



EDUS301214-N

R-410A

Engineering Data

VRV-III

Installation

RWEYQ-PTJU

3 phase

208/230V, 60Hz

RWEYQ-PYDN

3 phase

460V, 60Hz



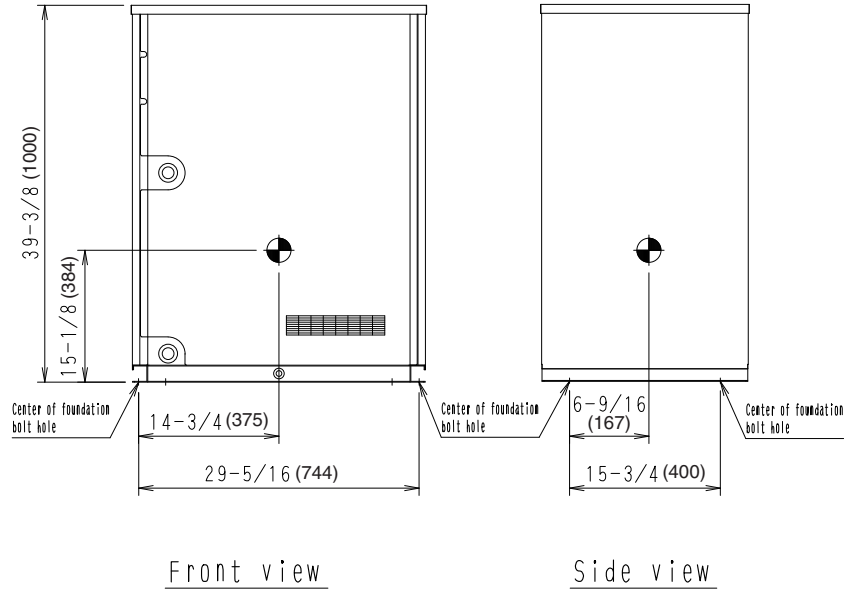
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1. Center of Gravity

RWEYQ72PTJU / RWEYQ84PTJU

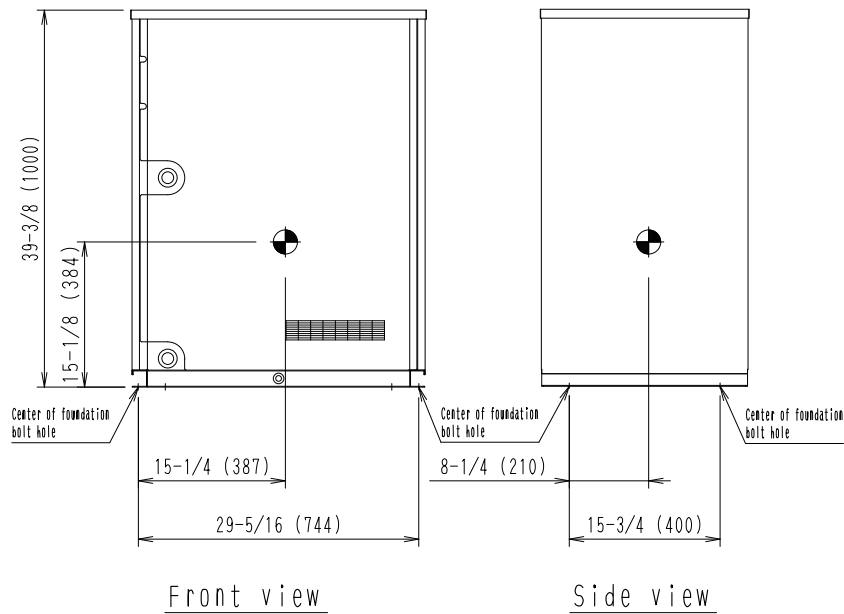
Unit: in. (mm)



C: 4D066040

RWEYQ72PYDN/RWEYQ84PYDN

Unit: in. (mm)



4D079929

2. Installation Manual

2.1 RWEYQ-PTJU/RWEYQ-PYDN

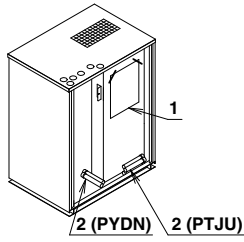


figure 1

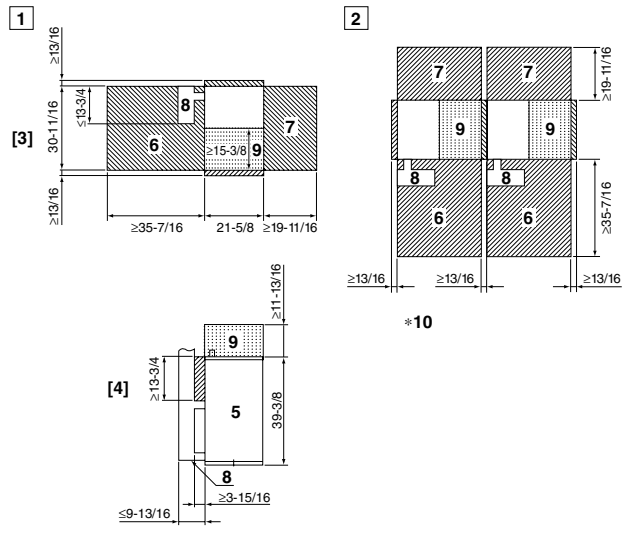


figure 2

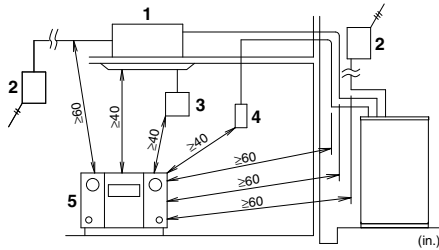


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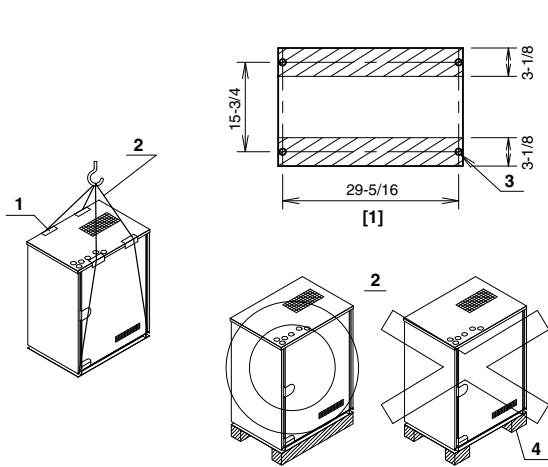


figure 4

figure 5

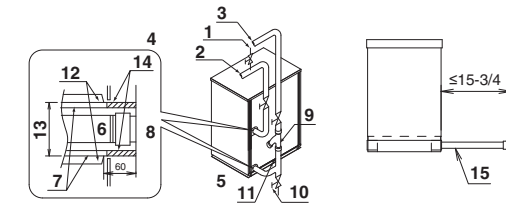


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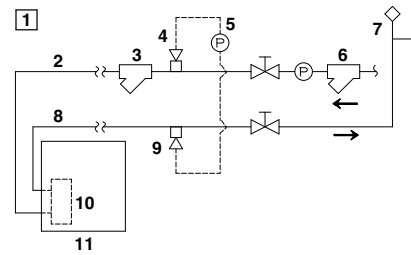


figure 7

[Heat pump system]

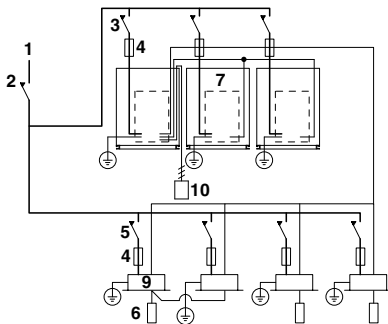


figure 8

[Heat recovery system]

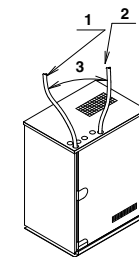
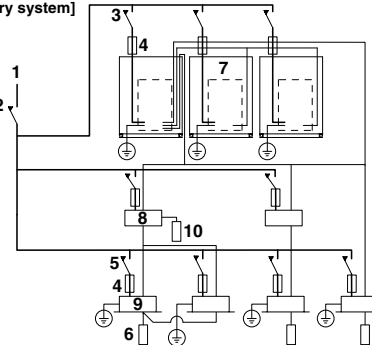
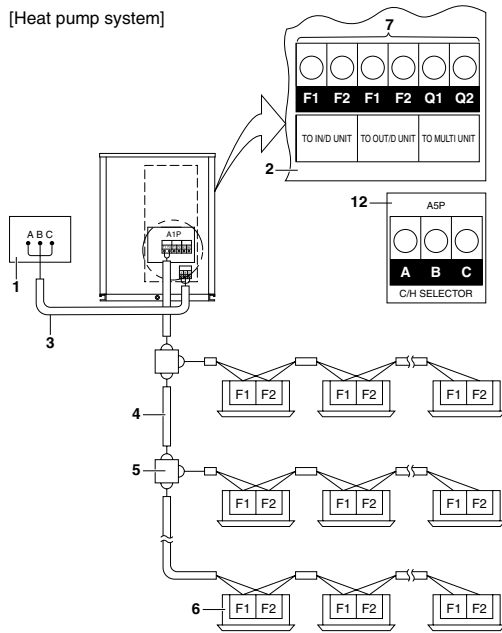


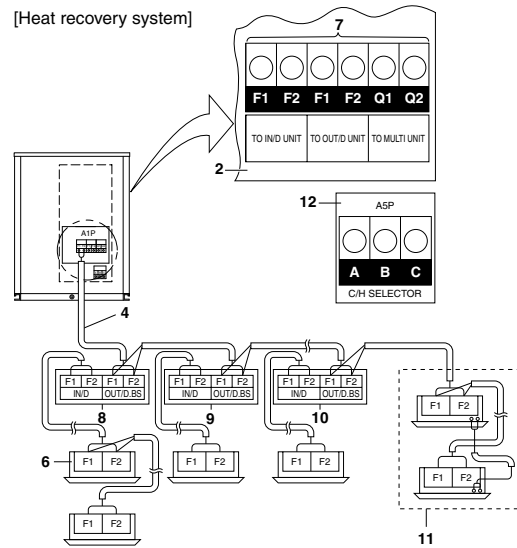
figure 9

<RWEYQ-PYDN>

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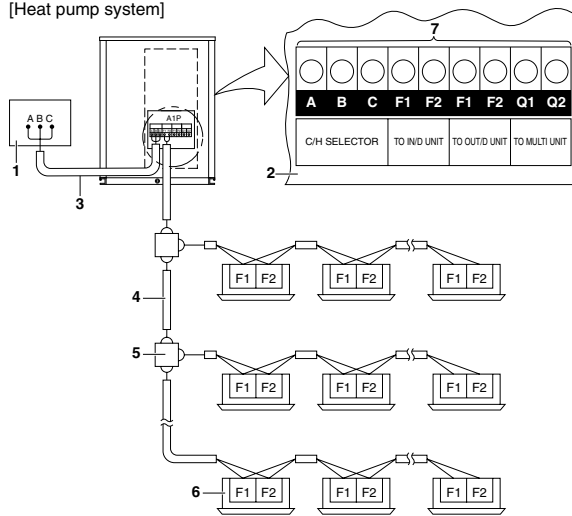


[Heat recovery system]



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[Heat pump system]



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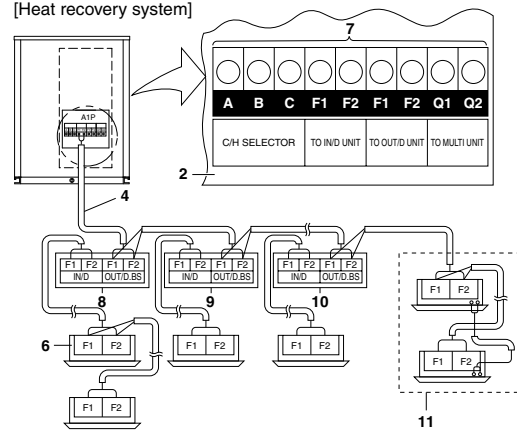


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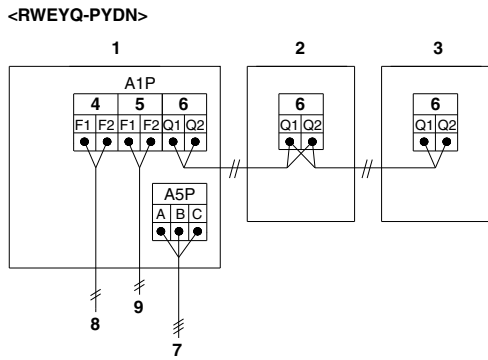


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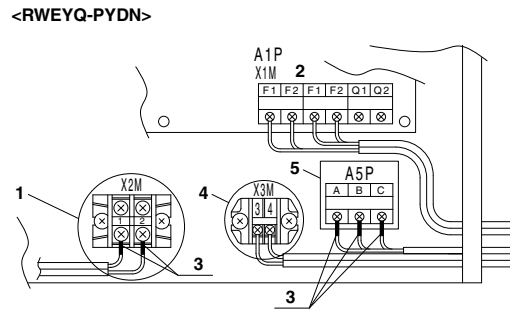


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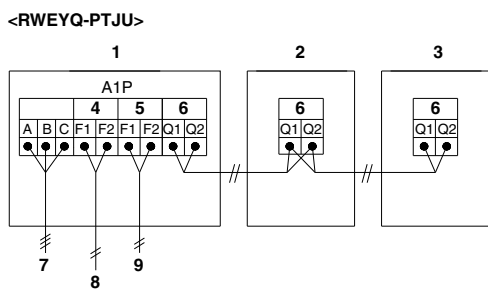


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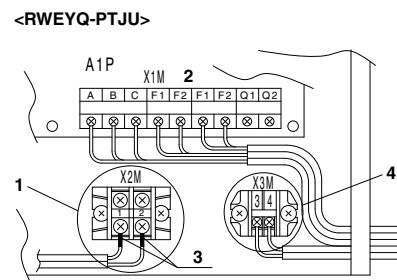


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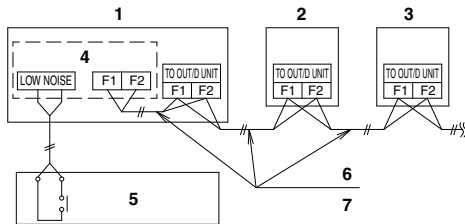


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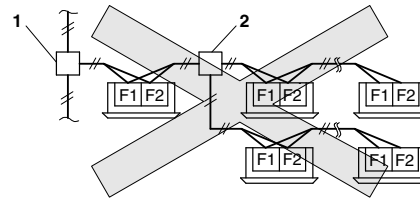


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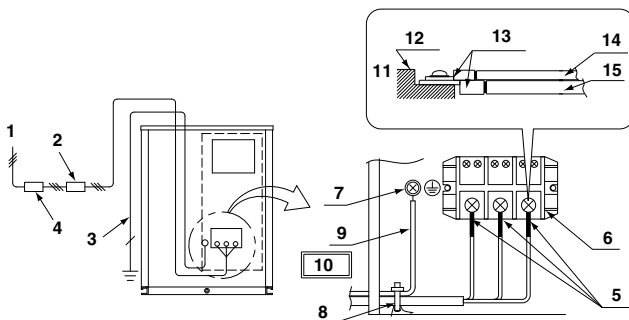


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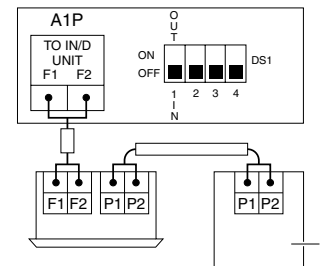


figure 18

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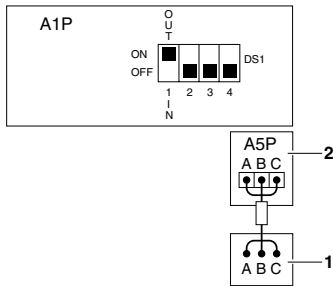


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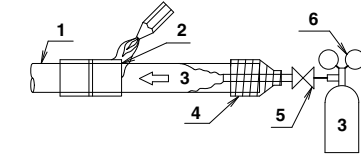
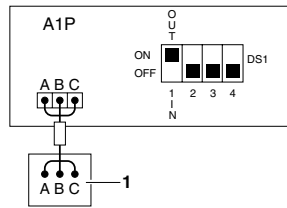


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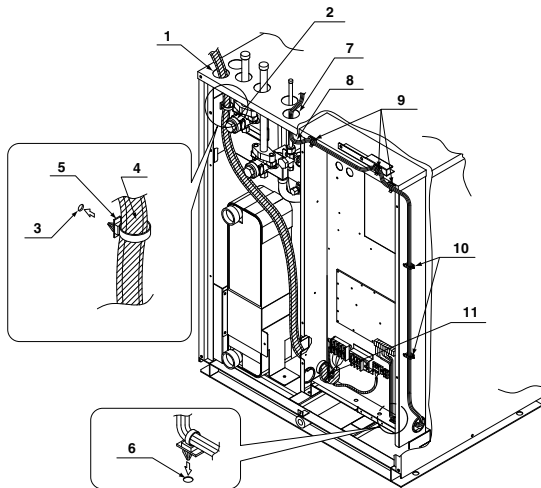
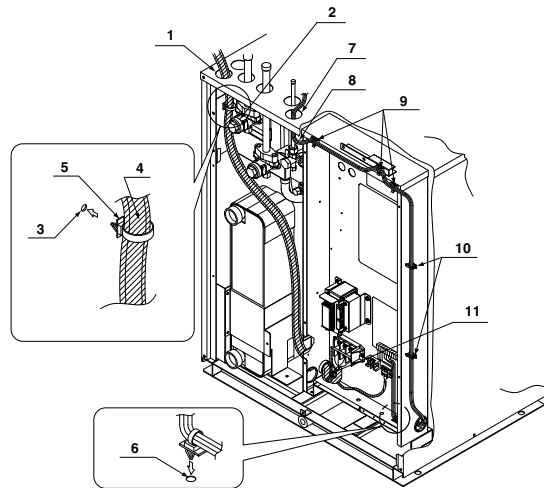
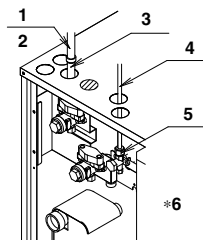


figure 19

<RWEYQ-PYDN>



[Heat pump system]



[Heat recovery system]

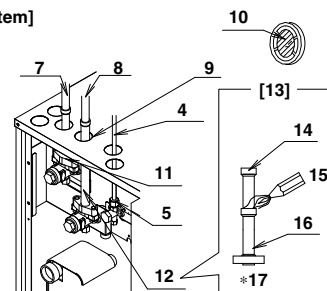


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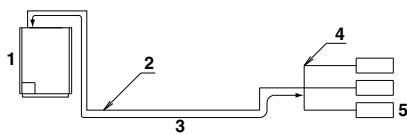


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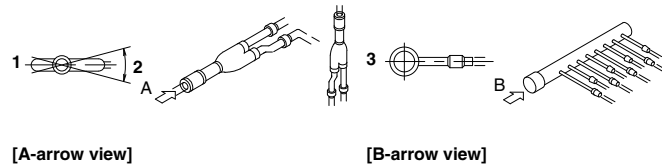


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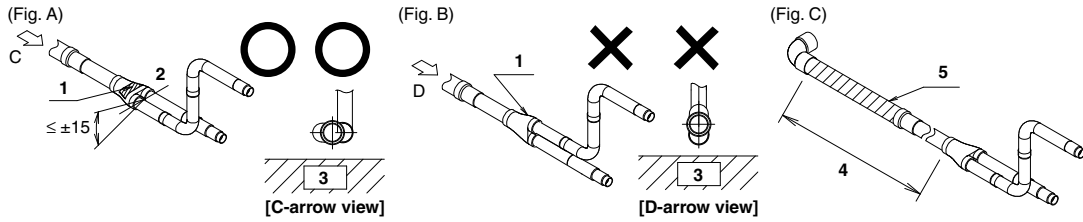
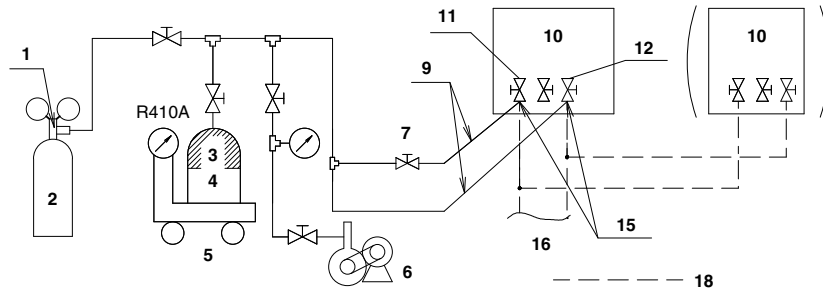


figure 23

[Heat pump system]



[Heat recovery system]

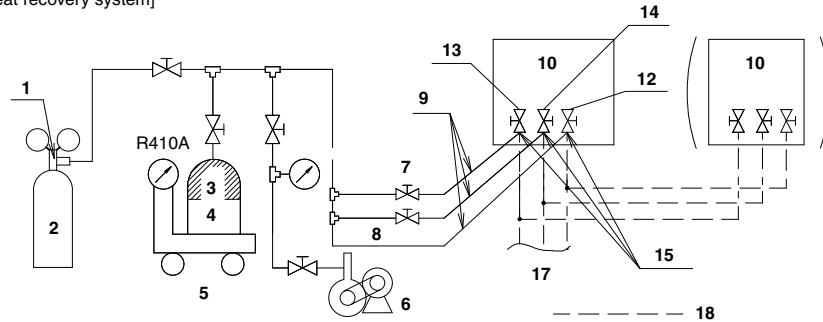


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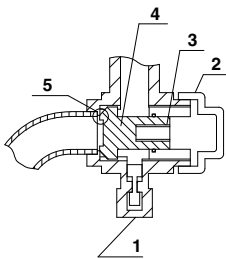


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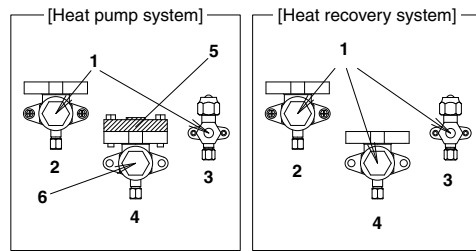


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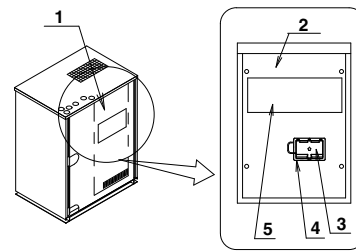


figure 27





1. SAFETY CONSIDERATIONS

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 start-up 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 for future reference.

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

Meanings of **DANGER**, **WARNING**, **CAUTION**, and **NOTE** 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.

DANGER

- Refrigerant gas is heavier than air and replaces oxygen. A massive leak will result in oxygen depletion, especially in basements, and an asphyxiation hazard will result in serious injury or death.
- Do not ground units to water pipes, gas pipes, telephone wires, or lightning rods as incomplete grounding will result a severe shock hazard resulting in severe injury or death. Additionally, grounding to gas pipes will result a gas leak and potential explosion resulting in severe injury or death.
- If refrigerant gas leaks during installation, ventilate the area immediately. Refrigerant gas will result in producing toxic gas if it comes into contact with fire. Exposure to this gas will result in 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 will result in serious injury or death.
- Safely dispose 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 will result in injuries or death by suffocation.
- Only qualified personnel must carry out the installation work. Installation must be done in accordance with this installation manual. Improper installation could 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, could result in oxygen deficiency.
- Use only specified accessories and parts for installation work. Failure to use specified parts could result in water leakage, electric shocks, 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 could result in the unit falling and causing injuries.
- Take into account strong winds, typhoons, or earthquakes when installing. Improper installation could 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 could result in electric shocks 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 could result in fire.
- When wiring, position the wires so that the terminal box lid can be securely fastened. Improper positioning of the terminal box lid could result in electric shocks, fire, or the terminals overheating.
- Before touching electrical parts, turn off the unit.
- This equipment can be installed with a Ground-Fault Circuit Breaker (GFCI). Although this is a recognized measure for additional protection, with the earthing 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 condenser 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 (R-410A) such as air. Any presence of air or other foreign substance in the refrigerant circuit could result in 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 could result.
- Do not touch the switch with wet fingers. Touching a switch with wet fingers may result in electric shock.
 - Do not allow children to play on or around the unit or it may result in injury.
 - The heat exchanger fins are sharp enough to cut, and may result in injury if improperly used. To avoid injury wear gloves or cover the fins while working around them.
 - 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. It may result in your hands getting 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.
 - 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 product.
 - Do not turn off the power immediately after stopping operation. Always wait for at least 5 minutes before turning off the power. Otherwise, water leakage may result.
 - Do not use a charging cylinder. Using a charging cylinder may cause the refrigerant to deteriorate.
 - Refrigerant R-410A 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 -- R-410A does not contain any chlorine, does not destroy the ozone layer, and does not reduce the earth's protection against harmful ultraviolet radiation. R-410A 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.
 - Since R-410A is a blend, the required additional refrigerant must be charged in its liquid state. If the refrigerant is charged in a state of gas, its composition can change and the system will not work properly.
 - The indoor unit is for R-410A. See the catalog for indoor models that can be connected. Normal operation is not possible when connected to other units.
 - Remote controller (wireless kit) transmitting distance can be shorter than expected in rooms with electronic fluorescent lamps (inverter or rapid start types). Install the indoor unit far away from fluorescent lamps as much as possible.
 - Indoor units are for indoor installation only. Outdoor units can be installed either outdoors or indoors. This unit is for indoor use.
 - 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 and thus may result in water leakage.
 - (b) Where corrosive gas, such as sulfuric 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 condenser 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.
 - Install the power supply and control wires for the indoor and outdoor units at least 3.5 feet away from televisions or radios to prevent image interference or noise. Depending on the radio waves, a distance of 3.5 feet 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 conventional refrigerants: gauge manifold, charge hose, gas leak detector, reverse flow check valve, refrigerant charge base, vacuum gauge, or refrigerant recovery equipment.
 - If the conventional refrigerant and refrigerator oil are mixed in R-410A, the refrigerant may result in deterioration.
 - This air conditioner or heat pump is an appliance that should not be accessible to the general public.
 - As design pressure is 478 psi, the wall thickness of field-installed pipes should be selected in accordance with the relevant local, state, and national regulations.

2. INTRODUCTION

This installation manual concerns VRV inverters of the Daikin RWEYQ-P series. These units are designed for indoor installation and used for cooling and heat pump applications.

The RWEYQ-P units can be combined with Daikin VRV series indoor units for air conditioning purposes.

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

2-1 Combination

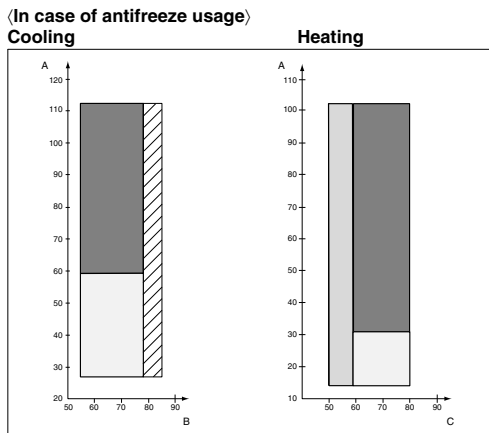
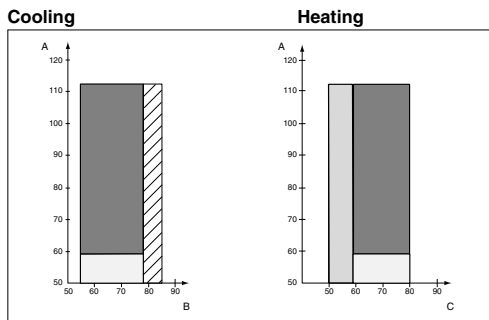
The indoor units can be installed in the following range.

- Always use appropriate indoor units compatible with R410A. To learn which models of indoor units are compatible with R410A, refer to the product catalogs.
- Total capacity/quantity of indoor units
 (Outside unit) (Total capacity index of indoor units) (Total quantity of indoor units)
 RWEYQ72PYDN/TJU 36 ~ 93.5 12 units
 RWEYQ84PYDN/TJU 42 ~ 109 14 units
 RWEYQ144PYDN/TJU 72 ~ 187 20 units
 RWEYQ168PYDN/TJU 84 ~ 218 20 units
 RWEYQ216PYDN/TJU ... 108 ~ 280 22 units
 RWEYQ252PYDN/TJU ... 126 ~ 327.5 32 units

2-2 Standard operation limit

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

- Equivalent pipe length 25 ft
- Level difference 0 ft



- A Entering water temperature (°F)
- B Indoor temperature (°FWB)
- C Indoor temperature (°FDB)
- Range for continuous operation
- Range for operation
- Range for pull down operation
- Range for warming up operation

- Operation range of water flow rate is 13.2~39.6 gpm. (21.2~39.5 gpm in case of antifreeze usage.)
- The unit is designed for the following operation range:
 Entering water temperature: 67~95°F
 Water flow rate: 16 gpm or more
- Can be expanded down to 14°F in heating and 27°F in cooling. Application rules apply; contact your local Daikin Sales off for design assistance. Prior Daikin dealer consultation is necessary for heat source equipment.
- Hold ambient temperature at 35~104°F
 Heat-release from the unit: 2420 Btu.
 It is therefore recommended to always ventilate the room.

2-3 Standard supplied accessories

- Make sure that the following accessories are included. (Check by removing the front panel.)

Name	Accessory pipes				
	For discharge gas	For suction gas (1)	For suction gas (2)	Clamp (A)	Clamp (B)
Quantity	1 pc.	1 pc.	1 pc.	7 pcs.	2 pcs.
Shape					
Name	Conduit mounting plate				
Quantity	2 pcs.	2 pcs.	[Others] • Installation manual • Operation manual		
Shape					

(Refer to figure 1)

- Operation manual
 Installation manual
 Clamp (A)
 Clamp (B)
 Conduit mounting plate
- Accessory pipes
 For discharge gas
 For suction gas (1)
 For suction gas (2)

NOTE

The accessory pipe for discharge gas is used for the heat recovery system. (Not used for the heat pump system.)

2-4 Option accessories

To install the above outside units, the following optional parts are also required.

- Refrigerant branching kit
 (For R410A only: Always use an appropriate kit dedicated for your system.)

(Heat pump system)

REFNET header	KHRP26M22H9	KHRP26M33H9	KHRP26M72H9	KHRP26M73HU9
REFNET joint	KHRP26A22T9	KHRP26A33T9	KHRP26M72TU9	KHRP26M73TU9

(Heat recovery system For 3-tube piping)

REFNET header	KHRP25M33H9	KHRP25M72H9	KHRP25M73HU9
REFNET joint	KHRP25A22T9	KHRP25A33T9	KHRP25M73TU9

(Heat recovery system For 2-tube piping)

REFNET header	KHRP26M22H9	KHRP26M33H9	KHRP26M72H9	KHRP26M73HU9
REFNET joint	KHRP26A22T9	KHRP26A33T9	KHRP26M72TU9	KHRP26M73TU9

- Outside unit multi connection piping kit
 (For R410A only: Always use an appropriate kit dedicated for your system.)

Number of outside units connected	2 units	3 units
Heat pump system	BHFP22MA56U	BHFP22MA84U
Heat recovery system	BHFP26MA56U	BHFP26MA84U

* To select an optimum kit, refer to "9. REFRIGERANT PIPING"

2-5 Technical specifications ⁽¹⁾

General	RWEYQ72PYDN/TJU	RWEYQ84PYDN/TJU
Nominal cooling capacity (2) (MBH)	72	84
Nominal heating capacity (3) (MBH)	81	94.5
Nominal input cooling / heating (4) (kW)	4.20 / 4.00	5.60 / 5.40
Dimensions HxWxD (inch)	39-3/8x30-3/4x21-11/16	
Weight (YDN/TJU) (lbs)	343/330	343/330
Connections		
refrigerant liquid pipe (inch)	3/8	3/8
refrigerant gas pipe (inch)	3/4	7/8
refrigerant discharge gas pipe (5) (inch)	5/8	3/4
Water piping connections		
Inlet pipe (inch)	1-1/4FPT female Thread	1-1/4FPT female Thread
Outlet pipe (inch)	1-1/4FPT female Thread	1-1/4FPT female Thread
Drain pipe (inch)	1/2FPS female Thread	1/2FPS female Thread

General	RWEYQ144PYDN/TJU	RWEYQ168PYDN/TJU
Nominal cooling capacity (2) (MBH)	144	168
Nominal heating capacity (3) (MBH)	162	189
Nominal input cooling / heating (4) (kW)	8.40 / 8.00	11.20 / 10.80
Dimensions HxWxD (inch)	(39-3/8x30-3/4x21-11/16)×2	
Weight (YDN/TJU) (lbs)	343×2/330×2	343×2/330×2
Connections		
refrigerant liquid pipe (inch)	1/2	5/8
refrigerant gas pipe (inch)	1-1/8	1-1/8
refrigerant discharge gas pipe (5) (inch)	7/8	7/8
Water piping connections		
Inlet pipe (inch)	(1-1/4FPT)×2 female Thread	(1-1/4FPT)×2 female Thread
Outlet pipe (inch)	(1-1/4FPT)×2 female Thread	(1-1/4FPT)×2 female Thread
Drain pipe (inch)	(1/2FPS)×2 female Thread	(1/2FPS)×2 female Thread

General	RWEYQ216PYDN/TJU	RWEYQ252PYDN/TJU
Nominal cooling capacity (2) (MBH)	216	252
Nominal heating capacity (3) (MBH)	243	283.5
Nominal input cooling / heating (4) (kW)	12.60 / 12.00	16.80 / 16.20
Dimensions HxWxD (inch)	(39-3/8x30-3/4x21-11/16)×3	
Weight (YDN/TJU) (lbs)	343×3/330×3	343×3/330×3
Connections		
refrigerant liquid pipe (inch)	5/8	3/4
refrigerant gas pipe (inch)	1-1/8	1-1/4
refrigerant discharge gas pipe (5) (inch)	1	1-1/8
Water piping connections		
Inlet pipe (inch)	(1-1/4FPT)×3 female Thread	(1-1/4FPT)×3 female Thread
Outlet pipe (inch)	(1-1/4FPT)×3 female Thread	(1-1/4FPT)×3 female Thread
Drain pipe (inch)	(1/2FPS)×3 female Thread	(1/2FPS)×3 female Thread

- (1) Refer to the engineering data book for the complete list of specifications.
- (2) The normal cooling capacities are based on:
 - Indoor temperature: 80°FDB / 67°FWB
 - Entering water temperature: 85°F
 - Leaving water temperature: 95°F
 - Equivalent pipe length: 25 ft
 - Level difference: 0 ft
- (3) The normal heating capacities are based on:
 - Indoor temperature: 70°FDB / 60°FWB
 - Entering water temperature: 70°F
 - Equivalent pipe length: 25 ft
 - Level difference: 0 ft
- (4) The nominal input includes total input of the unit: compressor and control circuit.
- (5) In case of heat recovery system

Compressor	RWEYQ72PYDN/TJU	RWEYQ84PYDN/TJU
Oil type	Synthetic (ether) oil	
Crankcase heater (W)	33	33
Refrigerant type	R410A	
Refrigerant charge (lbs)	9.9	11.5

Compressor	RWEYQ144PYDN/TJU	RWEYQ168PYDN/TJU
Oil type	Synthetic (ether) oil	
Crankcase heater (W)	(33)×2	(33)×2
Refrigerant type	R410A	
Refrigerant charge (lbs)	(9.9)×2	(11.5)×2

Compressor	RWEYQ216PYDN/TJU	RWEYQ252PYDN/TJU
Oil type	Synthetic (ether) oil	
Crankcase heater (W)	(33)×3	(33)×3
Refrigerant type	R410A	
Refrigerant charge (lbs)	(9.9)×3	(11.5)×3

2-6 Electrical specifications

Model	RWEYQ72PYDN	RWEYQ84PYDN
Power supply		
Phase	3~	3~
Frequency (Hz)	60	60
Voltage (V)	460	460
Voltage tolerance (%)	±10	±10
Recommended fuses (A)	15	15
Compressor		
Phase	3~	3~
Frequency (Hz)	60	60
Voltage (V)	460	460
Nominal running current (A)	5.3	7.0

Model	RWEYQ144PYDN	RWEYQ168PYDN
Power supply		
Phase	3~	3~
Frequency (Hz)	60	60
Voltage (V)	460	460
Voltage tolerance (%)	±10	±10
Recommended fuses (A)	(15)×2	(15)×2
Compressor		
Phase	3~	3~
Frequency (Hz)	60	60
Voltage (V)	460	460
Nominal running current (A)	(5.3)×2	(7.0)×2

Model	RWEYQ216PYDN	RWEYQ252PYDN
Power supply		
Phase	3~	3~
Frequency (Hz)	60	60
Voltage (V)	460	460
Voltage tolerance (%)	±10	±10
Recommended fuses (A)	(15)×3	(15)×3
Compressor		
Phase	3~	3~
Frequency (Hz)	60	60
Voltage (V)	460	460
Nominal running current (A)	(5.3)×3	(7.0)×3

Model		RWEYQ72PTJU	RWEYQ84PTJU
Power supply			
Phase		3~	3~
Frequency	(Hz)	60	60
Voltage	(V)	208/230	208/230
Voltage tolerance	(%)	±10	±10
Recommended fuses	(A)	40	40
Compressor			
Phase		3~	3~
Frequency	(Hz)	60	60
Voltage	(V)	208/230	208/230
Nominal running current	(A)	11.6	15.4

Model		RWEYQ144PTJU	RWEYQ168PTJU
Power supply			
Phase		3~	3~
Frequency	(Hz)	60	60
Voltage	(V)	208/230	208/230
Voltage tolerance	(%)	±10	±10
Recommended fuses	(A)	(40)×2	(40)×2
Compressor			
Phase		3~	3~
Frequency	(Hz)	60	60
Voltage	(V)	208/230	208/230
Nominal running current	(A)	(11.6)×2	(15.4)×2

Model		RWEYQ216PTJU	RWEYQ252PTJU
Power supply			
Phase		3~	3~
Frequency	(Hz)	60	60
Voltage	(V)	208/230	208/230
Voltage tolerance	(%)	±10	±10
Recommended fuses	(A)	(40)×3	(40)×3
Compressor			
Phase		3~	3~
Frequency	(Hz)	60	60
Voltage	(V)	208/230	208/230
Nominal running current	(A)	(11.6)×3	(15.4)×3

3. SELECTION OF LOCATION

This unit does not have specifications for outdoor installation. The unit must be installed indoors (example: machine room, ...). Paying attention to the conditions mentioned below, select the place for installation with a prior approval of customer.

1. The foundation is strong enough to support the weight of the unit and the floor is flat to prevent vibration and noise generation.
2. Consider the space required for refrigerant piping work when installing. Refer to [Necessary Space].
3. There is no danger of fire due to leakage of inflammable gas.
4. The piping length between the outside unit and the indoor unit may not exceed the allowable piping length. **"9. REFRIGERANT PIPING"**.
5. Locations where the noise of the unit operating will not disturb nearby houses, etc.
6. Locations with airflow and ventilation holes capable of dissipating heat from the machine and where the ambient temperature around the outside unit is between 35 and 104°F and the humidity does not exceed 80%. Consider condensate drain of condenser unit.

[Necessary Space]

When installing, secure the space mentioned below without fail.

(Refer to figure 2)

1. In case of a single installation [inch.]
2. In case of series installations [inch.]
3. Top view
4. Side view
5. Outside unit
6. Service Space (front side)
7. Service Space (back side)
8. Space for installing water piping
*Secure an enough space for removing the front panel.
9. Ventilation Space
*above the area (⋮⋮⋮) of the outside unit.
10. Secure spaces in the front, back and top sides as same as the case of single installation.

⚠ DANGER

- Do not install unit in an area where flammable materials are present due to risk of explosion resulting in serious injury or death.
- Refrigerant is heavier than air and replaces oxygen. A massive leak could lead to oxygen depletion, especially in basements, and an asphyxiation hazard could occur leading to serious injury or death. Refer to the chapter "Caution for refrigerant leaks".

⚠ NOTE

1. An inverter air conditioner may cause electronic noise generated from AM broadcasting. Examine where to install the main air conditioner and electric wires, keeping proper distances away from stereo equipment, personal computers, etc.
(Refer to figure 3)
 1. Indoor unit
 2. Branch switch, overcurrent breaker
 3. Remote controller
 4. Cool/Heat selector
 5. Personal computer or radio

If the electric wave of AM broadcasting is particularly weak, keep distances of 10 ft or more and use conduit tubes for power supply and transmission wiring.
2. Water quality
Water containing high level of foreign materials may cause the corrosion of heat exchanger and piping or scale accumulation. Use water satisfying "7-4 Water quality".
3. Cooling tower
Use a closed type cooling tower without fail. (Open type tower cannot be used.)
4. Strainer
Install a strainer (50 mesh or more) without fail at the inlet of water piping. (If sands, wastes, rust particles, etc. are mixed in the water circulation system, damage to the plate-type heat exchanger may be caused by the corrosion of metal materials and clogging of the heat exchanger.)

⚠ WARNING



Do not install in the following locations.

- Locations such as kitchens which contain a lot of mineral oil or steam in the atmosphere or where oil may splatter on the unit. Resin parts may deteriorate, causing the unit to fall or leak.
- 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 equipment that produces electromagnetic waves is found. The electromagnetic waves may cause the control system to malfunction, preventing normal operation.

4. INSPECTING AND HANDLING THE UNIT

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

When handling the unit, take into account the following:

1.  Fragile, handle the unit with care.
2.  Keep the unit upright in order to avoid compressor damage.
3. Choose the path along which the unit is to be brought in ahead of time.
3. In order to prevent any damage to the unit during installation, use slings (cloth) or patch plates and lift the unit referring to figure 4.
4. Lift the unit preferably with a crane and 2 belts of at least 27 ft long.
5. When lifting the unit with a crane, always use protectors to prevent belt damage and pay attention to the position of the unit's center of gravity.
6. Be sure use the standard supplied accessories and dedicated parts as installation parts.

(Refer to figure 4)

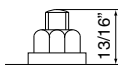
 1. Patch plates or clothes
 2. Belt sling

⚠ NOTE

- Use belt sling of 13/16" width or less which adequately bears the weight of the product.

5. UNPACKING AND PLACING THE UNIT

- Make sure the area around the machine drains properly by setting up drainage grooves around the foundation.
- Make sure the unit is installed level on a sufficiently strong base to prevent vibration and noise.
- Secure the unit to its base using foundation bolts. (Use four commercially available M12-type foundation bolts, nuts, and washers.)
- The foundation bolts should be inserted 13/16".
- Fix 4 foundation bolts.
- Support the unit with the foundation which is larger than the hatched area shown in figure 5.



(Refer to figure 5)

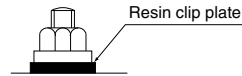
1. Front side
2. Position of foundation bolts
3. Hole for a foundation bolt ($\phi 11/16$ " holes at 4 corners)
4. Avoid such a foundation where the unit is supported by 4 corner points.

⚠ NOTE

- When installing the unit closely contacting the wall for any unavoidable reason, arrange so that no vibration from the unit may be transmitted to the wall surface by insulating the vibration using cushions, etc.

⚠ NOTE

- If the unit is to be installed on a roof, check the strength of the roof and its drainage facilities first.
- Make sure the area around the machine drains properly by setting up drainage grooves around the foundation. (Condensate water is sometimes discharged from the outside unit when it is running.)
- Use a nut with a resin clip plate to protect the nut tightening part from rusting.



6. WATER PIPING WORK

- The water pressure resistance of water piping of this outside unit is 285 psig.
- The connection port for water piping is located in the front. The connection ports for drain piping are located in the front and back. When using the back port, change the cast iron plug from the back to the front and securely close it.
- Because of indoor use, carry out piping work in such a way no water may drop on the outer plate.
- The lateral protruding section of the drain piping should be short (within 15-3/4) and installed in a downward direction. The diameter of drain pipe should be the same as the diameter of unit connection (1/2) or more.
- The diameter of water pipe should be the same as the diameter of unit connection (1-1/4) or more.
- Install an air purge valve in the midway of the water piping to prevent cavitation.
- After completing the drain piping work, make sure that the water runs smoothly without any clogging by dust.
- Do not connect the drain outlet to the water outlet.
- Install a strainer (50 mesh or more) in the inlet of water piping within a distance of 4.9 ft from the outside unit. (If sand, waste or rust particles are mixed in the water circulation system, metal materials will become corrosive.)
- Install insulation on the inlet/outlet of water piping to prevent condensation and freezing. At installing insulation on water in/outlet pipe, use Polyurethane form thickness 3/16 in. for insulation of water piping socket on heat exchanger.
- Install insulation up to the base of heat exchanger as shown in the figure 6.
- Install a gate valve for chemical cleaning in an easy position to handle.
- Use water pipes in compliance with the local and national codes.
- Run the water pump to flush inside of water piping. Then, clean the strainer.
- If there is a possibility of freezing, take measures to prevent freezing.
- Tighten securely the connection of water piping and socket with tightening torque of 220 ft-lbf or less. (If a large torque is applied, the unit may be damaged.)

(Refer to figure 6)

1. Air purge
2. Outlet of water
3. Inlet of water
4. Gate valve
5. Water piping socket
6. Water piping
7. Insulation
8. Heat exchanger
9. Strainer
10. Drain valve
11. Connection port to draining piping
12. Insulation cover
13. 3-1/8 in. or less
14. Insulation of water piping socket
15. Drain piping

7. HANDLING OF THE BRAZED PLATE-TYPE HEAT EXCHANGER



A brazed plate-type heat exchanger is used for this unit. Because its structure is different from a conventional type heat exchanger, it must be handled in a different manner.

7-1 When designing the equipment

1. Install a strainer (50 mesh or more) at the water inlet side adjacent to the outside unit in order to prevent any foreign materials such as dust, sand, etc. from entering.
2. Depending on the water quality, scale may stick to the plate-type heat exchanger. In order to remove scale, it is necessary to use chemicals to clean it at regular intervals. To this end, install a gate valve in the water piping. Set up a piping connection port on the piping between this gate valve and the outside unit for cleaning by chemicals.
3. For the purpose of cleaning and water drain-off from the outside unit (water draining during a long period of non-use in winter, draining upon starting of season-off), install an "air discharge valve" and a "water draining plug" at the inlet/outlet ports of water piping. In addition, install an "automatic air discharging valve" at the top of riser piping or at the top of a portion where air tends to stay.
4. Independent of the piping inlet of the outside unit, install a cleanable strainer at a portion close to the pump piping inlet.
5. Carry out complete cooling/thermal insulation of water piping and outdoor dehumidification. If complete cooling or thermal insulation has not been carried out, any damage may be caused during severe winter due to freezing, in addition to thermal loss.
6. When you stop operation during night or winter, it is necessary to take measures to prevent water-related circuits from natural freezing in the area the ambient temperature drops below 32°F (by water drain off, keeping the circulation pump running, warming up by a heater, etc.) Freezing of water related circuits may result in any damage to the plate-type heat exchanger. Therefore, take appropriate measures depending on the circumstances of use.

(Refer to figure 7)

1. Example of piping
2. Water inlet piping
3. Strainer
4. Air discharge valve (for joint use with cleaning port)
5. Cleaning device
6. Strainer for pump
7. Automatic air discharge valve
8. Water outlet piping
9. Joint use with water draining plug
10. Plate-type heat exchanger
11. Outside unit

7-2 Before starting a test run

1. Before starting a test run, please make sure that the piping work has been carried out in a proper manner. Especially, make sure that the strainer, air discharge valve, automatic water supply valve, expansion tank and cistern are positioned at their places correctly.
2. After water has been completely filled in, first run the pump only, and then make sure that no air has been caught in the water circulation system and that the water flow rate is correct. If any air has been caught or the flow rate is not enough, the plate-type heat exchanger may freeze. Measure any water pressure loss before and after the outside unit and make sure that the flow rate is as designed. In case of any abnormality, stop the test run immediately and carry out trouble shooting to resolve the trouble.
3. Following the installation manual, carry out a test run of the outside unit.
4. After the test run has been completed, inspect the strainer at the inlet piping of the outside unit. Clean it if it is dirty.

7-3 Daily service and maintenance

1. Management of water quality
The plate-type heat exchanger has a structure that does not permit dismantling and cleaning, or replacing any parts. Please pay attention carefully to the quality of water to be used for the plate-type heat exchanger in order to prevent corrosion and sticking of scale. The water to be used for the plate-type heat exchanger should have at least the quality as specified in the table below. When using any corrosion prevention agent, scale depressant agent, etc., such agent should have no corrosive features against stainless steel and copper.
2. Management of condenser water flow rate
If the condenser water flow rate is not enough, it will result in freezing damage to the plate-type heat exchanger. Check for any clogging of the strainer, any air being caught, any reduction in the flow rate due to failure of the circulation pump by measuring the temperature and pressure differences at the inlet and outlet ports of the plate-type heat exchanger. If the aged difference in the temperature or pressure has increased beyond the proper range, the flow rate should have decreased. Stop the operation and remove the cause before restarting the operation.
3. Steps to be taken if a freeze-protection device is activated
If the freeze-protection device is activated during operation, be sure to remove the cause before restarting the operation. If the freeze-protection device has been once activated, a partial freezing has already occurred. If you restart the operation without removing the cause, the plate-type heat exchanger will be closed and the ice cannot be melted, and in addition, the freezing process will be repeated, resulting in any damage to the plate-type heat exchanger, and this can lead to refrigerant leaking or water entering the refrigerant circuit.

7-4 Water quality

Water quality standards for condenser water, hot water and makeup water (4) (6)

Item (5)	Cooling water system (3)		Hot water system (2)		Tendency (1)	
	Circulation system		Circulation water (68°F - 140°F)	Makeup water	Corrosion	Scale
	Circulation water	Makeup water				
Standard items						
pH (77°F)	6.5 to 8.2	6.0 to 8.0	7.0 to 8.0	7.0 to 8.0	○	○
Electrical Conductivity (mS/ft)(77°F)	Less than 24.4	Less than 9.1	Less than 9.1	Less than 9.1	○	○
Chloride ions (mgCl/L)	Less than 200	Less than 50	Less than 50	Less than 50	○	
Sulfate ions (mgSO ₄ ²⁻ /L)	Less than 200	Less than 50	Less than 50	Less than 50	○	
Acid consumption (pH4.8) (mgCaCO ₃ /L)	Less than 100	Less than 50	Less than 50	Less than 50		○
Total hardness (mgCaCO ₃ /L)	Less than 200	Less than 70	Less than 70	Less than 70		○
Calcium hardness (mgCaCO ₃ /L)	Less than 150	Less than 50	Less than 50	Less than 50		○
Ionic-state silica (mgSiO ₂ /L)	Less than 50	Less than 30	Less than 30	Less than 30		○
Reference items						
Iron (mgFe/L)	Less than 1.0	Less than 0.3	Less than 1.0	Less than 0.3	○	○
Copper (mgCu/L)	Less than 0.3	Less than 0.1	Less than 1.0	Less than 0.1	○	
Sulfate ion (mgS ²⁻ /L)	Shall not be detected	Shall not be detected	Shall not be detected	Shall not be detected	○	
Ammonium ion (mgNH ₄ ⁺ /L)	Less than 1.0	Less than 0.1	Less than 0.3	Less than 0.1	○	
Residual chlorine (mgCl/L)	Less than 0.3	Less than 0.3	Less than 0.25	Less than 0.3	○	
Free carbon dioxide (mgCO ₂ /L)	Less than 4.0	Less than 4.0	Less than 0.4	Less than 4.0	○	
Stability index	6.0 to 7.0	—	—	—	○	○

[NOTES]

- (1) The circle marks in the columns for corrosion or scale to develop.
- (2) Corrosion has a tendency to occur when water temperature is high (104°F or more), and if metals with no protective coating whatsoever are directly exposed to water, it would be a good idea to take effective measures against corrosion such as adding a corrosion inhibitor or deterioration treatment.
- (3) In a condenser water circuit that uses a closed cooling tower, the closed circuit circulating water and makeup water must satisfy its water quality standards for the hot water system, and passing water and makeup water must satisfy those for the circulation type cooling water system.
- (4) The supply water must be clean tap water, industrial water or clean underground water.
Do not use purified or softened water.
- (5) The fifteen items in the table above represent typical causes of corrosion and scale.
- (6) Once-through water may cause corrosion.
Do not use once-through water.

7-5 Maintenance of plate-type heat exchanger

The performance of a plate-type heat exchanger may decline due to scale accumulation. It may be damaged by freezing due to the drop of flow rate. For this reason, it is necessary to carry out programmed maintenances at a regular interval in order to prevent the scale from being generated.

1. Before entering the season for use, carry out the following inspections:
 - 1) Conduct a water quality test and make sure that it is within the standard.
 - 2) Clean the strainer.
 - 3) Make sure that the flow rate is correct.
 - 4) Make sure that the operational conditions (pressure, flow rate, outlet temperature, etc.) are normal.
2. Because the plate-type heat exchanger has a structure which does not permit disassembling and cleaning, follow the following procedures for cleaning:
 - 1) For maintenance purposes it is required to provide for a connection port on the water inlet and on the water outlet. You must connect a circulation pump in between these 2 connection ports when cleaning the plate-type heat exchanger with chemicals.
For cleaning the scale in the plate-type heat exchanger it is recommended to use a solution with 5% diluted formic, citric, oxalic, acetic or phosphoric acid.
Never use hydrochloric, sulfuric or nitric acid because such solutions have a strong corrosive feature.
 - 2) Make sure to provide for a stop valve in front of that inlet water pipe connection port and for a stop valve after the outlet water pipe connection port.
 - 3) Connect the piping for circulation of cleaning chemicals to the inlet and outlet piping of plate-type heat exchanger. Fill the cleaning solution of 122 - 144°F for a while in the plate-type heat exchanger. Then, circulate the cleaning solution by a pump for 2-5 hours.
The time for cleaning depends on the temperature of cleaning solution or the degree of scale accumulation. Therefore, please watch the change of the dirtiness (color) of cleaning solution to determine the level of removal of scale.
 - 4) After circulating the cleaning solution, discharge the solution from the plate-type heat exchanger, fill the heat exchanger with a solution of 1-2% sodium hydroxide (NaOH) or sodium bicarbonate (NaHCO₃). Circulate this solution for 15-20 minutes for neutralization purpose.
 - 5) After the process of neutralization has been completed, rinse the inner part of the plate-type heat exchanger with care using fresh and clean water.
 - 6) When using any cleaning agent sold in the market, check in advance that such agent has no corrosive features against stainless steel and copper.
 - 7) For details of cleaning method, ask the manufacturer of related cleaning agent.
3. After cleaning has been completed, make sure that the unit can be operated in a normal fashion.

8. FIELD WIRING



NOTE

- All field wiring and components must be installed by a licensed electrician and must comply with relevant local and national regulations.
- The field wiring must be carried out in accordance with the wiring diagrams and the instructions given below.
- Be sure to use a dedicated power supply circuit. Never use a power supply shared by another appliance.
- Do not operate until refrigerant piping work is completed.
(If operated before complete the piping work, the compressor may be broken down.)
- Never remove thermistor, sensor or etc. when connecting power supply and transmission wiring.
(If operated with thermistor, sensor or etc. removed, the compressor may be broken down.)
- Be sure to install a ground fault circuit interrupter.
(This unit uses an inverter, so install a ground fault circuit interrupter that is capable of handling high harmonics in order to prevent malfunctioning of a ground fault circuit interrupter itself.)
- This product have reversed phase protection detector only works when the product started up.
- Replace two of the three phases (L1, L2, and L3) during reverse-phase protection circuit operation.
Reversed phase detection is not performed while the product is operating.
- Do not run the unit by short cutting the protection device (S1PH).
If there exists the possibility of reversed phase, lose phase, momentary blackout or the power supply goes on and off while the product is operating, attach a reversed phase protection circuit locally. Running the product in reversed phase may break the compressor and other parts.
- Attach the power supply wiring securely.

8-1 Optional parts

- Cool/Heat selector
 S1S Selector switch (fan, cool/heat)
 S2S Selector switch (cool/heat)



NOTE

- Use copper conductors only.
- When using the adaptor for sequential start, refer to chapter "Examples".
- For transmission wiring to outside-outside transmission F1-F2, outside-indoor transmission F1-F2, refer to chapter "Examples".
- For transmission wiring to the central remote controller, refer to the installation manual of the central remote controller.
- Use insulated wire for the power supply.

8-2 Power supply circuit and wire requirements

A power supply circuit (see table below) must be provided for connection of the unit. This circuit must be protected with the required safety devices, i.e. a main switch, a slow blow fuse on each phase and a ground fault circuit interrupter.

	Phase and frequency	Voltage	Minimum circuit amp.	Recommended fuses	Transmission wiring selection
RWEYQ72/84PYDN	φ3, 60 Hz	460 V	10.2 A	15 A	AWG18-16
RWEYQ144/168PYDN	φ3, 60 Hz	460 V	10.2+10.2 A	15+15 A	AWG18-16
RWEYQ216/252PYDN	φ3, 60 Hz	460 V	10.2+10.2+10.2 A	15+15+15 A	AWG18-16
RWEYQ72/84PTJU	φ3, 60 Hz	208/230 V	22.4 A	40 A	AWG18-16
RWEYQ144/168PTJU	φ3, 60 Hz	208/230 V	22.4+22.4 A	40+40 A	AWG18-16
RWEYQ216/252PTJU	φ3, 60 Hz	208/230 V	22.4+22.4+22.4 A	40+40+40 A	AWG18-16



NOTE

- Select the power supply wire in accordance with relevant local and national regulations.
- Wire size must comply with the applicable local and national code.
- Specifications for local power supply and branch wiring are in compliance with local code.

8-3 General

- Make sure to connect the power supply wire to the power supply terminal block and to clamp it as shown in figure 8, chapter "Field wiring connection".
- As this unit is equipped with an inverter, installing a phase advancing capacitor will not only reduce the power factor improvement effect, but also may cause the capacitor to overheat due to high-frequency waves. Therefore, never install a phase advancing capacitor.
- Keep power supply imbalance within 2% of the supply rating.
 1. Large imbalance will shorten the life of the smoothing capacitor.
 2. As a protective measure, the product will stop operating and an error indication will be made, when power supply imbalance exceeds 4% of the supply rating.
- Follow the "electrical wiring diagram" when carrying out any electrical wiring.
- Only proceed with wiring work after blocking off all power supply.
- Always ground wires. (In accordance with national regulations of the pertinent country.)
- This unit uses an inverter, and therefore generates noise, which will have to be reduced to avoid interfering with other devices. The outer casing of the product may take on an electrical charge due to leaked electrical current, which will have to be discharged with the grounding.
- This unit has a negative phase protection circuit. (If it operates, only operate the unit after correcting the wiring.)

WARNING

- Do not ground units to gas pipes, sewage pipes, lightning rods, or telephone ground wires because incomplete grounding could cause a severe shock hazard resulting in severe injury or death.
 - Gas pipes:** can explode or catch fire if there is a gas leak.
 - Sewage pipes:** no grounding effect is possible if hard plastic piping is used.
 - Telephone ground wires and lightning rods:** dangerous when struck by lightning due to an abnormal rise in electrical potential in the grounding.

8-4 Examples

System example (Refer to figure 8)

1. Field power supply
2. Main switch
3. Disconnect switch
4. Fuse
5. Ground fault circuit interrupter
6. Remote controller
7. Outside unit
8. Branch Selector unit
9. Indoor unit
10. Cool/Heat selector
 - power supply wiring (sheathed wire)
 - transmission wiring (sheathed wire)

CAUTION

- Use a conduit for the power supply wiring.
- Outside the unit, make sure the low-voltage electric wiring (i.e. for the remote controller, transmission, etc.) and the high-voltage electric wiring do not pass near each other, keeping them at least 5 in. apart. Proximity may cause electrical interference, malfunctions, and breakage.
- Be sure to connect the power supply wiring to the power supply terminal block and secure it as described in **Field wiring connection**.
- Transmission wiring should be secured as described in **Field wiring connection**.
- Secure the wiring with the accessory clamps so that it does not touch the piping.
- Make sure the wiring and the control box cover do not stick up above the structure, and close the cover firmly.

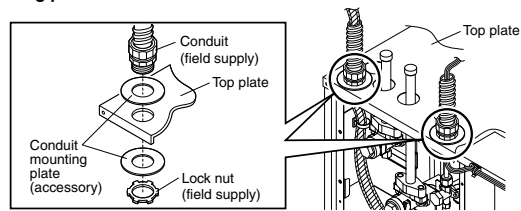
WARNING

- Never connect power supply wiring to the terminal block for remote controller wiring as this could damage the entire system.

Picking power supply and transmission wiring (Refer to figure 9)

1. Power supply wiring and wiring for pump operation (High voltage)
2. Transmission wiring (Low voltage)
3. Set apart

Connect the wire to the terminal block on PC board with care since too much pressure may cause breakage of the PC board.
Field wiring connection: transmission wiring, interlock circuit, pump operation output and Cool/Heat selector
Power supply and transmission wiring: Connect it using conduit mounting plates.



[In case of single outside unit]

(Refer to figure 10)

1. Cool/Heat selector
2. Outside unit PC board (A1P)
3. Take care of the polarity
4. Use the conductor of sheathed wire (2 wire) (no polarity)
5. Terminal board (field supply)
6. Indoor unit
7. Never connect the power supply wire.
8. Branch Selector unit A
9. Branch Selector unit B
10. Last Branch Selector unit
11. Cool-only unit
12. ABC I/P PC board (A5P)

[In case of multiple outside units]

(Refer to figure 11)

1. Unit A (Master unit)
2. Unit B
3. Unit C
4. TO IN/D UNIT
5. TO OUT/D UNIT
6. TO MULTI UNIT
7. To Cool/Heat selector (only Heat pump system)
8. To indoor unit
9. To other systems

- The transmission wiring between the outside units in the same pipe line must be connected to the Q1/Q2 (Out Multi) terminals. Connecting the wires to the (Out-Out) terminals results in system malfunction.
- The wiring for the other pipe line must be connected to the F1/F2 (Out-Out) terminals of the PC board in the outside unit to which the transmission wiring for the indoor units is connected.
- The outside unit to which the transmission wiring for the indoor units is connected is master unit.
- The transmission wiring between the outside units must be 100 ft. in length at maximum.

NOTE

- Be sure to keep the power supply and transmission wiring apart from each other. Be careful about polarity of the transmission wiring. Make sure that the transmission wiring is clamped as shown in the figure in chapter "Field wiring connection". Check that wiring does not make contact with refrigerant piping. Firmly close the lid and arrange the electric wires so as to prevent the lid or other parts from coming loose.

[Setting the interlock circuit and pump operation output.]

(Pump operation output [high voltage])

- Use insulated wires of the size as mentioned below having rated voltage of 250 V or more:
 - For single core: AWG16 or larger (conduit pipe work)
 - For multiple cores: AWG18 or larger
- *The wiring for pump operation output is to be procured locally.

(Refer to figure 12)

1. Pump operation output terminal (X2M). When water pump is linked with system operation, water pump operation circuit shall be set between terminals (1) and (2). Contact specification --- 220 VAC, 3 mA-0.5 A

2. PC board (A1P)
3. Mount an insulation sleeve.
4. **Connection of interlock circuit**
Do not forget to connect an interlock circuit (an auxiliary a-contact of electromagnetic switch for the water pump) to each outside unit.
(Select without fail an auxiliary a-contact able to switch minimum load of DC15 V, 1 mA.)

(When connecting for each outside unit)
Connect to the terminal block (X3M) as shown in the bottom right of the sketch.

(When connecting multiple outside units as 1 single unit (centralized interlock))
For this unit, it is possible to make a centralized interlock of multiple outside units using an adapter (sold separately as an accessory) for external control of outside units.
For details of wiring connection, refer to "**How to centralized interlock wiring**".
5. ABC I/P PC board (A5P)

(How to the centralized interlock wiring)

- When centralized interlock is done, see "**8-5 In case of a local setting**" - (3).
- No wiring to terminal block X3M is necessary when centralized interlock is employed.
- For multiple outside units, external/external transmission wiring shall be done for master unit only.
(Refer to figure 13)
 1. Outside unit A
 2. Outside unit B
 3. Outside unit C
 4. Adapter for external control
 5. Interlock circuit of water pump
 6. Out-Out transmission wiring
 7. Use the conductor of sheathed wire (2 wire) (no polarity)

[Setting the cool/heat operation type]

1. Performing cool/heat setting with the remote controller connected to the indoor unit.
Keep the Cool/Heat selector switch (DS1) on the outside unit PC board (A1P) at the factory setting position OFF.
(Refer to figure 16)
 1. Remote controller
 2. Performing cool/heat setting with the Cool/Heat selector.
Connect the Cool/Heat selector (optional) to the A/B/C terminals and set the Cool/Heat selector switch (DS1) on the outside unit PC board (A1P) to ON.
(Refer to figure 17)
 1. Cool/Heat selector
 2. ABC I/P PC board (A5P)
- The wiring from the indoor units must be connected to the F1/F2 (In-Out) terminals on the PC board in the outside unit.
 - For the above wiring, always use sheathed vinyl wire with AWG18-16 (2 core wire). (3 core wire is allowable for the Cool/Heat selector only.)



NOTE

- All transmission wire is field supply.
- Be sure to follow the limits below. If the transmission wiring is beyond these limits, it may result in malfunction of transmission.
Maximum wiring length: 3280 ft.
Total wiring length: 6560 ft.
Max. branches No. of branches: 16
Wire length between outside units: 98 ft.

Up to 16 branches are possible for transmission wiring. No branching is allowed after branching.

Never connect the power supply to transmission wiring terminal block. Otherwise the entire system may break down.

(Refer to figure 14)

1. Branch
2. Subbranching

For low-noise operation, it is necessary to get the optional "External control adaptor for outside unit".

For details, see the installation manual attached to the adaptor.

Field wiring connection:

L1, L2, L3, phase of the power supply wiring should be clamped to the safety catch using the included clamp material.

The green and yellow striped wrapped wires should be used for grounding.

Make sure to connect the power supply wire to the power supply terminal block and fix it using attached clamp as shown in figure 15 and 19.

(Refer to figure 15)

1. Power supply
2. Branch switch, overcurrent breaker
3. Grounding wire
4. Ground fault circuit interrupter
5. Attach insulation sleeves.
6. Power supply terminal block
7. Grounding terminal
8. Retain the ground wires along with the power supply wires using the accessory clamp (A).
9. Grounding wire
10. When wiring, do not allow the ground wires to contact the compressor lead wires. If the wires contact each other, adverse effects may occur to other units.
11. When connecting two wires to one terminal, ensure that the crimp-style terminals face with each other back to back. Moreover, make sure that the wire of the smaller gauge is located above.
12. Terminal block
13. Crimp-style terminal
14. Wire gauge: Small
15. Wire gauge: Large

(Refer to figure 19)

1. Intake for power supply wiring, pump operation output (high voltage) and ground wiring.
2. Stop valve for discharge gas (high temperature part)
3. Insert the accessory clamp (B) in the hole of the fixing plate for stop valve.
4. Power supply wiring, pump operation output (high voltage) and ground wiring.
5. Retain the power supply wiring, pump operation output (high voltage) and ground wiring with the accessory clamp (B) to prevent them from touching with the stop valve for discharge gas.
6. Insert the accessory clamp (B) in the hole of the bottom of electrical box.
7. Intake for transmission wiring. (low voltage)
8. Make sure to provide for a downward loop in the transmission wiring right in front of the location where the wiring is to be fixed over the top plate of the control box. This in order to prevent that condensate drips off the wiring into the control box.
9. Fix the transmission wiring to resin clamps with the accessory clamps (A)
10. Pass the transmission wiring (low voltage) through the wire clip.
11. Retain the power supply wiring, pump operation output (high voltage) and ground wiring to the bottom of electrical box with the accessory clamp (B)

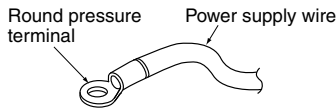


WARNING

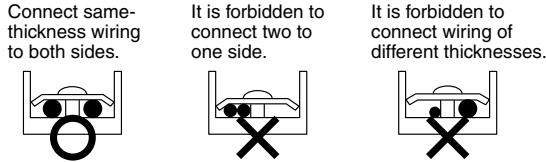
- Use only specified wire and connect wires to terminals tightly. Be careful that wires do not place external stress on terminals. Keep wires in neat order so as not to obstruct other equipment. Incomplete connections could result in overheating, and in worse cases, electric shock or fire.

CAUTION

(Precautions when laying power supply wiring)
Use round pressure terminals for connections to the power supply terminal block.



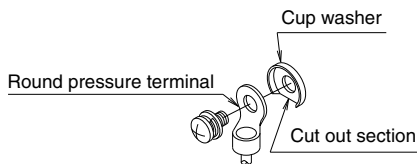
- When none is available, follow the instructions below.
- Do not connect wiring of different thicknesses to the power supply terminal block. (Slack in the power supply wiring may cause abnormal heat.)
 - When connecting wiring which is the same thickness, do as shown in the figure below.



- For wiring, use the designated power supply 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 table below for tightening torque for the terminal screws.

	Tightening torque (ft · lbf)
M5 (Power supply terminal block)	2.21-3.02
M5 (Ground)	
M3 (Transmission wiring terminal block)	0.59-0.72

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



8-5 In case of a local setting

If necessary, do the local settings as mentioned in the table below. For setting, refer to the plate “Cares to be taken in servicing” attached to the cover of control box.

Typical local settings

* For other settings than mentioned in the table below, refer to the equipment design materials and service manual.

(1) Setting of switching between cooling and heating	This setting is done when switching between cooling and heating is performed by a switching remote controller (sold separately as an accessory) installed on the outside unit.
(2) Setting to prohibit sequenced start	This setting is done when the outside units are not started in a sequenced order.
(3) Setting of centralized interlock Setting of external demand	These settings are done when the interlocks are connected in a lump-sum manner or when performing a demand operation by external instruction.
(4) Setting of abnormal display when interlock contact is OFF	This setting is done when making an abnormal display (HJ) on a remote controller when the interlock contact is OFF (when the heat source water pump is not operated).

CAUTION

A separate adapter (sold separately as an accessory) for external control of an outside unit is necessary when doing a demand operation from an external instruction, setting of cooling and heating through a centralized remote controller for cooling and heating (sold separately as an accessory) and setting of centralized interlock. For details, refer to the manual attached to the adapter.

9. REFRIGERANT PIPING

CAUTION

After completing installation, be sure to open the valves. (See 9-9 **Additional refrigerant charge** for details) (Operating the unit with the valves shut will break the compressor.)
Use R410A to add refrigerant. (The R410A refrigerant cylinder has a pink stripe painted around it.)
All field piping must be installed by a licensed refrigeration technician and must comply with relevant local and national regulations.

CAUTION TO BE TAKEN WHEN BRAZING REFRIGERANT PIPING
Do not use flux when brazing copper-to copper refrigerant piping. (Particularly for the HFC refrigerant piping) Therefore, use the phosphor copper brazing filler metal (B-Cu93P-710/795: ISO 3677) which does not require flux.

Note: Flux has an 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.

NOTE

- Installation tools:
 - Gauge manifold, charge hose, etc.**
Make sure to use installation tools that are exclusively used for R410A installations to withstand the pressure and to prevent foreign materials (e.g. mineral oils such as SUNISO and moisture) from mixing into the system. (The screw specifications differ for R410A and R407C.)

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.

9-1 Selection of piping material

- Foreign materials inside pipes (including oils for fabrication) must be 9 mg/10 ft or less.
- Use the following material specification for refrigerant piping:
 - Construction material: Phosphoric acid deoxidized seamless copper for refrigerant.
 - Size: Determine the proper size referring to chapter “Example of connection”.
 - The wall thickness of the refrigerant piping should comply with relevant local and national regulations. For R410A the design pressure is 450 psig.
- Make sure to use the particular branches of piping that have been selected referring to chapter “Example of connection”.
- Refer to chapter “Stop valve operation procedure” in 9-10 about the stop valve operation procedure.
- Make sure to perform the piping installation within the range of the maximum allowable pipe length, allowable level difference and allowable length after branching as indicated in chapter “Example of connection”
- For installation of the refrigerant branching kit, refer to the installation manual delivered with the kit. And follow the conditions listed below.
 - Mount the REFNET joint so that it branches either horizontally or vertically.
 - Mount the REFNET header so that it branches horizontally. (**Refer to figure 22**)
 - Horizontal connections
 - Up to ± 15° or vertically
 - Horizontal connections
- To connect the piping between outside units, an optional piping kit (multi connection piping kit) is always required. When installing the piping, follow the instructions in the installation manual that comes with the kit.

Restriction for the installation of the outside unit multi connection piping kit

- Install the joint horizontally within a lean of ±15° with caution name-plate on top. Refer to figure 23 (Fig. A)
Do not connect it vertically. Refer to figure 23 (Fig. B)
- Reserve the straight part of 19-11/16 in. or more to the branch pipe and do not bend the local pipe in that area. Straight part of 19-11/16 in. or more can be reserved if a local pipe (straight pipe) of 4-3/4 in. or more is connected to the joint. Refer to figure 23 (Fig. C)

- Incorrect installation may cause breakage of outside unit.
(Refer to figure 23)
 1. Caution nameplate
 2. Horizontal line
 3. Ground
 4. Straight part of 19-11/16 in. or more
 5. Local pipe (4-3/4 in. length or more)

Precautions when selecting branch piping.

- If the overall equivalent length of piping between the outside units and indoor units is 262.5 ft or more, be sure to enlarge the main pipe in the liquid-side branch piping. Depending on the length of the refrigerant piping, the cooling/heating capacity may drop, but even in such cases it is ok to enlarge the main pipe.
(Refer to figure 21)
 1. Outside unit
 2. Main pipe
 3. Enlarge
 4. The first refrigerant branching kit.
 5. Indoor unit

[Liquid side]

RWEYQ72/84P type:	φ3/8" → φ1/2"
RWEYQ144P type:	φ1/2" → φ5/8"
RWEYQ168/216P type:	φ5/8" → φ3/4"
RWEYQ252P type:	φ3/4" → φ7/8"

9-2 Protection against contamination when installing pipes

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

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

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

9-3 Pipe connection

- Only use the flare nuts included with the unit. Using different flare nuts may cause the refrigerant to leak.
- Be sure to perform a nitrogen blow when brazing. (Brazing without performing nitrogen replacement or releasing nitrogen into the piping will create large quantities of oxidized film on the inside of the pipes, adversely affecting valves and compressors in the refrigerating system and preventing normal operation.)
- Do not use a flux when brazing the refrigerant pipe joints. Use phosphor copper brazing (B-Cu93P-710/795: ISO 3677) which does not require flux. (Flux has an extremely negative effect on refrigerant piping systems. For instance, if chlorine based flux is used, it will cause pipe corrosion. If the flux contains fluorine, it will damage the refrigerant oil.)

⚠ DANGER

- Use of oxygen could cause an explosion resulting in severe injury or death. Only use nitrogen gas.
- Refrigerant gas may produce toxic gas if it comes in contact with fire such as from a fan heater, stove or cooking device. Exposure to this gas could cause severe injury or death.

⚠ NOTE

- The pressure regulator for the nitrogen released when doing the brazing should be set to 2.9 psig or less.
(Refer to figure 18)
 1. Refrigerant piping
 2. Location to be brazed
 3. Nitrogen
 4. Taping
 5. Manual valve
 6. Regulator

Precautions when connecting pipes

- See the following table for flare part machining dimensions.
- When connecting the flare nuts, apply refrigerant oil to the inside of the flares and turn them three or four times at first. (Use ester oil or ether oil.)
- See the following table for tightening torque. (Applying too much torque may cause the flares to crack.)
- After all the piping has been connected, check the gas leak with nitrogen.

pipe size (in.)	tightening torque (ft. · lbf)	A (in.)	flare shape
φ 3/8"	24.1 - 29.4	0.504 - 0.520	
φ 1/2"	36.5 - 44.5	0.638 - 0.654	
φ 5/8"	45.6 - 55.6	0.760 - 0.776	

—Not recommendable but in case of emergency

You must use a torque wrench but if you are obliged to install the unit without a torque wrench, you may follow the installation method mentioned below.

After the work is finished, make sure to check that there is no gas leak.

When you keep on tightening the flare nut with a spanner, there is a point where the tightening torque suddenly increases. From that position, further tighten the flare nut the angle shown below:

(Unit: in.)

Pipe size	Further tightening angle	Recommended arm length of tool
φ 3/8"	60 to 90 degrees	Approx. 7-7/8
φ 1/2"	30 to 60 degrees	Approx. 9-13/16
φ 5/8"	30 to 60 degrees	Approx. 11-13/16
φ 3/4"	20 to 35 degrees	Approx. 17-3/4

9-4 Connecting the refrigerant piping

Connect piping to outside unit by using accessory pipes

(Refer to figure 20)

1. Gas side piping
2. (field supply)
3. Gas side accessory pipe (for suction gas (1))
4. Liquid side pipe (field supply)
5. Flare nut (Included in the unit)
6. Accessory pipes (for discharge gas and suction gas (2)) is not used.
7. Piping on discharge gas side (field supply)
8. Piping on suction gas side (field supply)
9. Cut off the hatched area and use it as a cover for the drilled.
10. Hatched area
11. Accessory pipe (for discharge gas)
12. Accessory pipe (for suction gas)
13. Guideline for pipe machining
14. Accessory pipe (for suction gas (2))
15. Brazing
16. Accessory pipe (for suction gas (1))
17. Before fitting to the product, apply brazing.

⚠ NOTE

- Be sure to use the attached pipe when carrying out piping work in the field.
- Be sure that the local piping does not touch other pipes, the bottom panel or side panel. Especially for the bottom and side connection, be sure to protect the local piping with the provided insulation, to prevent it from coming into contact with the casing.

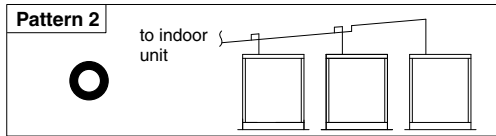
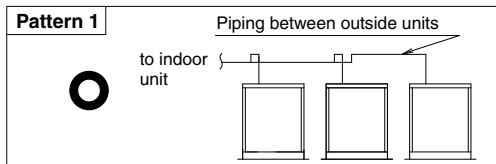
Precautions for installation of units

⚠ NOTE

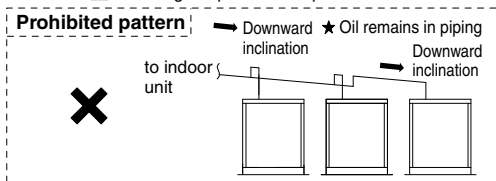
- The outside unit multi connection piping kit that is sold separately as an option (BHFP22MA56U + 84U, BHFP26MA56U + 84U) is necessary for the multi installation of outside units.
- See the installation manual attached to the kit with attention to installation restrictions described in "connecting the refrigerant piping" when installing.

(Cautions for installation of multiple outside units)

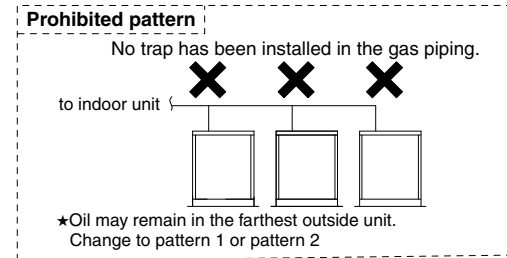
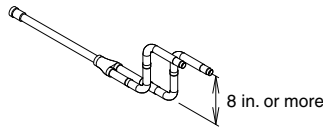
1. The piping between the outside units must be routed level or slightly upward to avoid the risk of oil detention to the piping side.



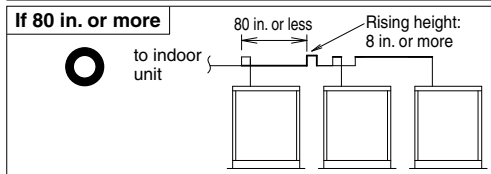
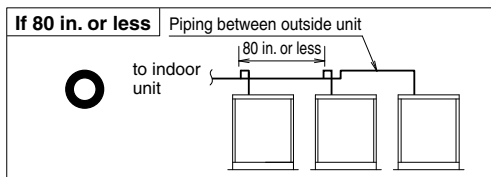
Change to pattern 1 or pattern 2



2. The gas piping (both discharge and suction gas piping in case of the heat recovery system) after branched, install without fail a trap of 8 in. or more using the piping included in the piping kit for connecting the outside unit. Otherwise, the refrigerant may stay within the piping, causing any damage to the outside unit.



3. If the piping length between the outside unit connecting pipe kit or between the outside units exceeds 80 in., create a rise of 8 in. or more in the gas piping within a length of 80 in. from the kit.



9-5 Example of connection

* In case of a system of switching between cooling and heating, all systems use 2-tube piping (for suction gas piping and liquid piping). No Branch Selector unit is required.

Example of connection

(Connection of 8 indoor units Heat pump system (2-tube piping))

Outside: Suction gas piping (2-tube piping) / Indoor: Suction gas piping (2-tube piping) / Liquid piping (2-tube piping)

- Piping between outside unit and BS unit
- Piping between BS unit and indoor unit
- Piping between outside unit and indoor unit

If the system capacity is RWEYO144 or more, re-lead the outside unit as the first outside branch seen from the indoor unit side.

Branch with REFNET joint

Example 1: Single outside unit installed (RWEYO72, 84)

Example 2: When multiple outside units (RWEYO144-)

Example 3: Pipe length between outside (2) and indoor units ≤ 390 ft

Example 4: Total piping length from outside (2) and indoor units ≤ 498 ft

Example 5: Piping length from outside branch to outside unit ≤ 33 ft

Example 6: Difference in height between indoor units (H1) ≤ 164 ft

Example 7: Difference in height between indoor unit (main) and outside unit (sub) (H3) ≤ 6.5 ft

Example 8: Pipe length from first refrigerant branch kit (either REFNET joint or REFNET header) to indoor unit ≤ 130 ft

Branch with REFNET joint and REFNET header

Example 1: Pipe length between outside (2) and indoor units ≤ 390 ft

Example 2: Total piping length from outside (2) and indoor units ≤ 498 ft

Example 3: Piping length from outside branch to outside unit ≤ 33 ft

Example 4: Difference in height between indoor units (H1) ≤ 164 ft

Example 5: Difference in height between indoor unit (main) and outside unit (sub) (H3) ≤ 6.5 ft

Example 6: Pipe length from first refrigerant branch kit (either REFNET joint or REFNET header) to indoor unit ≤ 130 ft

Branch with REFNET header

Example 1: Pipe length between outside (2) and indoor units ≤ 390 ft

Example 2: Total piping length from outside (2) and indoor units ≤ 498 ft

Example 3: Piping length from outside branch to outside unit ≤ 33 ft

Example 4: Difference in height between indoor units (H1) ≤ 164 ft

Example 5: Difference in height between indoor unit (main) and outside unit (sub) (H3) ≤ 6.5 ft

Example 6: Pipe length from first refrigerant branch kit (either REFNET joint or REFNET header) to indoor unit ≤ 130 ft

Refrigerant branch kit selection

Refrigerant branch kits can only be used with R410A.

Capacity type	Outside unit	Refrigerant branch kit name	Heat recovery system
RWEYO72, 84	RWEYO72, 84	KHRP25A33T9	KHRP25A33T9
RWEYO144, 168	RWEYO144, 168	KHRP25M72U9	KHRP25M72U9
RWEYO216, 252	RWEYO216, 252	KHRP25M73U9	KHRP25M73U9
RWEYO144	RWEYO144	KHRP25A33T9	KHRP25A33T9
RWEYO216	RWEYO216	KHRP25M72U9	KHRP25M72U9
RWEYO252	RWEYO252	KHRP25M73U9	KHRP25M73U9

How to select REFNET joint: Select the first branch counted from the outside unit side when using REFNET joints at the REFNET header.

How to select REFNET header: Select suitable one from the table below according to the total capacity of indoor units to be connected to the capacity of REFNET header.

Indoor capacity index	Refrigerant branch kit name	In case of 2-tube piping	In case of 3-tube piping
< 72	KHRP25M33H9	KHRP25M33H9	KHRP25M33H9
72~<111	KHRP25M34H9	KHRP25M34H9	KHRP25M34H9
111~<246	KHRP25M72H9	KHRP25M72H9	KHRP25M72H9
246~	KHRP25M73H9	KHRP25M73H9	KHRP25M73H9

How to select outside branch kit (Needed when the outside unit type is RWEYO144 or more):

Number of units of outside unit	Heat recovery system	Heat pump system
2 unit	BHP22MA56U	BHP22MA56U
3 unit	BHP22MA84U	BHP22MA84U

Pipe size selection

Example of downstream indoor units

For an outside unit multi installation (RWEYO144, 168, 216, 252 type), make the settings in accordance with the following figure.

Piping between outside unit and indoor units (part A)

Piping between outside branches (part B)

Piping between outside branch and outside unit (part C)

Capacity type	Piping size (outer diameter)	Piping size (outer diameter)	Piping size (outer diameter)
RWEYO72	φ 3/4	φ 3/4	φ 3/8
RWEYO84	φ 7/8	φ 3/4	φ 3/8
RWEYO144	φ 1-1/8	φ 7/8	φ 5/8
RWEYO168	φ 1-3/8	φ 1-1/8	φ 3/4
RWEYO216	φ 1-3/8	φ 1-1/8	φ 5/8
RWEYO252	φ 1-3/8	φ 1-1/8	φ 5/8

How to calculate the additional refrigerant to be charged

Additional refrigerant to be charged (R (lbs)) (R410A) and rounded off in units of 0.1 (lb).

NOTE: If the result is negative, it is gotten for R from the formula at right, no refrigerant needs to be added.

Example for refrigerant branch using REFNET joint and REFNET header for RWEYO252

System name	Heat recovery system	Heat pump system
1 unit (72 / 84)	6.6	4.4
2 unit multi (144 / 168)	9.9	5.5
3 unit multi (216 / 252)	13	6.6

* For Gedhermal Applications, if the condenser is lower than the indoor units, the maximum vertical separation is 65 ft (20 m).

9-6 Air tight test and vacuum drying

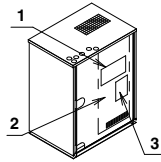
The units were checked for leaks by the manufacturer. Confirm that the valves are firmly closed before Air tight test or vacuum drying.

To prevent entry of any impurities and ensure sufficient pressure resistance, always use the special tools dedicated for R410A.

- **Air tight test:** Make sure to use nitrogen gas. (For the service port location, refer to the "Caution" label attached on the front panel [right] of the outside unit.)

(Refer to figure)

1. [Service precautions] Label
2. Control box cover
3. [Caution] Label



Pressurize the liquid and gas pipes to 550 psi (do not pressurize more than 550 psi). If the pressure does not drop within 24 hours, the system passes the test. If the pressure drops, check where the nitrogen leaks from.

- **Vacuum drying:** Use a vacuum pump which can evacuate to 500 microns.
 1. Evacuate the system from the liquid and gas pipes by using a vacuum pump for more than 2 hours and bring the system to 500 microns 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.
 2. Following should be executed if there is a possibility of moisture remaining inside the pipe (if piping work is carried out during the raining season or over a long period of time rainwater may enter the pipe during work).
After evacuating the system for 2 hours, pressurize the system to 7.25 psig (vacuum break) with nitrogen gas and evacuate the system again using the vacuum pump for 1 hour to 500 microns or less (vacuum drying). If the system cannot be evacuated to 500 microns within 2 hours, repeat the operation of vacuum break and vacuum drying.
Then, after leaving the system in vacuum for 1 hour, confirm that the vacuum gauge does not rise.

NOTE

Make sure to perform air tight test and vacuum drying using the service ports of the stop valve shown in the table below.

One outside unit installed	Liquid side stop valve Discharge gas side stop valve Suction gas side stop valve
Multiple outside units installed	Liquid side stop valve Discharge gas side stop valve Suction gas side stop valve Oil-equalizing stop valve

9-7 Pipe insulation

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

- Make sure to insulate the connection piping and refrigerant branch kits entirely.
- Be sure to use insulation that is designed for use with HVAC Systems.
- If you think the humidity around the cooling piping might exceed 86°F and RH80%, reinforce the insulation on the cooling piping (at least 13/16" thick). Condensation might form on the surface of the insulation.
- 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 outside unit is located higher than the indoor unit, etc., this must be prevented by caulking the connections, etc.

WARNING

- Be sure to insulate connection piping, as touching them can cause burns.

9-8 Checking of device and installation conditions

Be sure to check the followings.

1. Make sure there is no faulty power supply wiring or loosening of a nut. See "8. FIELD WIRING".
2. Make sure there is no faulty transmission wiring or loosening of a nut. See "8. FIELD WIRING".
3. Make sure there is no faulty refrigerant piping. See "9. REFRIGERANT PIPING".
4. Make sure piping size is correct. See "9-1 Selection of piping material".
5. Make sure insulation work is done. See "9-7 Pipe insulation".
6. Make sure insulation resistance of main power supply circuit is not deteriorated.
Using a megatester for 500 V, check that the insulation resistance of 2 MΩ or more is attained by applying a voltage of 500 V DC between power supply and ground terminals. Never use the megatester for the transmission wiring (between outside and indoor unit, outside and Cool/Heat selector and etc.).

9-9 Additional refrigerant charge

WARNING

- To avoid injury always use protective gloves and eye protection when charging refrigerant.
- To avoid injury do not charge with unsuitable substances. Use only the appropriate refrigerant.

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 (see above).
When charging a system, care shall be taken that its maximum permissible charge is never exceeded, in view of the danger of liquid hammer.
Refrigerant containers shall be opened slowly.

TO AVOID COMPRESSOR BREAKDOWN. DO NOT CHARGE THE REFRIGERANT MORE THAN THE SPECIFIED AMOUNT TO RAISE THE CONDENSING PRESSURE.

- This outside unit is factory charged with refrigerant and depending on pipe sizes and pipe lengths some systems require additional charging of refrigerant.
- Determine the amount of refrigerant to be added by referring to the table, write it down on the included "Added Refrigerant" plate and attach it to the rear side of the front cover.
Note: refer to the example of connection for the amount to be added.

Additional refrigerant charge procedure (1)-normally

- Charge the refrigerant to the liquid pipe in its liquid state. Since R410A is a mixed refrigerant, its composition changes if charged in a state of gas and normal system operation would no longer be assured.
- Make sure to use installation tools you exclusively use on R410A installations to withstand the pressure and to prevent foreign materials from mixing into the system.

1. Before charging, check whether the tank has a siphon attached or not.

How to charge with the siphon tank.

Charge with the tank upright.

(There is a siphon tube inside, so there is no need to turn the tank upside-down.)



Other ways of charging with the tank.

Charge with the tank upside-down.



2. After the vacuum drying is finished, charge the additional refrigerant in its liquid state through the liquid stop valve service port. Taking into account following instructions:
 - Check that gas and liquid stop valves are closed.
 - Stop the compressor and charge the specified weight of refrigerant.
 (If the outside unit is not in operation and the total amount cannot be charged, follow the Additional refrigerant charge procedure (2) shown below.)

NOTE

- Procedures for charging additional refrigerant. (Refer to figure 24)
 1. Pressure reducing valve
 2. Nitrogen
 3. Refrigerant tank
 4. With a siphon
 5. Measuring instrument
 6. Vacuum pump
 7. Valve A
 8. Valve B
 9. Charge hose
 10. Outside unit
 11. Gas side
 12. Liquid side
 13. Discharge gas side
 14. Suction gas side
 15. Stop valve service port
 16. To indoor unit
 17. To indoor units / BS units
 18. Dotted lines represent onsite piping

Additional refrigerant charge procedure (2)-by Additional refrigerant charge operation

To learn the system settings for additional refrigerant charging, refer to the [Service Precaution] label attached on the back of the control box cover in the outside unit.

1. Fully open all stop valves (valve A and valve B must be left fully closed).
2. After ten minutes, fully close liquid side stop valve and then, open the valve by turning 180°. Start the additional refrigerant charge operation. See [Service precautions] Label for detail. If it is difficult to charge the refrigerant additionally, decrease the water temperature or warm the refrigerant tank. (Warm the refrigerant tank with a stupe or a warm hot water of 104°F or less.)
3. After the system is charged with a specified amount of refrigerant, press the RETURN button (BS3) on the PC board (A1P) in the outside unit to stop the additional refrigerant charge operation.
4. Immediately open both liquid-side and gas-side stop valve. (If do not open the stop valve immediately, liquid seal may cause the pipe to burst.)



NOTE

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

9-10 Stop valve operation procedure



CAUTION

Do not open the stop valve until 1-6 of "9-8 Checking of device and installation conditions" are completed. If the stop valve is left open without turning on power supply, it may cause refrigerant to buildup in the compressor, leading to insulation degradation.

Opening stop valve

1. Remove the cap and turn the valve counterclockwise with the hexagon wrench.
2. Turn it until the shaft stops. Do not apply excessive force to the stop valve. Doing so may break the valve body, as the valve is not a backseat type. Always use the special tool.
3. Make sure to tighten the cap securely.

Closing stop valve

1. Remove the cap and turn the valve clockwise with the hexagon wrench.
2. Securely tighten the valve until the shaft contacts the main body seal.
3. Make sure to tighten the cap securely.
 - * For the tightening torque, refer to the table on the below.

Tightening torque

Stop valve size	Tightening torque ft.-lbf. (Turn clockwise to close)					
	Shaft (valve body)		Cap (valve lid)	Service port	Flare nut	Gas side accessory pipe (1)
Liquid side	3.98-4.87	Hexagonal wrench 1/8 in.	9.95-12.17	8.48-10.25	24.1-29.4	—
Gas side	19.91-24.33	Hexagonal wrench 3/8 in.	26.54-32.44	8.48-10.25	—	16.22-20.65

(Refer to figure 25)

1. Service port
2. Cap
3. Hexagon hole
4. Shaft
5. The main body seal

(Caution)

- Do not damage the cap sealing.
- Always use a charge hose for service port connection.
- After tightening the cap, check that no refrigerant leaks are present.
- After working, securely tighten the cover of service port without fail by specified torque.
- When loosening a flare nut, always use two wrenches in combination. When connecting the piping, always use a spanner and torque wrench in combination to tighten the flare nut.
- When connecting a flare nut, coat the flare (inner and outer faces) with ether oil or ester oil and hand-tighten the nut 3 to 4 turns as the initial tightening.
- Do not forget to open the stop valve before starting operation.

(Refer to figure 26)

1. Remove the cap and turn the valve counterclockwise with the hexagon wrenches until it stops.
2. Discharge gas side
3. Liquid side
4. Suction gas side
5. Never remove the partition flange for any reason.
6. Full close on the suction gas side

10. CHECKS AFTER INSTALLATION

⚠ WARNING

- Never connect power supply wiring to the terminal block for remote controller wiring as this could damage the entire system.
- Attach the power supply wire securely.
- To avoid injury, always make sure that the circuit breaker on the power supply panel of the installation is switched off before doing any work.

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

1. The position of the switches that requires an initial setting
Make sure that switches are set according to your application needs before turning the power supply on.
2. Power supply wiring and transmission wiring
Use a designated power supply and transmission wiring and make sure that it has been carried out according to the instructions described in this manual, the wiring diagrams and local and national regulations.
3. Pipe sizes and pipe insulation
Make sure that correct pipe sizes are installed and that the insulation work is properly executed.
4. Additional refrigerant charge
The amount of refrigerant to be added to the unit should be written on the included "Additional Refrigerant" label, and attach it to the rear side of the front cover.
5. Measurement of insulation in main power supply circuit
Using a megatester for 500 V, check that the insulation resistance of 2 MΩ or more is attained by applying a voltage of 500 V DC between power supply and ground terminals. Never use the megatester for the transmission wiring.
6. Installation date
Be sure to keep record of the installation date on the "Additional Refrigerant" label.

11. TEST RUN

⚠ CAUTION

After completing installation, be sure to open the valves.
(Operating the unit with the valves shut will break the compressor.)

11-1 Air discharge

- Running the heat source water pump, carry out air discharge process until the water comes out from the air discharge hole of local piping.
(For the operation to be done for the first time after installation, you need to perform a checking operation.)

11-2 Before turn on the power supply

- Close the control box cover securely before turning on power supply.
- Make settings for outside unit PC board (A1P) after turning on the power supply and check the LED display from inspection door that is on the control box cover.

11-3 Check operation

When running the unit for the first time after installation, be sure to perform a test operation following these steps. (Not performing a test operation when the unit is first installed may prevent the unit from operating properly.)

- During the operation, monitor the outside unit operation status and check for any incorrect wiring.

(1) Check the connection of interlock circuit	The outside unit cannot be operated if the interlock circuit has not been connected.																																																												
(2) • As necessary, configure the system settings onsite by using the dipswitch (DS1) on the outside unit PC-Board (A1P) and push button switches (BS1 to 5). • When the system is in the multiple-outside unit configuration, perform the configuration on the main unit. (Any settings made on a sub unit will be ignored.) After this, close the control box cover.	Always perform configuration after turning ON the power supply. To learn the setting method, refer to the [Service Precautions] label attached at the position shown in the figure on the right (Control box cover in outside unit). (Remember, the actual settings you have made must be recorded on the [Service Precautions] label.)																																																												
(3) Turn ON the power supply to the outside units and indoor units.	Make sure to turn ON the power supply 6 hours before starting the operation. This is necessary to warm the crankcase preliminarily by the electric heater.																																																												
(4) Start the heat source water pump and fill the heat source water in the outside unit.	The outside unit cannot be operated if the heat source water pump is not running.																																																												
(5) Make sure that the temperature of heat source water is kept within the operation range (60 - 100°F).	The outside unit cannot be operated at a temperature outside the operation range.																																																												
(6) Check the LED on the PC board (A1P) in the outside unit to see if the data transmission is performed normally.																																																													
<table border="1"> <thead> <tr> <th rowspan="2">LED display (Default status before delivery)</th> <th colspan="2">Microcomputer operation monitor</th> <th rowspan="2">Page</th> <th rowspan="2">Ready/ Error</th> <th colspan="3">Cooler/heater changeover</th> <th rowspan="2">Low noise</th> <th rowspan="2">Demand</th> <th rowspan="2">Multi</th> </tr> <tr> <th>HAP</th> <th>H1P</th> <th>H2P</th> <th>Individual</th> <th>Bulk (main)</th> <th>Bulk (sub)</th> </tr> </thead> <tbody> <tr> <td>One outside unit installed</td> <td>●</td> <td>●</td> <td>●</td> <td>○</td> <td>●</td> <td>●</td> <td>●</td> <td>●</td> <td>●</td> <td>●</td> </tr> <tr> <td rowspan="2">When multiple outside unit installed (*)</td> <td>Master station</td> <td>●</td> <td>●</td> <td>○</td> <td>●</td> <td>●</td> <td>●</td> <td>●</td> <td>●</td> <td>○</td> </tr> <tr> <td>Sub station 1</td> <td>●</td> <td>●</td> <td>●</td> <td>●</td> <td>●</td> <td>●</td> <td>●</td> <td>●</td> <td>●</td> </tr> <tr> <td>Sub station 2</td> <td>●</td> <td>●</td> <td>●</td> <td>●</td> <td>●</td> <td>●</td> <td>●</td> <td>●</td> <td>●</td> <td>●</td> </tr> </tbody> </table> <p>LED display: ● OFF ○ ON ● Blinking</p>		LED display (Default status before delivery)	Microcomputer operation monitor		Page	Ready/ Error	Cooler/heater changeover			Low noise	Demand	Multi	HAP	H1P	H2P	Individual	Bulk (main)	Bulk (sub)	One outside unit installed	●	●	●	○	●	●	●	●	●	●	When multiple outside unit installed (*)	Master station	●	●	○	●	●	●	●	●	○	Sub station 1	●	●	●	●	●	●	●	●	●	Sub station 2	●	●	●	●	●	●	●	●	●	●
LED display (Default status before delivery)	Microcomputer operation monitor		Page	Ready/ Error			Cooler/heater changeover						Low noise	Demand	Multi																																														
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When multiple outside unit installed (*)	Master station	●	●	○	●	●	●	●	●	○																																																			
	Sub station 1	●	●	●	●	●	●	●	●	●																																																			
Sub station 2	●	●	●	●	●	●	●	●	●	●																																																			
(*) The base (main) unit is the outside unit to which the interconnecting wiring for the indoor units is connected. The other outside units are sub units.																																																													
(7) • Using the push button switches (BS1 - 5) on the PC board (A1P) of outside unit, carry out a local setting, if necessary. • When the system is in the multiple-outside unit configuration, perform the configuration on the main unit. (Any settings made on a sub unit will be ignored.)	Always perform configuration after turning ON the power supply. To learn the setting method, refer to the [Service Precautions] label attached at the position shown in the figure on the right (Control box cover in outside unit). (Remember, the actual settings you have made must be recorded on the [Service Precautions] label.)																																																												
(8) Check all stop valves are opened. If some stop valve is closed, open them. (Refer to "9-10 Stop valve operation procedure".)	[CAUTION] Do not leave any stop valve closed. Otherwise the compressor will fail. For Heat recovery system of cooling and heating: Open all stop valves on the suction side, discharge gas side and liquid side. For cooling and heating switching operation system: Open the stop valves on discharge gas side and liquid side. (Keep the stop valve on suction side fully closed.)																																																												
(9) Perform the check operation following the instructions printed on the [Service Precautions] label.	If you push the test run button (BS4) on the PC board (A1P) of the outside unit for 5 seconds, the test run starts. If you want to interrupt the test run, push the RETURN button (BS3) on PC board (A1P) of the outside unit. The system continues residual operation for about 1 minute (maximum 10 minutes) and then stops. (During test run, you cannot stop it by a command from a remote controller.) You need to perform the above settings on the PCB by accessing the PCB through the inspection cover on the control box cover.																																																												

(Refer to figure 27)

1. Control box
2. Control box cover
3. Service lid
4. Inspection cover
5. [Service precaution] Label

⟨Cautions for check operation⟩

- If the system is started within about 12 minutes after the outside/indoor units are turned ON, the compressor will not run and H2P lights up. Before starting an operation, always verify that the LED display shows the contents of the table in “11-3 Check operation (6)”.
- The system may require up to 10 minutes until it can start the compressor after an operation start. This is a normal operation to equalize the refrigerant distribution.
- The check operation does not provide any means of checking the indoor units individually. For that purpose, perform normal operation using the remote controller after the check operation.
- Check operation is not possible in other modes such as collection mode.
- If the setting of indoor remote controller is changed before the check operation, it may not be performed correctly and malfunction code “UF” may be displayed.

Remote controller displays malfunction code

Malfunction code	Installation error	Remedial action
E3 E4 F3 F6 UF U2	The stop valve of an outside unit is left closed.	Open the stop valve. Check referring to the table in “9-9 Additional refrigerant charge”.
U1	The phases of the power supply to the outside units are reversed.	Exchange two of the three phases (L1, L2, L3) to make a positive phase connection.
U1 U2 U4	No power is supplied to an outside or indoor unit (including phase interruption).	Check if the power supply wiring for the outside units are connected correctly. (If the power supply wire is not connected to L2 phase, no malfunction display will appear and the compressor will not work.) Check if the ground fault circuit interrupter in the outside unit is ON.
UF	Incorrect transmission between units	Check if the refrigerant piping and the unit transmission wiring are consistent with each other.
E3 F6 UF U2	Refrigerant overcharge	Recalculate the required amount of refrigerant from the piping length and correct the refrigerant charge level by recovering any excessive refrigerant with a refrigerant recovery machine.
E4 F3	Insufficient refrigerant	<ul style="list-style-type: none"> • Check if the additional refrigerant charge has been finished correctly. • Recalculate the required amount of refrigerant from the piping length and add an adequate amount of refrigerant.
U7 UF	If an outside multi terminal is connected when there is one outside unit installed	Remove the wiring from the outside multi terminals (Q1 and Q2).
UF E4	The operation mode on the remote controller was changed before the check operation.	Set the operation mode on all indoor unit remote controllers to “cooling.”
HJ	The heat source water is not circulating.	Make sure that the water pump is running.
U3	The check operation has not been performed.	Perform the check operation.
E2 E3	E3 is activated, so On/Off button is pressed on the remote controller, but this does not turn E3 off. Or E2 is activated. In case of above, there is a malfunction of the compressor in the outside unit.	Measure the insulation resistance of the compressor to check the condition of the compressor.

11-4 Check of normal operation

After the check operation is completed, operate the unit normally. (Heating is not possible if the outdoor temperature is 75°F or higher. Refer to the Operation manual.)

Check the below items.

- Make sure the indoor and outside units are operating normally (If a knocking sound can be heard in the liquid compression of the compressor, stop the unit immediately and then energize the heater for a sufficient length of time before restarting the operation.)
- Run each indoor unit one at a time and make sure the corresponding outside unit is also running.
- Check to see if cold (or hot) air is coming out of the indoor unit.
- Press the fan direction and fan strength buttons on the indoor unit to check if they operate properly.

⚠ NOTE

⟨Cautions for normal operation check⟩

- Once stopped, the compressor will not restart in about 5 minutes even if the On/Off button of an indoor unit in the same system is pressed.
- When the system operation is stopped by the remote controller, the outside units may continue operating for further 5 minutes at maximum.
- If the system has not undergone any check operation by the test operation button since it was first installed, a malfunction code “U3” is displayed. In this case, perform check operation referring to “11-3 Check operation”.
- After the test operation, when handing the unit over to the customer, make sure the control box cover, the service lid, and the unit casing are all attached.

12. CAUTION FOR REFRIGERANT LEAKS

⚠ DANGER

- Refrigerant gas is heavier than air and replaces oxygen. A massive leak could lead to oxygen depletion, especially in basements, and an asphyxiation hazard could occur leading to serious injury or death.

(Points to note in connection with refrigerant leaks)

Introduction

The installer and system specialist shall secure safety against leakage according to local regulations or standards. The following standards may be applicable if local regulations are not available.

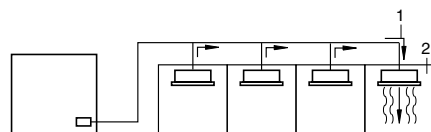
The VRV System, like other air conditioning systems, uses R410A as refrigerant. R410A itself is an entirely safe non-toxic, non-combustible refrigerant. Nevertheless care must be taken to ensure that air conditioning facilities are installed in a room which is sufficiently large. This assures that the maximum concentration level of refrigerant gas is not exceeded, in the unlikely event of major leak in the system and this in accordance to the local applicable regulations and standards.

Maximum concentration level

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

The unit of measurement of the concentration is lb./ft³ (the weight in lb. of the refrigerant gas in 1 ft³ 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 a special attention to the place, such as a basement, etc. where refrigerant can stay, since refrigerant is heavier than air.

Procedure for checking maximum concentration

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

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

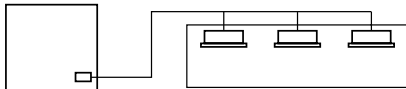
$$\begin{array}{rcl} \text{amount of refrigerant in a single unit system (amount of refrigerant with which the system is charged before leaving the factory)} & + & \text{additional charging amount (amount of refrigerant added locally in accordance with the length or diameter of the refrigerant piping)} \\ & & = \text{total amount of refrigerant (lb.) in the system} \end{array}$$

NOTE

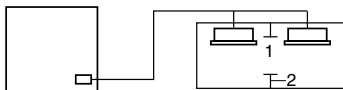
- Where a single refrigerant facility is divided into 2 entirely independent refrigerant systems then use the amount of refrigerant with which each separate system is charged.

2. Calculate the smallest room volume (ft³)
In case like the following, calculate the volume of (A), (B) as a single room or as the smallest room.

A. Where there are no smaller room divisions



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



1. opening between rooms
2. partition

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

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

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

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

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

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

2.2 RWEYQ-PTJU (In case of manufacturing code: RWEYQ-PTJU9)

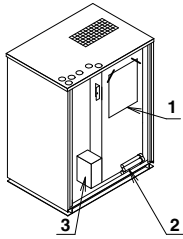


figure 1

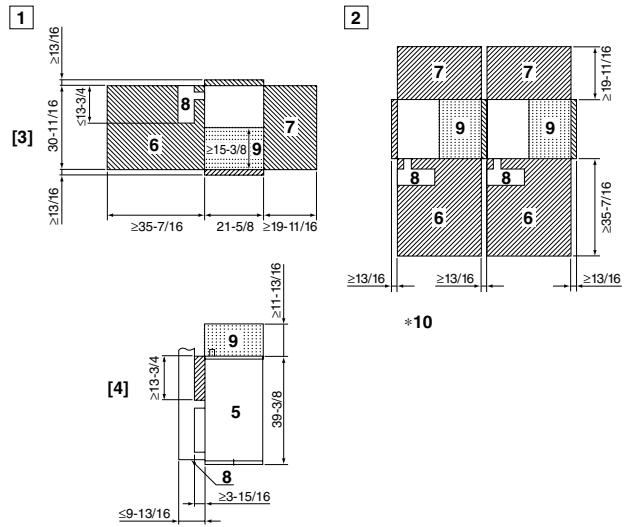


figure 2

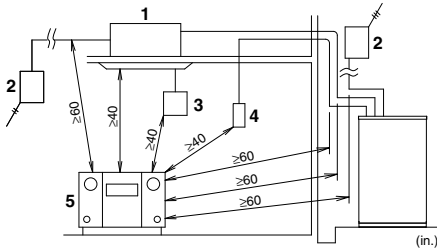


figure 3

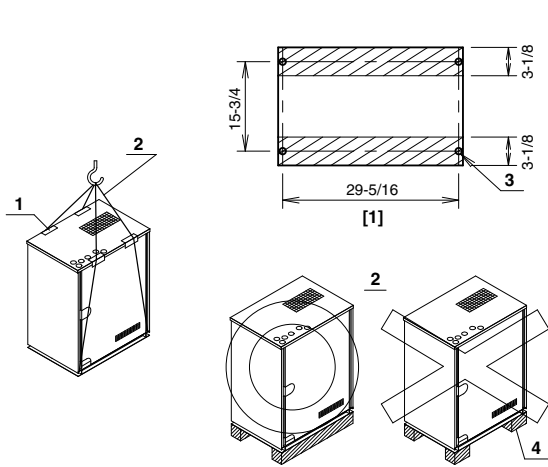


figure 4

figure 5

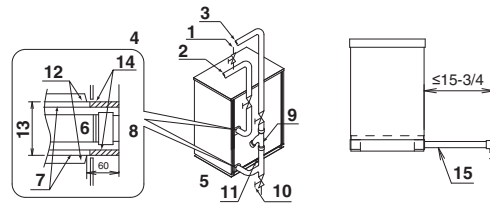


figure 6

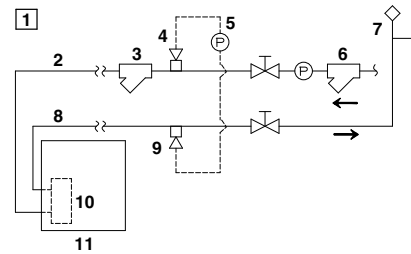
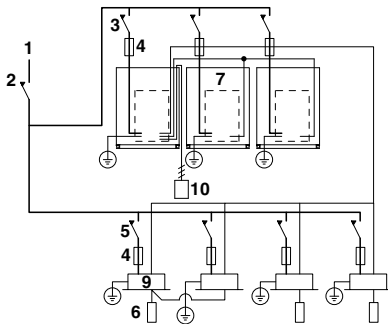


figure 7

[Heat pump system]



[Heat recovery system]

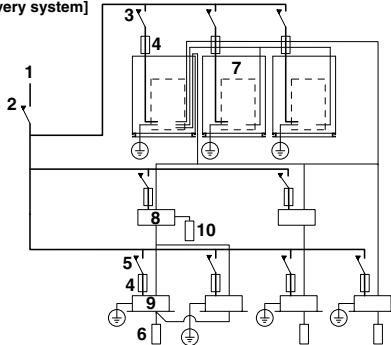
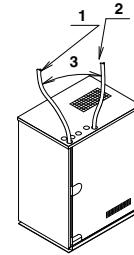


figure 8

figure 9



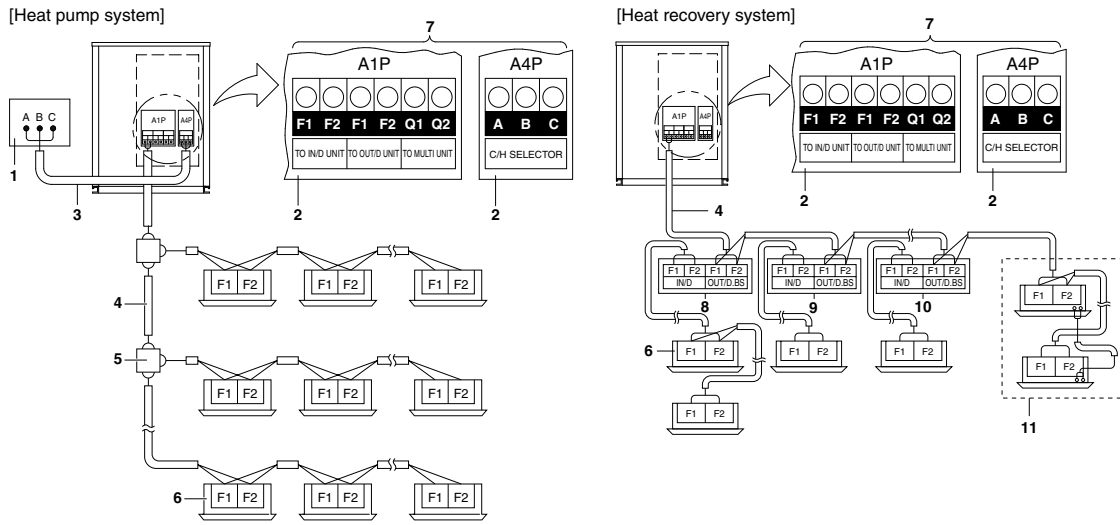


figure 10

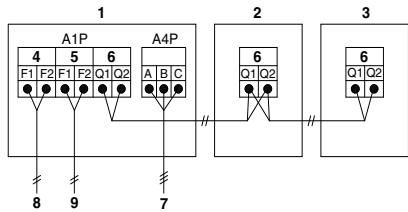


figure 11

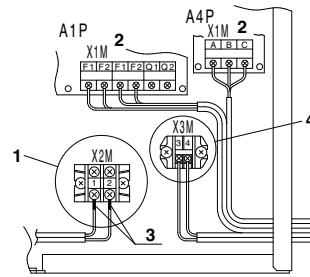


figure 12

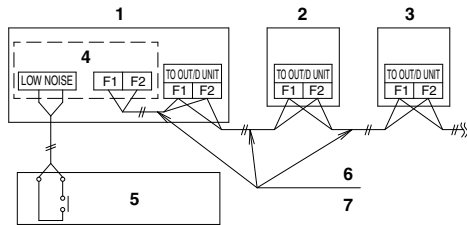


figure 13

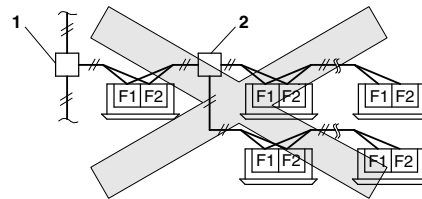


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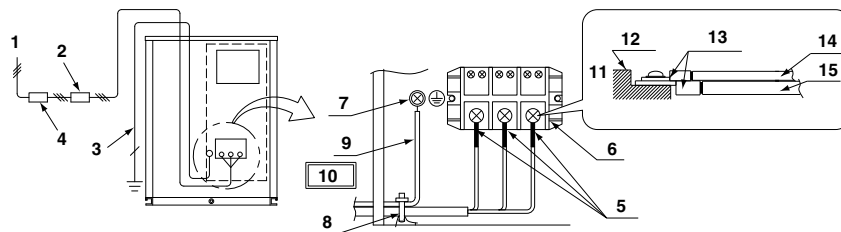


figure 15

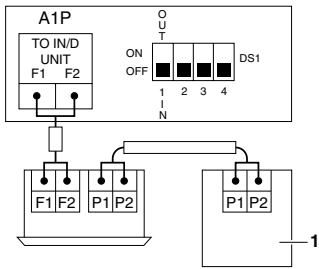


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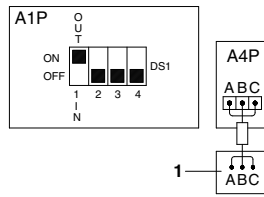


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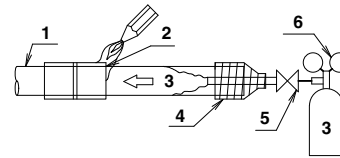


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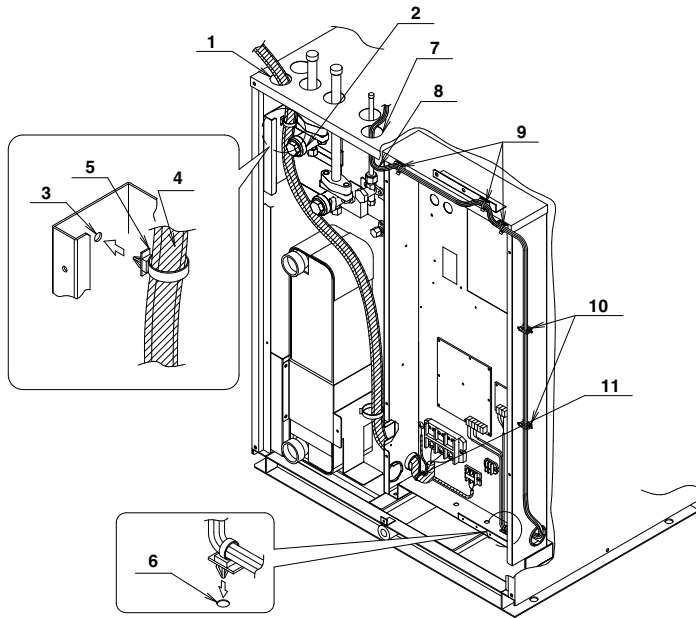
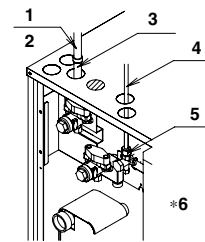


figure 19

[Heat pump system]



[Heat recovery system]

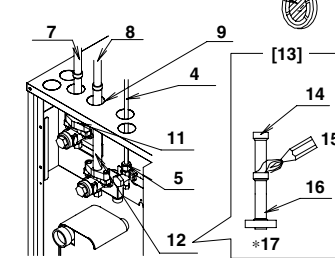


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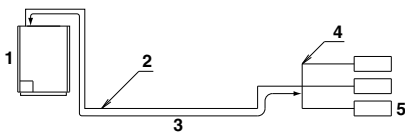
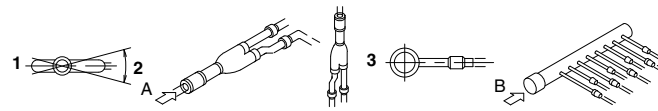


figure 21



[A-arrow view]

[B-arrow view]

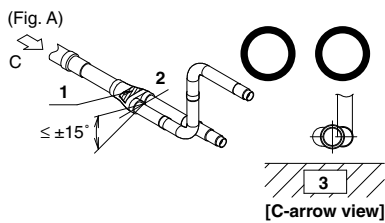
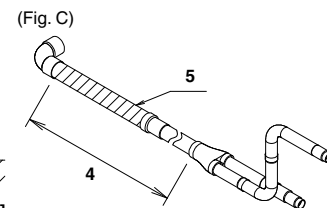
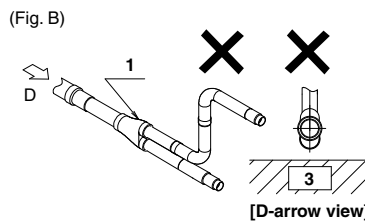
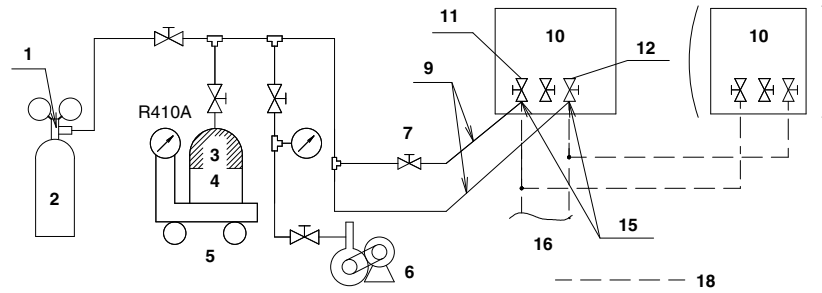


figure 23



[Heat pump system]



[Heat recovery system]

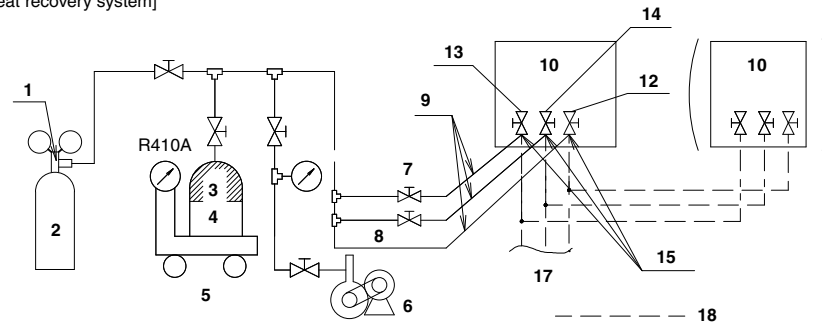


figure 24

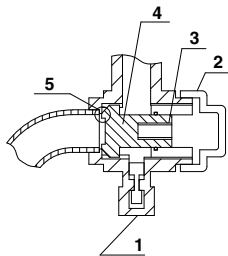


figure 25

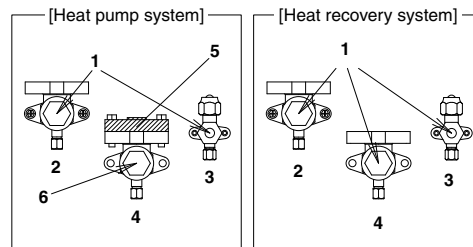


figure 26

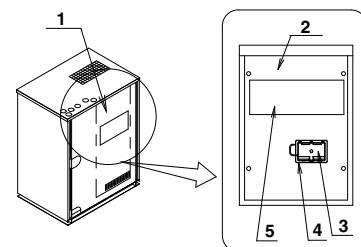


figure 27





1. SAFETY CONSIDERATIONS

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 start-up 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 for future reference.

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

Meanings of **DANGER**, **WARNING**, **CAUTION**, and **NOTE** 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.

DANGER

- **Refrigerant gas is heavier than air and replaces oxygen. A massive leak will result in oxygen depletion, especially in basements, and an asphyxiation hazard will result in serious injury or death.**
- **Do not ground units to water pipes, gas pipes, telephone wires, or lightning rods as incomplete grounding will result a severe shock hazard resulting in severe injury or death. Additionally, grounding to gas pipes will result a gas leak and potential explosion resulting in severe injury or death.**
- **If refrigerant gas leaks during installation, ventilate the area immediately. Refrigerant gas will result in producing toxic gas if it comes into contact with fire. Exposure to this gas will result in 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 will result in serious injury or death.**
- **Safely dispose 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 will result in injuries or death by suffocation.**
- **Only qualified personnel must carry out the installation work. Installation must be done in accordance with this installation manual. Improper installation could 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, could result in oxygen deficiency.**
- **Use only specified accessories and parts for installation work. Failure to use specified parts could result in water leakage, electric shocks, 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 could result in the unit falling and causing injuries.**
- **Take into account strong winds, typhoons, or earthquakes when installing. Improper installation could 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 could result in electric shocks 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 could result in fire.**
- **When wiring, position the wires so that the terminal box lid can be securely fastened. Improper positioning of the terminal box lid could result in electric shocks, fire, or the terminals overheating.**
- **Before touching electrical parts, turn off the unit.**
- **This equipment can be installed with a Ground-Fault Circuit Breaker (GFCI). Although this is a recognized measure for additional protection, with the earthing 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 condenser 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 (R-410A) such as air. Any presence of air or other foreign substance in the refrigerant circuit could result in 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 could result.
- Do not touch the switch with wet fingers. Touching a switch with wet fingers may result in electric shock.
 - Do not allow children to play on or around the unit or it may result in injury.
 - The heat exchanger fins are sharp enough to cut, and may result in injury if improperly used. To avoid injury wear gloves or cover the fins while working around them.
 - 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. It may result in your hands getting 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.
 - 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 product.
 - Do not turn off the power immediately after stopping operation. Always wait for at least 5 minutes before turning off the power. Otherwise, water leakage may result.
 - Do not use a charging cylinder. Using a charging cylinder may cause the refrigerant to deteriorate.
 - Refrigerant R-410A 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 -- R-410A does not contain any chlorine, does not destroy the ozone layer, and does not reduce the earth's protection against harmful ultraviolet radiation. R-410A 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.
 - Since R-410A is a blend, the required additional refrigerant must be charged in its liquid state. If the refrigerant is charged in a state of gas, its composition can change and the system will not work properly.
 - The indoor unit is for R-410A. See the catalog for indoor models that can be connected. Normal operation is not possible when connected to other units.
 - Remote controller (wireless kit) transmitting distance can be shorter than expected in rooms with electronic fluorescent lamps (inverter or rapid start types). Install the indoor unit far away from fluorescent lamps as much as possible.
 - Indoor units are for indoor installation only. Outdoor units can be installed either outdoors or indoors. This unit is for indoor use.
 - 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 and thus may result in water leakage.
 - (b) Where corrosive gas, such as sulfuric 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 condenser 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.
 - Install the power supply and control wires for the indoor and outdoor units at least 3.5 feet away from televisions or radios to prevent image interference or noise. Depending on the radio waves, a distance of 3.5 feet 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 conventional refrigerants: gauge manifold, charge hose, gas leak detector, reverse flow check valve, refrigerant charge base, vacuum gauge, or refrigerant recovery equipment.
 - If the conventional refrigerant and refrigerator oil are mixed in R-410A, the refrigerant may result in deterioration.
 - This air conditioner or heat pump is an appliance that should not be accessible to the general public.
 - As design pressure is 478 psi, the wall thickness of field-installed pipes should be selected in accordance with the relevant local, state, and national regulations.

2. INTRODUCTION

This installation manual concerns VRV inverters of the Daikin RWEYQ-P series. These units are designed for indoor installation and used for cooling and heatpump applications.

The RWEYQ-P units can be combined with Daikin VRV series indoor units for air conditioning purposes.

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

2-1 Combination

The indoor units can be installed in the following range.

- Always use appropriate indoor units compatible with R410A.

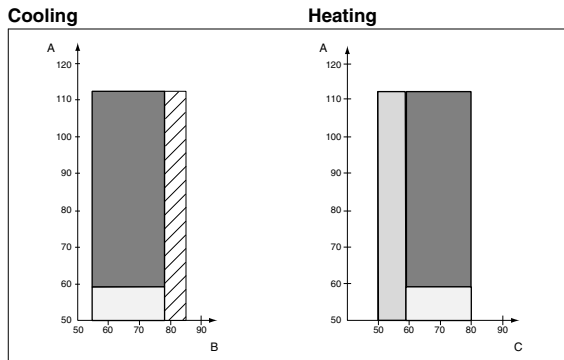
To lean which models of indoor units are compatible with R410A, refer to the product catalogs.

- Total capacity/quantity of indoor units
 (Outside unit) (Total capacity index of indoor units) (Total quantity of indoor units)
 RWEYQ72PTJU.....36 ~ 93.5 12 units
 RWEYQ84PTJU.....42 ~ 109 14 units
 RWEYQ144PTJU.....72 ~ 187 20 units
 RWEYQ168PTJU.....84 ~ 218 20 units
 RWEYQ216PTJU.....108 ~ 280 22 units
 RWEYQ252PTJU.....126 ~ 327.5 32 units

2-2 Standard operation limit

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

Equivalent pipe length25 ft
 Level difference0 ft



- A Inlet water temperature (°F)
- B Indoor temperature (°FWB)
- C Indoor temperature (°FDB)
- Range for continuous operation
- Range for operation
- Range for pull down operation
- Range for warming up operation

- Operation range of water volume is 13.5~39.5 gpm
- The unit is designed for the following operation range:
 Water temperature: 67~95°F
 Water volume: 16 gpm or more
- During cooling operation when the outside temperature is very low, it is possible that the thermostat switches off automatically in order to protect the unit from freezing.
- Hold ambient temperature at 35~95°F
 Heat-release from the unit: 0.64 kW / hour (Model 72, 84).
 It is therefore recommended to always ventilate the room.

2-3 Standard supplied accessories

- Make sure that the following accessories are included. (Check by removing the front panel.)

Name	Accessory pipes				
	For discharge gas	For suction gas (1)	For suction gas (2)	Clamp (A)	Clamp (B)
Quantity	1 pc.	1 pc.	1 pc.	7 pcs.	2 pcs.
Shape	(Note)			White	Black
Name	Strainer	Conduit mounting plate		[Others] • Installation manual • Operation manual	
Quantity	1 pc.	2 pcs.	2 pcs.		
Shape					

(Refer to figure 1)

- Operation manual
 Installation manual
 Clamp (A)
 Clamp (B)
 Conduit mounting plate
- Accessory pipes
 For discharge gas
 For suction gas (1)
 For suction gas (2)
- Strainer

NOTE

The accessory pipe for discharge gas is used for the heat recovery system. (Not used for the heat pump system.)

2-4 Option accessory

To install the above outside units, the following optional parts are also required.

- Refrigerant branching kit
 (For R410A only: Always use an appropriate kit dedicated for your system.)

Heat pump system

REFNET header	KHRP26M22H	KHRP26M33H	KHRP26M72H	KHRP26M73HU
REFNET joint	KHRP26M22T	KHRP26M33T	KHRP26M72TU	KHRP26M73TU

Heat recovery system.....For 3-tube piping

REFNET header	KHRP25M33H	KHRP25M72H	KHRP25M73HU
REFNET joint	KHRP25M22T	KHRP25M33T	KHRP25M72TU

Heat recovery system.....For 2-tube piping

REFNET header	KHRP26M22H	KHRP26M33H	KHRP26M72H	KHRP26M73HU
REFNET joint	KHRP26M22T	KHRP26M33T	KHRP26M72TU	KHRP26M73TU

- Outside unit multi connection piping kit
 (For R410A only: Always use an appropriate kit dedicated for your system.)

Number of outside units connected	2 units	3 units
Heat pump system	BHFP22MA56U	BHFP22MA84U
Heat recovery system	BHFP26MA56U	BHFP26MA84U

* To select an optimum kit, refer to "9. REFRIGERANT PIPING"

2-5 Technical specifications ⁽¹⁾

General	RWEYQ72PTJU	RWEYQ84PTJU
Nominal cooling capacity (2) (MBh)	72	84
Nominal cooling capacity (3) (MBh)	81	94.5
Nominal input cooling / heating (4) (kW)	4.20 / 4.00	5.60 / 5.40
Dimensions HxWxD (inch)	39-3/8x30-3/4x21-11/16	
Weight (lbs)	330	330
Connections		
refrigerant liquid pipe (inch)	3/8	3/8
refrigerant gas pipe (inch)	3/4	7/8
refrigerant discharge gas pipe (5) (inch)	5/8	3/4
Water piping connections		
Inlet pipe (inch)	1-1/4FPT female Thread	1-1/4FPT female Thread
Outlet pipe (inch)	1-1/4FPT female Thread	1-1/4FPT female Thread
Drain pipe (inch)	1/2FPS female Thread	1/2FPS female Thread

General	RWEYQ144PTJU	RWEYQ168PTJU
Nominal cooling capacity (2) (MBh)	144	168
Nominal cooling capacity (3) (MBh)	162	189
Nominal input cooling / heating (4) (kW)	8.40 / 8.00	11.20 / 10.80
Dimensions HxWxD (inch)	(39-3/8x30-3/4x21-11/16)x2	
Weight (lbs)	330x2	330x2
Connections		
refrigerant liquid pipe (inch)	1/2	5/8
refrigerant gas pipe (inch)	1-1/8	1-1/8
refrigerant discharge gas pipe (5) (inch)	7/8	7/8
Water piping connections		
Inlet pipe (inch)	(1-1/4FPT)x2 female Thread	(1-1/4FPT)x2 female Thread
Outlet pipe (inch)	(1-1/4FPT)x2 female Thread	(1-1/4FPT)x2 female Thread
Drain pipe (inch)	(1/2FPS)x2 female Thread	(1/2FPS)x2 female Thread

General	RWEYQ216PTJU	RWEYQ252PTJU
Nominal cooling capacity (2) (MBh)	216	252
Nominal cooling capacity (3) (MBh)	243	283.5
Nominal input cooling / heating (4) (kW)	12.60 / 12.00	16.80 / 16.20
Dimensions HxWxD (inch)	(39-3/8x30-3/4x21-11/16)x3	
Weight (lbs)	330x3	330x3
Connections		
refrigerant liquid pipe (inch)	5/8	3/4
refrigerant gas pipe (inch)	1-1/8	1-1/4
refrigerant discharge gas pipe (5) (inch)	1	1-1/8
Water piping connections		
Inlet pipe (inch)	(1-1/4FPT)x3 female Thread	(1-1/4FPT)x3 female Thread
Outlet pipe (inch)	(1-1/4FPT)x3 female Thread	(1-1/4FPT)x3 female Thread
Drain pipe (inch)	(1/2FPS)x3 female Thread	(1/2FPS)x3 female Thread

- (1) Refer to the engineering data book for the complete list of specifications.
- (2) The normal cooling capacities are based on:
 - indoor temperature: 80°FDB / 67°FWB,
 - inlet water temperature: 85°F,
 - outlet water temperature: 95°F,
 - equivalent pipe length: 25 ft,
 - level difference: 0 ft
- (3) The normal heating capacities are based on:
 - indoor temperature: 70°FDB / 60°FWB,
 - inlet water temperature: 70°F,
 - equivalent pipe length: 25 ft,
 - level difference: 0 ft
- (4) The nominal input includes total input of the unit: compressor and control circuit.
- (5) In case of heat recovery system

Compressor	RWEYQ72PTJU	RWEYQ84PTJU
Oil type	Synthetic (ether) oil	
Crankcase heater (W)	33	33
Refrigerant type	R410A	
Refrigerant charge (lbs)	9.9	11.5

Compressor	RWEYQ144PTJU	RWEYQ168PTJU
Oil type	Synthetic (ether) oil	
Crankcase heater (W)	(33)x2	(33)x2
Refrigerant type	R410A	
Refrigerant charge (lbs)	(9.9)x2	(11.5)x2

Compressor	RWEYQ216PTJU	RWEYQ252PTJU
Oil type	Synthetic (ether) oil	
Crankcase heater (W)	(33)x3	(33)x3
Refrigerant type	R410A	
Refrigerant charge (lbs)	(9.9)x3	(11.5)x3

2-6 Electrical specifications

Model	RWEYQ72PTJU	RWEYQ84PTJU
Power supply		
Phase	3~	3~
Frequency (Hz)	60	60
Voltage (V)	208-230	208-230
Voltage tolerance (%)	±10	±10
Recommended fuses (A)	40	40
Compressor		
Phase	3~	3~
Frequency (Hz)	60	60
Voltage (V)	208-230	208-230
Nominal running current (A)	11.6	15.4

Model	RWEYQ144PTJU	RWEYQ168PTJU
Power supply		
Phase	3~	3~
Frequency (Hz)	60	60
Voltage (V)	208-230	208-230
Voltage tolerance (%)	±10	±10
Recommended fuses (A)	(40)x2	(40)x2
Compressor		
Phase	3~	3~
Frequency (Hz)	60	60
Voltage (V)	208-230	208-230
Nominal running current (A)	(11.6)x2	(15.4)x2

Model	RWEYQ216PTJU	RWEYQ252PTJU
Power supply		
Phase	3~	3~
Frequency (Hz)	60	60
Voltage (V)	208-230	208-230
Voltage tolerance (%)	±10	±10
Recommended fuses (A)	(40)x3	(40)x3
Compressor		
Phase	3~	3~
Frequency (Hz)	60	60
Voltage (V)	208-230	208-230
Nominal running current (A)	(11.6)x3	(15.4)x3

3. SELECTION OF LOCATION

This unit does not have specifications for outdoor installation. The unit must be installed indoors (example: machine room, ...). Paying attention to the conditions mentioned below, select the place for installation with a prior approval of customer.

1. The foundation is strong enough to support the weight of the unit and the floor is flat to prevent vibration and noise generation.
2. Consider the space required for refrigerant piping work when installing. Refer to [Necessary Space].
3. There is no danger of fire due to leakage of inflammable gas.
4. The piping length between the outside unit and the indoor unit may not exceed the allowable piping length. "9. REFRIGERANT PIPING".
5. Locations where the noise of the unit operating will not disturb nearby houses, etc.
6. Locations with airflow and ventilation holes capable of dissipating heat from the machine and where the ambient temperature around the outside unit is between 35 and 104°F and the humidity does not exceed 80%.

[Necessary Space]

When installing, secure the space mentioned below without fail.

(Refer to figure 2)

1. In case of a single installation [inch.]
2. In case of series installations [inch.]
3. Top view
4. Side view
5. Outside unit
6. Service Space (front side)
7. Service Space (back side)
8. Space for installing water piping
*Secure a enough space for removing the front panel.
9. Ventilation Space
*above the area (.....) of the outside unit.
10. Secure spaces in the front, back and top sides as same as the case of single installation.

⚠ DANGER

- Do not install unit in an area where flammable materials are present due to risk of explosion resulting in serious injury or death.
- Refrigerant is heavier than air and replaces oxygen. A massive leak could lead to oxygen depletion, especially in basements, and an asphyxiation hazard could occur leading to serious injury or death. Refer to the chapter "Caution for refrigerant leaks".

⚠ NOTE

1. An inverter air conditioner may cause electronic noise generated from AM broadcasting. Examine where to install the main air conditioner and electric wires, keeping proper distances away from stereo equipment, personal computers, etc.
(Refer to figure 3)
 1. Indoor unit
 2. Branch switch, overcurrent breaker
 3. Remote controller
 4. Cool/heat selector
 5. Personal computer or radio

If the electric wave of AM broadcasting is particularly weak, keep distances of 10 ft or more and use conduit tubes for power and transmission lines.
2. Water quality
Water containing high level of foreign materials may cause the corrosion of heat exchanger and piping or scale accumulation. Use water satisfying "7-4 Water quality".
3. Cooling tower
Use a closed type cooling tower without fail. (Open type tower cannot be used.)
4. Strainer
Install the strainer (accessory) without fail at the inlet of water piping. (If sands, wastes, rust particles, etc. are mixed in the water circulation system, damage to the plate type heat exchanger may be caused by the corrosion of metal materials and clogging of the heat exchanger.)

⚠ WARNING



Do not install in the following locations.

- Locations such as kitchens which contain a lot of mineral oil or steam in the atmosphere or where oil may splatter on the unit.
Resin parts may deteriorate, causing the unit to fall or leak.
- 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 equipment that produces electromagnetic waves is found.
The electromagnetic waves may cause the control system to malfunction, preventing normal operation.

4. INSPECTING AND HANDLING THE UNIT

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

When handling the unit, take into account the following:

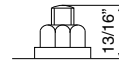
1.  Fragile, handle the unit with care.
 Keep the unit upright in order to avoid compressor damage.
2. Choose the path along which the unit is to be brought in ahead of time.
3. In order to prevent any damage to the unit during installation, use slings (cloth) or patch plates and lift the unit referring to figure 4.
4. Lift the unit preferably with a crane and 2 belts of at least 27 ft long.
5. When lifting the unit with a crane, always use protectors to prevent belt damage and pay attention to the position of the unit's center of gravity.
6. Be sure use the standard supplied accessories and dedicated parts as installation parts.
(Refer to figure 4)
 1. Patch plates or clothes
 2. Belt sling

⚠ NOTE

- Use belt sling of 13/16" width or less which adequately bears the weight of the product.

5. UNPACKING AND PLACING THE UNIT

- Make sure the area around the machine drains properly by setting up drainage grooves around the foundation.
- Make sure the unit is installed level on a sufficiently strong base to prevent vibration and noise.
- Secure the unit to its base using foundation bolts. (Use four commercially available M12-type foundation bolts, nuts, and washers.)
- The foundation bolts should be inserted 13/16".
- Fix 4 foundation bolts.
- Support the unit with the foundation which is larger than the hatched area shown in figure 5.



(Refer to figure 5)

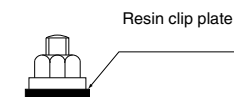
1. Front side
2. Position of foundation bolts
3. Hole for a foundation bolt
($\phi 1/16$ in. holes at 4 corners)
4. Avoid such a foundation where the unit is supported by 4 corner points.

⚠ CAUTION

- When installing the unit closely contacting the wall for any unavoidable reason, arrange so that no vibration from the unit may be transmitted to the wall surface by insulating the vibration using cushions, etc.

NOTE

- If the unit is to be installed on a roof, check the strength of the roof and its drainage facilities first.
- Make sure the area around the machine drains properly by setting up drainage grooves around the foundation.
(Condensate water is sometimes discharged from the outside unit when it is running.)
- Use a nut with a resin clip plate to protect the nut tightening part from rusting.



6. WATER PIPING WORK

- The water pressure resistance of water piping of this outside unit is 285 psi.
- The connection port for water piping is located in the front. The connection ports for drain piping are located in the front and back. When using the back port, change the cast iron plug from the back to the front and securely close it.
- Because of indoor use, carry out piping work in such a way no water may drop on the outer plate.
- The lateral protruding section of the drain piping should be short (within 15-3/4) and installed in a downward direction.
The diameter of drain pipe should be the same as the diameter of unit connection (1/2) or more.
- The diameter of water pipe should be the same as the diameter of unit connection (1-1/4) or more.
- Install an air purge valve in the midway of the water piping to prevent cavitation.
- After completing the drain piping work, make sure that the water runs smoothly without any clogging by dust.
- Do not connect the drain outlet to the water outlet.
- Install the strainer (accessory) in the inlet of water piping within a distance of 4.9 ft from the outside unit.
(If sand, waste or rust particles are mixed in the water circulation system, metal materials will become corrosive.)
- Install insulation on the inlet/outlet of water piping to prevent condensation and freezing.
Use Polyurethane form thickness of water piping thickness 3/16 in. for in socket on heat exchanger.
- Install insulation up to the base of heat exchanger as shown in the figure 6.
- Install a gate valve for chemical cleaning in an easy position to handle.
- Use water pipes complied with the local and national codes.
- Run the water pump to flush inside of water piping.
Then, clean the strainer.
- If there is a possibility of freezing, take measures to prevent freezing.
- Tighten securely the connection of water piping and socket with tightening torque of 220 lbf-ft or less.
(If a large torque is applied, the unit may be damaged.)

(Refer to figure 6)

1. Air purge
2. Outlet of water
3. Inlet of water
4. Gate valve
5. Water piping socket
6. Water piping
7. Insulation
8. Heat exchanger
9. Strainer (accessory)
10. Drain valve
11. Connection port to draining piping
12. Insulation cover
13. 3-1/8 in. or less
14. Insulation of water piping socket
15. Drain piping

7. HANDLING OF THE BRAZED PLATE TYPE HEAT EXCHANGER

CAUTION

A brazed plate type heat exchanger is used for this unit. Because its structure is different from a conventional type heat exchanger, it must be handled in a different manner.

7-1 When designing the equipment

1. Install the strainer (accessory) at the water inlet side adjacent to the outside unit in order to prevent any foreign materials such as dust, sand, etc. from entering.
2. Depending on the water quality, scale may stick to the plate type heat exchanger. In order to remove this scale, it is necessary to clean it at a regular interval using chemicals. To this end, install a gate valve in the water piping. Set up a piping connection port on the piping between this gate valve and the outside unit for cleaning by chemicals.
3. For the purpose of cleaning and water drain off from the outside unit (water draining during a long period of non-use in winter, draining upon starting of season-off), install an "air discharge plug" and a "water draining plug" at the inlet/outlet ports of water piping. In addition, install an "automatic air discharging valve" at the top of riser piping or at the top of a portion where air tends to stay.
4. Independent of the piping inlet of the outside unit, install a cleanable strainer at a portion close to the pump piping inlet.
5. Carry out complete cooling/thermal insulation of water piping and outdoor dehumidification. If complete cooling or thermal insulation has not been carried out, any damage may be caused during severe winter due to freezing, in addition to thermal loss.
6. When you stop operation during night or winter, it is necessary to take measures to prevent water related circuits from natural freezing in the area the ambient temperature drops below 32°F (by water drain off, keeping the circulation pump running, warming up by a heater, etc.) Freezing of water related circuits may result in any damage to the plate type heat exchanger. Therefore, please take appropriate measures depending on the circumstances of use.

(Refer to figure 7)

1. Example of piping
2. Water inlet piping
3. Strainer (accessory)
4. Air discharge plug (for joint use with cleaning port)
5. Cleaning device
6. Strainer for pump
7. Automatic air discharge valve
8. Water outlet piping
9. Joint use with water draining plug
10. Plate type heat exchanger
11. Outside unit

7-2 Before starting a test run

1. Before starting a test run, please make sure that the piping work has been carried out in a proper manner. Especially, make sure that the strainer, air discharge valve, automatic water supply valve, expansion tank and cistern are positioned at their places correctly.
2. After water has been completely filled in, first run the pump only, and then make sure that no air has been caught in the water circulation system and the water flow rate is correct. If any air has been caught or the flow rate is not enough, the plate type heat exchanger may freeze. Measure any water pressure loss before and after the outside unit and make sure that the flow rate is as designed. In case of any abnormal, stop the test run immediately and carry out trouble shooting to resolve the trouble.
3. Following the installation manual, carry out a test run of the outside unit.
4. After the test run has been completed, inspect the strainer at the inlet piping of the outside unit. Clean it if it is dirty.

7-3 Daily service and maintenance

1. Management of water quality
 The plate type heat exchanger has a structure that does not permit dismantling and cleaning, or replacing any parts. Please pay attention carefully to the quality of water to be used for the plate type heat exchanger in order to prevent corrosion and sticking of scale.
 The water to be used for the plate type heat exchanger should have at least the quality as specified in the table below.
 When using any corrosion prevention agent, scale depressant agent, etc., such agent should have no corrosive features against stainless steel and copper.
2. Management of chilled water flow rate
 If the chilled water flow rate is not enough, it will result in the freezing damage to the plate type heat exchanger. Check for any clogging of the strainer, any air being caught, any reduction in the flow rate due to failure of circulation pump by measuring the temperature and pressure differences at the inlet and outlet ports of the plate type heat exchanger. If the aged difference in the temperature or pressure has increased beyond the proper range, the flow rate should have decreased. Stop the operation and remove the cause before restarting the operation.
3. Steps to be taken when a freezing protection device was activated
 When the freezing protection device should be activated during operation, remove the cause without fail before restarting the operation. If the freezing protection device has been activated, a partial freezing has occurred. If you restart the operation without removing the cause, the plate type heat exchanger will be closed and the ice cannot be melted, and in addition, the freezing process will be repeated resulting in any damage to the plate type heat exchanger, leading to any such accidents that the refrigerant starts leaking or water starts entering the refrigerant circuit.

7-4 Water quality

Water quality standards for chilled water, hot water and make-up water (4) (6)

Item (5)	Cooling water system (3)		Hot water system (2)		Tendency (1)	
	Circulation system		Circulation water (68°F - 140°F)	Make-up water	Corrosion	Scale
	Circulation water	Make-up water				
Standard items						
pH (77°F)	6.5 to 8.2	6.0 to 8.0	7.0 to 8.0	7.0 to 8.0	○	○
Electrical Conductivity (mS/ft)(77°F)	Less than 24.4	Less than 9.1	Less than 9.1	Less than 9.1	○	○
Chloride ions (mgcl/L)	Less than 200	Less than 50	Less than 50	Less than 50	○	
Sulfate ions (mgSO ₄ ²⁻ /L)	Less than 200	Less than 50	Less than 50	Less than 50	○	
Acid consumption (pH4.8) (mgCaCO ₃ /L)	Less than 100	Less than 50	Less than 50	Less than 50		○
Total hardness (mgCaCO ₃ /L)	Less than 200	Less than 70	Less than 70	Less than 70		○
Calcium hardness (mgCaCO ₃ /L)	Less than 150	Less than 50	Less than 50	Less than 50		○
Ionic-state silica (mgSiO ₂ /L)	Less than 50	Less than 30	Less than 30	Less than 30		○
Reference items						
Iron (mgFe/L)	Less than 1.0	Less than 0.3	Less than 1.0	Less than 0.3	○	○
Copper (mgCu/L)	Less than 0.3	Less than 0.1	Less than 1.0	Less than 0.1	○	
Sulfate ion (mgS ²⁻ /L)	Shall not be detected	Shall not be detected	Shall not be detected	Shall not be detected	○	
Ammonium ion (mgNH ₄ ⁺ /L)	Less than 1.0	Less than 0.1	Less than 0.3	Less than 0.1	○	
Residual chlorine (mgCl/L)	Less than 0.3	Less than 0.3	Less than 0.25	Less than 0.3	○	
Free carbon dioxide (mgCO ₂ /L)	Less than 4.0	Less than 4.0	Less than 0.4	Less than 4.0	○	
Stability index	6.0 to 7.0	—	—	—	○	○

[NOTES]

- (1) The circle marks in the columns for corrosion or scale to develop.
- (2) Corrosion has a tendency to occur when water temperature is high (104°F or more), and if metals with no protective coating whatsoever are directly exposed to water, it would be a good idea to take effective measures against corrosion such as adding a corrosion inhibitor or deaeration treatment.
- (3) In a condenser water circuit that uses a closed cooling tower, the closed circuit circulating water and make-up water must satisfy its water quality standards for the hot water system, and passing water and make-up water must satisfy those for the circulation type cooling water system.
- (4) The supply water must be clean tap water, industrial water or clean underground water.
Do not use purified or softened water.
- (5) The fifteen items in the table above represent typical causes of corrosion and scale.
- (6) Once through water may cause corrosion.
Do not use once through water.

7-5 Maintenance of plate type heat exchanger

The performance of a plate type heat exchanger may decline due to scale accumulation. It may be damaged by freezing due to the drop of flow rate. For this reason, it is necessary to carry out programmed maintenances at a regular interval in order to prevent the scale from being generated.

1. Before entering the season for use, carry out the following inspections:
 - 1) Conduct a water quality test and make sure that it is within the standard.
 - 2) Clean the strainer.
 - 3) Make sure that the flow rate is correct.
 - 4) Make sure that the operational conditions (pressure, flow rate, outlet temperature, etc.) are normal.
2. Because the plate type heat exchanger has a structure which does not permit disassembling and cleaning, follow the following procedures for cleaning:
 - 1) For maintenance purposes it is required to provide for a connection port on the water inlet and on the water outlet. You must connect a circulation pump inbetween these 2 connection ports when cleaning the plate heat exchanger with chemicals.
 For cleaning the scale in the plate heat exchanger it is recommended to use a solution with 5% diluted formic, citric, oxalic, acetic or phosphoric acid.
 Never use hydrochloric, sulfuric or nitric acid because such solutions have a strong corrosive feature.
 - 2) Make sure to provide for a stop valve in front of that inlet water pipe connection port and for a stop valve after the outlet water pipe connection port.
 - 3) Connect the piping for circulation of cleaning chemicals to the inlet and outlet piping of plate type heat exchanger. Fill the cleaning solution of 122 - 144°F for a while in the plate type heat exchanger. Then, circulate the cleaning solution by a pump for 2-5 hours.
 The time for cleaning depends on the temperature of cleaning solution or the degree of scale accumulation. Therefore, please watch the change of the dirtiness (color) of cleaning solution to determine the level of removal of scale.
 - 4) After circulating the cleaning solution, discharge the solution from the plate type heat exchanger, fill the heat exchanger with a solution of 1-2% sodium hydroxide (NaOH) or sodium bicarbonate (NaHCO₃). Circulate this solution for 15-20 minutes for neutralization purpose.
 - 5) After the process of neutralization has been completed, rinse the inner part of the plate type heat exchanger with care using fresh and clean water.
 - 6) When using any cleaning agent sold in the market, check in advance that such agent has no corrosive features against stainless steel and copper.
 - 7) For details of cleaning method, ask the manufacturer of related cleaning agent.
3. After cleaning has been completed, make sure that the unit can be operated in a normal fashion.

8. FIELD WIRING

- NOTE**
- All field wiring and components must be installed by a licensed electrician and must comply with relevant local and national regulations.
 - The field wiring must be carried out in accordance with the wiring diagrams and the instructions given below.
 - Be sure to use a dedicated power circuit. Never use a power supply shared by another appliance.
 - Do not operate until refrigerant piping work is completed. (If operated before complete the piping work, the compressor may be broken down.)
 - Never remove thermistor, sensor or etc. when connecting power wiring and transmission wiring. (If operated with thermistor, sensor or etc. removed, the compressor may be broken down.)
 - Be sure to install a ground fault circuit interrupter. (This unit uses an inverter, so install a ground fault circuit interrupter that be capable of handling high harmonics in order to prevent malfunctioning of a ground fault circuit interrupter itself.)
 - This product have reversed phase protection detector only works when the product started up.
 - Replace two of the three phases (L1, L2, and L3) during reverse-phase protection circuit operation. Reversed phase detection is not performed while the product is operating.
 - Do not run the unit by short cutting the protection device (S1PH). If there exists the possibility of reversed phase, lose phase, momentary black out or the power goes on and off while the product is operating, attach a reversed phase protection circuit locally. Running the product in reversed phase may break the compressor and other parts.
 - Attach the power wire securely.

8-1 Optional parts

COOL/HEAT Selector
 S1S.....Selector switch (fan, cool/heat)
 S2S.....Selector switch (cool/heat)

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

8-2 Power circuit and cable requirements

A power circuit (see table below) must be provided for connection of the unit. This circuit must be protected with the required safety devices, i.e. a main switch, a slow blow fuse on each phase and a ground fault circuit interrupter.

	Phase and frequency	Voltage	Minimum circuit amp.	Recommended fuses	Transmission line selection
RWEYQ72/84PTJU	ø3, 60 Hz	208-230 V	22.4 A	40 A	AWG18-16
RWEYQ144/168PTJU	ø3, 60 Hz	208-230 V	44.8 A	40+40 A	AWG18-16
RWEYQ216/252PTJU	ø3, 60 Hz	208-230 V	67.1 A	40+40+40 A	AWG18-16

- NOTE**
- Select the power supply cable in accordance with relevant local and national regulations.
 - Wire size must comply with the applicable local and national code.
 - Specifications for local wiring power cord and branch wiring are in compliance with local code.

8-3 General

- Make sure to connect the power source wire to the power source terminal block and to clamp it as shown in figure 8, chapter "Field line connection".
- As this unit is equipped with an inverter, installing a phase advancing capacitor will not only reduce the power factor improvement effect, but also may cause the capacitor to overheat due to high-frequency waves. Therefore, never install a phase advancing capacitor.
- Keep power imbalance within 2% of the supply rating.
 - Large imbalance will shorten the life of the smoothing capacitor.
 - As a protective measure, the product will stop operating and an error indication will be made, when power imbalance exceeds 4% of the supply rating.
- Follow the "electrical wiring diagram" when carrying out any electrical wiring.
- Only proceed with wiring work after blocking off all power.
- Always ground wires. (In accordance with national regulations of the pertinent country.)
- This unit uses an inverter, and therefore generates noise, which will have to be reduced to avoid interfering with other devices. The outer casing of the product may take on an electrical charge due to leaked electrical current, which will have to be discharged with the grounding.
- This unit has a negative phase protection circuit. (If it operates, only operate the unit after correcting the wiring.)

- WARNING**
- Do not ground units to gas pipes, sewage pipes, lightning rods, or telephone ground wires because incomplete grounding could cause a severe shock hazard resulting in severe injury or death.
 - Gas pipes:** can explode or catch fire if there is a gas leak.
 - Sewage pipes:** no grounding effect is possible if hard plastic piping is used.
 - Telephone ground wires and lightning rods:** dangerous when struck by lightning due to abnormal rise in electrical potential in the grounding.

8-4 Examples

System example (Refer to figure 8)

- Field power supply
- Main switch
- Disconnect switch
- Fuse
- Ground fault circuit interrupter
- Remote controller
- Outside unit
- BS unit
- Indoor unit
- Cool / heat selector
 - power supply wiring (sheathed cable)
 - transmission wiring (sheathed cable)

- CAUTION**
- Use a power wire pipe for the power wiring.
 - Outside the unit, make sure the low-voltage electric wiring (i.e. for the remote controller, transmission, etc.) and the high-voltage electric wiring do not pass near each other, keeping them at least 5 in. 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 **Field line connection**.
 - Transmission wiring should be secured as described in **Field line connection**.
 - Secure the wiring with the accessory clamps so that it does not touch the piping.
 - Make sure the wiring and the electrical components box lid do not stick up above the structure, and close the cover firmly.

- WARNING**
- Never connect power supply wiring to the terminal block for remote controller wiring as this could damage the entire system.

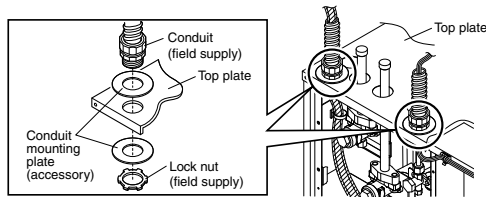
Picking power line and transmission line (Refer to figure 9)

- Power supply wiring and wiring for pump operation (High voltage)
- Connection wiring (Low voltage)
- Set apart

Connect the wire to the terminal block on PC board with care since too much pressure may cause breakage of the PC board.

Field line connection: transmission wiring, interlock circuit, pump operation output and COOL/HEAT selector

Power and transmission line: Connect it using conduit mounting plates.



[In case of single outside unit]

(Refer to figure 10)

1. COOL/HEAT selector
2. Outside unit PC board
3. Take care of the polarity
4. Use the conductor of sheathed wire (2 wire) (no polarity)
5. Terminal board (field supply)
6. Indoor unit
7. Never connect the power wire.
8. BS unit A
9. BS unit B
10. Last BS unit
11. Cool-only unit

[In case of multiple outside units]

(Refer to figure 11)

1. Unit A (Master unit)
 2. Unit B
 3. Unit C
 4. TO IN/D UNIT
 5. TO OUT/D UNIT
 6. TO MULTI UNIT
 7. To COOL/HEAT selector (only Heat pump system)
 8. To indoor unit
 9. To other systems
- The transmission wiring between the outside units in the same pipe line must be connected to the Q1/Q2 (Out Multi) terminals. Connecting the wires to the (Out-Out) terminals results in system malfunction.
 - The wiring for the other lines must be connected to the F1/F2 (Out-Out) terminals of the PC board in the outside unit to which the transmission wiring for the indoor units is connected.
 - The outside unit to which the transmission wiring for the indoor units is connected is master unit.
 - The transmission wiring between the outside units must be 100 ft. in length at maximum.



NOTE

- Be sure to keep the power line and transmission line apart from each other.
Be careful about polarity of the transmission line.
Make sure that the transmission line is clamped as shown in the figure in chapter "Field line connection".
Check that wiring lines do not make contact with refrigerant piping.
Firmly close the lid and arrange the electric wires so as to prevent the lid or other parts from coming loose.

[Setting the interlock circuit and pump operation output.]

(Pump operation output [high voltage])

- Use insulated wires of the size as mentioned below having rated voltage of 250 V or more:

For single core: AWG16 or larger (conduit pipe work)

For multiple cores: AWG18 or larger

*The wiring for pump operation output is to be procured locally.

(Refer to figure 12)

1. Pump operation output terminal (X2M).
When water pump is linked with system operation, water pump operation circuit shall be set between terminals (1) and (2).
Contact specification --- 220 VAC, 3 mA-0.5 A

2. PC board
3. Mount an insulation sleeve.
4. **Connection of interlock circuit**

Do not forget to connect an interlock circuit (an auxiliary a-contact of electromagnetic switch for the water pump) to each outside unit.
(Select without fail an auxiliary a-contact able to switch minimum load of DC15 V, 1 mA.)

(When connecting for each outside unit)
Connect to the terminal block (X3M) as shown in the bottom right of the sketch.

(When connecting multiple outside units as 1 single unit (centralized interlock))
For this unit, it is possible to make a centralized interlock of multiple outside units using an adapter (sold separately as an accessory) for external control of outside units.
For details of wiring connection, refer to "How to centralized interlock wiring".

(How to the centralized interlock wiring)

- When centralized interlock is done, see "8-5 In case of a local setting" -(3)
- No wiring to terminal block X3M is necessary when centralized interlock is employed
- For multiple outside units, external/external connection wiring shall be done for master unit only.

(Refer to figure 13)

1. Outside unit A
2. Outside unit B
3. Outside unit C
4. Adapter for external control
5. Interlock circuit of water pump
6. Out-Out connection wiring
7. Use the conductor of sheathed wire (2 wire) (no polarity)

[Setting the cool/heat operation type]

1. Performing cool/heat setting with the remote controller connected to the indoor unit.
Keep the COOL/HEAT selector switch (DS1) on the outside unit PC board (A1P) at the factory setting position OFF.

(Refer to figure 16)

1. Remote controller
2. Performing cool/heat setting with the COOL/HEAT selector.
Connect the COOL/HEAT selector (optional) to the A/B/C terminals and set the COOL/HEAT selector switch (DS1) on the outside unit PC board (A1P) to ON.

(Refer to figure 17)

1. COOL/HEAT selector
- The wiring from the indoor units must be connected to the F1/F2 (In-Out) terminals on the PC board in the outside unit.
 - For the above wiring, always use sheathed vinyl cords with AWG18-16 sheath or cables (2 core wires). (3 core wire are allowable for the COOL/HEAT selector only.)



NOTE

- All transmission wire is field supply.
- Be sure to follow the limits below. If the transmission wiring is beyond these limits, it may result in malfunction of transmission.
Maximum wiring length: 3280 ft.
Total wiring length: 6560 ft.
Max. branches No. of branches: 16
Wire length between outside units: 98 ft.

Up to 16 branches are possible for transmission wiring. No branching is allowed after branching.

Never connect the power supply to transmission wiring terminal block. Otherwise the entire system may break down.

(Refer to figure 14)

1. Branch
2. Subbranching

For low-noise operation, it is necessary to get the optional "External control adaptor for outside unit".

For details, see the installation manual attached to the adaptor.

Field line connection:

L1, L2, L3, phase of the power supply wiring should be clamped to the safety catch using the included clamp material. The green and yellow striped wrapped wires should be used for grounding.

Make sure to connect the power wire to the power terminal block and fix it using attached clamp as shown in figure 15 and 19.

(Refer to figure 15)

1. Power supply (208-230 V, Three-phase)
2. Branch switch, overcurrent breaker
3. Grounding wire
4. Ground fault circuit interrupter
5. Attach insulation sleeves.
6. Power supply terminal block
7. Grounding terminal
8. Retain the ground wires along with the power wires using the accessory clamp (A).
9. Grounding wire
10. When wiring, do not allow the ground wires to contact the compressor lead wires. If the wires contact each other, adverse effects may occur to other units.
11. When connecting two wires to one terminal, ensure that the crimp-style terminals face with each other back to back. Moreover, make sure that the wire of the smaller gauge is located above.
12. Terminal block
13. Crimp-style terminal
14. Wire gauge: Small
15. Wire gauge: Large

(Refer to figure 19)

1. Intake for power supply wiring, pump operation output (high voltage) and ground wiring.
2. Stop valve for discharge gas (high temperature part)
3. Insert the accessory clamp (B) in the hole of the fixing plate for stop valve.
4. Power supply wiring, pump operation output (high voltage) and ground wiring.
5. Retain the power supply wiring, pump operation output (high voltage) and ground wiring with the accessory clamp (B) to prevent them from touching with the stop valve for discharge gas.
6. Insert the accessory clamp (B) in the hole of the bottom of electrical box.
7. Intake for transmission wiring. (low voltage)
8. Make sure to provide for a downward loop in the transmission wiring right in front of the location where the wiring is to be fixed over the topplate of the switch box. This in order to prevent that condensate drips off the wiring into the switch box.
9. Fix the transmission wiring to resin clamps with the accessory clamps (A)
10. Pass the transmission wiring (low voltage) through the wire clip.
11. Retain the power supply wiring, pump operation output (high voltage) and ground wiring to the bottom of electrical box with the accessory clamp (B)

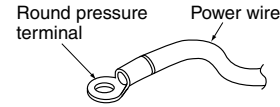
WARNING

- Use only specified wire and connect wires to terminals tightly. Be careful that wires do not place external stress on terminals. Keep wires in neat order so as not to obstruct other equipment. Incomplete connections could result in overheating, and in worse cases, electric shock or fire.

CAUTION

(Precautions when laying power wiring)

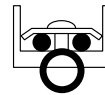
Use round pressure terminals for connections to the power terminal block.



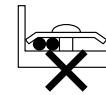
When none is available, follow the instructions below.

- Do not connect wiring of different thicknesses to the power terminal block. (Slack in the power wiring may cause abnormal heat.)
- When connecting wiring which is the same thickness, do as shown in the figure below.

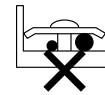
Connect same-thickness wiring to both sides.



It is forbidden to connect two to one side.



It is forbidden to connect wiring of different thicknesses.

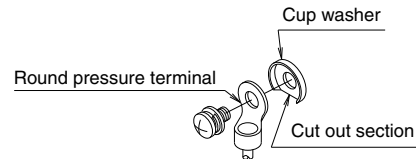


- For wiring, use the designated power wire and connect firmly, then secure to prevent outside pressure being exerted on the terminal board.
- Use an appropriate screwdriver for tightening the terminal screws. A screwdriver with a small head will strip the head and make proper tightening impossible.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

	Tightening torque (ft · lbf)
M5 (Power terminal block)	2.21-3.02
M5 (Ground)	
M3, M3.5 (Transmission wiring terminal block)	0.59-0.72

(Precautions when connecting the ground)

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



8-5 In case of a local setting

If necessary, do the local settings as mentioned in the table below. For setting, refer to the plate "Cares to be taken in servicing" attached to the cover of electrical components box.

Typical local settings

* For other settings than mentioned in the table below, refer to the equipment design materials and service manual.

(1) Setting of switching between cooling and heating	This setting is done when switching between cooling and heating is performed by a switching remote controller (sold separately as an accessory) installed on the outside unit.
(2) Setting to prohibit sequenced start	This setting is done when the outside units are not started in a sequenced order.
(3) Setting of centralized interlock Setting of external demand	These settings are done when the interlocks are connected in a lump-sum manner or when performing a demand operation by external instruction.
(4) Setting of abnormal display when interlock contact is OFF	This setting is done when making an abnormal display (HJ) on a remote controller when the interlock contact is OFF (when the heat source water pump is not operated).

CAUTION

A separate adapter (sold separately as an accessory) for external control of an outside unit is necessary when doing a demand operation from an external instruction, setting of cooling and heating through a centralized remote controller for cooling and heating (sold separately as an accessory) and setting of centralized interlock. For details, refer to the manual attached to the adapter.

9. REFRIGERANT PIPING

⚠ CAUTION

After completing installation, be sure to open the valves. (See 9-9 Additional refrigerant charge for details.) (Operating the unit with the valves shut will break the compressor.)

Use R410A to add refrigerant. (The R410A refrigerant cylinder has a pink stripe painted around it.)

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

CAUTION TO BE TAKEN WHEN BRAZING REFRIGERANT PIPING

Do not use flux when brazing copper-to copper refrigerant piping.

(Particularly for the HFC refrigerant piping) Therefore, use the phosphor copper brazing filler metal (BCuP-2: JIS Z 3264/B-Cu93P-710, 795: ISO 3677) which does not require flux.

(Flux has an 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.)

⚠ NOTE

- Installation tools:

Gauge manifold, charge hose, etc.

Make sure to use installation tools that are exclusively used for R410A installations to withstand the pressure and to prevent foreign materials (e.g. mineral oils such as SUNISO and moisture) from mixing into the system.

(The screw specifications differ for R410A and R407C.)

Vacuum pump

1. Use a 2-stage vacuum pump with a non-return valve.
2. Make sure the pump oil does not flow oppositely into the system while the pump is not working.
3. Use a vacuum pump which can evacuate to -14.6 psi.

9-1 Selection of piping material

1. Foreign materials inside pipes (including oils for fabrication) must be 9 mg/10 ft or less.
2. Use the following material specification for refrigerant piping:
 - Construction material: Phosphoric acid deoxidized seamless copper for refrigerant.
 - Size: Determine the proper size referring to chapter "Example of connection".
 - The wall thickness of the refrigerant piping should comply with relevant local and national regulations. For R410A the design pressure is 450 psi.
3. Make sure to use the particular branches of piping that have been selected referring to chapter "Example of connection".
4. Refer to chapter "Stop valve operation procedure" in 9-10 about the stop valve operation procedure.
5. Make sure to perform the piping installation within the range of the maximum allowable pipe length, allowable level difference and allowable length after branching as indicated in chapter "Example of connection".
6. For installation of the refrigerant branching kit, refer to the installation manual delivered with the kit.

And follow the conditions listed below.

 - Mount the REFNET joint so that it branches either horizontally or vertically.
 - Mount the REFNET header so that it branches horizontally. (Refer to figure 22)
 1. Horizontal connections
 2. Up to ± 15° or vertically
 3. Horizontal connections
7. To connect the piping between outside units, an optional piping kit (multi connection piping kit) is always required. When installing the piping, follow the instructions in the installation manual that comes with the kit.

Restriction for the installation of the outside unit multi connection piping kit

- Install the joint horizontally within a lean of ±15° with caution nameplate on top. Refer to figure 23 (Fig. A)
- Do not connect it vertically. Refer to figure 23 (Fig. B)
- Reserve the straight part of 19-11/16 in. or more to the branch pipe and do not bend the local pipe in that area. Straight part of 19-11/16 in. or more can be reserved if a local pipe (straight pipe) of 4-3/4 in. or more is connected to the joint. Refer to figure 23 (Fig. C)

- Incorrect installation may cause breakage of outside unit.

(Refer to figure 23)

1. Caution nameplate
2. Horizontal line
3. Ground
4. Straight part of 19-11/16 in. or more
5. Local pipe (4-3/4 in. length or more)

Precautions when selecting branch piping.

- If the overall equivalent length of piping between the outside units and indoor units is 262.5 ft or more, be sure to enlarge the main pipe in the liquid-side branch piping.

Depending on the length of the refrigerant piping, the cooling/heating capacity may drop, but even in such cases it is ok to enlarge the main pipe.

(Refer to figure 21)

1. Outside unit
2. Main pipe
3. Enlarge
4. The first refrigerant branching kit.
5. Indoor unit

[Liquid side]

RWEYQ72/84PTJU type: ϕ3/8" → ϕ1/2"

RWEYQ144PTJU type: ϕ1/2" → ϕ5/8"

RWEYQ168/216PTJU type: ϕ5/8" → ϕ3/4"

RWEYQ252PTJU type: ϕ3/4" → ϕ7/8"

9-2 Protection against contamination when installing pipes

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

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

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

9-3 Pipe connection

- Only use the flare nuts included with the unit. Using different flare nuts may cause the refrigerant to leak.
- Be sure to perform a nitrogen blow when brazing. (Brazing without performing nitrogen replacement or releasing nitrogen into the piping will create large quantities of oxidized film on the inside of the pipes, adversely affecting valves and compressors in the refrigerating system and preventing normal operation.)
- Do not use a flux when brazing the refrigerant pipe joints. Use phosphor copper brazing (B-Cu93P-710/795: ISO 3677) which does not require flux. (Flux has an extremely negative effect on refrigerant piping systems. For instance, if chlorine based flux is used, it will cause pipe corrosion. If the flux contains fluorine, it will damage the refrigerant oil.)

⚠ DANGER

- Use of oxygen could cause an explosion resulting in severe injury or death. Only use nitrogen gas.
- Refrigerant gas may produce toxic gas if it comes in contact with fire such as from a fan heater, stove or cooking device. Exposure to this gas could cause severe injury or death.

⚠ NOTE

- The pressure regulator for the nitrogen released when doing the brazing should be set to 2.9 psi or less.

(Refer to figure 18)

1. Refrigerant piping
2. Location to be brazed
3. Nitrogen
4. Taping
5. Manual valve
6. Regulator

Precautions when connecting pipes

- See the following table for flare part machining dimensions.
- When connecting the flare nuts, apply refrigerant oil to the inside of the flares and turn them three or four times at first. (Use ester oil or ether oil.)
- See the following table for tightening torque. (Applying too much torque may cause the flares to crack.)
- After all the piping has been connected, check the gas leak with nitrogen.

pipe size (in.)	tightening torque (ft. · lbf)	A (in.)	flare shape
φ 3/8"	24.1 - 29.4	0.504 - 0.520	
φ 1/2"	36.5 - 44.5	0.638 - 0.654	
φ 5/8"	45.6 - 55.6	0.760 - 0.776	

—Not recommendable but in case of emergency—

You must use a torque wrench but if you are obliged to install the unit without a torque wrench, you may follow the installation method mentioned below.

After the work is finished, make sure to check that there is no gas leak.

When you keep on tightening the flare nut with a spanner, there is a point where the tightening torque suddenly increases. From that position, further tighten the flare nut the angle shown below:

(Unit: in.)

Pipe size	Further tightening angle	Recommended arm length of tool
φ 3/8"	60 to 90 degrees	Approx. 7-7/8
φ 1/2"	30 to 60 degrees	Approx. 9-13/16
φ 5/8"	30 to 60 degrees	Approx. 11-13/16
φ 3/4"	20 to 35 degrees	Approx. 17-3/4

9-4 Connecting the refrigerant piping

Connect piping to outside unit by using accessory pipes

(Refer to figure 20)

1. Gas side piping
2. (field supply)
3. Gas side accessory pipe (for suction gas (1))
4. Liquid side pipe (field supply)
5. Flare nut (Included in the unit)
6. Accessory pipes (for discharge gas and suction gas (2)) is not used.
7. Piping on discharge gas side (field supply)
8. Piping on suction gas side (field supply)
9. Cut off the hatched area and use it as a cover for the drilled.
10. Hatched area
11. Accessory pipe (for discharge gas)
12. Accessory pipe (for suction gas)
13. Guideline for pipe machining
14. Accessory pipe (for suction gas (2))
15. Brazing
16. Accessory pipe (for suction gas (1))
17. Before fitting to the product, apply brazing.

NOTE

- Be sure to use the attached pipe when carrying out piping work in the field.
- Be sure that the local piping does not touch other pipes, the bottom panel or side panel. Especially for the bottom and side connection, be sure to protect the local piping with the provided insulation, to prevent it from coming into contact with the casing.

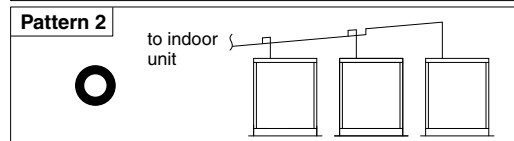
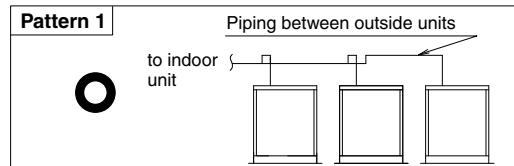
Precautions for installation of units

NOTE

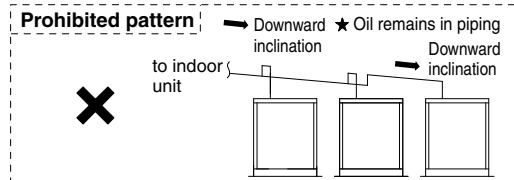
- The outside unit multi connection piping kit that is sold separately as an option (BHFP22MA56U + 84U, BHFP26MA56U + 84U) is necessary for the multi installation of outside units.
- See the installation manual attached to the kit with attention to installation restrictions described in "connecting the refrigerant piping" when installing.

(Cautions for installation of multiple outside units)

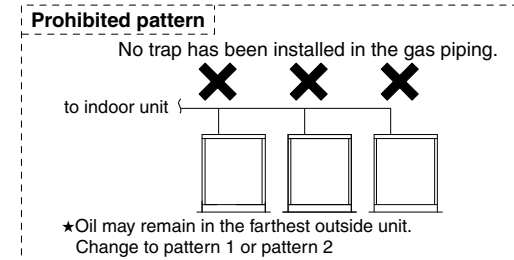
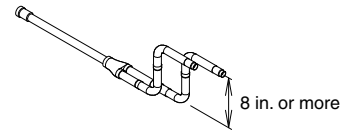
1. The piping between the outside units must be routed level or slightly upward to avoid the risk of oil detention to the piping side.



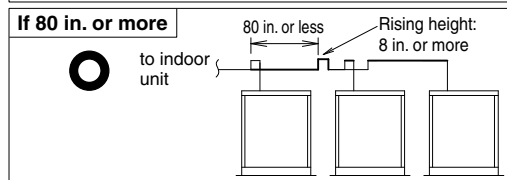
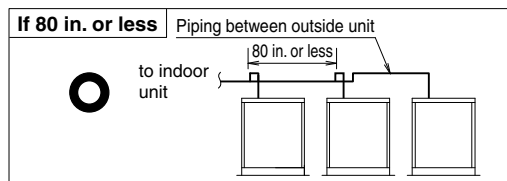
Change to pattern 1 or pattern 2



2. The gas piping (both discharge and suction gas pipings in case of the heat recovery system) after branched, install without fail a trap of 8 in. or more using the piping included in the piping kit for connecting the outside unit. Otherwise, the refrigerant may stay within the piping, causing any damage to the outside unit.



3. If the piping length between the outside unit connecting pipe kit or between the outside units exceeds 80 in., create a rise of 8 in. or more in the gas line within a length of 80 in. from the kit.



9-5 Example of connection

* In case of a system of switching between cooling and heating, all systems use 2-tube piping (for suction gas piping and liquid piping). No Branch Selector unit is required.

Example of connection	Branch with REFRNET joint	Branch with REFRNET joint and REFRNET header	Branch with REFRNET header
<p>(Connected indoor units (Heat pump (air split system)) (2-tube piping))</p> <p>Outside discharge gas piping (2-tube piping) Indoor gas piping unit side</p> <p>Outside suction gas piping (2-tube piping) Indoor suction gas piping unit side</p> <ul style="list-style-type: none"> Piping between outside unit and BS unit <ul style="list-style-type: none"> (Thin line): 2-tube piping (Discharge gas piping / Suction gas piping) (Thick line): 3-tube piping (Discharge gas piping / Suction gas piping / Liquid piping) Piping between BS unit and indoor unit. <ul style="list-style-type: none"> (Thin line): 2-tube piping (Suction gas piping / Liquid piping) (Thick line): 3-tube piping (Discharge gas piping / Suction gas piping / Liquid piping) <p>[*] If the system capacity is RWEYQ144 or more, re-read the outside unit as the first outside branch seen from the indoor unit side.</p>	<p>Single outside unit installed (RWEYQ272, 84)</p> <p>When multiple outside units are installed (RWEYQ144-)</p> <p>Actual pipe length</p> <p>Equivalent length</p> <p>Total extension length</p> <p>Actual pipe length</p> <p>Difference in height between outside and indoor unit (in case of RWEYQ144 or more)</p> <p>Allowable height</p> <p>Between outside and indoor units</p> <p>Between indoor and indoor units</p> <p>Between outside and outside units</p> <p>Allowable length after the branch</p>	<p>Example 1</p> <p>Example 2</p> <p>Example 3</p> <p>Example 4</p> <p>Example 5</p> <p>Example 6</p> <p>Example 3 (a) unit $a + b + c + d + e + f + g + h + i + j + k + l + m + n + o + p + q + r + s + t + u + v + w + x + y + z + \dots$</p> <p>Example 3 (b) unit $a + b + c + d + e + f + g + h + i + j + k + l + m + n + o + p + q + r + s + t + u + v + w + x + y + z + \dots$</p> <p>Example 3 (c) unit $a + b + c + d + e + f + g + h + i + j + k + l + m + n + o + p + q + r + s + t + u + v + w + x + y + z + \dots$</p>	<p>Example 3 (a) unit $a + b + c + d + e + f + g + h + i + j + k + l + m + n + o + p + q + r + s + t + u + v + w + x + y + z + \dots$</p> <p>Example 3 (b) unit $a + b + c + d + e + f + g + h + i + j + k + l + m + n + o + p + q + r + s + t + u + v + w + x + y + z + \dots$</p> <p>Example 3 (c) unit $a + b + c + d + e + f + g + h + i + j + k + l + m + n + o + p + q + r + s + t + u + v + w + x + y + z + \dots$</p>
<p>Refrigerant branch kit selection</p> <p>Refrigerant branch kits can only be used with F4TU4.</p>	<p>Heat recovery system</p> <p>Heat pump system</p> <p>Refrigerant branch kit name</p> <p>In case of 2-tube piping</p> <p>In case of 3-tube piping</p> <p>In case of 4-tube piping</p>	<p>Heat recovery system</p> <p>Heat pump system</p> <p>Refrigerant branch kit name</p> <p>In case of 2-tube piping</p> <p>In case of 3-tube piping</p> <p>In case of 4-tube piping</p>	<p>Heat recovery system</p> <p>Heat pump system</p> <p>Refrigerant branch kit name</p> <p>In case of 2-tube piping</p> <p>In case of 3-tube piping</p> <p>In case of 4-tube piping</p>
<p>Example of downslope indoor units</p> <p>Example of indoor units</p> <p>Example of indoor units</p> <p>Example of indoor units</p>	<p>Example 2 (3) In case of REFRNET Joint, indoor units of (a) ~ (z) + (A) ~ (Z)</p> <p>Piping between outside unit and refrigerant branch kit (part A)</p> <p>Match to the size of connection pipe of outside unit.</p> <p>Capacity type of outside unit</p> <p>Suction gas pipe (Discharge gas pipe) Liquid pipe</p> <p>Piping size (outer diameter) (Unit: inch)</p>	<p>Example 2 (3) In case of REFRNET Joint, indoor units of (a) ~ (z) + (A) ~ (Z)</p> <p>Piping between outside branch and outside unit (part C)</p> <p>Capacity type of outside unit</p> <p>Suction gas pipe (Discharge gas pipe) Liquid pipe</p> <p>Piping size (outer diameter) (Unit: inch)</p>	<p>Example 2 (3) In case of REFRNET Header</p> <p>Indoor units of (a) ~ (z) + (A) ~ (Z) + (AA) ~ (ZZ)</p> <p>Piping between BS unit and refrigerant branch kit</p> <p>Match to the size of connection pipe of outside unit.</p> <p>Capacity type of outside unit</p> <p>Suction gas pipe (Discharge gas pipe) Liquid pipe</p> <p>Piping size (outer diameter) (Unit: inch)</p>
<p>How to calculate the additional refrigerant to be charged</p> <p>Additional refrigerant to be charged R (lbs)</p> <p>R should be rounded off in units of 0.1 lbs.</p> <p>NOTE: If a negative result is gotten for R from the formula at right, no refrigerant needs to be added.</p>	<p>Example 2 (3) In case of REFRNET Joint, indoor units of (a) ~ (z) + (A) ~ (Z)</p> <p>Piping between outside branch and outside unit (part C)</p> <p>Capacity type of outside unit</p> <p>Suction gas pipe (Discharge gas pipe) Liquid pipe</p> <p>Piping size (outer diameter) (Unit: inch)</p>	<p>Example 2 (3) In case of REFRNET Header</p> <p>Indoor units of (a) ~ (z) + (A) ~ (Z) + (AA) ~ (ZZ)</p> <p>Piping between BS unit and refrigerant branch kit</p> <p>Match to the size of connection pipe of outside unit.</p> <p>Capacity type of outside unit</p> <p>Suction gas pipe (Discharge gas pipe) Liquid pipe</p> <p>Piping size (outer diameter) (Unit: inch)</p>	<p>Example 2 (3) In case of REFRNET Header</p> <p>Indoor units of (a) ~ (z) + (A) ~ (Z) + (AA) ~ (ZZ)</p> <p>Piping between BS unit and refrigerant branch kit</p> <p>Match to the size of connection pipe of outside unit.</p> <p>Capacity type of outside unit</p> <p>Suction gas pipe (Discharge gas pipe) Liquid pipe</p> <p>Piping size (outer diameter) (Unit: inch)</p>

* For Geothermal Applications, if the condenser is lower than the indoor units, the maximum vertical separation is 65 ft (20 m).

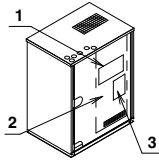
9-6 Air tight test and vacuum drying

The units were checked for leaks by the manufacturer. Confirm that the valves are firmly closed before Air tight test or vacuum drying. To prevent entry of any impurities and ensure sufficient pressure resistance, always use the special tools dedicated for R410A.

- **Air tight test:** Make sure to use nitrogen gas. (For the service port location, refer to the "Caution" label attached on the front panel [right] of the outside unit.)

(Refer to figure)

1. [Service precautions] Label
2. Electrical components box lid
3. [Caution] Label



Pressurize the liquid and gas pipes to 550 psi (do not pressurize more than 550 psi). If the pressure does not drop within 24 hours, the system passes the test. If the pressure drops, check where the nitrogen leaks from.

- **Vacuum drying:** Use a vacuum pump which can evacuate to 500 microns.
 1. Evacuate the system from the liquid and gas pipes by using a vacuum pump for more than 2 hours and bring the system to 500 microns 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.
 2. Following should be executed if there is a possibility of moisture remaining inside the pipe (if piping work is carried out during the raining season or over a long period of time rainwater may enter the pipe during work). After evacuating the system for 2 hours, pressurize the system to 500 microns (vacuum break) with nitrogen gas and evacuate the system again using the vacuum pump for 1 hour to 500 microns or less (vacuum drying). If the system cannot be evacuated to 500 microns within 2 hours, repeat the operation of vacuum break and vacuum drying. Then, after leaving the system in vacuum for 1 hour, confirm that the vacuum gauge does not rise.

NOTE

Make sure to perform air tight test and vacuum drying using the service ports of the stop valve shown in the table below.

One outside unit installed	Liquid line stop valve Discharge gas line stop valve Suction gas line stop valve
Multiple outside units installed	Liquid line stop valve Discharge gas line stop valve Suction gas line stop valve Oil-equalizing line stop valve

9-7 Pipe insulation

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

- Make sure to insulate the connection piping and refrigerant branch kits entirely.
- Be sure to use insulation that is designed for use with HVAC Systems.

- If you think the humidity around the cooling piping might exceed 86°F and RH80%, reinforce the insulation on the cooling piping (at least 13/16" thick). Condensation might form on the surface of the insulation.
- 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 outside unit is located higher than the indoor unit, etc., this must be prevented by caulking the connections, etc.

WARNING

- Be sure to insulate connection piping, as touching them can cause burns.

9-8 Checking of device and installation conditions

Be sure to check the followings.

1. Make sure there is no faulty power wiring or loosening of a nut. See "8. FIELD WIRING".
2. Make sure there is no faulty transmission wiring or loosening of a nut. See "8. FIELD WIRING".
3. Make sure there is no faulty refrigerant piping. See "9. REFRIGERANT PIPING".
4. Make sure piping size is correct. See "9-1 Selection of piping material".
5. Make sure insulation work is done. See "9-7 Pipe insulation".
6. Make sure insulation resistance of main power circuit is not deteriorated. Using a megatester for 500 V, check that the insulation resistance of 2 MΩ or more is attained by applying a voltage of 500 V DC between power terminals and earth. Never use the megatester for the transmission wiring (between outside and indoor unit, outside and COOL/HEAT selector and etc.).

9-9 Additional refrigerant charge

WARNING

- To avoid injury always use protective gloves and eye protection when charging refrigerant.
- To avoid injury do not charge with unsuitable substances. Use only the appropriate refrigerant.

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 (see above). When charging a system, care shall be taken that its maximum permissible charge is never exceeded, in view of the danger of liquid hammer. Refrigerant containers shall be opened slowly.

TO AVOID COMPRESSOR BREAKDOWN. DO NOT CHARGE THE REFRIGERANT MORE THAN THE SPECIFIED AMOUNT TO RAISE THE CONDENSING PRESSURE.

- This outside unit is factory charged with refrigerant and depending on pipe sizes and pipe lengths some systems require additional charging of refrigerant.
- Determine the amount of refrigerant to be added by referring to the table, write it down on the included "Added Refrigerant" plate and attach it to the rear side of the front cover. Note: refer to the example of connection for the amount to be added.

Additional refrigerant charge procedure (1)-normally

- Charge the refrigerant to the liquid pipe in its liquid state. Since R410A is a mixed refrigerant, its composition changes if charged in a state of gas and normal system operation would no longer be assured.
- Make sure to use installation tools you exclusively use on R410A installations to withstand the pressure and to prevent foreign materials from mixing into the system.

1. Before charging, check whether the tank has a siphon attached or not.

How to charge with the siphon tank.

Charge with the tank upright.
(There is a siphon tube inside, so there is no need to turn the tank upside-down.)



Other ways of charging with the tank.

Charge with the tank upside-down.



2. After the vacuum drying is finished, charge the additional refrigerant in its liquid state through the liquid stop valve service port. Taking into account following instructions:
 - Check that gas and liquid stop valves are closed.
 - Stop the compressor and charge the specified weight of refrigerant.

(If the outside unit is not in operation and the total amount cannot be charged, follow the Additional refrigerant charge procedure (2) shown below.)

NOTE

- Procedures for charging additional refrigerant. (Refer to figure 24)
 1. Pressure reducing valve
 2. Nitrogen
 3. Refrigerant tank
 4. With a siphon
 5. Measuring instrument
 6. Vacuum pump
 7. Valve A
 8. Valve B
 9. Charge hose
 10. Outside unit
 11. Gas side
 12. Liquid side
 13. Discharge gas side
 14. Suction gas side
 15. Stop valve service port
 16. To indoor unit
 17. To indoor units / BS units
 18. Dotted lines represent onsite piping

Additional refrigerant charge procedure (2)-by Additional refrigerant charge operation

To learn the system settings for additional refrigerant charging, refer to the [Service Precaution] label attached on the back of the electric box lid in the outside unit.

1. Fully open all stop valves (valve A and valve B must be left fully closed).
2. After ten minutes, fully close liquid line stop valve and then, open the valve by turning 180°. Start the additional refrigerant charge operation. See [Service precautions] Label for detail. If it is difficult to charge the refrigerant additionally, decrease the water temperature or warm the refrigerant tank. (Warm the refrigerant tank with a stupe or a warm hot water of 104°F or less.)
3. After the system is charged with a specified amount of refrigerant, press the RETURN button (BS3) on the PC board (A1P) in the outside unit to stop the additional refrigerant charge operation.
4. Immediately open both liquid-side and gas-side stop valve. (If do not open the stop valve immediately, liquid seal may cause the pipe to burst.)

NOTE

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

9-10 Stop valve operation procedure

CAUTION

Do not open the stop valve until 1-6 of “9-8 Checking of device and installation conditions” are completed. If the stop valve is left open without turning on power, it may cause refrigerant to buildup in the compressor, leading to insulation degradation.

Opening stop valve

1. Remove the cap and turn the valve counterclockwise with the hexagon wrench.
2. Turn it until the shaft stops. Do not apply excessive force to the stop valve. Doing so may break the valve body, as the valve is not a backseat type. Always use the special tool.
3. Make sure to tighten the cap securely.

Closing stop valve

1. Remove the cap and turn the valve clockwise with the hexagon wrench.
2. Securely tighten the valve until the shaft contacts the main body seal.
3. Make sure to tighten the cap securely.
 - * For the tightening torque, refer to the table on the below.

Tightening torque

Stop valve size	Tightening torque ft.-lbf. (Turn clockwise to close)					
	Shaft (valve body)		Cap (valve lid)	Service port	Flare nut	Gas side accessory pipe (1)
Liquid side	3.98-4.87	Hexagonal wrench 1/8 in.	9.95-12.17	8.48-10.25	24.1-29.4	—
Gas side	19.91-24.33	Hexagonal wrench 3/8 in.	26.54-32.44	8.48-10.25	—	16.22-20.65

(Refer to figure 25)

1. Service port
2. Cap
3. Hexagon hole
4. Shaft
5. The main body seal

(Caution)

- Do not damage the cap sealing.
- Always use a charge hose for service port connection.
- After tightening the cap, check that no refrigerant leaks are present.
- After working, securely tighten the cover of service port without fail by specified torque.
- When loosening a flare nut, always use two wrenches in combination. When connecting the piping, always use a spanner and torque wrench in combination to tighten the flare nut.
- When connecting a flare nut, coat the flare (inner and outer faces) with ether oil or ester oil and hand-tighten the nut 3 to 4 turns as the initial tightening.
- Do not forget to open the stop valve before starting operation.

(Refer to figure 26)

1. Remove the cap and turn the valve counterclockwise with the hexagon wrenches until it stops.
2. Discharge gas side
3. Liquid side
4. Suction gas side
5. Never remove the partition flange for any reason.
6. Full close on the suction gas side

10. CHECKS AFTER INSTALLATION

⚠ WARNING

- Never connect power supply wiring to the terminal block for remote controller wiring as this could damage the entire system.
- Attach the power wire securely.
- To avoid injury, always make sure that the circuit breaker on the power supply panel of the installation is switched off before doing any work.

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

1. The position of the switches that requires an initial setting
Make sure that switches are set according to your application needs before turning the power supply on.
2. Power supply wiring and transmission wiring
Use a designated power supply and transmission wiring and make sure that it has been carried out according to the instructions described in this manual, the wiring diagrams and local and national regulations.
3. Pipe sizes and pipe insulation
Make sure that correct pipe sizes are installed and that the insulation work is properly executed.
4. Additional refrigerant charge
The amount of refrigerant to be added to the unit should be written on the included "Additional Refrigerant" label, and attach it to the rear side of the front cover.
5. Measurement of insulation in main power circuit
Using a megatester for 500 V, check that the insulation resistance of 2 MΩ or more is attained by applying a voltage of 500 V DC between power terminals and earth. Never use the megatester for the transmission wiring.
6. Installation date
Be sure to keep record of the installation date on the "Additional Refrigerant" label.

11. TEST RUN

⚠ CAUTION

After completing installation, be sure to open the valves.
(Operating the unit with the valves shut will break the compressor.)

11-1 Air discharge

- Running the heat source water pump, carry out air discharge process until the water comes out from the air discharge hole of local piping.
(For the operation to be done for the first time after installation, you need to perform a checking operation.)

11-2 Before turn on the power supply

- Close the electrical components lid securely before turning on power.
- Make settings for outside unit PC board (A1P) after power-on and check the LED display from inspection door that is on the electrical components box lid.

11-3 Check operation

When running the unit for the first time after installation, be sure to perform a test operation following these steps. (Not performing a test operation when the unit is first installed may prevent the unit from operating properly.)

- During the operation, monitor the outside unit operation status and check for any incorrect wiring.

(1) Check the connection of interlock circuit	The outside unit cannot be operated if the interlock circuit has not been connected.																																																												
(2) • As necessary, configure the system settings onsite by using the dipswitch (DS1) on the outside unit PC-Board (A1P) and push button switches (BS1 to 5). • When the system is in the multiple-outside unit configuration (Out Multi), perform the configuration on the main unit. (Any settings made on a sub unit will be ignored.) After this, close the electrical components box lid.	Always perform configuration after turning ON the power. To learn the setting method, refer to the [Service Precautions] label attached at the position shown in the figure on the right (Electric box lid in outside unit). (Remember, the actual settings you have made must be recorded on the [Service Precautions] label.)																																																												
(3) Turn ON the power to the outside units and indoor units.	Make sure to turn ON the power 6 hours before starting the operation. This is necessary to warm the crankcase preliminarily by the electric heater.																																																												
(4) Start the heat source water pump and fill the heat source water in the outside unit.	The outside unit cannot be operated if the heat source water pump is not running.																																																												
(5) Make sure that the temperature of heat source water is kept within the operation range (60 - 100°F).	The outside unit cannot be operated at a temperature outside the operation range.																																																												
(6) Check the LED on the PC board (A1P) in the outside unit to see if the data transmission is performed normally.	<table border="1"> <thead> <tr> <th rowspan="2">LED display (Default status before delivery)</th> <th colspan="3">Microcomputer operation monitor</th> <th rowspan="2">Page Error</th> <th colspan="3">Cooler/heater changeover</th> <th rowspan="2">Low noise</th> <th rowspan="2">Demand</th> <th rowspan="2">Multi</th> </tr> <tr> <th>HAP</th> <th>H1P</th> <th>H2P</th> <th>Individual</th> <th>Bulk (main)</th> <th>Bulk (sub)</th> </tr> </thead> <tbody> <tr> <td>One outside unit installed</td> <td>●</td> <td>●</td> <td>●</td> <td>○</td> <td>●</td> <td>●</td> <td>●</td> <td>●</td> <td>●</td> <td>●</td> </tr> <tr> <td rowspan="2">When multiple outside unit installed (*)</td> <td>Master station</td> <td>●</td> <td>●</td> <td>○</td> <td>●</td> <td>●</td> <td>●</td> <td>●</td> <td>●</td> <td>○</td> </tr> <tr> <td>Sub station 1</td> <td>○</td> <td>●</td> <td>●</td> <td>○</td> <td>●</td> <td>●</td> <td>●</td> <td>●</td> <td>●</td> </tr> <tr> <td>Sub station 2</td> <td>○</td> <td>●</td> <td>●</td> <td>○</td> <td>●</td> <td>●</td> <td>●</td> <td>●</td> <td>●</td> <td>●</td> </tr> </tbody> </table> <p>LED display: ● OFF ○ ON ◐ Blinking</p> <p>(*) The base (main) unit is the outside unit to which the interconnecting wiring for the indoor units is connected. The other outside units are sub units.</p>	LED display (Default status before delivery)	Microcomputer operation monitor			Page Error	Cooler/heater changeover			Low noise	Demand	Multi	HAP	H1P	H2P	Individual	Bulk (main)	Bulk (sub)	One outside unit installed	●	●	●	○	●	●	●	●	●	●	When multiple outside unit installed (*)	Master station	●	●	○	●	●	●	●	●	○	Sub station 1	○	●	●	○	●	●	●	●	●	Sub station 2	○	●	●	○	●	●	●	●	●	●
LED display (Default status before delivery)	Microcomputer operation monitor			Page Error	Cooler/heater changeover			Low noise	Demand				Multi																																																
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When multiple outside unit installed (*)	Master station	●	●	○	●	●	●	●	●	○																																																			
	Sub station 1	○	●	●	○	●	●	●	●	●																																																			
Sub station 2	○	●	●	○	●	●	●	●	●	●																																																			
(7) • Using the push button switches (BS1 - 5) on the PC board (A1P) of outside unit, carry out a local setting, if necessary. • When the system is in the multiple-outside unit configuration (Out Multi), perform the configuration on the main unit. (Any settings made on a sub unit will be ignored.)	Always perform configuration after turning ON the power. To learn the setting method, refer to the [Service Precautions] label attached at the position shown in the figure on the right (Electric box lid in outside unit). (Remember, the actual settings you have made must be recorded on the [Service Precautions] label.)																																																												
(8) Check all stop valves are opened. If some stop valve is closed, open them. (Refer to "9-10 Stop valve operation procedure".)	[CAUTION] Do not leave any stop valve closed. Otherwise the compressor will fail. For Heat recovery system of cooling and heating: Open all stop valves on the suction side, discharge gas side and liquid side. For cooling and heating switching operation system: Open the stop valves on discharge gas side and liquid side. (Keep the stop valve on suction side fully closed.)																																																												
(9) Perform the check operation following the instructions printed on the [Service Precautions] label.	If you push the test run button (BS4) on the PC board (A1P) of the outside unit for 5 seconds, the test run starts. If you want to interrupt the test run, push the RETURN button (BS3) on PC board (A1P) of the outside unit. The system continues residual operation for about 1 minute (maximum 10 minutes) and then stops. (During test run, you cannot stop it by a command from a remote controller.) You need to perform the above settings on the PCB by accessing the PCB through the inspection cover on the switch box cover.																																																												

(Refer to figure 27)

1. Electrical components box
2. Electrical components box lid
3. Service lid
4. Inspection cover
5. [Service precaution] Label

(Cautions for check operation)

- If the system is started within about 12 minutes after the outside/indoor units are turned ON, the compressor will not run and H2P lights up. Before starting an operation, always verify that the LED display shows the contents of the table in "11-3 Check operation (6)".
- The system may require up to 10 minutes until it can start the compressor after an operation start. This is a normal operation to equalize the refrigerant distribution.
- The check operation does not provide any means of checking the indoor units individually. For that purpose, perform normal operation using the remote controller after the check operation.
- Check operation is not possible in other modes such as collection mode.
- If the setting of indoor remote controller is changed before the check operation, it may not be performed correctly and malfunction code "UF" may be displayed.

Remote controller displays malfunction code

Malfunction code	Installation error	Remedial action
E3 E4 F3 F6 UF U2	The stop valve of an outside unit is left closed.	Open the stop valve. Check referring to the table in "9-9 Additional refrigerant charge".
U1	The phases of the power to the outside units are reversed.	Exchange two of the three phases (L1, L2, L3) to make a positive phase connection.
U1 U2 U4	No power is supplied to an outside or indoor unit (including phase interruption).	Check if the power wiring for the outside units are connected correctly. (If the power wire is not connected to L2 phase, no malfunction display will appear and the compressor will not work.) Check if the ground fault circuit interrupter in the outside unit is ON.
UF	Incorrect transmission between units	Check if the refrigerant piping line and the unit transmission wiring are consistent with each other.
E3 F6 UF U2	Refrigerant overcharge	Recalculate the required amount of refrigerant from the piping length and correct the refrigerant charge level by recovering any excessive refrigerant with a refrigerant recovery machine.
E4 F3	Insufficient refrigerant	<ul style="list-style-type: none"> • Check if the additional refrigerant charge has been finished correctly. • Recalculate the required amount of refrigerant from the piping length and add an adequate amount of refrigerant.
U7 UF	If an outside multi terminal is connected when there is one outside unit installed	Remove the line from the outside multi terminals (Q1 and Q2).
UF E4	The operation mode on the remote controller was changed before the check operation.	Set the operation mode on all indoor unit remote controllers to "cooling."
HJ	The heat source water is not circulating.	Make sure that the water pump is running.
U3	The check operation has not been performed.	Perform the check operation.
E2 E3	E3 is activated, so On/Off button is pressed on the remote controller, but this does not turn E3 off. Or E2 is activated. In case of above, there is a malfunction of the compressor in the outside unit.	Measure the insulation resistance of the compressor to check the condition of the compressor.

11-4 Check of normal operation

After the check operation is completed, operate the unit normally. (Heating is not possible if the outdoor temperature is 75°F or higher. Refer to the Operation manual.)

Check the below items.

- Make sure the indoor and outside units are operating normally (If a knocking sound can be heard in the liquid compression of the compressor, stop the unit immediately and then energize the heater for a sufficient length of time before restarting the operation.)
- Run each indoor unit one at a time and make sure the corresponding outside unit is also running.
- Check to see if cold (or hot) air is coming out of the indoor unit.
- Press the fan direction and fan strength buttons on the indoor unit to check if they operate properly.

NOTE

(Cautions for normal operation check)

- Once stopped, the compressor will not restart in about 5 minutes even if the **On/Off** button of an indoor unit in the same system is pressed.
- When the system operation is stopped by the remote controller, the outside units may continue operating for further 5 minutes at maximum.
- If the system has not undergone any check operation by the test operation button since it was first installed, a malfunction code "U3" is displayed. In this case, perform check operation referring to "11-3 Check operation".
- After the test operation, when handing the unit over to the customer, make sure the electric box lid, the service lid, and the unit casing are all attached.

12. CAUTION FOR REFRIGERANT LEAKS

DANGER

- Refrigerant gas is heavier than air and replaces oxygen. A massive leak could lead to oxygen depletion, especially in basements, and an asphyxiation hazard could occur leading to serious injury or death.

(Points to note in connection with refrigerant leaks)

Introduction

The installer and system specialist shall secure safety against leakage according to local regulations or standards. The following standards may be applicable if local regulations are not available.

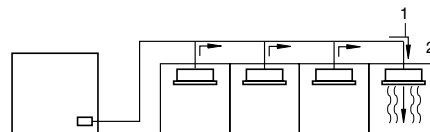
The VRV System, like other air conditioning systems, uses R410A as refrigerant. R410A itself is an entirely safe non-toxic, non-combustible refrigerant. Nevertheless care must be taken to ensure that air conditioning facilities are installed in a room which is sufficiently large. This assures that the maximum concentration level of refrigerant gas is not exceeded, in the unlikely event of major leak in the system and this in accordance to the local applicable regulations and standards.

Maximum concentration level

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

The unit of measurement of the concentration is lb./ft³ (the weight in lb. of the refrigerant gas in 1 ft³ 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 a special attention to the place, such as a basement, etc. where refrigerant can stay, since refrigerant is heavier than air.

Procedure for checking maximum concentration

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

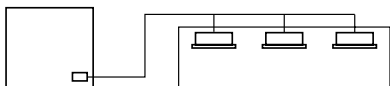
1. Calculate the amount of refrigerant (lb.) charged to each system separately.

$$\begin{array}{l} \text{amount of refrigerant} \\ \text{in a single unit} \\ \text{system (amount of} \\ \text{refrigerant with} \\ \text{which the system} \\ \text{is charged before} \\ \text{leaving the factory)} \end{array} + \begin{array}{l} \text{additional charging} \\ \text{amount (amount of} \\ \text{refrigerant added} \\ \text{locally in accordance} \\ \text{with the length or} \\ \text{diameter of the refrig-} \\ \text{erant piping)} \end{array} = \begin{array}{l} \text{total amount} \\ \text{of refrigerant} \\ \text{(lb.) in} \\ \text{the system} \end{array}$$

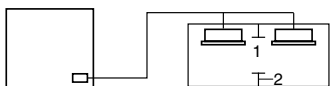
NOTE

- Where a single refrigerant facility is divided into 2 entirely independent refrigerant systems then use the amount of refrigerant with which each separate system is charged.
2. Calculate the smallest room volume (ft³)
In case like the following, calculate the volume of (A), (B) as a single room or as the smallest room.

A. Where there are no smaller room divisions



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



1. opening between rooms
2. partition

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

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

$$\frac{\text{total volume of refrigerant in the} \\ \text{refrigerant system}}{\text{size (ft}^3\text{) of smallest room in which} \\ \text{there is an indoor unit installed}} \leq \text{maximum concen-} \\ \text{tration level (lb./ft}^3\text{)}$$

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

4. Dealing with the situations where the result exceeds the maximum concentration level.
Where the installation of a facility results in a concentration in excess of the maximum concentration level then it will be necessary to revise the system. Please consult your Daikin supplier.

3. Instructions for Antifreeze Usage

Instructions for Antifreeze Usage

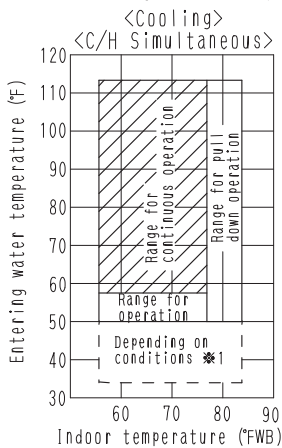
- Usable antifreeze
 - Ethylene Glycol : 10~50 (wt%)
 - Propylene Glyco : 10~50 (wt%)

CAUTION

- Maintain the antifreeze concentration at the desired concentration percentage. Lower concentration may result in rupture of the heat exchanger due to freeze-up or generation of bacteria, and the higher concentration may result in capacity reduction or corrosion.
- It is recommended to check the antifreeze concentration once a month.
- Comply with local and national codes when disposing of antifreeze.
- When diluting the antifreeze concentration, pay attention to weight percent of the stock solution.

- Operation limit

- The figures below assume the following operating conditions for indoor and outside units:
 Equivalent piping length: 25 ft
 Height difference: 0 ft
- The entering water temperature limit for heating varies depending on the antifreeze concentration as below.



<Heating>

Antifreeze concentration (%)	Entering water temperature (°F)	Indoor temperature (°F)
10	45 ~ 95	50~60 : Warming up operation 60~80 : Continuous operation
15	41 ~ 95	
20	37 ~ 95	
25	34 ~ 95	
30	23 ~ 95	
35	23 ~ 95	
40	14 ~ 95	
45 - 50%	14 ~ 95	

- *1: Entering water temperature can be lower depending on conditions. For details, ask your Daikin representative.
- The water flow rate is 21.5~39.5 gpm.
 - The maximum height difference between outside and indoor units is 164 ft if the outside unit is higher, and 65 ft if the outside unit is lower.

- Field setting for antifreeze control

CAUTION

- Be sure to carry out the field setting for antifreeze control as below in accordance with the antifreeze and the concentration. Failure to do so may result in incorrect operation or malfunction of the system.

- For details of setting procedures, refer to the label "SERVICE PRECAUTIONS" stacked on the control box cover of the outside unit or the service manual.

① Hold down the BS1 button for 5 seconds or more to go to the "SETTING MODE 2" (H1P is light ON.)

② Push the BS2 button 58 times to get the LED indications on the right.

	H1P	H2P	H3P	H4P	H5P	H6P	H7P
③ Push the BS3 button once, (The current setting will be indicated.)	○	○	○	○	●	○	●
④ Push the BS2 button to get the LED indications below in accordance with the antifreeze and concentration,							
0 (default) Water	○	●	●	●	●	●	●
2 EG 35%	○	●	●	●	●	○	●
3 EG 45% - 50%	○	●	●	●	●	○	○
4 EG 30%, PG 30%	○	●	●	●	○	●	●
5 PG 35%	○	●	●	●	○	●	○
6 EG 40%, PG 40%	○	●	●	●	○	○	●
7 PG 45% - 50%	○	●	●	●	○	○	○
9 EG 10%, PG 10%	○	●	●	○	●	●	○
10 EG 15%, PG 15%	○	●	●	○	●	○	●
11 EG 20%, PG 20%	○	●	●	○	●	○	○
12 EG 25%, PG 25%	○	●	●	○	○	●	●

⑤ Push the BS3 button twice to complete the setting.

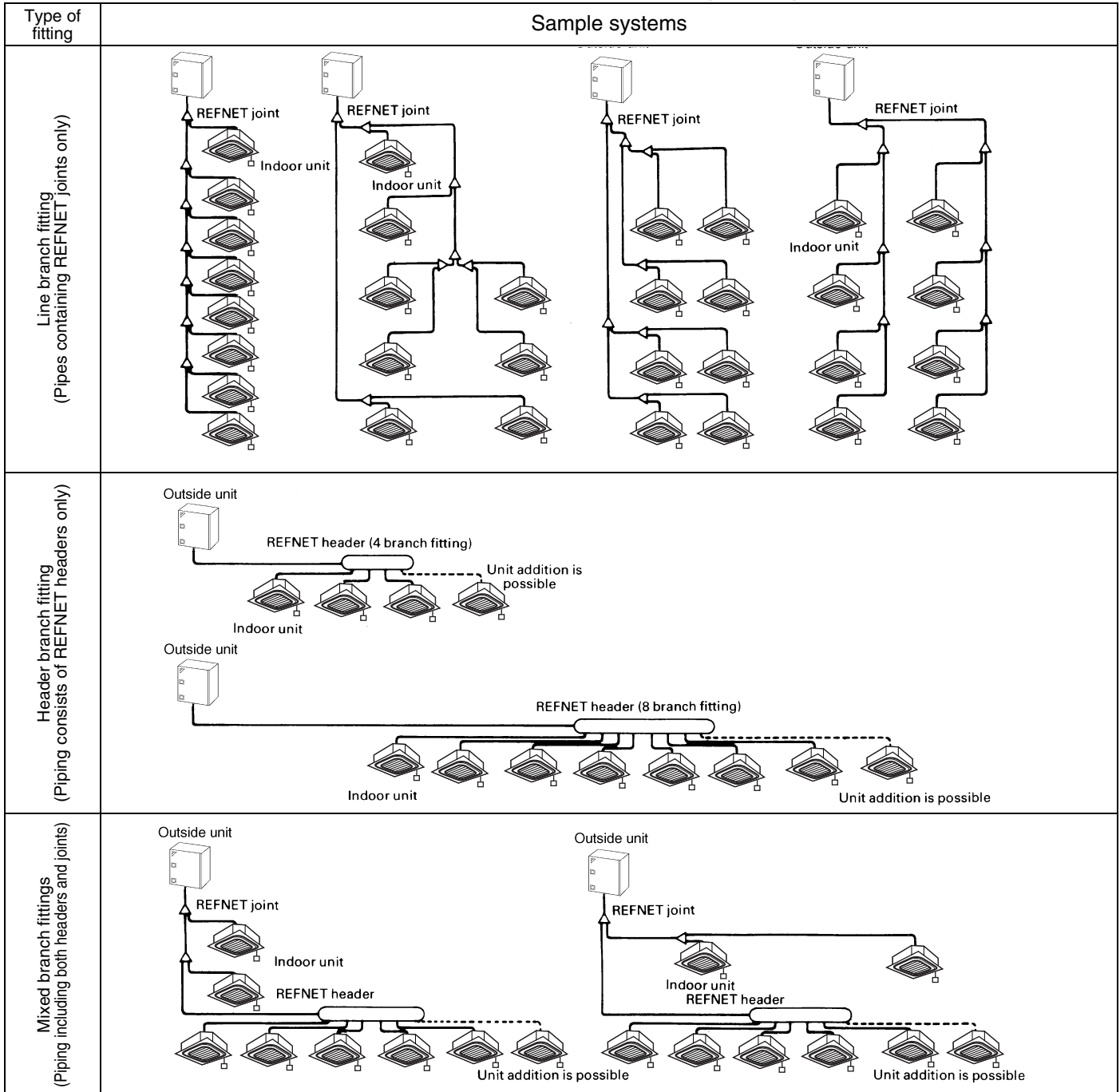
⑥ Push the BS1 button once to go back to the "SETTING MODE 1", (H1P is light OFF.)

EG: Ethylene Glycol, PG: Propylene Glycol

4. REFNET Pipe System

4.1 Layout Example

4.1.1 Heat Pump Series: Use of the particular branch fitting appropriate to each individual unit type not only permits the pipes to be laid with ease but also increases the reliability of the system as a whole.

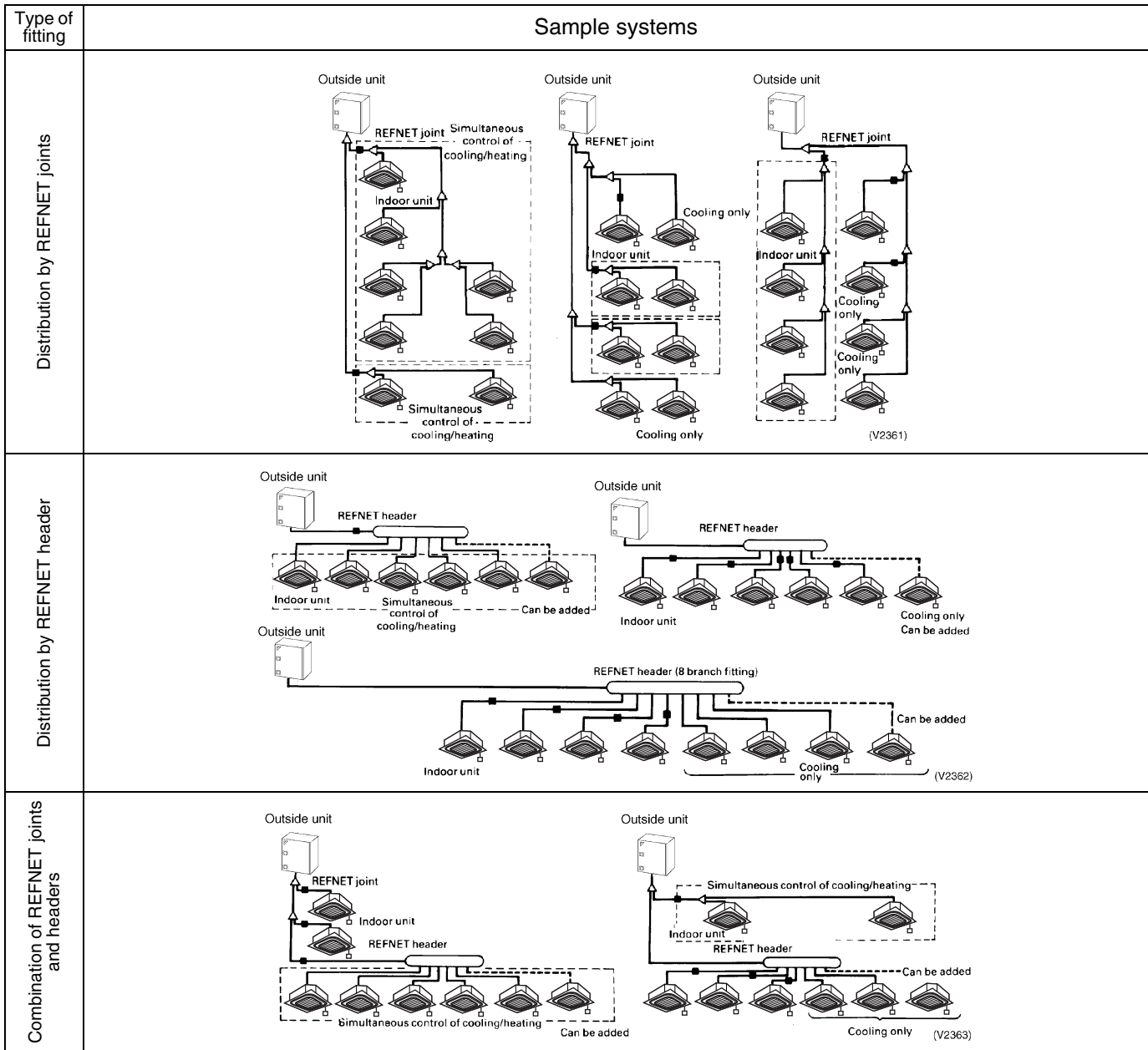


Units can be added by connecting them directly to the REFNET header or REFNET joint. Further branches cannot be included in the system below the REFNET header branch. **Notes:**

1. When the capacity ratio of the indoor system to the outside unit is more than 100% and when all the indoor units are in operation at the same time then the rated capacity of each unit will be somewhat reduced.
2. Special purpose REFNET pipe components must be used for all the pipe work. For further details concerning choosing components, see REFNET and Piping Selection Rules.
3. The Daikin REFNET kits are supplied with insulation intended to fit over the main body of the REFNET joint after installation of the REFNET kit is complete.
4. **IMPORTANT:** In applications where the REFNET kits are installed in an environment requiring fire-rated materials to be used, it is necessary for the installer to obtain from a third-party supplier and to utilize, for insulation, fire-rated materials that meet all applicable building codes and other requirements. The Factory-provided insulation that is supplied with the REFNET kits should be discarded in a manner meeting all applicable laws.

4.1.2 Heat Recovery Series

Use of the particular branch fitting appropriate to each individual unit type not only permits the pipes to be laid with ease but also increases the reliability of the system as a whole.



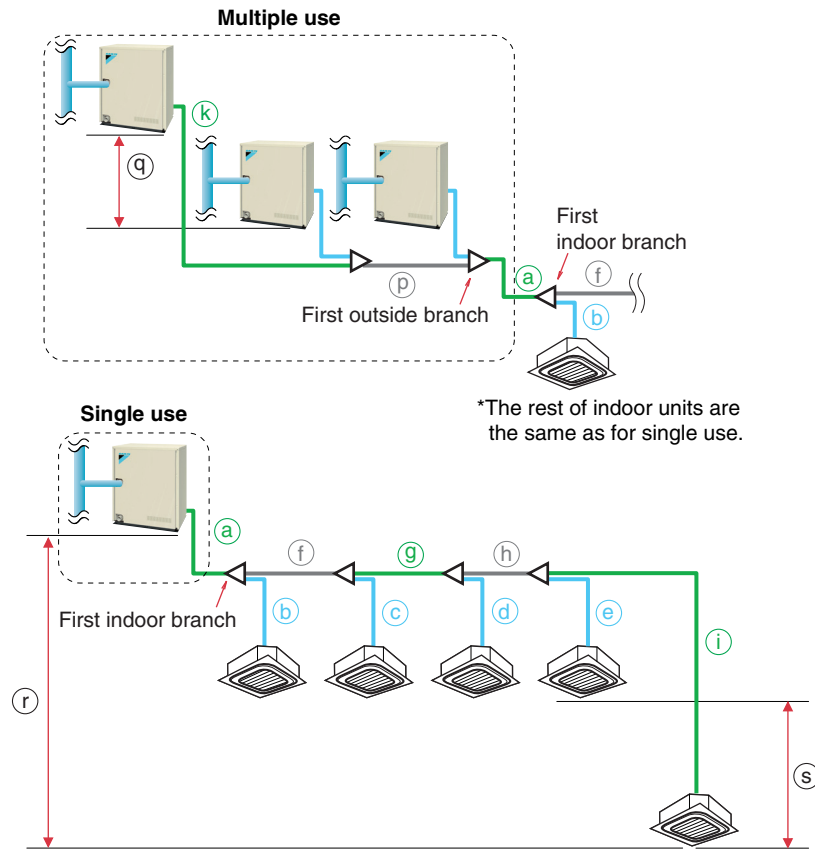
Units can be added by connecting them directly to the REFNET header or REFNET joint. Further branches cannot be included in the system below the REFNET header branch.

Notes:

1. When the capacity ratio of the indoor system to the outside unit is more than 100% and when all the indoor units are in operation at the same time then the rated capacity of each unit will be somewhat reduced.
2. Special purpose REFNET pipe components must be used for all the pipe work. For further details concerning choosing components, see REFNET and Piping Selection Rules.
3. The Daikin REFNET kits are supplied with insulation intended to fit over the main body of the REFNET joint after installation is complete.
4. **IMPORTANT:** In applications where the REFNET kits are installed in an environment requiring fire-rated materials to be used, it is necessary to utilize fire-rated materials that meet such requirements and to discard, in a manner meeting all applicable laws, the insulation that is factory provided with the REFNET kits.

4.2 Max. Refrigerant Piping Length

4.2.1 Heat Pump Series



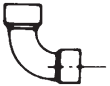
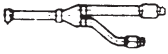

		Actual piping length	Example	Equivalent piping length
Maximum allowable piping length	Refrigerant piping length	390 ft (120 m)	a+f+g+h+i	459 ft (140 m) (Note 3)
	Total piping length	980 ft (300 m)	a+b+c+d+e+f+g+h+i	—
	Between the first indoor branch and the farthest indoor unit	130 ft (40 m) (Note 4)	f+g+h+i	—
	Between the outside branch and the last outside unit	33 ft (10 m)	k+p	43 ft (13 m)

		Level Difference	Example	Outside Units	
Maximum allowable level difference	Between the outside units (Multiple use)	6.5 ft (2 m)	q	RWEYQ-P	
	Between the indoor units	49 ft (15 m)	s	—	
	Between the outside units and the indoor units	If the outside unit is above.	164 ft (50 m)	r	RWEYQ-P
		If the outside unit is below.	130 ft (40 m)	r	

Notes:

1. Be sure to use a REFNET piping kit for the branch of piping.
2. A branch part can not be installed to the down flow of the REFNET header.
3. When the equivalent piping length between the outside and indoor units exceeds 262.5 ft (80 m), the size of main pipes on **the liquid side** must be increased according to “**Example of connection**” in the installation manual. (Never increase the suction gas pipe and HP/LP gas pipe.)
4. The maximum actual piping length can be 295 ft (90 m), depending on conditions. Various conditions and requirements have to be met to allow utilisation of 295 ft (90 m) piping length. Be sure to refer to “**Example of connection**” of the installation manual.

1. Equivalent Piping Length of Joints and Headers (Reference)

Pipe Size *	ϕ 1/4 in. (ϕ 6.4 mm)	ϕ 3/8 in. (ϕ 9.5 mm)	ϕ 1/2 in. (ϕ 12.7 mm)	ϕ 5/8 in. (ϕ 15.9 mm)	ϕ 3/4 in. (ϕ 19.1 mm)	ϕ 7/8 in. (ϕ 22.2 mm)	ϕ 1 in. (ϕ 25.4 mm)	ϕ 1-1/8 in. (ϕ 28.6 mm)	ϕ 1-1/4 in. (ϕ 31.8 mm)	ϕ 1-3/8 in. (ϕ 34.9 mm)	ϕ 1-1/2 in. (ϕ 38.1 mm)	ϕ 1-5/8 in. (ϕ 41.3 mm)
L Joints 	6-1/4 in. (0.16 m)	7-1/8 in. (0.18 m)	7-7/8 in. (0.20 m)	9-7/8 in. (0.25 m)	13-3/4 in. (0.35 m)	15-3/4 in. (0.40 m)	17-3/4 in. (0.45 m)	19-5/8 in. (0.50 m)	21-5/8 in. (0.55 m)	23-5/8 in. (0.60 m)	25-5/8 in. (0.65 m)	29-1/2 in. (0.75 m)
REFNET Joint 	1.6 ft (0.5 m)											
REFNET Header 	3.3 ft (1.0 m)											
Branch Selector units	BSVQ36/60PVJU: 13.1 ft (4.0 m), BSVQ96PVJU: 19.7 ft (6.0 m)											
Centralized Branch Selector units	BSV4/6Q36PVJU: 13.1 ft (4.0 m)											

* When the equivalent piping length in cooling operation is calculated, the gas pipe size is selected.
 When the equivalent piping length in heating operation is calculated, the liquid pipe size is selected.

4.3 Field Refrigerant Piping

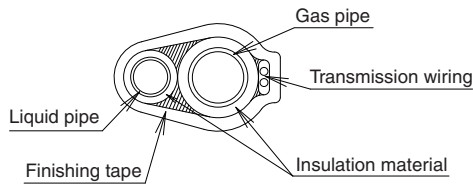
4.3.1 Heat Pump Series

1. The following materials should be used for all refrigerant piping.

- Materials: Deoxidized phosphorous seamless copper pipe or equivalent

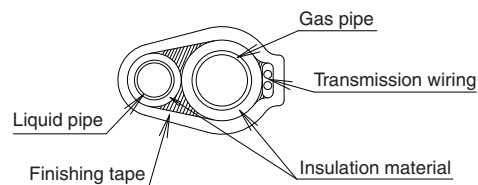
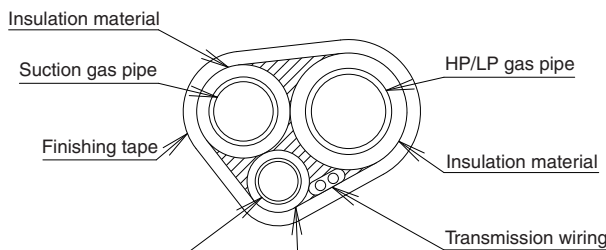
2. The tips for insulation

- Gas and liquid piping must be insulated.
- Be sure to insulate the liquid-side and gas-side piping for the inter-unit piping and the refrigerant branch kits and always use 18-type or better insulation for the oil pressure equalizer.
- Materials: Glass fiber or heat resistant polyethylene foam.
 Thickness: 1/2 inch (13 mm) or more depending on National or Local Code.
 Heat resistance: Be sure to use insulation that is designed for use with HVAC Systems. /
- If you think the humidity around the cooling piping might exceed 86°F (30°C) and RH80%, reinforce the insulation on the cooling piping (at least 1 inch (25.4 mm) thick). Condensation might form on the surface of the insulation.
- Insulation of both liquid and gas pipe



4.3.2 Heat Recovery Series

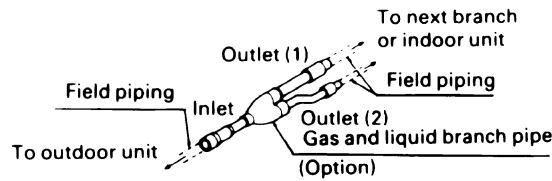
- Suction, HP/LP gas piping, liquid piping must be insulated.
- Example of thermal insulation work
- 3 piping section (between outdoor unit and Branch Selector unit)
- 2 piping section (between Branch Selector unit and indoor unit)



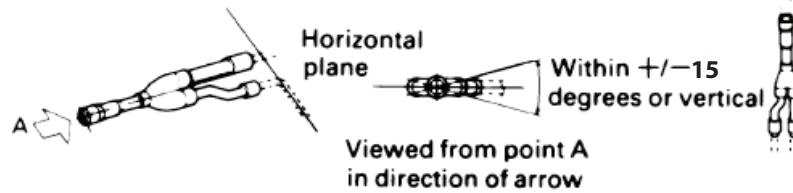
4.4 REFNET Joints and Headers

4.4.1 REFNET Joints

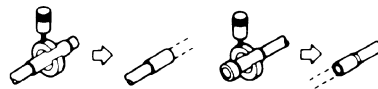
For gas and liquid branch pipes



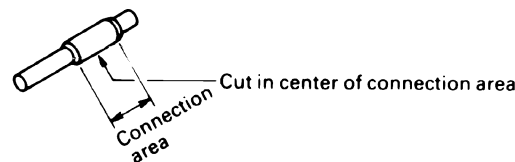
- Make sure that all branch pipes are fitted such that they branch either horizontally or vertically.



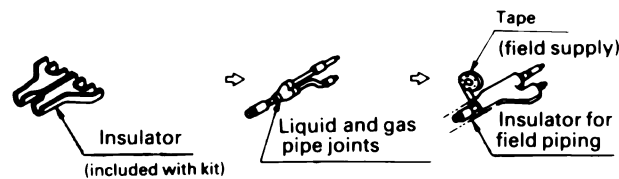
- When the size of the selected field piping is different from that of branch pipe then the connecting section should be cut with a pipe cutter as shown in the figure below.



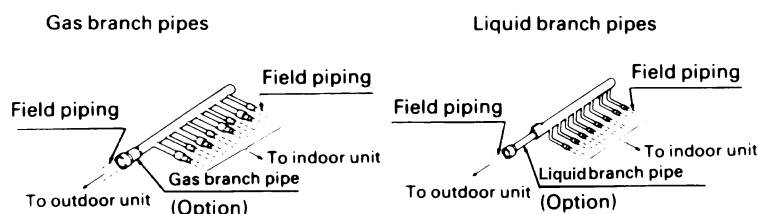
- When you are cutting an inlet or outlet pipe with a pipe cutter make sure that you make the cut in the center of the connection area.



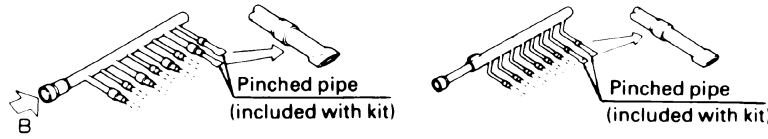
- Branch pipes must be insulated in accordance with the handbook which comes with each kit.



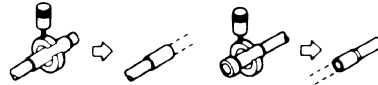
4.4.2 REFNET Headers



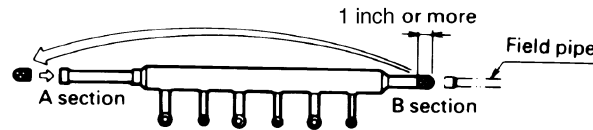
- When the number of indoor units to be connected to the branch pipes is less than the number of branch pipes available for connection then cap pipes should be fitted to the surplus branches.



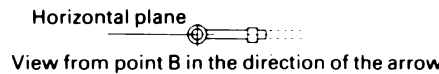
- When the size of the selected field piping is different from that of branch pipe then the connecting section should be cut with a pipe cutter as shown in the figure below.



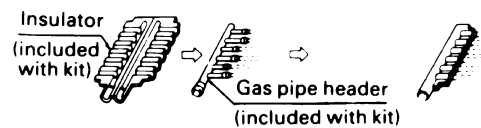
- When field piping is connected to the B section of the inlet/outlet pipe on the outside unit side of the liquid pipe header.
- Cut the B section with a pipe cutter as shown below and connect it to the A section.
- Connect the flared section of the field pipe to the B section.



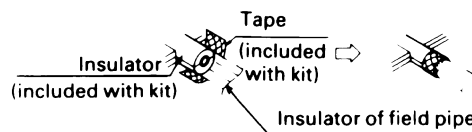
- Fit the branch pipe so that the branch lies in a horizontal plane.



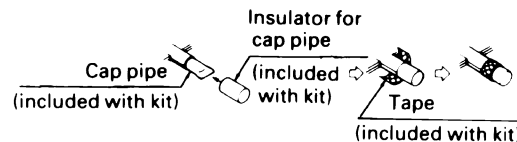
- The branch pipe must be insulated in accordance with the instruction manual which comes with each kit.
1. Use the insulator included in the kit to insulate the header.



2. Joints between insulators included in the kit and those already applied to the field piping should be sealed with the tape which is also included in each kit.



3. Any cap pipes should also be insulated using the insulator provided with each kit and then taped as described above.

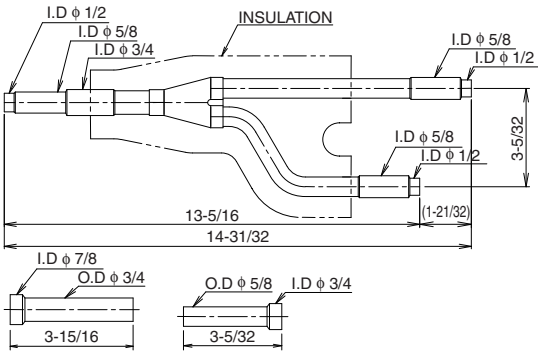


5. REFNET Joint and Header

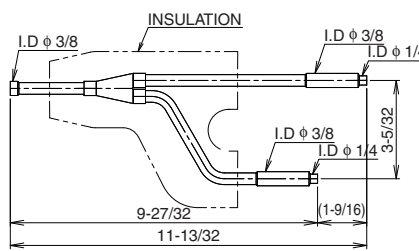
5.1 REFNET Joint (Branch Kit)

KHRP26A22T9

GAS SIDE JOINT



LIQUID SIDE JOINT

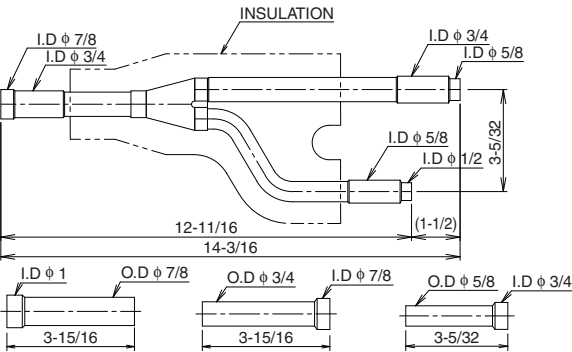


Unit (in.)

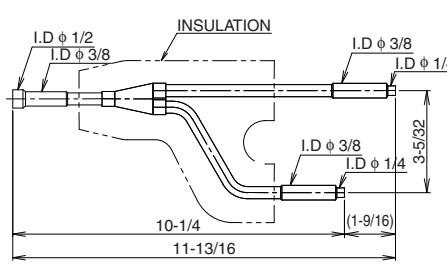
C: D3K05234A

KHRP26A33T9

GAS SIDE JOINT



LIQUID SIDE JOINT

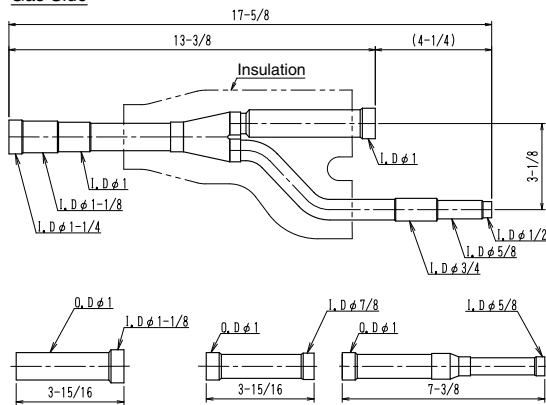


Unit (in.)

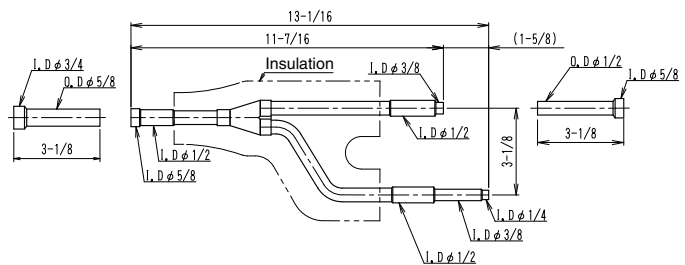
C: D3K05235B

KHRP26M72TU9

Gas Side



Liquid Side

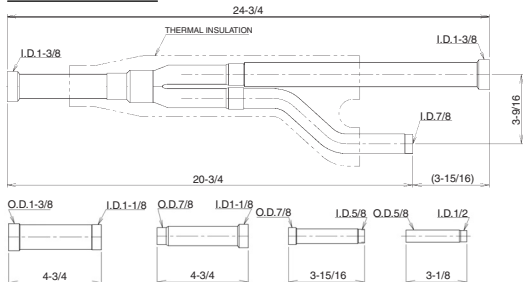


Unit (in.)

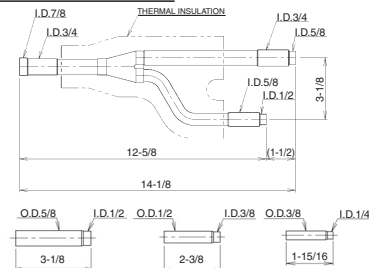
D3K04887A

KHRP26M73TU9

GAS SIDE JOINT



LIQUID SIDE JOINT

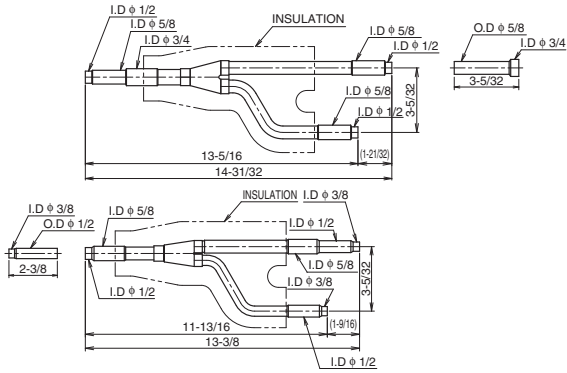


Unit (in.)

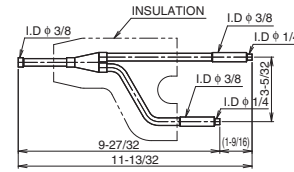
D3K05572A

KHRP25A22T9

GAS SIDE JOINT



LIQUID SIDE JOINT

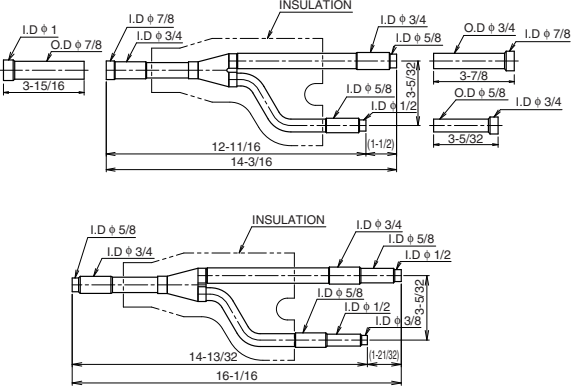


Unit (in.)

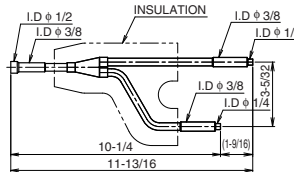
C: D3K05706

KHRP25A33T9

GAS SIDE JOINT



LIQUID SIDE JOINT

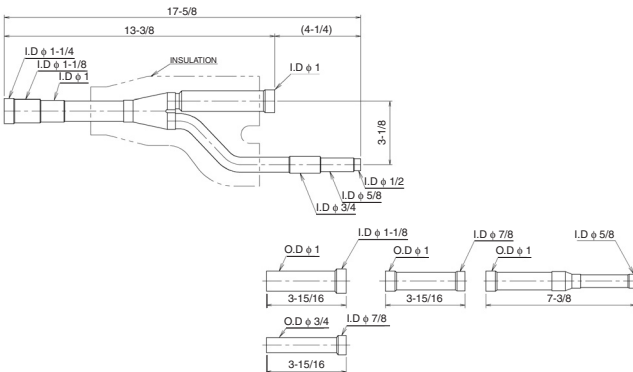


Unit (in.)

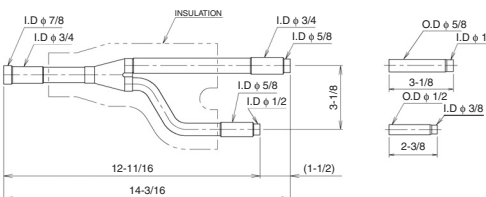
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KHRP25M72TU9

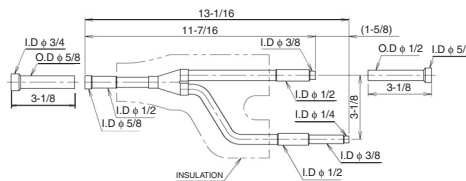
SUCTION GAS SIDE



DISCHARGE GAS SIDE



LIQUID SIDE

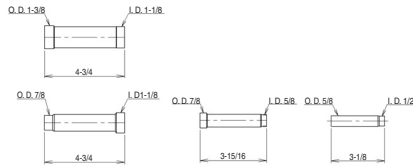
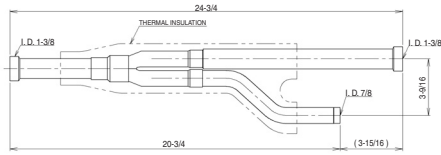


Unit (in.)

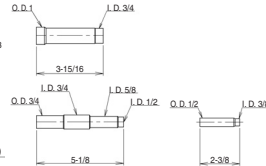
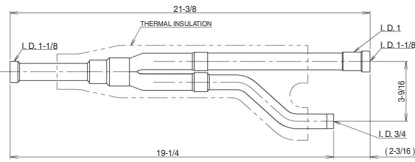
D3K04888B

KHRP25M73TU9

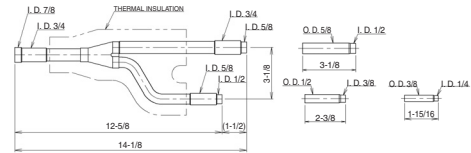
SUCTION GAS SIDE JOINT



DISCHARGE GAS SIDE JOINT



LIQUID SIDE JOINT



D3K05573A

Unit (in.)

KHRP26A22T9 / KHRP26A33T9

REFNET JOINT INSTALLATION MANUAL(Except for JAPAN)
KHRP26A22T • 33T(FOR R410A)

■ THIS KIT INCLUDES THE FOLLOWING PARTS.

KIT NAME	S H A P E				
	GAS SIDE JOINT	LIQUID SIDE JOINT	INSULATION	REDUCER(FOR GAS PIPE)	REDUCER(FOR LIQUID PIPE)
KHRP26A 22T					
KHRP26A 33T					

*...Make sure gas side joint and liquid side joint are for R410A, (Label for R410A is attached on each part,)

SELECTION PROCEDURE

According to the INSTALLATION MANUAL of outdoor unit.

INSTALLATION PROCEDURE

① The pipe size of each parts are shown below.

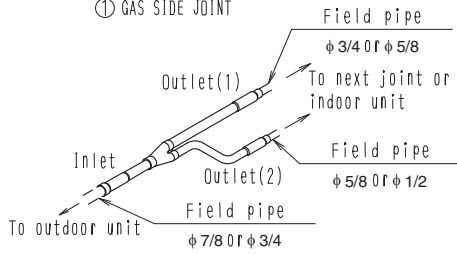
KIT NAME	GAS SIDE JOINT	LIQUID SIDE JOINT
KHRP26A 22T		
KHRP26A 33T		

C: 2P182411

2 According to SELECTION PROCEDURE, cut the pipe with a pipe cutter for use.

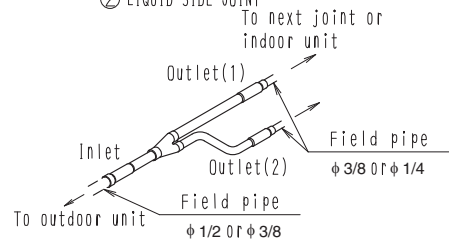
• (Ex.) FOR KHRP26A33T

① GAS SIDE JOINT

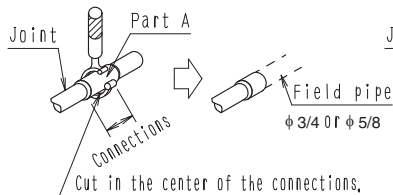


Note) For the size of inlet $\phi 3/4$ or the size of outlet(1) $\phi 3/4$, the size of outlet(2) $\phi 5/8$.
 • Cut the pipe with a pipe cutter.

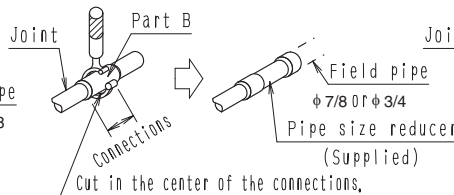
② LIQUID SIDE JOINT



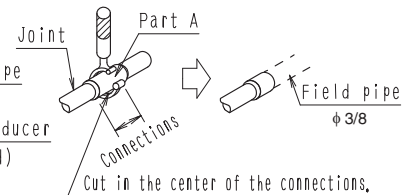
Note) For the size of inlet is $\phi 3/8$ or the size of outlet(1) is $\phi 3/8$, the size of outlet(2) is $\phi 3/8$.
 • Cut the pipe with a pipe cutter.



Cut in the center of the connections, Cut in the center of the part A and connect a field pipe.



Cut in the center of the connections, Cut in the center of the part B, use Pipe size reducer (supplied) and connect a field pipe.



Cut in the center of the part A and connect a field pipe.

• Make sure to flow nitrogen gas through the pipe when brazing.

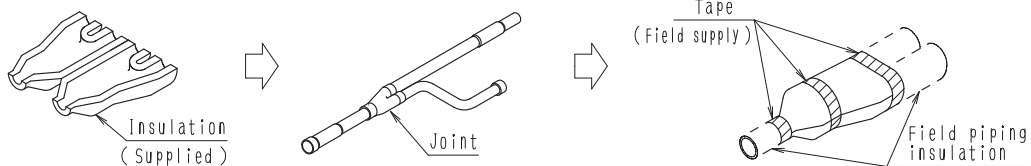
3 Insulation of Joint

Be sure to insulate the gas and liquid side Joint.

Note) The insulation of the refrigerant piping must be reinforced based on the environment of installation. Otherwise, dew may condensate on the surface of the insulation. For details, see Engineering Data.

GAS SIDE • Set the insulation matching the joint and wind the field supplied tape from the center without any clearances on the matching face of insulation.
 • Seal the insulation and field piping insulation joint with the field supplied tape.

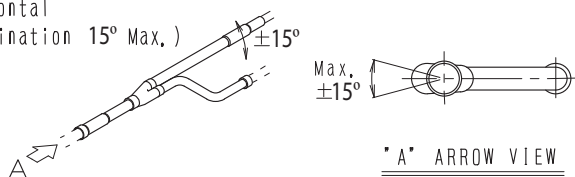
LIQUID SIDE • Insulate by the same method as gas side joint.



INSTALLATION PRECAUTIONS

• Install the Joint so that it is branched vertically or horizontally.

Horizontal (Inclination 15° Max.)

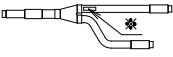
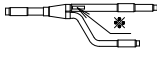
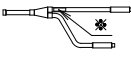

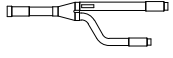

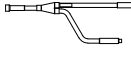



• Do not apply extra force on the piping part. The brazed part may be damaged and it may result in gas leakage.

KHRP25A22T9 / KHRP25A33T9

REFNET JOINT INSTALLATION MANUAL(Except for JAPAN)
KHRP25A22T • 33T(FOR R410A)

■ THIS KIT INCLUDES THE FOLLOWING PARTS.

KIT NAME	S H A P E			
	SUCTION GAS SIDE JOINT	HP/LP GAS SIDE JOINT	LIQUID SIDE JOINT	INSULATION
KHRP25A 22T	 REDUCER φ 3/4	 φ 3/8		 3 pcs.
KHRP25A 33T	 REDUCER φ 7/8 φ 1 φ 3/4			 3 pcs.

*...Make sure suction gas side joint, HP/LP gas side and liquid side joint are for R410A, (Label for R410A is attached on each part.)

INTRODUCTION

This kit is designed as a refrigerant branching kit for HEAT RECOVERY unit for installation in buildings.

- Between outdoor unit and BS unit (upstream of BS unit), use 3 pipings. Use this kit for such branching application.
- Between BS unit and indoor unit (downstream of BS unit) and between REFNET JOINT and cooling-only indoor unit, use 2 pipings.

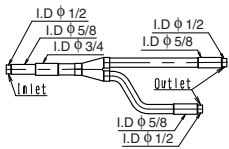
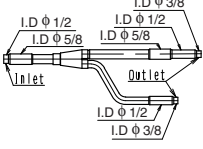
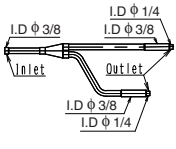
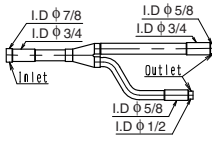
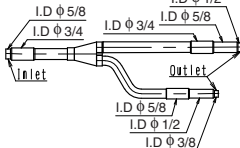
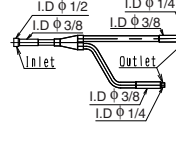
3 pipings		2 pipings	
Upstream of BS unit		Downstream of BS unit	To cooling-only indoor unit
Suction gas side piping	HP/LP gas side piping	Gas side piping	Suction gas side piping
Liquid side piping	Liquid side piping	Liquid side piping	Liquid side piping

SELECTION PROCEDURE

According to the INSTALLATION MANUAL of outdoor unit.

INSTALLATION PROCEDURE

① The pipe size of each parts are shown below.

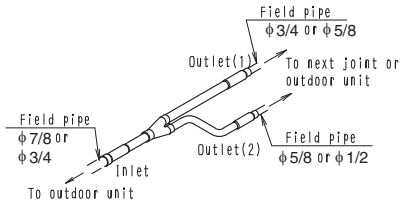
KIT NAME	SUCTION GAS SIDE JOINT	HP/LP GAS SIDE JOINT	LIQUID SIDE JOINT
KHRP25A 22T			
KHRP25A 33T			

C: 3P203737

2 According to SELECTION PROCEDURE cut the pipe with a pipe cutter for use.

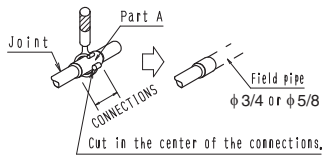
• (Ex) FOR KHRP25A33T

① SUCTION GAS SIDE JOINT

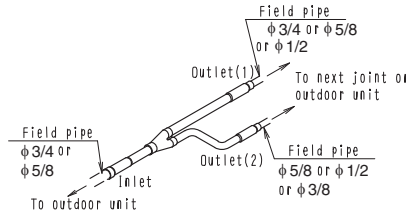


NOTE) For the size of inlet is $\phi 3/4$ or the size of outlet(1) is $\phi 3/4$, the size of outlet(2) is $\phi 5/8$

• Cut the pipe with a pipe cutter.

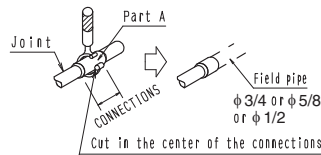


② HP/LP GAS SIDE JOINT



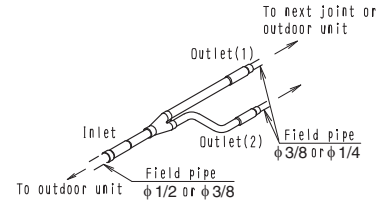
NOTE) For the size of inlet is $\phi 3/4$ or the size of outlet(1) is $\phi 3/4$ or $\phi 5/8$, the size of outlet(2) is $\phi 5/8$ or $\phi 1/2$

• Cut the pipe with a pipe cutter.



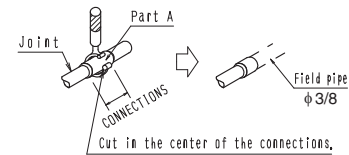
Cut in the center of the part A and connect a field pipe.

③ LIQUID SIDE JOINT

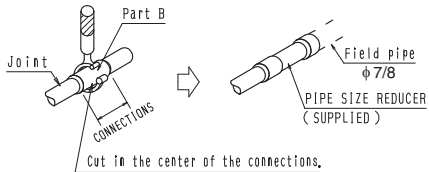


NOTE) For the size of inlet is $\phi 3/8$ or the size of outlet(1) or (2) is $\phi 3/8$

• Cut the pipe with a pipe cutter.



④ When the suction gas side pipe size of outlet(1) is $\phi 7/8$.



Cut the center of the part B and use PIPE SIZE REDUCER.

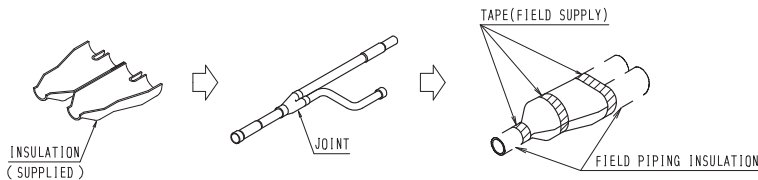
• Make sure to flow nitrogen gas through the pipe when brazing.

3 Insulation of JOINT

• Be sure to insulate the suction/discharge gas and liquid side JOINT.

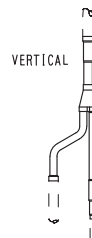
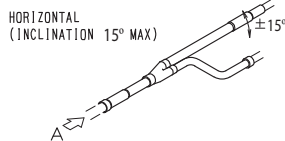
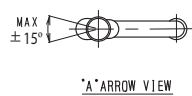
Note) The insulation of the refrigerant piping must be reinforced based on the environment of installation. Otherwise, dew may condensate on the surface of the insulation. For details, see Engineering Data.

• Seal the insulation and field piping insulation joint with the field supplied tape.



INSTALLATION PRECAUTIONS

• Install the JOINT so that it is branched vertically or horizontally.

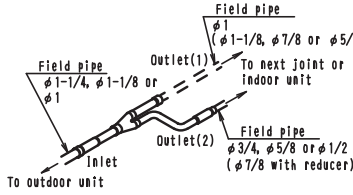


• Do not apply extra force on the piping part. The brazed part may be damaged and it may result in gas leakage.

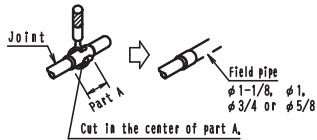
2 According to SELECTION PROCEDURE, cut the pipe with a pipe cutter and / or use the reducer.

• (EX)FOR KHRP25M72TU

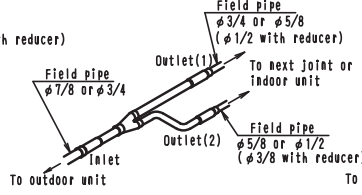
1 SUCTION GAS SIDE JOINT



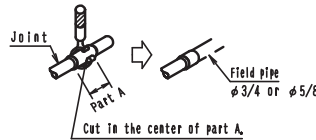
NOTE) In case of the field pipe size of inlet is $\phi 1-1/8$ or $\phi 1$, and the field pipe size of outlet(2) is $\phi 3/4$ or $\phi 5/8$, cut the pipe with a pipe cutter.



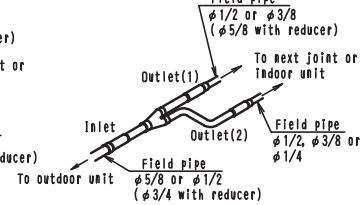
2 DISCHARGE GAS SIDE JOINT



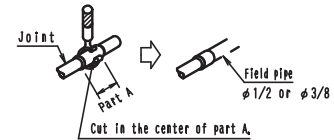
NOTE) In case of the field pipe size of inlet is $\phi 3/4$, the field pipe size of outlet(1) is $\phi 3/4$, and the field pipe size of outlet(2) is $\phi 5/8$, cut the pipe with a pipe cutter.



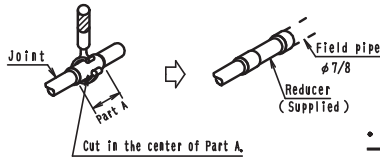
3 LIQUID SIDE JOINT



NOTE) In case of the field pipe size of inlet is $\phi 1/2$, the field pipe size of outlet(1) is $\phi 1/2$, and the field pipe size of outlet(2) is $\phi 1/2$ or $\phi 3/8$, cut the pipe with a pipe cutter.



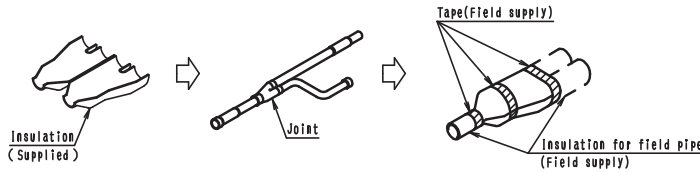
4 When the suction gas side field pipe size of outlet(2) is $\phi 7/8$, cut the center of part A and use the supplied reducer. Do the same way when the reducer is needed for discharge gas side field pipe and liquid side field pipe.



• Make sure to do nitrogen gas blowing through the pipe when brazing.

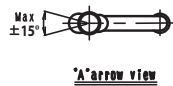
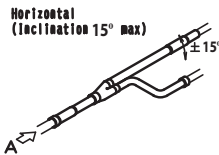
3 Insulation of joint

- Be sure to insulate all of the joints.
- Note) The insulation of the refrigerant piping must be reinforced based on the environment of installation. Otherwise, dew may condensate on the surface of the insulation. For details, see Engineering Data.
- Seal the supplied insulation and field supplied insulation with field supplied tape.



PRECAUTIONS OF INSTALLING

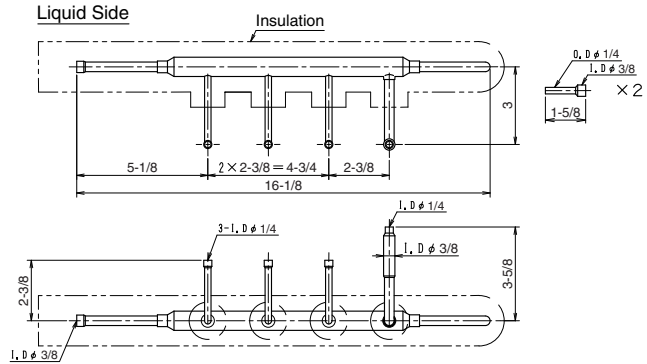
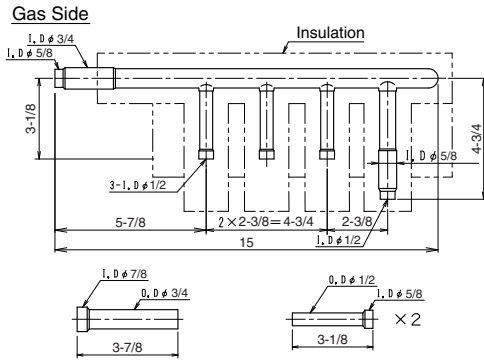
- Install the joint vertically or horizontally.



- Do not apply extra force on the piping part. The brazed part may be damaged and it may result in gas leakage.

5.2 REFNET Header (Branch Kit)

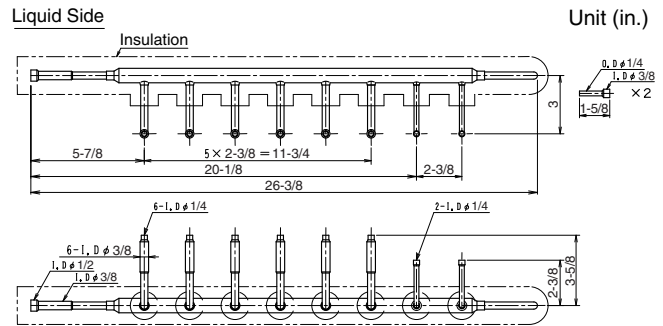
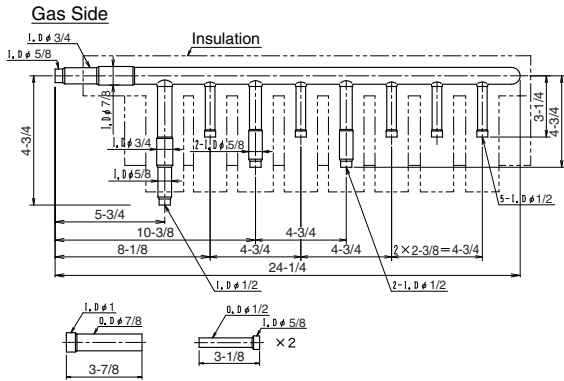
KHRP26M22H9



Unit (in.)

C: D3K03629C

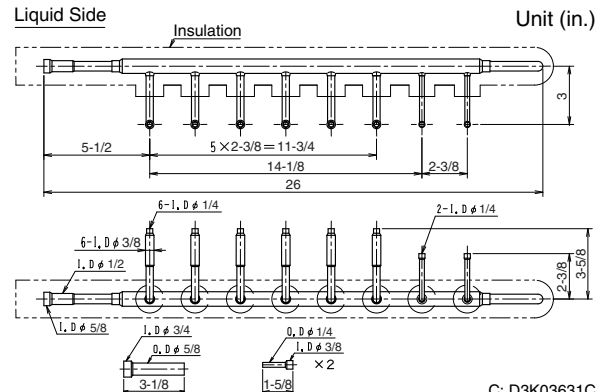
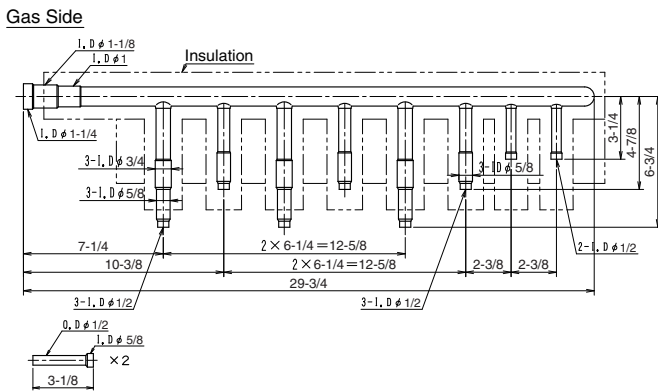
KHRP26M33H9



Unit (in.)

C: D3K03630C

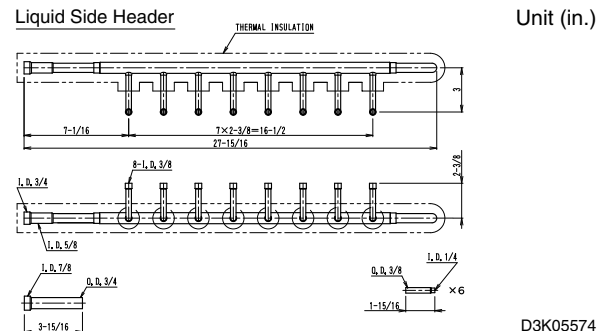
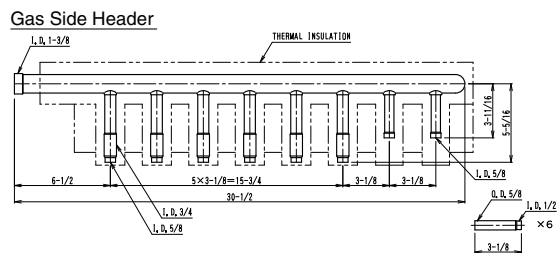
KHRP26M72H9



Unit (in.)

C: D3K03631C

KHRP26M73HU9

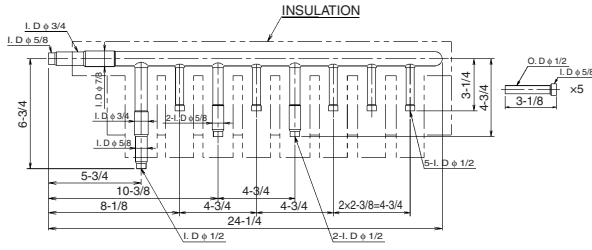


Unit (in.)

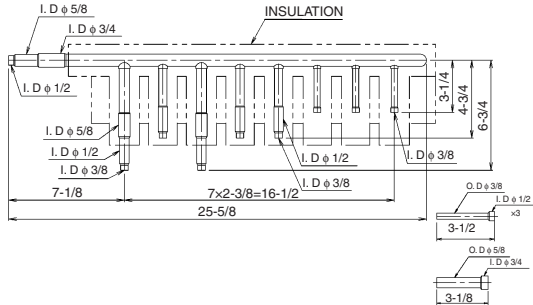
D3K05574

KHRP25M33H9

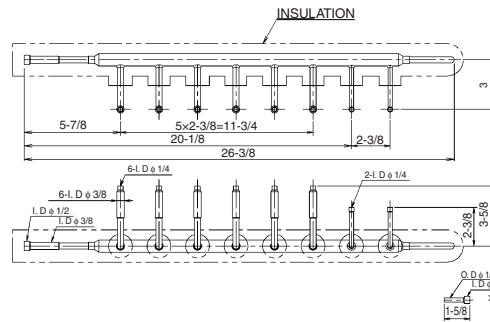
SUCTION GAS SIDE



HP/LP GAS SIDE



LIQUID SIDE

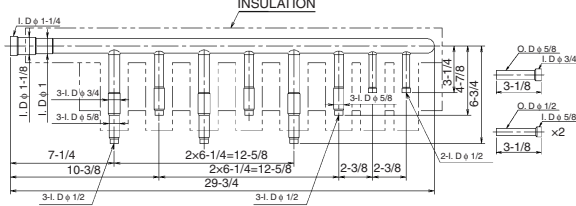


Unit (in.)

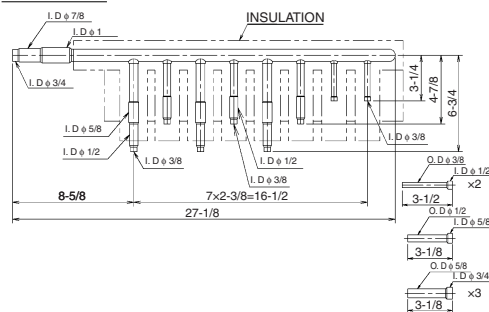
C: D3K03633D

KHRP25M72H9

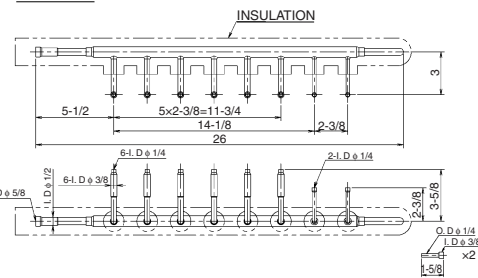
SUCTION GAS SIDE



HP/LP GAS SIDE



LIQUID SIDE

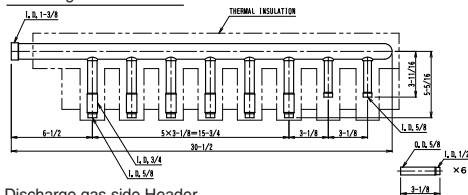


Unit (in.)

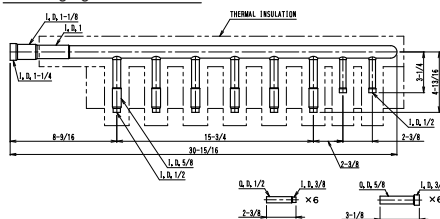
C: D3K03634D

KHRP25M73HU9

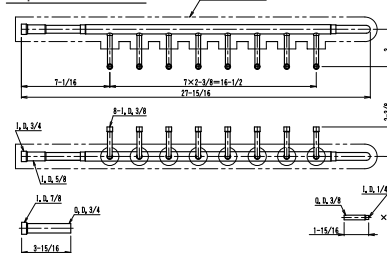
Suction gas side Header



Discharge gas side Header



Liquid side Header



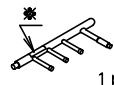

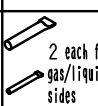
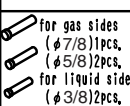
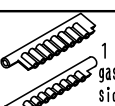


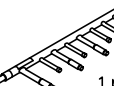
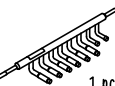
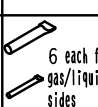
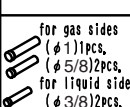
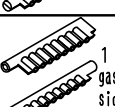


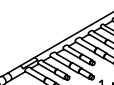

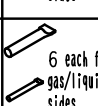
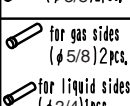
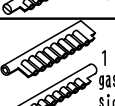


Unit (in.)

D3K05575

KHRP26M22H9 / KHRP26M33H9 / KHRP26M72H9

REFNET HEADER INSTALLATION MANUAL(Except for JAPAN)
KHRP26M22H • 33H • 72H(FOR R-410A)

■ THIS KIT INCLUDES THE FOLLOWING PARTS.

KIT NAME	S H A P E						
	GAS SIDE HEADER	LIQUID SIDE HEADER	PLUGGING TUBES	REDUCER	INSULATION FOR HEADER	INSULATION FOR GAS SIDE ENCLOSED PIPING	INSULATION FOR LIQUID SIDE PIPING
KHRP 26M22H 4branches	 1 pcs.	 1 pcs.	 2 each for gas/liquid sides	 for gas sides (φ7/8)1pcs, (φ5/8)2pcs, for liquid sides (φ3/8)2pcs.	 1 each for gas/liquid sides	 2 pcs.	 4 pcs.
KHRP 26M33H 8branches	 1 pcs.	 1 pcs.	 6 each for gas/liquid sides	 for gas sides (φ1)1pcs, (φ5/8)2pcs, for liquid sides (φ3/8)2pcs.	 1 each for gas/liquid sides	 6 pcs.	 8 pcs.
KHRP 26M72H 8branches	 1 pcs.	 1 pcs.	 6 each for gas/liquid sides	 for gas sides (φ5/8)2pcs, for liquid sides (φ3/4)1pcs, (φ3/8)2pcs.	 1 each for gas/liquid sides	 6 pcs.	 8 pcs.

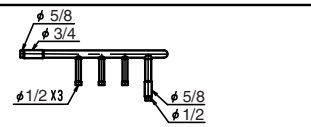
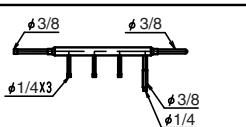
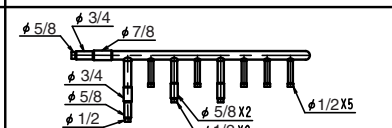
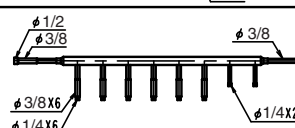
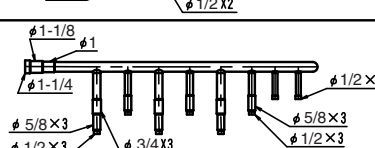
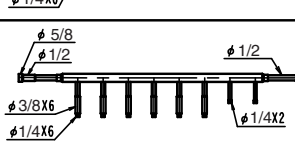
*...Make sure gas side header and liquid side header are for R410A. (Label for R410A is attached on each part.)

SELECTION PROCEDURE

According to the INSTALLATION MANUAL of outdoor unit.

INSTALLATION PROCEDURE

① The pipe size of each parts are shown below.

KIT NAME	GAS SIDE HEADER	LIQUID SIDE HEADER
KHRP26M22H 4branches		
KHRP26M33H 8branches		
KHRP26M72H 8branches		

C: 3P113151C

- 2 For the outlet/inlet pipings which can be connected in several piping sizes, cut the connections of piping diameter to be used with a pipe cutter according to the left lower table.

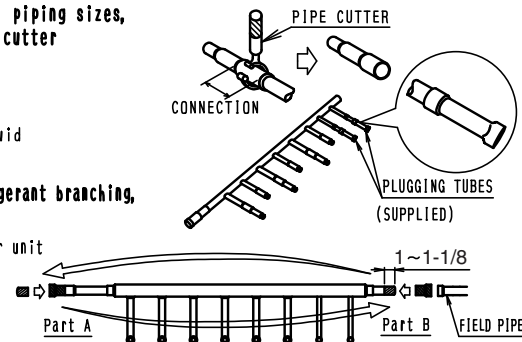
NOTE) 1. Cut in the center of the connections.
 2. PIPE SIDE REDUCER

ex) When connecting the field pipe (φ7/8) to inlet liquid side pipe of KHRP26M73H, use PIPE SIDE REDUCER,

- 3 For non-connected outlet pipings at the indoor unit side for refrigerant branching, install the supplied plugging tube.

When connecting the field piping to inlet piping part B at the outdoor unit of liquid side header,

- Cut part B as shown with a pipe cutter and install it to part A.
- Connect the flared field piping to part B.



• Make sure to flow nitrogen gas through the pipe when brazing.

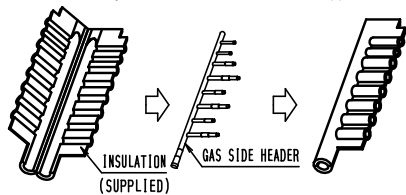
4 Insulation of HEADER

• Be sure to insulate the gas and liquid side HEADER.

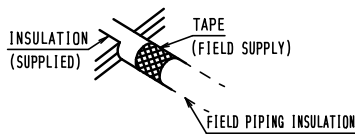
Note) The insulation of the refrigerant piping must be reinforced based on the environment of installation. Otherwise, dew may condensate on the surface of the insulation. For details, see Engineering Data.

GAS SIDE HEADER

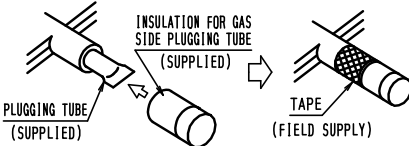
- i) Insulate the gas side header with the supplied insulation,



- ii) Seal the supplied insulation and field piping insulation junction with the field supplied tape,

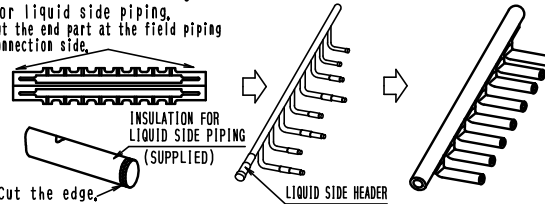


- iii) Seal the plugging tube mounting part with the field supplied tape after installing the supplied insulation for the supplied plugging tube,

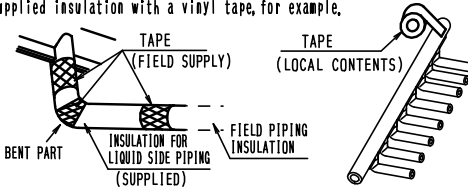


LIQUID SIDE HEADER

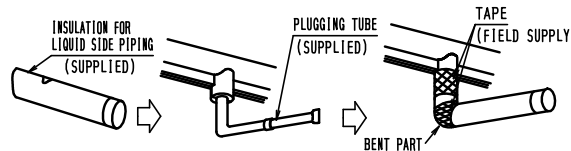
- i) Insulate the header using the insulation for header and the insulation for liquid side piping. Cut the end part at the field piping connection side.



- ii) Seal the supplied insulation and liquid side piping insulation joint, the supplied liquid side piping insulation bending part, and the joint with the field piping insulation, using the field supplied tape. Seal the supplied insulation with a vinyl tape, for example.



- iii) Using the field supplied tape, seal the plugging tube mounting part after installing the insulation for liquid side piping (supplied).

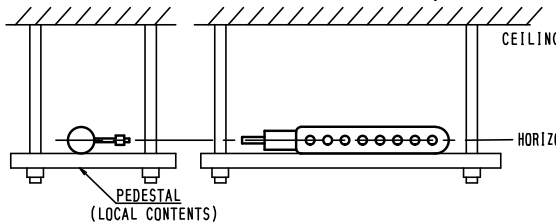


INSTALLATION PRECAUTIONS

• Do not apply extra force on the piping part. The brazed part may be damaged and it may result in gas leakage.

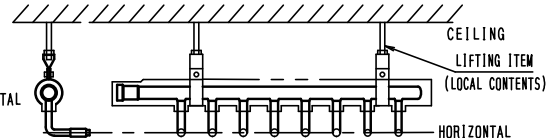
GAS SIDE HEADER

• Place the header on the pedestal and install it so that it is horizontal.



LIQUID SIDE HEADER

• Suspend the header from the ceiling, and be sure to install it so that the outlet/inlet pipings at the header indoor unit side are horizontal at the lower side as shown below.



KHRP25M33H9 / KHRP25M72H9

REFNET HEADER INSTALLATION MANUAL(Except for JAPAN)
KHRP25M33H • 72H(FOR R-410A)

■ THIS KIT INCLUDES THE FOLLOWING PARTS.

KIT NAME	S H A P E							
	SUCTION GAS SIDE HEADER	DISCHARGE GAS(HP/LP GAS) SIDE HEADER	LIQUID SIDE HEADER	INSULATION FOR HEADER	PLUGGING TUBES	REDUCER	INSULATION FOR GAS SIDE ENCLOSED PIPING	INSULATION FOR LIQUID SIDE PIPING
KHRP 25M33H 8branches	1 pcs.	1 pcs.	1 pcs.	2 pcs, for gas side 1 pcs, for liquid side	6 each for suction gas/discharge gas (HP/LP gas)/liquid sides	suction gas side (φ15.9) 5pcs, discharge gas(HP/LP gas)side (φ19.1) 1pc, (φ12.7) 3pcs, liquid side (φ9.5) 2pcs.	12 pcs.	8 pcs.
KHRP 25M72H 8branches	1 pcs.	1 pcs.	1 pcs.	2 pcs, for gas side 1 pcs, for liquid side	6 each for suction gas/discharge gas (HP/LP gas)/liquid sides	suction gas (φ19.1) 1pc, (φ15.9) 2pcs, discharge gas(HP/LP gas)side (φ19.1) 3pcs, (φ15.9) 1pc, (φ12.7) 2pcs, liquid side (φ9.5) 2pcs.	12 pcs.	8 pcs.

***Make sure suction gas side header, discharge gas(HP/LP gas) side and liquid side header are for R410A, (Label for R410A is attached on each part.)

INTRODUCTION

This kit is designed as a refrigerant branching kit for HEAT RECOVERY unit for installation in buildings.

- Between outdoor unit and BS unit (upstream of BS unit), use 3 pipings. Use this kit for such branching application.
- Between BS unit and indoor unit (downstream of BS unit) and between REFNET HEADER and cooling-only indoor unit, use 2 pipings.

3 pipings		2 pipings	
Upstream of BS unit	Downstream of BS unit	To cooling-only indoor unit	
Suction gas side piping	Gas side piping	Suction gas side piping	
Discharge gas(HP/LP gas) side piping	Liquid side piping	Liquid side piping	
Liquid side piping			

SELECTION PROCEDURE

According to the INSTALLATION MANUAL of outdoor unit.

INSTALLATION PROCEDURE

- 1 The pipe size of each parts are shown below.

KIT NAME	SUCTION GAS SIDE HEADER	DISCHARGE GAS(HP/LP GAS) SIDE HEADER	LIQUID SIDE HEADER
KHRP 25M33H 8branches			
KHRP 25M72H 8branches			

C: 3P113623D

- ② For the outlet/inlet pipings which can be connected in several piping sizes, cut the connections of piping diameter to be used with a pipe cutter according to the left lower table,

NOTE) 1. Cut in the center of the connections.

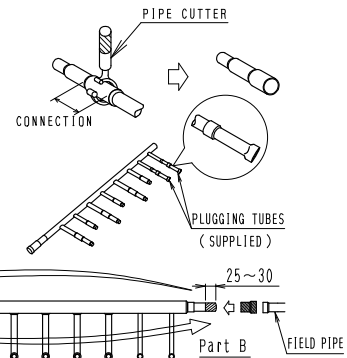
2. PIPE SIDE REDUCER

ex) When connecting the field pipe(φ22,2) to inlet liquid side pipe of KHRP25M73H, use PIPE SIDE REDUCER.

- ③ For non-connected outlet pipings at the indoor unit side for refrigerant branching, install the supplied plugging tube.

When connecting the field piping to inlet piping part B at the outdoor unit of liquid side header,

- Cut part B as shown with a pipe cutter and install it to part A.
- Connect the flared field piping to part B.



• Make sure to flow nitrogen gas through the pipe when brazing.

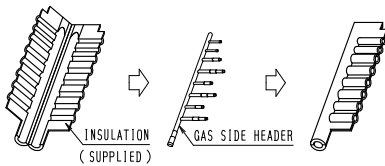
④ Insulation of HEADER

• Be sure to insulate the gas and liquid side HEADER.

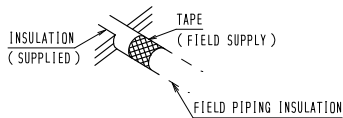
Note) The insulation of the refrigerant piping must be reinforced based on the environment of installation. Otherwise, dew may condensate on the surface of the insulation. For details, see Engineering Data.

SUCTION/DISCHARGE GAS SIDE HEADER

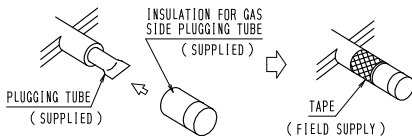
- i) Insulate the gas side header with the supplied insulation.



- ii) Seal the supplied insulation and field piping insulation junction with the field supplied tape.

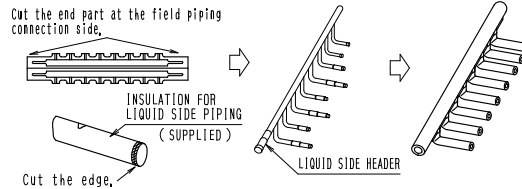


- iii) Seal the plugging tube mounting part with the field supplied tape after installing the supplied insulation for the supplied plugging tube.

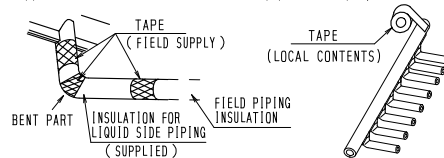


LIQUID SIDE HEADER

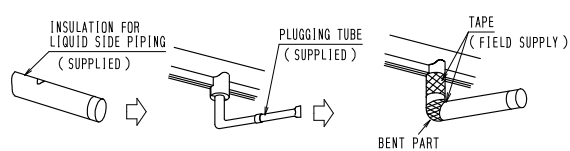
- i) Insulate the header using the insulation for header and the insulation for liquid side piping.



- ii) Seal the supplied insulation and liquid side piping insulation joint, the supplied liquid side piping insulation bending part, and the joint with the field piping insulation, using the field supplied tape. Seal the supplied insulation with a vinyl tape, for example.



- iii) Using the field supplied tape, seal the plugging tube mounting part after installing the insulation for liquid side piping (supplied).

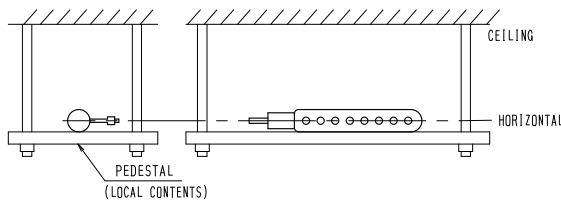


INSTALLATION PROCEDURE

- Do not apply extra force on the piping part. The brazed part may be damaged and it may result in gas leakage.

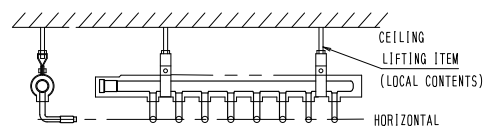
SUCTION/DISCHARGE GAS SIDE HEADER

- Place the header on the pedestal and install it so that it is horizontal.



LIQUID SIDE HEADER

- Suspend the header from the ceiling, and be sure to install it so that the outlet/inlet pipings at the header indoor unit side are horizontal at the lower side as shown below.

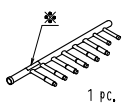
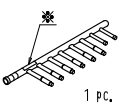
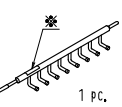
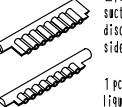
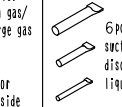

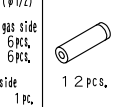
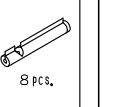
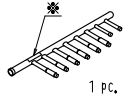
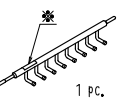
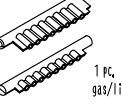
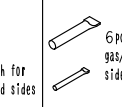
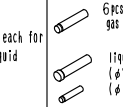
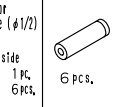
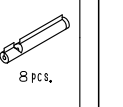


KHRP25M73HU9 / KHRP26M73HU9

REFNET HEADER INSTALLATION MANUAL

KHRP25M73HU • KHRP26M73HU (FOR R-410A)

■ THESE KITS INCLUDE THE FOLLOWING PARTS.

KIT NAME	S H A P E							
	(SUCTION) GAS SIDE HEADER	DISCHARGE GAS SIDE HEADER	LIQUID SIDE HEADER	INSULATION FOR HEADER	PLUG TUBE	REDUCER	INSULATION FOR GAS SIDE PLUG TUBE	INSULATION FOR LIQUID SIDE PIPING
KHRP 25M73HU (8branches)	 1 pc.	 1 pc.	 1 pc.	 2 pcs, for suction gas/discharge gas sides 1 pc, for liquid side	 6 pcs, each for suction gas/discharge gas/liquid sides	 6 pcs, for suction gas side (φ1/2) 6 pcs, for discharge gas side (φ3/4) 6 pcs, for liquid side (φ7/8) 6 pcs, (φ1/4)	 12 pcs.	 8 pcs.
KHRP 26M73HU (8branches)	 1 pc.		 1 pc.	 1 pc, each for gas/liquid sides	 6 pcs, each for gas/liquid sides	 6 pcs, for gas side (φ1/2) 6 pcs, for liquid side (φ7/8) 6 pcs, (φ1/4)	 6 pcs.	 8 pcs.

*---Make sure these headers are for R410A, (A label for R410A is stuck on them.)

APPLICATION

• Choose between the two kits according to the system and the location.

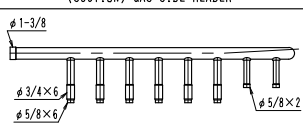
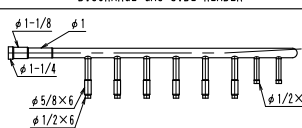
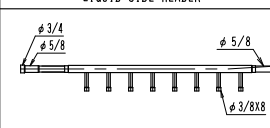
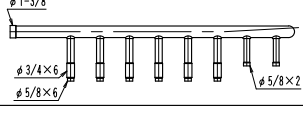
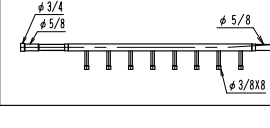
SYSTEM	HEAT PUMP		HEAT RECOVERY	
	KIT NAME		KIT NAME	
REFRIGERANT PIPING	Gas side piping	Suction gas side piping	Gas side piping	Suction gas side piping
	Liquid side piping	Discharge gas side piping	Liquid side piping	Liquid side piping
		Liquid side piping		

SELECTION PROCEDURE

According to the installation manual of outdoor unit.

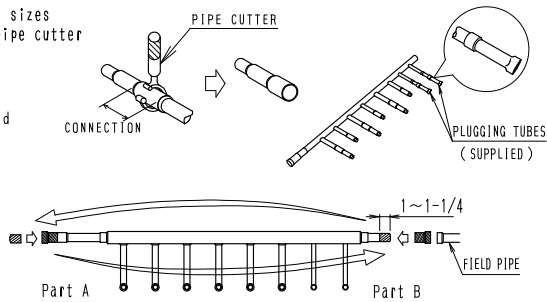
INSTALLATION PROCEDURE

① Inlet and outlet sizes of the headers

KIT NAME	(SUCTION) GAS SIDE HEADER	DISCHARGE GAS SIDE HEADER	LIQUID SIDE HEADER
KHRP 25M73HU			
KHRP 26M73HU			

② For the outlet/inlet of headers which can be connected with several sizes of field piping, cut the connections of headers to be used with a pipe cutter according to the above table.

- NOTE) 1. Cut the center of the connections,
2. Pipe size reducer
ex) When connecting a field pipe (φ7/8) to the inlet of liquid side header, use the supplied pipe size reducer.



③ For non-connected outlet at the indoor unit side, install the supplied plug tubes.

- When connecting a field piping to the inlet part B of liquid side header,
• Cut the part B as shown with a pipe cutter and install it to the part A,
• Connect a flared field piping to the part B.

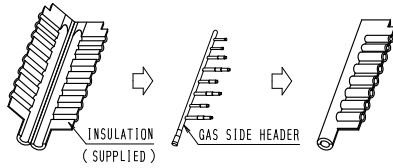
• Make sure to flow nitrogen gas through piping when brazing.

4 Insulation of HEADER

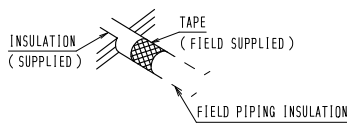
• Be sure to insulate the gas and liquid side header.
 Note) Insulation for refrigerant piping must be reinforced based on environment of installation site. Otherwise, dew may condensate on the surface of the insulation. For details, see the Engineering Data.

(SUCTION)GAS/DISCHARGE GAS SIDE HEADER

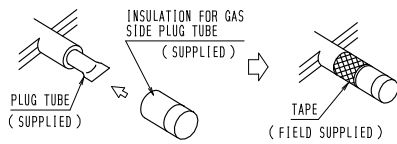
i) Insulate the gas side header with the supplied insulation.



ii) Seal the supplied insulation and field piping insulation junction with field supplied tape.

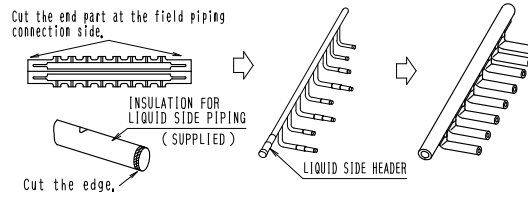


iii) Seal the plug tube with field supplied tape after installing the supplied insulation for the supplied plugging tube.

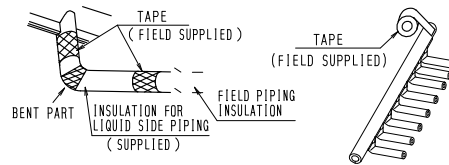


LIQUID SIDE HEADER

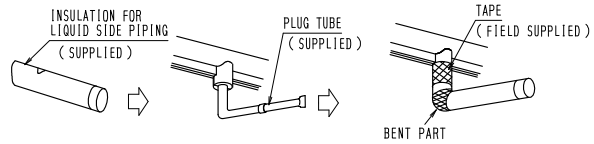
i) Insulate the liquid side header with the supplied insulation.



ii) Seal a joint of the insulations and a bent part with field supplied tape.



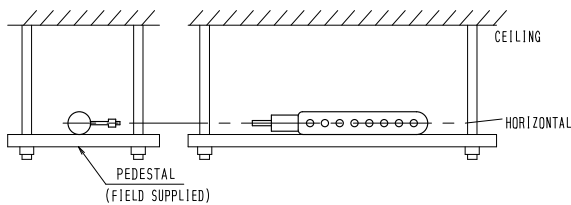
iii) Seal the plug tube after installing the insulation for liquid side piping (supplied).



INSTALLATION PROCEDURE

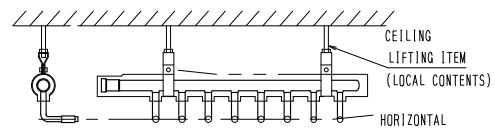
(SUCTION)GAS/DISCHARGE GAS SIDE HEADER

• Place the header on the pedestal and install it horizontally.



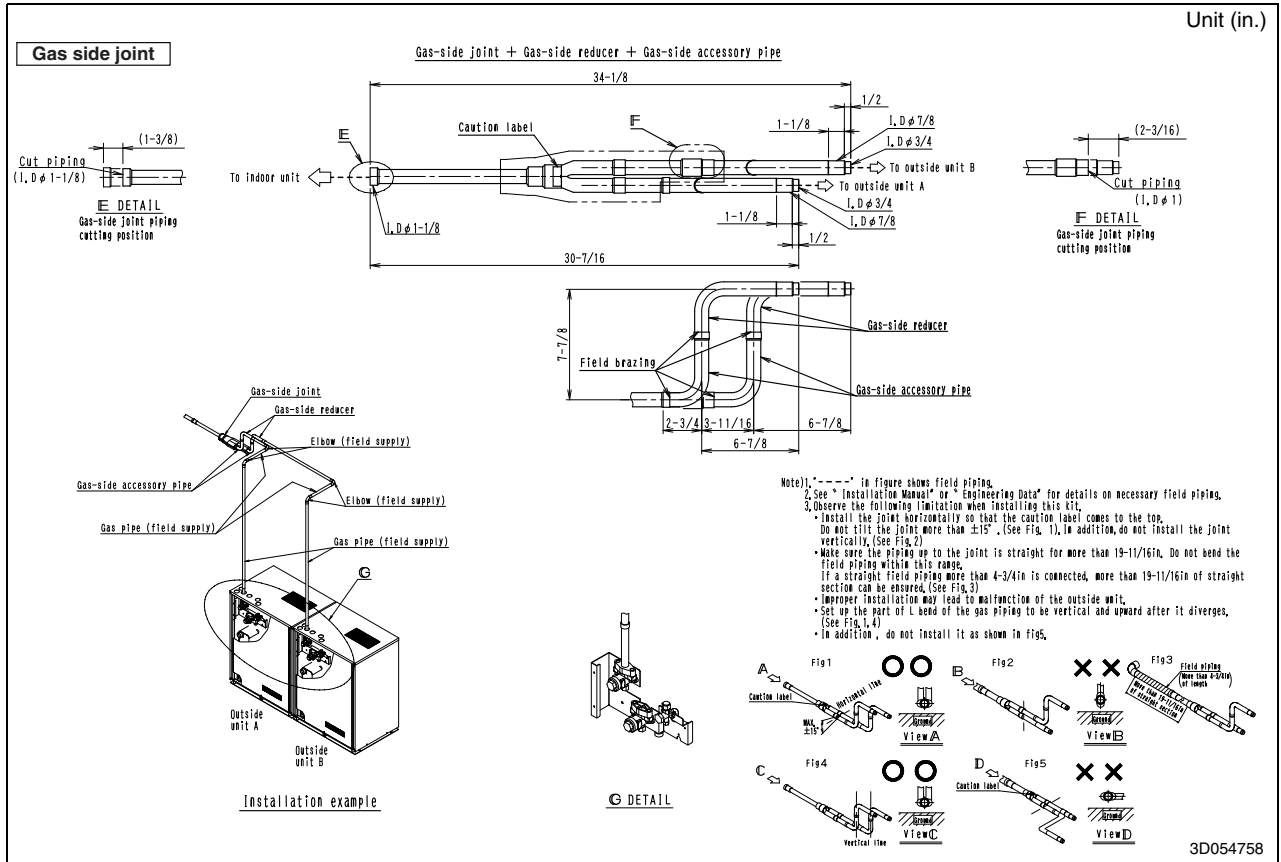
LIQUID SIDE HEADER

• Suspend the header from the ceiling and be sure to install it so that the outlet/inlet pipings at the indoor unit side are horizontal at the lower side as shown below.

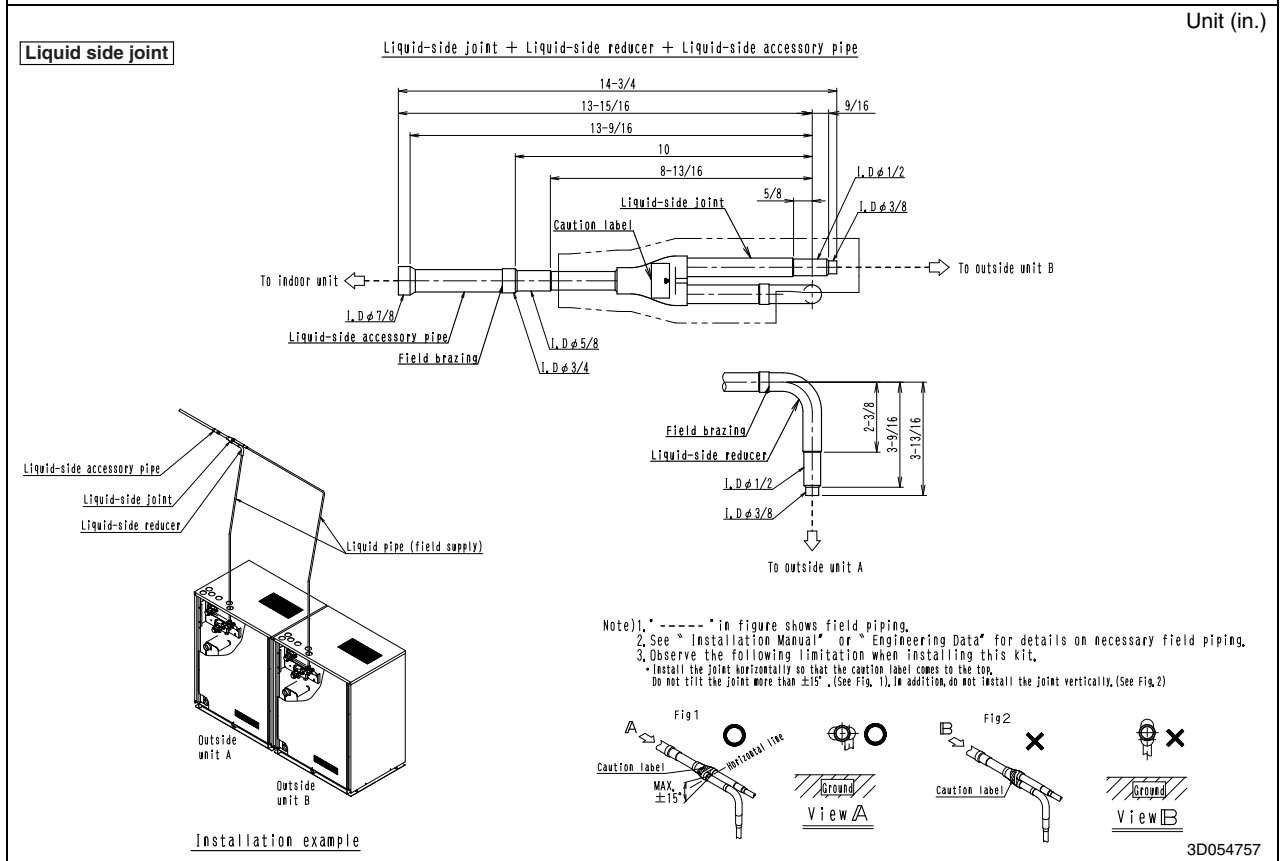


5.3 Outside Unit Multi Connection Piping Kit

BHFP22MA56U

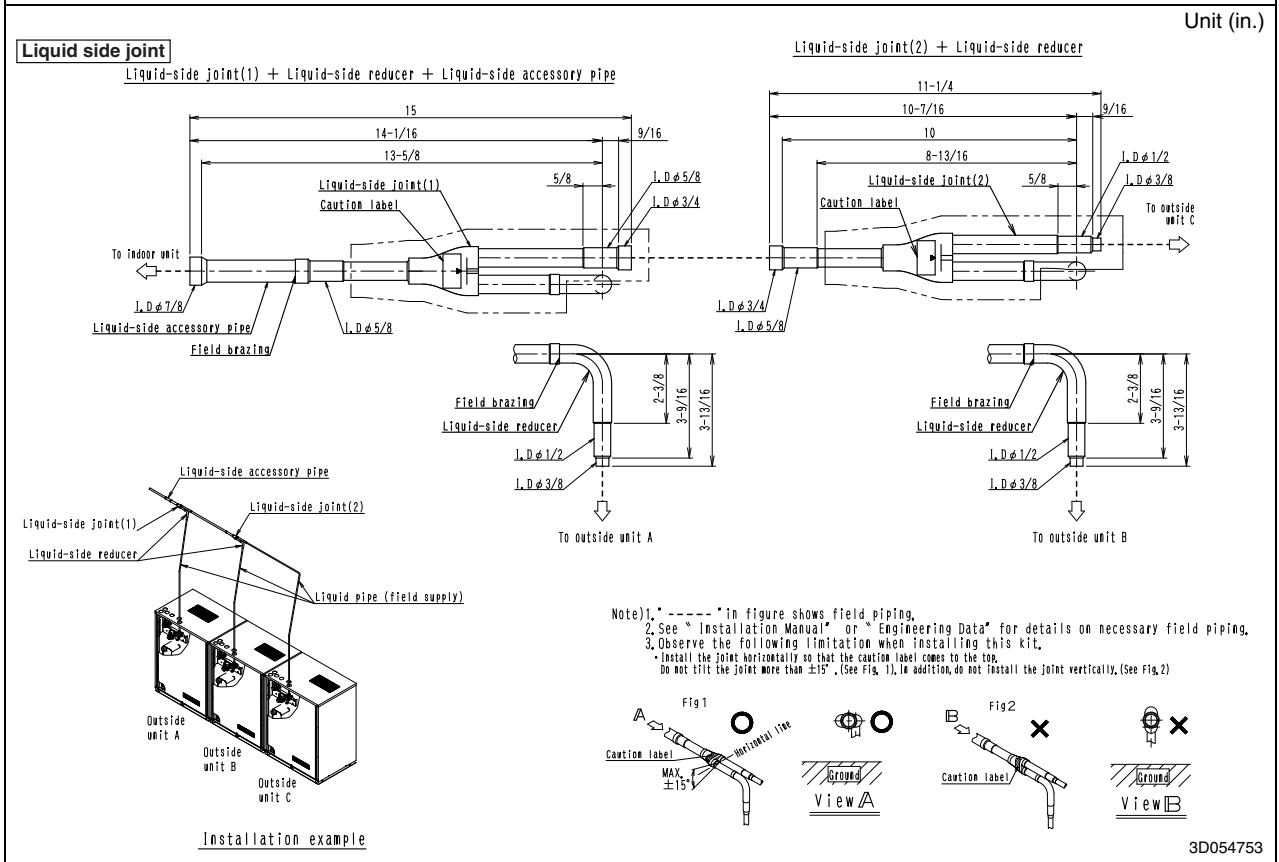
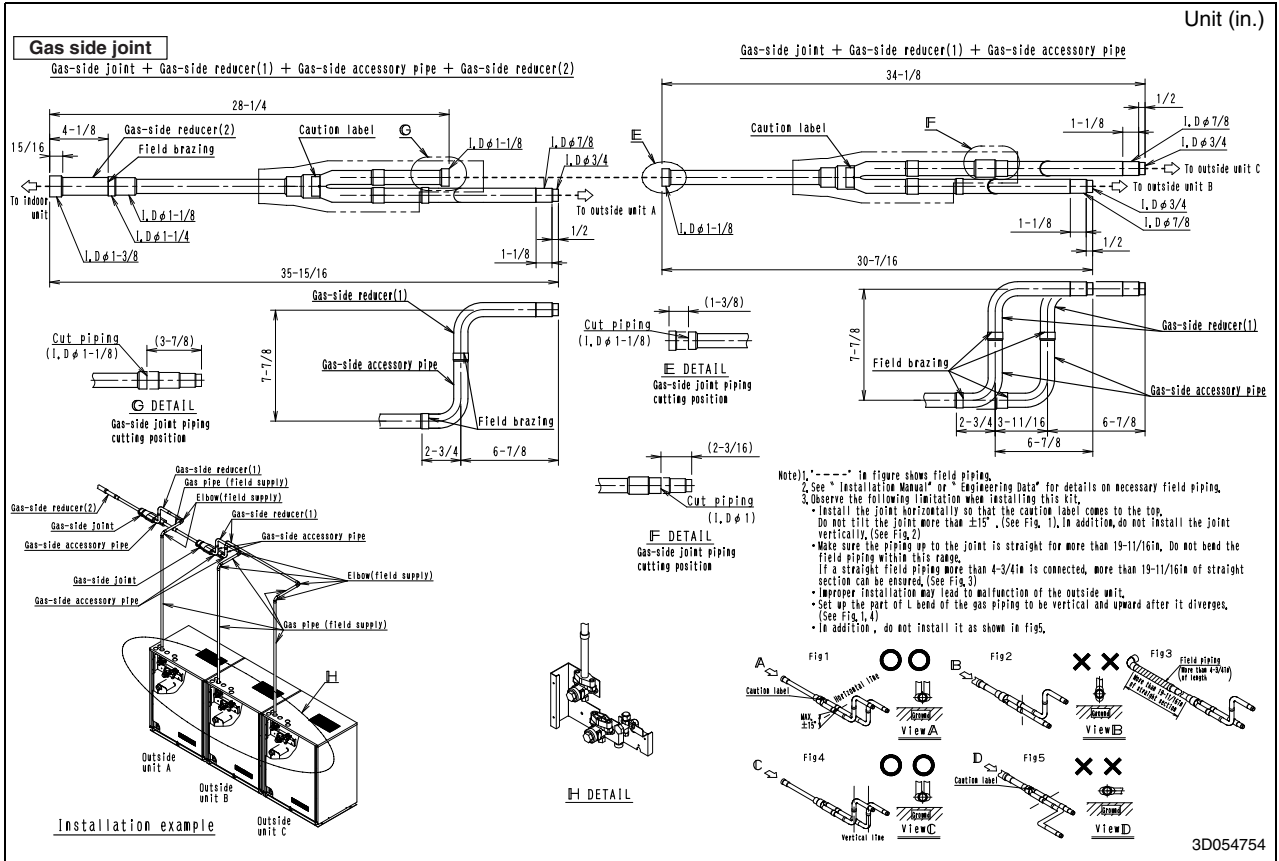


3D054758



3D054757

BHFP22MA84U



BHFP26MA56U

Unit (in.)

Gas side joint

Suction gas-side joint + Suction gas-side reducer + Suction gas-side accessory pipe

Labels: E, Caution label, F, To indoor unit, To outside unit B, To outside unit A, I.D. ϕ 1-1/8, I.D. ϕ 7/8, I.D. ϕ 3/4, I.D. ϕ 7/8, I.D. ϕ 3/4, I.D. ϕ 7/8, 34-1/8, 1-1/8, 1/2, 30-7/16, 1-1/8, 1/2, 7-7/8, Suction gas-side joint, Suction gas-side reducer, Field brazing, Suction gas-side accessory pipe, 2-3/4, 3-11/16, 6-7/8, 6-7/8.

E DETAIL
Suction gas-side joint piping cutting position

F DETAIL
Suction gas-side joint piping cutting position

G DETAIL

Installation example

Note): "----" in figure shows field piping.
 2. See "Installation Manual" or "Engineering Data" for details on necessary field piping.
 3. Observe the following limitation when installing this kit.
 - Install the joint horizontally so that the caution label comes to the top.
 - Do not tilt the joint more than $\pm 15^\circ$. (See Fig. 1), In addition, do not install the joint vertically. (See Fig. 2)
 - Make sure the piping up to the joint is straight for more than 19-11/16in. Do not bend the field piping within this range.
 - If a straight field piping more than 4-3/4in is connected, more than 19-11/16in of straight section can be ensured. (See Fig. 3)
 - Improper installation may lead to malfunction of the outside unit.
 - Set up the start of L bend of the gas piping to be vertical and upward after it diverges. (See Fig. 1, 4)
 - In addition, do not install it as shown in figs.

Fig 1, Fig 2, Fig 3, Fig 4, Fig 5, View A, View B, View C, View D.

3D054756

Unit (in.)

Liquid side joint

Liquid-side joint + Liquid-side reducer + Liquid-side accessory pipe

Labels: To indoor unit, To outside unit B, To outside unit A, 14-3/4, 13-15/16, 13-9/16, 10, 8-13/16, 5/8, I.D. ϕ 1/2, I.D. ϕ 3/8, I.D. ϕ 7/8, Liquid-side accessory pipe, Field brazing, I.D. ϕ 5/8, I.D. ϕ 3/4, 9/16, 2-3/8, 3-9/16, 3-13/16, Field brazing, Liquid-side reducer, I.D. ϕ 1/2, I.D. ϕ 3/8.

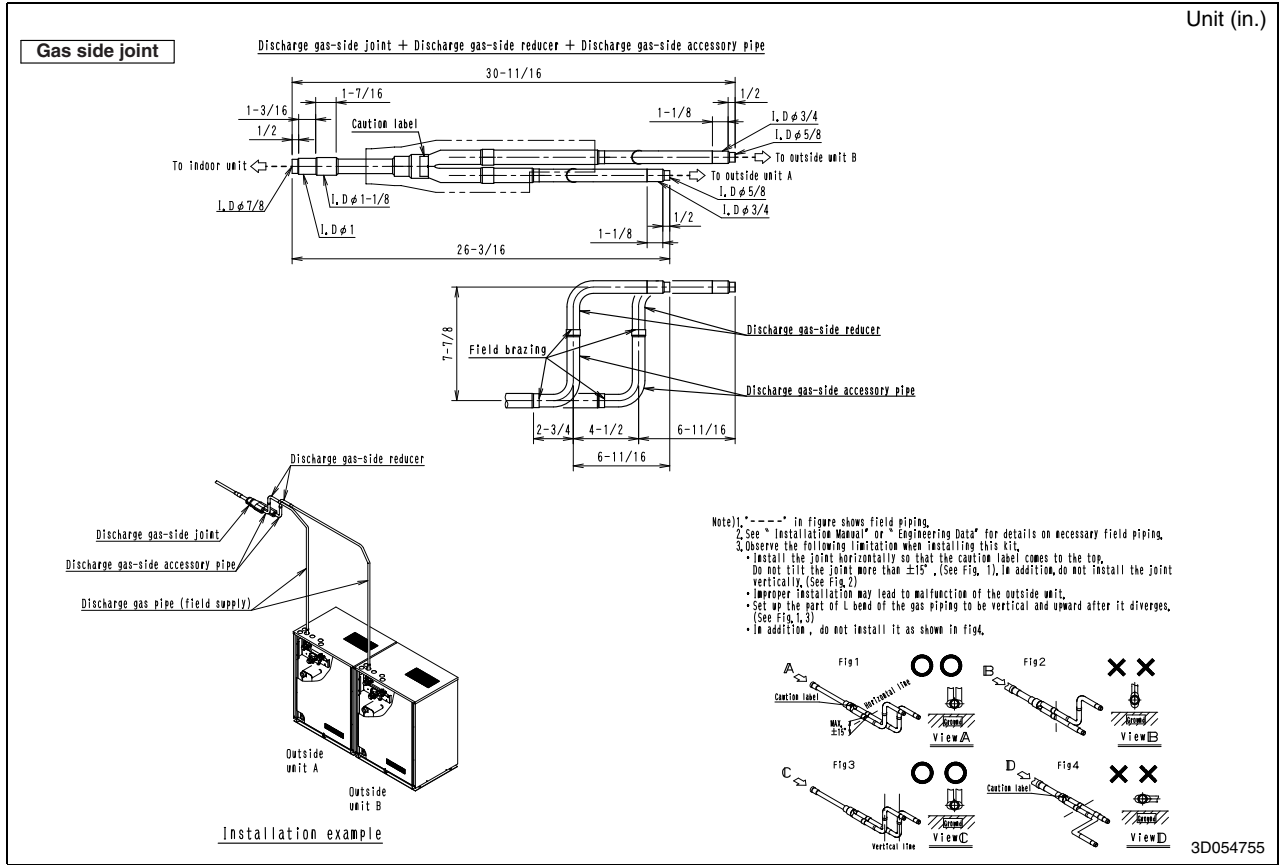
Installation example

Note): "----" in figure shows field piping.
 2. See "Installation Manual" or "Engineering Data" for details on necessary field piping.
 3. Observe the following limitation when installing this kit.
 - Install the joint horizontally so that the caution label comes to the top.
 - Do not tilt the joint more than $\pm 15^\circ$. (See Fig. 1), In addition, do not install the joint vertically. (See Fig. 2)

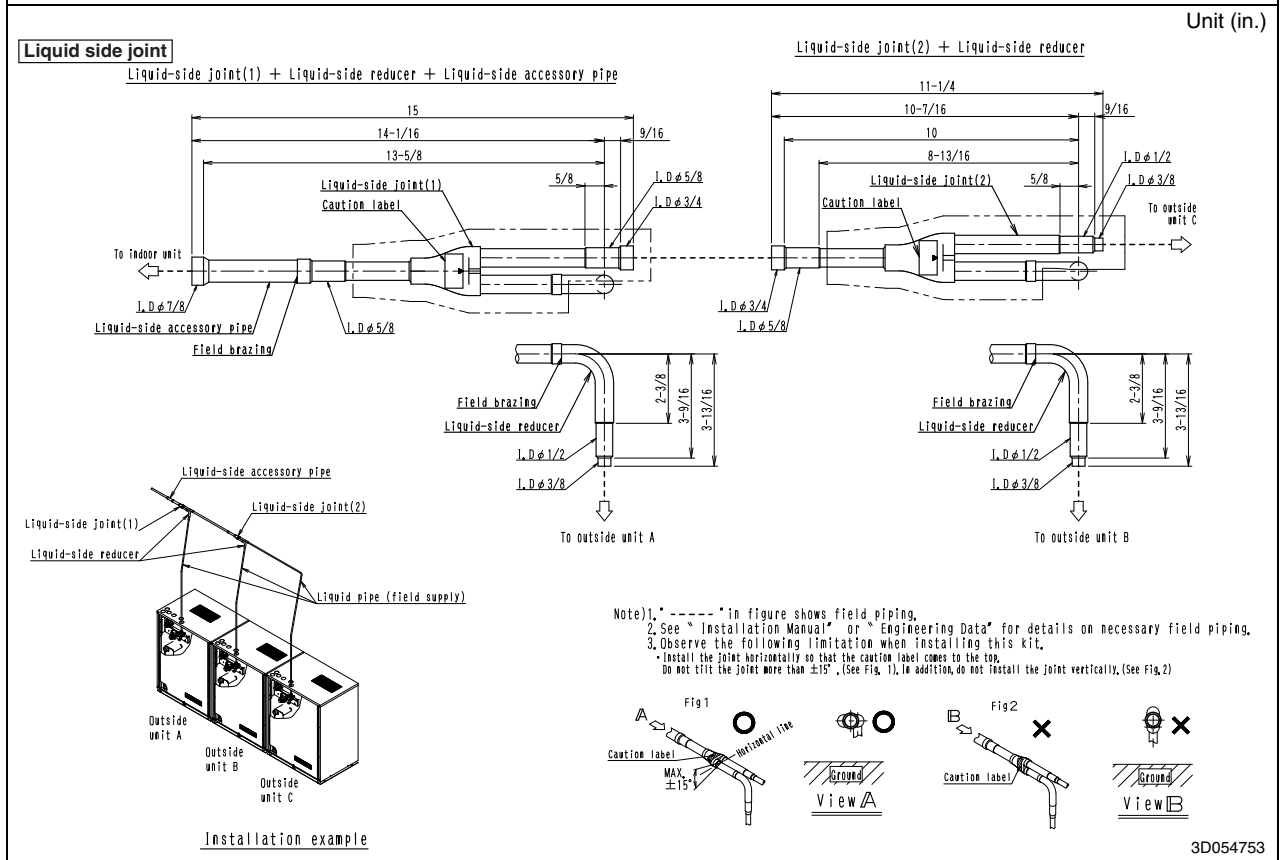
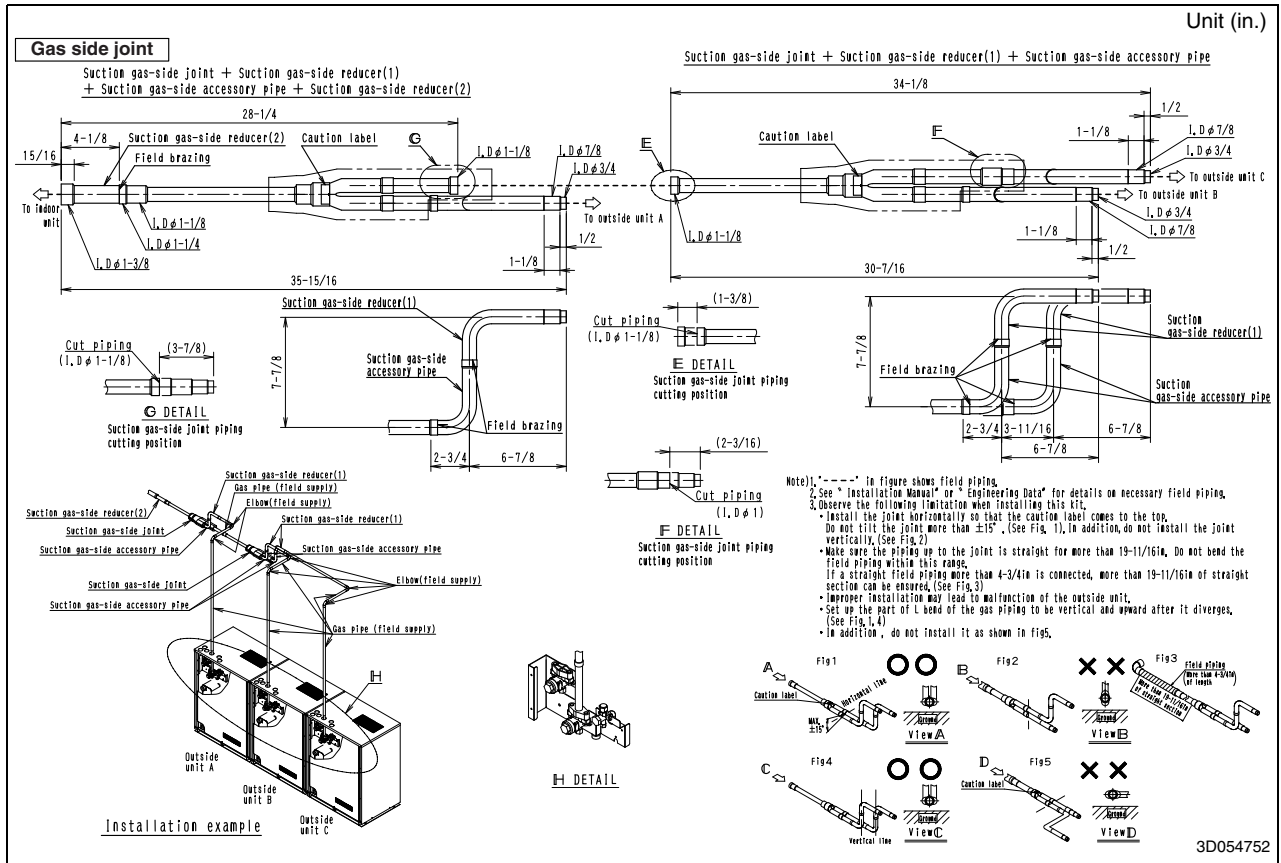
Fig 1, Fig 2, View A, View B.

3D054757

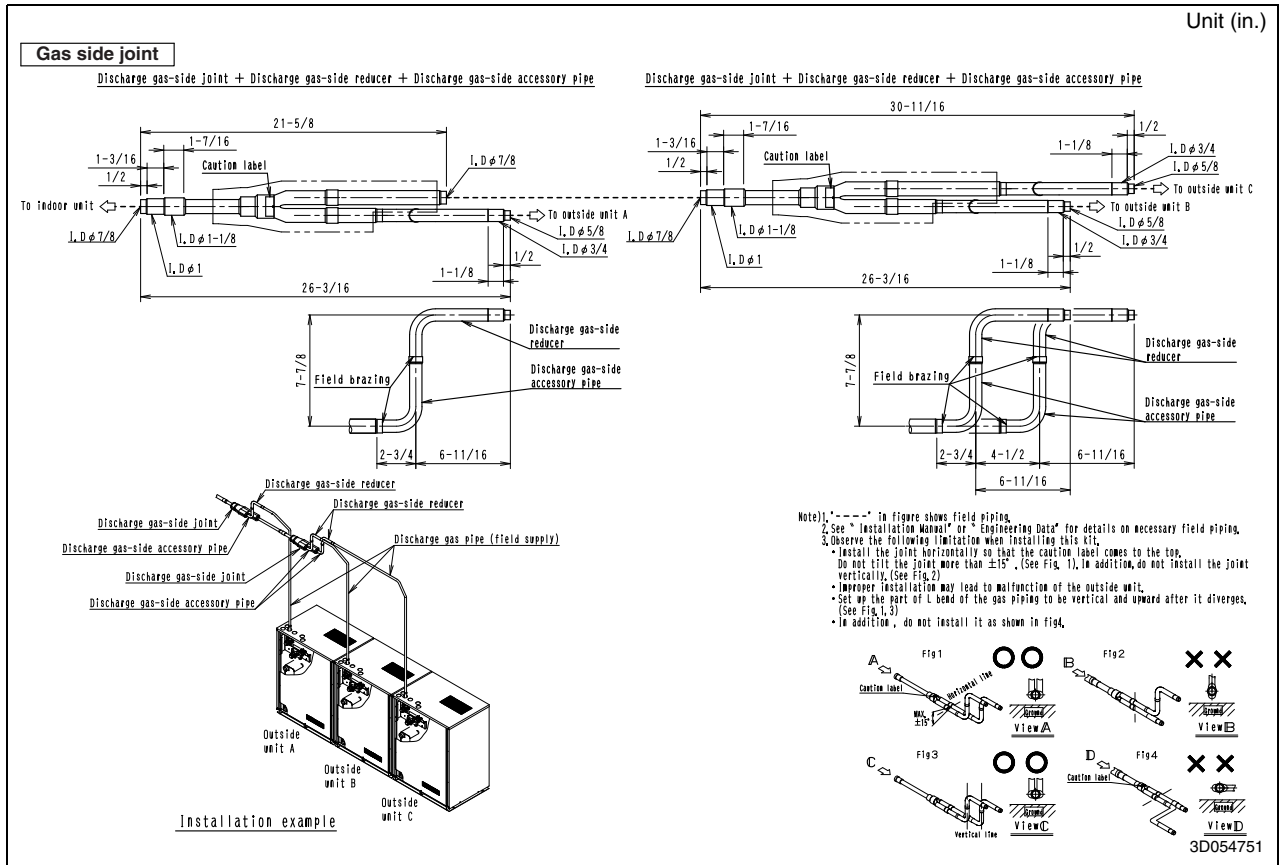
BHFP26MA56U, continued



BHFP26MA84U



BHFP26MA84U, continued



BHFP22MA56U / BHFP22MA84U, BHFP26MA56U / BHFP26MA84U

VRV-W Series Please be sure to read this manual before installation and follow the instructions carefully when performing installation work. 1P18542-1

Outside Unit Multi Connection Piping Kit Installation Manual BHFP22MA56・84U, BHFP26MA56・84U

Component parts ■ These kits contain the following parts, <Do not throw away any of the accessories until installation is completed.>

Kit name	(Section) gas-side joint	Discharge gas-side joint	SHAPE Liquid-side joint	(Section) gas-side reducer	(Section) gas-side accessory pipe	Discharge gas-side reducer	Discharge gas-side accessory pipe	Liquid-side reducer	Liquid-side accessory pipe	Horizontal trap for gas pipe	Horizontal trap for liquid pipe
BHFP22MA56U											
BHFP26MA56U											
BHFP22MA84U											
BHFP26MA84U											

Selection Procedure

Number of outside units connected	2 units	3 units
Outside unit Multi Connection Piping Kit	BHFP22・26MA56U	BHFP22・26MA84U

• 2 or 3 outside units can be connected.
• There are restrictions on the combination of outside units, so please refer to the Engineering Data of VRV for details.

Field supply parts ■ The following parts are needed to connect this kit.

Name	Qty	Selection Procedure
Elbow	4pc	Prepare a gas pipe diameter for the upper outside unit as listed in "Connecting Pipe Sizes and Location of Cutting the Joint".
Trap	1set	For installation materials

Caution
• Quantity and selection procedure of elbow only applies to a upper connection. (See the field part)
• The amount and selection procedure change by how to pass the refrigeration piping.

Installation examples

• The figure at the right shows a typical connection. Make sure to follow the installation restrictions and carry out installation taking the field requirements into consideration.

To the piping installer When installing this kit, apply the following restrictions.

Restrictions on installing multi connection piping kit

- Install the joint horizontally so that the caution label attached to joint comes to the top. Do not tilt the joint more than ±15°. (See Fig. 1), in addition, do not install the joint vertically. (See Fig. 2)
- Make sure the piping up to the joint is straight for more than 20in. Do not bend the field piping within this range. If a straight field piping more than 5in is connected, more than 20in of straight section can be observed. (See Fig. 3)
- Improper installation may lead to malfunction of the outside unit. Set up the part of a bend of the gas piping to be vertical and upward after it diverges. (See Fig. 4)
- In addition, do not install it as shown in Fig. 5.

Restrictions on piping between outside units

- Set up the piping to become horizontal or uphill so that oil does not collect in piping as for the piping between outside units.
 - Pattern 1: Piping between outside units. To indoor units.
 - Pattern 2: Piping between outside units. To indoor units.
 - Change to pattern 1 or 2.
 - Prohibited pattern: Descending inclination. To indoor units. Oil may collect in piping.
- Take the trap of 8in or more in the gas piping by using accessory pipe attached to this kit after it diverges. The refrigerant collects in piping and it causes the outside unit breakdown.
 - Prohibited pattern: The trap has not been installed in the gas piping. To indoor units. Oil collects in the stopping outside unit. Change to pattern 1 or 2.
- Install standing ups of 8in or more from the joint between the outside unit connection piping kits to the position within 6.5ft only for gas piping.
 - Case of With in 6.5ft: Piping between outside units. To indoor units. Min 6.5ft.
 - Case of more than 6.5ft: Min 6.5ft / Standing up of 8in or more. To indoor units.

BHFP22・26MA56U Installation Instructions **Caution** There are some restrictions on the interconnecting piping between the outside units. See the Installation manual attached to the outside units and make sure to carry out proper piping. If the piping restrictions are not observed, it may result in breakdown of the unit.

Connecting pipe sizes and location of cutting the joint

Main pipe (unit: in)	Pipe size (O.D.)		Liquid pipe
	(Section) gas pipe	Discharge gas pipe*	
RWEY0144	ø1-1/8	ø7/8	ø3/8
RWEY0158	ø1-1/8	ø7/8	ø5/8

*The discharge gas pipe is only for the heat recovery system.

Cutting procedure
• Use a pipe cutter for cutting.
• Cut the center of the connection area.

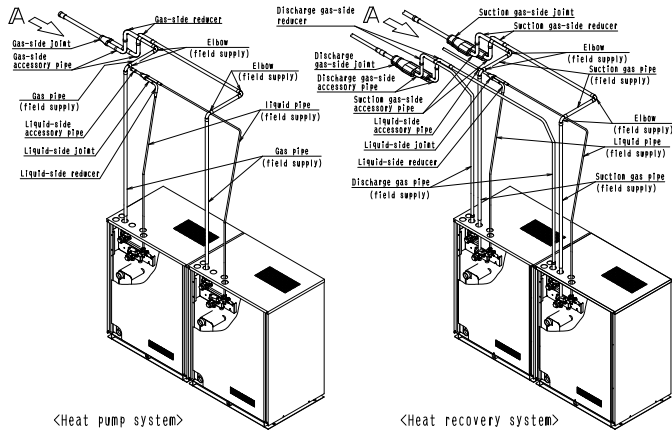
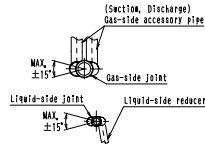
1 Installation examples Procedure for upper connection

1-1 Connection of gas and liquid pipes

Be sure to read **Restrictions on installing multi connection piping kit** and

Restrictions on piping between outside units.

- Connect the gas and liquid pipes as shown in the right figure. (When connecting the pipes, first connect the gas-side joint, the gas-side accessory pipe and the gas-side reducer, the liquid-side joint and the liquid-side reducer.)
- See the caution section in the installation manual attached to the outside unit for brazing pipes and connecting pipes with flare nuts.
- Install the joint in such a way that the face of the caution label stuck on it becomes horizontal (See the View A).



After connecting all the pipes, read **2**. The work after connecting the joints below for the next step.



BHPF22 • 26MA84U Installation Instructions



There are some restrictions on the interconnecting piping between the outside units. See the installation manual attached to the outside units and make sure to carry out proper piping. If the piping restrictions are not observed, it may result in breakdown of the unit.

Connecting pipe sizes and location of cutting the joint

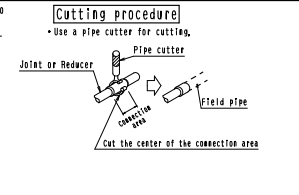
Select cutting point of a joint or a reducer which is suitable for the size of the interconnecting pipes determined according to the table below and cut it with a pipe cutter.

Main pipe (unit: in)	Pipe size (O.D.)			
	Suction gas pipe	Discharge gas pipe	Gas pipe	Liquid pipe
RWEY0216	#1-3/8	#1-1/8	#5/8	#3/4
RWEY0252	#1-3/8	#1-1/8	#5/8	#3/4

• The discharge gas pipe is only for the heat recovery system.

Pipe between the Outside unit Multi Connection Piping Kit and the outside unit (unit: in)	Pipe size (O.D.)			
	Suction gas pipe	Discharge gas pipe	Gas pipe	Liquid pipe
RWEY0216	#1-1/8	#7/8	#1/2	#3/4
RWEY0252	#1-1/8	#7/8	#5/8	#3/4

• The discharge gas pipe is only for the heat recovery system.

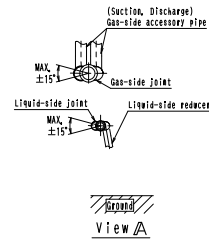
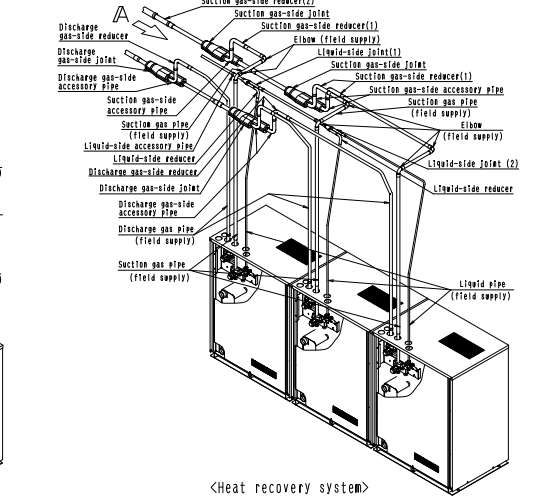
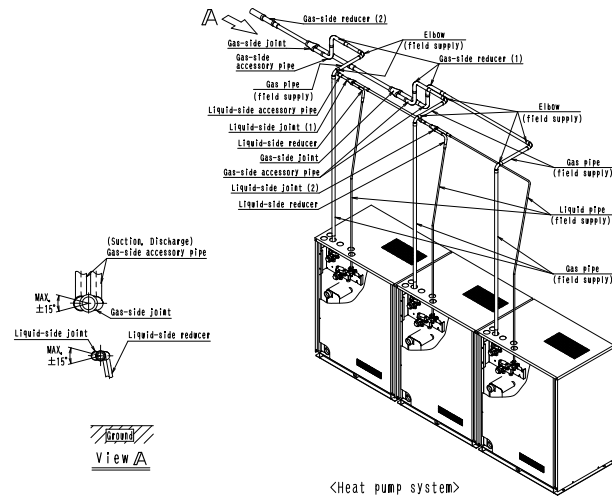


1 Installation examples Procedure for upper connection

1-1 Connection of gas and liquid pipes

Be sure to read **Restrictions on installing multi connection piping kit** and **Restrictions on piping between outside units.**

- Connect the gas and liquid pipes as shown in the right figure. (When connecting the pipes, first connect the gas-side joint, the gas-side accessory pipe and the gas-side reducer, the liquid-side joint and the liquid-side reducer.)
- See the caution section in the installation manual attached to the outside unit for brazing pipes and connecting pipes with flare nuts.
- Install the joint in such a way that the face of the caution label stuck on it becomes horizontal (See the View A).



2 The work after connecting the joints

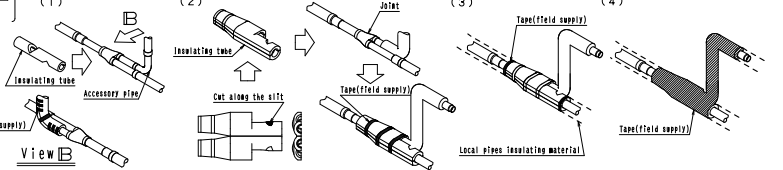
Connection of piping between the outside unit and the indoor unit

Follow the instructions in the installation manual attached to with the outside unit, when performing installation work.

Air tight test

Insulation of joints

- (1) Fit the insulation to the reducer and temporarily keep it in place with tape.
- (2) Fit the insulation to the joint and temporarily keep it in place with tape without leaving a seam between the insulation. (See the Figure at the right.)
- (3) Seal the seam between the insulation and the field supply piping insulation with the field supply tape.
- (4) Wrap the tape around the insulation attached to the joint without leaving a gap. (See the section shown in the figure at the right.)



6. Field Setting

6.1 RWEYQ-PTJU/RWEYQ-PYDN

⚠ SERVICE PRECAUTIONS (Touch the noncoating metal part, (ex. Control box) And make sure to eliminate static electricity before performing service.)

Caution when charging refrigerant additionally

This unit uses R410A as a refrigerant, so keep the following points.

- ① Use a charge hose and gauge manifold designed exclusive use R410A in order to ensure pressure resistance and prevent impurities (such as SUNISO oil) to get inside.
- ② Be sure to carry out a nitrogen blow when brazing.
If a flare connection is used, apply ETHER oil or ESTER oil to the flare section.
- ③ Air tight test should be performed at 450 psig.
- ④ Do vacuum drying certainly. And additional refrigerant must be charged in liquid state from liquid pipe.

Field setting If required, carry out field setting according to the following instructions. See the service manual for details.

1. Setting the dip switch

The dip switch settings should be done with the power shut off and remove the control box cover.

DS	No.	What to be set by dip switch
DS1	1	Setting of COOL/HEAT
	2~4	These are not used.
DS2	1~4	Do not change the factory setting.
DS3	1~2	

[[About setting of COOL/HEAT changeover]]

Carry out this setting only when customer will use COOL/HEAT selector (optional accessory).

Connect the COOL/HEAT selector to the printed circuit board (A1P) of outside unit and change the DS1-1 from 1N(factory set) to OUT.

2. Handling inspection door

When making the field settings using the push-button switch, shut the control box cover and open the inspection door as shown in the figure at right. Make sure to shut the inspection door when the work is finished.

3. Setting by push button switch(BS1-5)

- After turning on the power, make the settings using a resin ballpoint or other non-conducting object.
- Function of push button switch, (on the outside unit PCB(A1P))

MODE	TEST: ● HWL : ○	C/H SELECTOR		L. N. O. P		DEMAND
		IND	MASTER	SLAVE		
● H1P	● H2P	○ H3P	● H4P	● H5P	● H6P	● H7P

Lift this protruding portion to open the inspection door

LED STATE		
● LIGHT OFF	○ LIGHT ON	◐ FLICKERING

< Caution >

- The LED indication shown left shows the factory setting of the single system. (Not combination type)
- If you get confused in the middle of setting process, push the MODE button(BS1). Then, it returns to [SETTING MODE 1].

For resetting the address when the wiring is changed or an additional indoor unit is installed
 For test operation
 For field setting
 For changing the set mode

Change the setting mode The setting mode can be changed by the MODE button(BS1) according to the following procedure.

SETTING MODE 1

MODE

● H1P

LIGHT OFF

Hold down BS1 for 5 seconds.

Press BS1 once.

SETTING MODE 2

○ H1P

LIGHT ON

※ If H1P flickers(◐) and BS1 is pushed once, it changes to [SETTING MODE 1].

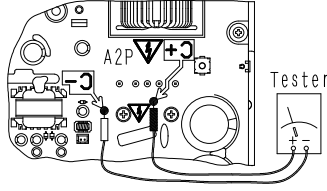
SETTING MODE 1 (COOL/HEAT selection setting): H1P is light OFF.										
Setting procedure	Details of COOL/HEAT selection setting									
① Push the SET button (BS2) and adjust the LED indication to either one of those shown in the right.	When setting COOL/HEAT selection for each outside system individually, (factory set)									
	In case of master unit when setting COOL/HEAT selection for multiple system together. (*1)									
	In case of slave unit when setting COOL/HEAT selection for multiple system together. (*1)									
② Push the RETURN button(BS3) and the setting is defined.										
* See the service manual for detail.										
SETTING MODE 2 : H1P is light ON		Setting of the following items (A) to (F) can be carried out.								
Setting procedure	Details of setting									
① Push the SET button(BS2) and adjust the LED indication to the example shown in the right according to the required mode(A ~ F).	(A) Additional refrigerant charging operation setting									
	(B) Refrigerant recovery operation /Evacuation mode setting									
	(C) Auto demand control setting									
	(D) Demand 1 level setting									
	(E) External control adapter setting (*1)									
	(F) Remote controller display malfunction code, when interlock open setting									
② Push the RETURN button(BS3). (The current setting will be indicated.)										
③ Push the SET button(BS2) and adjust the LED indication to the example shown in the right according to the required setting. (FOR (A),(D),(E) - ON • OFF FOR (C) - OFF • Demand 1 ~ 2 FOR (D) - LEVEL 1 ~ 3 FOR (F) - OFF • 5 ~ 35 minutes) *2 "Demand 2" setting is even more "power-saving" operation than "Demand 1" setting. *3 In setting (D), Auto demand operation can be carried Level 1: 60% level Level 2: 70% level Level 3: 80% level *4 There are 7 stages in "error indication - ON" setting where you can set the amount of interval time until each error indication.	(A)(B) ON									
	(E) OFF (factory set)									
	(C) OFF (factory set)									
	(*2) Demand setting 1									
	(D) Level 1									
		(*3) Level 2 (factory set)								
	(F) (*4)	OFF (factory set)								
		5 minutes								
		10 minutes								
		15 minutes								
20 minutes										
25 minutes										
30 minutes										
35 minutes										
④ Push the RETURN button(BS3) for defining the setting.										
⑤ When the RETURN button(BS3) is pushed again, the system starts the operation according to the setting.										
* See the service manual for setting other than the above.										
CONFIRMATION OF SETTING		The following items can be confirmed by [SETTING MODE 1] (H1P : light OFF).								
Confirming item										
Indication of the current operating state	● : Normal ○ : Malfunction ◐ : Under preparation or under check operation									
Indication of COOL/HEAT selection setting	When setting COOL/HEAT selection for each outside system individually, (factory set)									
	In case of master unit when setting COOL/HEAT selection for multiple system together.									
	In case of slave unit when setting COOL/HEAT selection for multiple system together.									

⚠ WARNING ⚡ ELECTRIC SHOCK

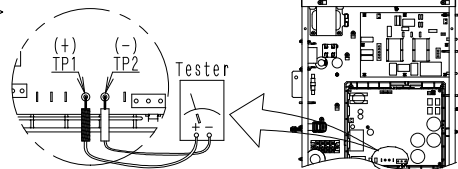
◎ Caution when performing service.

- Do not remove the control box cover for 10 minutes after the power supply is turned off because of high voltage.
- After removing the control box cover, measure the points shown below with a tester and confirm that the voltage of the capacitor in the main circuit is less than DC50V.

<RWEYQ72/84PTJU>



<RWEYQ72/84PYDN>



Caution for multiple combination units

- Carry out all the settings from the master unit, (Setting from the slave units is not effective.)
- Indication on the outside unit PCB (see the hatched area(▨))

	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
Master unit	●	●	○	●	●	●	●	○
Slave unit 1	●	●	●	●	●	●	●	▨
Slave unit 2	●	●	●	●	●	●	●	▨

- The outside unit connected transmission wiring to indoor unit is the master unit, (The other outside units are the slave units.)

AFTER SETTING When use the [Setting mode 2], mark your settings on the following.

Ⓒ Auto demand control setting	Demand 1 • Demand 2 • OFF
Ⓓ Demand 1 level setting	Level 1 • Level 2 • Level 3
Ⓔ External control adapter setting	* ON • OFF
Ⓕ Remote controller display malfunction code, when interlock open setting	OFF • ON(5 • 10 • 15 • 20 • 25 • 30 • 35 minutes)

*When use external control adapter, "ON" setting,

< Caution >

*1 When selecting demand operation by an outside order or operation mode setting with a COOL/HEAT central remote controller, External control adapter for outside unit(optional accessory) is required, See the instruction attached to the adapter for details,

Service mode operation method

1. In case of multiple combination units, do setting and check the LED indication with master unit. (see **Caution for multiple combination units**)
2. After turning on the power supply, the unit cannot be started the operation until the H2P LED goes off (maximum 12 minutes).

Check operation method

- Check the stop valves. (Make sure to open the gas and liquid stop valve.)
- Run the pump to circulate water.

• Carry out check operation after installation.

Otherwise the malfunction code "U3" will be shown in the remote controller display and the unit cannot be operated.

When carrying out check operation, shut the control box cover.

- ① For the purpose of compressor protection, make sure to turn on the power supply 6 hours before starting operation.
- ② Set to **SETTING MODE 1** (H1P: light OFF).
- ③ Press the TEST button(BS4) for 5 seconds or more when the unit is at standstill. Then, the unit starts the check operation.

If H2P flashes and the remote controller indicates "👁" (Test operation) and "CENTRAL CONTROL" (Under centralized control), it may take 10 minutes to bring the state of refrigerant uniform before the compressor starts, but this is not a malfunction.

The check operation is automatically carried out in cooling mode.

Depending on the situation, the refrigerant running sound or the magnetic sound of a solenoid valve may become loud during this operation.

The items on the right are automatically checked.

- ④ Close the front panel during the check operation. (A misjudgement may be carried out.)

- ⑤ After operating the unit for 15 minutes (maximum 30 minutes), it automatically stops.

Check the operation results by the outside unit LED indication. (See the table shown below.)

	H1P	H2P	H3P	H4P	H5P	H6P	H7P
Normally finish	●	●	○	●	●	●	●
Abnormally finish	●	○	○	●	●	●	●

- Check of miswiring
- Check of stop valve opening
- Check of refrigerant charge (excessive refrigerant charge)
- Automatic judgement of piping length

< Caution >

- The peculiar trouble of indoor units cannot be checked. After check operation is finished, check the indoor units individually by normal operation using the remote controller.
- The LED indication during this operation changes, but it is not a malfunction.
- Close the front panel to prevent a false judgement during check operation.

【Measures to be taken when operation finished by abnormality】

1. Confirm the malfunction code by the remote controller.
2. Correct what is abnormal. (See the installation manual, operation manual and service manual, or get in contact with the dealer.)
3. After the abnormality is corrected, press the RETURN button(BS3) and reset the malfunction code.
4. Carry out the check operation again and confirm that the abnormality is properly corrected.
 - * If no malfunction code is indicated on the remote controller, it is possible to start normal operation after 5 minutes.

Additional refrigerant charging method

* If the total refrigerant cannot be charged during the outside unit is at standstill, charge the additional refrigerant by this method. Otherwise, trouble will be caused.

- ① Turn on the power supply for the indoor units and the outside unit.
- ② Run the pump to circulate water.

2P190474H

- ③ All stop valves to full open,
 note) • Heat recovery system: Suction gas, discharge gas and liquid side stop valves to full open,
 • Heat pump system: Only discharge gas and liquid side stop valves to full open,
 (Suction gas side stop valve is totally shut.)
- ④ After 10 minutes, fully close liquid side stop valve and then open the valve by turning 180°.
- ⑤ While the unit is at standstill and under the [SETTING MODE 2], set the (A) additional refrigerant charging operation to ON. Then, the operation starts, H2P has flickered and the remote controller indicates "👁" (Test operation) and "CENTRAL CONTROL" (Under centralized control).
- ⑥ Once the appropriate amount of refrigerant is charged, press the RETURN button (BS3) and stop operation.
 (The operation automatically stops within approximately 30 minutes.
 If the refrigerant charge cannot be finished within 30 minutes, set the (A) additional refrigerant charge to ON and restart operation. If the operation stops immediately after restart, there is a possibility of having been overcharged. Stop adding refrigerant and check the added volume again.
 If it is difficult to charge the refrigerant additionally, decrease the water temperature or warm the refrigerant tank. (Warm the refrigerant tank with a stove or a hot water of 100°F or less.)
- ⑦ After the refrigerant charge hose is removed, make sure to bring the liquid side stop valve to full open immediately. (Otherwise the piping may burst due to liquid seal.)

Field setting for antifreeze control

① Hold down the BS1 button for 5 seconds or more to go to the "SETTING MODE 2" (H1P is light ON.)

② Push the BS2 button 58 times to get the LED indications on the right.

	H1P	H2P	H3P	H4P	H5P	H6P	H7P
③ Push the BS3 button once. (The current setting will be indicated.)	○	○	○	○	●	○	●
④ Push the BS2 button to get the LED indications below in accordance with the antifreeze and concentration.							
0 (default) Water	○	●	●	●	●	●	●
2 EG 35%	○	●	●	●	●	○	●
3 EG 45% - 50%	○	●	●	●	●	○	○
4 EG 30%, PG 30%	○	●	●	●	○	●	●
5 PG 35%	○	●	●	●	○	●	○
6 EG 40%, PG 40%	○	●	●	●	○	○	●
7 PG 45% - 50%	○	●	●	●	○	○	○
9 EG 10%, PG 10%	○	●	●	○	●	●	○
10 EG 15%, PG 15%	○	●	●	○	●	○	●
11 EG 20%, PG 20%	○	●	●	○	●	○	○
12 EG 25%, PG 25%	○	●	●	○	○	●	●



⑤ Push the BS3 button twice to complete the setting.

⑥ Push the BS1 button once to go back to the "SETTING MODE 1", (H1P is light OFF.)

EG: Ethylene Glycol, PG: Propylene Glycol

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Refrigerant recovery operation method

- ① When the unit is at standstill and under the **SETTING MODE 2**, set the **Ⓑ Refrigerant recovery/Evacuation mode** to ON. The expansion valves in the indoor and outside units will be opened completely and some of the solenoid valves will be turned on.
 (When H1P lights up and the remote controller indicates “” (Test operation) and “” (Under centralized control), the operation will be prohibited.)
- ② Recover the refrigerant by a refrigerant reclaimer. For details, see the operation manual attached to the refrigerant reclaimer.
- ③ Press the MODE button(BS1) and reset the **SETTING MODE 2**.

Caution


Do not shut off the power supply to the outside unit when evacuating the unit.

(If it is shut off, the solenoid valves close and the outside unit cannot be evacuated.)

※When evacuation is required for service, use this mode. Evacuate the system with a vacuum pump at present procedure ②.

⚠ CAUTION

- Be sure to carry out the field setting for antifreeze control as shown on the left in accordance with the antifreeze and the concentration. Failure to do so may result in incorrect operation or malfunction of the system.



CAUTION

Make sure to shut the inspection door after the service is finished.

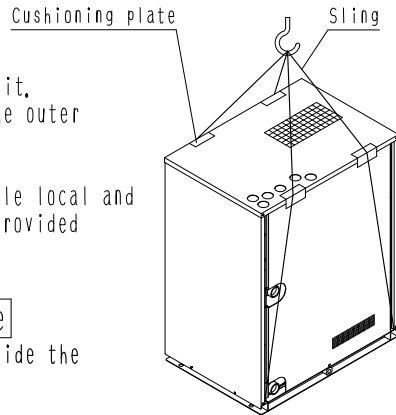
※Otherwise it may cause malfunction by such as intrusion of water or foreign materials

2P190474H

NOTE

To those who install or move the unit

1. When lifting the unit,
Use two slings that are at least 13ft long to hang the unit.
Put cushioning plates or rags where the slings contact the outer casing, in order to prevent it from being damaged.
2. Perform grounding work.
The unit must be grounded in compliance with the applicable local and national codes. All field wiring and components must be provided by licensed electrician.
3. Be sure to install a ground fault circuit interrupter.



To those who carry out maintenance service

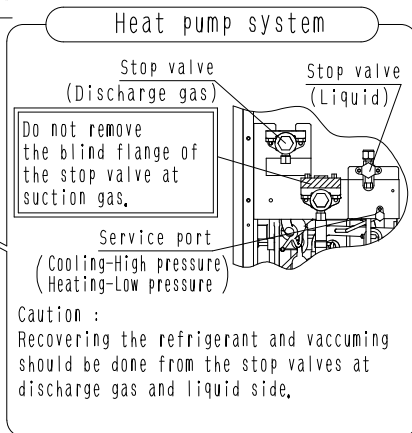
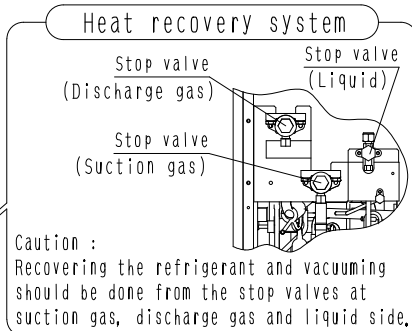
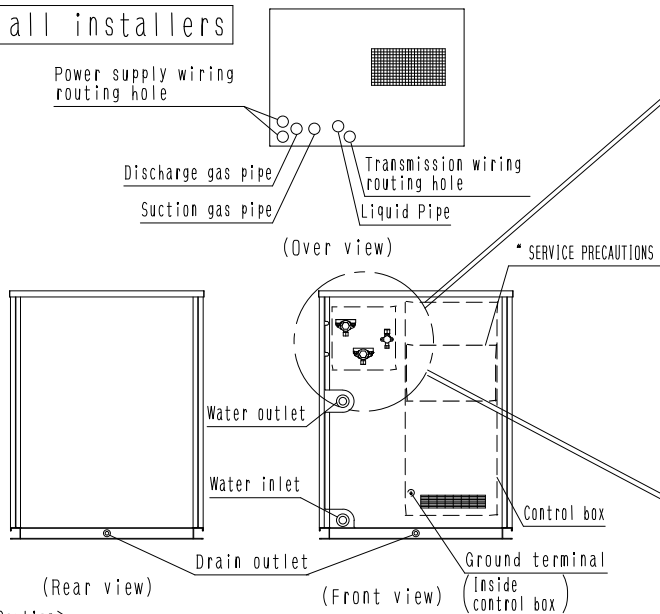
The abnormality lamp lights on the PC board installed inside the control box.

(When the lamp flashes : under preparation,
(When the lamp turns on : indication of abnormality.)

In case of multi connection outside units, check with the PC board mounted on the master unit. The outside unit connected to the indoor units with transmission wire is the master unit.

*For details see the "SERVICE PRECAUTIONS" label stucked on the control box.

To all installers



<Caution>
When recovering the refrigerant, run the water pump and circulate water at the specified flow rate and temperature to prevent heat exchanger from freezing.

3P190475C

6.2 RWEYQ-PTJU (In case of manufacturing code: RWEYQ-PTJU9)

⚠ SERVICE PRECAUTIONS (Touch the noncoating metal part, (ex. Electrical Components Box) And make sure to eliminate static electricity before performing service.)

Caution when charging the refrigerant additionally

This unit uses R410A as a refrigerant, so keep the following points,

- ① Use the charge hose and gauge manifold designed exclusive use R410A in order to ensure pressure resistance and prevent impurities (such as SUNISO oil) to get inside.
- ② Be sure to carry out a nitrogen blow when brazing.
If a flare connection is being used, apply ETHER oil or ESTER oil to the flare section.
- ③ The airtightness test should be performed at 450 psi.
- ④ Do vacuum drying certainly. And additional refrigerant must be charged in liquid state from liquid pipe.

Field setting If required, carry out field setting according to the following instructions. See the service manual for details.

1. Setting the dip switch

The dip switch settings should be done with the power shut off and remove the Electrical Components Box cover.

DS	No.	What to be set by dip switch
DS1	1	Setting of COOL/HEAT
	2~4	These are not used. Do not change the factory setting.

[[About setting of COOL/HEAT changeover]]

Carry out this setting only when customer will use COOL/HEAT selector (optional accessory).

2. Handling inspection door

When making the field settings using the push-button switch, shut the Electrical Components BOX cover and open the inspection door as shown in the figure at right. Make sure to shut the inspection door when the work is finished.

3. Setting by push button switch(BS1~5)

- After turning on the power, make the settings using a resin ballpoint or other non-conducting object.
- Function of push button switch, (on the outside unit PCB(A1P))

MODE	TEST: ●	C/H SELECTOR		L, N, O, P	DEMAND	
	HWL : ○	IND	MASTER			SLAVE
● H1P	● H2P	○ H3P	● H4P	● H5P	● H6P	● H7P

○ BS1	○ BS2	○ BS3	○ BS4	○ BS5
MODE	SET	RETURN	TEST	RESET

< Caution >

- The LED indication shown left shows the factory setting of the single system, (Not combination type)
- If you get confused in the middle of setting process, push the MODE button(BS1). Then, it returns to [SETTING MODE 1].

For resetting the address when the wiring is changed or an additional indoor unit is installed
 For test operation
 For field setting
 For changing the set mode

Change the setting mode The setting mode can be changed by the MODE button(BS1) according to the following procedure.

SETTING MODE 1 (MODE H1P, LIGHT OFF) → Hold down BS1 for 5 seconds → SETTING MODE 2 (MODE H1P, LIGHT ON) → Press BS1 once → SETTING MODE 1

* If H1P flickers (◐) and BS1 is pushed once, it changes to SETTING MODE 1.

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Installation of Outside Units

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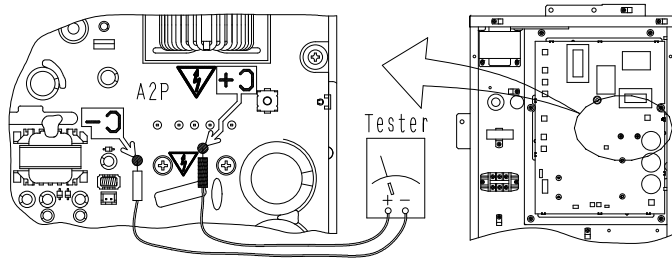
SETTING MODE 1 (COOL/HEAT selection setting): H1P is light OFF.		Example of LED indication and the places							
Setting procedure	Details of COOL/HEAT selection setting	H1P	H2P	H3P	H4P	H5P	H6P	H7P	
① Push the SET button (BS2) and adjust the LED indication to either one of those shown in the right.	When setting COOL/HEAT selection for each outside system individually, (factory set)	●	●	○	●	●	●	●	
	In case of master unit when setting COOL/HEAT selection for multiple system together. (*1)	●	●	○	●	●	●	●	
	In case of slave unit when setting COOL/HEAT selection for multiple system together. (*1)	●	●	○	●	●	●	●	
② Push the RETURN button (BS3) and the setting is defined.									
* See the service manual for detail.									
SETTING MODE 2 : H1P is light ON		Setting of the following items (A to F) can be carried out.							
Setting procedure	Details of setting	H1P	H2P	H3P	H4P	H5P	H6P	H7P	
① Push the SET button (BS2) and adjust the LED indication to the example shown in the right according to the required mode (A ~ F).	A) Additional refrigerant charging operation setting	○	●	○	●	○	●	○	
	B) Refrigerant recovery operation /Evacuation mode setting	○	●	○	●	○	●	○	
	C) Auto demand control setting	○	○	●	●	○	●	○	
	D) Demand 1 level setting	○	●	○	○	○	○	●	
	E) External control adapter setting (*1)	○	●	○	○	○	○	●	
	F) Remote controller display malfunction code, when interlock open setting	○	○	○	○	○	○	○	
② Push the RETURN button (BS3), (The current setting will be indicated.)									
③ Push the SET button (BS2) and adjust the LED indication to the example shown in the right according to the required setting. (FOR A, B, E) - ON • OFF FOR C - OFF • Demand 1 ~ 2 FOR D - LEVEL 1 ~ 3 FOR F - OFF • 5 ~ 35 minutes) *2 "Demand 2" setting is even more "power-saving" operation than "Demand 1" setting. *3 In setting D, Auto demand operation can be carried Level 1: 60% level Level 2: 70% level Level 3: 80% level *4 There are 7 stages in "error indication - ON" setting where you can set the amount of interval time until each error indication.	A, B) ON	○	●	●	●	○	●	○	
	E) OFF (factory set)	○	●	●	●	○	●	○	
	C) OFF (factory set)	○	●	●	●	○	●	○	
	(*2) Demand setting 1	Demand setting 1	○	●	●	●	○	●	○
		Demand setting 2	○	●	●	●	○	●	○
	(*3) Level 1	Level 1	○	●	●	●	○	●	○
		Level 2 (factory set)	○	●	●	●	○	●	○
		Level 3	○	●	●	●	○	●	○
	(*4) OFF (factory set)	5 minutes	○	●	●	●	○	●	○
		10 minutes	○	●	●	●	○	●	○
		15 minutes	○	●	●	●	○	●	○
		20 minutes	○	●	●	●	○	●	○
25 minutes		○	●	●	●	○	●	○	
30 minutes		○	●	●	●	○	●	○	
35 minutes		○	●	●	●	○	●	○	
④ Push the RETURN button (BS3) for defining the setting.									
⑤ When the RETURN button (BS3) is pushed again, the system starts the operation according to the setting.									
* See the service manual for setting other than the above.									
CONFIRMATION OF SETTING		The following items can be confirmed by [SETTING MODE 1] (H1P: light OFF).							
Confirming item		Example of LED indication and the places							
Indication of the current operating state	● : Normal ○ : Malfunction ◐ : Under preparation or under test operation	H1P	H2P	H3P	H4P	H5P	H6P	H7P	
Indication of COOL/HEAT selection setting	When setting COOL/HEAT selection for each outside system individually, (factory set)	●	●	○	●	●	●	●	
	In case of master unit when setting COOL/HEAT selection for multiple system together.	●	●	○	●	●	●	●	
	In case of slave unit when setting COOL/HEAT selection for multiple system together.	●	●	○	●	●	●	●	

⚠ WARNING

⚡ ELECTRIC SHOCK

⊙ Caution when performing service.

- Do not remove the Electrical Components Box cover for 10 minutes after the power supply is turned off because of high voltage.
- After removing the Electrical Components Box cover, measure the points shown below with a tester and confirm that the voltage of the capacitor in the main circuit is less than DC50V.



Caution for multiple combination units

- Carry out all the settings from the master unit, (Setting from the slave units are not effective.)
- Indication on the outside unit PCB (see the hatched area(▨))

	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
Master unit	●	●	○	●	●	●	●	▨
Slave unit 1	●	●	●	●	●	●	●	▨
Slave unit 2	●	●	●	●	●	●	●	▨

- The outside unit connected transmission wiring to indoor unit is the master unit. (The other outside units are the slave units.)

AFTER SETTING

When use the [Setting mode 2], mark your settings on the following.

- Ⓒ Auto demand control setting
Demand 1 • Demand 2 • OFF
- Ⓓ Demand 1 level setting
Level 1 • Level 2 • Level 3
- Ⓔ External control adapter setting
* ON • OFF
- Ⓕ Remote controller display malfunction code, when interlock open setting
OFF • ON (5 • 10 • 15 • 20 • 25 • 30 • 35 minutes)

* When use external control adapter, "ON" setting.


< Caution >

- *1 When selecting demand operation by an outside order or operation mode setting with a COOL/HEAT central remote controller, External control adapter for outside unit (optional accessory) is required. See the instruction attached to the adapter for details.

Service mode operation method

1. In case of multiple combination units, do setting and check the LED indication with master unit. (see **Caution for multiple combination units**)
2. After turning on the power supply, the unit cannot be started the operation until the H2P LED goes off (maximum 12 minutes).

Check operation method

- Check the stop valves. (Make sure to open the gas and liquid stop valve.)
 - Run the pump to circulate water.
 - Carry out check operation after installation.
 - Otherwise the malfunction code "U3" will be shown in the remote controller display and the unit cannot be operated.
 - When carry out check operation, shut the Electrical Components Box cover.
- ① For the purpose of compressor protection, make sure to turn on the power supply 6 hours before starting operation.
 - ② Set to **Setting mode 1** (H1P : light OFF).
 - ③ Press the TEST button (BS4) for 5 seconds or more when the unit is at standstill. Then, the unit starts the check operation.
 - (If H2P flashes and the remote controller indicates "  " (Test operation) and " **CENTRAL CONTROL** " (Under centralized control), it may take 10 minutes to bring the state of refrigerant uniform before the compressor starts, but this is not a malfunction.)
 - The check operation is automatically carried out in a cooling mode.
 - Depending on the situation, the refrigerant running sound or the magnetic sound of a solenoid valve may become loud during this operation.
 - The following items are automatically checked.
 - Check of miswiring
 - Check of stop valve opening
 - Check of refrigerant charge (excessive refrigerant charge)
 - Automatic judgement of piping length
 - ④ Close the front panel during the check operation. (A misjudgement may be carried out.)
 - ⑤ After operating the unit for 15 minutes (maximum 30 minutes), it automatically stops. Check the operation results by the outside unit LED indication. (See the table shown below.)

	H1P	H2P	H3P	H4P	H5P	H6P	H7P
Normally finish	●	●	○	●	●	●	●
Abnormally finish	●	○	○	●	●	●	●

< Caution >


- The peculiar trouble of indoor units cannot be checked. After check operation is finished, check the indoor units individually by normal operation using the remote controller.
- The LED indication during this operation changes, but it is not a malfunction.
- Close the front panel to prevent a false judgement during check operation.

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〔 Measures to be taken when operation finished by abnormality 〕



1. Confirm the malfunction code by the remote controller.
 2. Correct what is abnormal.
(See the installation manual, operation manual and service manual, or get in contact with the dealer.)
 3. After the abnormality is corrected, press the RETURN button(BS3) and reset the malfunction code.
 4. Carry out the check operation again and confirm that the abnormality is properly corrected.
- ※ If no malfunction code is indicated on the remote controller, it is possible to start normal operation after 5 minutes.

Additional refrigerant charging method

- ※ If the total refrigerant cannot be charged during the outside unit is at standstill, charge the additional refrigerant by this method. Otherwise, trouble will be caused.
- ① Turn on the power supply for the indoor units and the outside unit.
 - ② Run the pump to circulate water.
 - ③ All stop valves to full open.
note) • Heat recovery system: Suction gas, discharge gas and liquid side stop valves to full open,
• Heat pump system: Only discharge gas and liquid side stop valves to full open.
(Suction gas side stop valve is totally shut.)
 - ④ After 10 minutes, fully close liquid side stop valve and then open the valve by turning 180°.
 - ⑤ While the unit is at standstill and under the [Setting mode 2], set the (A) additional refrigerant charging operation to ON. Then, the operation starts, H2P has flickered and the remote controller indicates “” (Test operation) and “CENTRAL” (Under centralized control).
 - ⑥ Once the appropriate amount of refrigerant is charged, press the RETURN button(BS3) and stop operation.
(The operation automatically stops within approximately 30 minutes. If the refrigerant charge cannot be finished within 30 minutes, set the (A) additional refrigerant charge to ON and restart operation. If the operation stops immediately after restart, there is a possibility of having been overcharged. Stop adding refrigerant and check the added volume again.)
If it is difficult to charge the refrigerant additionally, decrease the water temperature or warm the refrigerant tank.
(Warm the refrigerant tank with a stupe or a hot water of 40 degrees or less.)
 - ⑦ After the refrigerant charge hose is removed, make sure to bring the liquid side stop valve to full open immediately.
(Otherwise the piping may burst due to liquid seal.)

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Refrigerant recovery operation method


- ① When the unit is at standstill and under the [Setting mode 2], set the (B) Refrigerant recovery/Evacuation mode to ON. The expansion valves in the indoor and outside units will be opened completely and some of the solenoid valves will be turned on.
 (When H1P lights up and the remote controller indicates "  " (Test operation) and "  " (Under centralized control), the operation will be prohibited.)
- ② Recover the refrigerant by a refrigerant reclaimer. For details, see the operation manual attached to the refrigerant reclaimer.
- ③ Press the MODE button (BS1) and reset the [Setting mode 2].

Caution

Do not block the power to the outside unit when evacuating the unit.

(If it is blocked, the solenoid valves close and the outside unit cannot be evacuated.)

- *When evacuation required for service, use this mode. Evacuate the system with a vacuum pump at present procedure ②.



CAUTIONS

Make sure to shut the inspection door after the service is finished.

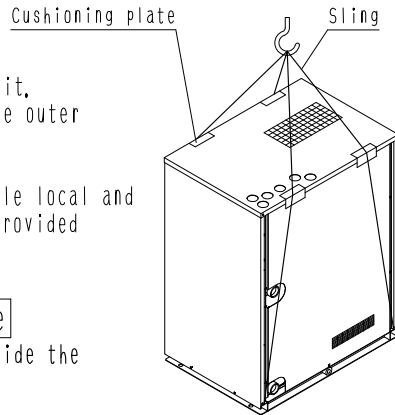
- *Otherwise it may cause malfunction by such as intrusion of water or foreign materials

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NOTE

To those who install or move the unit

- When lifting the unit,
Use two slings that are at least 13ft long to hang the unit.
Put cushioning plates or rags where the slings contact the outer casing, in order to prevent it from being damaged.
- Perform grounding work.
The unit must be grounded in compliance with the applicable local and national codes. All field wiring and components must be provided by licensed electrician.
- Be sure to install a ground fault circuit interrupter.



To those who carry out maintenance service

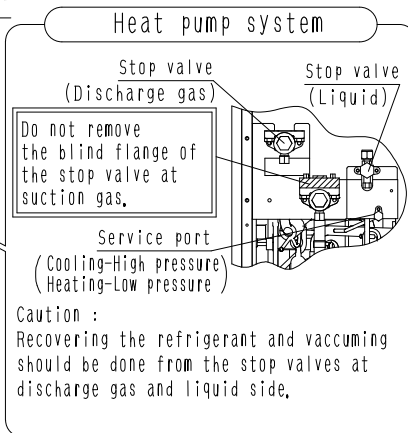
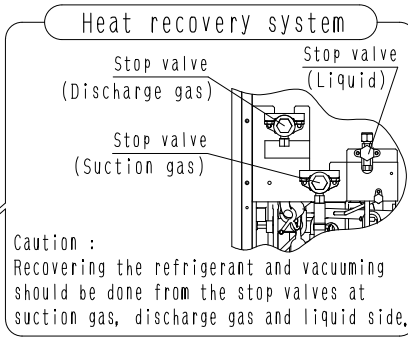
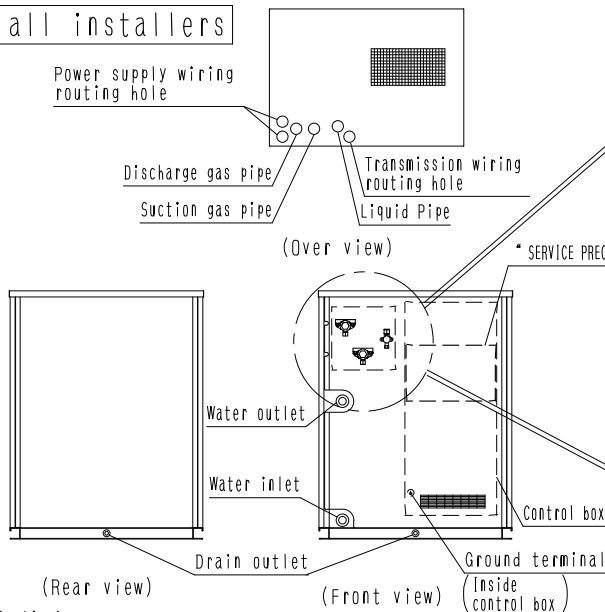
The abnormality lamp lights on the PC board installed inside the control box.

(When the lamp flashes : under preparation,
(When the lamp turns on : indication of abnormality.)

In case of multi connection outside units, check with the PC board mounted on the master unit. The outside unit connected to the indoor units with transmission wire is the master unit.

*For details see the "SERVICE PRECAUTIONS" label stuck on the control box.

To all installers



<Caution>
When recovering the refrigerant, run the water pump and circulate water at the specified flow rate and temperature to prevent heat exchanger from freezing.



Warning



- Ask a qualified installer or contractor to install this product. Do not try to install the product yourself. Improper installation can result in water or refrigerant leakage, electrical shock, fire or explosion.
- Use only those parts and accessories supplied or specified by Daikin. Ask a qualified installer or contractor to install those parts and accessories. Use of unauthorised parts and accessories or improper installation of parts and accessories can result in water or refrigerant leakage, electrical shock, fire or explosion.
- Read the User's Manual carefully before using this product. The User's Manual provides important safety instructions and warnings. Be sure to follow these instructions and warnings.

If you have any enquiries, please contact your local importer, distributor and/or retailer.

Cautions on product corrosion

1. Air conditioners should not be installed in areas where corrosive gases, such as acid gas or alkaline gas, are produced.
2. If the outdoor unit is to be installed close to the sea shore, direct exposure to the sea breeze should be avoided. If you need to install the outdoor unit close to the sea shore, contact your local distributor.



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