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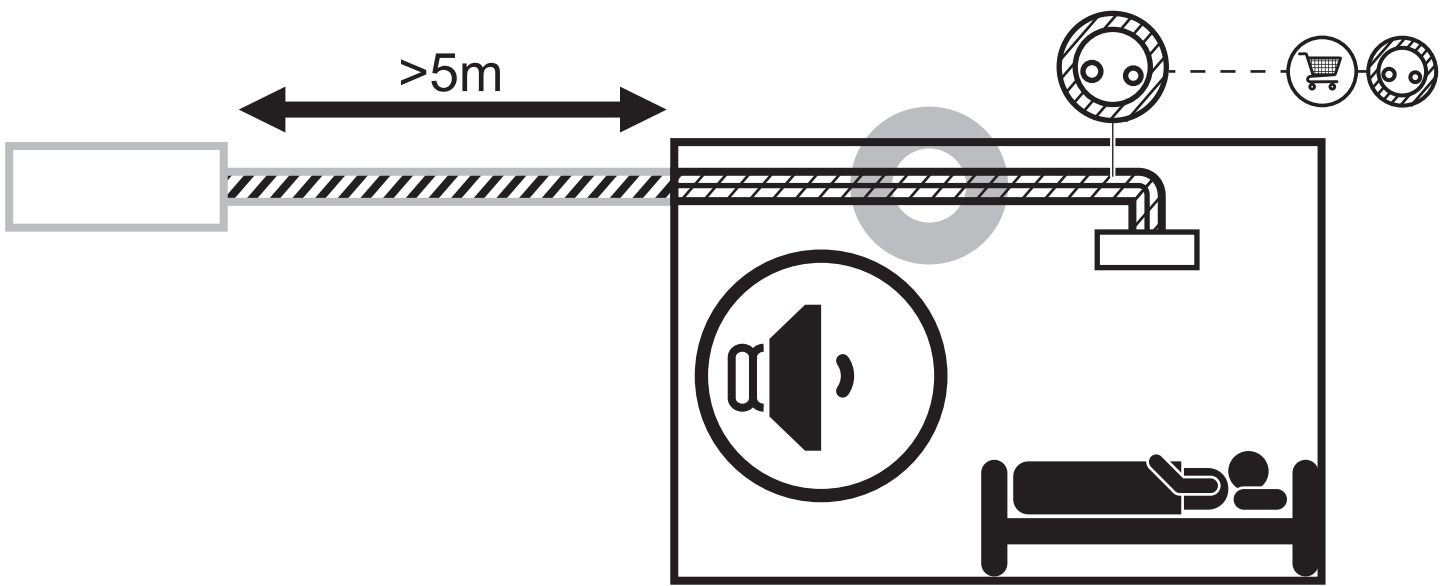
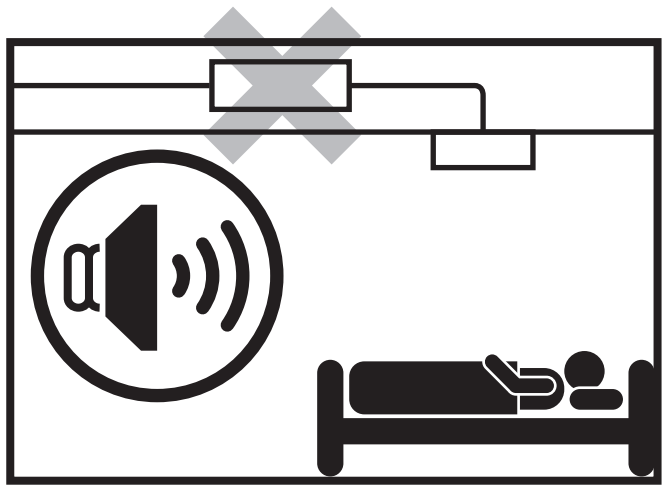


INSTALLATION MANUAL

VRV IV system air conditioner

BS4Q14AV1B
BS6Q14AV1B
BS8Q14AV1B

BS10Q14AV1B
BS12Q14AV1B
BS16Q14AV1B



A

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

1. SAFETY PRECAUTIONS


Be sure to follow this “SAFETY PRECAUTIONS”.


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

This 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.

This manual classifies the precautions into WARNINGS and CAUTIONS.

Be sure to follow all the precautions below: They are all important for ensuring safety.

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

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

WARNING

- Ask your local dealer or qualified personnel to carry out installation work.
Improper installation may result in water leakage, electric shocks or a fire.
- Perform installation work in accordance with this installation manual.
Improper installation may result in water leakage, electric shocks or a fire.
- Consult your local dealer regarding what to do in case of refrigerant leakage.
When the air conditioner is installed in a small room, it is necessary to take proper measures so that the amount of any leaked refrigerant does not exceed the concentration limit in the event of a leakage.
Otherwise, this may lead to an accident due to oxygen deficiency.
- Be sure to use only the specified parts and accessories for installation work.
Failure to use the specified parts may result in the air conditioner falling down, water leakage, electric shocks, a fire, etc.
- Install the air conditioner on a foundation that can withstand its mass.
Insufficient strength may result in the air conditioner falling down and causing injury.
In addition, it may lead to vibration of indoor units and cause unpleasant chattering noise.
- Carry out the specified installation work in consideration of strong winds, typhoons, or earthquakes.
Improper installation may result in an accident such as air conditioner falling.

- Make certain that all electrical work is carried out by qualified personnel according to the applicable legislation (note 1) and this installation manual, using a separate circuit.
In addition, even if the wiring is short, make sure to use a wiring that has sufficient length and never connect additional wiring to make the length sufficient.
Insufficient capacity of the power supply circuit or improper electrical construction may lead to electric shocks or a fire.
(note 1) applicable legislation means “All international, national and local directives, laws, regulations and/or codes which are relevant and applicable for a certain product or domain”.
- Earth the air conditioner.
Do not connect the earth wiring to gas or water piping, lightning conductor or telephone earth wiring.
Incomplete earthing may cause electric shocks or a fire.
A high surge current from lightning or other sources may cause damage to the air conditioner.
- Be sure to install an earth leakage circuit breaker.
Failure to do so may cause electric shocks and a fire.
- Disconnect the power supply before touching the electric components.
If you touch the live part, you may get an electric shocks.
- Make sure that all wiring is secure, using the specified wiring and ensuring that external forces do not act on the terminal connections or wiring.
Incomplete connection or fixing may cause an overheat or a fire.
- Wiring for power supply and between the indoor and outdoor units must be properly laid and formed, and the control box cover must be firmly fastened so that the wiring may not push up the structural parts such as the cover.
If the cover is improperly fastened, it may cause electric shock or fire.
- If refrigerant gas leaks during installation work, ventilate the area immediately.
Toxic gas may be produced if refrigerant gas comes into contact with a fire.
- After completing the installation work, check to make sure that there is no leakage of refrigerant gas.
Toxic gas may be produced if refrigerant gas leaks into the room and comes into contact with a source of a fire, such as a fan heater, stove or cooker.
- Never directly touch any accidental leaking refrigerant. This could result in severe wounds caused by frostbite.

 **CAUTION**

- Install drain piping according to this installation manual to ensure good drainage, and insulate the piping to prevent condensation.
Improper drain piping may cause water leakage, make the furniture get wet.
- Install the BS units, power supply wiring, remote controller wiring and transmission wiring at least 1 m away from televisions or radios to prevent image interference or noise.
(Depending on the radio waves, a distance of 1 m may not be sufficient to eliminate the noise.)
- Install the BS unit as far as possible from fluorescent lamps.
If a wireless remote controller kit is installed, the transmission distance may be shorter in a room where an electronic lighting type (inverter or rapid start type) fluorescent lamp is installed.
- Make sure to provide for adequate measures in order to prevent that the outdoor unit be used as a shelter by small animals.
Small animals making contact with electrical parts can cause malfunctions, smoke or fire. Please instruct the customer to keep the area around the unit clean.
- Do not install the air conditioner in places such as the following:
 1. The outside building, rain water permeates in BS unit and it becomes a cause of an electric shock.
 2. Where there is mist of oil, oil spray or vapour for example a kitchen.
Resin parts may deteriorate, and cause them to fall out or water to leak.
 3. Where corrosive gas, such as sulfurous acid gas, is produced.
Corrosion of copper pipings or brazed parts may cause the refrigerant to leak.
 4. Where there is machinery which emits electromagnetic waves.
Electromagnetic waves may disturb the control system, and cause malfunction of the equipment.

5. Where flammable gases may leak, where carbon fibre or ignitable dust is suspended in the air or where volatile flammables, such as thinner or gasoline, are handled.
If the gas should leak and remained around the air conditioner, it may cause ignition.
 6. Do not use in areas where the air is salty, such as along seacoasts, in factories or other areas with significant voltage fluctuations, or in automobiles and watercraft.
Doing so could result in a malfunction.
 7. Where a wind may flow, the surface of BS unit body dews, and it becomes a cause of a leak.
- The BS unit is not intended for use in a potentially explosive atmosphere.

2. BEFORE INSTALLATION

2-1 Precautions

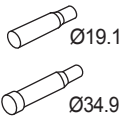
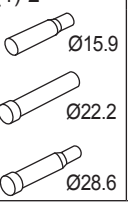
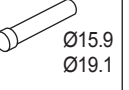




- Be sure to verify in advance that the refrigerant used in installation work is R410A.
The unit will not operate correctly with a different type of refrigerant.
- When moving the unit during or after unpacking, hold it using the 4 hanging brackets and avoid subjecting other parts, particularly refrigerant pipes and the control box, to force.
- For more information about installation of outdoor and indoor units, refer to the installation manual that came with each unit.







2-2 Accessories

- Verify that the following accessories have been included in the packaging.

Important

Do not throw away any accessories that may be needed in installation work until installation is complete.

Name		Accessory pipes (1)			Clamps (2)	Insulation tube (3)		Drain hoses (4)
		Suction gas	HP/LP gas	Liquid				
Quantity	BS4Q14AV1B	1 pc. (Ø19.1)	1 pc. (Ø15.9)		23 pcs.	4 pcs.	4 pcs.	1 pc.
	BS6Q14AV1B		1 pc. (Ø22.2)		32 pcs.	6 pcs.	6 pcs.	
	BS8Q14AV1B		2 pc. (Ø22.2, Ø28.6)	1 pc. (Ø15.9)	40 pcs.	8 pcs.	8 pcs.	
	BS10Q14AV1B				49 pcs.	10 pcs.	10 pcs.	
	BS12Q14AV1B	1 pc. (Ø34.9)		1 pc. (Ø19.1)	57 pcs.	12 pcs.	12 pcs.	
	BS16Q14AV1B				74 pcs.	16 pcs.	16 pcs.	
Shape		(1)-1 	(1)-2 	(1)-3 	(2) 	(3)-1 	(3)-2 	

Name		Metal clamp (5)	Sealing material (6)	Stopper pipes (7)		Insulation tube for stopper pipes (8)		Documentation
Quantity	BS4Q14AV1B	1 pc.	1 sheet					1 copy
	BS6Q14AV1B							
	BS8Q14AV1B			1 pc.	1 pc.	1 pc.	1 pc.	
	BS10Q14AV1B							
	BS12Q14AV1B							
	BS16Q14AV1B			3 pcs.	3 pcs.	3 pcs.	3 pcs.	
Shape				(7)-1 	(7)-2 	(8)-1 	(8)-2 	Installation Manual

NOTES

- You will need a reducing joint (to be supplied in the field) if the diameter of the pipe on site as described in the outdoor unit's installation manual or equipment design materials does not match the diameter of the connection pipe on the outdoor side of the BS unit.
- Thermal insulation for connection pipes on the outdoor unit side must be supplied in the field.

2-3 Combination

- This BS unit is only for systems for Models RWEYQ-T8/9.
It cannot be connected to systems for Models RWEYQ-P.
- For series of applicable indoor units, refer to the catalog or other literature.
- Select the BS unit to fit the total capacity (sum of unit's capacity) of the indoor units to be connected downstream, refer to the Table 1. About indoor unit's capacity, refer to the Table 2.

Table 1

Model	Total capacity of all downstream indoor units
BS4Q14AV1B	A ≤ 400 (*)
BS6Q14AV1B	A ≤ 600 (*)
BS8Q14AV1B BS10Q14AV1B BS12Q14AV1B BS16Q14AV1B	A ≤ 750 (*)

* The total capacity and number of indoor units connectable to each branch connector are up to 140 and 5, respectively.

* When the total capacity of indoor units to be connected downstream is larger than 140 (MAX. 250), use a junction pipe kit (KHRP26A250T, sold separately) to join two connections downstream from the BS unit.

Table 2

Capacity expressed as indoor unit's model No.	20	25	32	40	50	63	80	100	125
Indoor unit's capacity (for use in computation)	20	25	31.25	40	50	62.5	80	100	125

* About indoor unit's capacity for HRV type (VKM), refer to the Engineering data book.

<Example selection>

In case of the BS unit with connect a FXCQ32M and a FXSQ40M.

Total capacity = **31.25+40** = 71.25

2-4 Checklist

Exercise particular care concerning the following items during installation work and check again after installation is complete:

Post-installation checklist

Checklist	If defective	Check here.
Has the BS unit been installed securely?	The unit may fall, vibrate, or operate noisily.	
Did you conduct a gas leak inspection?	The unit may fail to heat or cool as designed.	
Was the unit fully insulated? (Refrigerant pipes and drain pipes)	The unit may leak water.	
Does water flow smoothly from the drain?	The unit may leak water.	
Is the supply voltage the same as the voltage indicated on the label?	The unit may fail to operate or burn up.	
Are there any wiring mistakes or erroneous wiring or erroneous pipe connections?	The unit may fail to operate, burn up, or produce abnormal noise.	
Has the unit been earthed?	The unit may pose a hazard in the event of a short-circuit.	
Is the thickness of the electrical wiring the same as described in the specifications?	The unit may fail to operate or burn up.	

Delivery checklist

Checklist	Check here.
Has a cover been installed on the control box?	
Did you give the customer the installation manual?	

3. SELECTING INSTALLATION SITE

Install the BS box on a location where the refrigerant noise cannot disturb the room occupants.

- To avoid the refrigerant noise disturbs the people in the room, keep at least 5 m piping between the occupied room and the BS unit. See figure A (page 2).
- If there is no false ceiling at the room, please add sound insulation around the piping between BS box and indoor unit, or keep much longer length between BS unit and occupied room. See figure A (page 2).

Consider the following requirements when choosing the installation location and obtain the customer's consent:

- The location must be able to withstand the weight of the BS unit.
- The location must allow reliable draining.
- The location must allow inspection holes to be installed on the control box side. (A separate opening is necessary when lowering the product.)
- There must be adequate space in which to perform installation and service work (**Refer to Fig. 1**).
- The length of pipe to the indoor unit and outdoor unit must be less than or equal to the permissible pipe length (as listed in the installation manual that came with the outdoor unit).
- The installation location should not be sensitive to the noise of refrigerant flowing through the pipes. Never install above the ceiling of an occupied room.

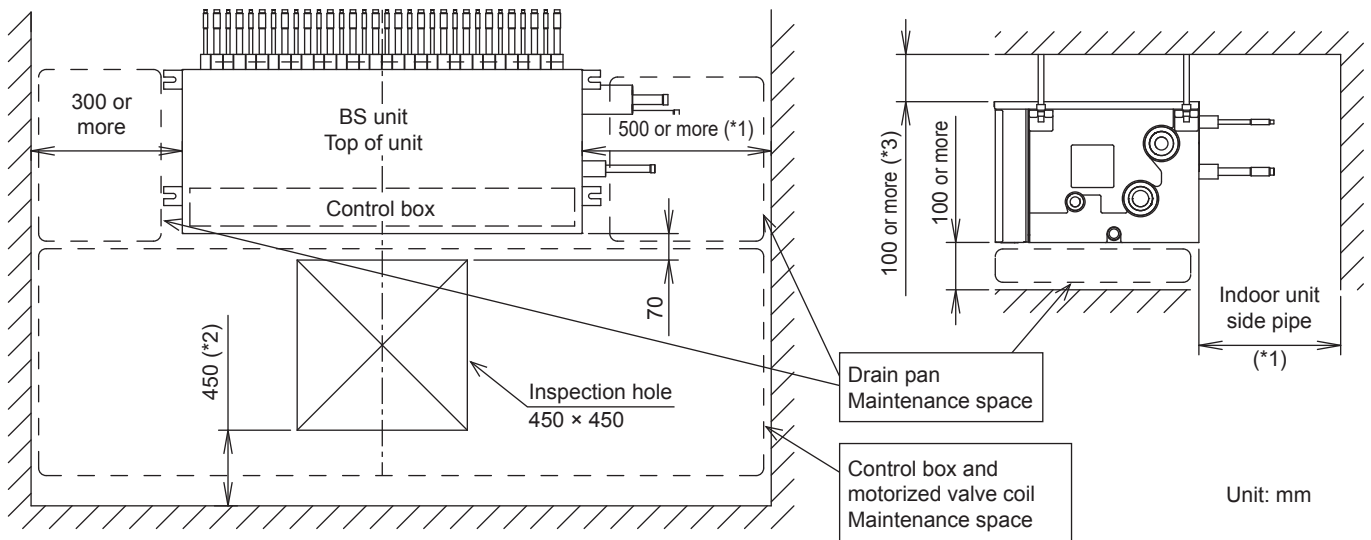


Fig. 1

(*1) Leave enough space to connect the site pipes.

(*2) This space is needed to place the top plate when performing service on the motor operated valve coil.

(*3) This space is needed to remove the top plate when performing service on the motor operated valve coil.

⚠ WARNING

Securely install the unit at a location that is capable of withstanding its weight.

Inadequate strength may cause the indoor unit to fall, resulting in bodily injury.

⚠ CAUTION

- Leave enough space to perform maintenance on the drain pan and control box.
- To prevent video and audio interference, install the BS unit as well as associated power wiring and signal transmission lines at least 1 m away from TVs and radios. However, depending on the reception, interference may result even if a minimum distance of 1 m is maintained.

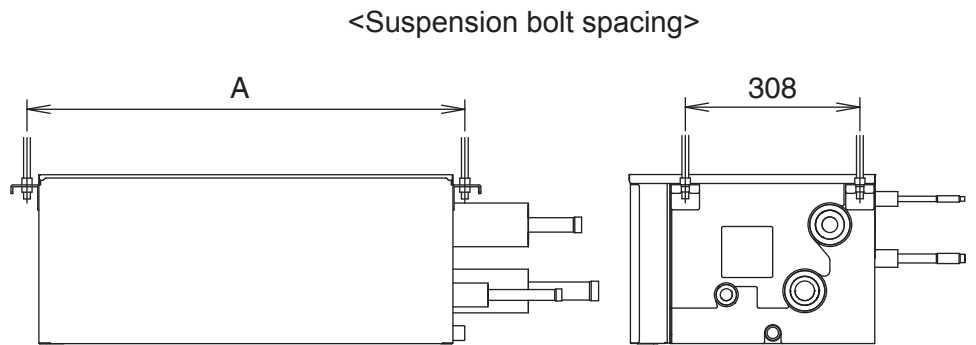
4. PREPARATIONS BEFORE INSTALLATION

Install suspension bolts and hanging brackets as illustrated in the diagram below.

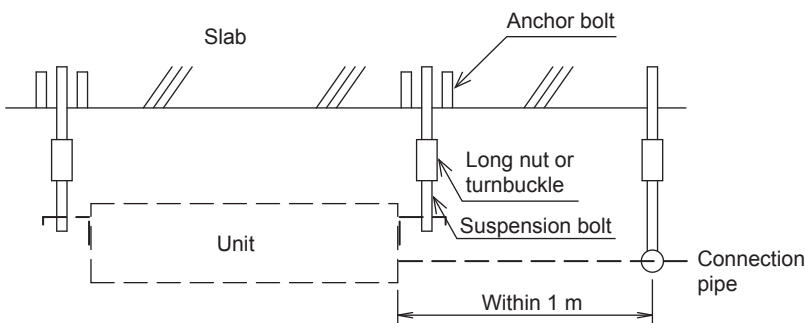
- Use a suspension bolt size of M8 to M10.
- Use mold-in inserts and embedded foundation bolts for new installations or hole-in anchor bolts or similar hardware for existing installations, taking care to install in a manner that can withstand the unit's weight.

Unit: mm

BS unit	A
BS4Q14AV1B	415
BS6Q14AV1B	625
BS8Q14AV1B	
BS10Q14AV1B	865
BS12Q14AV1B	
BS16Q14AV1B	1105



- Use the hanging brackets to support the connection pipes on both the front and back of the unit within 1 m of the unit's side. Placing an excessive amount of weight on the BS unit's hanging brackets may cause the unit to fall, resulting in bodily injury.

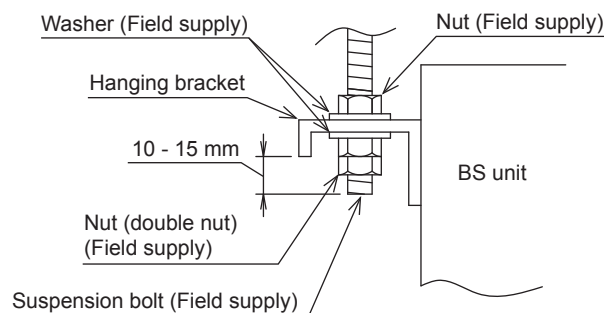


All the above parts must be supplied in the field
<Example installation>

5. BS UNIT INSTALLATION

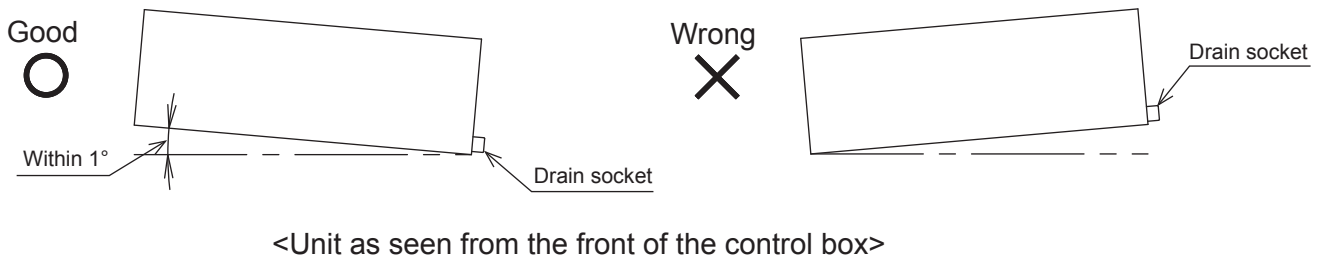
Use only accessories and parts that conform to the designated specifications when installing the unit.

1. Position the BS unit and secure it temporarily in place.
Attach the hanging brackets to the suspension bolts as per the instructions in the figure to the right. Be sure to affix nuts (M8 or M10, 3 pieces in 4 locations) and washers (for M8, outside diameter of 24 to 28 mm or for M10, outside diameter of 30 to 34 mm: 2 pieces in 4 locations) (to be supplied in the field) from both the top and bottom of the hanging brackets on both sides of the unit to secure it in place.
2. Adjust the height of the unit as desired.
3. Using a level, verify that the unit has been installed in a level orientation.
(The unit should be either level or within 1° of slope toward the drain socket.)



⚠ WARNING

- Install the BS unit in a level orientation.
Installing the unit in an inclined orientation so that the drain pipe side is higher may result in water leakage.
- Attach nuts on both the top and bottom of the hanging brackets.
Overtightening the lower nut without the upper nut in place may cause the hanging bracket and top plate to deform, causing the unit to produce abnormal noise.



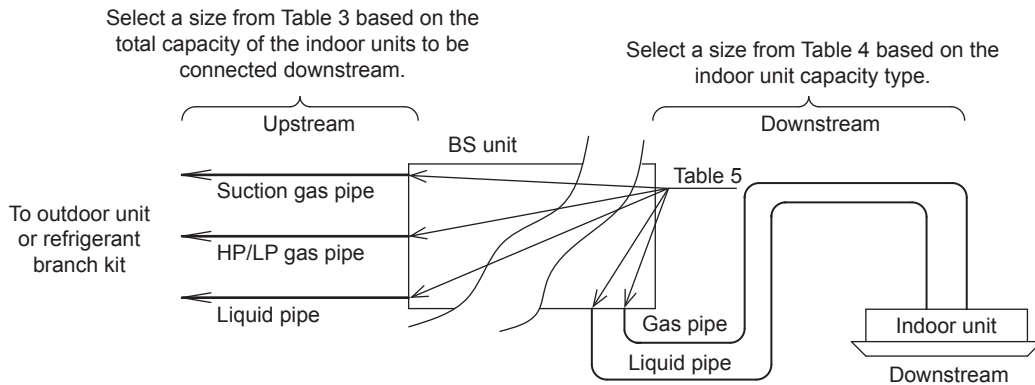
6. REFRIGERANT PIPING WORK

- For instructions for installing piping between the outdoor unit and the BS unit, selecting a refrigerant branch kit, and installing piping between the refrigerant branch kit and indoor units, refer to the installation manual and included with the outdoor unit.
- Before beginning the work, be sure to verify that the type of refrigerant used is R410A.
(The unit will not operate correctly with a different type of refrigerant.)
- Insulate all of the piping, including the liquid pipes, HP/LP gas pipes, suction gas pipes, gas pipes, and the pipe connections for these.
Not insulating these pipes could result in water leaks or burns.
In particular, low-temperature gas flows in the HP/LP gas piping during full cooling operation, so the same amount of insulation as used for the suction gas pipes is required.
In addition, high-temperature gas flows in the HP/LP gas piping and gas piping, so use insulation that can withstand more than 120°C.
- Select insulation material as necessary for the installation environment.
For details, refer to the Engineering date book.
If you fail to do so, condensation could form on the surface of the insulation.

6-1 Pipe size selection

Select the size of piping between the outdoor unit (refrigerant branch kit) and the BS unit and between the BS unit and indoor units (refrigerant branch kits) based on example connections 1 and 2 below and Tables 3 through 5.

Example connection 1 : When connecting 1 indoor unit downstream of the BS unit



Example connection 2 : When there is a branch downstream from the BS unit

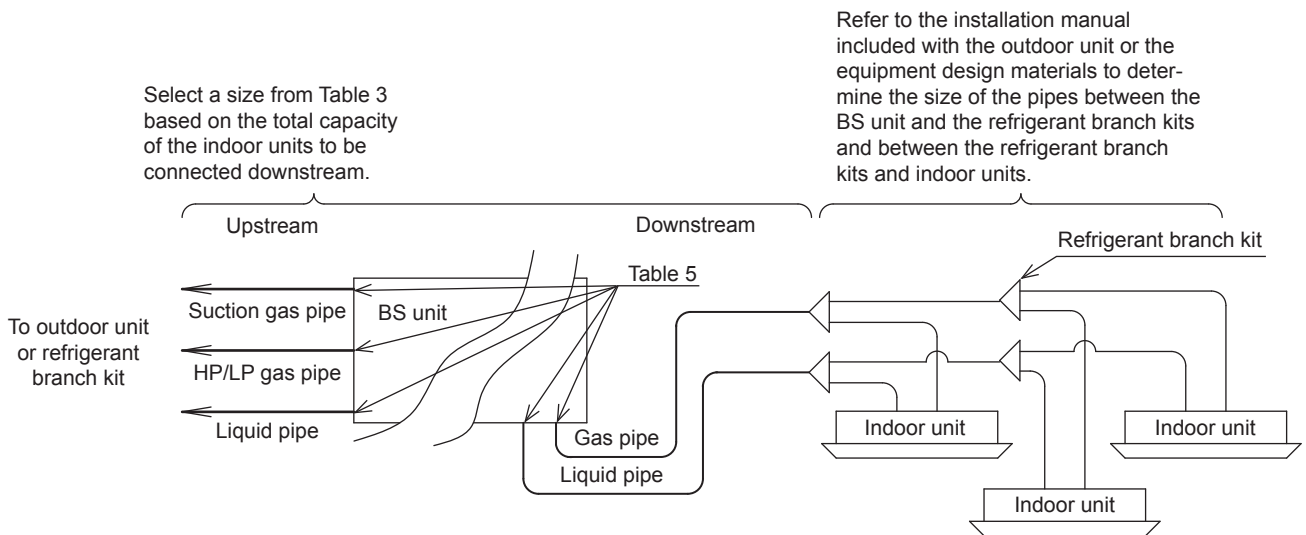


Table 3 Total indoor unit capacity and pipe size

Unit: mm

Total indoor unit capacity (Q)	Pipe size (outside diameter × minimum thickness)				
	Upstream			Downstream	
	Suction pipe	HP/LP gas pipe	Liquid pipe	Gas pipe	Liquid pipe
Q < 150	Ø15.9 × 1.0	Ø12.7 × 0.8	Ø9.5 × 0.8	Ø15.9 × 1.0	Ø9.5 × 0.8
150 ≤ Q < 200	Ø19.1 × 1.0	Ø15.9 × 1.0		Ø19.1 × 1.0	
200 ≤ Q < 290	Ø22.2 × 1.0	Ø19.1 × 1.0	Ø12.7 × 0.8	Ø22.2 × 1.0	
290 ≤ Q < 420	Ø28.6 × 1.0			Ø15.9 × 1.0	
420 ≤ Q < 640		Ø34.9 × 1.2	Ø28.6 × 1.0	Ø19.1 × 1.0	
640 ≤ Q ≤ 750					

- In case of connection to the main pipe, refer to the installation manual included with the outdoor unit or the equipment design materials.

Table 4 Indoor unit connection pipe size

Unit: mm

Indoor unit capacity type	Pipe size (outside diameter × minimum thickness)	
	Gas pipe	Liquid pipe
20, 25, 32, 40, 50	Ø12.7 × 0.80	Ø6.4 × 0.80
63, 80, 100, 125	Ø15.9 × 1.0	Ø9.5 × 0.80
200	Ø19.1 × 1.0	
250	Ø22.2 × 1.0	

- Table 5 lists BS unit connection pipe size.

Table 5 BS unit connection pipe size

Unit: mm

BS unit	Outdoor unit side (*1)			Indoor unit side (*2)	
	Suction pipe	HP/LP gas pipe	Liquid pipe	Gas pipe	Liquid pipe
BS4Q14AV1B	Ø22.2 (Ø19.1)	Ø19.1 (Ø15.9)	Ø9.5	Ø12.7 (Ø15.9)	Ø6.4 (Ø9.5)
BS6Q14AV1B	Ø28.6	Ø19.1 (Ø22.2)	Ø12.7		
BS8Q14AV1B		Ø19.1 (Ø22.2, Ø28.6)	Ø12.7 (Ø15.9)		
BS10Q14AV1B	Ø28.6 (Ø34.9)	Ø28.6	Ø15.9		
BS12Q14AV1B			Ø15.9 (Ø19.1)		
BS16Q14AV1B	Ø34.9		Ø19.1		

*1 Figures in parentheses indicate the size of the accessory pipes. If the pipe size differs from that of the size selected from Table 3, you will need a reducing joint (to be supplied in the field).

*2 The pipe diameter in parentheses can be used by cutting the pipes on the BS unit side with a pipe cutter. For details, refer to “6-3 Piping connection.”

NOTES

- If the number of indoor units to be connected is less than the number of branch ports (so that there are empty branch ports left, or if you plan to increase the number in the future), any of the branch ports can be left open.
- If you plan to add new indoor units in the future, select a pipe size based on the total indoor unit capacity before addition of new units.
- Be sure to use the stop valve kit for extension (KHFP26M224, sold separately) for pipe that you plan to expand in the future. Do not size pipe based on anticipated future expansion. Instead, reexamine the pipe size when you expand the system.
Failure to use the stop valve kit for extension will force you to recover the refrigerant before connecting any new indoor units.
- For more information about how to install the stop valve kit for extension, refer to the installation manual included with the stop valve kit for extension.

6-2 Pipe connection work precautions

Connect the pipes.

- Braze (*2) refrigerant pipes after nitrogen replacement (replacing air and nitrogen while allowing nitrogen to flow inside the refrigerant pipe (*1)). (Refer to Fig. 2))

(*1) The pressure regulator for the nitrogen released when doing the brazing should be set to about 0.02 MPa (enough to feel a slight breeze on your cheek).

(*2) Do not use flux when brazing the refrigerant pipe.

Use phosphor copper (BCuP-2: JIS Z 3264/B-Cu93P-710/795: ISO 3677), which does not require flux, as the filler metal for brazing.

(Using chlorine flux may cause the pipes to corrode, and if it contains fluoride it may cause the refrigerant lubricant to degrade, adversely affecting the refrigerant piping system.)

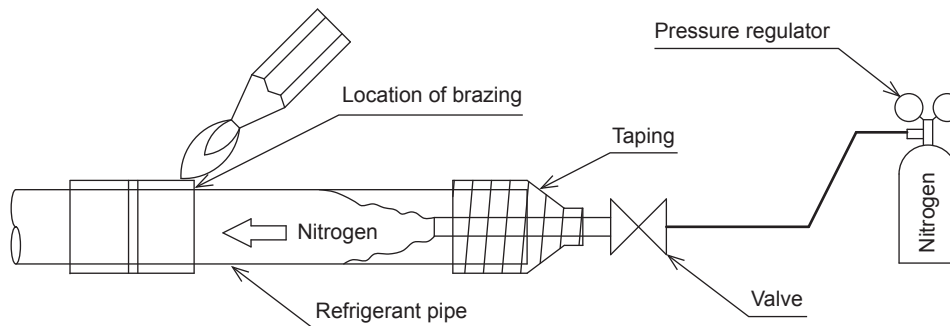
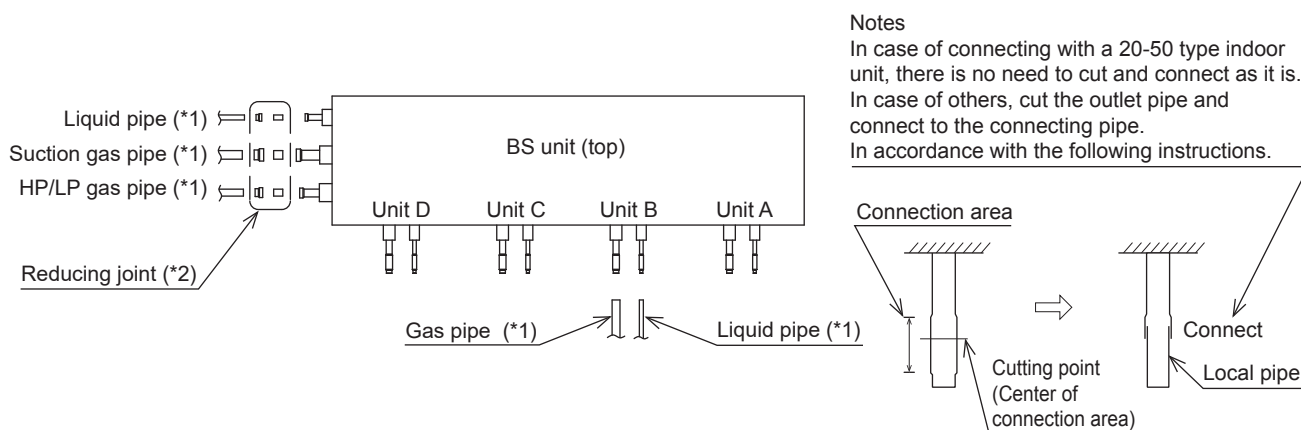


Fig. 2

— **CAUTION** —

- Do not use an anti-oxidizing agent when brazing the piping.
(Residual debris could clog the piping or cause parts to malfunction.)
- For more information about outdoor unit refrigerant pipes, see the installation manual included with the outdoor unit or the Engineering Guide.
(Failure to purge air from the pipes or fill additional refrigerant may result in an insufficient volume of refrigerant in the pipes or other problems, causing the equipment to malfunction [for example, to not cool or heat properly].)

6-3 Piping connection



- (*1) Indicates local pipe.
 (*2) Reducing joint may be required (field supply) if the local pipe size does not suit on the pipe size of the BS unit (Table 5).

— **If there are branch ports left unused (not connected to an indoor unit)** —

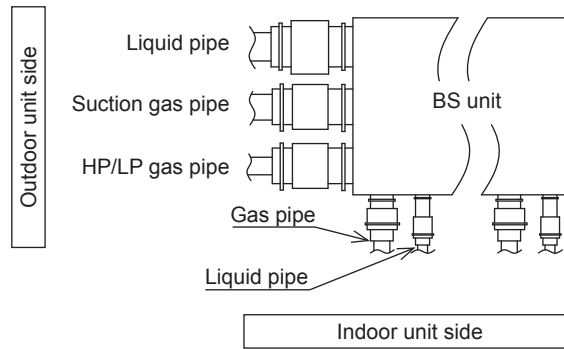
- If there are unused branch ports, use stopper pipe (7) (accessory).
If there are numerous unused branch ports, be sure to use the stop pipe kit (KHFP26A100C).
Be sure to use the stop valve kit for extension (KHFP26M224, sold separately), for branch ports that you plan to expand in the future.

6-4 Airtightness test and vacuum drying

- After completing refrigerant piping work for the indoor units, BS unit, and outdoor unit, conduct an airtightness test and vacuum drying.
For more information about the airtightness test pressure, refer to the outdoor unit's installation manual.

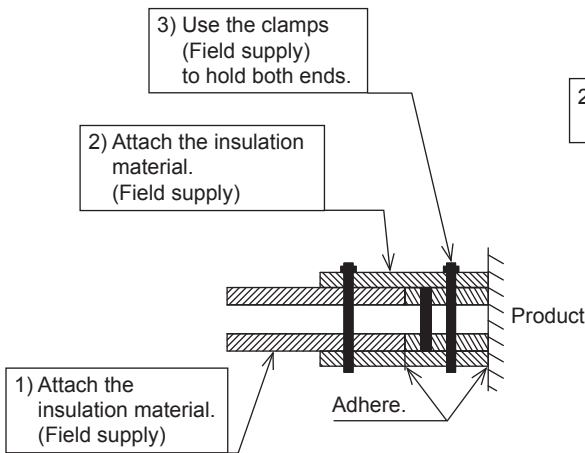
6-5 Piping insulation

- After the gas leak inspection is completed, refer to the following figures and use the included insulation tube (3) and clamps (2) to apply the insulation.

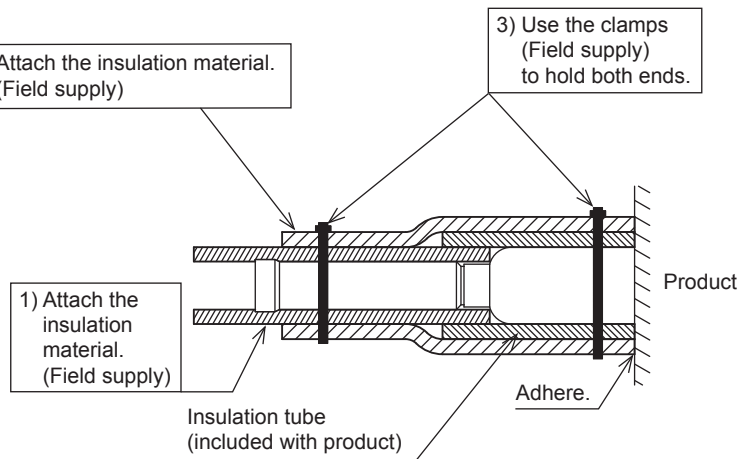


⚠ CAUTION

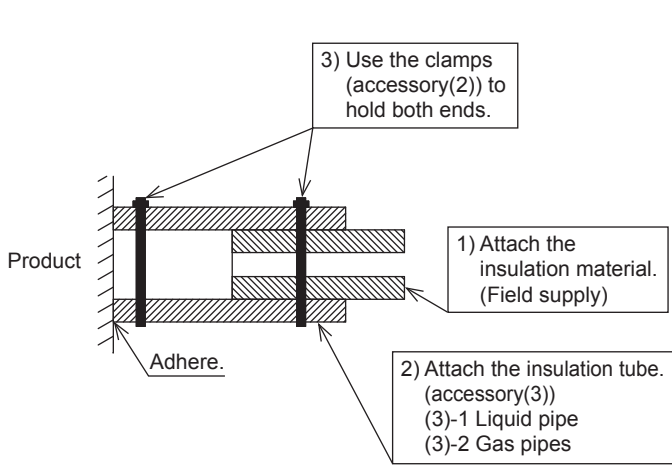
- Insulate all of the piping including the liquid pipes, HP/LP gas pipes, suction gas pipes, gas pipes, and the pipe connections for these.
Not insulating these pipes could result in water leaks or burns.
In particular, low-temperature gas flows in the HP/LP gas pipes during full cooling operation, so the same amount of insulation as used for the suction gas pipes is required.
In addition, high-temperature gas flows in the HP/LP gas piping and gas piping, so use insulation that can withstand more than 120°C.
- When reinforcing the insulation material in accordance with the installation environment, also reinforce the insulation on the piping protruding from the unit.
Insulation material required for reinforcement work should be supplied in the field.
For more information, refer to the Engineering data book.



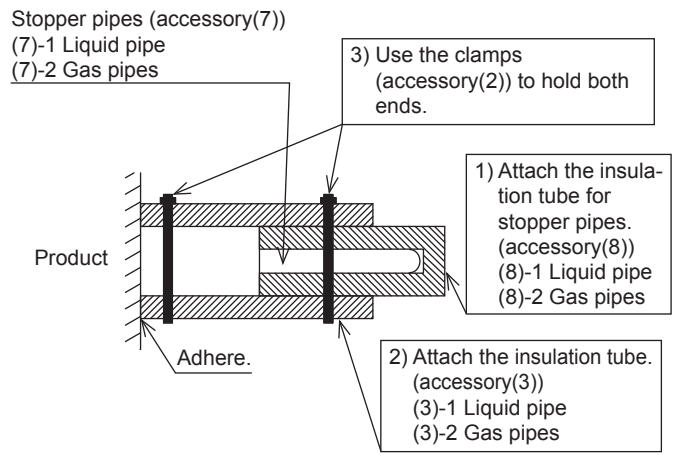
Insulation material installation instructions
(outdoor unit side) (liquid pipes)



Insulation material installation instructions
(outdoor unit side) (suction and HP/LP gas pipes)



Insulation tube installation instructions
(indoor unit side) (gas and liquid pipes)



Insulation tube installation instructions for unused branch ports
(indoor unit side) (gas and liquid pipes)

— **CAUTION** —

- Wrap insulation material with the seam facing up. (Refer to Fig. 3)

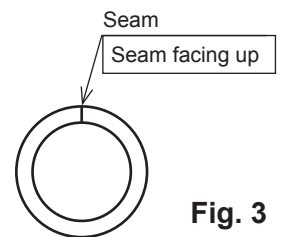


Fig. 3

7. DRAIN PIPING WORK

(1) Drain piping work

Install drain piping so that wastewater drains reliably.

- Use a pipe diameter that is the same as or greater than the connection pipe (PVC pipe, nominal diameter of 20 mm, outside diameter of 26 mm).
- Use a short length of pipe and route it at a downward slope of 1/100 or greater such that air does not collect in the pipe. (Refer to Fig. 4 and 5.)
- If unable to provide an adequate slope for the drain, use the drain up kit (sold separately).

<Example problem>

If water accumulates in the drain pipe, it may cause the drain to become clogged.

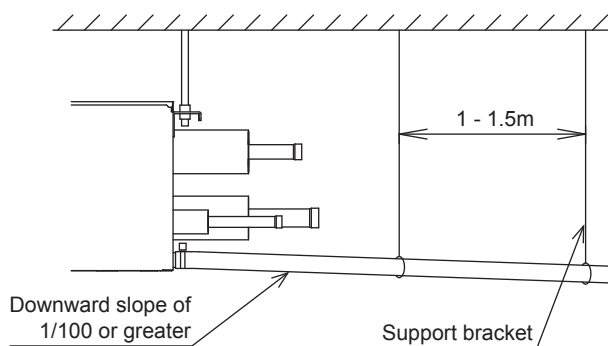
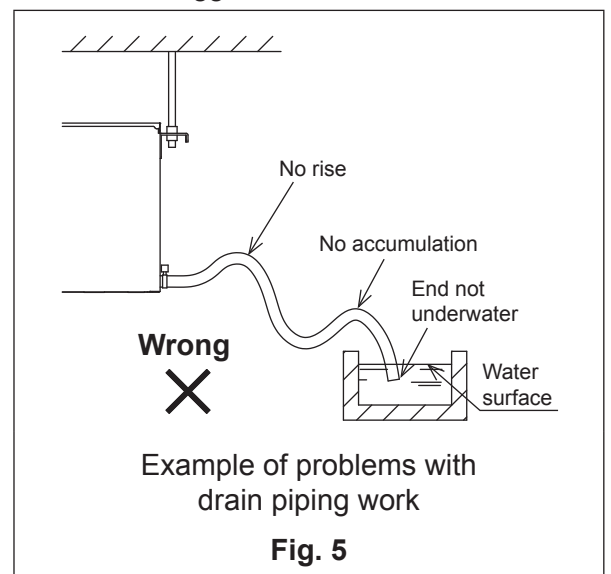


Fig. 4



Example of problems with
drain piping work

Fig. 5

- Be sure to use the included drain hose (4) and metal clamp (5).
In addition, insert the drain hose (4) all the way onto the drain socket, and tighten the metal clamp (5) in place at the base of the drain socket. **(Refer to Fig. 6 and 8.)**
(Install the metal clamp (5) so that the tightener falls within about 45°, as shown in the figure.)
- Bend the tip of the metal clamp (5) so that the sealing material does not swell. **(Refer to Fig. 8.)**
- Apply the included sealing material (6) to the metal clamp (5) in the direction of the arrow starting at the base of the drain hose (4) to apply insulation. **(Refer to Fig. 6 and 8.)**
- Be sure to apply insulation to the drain pipe, which passes through the interior space, and the drain socket.
- Do not allow the drain hose (4) to droop inside the BS unit. **(Refer to Fig. 7.)**
(Doing so may cause the drain to become clogged.)
- Install support brackets at an interval of 1 to 1.5 m so that the pipe does not droop. **(Refer to Fig. 4.)**

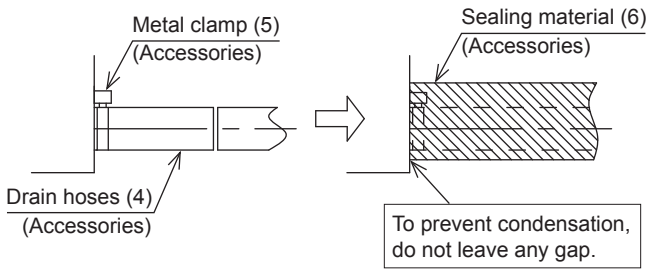


Fig. 6

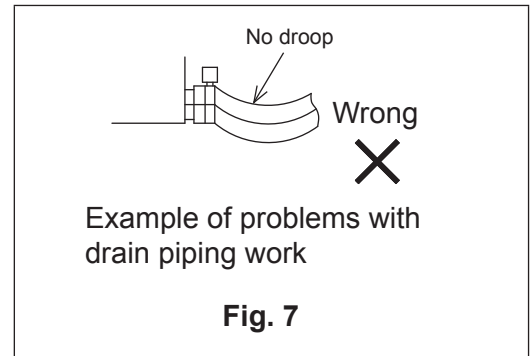


Fig. 7

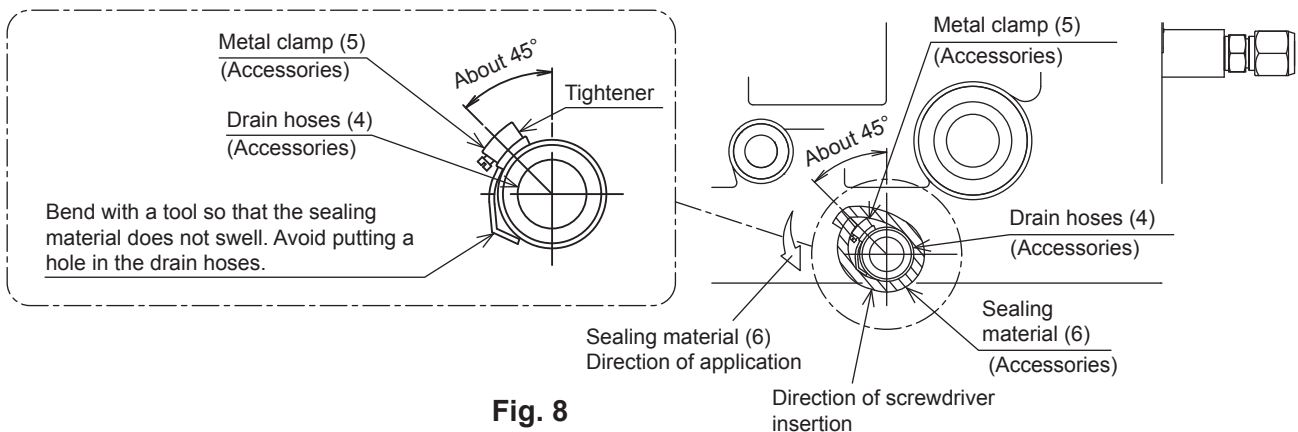


Fig. 8

To keep dust and other foreign matter out of the indoor unit, seal with putty, insulation material (to be supplied in the field), or other means so that there is no gap in the drain pipe.

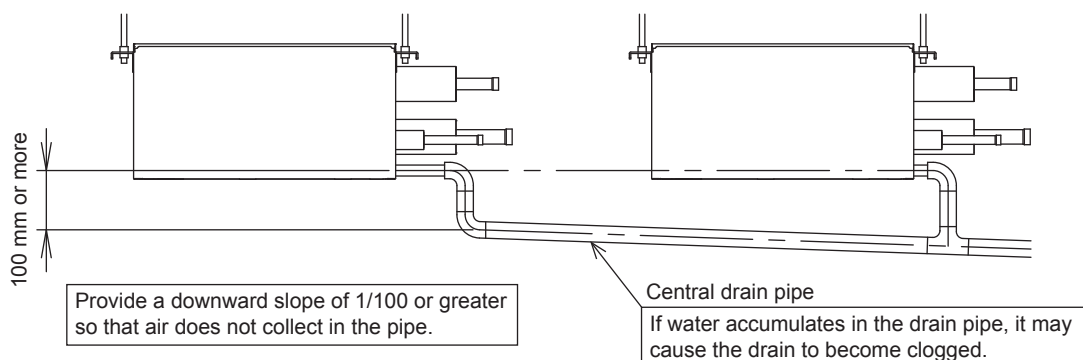


Fig. 9

—  **CAUTION** —

- To avoid subjecting the included drain hose (4) to excessive force, do not bend or twist. (Doing so may result in a water leak.)
- When using a central drain pipe, follow the instructions in **Figure 9**.

(2) After the completion of piping work, verify that water flows smoothly through the drain.

- Gradually add water to the inspection hole to verify the flow of wastewater into the drain pan. (**Refer to Fig. 10.**)

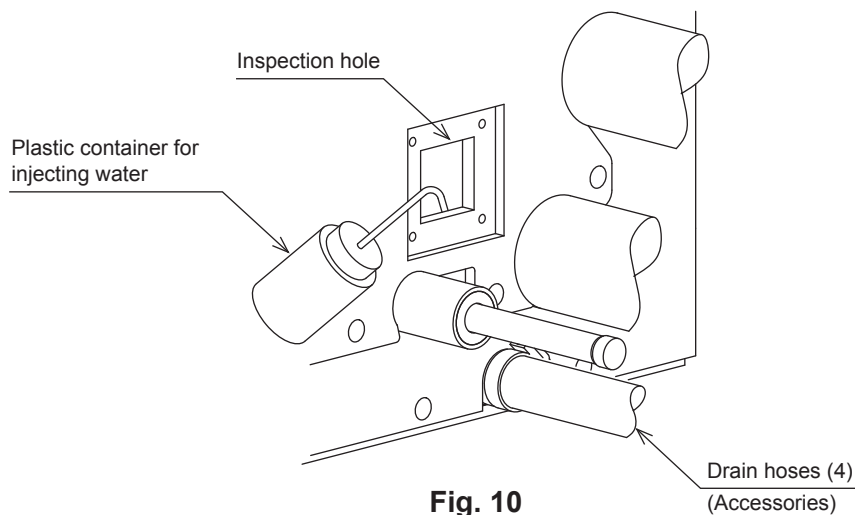


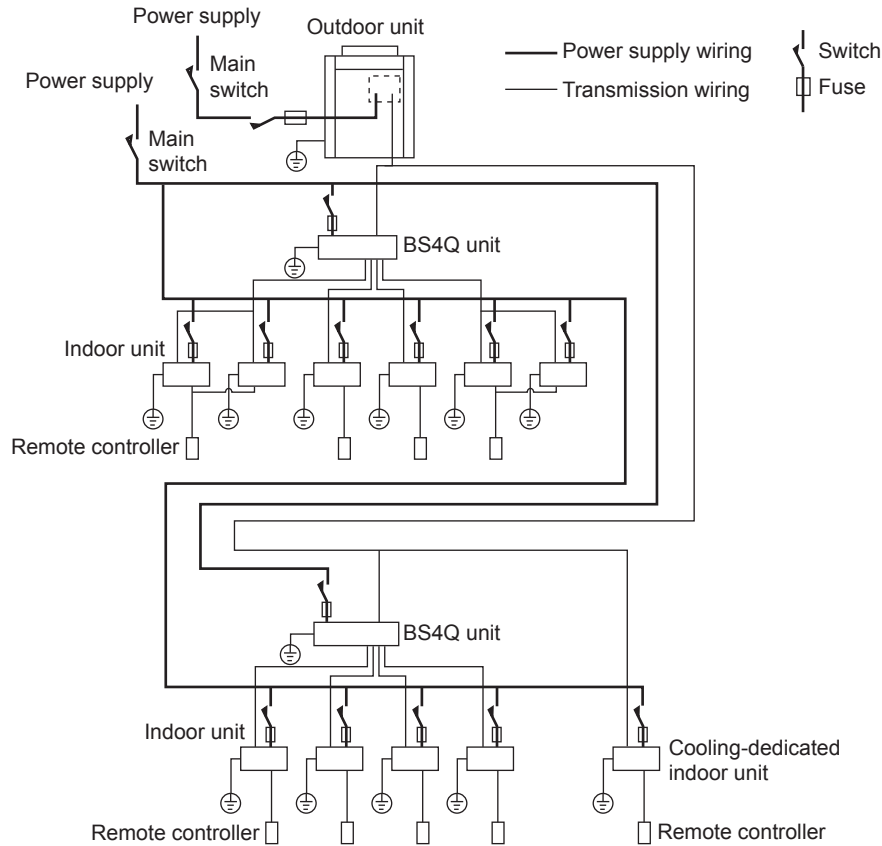
Fig. 10

8. ELECTRIC WIRING WORK

8-1 GENERAL INSTRUCTIONS

- All wiring must be performed by an authorized electrician.
- All field supplied parts and materials, electric works must conform to local codes.
- Always ground wires. (In accordance with national regulations of the pertinent country.)
- Always turn off the power before performing the electric wire installation work.
- Follow the “WIRING DIAGRAM” attached to the unit body to wire the outdoor unit and indoor units.
- Properly connect wire of the specified wire type and copper thickness. Also use the included clamp to avoid applying excessive force to the terminal (field wire, ground wire).
- Do not let the ground wire should come in contact with gas pipes, water pipes, lighting rods, or telephone ground wires.
 - Gas pipes: gas leaks can cause explosions and fire.
 - Water pipes: cannot be grounded if hard vinyl pipes are used.
 - Telephone ground and lightning rods: the ground potential when struck by lightning gets extremely high.
- A circuit breaker capable of shutting down the power supply to the entire system must be installed.
- This system consists of multiple BS units. Mark each BS unit as unit A, unit B . . . , and be sure the terminal board wiring to the outdoor unit and indoor unit are properly matched. If wiring and piping between the outdoor unit, BS unit and an indoor unit are mismatched, the system may cause a malfunction.
- Do not turn on the power supply (branch switches, overload interrupters) until all other work is done.

8-2 EXAMPLE FOR THE WHOLE SYSTEM



8-3 POWER CIRCUIT, SAFETY DEVICE AND CABLE REQUIREMENTS

- A power circuit (Refer to Table 6) 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 (0.1 second or less) 30mA 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-U3G for power supply wiring. And the size must comply with local codes.
- Use vinyl cord with sheath or cable (2 wire) of 0.75-1.25mm² for transmission wiring.
- The transmission wire lengths are as follows:
 - Between the BS unit and indoor units: Max. 1,000 m
 - Between the BS unit and outdoor unit: Max. 1,000 m
 - Between BS units: Max. 1,000 m
 - Total wiring length: 2,000 m or less

Table 6

Model	Type	Hz	Units		Power supply		
			Voltage	Voltage range		MCA	MFA
				Min.	Max.		
BS4Q14AV1B	V1	50	220-240	198	264	0.4	15
BS6Q14AV1B						0.6	
BS8Q14AV1B						0.8	
BS10Q14AV1B						1.0	
BS12Q14AV1B						1.2	
BS16Q14AV1B						1.6	

MCA: Min. Circuit Amps (A); MFA: Max. Fuse Amps (A)

NOTES

- The above Table 6 of Electrical Characteristics refers to one BS unit.

8-4 Wiring example

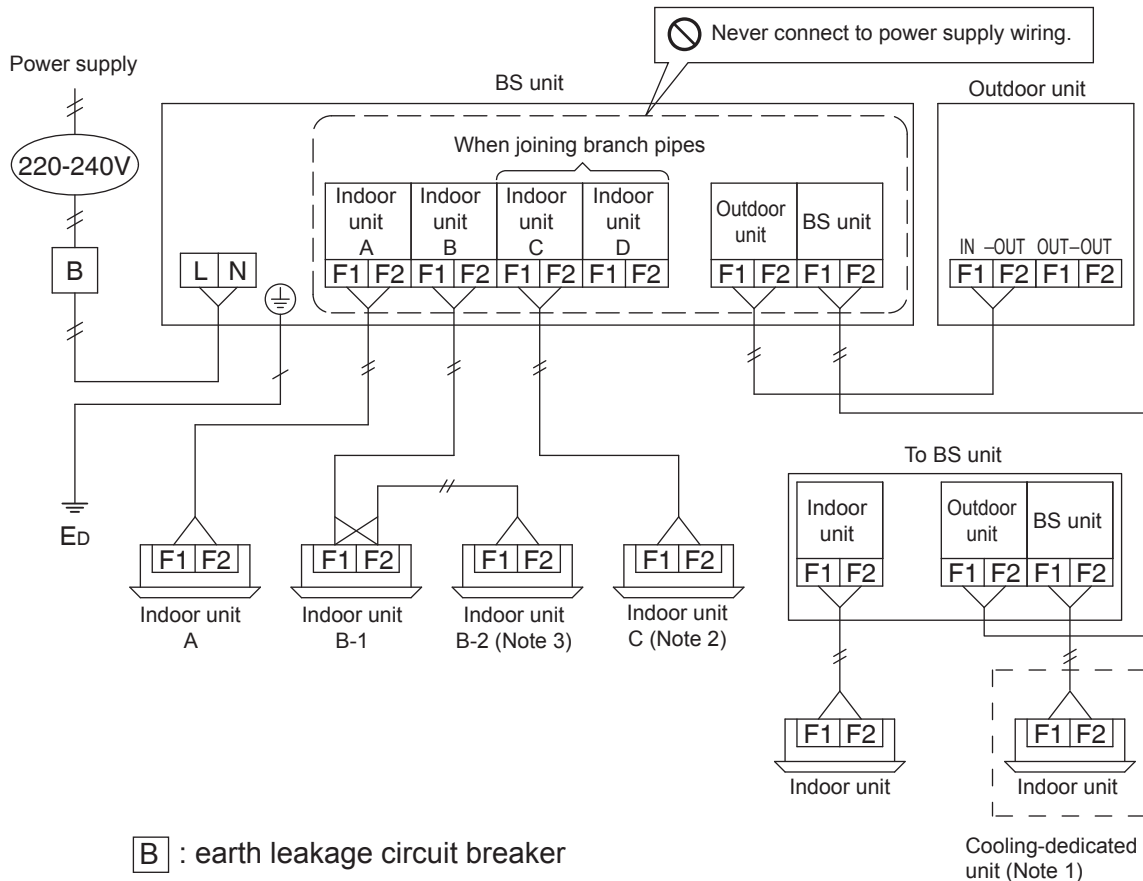
Here is shown a wiring example for transmission wiring.

⚠ WARNING

Install an earth leakage circuit breaker.

Failure to install an earth leakage circuit breaker may result in electric shock or fire.

- Connect terminals F1 and F2 (IN/OUT) on the control Printed Circuit Board in the outdoor unit's control box to terminals F1 and F2 (outdoor unit) on the first BS unit.



NOTES

1. Connect the cooling-dedicated unit to the final BS unit's F1 and F2 terminals (outdoor side).
2. This wiring example applies when joining the C and D branches and connecting them to indoor units. The terminal block to which the transmission wiring is connected can be connected to either indoor unit C or indoor unit D. However, the DIP switches must be set appropriately. For more information about how to set DIP switches, refer to "9. INITIAL SETTING".
3. The maximum connection number of indoor units per branch is 5 sets.

CAUTION

- Use 2-core transmission wiring.
Using the same wire with 3 or more cores to connect 2 or more indoor units may cause them to stop with an error.
- When the shield wire is used, be sure to ground the one side of the shield wire.
The total wiring length is 1500m when shielded wire is used.
- Be sure to use ring type crimp style terminals with insulation sleeves to connect wires to the power supply terminal block. **(Refer to Fig. 11.)**
- Do not use with the power supply terminal block and earth terminal connected to wiring for another circuit.
- Do not pre-solder stranded wire.
- Connect wires securely so that the terminals will not be subjected to external force.
- Use an appropriately sized screwdriver to tighten the terminal screws.
Use of a screwdriver that is too small could damage the screw head and prevent proper tightening.
- Overtightening the terminal screws could damage the screw.
Refer to the table for the terminal screw tightening torque.

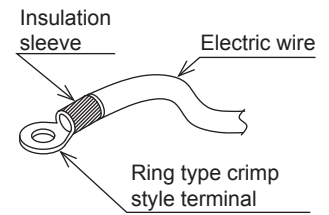


Fig. 11

Terminal screw size	Tightening torque (N·m)
M3.5 (transmission wire terminal block)	0.88 ± 0.08
M4 (power supply terminal block)	1.31 ± 0.13
M4 (earth terminal)	1.69 ± 0.17

- Never connect power supply wiring to the transmission wiring terminal block.
Doing so may damage the entire system.
- Transmission wiring cannot be branched again after the initial branch.
(Refer to Fig. 12.)

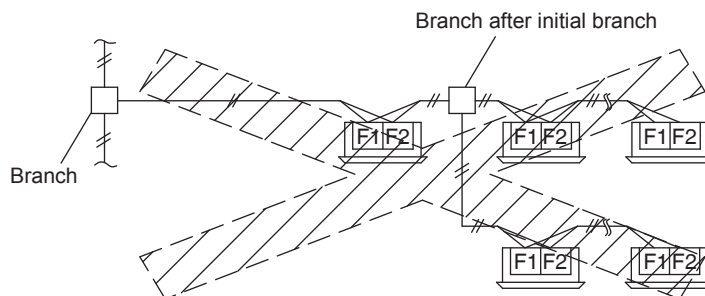
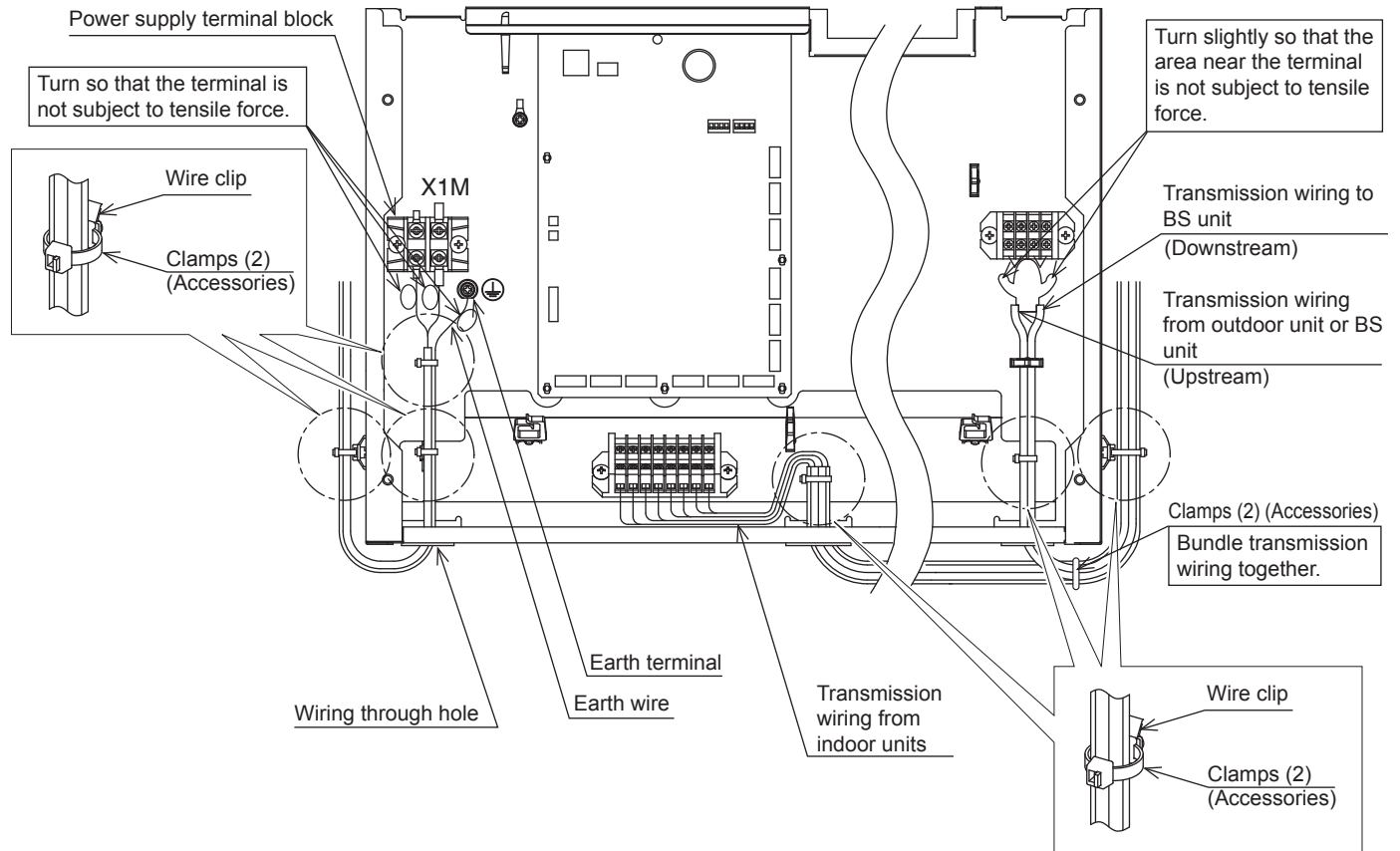


Fig. 12

8-5 Wiring connections

(Remove the control box cover and connect the wiring as shown in the figure below.)



- **Transmission wiring**

Remove the control box cover and connect the wires to the transmission wiring terminals (outdoor unit F1 and F2, BS unit F1 and F2, and each indoor unit (for example, for the BS16Q14AV1B, indoor unit A through P) (F1 and F2)).

At this time, pass the wiring into the unit through the wiring through hole and use the included clamps (2) to securely hold the wires. For more information about how much insulation to strip off transmission wiring, refer to the following figure.



— **⚠ CAUTION** —

Verify that the piping line coincides with the transmission wiring.

- Power supply wiring and earth wires

Remove the control box cover and connect the power supply wiring to the power terminal block (X1M).

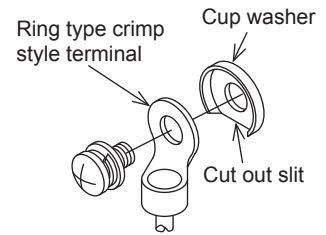
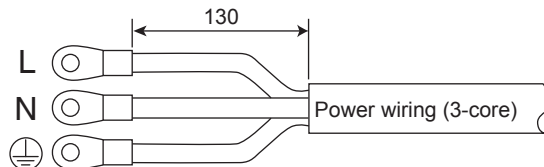
Also connect the earth wire to the earth wire terminal.

Pass both the power supply wires and the earth wire together through the wire through hole (left) into the control box and use the included clamps (2) to securely hold the wires in place.

Be sure to wire the earth wire so that it comes out of the cut out slit in the cup washer.

(Not doing so could cause insufficient earth wire contact, causing the wire not to function as a earth.)

For more information about how much insulation to strip off power wiring, refer to the following figure.

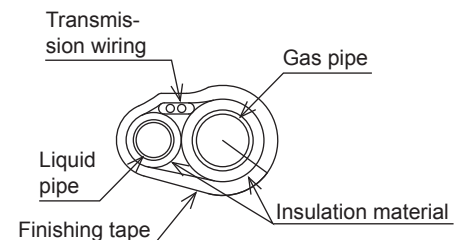


⚠ WARNING

Organize the wiring and securely reattach the control box cover.
Pinched wires or a loose control box cover could result in electric shock or fire.

⚠ CAUTION

- When fastening the wire, use the included clamp (2) so as not to apply tensile force to the wire connection and then securely fasten the wire.
Also, after the wiring is completed, organize the wiring so that the control box cover does not pop up and then properly replace the control box cover.
Make sure no wires are pinched when replacing the control box cover.
Always use the wire through hole to protect wires.
- Do not pass the transmission wiring and power supply wiring through the same locations, and outside of the unit keep them separated by at least 50 mm.
Not doing so could cause the transmission wiring to pick up electric noise (external noise) and result in a malfunction or breakdown.
- After the wiring work is complete, use sealer (to be supplied in the field) to seal closed the wire through hole.
(Entry by small animals, etc., could cause a malfunction.)
- As shown in the figure to the right, wrap the transmission wiring between each BS unit and indoor unit with finishing tape (to be supplied in the field).



9. INITIAL SETTING

9-1 Settings in the field

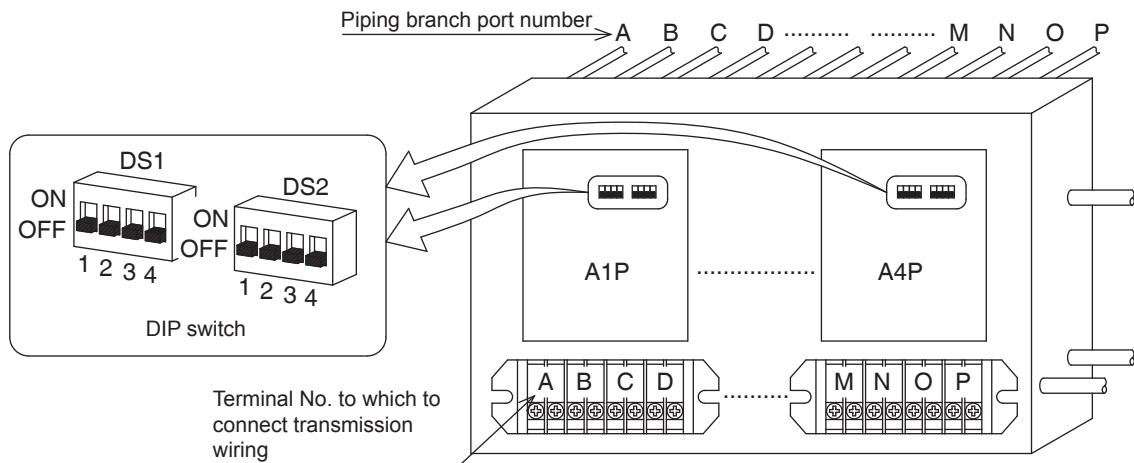
Follow the instructions below to set the DIP switches as necessary.

⚠ WARNING

Electric shock hazard! Before performing work, be sure to disconnect any power source connected to the unit.

Procedure

1. Disconnect the power source.
2. Set the DIP switches (DS1, DS2) for the corresponding branch ports based on the following table.
3. Once work is complete, be sure to close the cover on the control box.



<Setting>

1. Setting for branch ports to which no indoor unit is connected

	Setting	Setting for branch ports to which no indoor unit is connected (Example 1)															
	DIP switch setting	ON (Not connected) OFF (Factory default)															
	DIP switch No.	DS1 (A1P)				DS1 (A2P)				DS1 (A3P)				DS1 (A4P)			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
BS4Q14AV1B	Target branch port	Unit A	Unit B	Unit C	Unit D	Unit E	Unit F	Unit G	Unit H	Unit I	Unit J	Unit K	Unit L	Unit M	Unit N	Unit O	Unit P
BS6Q14AV1B																	
BS8Q14AV1B																	
BS10Q14AV1B																	
BS12Q14AV1B																	
BS16Q14AV1B																	

(Example 1)
When not connecting the indoor unit to the A and B branch circuits

2. Setting when joining branch ports

	Setting	Setting when joining branch ports (Example 2)							
	DIP switch setting	ON (Joined) OFF (Factory default)							
	DIP switch No.	DS2 (A1P)		DS2 (A2P)		DS2 (A3P)		DS2 (A4P)	
		1	2	1	2	1	2	1	2
BS4Q14AV1B	Target branch port	A and B units joined	C and D units joined	E and F units joined	G and H units joined	I and J units joined	K and L units joined	M and N units joined	O and P units joined
BS6Q14AV1B									
BS8Q14AV1B									
BS10Q14AV1B									
BS12Q14AV1B									
BS16Q14AV1B									

(Example 2)
When joining the A and B branches

When joining branches, only the branch port combinations shown in the above table can be used.
(For example, units B and C cannot be joined.)

10. ADDING AN ADDITIONAL CHARGE OF REFRIGERANT

Follow the instructions in the installation manual that came with the outdoor unit to add an additional charge of refrigerant.

11. CHECK OPERATION AND TEST OPERATION

1. Verify that the control box cover is closed.
2. Refer to the installation manual included with the outdoor unit and conduct a check and a test run after all the work on the BS unit and outdoor and indoor units is completed and the operational safety of the units is confirmed.
 - You will hear the motor operated valve operating for about 90 seconds as it is automatically initialized (closed) after power is turned on, but this is not a problem.
 - System malfunctions can be verified by means of the following methods:
Indication on the indoor operation remote controller
Overall system malfunctions, including of the BS unit, can be identified using the LCD malfunction display on the operation remote controller. For more information about the malfunction display and its significance, refer to the service precaution name plate affixed to the indoor unit and the user manual included with the outdoor unit.


12. WIRING DIAGRAM

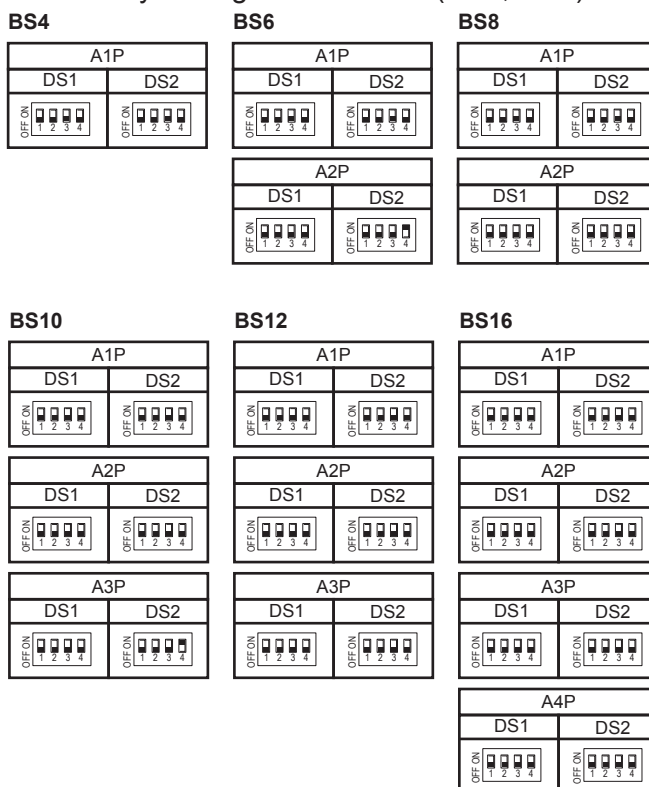
A1P~A4P	Printed circuit board (control)
C1	Capacitor (A1P~A4P)
DS1, DS2	DIP switch (A1P~A4P)
F1U	Fuse (T, 3.15 A, 250 V)(A1P~A4P)
HAP	Flashing lamp (service monitor - green)(A1P~A4P)
PS	Switching power supply (A1P~A4P)
V1R	Diode bridge (A1P~A4P)
X1M	Terminal strip (power)
X2M~X6M	Terminal strip (transmission)
Z1F	Noise filter (A1P~A4P)
Y1E, Y4E, Y7E, Y10E, Y13E, Y16E, Y19E, Y22E, Y25E, Y28E, Y31E, Y34E, Y37E, Y40E, Y43E, Y46E	Electric expansion valve (suction)
Y2E, Y5E, Y8E, Y11E, Y14E, Y17E, Y20E, Y23E, Y26E, Y29E, Y31E, Y34E, Y37E, Y41E, Y44E, Y47E	Electric expansion valve (HP/LP gas)
Y3E, Y6E, Y9E, Y12E, Y15E, Y18E, Y21E, Y24E, Y27E, Y30E, Y33E, Y36E, Y39E, Y42E, Y45E, Y48E	Electric expansion valve (Subcool)

Optional accessories

X15E	Connector (drain-up kit abnormal signal)(A1P)
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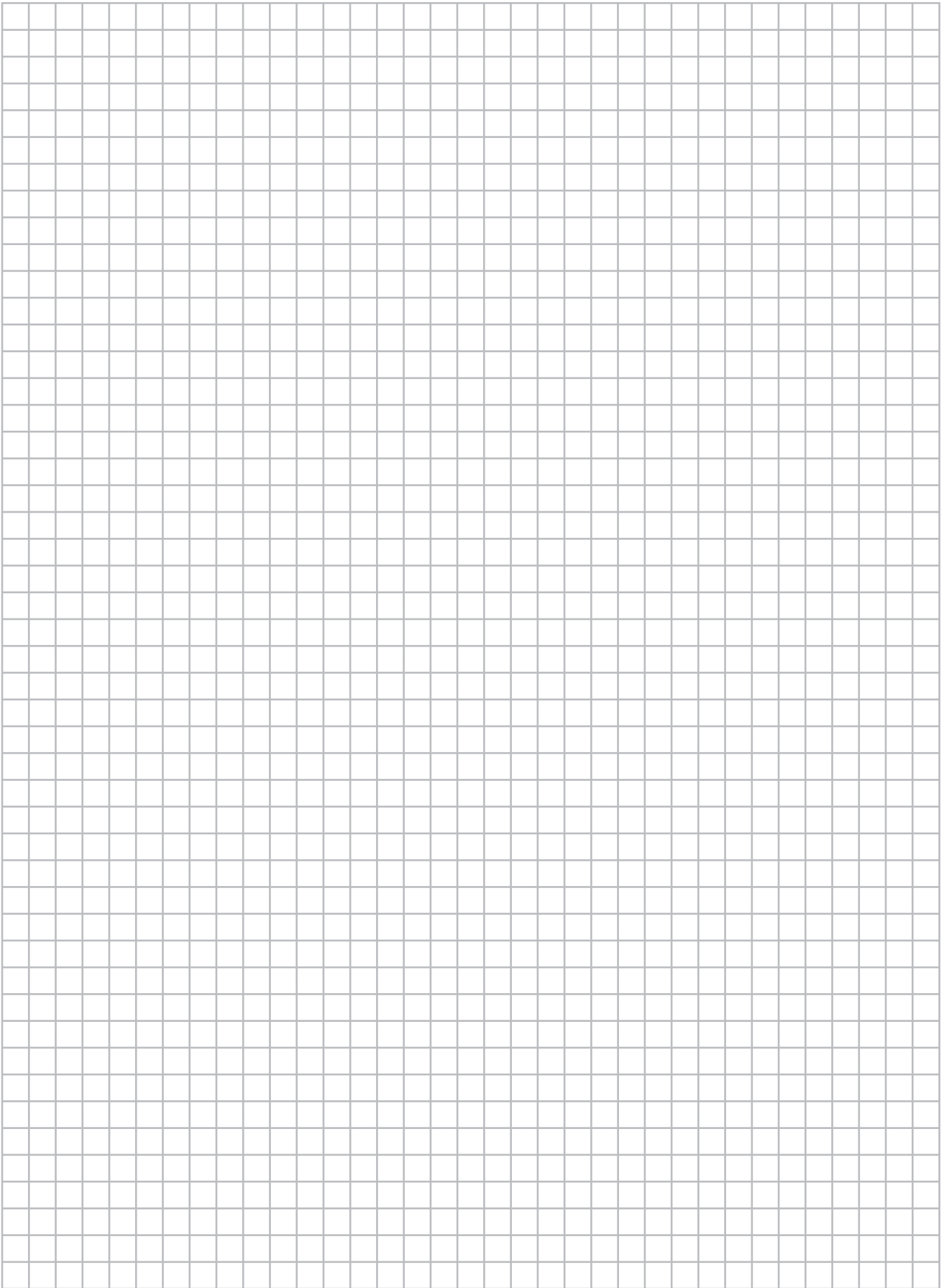
NOTES

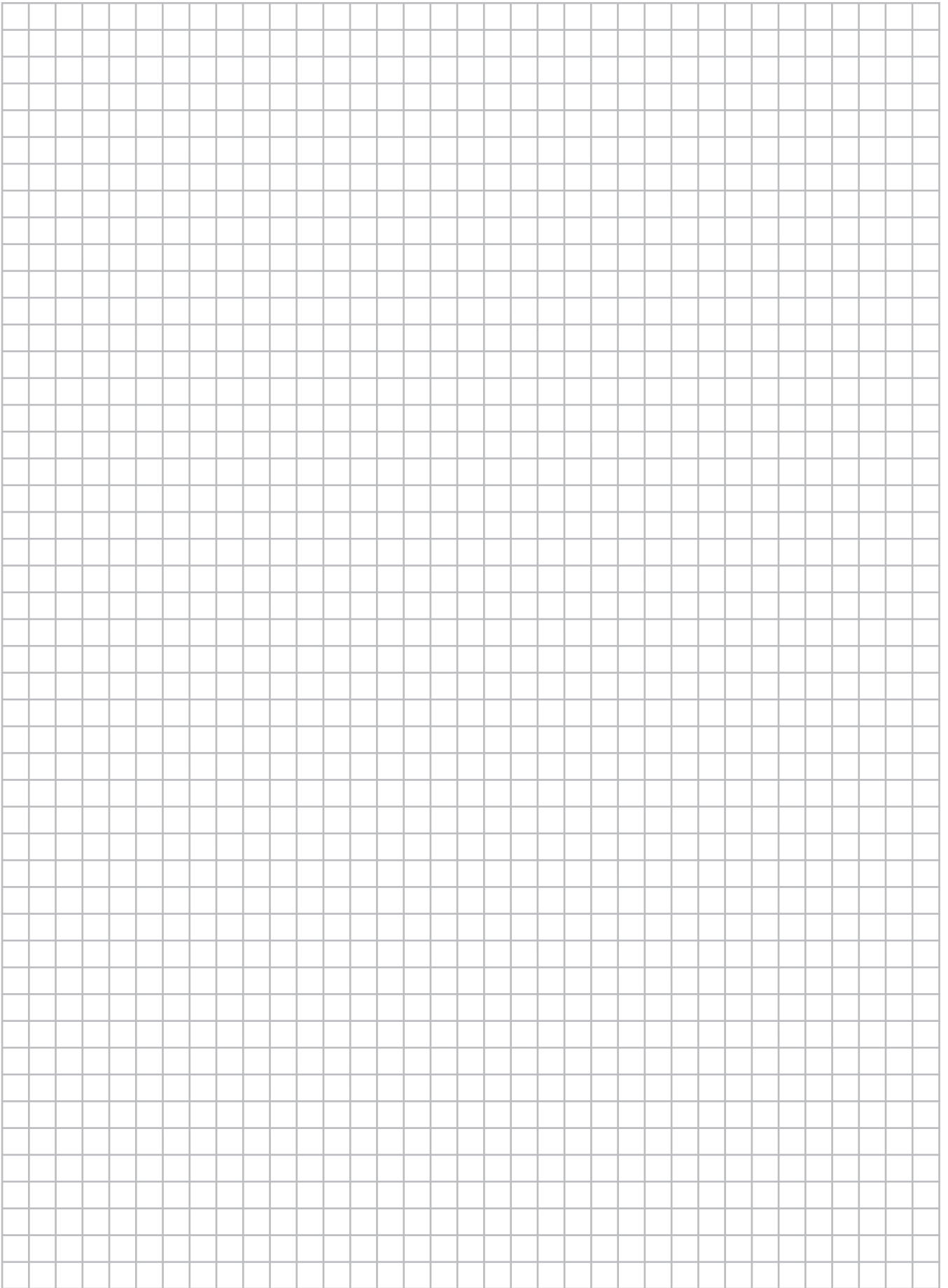
1. This wiring diagram is for the BS unit only.
2. The marks in this wiring diagram indicate:
: terminal block, : connector, : field wiring, ⊕: earth
3. For wiring the terminal block X2M~X6M (operation), refer to the installation manual attached to the product.
4. The factory setting of DIP switch (DS1, DS2) are as follows:



For the setting method of the DIP switches, refer to the installation manual.

5. For X15A (A1P), remove the short-circuit connector and connect the air conditioner stop signal (option) when using the drain-up kit (option). For details, please refer to the operation manual attached to the kit.





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