NORTEK GLOBAL HVAC, LLC

V5 HR Heat Recovery Cooling and Heating Mode Exchanger

Owner's Manual

Heat Recovery

Models:
V5BV-R1K
V5BV-R4K
V5BV-R8K

- Please read this owner's manual carefully before operation and retain it for future reference
- Specifications & illustrations subject to change without notice or incurring obligations

Preface

For correct installation and operation, please read this manual carefully. Before reading the manual, please note that:

(1) The design standard of multi VRF system conforms to national standard.

(2) To ensure safety when operating this system, please strictly follow the instructions in this manual.

(3) The total capacity of running indoor units must not exceed that of the outdoor units.

(4) Make sure that this manual is kept for future reference.

(5) In case of malfunction, please check the following items and contact a qualified service technician as soon as possible.

1） Air conditioner's nameplate (model, cooling capacity, product code, ship date)

2） Malfunction status (detail description of conditions before and after malfunction occurs)

(6) All units have been strictly tested and proved to be qualified before shipment. To avoid damage or operation failure which may be caused by improper service, please contact a qualified technician for service or maintenance.

(7) All graphics and information in this manual are only for reference. Manufacturer reserves the right for changes in terms of sales or production at any time and without prior notice.

(8) Under standby status, the unit will use a little power when not running for normal communication and preheating of refrigerant. If the unit won't be used for an extend period of time, turn off the power of the complete unit. However, the compressor will require preheating the next time it is used

Children are not allowed to play on or near this equipment

Correct Disposal of this product: This marking indicates that this product should not be disposed with other household wastes. To prevent possible harm to the environment or human health from uncontrolled waste disposal, recycle it responsibly.

Contents

1 Safety Precautions

WARNING
(1) Follow this instruction to complete the installation work. Please read this manual carefully before unit startup and service.
(2) Wire size of power cord should be sufficient to handle voltage. A damaged power cord and connection wire should be replaced by appropriate size cable.
(3) After connecting the power cord, please secure the electric box cover properly in order to avoid accident.
(4) Never fail to comply with the nitrogen charge requirements. Charge nitrogen when welding pipes.
(5) Never short circiut or cancel the pressure switch to prevent unit damage.
(6) Connect the wired controller before energization, otherwise wired controller cannot be used.
(7) Before using the unit, please check if the piping and wiring are correct to avoid water leakage, refrigerant leakage, electric shock, or fire etc.
(8) Do not insert fingers or objects into air outlet/inlet grille.
(9) Open the door and window and keep good ventilation in the room to avoid oxygen deficit when the gas/oil supplied heating equipment is used.
(10) Never start up or shut off the air conditioner by directly plugging or unplugging the power cord.
(11) Turn off the unit after it runs at least five minutes; otherwise it may damage the compressor.
(12) Do not allow children operate this unit.
(13) Do not operate this unit with wet hands.
(14) Turn off the unit or cut off the power supply before cleaning, otherwise electric shock or injury may occur.
(15) Never spray or flush water towards unit, otherwise malfunction or electric shock may occur.
(16) Do not expose the unit to the humid or corrosive conditions.
(17) Under cooling mode, please don't set the room temperature too low and keep the temperature difference between indoor and outdoor unit within 5°C (41°F).
(18) User is not allowed to repair the unit. Faulty service may cause electric shock or fire. Please contact a qualified service technician for help.
(19) Before installation, please check if the power supply matches requirements specified on the nameplate. \
(20) Installation should be conducted by dealer or qualified personnel. Please do not attempt to install the unit by yourself. Improper handling may result in water leakage, electric shock or fire etc.
(21) Be sure to use the aproved accessories and parts to prevent the water leakage, electric shock and fire.
(22) Make sure the unit can be grounded properly and to avoid electric shock. Please do not connect the ground wire to gas pipe, water pipe, lightning rod or telephone line.
(23) Connect power to the unit 8 hours before operation. Do not cut off the power if the unit will not be used for a short period of time (i.e. overnight) to protect the compressor.
(24) If refrigerant leakage occurs during installation, please ventilate immediately. Toxic gas will result if the refrigerant gas contacts spark or open flame..
(25) Volatile liquid, such as paint thinner or gasoline will damage the unit appearance. Only use soft cloth with a little mild detergent to clean the outer casing of unit.
(26) If anything abnormal happens (such as burning smell), please power off the unit and cut off the main power supply, and then immediately contact a qualified service technician. If unit continues to run, it might be damaged and lead to electric shock or fire.

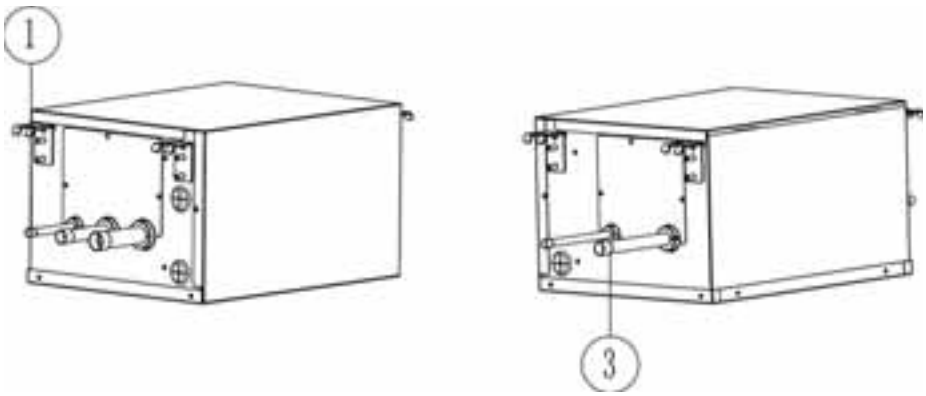
Manufacturer will not assume responsibility for any personal injury or property loss caused by

improper installation, improper test running, unnecessary repair,or not following the instructions of this manual.

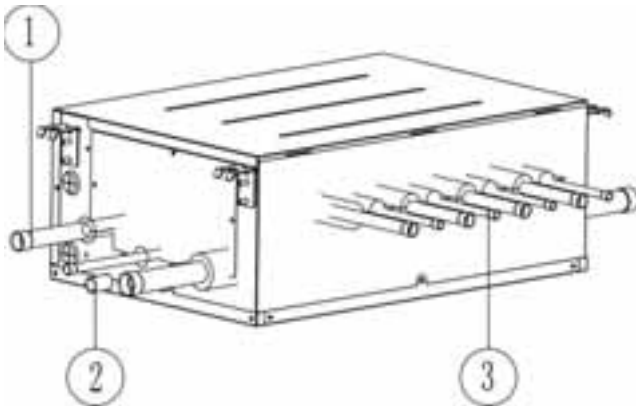
2 Product Introduction

2.1 Names of Main Parts

One-to-one Cooling and Heating Mode Exchanger



One-to-more Cooling and Heating Mode Exchanger



No.	①	②	③
Name	Connection pipe of outdoor unit	Drainage pipe	Connection pipe of indoor unit

2.2 Parameter table：

Model	Unit	NCHS1B(U)	NCHS4B(U)	NCHS8B(U)
Rated voltage	V	208-230V	208-230V	208-230V
Max. quantity of connecting indoor unit	-	8	32	64
Max. branch quantity of connecting indoor unit	-	1	4	8
Max. quantity of connecting indoor unit for each branch	-	8	8	8
Max. total capacity of connecting indoor unit for each branch	kW(kBtu/h)	14(47.77)	14(47.77)	14(47.77)
Total capacity of connecting indoor unit for mode convertor	kW(kBtu/h)	14(47.77)	45(153.55)	68(232.03)
Size of high pressure gas pipe (mode convertor connects outdoor unit)	mm(inch)	16(5/8)	22(7/8)	22(7/8)
Size of low pressure gas pipe (mode convertor connects outdoor unit)	mm(inch)	22(7/8)	28(1-1/8)	28(1-1/8)
Size of liquid pipe (mode convertor connects outdoor unit)	mm(inch)	9.52(3/8)	12(1/2)	16(5/8)
Size of liquid pipe (mode convertor connects indoor unit)	mm(inch)	16(5/8)	16(5/8)	16(5/8)
Size of gas pipe (mode convertor connects indoor unit)	mm(inch)	9.52(3/8)	9.52(3/8)	9.52(3/8)

3 Preparation before installation

Caution！

The product photos are only for reference. The unit for size is mm, except otherwise stated.

3.1 Standard Accessory

Please use below provided standard parts according to requirement.

No.	Name	Photo	Q'ty	Purpose
1	M10X8 Nut with washer M10X8		4	Used for hanging indoor unit
2	Nut M10 (hexagon nut M10X8.4)		4	Used for hanging indoor unit
3	Washer 10 (spring washer M10X2.6)		4	Used for hanging indoor unit
4	High-tenperature fastener		8	Wrap sponges at the connection position
5	Installation template	/	1	Use for drilling holes at the ceiling
6	M4X12 (green bonding screw M4X12)		1	use for connecting the earthing cord

The packed attachments should be subject to actual objects. If there are any alterations, there will be no further notice.

3.2 Installation Site

(1) Make sure the hanging parts can hold the weight of unit.
(2) Water can be drained out from the drainage hose conveniently.
(3) No obstacles at outlet and inlets. Keep the air ventilation in good condition.
(4) For indoor unit (as shown in below fig) and the space used for maintenance should be ensured.
(5) Please keep the unit away from those positions where there's thermal source, inflammable gas and smog.
(6) The unit is the cassette type (concealed type).
(7) Indoor unit, outdoor unit, power cord and connection cord should be kept 1m (39.37inch) above away from TV and radio for preventing graphic interference and noise. (Even the distance is 1m (39.37inch), if there's strong electric wave, there's still noise).

Unit：mm(inch)

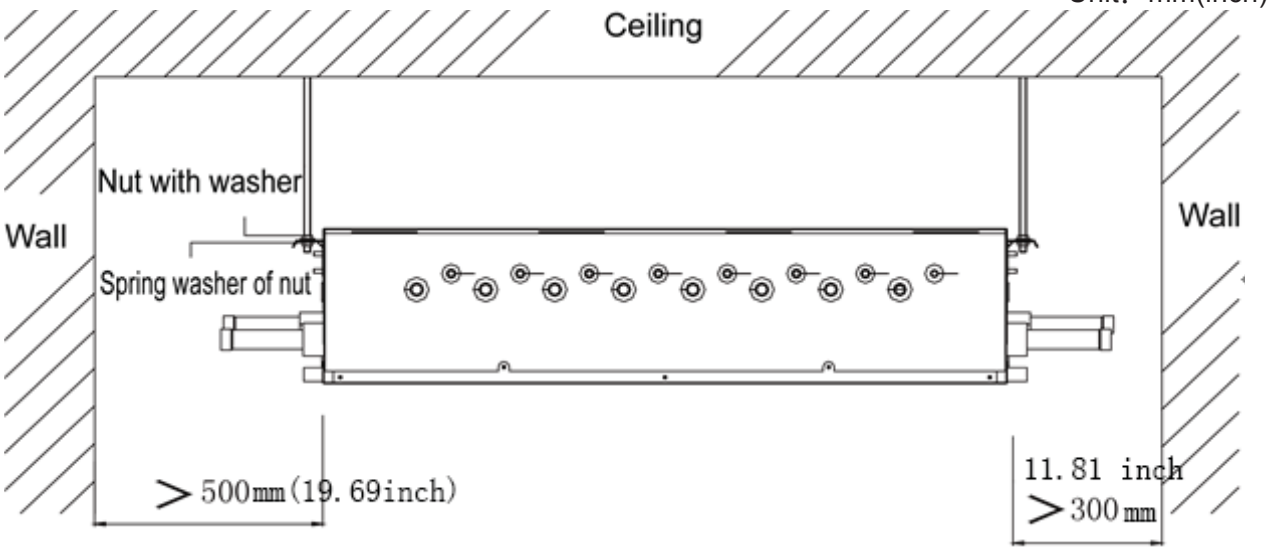


Fig. 3.1

Caution:

① The installation of the unit must comply with national and local safety regulations.
② Users can't install the unit, because the installation quality will affect the operation. After purchasing the unit, please contact with dealer. The unit must be installed and debugged by professional installer.
③ The unit can be put through power only after all installation work is finished.

3.3 Selection Requirement for Communication Wire

Caution:

If the unit is installed at the place where there's strong electromagnetic interference, the communication wire between indoor unit and wired controller must adopt shield wire, and the communication wire between indoor unit and indoor unit (outdoor unit) must adopt twisted wire with shielding function.

Communicaton Wire between mode exchanger and indoor unit, outdoor unit:

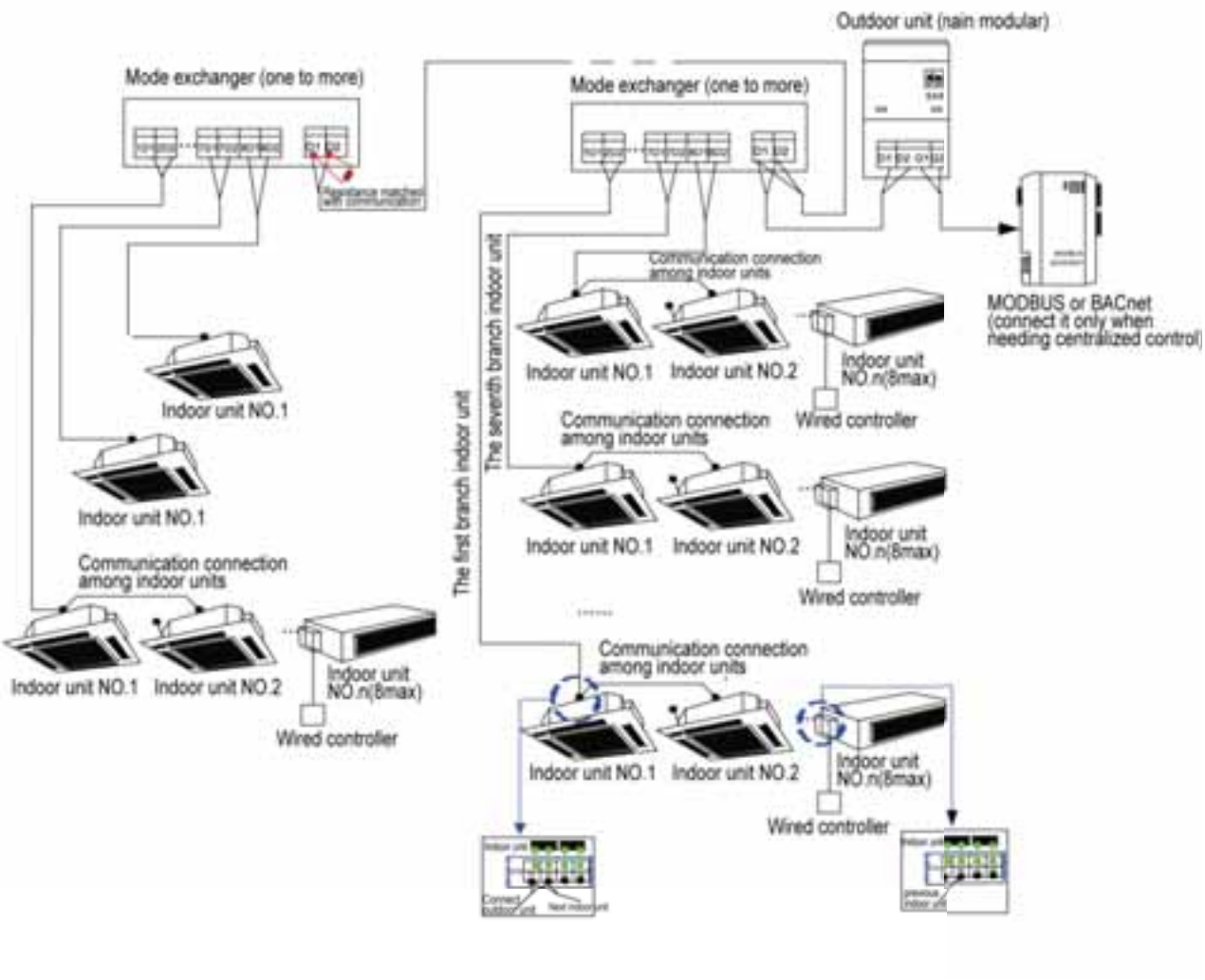


Fig.3.2

Type of wire	Total length of communication wire between indoor unit and another indoor/outdoor unit: L/m(inch)	Wire size	Remarks
Light/Ordinary polyvinyl chloride sheathed cord	L≤1000(3280-5/6)	AWG16~AWG18	① If the wire diameter is enlarged to 2 ×AWG16, the total communication length can reach 1500m (4921-1/4feet). ② The cord shall be Circular cord (the cores shall be twisted together). ③ If unit is installed in places with intense magnetic field or strong interference, it is necessary to use shielded wire.

3.4 Wiring Requirement

Model	Power	Fuse Capacity(A)	Minimum Circuit Ampacity(A)	Maximum Overcurrent Protection(A)
V5BV-R1K	208-230V 1Ph 60Hz	15	10	15
V5BV-R4K	208-230V 1Ph 60Hz	15	10	15
V5BV-R8K	208-230V 1Ph 60Hz	15	10	15

Caution:

① Above circuit breaker and power cord specification are selected according to the max power (max current).

② Specification of power cord is based on the working condition where ambient temperature is 40°C (104°F° F) and multi-core copper cable (working temperature is 90° C（194° F）, e.g. power cable with YJV cross-linked copper, insulated PE and PVC sheath) is lying on the surface of slot. If working condition changes, please adjust the specification according to national standard.

③ Specification of circuit breaker is based on the working condition where ambient temperature of circuit breaker is 40° C (104° F). If working condition changes, please adjust the specification according to national standard.

④ When installing the cut-off device next to the unit, the min space between every two levels of cut-off device should be 3mm (1/8inch) (for indoor unit and outdoor unit).

4 Installation Instruction

4.1 Installation of Cooling and Heating Mode Exchanger

4.1.1 Dimension of Outdoor Unit and Mounting Hole Position

When installing the unit, include a maintenance port (access opening) should be reserved at the electric box side of unit for maintenance. The position of maintenance port should be lower than the lower side of unit.

The mode exchanger shall be installed near the maintenance port or air return of indoor unit. (Note: if it is installed near the air return, please make sure it will not affect air return or indoor unit maintenance access).

The following pictures illustrate the installation of maintenance port and mode exchanger:

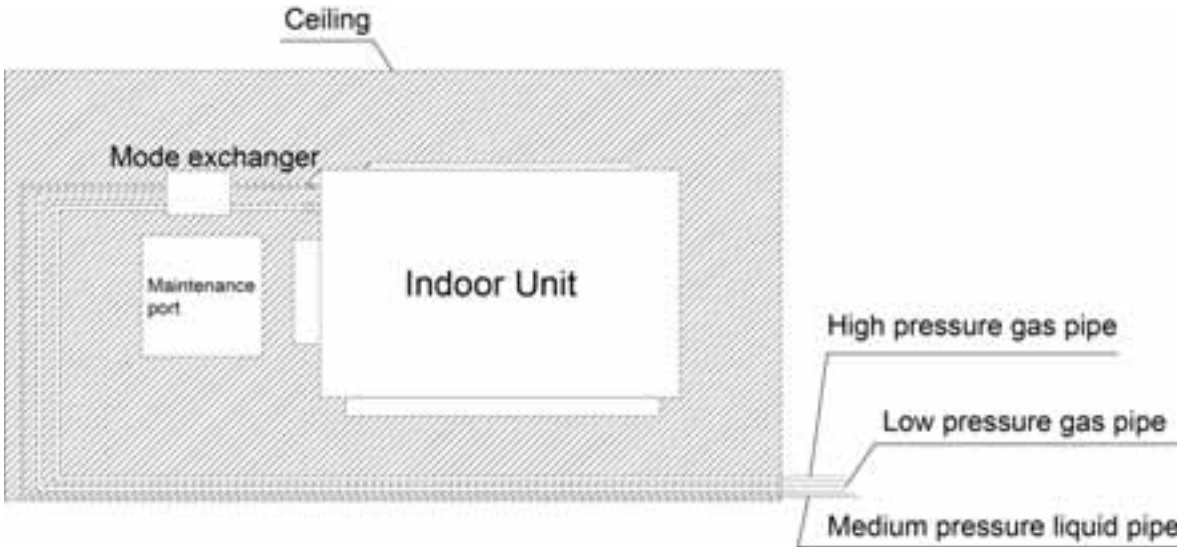


Fig. 4.1

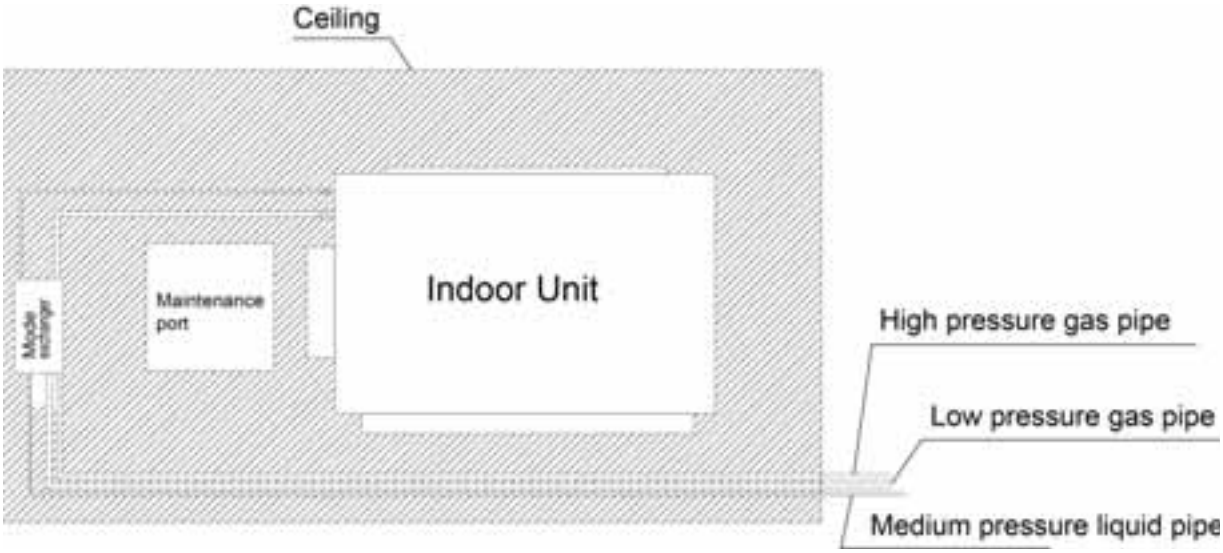


Fig. 4.2

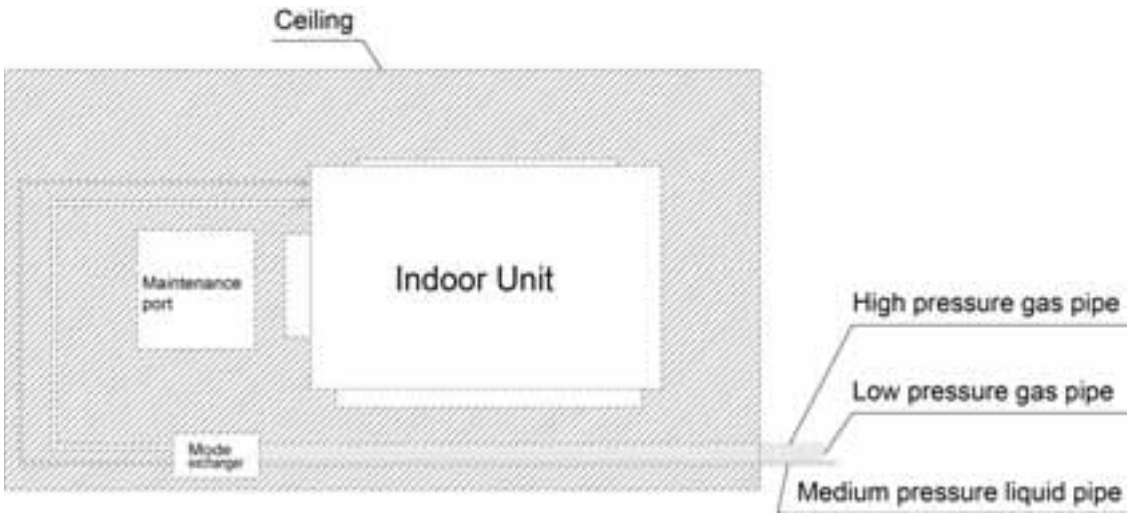


Fig. 4.3

If space restrictions require, include a separate maintenance port for mode exchanger.

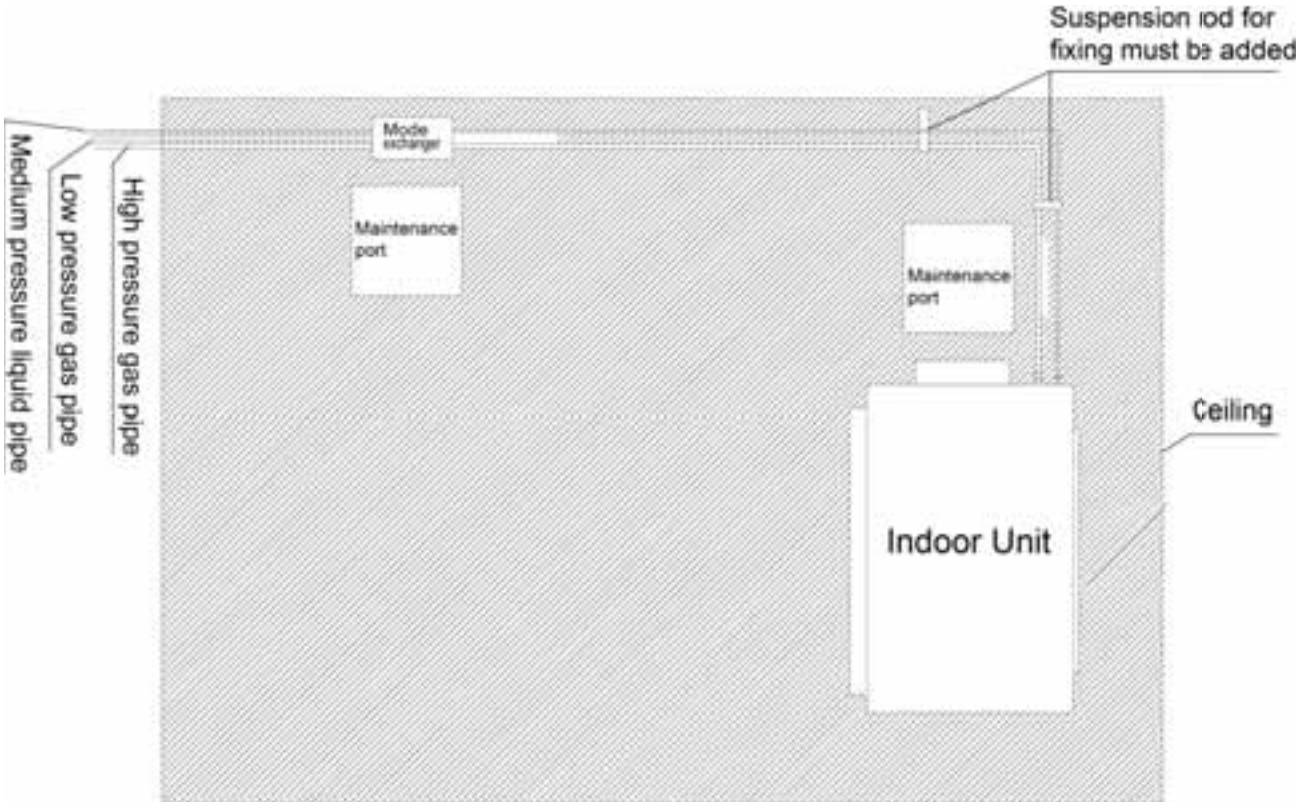


Fig. 4.4

Unit outline dimension：mm (inch)

V5BV-R1Koutline and installation dimension

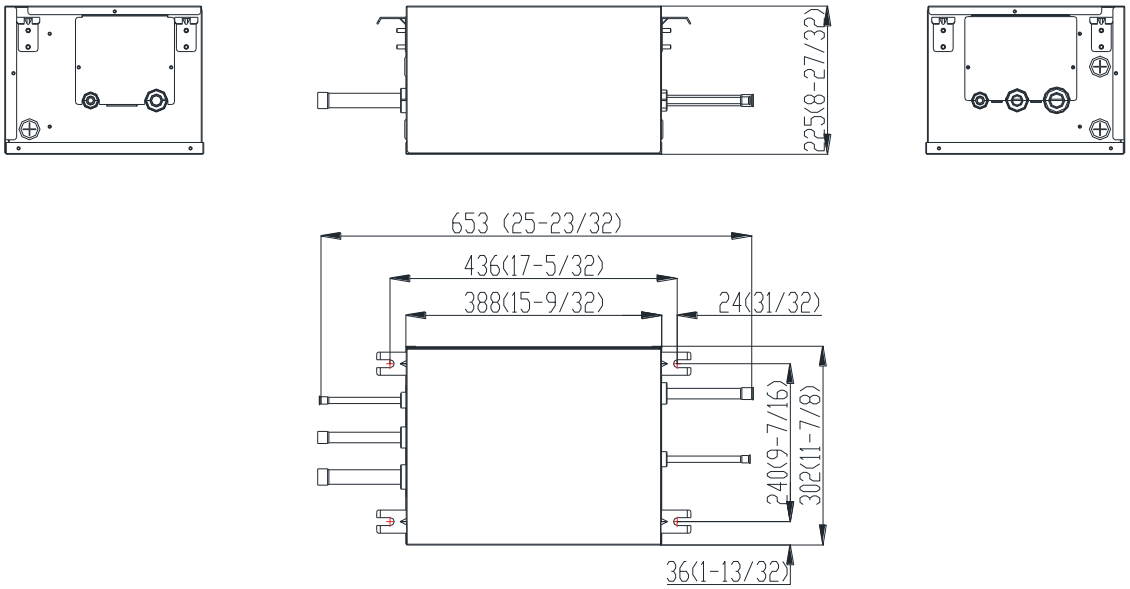


Fig. 4.5

V5BV-R4Koutline and installation dimension

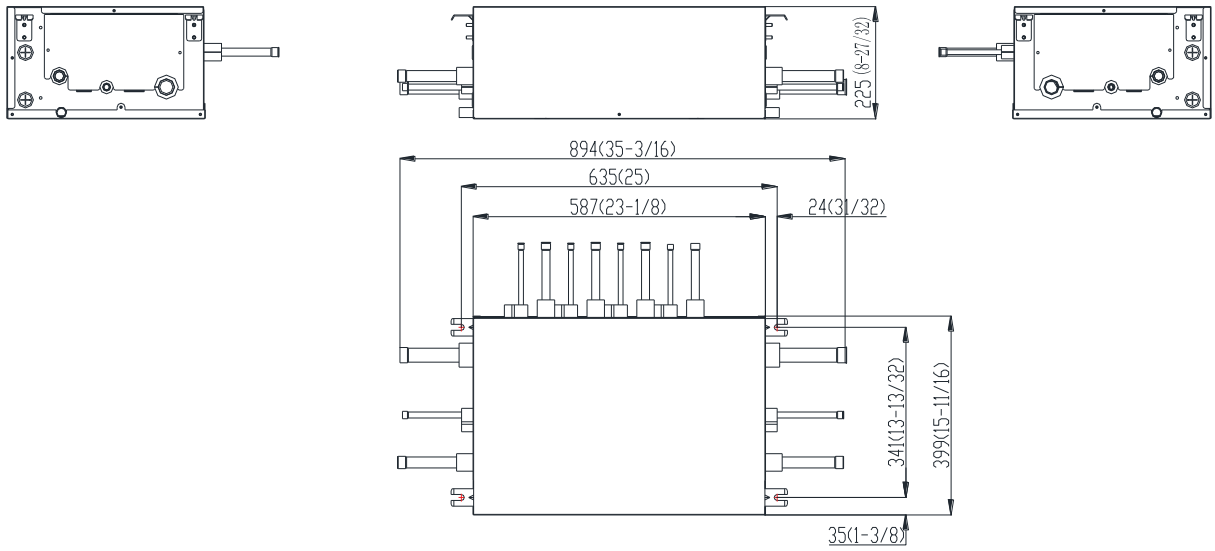


Fig. 4.6

V5BV-R8Koutline and installation dimension

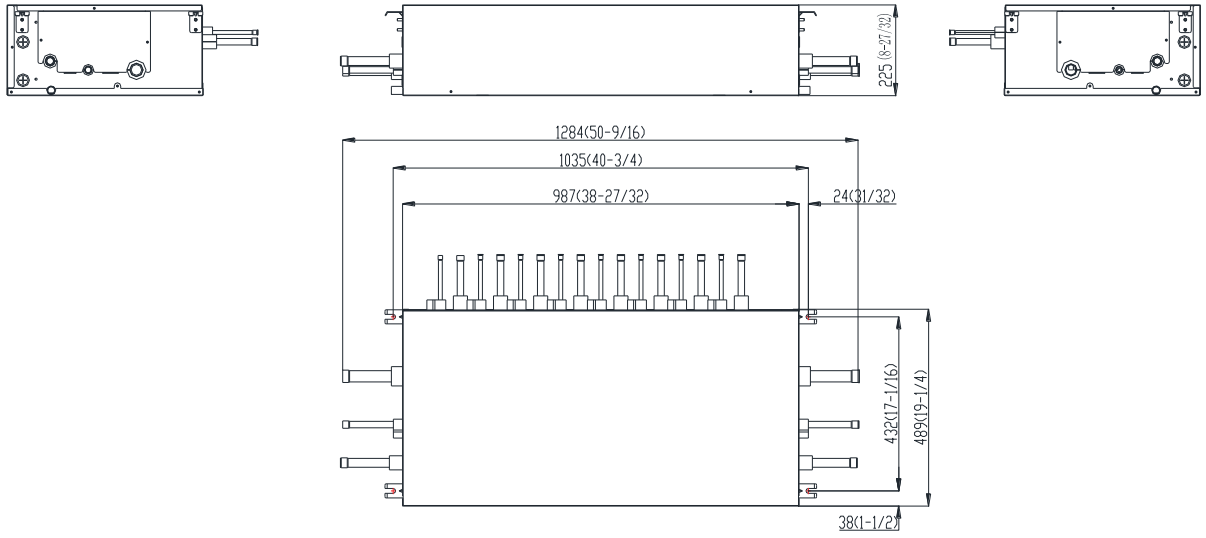


Fig. 4.7

4.1.2 Bolt Installation

(1) Attach the installation template at the installation position. Drill 4 holes at the installation position basing on the installation template as shown in Fig. 4.8. Please refer to the diameter of expansion bolt for the diameter of hole with depth of 60-70mm (2-1/2 – 2-3/4inch). As shown in Fig. 4.9.

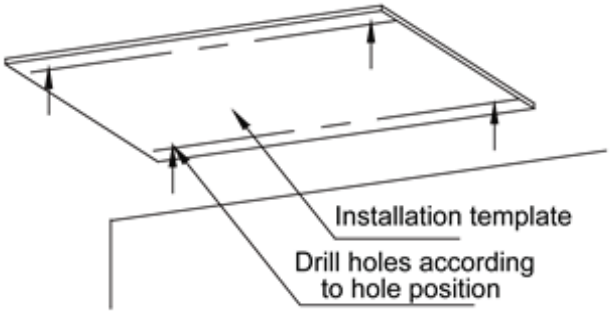


Fig. 4.8

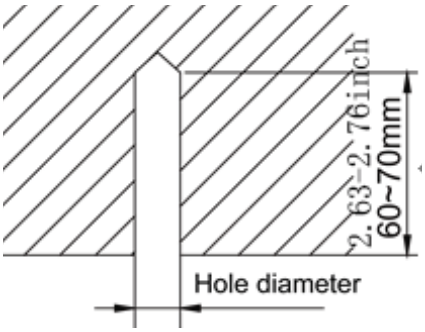


Fig. 4.9

(1) Insert M10 expansion bolt into hole, and then set the iron nail into bolt. As shown in Fig. 4.10.

Caution:

The length of bolt should be selected according to the height of room. Bolt should be purchased by the installer.

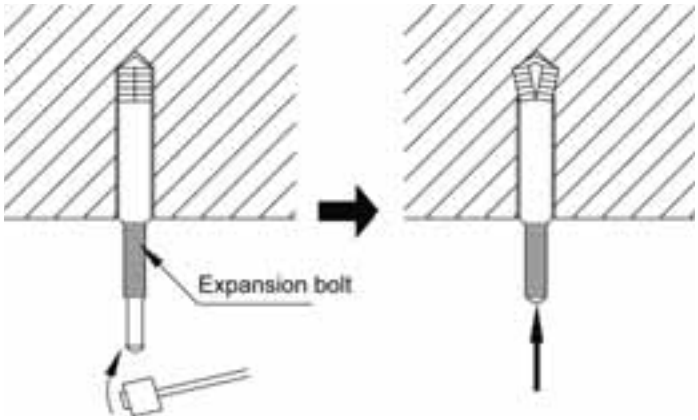


Fig. 4.10

4.1.3 Hang unit

Hang the unit at the bolt on the ceiling of room. Please use special nut for securing the unit.

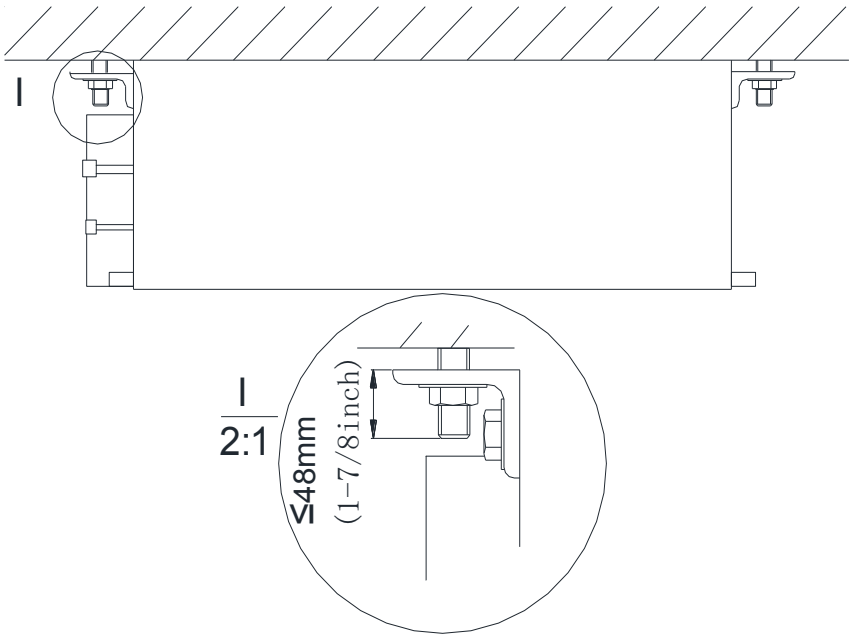


Fig. 4.11

Caution:

① Before operation, please prepare all pipelines (connection pipe, drainage hose) and wires (connection wire for wired controller, connection wire for indoor unit).

② When drilling holes on ceiling (air return outlet or air outlet), you may need to reinforce the ceiling to prevent vibration.

③ If the strength of the ceiling is not sufficient for the weight of the unit, please install a beam bracket, and then put the unit on the beam bracket.

4.1.4 Horizontal alignment

Be sure to install the unit at the proper angle. The unit should be level from front to back. From right to left the unit should slope at a 1 degree angle for condensate drainage. See Fig. 4.12.

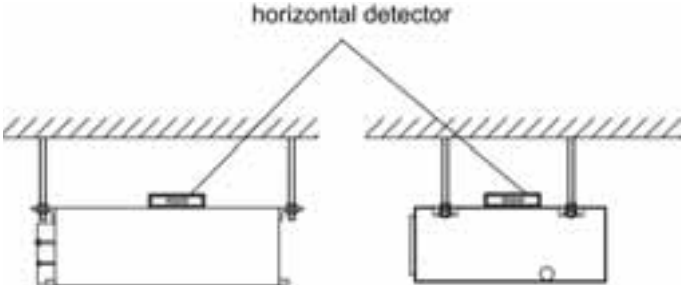


Fig. 4.12

Cautions for Installation

(1) The mode exchanger must be installed by using hanger rod. During installation, the components must be kept vertically upright according to the indicated direction;

(2) During installation, sufficient clearance should be maintained for service or removal of components. The pipe should not be jammed between the components.

(3) The distance of the component to the indoor unit along the pipe shall not be more than

5000mm (16 feet);

(4) The component must be installed in a straight line to the inlet pipe and branch pipe (See schematics below):

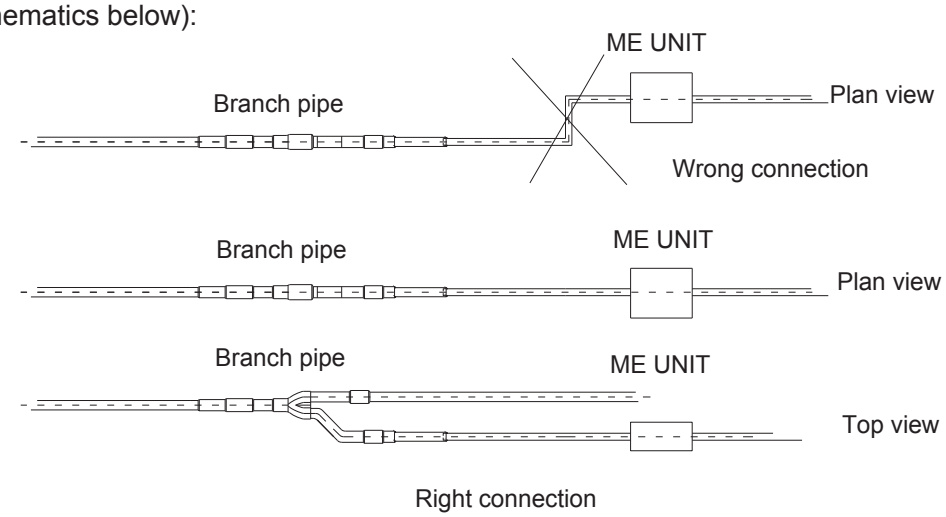


Fig. 4.13

4.2 Pipe Connection

4.2.1 Precautions for the Installation of Connection Pipe

(1) Please comply with the following rules during pipe connection: Connection pipe should be as short as possible. The height difference between indoor and outdoor units should also be short as possible. Keep the pipe bends as few as possible and the bend radius as large as possible.

(2) Install the connection pipes by welding. Please strictly follow the requirements for welding process. Rosin joints, weak joints or pin holes are not allowed.

(3) When laying the pipe, be careful not to distort it. Radius of bending parts must be over 200mm (8inch). Please do not bend or stretch the pipes frequently, otherwise the pipes will become brittle. A pipe shall not be bent or stretched for more than 3 times at the same position.

(4) Please use torque wrench to connect the union nut of indoor unit. See below fig.

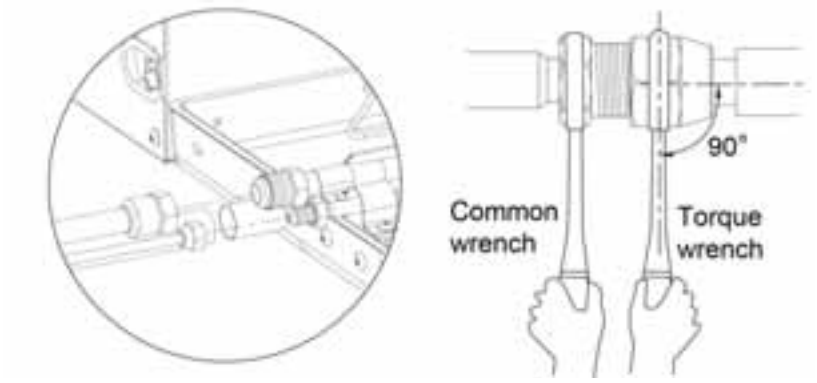


Fig. 4.14

1) Align the flared outlet of copper pipe with the center of screw, and then tighten the flared nut by hand.
2) Use torque wrench to tighten the flared nut until you hear it click.
3) Wrap the connection pipe (not insulated) and joint with sponge and then use plastic adhesive

tape to secure it.

4) Support the connection pipe with bracket.
5) If the degree of curvature of pipe is too small, the pipe may break. Installer should use pipe bender to bend the pipe.
6) When connecting pipe to indoor unit, do not forcibly pull on the pipe. Otherwise, capillary or other pipes of indoor unit may be broken.

4.2.2 Selection of Y-type branch

When connecting an outdoor unit to multiple mode exchanger, the Y-type branch should be used.

(1) Y-type branch

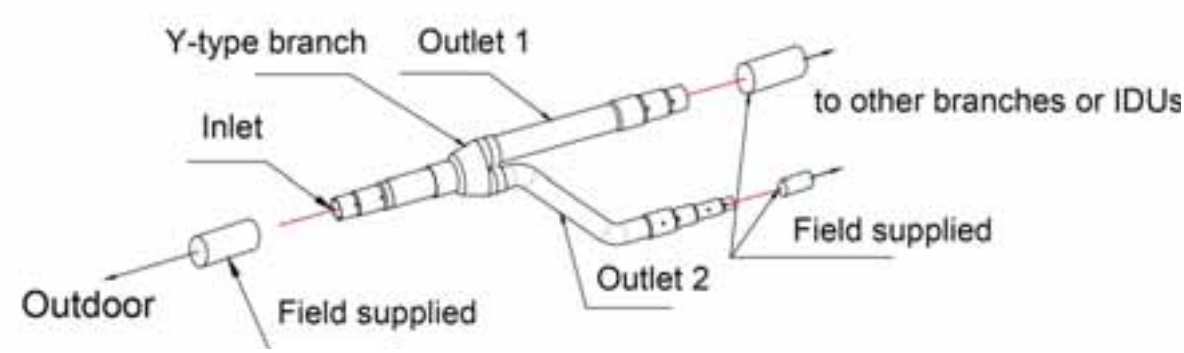


Fig. 4.15

(2) Y-type branch has several pipe sections with different size, which facilitates matching with various copper pipe sizes. Use pipe cutter to cut in the middle of the section that is the proper size and remove burrs. See the following figure.

(3) Y-type branch must be installed vertically or horizontally.

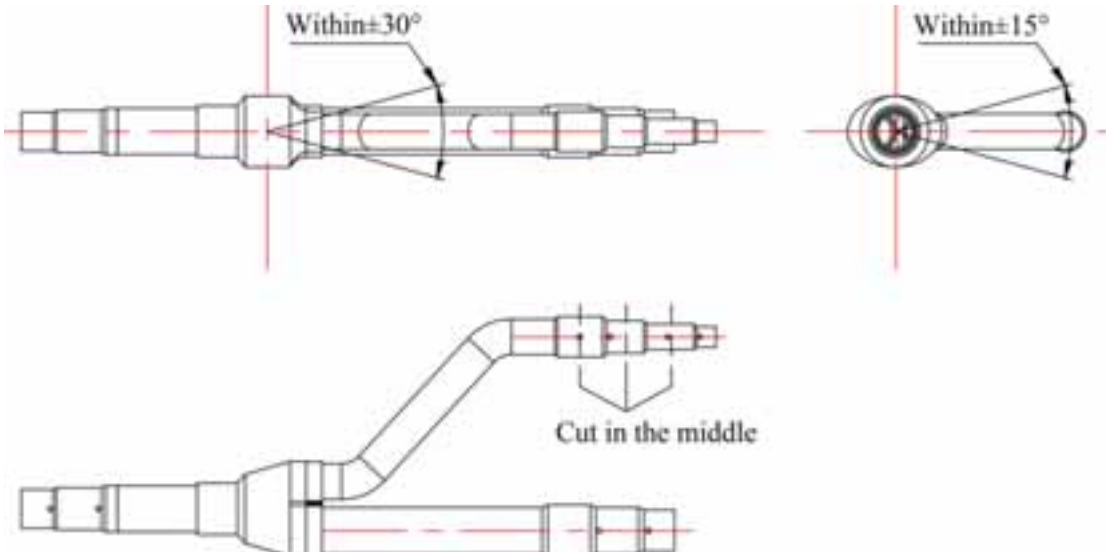
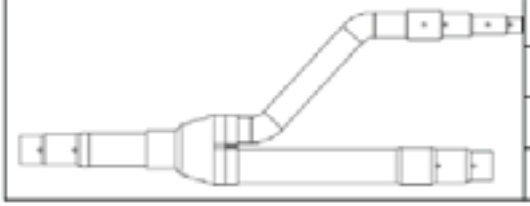


Fig. 4.16

Y-type manifold	Total capacity of downstream indoor unit(s) C (KBtu/h)	Model
	C≤68	FQ01A/A
	68<C≤102	FQ01B/A
	102<C≤239	FQ02/A
	239<C	FQ03/A

(4) Branch must be insulated with material that can withstand at least 120° C (248° F). The attached foam of branch cannot be used as insulating material.

4.2.3 Thermal insulation for pipeline

(1) For multi VRF system, every copper pipe should be labeled so as to avoid misconnection.

(2) At the branch inlet, leave at least 500mm (18 inches) straight pipe section. For FQ04 branch, leave at least 800mm (32 inches) straight pipe section.

(3) Thermal insulation for pipeline

1) To avoid condensate or water leak on the connection pipe, the gas pipe and liquid pipe must be wrapped with thermal insulating material and secured by adhesive tape.

2) Thermal insulating material shall be able to withstand the pipe temperature: For heat pump unit, liquid pipe should withstand at least 70° C (158° F) and gas pipe should withstand at least 120° C (248° F). For cooling only unit, both liquid pipe and gas pipe should withstand at least 70° C (158° F). Example: Polyethylene foam (rated to at least 120° C(248° F)); foaming polyethylene (rated to at least 100° C(212° F))

3) Joints of indoor and outdoor unit should be wrapped with insulating material leaving no gap. See Fig. 4.17.

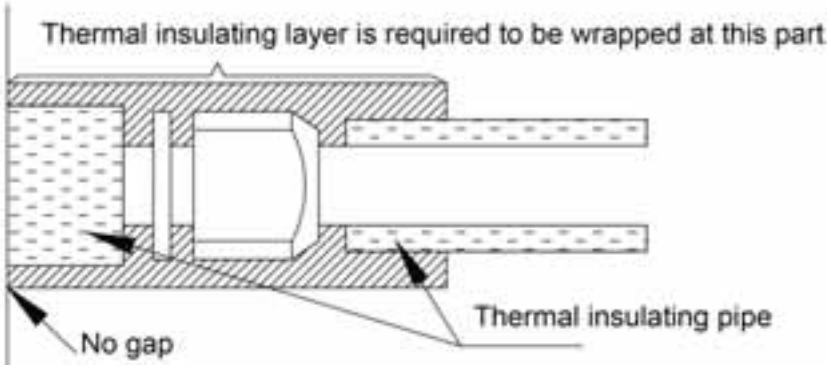


Fig. 4.17

4) Thermal insulating material of branches should be the same as that of the pipeline. The attached foam of branches cannot be used as insulating material.

5) When wrapping the tape, each layer should overlap ½ of the width of the previous layer. Don't wrap the tape too tightly or the insulation effect will be weakened.

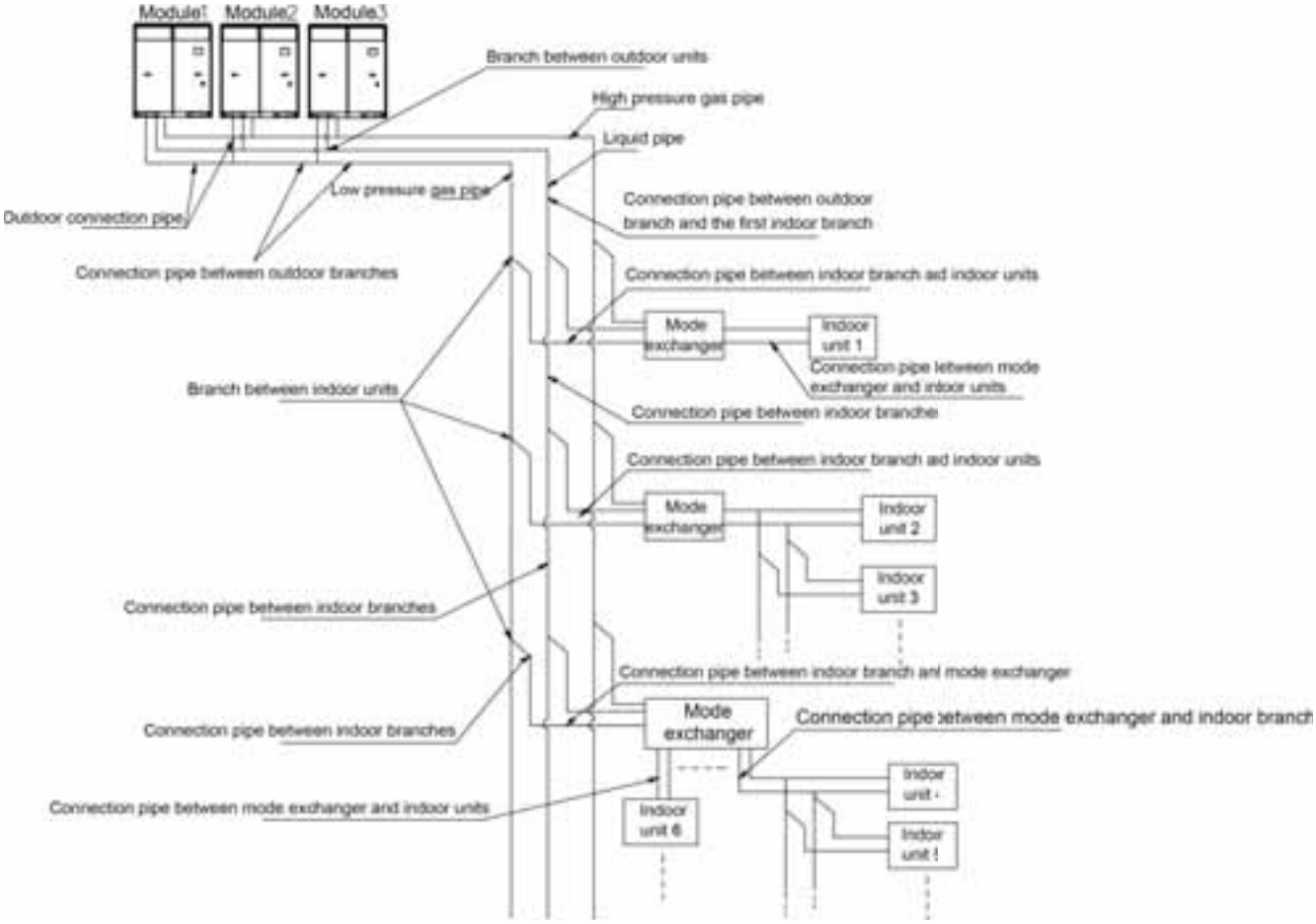
6) After wrapping the pipe, apply sealing material to completely seal the hole in the wall.

4.2.4 Support and protection of pipeline

(1) Support should be made for hanging connection pipe. Distance between each support cannot be over 1m (39 in.).

(2) Precaution should be made against accidental damage of outdoor pipeline. If pipeline exceeds 1m (39 in.), a pinch plate should be added for protection.

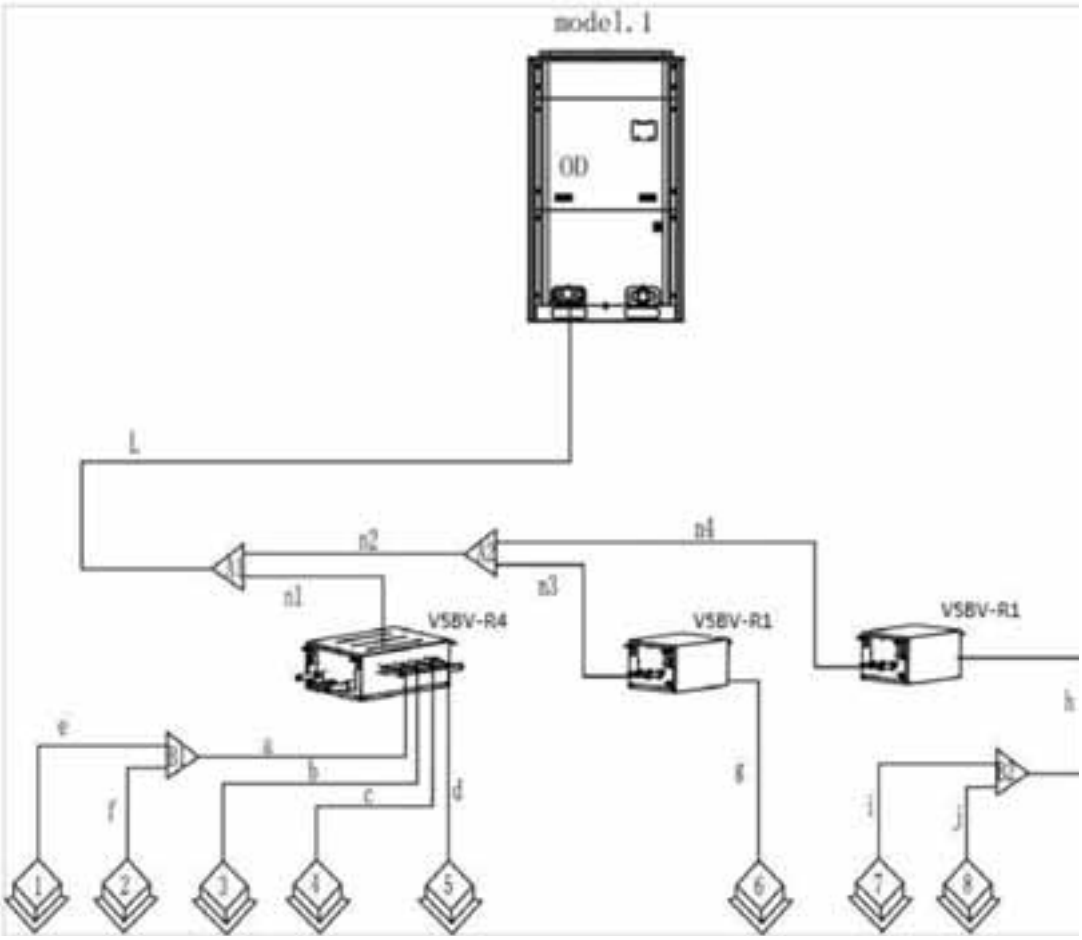
Schematic diagram of piping connection：



4.2.5 Connection of indoor unit

4.2.5.1 Connection for single indoor unit with capacity of less than 14kW (48MBH)

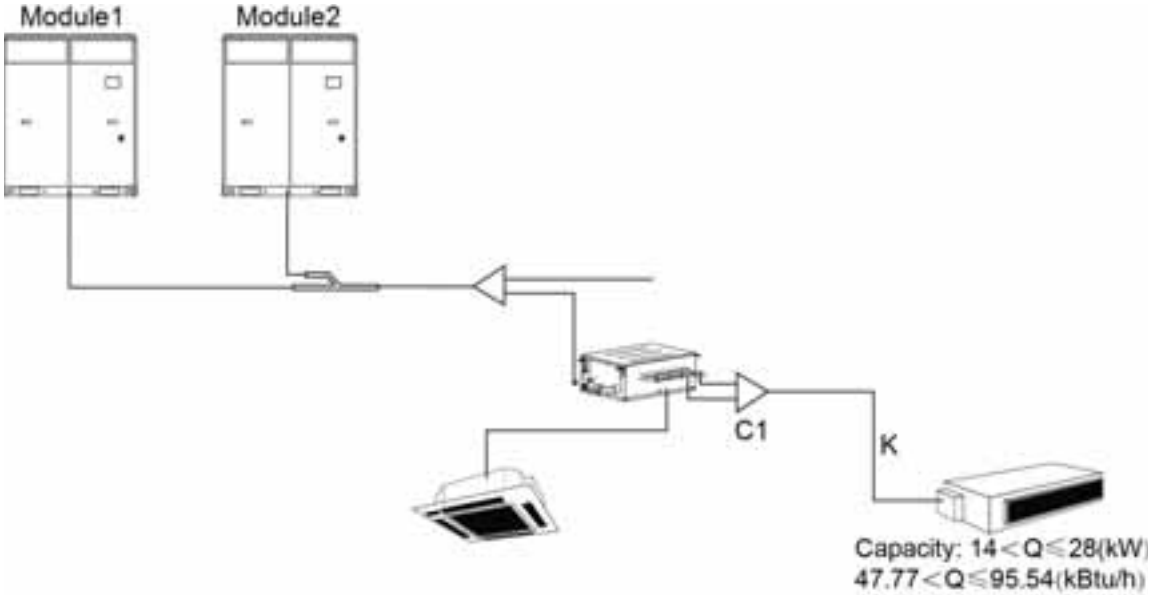
Each branch is to connect to a set of indoor units of the same type. If a branch does not connect to an indoor unit, make sure that the welding is reliable and will no leak refrigerant.



4.2.5.2 Connecting method for indoor unit with capacity of over 14 kW (48MBH)

When connecting to the indoor unit with capacity of over 14 kW (48MBH), do not connect with only one branch; two branches must be used controlled by the same mainboard for parallel connection. Parallel connection can be arranged as below: branch 1 and branch 2 are connected in parallel, branch 3 and branch 4 are connected in parallel, branch 5 and branch 6 are connected in parallel, branch 7 and branch 8 are connected in parallel. No other connection arrangement can be used. Note: after connection, manually set the SA2 dip switch of corresponding mainboard, and turn off dip switch in first position.

Connecting method is as shown in the picture:



4.2.6 Branch selection of indoor unit of mode exchanger (“C1”)

R410A refrigerant system	capacity of downstream indoor units: X /kW(MBH)	Model
Y-type branch	14.0(47.77)＜X≤28.0(95.54)	FQ01B/A

4.2.7 Piping size between mode exchanger and downstream indoor unit (“k”)

Size of connection pipe between indoor branch and indoor unit should be consistent with the connection pipe of indoor unit.

Piping between indoor branch and indoor unit “k”

Rated capacity of indoor units: c/kW(MBH)	Size of connection pipe between indoor branch and indoor unit	
	Gas pipe /mm(inch)	Liquid pipe /mm(inch)
14.2(48.45)＜c ≤22.4(76.43)	Φ19.05(3/4)	Φ9.52(3/8)
22.4(76.43)＜c≤28.0(95.54)	Φ22.2(7/8)	Φ9.52(3/8)

4.3 Drainage Hose Installation and Test

4.3.1 Precautions

(1) Drainage hose should be as short as possible. The drainage hose should be installed at least at 1%～2% gradient for draining the condensate water.

(2) The drainage hose must be larger than or equal to the size of drainage piping.

(3) Install the drainage hose according to below figure and apply thermal insulation. Improper installation may lead to.

(4) Use normal hard PVC pipe for the drainage pipeline. Insert the end part of PVC pipe into the drainage hole, and then tighten it with drainage hose and tie line. Do not use adhesive glue to connect drainage hole and drainage hose.

(5) When the pipeline is used for multiple units, the position for the common pipeline should be

lower than the drain outlet of every unit 100mm (4 in.). If this is the case, thick pipes should be use.

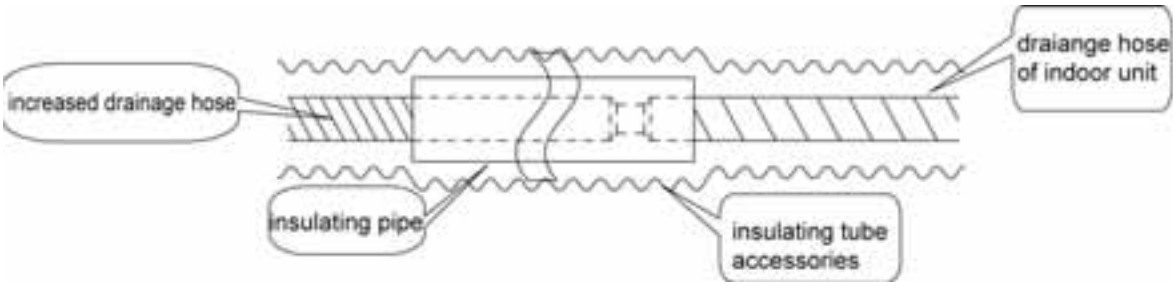


Fig. 4.18

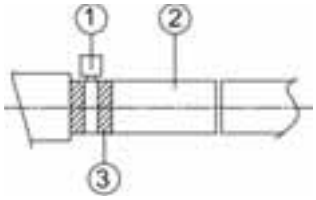


Fig. 4.19

4.3.2 Installation of Drainage Hose

(1) Insert the drainage hose into drain outlet and then secure it with adhesive tape.

(2) Tighten the pipe clamp to make the distance between screw cap and hose less than 4mm (3/16 in.).

① Metal clip (accessory)

② Drainage hose (accessory)

(3) Apply thermal insulation for Pipe clamp and hose with gasket.（apply the thermal insulation after the drainage system test is finished as shown in Fig. 4.20..

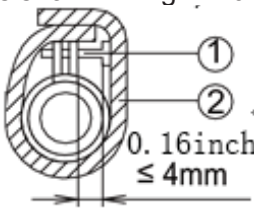


Fig. 4.20

① Metal clip (accessory)

② Insulating sponge (accessory)

(4) When multiple drainage pipe-s are connected together, install as shown in Fig. 4.21.

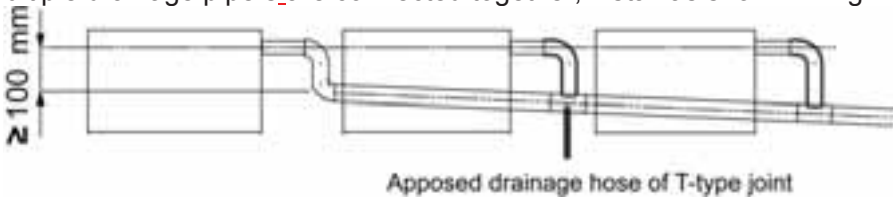


Fig. 4.21

(5) For the indoor unit with high pressure at the drainage pipe outlet, water trap must be installed.

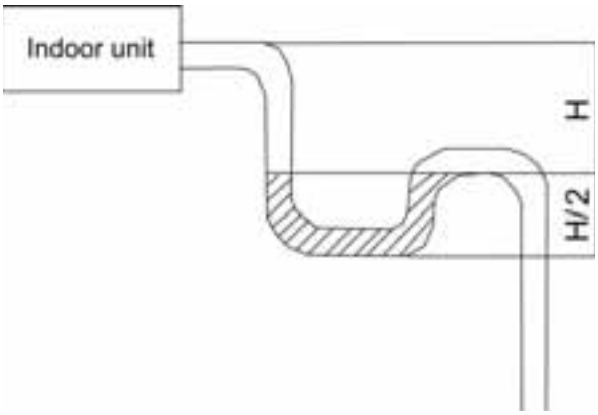


Fig. 4.22

(6) Install the U-trap as shown in Fig. 4.23.

(7) One U-trap should be installed for each unit.

(8) When installing U-trap leave sufficient clearance for cleaning and maintenance

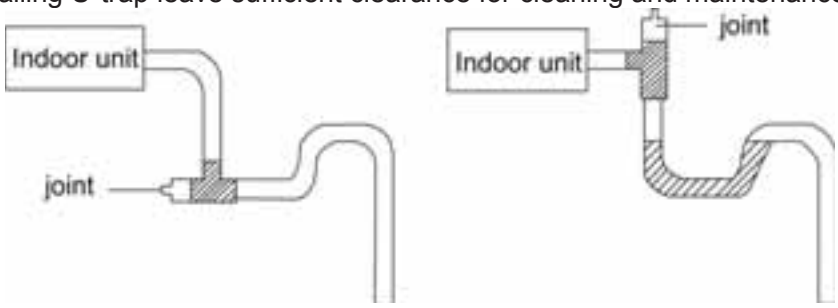


Fig. 4.23

(9) Horizontal pipe can't be connected to the vertical pipe. Please see below figure for the connection method:

Fig. 4.24: Three-way connection of drainage hose joint as shown;

Fig. 4.25: Down elbow connection as shown;

Fig. 4.26: Set into horizontal pipe as shown.

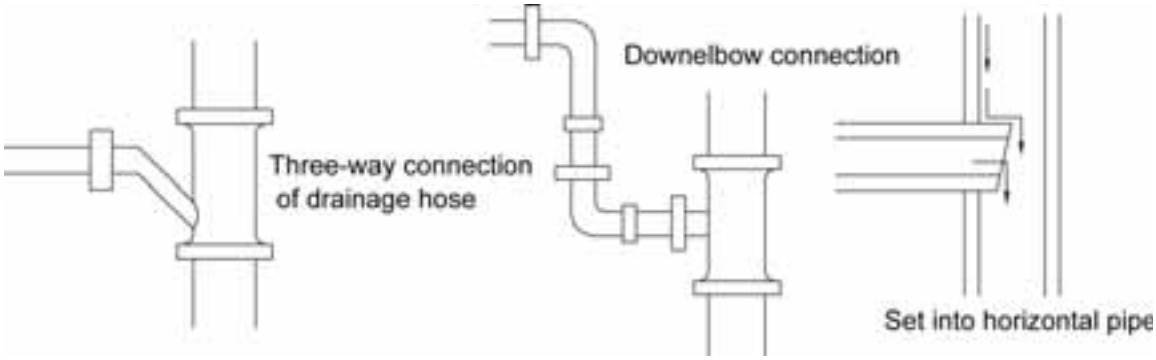


Fig. 4.24 Fig. 4.25 Fig. 4.26

(10) Drainage pipe should kept 1%～2% gradient downwards. Therefore, install a support bracket every 1000-1500mm (3-5 ft.).

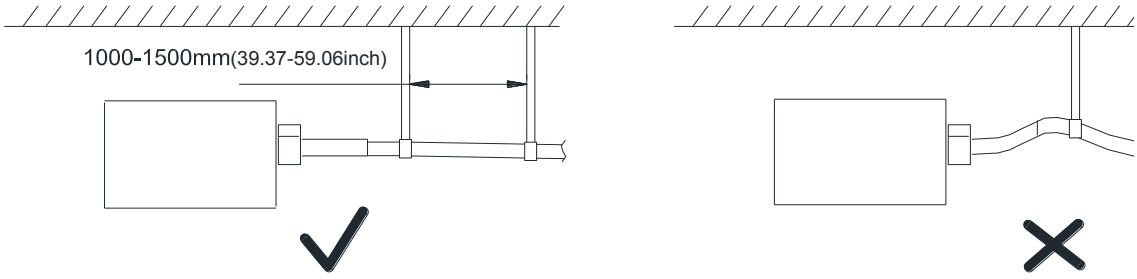


Fig.4.27

5 Cable Connection

Caution:

① Air conditioner must be grounded to prevent damage.

② Before connecting wires, please check the voltage on the nameplate and then connect wires according to wiring diagram. Improper wire connection may lead to malfunction or damage to the air conditioner.

③ Power capacity should be sufficient and the section area of wires should be 2.5 mm^2 (0.0039$inch^2$) or more.

④ Air conditioner should have dedicated power supply.

⑤ Wire according to standards and codes to ensure normal operation.

⑥ Install dedicated circuit breaker.

⑦ All wiring must use pressure terminal or single wire. Do not connect stranded wire to the wiring board directly.

⑧ Do not let cable contact refrigerant pipe, compressor or fan.

⑨ Do not tamper with the internal wiring of air conditioner. Manufacturer will not be responsible for the damage or malfunction if wiring has been modified.

⑩ If there's strong electromagnetic field, use twisted shielding wire. When connecting wires, please note that the metal shielding layer of twisted pair wire must be grounded (case) to prevent malfunction due to electromagnetic interference.

⑪Communication wire must be separated from power cord and outdoor/indoor unit connection wires.

⑫When higher pressure is needed for the project, please adjust it with wired controller. The appliance shall be installed in accordance with national wiring standards. If the supply cord is damaged, it must be replaced with an appropriate size cable.

5.1 Wiring Board Connection

(1) Connect single wire (as shown in Fig. 5.1).

1) Strip the insulation layer at the end of the single wire about 25mm (1 in.) with wire stripper to expose the single-core wire.
2) Use screwdriver to remove the terminal screw on wiring terminal board.
3) Bend the end of single wire with.
4) Attach wire to terminal board with screw.

(2) Connect stranded wire (as shown in fig. 5.2).

1) Strip the insulation layer at the end of the stranded wire about 10mm (3/8 in.).
2) Remove the screws on the wiring board of air conditioner with screwdriver.
3) Use crimping tool or pliers to attach round terminal to every strand of wire.
   Attach the terminal to the board.
4) Attach the terminal to the board.

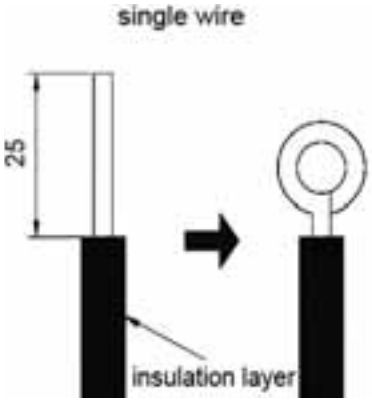


Fig. 5.1

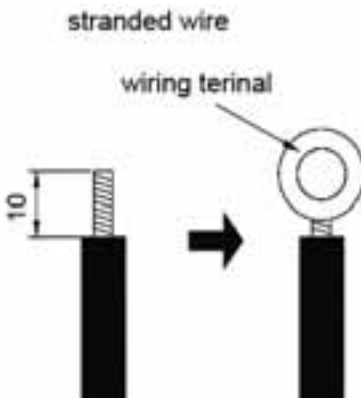


Fig. 5.2

5.2 Connect Power Cord

Caution: Each mode exchanger in the same system must be supplied power uniformly.

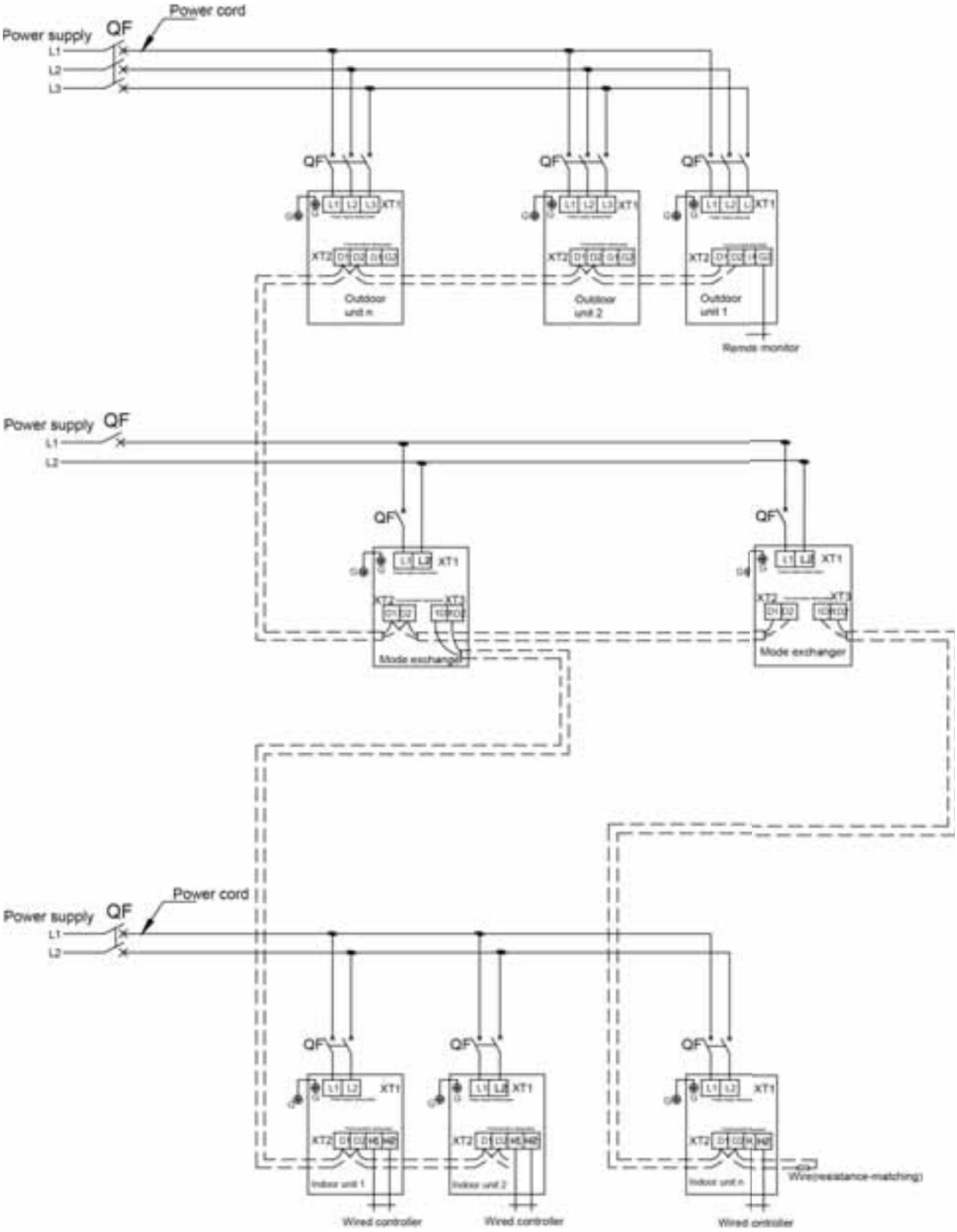


Fig. 5.3

Note: The maximum quantity “n” of indoor unit is determined by the capacity of indoor unit, please

refer to capacity of unit.

(1) Use single-phase power air conditioner

1) Remove electric box cover of indoor unit.
2) Lead the power cord through rubber ring.
3) Connect power cord to “L1, L2” terminal and grounding screw. Please use the green screw to connect the ground cord. The location is showing in the Fig 5.4

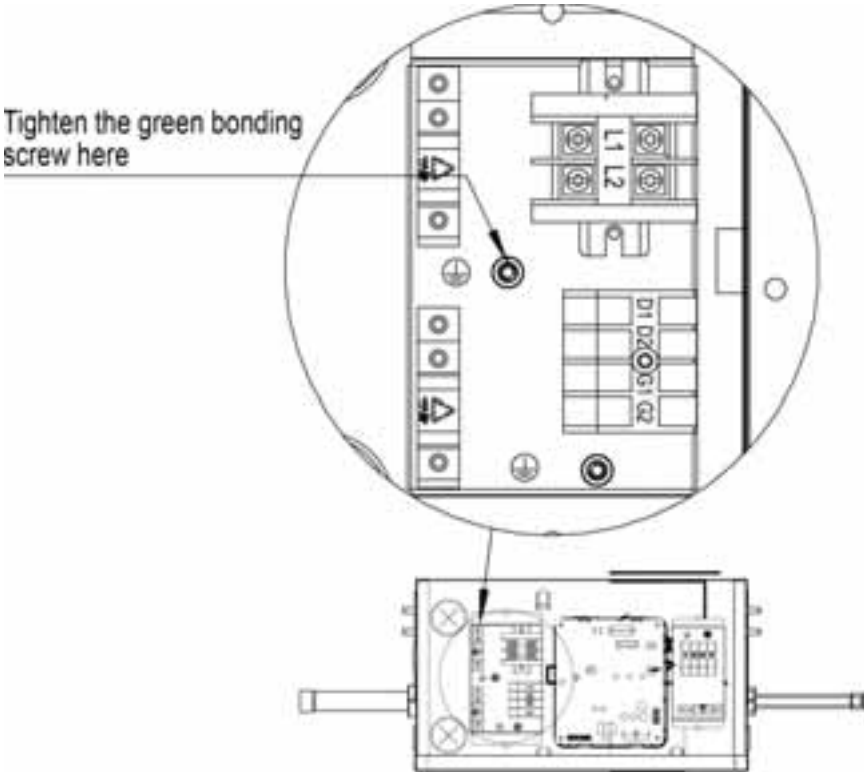


Fig. 5.4

4) Secure the power cord with wire- clamp.

5.3 Connect Communication Wire of Indoor Unit and Outdoor Unit

(1) Open electric box cover of indoor unit.
(2) Lead the communication wire through rubber ring.
(3) Connect communication wire to wiring board OD (D1, D2) of outdoor unit of mode exchanger.
(4) Connect communication wire lead from D1 and D2 terminal of 4-bit wiring board of indoor unit to wiring board ID1 (1D1, 1D2) of indoor unit of mode exchanger; ID2 (2D1, 2D2……ID-n (nD1, nD2)，n≤8, As shown in Fig. 5.5

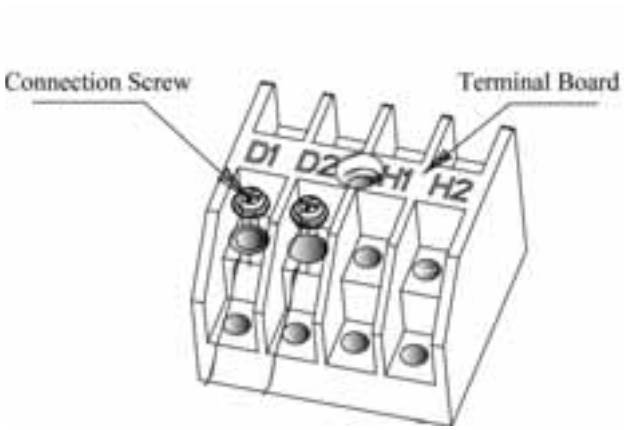


Fig. 5.5

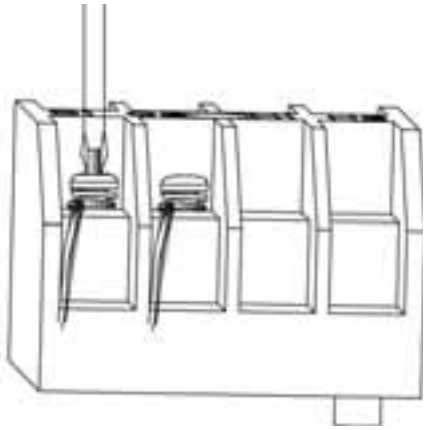


Fig. 5.6

(5) Secure the communication wire with wire clamp.

(6) In order to ensure the reliability of communication between indoor unit and outdoor unit, add a matched resistance (included in the packing bag) on the wiring board at the last connected mode exchanger. The matched resistance should be connected among terminal screw D1 and D2.

(7) When mode converter connects to the indoor unit with capacity of over 14kW (48MBH), it only requires to connect the indoor unit to one of the two corresponding branches. Note that the first place in the SA2 dip switch for corresponding mainboard of are set to off position.

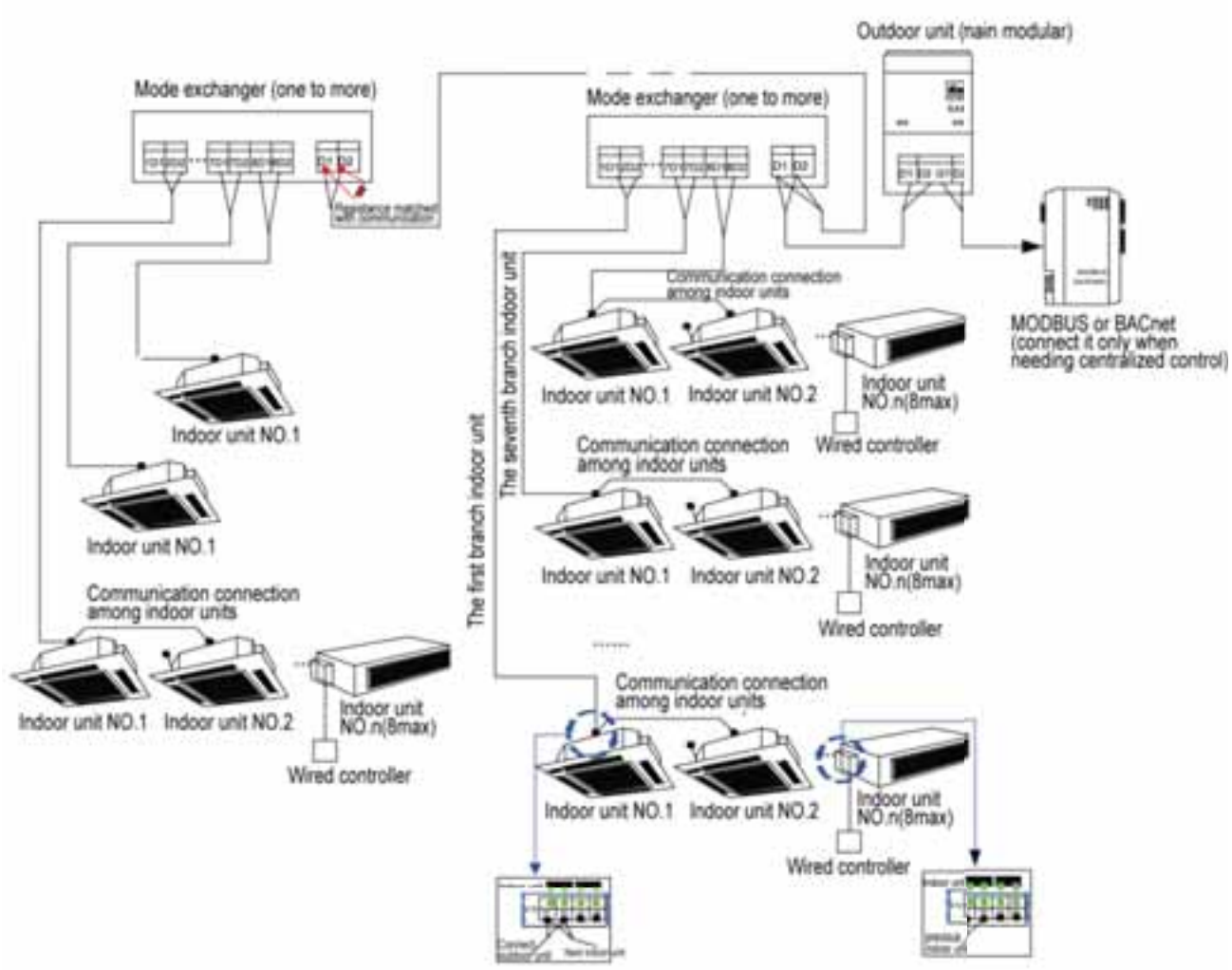


Fig. 5.7

6 Routine Maintenance

Caution:

① Turn off air conditioner and shut off main power before cleaning.

② Use a ladder or other solid support to reach air conditioner for cleaning.

③ Do not use hot water over 45° C(113° F) to clean the surface of air conditioner. This may cause discoloration or warping.

④ Do not dry the filter over open flame. Otherwise, the filter may catch fire or be warped.

⑤ Volatile liquid, such as paint thinner or gasoline, may damage the air conditioner. (Only use soft dry cloth or damp cloth dipped with mild detergent to clean the filter of air conditioner.

⑥ For more complicated maintenance contact a qualified technician.

6.1 Preseason Checklist

(1) Check if air inlets and air outlets of indoor and outdoor units are blocked;
(2) Check whether ground connection is secure;
(3) Check whether the wires are connected securely;
(4) After turning power, check to see if display on controller is working.

6.2 Post Seasonal Maintenance

(1) Run the air conditioner at fan mode on a sunny day for about 12 hours to dry the internal parts of unit.
(2) If the air conditioner won't be used for an extend period of long time, please cut off the power to save energy. After cutting off the power, the characters on the screen of wire controller will disappear.

7 Troubleshooting

If the air conditioner malfunctions, please check below items before calling for service:

Malfunction	Causes
Air conditioner can't be started up	① Power supply hasn't been connected ② Short circuit or tripped breaker ③ Voltage is too low ④ Unit is turned off at control panel ⑤ Malfunction of control loop wiring
Air conditioner can operate, but it will stop after a while	① There's an obstruction in front of condenser ② Control loop is malfunctioning ③ In cooling mode outdoor ambient temperature must be below 43° C(109.4° F)
Poor cooling performance	① Air filter is dirty or blocked ② There is a heat source or too many people in the room ③ Door or window is open ④ There are obstacles at air inlet or air outlet ⑤ Thermostat is set too high or refrigerant is leaking ⑥ Room temperature sensor is malfunctioning
Poor heating performance	① Air filter is dirty or blocked ② Door or window is not closed well ③ Thermostat is set too low ④ Refrigerant is leaking ⑤ Outdoor ambient temperature is below -5° C(23° F) ⑥ Control wiring is malfunctioning
Indoor fan can't be started up under heating mode	① The tube temperature sensor is not properly installed ② Tube temperature sensor is not inserted correctly ③ Wires for tube temperature sensor are broken ④ Capacitor is short circuiting

Caution：

After checking above items, if the air conditioner still can't operate normally, please turn off the air conditioner immediately and then contact a qualified maintenance technician.

Specifications & illustrations subject to change without notice or incurring obligations.

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