit. The refrigerant tank and the charge hose connection to service port of all valves in the figure below are needed in 14. Charging refrigerant on page 33.



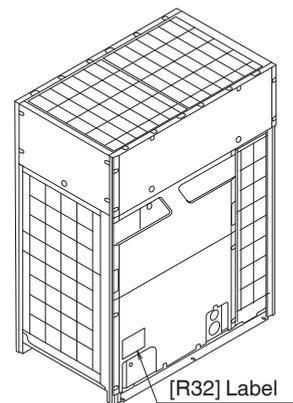
- 1 Gauge manifold
- 2 Nitrogen
- 3 Measuring instrument
- 4 Refrigerant R32 tank
- 5 Vacuum pump
- 6 Charge hose
- 7 High/low pressure gas pipe stop valve
- 8 Suction gas pipe stop valve \*1
- 9 Liquid pipe stop valve
- 10 Outdoor unit
- 11 To Indoor unit/Branch Selector unit \*2/Safety shut-off valve units
- 12 Stop valve service port
- A Valve A
- B Valve B \*1
- C Valve C

\*1 Only use for the heat recovery system

\*2 Branch Selector unit is only for the heat recovery system.

### NOTE

- The air-tightness test and vacuum drying should be done using the service ports of suction gas pipe, high/low pressure gas pipe\* and liquid pipe stop valve. See the [R32] Label attached to the front panel of the outdoor unit for details on the location of the service port (see the figure below).



- See 8.3.2. How to use the stop valve on page 23 for details on handling the stop valve.
- The refrigerant charge port is connected to unit pipe. When shipped, the unit contains the refrigerant, so use caution when attaching the charge hose.

\* Only use for the heat recovery system.

### <Air tight test>

Pressurize the suction gas pipe, high/low pressure gas pipe\* and liquid pipe from the service ports of each stop valve to 580 psi (4.0 MPa) (do not pressurize more than 580 psi (4.0 MPa)). If the pressure does not drop within 24 hours, the system passes the test.

If there is a pressure drop, check for leaks, make repairs and perform the air tight test again.

### <Vacuum drying>

Evacuate the system from the suction gas pipe, high/low pressure gas pipe\* and liquid pipe stop valve service ports by using a vacuum pump for more than 2 hours and bring the system to 500 microns (66.5 Pa) or less. 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.

\* High/low pressure gas pipe is only for the heat recovery system.

### NOTE

**During the rainy season, moisture might enter the piping. If working during a rainy season and the work takes long enough for condensation to form inside the pipes, take the following precautions:**

After evacuating the system for 2 hours, pressurize the system to 375,000 microns (0.05 MPa) (vacuum break) with nitrogen gas and evacuate the system again using the vacuum pump for 1 hour to 500 microns (66.5 Pa) or less (vacuum drying).

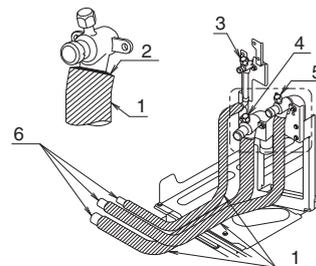
If the system cannot be evacuated to 500 microns (66.5 Pa) within 2 hours, repeat the operation of vacuum break and vacuum drying. Then, after leaving the system in a vacuum for 1 hour, confirm that the vacuum gauge does not rise.

## 10. Pipe insulation

### NOTE

Pipe insulation thickness provided below are guidelines only. Pipes must be insulated with the appropriate thickness of insulation per applicable local/state or national codes.

- Insulation of pipes should be done after performing 9. Air tight test and vacuum drying on page 24.
- Always insulate the suction gas pipe, high/low pressure gas pipe\*, liquid pipe and pipe connections.
- Failing to insulate the pipes may cause leaking or burns. Be sure to use insulation designed for HVAC equipment.
- Reinforce the insulation on the refrigerant piping according to the installation environment. Condensation might form on the surface of the insulation. Refer to the below.
  - Ambient temperature : 86°F (30°C), humidity : 75% to 80% RH : minimum thickness : 9/16 in. (15 mm).
  - If the ambient temperature exceeds 86°F (30°C) and the humidity 80% RH, then the minimum thickness is 3/4 in. (20 mm). See the Engineering Data Book for detail.
- If there is a possibility that condensation on the stop valve might drip down into the indoor unit through gaps in the insulation and piping because the outdoor unit is located higher than the indoor unit, this must be prevented by caulking the connections. (Refer to the following figure.)



- 1 Insulation material
- 2 Caulking, etc.
- 3 Liquid pipe stop valve
- 4 Suction gas pipe stop valve \*
- 5 High/low pressure gas pipe stop valve
- 6 Connection pipe

\* Only use for the heat recovery system.

## 11. Field wiring

### NOTE

- All field wiring and components must be installed by a licensed electrician and must comply with relevant local and national regulations.
- Means for full disconnection under overvoltage category III conditions must be incorporated in the fixed wiring according to national wiring rules.
- 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.
- A disconnection incorporated in the fixed wiring is to be provided. Use an all-pole disconnection type breaker with at least 1/8 in. (3 mm) between the contact point gaps.
- 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 ground 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 shell 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** are dangerous when struck by lightning due to abnormal rise in electrical potential in the grounding.

- This equipment can be installed with a Ground-Fault Circuit Interrupter (GFCI). Although this is a recognized measure for additional protection, with the grounding system in North America, a dedicated GFCI is not necessary.
- Electrical wiring must be done in accordance with the wiring diagrams and the description herein.
- Do not operate until refrigerant piping work is completed. Operating the unit before completing piping work could cause the compressor to break.
- Never remove a thermistor, sensor or similar parts when connecting power wiring and transmission wiring.  
(If operated with a thermistor, sensor or similar parts removed, the compressor may be broken down.)
- Never connect the power supply in reverse-phase.
- Make sure the electrical imbalance 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 error 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 ground terminal).
- If there exists the possibility of reverse-phase, lost phase, momentary blackout or the power goes on and off while the product is operating, attach a reverse-phase protection circuit locally. Running the product in reverse-phase may break the compressor and other parts.**
- The appliance incorporates grounding connections for functional purpose in addition to protective ground.
- Always use the dedicated circuit.  
Using the following electric wiring or power connection may cause the unit to malfunction or become inoperable.
  - Wiring from the same power transformer as the equipment that consumes a large amount of power\* or causes harmonics
  - Placing the power wire of the unit near that of the equipment that consumes a large amount of power\*
  - Insufficient power capacity or distorted power waveform

\* A lift, container crane, railway rectifier, inverter power supply, arc welder, electric furnace, large induction motor, large switch, etc.

## 11.1. Power circuit, safety device and cable requirements



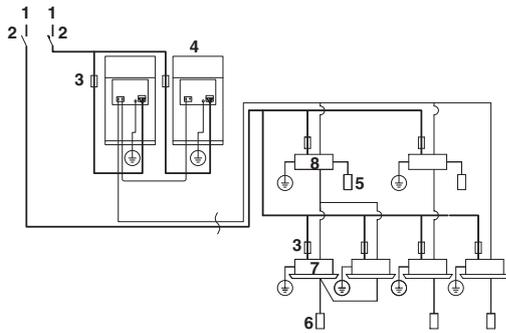
**WARNING**  
Risk of electric shock. Can cause injury or death. System contains oversize protective grounding terminal which shall be properly connected.

- Make sure to apply the rated voltage of 208/230V or 460V for the unit.
- 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.
- When using residual current operated circuit breakers, be sure to use a high-speed type (0.1 seconds 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.

Model name	Phase and frequency	Voltage	Minimum circuit amp.	Maximum overcurrent protective device	Transmission line selection
REYA72AATJ* RXYA72AATJ*	φ3, 60Hz	208/230V	33.0	35	AWG18-16
REYA96AATJ* RXYA96AATJ*	φ3, 60Hz	208/230V	34.9	40	AWG18-16
REYA120AATJ* RXYA120AATJ*	φ3, 60Hz	208/230V	40.0	45	AWG18-16
REYA144AATJ* RXYA144AATJ*	φ3, 60Hz	208/230V	50.0	60	AWG18-16
REYA168AATJ* RXYA168AATJ*	φ3, 60Hz	208/230V	60.2	70	AWG18-16
REYA192AATJ* RXYA192AATJ*	φ3, 60Hz	208/230V	64.2	80	AWG18-16
REYA216AATJ* RXYA216AATJ*	φ3, 60Hz	208/230V	70.0	80	AWG18-16
REYA240AATJ* RXYA240AATJ*	φ3, 60Hz	208/230V	79.1	90	AWG18-16
REYA264AATJ* RXYA264AATJ*	φ3, 60Hz	208/230V	40.0+50.0	45+60	AWG18-16
REYA288AATJ* RXYA288AATJ*	φ3, 60Hz	208/230V	50.0+50.0	60+60	AWG18-16
REYA312AATJ* RXYA312AATJ*	φ3, 60Hz	208/230V	50.0+60.2	60+70	AWG18-16
REYA336AATJ* RXYA336AATJ*	φ3, 60Hz	208/230V	60.2+60.2	70+70	AWG18-16
REYA360AATJ* RXYA360AATJ*	φ3, 60Hz	208/230V	60.2+64.2	70+80	AWG18-16
REYA384AATJ* RXYA384AATJ*	φ3, 60Hz	208/230V	64.2+64.2	80+80	AWG18-16
REYA408AATJ* RXYA408AATJ*	φ3, 60Hz	208/230V	64.2+70.0	80+80	AWG18-16
REYA432AATJ* RXYA432AATJ*	φ3, 60Hz	208/230V	70.0+70.0	80+80	AWG18-16
REYA456AATJ* RXYA456AATJ*	φ3, 60Hz	208/230V	70.0+79.1	80+90	AWG18-16
REYA480AATJ* RXYA480AATJ*	φ3, 60Hz	208/230V	79.1+79.1	90+90	AWG18-16
REYA72AAYD* RXYA72AAYD*	φ3, 60Hz	460V	14.9	20	AWG18-16
REYA96AAYD* RXYA96AAYD*	φ3, 60Hz	460V	17.5	20	AWG18-16
REYA120AAYD* RXYA120AAYD*	φ3, 60Hz	460V	18.2	25	AWG18-16
REYA144AAYD* RXYA144AAYD*	φ3, 60Hz	460V	23.3	30	AWG18-16
REYA168AAYD* RXYA168AAYD*	φ3, 60Hz	460V	27.1	30	AWG18-16
REYA192AAYD* RXYA192AAYD*	φ3, 60Hz	460V	30.7	35	AWG18-16
REYA216AAYD* RXYA216AAYD*	φ3, 60Hz	460V	32.8	40	AWG18-16
REYA240AAYD* RXYA240AAYD*	φ3, 60Hz	460V	35.1	40	AWG18-16
REYA264AAYD* RXYA264AAYD*	φ3, 60Hz	460V	18.2+23.3	25+30	AWG18-16
REYA288AAYD* RXYA288AAYD*	φ3, 60Hz	460V	23.3+23.3	30+30	AWG18-16
REYA312AAYD* RXYA312AAYD*	φ3, 60Hz	460V	23.3+27.1	30+30	AWG18-16
REYA336AAYD* RXYA336AAYD*	φ3, 60Hz	460V	27.1+27.1	30+30	AWG18-16
REYA360AAYD* RXYA360AAYD*	φ3, 60Hz	460V	27.1+30.7	30+35	AWG18-16
REYA384ATJ*A RXYA384ATJ*A	φ3, 60Hz	460V	30.7+30.7	35+35	AWG18-16
REYA408AAYD* RXYA408AAYD*	φ3, 60Hz	460V	30.7+32.8	35+40	AWG18-16
REYA432AAYD* RXYA432AAYD*	φ3, 60Hz	460V	32.8+32.8	40+40	AWG18-16
REYA456AAYD* RXYA456AAYD*	φ3, 60Hz	460V	32.8+35.1	40+40	AWG18-16
REYA480AAYD* RXYA480AAYD*	φ3, 60Hz	460V	35.1+35.1	40+40	AWG18-16

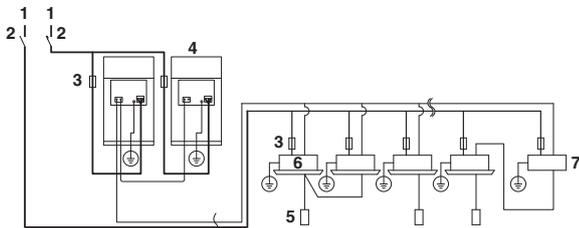
## 11.2. Wiring connection example for whole system

### In case of heat recovery system



- 1 Power supply
- 2 Main switch
- 3 Fuse or circuit breaker
- 4 Outdoor unit
- 5 COOL/HEAT selector
- 6 Remote controller
- 7 Indoor unit
- 8 Branch Selector unit

### In case of heat pump system



- 1 Power supply
- 2 Main switch
- 3 Fuse or circuit breaker
- 4 Outdoor unit
- 5 Remote controller
- 6 Indoor unit
- 7 Safety shut-off valve unit

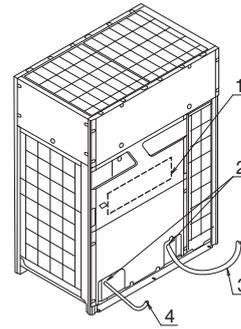
This image is intended as an example only. Please follow local and national electrical code.

### NOTE

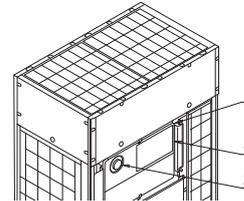
- Make sure the low voltage wiring (i.e. for the remote controller, between units) and the power wiring do not pass near each other, keeping them at least 1-15/16 in. (50 mm) apart. Proximity may cause electrical interference, malfunctions, and breakage.
- Be sure to connect the power wiring to the power wiring terminal block and secure it as described in 11.5. Power wiring connection procedure on page 29.
- Transmission wiring should be secured as described in 11.4. Transmission wiring connection procedure on page 28.
- 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 cover deforming. And close the cover firmly.
- All field wiring is to be procured on site.

## 11.3. Leading wire procedure

- The power wiring and ground wiring are passed out from the power wiring hole on the front (slit hole).
- The transmission wiring is passed out from the wiring hole (slit hole) on the front of the unit.



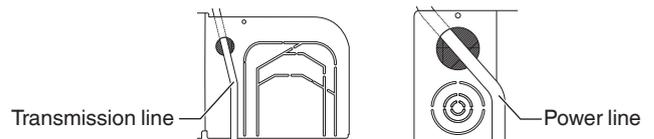
- 1 Wiring diagram printed on the back of the control box cover.
- 2 Slit hole
- 3 Power line
- 4 Transmission line



- 1 Control box cover
- 2 Inspection door
- 3 [Service precautions] Label location

### NOTE

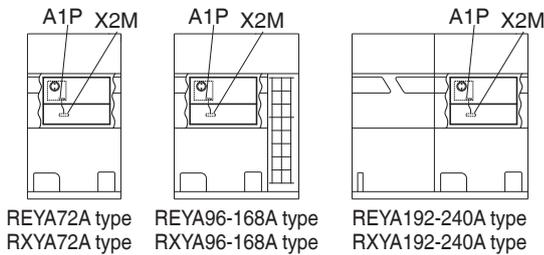
- Open the slit holes with a cutting nipper or similar tool.
- After cutting the slit holes, it is recommended to remove burrs in the slit holes and paint the edges and areas around the edges using the repair paint to prevent rusting.
- When passing wiring through the slit holes, remove burrs around the slit holes and protect the wiring with protective tape.
- After passing the wiring, be sure to fill any gap (indicated by the hatching in the figure below) with sealing material (field supply) to prevent small animals and dust from entering.



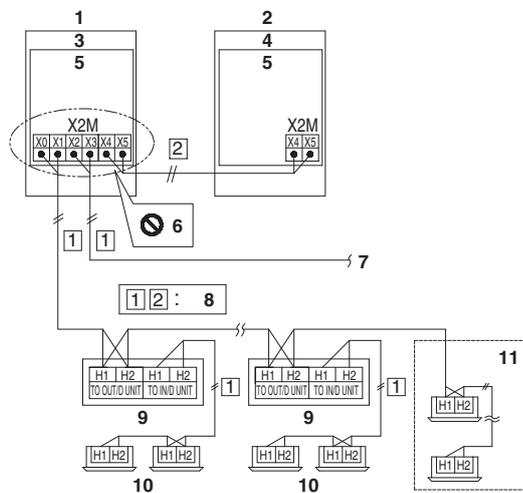
### 11.4. Transmission wiring connection procedure

- Referring to the figure below, connect the transmission wiring between outdoor unit and indoor unit, outdoor unit and outdoor unit of other system, outdoor unit and outdoor unit of same system.
- In order to reduce the risk of PCB failure due to contamination, the A1P has been sealed off and a relay terminal block X2M will be used for wire connection. X2M is equivalent of A1P connection below table.

	TO IN/D UNIT		TO OUT/D UNIT		TO MULTI UNIT	
A1P	H1	H2	H1	H2	Q1	Q2
X2M	X0	X1	X2	X3	X4	X5

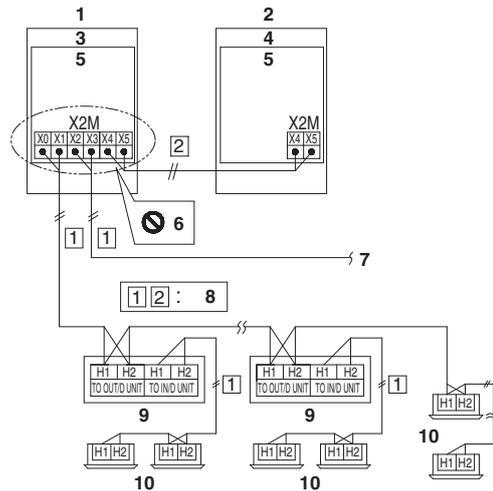


#### In case of heat recovery system



- Master unit (\*)
  - Sub unit (\*)
  - Outdoor unit A
  - Outdoor unit B
  - Control box
  - Never connect the power wire.
  - To outdoor unit of other refrigerant system
  - Use duplex wires (No polarity)
  - Branch Selector unit
  - Indoor unit
  - Indoor unit (Cooling only)
- (\*) : The outdoor unit that connect the transmission wiring to Branch Selector unit is Master unit of the multi system. And the other units are Sub unit. (In this figure, outdoor unit A is the Master unit.)  
Check operation in installation work, onsite settings and so on are done by operating the printed circuit board (A1P) of Master unit.

#### In case of heat pump system



- Master unit (\*)
  - Sub unit (\*)
  - Outdoor unit A
  - Outdoor unit B
  - Control box
  - Never connect the power wire.
  - To outdoor unit of other refrigerant system
  - Use duplex wires (No polarity)
  - Safety shut-off valve unit
  - Indoor unit
- (\*) : The outdoor unit that connect the transmission wiring to an indoor unit is Master unit of the multi system. And the other units are Sub unit. (In this figure, outdoor unit A is the Master unit.)  
Check operation in installation work, onsite settings and so on are done by operating the printed circuit board (A1P) of Master unit.

#### NOTE

- Do not connect the power wiring to terminals for the transmission wiring. Doing so would destroy the entire system.
- Wiring to the indoor unit (by way of Branch Selector: in case of heat recovery system) should be wired to X0 and X1 on the outdoor unit's terminal block (X2M).
- The above wiring should be wired using AWG18-16 stranded, non-shielded wiring.
- All transmission wiring is to be procured onsite. See the table below for the tightening torque of the transmission wiring terminals.

Screw size	Tightening torque
M3.5 (X2M)	0.59-0.71 ft·lbf (0.8-0.97 N·m)

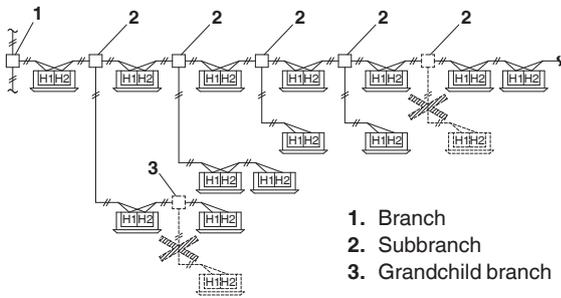
- Transmission wiring should be done within the following limitations. If they are exceeded, transmission problems may occur.
  - Farthest wiring length\*1 (10 systems\*2 or less) Max. 3280 ft. (1000 m)
  - Farthest wiring length\*1 (more than 10 systems\*2) Max. 2296 ft. (700 m)
  - Total wiring length Max. 6560 ft. (2000 m)
  - Wiring length between units Max. 656 ft. (200 m)
  - Max. no. of branches 20 (Up to 4 subbranches are available per system.)

\*1 Wiring length from outdoor unit to farthest unit

\*2 System: A set of units connected in the same refrigerant circuit

**Up to 4 subbranches per system are available.**

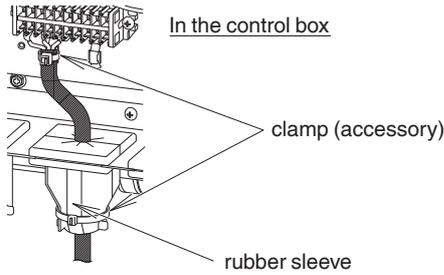
Grandchild branch in wiring between units is not available.



- 1. Branch
- 2. Subbranch
- 3. Grandchild branch

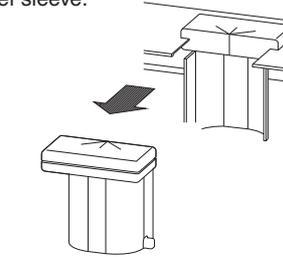
2 Between outdoor unit and outdoor unit of same system  
Max. wiring length : 98 ft. (30 m)

- Pass the transmission wiring through the rubber sleeve and fix with a clamp to prevent water and dust from entering the control box.

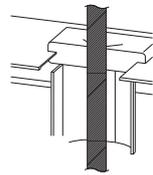


How to pass wire through the rubber sleeve:

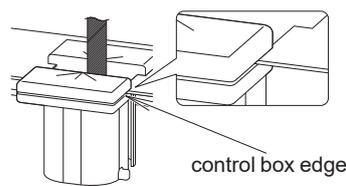
- 1 Remove the rubber sleeve (detachable portion).



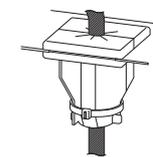
- 2 Place the wire.



- 3 Attach the rubber sleeve (detachable portion). Attach by inserting the control box edge into the slit of the rubber sleeve.

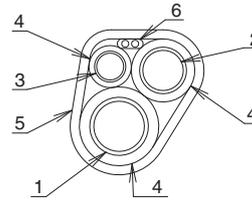


- 4 Fix with a clamp.



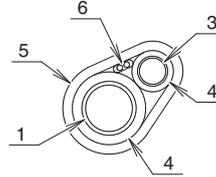
- Outside the units, the transmission wiring must be finished simultaneously with the local refrigerant piping, and wound with tape (field supply) as shown in the figure below.

#### In case of heat recovery system



- 1 Suction gas pipe
- 2 High/low pressure gas pipe
- 3 Liquid pipe
- 4 Insulation material
- 5 Finishing tape
- 6 Transmission wiring

#### In case of heat pump system



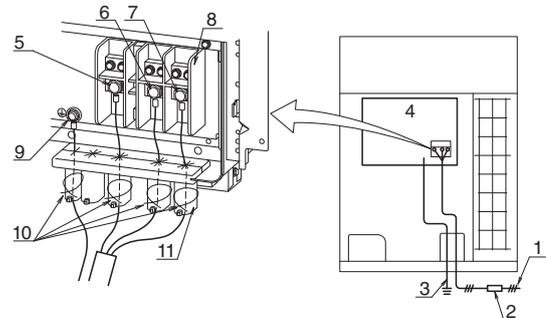
- For multi system:

1 Transmission wiring between outdoor units in the same piping system must be connected to terminals X4 and X5. Connecting the wires to the terminals X2 and X3 results in system malfunction.

2 Wiring to other systems should be connected to terminals X2 and X3 on the printed circuit board of the master unit. The outdoor unit that connects transmission wiring to indoor unit is the master unit. The others are sub unit.

### 11.5. Power wiring connection procedure

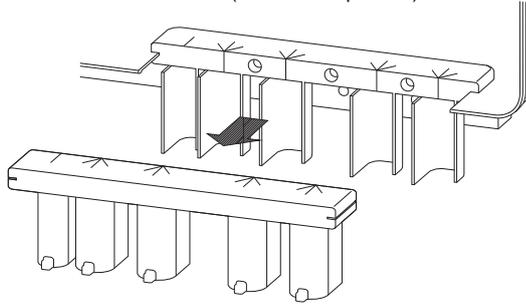
- Be sure to connect the power supply wiring to the power supply terminal block, pass each phase (L1, L2, L3) wire through separate rubber sleeves and fix with the included clamps.
- Fix the ground wiring with the included clamp by taking care not to apply external pressure on the terminal area.
- Pass the power supply wiring and ground wiring through their respective rubber sleeve and fix with the included clamps to prevent water from entering the control box.



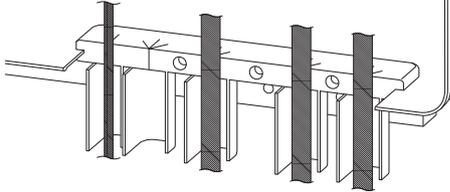
- 1 Power supply (MODEL AATJ\* : 3-208/230V 60 Hz) (MODEL AAYD\* : 3-460V 60 Hz)
- 2 Branch switch, Overcurrent breaker
- 3 Ground wire
- 4 Control box
- 5 L1 phase terminal
- 6 L2 phase terminal
- 7 L3 phase terminal
- 8 Power supply terminal block
- 9 Ground terminal
- 10 Clamp (accessory)
- 11 Rubber sleeve

How to pass wire through the rubber sleeve:

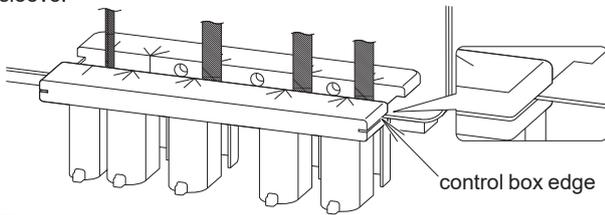
- 1 Remove the rubber sleeve (detachable portion).



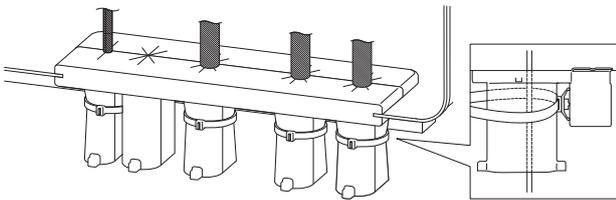
- 2 Place the wire.



- 3 Attach the rubber sleeve (detachable portion). Attach by inserting the control box edge into the slit of the rubber sleeve.

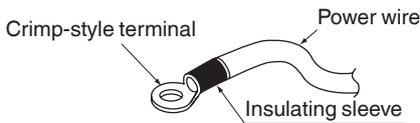


- 4 Fix with a clamp. Fix by passing the clamp through the hook on the back.



**CAUTION**

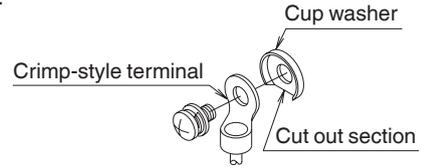
- Be sure to use crimp-style terminal with insulating sleeves for connections. (See the figure below.)



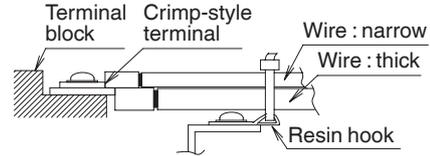
- For wiring, use the designated power wire and connect firmly, then secure to prevent outside pressure being exerted on the terminal board.
- Use an appropriate screwdriver for tightening the terminal screws. A screwdriver with a small head will strip the head and make proper tightening impossible.
- Over-tightening the terminal screws may break them. See the following table for the tightening torque of the terminal screws.

Screw size	Tightening torque
M8 Power terminal	4.1-5.3 ft·lbf (5.5-7.3 N·m)
M8 Ground terminal	7.2-8.6 ft·lbf (9.7-11.7 N·m)

- When pulling the ground wire out, wire it so that it comes through the cut out section of the cup washer. (See the figure below.) An improper ground connection may prevent a good ground from being achieved.

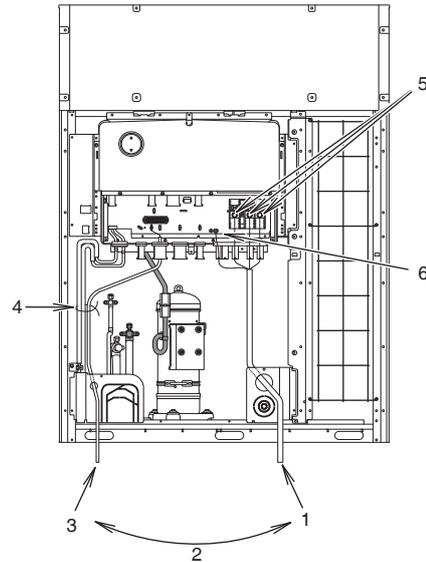


- When 2 wires are connected to a single terminal, connect them so that the rear sides of the crimp contacts face each other. Also, make sure the thinner wire is on top, securing the 2 wires simultaneously to the resin hook using the included clamp.



**11.6. Procedure for Wiring Inside Units**

- Referring to the figure below, secure and wire the power and transmission wiring using the included clamp.
- Wire so that the ground wiring does not come into contact with the compressor lead wiring. If they touch, this may have an adverse effect on other devices.
- The transmission wiring must be at least 1-15/16 in. (50 mm) away from the power wiring.
- Route wiring so that it does not come into contact with the high-temperature pipes (indicated by the hatching in the figure below).

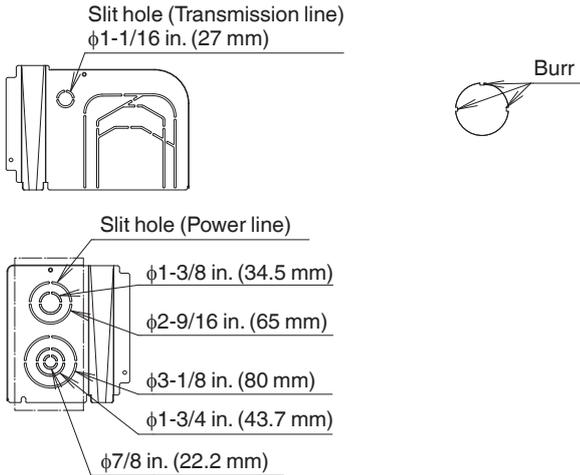


- |                                  |                     |
|----------------------------------|---------------------|
| 1 Power/ground wires             | 4 Clamp (accessory) |
| 2 Clear over 1-15/16 in. (50 mm) | 5 Power wiring      |
| 3 Transmission wiring            | 6 Ground wire       |

**Precautions when cutting the slit holes**

- Open the slit holes with a cutting nippers or similar tool.
- Open an appropriate hole as needed.
- After cutting the slit holes, it is recommended to remove burrs in the slit holes and paint the edges and areas around the edges using the repair paint to prevent rusting.
- Power line: Open a slit hole and connect it using a conduit. Choose an appropriate slit hole for conduit size suitable for the power and ground line to be used.
- Transmission line: Connect it using a conduit in the slit hole.

- When passing electrical wiring through the slit holes, protect the wiring with a conduit or bushings, making sure not to damage the wiring.
- Block all gaps in the holes for passing out piping and wiring using sealing material.



**NOTE**  
After wiring work is completed, check to make sure there are no loose connections among the electrical parts in the control box.

## 12. Checking of device and installation conditions

Be sure to check the followings.

### For those doing electrical work

- 1 Make sure there is no faulty transmission wiring or loosening of a nut.  
See 11.4. Transmission wiring connection procedure on page 28.
- 2 Make sure there is no faulty power wiring or loosening of a nut.  
See 11.5. Power wiring connection procedure on page 29.
- 3 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 7.2. Selection of piping material on page 11 and 7.4. Selection of refrigerant branch kits on page 13.
- 2 Make sure insulation work is done.  
See 10. Pipe insulation.
- 3 Make sure there is no faulty refrigerant piping.  
See 8. Precautions on refrigerant piping on page 19.

## 13. Making field settings

To continue the configuration of the outdoor units, it is required to give some input to the printed circuit board of the unit. This chapter will describe how manual input is possible by operating the push buttons/DIP switches on the printed circuit board and reading the feedback from the 7 segment displays.

For VRV REYA-A/RXYA-A series it is alternatively possible to make several commissioning field settings through a personal computer interface (for this operation, an optional cable is required). The installer can prepare the configuration (off-site) on PC and afterwards upload the configuration to the system. How to connect the cable is described in 13.3. Connecting the PC configurator to the outdoor unit on page 33.

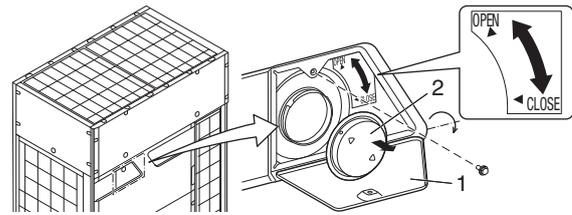
The contents of the actual settings is discussed and explained in 15.2. Monitoring function and field settings on page 38.

For a complete list of indoor and outdoor unit field settings, refer to the online service manual of this outdoor unit.

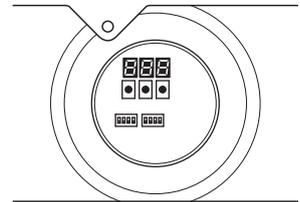
### 13.1. Accessing the push buttons on the printed circuit board

It is not required to open the complete control box to access the push buttons on the printed circuit board and read out the 7 segment display (s).

- 1 Open the service window cover.
- 2 Open the inspection door.



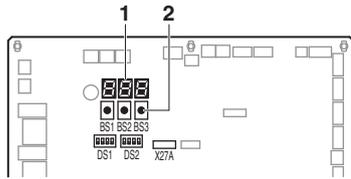
You can see 3 push buttons and 3 seven-segment displays and DIP switches.



**NOTE**  
Operate the switches and push buttons with an insulated stick (such as a closed ballpoint pen) to avoid touching of live parts.

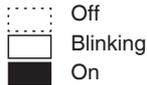


Location of the 7 segment displays, buttons and DIP switches:



- BS1** for changing setting mode
- BS2, BS3** for changing field setting
- DS1, DS2** DIP switches
- 1** 7 segment displays (3x)
- 2** Push buttons (3x)

Segment display indications:



## 13.2. Operating the push buttons and DIP switches on the printed circuit board

### 13.2.1. Operating the push buttons

By operating the push buttons it is possible to:

- Perform special actions (test run, etc).
- Perform field settings (demand operation, low noise, etc).

Below procedure explains how to operate the push buttons to reach the required mode in the menu, select the correct setting and modify the value of the setting. This procedure can be used any time special settings and regular field setting are discussed in this manual (see 15.2. Monitoring function and field settings on page 38).

Setting definition: [A-B]=C; A=mode; B=setting; C=setting value. A, B and C are numerical values for field settings. Parameter C has to be defined. It can be a chosen from a set (0, 1, 2, 3, 4, 5, ...) or regarded as an ON/OFF (1 or 0) depending on the contents. This is informed when the field setting is explained (see 15.2. Monitoring function and field settings on page 38).

#### **i** INFORMATION

During special operation (e.g., test run, etc.) or when an malfunction happened, information will contain letters and numerical values.

#### Initialization: default situation

Turn on the power supply of the outdoor unit and all indoor units. When the communication between indoor units and outdoor unit (s) is established and normal, the segment indication state will be as follows (default situation when shipped from factory):

When the power is turned on, the display lights up to confirm transmission.



When no trouble occurs: lighted as indicated

When there are zero connected indoor units: the display flashes on and off.



Ready for operation: blank display indication as indicated.



It may take up to several tens of minutes for the transmission confirmation to be completed. (Running a transmission line parallel to another system can cause signal congestion and take longer.)

When above situation cannot be confirmed, the error code can be

checked on the indoor unit user interface and the outdoor unit segment display. Solve the error code accordingly. The communication wiring should be checked at first.

#### **i** INFORMATION

Be sure to turn the power on at least 6 hours before operation in order to have power running to the crankcase heater.

#### Accessing modes

BS1 is used to change the mode you want to access.

- Access mode 1

Push BS1 one time. Segment indication changes to:



- Access mode 2

Push BS1 for at least 5 seconds. Segment indication changes to:



#### **i** INFORMATION

If you get confused in the middle of the process, push BS1.

Then it returns to idle situation (no indication on segment displays: blank.)

#### Mode 1

Mode 1 is used to set basic settings and to monitor the status of the unit (15.2. Monitoring function and field settings on page 38).

- Changing and access the setting in mode 1:  
Once mode 1 is selected (push BS1 one time), you can select the wanted setting. It is done by pushing BS2. Accessing the selected setting's value is done by pushing BS3 one time.
- To quit and return to the initial status, press BS1.

#### Example:

Checking the content of parameter [1-10] (to know how many indoor units are connected to the system).

[A-B]=C in this case defined as: A=1; B=10; C=the value we want to know/monitor:

- Make sure the segment indication is displayed in operational default mode as shipped from factory.
- Push BS1 one time; result segment display:



Result: mode 1 is accessed.

- Push BS2 10 times; result segment display:



Result: mode 1 setting 10 is addressed.

- Push BS3 one time; the value which is returned (depending on the actual field situation), is the amount of indoor units which are connected to the system.  
Result: mode 1 setting 10 is addressed and selected, return value is monitored information.
- To leave the monitoring function, push BS1 one time, you will return to the default situation when shipped from factory.

#### Mode 2

Mode 2 is used to set field settings of the outdoor unit and system.

- Changing and access the setting in mode 2:

Once mode 2 is selected (push BS1 for more than 5 seconds), you can select the wanted setting. It is done by pushing BS2. Accessing the selected setting's value is done by pushing BS3 one time.

- To quit and return to the initial status, press BS1.
- Changing the value of the selected setting in mode 2:
  - Once mode 2 is selected (push BS1 for more than 5 seconds) you can select the wanted setting. It is done by pushing BS2.
  - Accessing the selected setting's value is done by pushing BS3 one time.
  - Now BS2 is used to select the required value of the selected setting.
  - When the required value is selected, you can define the change of value by pushing BS3 one time.
  - Press BS3 again to start operation according to the chosen value.

**Example:**

Checking the content of parameter [2-18] (to define the high static pressure setting of the outdoor unit's fan).

[A-B]=C in this case defined as: A=2; B=18; C=the value we want to know/change

Make sure the segment indication is as during normal operation (default situation when shipped from factory).

- Push BS1 for over 5 seconds; result segment display:



Result: mode 2 is accessed.

- Push BS2 18 times; result segment display:



Result: mode 2 setting 18 is addressed.

- Push BS3 one time; the value which is returned (depending on the actual field situation), is the status of the setting. In the case of [2-18], default value is 0, which means the function is not active. Result: mode 2 setting 18 is addressed and selected, return value is the current setting situation.
- To change the value of the setting, push BS2 till the required value appears on the segment indication. When achieved, define the setting value by pushing BS3 one time. To start operation according to the chosen setting, confirm again by pushing BS3.
- To leave the field settings, push BS1 one time, you will return to the default situation when shipped from factory.

**13.2.2. Operating the DIP switches**

By operating the DIP switches it is possible to:

DIP switch DS1	Heat recovery system	Heat pump system
1	NOT USED DO NOT CHANGE THE FACTORY SETTING	Cool/Heat selector (refer to the manual of the Cool/Heat selector switch) OFF=not installed=factory setting
2		NOT USED DO NOT CHANGE THE FACTORY SETTING
3		
4		

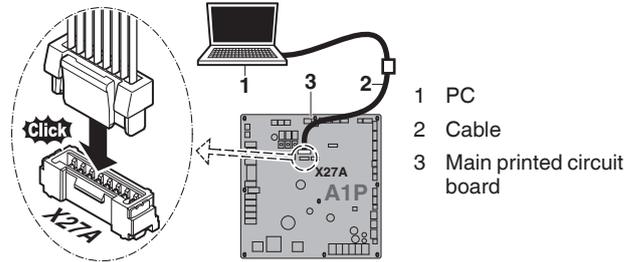
DIP switch DS2	Heat recovery system	Heat pump system
1	NOT USED DO NOT CHANGE THE FACTORY SETTING	NOT USED DO NOT CHANGE THE FACTORY SETTING
2		
3		
4		

**13.3. Connecting the PC configurator to the outdoor unit**

Connection of the optional PC configurator cable to the outdoor unit has to be done on A1P. Connect the optional cable to the 8-pin white connector X27A.

**CAUTION**

Works executed on the outdoor unit are best done under dry weather conditions to avoid water ingress.



**14. Charging refrigerant**

**14.1. Precautions**

**NOTE**

- Refrigerant cannot be charged until field wiring has been completed.
- Refrigerant may only be charged after performing the leak test and the vacuum drying.
- 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 a system with an unsuitable substance as refrigerant may cause explosions and accidents, so always ensure that the appropriate refrigerant R32 is charged.
- Refrigerant containers shall be opened slowly.
- Always use protective gloves and protect your eyes when charging refrigerant.
- When the refrigerant system is to be opened, refrigerant must be treated according to the applicable legislation.
- Additional refrigerant charge calculation parameters are required when installing the outdoor unit connected to AHU Integration kit. Refer to its installation manual for detailed information.

**DANGER**

See Safety considerations on page i.

- To avoid compressor breakdown, do not charge the refrigerant more than the specified amount.
- This outdoor unit is factory charged with refrigerant and depending on pipe sizes and pipe lengths systems require additional charging of refrigerant. See 14.2. Calculating the additional refrigerant charge.
- In case recharge is required, refer to the nameplate of the unit. It states the type of refrigerant and necessary amount.

## 14.2. Calculating the additional refrigerant charge



Refrigerant charge limits for models using R32 refrigerant are determined by room size and the installation height of the indoor unit, among other factors. In addition, the refrigerant charge of the system must be 175.4 lbs. (79.6 kg) or less under all conditions. See the General Safety Considerations in the separate booklet for more information. In case the calculated total refrigerant charge exceeds 175.4 lbs. (79.6 kg) you must divide your multiple outdoor system into smaller independent systems, each containing 175.4 lbs. (79.6 kg) or less refrigerant charge. For factory charge, refer to the unit nameplate.

### 14.2.1. How to calculate the additional refrigerant to be charged

Additional refrigerant to be charged=R (lbs.). R should be rounded off in units of 0.1 lbs.

$$R=[(X_1 \times \phi 7/8) \times 0.22 + (X_2 \times \phi 3/4) \times 0.16 + (X_3 \times \phi 5/8) \times 0.11 + (X_4 \times \phi 1/2) \times 0.067 + (X_5 \times \phi 3/8) \times 0.035 + (X_6 \times \phi 1/4) \times 0.013] \times 1.04 + [A] + [B] + [C]$$

X<sub>1...6</sub> = Total length (ft. (m)) of liquid piping size at  $\phi$ a

\* In units of 0.1 kg, additional refrigerant to be charged=R (kg).

$$R=[(X_1 \times \phi 22.2) \times 0.32 + (X_2 \times \phi 19.1) \times 0.23 + (X_3 \times \phi 15.9) \times 0.16 + (X_4 \times \phi 12.7) \times 0.10 + (X_5 \times \phi 9.5) \times 0.053 + (X_6 \times \phi 6.4) \times 0.020] \times 1.04 + [A] + [B] + [C]$$

Parameter [A] Refrigerant amount for Branch Selector units	
Branch Selector unit/ Safety shut-off valve unit model	Refrigerant amount
BSF4A54A*	1.4 lbs./unit (0.65 kg/unit)
BSF6A54A*	1.9 lbs./unit (0.85 kg/unit)
BSF8A54A*	2.2 lbs./unit (1.0 kg/unit)
BSA36A*	0.1 lbs./unit (0.05 kg/unit)
BSA60A*	0.2 lbs./unit (0.1 kg/unit)
BSA96A*	0.4 lbs./unit (0.2 kg/unit)
SVA60A*	0.1 lbs./unit (0.05 kg/unit)
SVA96A*	0.1 lbs./unit (0.05 kg/unit)

Parameter [B]	
Outdoor unit	Refrigerant amount
REYA/RXYA72A*	0.0 lbs./unit (0.0 kg/unit)
REYA/RXYA96A*	2.6 lbs./unit (1.2 kg/unit)
REYA/RXYA120A*	3.0 lbs./unit (1.4 kg/unit)
REYA/RXYA144A*	9.5 lbs./unit (4.3 kg/unit)
REYA/RXYA168A*	10.1 lbs./unit (4.6 kg/unit)
REYA/RXYA192A*	27.3 lbs./unit (12.4 kg/unit)
REYA/RXYA216A*	27.5 lbs./unit (12.5 kg/unit)
REYA/RXYA240A*	27.8 lbs./unit (12.6 kg/unit)

Parameter [C] Refrigerant amount by equivalent field piping length and indoor units capacity			
Equivalent field piping length	Total indoor unit capacity connection ratio	Refrigerant amount Total outdoor unit capacity type	
		REYA/RXYA72-240A*	REYA/RXYA264-480A*
<295.3 ft. (90 m)	≤85%	0.0 lbs. (0.0 kg)	
	>85%	The smaller of [D] or 2.43 lbs. (1.1 kg)	The smaller of [D] or 4.85 lbs. (2.2 kg)
≥295.3 ft. (90 m)	≤85%	0.0 lbs. (0.0 kg)	
	>85%	2.20 lbs. (1.0 kg)	

Indoor unit capacity type	Parameter [D]										
	FXFA type										
	07	09	12	15	18	24	30	36	48	54	Others
Refrigerant amount (lbs. (kg)/unit)	0.28 (0.13)	0.19 (0.09)	0.07 (0.03)	0.00 (0.00)	0.00 (0.00)	0.34 (0.16)	0.41 (0.19)	0.09 (0.04)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)

Example for refrigerant branch using REFNET joint and REFNET header for systems and each pipe length is shown below. (Example 7.5. System piping (length) limitations on page 14.)

Outdoor system: REYA264AATJ\* (REYA120AATJ\*+REYA144AATJ\*)

Branch Selector units and Safety shut-off valve units

SVA60A\* × 1, BSA60A\* × 1, BSA96A\* × 1, BSF4A54A\* × 2

Indoor units

FXMA type: 12 × 2, 15 × 2, 18 × 5

FXFA type: 36 × 2

Other: 48 × 1

Liquid piping

a: $\phi 3/4 \times 60$ ft.	f: $\phi 1/4 \times 5$ ft.	k: $\phi 3/8 \times 10$ ft.	p: $\phi 3/8 \times 15$ ft.	u: $\phi 3/8 \times 10$ ft.
b: $\phi 5/8 \times 10$ ft.	g: $\phi 1/4 \times 5$ ft.	l: $\phi 3/8 \times 10$ ft.	q: $\phi 1/4 \times 10$ ft.	v: $\phi 1/4 \times 5$ ft.
c: $\phi 1/2 \times 10$ ft.	h: $\phi 3/8 \times 5$ ft.	m: $\phi 3/8 \times 15$ ft.	r: $\phi 3/8 \times 10$ ft.	w: $\phi 1/4 \times 5$ ft.
d: $\phi 3/8 \times 10$ ft.	i: $\phi 1/4 \times 5$ ft.	n: $\phi 3/8 \times 15$ ft.	s: $\phi 1/4 \times 10$ ft.	A: $\phi 1/2 \times 10$ ft.
e: $\phi 3/8 \times 10$ ft.	j: $\phi 1/4 \times 5$ ft.	o: $\phi 3/8 \times 15$ ft.	t: $\phi 1/4 \times 5$ ft.	D: $\phi 1/2 \times 15$ ft.

Total length of liquid piping: 285 ft.

Total capacity of indoor unit: 100.0%

$$[D] = \frac{0.00 \times 2}{\text{FXMA}12 \times 2} + \frac{0.00 \times 2}{\text{FXMA}15 \times 2} + \frac{0.00 \times 5}{\text{FXMA}18 \times 5} + \frac{0.09 \times 2}{\text{FXFA}36 \times 2} + \frac{0.00 \times 1}{\text{Others}48 \times 1} = 0.18 \text{ lbs.}$$

[C]: The smaller of [D] or 6.61 lbs. = 0.18 lbs.

$$R = \left( \frac{60 \times 0.16}{a} + \frac{10 \times 0.11}{b} + \frac{35 \times 0.067}{c, A, D} + \frac{125 \times 0.035}{d, e, h, k, l, m, n, o, p, r, u} + \frac{55 \times 0.013}{f, g, i, j, q, s, t, v, w} \right) \times 1.04 + \frac{3.5}{A} + \frac{12.5}{B} + \frac{0.18}{C}$$

$$= 35.04 \Rightarrow \boxed{35.0 \text{ lbs.}}$$

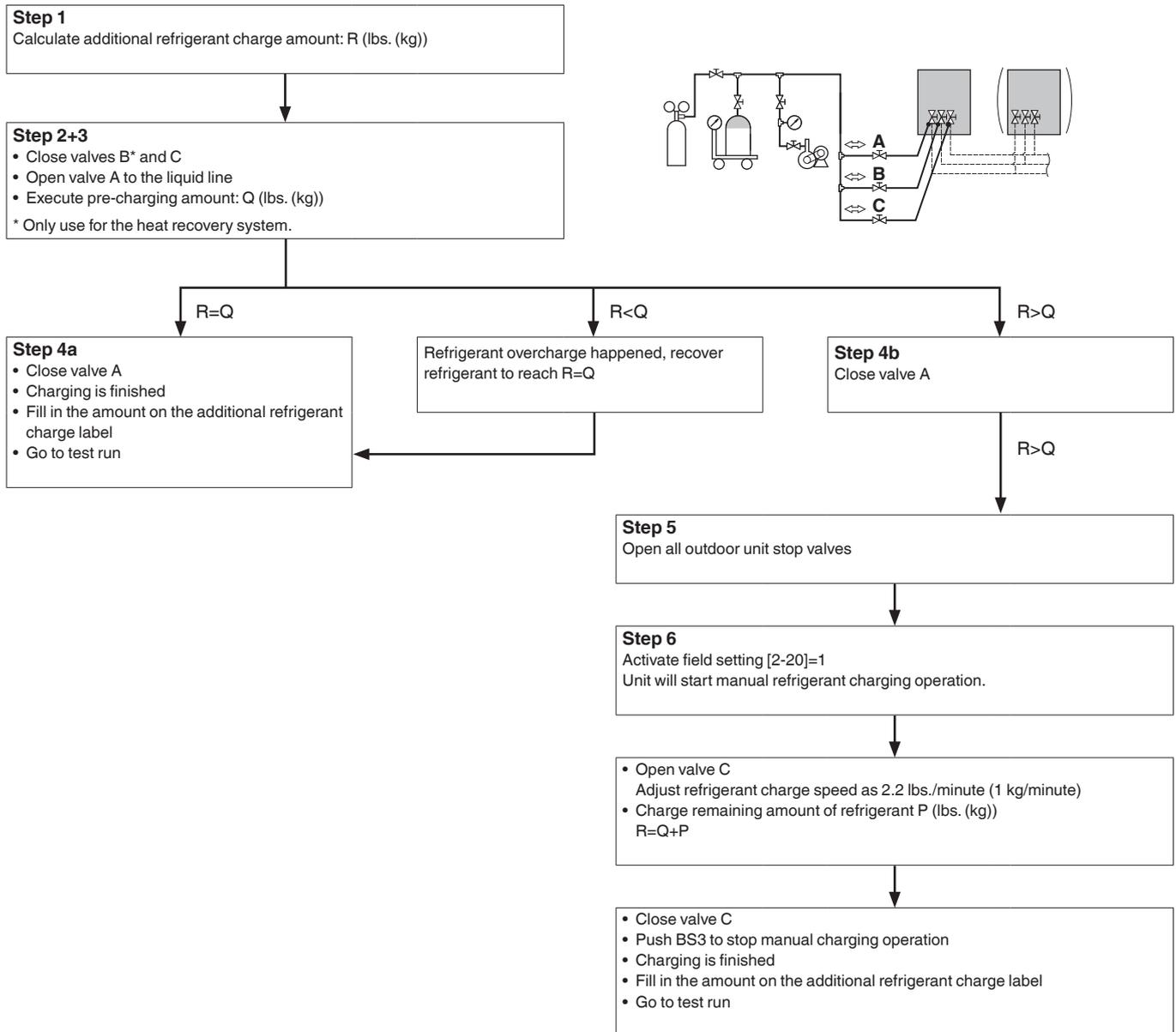
Round off in units of 0.1 lbs.

### INFORMATION

Piping length is considered by the distance from the outdoor unit to the farthest indoor unit.

### 14.3. Method for adding refrigerant

#### 14.3.1. Flow chart

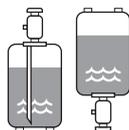


See figure location of valves next page for more information refer to the text in this chapter.

Be sure to charge the specified amount of refrigerant in liquid state.

- Before charging, check whether the refrigerant cylinder is equipped with a siphon tube or not.

If a siphon tube is equipped, change the liquid refrigerant with the cylinder in upright position.



If a siphon tube is not equipped, change the liquid refrigerant with the cylinder in upside down position.

- Be sure to use tools exclusively for R32 to ensure required pressure resistance and to prevent foreign materials from mixing into the system.

#### NOTE

- Charging with an unsuitable substance may cause explosions and accidents, so always make sure that the appropriate refrigerant (R32) is charged.
- Refrigerant containers must be opened slowly.

#### CAUTION

- When charging a system, charging over the permissible quantity may cause liquid hammer.
- Always use protective gloves and protect your eyes when charging refrigerant.
- When the refrigerant charging procedure is done or when pausing, close the valve of the refrigerant tank immediately. If the tank is left with the valve open, the amount of refrigerant which was properly charged may get off point. More refrigerant may be charged by any remaining pressure after the unit has stopped.

**NOTE**

- If the power of some units is turned off, the charging procedure cannot be finished properly.
- In case of a multiple outdoor system, turn on the power of all outdoor units.
- Make sure to turn ON the power 6 hours before starting the operation. This is necessary to warm the crankcase by the electric heater.
- If operation is performed within 12 minutes after the indoor and outdoor units are turned on, the compressor will not operate before the communication is established in a correct way between outdoor unit(s) and indoor units.
- Before starting charging procedures, check if the segment display indication of the main printed circuit board (A1P) is as normal (see 13.2. Operating the push buttons and DIP switches on the printed circuit board on page 32). If an error code is present, see 15.5. Error code list on page 49.
- Make sure all connected indoor units are recognized (see 15.2. Monitoring function and field settings on page 38).
- Close the front panel before any refrigerant charge operation is executed. Without the front panel attached the unit cannot judge correctly whether it is operating properly or not.

**14.3.2. Charging method**

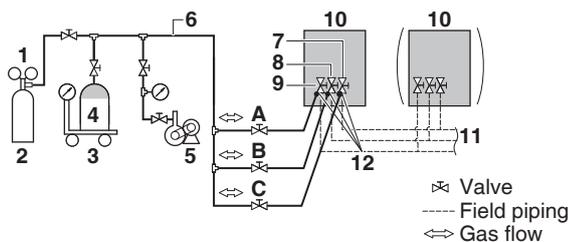
As explained during vacuum drying method, once vacuum drying is finished, additional refrigerant charging can start.

A flow chart is available which gives an overview of the possibilities and actions to be taken (see 14.3.1. Flow chart on page 35).

To speed up the process of pre-charging refrigerant for large systems, it is recommended to first charge a portion of the refrigerant before performing refrigerant charging operation of outdoor unit. This step is included in below procedure. This step can be skipped, but charging will take longer in such a case.

Follow the steps as described below.

- 1 Calculate the additional amount of refrigerant to be added using the formula mentioned in 14.2. Calculating the additional refrigerant charge on page 34.
- 2 The first 22 lbs. (10 kg) of additional refrigerant can be charged without outdoor unit operation.  
If the additional refrigerant amount is smaller than 22 lbs. (10 kg), perform the pre-charging procedure as explained in step 3 and 4a below.  
If the additional refrigerant charge is larger than 22 lbs. (10 kg), perform step 3 till the end of the procedure.
- 3 Pre-charging can be done without compressor running by connecting the refrigerant tank only to the liquid stop valve service port (open valve A). Make sure that all outdoor unit stop valves, as well as valves B and C are closed.



- 1 Gauge manifold
- 2 Nitrogen

- 3 Measuring instrument
- 4 Refrigerant R32 tank
- 5 Vacuum pump
- 6 Charge hose
- 7 High/low pressure gas pipe stop valve
- 8 Suction gas pipe stop valve \*1
- 9 Liquid pipe stop valve
- 10 Outdoor unit
- 11 To Indoor unit/Branch Selector unit \*2/Safety shut-off valve units
- 12 Stop valve service port
- A Valve A
- B Valve B \*1
- C Valve C

\*1 Only use for the heat recovery system.

\*2 Branch Selector unit is only for the heat recovery system.

- 4 a) If the calculated additional refrigerant amount is reached by above pre-charging procedure, close valve A.  
b) If the total amount of refrigerant could not be charged by pre-charging, then close valve A and go to step 5.

**INFORMATION**

If the total additional refrigerant amount was reached in step 4 (by pre-charging only), record the amount of refrigerant that was added on the additional refrigerant charge label provided with the unit and attach it on the back side of the front panel. Perform the test procedure as described in 15.4. Test operation on page 48.

- 5 After pre-charging, perform the refrigerant charge operation as shown below and charge the remaining refrigerant of the additional charging amount through valve C.  
Open all outdoor units stop valves. Valves A, B and C must remain closed!

**NOTE**

In order to ensure uniform refrigerant distribution, it may take the compressor ±10 minutes to start up after the unit has started operation. This is not a malfunction.

- 6 The remaining additional refrigerant charge can be charged by operating the outdoor unit by means of the refrigerant charge operation mode:
  - Turn on the power of the indoor units and outdoor unit.
  - Take all the precautions mentioned in **start-up and configuration** into account.
  - Activate outdoor unit setting [2-20]=1 to start refrigerant charge mode. Refer to page 40 for details.  
**Result:** The unit will start operation. Valve C can be opened. Charging of remaining additional refrigerant can be done. When the remaining calculated additional refrigerant amount is added, close valve C and push BS3 to stop the refrigerant charging procedure.

## INFORMATION

The refrigerant charge operation will automatically stop within 30 minutes. If charging is not completed after 30 minutes, perform the additional refrigerant charging operation again.

Perform the test procedure as described in 15.4.2. Test operation on page 48.

## INFORMATION

- When a malfunction is detected during the procedure (e.g., in case of closed stop valve), an error code will be displayed. In that case, refer to 15.5. Error code list on page 49 and solve the malfunction accordingly. Resetting the malfunction can be done by pushing BS3. The procedure can be restarted from 6).
- Aborting the refrigerant charge is possible by pushing BS3. The unit will stop and return to idle condition.
- Please refer to the Maintenance and service check list available on Daikin City or contact your Daikin representative for the latest document.

If any error code is displayed, close valve B immediately. Confirm the error code and take corresponding action, 15.5. Error code list on page 49.

### 14.3.3. Final charge adjustment

It is not necessary to do this final adjustment normally, but perform the following operation only when if the most adequate refrigerant for the best performance is required.

The outdoor temperature must be between 60°F (16°C) and 97°F (36 °C).

Run the system for 30 minutes in cooling by the forced operation using the field setting mode [2-6] (value 0: OFF, 1:ON) (Refer to 15.2. Monitoring function and field settings.) to allow pressures to stabilize, then check subcooling as detailed in the following sections.

Subcooling = Condensing\_temp.(TC) – (Heat exchanger liquid pipe)

Check subcooling for each outdoor unit by DAIKIN specified checker and calculate the average subcooling of the outdoor unit using weighted average method. (shown below)

To display the specific temperature in the unit, refer to the instructions in the manual that comes with the kit.

Average subcooling = ((C1) x (S1) + (C2) x (S2) + (C3) x (S3) ) / (CT)

C1 = O-1 Capacity index (Outdoor Unit 1)

S1 = O-1 Subcooling (Outdoor Unit 1)

C2 = O-2 Capacity index (Outdoor Unit 2)

S2 = O-2 Subcooling (Outdoor Unit 2)

C3 = O-3 Capacity index (Outdoor Unit 3)

S3 = O-3 Subcooling (Outdoor Unit 3)

CT = Total Capacity index of Outdoor unit

Systems should have a subcooling of following table.

Capacity index	72	96	120	144	168	192	216	240	264
Average subcooling	4.9	4.6	5.7	4.2	5.0	5.5	5.9	6.7	5.0

Capacity index	288	312	336	360	384	408	432	456	480
Average subcooling	4.2	4.6	5.0	5.3	5.5	5.7	5.9	6.3	6.7

- If average subcooling is low, add charge to raise subcooling to (Average subcooling) $\pm$ 0.5°C. (The maximum additional charge is 4.4 lbs. (2kg))
- If average subcooling is high, remove charge to lower the subcooling to (Average subcooling) $\pm$ 0.5°C.

### 14.3.4. Checks after adding refrigerant

- Are all stop valves open?
- Is the amount of refrigerant, that has been added, recorded on the refrigerant charge label?

## NOTE

- Make sure to open all stop valves after (pre-) charging the refrigerant. Operating with the stop valves closed will damage the compressor.
- After adding the refrigerant, do not forget to close the cover of the service port. The tightening torque for the cover is 7.9 to 10.8 ft·lbf (10.7 to 14.7 N·m).

## 15. Start-up and configuration

### INFORMATION

It is important that all information in this chapter is read sequentially by the installer and that the system is configured as applicable.

When the outdoor unit is connected to the AHU (Air Handling Unit) Integration kit, ensure that all information in the installation manual is read by installers and that the system is configured as specified in the installation manual.

### DANGER: ELECTRICAL SHOCK

See Safety considerations on page i.

### NOTE

Additional start-up procedures are required when the outdoor unit is connected to the AHU (Air Handling Unit) Integration kit. Refer to the installation manual for the start-up procedures before proceeding with VRV system start-up.

### 15.1. Checks before initial start-up

After the installation of the unit, first check the following items. Once all below checks are fulfilled, the unit must be closed, only then can the unit be powered up.

- 1 Installation  
Check that the unit is properly installed, to avoid abnormal noises and vibrations when starting up the unit.
- 2 Field wiring  
Be sure that the field wiring has been carried out according to the instructions described in 11. Field wiring on page 25, according to the wiring diagrams and according to the applicable legislation.
- 3 Power supply voltage  
Check the power supply voltage on the local supply panel. The voltage must correspond to the voltage on the identification label of the unit.
- 4 Ground wiring  
Be sure that the ground wires have been connected properly and that the ground terminals are tightened.
- 5 Insulation test of the main power circuit  
Using a megatester for 500 V, check that the insulation resistance of 1 MΩ or more is attained by applying a voltage of 500 V DC between power terminals and ground. Never use the megatester for the transmission wiring.
- 6 Fuses, circuit breakers, or protection devices  
Check that the fuses, circuit breakers, or the locally installed protection devices are of the size and type specified in 11. Field wiring on page 25. Be sure that neither a fuse nor a protection device has been bypassed.
- 7 Internal wiring  
Visually check the control box and the inside of the unit on loose connections or damaged electrical components.
- 8 Pipe size and pipe insulation  
Be sure that correct pipe sizes are installed and that the insulation work is properly executed.
- 9 Stop valves  
Be sure that all stop valves are open.
- 10 Damaged equipment  
Check inside of the unit on damaged components or squeezed pipes.
- 11 Refrigerant leak  
Check inside of the unit on refrigerant leakage. If there is a refrigerant leak, try to repair the leak. If the repair is unsuccessful, call your local dealer. Do not touch any refrigerant which has leaked out from refrigerant piping connections. This may result in frostbite.
- 12 Oil leak  
Check the compressor for oil leakage. If there is an oil leak, try to repair the leak. If the repairing is unsuccessful, call your local dealer.

### 13 Air inlet/outlet

Check that the air inlet and outlet of the unit is not obstructed by paper sheets, cardboard, or any other material.

### 14 Record the contents of field setting.

Record them on the accessory **REQUEST FOR THE INDICATION** label.

And attach the label on the back side of the front panel.

### 15 Record the installation date.

Record the installation date on the accessory **REQUEST FOR THE INDICATION** label.

And attach the label on the back side of the front panel.

## 15.2. Monitoring function and field settings

### NOTE

When the outdoor unit is connected to an AHU (Air Handling Unit) integration kit, there are certain field settings that cannot be used. For details, please refer to the Engineering Data or the service manual.

The operation of the outdoor unit can further be defined by changing some field settings. Next to making field settings it is also possible to confirm the current operation parameters of the unit. The setting can also be performed via the PC configuration software.

Below relevant Monitoring mode (mode 1) and Field setting mode (mode 2) settings are explained in detail. How to access them, how to change the value of the settings and how to confirm them is explained in 13. Making field settings on page 31. In that chapter, an example is given on how to make a setting. It is advised to check this procedure before accessing, checking and changing below settings.

Once the default situation of the segment indication is confirmed (see 13. Making field settings on page 31), the mode 1 and mode 2 can be accessed.

Making settings is done via the master outdoor unit.

### 15.2.1. Mode 1

Mode 1 can be used to monitor the current situation of the outdoor unit. Some field setting contents can be monitored as well. Below the settings in mode 1 are explained.

- [1-0]= shows whether the unit you are checking is a master or sub 1 unit.
- No indication=undefined situation
  - 0=outdoor unit is master unit
  - 1=outdoor unit is sub 1 unit

Master and sub 1 indications are relevant in multiple outdoor unit system configurations. The allocation of which outdoor unit is master or sub 1 is decided by the unit's logic.

**The master unit must be used to input field settings in mode 2.**

- [1-1]= shows the status of low noise operation.
- 1=unit is currently operating under low noise restrictions
  - 0=unit is currently not operating under low noise restrictions

Low noise operation reduces the sound generated by the unit compared to nominal operating conditions.

Low noise operation can be set in mode 2. There are two methods to activate low noise operation of the outdoor unit system.

The first method is to enable an automatic low noise operation during night time by field setting. The unit will operate at the selected low noise level during the selected time frames. The second method is to enable low noise operation based on an external input. For this operation an optional accessory is required.

[1-2]= shows the status of power consumption limitation operation.

- 1=unit is currently operating under power consumption limitation
- 0=unit is currently not operating under power consumption limitations

Power consumption limitation reduces the power consumption of the unit compared to nominal operating conditions. Power consumption limitation can be set in mode 2. There are two methods to activate power consumption limitation of the outdoor unit system.

The first method is to enable a forced power consumption limitation by field setting. The unit will always operate at the selected power consumption limitation.

The second method is to enable power consumption limitation based on an external input. For this operation an optional accessory is required.

[1-5]= shows the current  $T_e$  target parameter position.

Refer to 15.3. Energy saving and optimum operation on page 45 for more details about the contents of this value.

[1-6]= shows the current  $T_c$  target parameter position.

Refer to 15.3. Energy saving and optimum operation on page 45 for more details about the contents of this value.

[1-10]= shows the total number of connected indoor units.

It can be convenient to check if the total number of indoor units which are installed match the total number of indoor units which are recognized by the system. In case there is a mismatch, it is advised to check the communication wiring path between outdoor and indoor units (X0/X1 communication line).

[1-13]= shows the total number of connected outdoor units (in case of multiple outdoor system).

It can be convenient to check if the total number of outdoor units which are installed matches the total number of outdoor units which are recognized by the system. In case there is a mismatch, it is advised to check the communication wiring path between outdoor and outdoor units (Q1/Q2 communication line).

[1-17]= shows the latest error code.

[1-18]= shows the 2nd last error code.

[1-19]= shows the 3rd last error code.

When the latest error codes were reset by accident on an indoor unit user interface, they can be checked again through this monitoring settings. For the content or reason behind the error code see 15.5. Error code list on page 49, where most relevant error codes are explained. Detailed information about error codes can be consulted in the service manual of this unit.

[1-40]= shows the current cooling comfort setting. See 15.3. Energy saving and optimum operation on page 45 for more details about this setting.

[1-41]= shows the current heating comfort setting. See 15.3. Energy saving and optimum operation on page 45 for more details about this setting.

## 15.2.2. Mode 2

Mode 2 is used to change the field settings of the system. Consulting the current field setting value and changing the current field setting value is possible.

In general, normal operation can be resumed without special intervention after changing field settings.

Some field settings are used for special operation (e.g., 1 time operation, recovery/vacuuming setting, adding refrigerant setting, etc.). In such a case, it is required to abort the special operation before normal operation can restart. It will be indicated in below explanations.

[2-0]= Cool/Heat selection setting

Cool/Heat selection setting is used in case the optional Cool/Heat selector (KRC19-26A) is used. Depending on the outdoor unit setup (single outdoor unit setup or multi outdoor unit setup), the correct setting should be chosen. More details on how to use the Cool/Heat selector option can be found in the manual of the Cool/Heat selector.

Default value=0.

- 0=Each individual outdoor unit can select Cool/Heat operation (by Cool/Heat selector if installed).
- 1=Master unit decides Cool/Heat operation when outdoor units are connected in multiple system combination (a)
- 2=Sub unit for Cool/Heat operation when outdoor units are connected in multiple system combination (a)

Change [2-0]=0, 1 or 2 in function of required functionality.

[2-6]= Forced operation of indoor unit

Default value=0.

Value [2-6]	Description
0	OFF (default)
1	ON

[2-7]= Eco level setting for Eco mode via External control adaptor (Optional).

Value [2-7]	Description	Level
0	Inactive (Default)	–
1	Eco mode active by low noise terminal short circuit	Standard
2	Eco mode active by demand terminal short circuit	2-C short circuit = Low 3-C short circuit = Standard

Eco mode can be activated by short circuit the terminal on External control adaptor (Optional) according to [2-7] setting. ([2-64] should be "0")

This unit can operate with " $T_e$  or  $T_c$  fix control" and "Eco mode". Eco mode means "VRT" control.

If the terminal on external control adaptor is not connected by short circuit with [2-7]≠0, the system operates according to [2-8] or [2-9] setting.

[2-8]=  $T_e$  target temperature during cooling operation

Default value=2.

Value [2-8]	$T_e$ target
0	Auto
2	43°F (6°C) (default)
3	45°F (7°C)
4	46°F (8°C)
5	48°F (9°C)

6	50°F (10°C)
7	52°F (11°C)

Change [2-8]=0, 2-7 in function of required operation method during cooling.

For more information and advice about the effect of these settings, see 15.3. Energy saving and optimum operation on page 45.

[2-9]= T<sub>c</sub> target temperature during heating operation  
Default value=6.

Value [2-9]	T <sub>c</sub> target
0	Auto
1	106°F (41°C)
3	109°F (43°C)
6	115°F (46°C) (default)

Change [2-9]=0, 1, 3 or 6 in function of required operation method during heating.

For more information and advice about the effect of these settings, see 15.3. Energy saving and optimum operation on page 45.

[2-12]= Enable the low noise function and/or power consumption limitation via external control adaptor (DTA104A62)

If the system needs to run under low noise operation or under power consumption limitation conditions when an external signal is sent to the unit, this setting should be changed. This setting will only be effective when the optional external control adaptor (DTA104A62) is installed.  
Default value=0.

To activate this function change [2-12]=1.

[2-18]= Fan high static pressure setting

In order to increase the static pressure the outdoor unit fan is delivering, this setting should be activated. For details about this setting, see technical specifications.  
Default value=0.

To activate this function change [2-18]=1.

[2-19]= Field piping setting

Default value=0.

Value [2-19]	Description
0	OFF (default)
1	Piping for Phased installation
2	Piping for reused R410A Standard
3	Piping for reused R410A Size-up

The setting can be changed to suit the size of the connected main gas pipe. Changing the setting optimizes system operation and improves comfort.

Conditions/rules apply for this setting. Refer to selection software or contact your Daikin sales representative for further details.

[2-20]= Additional refrigerant charge

In order to activate the additional refrigerant charge amount, the following setting should be applied.  
Default value=0.

To activate additional refrigerant charge [2-20]=1.

Further instructions can be found in chapter 14.3. Method for adding refrigerant on page 35.

To stop the additional refrigerant charge operation (when the required additional refrigerant amount is charged), push BS3. If this function was not aborted by pushing BS3, the unit will stop its operation after 30 minutes. If 30 minutes was not sufficient to add the needed refrigerant amount, the function can be reactivated by changing the field setting again.

[2-21]= Refrigerant recovery/vacuuming mode

In order to achieve a free pathway to recovering refrigerant out of the system or to remove residual substances or to vacuum the system it is necessary to apply a setting which will open required valves in the refrigerant circuit so the recovering of refrigerant or vacuuming process can be done properly.  
Default value=0.

To activate function change [2-21]=1, 2 or 3.

[2-21]=1

For the indoor unit, Branch Selector unit, and shut-off valve unit whose shut-off valves are closed due to refrigerant leakage or any other reason, the valves are kept closed. For the outdoor unit as well as the indoor unit, Branch Selector unit, and shut-off valve unit whose shut-off valves are not closed, electronic expansion valves are fully opened and the solenoid valves are turned on.

[2-21]=2

For all outdoor units, indoor units, Branch Selector units, and shut-off valve units in the system, electronic expansion valves are fully opened and the solenoid valves are turned on. However, the electronic expansion valve of the indoor unit with the leaking refrigerant will not open.

[2-21]=3

For the outdoor unit, electronic expansion valves is fully opened and the solenoid valve is turned on.

To stop the refrigerant recovery/vacuuming mode, push BS3. If BS3 is not pushed, the system will remain in refrigerant recovery/vacuuming mode.

[2-22]= Automatic low noise setting and level during night time  
 By changing this setting, you can activate the automatic low noise operation function of the unit and define the level of operation. Depending on the chosen level, the noise level will be lowered (3: Level 3<2: Level 2<1: Level 1). The start and stop moments for this function are defined under setting [2-26] and [2-27].  
 Default value=0.  
 Change [2-22]=1, 2 or 3 in function of required level.

[2-25]= Low noise operation level via the external control adaptor  
 If the system needs to run under low noise operation conditions when an external signal is sent to the unit, this setting defines the level of low noise that will be applied (3: Level 3<2: Level 2<1: Level 1). This setting will only be effective when the optional external control adaptor (DTA104A62) is installed and the setting [2-12] is activated.  
 Default value=2.  
 Change [2-25]=1, 2 or 3. in function of required level.

[2-26]= Low noise operation start time  
 Change [2-26]=1, 2 or 3 in function of required timing.  
 Default value=2.

Value [2-26]	Start time automatic low noise operation (approximately)
1	8:00 p.m.
2	10:00 p.m. (default)
3	12:00 a.m.

This setting is used in conjunction with setting [2-22].

[2-27]= Low noise operation stop time  
 Default value=3.

Value [2-27]	Start time automatic low noise operation (approximately)
1	6:00 a.m.
2	7:00 a.m.
3	8:00 a.m. (default)

This setting is used in conjunction with setting [2-22].

[2-29]= Intermittent fan operation  
 Default value=0.

Value [2-29]	Intermittent fan operation
0	OFF (default)
1	30 minutes OFF, 1 minute ON with medium fan speed
2	30 minutes OFF, 1 minute ON with high fan speed

Outdoor fan speed would be increased for assisting to discharge snow on outdoor fan when outdoor fan is stop or low speed.

[2-30]= Power consumption limitation level (step 1) via the external control adaptor (DTA104A62)  
 If the system needs to run under power consumption limitation conditions when an external signal is sent to the unit, this setting defines the level power consumption limitation that will be applied for step 1. The level is according to the table.  
 Default value=3.  
 Change [2-30]=1, 2, 3, 4, 5, 6, 7 or 8 in function of required limitation.

Value [2-30]	Power consumption limitation (approximately)
1	60%
2	65%
3	70% (default)
4	75%
5	80%
6	85%
7	90%
8	95%

[2-31]= Power consumption limitation level (step 2) via the external control adaptor (DTA104A62)

If the system needs to run under power consumption limitation conditions when an external signal is sent to the unit, this setting defines the level power consumption limitation that will be applied for step 2. The level is according to the table.  
 Default value=1.  
 Change [2-31]=1, 2 or 3 in function of required limitation.

Value [2-31]	Power consumption limitation (approximately)
1	40% (default)
2	50%
3	55%

[2-32]= Forced, all time, power consumption limitation operation (no external control adaptor is required to perform power consumption limitation)

If the system always needs to run under power consumption limitation conditions, this setting activates and defines the level power consumption limitation that will be applied continuously. The level is according to the table.  
 Default value=0 (OFF).

Value [2-32]	Restriction reference
0	Function not active (default)
1	Follows [2-30] setting
2	Follows [2-31] setting

Change [2-32]=0, 1 or 2 in function of required limitation.

[2-34]= Indoor unit fan tap setting

Indoor units fan speed limitation related to connection capacity and outdoor air temperature for energy saving.

Default value=0.

Value [2-34]	Indoor unit fan tap setting
0	Fan speed is limited to L tap when indoor units capacity $\geq 130\%$ . (default)
1	In heating mode, fan speed is limited to L tap when indoor units capacity $\geq 130\%$ .
2	Fan speed follows the setting of remote controllers (not limited by indoor units connection capacity).

See the service manual for other indoor unit fan tap settings.

[2-35]= Height difference setting (The outdoor unit is the lowest position)

Default value=1.

In case the outdoor unit is installed in the lowest position (indoor units are installed on a higher position than outdoor units) and the height difference between the highest indoor unit and the outdoor unit exceeds 130 ft. (40 m), the setting [2-35] should be changed to 0.

If the setting [2-35] is changed to 0, continuous heating will not be provided during defrost of oil return for conditions above ambient temp. 50°F (10°C) and room temp. 75°F (24°C).

Other changes/limitations to the circuit apply, for more information see 7.5. System piping (length) limitations on page 14.

[2-45]= Low ambient cooling

Default value=0.

Value [2-45]	Description
0	No low ambient cooling available. (default)
1	Low ambient cooling available.

This setting is not applicable to multi Branch Selector unit. Single Branch Selector unit or Safety shut-off valve unit must be connected.

For the heat pump system, all indoor units must be connected to Safety shut-off valve unit.

For more information about this setting, refer to the service manual.

[2-47]\*=  $T_e$  target temperature during heat recovery operation

Default value=2.

Value [2-47]	$T_e$ target
0	Auto
2	43°F (6°C) (default)
3	45°F (7°C)
4	46°F (8°C)
5	48°F (9°C)
6	50°F (10°C)
7	52°F (11°C)

Change [2-47]=0, 2-7 in function of required operation method during heat recovery operation.

For more information and advice about the effect of these settings, see 15.3. Energy saving and optimum operation on page 45.

\* Only for the heat recovery system

[2-49]= Height difference setting (The outdoor unit is the highest position)

Default value=0.

In case the outdoor unit is installed in the highest position (indoor units are installed on a lower position than outdoor units) and the height difference between the lowest indoor unit and the outdoor unit exceeds 164 ft. (50 m), the setting [2-49] has to be changed to 1.

Other changes/limitations to the circuit apply, for more information see 7.5. System piping (length) limitations on page 14.

[2-60]= Gas furnace setting

Default value=0.

When a gas furnace is connected, the setting [2-60] has to be changed to 1.

[2-62]= Cooling and heating capacity learning control

Default value=0.

Value [2-62]	Description
0	OFF (default)
1	Cooling adjustment
2	Heating adjustment
3	Cooling and heating adjustment

Adjust cooling and heating system operation to achieve stable capacity.

Note: This setting may result in a longer reaction time to large load variations.

[2-64]= Eco mode invalid setting

Eco mode becomes invalid by this setting.

When this configuration is set, it is not possible to turn Eco mode ON/OFF using external control adaptor or other setting.

Value [2-64]	Eco mode control
0(default)	Activated both cooling and heating
1	Activated heating only
2	Activated cooling only
3	Deactivated

[2-64]= Dehumidification cooling setting

If a Branch Selector unit or shut-off valve unit is connected as part of the system and a humidity sensor is connected to the indoor unit, dehumidifying cooling is performed. Use this setting when "[2-86] Multi-temperature refrigerant control settings" have been set.

Value [2-64]	Dehumidification cooling setting
0(default)	OFF
4	Energy saving: High, Comfort: Low
5	Energy saving: Middle, Comfort: Middle
6	Energy saving: Low, Comfort: High

[2-81]= Cooling comfort setting for VRT control

Default value=1.

Value [2-81]	Cooling comfort setting
0	Eco
1	Mild (default)
2	Quick
3	Powerful

Change [2-81]=0, 1, 2 or 3 in function of required limitation. This setting is used in conjunction with setting [2-8] and [2-47]\*.

In the case of [2-81]=0, the original refrigerant temperature target based on [2-8] and [2-47]\* is kept without any correction, unless for protection control.

For more information and advice about the effect of these settings, see 15.3. Energy saving and optimum operation on page 45.

\* [2-47] is only for the heat recovery system

[2-82]= Heating comfort setting for VRT control

Default value=1.

Value [2-82]	Heating comfort setting
0	Eco
1	Mild (default)
2	Quick
3	Powerful

Change [2-82]=0, 1, 2 or 3 in function of required limitation. This setting is used in conjunction with setting [2-9]. In the case of [2-82]=0, the original refrigerant temperature target based on [2-9] is kept without any correction, unless for protection control.

For more information and advice about the effect of these settings, see 15.3. Energy saving and optimum operation on page 45.

[2-86]= Multi-temperature refrigerant control settings

Multi-temperature refrigerant control is a function that adjusts the refrigerant temperature of the indoor unit connected to the Branch Selector unit according to room load. All indoor units within the system must support VRT-smart control. Branch Selector unit or Safety shut-off valve unit must be connected. Eco mode must be enabled on the remote controller.

Value [2-86]	Multi-temperature refrigerant control settings
0(Default)	OFF
1	ON

[2-88]= Demand control among the system

While the demand control was previously configured separately for each system, setting the inter-system demand control value can increase comfort during demand operation. Transition wiring with an identical communication protocol must be used to connect different refrigerant systems. Make the setting so that the systems to be coordinated have the same set value.

The setting range is from 1 to 10 (default: 0).

Up to three systems can have the same set value.

To set the demand limitation levels of the individual systems, use [2-30] or [2-31] as before.

[2-89]= Optional setting to prioritize VRT control.

Value [2-89]	Level
0(Default)	Prioritize largest demand
2	Prioritize smallest demand

Note:

The setting of [2-89]=2 saves energy. But the time to reach set point may be longer.

[2-92]= Te target temperature upper limit

Default value=1.

Value [2-92]	Te target temperature upper limit
0	L
1	M (default)
2	H

If Auto Te, then use this setting to address different load profiles. If the frequent operation is at lower system load, then use a higher setting under [2-92].

Note: In high humid areas, it is recommended to keep this setting to 0 or 1.

### 15.2.3. Auxiliary heat control

To improve efficiency the AUX heat can be lockout based on outdoor temperature.

Item	Description	Min	Max	Increments
AUX Heater Allowable Temp	Below this temperature, AUX heater can be energized based on the indoor temperature condition.	0°F (-17.7°C)	65°F (18.3°C)*1	5°F (2.8°C)
AUX Heater Allowable temp Release differential	When the outdoor temp recovered by this temp, AUX heater cannot be allowed.		5°F (2.8°C) 10°F (5.6°C)*2 15°F (8.3°C)	

\*1 Default=35°F (1.6°C)

\*2 Default

[2-97]= AUX heater max allowable temp

AUX Heater is allowed to energize when the ambient temp is smaller than the AUX Heater Max Allowable Temp.

Value [2-97]	Fahrenheit (°F)	Celsius (°C)
0	0	- 17.7
1	5	- 15
2	10	- 12.2
3	15	- 9.4
4	20	- 6.6
5	25	- 3.8
6	30	- 1.1
7	35 (default)	1.6 (default)
8	40	4.4
9	45	7.2
10	50	10
11	55	12.7
12	60	15.5
13	65	18.3
14	AUX Heater always NOT allowed	
15	AUX Heater always allowed	

[2-98]= AUX heater max allowable temp release differential

AUX Heater is not allowed to energize when the outdoor ambient temp is recovered by differential (below) above the AUX Heater Max Allowable Temp.

Value [2-98]	Fahrenheit (°F)	Celsius (°C)
0	5	2.8
1	10 (default)	5.6 (default)
2	15	8.3

### 15.2.4. Heat pump lockout

- Control logic to provide more application options for cold climates.
- Outside temperature can now be measured directly from the outdoor unit coil sensor.
- This system can also be programmed to automatically switch to emergency heat if there is a system fault.

Item	Description	Min	Max	Increments
Heat Pump Lockout Temp	Below this temperature, heat pump is locked out.	- 15°F (-26.1°C)*	50°F (10°C)	5°F (2.8°C)
Heat Pump Lockout Release differential	When the outdoor temp is recovered by this temp, heat pump is resumed.		5°F (2.8°C) 10°F (5.6°C)* 15°F (8.3°C)	

\* Default

[2-16]= AUX heater setting (Type I)

Value [2-16]	AUX heater	Description
0	OFF	Function not active
1	ON	Heat-pump heating is always locked out

Value [2-16]	Actions				
	Shorted between	Heating Thermo-on		Heating Thermo-off	
		AUX heater	Indoor fan	AUX heater	Indoor fan
0	-	-	-	-	-
1	-	ON	ON (H/L)	OFF	LL

[2-37]= AUX heater setting (Type II)

Value [2-37]	Controlling mode	Description
1	Mode 1	Lockout is controlled by ABC terminals
2	Mode 2 *	
3	Mode 3	Lockout is controlled by the outdoor ambient temperature and setpoint which is configured by the field setting 2-78 and 2-79
4	Mode 4	
5	Mode 5 *	
6	Mode 6 *	

\* For a heater which doesn't need airflow

Value [2-37]	Actions				
	Shorted between	Heating Thermo-on		Heating Thermo-off	
		AUX heater	Indoor fan	AUX heater	Indoor fan
1	A-C	ON	ON (H/L)	OFF	LL
	B-C				OFF
2	A-C		LL		LL
	B-C		OFF		OFF
3	Same as 2-37 = Mode 1 & A-C shorted				
4	Same as 2-37 = Mode 1 & B-C shorted				
5	Same as 2-37 = Mode 2 & A-C shorted				
6	Same as 2-37 = Mode 2 & B-C shorted				

[2-78]= Heat pump lockout temp

Heat pump would be locked out when the outdoor ambient temp is smaller than the Heat Pump Lockout Temp below – this setting is only effective when heat pump lockout mode has been set. Unit will switch to heat pump lock out.

Value [2-78]	Fahrenheit (°F)	Celsius (°C)
0	- 15 (default)	- 26.1 (default)
1	- 10	- 23.3
2	- 5	- 20.5
3	0	- 17.7
4	5	- 15
5	10	- 12.2
6	15	- 9.4
7	20	- 6.6
8	25	- 3.8
9	30	- 1.1
10	35	1.6
11	40	4.4
12	45	7.2
13	50	10
14	Forced Heat pump Lock out	

[2-79]= Heat pump lockout release differential

Heat pump would be resumed when the outdoor ambient temp is recovered by differential (below) above the Heat Pump Lockout Temp.

Value [2-79]	Fahrenheit (°F)	Celsius (°C)
0	5	2.8
1	10 (default)	5.6 (default)
2	15	8.3

When HP lockout mode has been set the auto backup function will automatically be set. This will allow the auxiliary or secondary heat source to be automatically energized in the event of a system failure.

Error codes capable of auto backup are listed in the table below. Please be aware that the error codes that are not listed do not auto backup in order to protect the unit.

Error contents	Error code (Auto backup possible)
Branch Selector unit abnormality	A1
Actuation of high pressure switch	E3
Actuation of low pressure sensor	E4
Inv. compressor motor lock	E5
Compressor damage alarm	E6
Outdoor unit fan motor abnormality	E7
Electronic expansion valve coil abnormality	E9
Four way valve abnormality	EA
Opposite air conditioning alarm	
Box air thermistor abnormality	H1
Harness abnormality (between outdoor unit main PCB and inverter PCB)	H3
Position signal abnormality of outdoor unit fan motor	H7
Outdoor air thermistor (R1T) abnormality	H9
Discharge pipe temperature abnormality	F3
Wet alarm	F4
Branch Selector unit electronic expansion valve abnormality	F9
Discharge pipe thermistor (R21T, R22T) and compressor surface temperature thermistor (R14T) abnormality	J3
Accumulator inlet thermistor (R10T) abnormality	J5
Heat exchanging deicer thermistor (R11T) and heat exchanger gas pipe thermistor (R8T, R9T) abnormality	J6
Receiver inlet thermistor (R3T) and sub cooling heat exchanger liquid pipe thermistor (R7T) abnormality	J7
Heat exchanger liquid pipe thermistor (R15T, R4T, R5T) abnormality	J8
Subcooling heat exchanger gas pipe thermistor (R6T) and receiver gas purge thermistor (R13T) abnormality	J9
High pressure sensor abnormality	JA
Low pressure sensor abnormality	JC
Inverter PCB abnormality	L1
Reactor temperature rise abnormality	L3
Inverter radiation fin temperature rise abnormality	L4
Inv. compressor instantaneous overcurrent	L5
Inv. compressor overcurrent	L8
Inv. compressor startup abnormality	L9
Transmission error between inverter and control PCB	LC

### 15.3. Energy saving and optimum operation

This VRV heat pump system is equipped with two kinds of advanced energy saving functionality (VRT and VRT smart control). After detecting all connected indoor unit type, advanced energy saving functionality type is selected automatically. Depending on the priority, emphasis can be put on energy saving or comfort level. Several parameters can be selected, resulting in the optimal balance between energy consumption and comfort for the particular application.

Several patterns are available and explained on the next page. Modify the parameters to the needs of your building and to realize the best balance between energy consumption and comfort. Refer to Service Manual for changing the field settings. Setting definition:[A-B]=C;A=mode,B=setting NO.,C=setting value.

#### <Precautions regarding VRT smart control operation>

- When the operation mode is changed over from Cool to Dry during VRT smart control, it will be back to Cool after a certain period of time to prevent the system from repeating ON/OFF for energy saving. Refer to Service Manual for the period of Dry operation which can be changed by field setting.

#### 15.3.1. Four main operation methods are available:

##### • Basic

The refrigerant temperature is fixed independent from the situation. It corresponds to the standard operation which is known and can be expected from/under previous VRV systems:

- To activate this operation method under cooling operation: Change field setting [2-64]=1 or disconnect the circuit between terminal on external control adapter with [2-7]≠0. And also change field setting [2-81]=0
- To activate this operation method under heating operation: Change field setting [2-64]=2 or disconnect the circuit between terminal on external control adapter with [2-7]≠0. And also change field setting [2-82]=0

##### • Automatic for VRT control

The refrigerant temperature is set depending on the outdoor ambient conditions. As such adjusting the refrigerant temperature to match the required load (which is also related to the outdoor ambient conditions).

E.g., when your system is operating in cooling, you do not need as much cooling under low outdoor ambient temperatures (e.g., 77°F (25°C)) as under high outdoor ambient temperatures (e.g., 95°F (35°C)).

Using this idea, the system automatically starts increasing its refrigerant temperature, automatically reducing the delivered capacity and increasing the system's efficiency.

- This operation is selected automatically with checking connected indoor unit type.

E.g., when your system is operating in heating, you do not need as much heating under high outdoor ambient temperatures (e.g., 68°F (20°C)) as under low outdoor ambient temperatures (e.g., 23°F (-5°C)).

Using this idea, the system automatically starts decreasing its refrigerant temperature, automatically reducing the delivered capacity and increasing the system's efficiency.

- This operation is selected automatically with checking connected indoor unit type.

##### • Automatic for VRT smart control

The refrigerant temperature is set depending on the required capacity sent from every indoor unit.

- This operation is selected automatically with checking connected indoor unit type.

##### • Hi-sensible

The refrigerant temperature is set higher/lower (cooling/heating) compared to basic operation.

The focus under high sensible mode is comfort feeling for the customer.

The selection method of indoor units is important and has to be considered as the available capacity is not the same as under basic operation. For details concerning to Hi-sensible applications, please contact your dealer.

- To activate this setting under cooling operation: change field setting [2-8] to the appropriate value, matching the requirements of the pre-designed system containing a high sensible solution.

Value [2-8]	T <sub>e</sub> target
0	Auto
2	43°F (6°C) (default)
3	45°F (7°C)
4	46°F (8°C)
5	48°F (9°C)
6	50°F (10°C)
7	52°F (11°C)

- To activate this setting under heating operation: change field setting [2-9] to the appropriate value, matching the requirements of the pre-designed system containing a high sensible solution.

Value [2-9]	T <sub>c</sub> target
0	Auto
1	106°F (41°C)
3	109°F (43°C)
6	115°F (46°C) (default)

#### 15.3.2. Several comfort settings are available in VRT control/VRT smart control

A comfort level can be set for VRT control/VRT smart control mode and hi-sensible mode. The comfort level is related to the time and power (energy consumption) expended in order to achieve a certain room temperature.

The requested conditions are achieved more quickly by temporarily changing the refrigerant temperature.

##### • Powerful

Overshoot (during heating operation) or undershoot (during cooling operation) is allowed compare to the requested refrigerant temperature, in order to achieve the required room temperature very fast.

The overshoot or undershoot is allowed from the start up moment. In case of cooling operation the evaporating temperature is allowed to go down to 37°F (3°C) on temporary base depending on the situation.

In case of heating operation the condense temperature is allowed to go up to 120°F (49°C) on temporary base depending on the situation.

When the request from the indoor units becomes more moderate, the system will eventually go to the steady state condition which is defined by the operation method above.

- To activate the powerful comfort setting under cooling operation, change field setting [2-81]=3.
- To activate the powerful comfort setting under heating operation, change field setting [2-82]=3.

- **Quick**

Overshoot (during heating operation) or undershoot (during cooling operation) is allowed compared to the requested refrigerant temperature, in order to achieve the required room temperature very fast. The overshoot or undershoot is allowed from the start up moment. In case of cooling operation the evaporating temperature is allowed to go down to 43°F (6°C) on temporary base depending on the situation.

In case of heating operation the condense temperature is allowed to go up to 115°F (46°C) on temporary base depending on the situation.

When the request from the indoor units becomes more moderate, the system will eventually go to the steady state condition which is defined by the operation method above.

- To achieve the quick comfort setting under cooling operation, change field setting [2-81]=2.
- To achieve the quick comfort setting under heating operation, change field setting [2-82]=2.

- **Mild (default)**

Overshoot (during heating operation) or undershoot (during cooling operation) is allowed compared to the requested refrigerant temperature, in order to achieve the required room temperature very fast. The overshoot or undershoot is not allowed from the start up moment. The start up occurs under the condition which is defined by the operation mode above.

In case of cooling operation the evaporating temperature is allowed to go down to 43°F (6°C) on temporary base depending on the situation.

In case of heating operation the condense temperature is allowed to go up to 115°F (46°C) on temporary base depending on the situation.

When the request from the indoor units becomes more moderate, the system will eventually go to the steady state condition which is defined by the operation method above.

The start up condition is different from the powerful and quick comfort setting.

- To activate the mild comfort setting under cooling operation, change field setting [2-81]=1.
- To activate the mild comfort setting under heating operation, change field setting [2-82]=1.

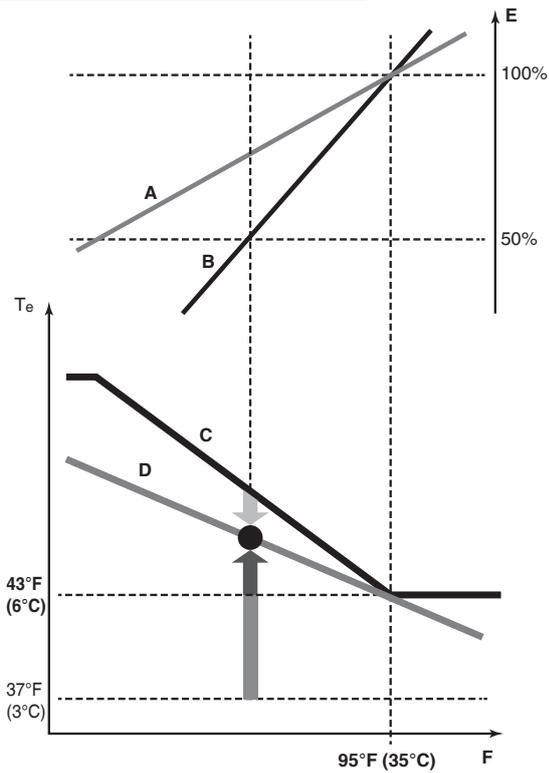
- **Eco**

The original refrigerant temperature target, which is defined by the operation method (see above) is kept without any correction, unless for protection control.

- To activate the eco comfort setting under cooling operation, change field setting [2-81]=0.
- To activate the eco comfort setting under heating operation, change field setting [2-82]=0.

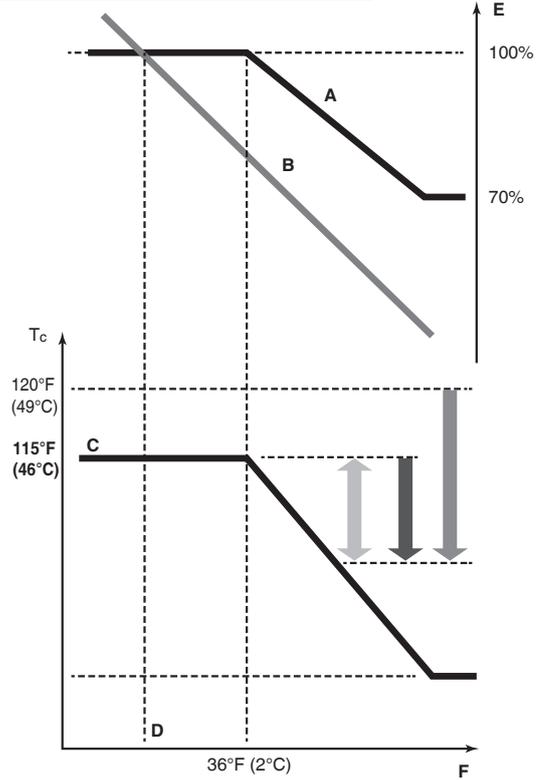
No matter which control is selected, variations on the behaviour of the system are still possible due to protection controls to keep the unit operating under reliable conditions. The intentional target, however, is fixed and will be used to obtain the best balance between energy consumption and comfort, depending on the application type.

**Example: Automatic mode during cooling**



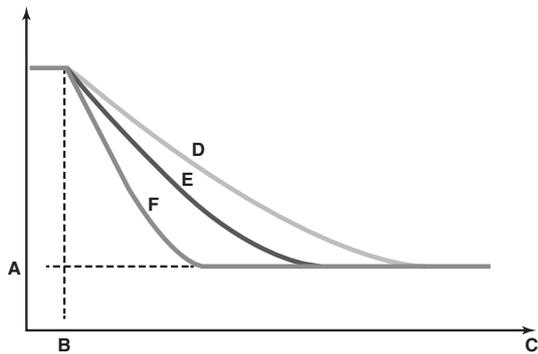
- A** Actual load curve
- B** Virtual load curve (initial capacity automatic mode)
- C** Virtual target value (initial evaporation temperature value automatic mode)
- D** Required evaporation temperature value
- E** Load factor
- F** Outside air temperature
- Te** Evaporating temperature
- Quick
- Powerful
- Mild

**Example: Automatic mode during heating**



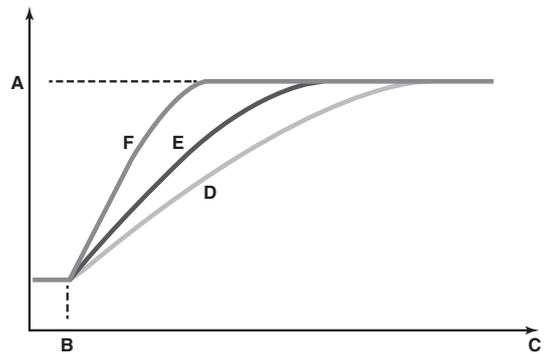
- A** Virtual load curve (default automatic mode peak capacity)
- B** Load curve
- C** Virtual target value (initial condensation temperature value automatic mode)
- D** Design temperature
- E** Load factor
- F** Outside air temperature
- Tc** Condensing temperature
- Quick
- Powerful
- Mild

**Room temperature evolution:**



- A** Indoor unit set temperature
- B** Operation start
- C** Operating time
- D** Mild
- E** Quick
- F** Powerful

**Room temperature evolution:**



- A** Indoor unit set temperature
- B** Operation start
- C** Operating time
- D** Mild
- E** Quick
- F** Powerful

## 15.4. Test operation

After installation and once the field settings are defined, the installer is obliged to verify correct operation. Therefore a test run must be performed according to the procedures described below.

### 15.4.1. Precautions before starting test operation

During test operation, the outdoor units, the Branch Selector units\*, Safety shut-off valve units and the indoor units will start up:

- Make sure that the preparations of all Branch Selector units\*, Safety shut-off valve units and all indoor units are finished (field piping, electrical wiring, air purge, etc.). See installation manual of the Branch Selector units\* and the indoor units for details.

\* Branch Selector unit is only for the heat recovery system

#### — CAUTION —

Do not insert fingers, rods or other objects into the air inlet or outlet. When the fan is rotating at high speed, it will cause injury.

#### — CAUTION —

Do not perform the test operation while working on the Branch Selector units\*, Safety shut-off valve units, indoor units and outdoor units (multi system).

When performing the test operation, not only the outdoor units, but the connected indoor units will operate as well.

Working on indoor units or Branch Selector units\* or Safety shut-off valve units while performing a test operation is dangerous.

\* Branch Selector unit is only for the heat recovery system

#### — CAUTION —

- During tests never pressurize the appliances with a pressure higher than the maximum allowable pressure (as indicated on the nameplate of the unit).
- If refrigerant gas leaks, ventilate the area immediately. Toxic gas may be produced if refrigerant gas comes into contact with fire.
- Never directly touch any accidental leaking refrigerant. This could result in severe wounds caused by frostbite.
- Test run is possible for ambient temperatures between 23°F and 95°F (-5°C and 35°C).

#### — DANGER: DO NOT TOUCH PIPING AND INTERNAL PARTS —

See Safety considerations on page i.

#### — DANGER: ELECTRICAL SHOCK —

See Safety considerations on page i.

- Provide a logbook and machine card.  
In accordance with the applicable legislation, it may be necessary to provide a logbook with the equipment containing at least: information on maintenance, repair work, results of tests, stand-by periods, etc.

#### — INFORMATION —

Note that during the first running period of the unit (break in period for compressor), 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.

#### — NOTE —

To protect the compressor, be sure to turn on the power supply 6 hours before starting operation.

## 15.4.2. Test operation

The procedure below describes the test operation of the complete system. This operation checks and judges following items:

- Check of wrong wiring (communication check with indoor units).
- Check of the stop valves opening.
- Judgment of piping length.

On top of this system test operation, Branch Selector units\*, Safety shut-off valve units and indoor units operation should also be checked separately.

- Make sure to carry out the system test operation after the first installation. Otherwise, the error code U3 will be displayed on the user interface and normal operation or individual Branch Selector unit\*, Safety shut-off valve units and indoor unit test run cannot be carried out.
- **Abnormalities on Branch Selector units\*, Safety shut-off valve units and indoor units cannot be checked for each unit separately. After the test operation is finished, check the Branch Selector units\*, Safety shut-off valve units and the indoor units one by one by performing a normal operation using the user interface. Refer to the Branch Selector units\*, Safety shut-off valve units and the indoor units installation manual for more details concerning the individual test run.**

\* Branch Selector unit is only for the heat recovery system

#### — INFORMATION —

- It may take 10 minutes to achieve a uniform refrigerant state before the compressor starts.
- During the test operation, the refrigerant running sound or the magnetic sound of a solenoid valve may become loud and the display indication may change. These are not malfunctions.

### Procedure

- 1 Close all front panels in order to not let it be the cause of misjudgment.
- 2 Make sure all field settings you want are set; see 15.2. Monitoring function and field settings on page 38.  
For a complete list of indoor and outdoor unit field settings, refer to the online service manual of this outdoor unit.
- 3 Turn ON the power to the outdoor units, the connected Branch Selector units\*, the connected Safety shut-off valve units and the connected indoor units.

\* Branch Selector unit is only for the heat recovery system

#### — NOTE —

Be sure to turn on the power 6 hours before operation in order to have power running to the crankcase heater and to protect the compressor.

- 4 Make sure the default (idle) situation is existing; see 13.2. Operating the push buttons and DIP switches on the printed circuit board on page 32. Push BS2 for 5 seconds or more. The unit will start test operation.
  - The test operation is automatically carried out, the outdoor unit display will indicate **t01** and the indication **Test operation** and **Under centralized control** will display on the user interface of indoor units.  
Steps during the automatic system test run procedure:
    - **t01**: control before start up (pressure equalization)
    - **t02**: cooling start up control
    - **t03**: cooling stable condition
    - **t04**: communication check
    - **t05**: stop valve check
    - **t06**: pipe length check
    - **t07**: refrigerant amount check
    - **t08**: —
    - **t09**: pump down operation
    - **t10**: unit stop
  - During the test operation, the progress rate\*1 will be displayed alternately with the display.
  - During the test operation, it is not possible to stop the unit operation from a user interface. To abort the operation, press BS3. The unit will stop after ±30 seconds.

\*1 The progress rate is displayed in **t09-99%**, but it may advance rapidly.

- 5 Check the test operation results on the outdoor unit segment display.
- Normal completion: no indication on the segment display (idle).
  - Abnormal completion: indication of error code on the segment display.
- Refer to 15.4.3. Correcting after abnormal completion of the test operation to take actions for correcting the abnormality. When the test operation is fully completed, normal operation will be possible after 5 minutes.

#### 15.4.3. Correcting after abnormal completion of the test operation

The test operation is only completed if there is no error code displayed on the user interface or outdoor unit segment display. In case an error code is displayed, perform correcting actions as explained in the error code table. Carry out the test operation again and confirm that the abnormality is properly corrected.



#### INFORMATION

Refer to the installation manual of the indoor unit for other detailed error codes related to indoor units.

#### 15.5. Error code list

In case of a displayed error code, perform correcting actions as explained in the error code table.

After correcting the abnormality, press BS3 to reset the error code and retry operation.

The error code which is displayed on the outdoor unit will indicate a main error code and a sub code. The sub code indicates more detailed information about the error code. The error code will be displayed intermittent.

#### Example:

Main code	Sub code
E3 -	01

With an interval of 1 second, the display will switch between main code and sub code.

Error code		Contents	Solution
Main code	Sub code Master/sub 1		
E3	01/03 20/21	<ul style="list-style-type: none"> <li>High pressure switch is activated. (S1PH)-A1P (X2A), (S2PH)-A1P (X3A)</li> <li>High pressure switch connectors are detached. -A1P (X2A, X3A, X4A)</li> <li>Misconnection of gas pipe*4</li> </ul>	<ul style="list-style-type: none"> <li>Check stop valves situation or abnormalities in (field) piping or airflow over air cooled coil.</li> <li>Securely connect each connector. Refer to the wiring diagram attached to the back of the control box cover.</li> <li>Check that the gas line is connected to the high/low pressure gas stop valve.*4</li> </ul>
	02/04	<ul style="list-style-type: none"> <li>Stop valves are closed.</li> <li>Refrigerant overcharge.</li> </ul>	<ul style="list-style-type: none"> <li>Open stop valves.</li> <li>Check refrigerant amount and recharge.</li> </ul>
	13/14	Liquid pipe stop valve is closed.	Open liquid pipe stop valve.
	18	<ul style="list-style-type: none"> <li>Stop valves are closed.</li> <li>Refrigerant overcharge.</li> </ul>	<ul style="list-style-type: none"> <li>Open stop valves.</li> <li>Check refrigerant amount and recharge.</li> </ul>
E4	01/02	Low pressure malfunction: <ul style="list-style-type: none"> <li>Stop valves are closed.</li> <li>Refrigerant shortage.</li> <li>Reverse connection of high/low pressure gas pipe and suction gas pipe of Branch Selector unit.</li> </ul>	<ul style="list-style-type: none"> <li>Open stop valves.</li> <li>Check refrigerant amount and recharge.</li> </ul>
E5	01/05	Electronic expansion valve malfunction (Y1E)-A1P (X21A)	Check connection on printed circuit board or actuator.
	03/06	Electronic expansion valve malfunction (Y2E)-A1P (X22A)	Check connection on printed circuit board or actuator.
	04/07	Electronic expansion valve malfunction (Y3E)-A1P (X23A)	Check connection on printed circuit board or actuator.
	11/12	Electronic expansion valve malfunction (Y6E)-A8P(X8A)	Check connection on printed circuit board or actuator.
	26/27	Electronic expansion valve malfunction (Y4E)-A1P (X25A)	Check connection on printed circuit board or actuator.
	29/34	Electronic expansion valve malfunction (Y5E)-A1P(X26A)	Check connection on printed circuit board or actuator.
	30/35	Electronic expansion valve malfunction (Y7E)-A8P(X9A)	Check connection on printed circuit board or actuator.
F3	01/03	Discharge temperature too high (R15T/R17T): <ul style="list-style-type: none"> <li>Stop valves are closed.</li> <li>Reverse connection of high/low pressure gas pipe and suction gas pipe of Branch Selector unit.</li> <li>Refrigerant shortage.</li> </ul>	<ul style="list-style-type: none"> <li>Open stop valves.</li> <li>Check refrigerant amount and recharge.</li> <li>Check connection of high/low pressure gas pipe and suction gas pipe.</li> </ul>
	20/21	Compressor casing temperature too high (R16T/R18T): <ul style="list-style-type: none"> <li>Stop valves are closed.</li> <li>Refrigerant shortage.</li> </ul>	<ul style="list-style-type: none"> <li>Open stop valves.</li> <li>Check refrigerant amount and recharge.</li> </ul>
F5	02	<ul style="list-style-type: none"> <li>Stop valves are closed.</li> <li>Refrigerant overcharge.</li> </ul>	<ul style="list-style-type: none"> <li>Open stop valves.</li> <li>Check refrigerant amount and recharge.*1</li> </ul>
F9	01	Electronic expansion valve malfunction (Branch Selector units or Safety shut-off valve units).	Check connection on printed circuit board or actuator.
	02		
	05		
	06		
	07		
	12		
H1	01/02	Temperature sensor malfunction (R20T)-A8P(X15A)	Check connection on printed circuit board or actuator.
H3	01/02	Temperature sensor malfunction (R1T)-A1P (X18A)	Check connection on printed circuit board or actuator.
J3	16/22 17/23	Temperature sensor malfunction (R15T)-A1P(X19A)*3 or (R17T)-A1P(X33A)*2	Check connection on printed circuit board or actuator.
	18/24 19/25	Temperature sensor malfunction (R17T)-A1P(X33A)	Check connection on printed circuit board or actuator.
	47/49 48/50	Temperature sensor malfunction (R16T)-A1P(X19A)*3 or (R18T)-A1P(X33A)*2	Check connection on printed circuit board or actuator.
	38/42 39/43	Temperature sensor malfunction (R18T)-A1P(X33A)	Check connection on printed circuit board or actuator.

\*1: To check while reducing the amount of refrigerant, reduce the amount by 5 kg for single system and 8 kg for multi system, and perform the check operation again.

\*2: REYA/RXYA72A type

\*3: Other types except REYA/RXYA72A type

\*4: Only heat pump system (RXYA type)

Error code		Contents	Solution
Main code	Sub code Master/sub 1		
U5	01/03	Temperature sensor malfunction (R19T)-A1P(X46A)	Check connection on printed circuit board or actuator.
	18/19	Temperature sensor malfunction (R5T)-A1P(X35A)	Check connection on printed circuit board or actuator.
U6	01/02	Temperature sensor malfunction (R8T)-A1P(X29A)	Check connection on printed circuit board or actuator.
	08/09	Temperature sensor malfunction (R2T)-A1P(X35A)	Check connection on printed circuit board or actuator.
	11/12	Temperature sensor malfunction (R9T)-A1P(X29A)	Check connection on printed circuit board or actuator.
	22/23	Temperature sensor malfunction (R23T)-A8P(X15A)	Check connection on printed circuit board or actuator.
	25/26	Temperature sensor malfunction (R21T)-A8P(X15A)	Check connection on printed circuit board or actuator.
U7	01/02	Temperature sensor malfunction (R10T)-A1P(X30A)	Check connection on printed circuit board or actuator.
	06/07	Temperature sensor malfunction (R11T)-A1P(X30A)	Check connection on printed circuit board or actuator.
	18/19	Temperature sensor malfunction (R14T)-A1P(X30A)	Check connection on printed circuit board or actuator.
U8	01/02	Temperature sensor malfunction (R6T)-A1P(X29A)	Check connection on printed circuit board or actuator.
	08/09	Temperature sensor malfunction (R7T)-A1P(X29A)	Check connection on printed circuit board or actuator.
	11/12	Temperature sensor malfunction (R22T)-A8P(X15A)	Check connection on printed circuit board or actuator.
U9	01/02	Temperature sensor malfunction (R12T)-A1P(X30A)	Check connection on printed circuit board or actuator.
	11/12	Temperature sensor malfunction (R4T)-A1P(X35A)	Check connection on printed circuit board or actuator.
	17/18	Temperature sensor malfunction (R3T)-A1P(X35A)	Check connection on printed circuit board or actuator.
U10	06/08	High pressure sensor malfunction: open circuit (S1NPH)-A1P (X32A)	Check connection on printed circuit board or actuator.
	07/09	High pressure sensor malfunction: short circuit (S1NPH)-A1P (X32A)	Check connection on printed circuit board or actuator.
U11	06/08	Low pressure sensor malfunction: open circuit (S1NPL)-A1P (X31A)	Check connection on printed circuit board or actuator.
	07/09	Low pressure sensor malfunction: short circuit (S1NPL)-A1P (X31A)	Check connection on printed circuit board or actuator.
U12	14/15	Transmission trouble. A3P(X4A)-A8P(X3A)	Check connection.
	19/20	Transmission trouble. A4P(X3A)-A3P(X41A)	Check connection.
	24/25	Transmission trouble. A7P(X3A)-A4P(X4A)	Check connection.
	30/31	Transmission trouble. A6P(X4A)-A1P(X100A)	Check connection.
	33/34	Transmission trouble. A8P(X2A)-A1P(X20A)	Check connection.
P1	01/02	Unbalanced power supply voltage.	Check if power supply is within the range.
	07/08		
U2	01/08	Voltage power shortage or open power supply phase.	• Check if power supply is within the range.
	22/25		• Correct phase order.
U2	02/09	Reversed or open power supply phase.	• Check if power supply is within the range.
	23/26		• Correct phase order.

Error code		Contents	Solution
Main code	Sub code Master/sub 1		
U3	03	System test run not yet executed (system operation not possible).	Execute system test run.
	04	An error occurred during the test run.	Check the piping and re-execute the test run.
	05	Test run aborted.	Re-execute the test run.
	06		
	07	Test run aborted due to communication issues.	Check the communication wires and re-execute the test run.
	08		
U4	01	Faulty wiring to X4/X5 or indoor- outdoor.	Connect transmission wiring of Branch Selector units and indoor units to "TO IN/D UNIT (X0, X1)" and transmission wiring of other outdoor units to "TO OUT/D UNIT (X2, X3)".
	09-19	Transmission wires (for wiring a Branch Selector unit, indoor unit, or different refrigerant system) are connected to the Out Multi terminals (X4, X5) for wiring between outdoor units.  The outdoor unit or indoor unit is not powered (including the case of the open phase).	For transmission wires for wiring a Branch Selector unit or indoor unit system, connect them to the indoor-outdoor terminals (X0, X1), and for those for wiring a different refrigerant system, connect them to the outdoor-outdoor (F1/X2, F2/X3) terminals.  Check the power wiring of the outdoor or indoor unit and correct it if it is wrong.
U7	01	Faulty wiring to X4/X5 or indoor- outdoor.	Connect transmission wiring of Branch Selector units and indoor units to "TO IN/D UNIT (X0, X1)" and transmission wiring of other outdoor units to "TO OUT/D UNIT (X2, X3)".
	02		
	03	Transmission wires (for wiring a Branch Selector unit, indoor unit, or different refrigerant system) are connected to the Out Multi terminals (X4, X5) for wiring between outdoor units.	For transmission wires for wiring a Branch Selector unit or indoor unit system, connect them to the indoor-outdoor terminals (X0, X1), and for those for wiring a different refrigerant system, connect them to the outdoor-outdoor (F1/X2, F2/X3) terminals.
	04		
	05	In the system with multiple outdoor units, no transmission wires are connected to an indoor unit. Otherwise, transmission wires are used to connect between outdoor units.	Correct the wrongly connected transmission wires.
	06		
	07	Invalid number of units connected with the transmission wires for wiring between outdoor units	<ul style="list-style-type: none"> <li>• Check indoor unit amount and total capacity connected.</li> <li>• Check connection.</li> </ul>
	11	<ul style="list-style-type: none"> <li>• Too many indoor units are connected to X0, X1 line.</li> <li>• Faulty wiring between units.</li> </ul>	
U3	01	<ul style="list-style-type: none"> <li>• System mismatch. Wrong type of indoor units combined.</li> <li>• Indoor unit malfunction.</li> </ul>	Check if other indoor units have malfunction and confirm indoor unit mix is allowed.
	02	Error due to refrigerant leakage in the system.	Find and fix the refrigerant leakage point in the indoor unit.
	06	Transmission error between outdoor units belonging to different refrigerant systems	Reconnect the transmission wires between the outdoor units.
U8	03	Connection malfunction over indoor units or type mismatch.	Check if other indoor units have malfunction and confirm indoor unit mix is allowed.
	18		
	20	Wrong combination (different series (e.g. RXYA and REYA), or different type (e.g. REYQ)).	Correct the units combination.
	27	Assembly defect of indoor, Branch Selector, Safety shut-off valve units and outdoor units (e.g. different models, number of units or part numbers, or different series are mixed).	<ul style="list-style-type: none"> <li>• Check and modify the number of indoor units that are connected.</li> <li>• Check the type of refrigerant for indoor and outdoor units, and replace them with adaptable indoor/outdoor units in the case of inconsistency.</li> </ul>
	28	Different type of Branch Selector units are combined in the system. Combination of T type (BSQ-T*, BS-Q54T*, BSF-Q54T*) and A type (BSA*A*, BSF*A54A*) cause error.	Configure the system with only A type Branch Selector units.
	31	Wrong combination of outdoor units.	Correct the units combination.
49			

Error code		Contents	Solution
Main code	Sub code Master/sub 1		
UR	53	<ul style="list-style-type: none"> <li>Defect of Branch Selector units connecting position or abnormality due to wiring error.</li> <li>Abnormality of Branch Selector units DIP switches settings.</li> </ul>	<ul style="list-style-type: none"> <li>Check that the wiring connection are correct, referring to the wiring diagram for Branch Selector units, and correct if there are any errors.</li> <li>Check that the DIP switches settings are correct, referring to the installation manual enclosed in Branch Selector units package, or to the "Service precautions" plate attached to the control box cover, and correct if there are any errors.</li> </ul>
UE	03	The setting of the inter-system priority demanding function is wrong.	The number of different systems to be integrated is invalid. Correct the set number so that the number of systems falls within the allowable range.
	04		
UH	01	Auto address malfunction (inconsistency)	Check if transmission wired unit amount matches with powered unit amount (by monitor mode) or wait till initialization is finished.
	13		
	14		
UF	01	<ul style="list-style-type: none"> <li>Auto address malfunction (inconsistency)</li> <li>Wrong wiring detection</li> </ul>	<ul style="list-style-type: none"> <li>Check if transmission wired unit amount matches with powered unit amount (by monitor mode) or wait till initialization is finished.</li> <li>Check whether the piping and wiring between the indoor unit and Branch Selector unit are correct.</li> </ul>
	19		
	20		
	23-25		
	28-31		
	01	<ul style="list-style-type: none"> <li>Stop valves closed.</li> <li>Misconnection of gas pipe*4</li> </ul>	<ul style="list-style-type: none"> <li>Open stop valves.</li> <li>Check that the gas line is connected to the high/low pressure gas stop valve.*4</li> </ul>
	05		
10		Transmission wires (for wiring an indoor unit or different refrigerant system) are connected to the Out Multi terminals (X4, X5) for wiring between outdoor units.	For transmission wires for wiring an indoor unit system, reconnect them to the indoor-outdoor terminals (X0, X1), and for those for wiring a different refrigerant system, reconnect them to the outdoor-outdoor (F1/X2, F2/X3) terminals.
		The outdoor unit is not powered (including the case of the open phase).	Check the power wiring of the outdoor unit and correct it if it is wrong.
26		Defective transmission wire	Check for a shorted transmission wire and correct it if any.

\*4: Only heat pump system (RXYA type)

## 16. Operation of the unit

Once the units are installed and test operation of outdoor units, Branch Selector units\* and indoor units are finished, the operation of the system can start.

For operating the indoor units, the user interface of the indoor units should be switched ON. Refer to the indoor unit operation manual for more details.

\* Only for the heat recovery system

## 17. Maintenance and service

### 17.1. Maintenance introduction

In order to ensure optimal operation of the unit, a number of checks and inspections should be carried out on the unit at regular intervals, preferably yearly.

This maintenance shall be carried out by the installer or service agent. Please refer to the Maintenance and service check list available on Daikin City or contact your Daikin representative for the latest document.

### 17.2. Service precautions

**⚠ DANGER: DO NOT TOUCH PIPING AND INTERNAL PARTS** —  
See Safety considerations on page i.

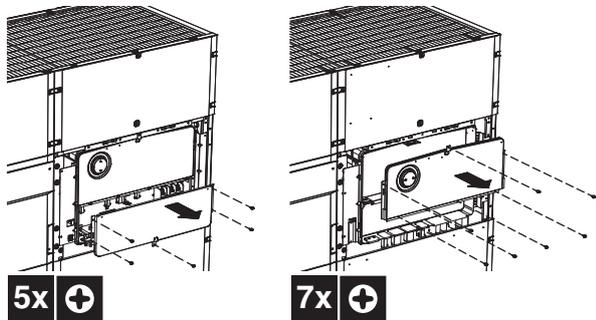
**⚠ CAUTION** —

When performing service to inverter equipment:

- 1 Make sure to turn off the power supply before opening the control box cover.
  - Do not open the control box cover for 10 minutes after the power supply is turned off.

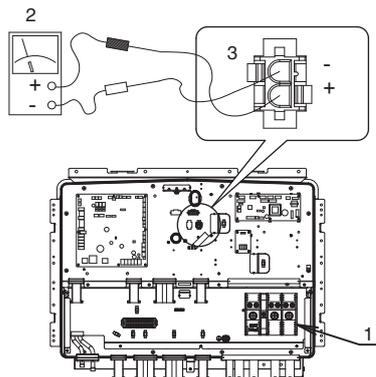
How to open the control box cover:

1. Open the bottom cover
2. Open the top cover

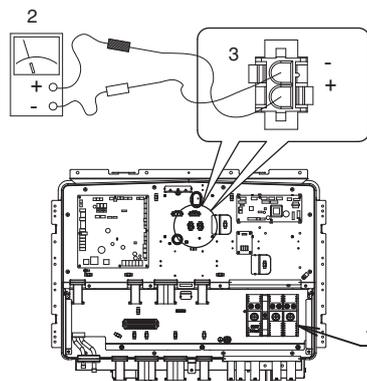


- 2 Measure the voltage between terminals on the terminal block for power supply with a tester and confirm that the power supply is turned off. In addition, measure points as shown in the figure below, with a tester and confirm that the voltage of the capacitor in the main circuit is less than 50 V DC.

REYA72A type  
RXYA72A type



REYA96-240A type  
RXYA96-240A type



- 1 Terminal block for power supply
- 2 Tester
- 3 White connector

- 3 To prevent damaging the printed circuit board, touch a noncoated metal part to eliminate static electricity before pulling out or plugging in connectors.
- 4 Pull out junction connectors X1A, X2A for the fan motors in the outdoor unit before starting service operation on the inverter equipment. Be careful not to touch the live parts.  
(If a fan rotates due to strong wind, it may store electricity in the capacitor or in the main circuit and cause electric shock.)
- 5 After the service is finished, plug the junction connector back in. Otherwise the error code E7 will be displayed on the user interface or on the outdoor unit segment display and normal operation will not be performed.

For details refer to the wiring diagram labelled on the back of the control box cover.

Pay attention to the fan. It is dangerous to inspect the unit while the fan is running. Make sure to turn off the main switch and to remove the fuses from the control circuit located in the outdoor unit.

**⚠ NOTE** —

Play it safe. For protection of the printed circuit board, touch the control box casing by hand in order to eliminate static electricity from your body before performing service.

### 17.3. Service mode operation

Refrigerant recovery operation/vacuuming operation is possible by applying setting [2-21]. Refer to 13.2. Operating the push buttons and DIP switches on the printed circuit board on page 32 for details how to set mode 2.

When vacuuming/recovery mode is used, check very carefully what should be vacuumed/recovered before starting. See installation manual of the indoor unit for more information about vacuuming and recovery.

### 17.3.1. Vacuuming method

- 1 When the unit is at standstill, set the unit in [2-21]=1.
- 2 When confirmed, the indoor units, the Branch Selector units\* and outdoor unit expansion valves will fully open. At that moment the segment display indication= $\frac{1}{2}$  and the user interface of all indoor units indicate "Test Operation" and **CENTRAL CONTROL** and the operation will be prohibited.
- 3 Evacuate the system with a vacuum pump.
- 4 Press BS3 to stop vacuuming mode.

\* Only for the heat recovery system

### 17.3.2. Refrigerant recovery operation method

This should be done by a refrigerant recovery equipment. Follow the same procedure as for vacuuming method.

## 18. Caution for refrigerant leaks

### 18.1. Introduction

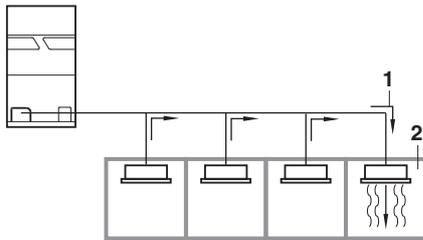
**The installer and system specialist shall secure safety against leakage according to ASHRAE 15 local regulations or standards.**

The VRV System, like other air conditioning systems, uses R32 as refrigerant. R32 itself is an entirely safe non-toxic, but slightly combustible refrigerant. Nevertheless care must be taken to ensure that air conditioning facilities are installed in a room that is sufficiently large. See below and the General Safety Considerations in the separate booklet for room size limitations. 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 lbs./ft.<sup>3</sup> (kg/m<sup>3</sup>) (the weight in lbs. (kg) of the refrigerant gas in 1 ft.<sup>3</sup> (1 m<sup>3</sup>) volume of the occupied space). Compliance to the local applicable regulations and standards for the maximum allowable concentration level is required.



- 1 Direction of the refrigerant flow.
- 2 Room where refrigerant leak has occurred (outflow of all the refrigerant from the system).

**Pay special attention to places, such as basements etc., where refrigerant could stay, since refrigerant is heavier than air.**

#### Procedure for checking maximum concentration

Check the maximum concentration level in accordance with steps 1 to 2 below and take whatever action necessary to comply.

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

Amount of refrigerant in a single unit system (amount of refrigerant with which the system is charged before leaving the factory)	+	Additional charging amount (amount of refrigerant added locally in accordance with the length or diameter of the refrigerant piping)	=	Total amount of refrigerant (lbs. (kg)) in the system
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### 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 Follow local code requirements.

## 19. 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.

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