7.14 Bad Examples and Good Examples in Installation

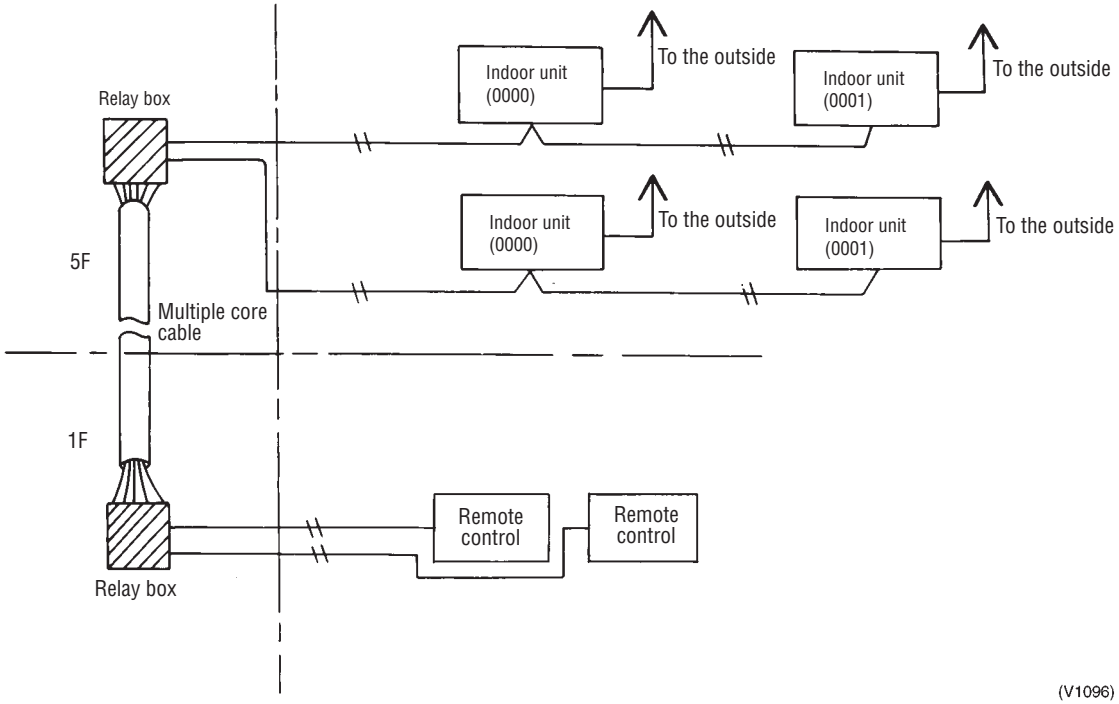
7.14.1 Example 1: Signal Interference due to Use of Multiple Core Cable (All Model)

Situation

Although for the purposes of group control there are only 2 units per group there are transmission malfunctions between the indoor units and the remote control and the remote control's address display is showing non-existent addresses such as 13 or 15.

Source of Problem and Remedial Action

Multiple core cable has been used for at least part of the interconnecting wiring between the remote control and the indoor units.
This has resulted in signal interference leading to a transmission malfunction.



The multiple core cable was replaced by twin core cable and the fault disappeared.

Main Points

- Although twin core cable had been run from each unit, multiple core cable was used on the way.
- In schools, etc., because remote controls are often installed in a single first floor control room, it is easier to use a multi-core cable.
- Signal interference can result in non-existent addresses appearing on the display.

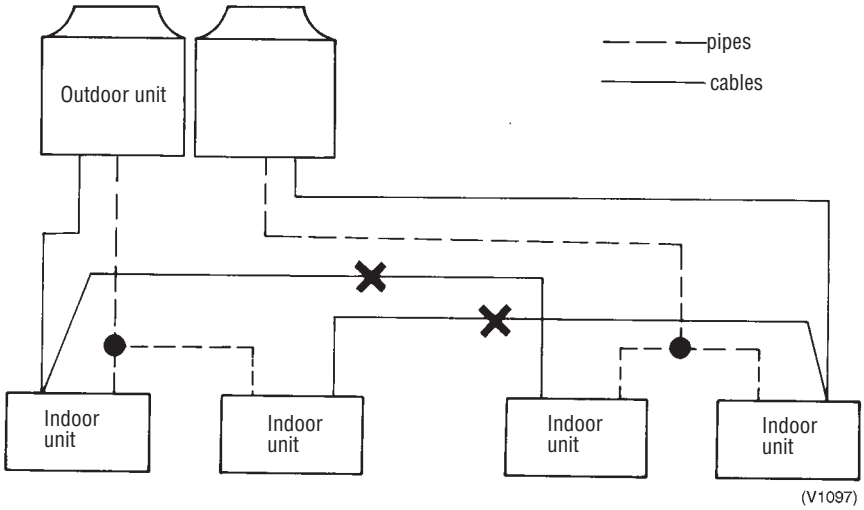
7.14.2 Example 2: Mismatch between Cables Connecting Indoor and Outdoor Units and Corresponding Piping (All Model)

Situation

The remote control is not showing any malfunction and the system is operating but there is no flow of warm air from the indoor unit (in heating mode).

Source of Problem and Remedial Action

The connecting cables and the corresponding piping were not correctly matched.
Recabling was carried out and the fault disappeared.



Main Points

- Special care must be taken when the pipework and cabling are carried out by different people.
- Run each indoor unit in turn to check that the system is correctly matched.

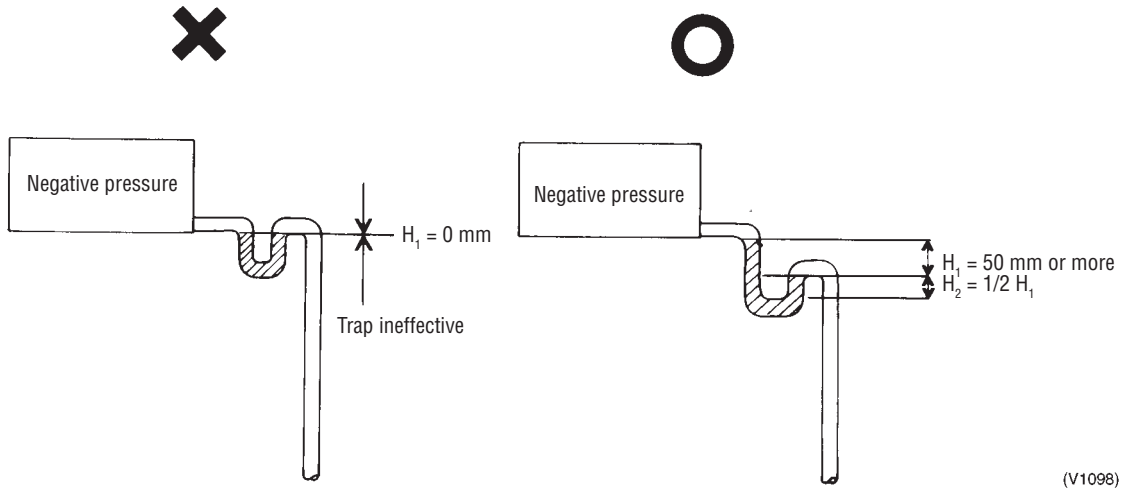
7.14.3 Example 3: Drain Pipe Trap Shape Defective

Situation

Indoor unit was fitted with a drain trap but a leak occurred during subsequent operation.

Source of Problem and Remedial Action

The trap was not properly shaped thus preventing it from functioning effectively as a trap and resulting in drain leakage. The trap was reshaped and the fault disappeared.



Main Points

- Duct types (40~125) require a drain trap.

Reason:There is resistance on the air inlet side caused by the heat exchanger and air filter and this in turn creates negative pressure in relation to the atmospheric pressure on the discharge side. If there is no drain trap then air will be drawn in from the drain pipe and the waste water splashed around giving rise to the risk of water overflowing from the drain pan. To avoid this problem it is therefore necessary to design a trap which takes account of the maximum negative pressure which is likely to be created on the suction side.

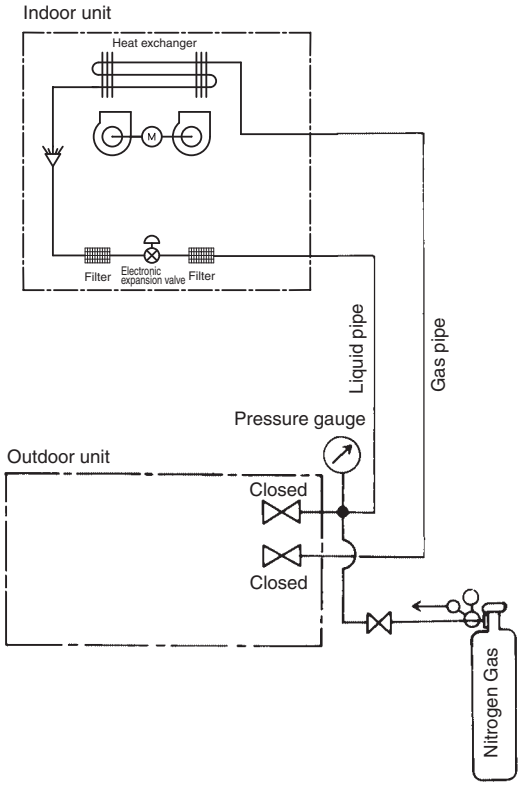
7.14.4 Example 4: Pressure down Despite Absence of Leaks during Air Tight Test (All Model)

Situation

In order to carry out local air tight tests on the refrigerant piping the system was pressurized via the liquid pipe service port and after 24 hours the pressure was found to have fallen. The local refrigerant piping alone does not lose any pressure. Maybe the gas leak is supposed to be located in the indoor unit itself.

Source of Problem and Remedial Action

The system was pressurized from the liquid pipe side and the gas pipes were therefore not pressurized. The system was then left under pressure for 24 hours but during that time gas leaked through into the gas pipes due to internal leaks within electronic expansion valves and the gas pressure inside the liquid pipes consequently dropped.



Main Points

When carrying out air tight tests on local pipework **it is essential that the system be pressurized via both the liquid pipes and the gas pipes**.

7.14.5 Example 5: Excessive Noise due to Incorrect Angling of REFNET Joints

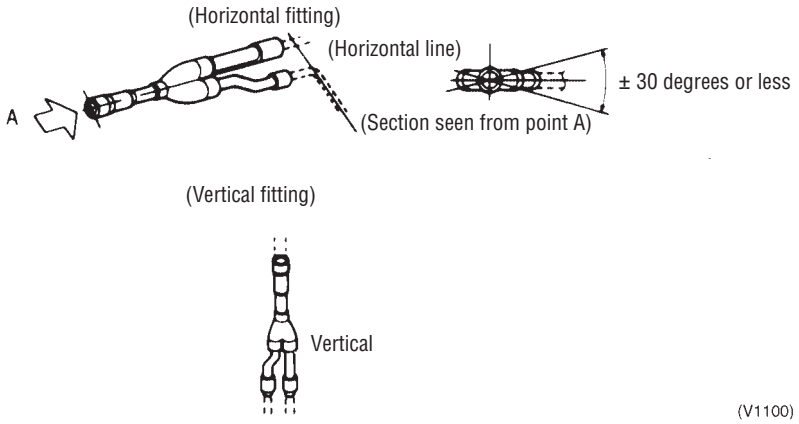
Situation

The noise of the refrigerant flow during defrosting is excessive.

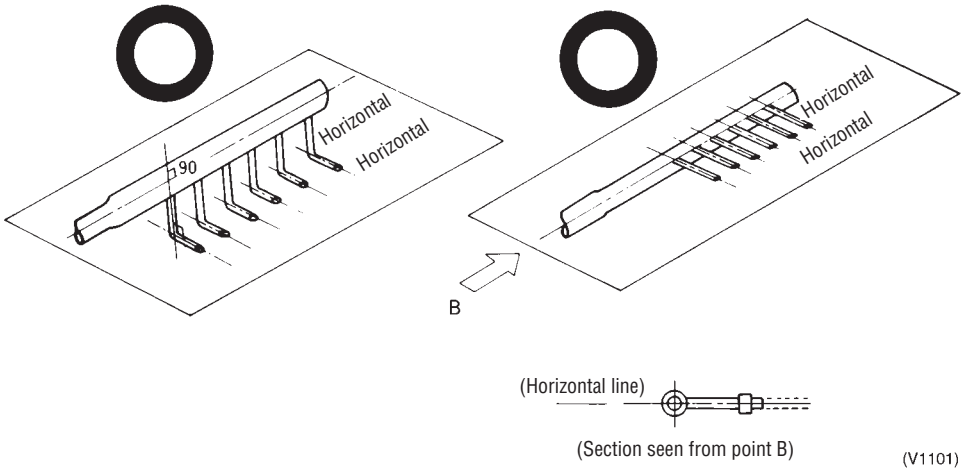
Source of Problem and Remedial Action

The angle of the fittings was incorrect and needed to be rectified as shown in the following figure.

1. REFNET joints
   The REFNET joints should be installed such that branches meet the main pipe either horizontally or vertically at an angle of exactly 90 degrees.



2. REFNET header
   The REFNET header is a lateral flow pipe and should be fitted so as to allow horizontal branch fittings. (Vertical or sloping fitting is not permissible.)



Main Points

- Reasons for using refrigerant branch kit
  Fittings of REFNET joints or headers which are not carried out in strict accordance with the principles outlined here may result in complaints relating, for example, to “poor performance” of the system or “noisy refrigerant flow”. (To prevent unbalance flow or oil shortage)

7.14.6 Example 6: Cracks Develop in Field Pipes due to Thermal Expansion and Contraction

Situation

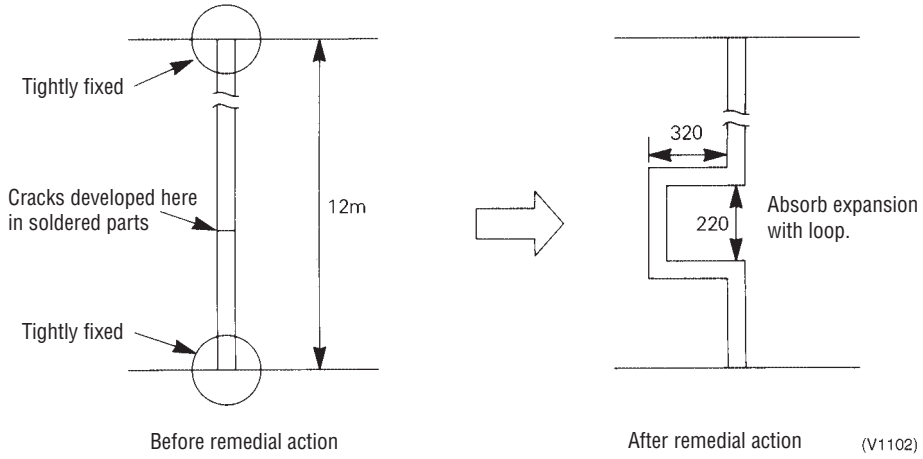
Refrigerant piping has developed cracks in soldered points and is leaking gas.

Cause

Both ends of the pipe have been tightly fixed in place.
↓
Starting and stopping the compressor has caused temperature to vary, thus the pipes have expanded and contracted which places stress on soldered parts.
↓
Cracks have formed because of repeated expansion and contraction.

Remedial Action

Fit the pipe with a loop as shown in the below drawing.



Main Points

- Take thermal expansion and contraction along the spline into consideration when installing pipe supports.

For Your Reference

Expansion (m) = Full length × Coefficient of thermal expansion × Rise in temperature
Coefficient of thermal expansion for copper: 16.5×10^{-6}

Example For a pipe length of 10 m and a rise in temperature of 50°C, expansion reaches 8.2 mm.

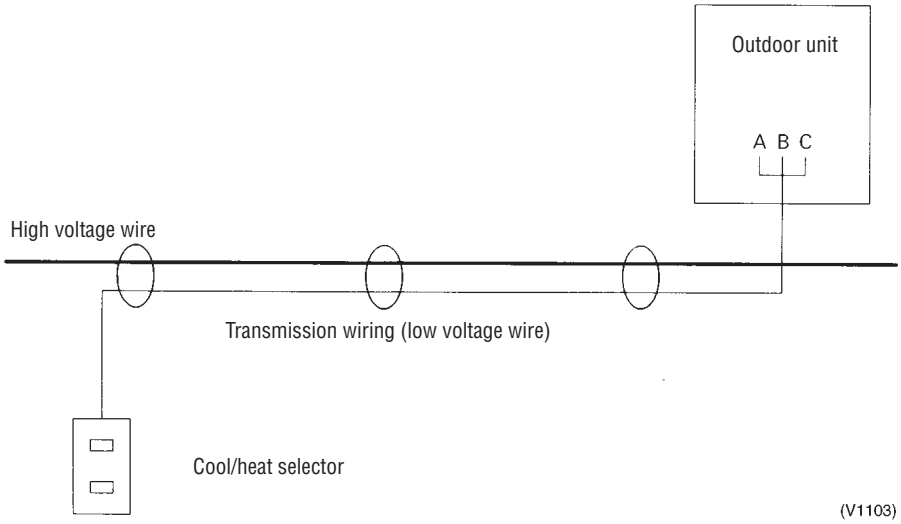
7.14.7 Example 7: Transmission Wiring between the Cool/heat Selector and the Outdoor Unit is too Close to a High Voltage Wire.

Situation

Heating is indicated despite having selected cooling with the cool/heat selector.

Cause and Remedial Action

The transmission wiring between the cool/heat selector and the outdoor unit is too close to a high voltage wire. An induced voltage is, therefore, being impressed on the transmission wiring which is causing a heating/cooling malfunction in the outdoor unit PC board.



Bypassing the transmission wiring will allow the unit to function normally.

Main Points

- Keep low and high voltage wiring away from each another.

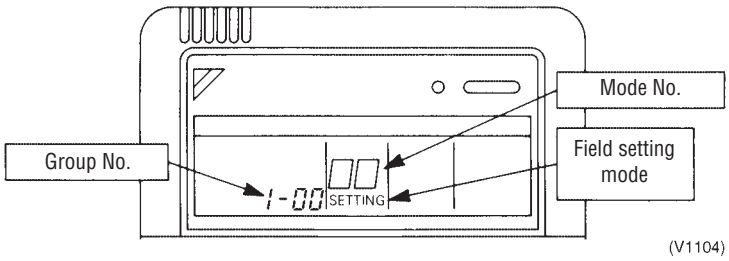
7.14.8 Example 8: The Centralized Control Group Number cannot be Set (Inverter K Series).

Situation

An attempt was made to set the centralized control group number with the indoor unit remote control, but “00” cannot be selected in the field setting mode.

Cause

1. The central remote control or unified ON/OFF controller is OFF.
2. The central remote control or unified ON/OFF controller, or indoor unit is not wired to the centralized control line (F1 & F2).



Remedial Action

Supply power to either the central remote control or unified ON/OFF controller.
Wire the central remote control or unified ON/OFF controller, or indoor unit to the centralized control line.

Main Points

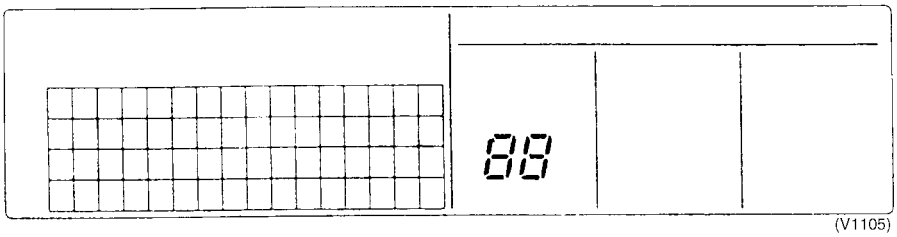
- When communications with the central remote control are down, “00” cannot be selected in the field setting mode.
- Activate power to the central remote control, unified ON/OFF controller and indoor unit before setting the centralized control group number.

7.14.9 Example 9: "*88*" cannot be Cleared from the Central Remote Control.

Situation

The display on the central remote control does not change from its initial state after turning power ON.

Initial display of the central remote control



Cause

1. None of the indoor units connected to the central remote control have been given a group No.
2. The connector for setting the master controller inside the central remote control is disconnected.

Remedial Action

- Set a centralized control group No. for each indoor unit with the respective remote controls.
- Connect the connector for setting the master controller in one of the central remote control.

Main Points

- If the setting for master controller has been changed, reset the power to the unit at the ON/OFF switch or the forced reset switch of the controller.
- Activate power to the central remote control, unified ON/OFF controller and indoor unit before setting the centralized control group No.
- For details on how to set the centralized control group number, refer to the installation manual.

7.14.10 Malfunction "F6" is Displayed during Check Operation in the Winter Season.

Applicable Models

RX(Y)(Q) ~ P (VRV III series)

Condition

A malfunction "F6" (overcharge of refrigerant) is displayed when a "check operation" is executed as a test operation under the condition of low outdoor temperature in the winter season.

Cause

Due to temporary refrigerant mixing into refrigerating oil, misjudgment is made when a "check operation" is executed under the condition of low outdoor temperature.

Measure

The condition completes by executing the "check operation" again.

Point of Diagnosis

Be sure to execute a "check operation" with the front panel closed. Or, misjudgment is made even if the outdoor temperature is low.

Conditions	Possible misjudgment
Low outdoor temperature	F6
High outdoor humidity	E3, E4. UF

7.14.11 LED Display for Master/slave Judgment Malfunctions at the Time of Test Operation.

Applicable Models

RX(Y)(Q) ~ P (Outdoor unit multi system of VRV III series)

Condition

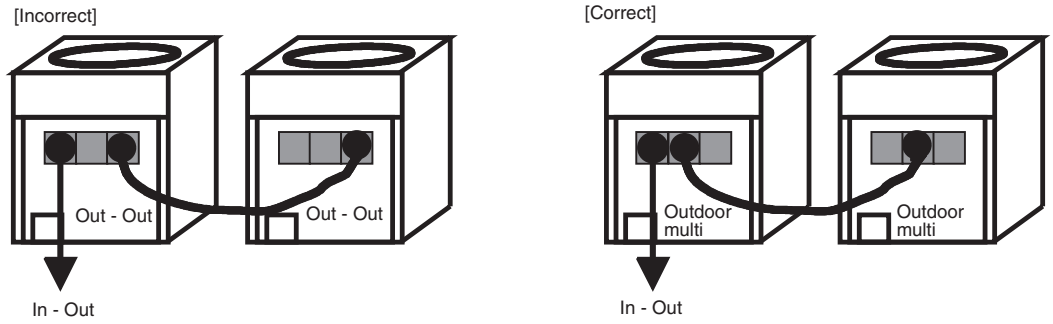
LED display for master/slave judgment remained to be turned off the test operation of the multi system of two VRV III units though the unit being connected to the indoor-to-outdoor unit connection wire should be judged as a master unit normally.
At that time, the same LED for the slave unit of outdoor multi connection was blinking.

Cause

Instead of connection of "outdoor multi terminals (Q1 and Q2)", "outdoor-to-outdoor (F1 and F2)" connection was being applied at the time of multiple operation.

Measure

Recovers by correcting the wire connections between outdoor units to "outdoor multi (Q1 and Q2)".



Point of Diagnosis

Select the method of connection of outdoor units from the following two methods, A and B.

A. Batch connection between outdoor units of different systems →Connect the "Out - Out terminals (F1 and F2)".
B. Multiple connection of the same system → Connect the "outdoor multiple terminals (Q1 and Q2)".

7.14.12 Cautions for Test Operation

Applicable Models	RX(Y)(Q) ~ P (VRV III series)
Condition	Though a test operation (check operation) in combination with the VRV III series outdoor unit had completed, an malfunction "E4 (abnormal low pressure malfunction)" or an malfunction "F3 (abnormal discharge pipe temperature malfunction)" occurred frequently after that.
Cause	Due to erroneous connection of wires and pipes, electronic expansion valve of the indoor unit does not open when only a single system is operated, which causes a faulty refrigerant circulation and results in a drop of pressure for low-pressure. Normal pressure is obtained by operating two systems simultaneously.
Measure	Issue a slip of request for modification work so that the erroneous connection of wires and pipes is corrected.
Point of Diagnosis	If a test operation (check operation) of multiple units of VRV III series is executed simultaneously, the test operation ends normally even if an erroneous connection exists. Be sure to execute a test operation (check operation) on an individual unit. Check whether there is an erroneous connection if an malfunction "E4" or an malfunction "F3" generates on the existing equipment.

7.14.13 Cautions for Demand Control with Externally Controlled Adapter

Applicable Models	RX(Y)(Q) ~ P (VRV III series)
Condition	Demand control with an externally control adapter attached to the VRV III series outdoor unit is desired. Thermostat does not turn off though C and 3 were short-circuited i.e., demand level 3, after setting. * Set items: Demand address 1 (Setting mode 2-2) Externally control ADP address 1 Demand setting change to ON from OFF (Setting mode 2-12)
Cause	Demand level setting (setting mode 2-30) remained to be the factory set value i.e., "70%". It should be changed the setting to "60%" to turn OFF the thermostat by the short circuit between C and 3.
Measure	The thermostat turns OFF by changing the setting mode 2-30 to "60%".
Point of Diagnosis	Change of mode setting is needed in accordance with the purpose of use. For setting methods, refer to the page 101 "4.4.2 Field setting from outdoor unit", of the section "4.4 Filed Settings from remote control".

7.14.14 Inferior Insulation of the Compressor before Test Operation

Applicable Models	VRV in general
Condition	At the time of test operation, compressor was replaced since the insulation was found insufficient in the insulation measurement with the power not supplied.
Cause	Insulation at the terminal section inside the compressor dropped temporarily due to non-operational condition of liquid refrigerant accumulated inside the compressor.
Measure	Resolved by supplying power to the crank case heater for 6 hours.
Point of Diagnosis	Measure the insulation resistance of the compressor after supplying power to the crank case heater for 6 hours.

7.14.15 No Heating Operation is Available though Cooling Operation is Possible. (Fan only Operation Continues with no Malfunction Displayed.)

Applicable Models	VRV in general
Condition	Compressor for one of two systems failed three times. Noise is heard on the compressor another system.
Cause	Erroneous connection of wires and pipes.
Measure	Recovers by correcting the connection.
Point of Diagnosis	1. Operate a single indoor unit and check whether cold or hot air is obtained. 2. Operate also an another indoor unit. Then stop the 1st unit and check whether cold or hot blast is obtained. 3. Check the remaining units according to the above steps.

Note: Please note that, if an operation of another unit is initiated after stopping the 1st unit, the outdoor unit does not start for a while due to restart protection control.

7.14.16 Cooling Operation of Specific Indoor Units is not Good.

Applicable Models	VRV in general
Condition	Cooling operation of specific indoor units only is not good though remaining indoor units work well and reach the set temperature. The pressure of the outdoor units for low-pressure use (evaporating temperature) has reached the target value. Liquid pipe temperature of the faulty indoor units is 4 to 5°C and gas pipe temperature is 18 to 22°C.
Cause	Liquid pipe at the inlet of indoor unit was bent by hands and broken. It caused lacking in gas supply because essential refrigerant circulation amount was not secured for the indoor units.
Measure	Recovers by correcting the field piping.
Point of Diagnosis	1. Check the following: Make sure that the difference between thermistor temperature of indoor unit's gas pipe and thermistor temperature of liquid pipe is approx. 5°C. (Thermistor temperature of indoor unit's liquid pipe: 5 to 8°C; Thermistor temperature of gas pipe: 10 to 13°C) 2. Check whether the pressure of outdoor unit for low-pressure (evaporating temperature) is approx. 0.4 MPa.

7.14.17 Malfunction Heating Due to Overcharge of Refrigerant

Applicable Models	VRV in general
Condition	Inverter compressor only operates at low frequency. Discharge temperature of the indoor units is 25°C or less and thermistor temperature of the liquid pipe is approx. 30°C when it is monitored through the service mode of the indoor remote control. The low-pressure at that time is around 0.2MPa.
Cause	Overcharged refrigerant. Due to overcharge, refrigerant accumulates in the indoor unit. Under this condition, temperature of the heat exchanger itself drops though the high-pressure rises. In addition, rise of high-pressure causes rise of liquid pressure that results in minimum opening of the electronic expansion valve of outdoor units leading to the wet operation. (The low-pressure at that time comes to be 0.2MPa due to minimum EV opening.)
Measure	Recovers by correcting the refrigerant to the specified amount.
Point of Diagnosis	1. Use a manifold gauge to measure the high-pressure side of the outdoor unit and the pressure of service port of the liquid-side stop valve. Then check that the difference between the pressure on the high-pressure side and the pressure of the liquid pipe (intermediate pressure) is approx. 0.2MPa or more. (Approx. 0.2-MPa differential pressure is required to secure the flow rate at the electronic expansion valve.) 2. Check whether the subcooling of each indoor unit is normal. Difference between the saturation temperature being equivalent to the high-pressure and the thermistor temperature of liquid pipe of each indoor unit is approx. 5 to 8°C (Liquid pipe temperature is normally approx. 38°C or higher.)

7.14.18 High-pressure Shutdown Occurs only when the STD Compressor Starts.

Applicable Models	VRV in general
Condition	High-pressure rises abnormally and the high-pressure shutdown results when the STD compressor starts during cooling operation. (High-pressure tends to be higher even in the operation of inverter compressor only.) Temperature of heat exchanger thermistor of outdoor unit was found being equivalent to the outdoor temperature when data was collected by using the service checker type III.
Cause	Liquid-side stop valve was not fully open. (The staff considered it was fully open when inspected.)
Measure	Recovers by fully opening the stop valve.
Point of Diagnosis	Check whether the detecting temperature of heat exchanger thermistor is close to the saturation temperature being equivalent to the high-pressure. [Be sure to check all basic items like liquid-side stop valve and electronic expansion valve.]

7.15 Malfunction of Transmission Examples

7.15.1 [Malfunction of Transmission Examples] Display of Malfunction of Transmission due to the Elevator's Power Line

Applicable Models	VRV in general
Condition	A malfunction "UE" is issued at random. It continues to be generated maximum 30 seconds. Transmitted waveforms were checked to be distorted for a period of approx. 10 seconds on site.
Cause	Out-Out transmission line had been laid next to the high-voltage line of the elevator.
Measure	Request to correct wiring.
Point of Diagnosis	

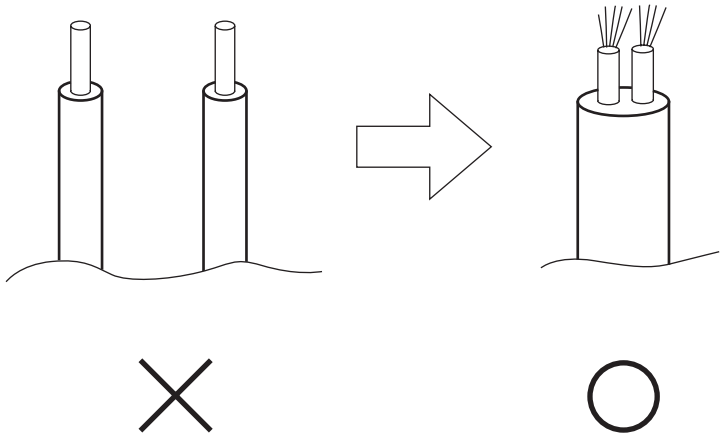
7.15.2 [Malfunction of Transmission Examples] Malfunction of Transmission due to Wiring next to the High-voltage Line for Indoor Unit

Applicable Models	VRV in general
Condition	A malfunction "U4" sometimes occurred on the specific system. Its cause was not located though the transmission waveforms on the outdoor unit side were checked.
Cause	Waveforms on the indoor unit side were checked. The wiring on the indoor unit side had been laid next to the high-voltage line.
Measure	Keep the wiring of indoor unit away from the high voltage line.
Point of Diagnosis	

7.15.3 [Malfunction of Transmission Examples] Faulty Condition to Multi-core Wire

Applicable Models	VRV in general
Condition	
Cause	According to the wiring company, two-core lines were to be used as transmission line. However, multi-core lines are used actually. There was also a case where two cores out of four cores were being used for power supply.
Measure	Request to correct the wiring.
Point of Diagnosis	

7.15.4 [Malfunction of Transmission Examples] Faulty Condition Caused by the Use of Single-core Line

Applicable Models	VRV in general
Condition	
Cause	A malfunction "U4" is issued due to a single-core line used as a transmission line.
Measure	Changed to the VTCF two-core line.
Point of Diagnosis	

7.15.5 [Malfunction of Transmission Examples] Faulty Condition Caused by Branch Lines.

Applicable Models	VRV in general
Condition	A transmission malfunction occurred when the centralized controller was added to the existing system.
Cause	Ten of all indoor-to-outdoor lines were branch lines from a single bus cable.
Measure	Corrected IN - OUT wiring to one - after another wiring
Point of Diagnosis	

Part 2
Installation Manual

3. Heat Pump / Cooling Only 50Hz (RX(Y)Q5~54P)

DAIKIN

INSTALLATION MANUAL

VRV III System air conditioner

RXYQ5PY1	RXQ5PY1
RXYQ8PY1	RXQ8PY1
RXYQ10PY1	RXQ10PY1
RXYQ12PY1	RXQ12PY1
RXYQ14PY1	RXQ14PY1
RXYQ16PY1	RXQ16PY1
RXYQ18PY1	RXQ18PY1
RXYQ20PY1	RXQ20PY1
RXYQ22PY1	RXQ22PY1
RXYQ24PY1	RXQ24PY1
RXYQ26PY1	RXQ26PY1
RXYQ28PY1	RXQ28PY1
RXYQ30PY1	RXQ30PY1
RXYQ32PY1	RXQ32PY1
RXYQ34PY1	RXQ34PY1
RXYQ36PY1	RXQ36PY1
RXYQ38PY1	RXQ38PY1
RXYQ40PY1	RXQ40PY1
RXYQ42PY1	RXQ42PY1
RXYQ44PY1	RXQ44PY1
RXYQ46PY1	RXQ46PY1
RXYQ48PY1	RXQ48PY1
RXYQ50PY1	RXQ50PY1
RXYQ52PY1	RXQ52PY1
RXYQ54PY1	RXQ54PY1

3PN08043-2 EM06A045 (0611) HT

3.1 First of All

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

3.1.1 Safety considerations

Please read these “Safety considerations” carefully before installing air conditioning unit and be sure to install it correctly. The safety precautions listed here are divided into two categories. In either case, important safety information is listed which must be read carefully.

Warning: Failure to observe a warning may result in death or serious injury.

Caution: Failure to observe a caution may result in injury or damage to the unit. These too might lead to serious injury depending on the circumstances.

Warning:

- Ask your dealer or qualified personnel to carry out installation work. Do not try to install the machine yourself. Improper installation may result in water leakage, electric shocks or fire.
- Perform installation work in accordance with this installation manual. Improper installation may result in water leakage, electric shocks or fire.
- When installing the unit in a small room, take measures against to keep refrigerant concentration from exceeding allowable safety limits in the event of refrigerant leakage. Contact your dealer for more information. Excessive refrigerant in a closed ambient can lead to oxygen deficiency.
- Be sure to use only the specified accessories and parts for installation work. Failure to use the specified parts may result in water leakage, electric shocks, fire or the unit falling.
- Install the air conditioner on a foundation strong enough to withstand the weight of the unit. A foundation of insufficient strength may result in the unit falling and causing injuries.
- Carry out the specified installation work after taking into account strong winds, typhoons or earthquakes. Improper installation work may result in the unit falling and causing accidents.
- Make sure that a separate power supply circuit is provided for this unit and that all electrical work is carried out by qualified personnel according to local and national regulations and this installation manual. An insufficient power supply capacity or improper electrical construction may lead to electric shocks or fire.
- Make sure that all wiring is secured, the specified wires are used, and no external forces act on the terminal connections or wires. Improper connections or installation may result in the terminals overheating or fire.
- When wiring the power supply and connecting the remote control wiring and transmission wiring, position the wires so that the EL.COMPO.BOX lid can be securely fastened. Improper positioning of the EL.COMPO.BOX lid may result in electric shocks or fire.
- If the refrigerant gas leaks during installation, ventilate the area immediately. Toxic gas may be produced if the refrigerant gas comes into contact with fire.
- After completing the installation work, check that the refrigerant gas does not leak. Toxic gas may be produced if the refrigerant gas leaks into the room and comes into contact with a source of fire, such as a fan heater, stove or cooker.
- Do not directly touch the refrigerant leaked from refrigerant piping connections. Frostbite may be caused.
- Before touching electrical parts, turn off the power.

- Do not allow children to mount on the outdoor unit, or avoid placing any object on it. Falling or tumble may result in injury.
- Be sure to establish an earth.
  Do not earth the unit to a utility pipe, arrester or telephone earth.
  Incomplete earth may cause electrical shock or fire.
  A high surge current from lightning or other sources may cause damage to the air conditioner.
- Be sure to install an earth leakage breaker.
  Failure to install an earth leakage breaker may result in electric shocks or fire.

Caution:

- While following the instructions in this installation manual, install drain piping in order to ensure proper drainage and insulate piping in order to prevent condensation.
  Improper drain piping may result in water leakage and property damage.
- Install the indoor and outdoor units, power supply wiring and connecting wiring at least 1 meter away from televisions or radios in order to prevent image interference or noise.
  (Depending on the radio waves, a distance of 1 meter may not be sufficient enough to eliminate the noise.)
- The indoor unit should be installed as far away from fluorescent lighting as possible.
  remote control (wireless kit) transmitting distance can result shorter than expected in rooms with electronic fluorescent lamps (inverter or rapid start types).
- Do not install the air conditioner in the following locations:
  (a) where a mineral oil mist or an oil spray or vapor is produced, for example in a kitchen.
  Plastic parts may deteriorate and fall off or result in water leakage.
  (b) where corrosive gas, such as sulfurous acid gas, is produced.
  Corroding copper pipes or soldered parts may result in refrigerant leakage.
  (c) near machinery emitting electromagnetic waves.
  Electromagnetic waves may disturb the operation of the control system and result in a malfunction of the unit.
  (d) where flammable gas may leak, where there are carbon fiber or ignitable dust suspensions in the air, or where volatile flammables such as thinner or gasoline are handled.
  Operating the unit in such conditions may result in fire.
  (e) Locations where small animals might build nests inside the unit.
  If small animals enter and come in contact with electrical parts, this can cause malfunctions, smoke, and fire.

3.1.2 Special notice of product

[CLASSIFICATION]

This air conditioner comes under the term “appliances not accessible to the general public”.

[EMC CHARACTERISTICS]

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

[REFRIGERANT]

VRVIII System use R-410A refrigerant.

- The refrigerant R-410A requires strict cautions for keeping the system clean, dry and tight. Read the chapter “REFRIGERANT PIPING” carefully and follow these procedures correctly.
  A. Clean and dry
     Foreign materials (including mineral oils such as SUNISO oil or moisture) should be prevented from getting mixed into the system.
  B. Tight
     Take care to keep the system tight when installing.
     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 slightly to the greenhouse effect if it is released.
- Since R-410A is a mixed refrigerant, the required additional refrigerant must be charged in its liquid state. If the refrigerant is charged in a state of gas, its composition changes and the system will not work properly.

Limit by the total maximum refrigerant charge

The total maximum refrigerant charge of a VRVIII system must be below 100kg, this to be in accordance with CE requirement (EN60335-2-40 standard).
This means that in case the total maximum refrigerant charge of the system (factory and additional charge) is equal to or more than 100kg you must divide your multiple outdoor system into smaller independent systems, each containing less than 100kg refrigerant charge.
For factory charge, refer to the unit name plate.

[DESIGN PRESSURE]

Since design pressure is 4.0MPa or 40bar (for R-407C units: 3.3MPa or 33bar),the wall thickness of pipes should be more carefully selected in accordance with the relevant local and national regulations.

3.1.3 Disposal requirements

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

3.2 Introduction

- RX(Y)Q-P series are designed for outdoor installation and used for cooling and heatpump (except RXQ-P) applications. Outdoor units come in three standard sizes, and with a single system through a multi system combining up to three outdoor units, rated cooling capacity from 14.0 kW to 147 kW and rated heating capacity from 16.0 kW to 170 kW (except RXQ-P) can be achieved.
- The RX(Y)Q-P units can be combined with Daikin VRV series indoor units for air conditioning purposes. Always use appropriate indoor units compatible with R-410A. To lean which models of indoor units are compatible with R-410A, refer to the product catalogs. To combine with other refrigerant indoor unit will cause malfunction.

3.2.1 Combination

The indoor units can be installed in the following range.
(The total number of indoor units cannot exceed 64 units.)

<Outdoor unit>	<Total capacity of indoor units>	<Total quantity of indoor units>
RX(Y)Q5PY1	62.5 ~ 250	12 units
RX(Y)Q8PY1	100 ~ 400	20 units
RX(Y)Q10PY1	125 ~ 500	25 units
RX(Y)Q12PY1	150 ~ 600	30 units
RX(Y)Q14PY1	175 ~ 700	35 units
RX(Y)Q16PY1	200 ~ 800	40 units
RX(Y)Q18PY1	225 ~ 900	45 units
RX(Y)Q20PY1	250 ~ 800	40 units
RX(Y)Q22PY1	275 ~ 880	44 units
RX(Y)Q24PY1	300 ~ 960	48 units
RX(Y)Q26PY1	325 ~ 1040	52 units
RX(Y)Q28PY1	350 ~ 1120	56 units
RX(Y)Q30PY1	375 ~ 1200	60 units
RX(Y)Q32PY1	400 ~ 1280	64 units
RX(Y)Q34PY1	425 ~ 1360	64 units
RX(Y)Q36PY1	450 ~ 1440	64 units
RX(Y)Q38PY1	475 ~ 1235	61 units
RX(Y)Q40PY1	500 ~ 1300	64 units
RX(Y)Q42PY1	525 ~ 1365	64 units
RX(Y)Q44PY1	550 ~ 1430	64 units
RX(Y)Q46PY1	575 ~ 1495	64 units
RX(Y)Q48PY1	600 ~ 1560	64 units
RX(Y)Q50PY1	625 ~ 1625	64 units
RX(Y)Q52PY1	650 ~ 1690	64 units
RX(Y)Q54PY1	675 ~ 1755	64 units

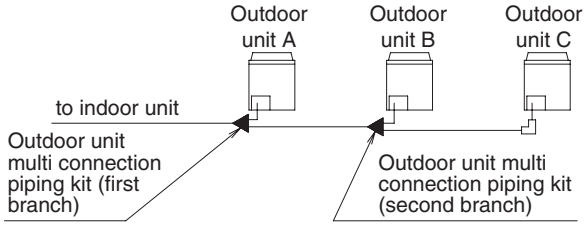
Note:

- Be sure to connect an R-410A indoor unit.
  See the catalog for indoor unit models which can be connected.
- At above is the total capacity and total number of units of the indoor units when configured in a standard combination. See the technical reference for details on total capacity and total number of indoor units when using a configuration other than the standard combination. The standard combination are as follows.

<Combination unit>	<Independent unit>
RXYQ5PY1	RXYQ5PY1
RXYQ8PY1	RXYQ8PY1
RXYQ10PY1	RXYQ10PY1
RXYQ12PY1	RXYQ12PY1
RXYQ14PY1	RXYQ14PY1
RXYQ16PY1	RXYQ16PY1
RXYQ18PY1	RXYQ18PY1
RXYQ20PY1	RXYQ8PY1+ RXYQ12PY1
RXYQ22PY1	RXYQ10PY1+ RXYQ12PY1
RXYQ24PY1	RXYQ8PY1+ RXYQ16PY1
RXYQ26PY1	RXYQ8PY1+ RXYQ18PY1
RXYQ28PY1	RXYQ10PY1+ RXYQ18PY1
RXYQ30PY1	RXYQ12PY1+ RXYQ18PY1
RXYQ32PY1	RXYQ16PY1+ RXYQ16PY1
RXYQ34PY1	RXYQ16PY1+ RXYQ18PY1
RXYQ36PY1	RXYQ18PY1+ RXYQ18PY1
RXYQ38PY1	RXYQ8PY1+ RXYQ12PY1 + RXYQ18PY1
RXYQ40PY1	RXYQ8PY1+ RXYQ16PY1 + RXYQ16PY1
RXYQ42PY1	RXYQ8PY1+ RXYQ16PY1+ RXYQ18PY1
RXYQ44PY1	RXYQ8PY1+ RXYQ18PY1+ RXYQ18PY1
RXYQ46PY1	RXYQ10PY1+ RXYQ18PY1+ RXYQ18PY1
RXYQ48PY1	RXYQ12PY1+ RXYQ18PY1+ RXYQ18PY1
RXYQ50PY1	RXYQ14PY1+ RXYQ18PY1+ RXYQ18PY1
RXYQ52PY1	RXYQ16PY1+ RXYQ18PY1+ RXYQ18PY1
RXYQ54PY1	RXYQ18PY1+ RXYQ18PY1+ RXYQ18PY1

<Combination unit>	<Independent unit>
RXQ5PY1	RXQ5PY1
RXQ8PY1	RXQ8PY1
RXQ10PY1	RXQ10PY1
RXQ12PY1	RXQ12PY1
RXQ14PY1	RXQ14PY1
RXQ16PY1	RXQ16PY1
RXQ18PY1	RXQ18PY1
RXQ20PY1	RXQ8PY1+ RXQ12PY1
RXQ22PY1	RXQ10PY1+ RXQ12PY1
RXQ24PY1	RXQ8PY1+ RXQ16PY1
RXQ26PY1	RXQ8PY1+ RXQ18PY1
RXQ28PY1	RXQ10PY1+ RXQ18PY1
RXQ30PY1	RXQ12PY1+ RXQ18PY1
RXQ32PY1	RXQ16PY1+ RXQ16PY1
RXQ34PY1	RXQ16PY1+ RXQ18PY1
RXQ36PY1	RXQ18PY1+ RXQ18PY1
RXQ38PY1	RXQ8PY1+ RXQ12PY1 + RXQ18PY1
RXQ40PY1	RXQ8PY1+ RXQ16PY1 + RXQ16PY1
RXQ42PY1	RXQ8PY1+ RXQ16PY1+ RXQ18PY1
RXQ44PY1	RXQ8PY1+ RXQ18PY1+ RXQ18PY1
RXQ46PY1	RXQ10PY1+ RXQ18PY1+ RXQ18PY1
RXQ48PY1	RXQ12PY1+ RXQ18PY1+ RXQ18PY1
RXQ50PY1	RXQ14PY1+ RXQ18PY1+ RXQ18PY1
RXQ52PY1	RXQ16PY1+ RXQ18PY1+ RXQ18PY1
RXQ54PY1	RXQ18PY1+ RXQ18PY1+ RXQ18PY1

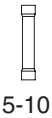
- If the total capacity of the connected indoor units exceeds the capacity of the outdoor unit, cooling and heating performance may drop when running the indoor units. See the capacity table in the Engineering Data Book for details.
- There are restrictions on the refrigerant pipe connecting order between outdoor unit in the case of the multi system.
  Install so that the following restrictions are satisfied.
  <Restrictions>
  The capacities of outdoor units A, B and C must fulfill the following conditions.
  A ≥ B ≥ C



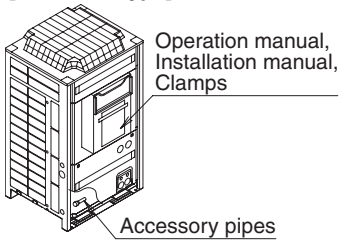
3.2.2 Standard supplied accessories

The following accessories are included. The storage location of the accessories is shown in figure 1.

Q5~Q18 type				
Name	Clamp (1)	Clamp (2)	Clamp (3)	Gas side accessory pipe (1)
Quantity	9 pcs.	2 pcs.	1 pc.	1 pc.
Shape	 Small		 Large	

Q5~Q18 type				
Name	Gas side accessory pipe (2)	Liquid side accessory pipe (1)	Liquid side accessory pipe (2)	Others
Quantity	1 pc.	1 pc.	1 pc.	■ Operation manual ■ Installation manual ■ "REQUEST FOR THE INDICATION" label (Installation records)
Shape	 5-10 HP type  12-18 HP type		 5-10, 14,16 HP type  12,18 HP type	

[Q5 · 8 · 10 type]



[Q12 · 14 · 16 · 18 type]

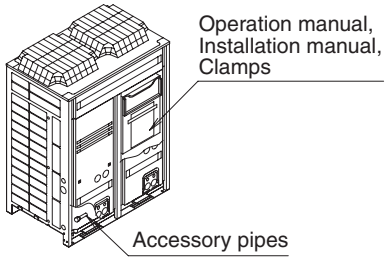


figure 1

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

3.2.3 Option accessory

To install the outdoor units, the following optional parts are also required. To select an optimum kit, refer to **"6. Refrigerant Piping"**.

■ **Refrigerant branching kit**

REFNET header	KHRP26M22H	KHRP26M33H	KHRP26M72H	KHRP26M73H
REFNET joint	KHRP26A22T	KHRP26A33T	KHRP26A72T	KHRP26A73T

■ **Outdoor unit multi connection piping kit**

Number of outdoor units connected	2 units	3 units
Kit name	BHFP22P100	BHFP22P151

■ **Pipe size reducer**

Kit name	KHRP26M73TP	KHRP26M73HP

Note: Make sure that any separately purchased accessories are designed for use with R-410A.

3.2.4 Technical and Electrical specifications

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

3.2.5 Main components

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

3.2.6 Installation Process

Figure 2 shows the installation process. Install in the order of the steps shown.

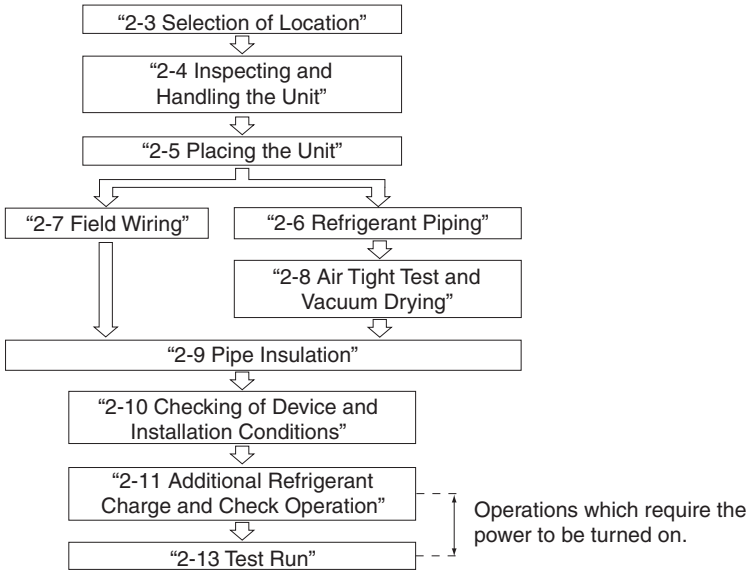


figure 2

3.3 Selection of Location

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

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

Installation Space Examples

- The installation space requirement shown in figure 3 is a reference for cooling operation when the outdoor temperature is 35°C.
  If the design outdoor temperature exceeds 35°C or the heat load exceeds maximum capacity in all the outdoor unit, take an even large space on the intake shown in figure 3.
- During installation, install the units using the most appropriate of the patterns shown in figure 3 for the location in question, taking into consideration human traffic and wind.
- If the number of units installed is more than that shown in the pattern in figure 3, install the units so there are no short circuits.
- As regards space in front of the unit, consider the space needed for the local refrigerant piping when installing the units.
- If the work conditions in figure 3 do not apply, contact your dealer or Daikin directly.

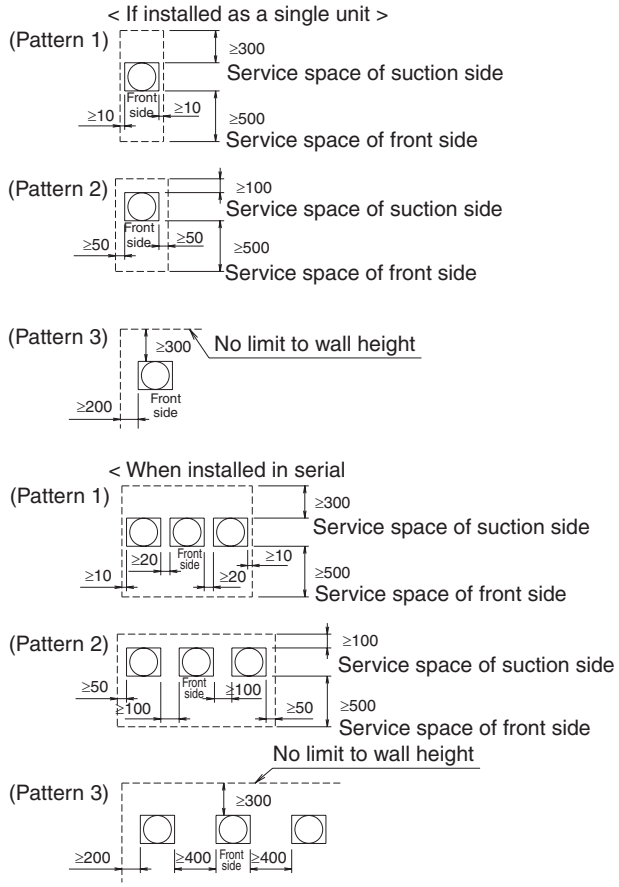
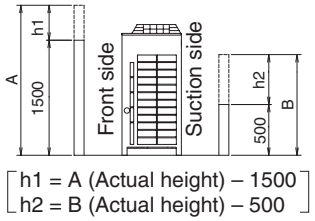


figure 3

For Patterns 1 and 2 in figure 3:

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



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.
   Particularly for locations with weak reception, ensure there is a distance of at least 3 meters for indoor remote controls, place power wiring and transmission wiring in conduits, and ground the conduits.

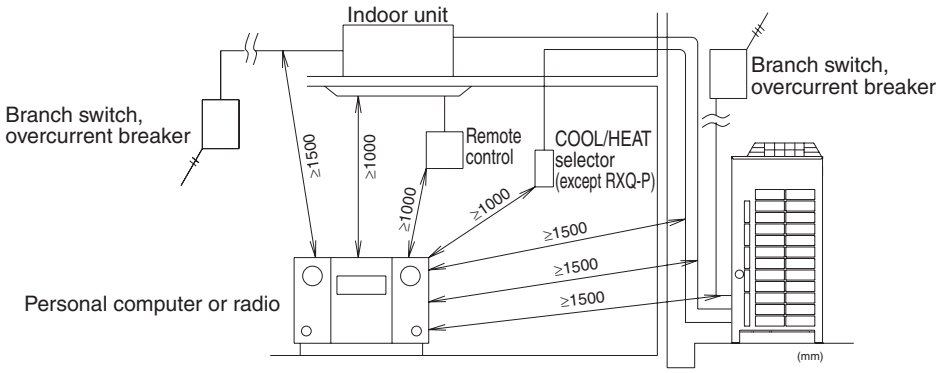


figure 4

2. When installing in a locations where there is heavy snowfall, implement the following snow measures.
   - Ensure the base is high enough that intakes are not clogged by snow.
   - Remove the rear intake grille to prevent snow from accumulating on the fins.
3. If condensate may drip on downstairs (or walkway) depending on the floor condition, take a measure such as the installation of central drain pan kit (sold separately).
4. The refrigerant R-410A itself is nontoxic, nonflammable and is safe. If the refrigerant should leak however, its concentration may exceed the allowable limit depending on room size. Due to this it could be necessary to take measures against leakage. See “1-14 Caution for Refrigerant Leaks” for details.

3.4 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. Decide on the transportation route.
3. If a forklift is to be used, pass the forklift arms through the large openings on the bottom of the unit. **(Refer to figure 5)**
4. If hanging the unit, use a cloth sling to prevent damaging the unit. Keeping the following points in mind, hang the unit following the procedure shown in figure 6.
   - Use a sling sufficiently strong to hold the mass of the unit.
   - Use 2 belts of at least 8m long.
   - Place extra cloth or boards in the locations where the casing comes in contact with the sling to prevent damage.
   - Hoist the unit making sure it is being lifted at its center of gravity.
5. After installation, remove the transportation clasp attached to the large openings. **(Refer to figure 6)**

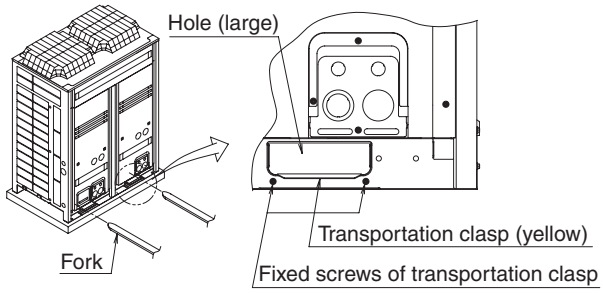


figure 5

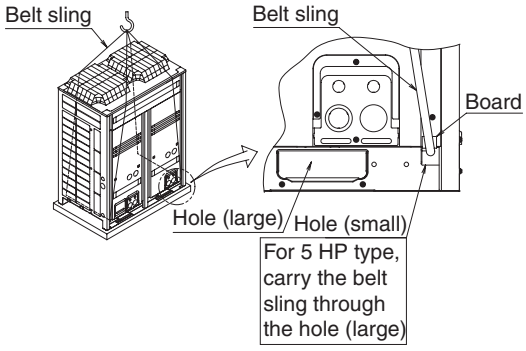
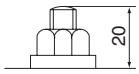


figure 6

3.5 Placing the Unit

- Make sure the unit is installed level on a sufficiently strong base to prevent vibration and noise. **(Refer to figure 7)**
- The base should be bigger around than the width of the unit's legs (66 mm), and should support the unit. **(Refer to figure 8)**
  If protective rubber is to be attached, attach it to the whole face of the base.
- The height of the base should be at least 150mm from the floor.
- Secure the unit to its base using foundation bolts. (Use four commercially available M12-type foundation bolts, nuts, and washers.)
- The foundation bolts should be inserted 20 mm.



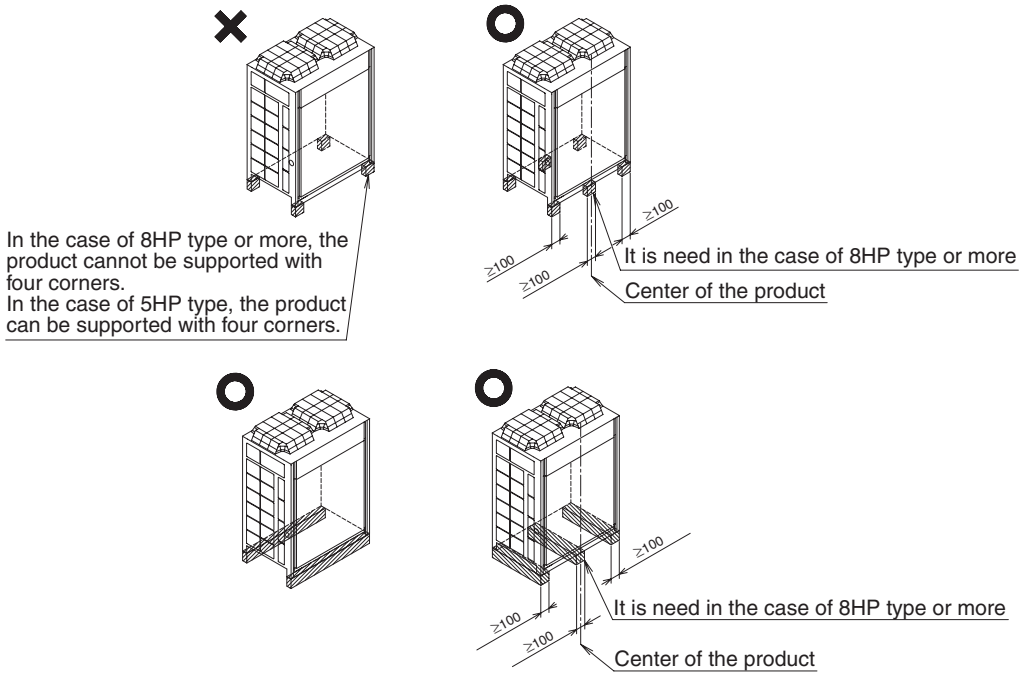


figure 7

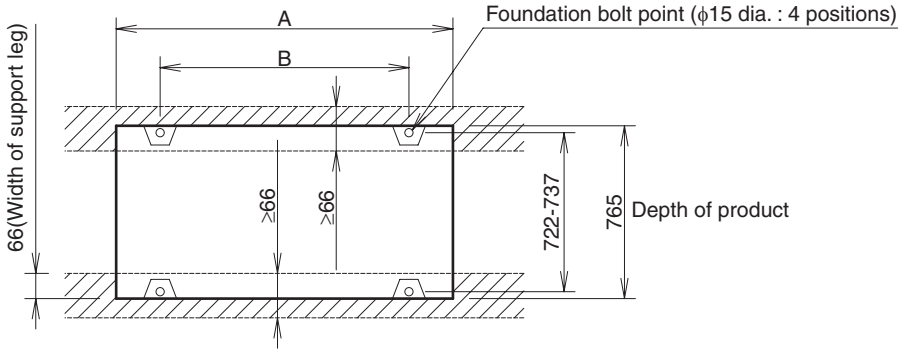


figure 8

Model	A	B
5HP type	635	497
8 · 10HP type	930	792
12 · 14 · 16 · 18HP type	1240	1102

Note:

- There are restrictions on the refrigerant pipe connecting order between outdoor unit in the case of the multi system.
  See the Note in "1-2-1 Combination" for detail.
- When installing on a roof, make sure the roof floor is strong enough and be sure to water-proof all work.
- Make sure the area around the machine drains properly by setting up drainage grooves around the foundation.
  Drain water is sometimes discharged from the outdoor unit when it is running.

3.6 Refrigerant Piping

Note:
- All field piping must be installed by a licensed refrigeration technician and must comply with relevant local and national regulations.
- After piping work is complete, do not under any circumstances open the shutoff valve until "1-7 Field Wiring" and "1-10 Checking of Device and Installation Conditions" are complete.
- Do not use flux when brazing the refrigerant piping. 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 extremely harmful influence 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.)

3.6.1 Selection of piping material and Refrigerant branching kit

- Use only pipes which are clean inside and outside and which do not accumulate harmful sulfur, oxidants, dirt, cutting oils, moisture, or other contamination. (Foreign materials inside pipes including oils for fabrication must be 30mg/10m or less.)
- Use the following items for the refrigerant piping.
  Material: Jointless phosphor-deoxidized copper pipe
  Size: See "1-6-5 Example of connection" to determine the correct size.
  Thickness: Select a thickness for the refrigerant piping which complies with national and local laws.
  For R-410A, the design pressure is 4.0 MPa (40-bar).
  The minimum thickness of piping according to Japan's High-Pressure Gas Safety Law (as of January 2003) is shown below.
  Temper grade (O type, 1/2H type) in the table indicate the material types specified in JIS H 3300.

(unit: mm)

Temper grade	O type			
outer diameter	ϕ6.4	ϕ9.5	ϕ12.7	ϕ15.9
smallest thickness	0.80	0.80	0.80	0.99

(unit: mm)

Temper grade	1/2H type							
outer diameter	ϕ19.1	ϕ22.2	ϕ25.4	ϕ28.6	ϕ31.8	ϕ34.9	ϕ38.1	ϕ41.3
smallest thickness	0.80	0.80	0.88	0.99	1.10	1.21	1.32	1.43

- For piping work, follow the maximum tolerated length, difference in height, and length after a branch indicated in the **"1-6-5 Example of connection"**.
- A refrigerant branching kit (sold separately) is needed for piping branches and connection of piping between outdoor unit (in case of multi system).
  Use only separately sold items selected specifically according to the refrigerant branch kit selection in the **"1-6-5 Example of connection"**.

3.6.2 Protection against contamination when installing pipes

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

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

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

3.6.3 Pipe connection

- Be sure to perform nitrogen permutation or nitrogen blow when brazing. **(Refer to figure 10)** Brazing without performing nitrogen permutation or nitrogen blow into the piping will create large quantities of oxidized film on the inside of the pipes, adversely affecting valves and compressors in the refrigerating system and preventing normal operation.

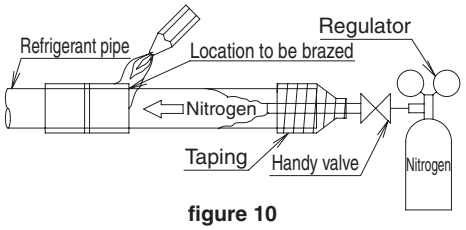


figure 10

- The pressure regulator for the nitrogen released when doing the brazing should be set to 0.02 MPa (about 0.2kg/cm^2:Enough to feel a slight breeze on your cheek).

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

3.6.4 Connecting the refrigerant piping

1. Direction to bring out the pipes
   The local interunit piping can be connected either forward or to the sides (taken out through the bottom) as shown in the figure 11.
   (When passing out through the bottom, use the knock hole in the bottom frame.)

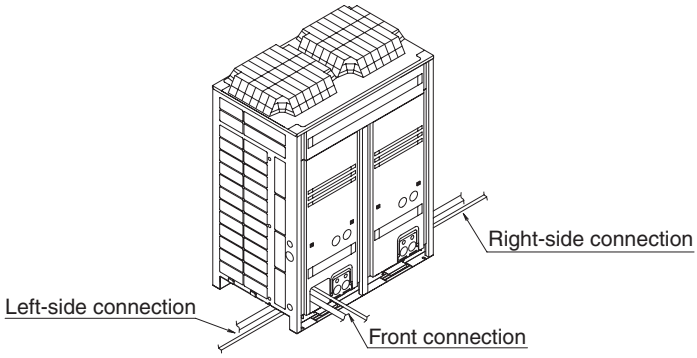
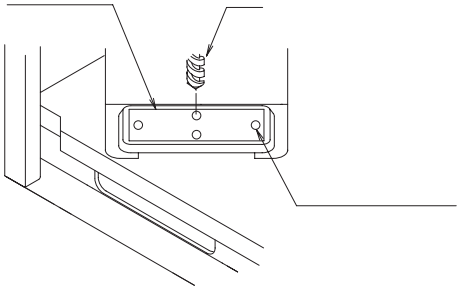


figure 11

Precautions when knocking out knock holes

- Open knock hole in the base frame by drilling the 4 concave around it with a 6mm bit. **(Refer to figure 12)**



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

2. Removing Pinch Piping
   - When connecting refrigerant piping to an outdoor unit, remove the pinch piping. (**Refer to figure 13**)
   - Pinch piping should be removed using the procedure in the figure 13.

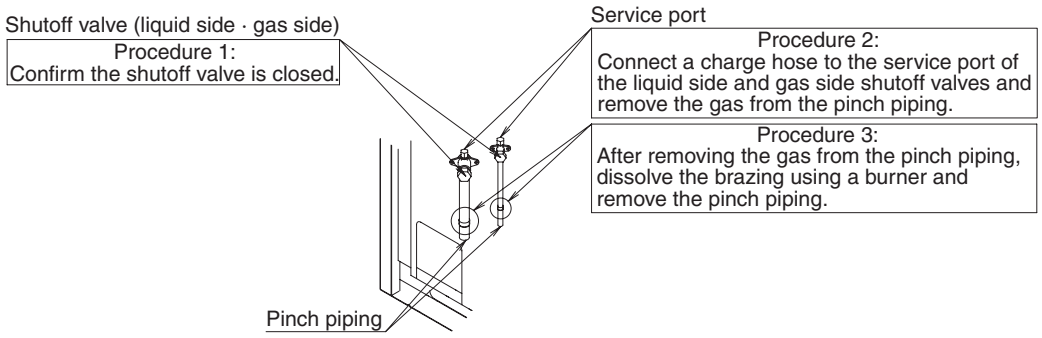


figure 13

Caution: After removing the gas, remove the pinch piping.
Any gas remaining inside may blow off the pinch piping when you dissolve the brazing, causing damage.

3. Connecting refrigerant piping to outdoor units
   <In case of single system: 5-18HP type>

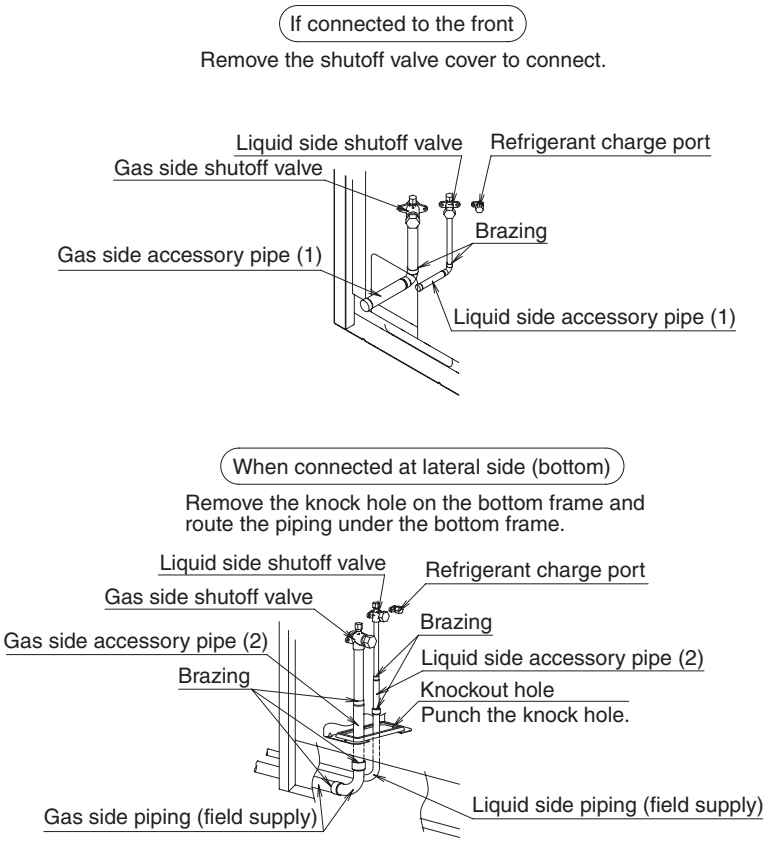
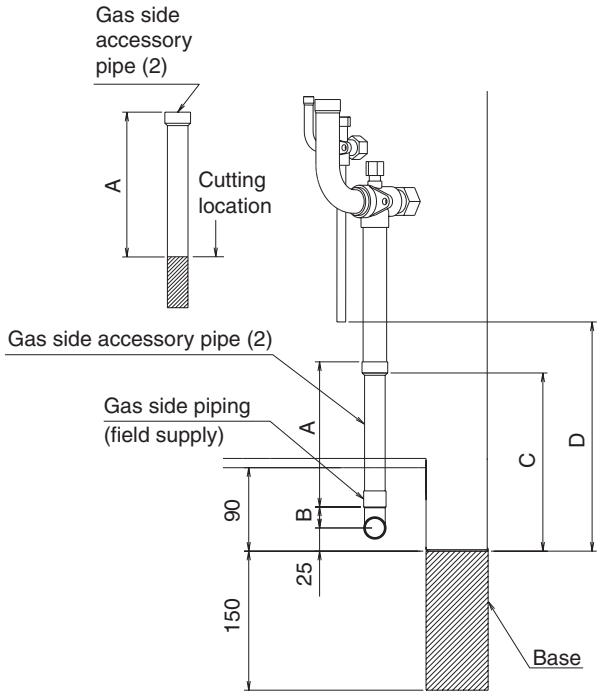


figure 14

Processing the Gas side accessory pipe (2)

Only in case of connecting at lateral side, cut the Gas side accessory pipe (2) referring the figure below.



(mm)

Model	A	B	C	D
5HP type	166	16	199	246
8HP type	156	17	188	247
10HP type	156	23	192	247
12HP type	150	29	192	247
14·16·18HP type	150	29	192	251

<In case of multi system: RX(Y)Q20-54P>

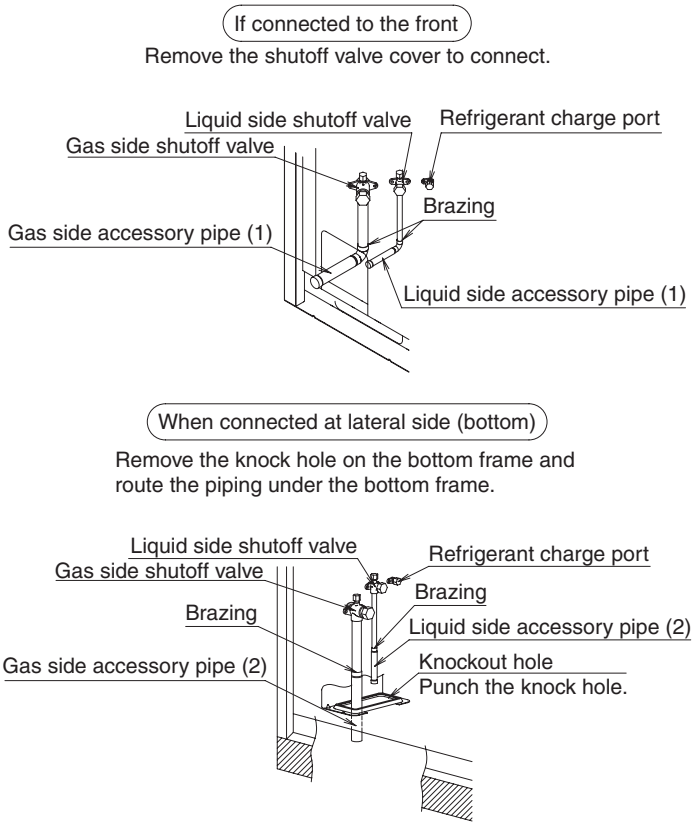


figure 15

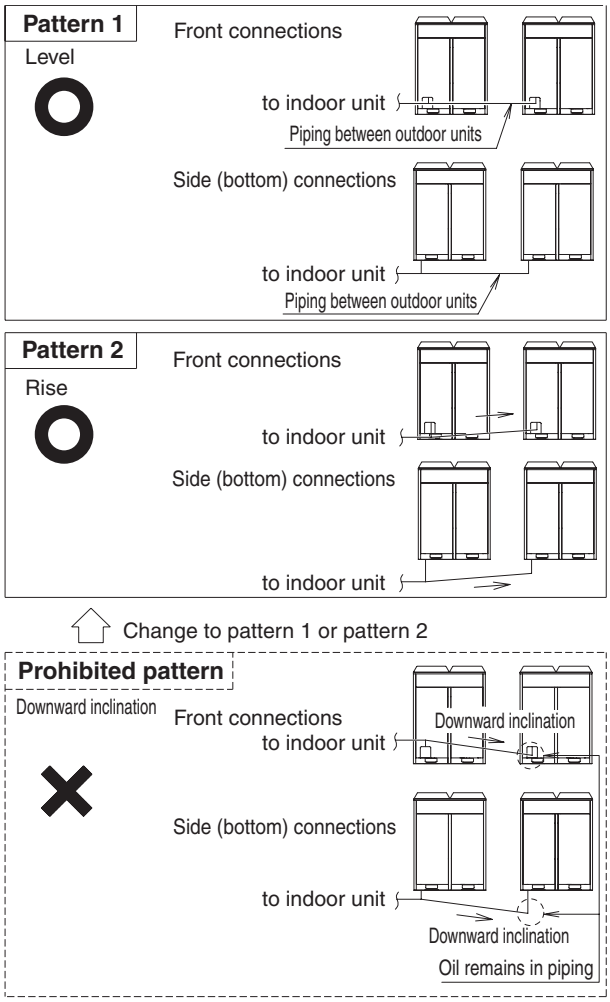
Note: **<Connecting Refrigerant Piping>**

- When connecting the piping on site, be sure to use the accessory piping.
- Make sure the onsite piping does not come into contact with other piping or the bottom frame or side panels of the unit.

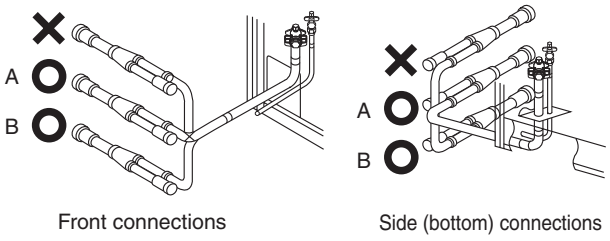
<Multi Systems>

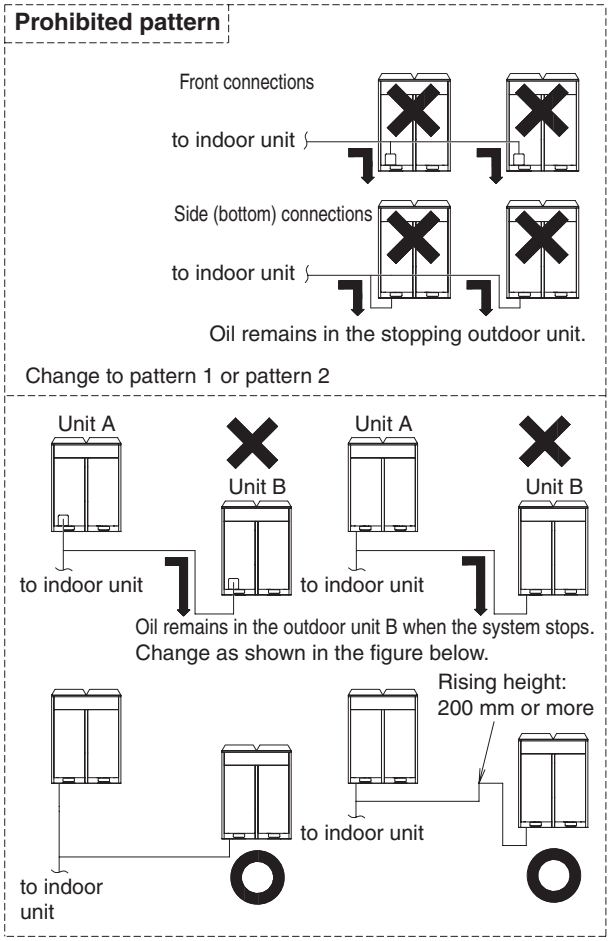
- The 5HP type cannot be used as an independent unit in a multi system.
- The Outdoor unit multi connection piping kit (sold separately) is needed when connecting piping between outdoor units.
  Refer to the installation manual that comes with the kit when doing this piping work.

4. Precautions when connecting piping between outdoor units (In case of multi system)
   The Outdoor unit multi connection piping kit (sold separately) is needed to connect piping between outdoor units in multi system. Only proceed with piping work after considering the limitations on installation listed here and in “5. Branching the refrigerant piping”, always referring to the kit’s installation manual.
   (1) The piping between outdoor units must be installed level (Pattern 1) or with a rise (Pattern 2). Otherwise oil may pool in the pipes.

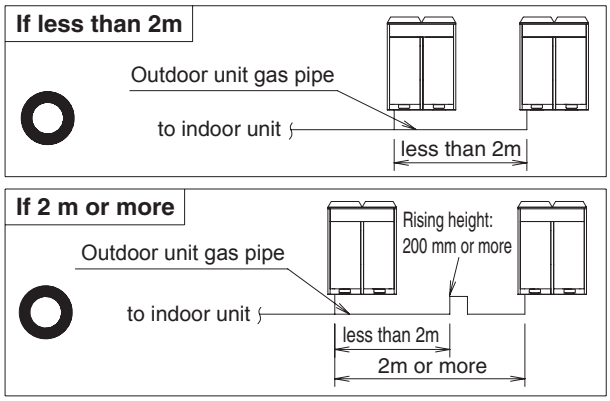


(2) To avoid the risk of oil detention in the stopping unit, always connect the shutoff valve and the piping between outdoor units as shown in the figure A or figure B.





(3) If the piping length between the outdoor units exceeds 2 m, create a rise of 200 mm or more in the gas line under a length of 2 m from the outdoor unit multi connection piping kit.



5. Branching the refrigerant piping
   Heed the restrictions below when installing the refrigerant branching kit and read the installation instruction manual with the kit.
   (Improper installation could lead to malfunctioning or breakdown of the outdoor unit.)

<REFNET joint>
Install the REFNET joint so it splits horizontally or vertically.

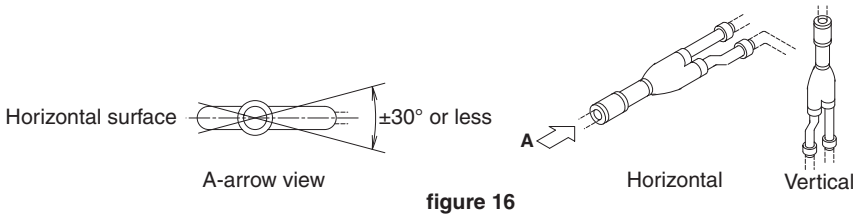


figure 16

<REFNET header>
Install the REFNET header so it splits horizontally.

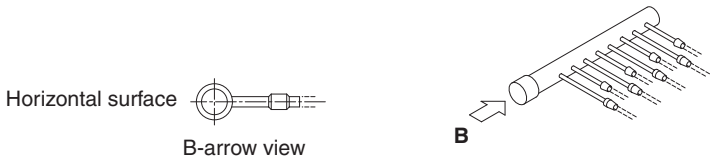


figure 17

<Outdoor unit multi connection piping kit>

- Install the joint horizontally so that the attached warning label faces strait up, and the tilt is within ±15°. **(Refer to figure 18-1)**
  Do not install vertically. **(Refer to figure 18-2)**
- Maintain a straight portion of 500 mm or more until the split of the joint without wrapping any onsite piping around this area.
  Over 500 mm of straight area can be maintained by connecting at least 120 mm of onsite pipe (straight) to the joint. **(Refer to figure 18-3)**

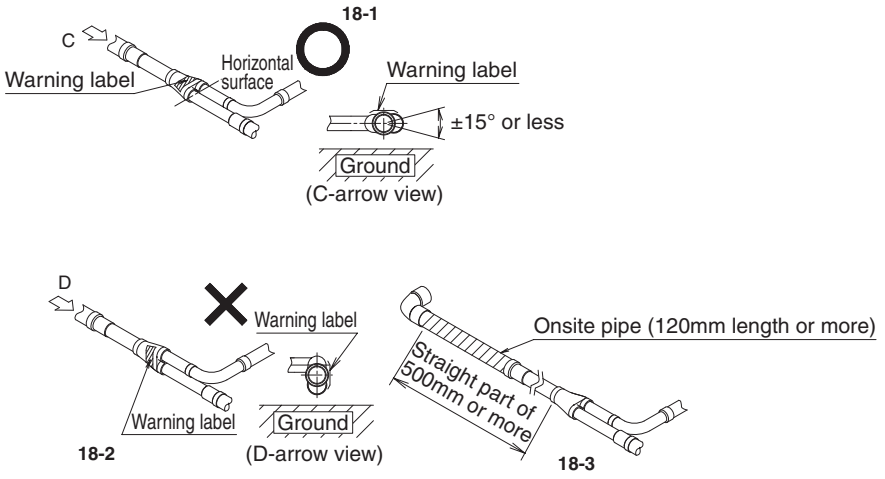


figure 18

3.6.5 EXAMPLE OF CONNECTION)

Example of connection

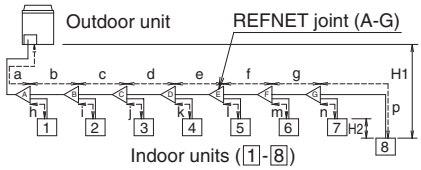
(Connection of 8 indoor units)

(∗1) " ◄ " indicate the Outdoor unit multi connection piping kit

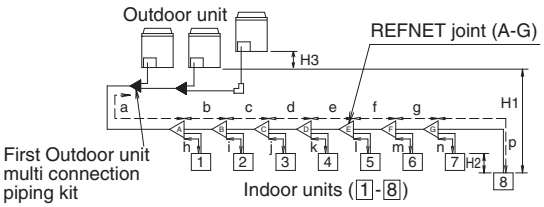
(∗2) In case of multi outdoor system, re-read to the first Outdoor unit multi connection piping kit as seen from the indoor unit.

Example refrigerant branch using REFNET joint

Single outdoor system



Multi outdoor system



Maximum allowable length	Between outdoor (∗2) and indoor units	Actual pipe length	Pipe length between outdoor (∗2) and indoor units ≤ 165m
			Example unit 8 : a + b + c + d + e + f + g + p ≤ 165m
		Equivalent length	Equivalent pipe length between outdoor (∗2) and indoor units ≤ 190m (assume equivalen
		Total extension length	Total pipe length from outdoor unit (∗2) to all indoor units ≤ 1000m
	Between outdoor unit and Outdoor unit multi connection piping kit (Only for multi system)	Actual pipe length Equivalent length	Pipe length between outdoor unit and Outdoor unit multi connection piping kit ≤ 10m, Equ
Allowable height length	Between outdoor and indoor units	Difference in height	Difference in height between outdoor and indoor units (H1) ≤ 50m (≤ 90m if the outdo
	Between indoor and indoor units	Difference in height	Difference in height between indoor units (H2) ≤ 15m
	Between outdoor and outdoor units	Difference in height	Difference in height between outdoor unit (H3) ≤ 5m
Allowable length after the branch		Actual pipe length	Pipe length from first refrigerant branch kit (either REFNET joint or REFNET header) to
			Example unit 8 : b + c + d + e + f + g + p ≤ 40m

Refrigerant branch kit selection

Refrigerant branch kits can only be used with R-410A.

⚠ • When multi outdoor system are installed, be sure to use the special separately sold Outdoor unit multi connection piping kit.
The table at right shows how to select the proper kit.

How to select the REFNET joint

• When using REFNET joint at the first branch counted from the outdoor unit side. Choose from the following table in accordance with the outdoor unit capacity type. (Example: REFNET joint A)

Outdoor unit capacity type	Refrigerant branch kit m
5HP type	KHRP26A22T
8, 10HP type	KHRP26A33T
12~22HP type	KHRP26A72T
24HP type~	KHRP26A73T + KI

• Choose the REFNET joints other than that for the first branch from the following table in capacity index of all the indoor units connected below the REFNET joint.

Indoor unit total capacity index	Refrigerant branch kit m
< 200	KHRP26A22T
200 ≤ x< 290	KHRP26A33T
290 ≤ x< 640	KHRP26A72T
640 ≤	KHRP26A73T + KI

Example for indoor units connected downstream

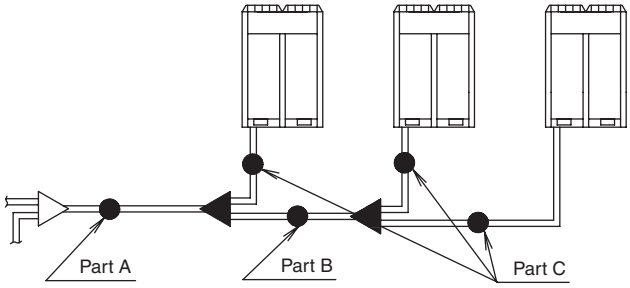
Example REFNET joint C: indoor units 3+4+5+6+7+8

Pipe size selection

⚠ **Caution**

The thickness of the pipes in the table shows the requirements of Japanese High Pressure Gas Control low. (As of Jan. 2003)
The thickness and material shall be selected in accordance with local code.

For the multi outdoor unit system, select in accordance with the following figure.



Temper grade and wall thickness for pipes.
(Temper grade, O type and 1/2H type indicate the material types specified in JIS H 3300.)

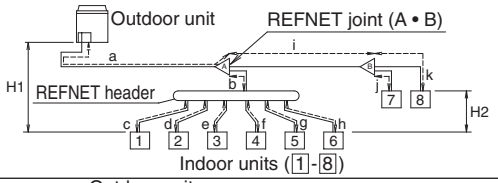
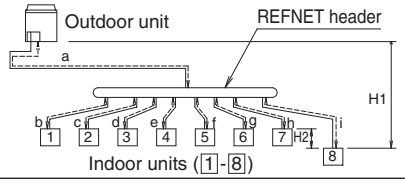
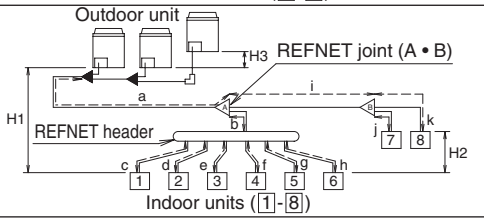
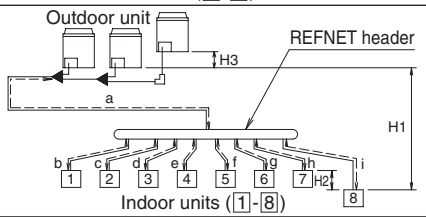
(Unit:mm)

Copper tube O.D.	Copper tube W.T. (Minimum requirement)	Temper grade
ϕ6.4	0.80	O type
ϕ9.5	0.80	
ϕ12.7	0.80	
ϕ15.9	0.99	
ϕ19.1	0.80	1/2H type
ϕ22.2	0.80	
ϕ25.4	0.88	
ϕ28.6	0.99	
ϕ31.8	1.10	
ϕ34.9	1.21	
ϕ38.1	1.32	
ϕ41.3	1.43	

How to calculate the additional refrigerant to be charged

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

$$R = (\text{Total length (m) of liquid piping size at } \phi 22.2) \times 0.37 + (\text{Total length (m) of liquid piping size at } \phi 19.1) \times 0.26 + (\text{Total length (m) of liquid piping size at } \phi 15.9) \times 0.18 + (\text{Total length (m) of liquid piping size at } \phi 6.4) \times 0.022$$

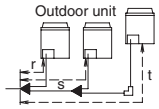
nt	Example refrigerant branch using REFNET joint and REFNET header	Example refrigerant branch using REFNET header
		
		
	Example unit 6 : a + b + h ≤ 165m, unit 8 : a + i + k ≤ 165m	Example unit 8 : a + i ≤ 165m

ume equivalent pipe length of REFNET joint to be 0.5m, that of REFNET header to be 1m, calculation purposes) (See Note 1 - Next page)

kit ≤ 10m, Equivalent length between outdoor unit and Outdoor unit multi connection piping kit ≤ 13m

0m if the outdoor unit is below)

T header) to indoor unit ≤ 40m (See Note 2 - Next page)



r ≤ 10m (Equivalent length: ≤ 13m)
s ≤ 10m (Equivalent length: ≤ 13m)
t ≤ 10m (Equivalent length: ≤ 13m)

	Example unit 6 : b + h ≤ 40m, unit 8 :i + k ≤ 40m	Example unit 8 : i ≤ 40m

nit side.
acity type.

t branch kit name
P26A22T
P26A33T
P26A72T
P26A73T + KHRP26M73TP

llowing table in accordance with the total

t branch kit name
P26A22T
P26A33T
P26A72T
P26A73T + KHRP26M73TP

How to select the REFNET header
- Choose from the following table in accordance with the total capacity index of all the indoor units connected below the REFNET header.
- Note: 250 type indoor unit cannot be connected below the REFNET header.

Indoor unit total capacity index	Refrigerant branch kit name
< 200	KHRP26M22H (Max. 4 branch)
200 ≤ x< 290	KHRP26M33H (Max. 8 branch)
290 ≤ x< 640	KHRP26M72H (Max. 8 branch) (See Note 3 - Next page)
640 ≤	KHRP26M73H (Max. 8 branch) + KHRP26M73HP

How to select the Outdoor unit multi connection piping kit (This is required when the system is multi outdoor unit system.)
- Choose from the following table in accordance with the number of outdoor units.

Number of outdoor units	Connection piping kit name
2 units	BHFP22P100
3 units	BHFP22P151

Example REFNET joint B: indoor units 7+8 Example REFNET header: indoor units 1+2+3+4+5+6	Example REFNET header: indoor units 1+2+3+4+5+6+7+8

in JIS
t:mm)

ade

e

Piping between Outdoor unit and first refrigerant branch kit.
Piping between first Outdoor unit multi connection piping kit and first refrigerant branch kit. (Part A)
- Choose from the following table in accordance with the outdoor unit capacity type.

Piping between Outdoor unit multi connection piping kits. (Part B)
Piping between outdoor unit and Outdoor unit multi connection piping kit. (Part C)
- Choose from the following table in accordance with the total capacity type of all the outdoor units connected above Outdoor unit multi connection piping kit.

(Unit:mm)

Outdoor unit capacity type	Piping size (O.D.)	
	Gas pipe	Liquid pipe
5HP type	ϕ15.9	ϕ9.5
8HP type	ϕ19.1	
10HP type	ϕ22.2	
12~16HP type	ϕ28.6	ϕ12.7
18~22HP type		ϕ15.9
24HP type	ϕ34.9	
26~34HP type		ϕ19.1
36~54HP type	ϕ41.4	

(See Note 1 - Next page)

Piping between refrigerant branch kits
- Choose from the following table in accordance with the total capacity index of all the indoor units connected below this.
- Do not let the connection piping exceed the main refrigerant piping size. (Unit:mm)

Indoor unit total capacity index	Piping size (O.D.)	
	Gas pipe	Liquid pipe
< 150	ϕ15.9	ϕ9.5
150 ≤ x< 200	ϕ19.1	
200 ≤ x< 290	ϕ22.2	
290 ≤ x< 420	ϕ28.6	ϕ12.7
420 ≤ x< 640		ϕ15.9
640 ≤ x< 920	ϕ34.9	ϕ19.1
920 ≤	ϕ41.3	

Piping between refrigerant branch kit and indoor unit
- Match to the size of the connection piping on the indoor unit. (Unit:mm)

Indoor unit capacity type	Piping size (O.D.)	
	Gas pipe	Liquid pipe
20 · 25 · 32 · 40?· 50 type	ϕ12.7	ϕ6.4
63 · 80 · 100 · 125 type	ϕ15.9	ϕ9.5
200 type	ϕ19.1	
250 type	ϕ22.2	

(m))
ing
9
×0.18 + (Total length (m) of liquid piping size at ϕ12.7) ×0.12 + (Total length (m) of liquid piping size at ϕ9.5) ×0.059

Example for refrigerant branch using REFNET joint and REFNET header

In case the outdoor unit is RXYQ34 type and the piping lengths are as at right

a: ϕ19.1 × 30m	d: ϕ9.5 × 10m	g: ϕ 6.4 × 10m	j : ϕ 6.4 × 10m
b: ϕ15.9 ×10m	e: ϕ9.5 × 10m	h: ϕ 6.4 × 20m	k: ϕ 6.4 × 9m
c: ϕ 9.5 × 10m	f : ϕ9.5 × 10m	i : ϕ12.7 × 10m	

R= 30×0.26 + 10×0.18 + 10×0.12 + 40×0.059 + 49×0.022 = 14.238 ⇩ 14.2 kg
(a, b, i, c+d+e+f, g+h+j+k)

3.6.6 EXAMPLE OF CONNECTION)

∗Note 1

When the equivalent pipe length between outdoor and indoor units is 90m or more, the size of main pi
Depending on the length of the piping, the capacity may drop, but even in such case it is able to increa

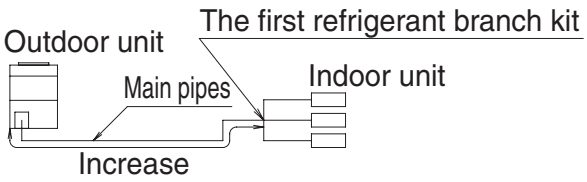


figure 9

■ Diameter of above case

Model	Gas	Liquid
RX(Y)Q5 Type	ϕ19.1	Not Increased
RX(Y)Q8 Type	ϕ22.2	ϕ12.7
RX(Y)Q10 Type	ϕ25.4*	ϕ12.7
RX(Y)Q12 Type	Not Increased	ϕ15.9
RX(Y)Q14 Type	Not Increased	ϕ15.9
RX(Y)Q16 Type	ϕ31.8*	ϕ15.9
RX(Y)Q18 Type	ϕ31.8*	ϕ19.1

Model	Gas	Liquid
RX(Y)Q20 Type	ϕ31.8*	ϕ19.1
RX(Y)Q22 Type	ϕ31.8*	ϕ19.1
RX(Y)Q24 Type	Not Increased	ϕ19.1
RX(Y)Q26 Type	ϕ38.1*	ϕ22.2
RX(Y)Q28 Type	ϕ38.1*	ϕ22.2
RX(Y)Q30 Type	ϕ38.1*	ϕ22.2
RX(Y)Q32 Type	ϕ38.1*	ϕ22.2

∗Note 2

Allowable length after the first refrigerant branch kit to indoor units is 40 m or less, however it can be extend

Required Conditions	Example Drawings
1. It is necessary to increase the pipe size between the first branch kit and the final branch kit. (Reducers must be procured on site) However, the pipes that are same pipe size with main pipe must not be increased.	[8] b+c+d+e+f+g+p≤ 90 m increase the pipe size of b, c, d, e, f
2. For calculation of Total extension length, the actual length of above pipes must be doubled. (except main pipe and the pipes that are not increased)	a+b×2+c×2+d×2+e×2+f×2+g +h+i+j+k+l+m+n+p≤ 1000 m
3. Indoor unit to the nearest branch kit ≤ 40 m	h, i, j..... p ≤ 40 m
4. The difference between [Outdoor unit to the farthest indoor unit] and [Outdoor unit to the nearest indoor unit] ≤ 40 m	The farthest indoor unit [8] The nearest indoor unit [1] (a+b+c+d+e+f+g+p)-(a+h)≤ 4

*If available on the site, use this size. Otherwise it can not be increased.

∗Note 3

If the pipe size above the REFNET header is ϕ34.9 or more, KHRP26M73HP is required.

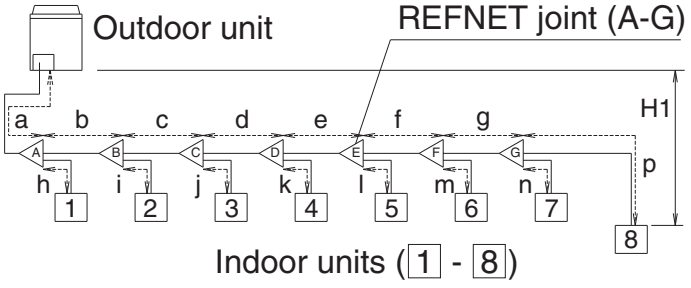
in pipes (both gas-side and liquid-side) must be increased.
crease the size of main pipes.

Model	Gas	Liquid
RX(Y)Q34 Type	ϕ38.1*	ϕ22.2
RX(Y)Q36 Type	Not Increased	ϕ22.2
RX(Y)Q38 Type	Not Increased	ϕ22.2
RX(Y)Q40 Type	Not Increased	ϕ22.2
RX(Y)Q42 Type	Not Increased	ϕ22.2
RX(Y)Q44 Type	Not Increased	ϕ22.2
RX(Y)Q46 Type	Not Increased	ϕ22.2

Model	Gas	Liquid
RX(Y)Q48 Type	Not Increased	ϕ22.2
RX(Y)Q50 Type	Not Increased	ϕ22.2
RX(Y)Q52 Type	Not Increased	ϕ22.2
RX(Y)Q54 Type	Not Increased	ϕ22.2

*If available on the site, use this size.
Otherwise, it can not be increased.

xtended up to **90** m if all the following conditions are satisfied. (In case of **" Branch with REFNET joint "**)

vings	
n , e, f, g	Increase the pipe size as follows ϕ 9.5 → ϕ12.7 ϕ15.9 → ϕ19.1 ϕ22.2 → ϕ25.4* ϕ34.9 → ϕ38.1* ϕ12.7 → ϕ15.9 ϕ19.1 → ϕ22.2 ϕ28.6 → ϕ31.8*
:2+g×2) m	
ı) ≤ 40 m	

1.7 Field Wiring

Caution:

- All field wiring and components must be installed by a licensed electrician and must comply with relevant local and national regulations.
- Be sure to use a dedicated power circuit. Never use a power supply shared by another appliance.
- Never install a phase advancing capacitor. As this unit is equipped with an inverter, installing a phase advancing capacitor will not only deteriorate power factor improvement effect, but also may cause capacitor abnormal heating accident due to high-frequency waves.
- Only proceed with wiring work after blocking off all power.
- Always ground wires in accordance with relevant local and national regulations.
- This machine includes an inverter device. Connect earth and leave charge to eliminate the impact on other devices by reducing noise generated from the inverter device and to prevent leaked current from being charged in the outer hull of the product.
- Do not connect the ground wire to gas pipes, sewage pipes, lightning rods, or telephone ground wires.
  Gas pipes: can explode or catch fire if there is a gas leak.
  Sewage pipes: no grounding effect is possible if hard plastic piping is used.
  Telephone ground wires and lightning rods: dangerous when struck by lightning due to abnormal rise in electrical potential in the grounding.
- Be sure to install an earth leakage circuit breaker.
  This unit uses an inverter, so install the earth leakage circuit breaker that be capable of handling high harmonics in order to prevent malfunctioning of the earth leakage circuit breaker itself.
- Earth leakage circuit breaker which are especially for protecting ground-faults should be used in conjunction with main switch or fuse for use with wiring.

Note:

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

1.7.1 Power circuit, safety device, and cable requirements

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

	Phase and frequency	Voltage	Minimum circuit amp.	Recommended fuses
RX(Y)Q5PY1	ϕ 3, 50Hz	380-415V	11.9A	15A
RX(Y)Q8PY1	ϕ 3, 50Hz	380-415V	18.5A	25A
RX(Y)Q10PY1	ϕ 3, 50Hz	380-415V	21.6A	25A
RX(Y)Q12PY1	ϕ 3, 50Hz	380-415V	22.7A	25A
RX(Y)Q14PY1	ϕ 3, 50Hz	380-415V	31.5A	35A
RX(Y)Q16PY1	ϕ 3, 50Hz	380-415V	31.5A	35A
RX(Y)Q18PY1	ϕ 3, 50Hz	380-415V	32.5A	40A
RX(Y)Q20PY1	ϕ 3, 50Hz	380-415V	41.2A	50A
RX(Y)Q22PY1	ϕ 3, 50Hz	380-415V	44.3A	50A
RX(Y)Q24PY1	ϕ 3, 50Hz	380-415V	50.0A	60A
RX(Y)Q26PY1	ϕ 3, 50Hz	380-415V	51.0A	60A
RX(Y)Q28PY1	ϕ 3, 50Hz	380-415V	54.1A	60A
RX(Y)Q30PY1	ϕ 3, 50Hz	380-415V	55.2A	70A
RX(Y)Q32PY1	ϕ 3, 50Hz	380-415V	63.0A	70A
RX(Y)Q34PY1	ϕ 3, 50Hz	380-415V	64.0A	80A
RX(Y)Q36PY1	ϕ 3, 50Hz	380-415V	65.0A	80A
RX(Y)Q38PY1	ϕ 3, 50Hz	380-415V	73.7A	90A
RX(Y)Q40PY1	ϕ 3, 50Hz	380-415V	81.5A	90A
RX(Y)Q42PY1	ϕ 3, 50Hz	380-415V	82.5A	100A
RX(Y)Q44PY1	ϕ 3, 50Hz	380-415V	83.5A	100A
RX(Y)Q46PY1	ϕ 3, 50Hz	380-415V	86.6A	100A
RX(Y)Q48PY1	ϕ 3, 50Hz	380-415V	87.7A	100A
RX(Y)Q50PY1	ϕ 3, 50Hz	380-415V	96.5A	110A
RX(Y)Q52PY1	ϕ 3, 50Hz	380-415V	96.5A	110A
RX(Y)Q54PY1	ϕ 3, 50Hz	380-415V	97.5A	110A

Note: The above table indicates power specifications for standard combinations (see 1-2 Introduction).

If using anything other than the above combinations in a multi system, calculate using the following procedure.

Minimum circuit amp value: add the minimum circuit amp values for each independent unit

Recommended fuse capacity: select the fuse capacity with the next higher value of the calculated minimum circuit amp. multiplied by 1.1.

Ex: Combining the RXYQ30PY1 using RXYQ8PY1, RXYQ10PY1, and RXYQ12PY1.

Minimum circuit amp. of the RXYQ8PY1 in table above = 18.5 A

Minimum circuit amp. of RXYQ10PY1 in table above = 21.6 A

Minimum circuit amp. of RXYQ12PY1 in table above = 22.7 A

Accordingly, the minimum circuit amp. of the RXYQ30PY1 = 18.5 + 21.6 + 22.7= 62.8 A

Multiplying the result above by 1.1 (62.8 × 1.1) = 69.1 A, so the recommended fuse capacity would be 70 A.

1.7.2 Wiring Connection Example for Whole System

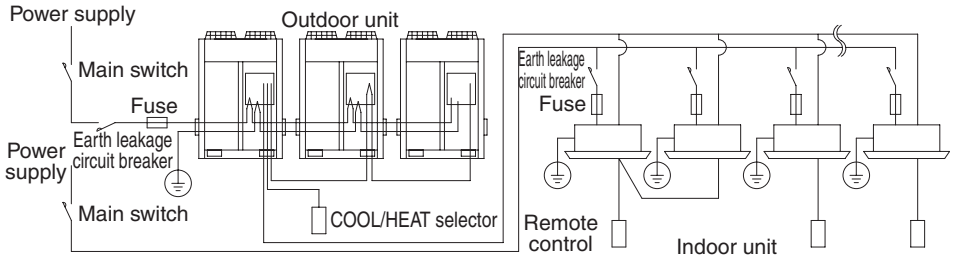


figure 19

Note:
- Make sure the weak electric wiring (i.e. for the remote control, between units, etc.) and the power wiring do not pass near each other, keeping them at least 50 mm apart. Proximity may cause electrical interference, malfunctions, and breakage.
- Be sure to connect the power wiring to the power wiring terminal block and secure it as described in **"1-7-5 Power Wiring Connection Procedure"**.
- Transmission wiring should be secured as described in **"1-7-4 Transmission Wiring Connection Procedure"**.
- Secure wiring with clamp such as insulation lock ties to avoid contact with piping.
- Shape the wires to prevent the structure such as the EL. COMPO. BOX lid deforming. And close the cover firmly.
- 5HP type can not compose multi system.

1.7.3 Leading wire Procedure

- The power wiring and ground wiring are passed out from the power wiring hole on the sides, the front (knock hole) or the bottom frame (knock hole) .
- The transmission wiring is passed out from the wiring hole (knock hole) on the front of the unit or from a piping hole.

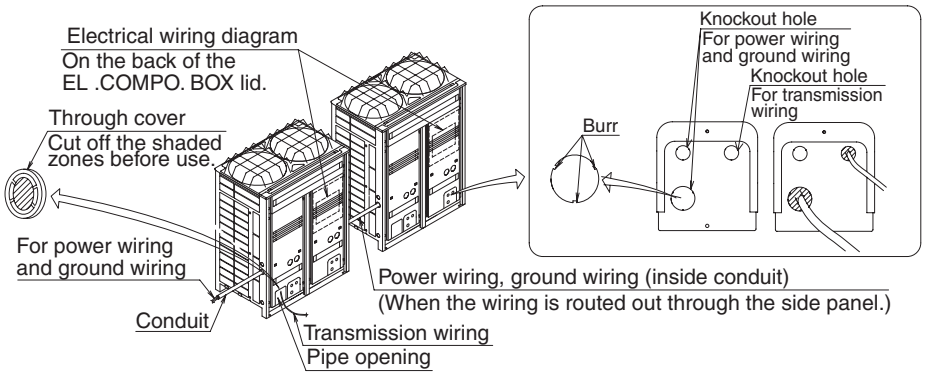


figure 20

Note:
- Open the knock holes with a hammer or the like.
- After knocking out the holes, we recommend you remove any burrs and paint them using the repair paint to prevent rusting.
- When passing wiring through the knock holes, remove burrs around the knock holes and protect the wiring with protective tape. **(Refer to figure 20)**
- If small animals might enter the unit, block off any gaps (hatching parts in figure 20) with material (field supply).

1.7.4 Transmission Wiring Connection Procedure

- Referring to figure 21, 22 connect the transmission wiring between outdoor unit and indoor unit, outdoor unit and outdoor unit of other system, outdoor unit and outdoor unit of same system (only multi system) or to COOL/HEAT selector (except RXQ-P).

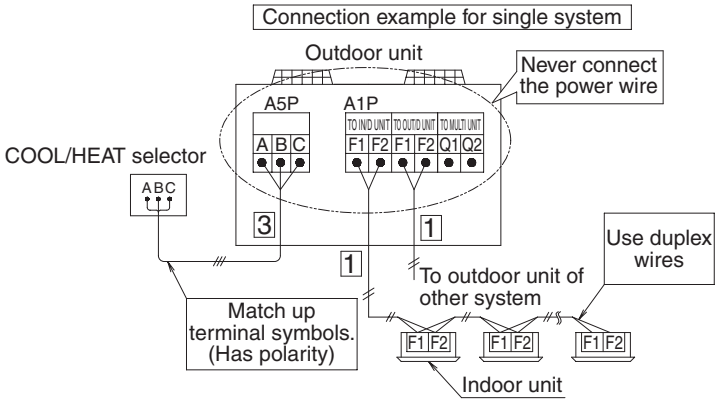


figure 21

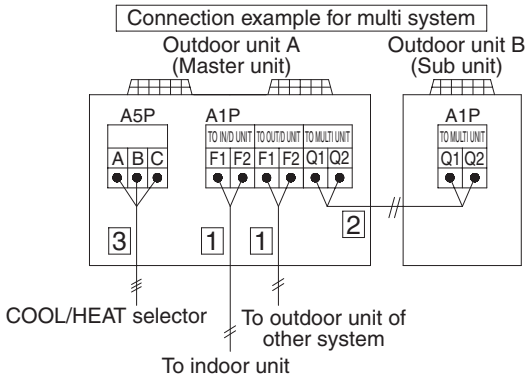


figure 22

- All transmission wiring is to be procured on site. All wiring should use sheathed vinyl cord 0.75-1.25 mm^2 or cable (duplex). (Triplex only for the COOL/HEAT selector.)
- Transmission wiring (About the symbol 1 ~ 3, see figure 21, 22) should be done within the following limitations.
  If they are exceeded, transmission problems may occur.

  1 Between outdoor unit and indoor unit
  Between outdoor unit and outdoor unit of other systems
  Max. wiring length : 1,000 m
  Max. total wiring length : 2,000 m
  Max. no. of branches : 16
  [Note]
  No branch is allowed after branch (See figure 23)
  Max. no. of outdoor units of other system
  that can be connected : 10

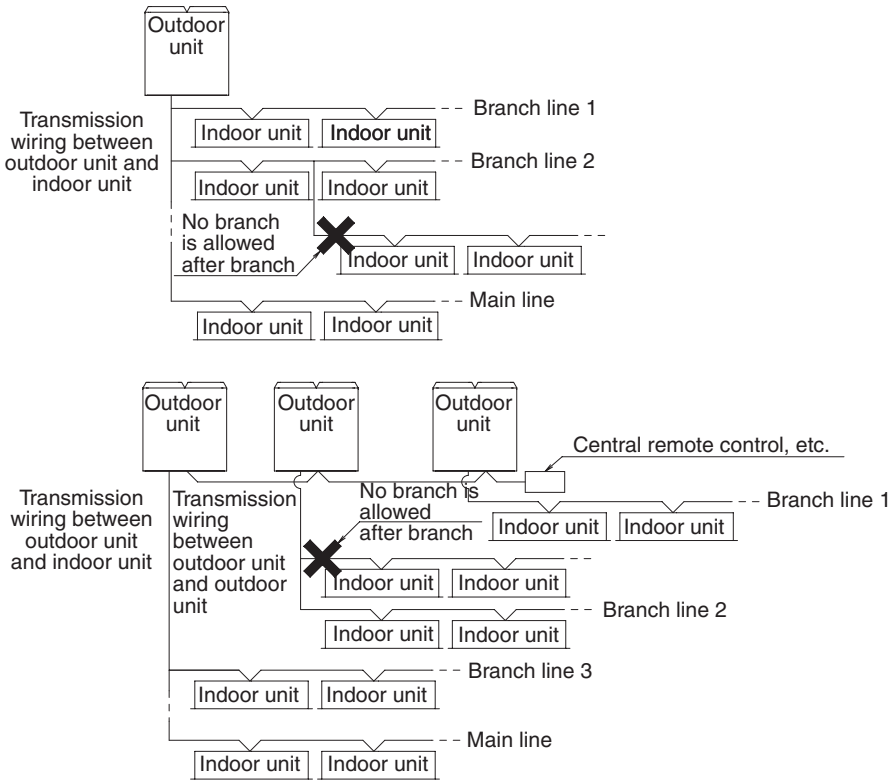


figure 23

  2 Between outdoor unit and outdoor unit of same system (Only for multi system)
  Max. wiring length : 30 m

  3 Transmission wiring to COOL/HEAT selector
  Max. wiring length : 500 m

- The transmission wiring inside the EL.COMPO.BOX should be secured using the clamp (1) as shown in figure 24.

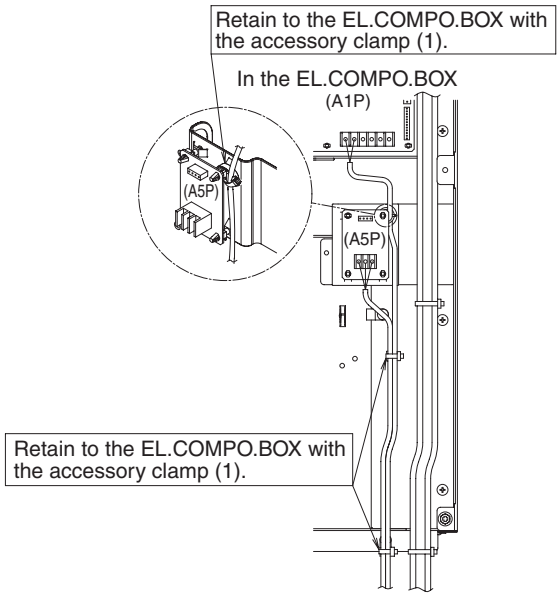


figure 24

- Outside the units, the transmission wiring must be finished simultaneously with the local refrigerant piping, and wound with tape (field supply) as shown in figure 25.

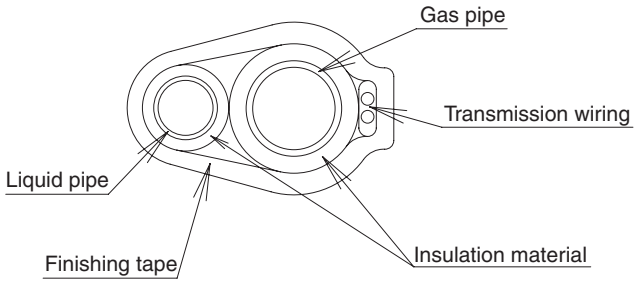


figure 25

- For multi system:
  1. Transmission wiring between outdoor units in the same piping system must be connected to terminals Q1 and Q2 (TO MULTI UNIT).
     Connecting the wires to the F1, F2 (TO OUT/D UNIT) terminals results in system malfunction.
  2. Wiring to other systems should be connected to terminals F1 and F2 (TO OUT/D UNIT) on the PC-board of the master unit. The outdoor unit that connected transmission wiring to indoor unit is the master unit. The others are sub unit.

Caution:

- Do not connect the power wiring to terminals for the transmission wiring. Doing so would destroy the entire system.
- When connecting wires to the terminal block on the PC-board, too much heat or tightening could damage the PC-board. Attach with care.
  See the table below for the tightening torque of the transmission wiring terminals.

Screw size	Tightening torque (N · m)
M3 (A5P)	0.53 - 0.63
M3.5 (A1P)	0.80 - 0.96

1.7.5 Power Wiring Connection Procedure

Be sure to connect the power supply wiring to the power supply terminal block and hold it in place using the included clamp as shown in the figure 26.

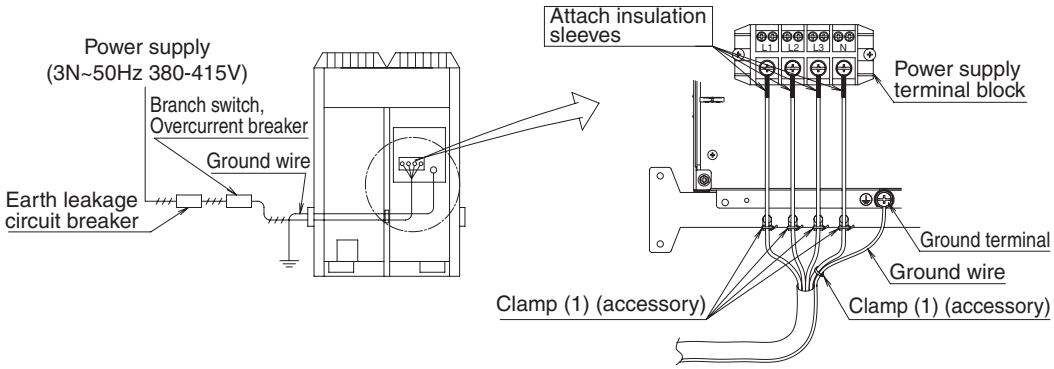
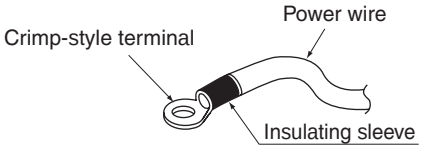


figure 26

- The L1, L2, L3 and N phases of the power wiring should be secured separately to the hook using the included clamp (1).
- The ground wiring should be bound to the power wiring using the included clamp (1) to prevent outside force from being applied to the terminal area.
- Wire so that the ground wiring does not come into contact with the compressor lead wiring. If they touch, this may have an adverse effect on other devices.

Caution:

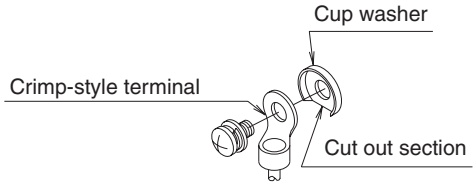
- Be sure to use crimp-style terminal with insulating sleeves for connections. (See the figure below.)



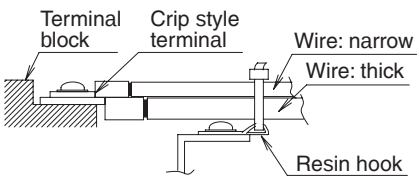
- For wiring, use the designated power wire and connect firmly, then secure to prevent outside pressure being exerted on the terminal board.
- Use an appropriate screwdriver for tightening the terminal screws. A screwdriver with a small head will strip the head and make proper tightening impossible.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

Screw size	Tightening torque (N·m)
M8 Power terminal, ground terminal	5.5 ~7.3

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



- When two wires are connected to a single terminal, connect them so that the rear sides of the crimp contacts face each other. Also, make sure the thinner wire is on top, securing the two wires simultaneously to the resin hook using the included clamp (1).



1.7.6 Procedure for Wiring Inside Units

- Referring to figure 27, secure and wire the power and transmission wiring using the included clamp (1), (2), and (3).

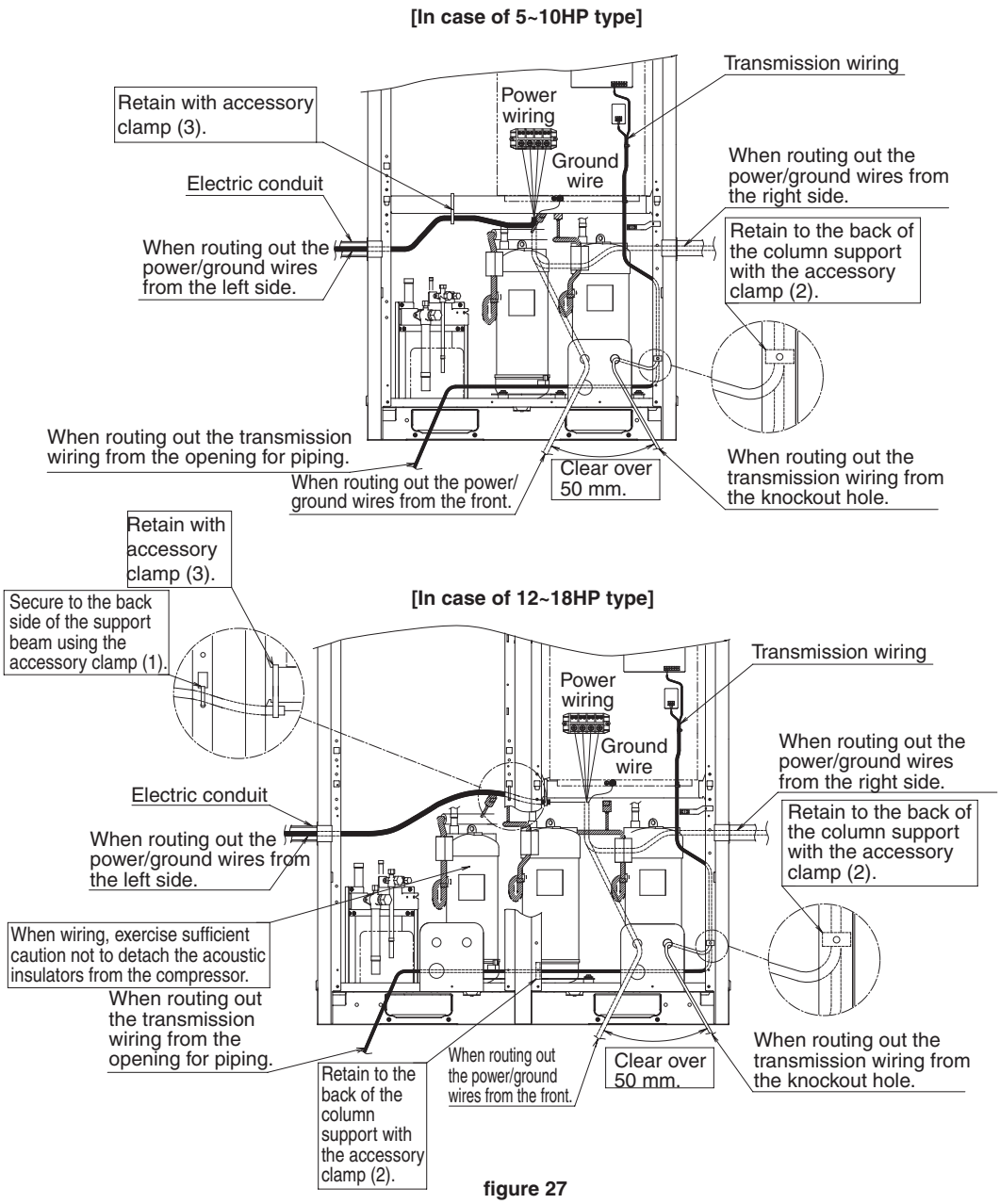


figure 27

Caution:

- The transmission wiring must be at least 50 mm away from the power wiring.
- Make sure all wiring do not contact to the pipes (hatching parts in the figure 27).
- After wiring work is completed, check to make sure there are no loose connections among the electrical parts in the EL.COMPO.BOX.

1.8 Air Tight Test and Vacuum Drying

Note:
- Always use nitrogen gas for the airtightness test.
- Absolutely do not open the shutoff valve until the main power circuit insulation measurement has been completed. (measuring after the shutoff valve is opened will cause the insulation value to drop.)

1.8.1 Preparations

<Needed tools>

Gauge manifold Charge hose valve	■ To prevent entry of any impurities and insure sufficient pressure resistance, always use the special tools dedicated for R-410A. ■ Use charge hose that have pushing stick for connecting to service port of shutoff valves or refrigerant charge port.
Vacuum pump	■ The vacuum pump for vacuum drying should be able to lower the pressure to –100.7kPa (5 Torr –755mm Hg). ■ Take care the pump oil never flow backward into the refrigerant pipe during the pump stops.

<The system for air tight test and vacuum drying>

- Referring to figure 28, connect an nitrogen tank, refrigerant tank, and a vacuum pump to the outdoor unit.
  The refrigerant tank and the charge hose connection to refrigerant charge port or the valve A, C in figure 28 are needed in “1-11. Additional Refrigerant Charge and Check Operation”.
- The shutoff valve and valve A~C in figure 28 should be open or closed as shown in the table below.

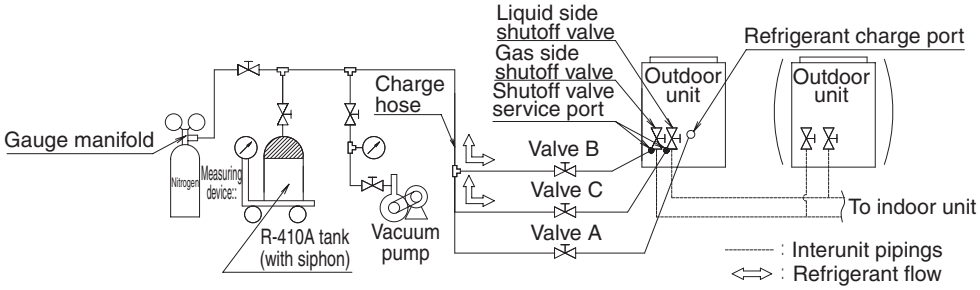
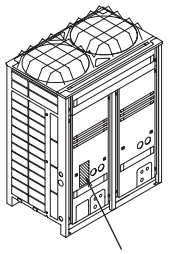


figure 28

State of valve A, B and C and shutoff valves	Valve			shutoff valve	
	A	B	C	Liquid side	Gas side
Air tight test, Vacuum drying (Close valve A and shutoff valves certainly. Otherwise the refrigerant in the unit are released.)	Close	Open	Open	Close	Close

Note:
- The airtightness test and vacuum drying should be done using the liquid side and gas side shutoff valve service ports.
  See the [R-410A] Label attached to the front plate of the outdoor unit for details on the location of the service port (see figure at right).
- See **[Shutoff valve operation procedure]** in “1-11-1 Before working” for details on handling the shutoff valve.
- The refrigerant charge port is connected to unit pipe.
  When shipped, the unit contains the refrigerant, so use caution when attaching the charge hose.


[R-410A] Label

1.8.2 Air tight test and vacuum drying method

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

<Air tight test>

Pressurize the liquid and gas pipes to 4.0MPa (40bar) (do not pressurize more than 4.0MPa (40bar)). If the pressure does not drop within 24 hours, the system passes the test.
If there is a pressure drop, check for leaks, make repairs and perform the airtight test again.

<Vacuum drying>

Evacuate the system from the liquid and gas pipes by using a vacuum pump for more than 2 hours and bring the system to –100.7kPa 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.

Note: **If moisture might enter the piping, follow below.**
(I.e., if doing work during the rainy season, if the actual work takes long enough that condensation may form on the inside of the pipes, if rain might enter the pipes during work, etc.)

(1) After performing the vacuum drying for two hours, pressurize to 0.05 MPa (i.e., vacuum breakdown) with nitrogen gas, then depressurize down to –100.7 kPa for an hour using the vacuum pump (vacuum drying).
(2) If the pressure does not reach –100.7 kPa even after depressurizing for at least two hours, repeat the vacuum breakdown - vacuum drying process.

After vacuum drying, maintain the vacuum for an hour and make sure the pressure does not rise by monitoring with a vacuum gauge.

1.9 Pipe Insulation

- Insulation of pipes should be done after performing **"1-8 Air Tight Test and Vacuum Drying"**.
- Always insulate the liquid side piping and gas side piping in the interunit piping and refrigerant branching kit. Failing to insulate the pipes could cause leaking or burns. (The gas side piping can reach temperatures of 120°C. Be sure the insulation used can withstand such temperatures.)
- Reinforce the insulation on the refrigerant piping according to the installation environment. Condensation might form on the surface of the insulation.
  - Ambient temperature: 30°C, humidity: 75% to 80% RH: min. thickness: 15 mm.
  - If the ambient temperature exceeds 30°C and the humidity 80% RH, then the min. thickness is 20 mm.
- If there is a possibility that condensation on the shutoff valve might drip down into the indoor unit through gaps in the insulation and piping because the outdoor unit is located higher than the indoor unit, etc., this must be prevented by caulking the connections, etc. **(Refer to figure 29)**
- The piping lead-out hole lid should be attached after opening a knock hole. **(Refer to figure 30)**
- If small animals and the like might enter the unit through the piping lead-out hole, close the hole with blocking material (procured on site) after completion of **"1-11. Additional Refrigerant Charge and Check Operation". (Refer to figure 30)**

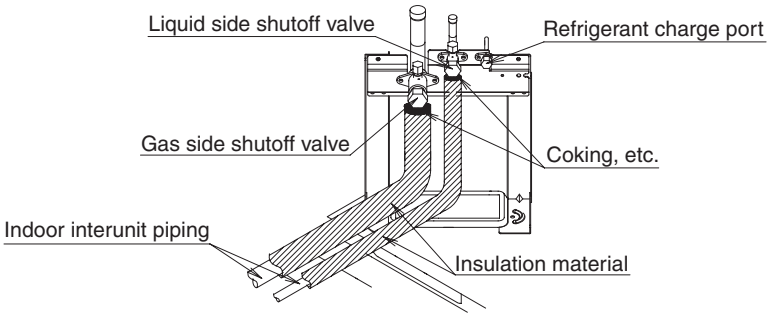


figure 29

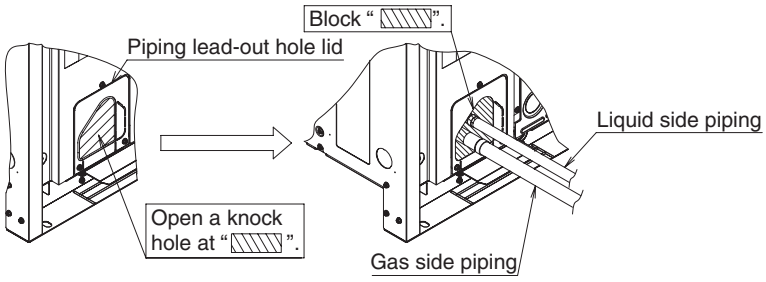


figure 30

Note:
- After knocking out the holes, we recommend you remove burrs in the knock holes (see figure 30) and paint the edges and areas around the edges using the repair paint.

1.10 Checking of Device and Installation Conditions

Be sure to check the followings.

For those doing electrical work

1. Make sure there is no faulty transmission wiring or loosen a nut.
   See **"1-7-4 Transmission Wiring Connection Procedure"**.
2. Make sure there is no faulty power wiring or loosen a nut.
   See **"1-7-5 Power Wiring Connection Procedure"**.
3. Has the insulation of the main power circuit deteriorated?
4. Measure the insulation and check the insulation is above regular value in accordance with relevant local and national regulations.

For those doing pipe work

1. Make sure piping size is correct.
   See **"1-6-1 Selection of piping material and Refrigerant branching kit"**.
2. Make sure insulation work is done.
   See **"1-9 Pipe Insulation"**.
3. Make sure there is no faulty refrigerant piping.
   See **"1-6 Refrigerant Piping"**.

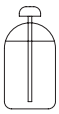
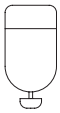
1.11 Additional Refrigerant Charge and Check Operation

The outdoor unit is charged with refrigerant when shipped from the factory, but depending on the size and length of the piping when installed, it may require additional charging.
For charging the additional refrigerant, follow the procedure in this chapter.
And then carry out the check operation.

1.11.1 Before working

[About the refrigerant tank]

Check whether the tank has a siphon pipe before charging and place the tank so that the refrigerant is charged in liquid form. (See the figure below.)

With siphon pipe
 Stand the tank upright and charge. (The siphon pipe goes all the way inside, so the tank does not need be put upside-down charge in liquid form.)
Other tanks
 Stand the tank upside-down and charge.

Caution:

- Always use the proper refrigerant (R-410A). If charged with the refrigerant containing an improper material, it may cause an explosion or accident.
- R-410A is a mixed refrigerant, so charging it as a gas will cause the refrigerant composition to change, which may prevent normal operation.

[Shutoff valve operation procedure]

When operating the shutoff valve, follow the procedure instructed below.

Note:

- Do not open the shutoff valve until “1-10 Checking of Device and Installation Conditions” are completed. If the shutoff valve is left open without turning on the power, it may cause refrigerant to buildup in the compressor, leading insulation degradation.
- Be sure to use the correct tools.
  The shutoff valve is not a back-seat type. If forced it to open, it might break the valve body.
- When using a service port, use the charge hose.
- After tightening the cap, make sure no refrigerant gas is leaking.

[Tightening torque]

The sizes of the shutoff valves on each model and the tightening torque for each size are listed in the table below.

<Size of Shutoff Valve>

	5HP type	8HP type	10HP type	12HP type	14HP type	16HP type	18HP type
Liquid side shutoff valve	ϕ 9.5 The 12HP type corresponds to the 12.7-diameter onsite piping using the included piping.				ϕ 12.7 The 18HP type corresponds to the 15.9-diameter onsite piping using the accessory pipe.		
Gas side shutoff valve	ϕ 15.9	ϕ 19.1	ϕ 25.4 The 10HP type corresponds to the 22.2-diameter onsite piping using the accessory pipe. The 12 ~ 18HP type corresponds to the 28.6-diameter onsite piping using the accessory pipe.				

<Tightening torque>

Shutoff valve size	Tightening torque N·m (Turn clockwise to close)			
	Shaft (valve body)		Cap (valve lid)	Service port
ϕ 9.5	5.4 - 6.6	Hexagonal wrench 4 mm	13.5 - 16.5	11.5 - 13.9
ϕ 12.7	8.1 - 9.9		18.0 - 22.0	
ϕ 15.9	13.5 - 16.5	Hexagonal wrench 6 mm	22.5 - 27.5	
ϕ 19.1	27.0 - 33.0	Hexagonal wrench 8 mm		
ϕ 25.4				

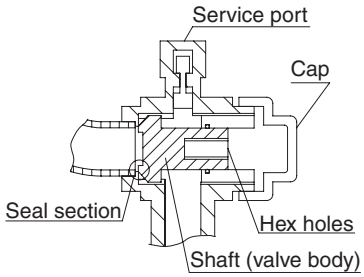


figure 34

[To open]
1. Remove the cap and turn the shaft counterclockwise with the hexagon wrench (JISB4648).
2. Turn it until the shaft stops.
3. Make sure to tighten the cap securely.
   (For the tightening torque, refer to the item <Tightening Torque>.)

[To close]
1. Remove the cap and turn the shaft clockwise with the hexagon wrench (JISB4648).
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 item <Tightening Torque>.)

[How to Check How Many Units are Connected]

It is possible to find out how many indoor or outdoor unit in the system are turned on by operating the push button on the PC-board (A1P) of outdoor unit (In case of multi system master unit).

Follow the procedure below to check how many indoor or outdoor units are turned on.

(LED display: ● ...OFF ☼ ...ON ◑ ...Blinking ＊...Uncertain)		LED display						
		H1P	H2P	H3P	H4P	H5P	H6P	H7P
(1) Press the MODE button (BS1) once, and set the MONITOR MODE (H1P: Blinking).		◑	●	●	●	●	●	●
(2) Press the SET button (BS2) the number of times until the LED display matches that at right.	For checking the number of outdoor units: eight times	◑	●	●	☼	●	●	●
	For checking the number of indoor units: five times	◑	●	●	●	☼	●	☼
(3) Press the RETURN button (BS3) and read the number of units from the display of H2P through H7P. [Reading Method] The display of H2P through H7P should be read as a binary number, with ◑ standing for "1" and ● standing for "0".		◑	＊	＊	＊	＊	＊	＊
Ex: For the LED display at right, this would be "0 1 0 1 1 0", which would mean 22 units are connected. 32 × **0** + 16 × **1** + 8 × **0** + 4 × **1** + 2 × **1** + 1 × **0** = 22 units Note: "000000" indicates 64 units.		◑	●	◑	●	◑	◑	●
(4) Press the MODE button (BS1) once. This returns to **Setting Mode 1** (default).		●	●	☼	●	●	●	●

Note: Press the "MODE button" (BS1) if you get confused while operating.
This returns to **Setting Mode 1** (default).

1.11.2 Procedure of Adding Refrigerant charging and check operation

Warning **Electric Shock Warning:**

- Make sure to close the EL. COMPO. BOX lid before turning on the power when performing the refrigerant charging operation.
- Perform the setting on the PC-board (A1P) of the outdoor unit and check the LED display after the power is on via the inspection door which is in the EL. COMPO. BOX lid.
- Use an insulated rod to operate the push buttons via the EL. COMPO. BOX's inspection door.
  There is a risk of electric shock if you touch any live parts, since this operation must be performed with the power on.

Caution:

- Make sure to use the protect tool (protective groves and goggles) when charging the refrigerant.
- Due to a danger of liquid hammer, the refrigerant must not be charged over the allowable maximum amount when charging the refrigerant.
- Do not perform the refrigerant charging operation under working for the indoor unit.
- When opening the front panel, make sure to take caution to the fan rotation during the working.
  After the outdoor unit stops operating, the fan may keep rotation for a while.

Note:

- If operation is performed within 12 minutes after the indoor and outdoor units are turned on, H2P will be lit on and the compressor will not operate.
- In order to ensure uniform refrigerant distribution, it may take up to around 10 minutes for the compressor to start up after the unit starting operating. This is not a malfunction.

<About refrigerant charging>

- The refrigerant charge port is connected to the piping inside the unit.
  When the unit is shipped from the factory, the unit's internal piping is already charged with refrigerant, so be careful when connecting the charge hose.
- After adding the refrigerant, make sure to close the lid of the refrigerant charging port.
  The tightening torque for the lid is 11.5 to 13.9 Nm.
- See [Shutoff valve operation procedure] in chapter 1-11-1 for details on how to handle shutoff valves.
- When done or when pausing the refrigerant charging operation, close the valve of the refrigerant tank immediately. If the tank is left with the valve open, the amount of refrigerant which is properly charged may be off the point. More refrigerant may be charged by any remaining pressure after the machine is stopped.

<About check operation>

- Make sure to perform the check operation after installation. Otherwise, the malfunction code "U3" will be displayed and normal operation cannot be performed.
  And the failure of "Check of miswiring" may also cause abnormal operation. Performance may drop due to the failure of "Judgment of piping length".
- Check operation must be performed for each refrigerant piping system.
  Checking is impossible if plural systems are being done at once.
- The individual problems of indoor units can not be checked.
  About these problems check by test run after the check operation is completed. (See chapter 1-13)
- The check operation cannot be performed in recovery or other service modes.

1. Make sure the following works are complete in accordance with the installation manual.
   - Piping work
   - Wiring work
   - Air tight test
   - Vacuum drying
   - Installation work for indoor unit
2. Calculate the "additional charging amount" using "How to calculate the additional refrigerant to be charged" in "1-6-5 Example of connection".
3. Open the valve C (See the figure 31. The valve A, B and the liquid and gas side shutout valve must be left closed), and charge the refrigerant of the "additional charging amount" from the liquid side shutout valve service port.
   If the "additional charging amount" was charged fully, close the valve C and go to step 5.
   If the "additional charging amount" was not charged fully, go to step 4.

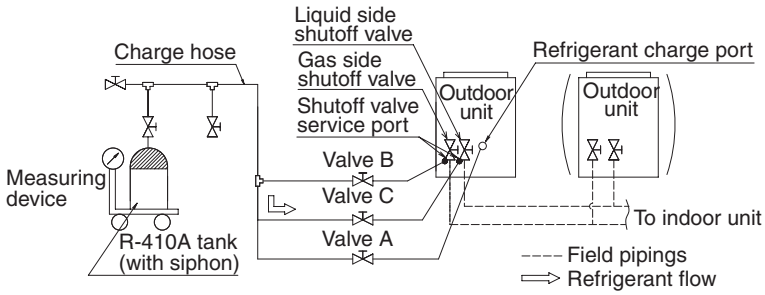


figure 31

4. Perform the refrigerant charging operation following [Refrigerant charging operation procedure] as shown below, and charge the remaining refrigerant of the “additional charging amount”. For performing the refrigerant charging operation the push button on the PC-board (A1P) of outdoor unit (Incase of multi system master unit) are use. (See the figure 32) In addition, the refrigerant are charged from the refrigerant charge port via the valve A. (See the figure 33)
   For operating the push button and opening and closing the valve, follow the work procedure.

Note: The refrigerant will be charged about 22kg in one hour at outdoor temp. 30°C DB (6kg at 0°C DB).
If you need to speedup in case of multi system, connect the refrigerant tanks to each outdoor unit as shown in the figure 33.

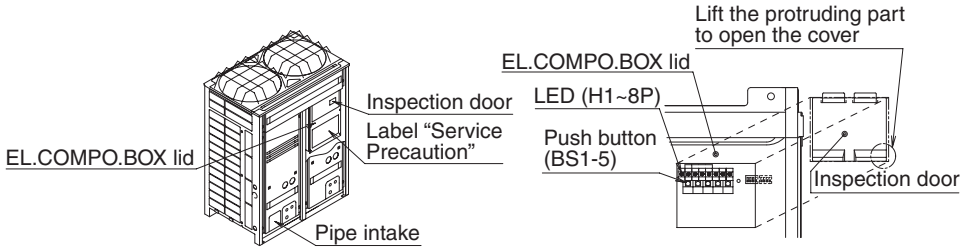


figure 32

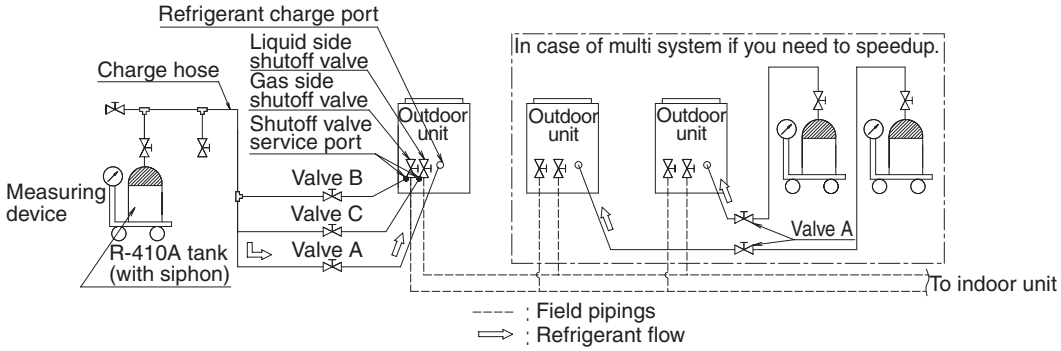


figure 33

[Refrigerant Charging Operation Procedure]

(1) Open the liquid and gas side shutoff valves (The valve A~C must be closed. The valve A~C means the valves in the figure 33.)

[Display of normal system]

LED display (Default status of shipped)		SERV. MONITOR	MODE	TEST/ HWL	C/H SELECTOR			L.N.O.P	DEMA-ND	MULTI
					IND	MASTER	SLAVE			
		HAP	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
Single system		◑	●	●	☼	●	●	●	●	●
Multi system (*)	Master unit	◑	●	●	☼	●	●	●	●	☼
	Sub unit 1	◑	●	●	●	●	●	●	●	◑
	Sub unit 2	◑	●	●	●	●	●	●	●	●

LED display: ●...OFF, ☼...ON, ◑...Blinking
(*)How to distinguish the master unit, sub unit 1, and sub unit 2 in the multi system.

Method 1: By the H8P (MULTI) LED display

☼ (ON): Master unit	◑ (Blinking): Sub unit 1	● (OFF): Sub unit 2

Method 2: By the transmission wiring to indoor unit

Transmission wiring is connected: Master unit
Transmission wiring is not connected : Sub unit 1 or Sub unit 2

(2) If necessary, set the field setting by using the dip switch on the outdoor unit PC-board (A1P). (For how to set, see "1-12-1 Onsite Settings With the Power Off")

(3) • Close the EL. COMPO. BOX lid and all front panel except on the side of the EL. COMPO. BOX (*1) and turn the power to the outdoor unit and all connected indoor units. (*2)
• After H2P stop blinking (about 12 minutes after turning on the power), check LED displays as shown in the table [Display of normal system] and the system is normal state.
If H2P is blinking, check the malfunction code in the remote control, and correct the malfunction in accordance with [remote control display malfunction code] in step 5.

(*1)Lead the refrigerant charge hose etc., from the pipe intake. All front panels must be closed at the procedure (9).

(*2)• If you perform the refrigerant charging operation within the refrigerant system that have the power off unit, the operation cannot finish properly.
For confirming the number of the outdoor and indoor units with the power on, see [How to check how many units are connected] in chapter 1-11-1. In case of a multi system, turn on the power to all outdoor units in the refrigerant system.
• To energize the crankcase heater, make sure to turn on for 6 hours before starting operation.

(4) Start the additional refrigerant charge operation.
(About the system settings for additional refrigerant charge operation, refer to the [Service Precaution] label attached on the EL. COMPO. BOX lid in the outdoor unit.)
Open valve A immediately after starting the compressor.

(5) Close the valve A if the "additional charging amount" of refrigerant was charged, and push the RETURN button (BS3) once.

(6) Record the charging amount on the accessory "REQUEST FOR THE INDICATION" label and attach it to the back side of the front panel.

5. After completing the additional refrigerant charging perform the check operation following below.

Note:
- For check operation, the following work will be performed.
  - ◆ Check of shutoff valve opening
  - ◆ Check of miswiring
  - ◆ Judgment of piping length
  - ◆ Check of refrigerant overcharge
- It takes about 40 minutes to complete the check operation.

[Check Operation Procedure]

(1) Make the onsite setting as needed using the dip switches on the outdoor unit PC-board (A1P) with the power off (See "1-12-1 Onsite Settings With the Power Off")

(2) Close the EL. COMPO. BOX lid and all front panels except as the side of the EL. COMPO. BOX and turn on the power to the outdoor unit and all connected indoor units. (Be sure to turn the power on at least 6 hours before operation in order to have power running to the crank case heater.)

(3) Check the LED display on the outdoor unit PC-board (A1P) is as shown in the table below and transmission is normal.

LED display (Default status of shipped)		SERV. MONITOR	MODE	TEST/ HWL	C/H SELECTOR			L.N.O.P	DEMA-ND	MULTI
					IND	MASTER	SLAVE			
		HAP	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
Single system		◑	●	●	☼	●	●	●	●	●
Multi system (*)	Master unit	◑	●	●	☼	●	●	●	●	☼
	Sub unit 1	◑	●	●	●	●	●	●	●	◑
	Sub unit 2	◑	●	●	●	●	●	●	●	●

LED display: ●...OFF, ☼...ON, ◑...Blinking

(*)How to distinguish the master unit, sub unit 1, and sub unit 2 in the multi system.

Method 1: By the H8P (MULTI) LED display

☼ (ON): Master unit	◑ (Blinking): Sub unit 1	● (OFF): Sub unit 2

Method 2: By the transmission wiring to indoor unit

Transmission wiring is connected: Master unit
Transmission wiring is not connected : Sub unit 1 or Sub unit 2

(4) Make the onsite settings as needed using the push button (BS1-BS5) on the outdoor unit PC-board (A1P) with the power on. (See “1-12-2 Onsite Settings With the Power On”)

(5) Perform the check operation following the Check Operation Method of the [Service Precautions] label on the EL. COMPO. BOX lid. The system operation for about 40 minutes and automatically stops the check operation.
If the malfunction code is not displayed in the remote control after the system stop, check operation is completed. Normal operation will be possible after 5 minutes. If the malfunction code is displayed in the remote control, correct the malfunction following [remote control displays malfunction code] and perform the check operation again.

[remote control displays malfunction code]

Malfunction code	Installation error	Remedial action
E3, E4 F3, F6 UF	The shutoff valve of the outdoor unit is left closed.	Open the shutoff valve.
U1	The phases of the power to the outdoor unit is reversed.	Exchange two of the three phases (L1, L2, L3) to make a proper connection.
U1 U4 LC	No power is supplied to an outdoor or indoor unit (including phase interruption).	Make sure the power source wire is properly connected to the outdoor unit and revise if necessary.
UF	There is conflict on the connection of transmission wiring in the system.	Check if the refrigerant piping line and the transmission wiring are consistent with each other.
E3 F6 UF	Refrigerant overcharge.	Recalculate the additional amount 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.	■ Check if the additional refrigerant charge has been finished correctly. ■ Recalculate the additional amount refrigerant from the piping length and add the adequate amount.
U7, U4 UF, UH	If the outdoor unit terminal is connected when there is one outdoor unit installed.	Remove the line from the outdoor multi terminals (Q1 and Q2).

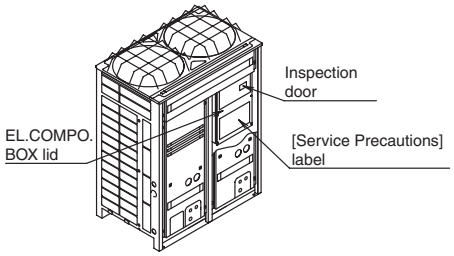
If any malfunction codes other than the above are displayed, check the service manual for how to respond.

1.12 Onsite Settings

Note: In the case of a multi system, all onsite settings should be made on the master unit. Settings made on sub units are invalid.
The outdoor unit to which the indoor unit transmission wire are connected is the master unit, and all other units are sub units.

1.12.1 Onsite Settings With the Power Off

If the COOL/HEAT selector was connected to the outdoor unit in "1-7 Field Wiring", set the dip switch (DS1) on the outdoor unit PC-board (A1P) to "ON" (it is set to "OFF" when shipped from the factory).



For the position of the dip switch (DS1), see the "Service Precautions" label (see at right) which is attached to the EL. COMPO. BOX lid.

Warning **Electric Shock Warning:**
Never perform with the power on.
There is a serious risk of electric shock if any live part is touched.

1.12.2 Onsite Settings with the Power On

Use the push button switches (BS1 through BS5) on the outdoor unit PC-board (A1P) to make the necessary onsite settings.
See the "Service Precautions" label on the EL. CONPO. BOX lid for details on the positions and operating method of the push button switches and on the onsite setting.
Make sure to record the setting on the accessory "REQUEST FOR THE INDICATION" label.

Warning **Electric Shock Warning:**
Use an insulated rod to operate the push buttons via the inspection door of EL. COMPO. BOX lid.
There is a risk of electric shock if you touch any live parts, since this operation must be performed with the power on.

1.13 Test Run

1.13.1 Before Test Run

- Make sure the following works are completed in accordance with the installation manual.
  - Piping work
  - Wiring work
  - Air tight test
  - Vacuum drying
  - Additional refrigerant charge
- Check that all work for the indoor unit are finished and there are no danger to operate.

1.13.2 Test Run

After check operation is completed, operate the unit normally and check the following.

1. Make sure the indoor and outdoor units are operating normally.
2. Operate each indoor unit one by one and make sure the corresponding outdoor unit is also operating.
3. Check to see if cold (or hot, except RXQ-P) air is coming out from the indoor unit.
4. Push the fan direction and strength buttons on the remote control to see if they operate properly.

Note:

- Heating is not possible if the outdoor temperature is 24°C or higher. Refer to the Operation manual.
- If a knocking sound can be heard in the liquid compression of the compressor, stop the unit immediately and then energize the crank case heater for a sufficient length of time before restarting the operation.
- Once stopping, the compressor will not restart in about 5 minutes even if the On/Off button of the remote control is pushed.
- When the system operation is stopped by the remote control, the outdoor units may continue operating for further 5 minutes at maximum.
- The outdoor unit fan may rotate at low speeds if the Night-time low noise setting or the External low noise level setting is made, but this is not a malfunction.

1.13.3 Checks after Test Run

Perform the following checks after the test run is complete.

- Record the contents of field setting.
  → Record them on the accessory “REQUEST FOR THE INDICATION” label.
  And attach the label on the back side of the front panel.
- Record the installation date.
  → Record the installation date on the accessory “REQUEST FOR THE INDICATION” label in accordance with the IEC60335-2-40.
  And attach the label on the back side of the front panel.

Note: After the test run, when handing the unit over to the customer, make sure the EL.COMPO.BOX lid, the inspection door, and the unit casing are all attached.

1.14 Caution for Refrigerant Leaks

(Points to note in connection with refrigerant leaks)

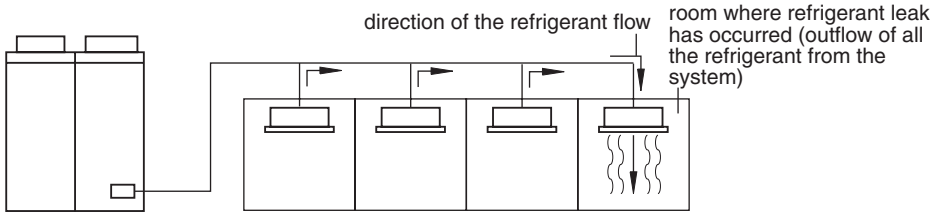
Introduction

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 R-410A as refrigerant. R-410A itself is an entirely safe non-toxic, non-combustible refrigerant. Nevertheless care must be taken to ensure that air conditioning facilities are installed in a room which is sufficiently large. This assures that the maximum concentration level of refrigerant gas is not exceeded, in the unlikely event of major leak in the system and this in accordance to the local applicable regulations and standards.

Maximum concentration level

The maximum charge of refrigerant and the calculation of the maximum concentration of refrigerant is directly related to the humanly occupied space in to which it could leak.
The unit of measurement of the concentration is kg/m^3 (the weight in kg of the refrigerant gas in 1m3 volume of the occupied space).
Compliance to the local applicable regulations and standards for the maximum allowable concentration level is required.
In Australia the maximum allowed concentration level of refrigerant to a humanly space is limited to 0.35kg/m^3 for R-407C and 0.44kg/m^3 for R-410A.



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

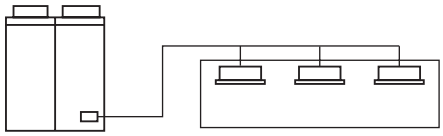
Check the maximum concentration level in accordance with steps 1 to 4 below and take whatever action is necessary to comply.

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

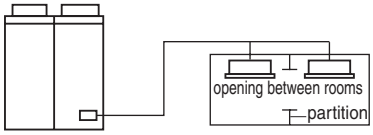
amount of refrigerant in a single unit system (amount of refrigerant with which the system is charged before leaving the factory)	+	additional charging amount (amount of refrigerant added locally in accordance with the length or diameter of the refrigerant piping)	=	total amount of refrigerant (kg) in the system

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 (m^3)
   Incase 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.



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

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

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

   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. Heat Pump 60Hz (RXYQ5~54P)

DAIKIN

INSTALLATION MANUAL

VRV III System air conditioner

RXYQ5PYL(E)
RXYQ8PYL(E)
RXYQ10PYL(E)
RXYQ12PYL(E)
RXYQ14PYL(E)
RXYQ16PYL(E)
RXYQ18PYL(E)
RXYQ20PYL(E)
RXYQ22PYL(E)
RXYQ24PYL(E)
RXYQ26PYL(E)
RXYQ28PYL(E)
RXYQ30PYL(E)
RXYQ32PYL(E)
RXYQ34PYL(E)
RXYQ36PYL(E)
RXYQ38PYL(E)
RXYQ40PYL(E)
RXYQ42PYL(E)
RXYQ44PYL(E)
RXYQ46PYL(E)
RXYQ48PYL(E)
RXYQ50PYL(E)
RXYQ52PYL(E)
RXYQ54PYL(E)

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2.1 First of All

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

2.1.1 Safety considerations

Please read these “Safety considerations” carefully before installing air conditioning unit and be sure to install it correctly. The safety precautions listed here are divided into two categories. In either case, important safety information is listed which must be read carefully.

Warning: Failure to observe a warning may result in death or serious injury.

Caution: Failure to observe a caution may result in injury or damage to the unit.
These too might lead to serious injury depending on the circumstances.

Warning:

- Ask your dealer or qualified personnel to carry out installation work. Do not try to install the machine yourself.
  Improper installation may result in water leakage, electric shocks or fire.
- Perform installation work in accordance with this installation manual.
  Improper installation may result in water leakage, electric shocks or fire.
- When installing the unit in a small room, take measures against to keep refrigerant concentration from exceeding allowable safety limits in the event of refrigerant leakage. Contact your dealer for more information. Excessive refrigerant in a closed ambient can lead to oxygen deficiency.
- Be sure to use only the specified accessories and parts for installation work.
  Failure to use the specified parts may result in water leakage, electric shocks, fire or the unit falling.
- Install the air conditioner on a foundation strong enough to withstand the weight of the unit.
  A foundation of insufficient strength may result in the unit falling and causing injuries.
- Carry out the specified installation work after taking into account strong winds, typhoons or earthquakes.
  Improper installation work may result in the unit falling and causing accidents.
- Make sure that a separate power supply circuit is provided for this unit and that all electrical work is carried out by qualified personnel according to local and national regulations and this installation manual.
  An insufficient power supply capacity or improper electrical construction may lead to electric shocks or fire.
- Make sure that all wiring is secured, the specified wires are used, and no external forces act on the terminal connections or wires.
  Improper connections or installation may result in the terminals overheating or fire.
- When wiring the power supply and connecting the remote control wiring and transmission wiring, position the wires so that the EL.COMPO.BOX lid can be securely fastened.
  Improper positioning of the EL.COMPO.BOX lid may result in electric shocks or fire.
- If the refrigerant gas leaks during installation, ventilate the area immediately.
  Toxic gas may be produced if the refrigerant gas comes into contact with fire.
- After completing the installation work, check that the refrigerant gas does not leak.
  Toxic gas may be produced if the refrigerant gas leaks into the room and comes into contact with a source of fire, such as a fan heater, stove or cooker.
- Do not directly touch the refrigerant leaked from refrigerant piping connections.
  Frostbite may be caused.
- Before touching electrical parts, turn off the power.
- Do not allow children to mount on the outdoor unit, or avoid placing any object on it. Falling or tumble may result in injury.

- Be sure to establish an earth.
  Do not earth the unit to a utility pipe, arrester or telephone earth.
  Incomplete earth may cause electrical shock or fire.
  A high surge current from lightning or other sources may cause damage to the air conditioner.
- Be sure to install an earth leakage breaker.
  Failure to install an earth leakage breaker may result in electric shocks or fire.

Caution:

- While following the instructions in this installation manual, install drain piping in order to ensure proper drainage and insulate piping in order to prevent condensation.
  Improper drain piping may result in water leakage and property damage.
- Install the indoor and outdoor units, power supply wiring and connecting wiring at least 1 meter away from televisions or radios in order to prevent image interference or noise.
  (Depending on the radio waves, a distance of 1 meter may not be sufficient enough to eliminate the noise.)
- The indoor unit should be installed as far away from fluorescent lighting as possible.
  remote control (wireless kit) transmitting distance can result shorter than expected in rooms with electronic fluorescent lamps (inverter or rapid start types).
- Do not install the air conditioner in the following locations:
  (a) where a mineral oil mist or an oil spray or vapor is produced, for example in a kitchen.
  Plastic parts may deteriorate and fall off or result in water leakage.
  (b) where corrosive gas, such as sulfurous acid gas, is produced.
  Corroding copper pipes or soldered parts may result in refrigerant leakage.
  (c) near machinery emitting electromagnetic waves.
  Electromagnetic waves may disturb the operation of the control system and result in a malfunction of the unit.
  (d) where flammable gas may leak, where there are carbon fiber or ignitable dust suspensions in the air, or where volatile flammables such as thinner or gasoline are handled.
  Operating the unit in such conditions may result in fire.
  (e) Locations where small animals might build nests inside the unit.
  If small animals enter and come in contact with electrical parts, this can cause malfunctions, smoke, and fire.

2.1.2 Special Notice of Product

[CLASSIFICATION]

This air conditioner comes under the term “appliances not accessible to the general public”.

[EMC CHARACTERISTICS]

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

[REFRIGERANT]

VRVIII System use R-410A refrigerant.

- The refrigerant R-410A requires strict cautions for keeping the system clean, dry and tight. Read the chapter “Refrigerant Piping” carefully and follow these procedures correctly.
  A. Clean and dry
     Foreign materials (including mineral oils such as SUNISO oil or moisture) should be prevented from getting mixed into the system.
  B. Tight
     Take care to keep the system tight when installing.
     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 slightly to the greenhouse effect if it is released.
- Since R-410A is a mixed refrigerant, the required additional refrigerant must be charged in its liquid state. If the refrigerant is charged in a state of gas, its composition changes and the system will not work properly.

Limit by the total maximum refrigerant charge

The total maximum refrigerant charge of a VRVIII system must be below 100kg, this to be in accordance with CE requirement (EN60335-2-40 standard).
This means that in case the total maximum refrigerant charge of the system (factory and additional charge) is equal to or more than 100kg you must divide your multiple outdoor system into smaller independent systems, each containing less than 100kg refrigerant charge.
For factory charge, refer to the unit name plate.

[DESIGN PRESSURE]

Since design pressure is 4.0MPa or 40bar, the wall thickness of pipes should be more carefully selected in accordance with the relevant local and national regulations.

2.1.3 Disposal Requirements

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

2.2 Introduction

- RXYQ-P series are designed for outdoor installation and used for cooling and heatpump applications. Outdoor units come in three standard sizes, and with a single system through a multi system combining up to three outdoor units, rated cooling capacity from 14.0 kW to 147 kW and rated heating capacity from 16.0 kW to 170 kW can be achieved.
- The RXYQ-P units can be combined with Daikin VRV series indoor units for air conditioning purposes. Always use appropriate indoor units compatible with R-410A. To lean which models of indoor units are compatible with R-410A, refer to the product catalogs.
  To combine with other refrigerant indoor unit will cause malfunction.

2.2.1 Combination

The indoor units can be installed in the following range.

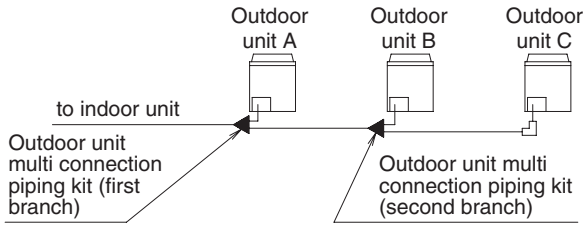
<Outdoor unit>	<Total capacity of indoor units>	<Total quantity of indoor units>
RXYQ5PYL(E)	62.5 ~ 250	12 units
RXYQ8PYL(E)	100 ~ 400	20 units
RXYQ10PYL(E)	125 ~ 500	25 units
RXYQ12PYL(E)	150 ~ 600	30 units
RXYQ14PYL(E)	175 ~ 700	35 units
RXYQ16PYL(E)	200 ~ 800	40 units
RXYQ18PYL(E)	225 ~ 900	45 units
RXYQ20PYL(E)	250 ~ 800	40 units
RXYQ22PYL(E)	275 ~ 880	44 units
RXYQ24PYL(E)	300 ~ 960	48 units
RXYQ26PYL(E)	325 ~ 1040	52 units
RXYQ28PYL(E)	350 ~ 1120	56 units
RXYQ30PYL(E)	375 ~ 1200	60 units
RXYQ32PYL(E)	400 ~ 1280	64 units
RXYQ34PYL(E)	425 ~ 1360	64 units
RXYQ36PYL(E)	450 ~ 1440	64 units
RXYQ38PYL(E)	475 ~ 1235	61 units
RXYQ40PYL(E)	500 ~ 1300	64 units
RXYQ42PYL(E)	525 ~ 1365	64 units
RXYQ44PYL(E)	550 ~ 1430	64 units
RXYQ46PYL(E)	575 ~ 1495	64 units
RXYQ48PYL(E)	600 ~ 1560	64 units
RXYQ50PYL(E)	625 ~ 1625	64 units
RXYQ52PYL(E)	650 ~ 1690	64 units
RXYQ54PYL(E)	675 ~ 1755	64 units

Note:

- Be sure to connect an R-410A indoor unit.
  See the catalog for indoor unit models which can be connected.
- At above is the total capacity and total number of units of the indoor units when configured in a standard combination. See the technical reference for details on total capacity and total number of indoor units when using a configuration other than the standard combination. The standard combination are as follows.

<Combination unit>	<Independent unit>
RXYQ5PYL(E)	RXYQ5PYL(E)
RXYQ8PYL(E)	RXYQ8PYL(E)
RXYQ10PYL(E)	RXYQ10PYL(E)
RXYQ12PYL(E)	RXYQ12PYL(E)
RXYQ14PYL(E)	RXYQ14PYL(E)
RXYQ16PYL(E)	RXYQ16PYL(E)
RXYQ18PYL(E)	RXYQ18PYL(E)
RXYQ20PYL(E)	RXYQ8PYL(E)+ RXYQ12PYL(E)
RXYQ22PYL(E)	RXYQ10PYL(E)+ RXYQ12PYL(E)
RXYQ24PYL(E)	RXYQ8PYL(E)+ RXYQ16PYL(E)
RXYQ26PYL(E)	RXYQ8PYL(E)+ RXYQ18PYL(E)
RXYQ28PYL(E)	RXYQ10PYL(E)+ RXYQ18PYL(E)
RXYQ30PYL(E)	RXYQ12PYL(E)+ RXYQ18PYL(E)
RXYQ32PYL(E)	RXYQ16PYL(E)+ RXYQ16PYL(E)
RXYQ34PYL(E)	RXYQ16PYL(E)+ RXYQ18PYL(E)
RXYQ36PYL(E)	RXYQ18PYL(E)+ RXYQ18PYL(E)
RXYQ38PYL(E)	RXYQ8PYL(E)+ RXYQ12PYL(E) + RXYQ18PYL(E)
RXYQ40PYL(E)	RXYQ8PYL(E)+ RXYQ16PYL(E) + RXYQ16PYL(E)
RXYQ42PYL(E)	RXYQ8PYL(E)+ RXYQ16PYL(E) + RXYQ18PYL(E)
RXYQ44PYL(E)	RXYQ8PYL(E)+ RXYQ18PYL(E) + RXYQ18PYL(E)
RXYQ46PYL(E)	RXYQ10PYL(E)+ RXYQ18PYL(E) + RXYQ18PYL(E)
RXYQ48PYL(E)	RXYQ12PYL(E)+ RXYQ18PYL(E) + RXYQ18PYL(E)
RXYQ50PYL(E)	RXYQ14PYL(E)+ RXYQ18PYL(E) + RXYQ18PYL(E)
RXYQ52PYL(E)	RXYQ16PYL(E)+ RXYQ18PYL(E) + RXYQ18PYL(E)
RXYQ54PYL(E)	RXYQ18PYL(E)+ RXYQ18PYL(E) + RXYQ18PYL(E)

- If the total capacity of the connected indoor units exceeds the capacity of the outdoor unit, cooling and heating performance may drop when running the indoor units. See the capacity table in the Engineering Data Book for details.
- There are restrictions on the refrigerant pipe connecting order between outdoor unit in the case of the multi system.
  Install so that the following restrictions are satisfied.
  <Restrictions>
  The capacities of outdoor units A, B and C must fulfill the following conditions.
  $A \geq B \geq C$



2.2.2 Standard Supplied Accessories

The following accessories are included. The storage location of the accessories is shown in figure 1.

Q5~Q18 type				
Name	Clamp (1)	Clamp (2)	Clamp (3)	Gas side accessory pipe (1)
Quantity	9 pcs.	2 pcs.	1 pc.	1 pc.
Shape	 Small		 Large	

Q5~Q18 type				
Name	Gas side accessory pipe (2)	Liquid side accessory pipe (1)	Liquid side accessory pipe (2)	Others
Quantity	1 pc.	1 pc.	1 pc.	■ Operation manual ■ Installation manual ■ "REQUEST FOR THE INDICATION" label (Installation records)
Shape	 5-10 HP type  12-18 HP type		 5-10, 14,16 HP type  12,18 HP type	

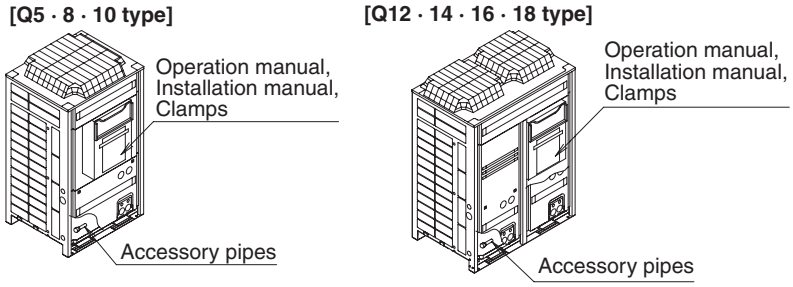


figure 1

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

2.2.3 Option Accessory

To install the outdoor units, the following optional parts are also required. To select an optimum kit, refer to **"2-6 Refrigerant Piping".**

■ **Refrigerant branching kit**

REFNET header	KHRP26M22H	KHRP26M33H	KHRP26M72H	KHRP26M73H
REFNET joint	KHRP26A22T	KHRP26A33T	KHRP26A72T	KHRP26A73T

■ **Outdoor unit multi connection piping kit**

Number of outdoor units connected	2 units	3 units
Kit name	BHFP22P100	BHFP22P151

■ **Pipe size reducer**

Kit name	KHRP26M73TP	KHRP26M73HP

Note: Make sure that any separately purchased accessories are designed for use with R-410A.

2.2.4 Technical and Electrical Specifications

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

2.2.5 Main Components

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

2.2.6 Installation Process

Figure 2 shows the installation process. Install in the order of the steps shown.

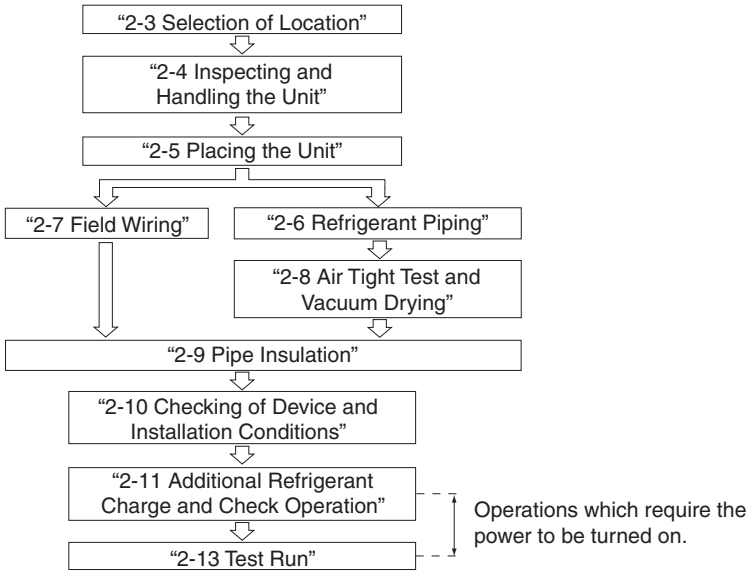


figure 2

2.3 Selection of Location

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

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

Installation Space Examples

- The installation space requirement shown in figure 3 is a reference for cooling operation when the outdoor temperature is 35°C.
  If the design outdoor temperature exceeds 35°C or the heat load exceeds maximum capacity in all the outdoor unit, take an even large space on the intake shown in figure 3.
- During installation, install the units using the most appropriate of the patterns shown in figure 3 for the location in question, taking into consideration human traffic and wind.
- If the number of units installed is more than that shown in the pattern in figure 3, install the units so there are no short circuits.
- As regards space in front of the unit, consider the space needed for the local refrigerant piping when installing the units.
- If the work conditions in figure 3 do not apply, contact your dealer or Daikin directly.

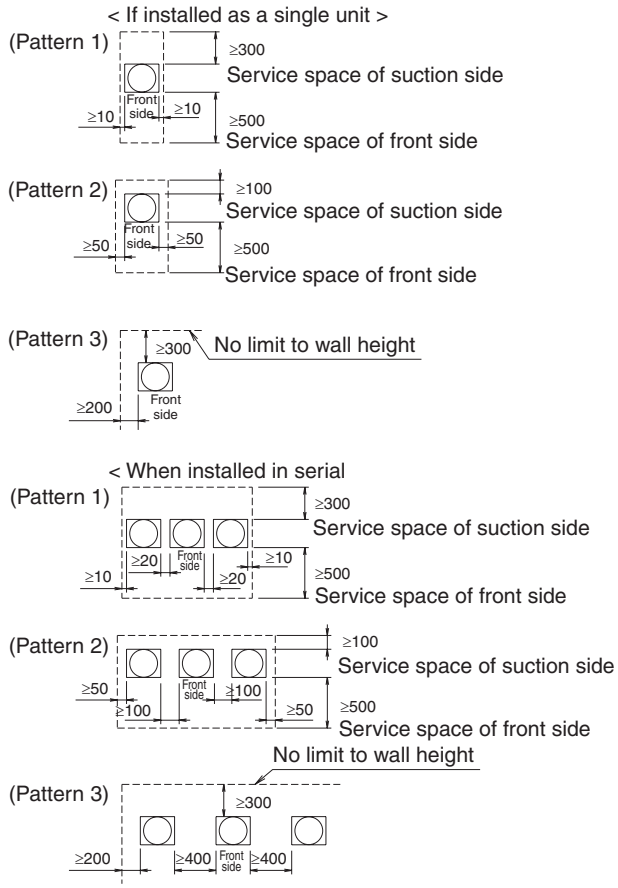
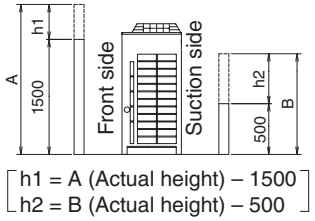


figure 3

For Patterns 1 and 2 in figure 3:

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



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.
   Particularly for locations with weak reception, ensure there is a distance of at least 3 meters for indoor remote controls, place power wiring and transmission wiring in conduits, and ground the conduits.

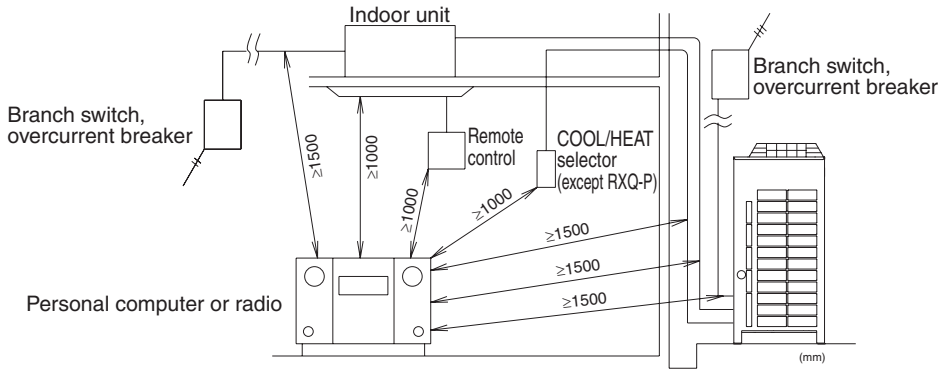


figure 4

2. When installing in a locations where there is heavy snowfall, implement the following snow measures.
   - Ensure the base is high enough that intakes are not clogged by snow.
   - Remove the rear intake grille to prevent snow from accumulating on the fins.
3. If condensate may drip on downstairs (or walkway) depending on the floor condition, take a measure such as the installation of central drain pan kit (sold separately).
4. The refrigerant R-410A itself is nontoxic, nonflammable and is safe. If the refrigerant should leak however, its concentration may exceed the allowable limit depending on room size. Due to this it could be necessary to take measures against leakage. See “2-14 Caution for Refrigerant Leaks” for details.

2.4 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. Decide on the transportation route.
3. If a forklift is to be used, pass the forklift arms through the large openings on the bottom of the unit. **(Refer to figure 5)**
4. If hanging the unit, use a cloth sling to prevent damaging the unit. Keeping the following points in mind, hang the unit following the procedure shown in figure 6.
   - Use a sling sufficiently strong to hold the mass of the unit.
   - Use 2 belts of at least 8m long.
   - Place extra cloth or boards in the locations where the casing comes in contact with the sling to prevent damage.
   - Hoist the unit making sure it is being lifted at its center of gravity.
5. After installation, remove the transportation clasp attached to the large openings. **(Refer to figure 6)**

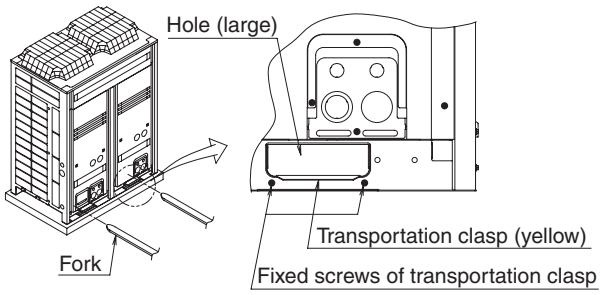


figure 5

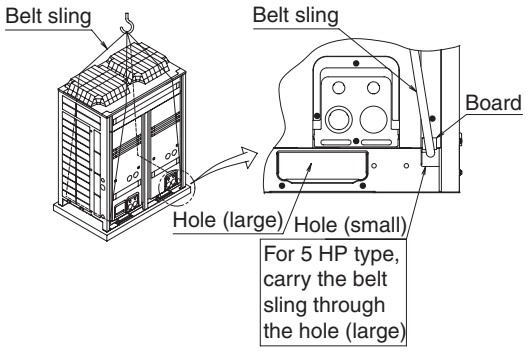
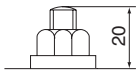


figure 6

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

2.5 Placing the Unit

- Make sure the unit is installed level on a sufficiently strong base to prevent vibration and noise. **(Refer to figure 7)**
- The base should be bigger around than the width of the unit's legs (66 mm), and should support the unit. **(Refer to figure 8)**
  If protective rubber is to be attached, attach it to the whole face of the base.
- The height of the base should be at least 150mm from the floor.
- Secure the unit to its base using foundation bolts. (Use four commercially available M12-type foundation bolts, nuts, and washers.)
- The foundation bolts should be inserted 20 mm.



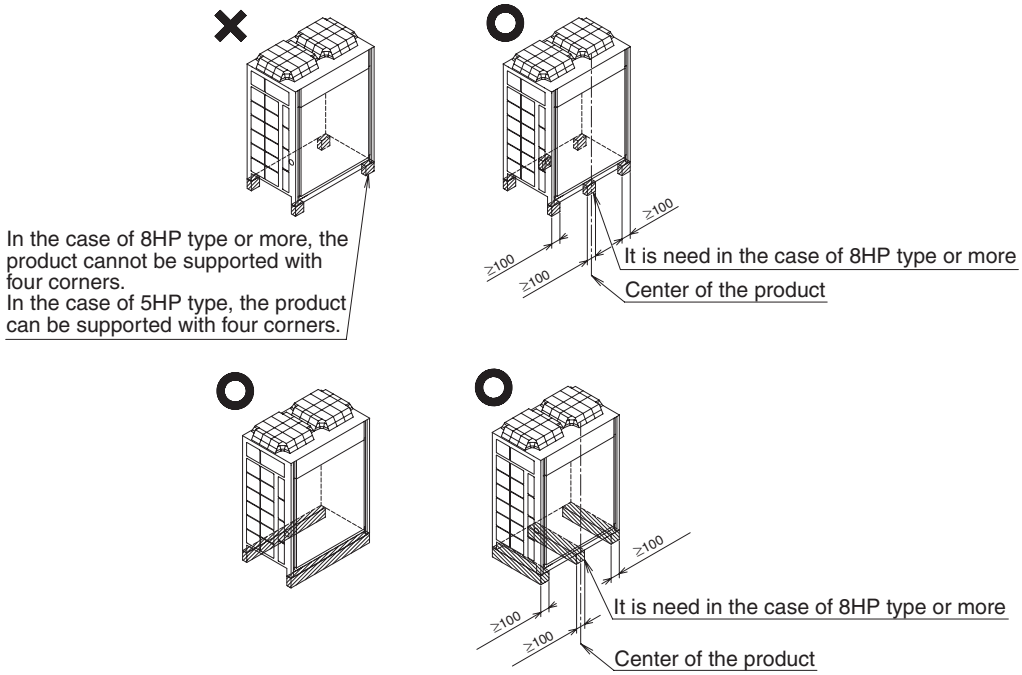


figure 7

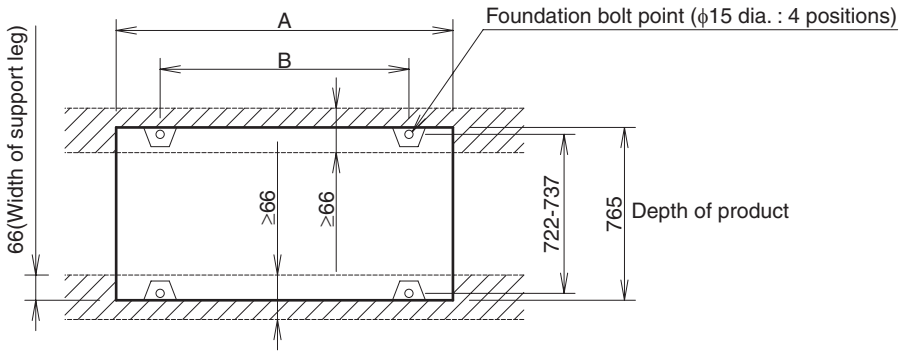
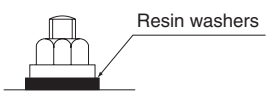


figure 8

Model	A	B
5HP type	635	497
8 · 10HP type	930	792
12 · 14 · 16 · 18HP type	1240	1102

Note:

- There are restrictions on the refrigerant pipe connecting order between outdoor unit in the case of the multi system.
  See the Note in "2-2-1 Combination" for detail.
- When installing on a roof, make sure the roof floor is strong enough and be sure to water-proof all work.
- Make sure the area around the machine drains properly by setting up drainage grooves around the foundation.
  Drain water is sometimes discharged from the outdoor unit when it is running.
- For anti-corrosion type use nuts with resin washers. If the paint on nut connections comes off, the anti-corrosion effect may decrease.



2.6 Refrigerant Piping

Note:
- All field piping must be installed by a licensed refrigeration technician and must comply with relevant local and national regulations.
- After piping work is complete, do not under any circumstances open the shutoff valve until "2-7. Field Wiring" and "2-10. Checking of Device and Installation Conditions" are complete.
- Do not use flux when brazing the refrigerant piping. 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 extremely harmful influence 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.)

2.6.1 Selection of Piping Material and Refrigerant Branching Kit

- Use only pipes which are clean inside and outside and which do not accumulate harmful sulfur, oxidants, dirt, cutting oils, moisture, or other contamination. (Foreign materials inside pipes including oils for fabrication must be 30mg/10m or less.)
- Use the following items for the refrigerant piping.
  Material: Jointless phosphor-deoxidized copper pipe
  Size: See "2-6-5 Example of connection" to determine the correct size.
  Thickness: Select a thickness for the refrigerant piping which complies with national and local laws.
  For R-410A, the design pressure is 4.0 MPa (40-bar).
  The minimum thickness of piping according to Japan's High-Pressure Gas Safety Law (as of January 2003) is shown below.
  Temper grade (O type, 1/2H type) in the table indicate the material types specified in JIS H 3300.

(unit: mm)

Temper grade	O type			
outer diameter	ϕ6.4	ϕ9.5	ϕ12.7	ϕ15.9
smallest thickness	0.80	0.80	0.80	0.99

(unit: mm)

Temper grade	1/2H type							
outer diameter	ϕ19.1	ϕ22.2	ϕ25.4	ϕ28.6	ϕ31.8	ϕ34.9	ϕ38.1	ϕ41.3
smallest thickness	0.80	0.80	0.88	0.99	1.10	1.21	1.32	1.43

- For piping work, follow the maximum tolerated length, difference in height, and length after a branch indicated in the **"2-6-5 Example of connection"**.
- A refrigerant branching kit (sold separately) is needed for piping branches and connection of piping between outdoor unit (in case of multi system).
  Use only separately sold items selected specifically according to the refrigerant branch kit selection in the **"2-6-5 Example of connection"**.

2.6.2 Protection Against Contamination when Installing Pipes

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

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

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

2.6.3 Pipe Connection

- Be sure to perform nitrogen permutation or nitrogen blow when brazing. **(Refer to figure 10)** Brazing without performing nitrogen permutation or nitrogen blow into the piping will create large quantities of oxidized film on the inside of the pipes, adversely affecting valves and compressors in the refrigerating system and preventing normal operation.

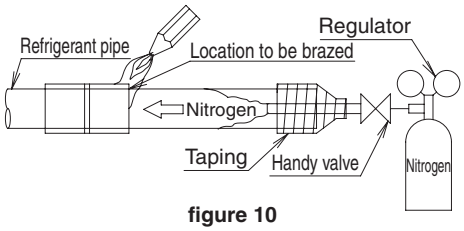


figure 10

- The pressure regulator for the nitrogen released when doing the brazing should be set to 0.02 MPa (about 0.2kg/cm^2:Enough to feel a slight breeze on your cheek).

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

2.6.4 Connecting the Refrigerant Piping

1. Direction to bring out the pipes
   The local interunit piping can be connected either forward or to the sides (taken out through the bottom) as shown in the figure 11.
   (When passing out through the bottom, use the knock hole in the bottom frame.)

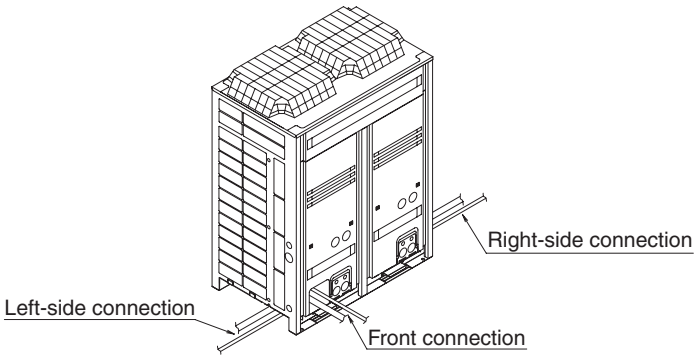
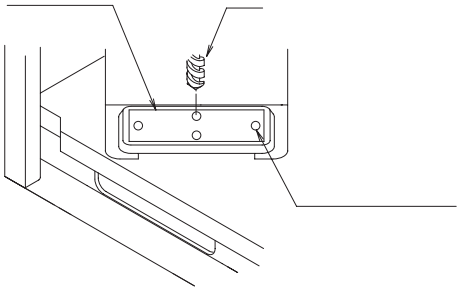


figure 11

Precautions when knocking out knock holes

- Open knock hole in the base frame by drilling the 4 concave around it with a 6mm bit. **(Refer to figure 12)**



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

2. Removing Pinch Piping
   - When connecting refrigerant piping to an outdoor unit, remove the pinch piping. **(Refer to figure 13)**
   - Pinch piping should be removed using the procedure in the figure 13.

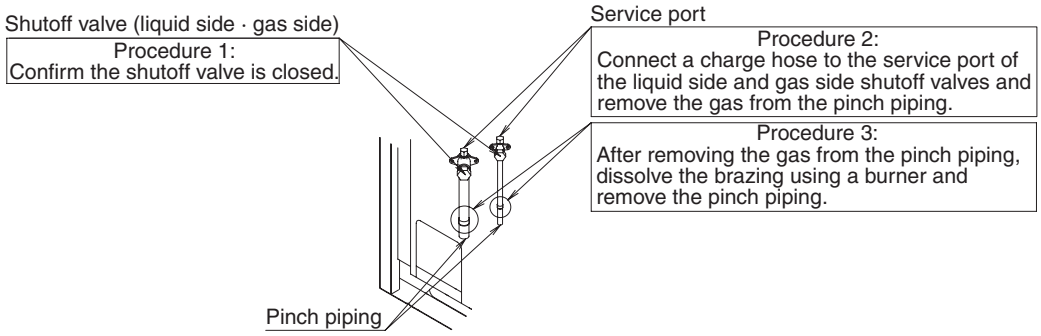


figure 13

Caution: After removing the gas, remove the pinch piping.
Any gas remaining inside may blow off the pinch piping when you dissolve the brazing, causing damage.

3. Connecting refrigerant piping to outdoor units
   <In case of single system: 5-18HP type>

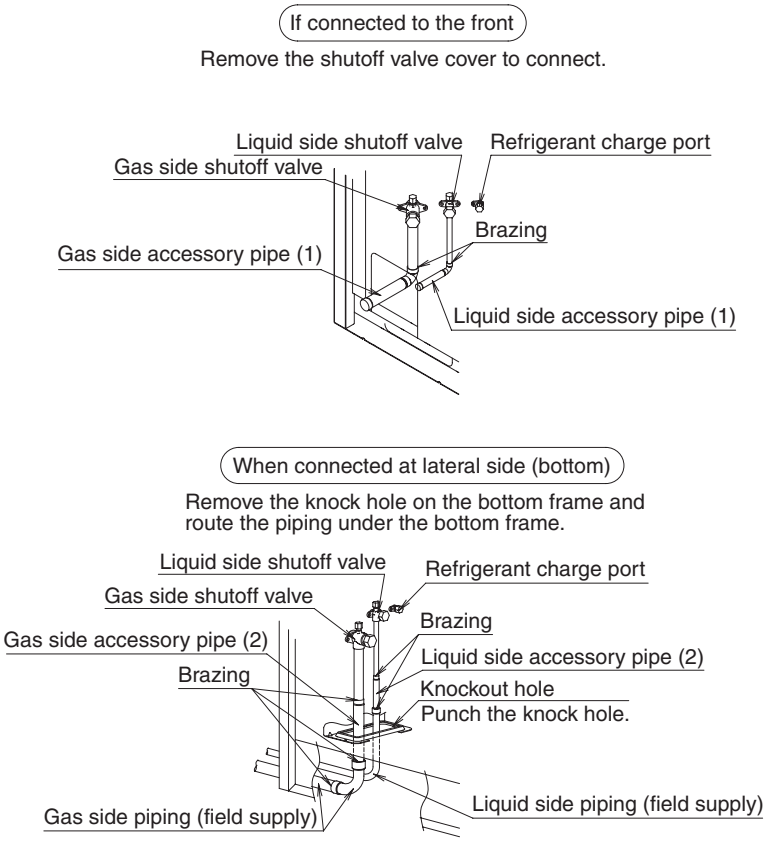
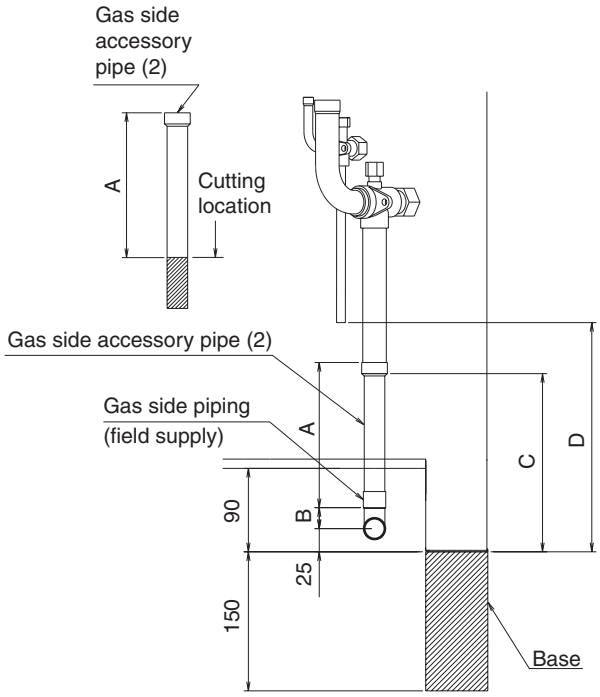


figure 14

Processing the Gas side accessory pipe (2)

Only in case of connecting at lateral side, cut the Gas side accessory pipe (2) referring the figure below.



(mm)

Model	A	B	C	D
5HP type	166	16	199	246
8HP type	156	17	188	247
10HP type	156	23	192	247
12HP type	150	29	192	247
14·16·18HP type	150	29	192	251

<In case of multi system: RXYQ20-54P(E)>

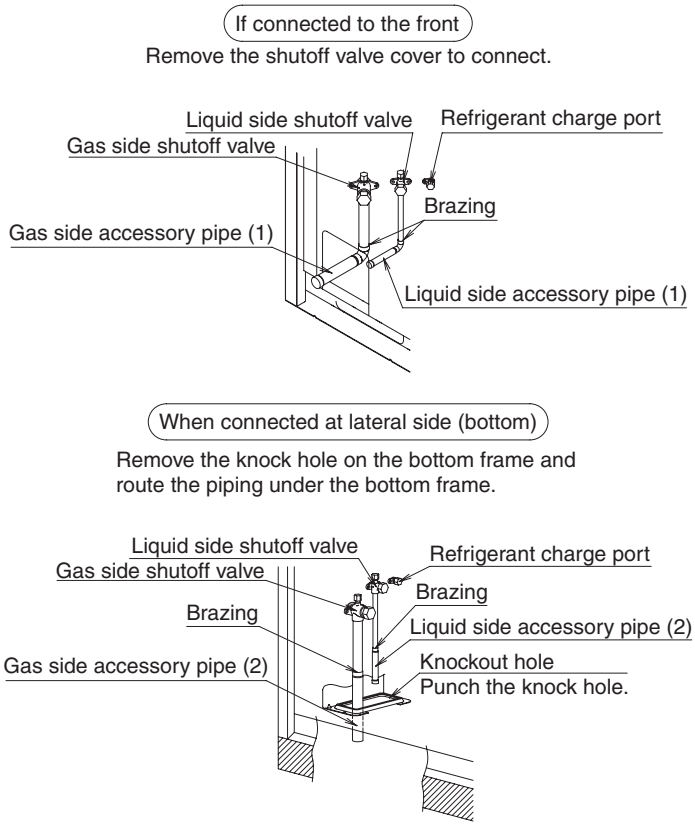


figure 15

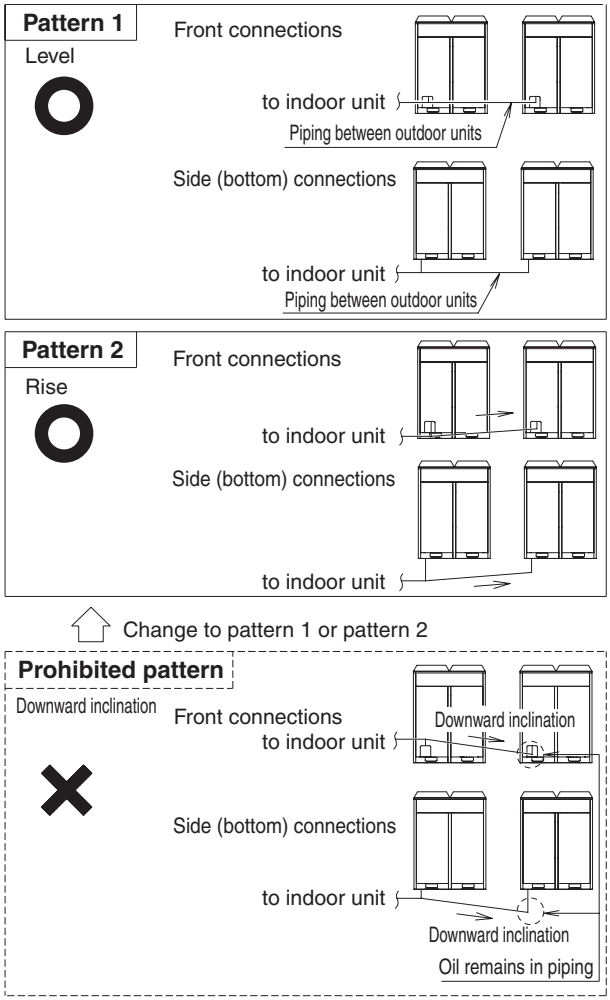
Note: **<Connecting Refrigerant Piping>**

- When connecting the piping on site, be sure to use the accessory piping.
- Make sure the onsite piping does not come into contact with other piping or the bottom frame or side panels of the unit.

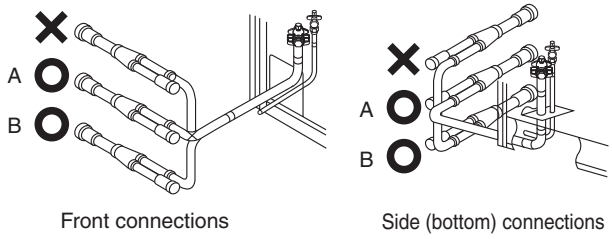
<Multi Systems>

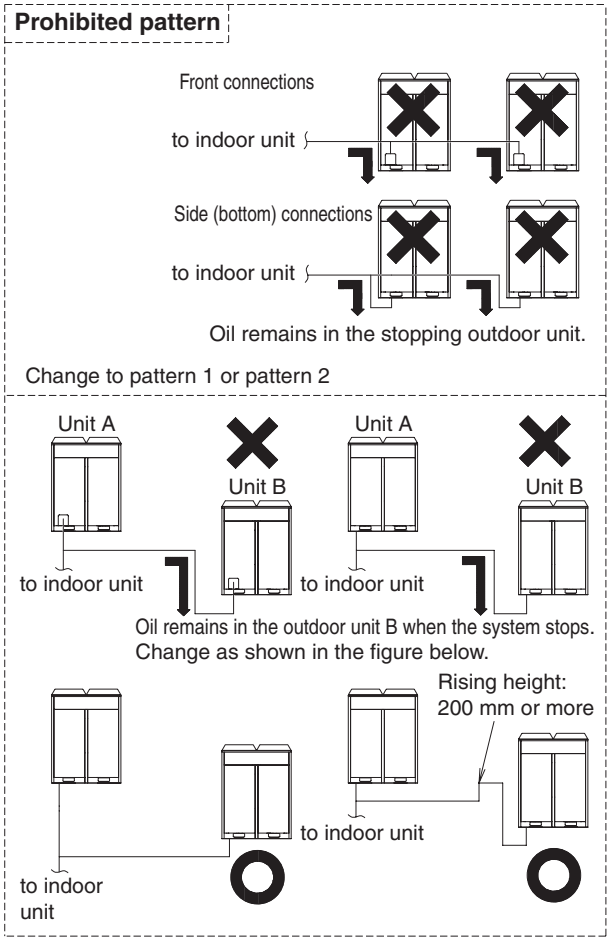
- The 5HP type cannot be used as an independent unit in a multi system.
- The Outdoor unit multi connection piping kit (sold separately) is needed when connecting piping between outdoor units.
  Refer to the installation manual that comes with the kit when doing this piping work.

4. Precautions when connecting piping between outdoor units (In case of multi system)
   The Outdoor unit multi connection piping kit (sold separately) is needed to connect piping between outdoor units in multi system. Only proceed with piping work after considering the limitations on installation listed here and in “5. Branching the refrigerant piping”, always referring to the kit’s installation manual.
   (1) The piping between outdoor units must be installed level (Pattern 1) or with a rise (Pattern 2). Otherwise oil may pool in the pipes.

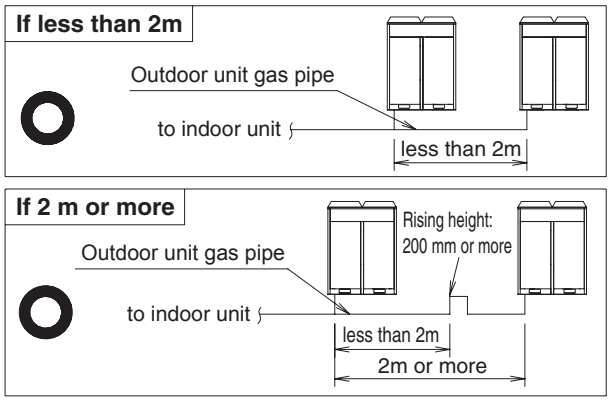


(2) To avoid the risk of oil detention in the stopping unit, always connect the shutoff valve and the piping between outdoor units as shown in the figure A or figure B.





(3) If the piping length between the outdoor units exceeds 2 m, create a rise of 200 mm or more in the gas line under a length of 2 m from the outdoor unit multi connection piping kit.



5. Branching the refrigerant piping
   Heed the restrictions below when installing the refrigerant branching kit and read the installation instruction manual with the kit.
   (Improper installation could lead to malfunctioning or breakdown of the outdoor unit.)

<REFNET joint>

Install the REFNET joint so it splits horizontally or vertically.

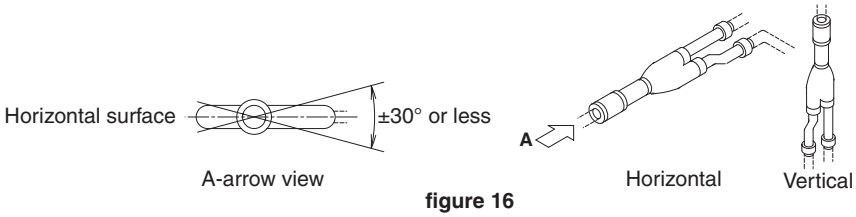


figure 16

<REFNET header>

Install the REFNET header so it splits horizontally.

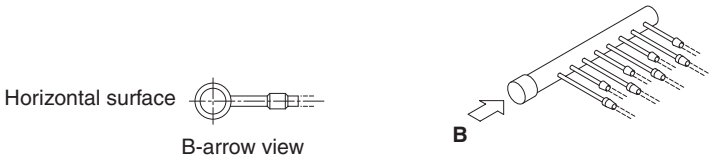


figure 17

<Outdoor unit multi connection piping kit>

- Install the joint horizontally so that the attached warning label faces strait up, and the tilt is within ±15°. **(Refer to figure 18-1)**
  Do not install vertically. **(Refer to figure 18-2)**
- Maintain a straight portion of 500 mm or more until the split of the joint without wrapping any onsite piping around this area.
  Over 500 mm of straight area can be maintained by connecting at least 120 mm of onsite pipe (straight) to the joint. **(Refer to figure 18-3)**

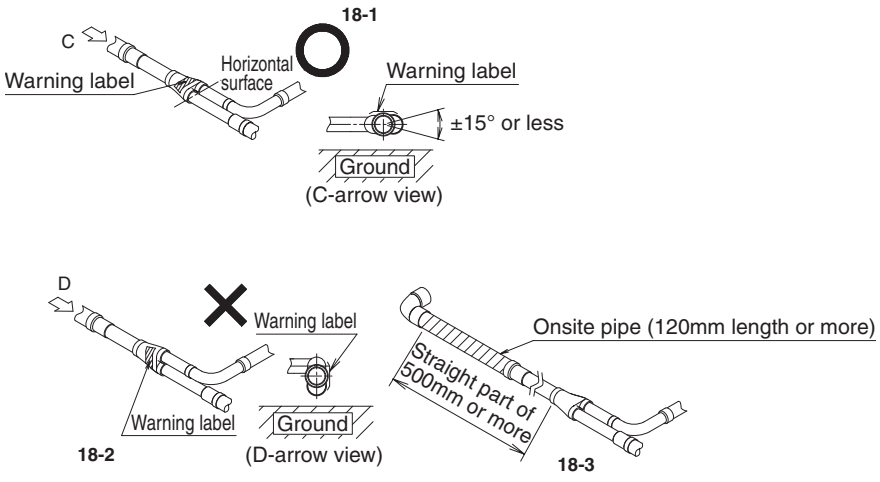


figure 18

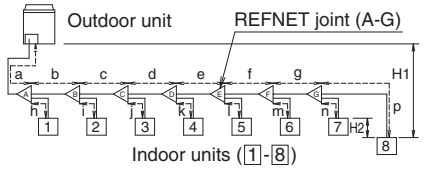
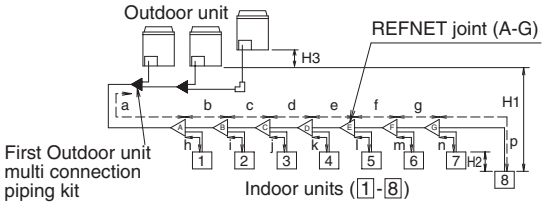
2.6.5 EXAMPLE OF CONNECTION)

Example of connection

(Connection of 8 indoor units)

(∗1) " ◄ " indicate the Outdoor unit multi connection piping kit

(∗2) In case of multi outdoor system, re-read to the first Outdoor unit multi connection piping kit as seen from the indoor unit.

		Example refrigerant branch using REFNET joint	Exam
Single outdoor system			
Multi outdoor system			

Maximum allowable length	Between outdoor (∗2) and indoor units	Actual pipe length	Pipe length between outdoor (∗2) and indoor units ≤ 165m	
			Example unit 8 : a + b + c + d + e + f + g + p ≤ 165m	Exam
		Equivalent length	Equivalent pipe length between outdoor (∗2) and indoor units ≤ 190m (assume equivalent	
		Total extension length	Total pipe length from outdoor unit (∗2) to all indoor units ≤ 1000m	
	Between outdoor unit and Outdoor unit multi connection piping kit (Only for multi system)	Actual pipe length Equivalent length	Pipe length between outdoor unit and Outdoor unit multi connection piping kit ≤ 10m, Equiv	
Allowable height length	Between outdoor and indoor units	Difference in height	Difference in height between outdoor and indoor units (H1) ≤ 50m (≤ 90m if the outdoor	
	Between indoor and indoor units	Difference in height	Difference in height between indoor units (H2) ≤ 15m	
	Between outdoor and outdoor units	Difference in height	Difference in height between outdoor unit (H3) ≤ 5m	
Allowable length after the branch		Actual pipe length	Pipe length from first refrigerant branch kit (either REFNET joint or REFNET header) to in	
			Example unit 8 : b + c + d + e + f + g + p ≤ 40m	Examp

Refrigerant branch kit selection

Refrigerant branch kits can only be used with R-410A.

⚠ • When multi outdoor system are installed, be sure to use the special separately sold Outdoor unit multi connection piping kit.
The table at right shows how to select the proper kit.

How to select the REFNET joint

- When using REFNET joint at the first branch counted from the outdoor unit side. Choose from the following table in accordance with the outdoor unit capacity type. (Example: REFNET joint A)

Outdoor unit capacity type	Refrigerant branch kit na
5HP type	KHRP26A22T
8, 10HP type	KHRP26A33T
12~22HP type	KHRP26A72T
24HP type~	KHRP26A73T + KHF

- Choose the REFNET joints other than that for the first branch from the following table in a capacity index of all the indoor units connected below the REFNET joint.

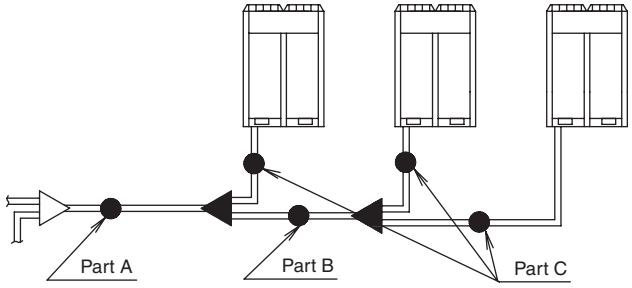
Indoor unit total capacity index	Refrigerant branch kit na
< 200	KHRP26A22T
200 ≤ x< 290	KHRP26A33T
290 ≤ x< 640	KHRP26A72T
640 ≤	KHRP26A73T + KHF

Example for indoor units connected downstream	Example REFNET joint C: indoor units 3+4+5+6+7+8	Exam Exam

Pipe size selection

⚠ **Caution**
The thickness of the pipes in the table shows the requirements of Japanese High Pressure Gas Control low. (As of Jan. 2003)
The thickness and material shall be selected in accordance with local code.

For the multi outdoor unit system, select in accordance with the following figure.



Temper grade and wall thickness for pipes.
(Temper grade, O type and 1/2H type indicate the material types specified in JIS H 3300.)

(Unit:mm)

Copper tube O.D.	Copper tube W.T. (Minimum requirement)	Temper grade
ϕ6.4	0.80	O type
ϕ9.5	0.80	
ϕ12.7	0.80	
ϕ15.9	0.99	
ϕ19.1	0.80	1/2H type
ϕ22.2	0.80	
ϕ25.4	0.88	
ϕ28.6	0.99	
ϕ31.8	1.10	
ϕ34.9	1.21	
ϕ38.1	1.32	
ϕ41.3	1.43	

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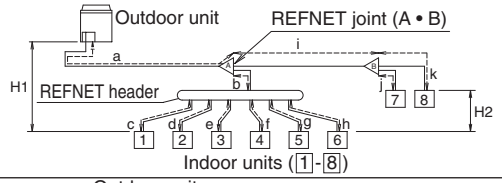
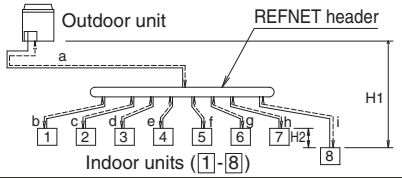
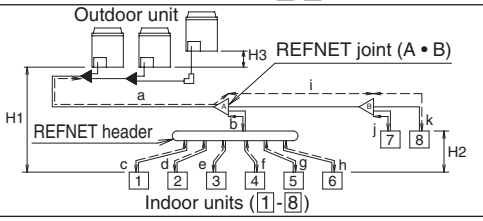
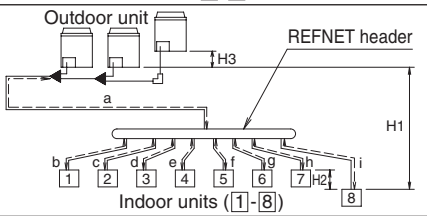
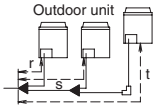
How to calculate the additional refrigerant to be charged

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

$$R = \left(\text{Total length (m) of liquid piping size at } \phi 22.2\right) \times 0.37 + \left(\text{Total length (m) of liquid piping size at } \phi 19.1\right) \times 0.26 + \left(\text{Total length (m) of liquid piping size at } \phi 15.9\right) \times 0.18 + \left(\text{Total length (m) of liquid piping size at } \phi 6.4\right) \times 0.022$$

	Example refrigerant branch using REFNET joint and REFNET header	Example refrigerant branch using REFNET header
		
		
	Example unit 6 : a + b + h ≤ 165m, unit 8 : a + i + k ≤ 165m	Example unit 8 : a + i ≤ 165m
	e equivalent pipe length of REFNET joint to be 0.5m, that of REFNET header to be 1m, calculation purposes) (See Note 1 - Next page)	

≤ 10m, Equivalent length between outdoor unit and Outdoor unit multi connection piping kit ≤ 13m



r ≤ 10m (Equivalent length: ≤ 13m)
s ≤ 10m (Equivalent length: ≤ 13m)
t ≤ 10m (Equivalent length: ≤ 13m)

if the outdoor unit is below)

eader) to indoor unit ≤ 40m (See Note 2 - Next page)

Example unit 6 : b + h ≤ 40m, unit 8 :i + k ≤ 40m	Example unit 8 : i ≤ 40m

side.
y type.

branch kit name
26A22T
26A33T
26A72T
26A73T + KHRP26M73TP

wing table in accordance with the total

branch kit name
26A22T
26A33T
26A72T
26A73T + KHRP26M73TP

How to select the REFNET header
- Choose from the following table in accordance with the total capacity index of all the indoor units connected below the REFNET header.
- Note: 250 type indoor unit cannot be connected below the REFNET header.

Indoor unit total capacity index	Refrigerant branch kit name
< 200	KHRP26M22H (Max. 4 branch)
200 ≤ x< 290	KHRP26M33H (Max. 8 branch)
290 ≤ x< 640	KHRP26M72H (Max. 8 branch) (See Note 3 - Next page)
640 ≤	KHRP26M73H (Max. 8 branch) + KHRP26M73HP

How to select the Outdoor unit multi connection piping kit (This is required when the system is multi outdoor unit system.)
- Choose from the following table in accordance with the number of outdoor units.

Number of outdoor units	Connection piping kit name
2 units	BHFP22P100
3 units	BHFP22P151

Example REFNET joint B: indoor units 7+8 Example REFNET header: indoor units 1+2+3+4+5+6	Example REFNET header: indoor units 1+2+3+4+5+6+7+8

JIS
m)

Piping between Outdoor unit and first refrigerant branch kit.
Piping between first Outdoor unit multi connection piping kit and first refrigerant branch kit. (Part A)
- Choose from the following table in accordance with the outdoor unit capacity type.
  Piping between Outdoor unit multi connection piping kits. (Part B)
  Piping between outdoor unit and Outdoor unit multi connection piping kit. (Part C)
- Choose from the following table in accordance with the total capacity type of all the outdoor units connected above Outdoor unit multi connection piping kit.

(Unit:mm)

Outdoor unit capacity type	Piping size (O.D.)	
	Gas pipe	Liquid pipe
5HP type	ϕ15.9	ϕ9.5
8HP type	ϕ19.1	
10HP type	ϕ22.2	
12~16HP type	ϕ28.6	ϕ12.7
18~22HP type		ϕ15.9
24HP type	ϕ34.9	
26~34HP type		ϕ19.1
36~54HP type	ϕ41.3	

(See Note 1 - Next page)

Piping between refrigerant branch kits
- Choose from the following table in accordance with the total capacity index of all the indoor units connected below this.
- Do not let the connection piping exceed the main refrigerant piping size. (Unit:mm)

Indoor unit total capacity index	Piping size (O.D.)	
	Gas pipe	Liquid pipe
< 150	ϕ15.9	ϕ9.5
150 ≤ x< 200	ϕ19.1	
200 ≤ x< 290	ϕ22.2	
290 ≤ x< 420	ϕ28.6	ϕ12.7
420 ≤ x< 640		ϕ15.9
640 ≤ x< 920	ϕ34.9	ϕ19.1
920 ≤	ϕ41.3	

Piping between refrigerant branch kit and indoor unit
- Match to the size of the connection piping on the indoor unit. (Unit:mm)

Indoor unit capacity type	Piping size (O.D.)	
	Gas pipe	Liquid pipe
20 · 25 · 32 · 40?· 50 type	ϕ12.7	ϕ6.4
63 · 80 · 100 · 125 type	ϕ15.9	ϕ9.5
200 type	ϕ19.1	
250 type	ϕ22.2	

)) ×0.18 + (Total length (m) of liquid piping size at ϕ12.7) ×0.12 + (Total length (m) of liquid piping size at ϕ9.5) ×0.059

Example for refrigerant branch using REFNET joint and REFNET header

In case the outdoor unit is RXYQ34 type and the piping lengths are as at right

a: ϕ19.1 × 30m	d: ϕ9.5 × 10m	g: ϕ 6.4 × 10m	j : ϕ 6.4 × 10m
b: ϕ15.9 ×10m	e: ϕ9.5 × 10m	h: ϕ 6.4 × 20m	k: ϕ 6.4 × 9m
c: ϕ 9.5 × 10m	f : ϕ9.5 × 10m	i : ϕ12.7 × 10m	

R= 30×0.26 + 10×0.18 + 10×0.12 + 40×0.059 + 49×0.022 = 14.238 → 14.2 kg
(a, b, i, c+d+e+f, g+h+j+k)

2.6.6 EXAMPLE OF CONNECTION)

∗Note 1

When the equivalent pipe length between outdoor and indoor units is 90m or more, the size of main p
Depending on the length of the piping, the capacity may drop, but even in such case it is able to incre

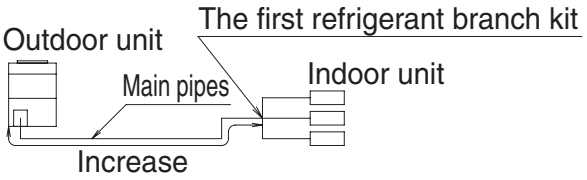


figure 9

■ Diameter of above case

Model	Gas	Liquid
RX(Y)Q5 Type	ϕ19.1	Not Increased
RX(Y)Q8 Type	ϕ22.2	ϕ12.7
RX(Y)Q10 Type	ϕ25.4*	ϕ12.7
RX(Y)Q12 Type	Not Increased	ϕ15.9
RX(Y)Q14 Type	Not Increased	ϕ15.9
RX(Y)Q16 Type	ϕ31.8*	ϕ15.9
RX(Y)Q18 Type	ϕ31.8*	ϕ19.1

Model	Gas	Liquid
RX(Y)Q20 Type	ϕ31.8*	ϕ19.1
RX(Y)Q22 Type	ϕ31.8*	ϕ19.1
RX(Y)Q24 Type	Not Increased	ϕ19.1
RX(Y)Q26 Type	ϕ38.1*	ϕ22.2
RX(Y)Q28 Type	ϕ38.1*	ϕ22.2
RX(Y)Q30 Type	ϕ38.1*	ϕ22.2
RX(Y)Q32 Type	ϕ38.1*	ϕ22.2

∗Note 2

Allowable length after the first refrigerant branch kit to indoor units is 40 m or less, however it can be exte

Required Conditions	Example Drawing
1. It is necessary to increase the pipe size between the first branch kit and the final branch kit. (Reducers must be procured on site) However, the pipes that are same pipe size with main pipe must not be increased.	8 b+c+d+e+f+g+p≤ 90 m increase the pipe size of b, c, d, e,
2. For calculation of Total extension length, the actual length of above pipes must be doubled. (except main pipe and the pipes that are not increased)	a+b×2+c×2+d×2+e×2+f×2- +h+i+j+k+l+m+n+p≤ 1000 m
3. Indoor unit to the nearest branch kit ≤ 40 m	h, i, j..... p ≤ 40 m
4. The difference between [Outdoor unit to the farthest indoor unit] and [Outdoor unit to the nearest indoor unit] ≤ 40 m	The farthest indoor unit 8 The nearest indoor unit 1 (a+b+c+d+e+f+g+p)-(a+h)≤

*If available on the site, use this size. Otherwise it can not be increased.

∗Note 3

If the pipe size above the REFNET header is ϕ34.9 or more, KHRP26M73HP is required.

f main pipes (both gas-side and liquid-side) must be increased.
to increase the size of main pipes.

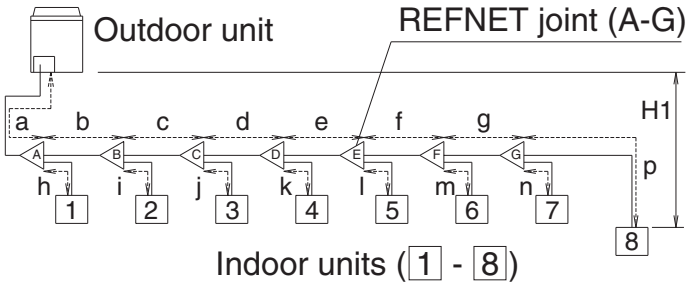
d
2
2
2
2

Model	Gas	Liquid
RX(Y)Q34 Type	ϕ38.1*	ϕ22.2
RX(Y)Q36 Type	Not Increased	ϕ22.2
RX(Y)Q38 Type	Not Increased	ϕ22.2
RX(Y)Q40 Type	Not Increased	ϕ22.2
RX(Y)Q42 Type	Not Increased	ϕ22.2
RX(Y)Q44 Type	Not Increased	ϕ22.2
RX(Y)Q46 Type	Not Increased	ϕ22.2

Model	Gas	Liquid
RX(Y)Q48 Type	Not Increased	ϕ22.2
RX(Y)Q50 Type	Not Increased	ϕ22.2
RX(Y)Q52 Type	Not Increased	ϕ22.2
RX(Y)Q54 Type	Not Increased	ϕ22.2

*If available on the site, use this size.
Otherwise, it can not be increased.

pe extended up to **90** m if all the following conditions are satisfied. (In case of **" Branch with REFNET joint "**)

Drawings	
90 m c, d, e, f, g	Increase the pipe size as follows ϕ 9.5 → ϕ12.7 ϕ15.9 → ϕ19.1 ϕ22.2 → ϕ25.4* ϕ34.9 → ϕ38.1* ϕ12.7 → ϕ15.9 ϕ19.1 → ϕ22.2 ϕ28.6 → ϕ31.8*
+f×2+g×2 1000 m	
a+h) ≤ 40 m	

2.7 Field Wiring

Caution:

- All field wiring and components must be installed by a licensed electrician and must comply with relevant local and national regulations.
- Be sure to use a dedicated power circuit. Never use a power supply shared by another appliance.
- Never install a phase advancing capacitor. As this unit is equipped with an inverter, installing a phase advancing capacitor will not only deteriorate power factor improvement effect, but also may cause capacitor abnormal heating accident due to high-frequency waves.
- Only proceed with wiring work after blocking off all power.
- Always ground wires in accordance with relevant local and national regulations.
- This machine includes an inverter device. Connect earth and leave charge to eliminate the impact on other devices by reducing noise generated from the inverter device and to prevent leaked current from being charged in the outer hull of the product.
- Do not connect the ground wire to gas pipes, sewage pipes, lightning rods, or telephone ground wires.
  Gas pipes: can explode or catch fire if there is a gas leak.
  Sewage pipes: no grounding effect is possible if hard plastic piping is used.
  Telephone ground wires and lightning rods: dangerous when struck by lightning due to abnormal rise in electrical potential in the grounding.
- Be sure to install an earth leakage circuit breaker.
  This unit uses an inverter, so install the earth leakage circuit breaker that be capable of handling high harmonics in order to prevent malfunctioning of the earth leakage circuit breaker itself.
- Earth leakage circuit breaker which are especially for protecting ground-faults should be used in conjunction with main switch or fuse for use with wiring.

Note:

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

2.7.1 Power Circuit, Safety Device, and Cable Requirements

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

	Phase and frequency	Voltage	Minimum circuit amp.	Recommended fuses
RXYQ5PYL	ϕ 3, 60Hz	380V	11.9A	15A
RXYQ8PYL	ϕ 3, 60Hz	380V	18.5A	25A
RXYQ10PYL	ϕ 3, 60Hz	380V	22.8A	30A
RXYQ12PYL	ϕ 3, 60Hz	380V	23.9A	30A
RXYQ14PYL	ϕ 3, 60Hz	380V	33.9A	40A
RXYQ16PYL	ϕ 3, 60Hz	380V	33.9A	40A
RXYQ18PYL	ϕ 3, 60Hz	380V	34.9A	40A
RXYQ20PYL	ϕ 3, 60Hz	380V	42.4A	50A
RXYQ22PYL	ϕ 3, 60Hz	380V	46.7A	60A
RXYQ24PYL	ϕ 3, 60Hz	380V	52.4A	60A
RXYQ26PYL	ϕ 3, 60Hz	380V	53.4A	60A
RXYQ28PYL	ϕ 3, 60Hz	380V	57.7A	70A
RXYQ30PYL	ϕ 3, 60Hz	380V	58.8A	70A
RXYQ32PYL	ϕ 3, 60Hz	380V	67.8A	80A
RXYQ34PYL	ϕ 3, 60Hz	380V	68.8A	80A
RXYQ36PYL	ϕ 3, 60Hz	380V	69.8A	80A
RXYQ38PYL	ϕ 3, 60Hz	380V	77.3A	90A
RXYQ40PYL	ϕ 3, 60Hz	380V	86.3A	100A
RXYQ42PYL	ϕ 3, 60Hz	380V	87.3A	100A
RXYQ44PYL	ϕ 3, 60Hz	380V	88.3A	100A
RXYQ46PYL	ϕ 3, 60Hz	380V	92.6A	110A
RXYQ48PYL	ϕ 3, 60Hz	380V	93.7A	110A
RXYQ50PYL	ϕ 3, 60Hz	380V	103.7A	120A
RXYQ52PYL	ϕ 3, 60Hz	380V	103.7A	120A
RXYQ54PYL	ϕ 3, 60Hz	380V	104.7A	120A

Note: The above table indicates power specifications for standard combinations (see 2-2 Introduction).
If using anything other than the above combinations in a multi system, calculate using the following procedure.

Minimum circuit amp value: add the minimum circuit amp values for each independent unit
Recommended fuse capacity: select the fuse capacity with the next higher value of the calculated minimum circuit amp. multiplied by 1.1.
Ex: Combining the RXYQ30PYL using RXYQ8PYL, RXYQ10PYL, and RXYQ12PYL.
Minimum circuit amp. of the RXYQ8PYL in table above = 18.5 A
Minimum circuit amp. of RXYQ10PYL in table above = 22.8 A
Minimum circuit amp. of RXYQ12PYL in table above = 23.9 A
Accordingly, the minimum circuit amp. of the RXYQ30PYL = 18.5 + 22.8 + 23.9 = 65.2A
Multiplying the result above by 1.1 (65.2 × 1.1) = 71.7 A, so the recommended fuse capacity would be 80 A.

2.7.2 Wiring Connection Example for Whole System

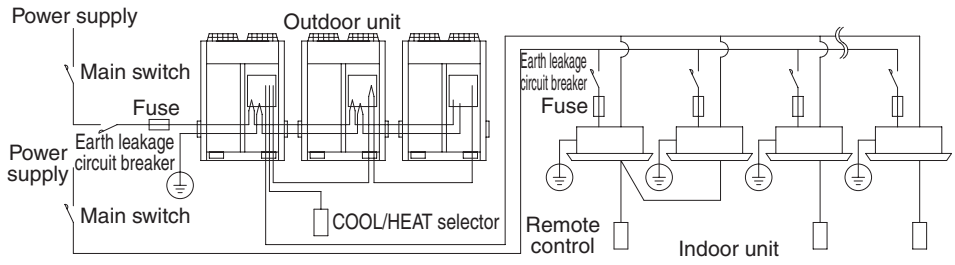


figure 19

Note:
- Make sure the weak electric wiring (i.e. for the remote control, between units, etc.) and the power wiring do not pass near each other, keeping them at least 50 mm apart. Proximity may cause electrical interference, malfunctions, and breakage.
- Be sure to connect the power wiring to the power wiring terminal block and secure it as described in **"2-7-5 Power Wiring Connection Procedure"**.
- Transmission wiring should be secured as described in **"2-7-4 Transmission Wiring Connection Procedure"**.
- Secure wiring with clamp such as insulation lock ties to avoid contact with piping.
- Shape the wires to prevent the structure such as the EL. COMPO. BOX lid deforming. And close the cover firmly.
- 5HP type can not compose multi system.

2.7.3 Leading wire Procedure

- The power wiring and ground wiring are passed out from the power wiring hole on the sides, the front (knock hole) or the bottom frame (knock hole) .
- The transmission wiring is passed out from the wiring hole (knock hole) on the front of the unit or from a piping hole.

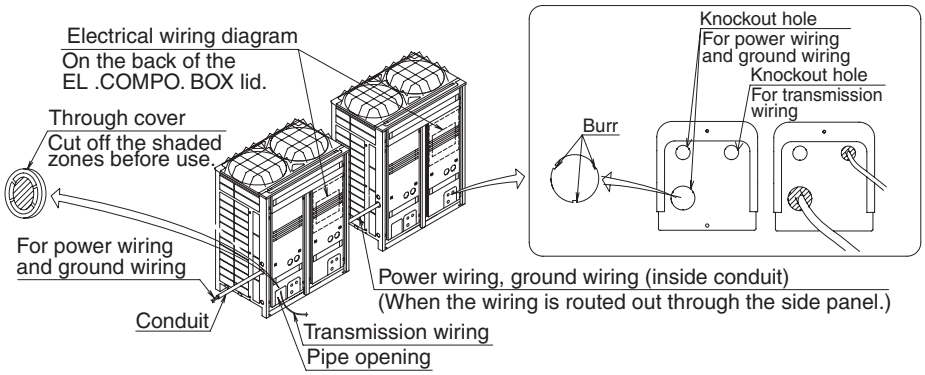


figure 20

Note:
- Open the knock holes with a hammer or the like.
- After knocking out the holes, we recommend you remove any burrs and paint them using the repair paint to prevent rusting.
- When passing wiring through the knock holes, remove burrs around the knock holes and protect the wiring with protective tape. **(Refer to figure 20)**
- If small animals might enter the unit, block off any gaps (hatching parts in figure 20) with material (field supply).

2.7.4 Transmission Wiring Connection Procedure

- Referring to figure 21, 22 connect the transmission wiring between outdoor unit and indoor unit, outdoor unit and outdoor unit of other system, outdoor unit and outdoor unit of same system (only multi system) or to COOL/HEAT selector.

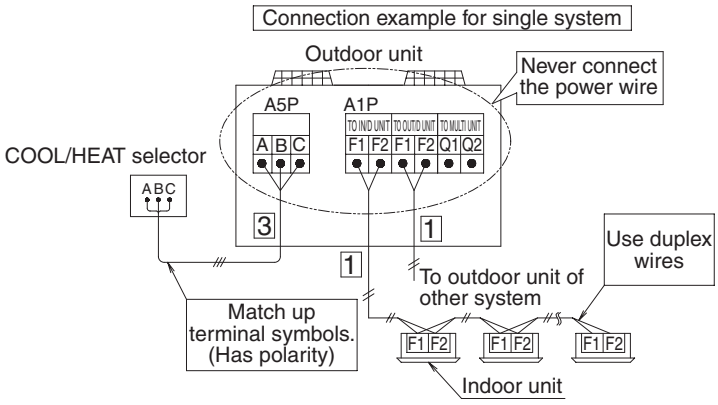


figure 21

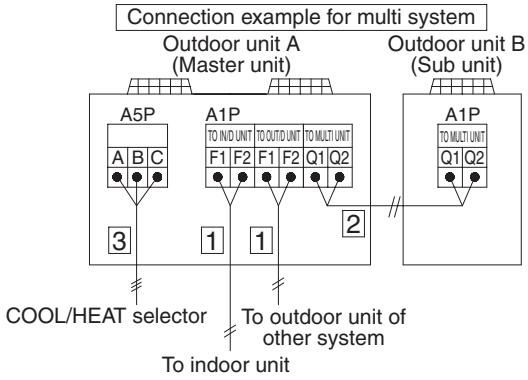


figure 22

- All transmission wiring is to be procured on site. All wiring should use sheathed vinyl cord 0.75-1.25 mm2 or cable (duplex). (Triplex only for the COOL/HEAT selector.)
- Transmission wiring (About the symbol 1 ~ 3, see figure 21, 22) should be done within the following limitations.
  If they are exceeded, transmission problems may occur.

1 Between outdoor unit and indoor unit
  Between outdoor unit and outdoor unit of other systems
  Max. wiring length : 1,000 m
  Max. total wiring length : 2,000 m
  Max. no. of branches : 16
  [Note]
  No branch is allowed after branch (See figure 23)
  Max. no. of outdoor units of other system that can be connected
  : 10

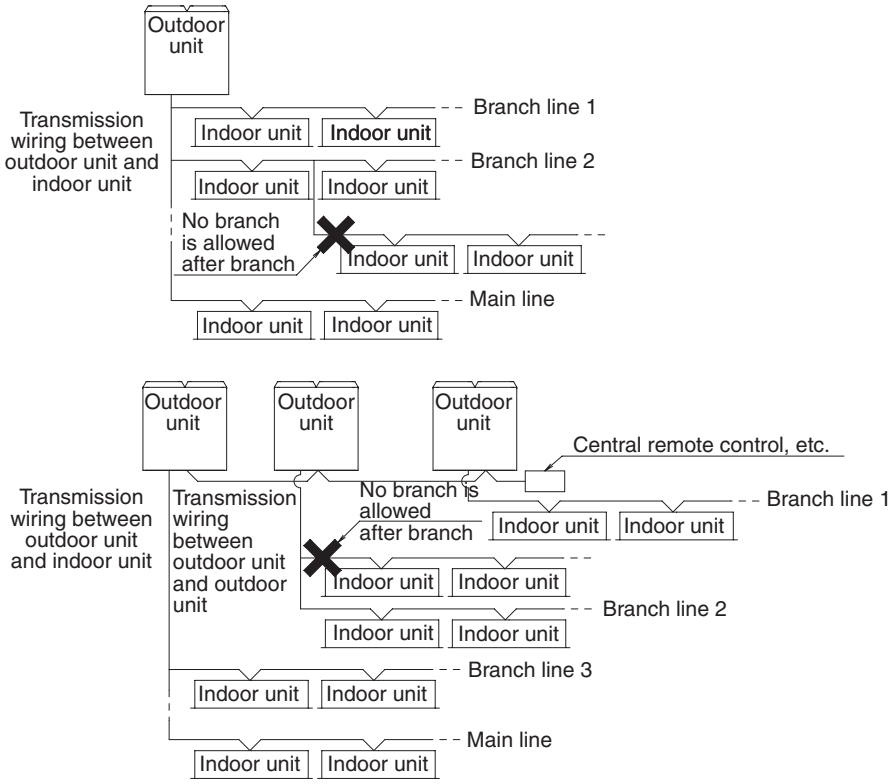


figure 23

2 Between outdoor unit and outdoor unit of same system (Only for multi system)
  Max. wiring length : 30 m

3 Transmission wiring to COOL/HEAT selector
  Max. wiring length : 500 m

- The transmission wiring inside the EL.COMPO.BOX should be secured using the clamp (1) as shown in figure 24.

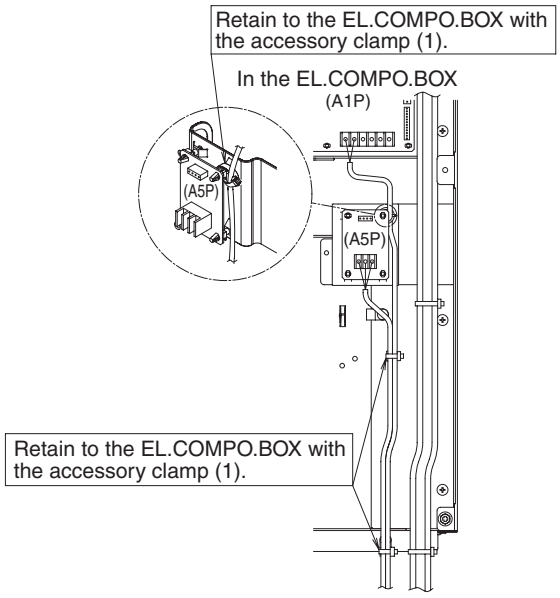


figure 24

- Outside the units, the transmission wiring must be finished simultaneously with the local refrigerant piping, and wound with tape (field supply) as shown in figure 25.

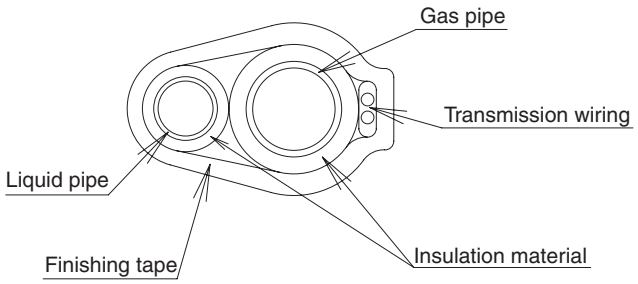


figure 25

- For multi system:
  1. Transmission wiring between outdoor units in the same piping system must be connected to terminals Q1 and Q2 (TO MULTI UNIT).
     Connecting the wires to the F1, F2 (TO OUT/D UNIT) terminals results in system malfunction.
  2. Wiring to other systems should be connected to terminals F1 and F2 (TO OUT/D UNIT) on the PC-board of the master unit. The outdoor unit that connected transmission wiring to indoor unit is the master unit. The others are sub unit.

Caution:

- Do not connect the power wiring to terminals for the transmission wiring. Doing so would destroy the entire system.
- When connecting wires to the terminal block on the PC-board, too much heat or tightening could damage the PC-board. Attach with care.
  See the table below for the tightening torque of the transmission wiring terminals.

Screw size	Tightening torque (N · m)
M3 (A5P)	0.53 - 0.63
M3.5 (A1P)	0.80 - 0.96

2.7.5 Power Wiring Connection Procedure

Be sure to connect the power supply wiring to the power supply terminal block and hold it in place using the included clamp as shown in the figure 26.

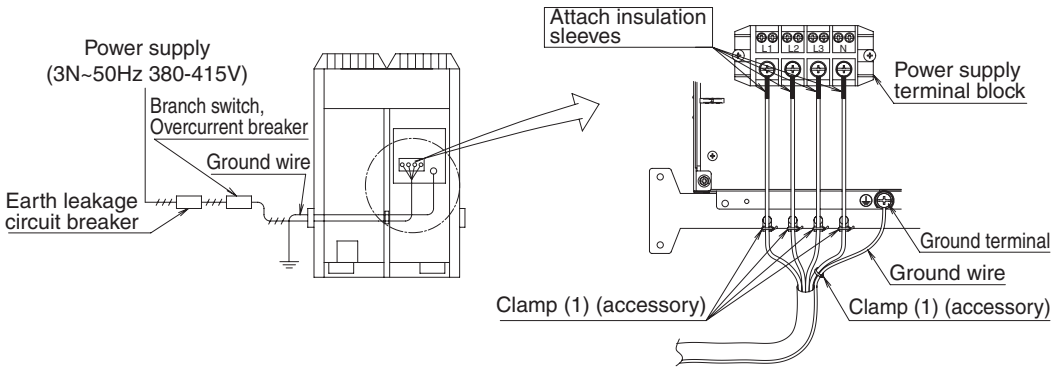
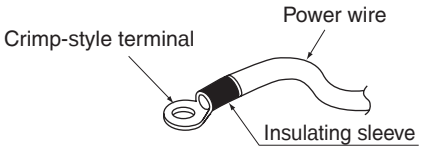


figure 26

- The L1, L2, L3 and N phases of the power wiring should be secured separately to the hook using the included clamp (1).
- The ground wiring should be bound to the power wiring using the included clamp (1) to prevent outside force from being applied to the terminal area.
- Wire so that the ground wiring does not come into contact with the compressor lead wiring. If they touch, this may have an adverse effect on other devices.

Caution:

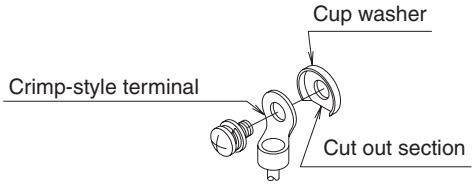
- Be sure to use crimp-style terminal with insulating sleeves for connections. (See the figure below.)



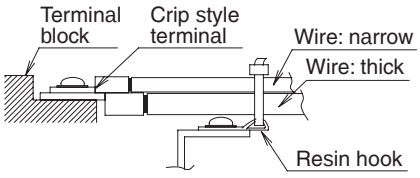
- For wiring, use the designated power wire and connect firmly, then secure to prevent outside pressure being exerted on the terminal board.
- Use an appropriate screwdriver for tightening the terminal screws. A screwdriver with a small head will strip the head and make proper tightening impossible.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

Screw size	Tightening torque (N·m)
M8 Power terminal, ground terminal	5.5 ~7.3

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



- When two wires are connected to a single terminal, connect them so that the rear sides of the crimp contacts face each other. Also, make sure the thinner wire is on top, securing the two wires simultaneously to the resin hook using the included clamp (1).



2.7.6 Procedure for Wiring Inside Units

- Referring to figure 27, secure and wire the power and transmission wiring using the included clamp (1), (2), and (3).

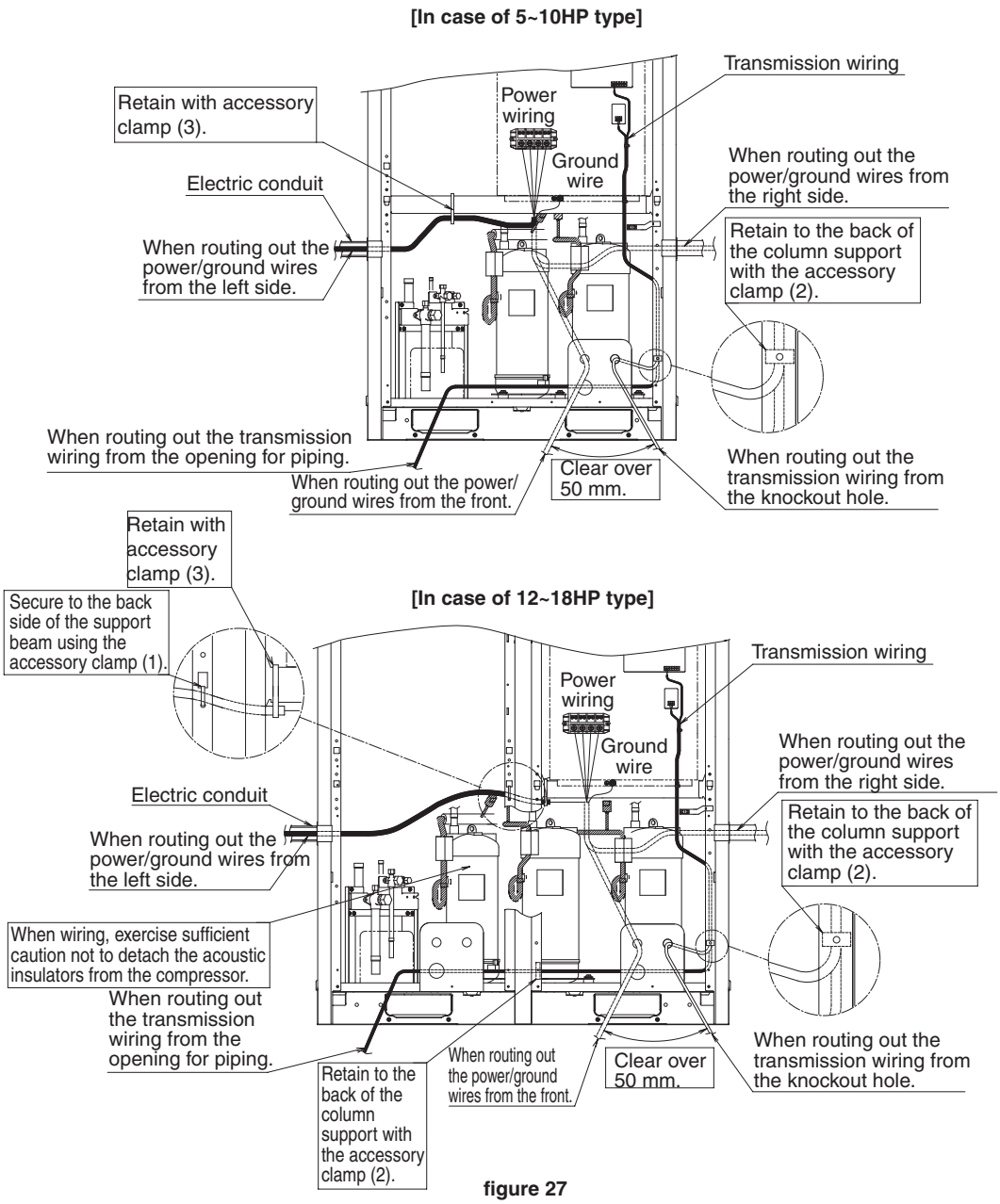


figure 27

Caution:

- The transmission wiring must be at least 50 mm away from the power wiring.
- Make sure all wiring do not contact to the pipes (hatching parts in the figure 27).
- After wiring work is completed, check to make sure there are no loose connections among the electrical parts in the EL.COMPO.BOX.