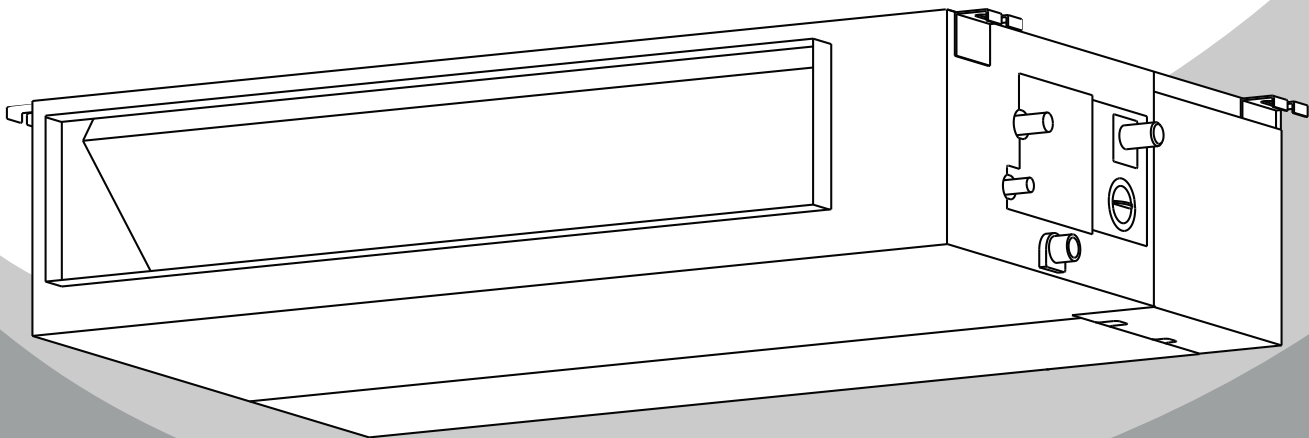


SOPHIA SERIES

Middle Static Pressure Duct Type

Installation Manual



Models:

CH-M09DTUI

CH-M12DTUI

CH-M18DTUI

CH-M24DTUI

CH-24LCUO

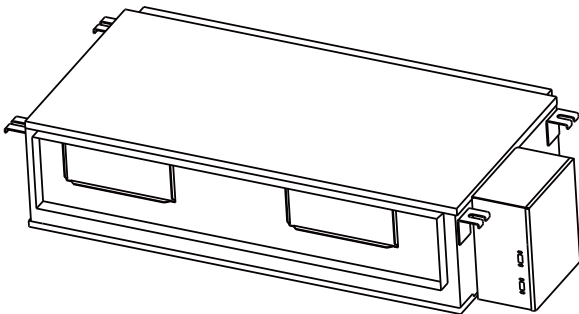
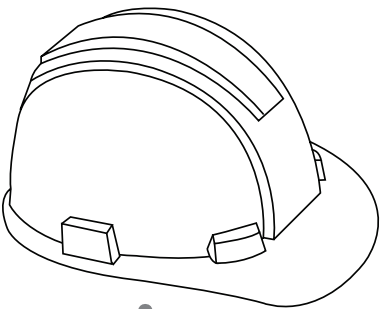
IMPORTANT NOTE:

Read this manual carefully before installing or operating your new air conditioning unit.
Be sure to save this manual for future reference.

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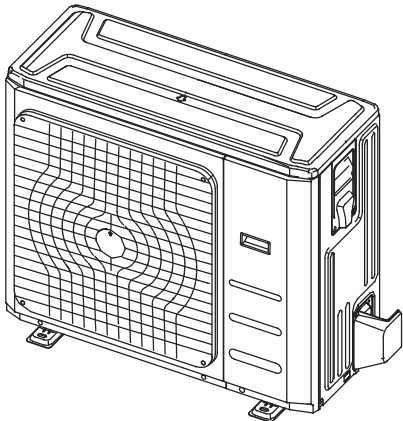
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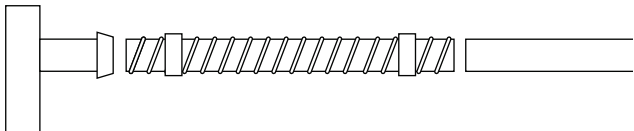


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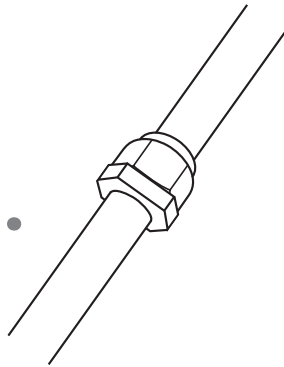
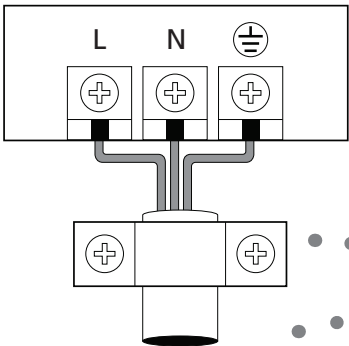




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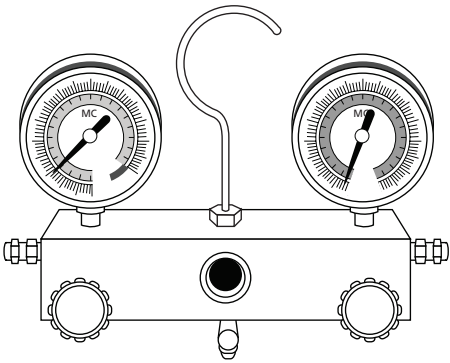
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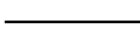
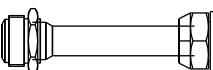
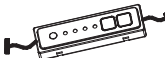
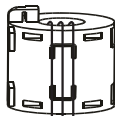
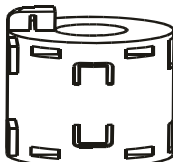
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Accessories

1

The air conditioning system comes with the following accessories. Use all of the installation parts and accessories to install the air conditioner. Improper installation may result in water leakage, electrical shock and fire, or cause the equipment to fail.

	NAME	SHAPE	QUANTITY
Tubing & Fittings	Soundproof / insulation sheath		2
Drainpipe Fittings (for cooling & heating)	Drain joint (some models)		1
	Seal ring (some models)		1
Others	Owner's manual		1
	Installation manual		1
	Transfer connector (some models) (Ø0.375in-Ø0.375in)/(Ø9.52-Ø9.52) (Packed with the indoor unit) NOTE: Pipe size may differ from appliance to appliance. To meet different pipe size requirements, sometimes the pipe connections need a transfer connector installed on the outdoor unit.		1
	Component of display control unit (some models)		1
EMC Magnetic Ring (some models)	Magnetic ring (wrap the electric wires S1 & S2 (P & Q & E) around the magnetic ring twice)	 S1&S2(P&Q&E)	1
	Magnetic ring (Hitch on the connective cable between the indoor unit and outdoor unit after installation.)		1

Optional accessories

- There are two types of remote controls: wired and wireless.
Select a remote control based on customer preferences and requirements and install in an appropriate place.
Refer to catalogues and technical literature for guidance on selecting a suitable remote control.

Safety Precautions

2

Read Safety Precautions Before Installation

Incorrect installation due to ignoring instructions can cause serious damage or injury.

The seriousness of potential damage or injuries is classified as either a **WARNING** or **CAUTION**.



WARNING

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



CAUTION

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



WARNING

- **Carefully read the Safety Precautions before installation.**
- In certain functional environments, such as kitchens, server rooms, etc., the use of specially designed air-conditioning units is highly recommended.
- **Only trained and certified technicians should install, repair and service this air conditioning unit.**
Improper installation may result in electrical shock, short circuit, leaks, fire or other damage to the equipment and personal property.
- **Strictly follow the installation instructions set forth in this manual.**
Improper installation may result in electrical shock, short circuit, leaks, fire or other damage to the equipment.
- Before you install the unit, consider strong winds, typhoons and earthquakes that might affect your unit and locate it accordingly. Failure to do so could cause the equipment to fail.
- After installation, ensure there are no refrigerant leaks and that the unit is operating properly. Refrigerant is both toxic and flammable and poses a serious health and safety risk.
- This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.
- The appliance (indoor units) shall not be installed in the laundry.

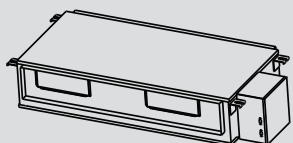
Note about Fluorinated Gasses

1. This air-conditioning unit contains fluorinated gasses. For specific information on the type of gas and the amount, please refer to the relevant label on the unit itself.
2. Installation, service, maintenance and repair of this unit must be performed by a certified technician.
3. Product uninstallation and recycling must be performed by a certified technician.
4. If the system has a leak-detection system installed, it must be checked for leaks at least every 12 months.
5. When the unit is checked for leaks, proper record-keeping of all checks is strongly recommended.

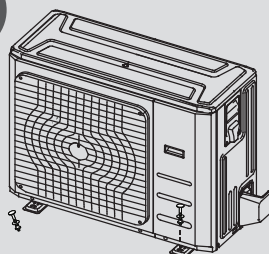
Installation Overview

3

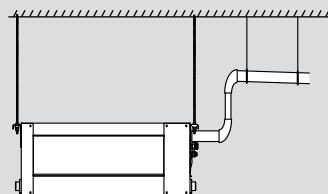
INSTALLATION ORDER

1

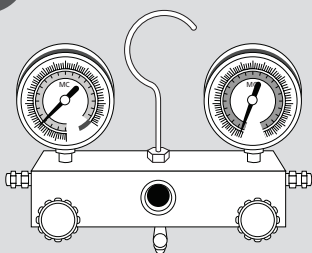
Install the indoor unit
(Page 7)

2

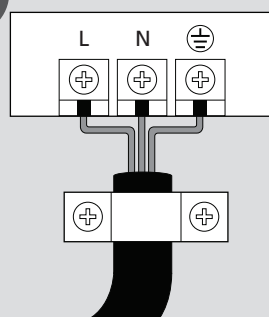
Install the outdoor unit
(Page 13)

3

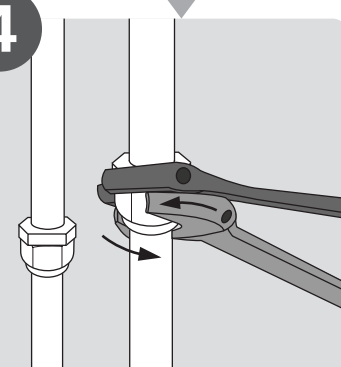
Install the drainpipe
(Page 16)

6

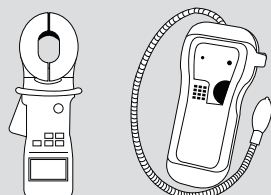
Evacuate the refrigeration system
(Page 25)

5

Connect the wires
(Page 21)

4

Connect the refrigerant pipes
(Page 18)

7

Perform a test run
(Page 27)

Indoor Unit Installation

4

Indoor Unit Parts

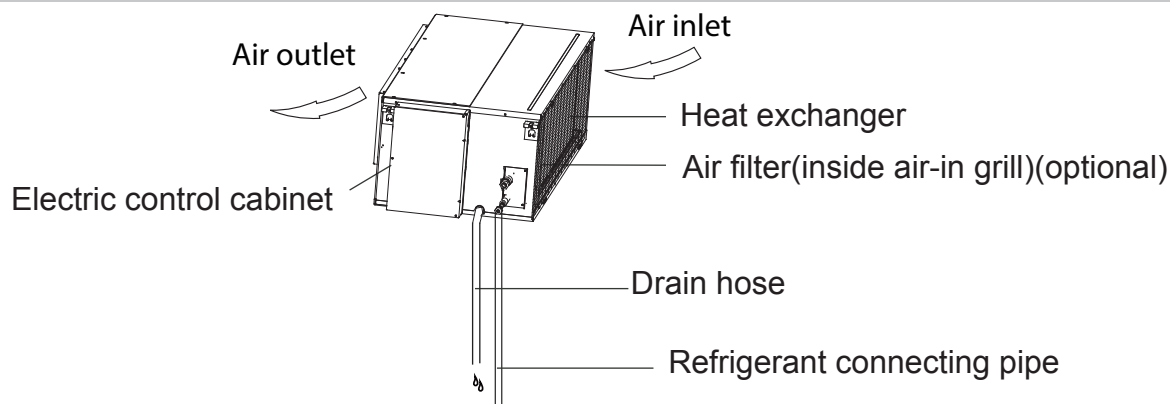


Fig. 4.1

Safety Precautions

⚠ WARNING

- Securely install the indoor unit on a structure that can sustain its weight. If the structure is too weak, the unit may fall causing personal injury, unit and property damage, or even death
- **DO NOT** install the indoor unit in a bathroom or laundry room as excessive moisture can short the unit and corrode the wiring.

Indoor Unit Installation Instructions

Step 1: Select installation location

The indoor unit should be installed in a location that meets the following requirements:

- ☑ Enough room for installation and maintenance.
- ☑ Enough room for the connecting pipe and drainpipe.
- ☑ The ceiling is horizontal and its structure can sustain the weight of the indoor unit.
- ☑ The air inlet and outlet are not impeded.
- ☑ The airflow can fill the entire room.
- ☑ There is no direct radiation from heaters.

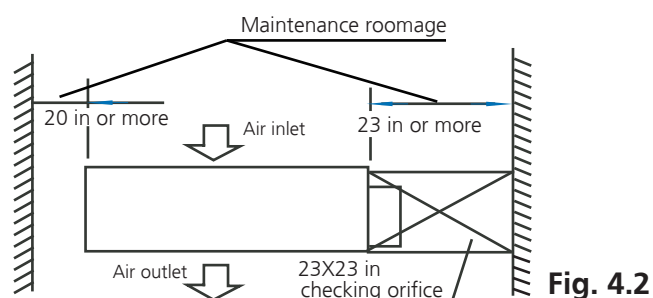


Fig. 4.2

⚠ CAUTION

- Install the indoor and outdoor units, cables and wires at least 3.2' (1m) from televisions or radios to prevent static or image distortion. Depending on the appliances, a 3.2' (1m) distance may not be sufficient.
- If the indoor unit is installed on a metal part of the building, it must be grounded.
- Install the indoor unit at least 7.87' (2.4m) from the floor.

⚠ CAUTION

DO NOT install the unit in the following locations:

- ⊗ Where oil drilling or fracking is taking place
- ⊗ Coastal areas with high salt content in the air
- ⊗ Areas with caustic gases in the air, such as near hot springs
- ⊗ Areas with power fluctuations, such as factories
- ⊗ Enclosed spaces, such as cabinets
- ⊗ Areas with strong electromagnetic waves
- ⊗ Areas that store flammable materials or gas
- ⊗ Rooms with high humidity, such as bathrooms or laundry rooms

Step 2: Hang indoor unit.

1. Please refer to the following diagrams to locate the four positioning screw bolt holes on the ceiling. Be sure to mark the places where you will drill ceiling hook holes.

The size of installation for indoor unit following the Fig.4-3, This unit has installed with air filter.

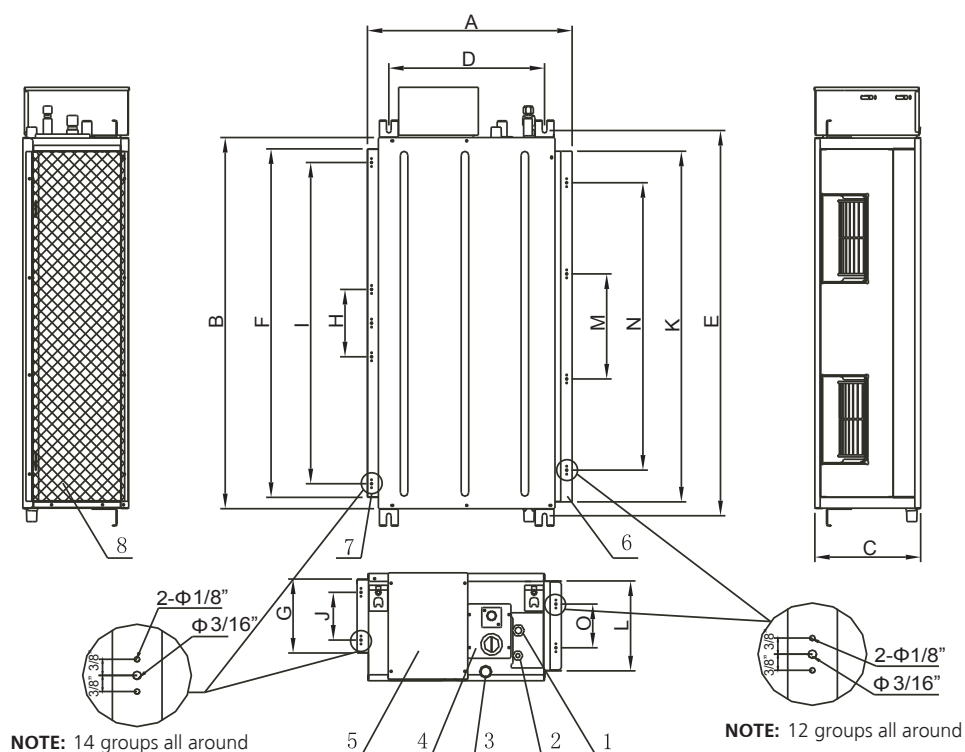


Fig. 4.3

Table.4-1

(unit: in/mm)

MODEL (Btu/h)	Outline dimension			size of mounted lug		air outlet opening size (symmetry of air outlet opening)					air inlet opening size (symmetry of air inlet opening)				
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
24K	20.6/525	35.4/900	10.6/270	15.6/397	36.8/936	33.2/844	7.2/185	6.3/160	30.7/780	4.7/120	33.5/851	8.9/226	8.4/215	26.2/665	4.3/110
30K~36K	20.6/525	43.7/1110	10.6/270	15.6/397	45/1146	41.5/1054	7.2/185	8.6/220	37.8/960	4.7/120	41.7/1061	8.9/226	12.4/315	34.4/875	4.3/110
45K~60K	24.6/625	47.2/1200	15/380	19.5/495	48.6/1236	39.3/1000	10/253	10.6/270	35.4/900	6.7/170	45/1145	13.1/334	12.8/325	36.4/925	5.1/130
55K~60K	33.8/858	55.1/1400	17.3/440	27.5/700	56.5/1436	46.7/1188	15/385	20/500	39.3/1000	11/280	46.7/1188	12.8/325	20/500	39.3/1000	11/280

Table.4-2

Number	Name	fixed-frequency	inverter
1	Gas pipe connection	Ø5/8" (24~36K units) Ø3/4" (48~60K units)	Ø5/8"
2	Liquid pipe connection	Ø3/8"	Ø3/8"
3	Drain pipe connection	OD Ø1" ID Ø3/4"	OD Ø1" ID Ø3/4"
4	Drain pipe connection	Using drain pump (optional)	Using drain pump (optional)
5	Power supply connection	—	—
6	Air inlet duct flange	—	—
7	Air outlet duct flange	—	—
8	Air filter	optional	optional

Wood

Place the wood mounting across the roof beam, then install the hanging screw bolts. (See Fig.4.4)

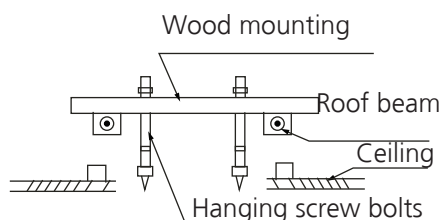


Fig. 4.4

New concrete bricks

Inlay or embed the screw bolts. (See Fig.4.5)

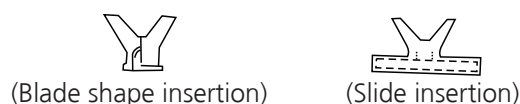


Fig. 4.5

Original concrete bricks

Use an embedding screw bolt, crock, and stick harness. (See Fig.4.6)

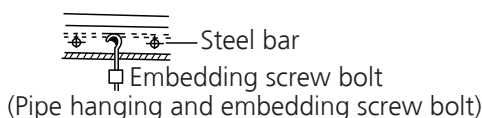


Fig. 4.6

Steel roof beam structure

Install and use the supporting steel angle. (See Fig.4.7)

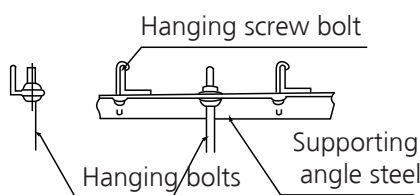


Fig. 4.7

! CAUTION

The unit body must be completely aligned with the hole. Ensure that the unit and the hole are the same size before moving on.

2. Install and fit pipes and wires after you have finished installing the main body. When choosing where to start, determine the direction of the pipes to be drawn out. Especially in cases where there is a ceiling involved, align the refrigerant pipes, drain pipes, and indoor and outdoor lines with their connection points before mounting the unit.

3. Install hanging screw bolts.
 - Cut off the roof beam.
 - Strengthen the point at which the cut was made. Consolidate the roof beam.
4. After you select an installation location, align the refrigerant pipes, drain pipes, as well as indoor and outdoor wires with their connection points before mounting the unit.
5. Drill 4 holes 4" (10cm) deep at the ceiling hook positions in the internal ceiling. Be sure to hold the drill at a 90° angle to the ceiling.
6. Secure the bolt using the washers and nuts provided.
7. Install the four suspension bolts.
8. Mount the indoor unit with at least two people to lift and secure it. Insert suspension bolts into the unit's hanging holes. Fasten them using the washers and nuts provided. (See Fig. 4.8).

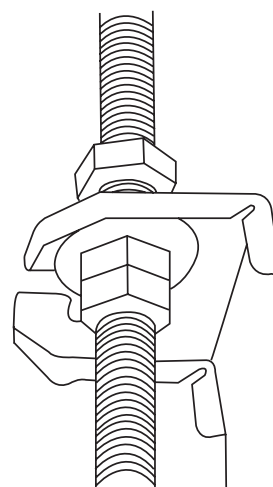


Fig. 4.8

9. Mount the indoor unit onto the hanging screw bolts with a block. Position the indoor unit flat using a level indicator to prevent leaks. (See Fig. 4.9).

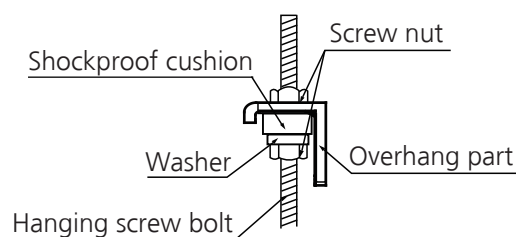


Fig. 4.9

NOTE: Confirm the minimum drain tilt is 1/100 or more.

Step 3: Diagrammatic sketch for installing the main body

Installing the dust proof net and canvas air passage

1. Install the dust proof net according to the installation manual;
2. Install the canvas air passage underneath the dust proof net.

Step 4: Duct and accessories installation

1. The air inlet and air outlet duct should be far enough apart enough to prevent air outlet entering Air Inlet.
2. There is dust filter on the indoor unit.
3. Please attach the outside air duct to the indoor air outlet/inlet flange by using the type ST3.9 x 10 screw.
4. Connect the duct according to the following diagram:

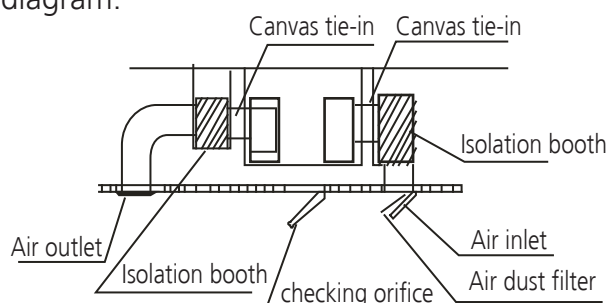


Fig. 4.10

NOTE:

1. Do not put the connecting duct weight on the indoor unit.
2. When connecting the duct, use an nonflammable canvas tie-in to prevent vibrating.
3. When connecting duct, install in place prone to takedown for maintenance.
4. Change the fan motor static pressure corresponding to external duct static pressure.
5. If installed in place like meeting room where noise is easy to be perceived, design isolation booth and internal duct underlayer to muffle the duct system and weaken the air encounter noise in the duct.

Step 5: Motor and drain pump maintenance

Pump maintenance:

1. Remove four screws from the drain pump.
2. Unplug the pump power supply and water level switch cable.
3. Detach the pump.

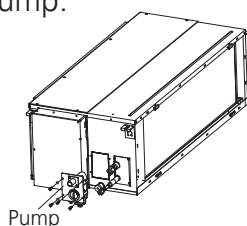


Fig. 4.11

Motor maintain:

There are three methods:

- 1: Remove the front side plate from the top.
 - Remove the top cover as shown.

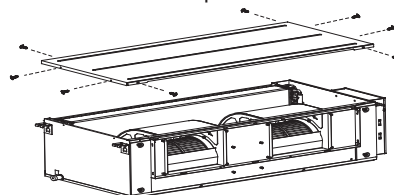


Fig. 4.12

- Loosen the four bolts and two screws which used to fasten the front side plate.

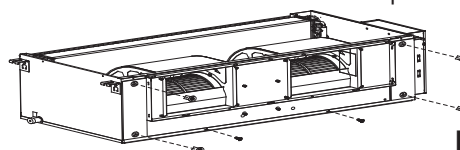


Fig. 4.13

- Remove the cord of motor, take off the front side plate and repair the motor.

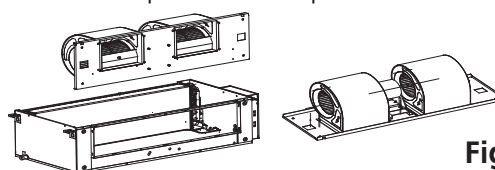


Fig. 4.14

- 2: Remove the front side plate from the bottom.

- Remove the bottom base as shown.

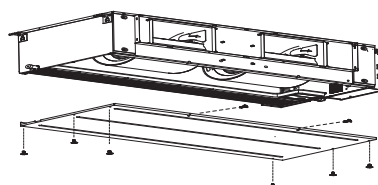


Fig. 4.15

- Loosen the four bolts and two screws which used to fasten the front side plate (Be careful, the front side plate may fall down)

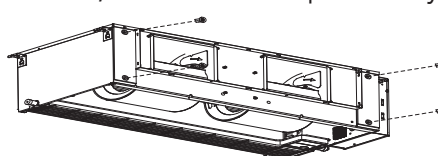


Fig. 4.16

- Remove the cord of motor, take off the front side plate and repair the motor.

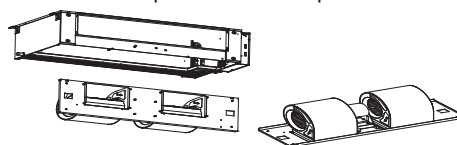


Fig. 4.17

- 3: Repair it directly (only applicable to plastic scroll and fan wheel)

- Take off the chassis assembly and filter .
- Take off the volute. • Take off the motor.

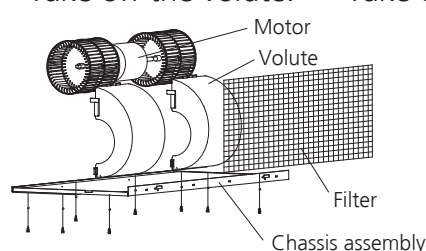


Fig. 4.18

Outdoor Unit Installation

5

Outdoor Unit Installation Instructions

Step 1: Select installation location.

The outdoor unit should be installed in the location that meets the following requirements:

- ☑ Place the outdoor unit as close to the indoor unit as possible.
- ☑ Ensure that there is enough room for installation and maintenance.
- ☑ The air inlet and outlet must not be obstructed or exposed to strong wind.
- ☑ Ensure the location of the unit will not be subject to snowdrifts, accumulation of leaves or other seasonal debris. If possible, provide an awning for the unit. Ensure the awning does not obstruct airflow.
- ☑ The installation area must be dry and well ventilated.
- ☑ There must be enough room to install the connecting pipes and cables and to access them for maintenance.

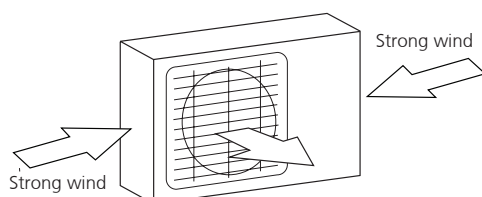


Fig. 5.1

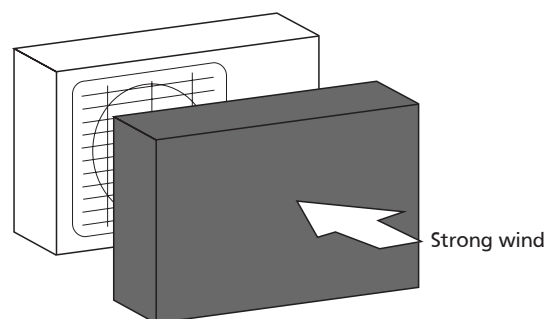


Fig. 5.2

Step 2: Install outdoor unit.

Fix the outdoor unit with anchor bolts (M10)

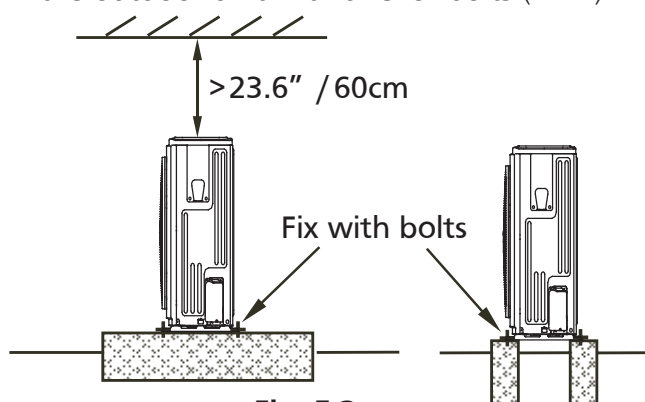


Fig. 5.3

- ☑ The area must be free of combustible gases and chemicals.
- ☑ The pipe length between the outdoor and indoor unit may not exceed the maximum allowable pipe length.
- ☑ If possible, **DO NOT** install the unit where it is exposed to direct sunlight.
- ☑ If possible, make sure the unit is located far away from your neighbors' property so that the noise from the unit will not disturb them.
- ☑ If the location is exposed to strong winds (for example: near a seaside), the unit must be placed against the wall to shelter it from the wind. If necessary, use an awning. (See Fig. 5.1 & 5.2)
- ☑ Install the indoor and outdoor units, cables and wires at least 1 meter from televisions or radios to prevent static or image distortion. Depending on the radio waves, a 1 meter distance may not be enough to eliminate all interference.

Outdoor Unit
Installation

! CAUTION

- Be sure to remove any obstacles that may block air circulation.
- Make sure you refer to Length Specifications to ensure there is enough room for installation and maintenance.

Split Type Outdoor Unit

(Refer to Fig 5.4, 5.5, 5.6, 5.10 and Table 5.1)

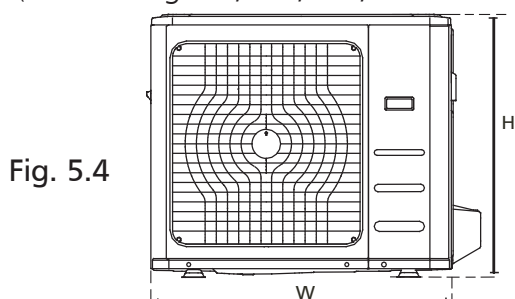


Fig. 5.4

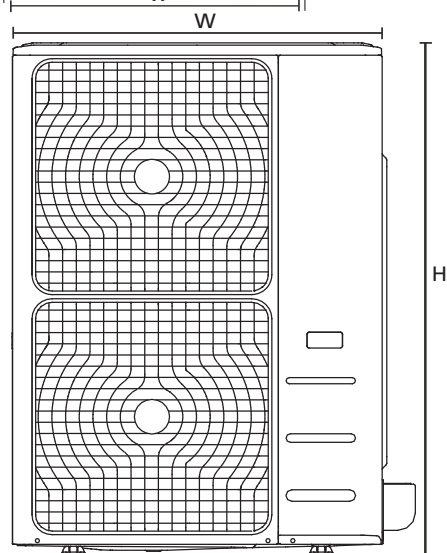


Fig. 5.5

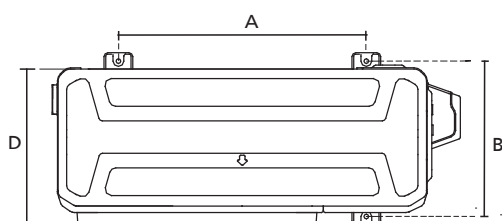


Fig. 5.6

Table 5.1: Length Specifications of Split Type Outdoor Unit (unit: mm/inch)

Outdoor Unit Dimensions W x H x D	Mounting Dimensions	
	Distance A	Distance B
29.9x23.2x11.2 (760x590x285)	20.85 (530)	11.4 (290)
31.9x22x12.2 (810x558x310)	21.6 (549)	12.8 (325)
33.27x27.5x12.6 (845x700x320)	22 (560)	13.2 (335)
35.4x33.85x12.4 (900x860x315)	23.2 (590)	13.1 (333)
37.2x31.9x15.55 (945x810x395)	25.2 (640)	15.95 (405)
38.98x38x13.58 (990x965x345)	24.58 (624)	14.4 (366)
36.93x53.9x15.43 (938x1369x392)	24.96 (634)	15.9 (404)
35.4x46x13.8 (900x1170x350)	23.2 (590)	14.88 (378)
31.5x21.8x13.1 (800x554x333)	20.24 (514)	13.39 (340)
33.27x27.6x14.3 (845x702x363)	21.26 (540)	13.8 (350)
37.24x31.9x16.53 (946x810x420)	26.5 (673)	15.87 (403)
37.24x31.9x16.14 (946x810x410)	26.5 (673)	15.87 (403)
37.5x52.5x16.14 (952x1333x410)	24.96 (634)	15.9 (404)
37.5x52.5x16.3 (4952x1333x415)	24.96 (634)	15.9 (404)

Vertical Discharge Type Outdoor Unit

(Refer to Fig 5.7, 5.8, 5.9 and Table 5.2)

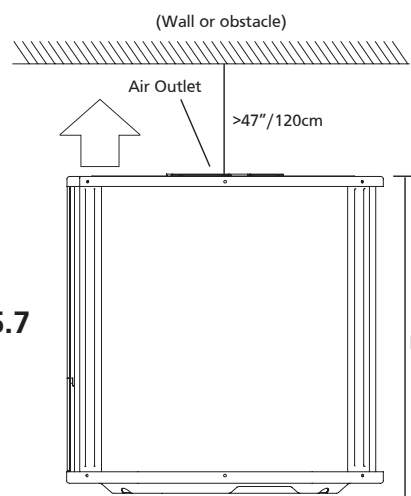


Fig. 5.7

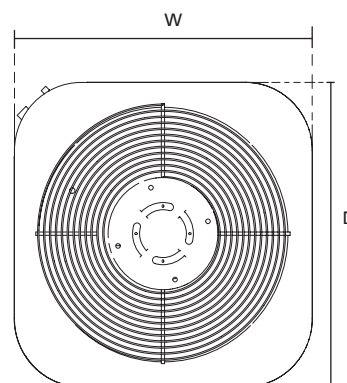


Fig. 5.8

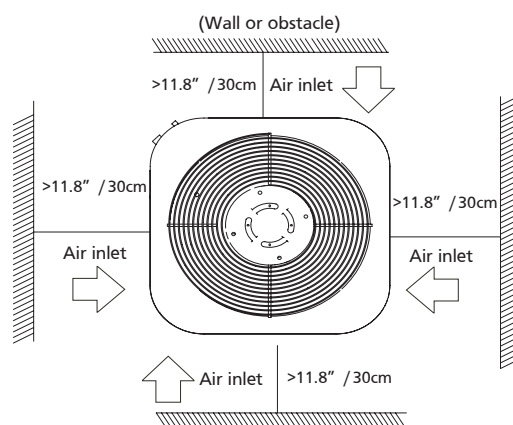


Fig. 5.9

Table 5.2: Length Specifications of Vertical Discharge Outdoor Unit (unit: mm/inch)

MODEL	DIMENSIONS		
	W	D	H
18	21.8/554	21.8/554	25/633
24	21.8/554	21.8/554	25/633
36	21.8/554	21.8/554	29.8/759
36	23.6/600	23.6/600	25/633
48	28/710	28/710	29.8/759
60	28/710/	28/710	33/843

NOTE: The minimum distance between the outdoor unit and walls described in the installation guide does not apply to airtight rooms. Be sure to keep the unit unobstructed in at least two of the three directions (M, N, P) (See Fig. 5.10)

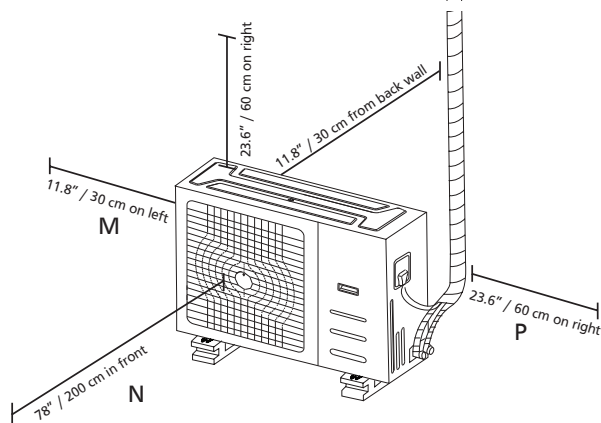


Fig. 5.10

Rows of series installation

Table 5.3 The relations between H, A and L are as follows.

	L	A
$L \leq H$	$L \leq 1/2H$	9.8" / 25 cm or more
	$1/2H < L \leq H$	11.8" / 30 cm or more
$L > H$	Can not be installed	

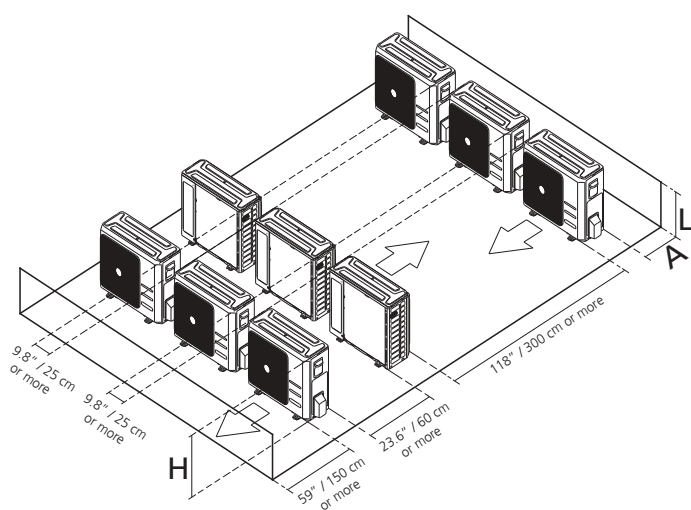


Fig. 5.11

Drain Joint Installation

Before bolting the outdoor unit in place, you must install the drain joint at the bottom of the unit. (See Fig. 5.12)

1. Fit the rubber seal on the end of the drain joint that will connect to the outdoor unit.
2. Insert the drain joint into the hole in the base pan of the unit.
3. Rotate the drain joint 90° until it clicks in place facing the front of the unit.
4. Connect a drain hose extension (not included) to the drain joint to redirect water from the unit during heating mode.

NOTE: Make sure the water drains to a safe location where it will not cause water damage or a slipping hazard.

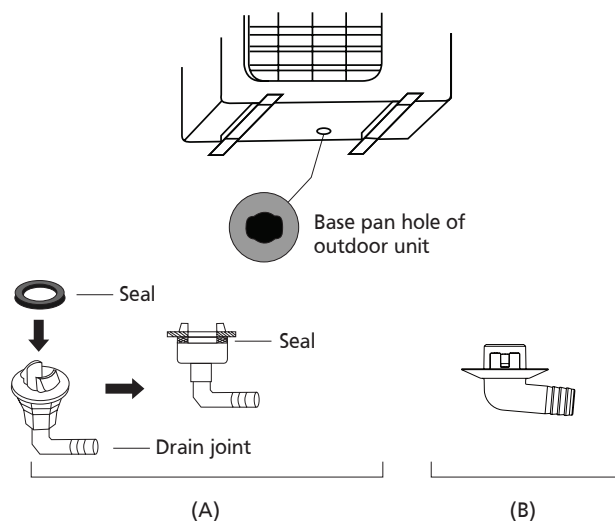


Fig. 5.12

Notes On Drilling Hole In Wall

You must drill a hole in the wall for the refrigerant piping, and the signal cable that will connect the indoor and outdoor units.

1. Determine the location of the wall hole based on the location of the outdoor unit.
2. Using a 2.5" (65 mm) core drill, drill a hole in the wall.

NOTE: When drilling the wall hole, make sure to avoid wires, plumbing, and other sensitive components.

3. Place the protective wall cuff in the hole. This protects the edges of the hole and will help seal it when you finish the installation process.

Drainpipe Installation

6

The drainpipe is used to drain water away from the unit. Improper installation may cause unit and property damage.

! CAUTION

- Insulate all piping to prevent condensation, which could lead to water damage.
- If the drainpipe is bent or installed incorrectly, water may leak and cause a water-level switch malfunction.
- In HEAT mode, the outdoor unit will discharge water. Ensure that the drain hose is placed in an appropriate area to avoid water damage and slippage.
- **DO NOT** pull the drainpipe forcefully. This could disconnect it.

NOTE ON PURCHASING PIPES

Installation requires a polyethylene tube (exterior diameter = 1.5", interior diameter = 1.25"), which can be obtained at your local hardware store or dealer.

Indoor Drainpipe Installation

Install the drainpipe as illustrated in Figure 6.2.

1. Cover the drainpipe with heat insulation to prevent condensation and leakage.
2. Attach the mouth of the drain hose to the unit's outlet pipe. Sheath the mouth of the hose and clip it firmly with a pipe clasp. (Fig 6.1)

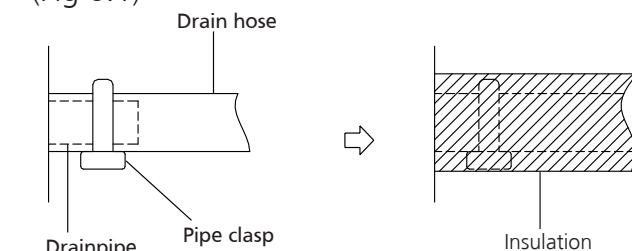


Fig. 6.1

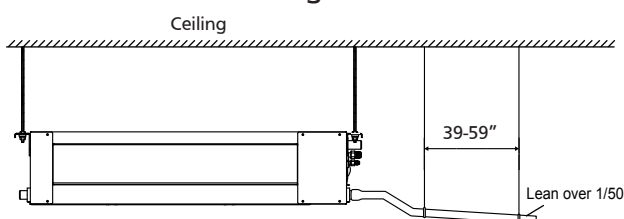


Fig. 6.2

NOTE ON DRAINPIPE INSTALLATION

- When using an extended drainpipe, tighten the indoor connection with an additional protection tube to prevent it from pulling loose.
- The drainpipe should slope downward at a gradient of at least 1/50 to prevent water from flowing back into the air conditioner.
- To prevent the pipe from sagging, space hanging wires every 39-59" (1-1.5m).
- If the outlet of the drainpipe is higher than the body's pump joint, provide a lift pipe for the exhaust outlet of the indoor unit. The lift pipe must be installed no higher than 21.7" (55cm) from the ceiling board and the distance between the unit and the lift pipe must be less than 7.9" (20cm). Incorrect installation could cause water to flow back into the unit and flood.
- To prevent air bubbles, keep the drain hose level or slightly tilted up (<3"/75mm).

Drainpipe installation for units with a pump

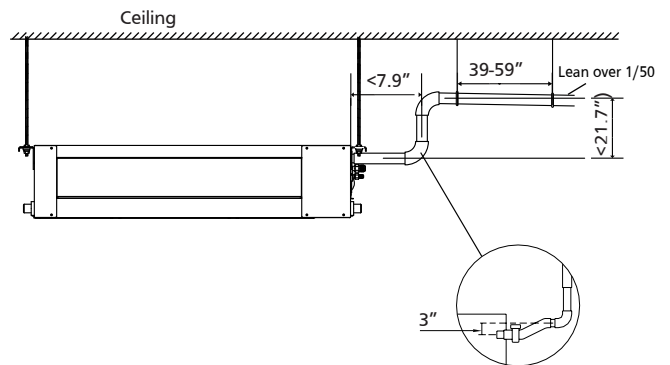


Fig. 6.3

NOTE: When connecting multiple drainpipes, install the pipes as shown in Fig 6.4.

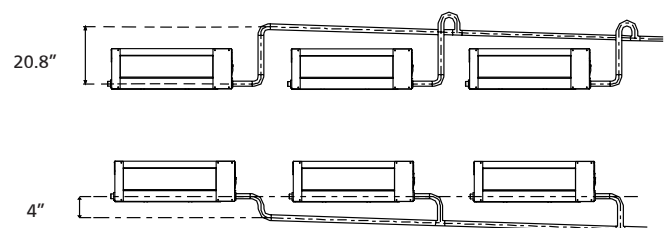


Fig. 6.4

- Using a 2.5" (65-mm) core drill, drill a hole in the wall. Make sure that the hole is drilled at a slight downward angle, so that the outdoor end of the hole is lower than the indoor end by about 0.5" (12mm). This will ensure proper water drainage (See Fig. 6.5). Place the protective wall cuff in the hole. This protects the edges of the hole and will help seal it when you finish the installation process.

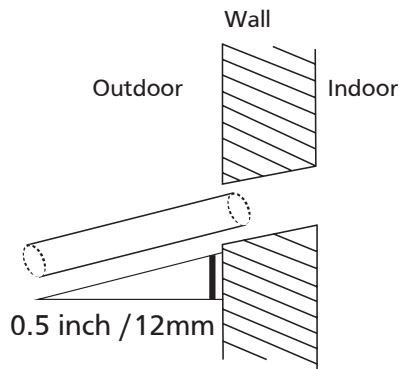


Fig. 6.5

NOTE: When drilling the wall hole, make sure to avoid wires, plumbing, and other sensitive components.

- Pass the drain hose through the wall hole. Make sure the water drains to a safe location where it will not cause water damage or a slipping hazard.

NOTE: The drainpipe outlet should be at least 1.9" (5cm) above the ground. If it touches the ground, the unit may become blocked and malfunction. If you discharge the water directly into a sewer, make sure that the drain has a U or S pipe to catch odors that might otherwise come back into the house.

Drainage test

Check that the drainpipe is unhindered. This test should be performed on newly built houses before the ceiling is paved.

The unit without pump.

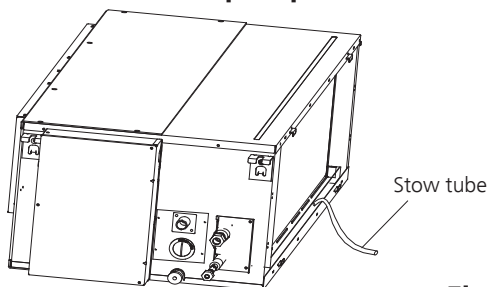


Fig.6.6

Fill the water pan with 2.11 quart of water. Check that the drainpipe is unhindered.

The unit with pump.

- Remove the test cover. Fill the water pan with 2.11 quart of water.

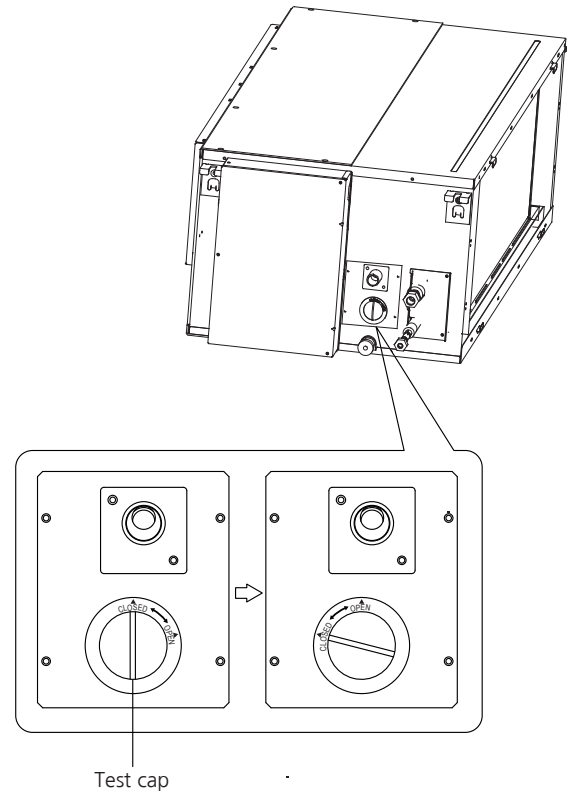


Fig.6.7

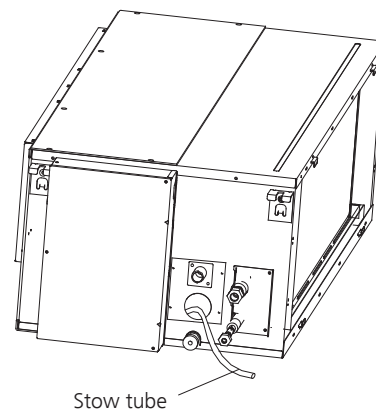


Fig.6.8

- Turn on the unit in COOLING mode. You will hear the drain pump. Check whether the water is discharged properly (a 1-minute lag is possible, depending on the length of the drain pipe). Check whether water leaks from the joints.
- Turn off the air conditioner and put the cap back on.

Safety Precautions



WARNING

- All field piping must be completed by a licensed technician and must comply with the local and national regulations.
- When the air conditioner is installed in a small room, measures must be taken to prevent the refrigerant concentration in the room from exceeding the safety limit in the event of refrigerant leakage. If the refrigerant leaks and its concentration exceeds its proper limit, hazards due to lack of oxygen may result.
- When installing the refrigeration system, ensure that air, dust, moisture or foreign substances do not enter the refrigerant circuit. Contamination in the system may cause poor operating capacity, high pressure in the refrigeration cycle, explosion or injury.
- Ventilate the area immediately if there is refrigerant leakage during the installation. Leaked refrigerant gas is both toxic and flammable. Ensure there is no refrigerant leakage after completing the installation work.

Notes On Pipe Length and Elevation

Ensure that the length of the refrigerant pipe, the number of bends, and the drop height between the indoor and outdoor units meets the requirements shown in Table 7.1:

Table 7.1: The Maximum Length And Drop Height Based on Models. (Unit: ft/m)

Type of model	Capacity (Btu/h)	Length of piping	Maximum drop height
North America, Australia and the eu frequency conversion Split Type	<15K	82/25	32.8/10
	≥15K - <24K	98.4/30	65.6/20
	≥24K - <36K	164/50	82/25
	≥36K - ≤60K	213/65	98.4/30
Other Split Type	12K	49/15	26/8
	18K-24K	82/25	49/15
	30K-36K	98.4/30	65.6/20
	42K-60K	164/50	98.4/30

Refrigerant Piping Connection Instructions

! CAUTION

- The branching pipe must be installed horizontally. An angle of more than 10° may cause malfunction.
- DO NOT** install the connecting pipe until both indoor and outdoor units have been installed.
- Insulate both the gas and liquid piping to prevent water leakage.

Step1: Cut pipes

When preparing refrigerant pipes, take extra care to cut and flare them properly. This will ensure efficient operation and minimize the need for future maintenance.

- Measure the distance between the indoor and outdoor units.
- Using a pipe cutter, cut the pipe a little longer than the measured distance.

! CAUTION

DO NOT deform pipe while cutting. Be extra careful not to damage, dent, or deform the pipe while cutting. This will drastically reduce the heating efficiency of the unit.

- Make sure that the pipe is cut at a perfect 90° angle. Refer to Fig. 7.1 for examples of bad cuts

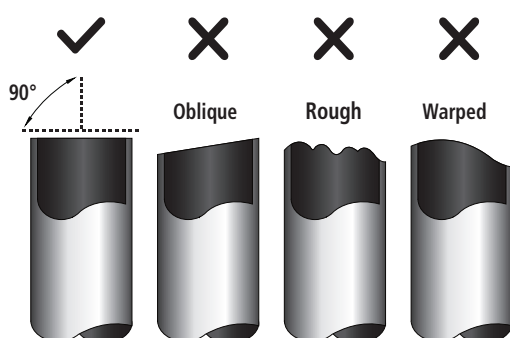


Fig. 7.1

Step 2: Remove burrs.

Burrs can affect the air-tight seal of refrigerant piping connection. They must be completely removed.

- Hold the pipe at a downward angle to prevent burrs from falling into the pipe.
- Using a reamer or deburring tool, remove all burrs from the cut section of the pipe.

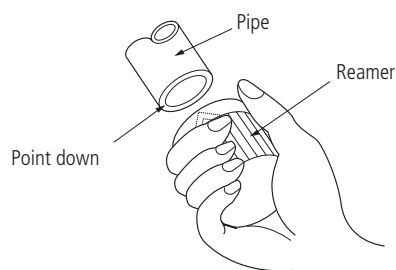


Fig. 7.2

Step 3: Flare pipe ends

Proper flaring is essential to achieve an airtight seal.

- After removing burrs from cut pipe, seal the ends with PVC tape to prevent foreign materials from entering the pipe.
- Sheath the pipe with insulating material.
- Place flare nuts on both ends of pipe. Make sure they are facing in the right direction, because you can't put them on or change their direction after flaring. See Fig. 7.3

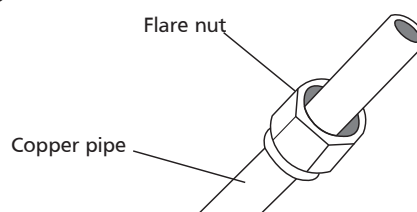


Fig. 7.3

- Remove PVC tape from ends of pipe when ready to perform flaring work.
- Clamp flare form on the end of the pipe. The end of the pipe must extend beyond the flare form.

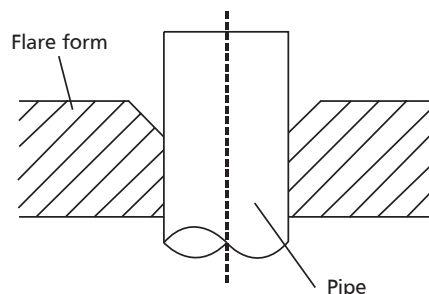


Fig. 7.4

- Place flaring tool onto the form.
- Turn the handle of the flaring tool clockwise until the pipe is fully flared. Flare the pipe in accordance with the dimensions shown in table 7.2.

Table 7.2: PIPING EXTENSION BEYOND FLARE FORM

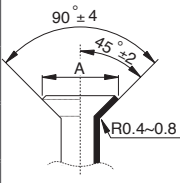
Pipe gauge	Tightening torque	Flare dimension (A) (Unit: in/mm)		Flare shape
		Min.	Max.	
Ø 1/4"	14.2-17.2 N.m (144-176 kgf.cm)	0.3/8.3	0.3/8.3	
Ø 3/8"	32.7-39.9 N.m (333-407 kgf.cm)	0.48/12.4	0.48/12.4	
Ø 1/2"	49.5-60.3 N.m (504-616 kgf.cm)	0.6/15.4	15.8/0.62	
Ø 5/8"	61.8-75.4 N.m (630-770 kgf.cm)	0.7/18.6	0.74/19	
Ø 3/4"	97.2-118.6 N.m (990-1210 kgf.cm)	0.9/22.9	0.91/23.3	
Ø 7/8"	109.5-133.7 N.m (1117-1364 kgf.cm)	1.06/27	1.07/27.3	

Fig. 7.5

- Remove the flaring tool and flare form, then inspect the end of the pipe for cracks and even flaring.

Step 4: Connect pipes

Connect the copper pipes to the indoor unit first, then connect it to the outdoor unit. You should first connect the low-pressure pipe, then the high-pressure pipe.

- When connecting the flare nuts, apply a thin coat of refrigeration oil to the flared ends of the pipes.
- Align the center of the two pipes that you will connect.

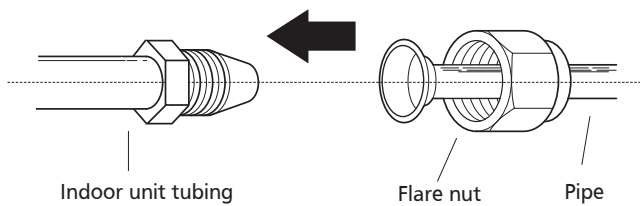


Fig. 7.6

- Tighten the flare nut as tightly as possible by hand.
- Using a spanner, grip the nut on the unit tubing.
- While firmly gripping the nut, use a torque wrench to tighten the flare nut according to the torque values in table 7.2.

NOTE: Use both a spanner and a torque wrench when connecting or disconnecting pipes to/from the unit.

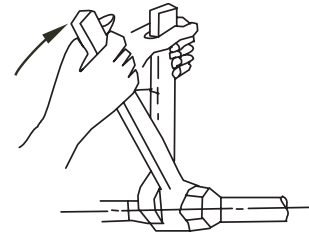


Fig. 7.7

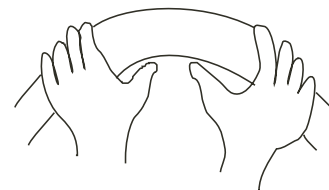
! CAUTION

- Ensure to wrap insulation around the piping. Direct contact with the bare piping may result in burns or frostbite.
- Make sure the pipe is properly connected. Over tightening may damage the bell mouth and under tightening may lead to leakage.

NOTE ON MINIMUM BEND RADIUS

Carefully bend the tubing in the middle according to the diagram below. **DO NOT** bend the tubing more than 90° or more than 3 times.

Bend the pipe with thumb



min-radius 3.9" (10cm)

Fig. 7.8

- After connecting the copper pipes to the indoor unit, wrap the power cable, signal cable and the piping together with binding tape.

NOTE: DO NOT intertwine signal cable with other wires. While bundling these items together, do not intertwine or cross the signal cable with any other wiring.

- Thread this pipeline through the wall and connect it to the outdoor unit.
- Insulate all the piping, including the valves of the outdoor unit.
- Open the stop valves of the outdoor unit to start the flow of the refrigerant between the indoor and outdoor unit.

! CAUTION

Check to make sure there is no refrigerant leak after completing the installation work. If there is a refrigerant leak, ventilate the area immediately and evacuate the system (refer to the Air Evacuation section of this manual).

Safety Precautions

WARNING

- Disconnect the power supply before working on the unit.
- All wiring must be performed according to local and national regulations.
- Wiring must be done by a qualified technician. Improper connections may cause electrical malfunction, injury, or fire.
- An independent circuit and single outlet must be used for this unit.
DO NOT plug another appliance or charger into the same outlet. If the outlet cannot handle the load or there is a defect in the wiring, it can lead to shock, fire, and unit and property damage.
- Connect the power cable to the terminals and fasten it with a clamp. An insecure connection may cause fire.
- Make sure that all wiring is done correctly and the control board cover is properly installed. Failure to do so can cause overheating at the connection points, fire, and electrical shock.
- Ensure that main power supply connection is made through a switch that disconnects all poles, with contact gap of at least 3mm (0.118").
- **DO NOT** modify the length of the power cord or use an extension cord.
- If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

CAUTION

- Connect the out door wires before connecting the indoor wires.
- Make sure you ground the unit. The grounding wire should be located away from gas pipes, water pipes, lightning rods, telephone wires or other grounding wires. Improper grounding may cause electrical shock.

- **DO NOT** connect the unit to the power source until all wiring and piping is completed.
- Make sure that you do not cross your electrical wiring with your signal wiring. This may cause distortion and interference.

Follow these instructions to prevent distortion when the compressor starts:

- The unit must be connected to the main outlet. Normally, the power supply must have a low output impedance of 32 ohms.
- No other equipment should be connected to the same power circuit.

TAKE NOTE OF FUSE SPECIFICATIONS

The air conditioner's printed circuit board (PCB) is designed with a fuse that provides overcurrent protection. The specifications of the fuse are printed on the circuit board, examples of such are T5A/250VAC and T10A/250VAC.

Outdoor Unit Wiring

WARNING

Before performing any electrical or wiring work, turn off the main power to the system.

1. Prepare the cable for connection
 - a. You must first choose the right cable size before preparing it for connection. Be sure to use H07RN-F cables.

Table 8.1: Minimum Cross-Sectional Area of Power and Signal Cables in North America

Rated Current of Appliance (A)	AWG
≤7	18
7 - 13	16
13 - 18	14
18 - 25	12
25 - 30	10

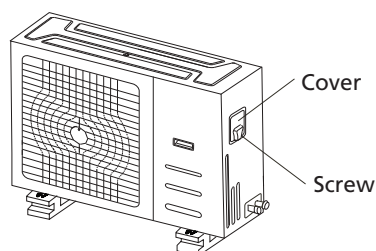
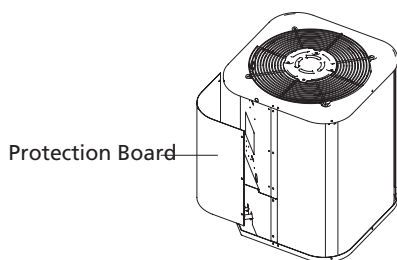
Table 8.2: Other World Regions

Rated Current of Appliance (A)	Nominal Cross-Sectional Area (mm ²)
≤ 6	0.75
6 - 10	1
10 - 16	1.5
16 - 25	2.5
25 - 32	4
32 - 45	6

- Using wire strippers, strip the rubber jacket from both ends of the signal cable to reveal approximately 15cm (5.9") of wire.
- Strip the insulation from the ends.
- Using a wire crimper, crimp u-lugs on the ends.

NOTE: When connecting the wires, strictly follow the wiring diagram found inside the electrical box cover.

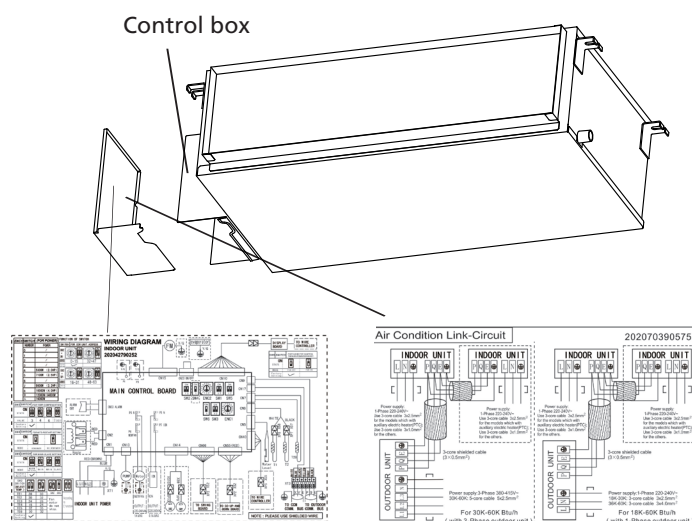
- Remove the electric cover of the outdoor unit. If there is no cover on the outdoor unit, take off the bolts from the maintenance board and remove the protection board. (See Fig. 8.1, 8.2)

**Fig. 8.1****Fig. 8.2**

- Connect the u-lugs to the terminals. Match the wire colors/labels with the labels on the terminal block, and firmly screw the u-lug of each wire to its corresponding terminal.
- Clamp down the cable with the cable clamp.
- Insulate unused wires with electrical tape. Keep them away from any electrical or metal parts.
- Reinstall the cover of the electric control box.

Indoor Unit Wiring

- Prepare the cable for connection
 - Using wire strippers, strip the rubber jacket from both ends of the signal cable to reveal about 15cm (5.9") of the wire.
 - Strip the insulation from the ends of the wires.
 - Using a wire crimper, crimp the u-lugs to the ends of the wires.
- Remove the cover of the electric control box on your indoor unit.
- Connect the u-lugs to the terminals. Match the wire colors/labels with the labels on the terminal block, and firmly screw the u-lug of each wire to its corresponding terminal. Refer to the Serial Number and Wiring Diagram located on the cover of the electric control box.



Wiring diagram

Connective wiring diagram

Fig. 8.3

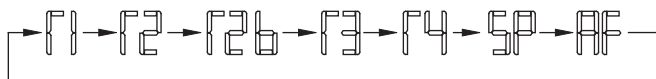
! CAUTION

- While connecting the wires, please strictly follow the wiring diagram.
- The refrigerant circuit can become very hot. Keep the interconnection cable away from the copper tube.

- Clamp down the cable with the cable clamp. The cable must not be loose or pull on the u-lugs.
- Reattach the electric box cover.

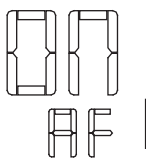
Using the wire control to set external static pressure (some models)

- You can use the unit's automatic airflow adjustment function to set external static pressure.
 - Automatic airflow adjustment is the volume of blow-off air that has been automatically adjusted to the quantity rated.
1. Make sure the test run is done with a dry coil. If the coil is not dry, run the unit for 2 hours in FAN ONLY mode to dry the coil.
 2. Check that both power supply wiring and duct installation have been completed. Check that any closing dampers are open. Check that the air filter is properly attached to the air suction side passage of the unit.
 3. Set the parameters for automatic airflow adjustment. When the air conditioning unit is off, perform the following steps:
 - Press the button "COPY" long.
 - Press "+" or "-" to select the AF.



- Press "CONFIRM". The air conditioning unit will then start the fan for airflow automatic adjustment.

ON will flash during when the fan is on during automatic airflow adjustment.



! CAUTION

- DO NOT** adjust the dampers when automatic airflow adjustment is active.

After 3 to 6 minutes, the air conditioning unit stops operating once automatic airflow adjustment has finished.

! CAUTION

- If there is no change after airflow adjustment in the ventilation paths, be sure to reset automatic airflow adjustment.
- If there is no change to ventilation paths after airflow adjustment, contact your dealer, especially if this occurs after testing the outdoor unit or if the unit has been moved to a different location.
- Do not use automatic airflow adjustment with remote control, if you are using booster fans, outdoor air processing unit, or a HRV via duct.
- If the ventilation paths have been changed, reset airflow automatic adjustment as described from step 3 onwards.

Power Specifications

NOTE: Electric auxiliary heating type circuit breaker/fuse need to add more than 10 A.

Indoor Power Supply Specifications

MODEL (Btu/h)		≤18K	19K~24K	25K~36K	37K~48K	49K~60K
POWER	PHASE	1 Phase	1 Phase	1 Phase	1 Phase	1 Phase
	FREQUENCY AND VOLT	208-240V	208-240V	208-240V	208-240V	208-240V
CIRCUIT BREAKER/ FUSE(A)		25/20	32/25	50/40	70/55	70/60

Outdoor Power Supply Specifications

MODEL (Btu/h)		≤18K	19K~24K	25K~36K	37K~48K	49K~60K
POWER	PHASE	1 Phase	1 Phase	1 Phase	1 Phase	1 Phase
	FREQUENCY AND VOLT	208-240V	208-240V	208-240V	208-240V	208-240V
CIRCUIT BREAKER/ FUSE(A)		25/20	32/25	50/40	70/55	70/60

Independent Power Supply Specifications

MODEL (Btu/h)		≤18K	19K~24K	25K~36K	37K~48K	49K~60K
POWER (indoor)	PHASE	1 Phase	1 Phase	1 Phase	1 Phase	1 Phase
	FREQUENCY AND VOLT	208-240V	208-240V	208-240V	208-240V	208-240V
CIRCUIT BREAKER/ FUSE(A)		15/10	15/10	15/10	15/10	15/10
POWER (outdoor)	PHASE	1 Phase	1 Phase	1 Phase	1 Phase	1 Phase
	FREQUENCY AND VOLT	208-240V	208-240V	208-240V	208-240V	208-240V
CIRCUIT BREAKER/ FUSE(A)		25/20	32/25	50/40	70/55	70/60

MODEL (Btu/h)		≤36K	37K~60K	≤36K	37K~60K
POWER (indoor)	PHASE	1 Phase	1 Phase	1 Phase	1 Phase
	FREQUENCY AND VOLT	208-240V	208-240V	208-240V	208-240V
CIRCUIT BREAKER/FUSE(A)		15/10	15/10	15/10	15/10
POWER (outdoor)	PHASE	3 Phase	3 Phase	3 Phase	3 Phase
	FREQUENCY AND VOLT	380-420V	380-420V	208-240V	208-240V
CIRCUIT BREAKER/FUSE(A)		25/20	32/25	32/25	45/35

Inverter Type A/C Power Specifications

MODEL (Btu/h)		≤18K	19K~24K	25K~36K	37K~48K	49K~60K
POWER (indoor)	PHASE	1 Phase	1 Phase	1 Phase	1 Phase	1 Phase
	FREQUENCY AND VOLT	220-240V	220-240V	220-240V	220-240V	220-240V
CIRCUIT BREAKER/ FUSE(A)		15/10	15/10	15/10	15/10	15/10
POWER (outdoor)	PHASE	1 Phase	1 Phase	1 Phase	1 Phase	1 Phase
	FREQUENCY AND VOLT	208-240V	208-240V	208-240V	208-240V	208-240V
CIRCUIT BREAKER/ FUSE(A)		25/20	25/20	40/30	50/40	50/40

MODEL (Btu/h)		≤36K	37K~60K	≤36K	37K~60K
POWER (indoor)	PHASE	1 Phase	1 Phase	1 Phase	1 Phase
	FREQUENCY AND VOLT	220-240V	220-240V	220-240V	220-240V
CIRCUIT BREAKER/FUSE(A)		15/10	15/10	15/10	15/10
POWER (outdoor)	PHASE	3 Phase	3 Phase	3 Phase	3 Phase
	FREQUENCY AND VOLT	380-420V	380-420V	208-240V	208-240V
CIRCUIT BREAKER/FUSE(A)		25/20	32/25	32/25	40/30

Safety Precautions

! CAUTION

- Use a vacuum pump with a gauge reading lower than -0.1MPa and an air discharge capacity above 40L/min.
- The outdoor unit does not need vacuuming. **DO NOT** open the outdoor unit's gas and liquid stop valves.
- Ensure that the Compound Meter reads -0.1MPa or below after 2 hours. If after three hours the gauge reading is still above -0.1MPa, check if there is a gas leak or water inside the pipe. If there is no leak, perform another evacuation for 1 or 2 hours.
- **DO NOT** use refrigerant gas to evacuate the system.

Evacuation Instructions

Before using a manifold gauge and a vacuum pump, read their operation manuals to make sure you know how to use them properly.

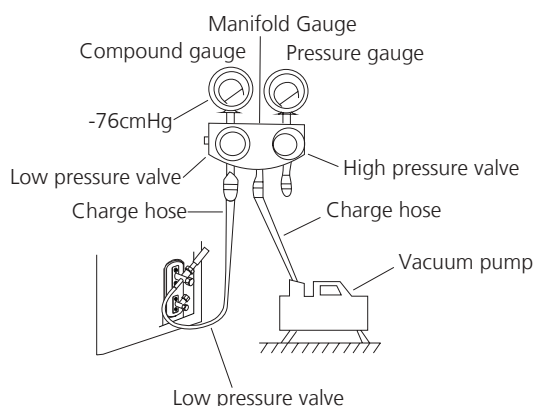


Fig. 9.1

1. Connect the manifold gauge's charge hose to the service port on the outdoor unit's low pressure valve.
2. Connect the manifold gauge's charge hose from the to the vacuum pump.
3. Open the Low Pressure side of the manifold gauge. Keep the High Pressure side closed.

4. Turn on the vacuum pump to evacuate the system.
5. Run the vacuum for at least 15 minutes, or until the Compound Meter reads -76cmHG (-1x105Pa).
6. Close the manifold gauge's Low Pressure valve and turn off the vacuum pump.
7. Wait for 5 minutes, then check that there has been no change in system pressure.

NOTE: If there is no change in system pressure, unscrew the cap from the packed valve (high pressure valve). If there is a change in system pressure, there may be a gas leak.

8. Insert hexagonal wrench into the packed valve (high pressure valve) and open the valve by turning the wrench 1/4 counterclockwise. Listen for gas to exit the system, then close the valve after 5 seconds.

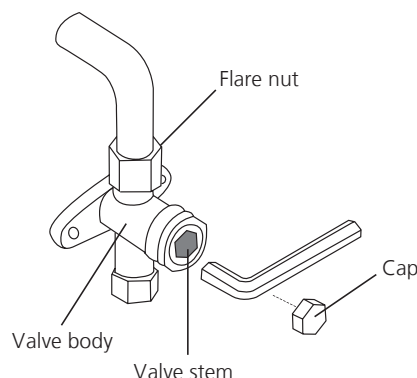


Fig. 9.2

9. Watch the Pressure Gauge for one minute to make sure that there is no change in pressure. It should read slightly higher than the atmospheric pressure.
10. Remove the charge hose from the service port.
11. Using hexagonal wrench, fully open both the high pressure and low pressure valves.

OPEN VALVE STEMS GENTLY

When opening valve stems, turn the hexagonal wrench until it hits against the stopper. **DO NOT** try to force the valve to open further.

12. Tighten valve caps by hand, then tighten it using the proper tool.

Note On Adding Refrigerant

! CAUTION

- Refrigerant charging must be performed after wiring, vacuuming, and the leak testing.
- **DO NOT** exceed the maximum allowable quantity of refrigerant or overcharge the system. Doing so can damage the unit or impact it's functioning.
- Charging with unsuitable substances may cause explosions or accidents. Ensure that the appropriate refrigerant is used.
- Refrigerant containers must be opened slowly. Always use protective gear when charging the system.
- **DO NOT** mix refrigerants types.

Some systems require additional charging depending on pipe lengths. The standard pipe length varies according to local regulations. For example, in North America, the standard pipe length is 7.5m (25') In other areas, the standard pipe length is 5m (16'). The additional refrigerant to be charged can be calculated using the following formula:

	Liquid Side Diameter		
	Ø1/4" (6.35)	Ø3/8" (9.52)	Ø1/2" (12.7)
R22 (orifice tube in the indoor unit):	(Total pipe length - standard pipe length) x 0.32oz(30g)/ft(m)	(Total pipe length - standard pipe length) x 0.69oz(65g)/ft(m)	(Total pipe length - standard pipe length) x 1.23oz(115g)/ft(m)
R22 (orifice tube in the outdoor unit):	(Total pipe length - standard pipe length) x 0.16oz(15g)/ft(m)	(Total pipe length - standard pipe length) x 0.32oz(30g)/ft(m)	(Total pipe length - standard pipe length) x 0.64oz(60g)/ft(m)
R410A: (orifice tube in the indoor unit):	(Total pipe length - standard pipe length) x 0.32oz(30g)/ft(m)	(Total pipe length - standard pipe length) x 0.69oz(65g)/ft(m)	(Total pipe length - standard pipe length) x 1.23oz(115g)/ft(m)
R410A: (orifice tube in the outdoor unit):	(Total pipe length - standard pipe length) x 0.16oz(15g)/ft(m)	(Total pipe length - standard pipe length) x 0.32oz(30g)/ft(m)	(Total pipe length - standard pipe length) x 0.69oz(65g)/ft(m)

Air Evacuation

Before Test Run

A test run must be performed after the entire system has been completely installed. Confirm the following points before performing the test:

- a) Indoor and outdoor units are properly installed.
- b) Piping and wiring are properly connected.
- c) No obstacles near the inlet and outlet of the unit that might cause poor performance or product malfunction.
- d) Refrigeration system does not leak.
- e) Drainage system is unimpeded and draining to a safe location.
- f) Heating insulation is properly installed.
- g) Grounding wires are properly connected.
- h) Length of the piping and the added refrigerant stow capacity have been recorded.
- i) Power voltage is the correct voltage for the air conditioner.

! CAUTION

Failure to perform the test run may result in unit damage, property damage or personal injury.

Test Run Instructions

1. Open both the liquid and gas stop valves.
2. Turn on the main power switch and allow the unit to warm up.
3. Set the air conditioner to COOL mode.
4. For the Indoor Unit
 - a. Ensure the remote control and its buttons work properly.
 - b. Ensure the louvers move properly and can be changed using the remote control.
 - c. Double check to see if the room temperature is being registered correctly.
 - d. Ensure the indicators on the remote control and the display panel on the indoor unit work properly.
 - e. Ensure the manual buttons on the indoor unit works properly.

- f. Check to see that the drainage system is unimpeded and draining smoothly.
- g. Ensure there is no vibration or abnormal noise during operation.
5. For the Outdoor Unit
 - a. Check to see if the refrigeration system is leaking.
 - b. Make sure there is no vibration or abnormal noise during operation.
 - c. Ensure the wind, noise, and water generated by the unit do not disturb your neighbors or pose a safety hazard.
6. Drainage Test
 - a. Ensure the drainpipe flows smoothly. New buildings should perform this test before finishing the ceiling.
 - b. Remove the test cover. Add 2,11 quart of water to the tank through the attached tube.
 - c. Turn on the main power switch and run the air conditioner in COOL mode.
 - d. Listen to the sound of the drain pump to see if it makes any unusual noises.
 - e. Check to see that the water is discharged. It may take up to one minute before the unit begins to drain depending on the drainpipe.
 - f. Make sure that there are no leaks in any of the piping.
 - g. Stop the air conditioner. Turn off the main power switch and reinstall the test cover.

NOTE: If the unit malfunctions or does not operate according to your expectations, please refer to the Troubleshooting section of the Owner's Manual before calling customer service.