

TOSHIBA

R32 or R410A

AIR CONDITIONER (SPLIT TYPE) Installation manual

BRANCH PIPE KIT

Model name:

RBC-TWP30E2
RBC-TWP50E2

BRANCH PIPE KIT Installation manual	2	ENGLISH
KIT DE TUYAU DE BRANCHEMENT Manuel d'installation	16	FRANÇAIS
AUSRÜSTUNG FÜR DIE ZWEIFLEITUNG Installations-handbuch	30	DEUTSCH
KIT DEI TUBI DI RACCORDO Manuale di installazione	44	ITALIANO

As for "Precautions for safety", please read the Installation Manual for each outdoor unit, and be sure to observe the description.

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NOTES

Be careful of the following items before installation

1. This Installation Manual is for the branch pipe using for twin simultaneous or double twin simultaneous system.
2. Check the combination of indoor unit, outdoor unit and branch pipe again before installation.
3. Be sure to install the indoor unit in the same room and to observe the application of floor space.
Should the refrigerant leaks and exceeds the limit concentration, accumulation of highly concentrated refrigerant occurs, cause an oxygen deficiency accident or a fire.
4. For installation for indoor or outdoor unit, please read the Installation Manual supplied with indoor or outdoor unit.
5. Make sure to observe the cautions for each contents.
Be sure to follow the wiring or the setting procedure in the Installation Manual.

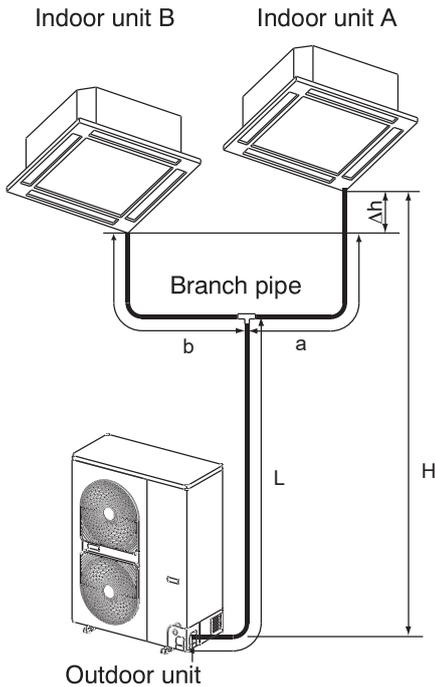
1 COMPONENT

The following parts are supplied as accessories of the branch pipes. Check them when opening the carton box.

Part		Quantity	Shape	Use
Installation Instructions		1	This booklet	For installation works
Branch pipe	Gas side	1		For refrigerant pipe branching and collection
	Liquid side	1		
Noise filter		2		For connection on the P.C. board

2 REFRIGERANT PIPING

Tolerance of pipe length and pipe head



Model (RAV-)	Pipe Length (One Direction)			Height Difference			Remarks
	Full length $L + a$ or $L + b$	Branch piping a, b	Difference of branch piping length $b - a$, or $a - b$	Outdoor Unit - Indoor Unit H		Between Indoor Units Δh	
				Outdoor Unit Installed Above Indoor Unit	Outdoor Unit Installed Below Indoor Unit		
80*AT 110*AT 140*AT 160*AT	Below 50 m (actual length)	Below 15 m (actual length)	Below 10 m	Below 30 m	Below 30 m	Below 0.5 m	Less than 10 bends

⚠ CAUTION

Ensure that the shortest pipe length complies with the following:

$$L + b \geq 5 \text{ m}$$

$$a \geq b$$

⚠ CAUTION

When planning a layout for Units A and B, comply with the following:

1. The lengths after branching ("a" and "b") should be equal if feasible. Install Units A and B so that the difference of the branching lengths becomes less than 10m if the lengths cannot be equal due to the branch pipe position.
2. Install Units A and B on the same level. If Units A and B cannot be installed on the same level, the difference in level should be limited to 0.5 m or less.
3. Be certain to install Units A and B in the same room. Units A and B cannot be operated independently each other.

Piping materials and sizes

Use copper tube of Copper and copper alloy seamless pipes and tubes, with 40 mg/10 m or less in the amount of oil stuck on inner walls of pipe and 0.8 mm in pipe wall thickness for diameters 6.4, 9.5 and 12.7 mm and 1.0 mm, for diameter 15.9 mm. Never use pipes of thin wall thickness such as 0.7 mm.

In parentheses () are wall thickness

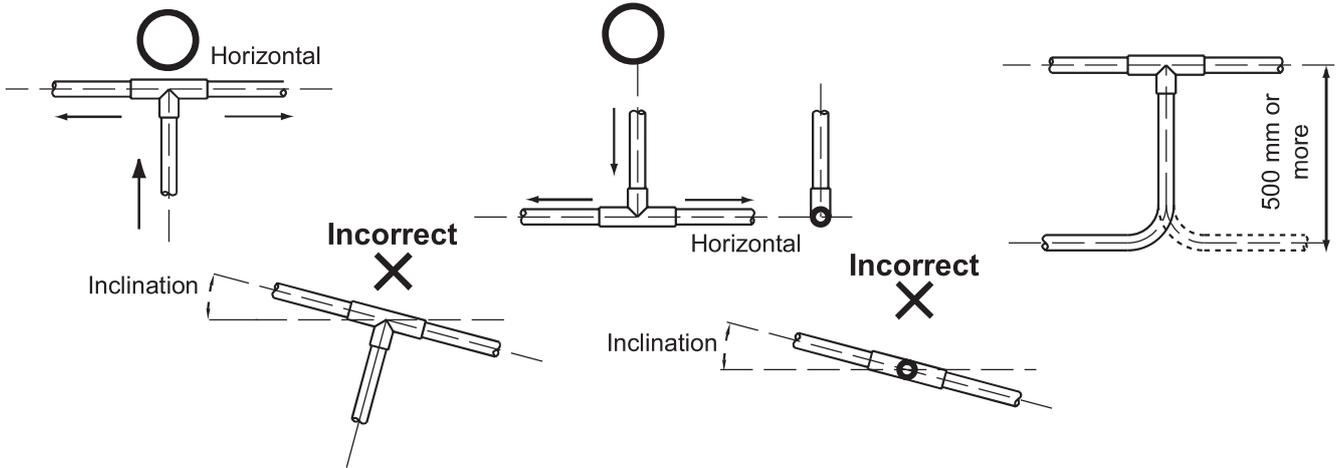
Model (RAV -)		80*AT, 110*AT	140*AT, 160*AT
Pipe side	Gas side	Main piping	Ø15.9 (1.0)
		Branch piping	Ø12.7 (0.8) Ø15.9 (1.0)
	Liquid side	Main piping	Ø9.5 (0.8)
		Branch piping	Ø6.4 (0.8) Ø9.5 (0.8)

EN

Branch pipe

Now the refrigerant pipe is installed using branch pipes supplied as accessories.

- Bend and adjust the refrigerant piping so that the branch pipes and pipe after branching become horizontal.
- Fix the branch pipes onto a wall in a ceiling or onto a column.
- Provide a straight pipe longer than 500 mm in length as the main piping of the branches.



Air Purging

For the complete information, read the installation instructions for outdoor units of air conditioner.

Additional Refrigerant Amount

<Formula for Calculating Additional Refrigerant Amount>

Do not remove the refrigerant even if the additional refrigerant amount becomes minus result as a result of calculations by the following formula and operate the air conditioner as it is.

$$\begin{aligned} \text{Additional refrigerant amount (kg)} &= \text{Main piping additional refrigerant amount (kg)} + \text{Branch piping additional refrigerant amount (kg)} \\ &= A \times (L - 28) + B \times (a + b - 4) \end{aligned}$$

A: Additional refrigerant amount per meter of actual main piping length (kg)

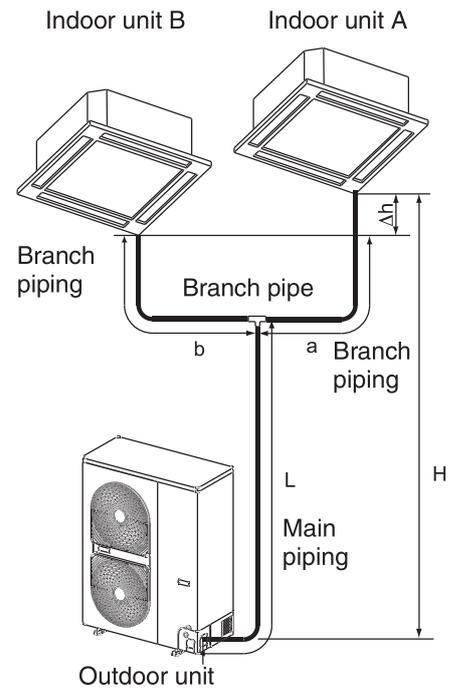
B: Additional refrigerant amount per meter of actual branch piping length (kg)

L: Actual length of main piping (m)

a, b: Actual length of branch piping (m)

R410A Model	Standard piping length		Additional refrigerant amount per Meter (kg/m)	
	Main piping	Branch piping	A	B
80*AT 110*AT	28m	2m	0.040	0.020
140*AT 160*AT	28m	2m	0.040	0.040

R32 Model	Standard piping length		Additional refrigerant amount per Meter (kg/m)	
	Main piping	Branch piping	A	B
80*AT 110*AT	28m	2m	0.035	0.020
140*AT	28m	2m	0.035	0.035



CAUTION

1. Be certain to write the additional refrigerant amount, pipe length (actual length), head and other specification on the nameplate put on the outdoor unit for recording.
2. Seal the correct amount of additional refrigerant in the system.

Gas Leak Test

- Use a leak detector manufactured specially for the HFC refrigerant (R32, R410A, R134a, etc.) when testing R32, R410A. The sensitivity of leak detectors for previous HCFC refrigerants (such as R22) lowers to about 1/40 when used with HFC refrigerants and these detectors cannot be used.

3 WIRING

1. Using the specified cables, ensure to connect the wires, and fix wires securely so that the external tension to the cables do not affect the connecting part of the terminals.

Incomplete connection or fixation may cause a fire, etc.

Be certain to install wires by connecting them to terminals of the same numbers according to the following wiring diagram.

2. Be sure to connect earth wire. (Grounding work)

Do not connect the earths wire to gas pipe, city water pipe, lightning rod, or the earth wire of telephone.

Incomplete grounding causes an electrical shock.

3. For electric work, strictly follow the Local Regulation in each country, Indoor, outdoor, and this Installation Manual, and use an exclusive circuit.

Capacity shortage of power circuit or incomplete installation may cause an electrical shock or a fire.

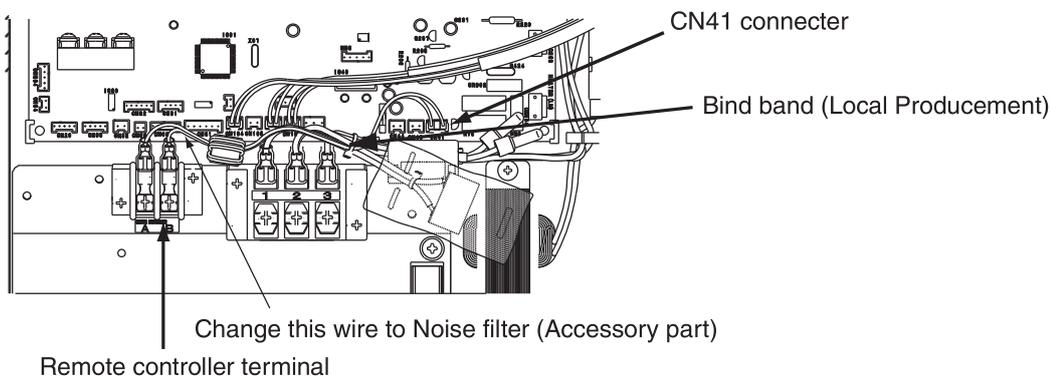
Indoor Unit P.C electrical parts

This work is unnecessary for concealed duct type, under ceiling type and 4-way air discharge cassette type (0 to 3 series).

This work is necessary for each indoor unit.

1. Disconnect the read wire between remote controller terminal and CN41 (RC) connector on the P.C.board.

P.C board of Indoor Unit



2. Connect the Noise Filter between remote controller terminal and CN41 (RC) connector on the P.C.board.
3. Bind this wire and main terminal wire by bind band.

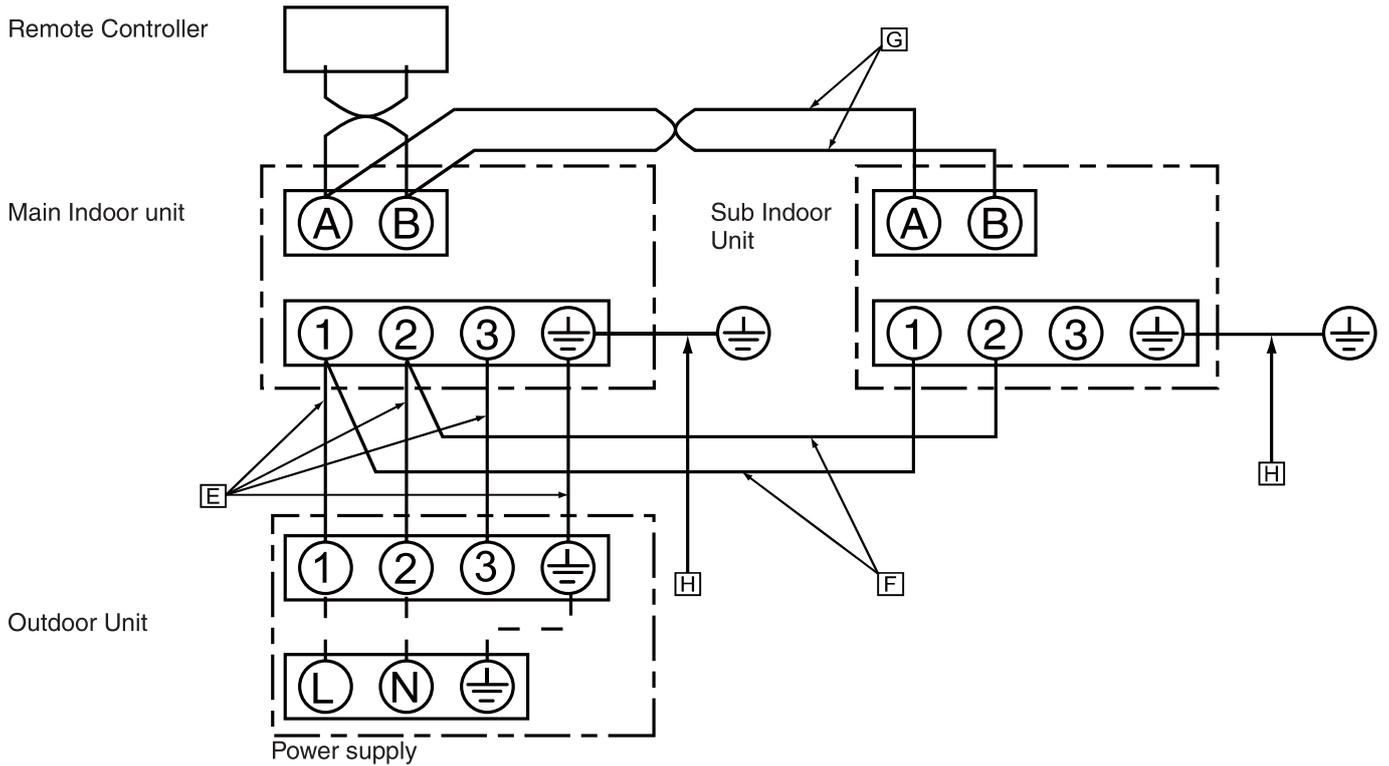
Internal And External Connection Wiring

1. Install wires from the outdoor unit to the main unit as in usual wiring.
(Wires (1), (2), (3) and ground wire.)
2. Install wires (1), (2) and ground wire only when installing connection wires from the master unit to the sub unit.

Remote Controller wiring

1. Installing connection wires from the master unit to the sub unit.
2. Install jumper wires between the main unit and sub unit. The jumper wires of the remote controller have no polarities. The remote controller circuits are low voltage circuits. These circuits must not be made to directly contact internal and external wires or contained in the same conduit tubes that house internal and external wires.
(Otherwise malfunction will be caused by noise)

Wiring Diagram



Wiring Specification

Specification of Wires Between Units and Numbers of Wires.

Outdoor unit - indoor unit (main unit) [E]	No. of wires	4 (Include ground wire)
	Wire diameter	H07RN-F or 245IEC66 1.5 mm ² or more
Indoor unit (main unit) - indoor unit (sub unit) [F]	No. of wires	2
	Wire diameter	H07RN-F or 245IEC66 1.5 mm ² or more
Remote controller wiring [G]	No. of wires	2
	Wire diameter	Between 0.5 mm ² and 2 mm ² (up to 200 m)
Grounding wire of indoor sub unit [H]		H07RN-F or 245IEC66 1.5 mm ² or more

Procure necessary parts and perform all connection work locally.

NOTES

When using the equipment at the first time, it will take a lot of time that the remote controller accepts an operation after power was on. However, it is not a trouble.

Automatic address

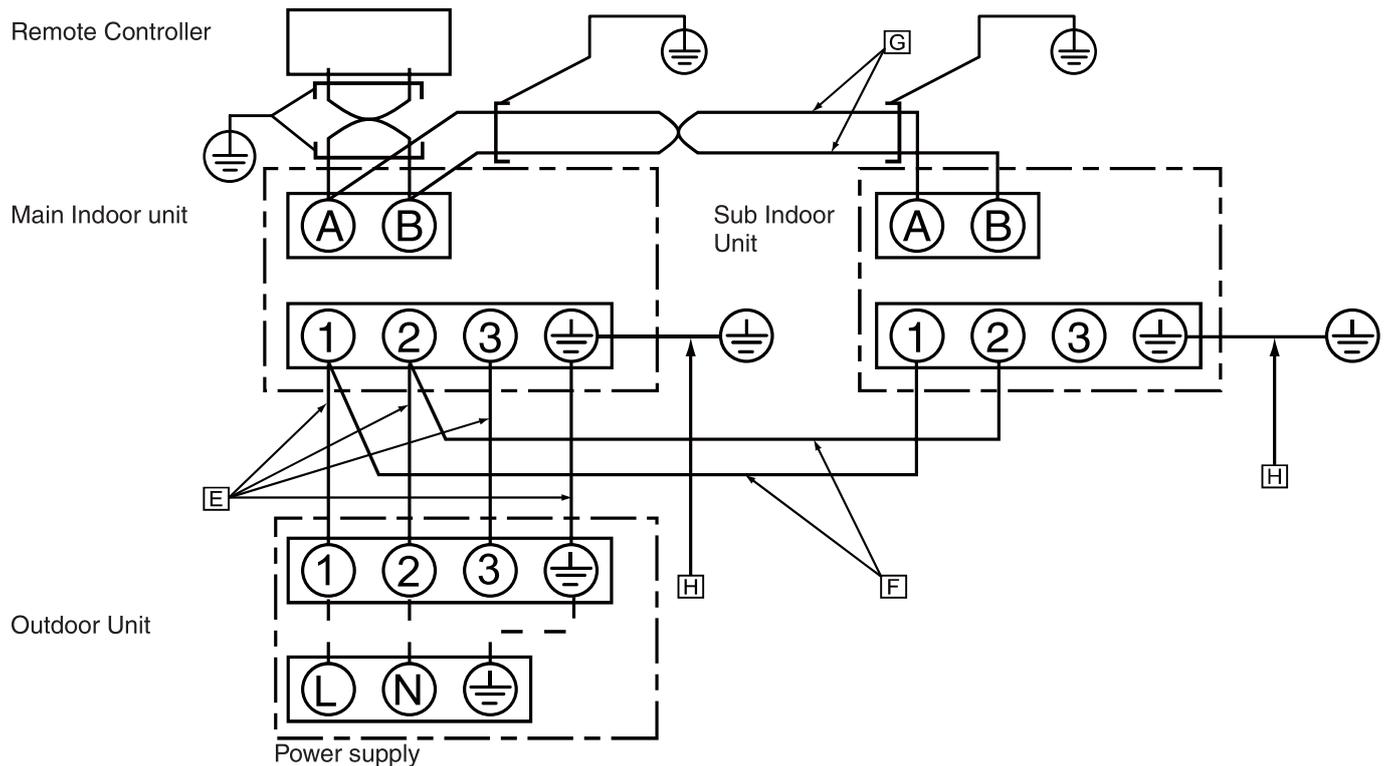
While automatic addressing, the operation can not be performed on the remote controller.
For automatic addressing, Max. 10 minutes (generally, approx. 5 minutes) are required.

When power will be turned on after finish of automatic addressing;

It will require Max. 10 minutes (generally, approx. 3 minutes) that outdoor unit starts operation after power was on.

■ When installing the RAV-SM1603AT-E

Wiring Diagram



Wiring Specification

Specification of Wires Between Units and Numbers of Wires.

Outdoor unit - indoor unit (main unit) E	No. of wires	4 (Include ground wire)
	Wire diameter	H07RN-F or 245IEC66 1.5 mm ² or more
Indoor unit (main unit) - indoor unit (sub unit) F	No. of wires	2
	Wire diameter	H07RN-F or 245IEC66 1.5 mm ² or more
Remote controller wiring G	No. of wires	2 (Shield wire)
	Wire diameter	Between 0.5 mm ² and 2 mm ² (up to 200 m)
Grounding wire of indoor sub unit H		H07RN-F or 245IEC66 1.5 mm ² or more

Procure necessary parts and perform all connection work locally.

NOTES

When using the equipment at the first time, it will take a lot of time that the remote controller accepts an operation after power was on. However, it is not a trouble.

Automatic address

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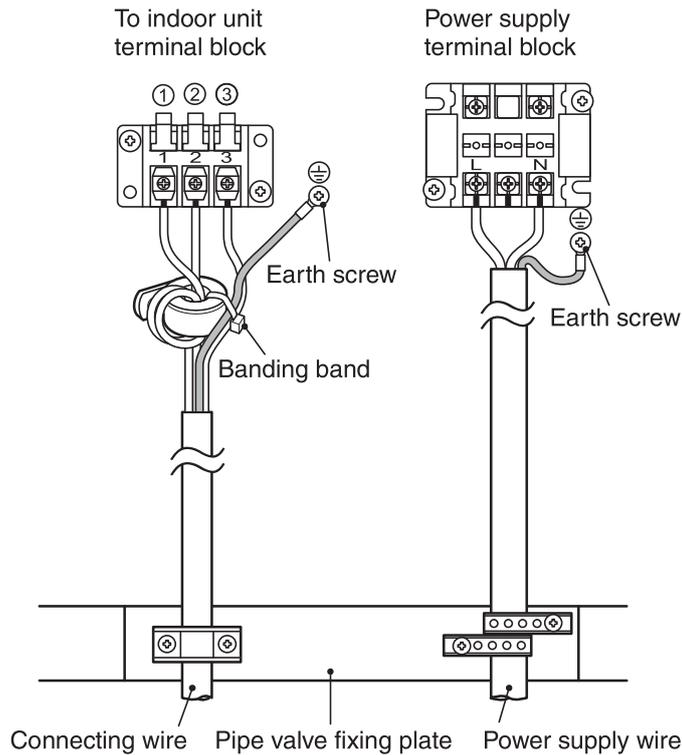
⚠ WARNING

For simultaneous twin systems, perform the following to conform to EMC standards.

1. Be sure to use shield wire for remote controller wiring.
2. Connect earth wire independently to each indoor unit.
3. Attach the ferrite core (white) supplied with the outdoor unit to indoor/outdoor connecting wires.
 - Pass indoor/outdoor connecting wires ① and ② through the supplied ferrite core and wind them making a single turn, and then connect them to the terminals of the outdoor unit. Connect the indoor/outdoor connecting wire ③ and the earth wire directly to the outdoor unit terminals.
4. Attach the clamp filter (gray) supplied with the outdoor unit to the outdoor fan motor lead wire.
 - Attach the supplied clamp filter securely to the fan motor lead wire (lower) in the electric parts box of the outdoor unit.

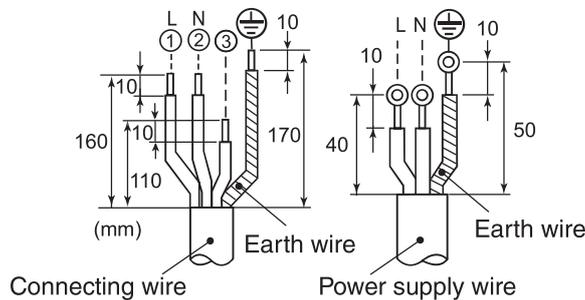
- For how to install the indoor unit, refer to the Installation Manual supplied with the indoor unit.

1. Attaching the ferrite core

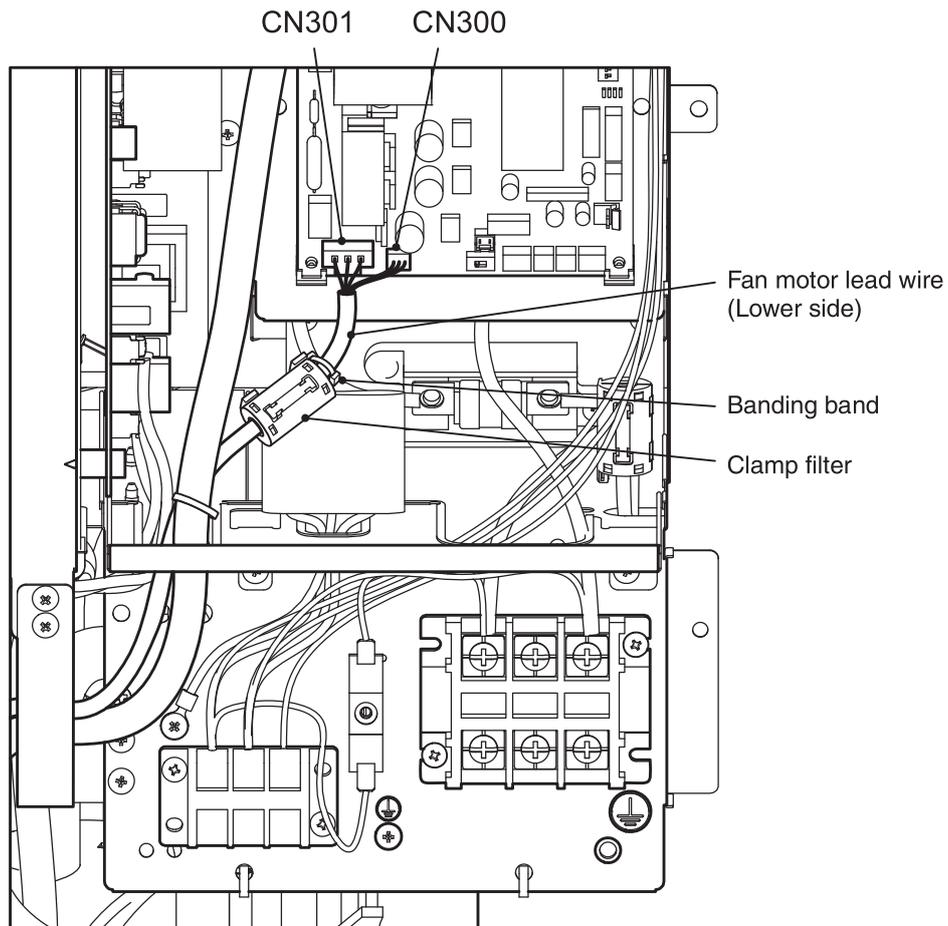


* Clamp the indoor/outdoor connecting wire ③ and the earth wire together with the ferrite core with the supplied banding band.

Stripping length power cord and connecting wire



2. Attaching the clamp filter



Attach the clamp filter supplied with the outdoor unit to the lower outdoor fan motor lead wire.

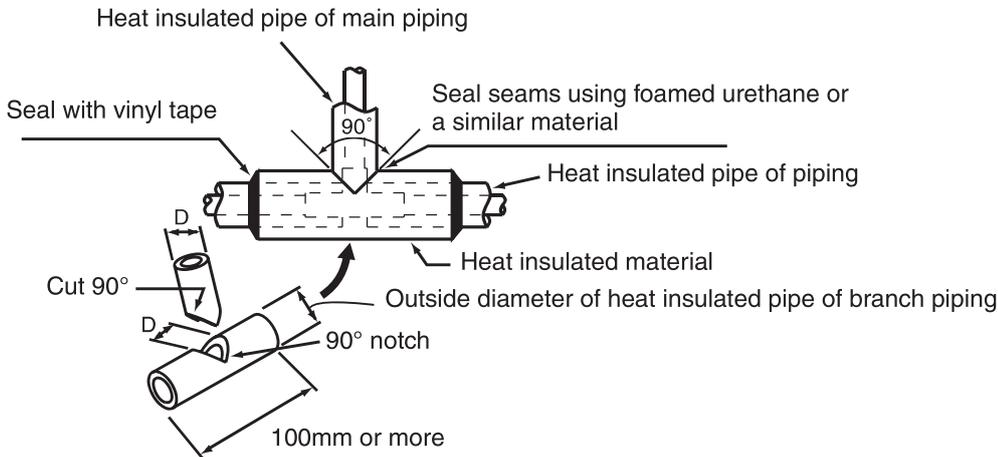
- Make sure that the claw of the clamp filter is securely locked.
- Pass the banding band supplied with the outdoor unit through the upper hole of the clamp filter to clamp it together with the fan motor lead wire.
- The fan motor lead wires are connected to the connectors CN301 and CN300 on the P.C. board of the outdoor unit.

4 PIPING HEAT INSULATION

Heat insulation was produced locally.

Be certain to heat insulate the piping both on the liquid and gas sides.

- Use heat insulating materials for piping higher than 120 degree in heat resistance.
Example: EPT - Ethylene, propylene, terpolymer
- Heat insulate the branch pipe sections using fitting covers (for tees) more than 10mm in thickness or processing thermal insulation materials as follows.
(Heat insulation materials for the branch pipes are not supplied as accessories.)
- Seal the branch pipe sections tightly without producing gaps



5 TEST RUN

Be certain to conduct a test run in accordance with the procedures contained in the operating and installation instructions supplied with the indoor units.

6 DELIVERY TO CUSTOMER

- Make certain to hand over the instruction manual supplied with the indoor units to the customer.
- Deliver the system after thoroughly explaining the contents of the instruction manual.
It is important to explain to the customer in details about simultaneously starting and stopping the two indoor units by operating one remote controller switch.

7 INDOOR UNIT OPERATION WHEN CONNECTED TO MULTIPLE UNITS

Group combination

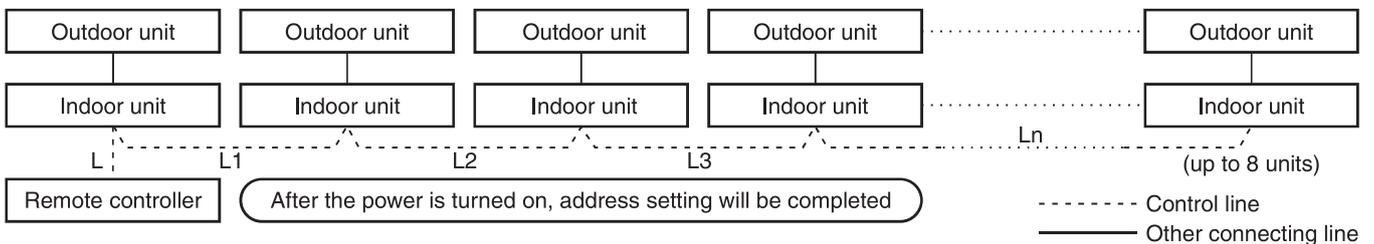
When executing group control on multiple unit system

Group control of up to 8 units is available with single remote controller.
Use wired remote controller for group control.

- For wiring and wiring procedures for individual system (using the same refrigerant), refer to the installation manual of each combination.
- Wiring between systems should be done by the following procedures:
Connect the remote-controller terminal plate (A, B) on the indoor unit, to which the remote controller is connected, to the terminal plate (A, B) on each of other indoor units by linking them with each other with remote controller wiring.
- Automatic address setting commences when the power is turned on. After 3 minutes, "SETTING" will be indicated on the display panel to show that the address is being set.

Automatic address setting takes approximately 5 minutes until completion.

(Group Control of Single System)



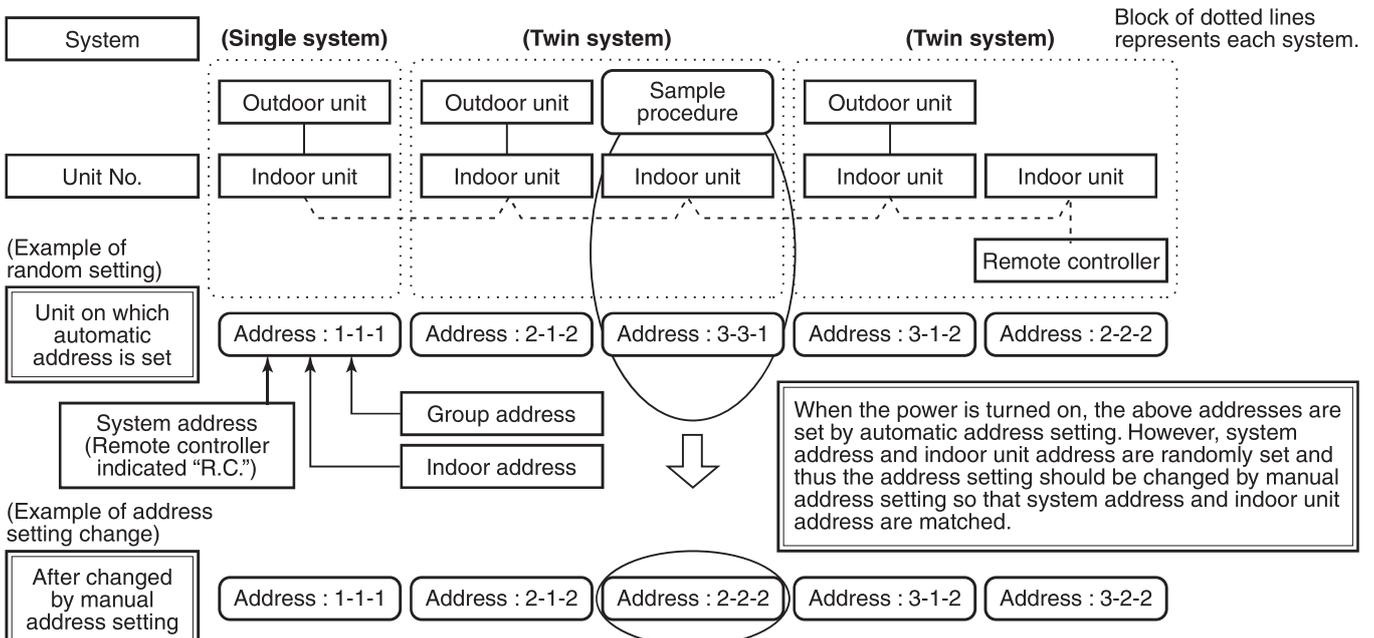
- Length of wires for remote controller (L) should be 200 m (in case of using wireless remote receiver), 300 m (another controller) or less.
- Length of wires for remote controller should be 200 m or shorter in total (i.e., $L_1 + L_2 + \dots + L_n$).

NOTE

Some group control system configuration requires manual address change after automatic address setting.

- System configuration that requires address change is the combined system where twin and triple system of multiple units are controlled by group control with single remote controller.

(Group Control on Combined System) (For example)



- Change and check of address should be carried out by the following procedures.