



technical data

VRV™ Systems

Installation

Installation

Table of contents

Introduction	
Precautions on installation.....	2
Procedure and tools for refrigerant piping work.....	3
Installation of outdoor units	6
1 Field refrigerant piping	
Inverter heat pump series.....	9
2 Field wiring	
cooling only / heat pump.....	10
Inverter cooling only / heat pump series.....	16
Heat recovery series.....	21
VRV plus.....	24

Introduction

Precautions on installation

R-407C applies higher pressure than R-22 and uses refrigeration oil different from R-22. Therefore, piping works and tools are also different from those for R-22 refrigerants.

Refrigerant	R-22 (Single-component refrigerant)	R-407C (Multiple-component refrigerant)
Refrigeration oil	Mineral oil (Suniso)	Synthetic (ether) oil
Condensing pressure	1.84MPa (18.8kg/cm ²)	2.01MPa (20.5kg/cm ²)

Refrigerant piping materials

REFNET piping materials

- Branch pipe and dividing pipe for R-407C are provided specially for REFNET piping. Since these new parts are not interchangeable with current REFNET parts, do not use current REFNET piping materials for R-407C. (Refer to the option list)

Other refrigerant piping materials

- Use C 1220 type copper tube for refrigerant piping. Wall thickness of copper tube shown in the below table can be applied. (The table is the same as the recommendation for R-22)

Recommendable oil for pipe processing

- Daphne Master Draw 510LS•530LS•565NR•566LS (Idemitsu Kosan Co.,Ltd.)
- Master Draw 5128 (Etna Products inc.)
- Shell Drawing XA (Shell)
* Mixing amount of oil is 30mg/10m at maximum.

Wall thickness of refrigerant pipe (Reference)

(Unit: mm)

Type	O type					1/2H and H type				
Copper tube O.D.	ø 6.4	ø 9.5	ø 12.7	ø 15.9	ø 19.1	ø 22.2	ø 25.4	ø 28.6	ø 34.9	ø 41.3
Copper tube W.T.	0.8	0.8	0.8	1.0	1.0	1.0	1.0	1.2	1.3	1.7

NOTE

- When selecting and using a copper tube, observe strictly the relevant standards or regulations of each country.

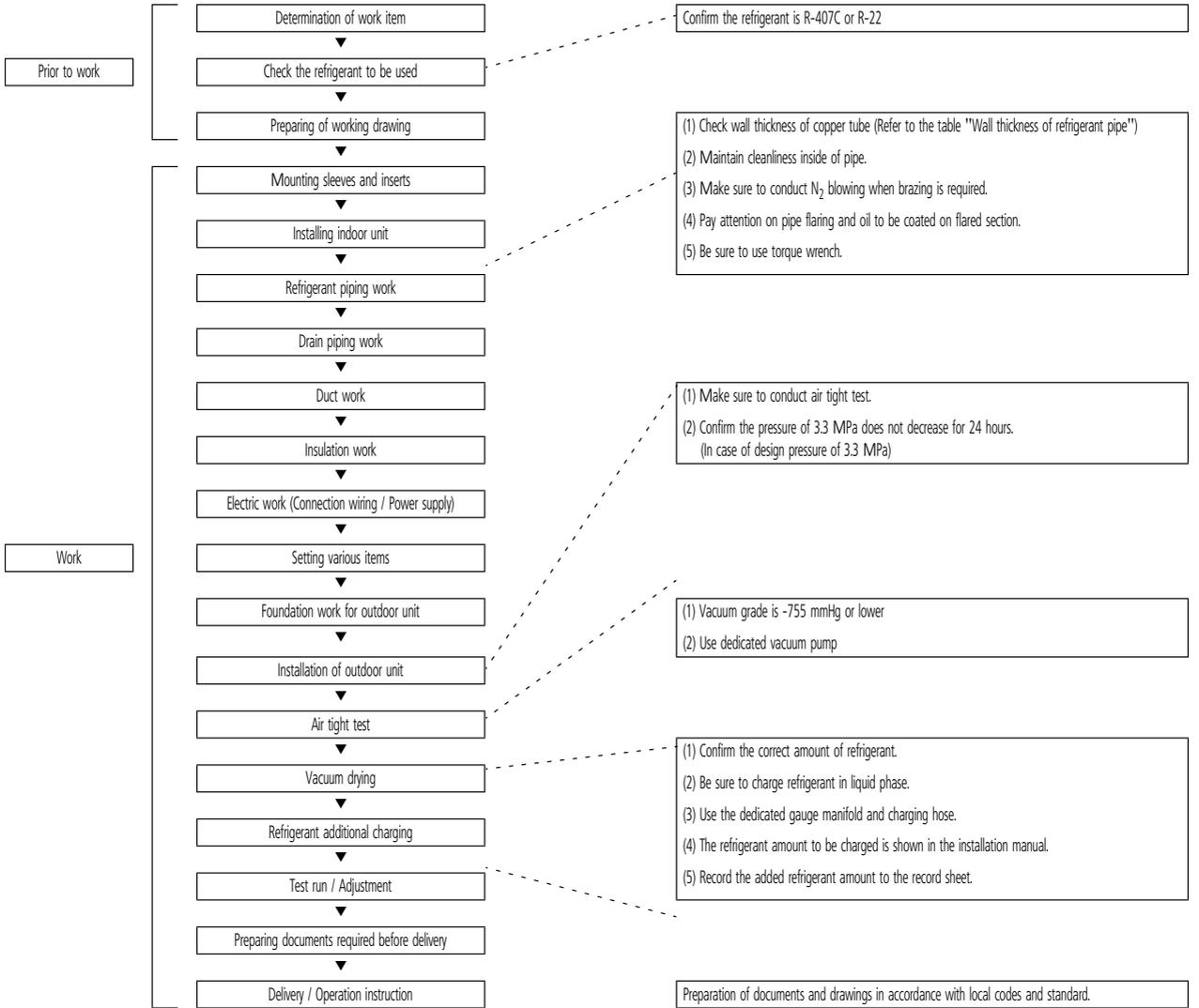
Introduction

Procedure and tools for refrigerant piping work

Procedure

- Piping work for R-407C models partially differs from R-22 models in items and procedures of piping work and refrigerant charging due to different component and higher pressure for R-407C. The chart below shows general work procedure for R-407C models.

Work items and precautions



(V2349)

Introduction

Procedure and tools for refrigerant piping work

Tools

- Several dedicated tools are required for the installation work of R-407C models. Some conventional tools can be used except tools actually used to install R-22 models.

Representative tools and devices and interchangeability

Tool name		Work process / Usage	Interchangeability with conventional tool
Pipe cutter	Refrigerant piping work	Pipe cutting	Interchangeable and can be used.
Flaring tool		Pipe flaring	
Refrigeration oil		Applying to flared section	Use dedicated ether oil, ester oil, alkyl-benzene oil or mixture of those oils.
Torque wrench		Flare nut jointing	Interchangeable and can be used.
Pipe expander		Pipe expanding in connection of pipe	
Pipe bender		Pipe bending	
Nitrogen	Air tight test	Oxidation proof for inside pipe	
Welder		Pipe brazing	
Gauge manifold	From air tight test to refrigerant additional charging	Refrigerant charging using vacuum and operation check	Dedicated gauge is required due to high pressure.
Charging hose			To prevent refrigerant leakage and mixing of foreign matters, dedicated charging hose is required.
Vacuum pump	Vacuum drying		Interchangeable and can be used. (Be strictly sure that oil does not flow in reverse to the unit during pump stop.)
Charging cylinder	Refrigerant additional charging		Not required since charging work conducted with weighing scale.
Weighing scale for refrigerant charging			Interchangeable and can be used.
Gas leakage detector		Gas leakage check	Dedicated detector is required (Detector for R-134a can be used).

Precautions for installation work

Caution to be taken when brazing refrigerant piping

- “Do not use flux when brazing copper-to-copper refrigerant piping. (Particularly for the HFC refrigerant piping) Therefore, use the phosphor copper brazing filler metal (BCuP) 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. The use of flux is strictly forbidden since the cleaning on site is impossible.)

NOTE

- 1 Keep in mind that if the phosphor copper brazing filler metal is used and the brazing temperature and the heating time exceed a certain point, the phosphor changes into the gaseous state (e.g. BCuP -1 to 5 : between 700 and 800°C) which causes pin holes and results in refrigerant leakage.

Joint brazing

- Since stricter caution should be necessary for R-407C to prevent intrusion of foreign matters into the refrigerant piping line, be sure to conduct N₂ blowing when brazing is required.
- Other than brazing, a stricter work control including pipe covering and drying is required to prevent pipe from intrusion of foreign matters.

Flaring

- Make sure to conduct chamfering (filing) at cut section, since a large wall thickness of pipe results large burr. Be aware of no cutting chips left inside pipe.
- Apply appropriate amount of refrigeration oil on outer / inner surface of flared section to prevent leakage. Make sure to use synthetic oil (ether oil, ester oil, archi-benzene oil or mixture of those oils) as refrigeration oil.

Introduction

Procedure and tools for refrigerant piping work

Refrigerant charging

- Charge R-407C from service port at liquid side stop valve of outdoor unit in liquid phase. At that time, conduct vacuum drying using vacuum pump.

Air-tightness test

- Make sure to conduct air-tightness test.



Conduct installation work for R-407C models according to above mentioned piping work procedure. Otherwise, the unit may have trouble. Refer to the "Work execution and control for R-407C model" for the details on handling of R-407C, installation works and tools.

CAUTION

- 1 Air conditioners should not be installed in areas where corrosive gases, such as acid gas or alkaline gas, are produced.
- 2 If the outdoor unit is to be installed close to the sea shore, direct exposure to the sea breeze should be avoided and choose an outdoor unit with anti-corrosion treatment.

Introduction

Installation of outdoor units

Determination of the Installation Location

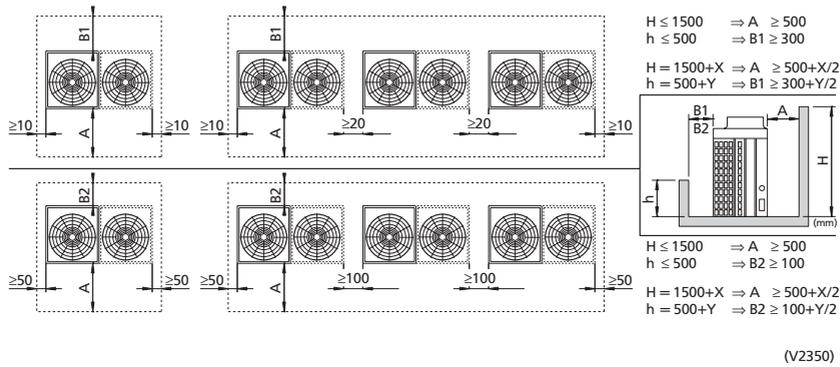
Selection of location

- This unit, both indoor and outdoor, is suitable for installation in a commercial and light industrial environment. If installed as a household appliance it could cause electromagnetic interference.
- The VRV outdoor units should be installed in a location that meets the following requirements:
 1. The foundation is strong enough to support the weight of the unit and the floor is flat to prevent vibration and noise generation.
 2. The space around the unit is adequate for servicing and the minimum space for air inlet and air outlet is available. (Refer to below figure and choose one of both possibilities.)
 3. There is no danger of fire due to leakage of inflammable gas.
 4. Ensure that water cannot cause any damage to the location in case it drips out of the unit (e.g. in case of a blocked drain pipe).
 5. The piping length between the outdoor unit and the indoor unit may not exceed the allowable piping length. (See "Example of connection".)
 6. Select the location of the unit in such a way that neither the discharged air nor the sound generated by the unit disturb anyone.
 7. Make sure that the air inlet and outlet of the unit are not positioned towards the main wind direction. Frontal wind will disturb the operation of the unit. If necessary, use a windscreen to block the wind.
 8. Locations where there is mineral oil or kitchens and other locations where oil may splatter or there may be a lot of steam in the air. Deterioration of resin parts may cause parts to fall or leak.
 9. Locations where corrosive gases are present, such as sulfuric gas. This may cause corrosion of copper pipes and brazed parts, causing the refrigerant to leak.
 10. Locations with machinery which gives off electromagnetic waves. Such waves may cause the control system to malfunction and prevent normal operation.

Introduction

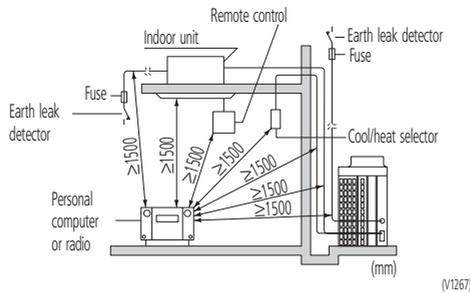
Installation of outdoor units

5, 8, 10HP



CAUTION

- 1 An inverter air conditioner may cause electronic noise generated from AM broadcasting. Examine where to install the main air conditioner and electric wires, keeping proper distances away from stereo equipment, personal computers, etc.



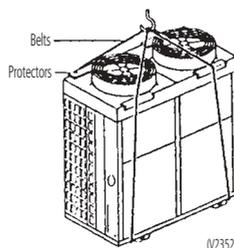
If the electric wave of AM broadcasting is particularly weak, keep distances of 3m or more and use conduit tubes for power and transmission lines.

- 2 In heavy snowfall areas, select an installation site where snow will not affect operation of the unit.
- 3 The refrigerant R-407C itself is nontoxic, nonflammable and is safe. If the refrigerant should leak however, its concentration may exceed the allowable limit depending on room size. Due to this it could be necessary to take measures against leakage. Refer to the chapter "Caution for refrigerant leaks".

Suspension Method

- The units are packed in a wooden crate and attached on a wooden pallet. At delivery, the package should be checked and any damage should be reported immediately to the carrier claims agent. When handling the unit, take into account the following:
 1. Fragile, handle the unit with care.
 2. Keep the unit upright in order to avoid compressor damage.
 2. Lift the unit preferably with a crane and 2 belts of at least 8m long.
 3. When lifting the unit with a crane, always use protectors to prevent belt damage and pay attention to the position of the unit's center of gravity.
 4. Bring the unit as close to its final installation position in its original package to prevent damage during transport.

5, 8, 10HP

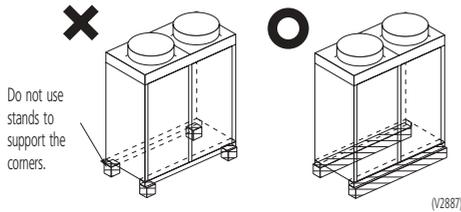


Introduction

Installation of outdoor units

Caution when installing

1. Remove the crate from the unit.
2. Remove the four screws fixing the unit to the pallet.

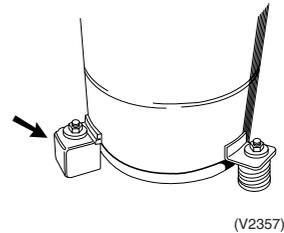


NOTE

- 1 Note : Maximum height of the foundation is 150mm.

3. Lift the unit from the pallet and place it on its installation position.

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



CAUTION

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

1 Field refrigerant piping

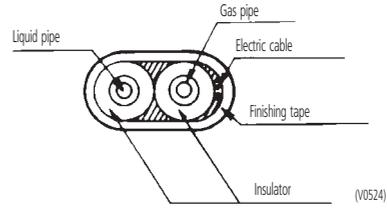
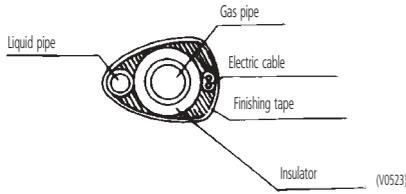
1-1 Inverter heat pump series

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

- Materials: Deoxidized phosphorous seamless copper pipe (for external diameters of 25.4mm or more, C1220T-0 for the rest) or equivalent

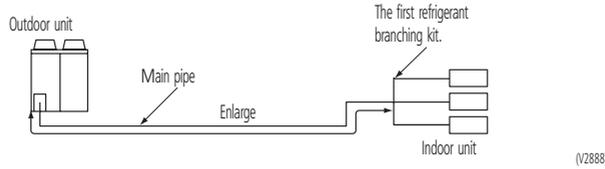
(2) Tips for insulation

- Gas piping must be insulated.
- If it is considered likely that the air conditioner will be operated at temperatures between 0°C and 10°C in cooling mode then the liquid pipes must also be insulated.
- Materials: Glass fiber or heat resistant polyethylene foam.
Thickness: 10mm or more
Heat resistance: Gas pipe : 120°C or more / Liquid pipe : 70°C or more
- Insulation of single pipe only
- Insulation of both liquid and gas pipe



Precautions when selecting branch piping

- If the piping between the outdoor units is 90m or longer, be sure to enlarge the main pipe in the gas-side branch piping. Depending on the length of the refrigerant piping, the power may drop, but even in such cases it is ok to enlarge the main pipe.



NOTES

- 5Hp $\phi 19.1 \rightarrow \phi 22.2$
(Lowest thickness 1.0mm)
- 8Hp $\phi 25.4 \rightarrow \phi 28.6$
(Lowest thickness 1.2mm)
- 10Hp $\phi 28.6 \rightarrow \phi 31.8$
(Lowest thickness 1.2mm)

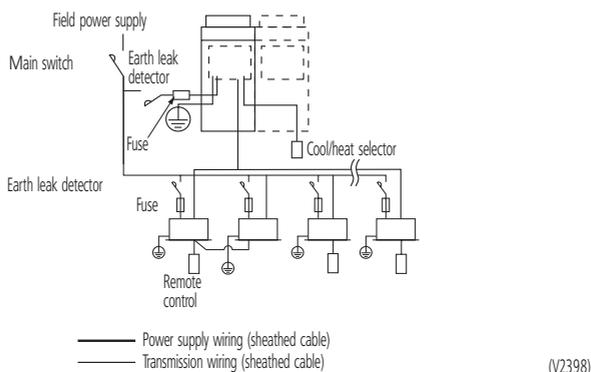
2 Field wiring

2-1 cooling only / heat pump

2

- Up to 3 units can be connected by crossover power source wiring between outdoor units. However, units of smaller capacity must be connected downstream. For details, refer to the equipment design data and technical data.
- Make sure to connect the power source wire to the power source terminal block and to clamp it as shown in figure chapter “Field line connection”.
- As this unit is equipped with an inverter, installing a phase advancing capacitor not only will deteriorate power factor improvement effect, but also may cause capacitor abnormal heating accident due to high frequency waves. Therefore, never install a phase advancing capacitor.
- Keep power imbalance within 2% of the supply rating.
 1. Large imbalance will shorten the life of the smoothing capacitor.
 2. As a protective measure, the product will stop operating and an error indication will be made, when power imbalance exceeds 4% of the supply rating.
- Follow the “electrical wiring diagram” when carrying out any electrical wiring.
- Only proceed with wiring work after blocking off all power.
- Always ground wires. (In accordance with national regulations of the pertinent country.)
- 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.
- This unit uses an inverter, and therefore generates noise, which will have to be reduced to avoid interfering with other devices. The outer casing of the product may take on an electrical charge due to leaked electrical current, which will have to be discharged with the grounding.
- Be sure to install an earth leak detector. (One that can handle higher harmonics.)
(This unit uses an inverter, which means that an earth leak detector capable handling high harmonics in order to prevent malfunctioning of the earth leak detector itself.)
- Earth leak detectors made especially for protecting ground-faults should be used in conjunction with main switch or fuse for use with wiring.
- This unit has a negative phase protection circuit. (If it operates, only operate the unit after correcting the wiring.)

Heat Pump (5~10HP)



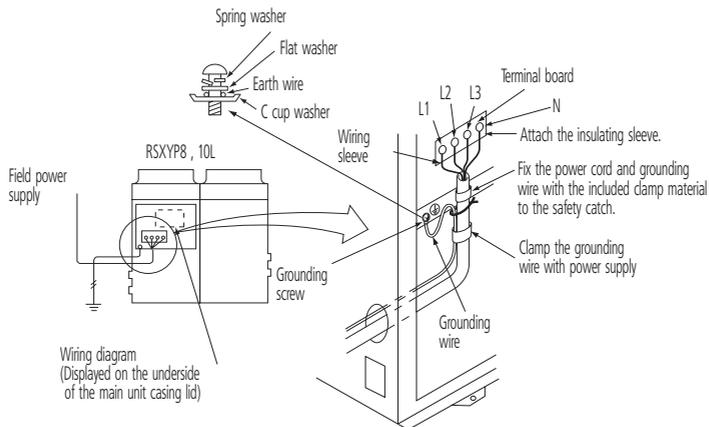
2 Field wiring

2-1 VRV™ cooling only / heat pump

2-1-1 Field line connection

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

Heat Pump



(V2889)

CAUTION

- 1 Wire so that the ground line does not come into contact with the compressor lead line. If these two lines touch, it may have an adverse effect on the other devices.
- 2 Precautions when laying power wiring
 - Use a round pressure terminal for connections to the power terminal block. (Refer to figure)
 - For wiring, use the designated power wire and connect firmly, then secure using the included clamping material to prevent outside pressure being exerted on the terminal board.

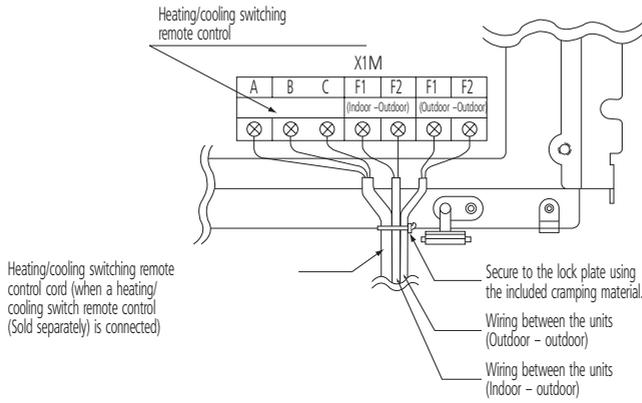


(V2889)

2 Field wiring

2-1 VRV™ cooling only / heat pump

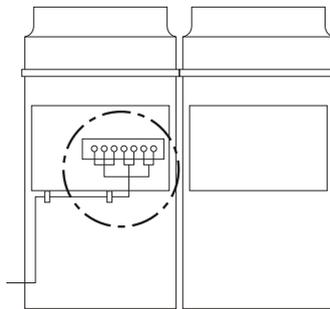
2 2-1-2 Field line connection: transmission wiring (cool/heat selection)



(V2889)

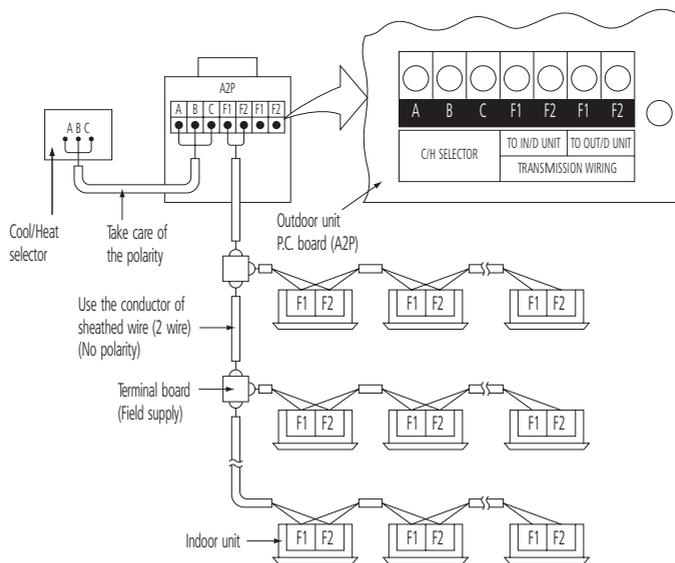
NOTES

- 1 Pass the wiring between the units through the 2 wire clips in the bottom part of the switch box and out of the unit



(V2889)

Example of performing cool/heat with cool/heat selector



(V2889)

2 Field wiring

2-1 VRV™ cooling only / heat pump

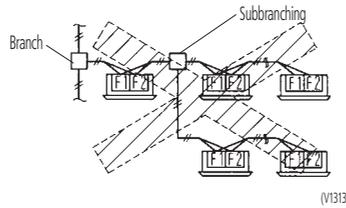
2-1-3 Example of performing cool/heat setting of two or more outdoor units in block with cool/heat selector

2

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

CAUTION

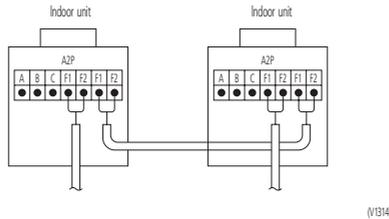
- 1 Be sure to follow the limits below. If the unit-to-unit cables are beyond these limits, it may result in malfunction of transmission.
 Maximum wiring length: 1,000m
 Total wiring length: 2,000m
 Max branches No. of branches: 16
- 2 Up to 16 branches are possible for unit-to-unit cabling. No branching is allowed after branching.



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

2-1-4 Sequential start

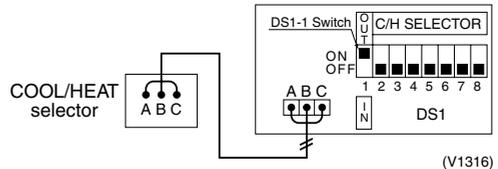
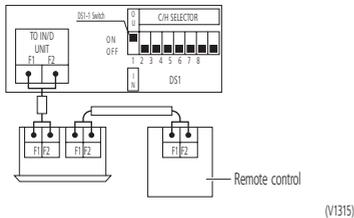
- Make the outdoor unit cable connections shown below.
- The outdoor unit PC board (A2P) is factory set at "Sequential start available".



2-1-5 Setting the cool/heat operation

Heat Pump System

1. Performing cool/heat setting with the remote control connected to the indoor unit.
 Keep the cool/heat selector switch (DS1-1) on the outdoor unit PC board (A2P) at the factory setting position IN/D UNIT.
2. Connect the optional remote control for COOL/HEAT changeover to the outdoor unit printed circuit board (PCB) (A2P) and change the COOL/HEAT setting switch (DS1-1) from IN (factory set) to out.



CAUTION

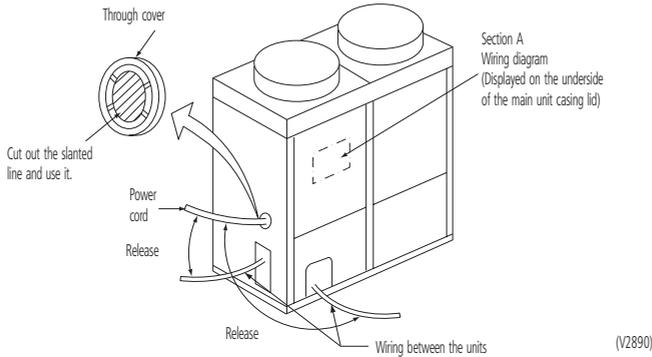
- 1 For low-noise operation, it is necessary to get the optional "External control adapter for outdoor unit".
- 2 For details, see the installation manual attached to the adapter.

2 Field wiring

2-1 VRV™ cooling only / heat pump

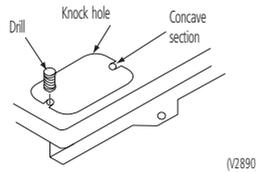
2 2-1-6 Picking power line and transmission line

- Pick the power line from the upper hole on the left side plate, from the front position of the main unit (Through the conduit hole of the wiring mounting plate - optional parts) or from a knock out hole to be made in the unit's bottom plate.

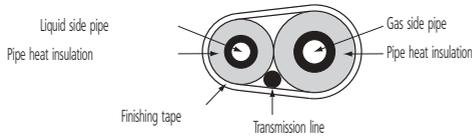
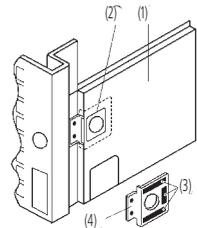


Precautions when knocking out knock holes

- Be sure to avoid damaging the casing
- After knocking out the holes, we recommend you paint the edges and areas around the edges using the repair paint to prevent rusting.
- When passing electrical wiring through the knock holes, wrap the wiring with protective tape to prevent damage.
- Open knock holes around the 4 concave knock holes in the base frame, using a $\phi 6\text{mm}$ -bit drill.



- If you pick the power line from the front position of the unit, proceed as follows and refer to figure
 - Remove the lower frontplate (1), punch a hole in the knock hole and cut the hole (2) all the way to the slit.
 - Attach the 3 sealing pads (Optional parts) (3) on the wiring mounting plate (Optional parts) (4) corresponding to the overlapped area of the front plate.
 - Install the wiring mounting plate to the front side of the side plate with the 2 delivered screws.
- Pick the transmission line from the middle positioned conduit hole on the left side plate, from the lower conduit hole on the right side plate or from the front position of the main unit (After binding it to the piping with finishing tape as in figure 2).



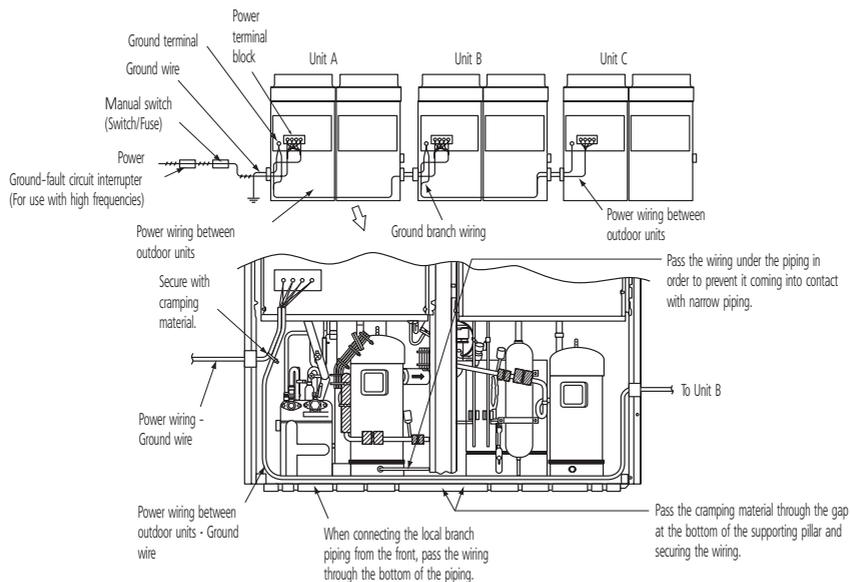
2 Field wiring

2-1 VRV™ cooling only / heat pump

2-1-6 Picking power line and transmission line

When the power goes from outdoor unit to outdoor unit

- Pass the power wiring which goes between the outdoor units through the bottom after securing it to the power wiring using cramping material so that it does not come into contact with the shut-off valve and the piping.



(V2890)

CAUTION

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

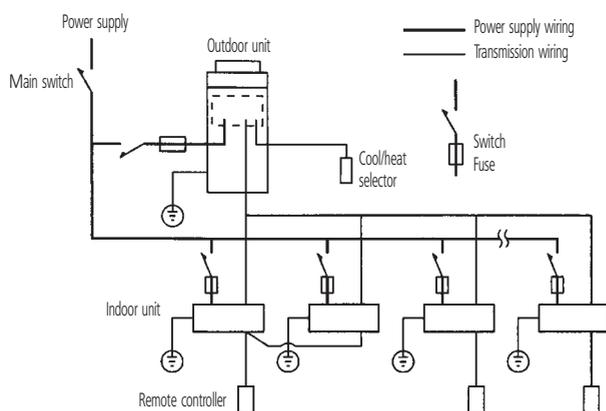
2 Field Wiring

2-2 Inverter cooling only / heat pump series

2-2-1 General instructions

- All wiring components, parts which will be obtained locally and materials must comply with the applicable standards of the country and the region.
- Use copper conductors only.
- Follow the schematic attached to the unit for details on wiring.
- The electrical work must be executed entirely by the authorized electricians.
- The attached gist of wiring gives only an outline and does not refer to any further details on the actual installation work.
- Install the main switch that can interrupt all the power sources in an integrated manner because this system consists of the equipment utilizing the multiple power sources.
- Be sure to install the switch and the fuse to the power line of each equipment.
- Connect the wires tightly and with no force upon the terminals. Dress the wires so that the covers and other related parts do not get loose. If poorly connected or loosely placed, an overheat, electric shock or fire may result.

2-2-2 Example for the whole system



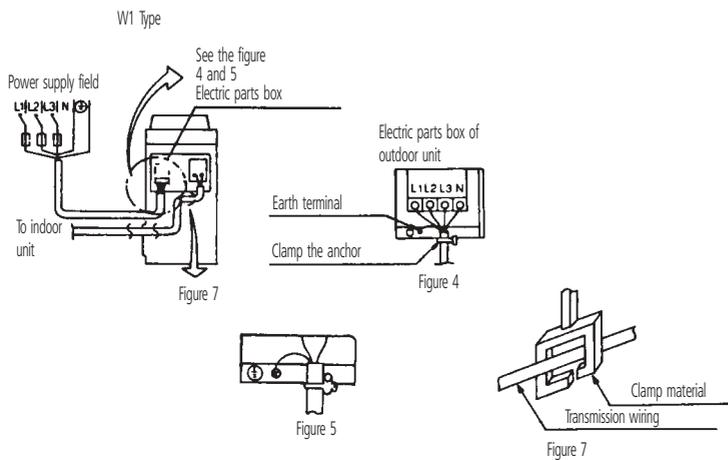
NOTES

- 1 Up to 3 units can be connected by crossover power supply wiring between outdoor units. However, units of smaller capacity must be connected downstream.
- 2 Be sure to connect the power supply wire to the power supply terminal block (X1M) and clamp it as shown in the below hand figure.
- 3 As this unit is equipped with an inverter, installing a phase advancing capacitor not only will deteriorate power factor improvement effect, but also may cause a capacitor abnormal heating accident due to high-frequency waves. Therefore never install a phase advancing capacitor.
- 4 Keep power imbalance to within 2% of the supply rating.
 - Large imbalance will shorten the life of the smoothing capacitor
 - As a protective measure, the product will stop operating and an error indication will be made when power imbalance exceeds 4% of the supply rating.

2 Field Wiring

2-2 Inverter cooling only / heat pump series

2-2-3 Gist of field line connection



2-2-4 Specifications for field supplied fuses and wire

Model	Supply wiring			Transmission wiring	
	Field fuse 	Wire	Size	Wire	Size
RSX(Y)5K	20A	H05W-U5G	Note 1	Note 2	0.75 - 1.25 mm ²
RSX(Y)8K	35A				
RSX(Y)10K	35A				

NOTES

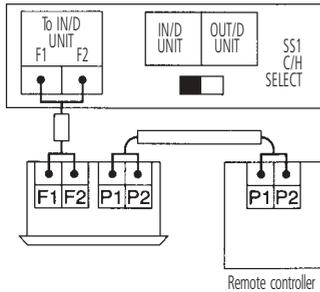
- 1 Select the particular size of electrical wire for power supply wiring in accordance with the standards of the given nation and region.
- 2 Select the transmission wiring under the following conditions.
 - Use the sheathed wire (3 wire) in case of C/H selector. (Heat pump unit only.)
 - Use the sheathed wire (2 wire) in other case.

2 Field Wiring

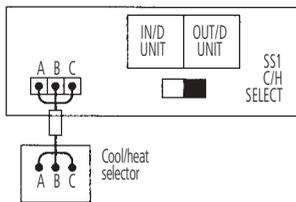
2-2 Inverter cooling only / heat pump series

2-2-6 Setting gist of cool/heat operation (heat pump unit only)

- When performing cool/heat setting with remote controller connecting indoor unit.
Keep the cool/heat selector switch (SS1) on the outdoor unit PC board (A1P) at the factory setting position (set the IN/D unit).



- When performing cool/heat setting with cool /heat selector.
Connect the Cool/Heat selector remote controller (optional) to the A/B/C terminals. Set the Cool/Heat selector switch (SS1) on the outdoor unit PC board (A1P) to the OUT/D unit.



NOTES

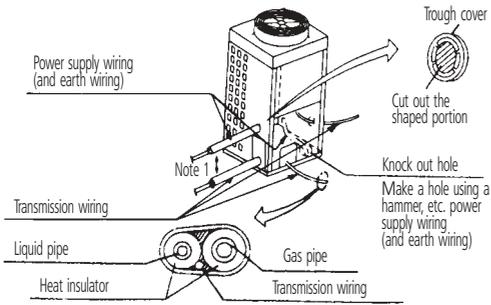
- For low-noise operation, it is necessary to get the optional "External control adapter for outdoor unit".
For details, see the Installation manual attached to the adaptor.

2 Field Wiring

2-2 Inverter cooling only / heat pump series

2-2-7 Gist of picking power line and transmission line

- Be sure to let the power supply wiring and the transmission wiring pass through the conduit tube as shown in the figure.
- Pick the power supply wiring from the upper position or the front position on the flank of the main unit or a knock out hole to be made in the unit button board. Pick the power supply wiring, with the attached wiring board if it is picked from the front position.
- Pick the transmission wiring from the middle position of the main unit or from the front position. Pick the transmission wiring after binding it to the piping with finishing tape if it is picked from the front position.



NOTES

- 1 Be sure to keep the power supply wiring and the transmission wiring apart from each other.
- 2 No sagging of transmission wiring as shown in the figure 7 by always clamping them together.
- 3 No contact of line with refrigerant piping.

2-2-8 Gist of picking power line from the front plate

- Remove the front plate (lower), and punch a hole in the knock hole: then, cut it off all the way to the slit. (Knock hole in the front plate)
- Apply the sealing pad to the line installation plate.
- Install the line installation plate to the front side of the side plate (left) with the attached screw.

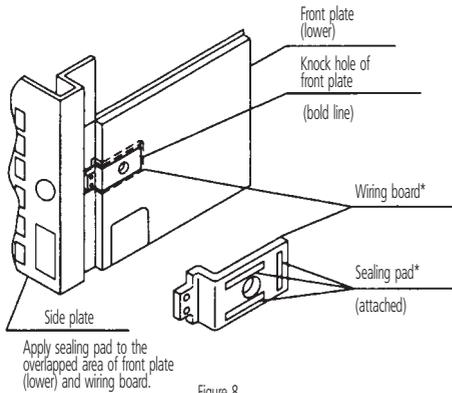


Figure 8

*Option for KL series

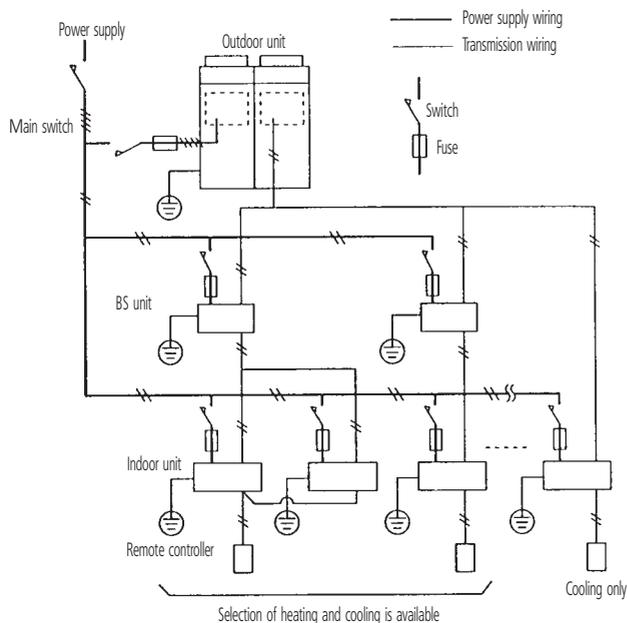
2 Field Wiring

2-3 Heat recovery series

2-3-1 General instructions

- All wiring components, parts which will be obtained locally and materials must comply with the applicable standards of the country and the region.
- Use copper conductors only.
- Follow the schematic attached to the unit for details on wiring.
- The electric work must be executed entirely by the authorized electricians.
- The attached gist of wiring gives only an outline and does not refer to any further details on the actual installation work.
- Install the main switch that can interrupt all the power sources in an integrated manner because this system consists of the equipment utilizing the multiple power sources.
- Be sure to install the switch and the fuse to the power line of each equipment.
- Connect the wires tightly and with no force upon the terminals. Dress the wires so that the covers and other related parts do not get loose. If poorly connected or loosely placed, an overheat, electric shock or fire may result.
- Unit shall be grounded in compliance with the applicable local and national codes.

2-3-2 Example for the whole system



2-3-3 Specifications for field supplied fuses and wire

Model	Power supply wiring			Transmission wiring	
	Field fuse 	Wire	Size	Wire	Size
RSEY8K	30A	H05V V-U5G	Note 1	Sheated wire (2 wire)	0.75 - 1.25 mm ²
RSEY10K	35A				

NOTE

- 1 Select the particular size of electrical wire for power supply wiring in accordance with the standards of the given nation and region.

2 Field Wiring

2-3 Heat recovery series

2 2-3-4 Gist of field line connection

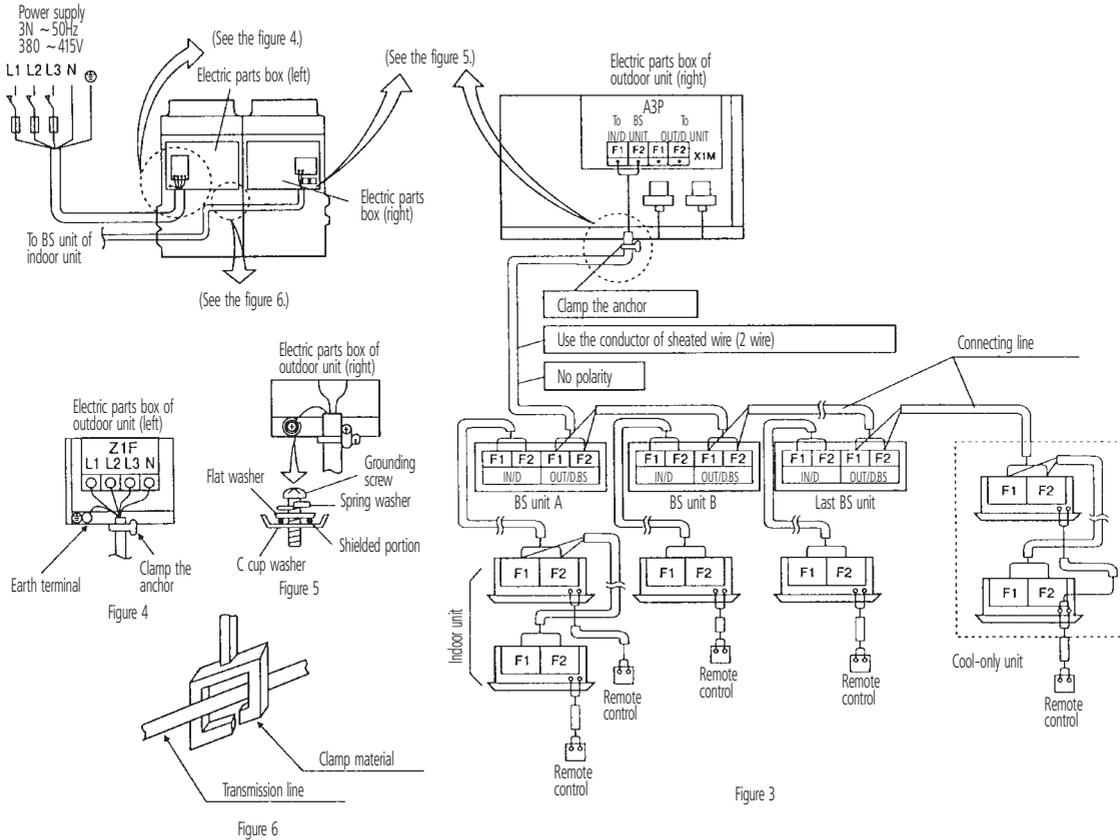


Figure 3

NOTES

- 1 Be sure to keep the power supply wiring away from the transmission wiring.
- 2 No sagging of transmission line as shown in the figure 6 by always clamping them together.
- 3 No contact of line with refrigerant piping.

2-3-5 Example of transmission line connection

- Connect the output terminal F1 and F2 of the terminal block (X1M) on the PC board of outdoor unit with the input terminal F1 and F2 of the first BS unit A. (See the figure 3.)
- In case of the indoor unit connect as the cool-only unit, it wire the terminal

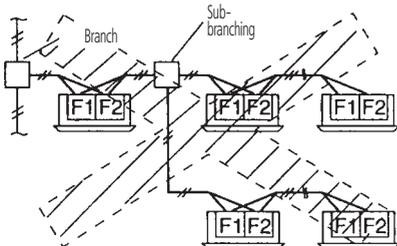
F1	F2
OUT/D,BS	

 of the last BS unit.

NOTES

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

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



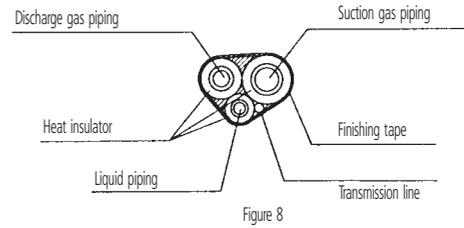
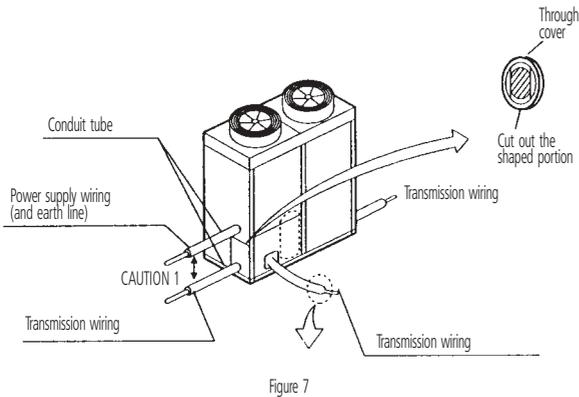
2 Field Wiring

2-3 Heat recovery series

2-3-6 Gist of picking power line and transmission line

- Be sure to let the power supply wiring and the transmission wiring pass through the conduit tube as shown in the right figure.
- Pick the power supply wiring from the upper position or the front position on the flank of the main unit or a knock out hole to made in the unit button board. Pick the power supply wiring, as shown in the figure 9, with the attached wiring board if it is picked from the front position.
- Pick the transmission wiring from the middle position of the main unit or from the front position. Pick the transmission wiring after binding it to the piping with finishing tape if it is picked from the front position.

2

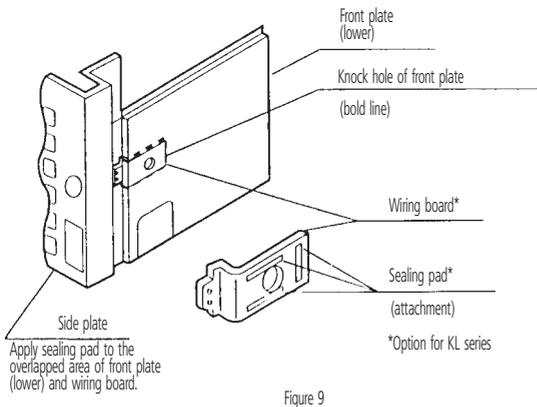


NOTES

- 1 Be sure to keep the power supply wiring and transmission wiring apart from each other.
- 2 No sagging of transmission wirings as shown in the figure 7 by always clamping together. No contact of line with refrigerant piping.

2-3-7 Gist of picking power line and transmission line

- Remove the front plate (lower), and punch a hole in the knock hole: then, cut it off all the way to the slit. (knock hole in the front plate)
- Apply the sealing pad the line installation plate.
- Install the line installation plate to the front side of the side plate (left) with the attached screw.



2 Field Wiring

2-4 VRV plus

2-4-1 General instructions

- All field wiring and components must be installed and maintained by a licensed electrician and must comply with relevant local and national regulations.
- The field wiring must be carried out in accordance with the wiring diagrams and instructions given below.
- Be sure to use a dedicated power circuit. Never use a power supply shared by another appliance.
- Use copper conductors only.
- When using the adaptor for sequential start, refer to chapter "Examples".
- For connection wiring to outdoor-outdoor transmission F1-F2, outdoor-indoor transmission F1-F2, refer to chapter "Examples".
- For connection wiring to the central remote controller, refer to the installation manual of the central remote controller.
- Use insulated wire for the power cord.

Power circuit and cable requirements

A power circuit (See table below) must be provided for connection of the unit. This circuit must be protected with the required safety devices, i.e. a main switch, a slow blow fuse on each phase and an earth leak detector.

	Phase and frequency	Voltage	Recommended fuses	Transmission
RSXYP16	3N ~ 50Hz	380-415V	45A	0.75-1.25mm ²
RSXYP18	3N ~ 50Hz	380-415V	50A	0.75-1.25mm ²
RSXYP20	3N ~ 50Hz	380-415V	60A	0.75-1.25mm ²
RSXYP24	3N ~ 50Hz	380-415V	60A	0.75-1.25mm ²
RSXYP26	3N ~ 50Hz	380-415V	70A	0.75-1.25mm ²
RSXYP28	3N ~ 50Hz	380-415V	70A	0.75-1.25mm ²
RSXYP30	3N ~ 50Hz	380-415V	70A	0.75-1.25mm ²

When using residual current operated circuit breakers, be sure to use a high-speed type 200mA rated residual operating current.

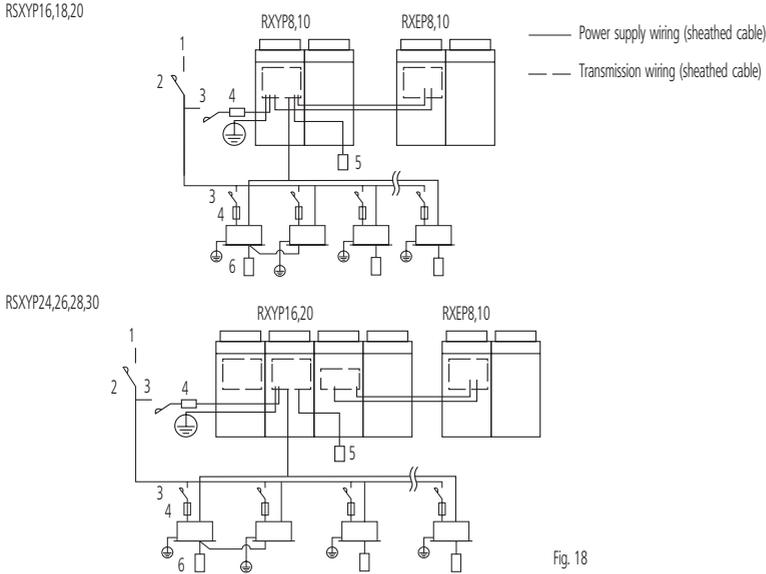
- Select the power supply cable in accordance with relevant local and national regulations.
- Make sure to connect the power source wire to the power source terminal block and to clamp it as shown in figure 19, chapter "Field line connection".
- As this unit is equipped with an inverter, installing a phase advancing capacitor not only will deteriorate power factor improvement effect, but also may cause capacitor abnormal heating accident due to high-frequency waves. Therefore, never install a phase advancing capacitor.
- Keep power imbalance within 2% of the supply rating.
 1. Large imbalance will shorten the life of the smoothing capacitor.
 2. As a protective measure, the product will stop operating and an error indication will be made, when power imbalance exceeds 4% of the supply rating.
- Follow the "electrical wiring diagram" when carrying out any electrical wiring.
- Only proceed with wiring work after blocking off all power.
- Always ground wires. (In accordance with national regulations of the pertinent country.)
- 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.
- This unit uses an inverter, and therefore generates noise which will have to be reduced to avoid interfering with other devices. The outer casing of the product may take on an electrical charge due to leaked electrical current, which will have to be discharged with the grounding.
- Be sure to install an earth leak detector. (One that can handle higher harmonics.)
- This unit uses an inverter, which means that an earth leak detector capable handling high harmonics in order to prevent malfunctioning of the earth leak detector itself.)
- Earth leak detector which are especially for protecting groundfaults should be used in conjunction with main switch or fuse for use with wiring.
- This unit has a negative phase protection circuit. (If it operates, only operate the unit after correcting the wiring.)

2 Field Wiring

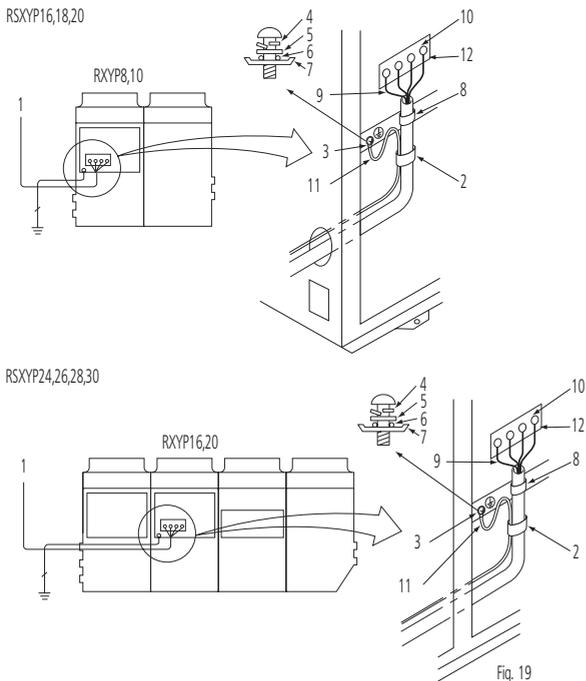
2-4 VRV plus

2-4-2 System Example

1. Field power supply
2. Main switch
3. Earth leak detector
4. Fuse
5. Cool/heat selector
6. Remote control



2-4-3 Field line connection



L1, L2, L3, N-phase of the power cord should be clamped to the safety catch using the included clamp material.

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

1. field power supply
2. clamp the grounding wire with power supply
3. grounding screw
4. spring washer
5. flat washer
6. earth wire
7. C cup washer
8. Fix the power cord with the included clamp material to the safety catch.
9. Wiring sleeve
10. Terminal board
11. Grounding wire
12. Attach the insulating sleeve.

2 Field Wiring

2-4 VRV plus

2-4-4 Field line connection between main unit (RXYP-) and sub unit (RXEP-)

NOTES

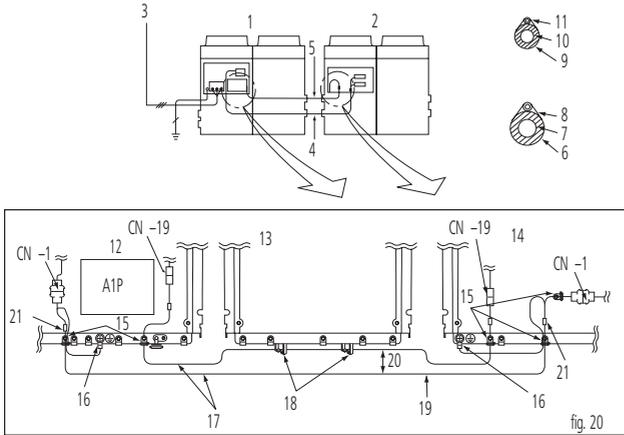
- 1 In the event that the main unit and the sub unit are separated by 1000 mm or more, the attached cables cannot be used. The wiring between the outdoor units should be connected by extending the attached cable using the included connectors.
- 2 The connector must be wired to be inside the switch box.

RSXYP16,18,20 (Refer to figure 20)

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. RXYP8,10 (main unit) 2. RXEP8,10 (sub unit) 3. Power supply 4. Branch wiring between outdoor units (high voltage) 5. Branch wiring between outdoor units (low voltage) 6. insulation material 7. gas line 8. cable (high voltage) 9. insulation material 10. liquid line 11. cable (low voltage) 12. RXYP (main unit) Switch box | <ol style="list-style-type: none"> 13. RXYP (main unit) Inverter box 14. RXEP (sub-unit) 15. Fix to the safety catch. 16. Connect the ground wire (green/yellow) to the ground terminal 17. Extended wiring (7000 mm or less)
(Sheathed cable or 0.75 mm² cables) 18. Divide the low voltage wire from the high voltage wire using the wire clip on the bottom of the inverter box 19. Always separate the high voltage wiring from the low voltage wiring in the branch wiring 20. 30 mm or more 21. Connection binder |
|--|---|

RSXYP16,18,20

RSXYP16,18,20



2 Field Wiring

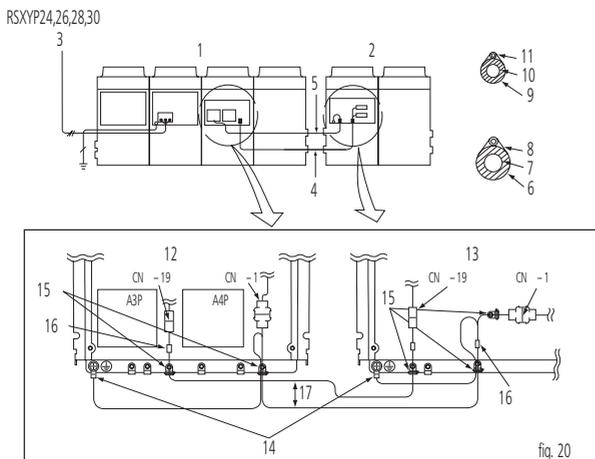
2-4 VRV plus

2-4-4 Field line connection between main unit (RXYP-) and sub unit (RXEP-)

RSXYP24,26,28,30

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. RXYP16,20 (main unit) 2. RXEP8,10 (sub unit) 3. Power supply 4. Branch wiring between outdoor units (high voltage) 5. Branch wiring between outdoor units (low voltage) 6. insulation material 7. gas line 8. cable (high voltage) 9. insulation material 10. liquid line | <ol style="list-style-type: none"> 11. cable (low voltage) 12. RXYP (main unit) Switch Box 13. RXEP (sub-unit) Switch box 14. Connect the ground wire (green/yellow) to the ground terminal
Extended wiring (7000 mm or less)
(Sheathed cable or 0.75 mm² cables)
Always separate the high voltage wiring from the low voltage wiring in the branch wiring 15. Fix to safety catch 16. Connection binder 17. 30mm or more |
|---|---|

RSXYP24,26,28,30



2 Field Wiring

2-4 VRV plus

2-4-5 Field line connection: transmission wiring and cool/heat selection

1. Switch box (main unit)
2. Fix to the safety catch using the attached clamp material
3. Attached cable (between main and sub units)

RXYP 8, 10, 16, 20

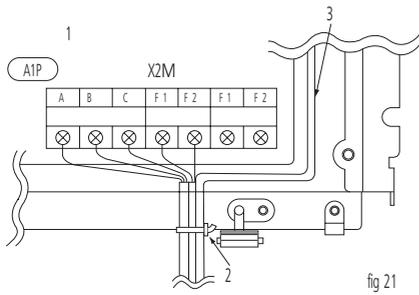


fig. 21

2-4-6 Example of performing cool/heat with cool/heat selector

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

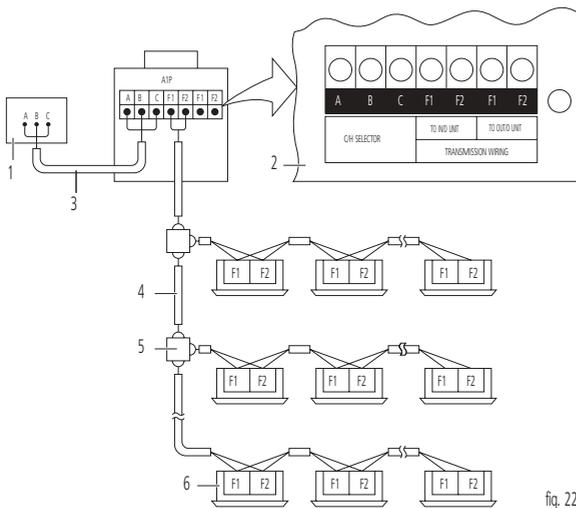


fig. 22

2 Field Wiring

2-4 VRV plus

2-4-7 Example of performing cool/heat setting of two or more outdoor units in block with cool/heat selector

2

- For the wiring shown in figure 22, be sure to use 0.75-1.25 mm² vinyl cords with sheath or cables (two-core). (Three-core cables can be used only for the cool/heat selector.) (Insulated thickness: 1mm or more)
- The wires shown in figure 22 are field supply.

NOTES

Be sure to follow the limits below. If the unit-to-unit cables are beyond these limits, it may result in malfunction of transmission.

Maximum wiring length: 1000m

Total wiring length: 2000m

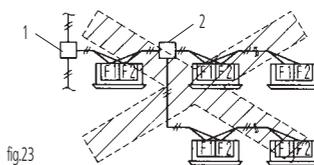
Max branches No. of branches: 16

Up to 16 branches are possible for unit-to-unit cabling. No branching is allowed after branching.

1. Branch

2. Subbranching

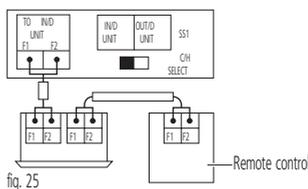
Never connect the power supply to unit-to-unit cabling terminal block. Otherwise the entire system may break down.



2-4-8 Setting the cool/heat operation

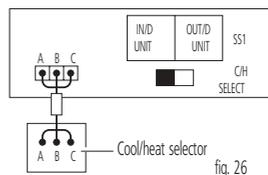
1. Performing cool/heat setting with the remote controller connected to the indoor unit.

Keep the cool/heat selector switch (SS1) on the outdoor unit PC board at the factory setting position IN/D UNIT.



2. Performing cool/heat setting with the cool/heat selector.

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



NOTES

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

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

2 Field Wiring

2-4 VRV plus

2 2-4-9 Picking power line and transmission line

- Be sure to let the power line and the transmission line pass through a conduit hole.
- Pick the power line from the upper hole on the left side plate, from the front position of the main unit (through the conduit hole of the wiring mounting plate - optional parts) or from a knock out hole to be made in the unit's bottom plate.

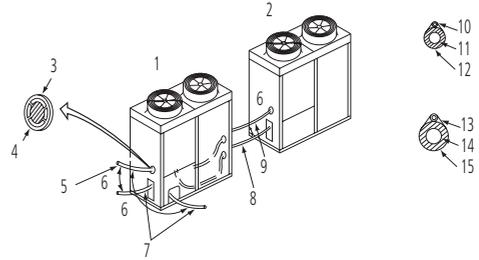
RXYP16,18,20

1. RXYP8,10 (main unit)
2. RXEP8,10 (sub unit)
3. Through -slot cover
4. Cut out the diagonal line area
5. Power cord
6. Separate
7. Branch wiring between indoor and outdoor units.
8. Branch wiring between outdoor units (high voltage)
9. Branch wiring between outdoor units (low voltage)
10. cable (low voltage)
11. liquid line
12. insulation material
13. cable (high voltage)
14. gas line
15. insulation material

RXYP24,26,28,30

1. RXYP16,20 (main unit)
- 2-15. Same as RXYP16,18,20

RSXYP16,18,20



RSXYP24,26,28,30

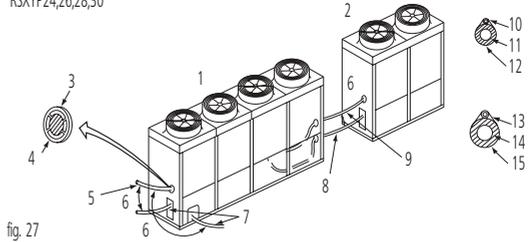
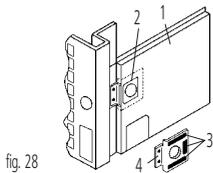


fig. 27

- If you pick the power line from the front position of the unit, proceed as follows and refer to figure 28:



- Remove the lower frontplate (1), punch a hole in the knock hole and cut the hole (2) all the way to the slit.
- Attach the 3 sealing pads (optional parts) (3) on the wiring mounting plate (optional parts) (4) corresponding to the over-lapped area of the front plate.
- Install the wiring mounting plate to the front side of the side plate with the 2 delivered screws.
- Pick the transmission line from the middle positioned conduit hole on the left side plate, or from the front position of the main unit (after binding it to the piping with finishing tape as in figure 29).

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

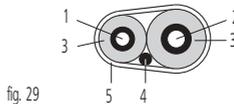


fig. 29

NOTE

Be sure to keep the power line and transmission line apart from each other.

Be careful about polarity of the transmission line.

Make sure that the transmission line is clamped as shown in the figure in chapter "Field line connection".

Check that wiring lines do not make contact with refrigerant piping.

Firmly close the lid and arrange the electrical wires so as to prevent the lid or other parts from coming loose.

When you don't use a wire conduit, be sure to protect the wires with vinyl tubes etc, to prevent the edge of the knock-out hole from cutting the wires.

2

VRV™
Systems



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Daikin units comply with the European regulations that guarantee the safety of the product.



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VRV products are not within the scope of the Eurovent certification programme.

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