Carrier

United Technologies
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INSTALLATION MANUAL

FULL DC INVERTER XPOWER VRF OUTDOOR UNIT

Thank you very much for purchasing our air conditioner.
Before using your air conditioner , please read this manual carefully and keep it for future reference.

Caution: The heating function of an indoor unit is available only when it is connected to a cooling & heating outdoor unit.

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1. PRECAUTIONS

Precautions before reading the Installation manual.

- This Installation manual is for the outdoor unit.
- Refer to the indoor unit Installation manual to install indoor parts.
- Please read the power source unit Installation manual to install the power source unit.
- Please refer to the refrigerant distributor Installation manual to install the refrigerant distributor.

There are two types of safety precautions - please read both carefully.

WARNING

Failure to observe a warning may result in death. The appliance shall be installed in accordance with national wiring regulations.

CAUTION

Failure to observe a caution may result in serious injury or damage to the equipment.

After completing installation, ensure the unit works properly. Instruct the customer on how to operate the unit, and tell them to store this manual with the owner's manual for future reference.

WARNING

- **Only qualified service personnel should install, repair or service the equipment.**
  Improper installation, repair, or maintenance may result in electric shocks, short-circuiting, leaks, fires, or other damage to the equipment.
- **Follow these instructions carefully for installation.**
  Improper installation may cause water leaks, electrical shocks, or fires.
- **When installing the unit in a small room, keep the refrigerant concentration below the safety limit in case of leaks.**
  Contact the place of purchase for more information. Excessive refrigerant in a closed ambient environment can lead to oxygen deficiency.
- **Use the enclosed accessories and parts for installation.**
  Failure to do so may cause the unit to fall or cause water leaks, electric shocks, or fires.
- **Install the unit in a stable location that can bear its weight.**
  Failure to do so may cause injury and damage the unit if it falls.
- **Follow national wiring regulations when installing the unit.**
- **Do not install the unit in the laundry room.**
- **Disconnect all electric circuits before accessing the terminals.**
- **Position the unit so that the plug is accessible.**
- **Mark the direction of flow with a symbol or words.**
- **Follow national wiring regulations when installing the unit, and use an independent circuit and single outlet.**
  Insufficient electrical circuit capacity or faults can cause electric shocks or fires.
- **Connect and clamp the specified cable firmly so that no external force can affect the terminal.**
  A poor connection may cause a fire.
- **Route the wiring to fix the control board cover properly.**
  Improper installation may cause the terminal's connection point to heat-up, which may cause electric shocks or fires.
- **Replace a damaged supply cord through the manufacturer or agent to avoid hazards.**
- **An all-pole disconnection switch having a contact separation of at least 3 mm in all poles should be connected in fixed wiring.**
- **Do not let air or matter enter the refrigeration cycle when connecting the pipes.**
  Air or foreign matter may lower capacity and raise pressure, risking an explosion.

- **Do not modify the length of the power supply cord, use an extension cord, or share an outlet with another electric appliance.**
  Doing so may cause a fire or electric shocks.

- **Exercise caution during installation in poor weather.**
  Improper installation may cause an accident if the unit falls.

- **Keep cables away from the copper tube because the temperature of the refrigerant circuit will be high.**

- **The power cord type designation is H07RN-F.**
  Equipment complies with IEC 61000-3-12.

- **If the refrigerant leaks during installation, ventilate the area immediately.**
  Toxic gas may be produced if the refrigerant comes into contact with fire.

- **After completing installation, check that the refrigerant does not leak.**
  Toxic gas may be produced if the refrigerant leaks into the room and comes into contact with fire, such as a fan heater, stove, or cooker.

- **Young children and elderly should not use the unit unsupervised.**

- **Young children should be supervised to ensure they do not play with the appliance.**

- **Don't install the air conditioner in the following locations:**

- Where there's petrol.
- In salty air, e.g., coasts (except corrosion-resistant models)
- Where there's caustic gas (e.g., sulfide near a hot spring).
- Where voltage vibrations are excessive (e.g., factories).

  In buses or cabinets.

  In a kitchens with a lot of oil or gas.
- Where there are strong electromagnetic waves.
- Near flammable materials or gas.
- Where there are acidic or alkaline liquids that could evaporate.
- Other special conditions.

- **The insulation of metal parts in the building and the air conditioner should comply with the regulation of National Electric Standard.**

CAUTION

- **Caution:** The heating function of the indoor unit is available only when the indoor unit connected to the outdoor unit for cooling and heating.

- **This A/C is an amenity. Do not install it at places where machinery, precision instruments, food, plants, animals, or artwork is stored.**

- **Ground the air conditioner.**
  Do not connect the ground wire to gas or water pipes, lightning rod, or a telephone grounding wire. Incomplete grounding may result in electric shocks.

- **Install an earth leakage breaker.**
  Failure to install an earth leakage breaker may result in electric shocks.

- **Connect the outdoor unit's wires before the indoor unit's wires.**
  Do not connect the air conditioner to a power source until the wiring and piping is completed.

- **Install and insulate the drainage pipe.**
  Failure to do so may cause leaks and damage.

- **Install the indoor and outdoor units, power supply wiring, and connecting wires at least 1 meter from TV sets or radios to prevent image or noise interference.**
  Depending on radio waves, a distance of 1 meter may not be sufficient enough to eliminate noise.

2. CONSTRUCTION CHECKPOINTS

- Acceptance and Unpacking

- After the machine arrives, check whether it is damaged. If the surface or inner side of the machine is damaged, submit a written report to the shipping company.

- Check whether the model, specifications, and quantity of the equipment is as per the contract.

- After removing the outer packaging, keep the instructions securely and ensure you have all the accessories.

- Refrigerant pipe

- Check the model and name to avoid installing the wrong unit.

- An additionally purchased refrigerant distributor (manifold adapter and manifold pipe) must be used for installing the refrigerant pipes.

- The refrigerant pipes must be the specified diameter. The refrigerant pipe must be filled with nitrogen at a certain pressure before welding.

- The refrigerant pipe must be heat insulated.

- After the refrigerant pipe is installed completely, the indoor unit cannot be powered on before performing the airtight test and creating a vacuum. The gas-side and liquid-side pipes must undergo the airtight test and vacuum extraction.

- Airtight test
  The refrigerant pipe must undergo the airtight test [with 3.9 MPa(40kgf/cm^2) nitrogen].

■ Creating a vacuum
Use the vacuum pump to create a vacuum with the connective pipe at the gas side and liquid side concurrently.

■ Refrigerant replenishment

- If the length is greater than the reference pipe, the refrigerant replenishment quantity for each system should be calculated through the formula obtained according to the actual length of pipe.
- Record the refrigerant replenishment quantity, actual length of the pipe and the height difference of the indoor & outdoor unit onto the operation confirmation table of the outdoor unit in advance for future reference.

■ Electric wiring

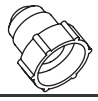
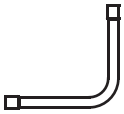
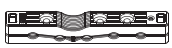
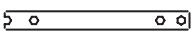
- Select the power supply capacity and wire size according to the design manual. The power cable for the air conditioner is generally thicker than the power cable for the motor.
- To prevent mis-operating the air conditioner, do not entwine the power cable with the connection wires (low-voltage wires) for the indoor/outdoor unit.
- Power on the indoor unit after performing the airtight test and creating a vacuum.
- For details of setting the address of the outdoor unit, see Outdoor unit address bits.

■ Trial run

- Remove the six pieces of protective PE foam at the rear of the unit before powering it on. Be careful not to damage the fin or the heat exchange performance may be affected.
- Perform the trial run only after the outdoor unit has been powered on for over 12 hours.

3. ACCESSORIES

Table.3-1

Name	All units	Outline	Function
Outdoor unit installation manual	1		——
Guideline of outdoor unit main control board	1		——
Outdoor unit owner's manual	1		Deliver it to the customer
Indoor unit owner's manual	2		Deliver it to the customer
Screw bag(accessory)	1		For maintenance
Flat-head screwdriver for DIP switch	1		Used for DIP switches of indoor and outdoor units
90° bell-end elbow	1		For connecting pipes
Seal plug	8		For cleaning pipes
Connective pipe accessory	3		For connecting pipes
Matched resistance(network matched wire group)	2		Enhance communication stability
Cable clip kit	1(Optional)		For grooving the power wire
Simple wrench	1		For removing screws from the side plates

4. OUTDOOR UNIT INSTALLATION

4.1 Outdoor unit combination

Table.4-1

(HP) Outdoor unit capacity / Combination way (HP)	8	10	12	14	16	18	20	22	Max Qty.of indoor units	Max recommeded Qty. of indoor units
8	●								13	7
10		●							16	9
12			●						20	11
14				●					23	13
16					●				26	15
18						●			29	16
20							●		33	18
22								●	36	20
24			●●						39	22
26		●			●				43	24
28		●				●			46	26
30		●					●		50	27
32		●						●	53	29
34			●					●	56	31
36						●●			59	32
38					●			●	63	35
40						●		●	64	36
42							●	●	64	38
44								●●	64	38
46			●●					●	64	38
48		●			●			●	64	38
50		●				●		●	64	38
52		●					●	●	64	38
54		●						●●	64	38
56			●					●●	64	40
58						●●		●	64	40
60					●			●●	64	40
62						●		●●	64	40
64							●	●●	64	40
66								●●●	64	40
68			●●					●●	64	44
70		●			●			●●	64	44
72		●				●		●●	64	44
74		●					●	●●	64	44
76		●						●●●	64	44
78			●					●●●	64	48
80						●●		●●	64	48
82					●			●●●	64	48
84						●		●●●	64	48
86							●	●●●	64	48
88								●●●●	64	48

CAUTION

- When all of the indoor units in the system run simultaneously, their total capacity should less than or equal to the combined capacity of the outdoor units. Otherwise, overloading will occur if working conditions are bad or the space is narrow.
- If all the indoor units are not running in the system simultaneously, their maximum total capacity can be 130% of the combined capacity of outdoor units.
- If the system is used in cold environments (ambient temperature is under -10℃) or in high-heat and overloaded conditions, the total capacity of the indoor units should less than the combined capacity of the outdoor units.

4.2 Dimension of outdoor unit

8~12 HP Unit:mm

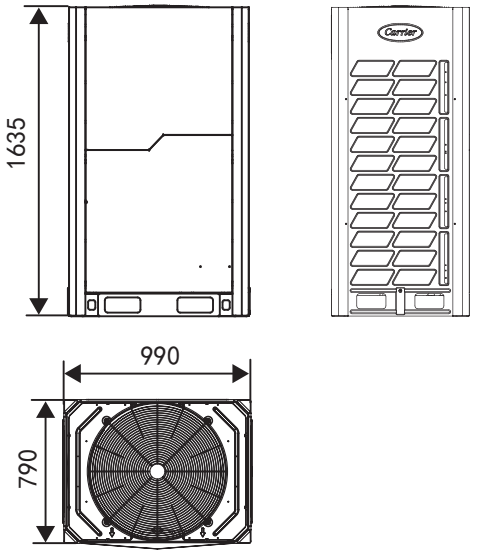


Fig.4-1

The figure shown above is for reference only and may be slightly different from the actual product.

14~22 HP

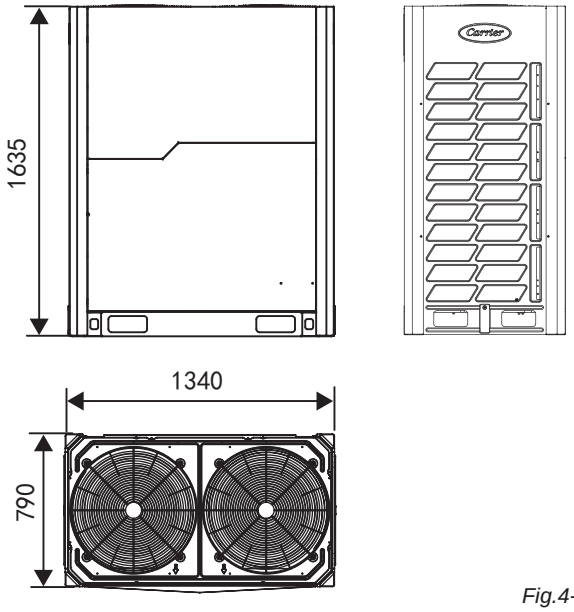


Fig.4-2

The figure shown above is for reference only and may be slightly different from the actual product.

4.3 Selecting the installation position

- Ensure that the outdoor unit is installed in a dry, well-ventilated place.
- Ensure that the noise and exhaust ventilation of the outdoor unit do not affect the neighbors or surrounding ventilation.
- Ensure that the outdoor unit is installed in a well-ventilated place that is as close as possible to the indoor unit.
- Ensure that the outdoor unit is installed in a cool place out of direct sunshine or radiation of high-temp heat source.
- Do not install the outdoor unit in a dirty or severely polluted place to avoid blocking the heat exchanger in the outdoor unit.
- Do not install the outdoor unit where there is oil pollution or harmful gases such as sulfurous gas.
- Do not install the outdoor unit where the air is salty air (except corrosion-resistant models).

4.4 Base for outdoor unit

- A solid, correct base can:
  - Avoid the outdoor unit from sinking.
  - Avoid abnormal noise from the base.
- Base types
  - Steel structure
  - Concrete base (see the figure below for the general making method)

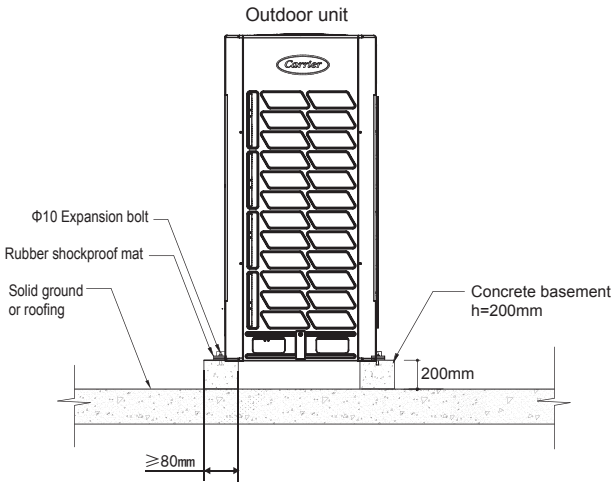


Fig.4-3

CAUTION

- Key points for the base:
  - The master unit's base must be solid concrete. Refer to the structural diagram.
  - To ensure every point has equal contact, the base should be on level ground

- If the base is placed on a roof, the detritus layer is not needed, but the concrete surface must be roughened. The standard concrete mixture ratio is 1:2:4 (cement:sand:cobblestone), and Φ10 reinforced steel bar must be used. The surface must be flattened with cement mortar, and the base borders must be chamfered.
- Before constructing the base, ensure the base directly supports the rear and front folding edges of the bottom panel vertically, because these edges are the supported sides of the unit.
- To drain off seepage, set up a discharge ditch around the base.
- Please check the load capacity of the roof.
- When piping from the bottom of the unit, the base height should no less than 200 mm.

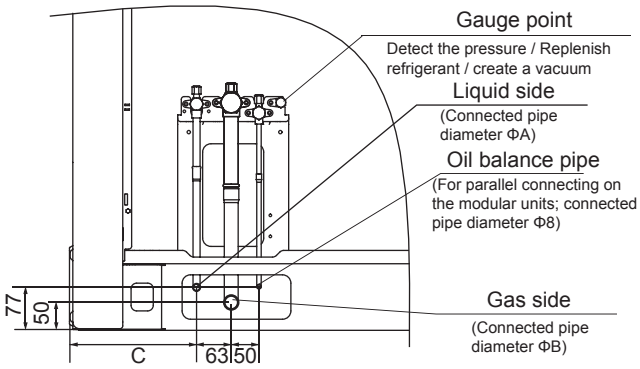


Fig.4-5.1 R amplification

■ Position illustration of screw bolt (Unit: mm)

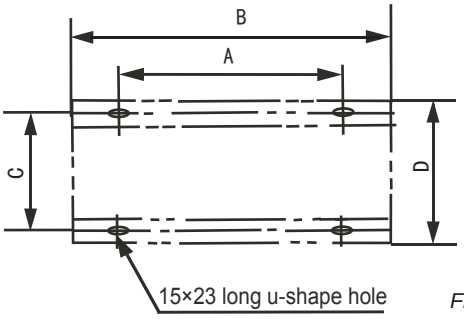


Fig.4-4

Table.4-2 Unit: mm

HP / SIZE	8，10, 12	14，16，18, 20, 22
A	740	1090
B	990	1340
C	723	723
D	790	790

■ Centering position illustration of each connective pipe (Unit: mm)

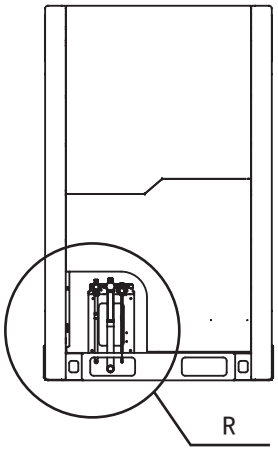


Fig.4-5

Table.4-3 Unit: mm

HP / SIZE	8，10	12	14，16	18, 20, 22
A	12.7	15.9	15.9	19
B	25.4	28.6	31.8	31.8
C	229	229	244	244

4.5 Outdoor units' placement sequence & master and slave unit settings

Set a system with more than two outdoor units as follows: Place the outdoor units in sequence from large capacity to small. Mount the largest-capacity unit on the first branch joint site and set its address as the master unit. Set the other as the slave unit. Take 48HP (composed by 10HP, 16HP and 22HP) as an example:

1) Place the 22HP at the side of the first branch joint site.
2) Place the units from large capacity to small (see the detailed placement illustration).
3) Set 22HP as the main unit, while the 16HP and the 10HP as the aux. unit.

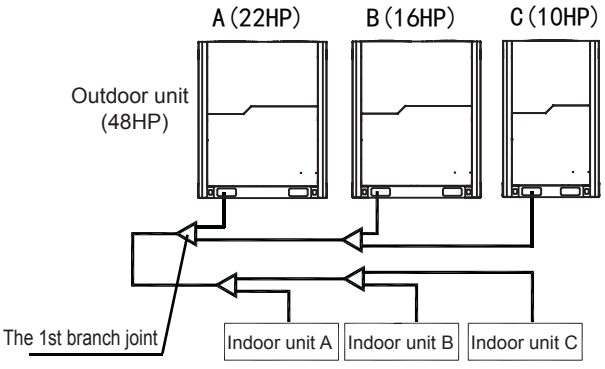
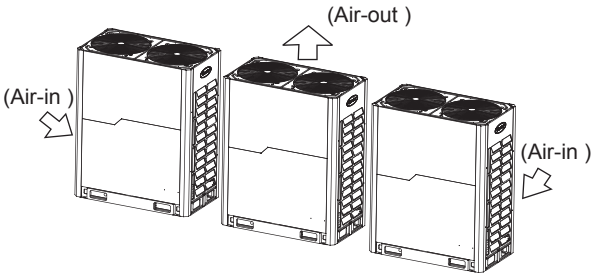


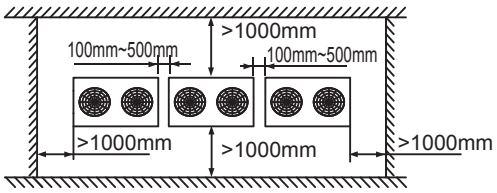
Fig.4-6

4.6 Installation space for outdoor unit

- Ensure enough space for maintenance. The modules in the same system must be on the same height.(*Fig.4-7*)
- When installing the unit, leave space for maintenance, as shown in Fig.4-8. Install the power supply at the side of the outdoor unit. For the installation procedure, see the Installation manual for the power supply device.
- If there are obstacles above the outdoor unit, refer to Fig.4-13.



Installation and maintenance surface *Fig.4-7*



Top view of the outdoor unit

Fig.4-8

4.7 Layout

- When the outdoor unit is higher than the surrounding obstacle
  - One row

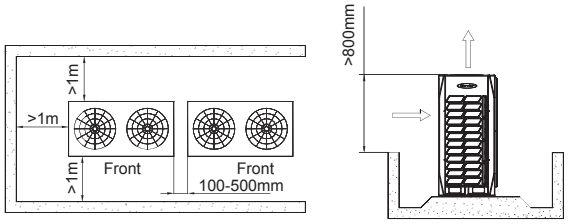


Fig.4-9

  - Tow rows

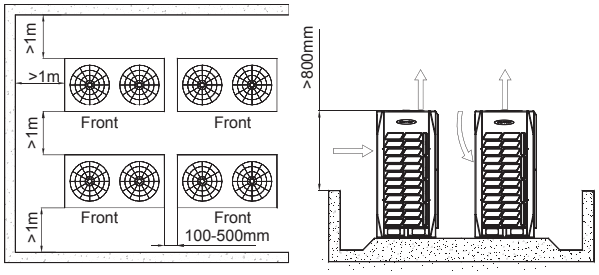


Fig.4-10

  - More than two rows

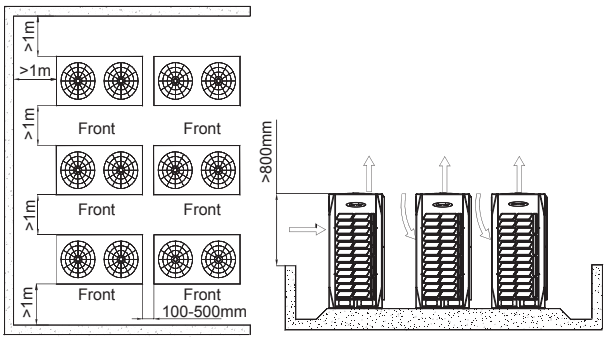


Fig.4-11

- When the outdoor unit is lower than the surrounding obstacle, refer to the layout used when the outdoor unit is higher than the surrounding obstacle. However, to stop cross connection from the outdoor hot air affecting heat exchange, add an air director to the exhaust hood of the outdoor unit. See the figure below. The height of the air director is HD (H-h). Make the air director on site.

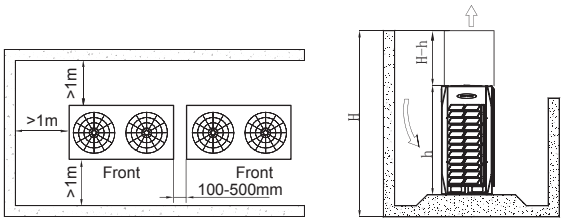


Fig.4-12

- If miscellaneous items are placed around the outdoor unit, they must be 800 mm below the top of the outdoor unit or a manual exhaust device must be added.

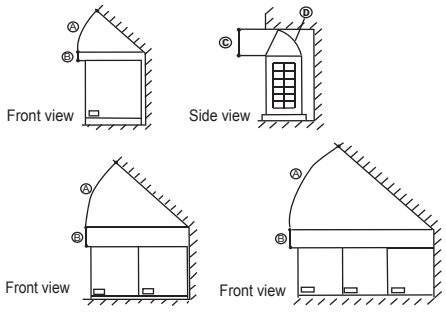


Fig.4-13

4.8 Set the snow-proof function

■ Applies to snowy areas (see the figure below). Defective equipment may cause a malfunction. Lift the bracket and install the snow shed at the air inlet and air outlet.

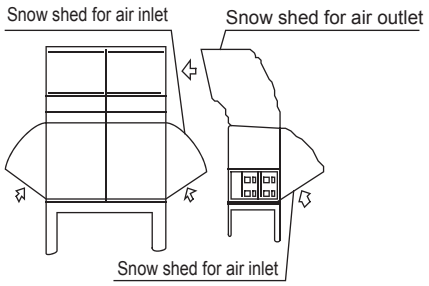


Fig.4-14

4.9 Dismantling the panel

1. Dismantle the front left and right posts: Remove the four screws from the left and right posts (Fig 4-15). Then rotate the posts, and lift them by about 2 mm (Fig 4-16 and Fig 4-17) to remove them.
2. Dismantling the upper panel: Remove the four screws on the left and right side of the upper panel (Fig 4-18) and then lift it by about 3 mm to remove it.

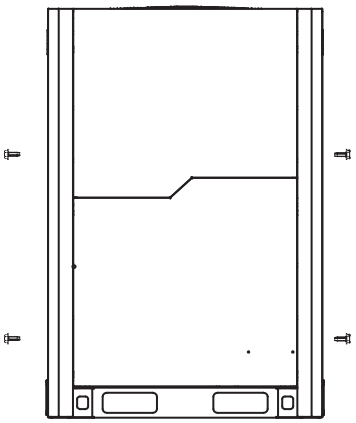


Fig.4-15

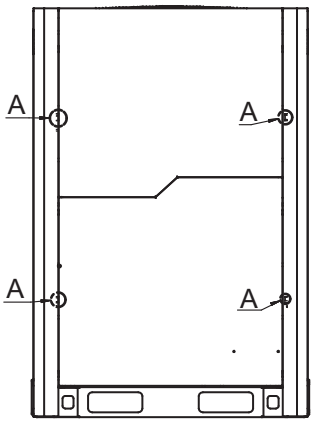
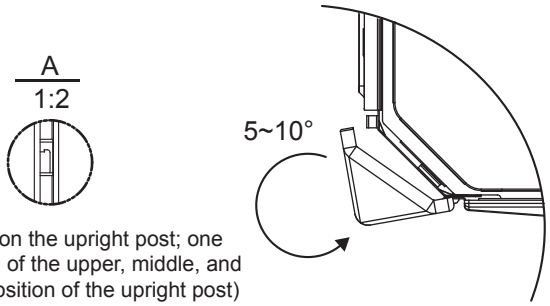


Fig.4-16



(Hooks on the upright post; one on each of the upper, middle, and lower position of the upright post)

Fig.4-17

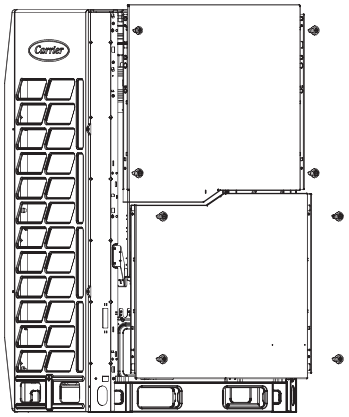


Fig.4-18

The figure shown above is for reference only and the actual panel may be different.

4.10 Explanation of valve

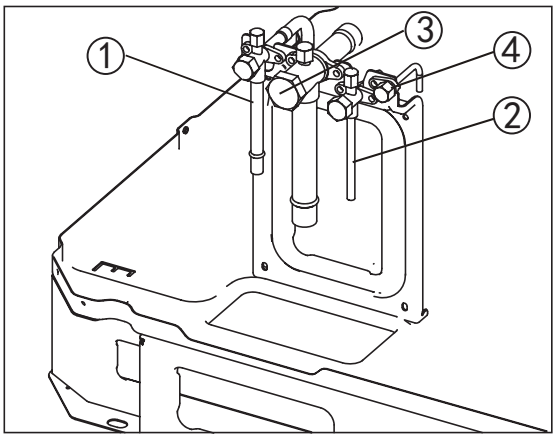


Fig.4-19

①	Liquid side ball valve
②	Connecting Oil balance pipe (※)
③	Gas side ball valve
④	Needle valve (for pressure tests and adding refrigerant)

※ Note: For a single module, there's no need to connect an oil balance pipe.

4.11 Mount the air deflector

(If the static pressure of outdoor unit is over 20 Pa, the unit needs to be customized.)

■ **8~12HP Installation illustration**

Example A

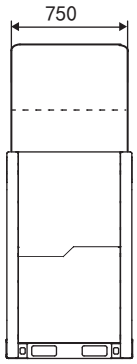
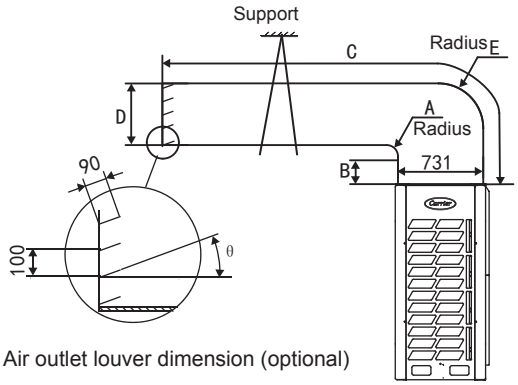


Fig.4-20



Air outlet louver dimension (optional)

Fig.4-21

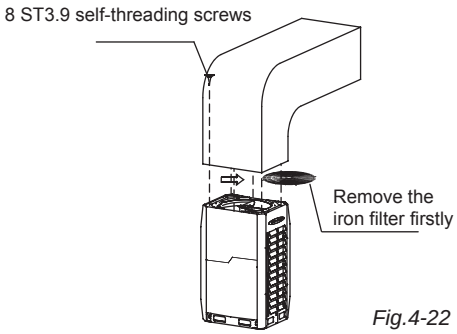


Fig.4-22

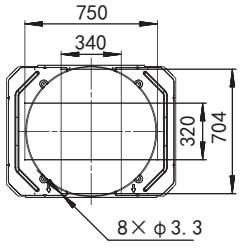
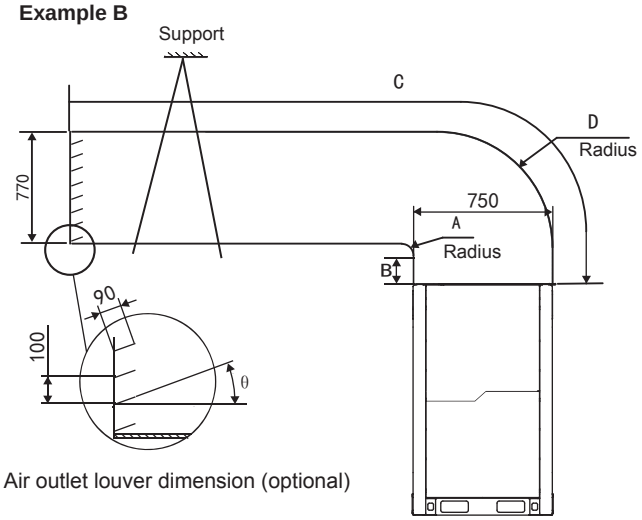


Fig.4-23

Table.4-5 Unit: mm

A	A≥300
B	B≥250
C	C≤3000
D	731≤D≤770
E	E=A+731
θ	θ ≤15°

Example B



Air outlet louver dimension (optional)

Fig.4-24

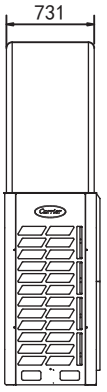


Fig.4-25

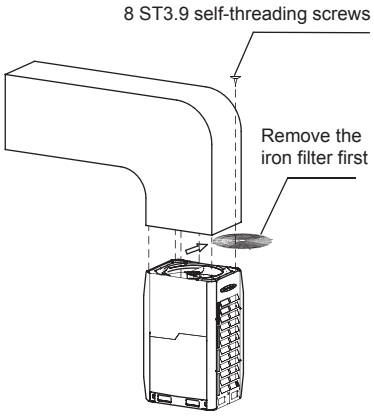


Fig.4-26

A	A≥300
B	B≥250
C	C≤3000
D	D=A+750
θ	θ ≤15°

Table.4-4

Static pressure	Remark
0Pa	Factory default
0～20Pa	Remove the wire mesh and connect it to the wind duct (less than 3 meters).
Above 20Pa	Customization needed

■ **14~22HP Installation illustration**

Example A

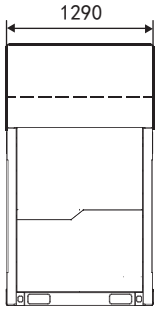


Fig.4-27

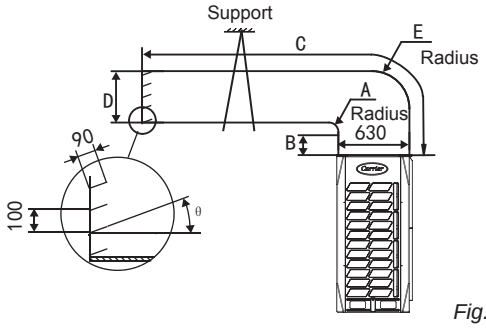


Fig.4-28

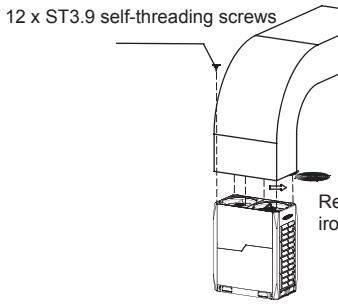


Fig.4-29

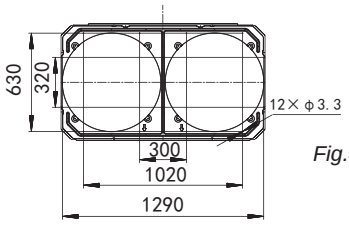


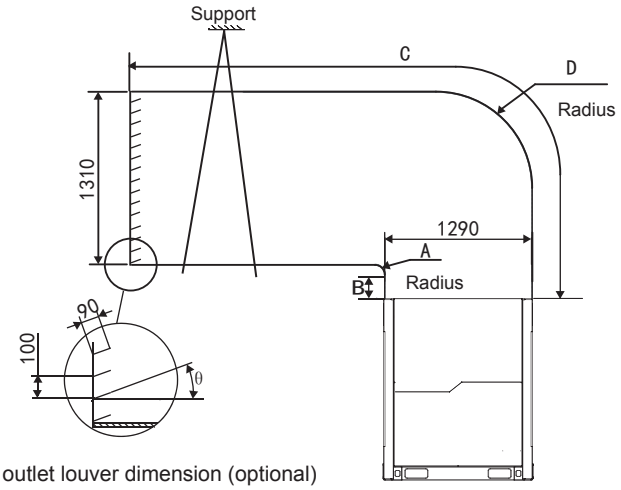
Fig.4-30

A	A≥300
B	B≥250
C	C≤3000
D	630≤D≤660
E	E=A+630
θ	θ ≤15°

Table.4-5

Static pressure	Remark
0Pa	Factory default
0～20Pa	Remove the wire mesh and connect them to the wind duct (less than 3 meters).
Above 20Pa	Customization needed

Example B



Air outlet louver dimension (optional)

Fig.4-31

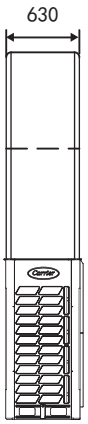


Fig.4-32

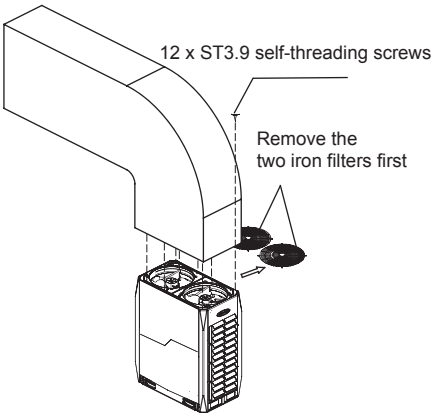


Fig.4-33

A	A≥300
B	B≥250
C	C≤3000
D	D=A+1290
θ	θ ≤15°

NOTE

- Before installing the air deflector, remove the mesh enclosure to prevent air supply blockages.
- Mounting the shutter on the unit limits the air volume, cooling (heating) capacity, and efficiency depending on the shutter angle. Do not mount the shutter or keep it angled to under 15°.
- Only one bending site is allowed in the air duct (see as above figure) or the unit may not function normally.
- Install the flexible connector between the unit and the air pipe to avoid noise from vibrations

NOTE

- Before installing the air deflector, remove the mesh enclosure to avoid blocking the air supply.
- Mounting the shutter on the unit limits the air volume, cooling (heating) capacity, and efficiency depending on the shutter angle. Do not mount the shutter or keep it angled to under 15°.
- Only one bending site is allowed in the air duct (see as above figure) or the unit may not function normally.
- Please install a soft connector between the air duct and machine to reduce noise.
- The Air-duct device should not larger than the cover, because you have to lift the upright and panel to dismantle them.
- Independently install the wind scooper. Do not combine the wind scoopers between units or a fault may occur. Figure 4-34 shown shows incorrect installation.

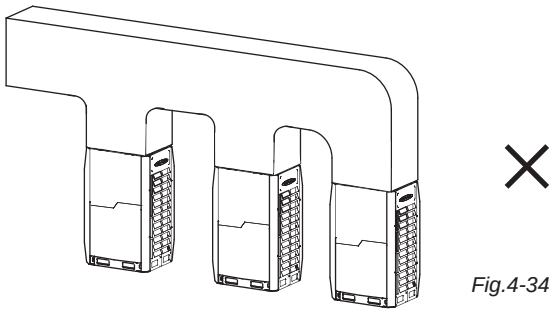


Fig.4-34

- Curve diagram of static pressure and air flow volume.

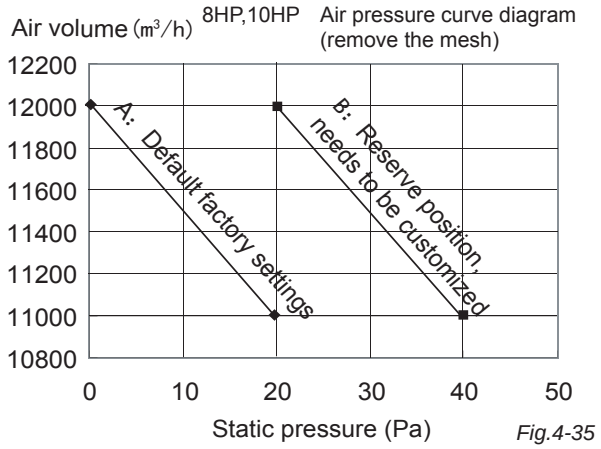


Fig.4-35

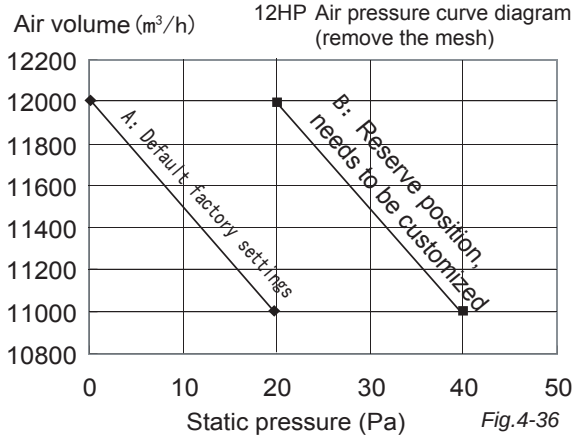


Fig.4-36

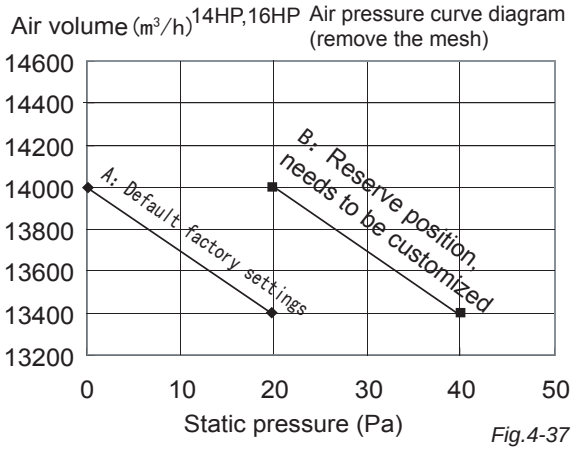


Fig.4-37

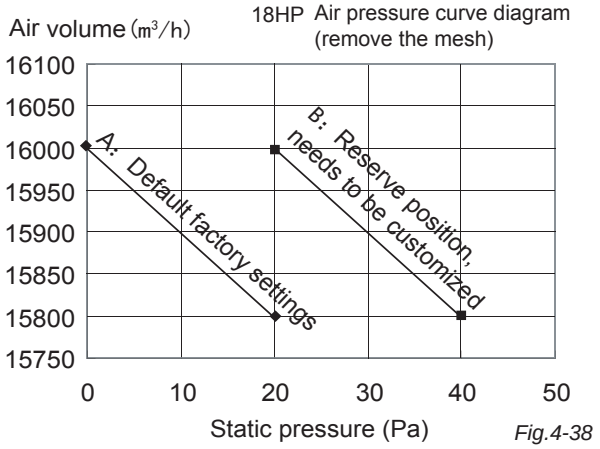


Fig.4-38

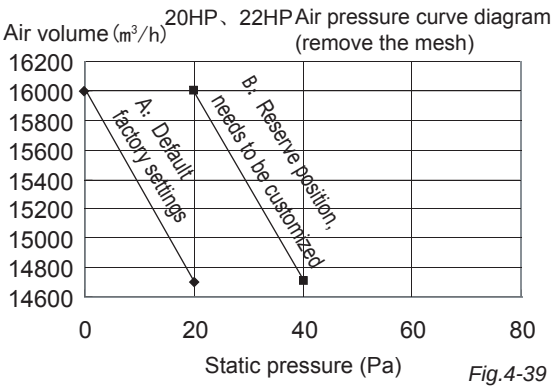


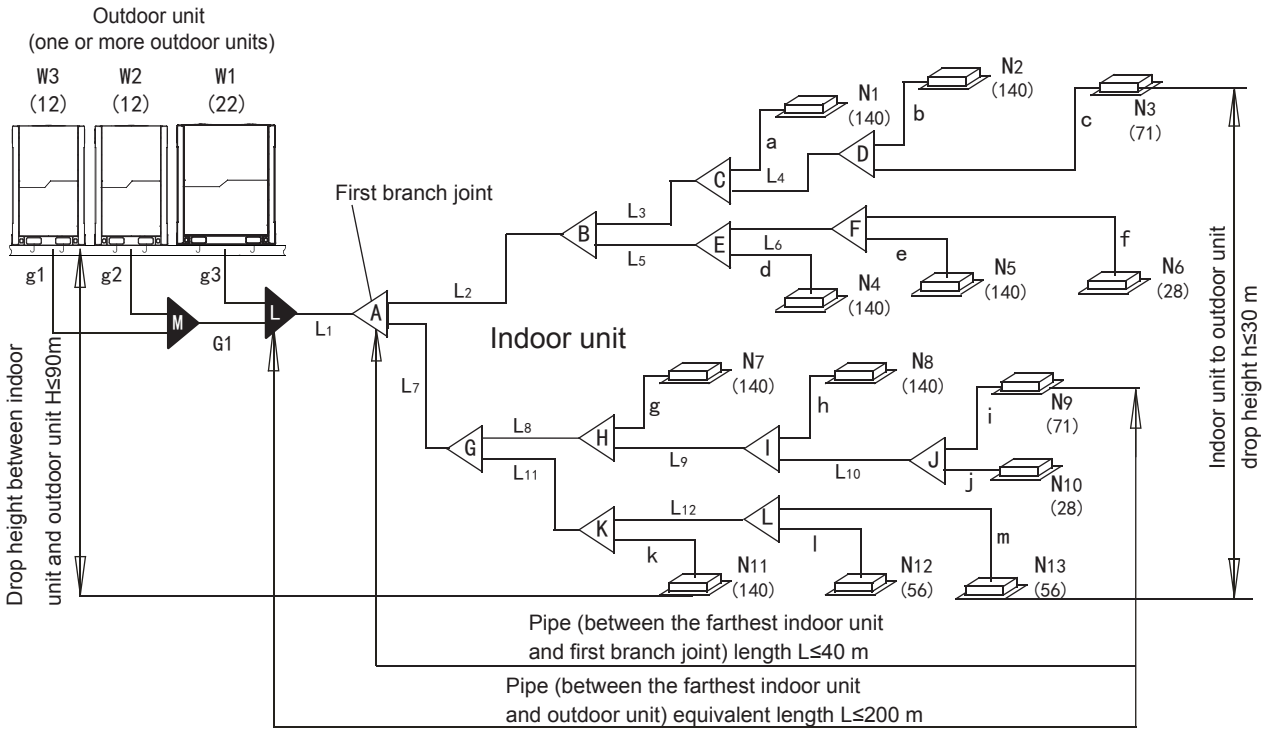
Fig.4-39

5. REFRIGERANT PIPE

5.1 Length and drop height permitted of the refrigerant piping

Table.5-1

			Permitted value	Piping(refer to Fig.5-1)
Pipe length	Total pipe length (total extended length)		1,000 m (refer to caution 5 of conditions 2)	$L_1+(L_2+L_3+L_4+L_5+L_6+L_7+L_8+L_9+L_{10}+L_{11}+L_{12})\times2+a+b+c+d+e+f+g+h+i+j+k+l+m$
	Maximum piping (L)	Actual length	175m	$L_1+L_7+L_8+L_9+L_{10}+i$ (Pipe diameter requirements. Refer to table. 5-4 or 5-5)
		Equivalent length	200m (refer to caution 1)	
	Pipe(between the farthest indoor unit and first branch joint) length		40/90*m (refer to caution 5)	$L_7+L_8+L_9+L_{10}+i$
Drop height	Indoor unit-outdoor unit drop height	Outdoor unit up	90m	(Refer to caution 3)
		Outdoor unit down	110m	(Refer to caution 4)
	Indoor unit to indoor unit drop height		30m	———



*1. Level differences cannot be above 90 m unless customization is requested (if the outdoor unit is above the indoor unit).

Fig.5-1

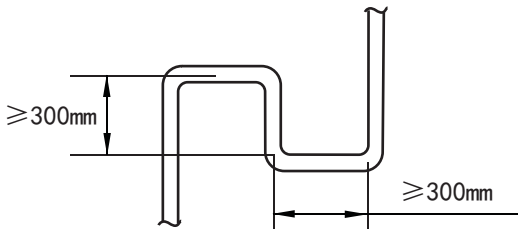


Fig.5-2

CAUTION

1. The reduced length of the branch joint is the 0.5m of the equivalent length.
2. The inner units should as equal as possible to be installed in the both sides of the U-shape branch joint.
3. When the outdoor unit is higher and the difference in levels is over 20 m, set an oil return bend every 10 m in the air pipe of the main pipe. See Fig.5-2 for the specification of the oil return bend.
4. When the outdoor unit is lower, H≥40m, the liquid pipe of the main pipe needs to be increased by one size.
5. The first branch joint connected to the indoor unit must be no more than 40 m unless the following conditions are met. Then it can extend to 90 m.

Conditions
1. Increase all pipe diameters of the main distribution pipe between the first and the last branch joint assembly. (Change the pipe diameter in the field.) If the pipe diameter of the main slave pipe is the same as the main pipe, it does not need to be increased.
Examples
■ N9 $L_7+L_8+L_9+L_{10}+i \leqslant 90m$, L_2, L_3, L_4, L_5, L_6, L_7, L_8, L_9, L_{10}, L_{11}, L_{12} Need to increase the pipe diameter of the distribution pipe. ■ Increase the size as follows φ9.5→φ12.7 φ12.7→φ15.9 φ15.9→φ19.1 φ19.1→φ22.2 φ22.2→φ25.4 φ25.4→φ28.6 φ28.6→φ31.8 φ31.8→φ38.1 φ38.1→φ41.2 φ41.2→φ44.5 φ44.5→φ54.0
Conditions
2. When counting the total extended length, the actual length of above distribution pipes must be doubled (except main pipes and distribution pipes that do not need to be increased). $L_1+(L_2+L_3+L_4+L_5+L_6+L_7+L_8+L_9+L_{10}+L_{11}+L_{12})\times 2+a+b+c+d+e+f+g+h+i+j+k+l+m \leqslant 1000m$
Examples
Reference Fig. 5-1
Conditions
3. The length from the indoor unit to the nearest branch joint assembly ≤20m a, b, c, . . . m≤20m(Pipe diameter requirements, please refers to Tab .5-9)
Examples
Reference Fig.5-1
Conditions
4. The distance difference between [the outdoor unit to the farthest indoor unit] and [the outdoor unit to the nearest indoor unit] is ≤40m. The farthest indoor unit N9 The nearest indoor unit N1 $(L_1+L_7+L_8+L_9+L_{10}+i)-(L1+L2+L3+a) \leqslant 40m$
Examples
Reference Fig.5-1

5.2 Size of joint pipes for indoor unit

Table.5-2

Pipe name	Code(refer to Fig.5-1)
Main pipe	L_1
Indoor unit main pipe	L_2, L_3, L_4, L_5,... L12
Indoor unit aux. pipe	a, b, c, d,... m
Indoor unit branch joint assembly	A, B, C, D, E, F, G, H, I, J, K, L
Outdoor unit branch joint assembly	L, M
Outdoor unit connective pipe	g1, g2, g3, G1

Table.5-3 Size of joint pipes for 410A indoor unit

Capacity of indoor unit A(×100W)	Size of main pipe(mm)		
	Gas side	Liquid side	Available branch joint
A<166	Φ15.9	Φ9.5	BJF-224-CM(i)
166≤A<230	Φ19.1	Φ9.5	BJF-224-CM(i)
230≤A<330	Φ22.2	Φ9.5	BJF-330-CM(i)
330≤A<460	Φ28.6	Φ12.7	BJF-710-CM(i)
460≤A<660	Φ28.6	Φ15.9	BJF-710-CM(i)
660≤A<920	Φ31.8	Φ19.1	BJF-710-CM(i)
920≤A<1350	Φ38.1	Φ19.1	BJF-1344-CM(i)
1350≤A<1800	Φ41.2	Φ22.2	BJF-E1344-CM(i)
1800≤A	Φ44.5	Φ25.4	BJF-E1344-CM(i)

e.x.1: Refer to Fig.5-3, the capacity of downstream units to L4 is 140+71=211; the gas pipe for L4 is Φ19.1; the liquid pipe is Φ9.5.

5.3 Select the refrigerant piping type

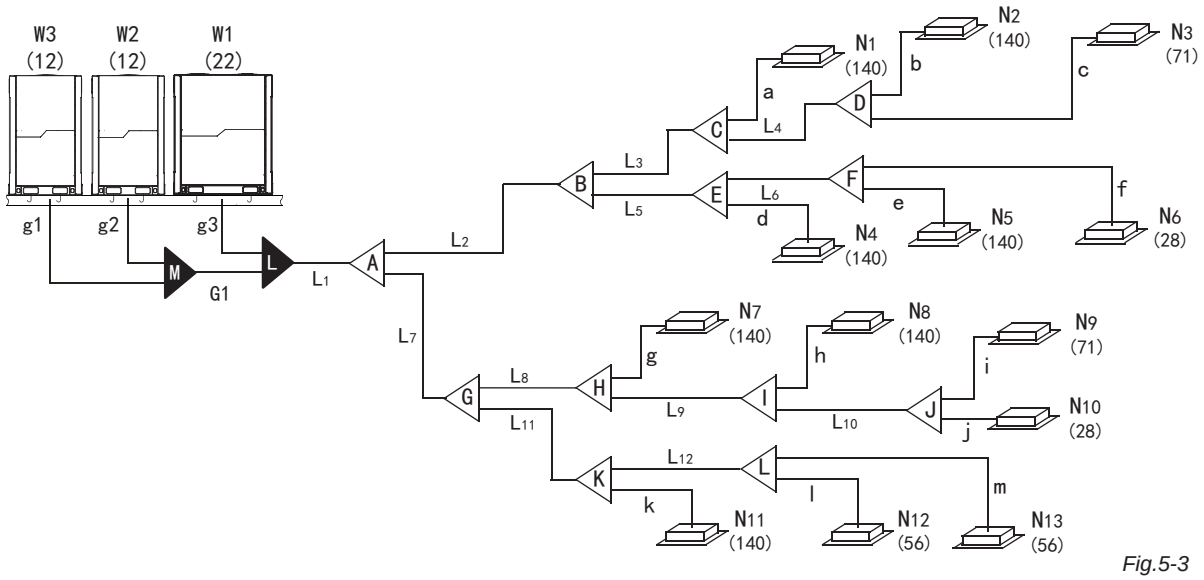


Fig.5-3

5.4 Size of joint pipes for outdoor unit

Base on the following tables, select the diameters of the outdoor unit connective pipes. If the main accessory pipe is larger than the main pipe, select the larger.

Example: parallel connection of three outdoor units 12+12+22 (total capacity 46 HP). The total capacity of the indoor units is 1,290, if the equivalent length of all pipes is ≥90 m. According to Tab.5-5, the main pipe's diameter is Φ38.1/Φ22.2. The master unit's diameter is Φ38.1/Φ19.1 based on Tab.5-3. Select the largest. The main pipe's diameter is Φ38.1/Φ22.2.

Table.5-4 Size of joint pipes for 410A outdoor unit

Model	When the equivalent length of all liquid pipes < 90 m, the size of the main pipe (mm)		
	Gas side	Liquid side	The 1st branch joint
8HP	Φ22.2	Φ9.53	BJF-330-CM(i)
10HP	Φ22.2	Φ9.53	BJF-330-CM(i)
12~14HP	Φ25.4	Φ12.7	BJF-330-CM(i)
16HP	Φ28.6	Φ12.7	BJF-710-CM(i)
18~22HP	Φ28.6	Φ15.9	BJF-710-CM(i)
24HP	Φ28.6	Φ15.9	BJF-710-CM(i)
26~34HP	Φ31.8	Φ19.1	BJF-710-CM(i)
36~50HP	Φ38.1	Φ19.1	BJF-1344-CM(i)
52~66HP	Φ41.2	Φ22.2	BJF-E1344-CM(i)
68~88HP	Φ44.5	Φ25.4	BJF-E1344-CM(i)

Table.5-5 Size of joint pipes for 410A outdoor unit

Model	When the equivalent length of all liquid pipes ≥ 90m, the size of main pipe(mm)		
	Gas side	Liquid side	The 1st branch joint
8HP	Φ22.2	Φ12.7	BJF-330-CM(i)
10HP	Φ25.4	Φ12.7	BJF-330-CM(i)
12~14HP	Φ28.6	Φ15.9	BJF-710-CM(i)
16HP	Φ31.8	Φ15.9	BJF-710-CM(i)
18~22HP	Φ31.8	Φ19.1	BJF-710-CM(i)
24HP	Φ31.8	Φ19.1	BJF-710-CM(i)
26~34HP	Φ38.1	Φ22.2	BJF-1344-CM(i)
36~50HP	Φ38.1	Φ22.2	BJF-1344-CM(i)
52~66HP	Φ44.5	Φ25.4	BJF-E1344-CM(i)
68~88HP	Φ54.0	Φ25.4	BJF-E1500-CM(i)

5.5 Branch pipes for outdoor unit

Table.5-6

Model	Outdoor unit pipe connection opening dimension (mm)	
	Gas side	Liquid side
8~12HP	Φ25.4	Φ12.7
14~22HP	Φ31.8	Φ15.9

5.6 Branch pipes for indoor unit

Based on Tab.5-7 and Tab.5-8, select the multi connection pipes for the outdoor unit. Before installation, read the installation manual for Outdoor Unit branch joints.

Table.5-7 Outdoor unit multi-connective pipe assembly (Illustration)

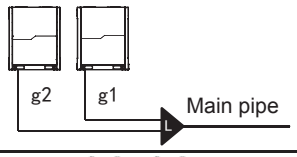
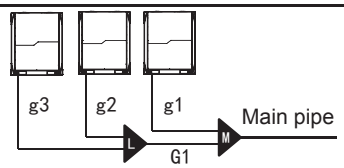
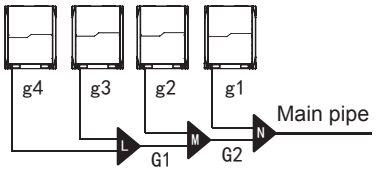
Outdoor unit Qty.	Illustration
2 units	
3 units	
4 units	

Table.5-8 Outdoor unit multi-connective pipe assembly

Outdoor unit Qty.	Outdoor unit connective pipe diameter	Parallel connect with the branch joint assembly	Main pipe
2 units	g1, g2: 8~12HP: Φ25.4/Φ12.7; 14~22HP: Φ31.8/Φ15.9	L: BJC-02-CM (i)	Refer to Table. 5-4 or 5-5 for main pipe's dimensions
3 units	g1, g2, g3: 8~12HP: Φ25.4/Φ12.7; 14~22HP: Φ31.8/Φ15.9; G1: Φ38.1/Φ19.1	L+M: BJC-03-CM(i)	
4 units	g1, g2, g3, g4: 8~12HP: Φ25.4/Φ12.7; 14~22HP: Φ31.8/Φ15.9; G1: Φ38.1/Φ19.1; G2: Φ41.2/Φ22.2	L+M+N: BJC-04-CM(i)	

Note: The pipe assemblies in the above table are special to this model and must be purchased separately.

5.7 Example

1) Take (22+12+12) HP with three modules as an example to clarify pipe selection.

2) Take Fig.5-4 as an example, where the equivalent length of all pipes is larger than 90 m.

Table.5-9 Unit: mm

Indoor unit capacity A(×100W)	When the branch joint's length ≤10 m		When the branch joint's length＞10 m	
	Gas side	Liquid side	Gas side	Liquid side
A≤45	Φ12.7	Φ6.4	Φ15.9	Φ9.5
A≥56	Φ15.9	Φ9.5	Φ19.1	Φ12.7

A The branch joint in the inside of the unit.
There are a~m branch joints in the inside of the unit. The branch joint diameter should be selected as per Tab. 5-9.

B Main pipe inside the unit (Refer to Table. 5-3)

1) The main pipe L4 with N2, N3 downstream indoor units has a total capacity of 140+71=211l. Pipe L4 diameter is Φ19.1/Φ 9.5. So, select BJF-224-CM(i) for branch joint D.

2) The main pipe L3 with N1~N3 downstream indoor units has a total capacity of 140×2+71=351. Pipe L3 diameter is Φ28.6/ Φ 12.7. So, select BJF-710-CM(i) for branch joint C.

3) The main pipe L6 with N5, N6 downstream indoor units has a total capacity is 140+28=168. Pipe L4 diameter is Φ19.1/Φ 9.5. So, select BJF-224-CM(i) for branch joint F.

4) The main pipe L5 with N4~N6 downstream indoor units has a total capacity of 140×2+28=308. Pipe L5 diameter is Φ22.2/ Φ 9.5. So, select BJF-330-CM(i) for branch joint E.

5) The main pipe L2 with N1~N6 downstream indoor units has a total capacity of 140×4+71+28=659. Pipe L2 diameter is Φ 28.6/Φ15.9. So, select BJF-710-CM(i) for branch joint B.

6) The main pipe L10 with N9, N10 downstream indoor units has a total capacity of 71+28=99. Pipe L10 diameter is Φ15.9/Φ 9.5. So, select BJF-224-CM(i) for branch joint J.

7) The main pipe L9 with N8~N10 downstream indoor units has a total capacity of 140+71+28=239. Pipe L9 diameter is Φ 22.2/Φ9.5. So, select BJF-330-CM(i) for branch joint I.

8) The main pipe L8 with N7~N10 downstream indoor units has a total capacity of 140X2+71+28=379. Pipe L8 diameter is Φ 28.6/Φ12.7. So, select BJF-710-CM(i) for branch joint H.

9) The main pipe L12 with N12, N13 downstream indoor units has a total capacity of 56×2=112. Pipe L12 diameter is Φ 15.9/Φ9.5. So, select BJF-224-CM(i) for branch joint L.

10) The main pipe L11 with N11~N13 downstream indoor units has a total capacity of 140+56×2＝252. Pipe L11 diameter is Φ 22.2/Φ9.5. So, select BJF-330-CM(i) for branch joint K.

11) The main pipe L7 with N7~N13 downstream indoor units has a total capacity of 140×3+71+56×2+28＝631, the pipe L7 diameter is Φ28.6/Φ15.9. So, select BJF-710-CM(i) for branch joint G.

12) The branch joint A with N1~N13 downstream indoor units has a total capacity of 140×7+71×2+56×2+28×2＝1290. So, select BJF-1344-CM(i) for branch joint A.

C Example: parallel connection of three outdoor units 12+12+22 (total capacity 46 HP). The total capacity of the indoor units is 1,290, if the equivalent length of all pipes is ≥90 m. According to Tab.5-5, the main pipe's diameter is Φ38.1/Φ22.2. The master unit's diameter is Φ38.1/Φ19.1 based on Tab.5-3. Select the largest. The main pipe's diameter is Φ38.1/Φ22.2

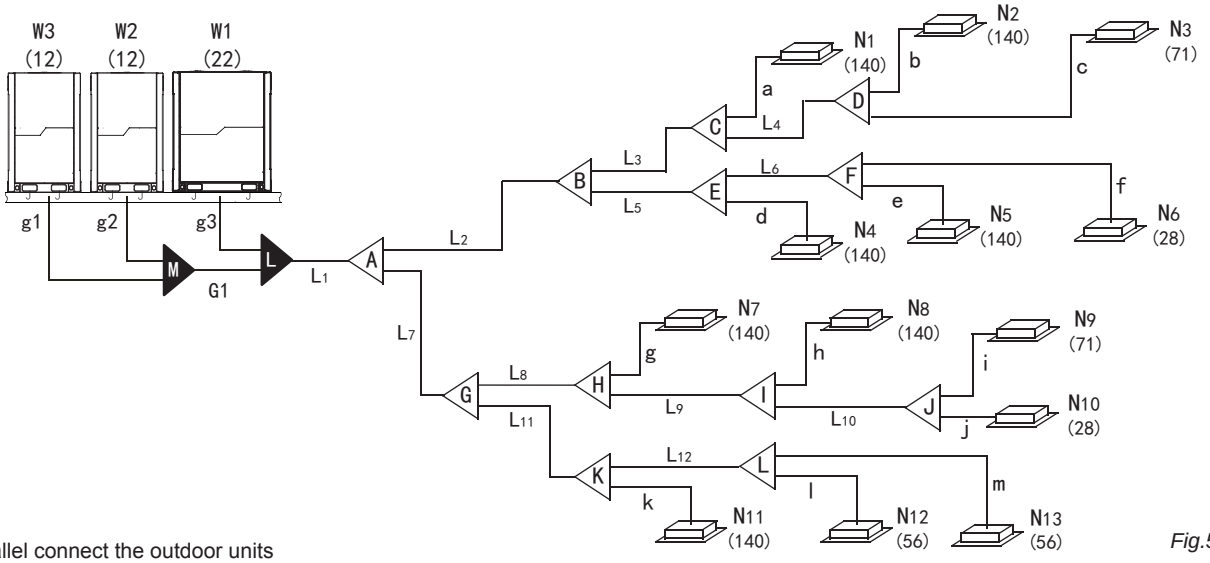


Fig.5-4

D Parallel connect the outdoor units

1) The outdoor unit linked by Pipe g1 is 12HP, which parallel connects with the outdoor unit. Refer to Tab.5-8 the connective pipe g1 diameter is Φ25.4/Φ12.7.
   The outdoor unit linked by Pipe g2 is 12HP, which parallel connects with the outdoor unit. Refer to Tab.5-8 the connective pipe g2 diameter is Φ25.4/Φ12.7.
   The outdoor unit linked by Pipe g3 is 22HP, which parallel connects with the outdoor unit. Refer to Tab.5-8 the connective pipe g3 diameter is Φ31.8/Φ15.9.

2) The upstream of G1 is the two parallel connected outdoor units. Refer to Tab.5-8 to select the three parallel connected outdoor units. The pipe diameter isΦ38.1/Φ19.1.

3) Parallel connect the three outdoor units. Refer to Tab.5-8 to select BJC-03-CM(i) for outdoor unit connective pipes (L+M).

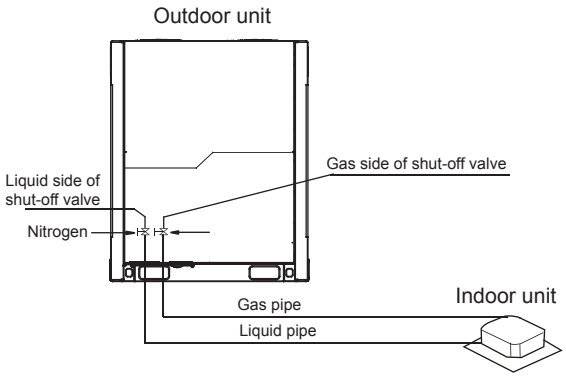


Fig.5-5

5.8 Remove dirt or water from the pipe

- Ensure there is no dirt or water before connecting the piping to the outdoor units.
- Wash the piping with high pressure nitrogen. Do not use the refrigerant of the outdoor unit.

5.9 Gas tight test

1) When setting up the indoor unit pipeline, connect the high-pressure pipe to the shut-off valve first.
2) Weld the pipe at the low-pressure side of the meter connector.
3) Use the vacuum pump for discharging air inside the liquid side of the shut-off valve and meter connecter until it reaches -1 kgf/cm^2.
4) Close the vacuum pump and charge 40 kgf/cm2 of nitrogen gas from the piston of the shut-off valve and meter connector. The pressure inside should be maintained for no less than 24 hrs.
5) During the airtight test, weld the float valve and pipe at the low-pressure side.

CAUTION

- Pressurized nitrogen (3.9MPa; 40 kgf/cm^2) is used for the airtight test.
- Do not bring pressure into the float valve directly. (See Fig. 5-5)
- Do not use oxygen, combustible gas, or toxic gas to conduct the airtight test.
- When welding, use a wet cloth to insulate the two shut-off valves for protection.
- Avoid equipment damage by not maintaining the pressure for too long.

5.10 Vacuum with vacuum pump

1) Use the vacuum pump. The vacuum level needs to be lower than -0.1MPa and the air discharge capacity above 4L/S.
2) There is no need to create a vacuum in the outdoor unit, so do not open the outdoor unit gas and liquid pipe shut-off valves.
3) Ensure the vacuum pump's is -0.1 MPa or below after it has ran for 2 hrs or more. If it runs for more than 3 hrs and cannot get to -0.1MPa or below, check whether water has mixed or gas has leaked inside the pipe.

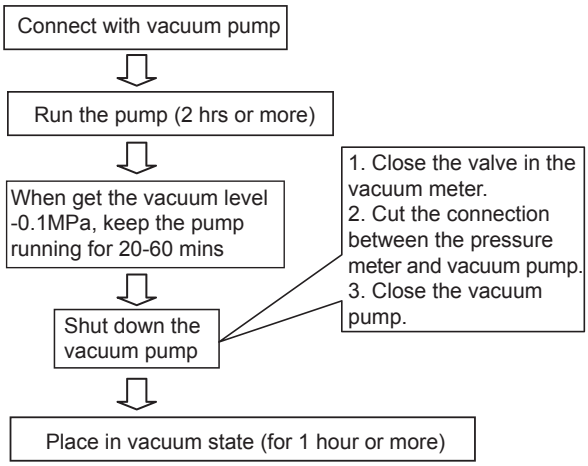


Fig.5-6

CAUTION

- Mixed use of different refrigerants or tools and measurement instruments that are in direct contact with the refrigerants is not allowed.
- Do not use refrigerant gas for creating a vacuum.
- If the vacuum level cannot reach -0.1M Pa, check if there's a leak. If not, run the vacuum pump again for 1-2 hrs.

5.11 Refrigerant amount to be added

Calculate the refrigerant to be added based on the diameter and length of the liquid-side pipe for the outdoor/indoor unit connection. The refrigerant is R410A.

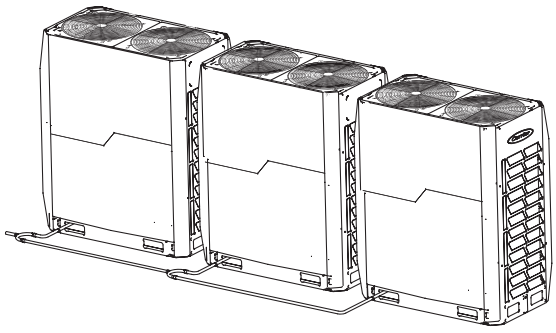
Table.5-10

Pipe size on liquid side	Refrigerant to be added per meter
Φ6.4	0.022kg
Φ9.5	0.057kg
Φ12.7	0.110kg
Φ15.9	0.170kg
Φ19.1	0.260kg
Φ22.2	0.360kg
Φ25.4	0.520kg
Φ28.6	0.680kg

5.12 Key installation points for connective pipes between outdoor units

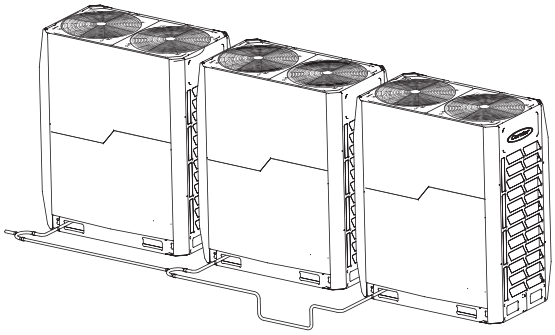
1) Connect the pipes between outdoor units horizontally (Fig.5-7 and Fig.5-8). Avoid a concave shape at the junction site (see Fig.5-9).

2) No pipes connecting the outdoor units can exceed the height of the pipe outlets (see Fig.5-10).



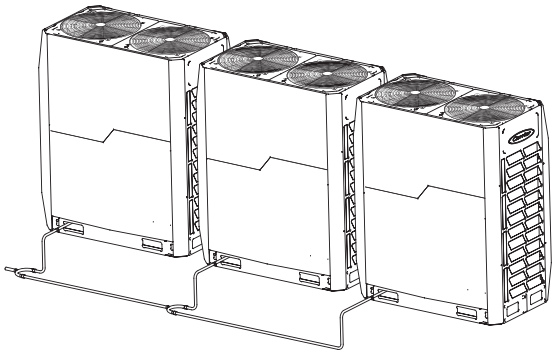
√ Correct

Fig.5-7



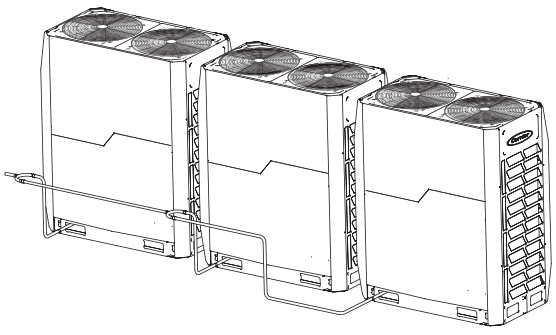
× Incorrect

Fig.5-8



√ Correct

Fig.5-9



× Incorrect

Fig.5-10

3) The branch joint must be installed horizontally. The error angle cannot be more than 10° or a fault may occur.

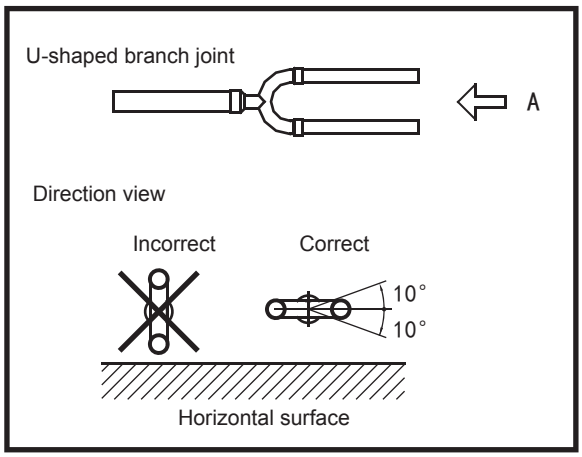


Fig.5-11

4) To stop oil accumulating in the outdoor unit, install the branch joints correctly.

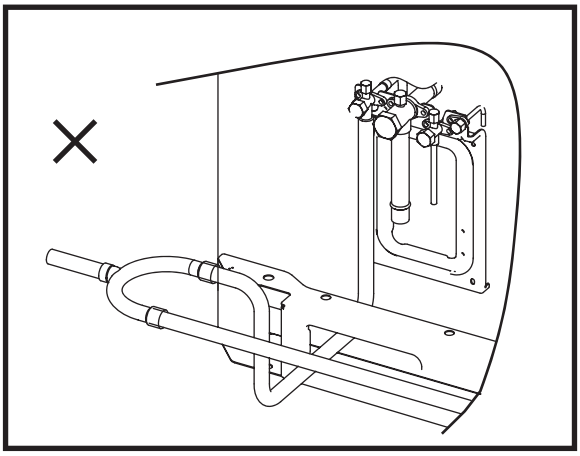


Fig.5-12

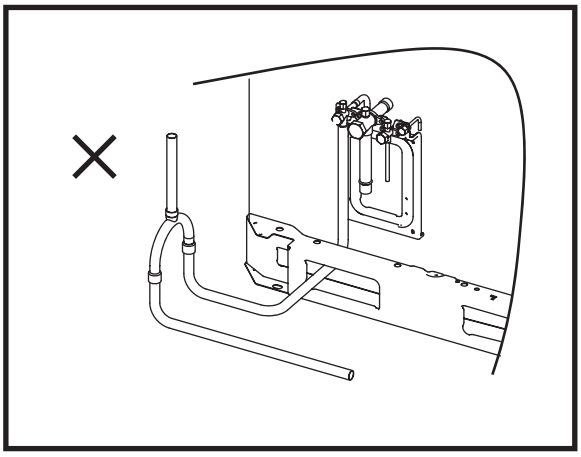


Fig.5-13

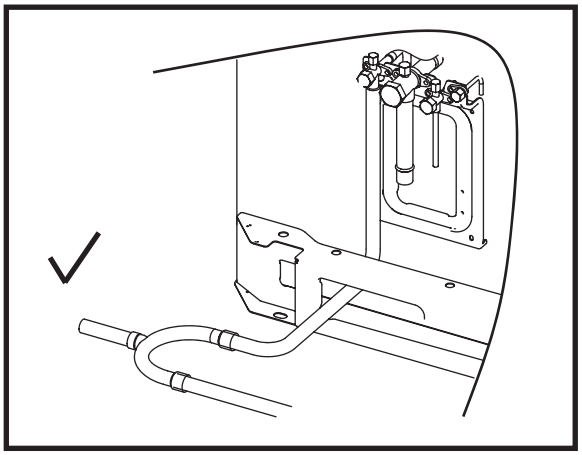


Fig.5-14

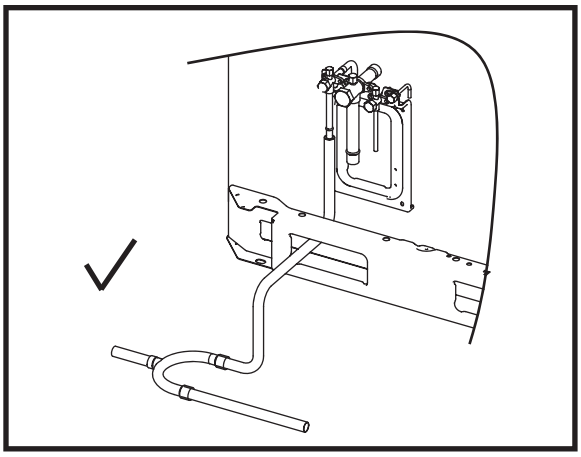


Fig.5-15

6. ELECTRIC WIRING

6.1 Sw2 query instructions

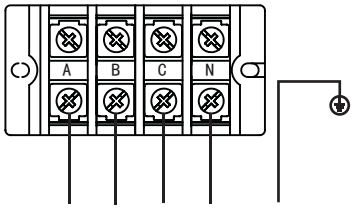
Apply the SW2 spot check Table.6-1

No.	Display content (normal)	Note
1	Outdoor unit address	0, 1, 2, 3
2	Outdoor unit capacity	8, 10, 12, 14, 16, 18, 20, 22
3	Modular outdoor unit qty.	Available for main unit
4	Qty.setting of indoor units	Available for main unit
5	Total capacity of outdoor units	Capacity requirement
6	Total requirements on indoor unit capacity	Available for main unit
7	Total requirements on correct main unit corrected	Available for main unit
8	Operation mode	0, 2, 3, 4
9	Outdoor units' capacity when running	Capacity requirement
10	Speed of fan A	
11	Speed of fan B	
12	T2B/T2 average temp.	Actual value
13	T3 pipe temp.	Actual value
14	T4 ambient temp.	Actual value
15	Discharge Temp.of Inverter compressor A	Actual value
16	Discharge Temp.of Inverter compressor B	Actual value
17	Heat sink Temp.	Actual value
18	Discharge pressure corresponding to the saturation temperature	Actual value +30
19	Current of inverter compressor A	Actual value
20	Current of inverter compressor B	Actual value
21	Opening angle of EXV A	
22	Opening angle of EXV B	
23	High pressure	Display value×0. 1MPa
24	Low pressure (reserve)	
25	Qty. of indoor units	That can communicate with indoor units
26	Qty. of working Indoor units	Actual value
27	Priority mode	0, 1, 2, 3, 4
28	Night noise control mode	0, 1, 2, 3
29	Static pressure mode	0, 1, 2, 3
30	DC voltage A	
31	DC voltage B	
32	Reserve	
33	Last-time error or protection code	If there is no protection or error, the panal will diaplay 8.8.8.
34	Times of error clearance	
35	----	Check end

The display contains the following:

1) Normal display: On standby, the high position displays the address of the outdoor unit, and the low position displays the Qty. of indoor units that can communicate with the outdoor units. When running, it will display the rotation frequency of the compressor.
2) Operation mode: 0-OFF; 2-Cooling; 3-Heating; 4-Constraint cooling.
3) Fan speed: 0-stop; 1~15: speed increases sequentially; 15 is the max. fan speed.
4) EXV opening angle: Pulse count=display value×8;
5) Priority mode: 0-heating priority mode; 1-cooling priority mode; 2-Number 63 and higher operating modes first; 3-responds to heating mode only; 4-responds to cooling mode only.
6) Night noise control mode: 0-Night noise control mode; 1- silent mode ; 2-most silent mode; 3-no priority.
7) Static pressure mode: 0-Static pressure is 0 Mpa ; 1-Static pressure mode is low pressure ; 2-Static pressure mode is medium pressure ; 3-high static pressure mode is high pressure.

6.2 Terminal base function



To 380-415V 3N~ 50Hz/60Hz

Fig.6-1

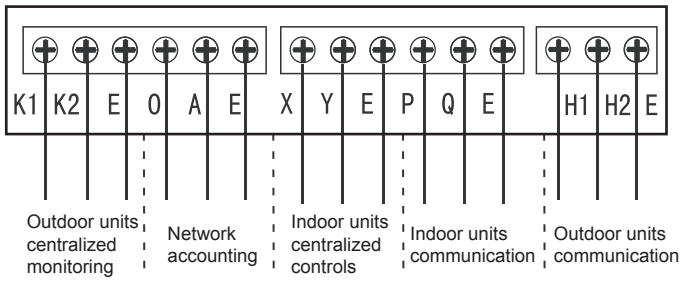


Fig.6-2

6.3 Electric wiring system and installation

■ **Outdoor unit power wiring**

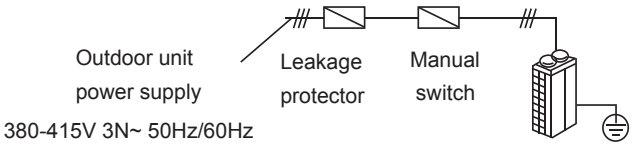


Fig.6-3

■ **Indoor unit power wiring**

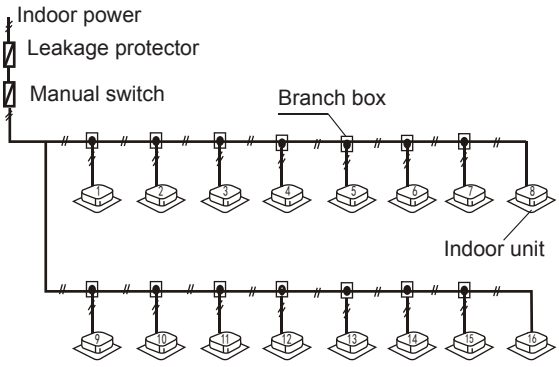


Fig.6-4

CAUTION

- Set refrigerant piping system, signal wires between indoor-indoor unit, and that between outdoor-outdoor unit into one system.
- Power must unified supply to all indoor units in the same system.
- Please do not put the signal wire and power wire in the same wire tube; keep distance between the two tubes. (Current capacity of power supply: less than 10A--300mm, less than 50A--500mm.)
- Make sure to set address of outdoor unit in case of parallel multi-outdoor units.

6.4 Electric parameter form of outdoor unit

Table.6-2

System	Outdoor Unit				Power Current			Compressor		OFM	
	Voltage (V)	Hz	Min. (V)	Max. (V)	MCA (A)	TOCA (A)	MFA (A)	MSC (A)	RLA (A)	KW	FLA (A)
8HP	380~415	50/60	342	456	22.0	24.6	25	-	7.2	0.56	4.6
10HP	380~415	50/60	342	456	23.1	24.6	25	-	8.7	0.56	4.6
12HP	380~415	50/60	342	456	25.3	26.9	30	-	9.8	0.56	4.5
14HP	380~415	50/60	342	456	30.0	29.2	35	-	7.1X2	0.56X2	2.8+2.4
16HP	380~415	50/60	342	456	32.9	29.2	35	-	7.8X2	0.56X2	2.8+2.4
18HP	380~415	50/60	342	456	37.8	42.4	40	-	10.0+6.0	0.56X2	3.9+3.5
20HP	380~415	50/60	342	456	45.3	53.4	50	-	10.9X2	0.56X2	4.0+3.4
22HP	380~415	50/60	342	456	49.4	53.4	50	-	11.7X2	0.56X2	4.0+3.4

Notes:
1.The current value of combination unit is the total value of each basic model(refer to Table.6-2)
For example: 46HP=22HP+12HP+12HP
Power current: MCA=49.4+25.3+25.3=100
TOCA=53.4+26.9+26.9=107.2
MFA=50+30+30=110
Compressor: RLA=11.7X2+9.8+9.8=43.0
OFM: FLA=4.0+3.4+4.5+4.5=16.4
2. RLA is based on the following conditions, Indoor temp. 27°C DB/19°C WB, Outdoor temp. 35°C DB
3. TOCA means the total value of each OC set.
4. MSC means the Max. current during the starting of compressor.
5. Voltage range units are suitable for use on electrical systems where voltage supplied to unit terminals is not below or above listed range limits.
6. Maximum allowable voltage variation between phase is 2%
7. Selection wire size based on the larger value of MCA or TOCA
8. MFA is used to select the circuit breaker and the ground fault circuit interrupter (earth circuit breaker).

Remark:
MCA: Min. Current Amps. (A) TOCA: Total Over-current Amps. (A) MFA: Max. Fuse Amps. (A) MSC: Max. Starting Amps. (A)
RLA: Rated Locked Amps. (A) OFM:Outdoor Fan Motor. FLA: Full Load Amps. (A) KW: Rated Motor Output (KW)

6.5 Electric wiring system and installation

CAUTION

- Select the power supply for the indoor units and outdoor units separately.
- The power supply should have a specified branch circuit with a leakage protector and manual switch.
- The power supply, leakage protector, and manual for all the indoor units connecting to the same outdoor unit should be universal. (Set the power supply for all indoor units in one system on the same circuit. It should turn the units on and off at the same time, or it will degrade service life or stop the units from turning on at all.)
- Install the connective wiring system between the indoor and outdoor units together with the refrigerant piping system.
- Use a 3-core shielded wire as a signal wire between indoor and outdoor units. A multi-core wire is unavailable.
- Comply with relevant National Electric Standard.
- Power wiring should be completed by a professional electrician.

6.5.1 Outdoor unit power wiring

- Separate Power Supply (without power facility) (See Table.6-3)

Table.6-3

Item / Model	Power supply	Min. Power wire diameter (mm^2) Wiring of mental and synthetic resin		Manual switch (A)		Leakage protector
		Size (Continuous length of pipe m)	Grounding wire	Capacity	Fuse	
8~12HP	380-415V 3N~ 50Hz /60Hz	4×10 mm^2 (<20 m) 4×16 mm^2 (<50 m)	1×10 mm^2	32	25	100mA 0.1sec or less
14HP		4×10 mm^2 (<20 m) 4×16 mm^2 (<50 m)	1×10 mm^2	40	35	
16HP		4×10 mm^2 (<20 m) 4×16 mm^2 (<50 m)	1×10 mm^2	40	35	
18HP		4×16 mm^2 (<20 m) 4×25 mm^2 (<50 m)	1×16mm^2	50	40	
20~22HP		4×16 mm^2 (<20 m) 4×25 mm^2 (<50 m)	1×16mm^2	63	50	

NOTE

- Select the power cord for these models separately according to relevant standard.
- The wiring diameter and the length in the table indicate that the voltage drop range is within 2%. If the length exceeds the above figure, please select the wire diameter according to the relevant standard.

- With power facilities

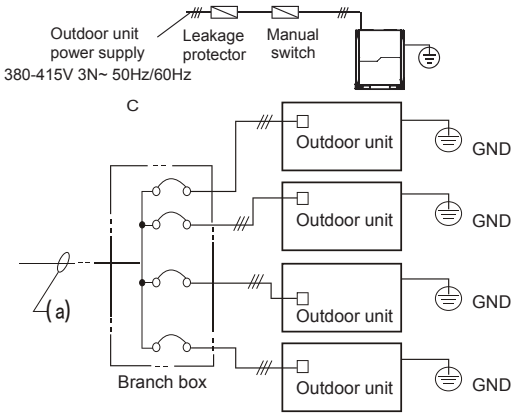


Fig.6-5

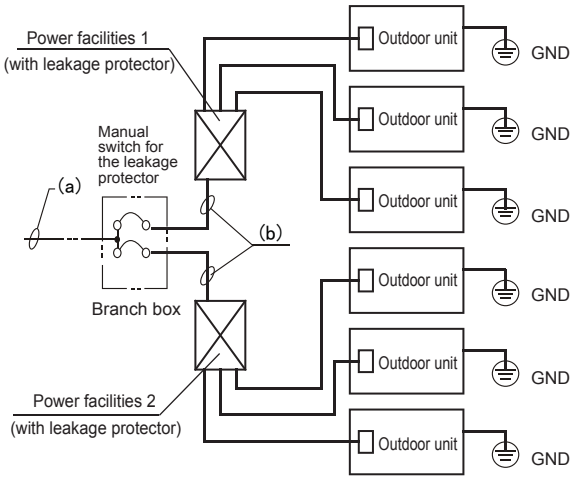


Fig.6-6

- Select the wire diameter
  Power wiring refers to the main wire (a) connecting to branch box and the wiring (b) between branch box and power facilities. Please select the wire diameter according to the following requirements.

- Diameter of main wire (a)
  Depends on the total horsepower of the outdoor unit and following table.
  e.g., In system: (8Hp×1unit+8Hp×1unit+10Hp×1unit)
  Total Hp=26Hp→(Table.6-3)→size of wire=35mm2(within 50m)

- Wiring (b): between the branch box and power equipment.
  Depends on the total number of outdoor units. Fewer than five means the diameter is the same as of the diameter of the main wire (a); More than six requires two electric control boxes. The diameter of the wiring depends on the total horsepower of outdoor units connecting to each electric control box and the following table.

- Select wire diameter (≥) (table.6-4) (unit :mm^2)

Table.6-4

Total HP	<20m	<50m
8	10	16
10	10	16
12	10	16
14	16	25
16	16	25
18	16	25
20	16	25
22	16	25
24	25	35
26	25	35
28	25	35
30	35	50
32	35	50
34	35	50
36	35	50
38	35	50
40	35	50
42	50	70
44	50	70
46	50	70
48	50	70
50	70	95
52	70	95
54	70	95
56	90	110
58	90	110
60	90	110
62	90	110
64	90	110
66	90	110
68	90	110
70	90	110
72	90	110
74	90	110
76	90	110
78	90	110
80	90	110
82	90	110
84	90	110
86	90	110
88	90	110

■ Select the capacity of manual switch and fuse of the branch box.

- See the following table. When there are no power facilities, it depends on the outdoor unit it connects to.
- See table.6-4 below. When there is power, it depends on total horsepower.

Table.6-5 Total horsepower, capacity of manual switch and fuse

Total (HP)	Manual switch (A)	Fuse(A)	Total (HP)	Manual switch (A)	Fuse(A)
8~12	32	25	30~34	100	80
14	40	35	36~40	125	100
16	40	35	42~44	125	100
18	50	40	46~50	150	125
20~22	63	50	52~60	200	150
24~28	80	70	62~88	250	200

■ Indoor power supply

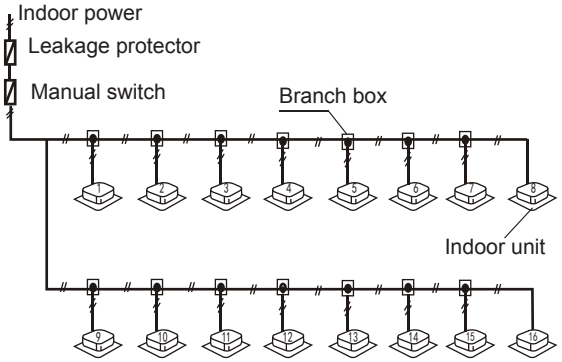


Fig.6-7

CAUTION

■ Set the refrigerant piping system, signal wires between indoor-indoor unit, and those between the outdoor-outdoor unit into one system.

■ Unify the power supply to all indoor units in the same system.

■ Do not put the signal wire and power wire in the same wire tube; keep some distance between the two tubes. (Current capacity of the power supply: less than 10A--300mm, less than 50A--500mm.)

■ Set the address of the outdoor unit in case there are parallel multi-outdoor units.

6.5.2 Cable clips of main power wire instructions

The attached cable clip includes two parts: the base and upper cover. The base is installed in the electric control box located under the terminals. The upper cover is put together with the other accessories as an attachment.
Both the front and back side of the cable clip can be used to groove wire. Groove the wire according to its size.
The upper cover of the cable clip must be fixed with three M4*30mm screws.
When the cross section of the power wire is less than 10 mm^2, groove the power wires as one. When stripping the outermost insulating layer, keep the sum of the stripped length and terminal length to less than 70 mm, as shown in Fig.6-8:

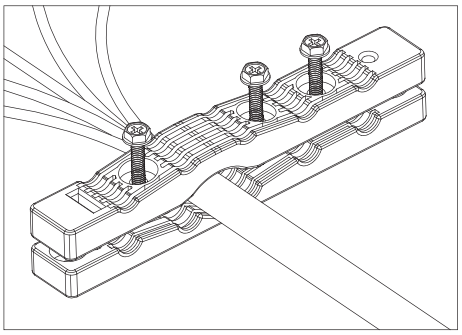


Fig.6-8

When the cross section of the power wire is more than 10 mm^2, groove the power wires separately. When stripping the outer wire, ensure the sum of stripped length and terminal length is between 100 mm and 200 mm, as shown in Fig.6-9:

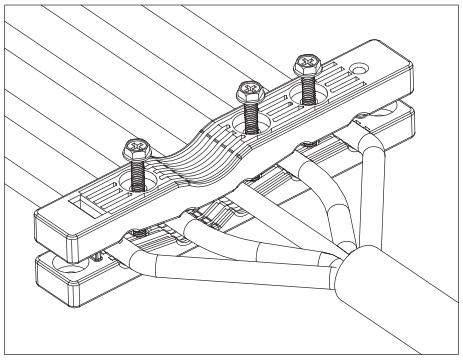


Fig.6-9

CAUTION

- First, connect the power wires and terminals and then groove the wires, or installation will be hard.
- When installing the main power wire, strip of appropriate length of the insulation layer according to the groove and position of the cable clip.
- When installing the three fixed screws, twisting the length should ensure displacement is less than 2 mm when applying 100 N force onto the wire. Twisting it incorrectly will damage the protective cover of the power wire.

6.6 Control system and Installation

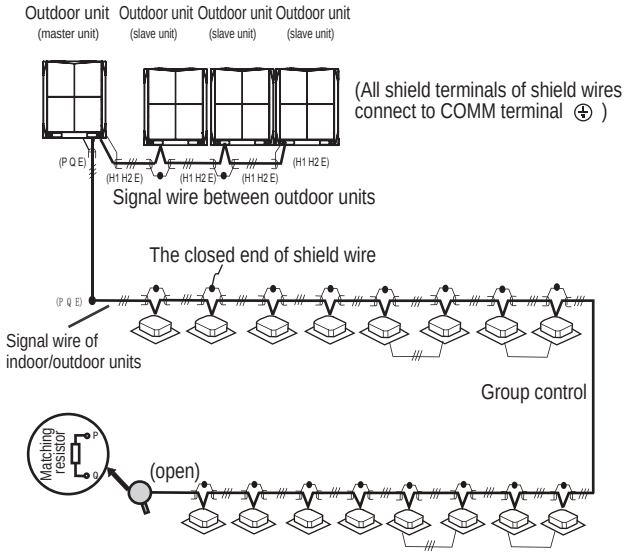
- The control line should be shielded wire. Using other wire will cause signal interference and faulty operations.
- The shielded nets on the two sides of shielded wires are either grounded to the earth, or connected with each other and jointed to the sheet metal along to the earth.
- The control wire cannot be bound with the refrigerant pipeline and power wire. When the power wire and control wire are distributed in parallel, keep the gap between them above 300 mm to prevent signal interference.
- The control wire must not form a closed loop.
- Control wire has polarity, so be careful when connecting it.

NOTE

The shield net should be grounded at the wiring terminal of the outdoor unit. The inlet and outlet wire net of indoor communication wire should be connected directly and not grounded. It should form an open circuit at the shield net of final indoor unit.

6.7 Signal wire of indoor/outdoor units

- Signal wire of indoor/outdoor unit adopts 3-core shielded wire (≥0.75 mm^2), which has polarity, so please connect it correctly.



The indoor unit at the terminal of communication system should parallel-connect to impedance between port P and port Q.

Fig.6-10

6.8 Example for power wire connection

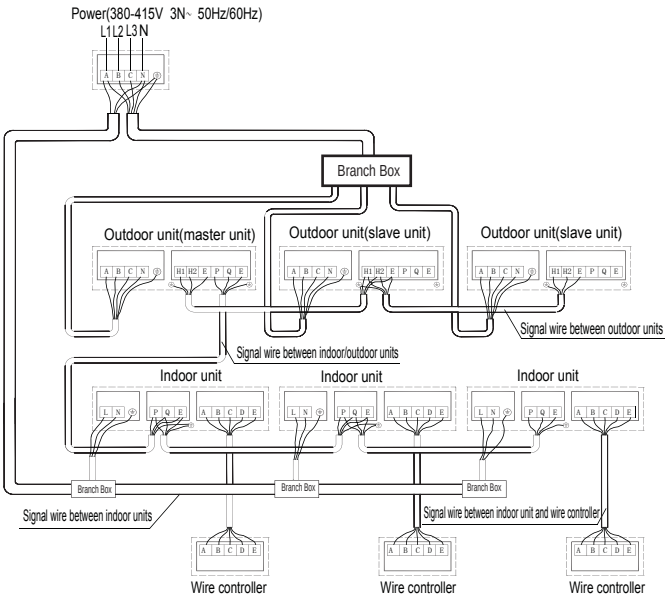


Fig.6-11

7. TRIAL RUN

7.1 Inspection and confirmation before commissioning

- Check that the refrigeration pipe line and communication wire between the indoor and outdoor units are connected to the same refrigeration system or faults will occur.
- Power voltage is within ±10% of the rated voltage.
- Check that the power wire and control wire are correctly connected.
- Check that the wire controller is properly connected.
- Before powering on, confirm there is no short circuit on each line.
- Check whether all units have passed a nitrogen pressure test for 24 hours with R410A: 40 kg/cm^2.
- Confirm whether system debugging has been carried out for vacuum drying and packed with refrigeration as required.

7.2 Preparation before debugging

- Calculating the additional refrigerant quantity for each set of units according to the actual length of the liquid pipe.
- Keep the required refrigerant ready.
- Keep the system plan, system piping diagram, and control wiring diagram handy.
- Record the setting address code on the system plan.
- Turn on the power switches for outdoor units in advance, and keep them connected for at least 12 hours, so that the heater heats up the refrigerant oil in compressor.
- Fully turn on the air pipe stop valve, liquid pipe stop valve, oil balance valve, and air balance valve. If the above valves are not turned on fully, the unit will be damaged.
- Check whether the power phase sequence of outdoor unit is correct.
- All dial switches for indoor and outdoor units are set according to the Technical Requirements of the Product.

7.3 Fill the name of connected system

To clearly identify the connected systems between two or more indoor units and the outdoor unit, select names for every system, and record them on the nameplate on the outdoor electric control box cover.

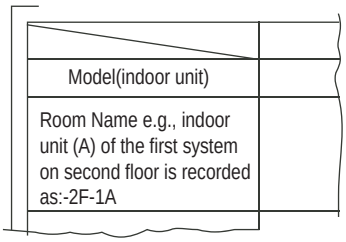


Fig.7-1

7.4 Important information for the used refrigerant

This product has the fluorinated gas which is listed in kyoto protocol it is forbidden to release to air.
Refrigerant type: R410A,volume of GWP: 2088,
GWP=Global Warming Potential

Table.7-1

Model	Factory charge / kg	tonnes CO_2 equivalent
8,10HP	9.00	18.79
12HP	11.00	22.97
14,16,18HP	13.00	27.14
20,22HP	16.00	33.41

Attention:
Frequency of Refrigerant Leak Checks.

1) For equipment that contains fluorinated greenhouse gases in quantities of 5 tonnes of CO_2 equivalent or more,but of less than 50 tonnes of CO_2 equipment,at least every 12 monthes,or where a leakage detection system is installed, at least every 24 monthes.

2) For equipment that contains fluorinated greenhouse gases in quantities of 50 tonnes of CO_2 equivalent or more,but of less than 500 tonnes of CO_2 equipment,at least every six monthes, or where a leakage detection system is installed, at least every 12 monthes.

3) For equipment that contains fluorinated greenhouse gases in quantities of 500 tonnes of CO_2 equivalent or more,at least every three monthes ,or where a leakage detection system is installed, at least every six monthes.

4) Non-hermetically sealed equipment charged with fluorinated greenhouse gases shall only be sold to the end user where evidence is provide that the installation is to be carried out by an undertaking certified person.

5) Only certificated person is allowed to do installation, operation and maintenance.

7.5 Caution on refrigerant leakage

- This air conditioner uses R410A as refrigerant, which is safe and noncombustible.
- The room housing the air conditioner should be big enough so that a refrigerant leakage cannot reach critical thickness.
- Critical thickness-----the max thickness of Freon without harming people. R410A critical thickness: 0.42 [kg/m^3]

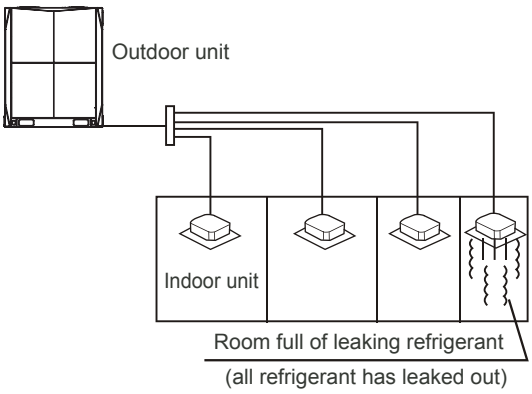


Fig.7-2

- Calculate the critical thickness as follows and take the necessary action.

• Calculate the sum of the charge volume (A[kg])
Total refrigerant volume=refrigerant volume when delivered (nameplate)+super addition

• Calculate the indoor cubage (B[m3]) (as the minimum cubage)

• Calculate the refrigerant thickness.

$$\frac{A\ [kg]}{B\ [m^3]} \leq \text{Critical thickness: } 0.42\ [kg/m^3]$$

- Countermeasure against excessive thickness

• Install a mechanical ventilator to reduce the refrigerant thickness to under the critical level (ventilate regularly).

• Install a leakage detector alarm for the mechanical ventilator if you cannot regularly ventilate the room.

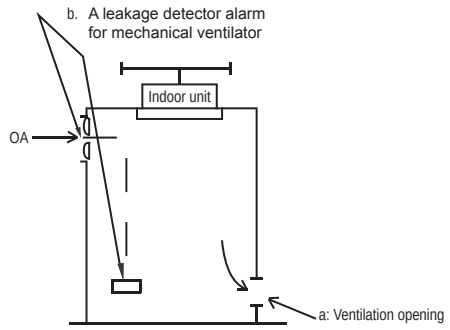


Fig.7-3

7.6 Hand over to the customer

Give the installation manual for the indoor unit and outdoor unit to the user.

8. CUSTOMER DETAILS

Branch Address : .....

.....

.....

Telephone : .....

Person to be contacted : .....

Dealer address : .....

.....

.....

Telephone : .....

Person to be contacted : .....

.....

Signature of the Dealer with Seal.

In all correspondence/communication state your name, address, the serial number of your air conditioning unit, date of purchase and dealer's name (include address), location of unit and description of problem, for prompt and immediate attention

Name of Customer : .....

Address : .....

.....

.....

Sr.No. of the Unit : .....

Sr.No. of the Compressor : ..... Date of purchase:.....

Invoice No : .....

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