



BOSCH

Installation Manual

CASSETTE-TYPE AIR CONDITIONER **Climate 5000 SCI**

CL5000SCI

18 CAS/OU- OUE

24 CAS/OU- OUE

36 CAS/OU- OUE

48 CAS/OU- OUE

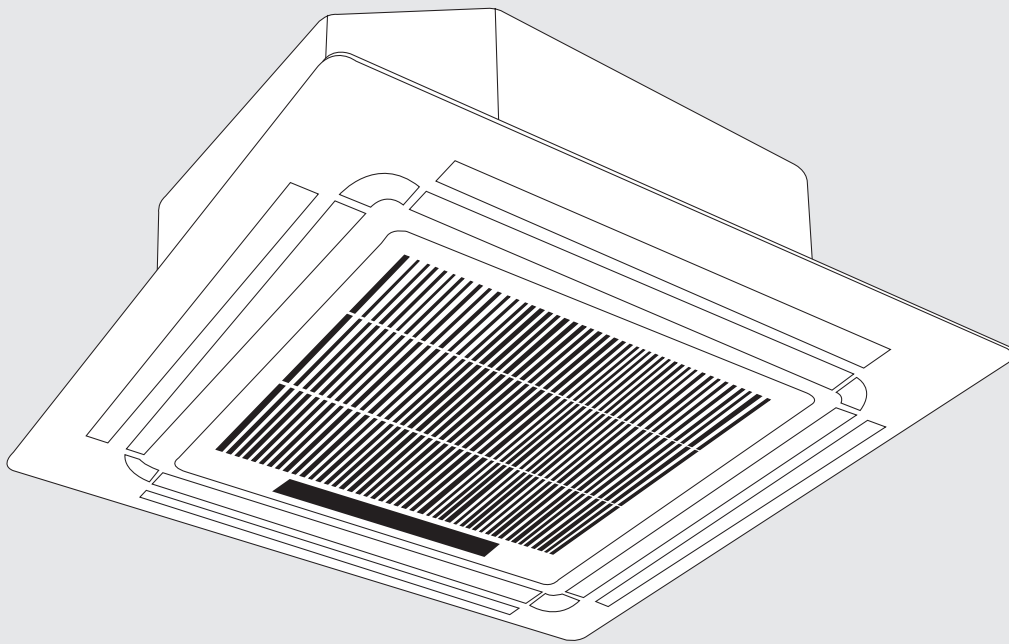


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**CAUTION**

Risk of fire (for R32 refrigerant only)

1 Accessories

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.

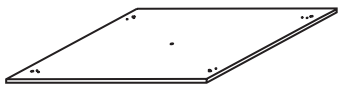





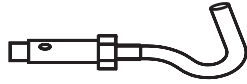

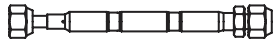
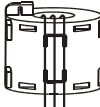
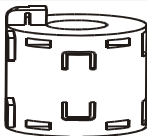
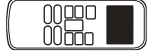






	Name	Shape	Quantity
Indoor unit installation	Installation paper template (some models)		1
Refrigeration Fittings	Soundproof/insulation sheath (some models)		1
Drainpipe Fittings	Outlet pipe sheath (some models)		1
	Outlet pipe clasp (some models)		1
	Drain joint (some models)		1
	Seal ring (some models)		1
Installation Accessory (some models)	Ceiling hook		4
	Suspension bolt		4
	Orifice tube (some units)		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 (the connective cable between indoor unit and outdoor unit after installation.)		1
Remote controller & Its Frame (some models)	Remote controller		1
	Fixing screw for remote controller holder ST2.9 x 10		2
	Remote controller holder		1
	Dry battery AAA		2
	Remote controller illustration		1
Others	Owner's manual		1
	Installation manual		1

Table 1.

2 Safety Precautions

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 serious injury. 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 Qualified Personnel 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.
- An all-pole disconnection device which has at least 3 mm clearances in all poles and a leakage current that may exceed 10 mA, the residual current device (RCD) having a rated residual operating current not exceeding 30 mA, and disconnection must be incorporated in the fixed wiring in accordance with the wiring rules.
- 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. The refrigerant is both toxic and flammable and poses a serious health and safety risk.
- Do not use means for accelerating the defrosting process or for cleaning, other than those recommended by the manufacturer.
- The appliance must be stored so as to prevent mechanical damage from occurring.

WARNING

- The appliance disconnection must be incorporated with an all-pole disconnection device in the fixed wiring in accordance with the wiring rules.
- Any person who is involved with working on or breaking a refrigerant circuit should hold a currently valid certificate from an industry-accredited assessment authority, which authorises their competence to handle refrigerants safely in accordance with an industry recognised assessment specification.
- Servicing must only be performed by Qualified Personnel. Maintenance and repair requiring the assistance of other skilled personnel be carried out under the supervision of Qualified Personnel in the use of flammable refrigerants.
- The appliance must be stored so as to prevent mechanical damage from occurring.
- Keep ventilation openings clear of obstruction.

NOTE:

The following information is required for the units with R32 refrigerant.

- The appliance must be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater).
- Do not pierce or burn.
- Be aware that the refrigerants may be odourless.
- Compliance with national gas regulations must be observed.
- The appliance must be stored in a well-ventilated area where the room size corresponds to the room area as specified for operation.
- The appliance must be installed, operated and stored in a room with a floor area larger than X m², installation of pipe-work must be kept to a minimum X m² (please see the following form).
The appliance must not be installed in an unventilated space if that space is smaller than X m² (please see the following form). Spaces where refrigerant pipes are located must be compliant with national gas regulations.






Model (Btu/h)	Amount of refrigerant to be charged (kg)	Maximum installation height (m)	Minimum room area (m ²)
≤30000	≤2.048	2.2m	4
30000-48000	2.048-3.0	2.2m	4
>48000	>3.0	2.2m	5

Table 2.

Note about Fluorinated Gases

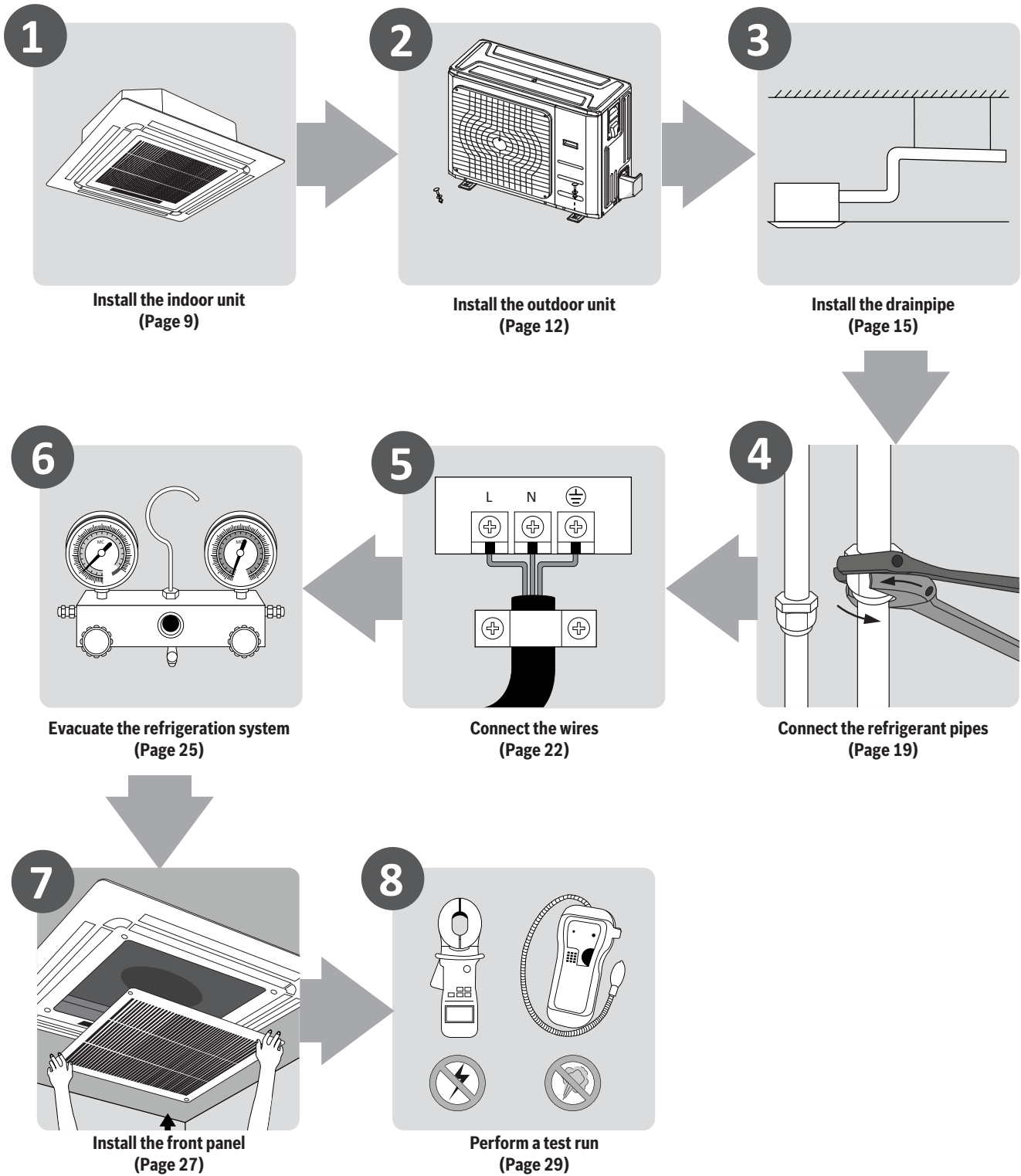
1. This air-conditioning unit contains fluorinated gases. For specific information on the type of gas and the amount, please refer to the relevant label on the unit itself.
2. Installation, service, maintenance and repair of this unit must be performed by qualified personnel.
3. Product uninstallation and recycling must be performed by a qualified personnel.
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.

**Explanation of symbols displayed on the indoor unit or outdoor unit
(applicable to the unit with R32 refrigerant only):**

	WARNING	This symbol shows that this appliance uses a flammable refrigerant. If the refrigerant is leaked and exposed to an external ignition source, there is a risk of fire.
	CAUTION	This symbol shows that the operation manual should be read carefully.
	CAUTION	This symbol shows that a service person should be handling this equipment according to the installation manual.
	CAUTION	This symbol shows that information is available, such as the operating manual or installation manual.
	CAUTION	This symbol shows that information is available, such as the operating manual or installation manual.

3 Installation Overview

INSTALLATION ORDER



4 Indoor Unit Installation

4.1 Indoor Unit Parts

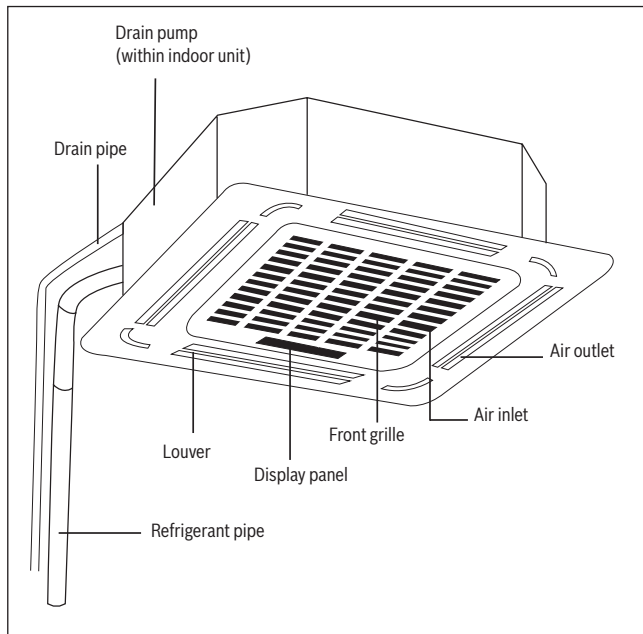


Fig. 1.

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 and cause personal injury, unit and property damage.
- Install the indoor unit at a height of more than 2.5 m above the floor.
- **DO NOT** install the indoor unit in a bathroom or laundry room, as excessive moisture can short the unit and corrode the wiring.

CAUTION

- Install the indoor and outdoor units, cables, and wires at least 1 m from televisions and radios to prevent static or image distortion. Depending on the appliances, a 1 m distance may not be sufficient.
- If the indoor unit is installed on metal, it must be electrically grounded.

4.2 Indoor Unit Installation Instructions

NOTE:

Panel installation should be done after piping and wiring.

Step 1: Select installation location

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

- ▶ The unit is at least 1 m from the nearest wall.
- ▶ There is enough room for installation and maintenance.
- ▶ There is 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.

CAUTION

DO NOT install the unit in the following locations:

- ⊘ In areas with oil drilling or fracking
- ⊘ In coastal areas with high salt content in the air In areas with caustic gases in the air, such as near hot springs
- ⊘ In areas with power fluctuations, such as factories
- ⊘ In enclosed spaces, such as cabinets
- ⊘ In kitchens that use natural gas
- ⊘ In areas with strong electromagnetic waves
- ⊘ In areas where store flammable materials or gas are stored
- ⊘ In rooms with high humidity, such as bathrooms or laundry rooms

RECOMMENDED DISTANCES BETWEEN THE INDOOR UNIT AND THE CEILING

The distance between the mounted indoor unit and the internal ceiling should meet the following specifications. (See Fig. 2)

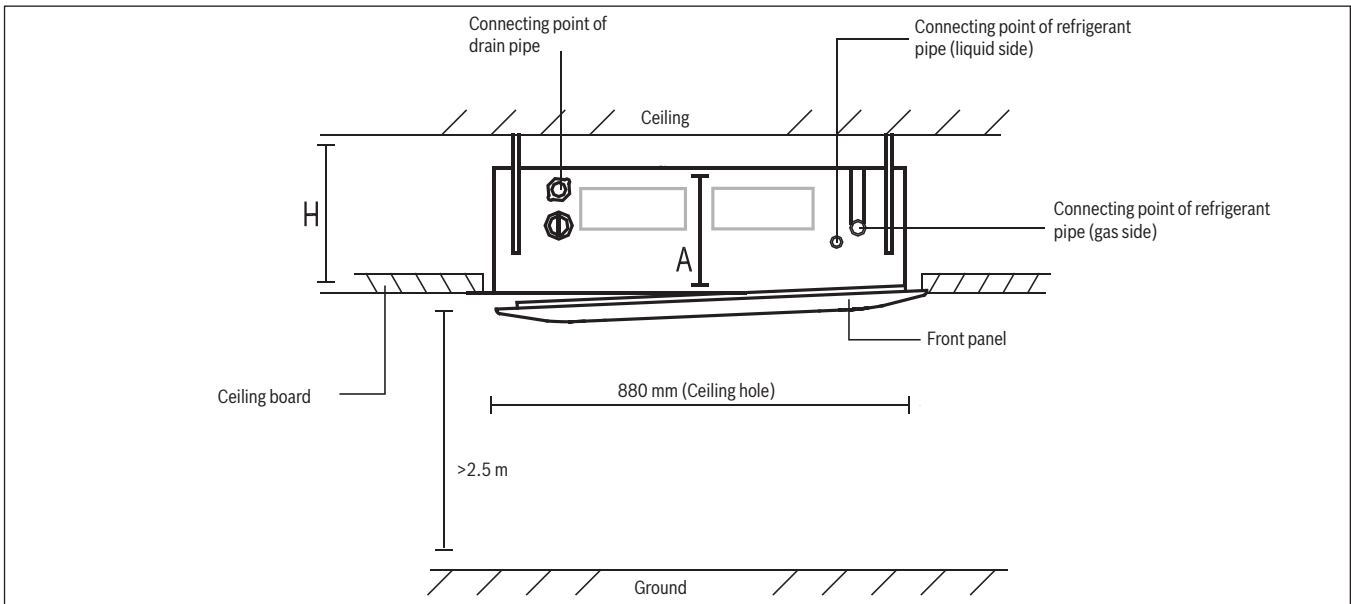


Fig. 2.

MODEL	Length of A (mm)	Length of H (mm)
18	205	> 235
24	205	> 235
30	205	> 235
30-48	245	> 275
48-60	287	> 317

Table 3. Distance from ceiling relative to height of indoor unit

Step 2: Hang indoor unit.

1. Use the included paper template to cut a rectangular hole in the ceiling, leaving at least 1 m on all sides. The cut hole size should be 40 mm larger than the body size (See Fig. 3). Ensure to mark the areas where ceiling hook holes will be drilled.

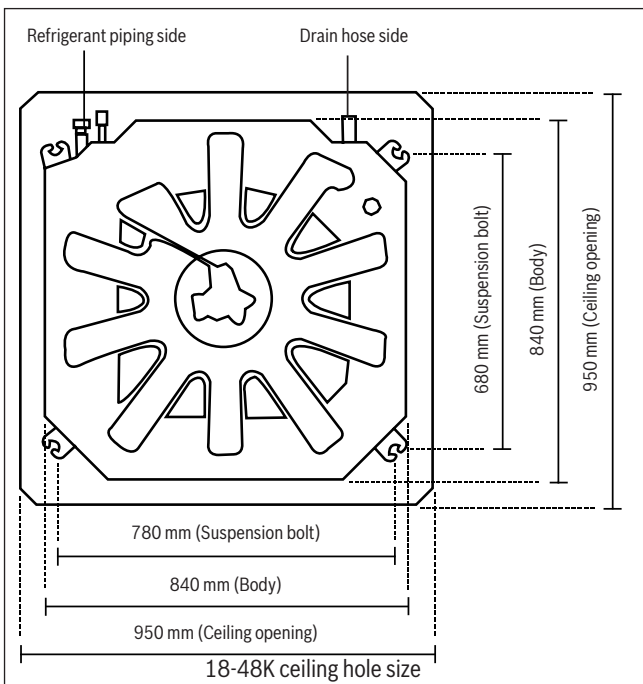


Fig. 3.

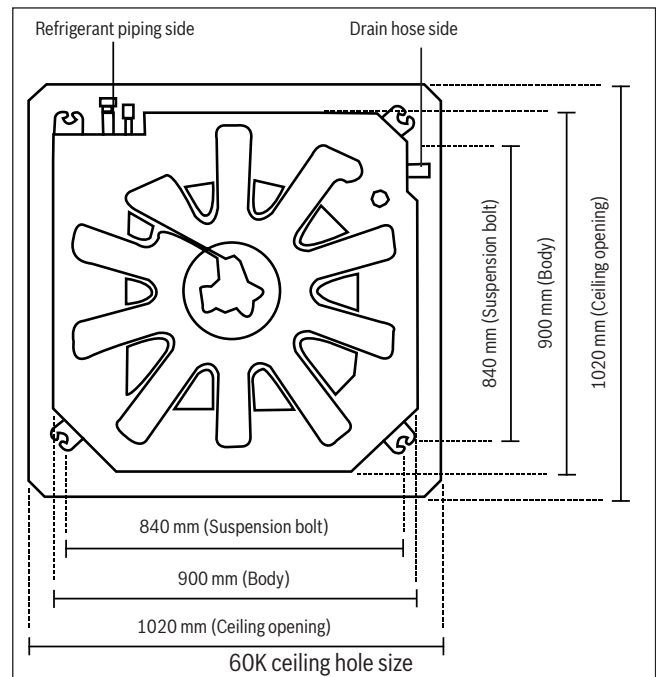


Fig. 4.

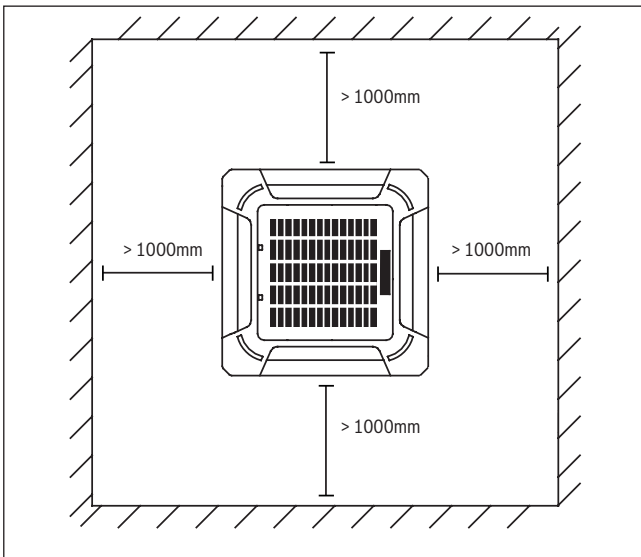


Fig. 5.

CAUTION

The unit body should align perfectly with the hole. Ensure that the unit and the hole are the same size before proceeding further.

2. Drill 4 holes 50 mm deep at the ceiling hook positions in the internal ceiling. Ensure to hold the drill at a 90° angle to the ceiling.
3. Using a hammer, insert the ceiling hooks into the pre-drilled holes. Secure the bolt using the included washers and nuts.
4. Install the four suspension bolts (See Fig. 6).

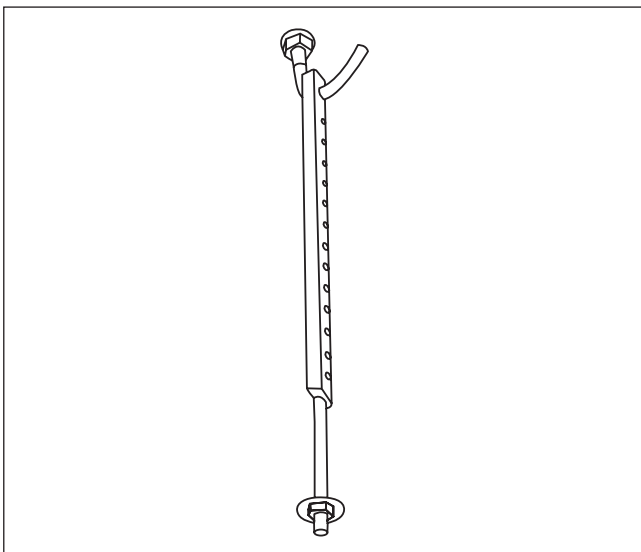


Fig. 6.

5. Mount the indoor unit. You will need two people to lift and secure it. Insert suspension bolts into the unit's hanging holes. Fasten them using the included washers and nuts (See Fig. 7).

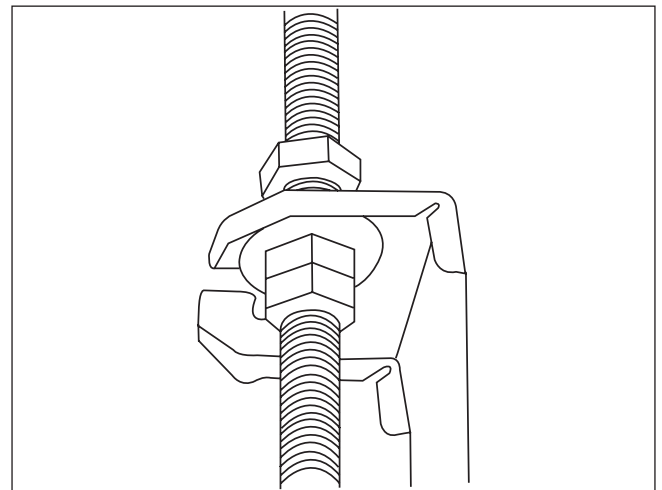


Fig. 7.

NOTE:

The bottom of the unit should be 10 - 18 mm higher than the ceiling board. Generally, L (indicated in Fig. 8) should be half the length of the suspension bolt or long enough to prevent the nuts from coming off.

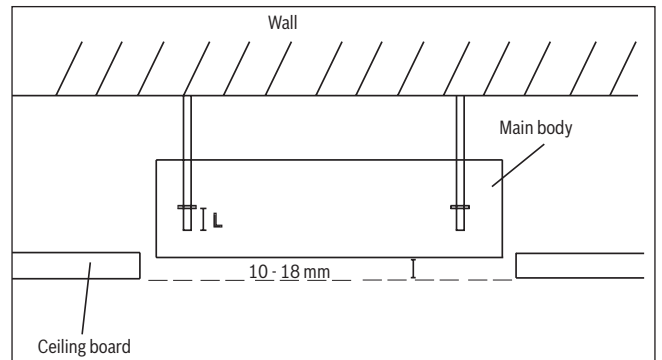


Fig. 8.

CAUTION

Ensure that the unit is completely level. Improper installation can cause the drain pipe to back up into the unit or water leakage.

NOTE:

Ensure that the indoor unit is level. The unit is equipped with a built-in drain pump and float switch. If the unit is tilted against the direction of condensate flow (the drainpipe side is raised), the float switch may malfunction and cause water to leak.

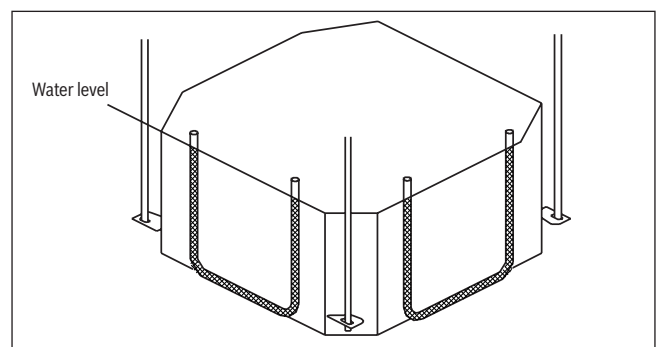


Fig. 9.

NOTE FOR NEW HOME INSTALLATION

When the unit is installed in a new home, the ceiling hooks can be embedded in advance. Ensure that the hooks do not come loose due to concrete shrinkage. After installing the indoor unit, fasten the paper installation template onto the unit with bolts (M6X12) to determine in advance the dimension and position of the opening on the ceiling. Follow the instructions above for the remainder of the installation.

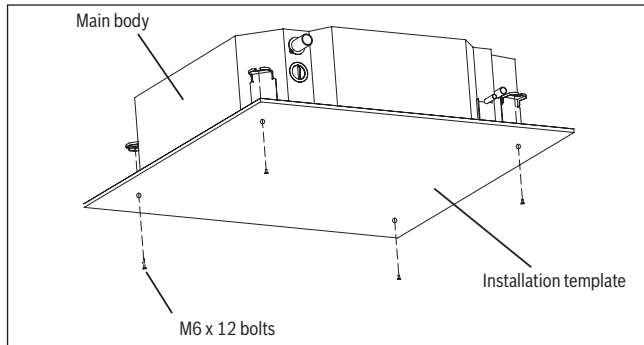


Fig. 10.

5 Outdoor Unit Installation

5.1 Outdoor Unit Installation Instructions

The outdoor unit should be installed in a 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 that 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 that the awning does not obstruct airflow.
- ▶ The installation area must be dry and well ventilated.
- ▶ Ensure there is enough room to install the connecting pipes and cables and to access them for maintenance.

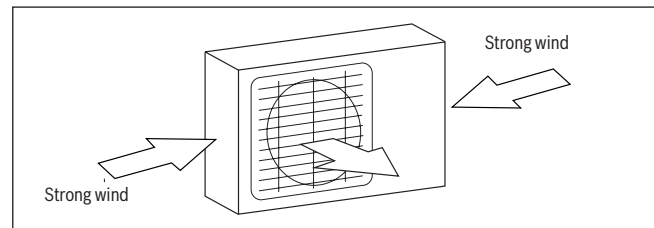


Fig. 11.

- ▶ 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, ensure the unit is located far away from neighboring property so that the noise from the unit will not disturb them.
- ▶ If the location is exposed to strong winds (for example: coastal area), the unit must be placed against the wall to shelter it from the wind. If necessary, use an awning. (See Fig. 11 & 12)
- ▶ 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.

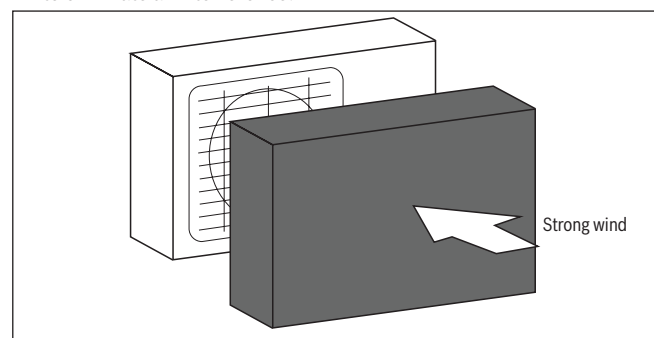
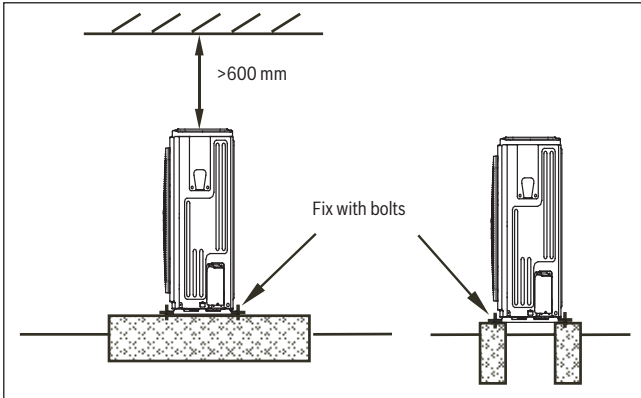


Fig. 12.

Step 2: Install outdoor unit.

Fix the outdoor unit with anchor bolts (M10)



CAUTION

- Ensure to remove any obstacles that may block air circulation.
- Ensure you refer to the length specifications to ensure that there is enough room for installation and maintenance.

Split Type Outdoor Unit

(Refer to Fig 14, 15, 16, 20 and Table 4)

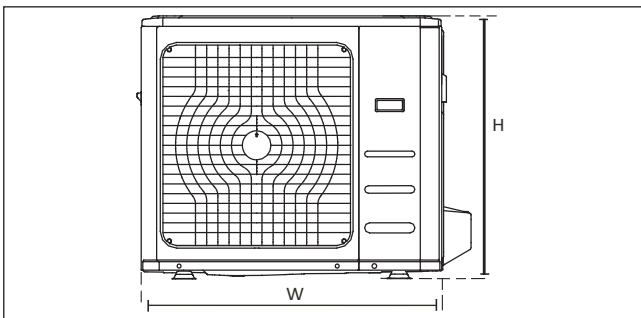


Fig. 13.

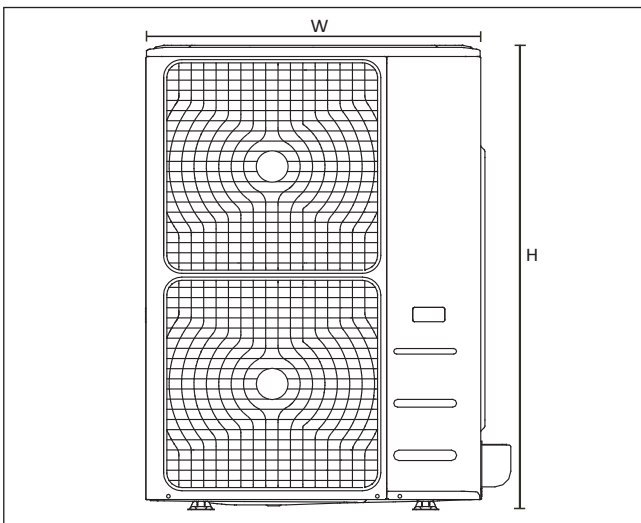


Fig. 14.

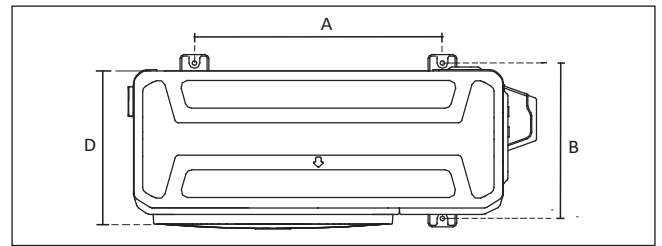


Fig. 15.

Outdoor Unit Dimensions W x H x D	Mounting Dimensions	
	Distance A	Distance B
760x590x285	530	290
810x558x310	549	325
845x700x320	560	335
900x860x315	590	333
945x810x395	640	405
990x965x345	624	366
938x1369x392	634	404
900x1170x350	590	378
800x554x333	514	340
845x702x363	540	350
946x810x420	673	403
946x810x410	673	403
952x1333x410	634	404
952x1333x415	634	404

Table 4. Length Specifications of Split Type Outdoor Unit (unit: mm)

Vertical Discharge Type Outdoor Unit

NOTE:

The minimum distance between the outdoor unit and walls described in the installation guide does not apply to airtight rooms. Ensure to keep the unit unobstructed in at least two of the three directions (M, N, P) (See Fig. 16)

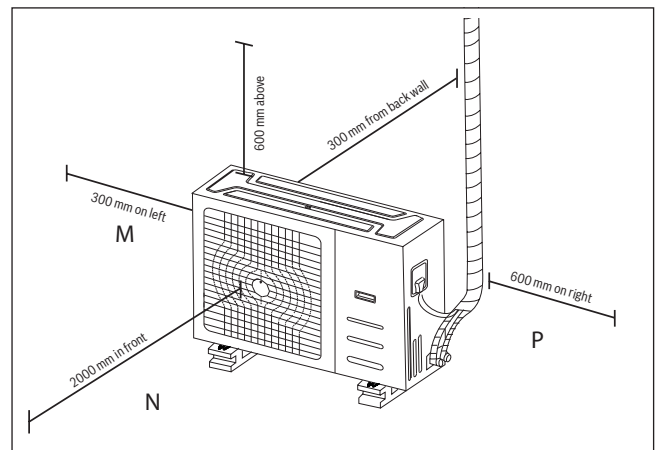


Fig. 16.

Rows of series installation

	L	A
L ≤ H	L ≤ 1/2H	250 mm or more
	1/2H < L ≤ H	300 mm or more
L > H	Cannot be installed	

Table 5. The relations between H, A and L are as follows

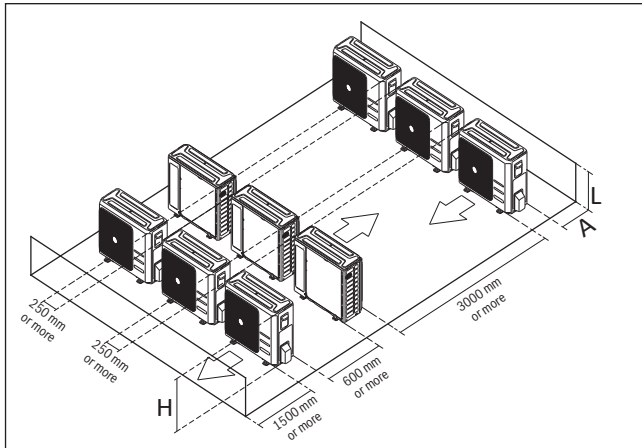


Fig. 17.

5.2 Drain Joint Installation

If the drain joint comes with a rubber seal (see Fig. 18 - A), do the following:

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.

If the drain joint does not come with a rubber seal (see Fig. 18 - B), do the following:

1. Insert the drain joint into the hole in the base pan of the unit. The drain joint will click in place.
2. Connect a drain hose extension (not included) to the drain joint to redirect water from the unit in heating mode.

NOTE:

Ensure the water drains to a safe location where it will not cause water damage or a slipping hazard.

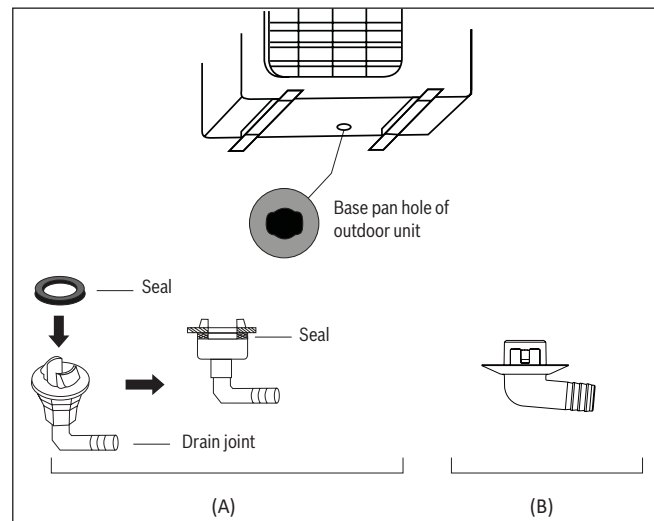


Fig. 18.

5.3 Notes On Drilling a Hole in the 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 65 mm core drill, drill a hole in the wall.

NOTE:

When drilling the wall hole, ensure 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.

6 Drainpipe Installation

The drainpipe is used to drain water 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 malfunction of the water level switch.
- 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 due to frozen drain water.
- **DO NOT** pull the drainpipe forcefully, as this could cause it to disconnect.

NOTE ON PURCHASING PIPES

This installation requires a polyethylene tube (outside diameter = 37-39mm, inside diameter = 32mm), which can be obtained at your local hardware store or from your dealer.

Indoor Drainpipe Installation

Install the drainpipe as shown in Figure 20.

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. 19)

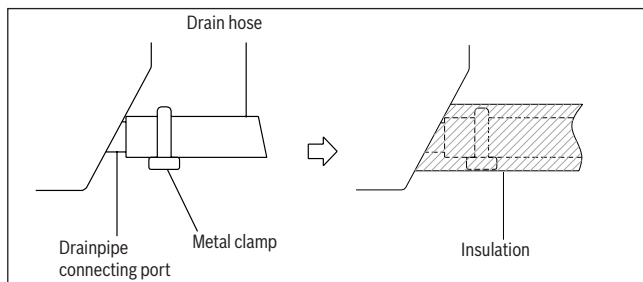


Fig. 19.

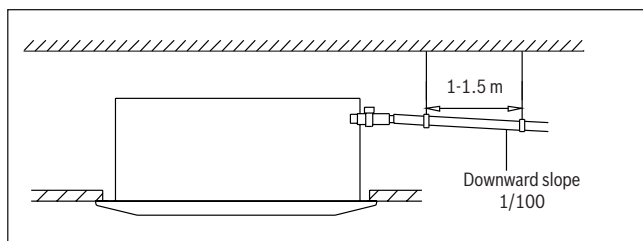


Fig. 20.

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 1/100 to prevent water from flowing back into the air conditioner.
- To prevent the pipe from sagging, space hanging wires every 1-1.5 m.
- 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 750 mm from the ceiling board, and the distance between the unit and the lift pipe must be less than 300 mm. 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 (<75 mm).

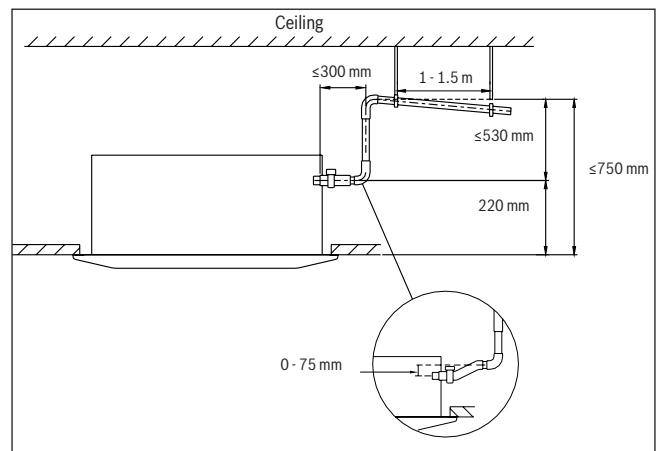


Fig. 21.

NOTE:

When connecting multiple drainpipes, install the pipes as shown in Figure 22.

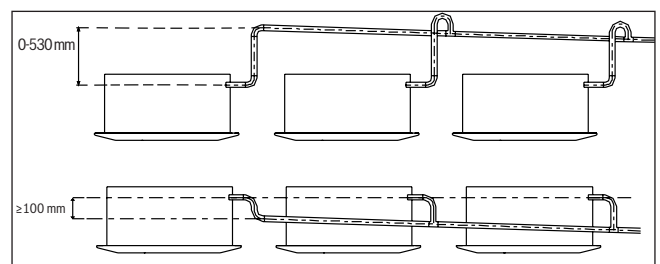


Fig. 22.

3. Using a 65 mm core drill, drill a hole in the wall. Ensure that the hole is drilled at a slightly downward angle, so that the outdoor end of the hole is lower than the indoor end by about 12 mm. This will ensure proper water drainage (See Fig. 23). 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.

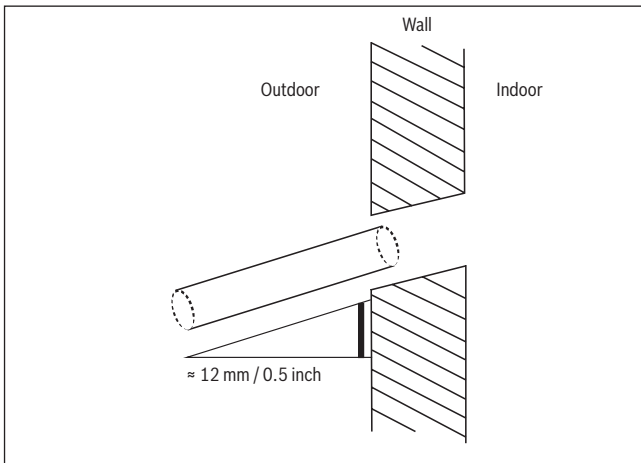


Fig. 23.

NOTE:

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

4. Pass the drain hose through the wall hole. Ensure 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 50 mm 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 odours that might otherwise come back into the house.

7 Refrigerant Piping Connection

Safety Precautions

WARNING

- All field piping must be completed by qualified personnel 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.

Refrigerant Piping with Twin Indoor Units

When installing multiple indoor units to a single outdoor unit, ensure that the length of the refrigerant pipe and the drop height between the indoor and outdoor units meets the following requirements:

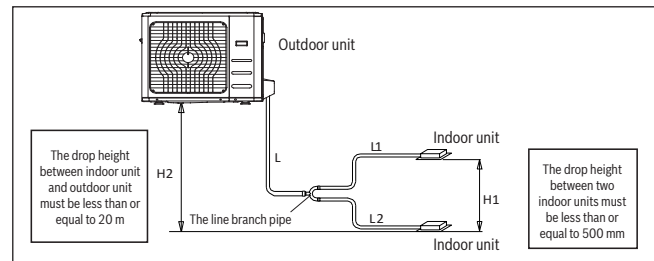


Fig. 24.

7.1 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 6:

Type of model	Capacity (Btu/h)	Length of piping	Maximum drop height
Split Inverter	<15K	25	10
	≥15K - <24K	30	20
	≥24K - <36K	50	25
	≥36K - ≤60K	65	30

Table 6. The Maximum Length and Drop Height Based on Models (Unit: m)

CAUTION

Mark the data plate with the installed orifice (for some models).

- Please purchase the fittings strictly according to the requirements in the manual.
- Refer to the diagram when installing. (See Fig. 25)

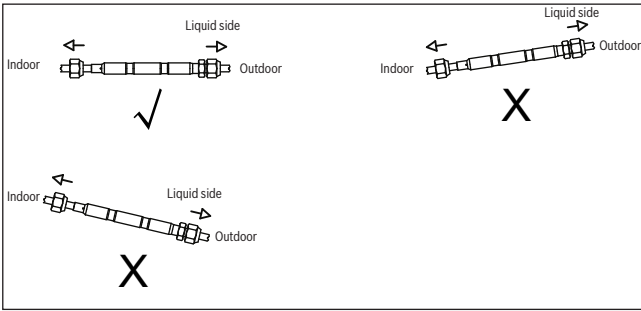


Fig. 25.

CAUTION

- Oil traps
 - If the indoor unit is installed higher than the outdoor unit:
 - If oil flows back into the outdoor unit's compressor, this might cause liquid compression or deterioration of oil return. Oil traps in the rising gas piping can prevent this.
 - An oil trap should be installed every 10 m of vertical suction line riser. (See Fig. 26)

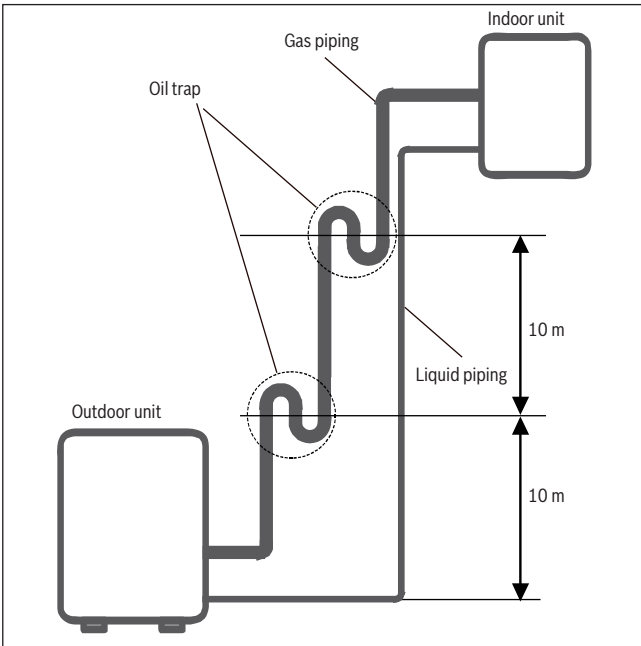


Fig. 26.

The indoor unit is installed higher than the outdoor unit

CAUTION

- If the outdoor unit is installed higher than the indoor unit:
 - It is recommended that vertical suction risers not be upsized. Proper oil return to the compressor should be maintained with suction gas velocity. If velocities drop below 7.62 m/s, the oil return will be decreased. An oil trap should be installed every 6 m of vertical suction line riser. (See Fig. 27)

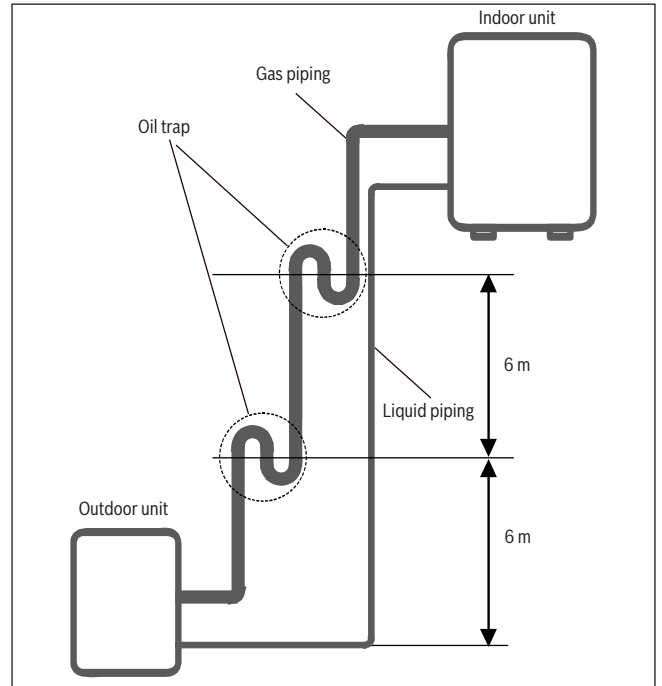


Fig. 27.

The outdoor unit is installed higher than the indoor unit

Permitted length				
Piping length	Total piping length	18K+18K	30	L+Max (L1, L2)
		24K+24K 30K+30K	50	
	(farthest distance from the line pipe branch)	15		L1, L2
	(farthest distance from the line pipe branch)	10		L1-L2
Drop height	Drop height between indoor and outdoor unit	20		H1
	Drop height between two indoor units	0.5		H2

Table 7.

7.2 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 correctly. This will ensure efficient operation and minimize the need for future maintenance.

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

CAUTION

DO NOT deform the 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.

1. Ensure that the pipe is cut at a perfect 90° angle. Refer to Fig. 28 for examples of bad cuts

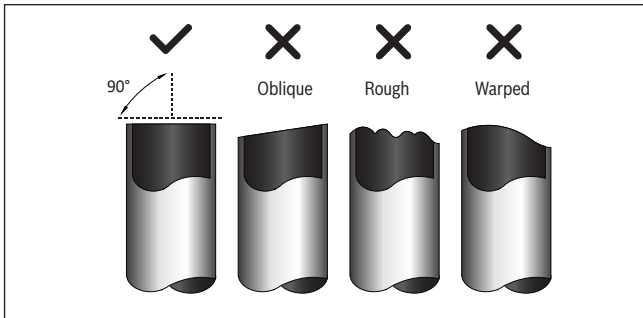


Fig. 28.

Step 2: Remove burrs.

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

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

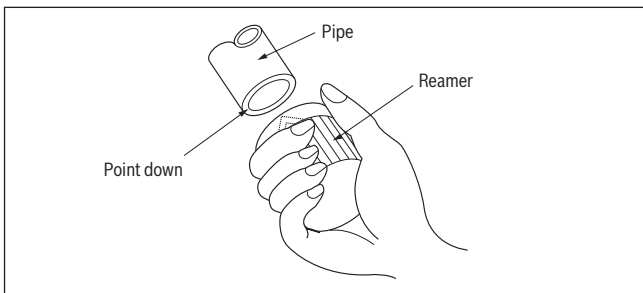


Fig. 29.

Step 3: Flare pipe ends

Proper flaring is essential to achieve an airtight seal.

1. After removing burrs from the cut pipe, seal the ends with PVC tape to prevent foreign materials from entering the pipe.
2. Sheath the pipe with insulating material.
3. Place flare nuts on both ends of pipe. Make sure they are facing in the right direction, because you cannot put them on or change their direction after flaring. See Fig. 30

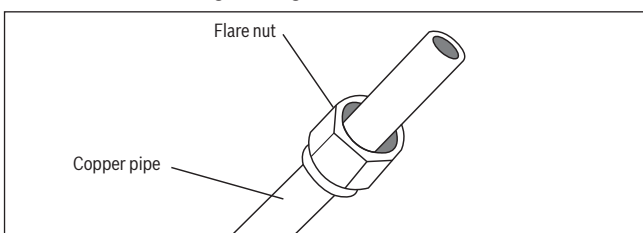


Fig. 30.

4. Remove the PVC tape from the ends of the pipe when you are ready.
5. Clamp the flare form on the end of the pipe. The end of the pipe must extend beyond the flare form.

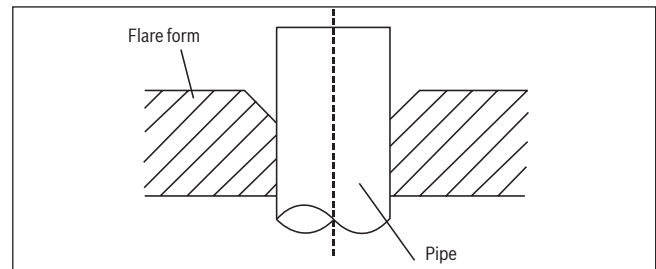


Fig. 31.

6. Place the flaring tool onto the form.
7. 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 8.

Pipe gauge	Tightening torque (Unit: N.m)	Flare dimension (A) (Unit: mm)		Flare shape
		Min.	Max.	
Ø 6.4	18-20 N.m (183-204 kgf.cm)	8.4	8.7	
Ø 9.5	25-26 N.m (255-265 kgf.cm)	13.2	13.5	
Ø 12.7	35-36 N.m (357-367 kgf.cm)	16.2	16.5	
Ø 15.9	45-47 N.m (459-480 kgf.cm)	19.2	19.7	
Ø 19.1	65-67 N.m (663-683 kgf.cm)	23.2	23.7	
Ø 22	75-85 N.m (765-867 kgf.cm)	26.4	26.9	

Table 8. PIPING EXTENSION BEYOND FLARE FORM

8. 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.

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

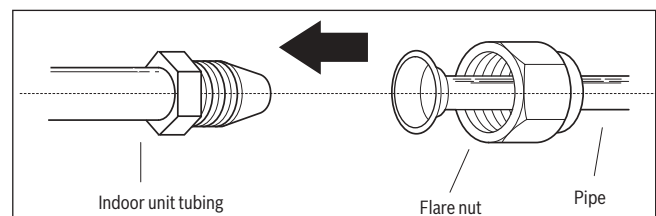


Fig. 33.

3. Tighten the flare nut as tightly as possible by hand.
4. Using a spanner, grip the nut on the unit tubing.
5. While firmly gripping the nut, use a torque wrench to tighten the flare nut according to the torque values in table 8.

NOTE:

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

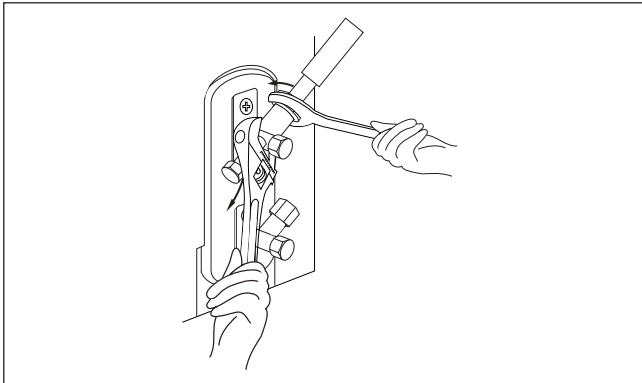


Fig. 34.

CAUTION

- Ensure to wrap insulation around the piping. Direct contact with the bare piping may result in burns or frostbite.
- Ensure the pipe is properly connected. Overtightening may damage the bell mouth and undertightening 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.

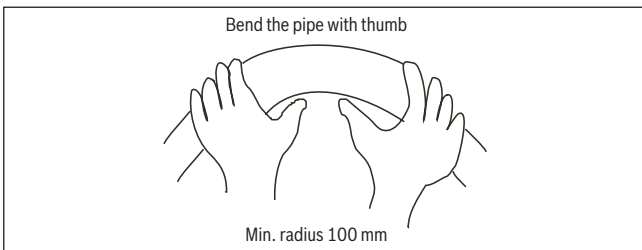


Fig. 35.

6. 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.

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

CAUTION

Check to ensure 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).

8 Wiring

Safety Precautions

WARNING

- Ensure to disconnect the power supply before working on the unit.
- All electrical wiring must be done according to local and national regulations.
- Electrical wiring must be done by qualified personnel. Improper connections may cause electrical malfunction, injury and 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 electrical circuit capacity is not enough or there is a defect in the electrical work, it can lead to shock, fire, unit and property damage.
- Connect the power cable to the terminals and fasten it with a clamp. An insecure connection may cause fire.
- Ensure 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 the main supply connection is made through a switch that disconnects all poles, with a contact gap of at least 3 mm.
- **DO NOT** modify the length of the power cord or use an extension cord.

CAUTION

- Connect the outdoor wires before connecting the indoor wires.
- Ensure you earth the unit. The earthing wire should be away from gas pipes, water pipes, lightning rods, telephone or other earthing wires. Improper earthing may cause electrical shock.
- **DO NOT** connect the unit with the power source until all wiring and piping is completed.
- Ensure that you do not cross your electrical wiring with your signal wiring, as this can 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.
- The unit's power information can be found on the rating sticker on the product.

TAKE NOTE OF FUSE SPECIFICATIONS

The air conditioner's circuit board (PCB) is designed with a fuse to provide overcurrent protection. The specifications of the fuse are printed on the circuit board, such as:

Indoor unit: T3.15A/250VAC, T5A/250VAC (applicable for unit with R32 refrigerant only)

Outdoor unit: T20A/250VAC (for <24000 Btu/h unit), T30A/250VAC (for >24000 Btu/h unit)

NOTE:

The fuse is made of ceramic.

8.1 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 correct cable size before preparing the cable for connection. Ensure to use HO7RN-F cables.

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

Table 9. Minimum cross sectional area of power and signal cables

- b. Using wire strippers, strip the rubber jacket from both ends of signal cable to reveal about 150 mm of the wires inside.
- c. Strip the insulation from the ends of the wires.
- d. Using a wire crimper, crimp u-lugs on the ends of the wires.

NOTE:

While connecting the wires, please strictly follow the wiring diagram (found inside the electrical box cover).

2. Remove the electric cover of the outdoor unit. If there is no cover on the outdoor unit, disassemble the bolts from the maintenance board and remove the protection board. (See Fig. 36)

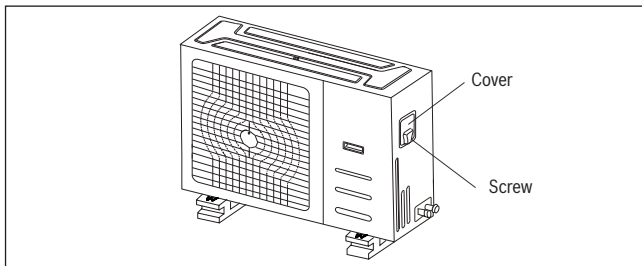


Fig. 36.

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

8.2 Indoor Unit Wiring

1. Prepare the cable for connection
 - a. Using wire strippers, strip the rubber jacket from both ends of signal cable to reveal about 150 mm of the wires inside.
 - b. Strip the insulation from the ends of the wires.
 - c. Using wire crimper, crimp the u-lugs to the ends of the wires.

2. Open the front panel of the indoor unit. Using a screwdriver, remove the cover of the electric control box on your indoor unit.
3. Thread the power cable and the signal cable through the wire outlet.

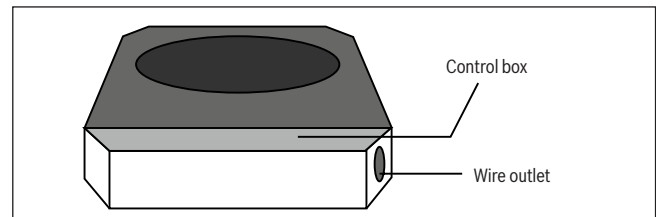


Fig. 37.

4. 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.

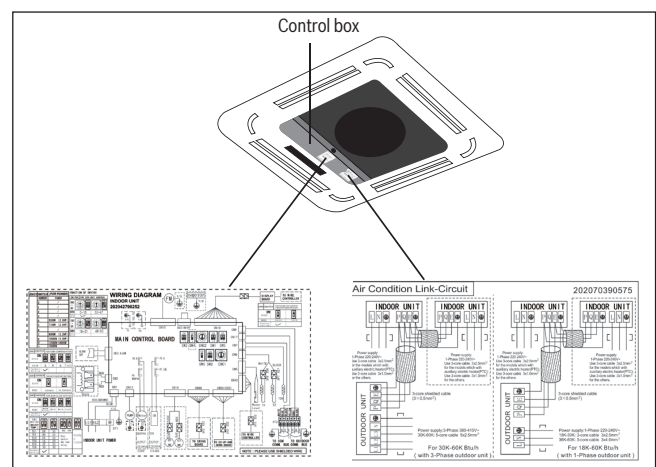


Fig. 38.

Magnetic ring (if supplied and packed with the accessories)

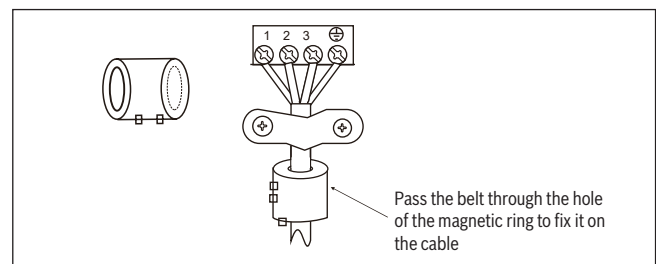


Fig. 39.



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.
5. Clamp down the cable with the designated cable clamp to secure it in place. The cable should not be loose, and it should not pull on the u-lugs.
 6. Reinstall the electric box cover and the front panel of the indoor unit.

8.3 Power Specifications

NOTE:

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

Inverter Type A/C Power Specifications

MODEL (Btu/h)		≤18K	19K~24K	25K~36K
POWER (indoor)	PHASE	1 phase	1 phase	1 phase
	VOLT	220-240 V	220-240 V	220-240 V
CIRCUIT BREAKER/FUSE (A)		15/10	15/10	15/10
POWER (outdoor)	PHASE	1 phase	1 phase	1 phase
	VOLT	208-240 V	208-240 V	208-240 V
CIRCUIT BREAKER/FUSE (A)		25/20	25/20	40/30

MODEL (Btu/h)		≤36K	37K~60K
POWER (indoor)	PHASE	1 phase	1 phase
	VOLT	220-240 V	220-240 V
CIRCUIT BREAKER/FUSE (A)		15/10	15/10
POWER (outdoor)	PHASE	3 phase	3 phase
	VOLT	380-415 V	380-415 V
CIRCUIT BREAKER/FUSE (A)		25/20	32/25

Table 10.

9 Air Evacuation

Safety Precautions

CAUTION

- Use a vacuum pump with a gauge reading lower than -0.1 MPa and an air discharge capacity above 40 L/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 -0.1 MPa or below after 2 hours. If the gauge reading is still above -0.1 MPa after three hours of operation check if there is a gas leak or water inside the pipe. If there is no leakage, perform another evacuation for 1 or 2 hours.
- **DO NOT** use refrigerant gas to evacuate the system.

9.1 Evacuation Instructions

Before using a manifold gauge and vacuum pump, read their operation manuals to familiarize yourself with how to use them properly.

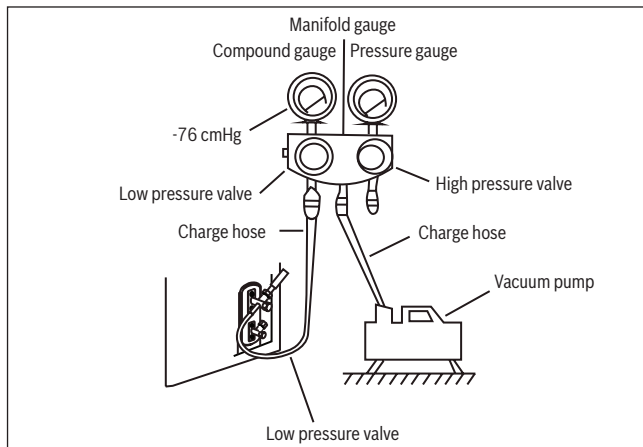


Fig. 40.

1. Connect the charge hose of the manifold gauge to the service port on the outdoor unit's low pressure valve.
2. Connect another charge hose from the manifold gauge 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 -76 cmHG (-1x10⁵ Pa).
6. Close the low pressure side of the manifold gauge, 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 the system pressure, unscrew the cap from the packed valve (high pressure valve). If there is a change in the system pressure, there may be a gas leak.

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

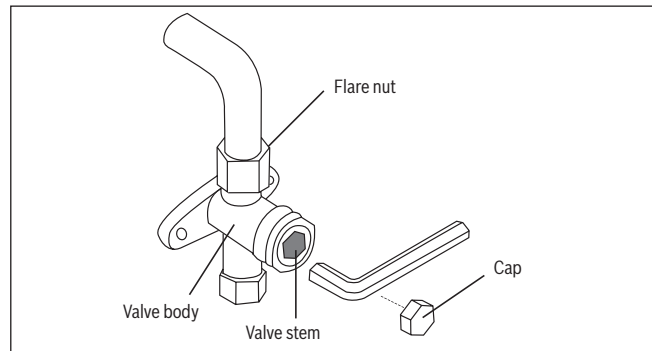


Fig. 41.

9. Watch the pressure gauge for one minute to ensure that there is no change in pressure. The pressure gauge should read slightly higher than atmospheric pressure.
10. Remove the charge hose from the service port.
11. Using a 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 them using the proper tool.

9.2 Note On Adding Refrigerant

CAUTION

- Refrigerant charging must be performed after wiring, vacuuming and the leak test.
- **DO NOT** exceed the maximum allowable quantity of refrigerant or overcharge the system. Doing so can damage or impact the unit's function.
- 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 refrigerant types.
- For the R32 refrigerant model, make sure the conditions within the area have been made safe by controlling flammable material when the refrigerant is added to the air conditioner.

Some systems require additional charging depending on pipe lengths. The standard pipe length varies according to local regulations. The additional refrigerant to be charged can be calculated using the following formula:

Liquid Side Diameter

	Ø 6.35(1/4")	Ø 9.52(3/8")	Ø 12.7(1/2")
R410A (Orifice tube in the indoor unit):	(Total pipe length – standard pipe length) x 30 g (0.32 oZ)/m(ft)	(Total pipe length – standard pipe length) x 65g (0.69 oZ)/m(ft)	(Total pipe length – standard pipe length) x 115 g (1.23 oZ)/m(ft)
R410A (Orifice tube in the outdoor unit):	(Total pipe length – standard pipe length) x 15 g (0.16 oZ)/m(ft)	(Total pipe length – standard pipe length) x 30 g (0.32 oZ)/m(ft)	(Total pipe length – standard pipe length) x 65 g (0.69 oZ)/m(ft)
R32	(Total pipe length – standard pipe length) x 12 g(0.13 oZ)/m(ft)	(Total pipe length – standard pipe length)x 24 g (0.26 oZ)/m(ft)	(Total pipe length – standard pipe length) x 40 g (0.42 oZ)/m(ft)

Table 11.

10 Panel Installation

CAUTION

DO NOT place the panel face down on the floor, against a wall, or on uneven surfaces.

Step 1: Remove the front grille.

1. Push both of the tabs towards the middle simultaneously to unlock the hook on the grille.
2. Hold the grille at a 45° angle, lift it up slightly and detach it from the main body.

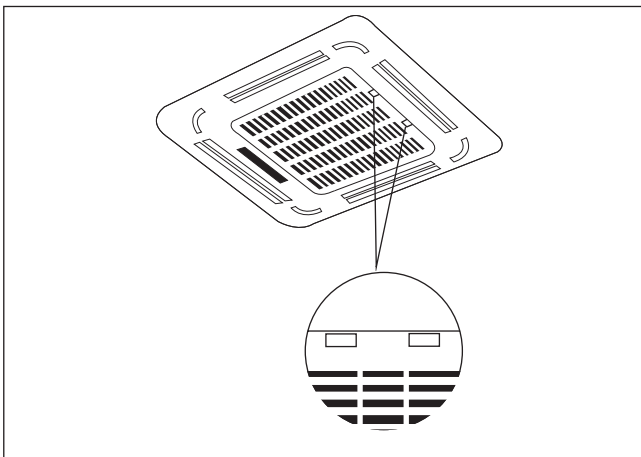


Fig. 42.

Step 2: Remove the installation covers at the four corners by sliding them outwards.

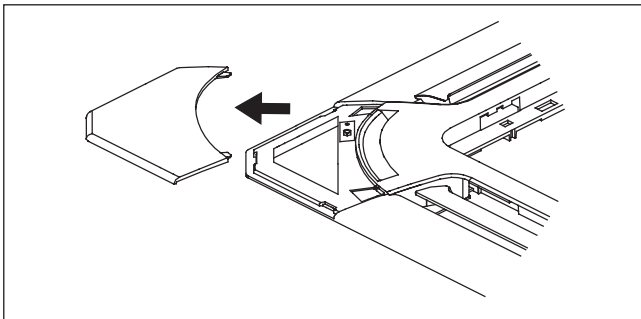


Fig. 43.

Step 3: Install the panel

Align the front panel to the main body, taking into account the position of the piping and drain sides. Hang the four latches of the decorative panel on the hooks of the indoor unit. Tighten the panel hook screws evenly at the four corners. (See Fig. 44)

NOTE:

Tighten the screws until the thickness of the sponge between the main body and the panel decreases to 4-6 mm. The edge of the panel should be in contact with the ceiling well.

Adjust the panel by turning it to the direction of the arrows shown in Fig. 44 so that the ceiling opening is completely covered.

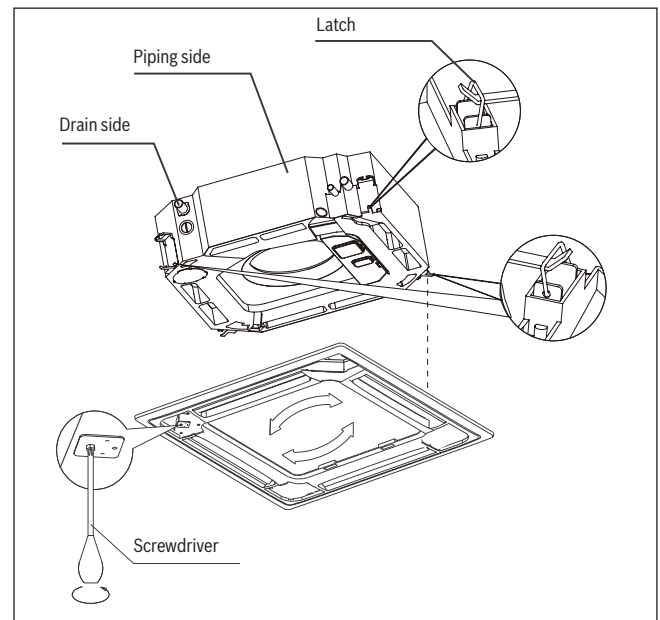


Fig. 44.

1. Connect the two louver motor connectors to the corresponding wires in the control box.

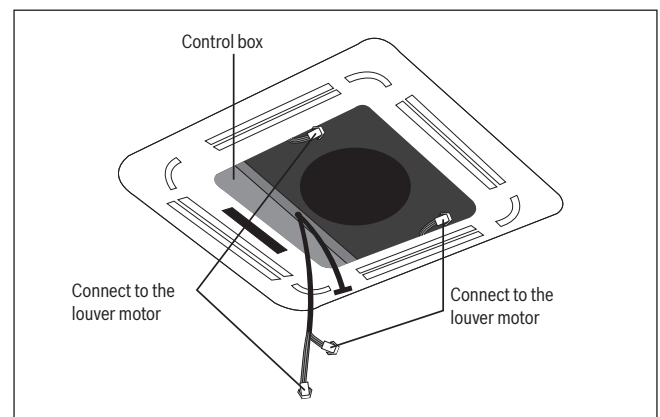


Fig. 45.

2. Remove foam stops from inside the fan.
3. Attach the side of the front grille to the panel.

4. Connect the display panel cable to the corresponding wire on the main body.

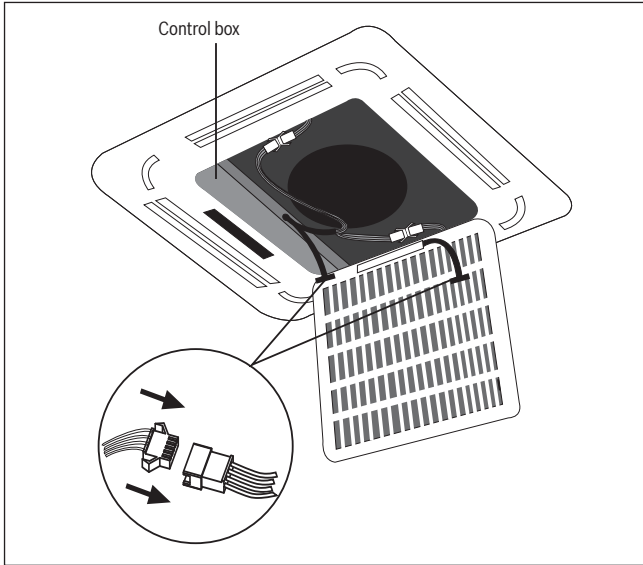


Fig. 46.



CAUTION

Failure to tighten screws can cause water leakage.

5. Close the front grille.
6. Fasten the installation covers at all four corners by pushing them inwards. (See Fig. 47)

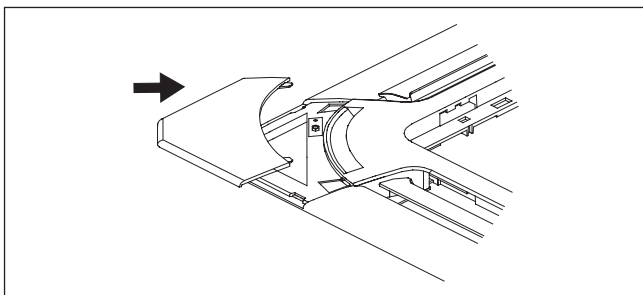


Fig. 47.

NOTE:

If the height of the indoor unit needs to be adjusted, you can do so through the openings at the panel's four corners. Ensure that the internal wiring and drainpipe are not affected by this adjustment.

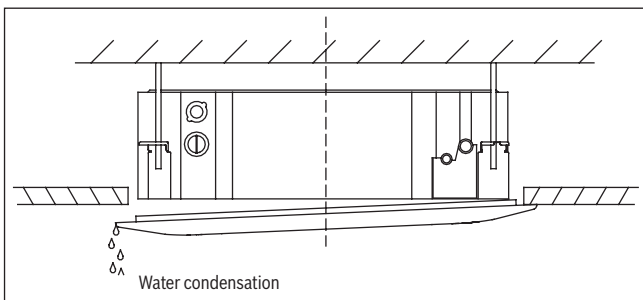


Fig. 48.



CAUTION

If the unit is not hung correctly and a gap exists, the unit's height must be adjusted to ensure proper function. The unit's height can be adjusted by loosening the upper nut and adjusting the lower nut.

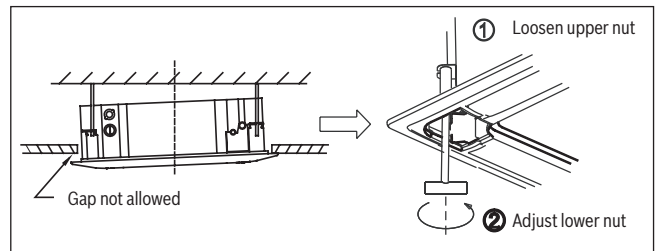


Fig. 49.

11 Test Run

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. The indoor and outdoor units are properly installed.
- b. Piping and wiring are properly connected.
- c. There are obstacles near the inlet and outlet of the unit that might cause poor performance or product malfunction.
- d. The refrigeration system does not leak.
- e. Drainage system is unimpeded and drains to a safe location.
- f. The heating insulation is properly installed.
- g. The earthing wires are properly connected.
- h. Length of the piping and additional refrigerant stow capacity have been recorded.
- i. The 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 correctly.
 - b. Ensure the louvres move correctly 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 correctly.
 - e. Ensure the manual buttons on the indoor unit work properly.
 - f. Check if 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 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 neighbours or pose a safety hazard.
6. Drainage test
 - a. Ensure the drainpipe flows smoothly. In the case of new buildings, this test should be performed before the ceiling is finished.
 - b. Remove the test cover. Add 2,000 ml 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 that the water is discharged. It may take up to one minute before the unit begins to drain depending on the drainpipe.
 - f. Ensure 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 correctly, refer to the Troubleshooting section of the owner's manual before calling Technical Service.

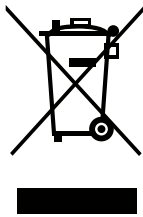
12 European Disposal Guidelines

Users in European countries may be required to properly dispose of this unit. This appliance contains refrigerant and other potentially hazardous materials. When this appliance is disposed of, the law requires special collection and treatment. **DO NOT** dispose of this product as household waste or unsorted municipal waste. When disposing of this appliance, you have the following options:

- Dispose of the appliance at a designated municipal electronic waste collection facility.
- Sell the appliance to certified scrap metal dealers.

NOTE:

Disposing of this appliance in the forest or other natural surroundings endangers your health and is bad for the environment. Hazardous substances may leak into the ground water and enter the food chain.



13 Information on Servicing

(Required for the units with R32 refrigerant only)

1. Area checks

Prior to beginning work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimised. For repair to the refrigerating system, the following precautions must be taken prior to conducting work on the system.

2. Work procedure

Work must be done with a controlled procedure so as to minimise the risk of a flammable gas or vapour being present while the work is being performed.

3. General work area

All maintenance staff and others working in the local area must be instructed on the nature of the work being carried out. Work in confined spaces must be avoided. The area around the work space must be sectioned off. Ensure that the conditions within the area have been made safe by checking for flammable material.

4. Checking for presence of refrigerant

The area must be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with flammable refrigerants, i.e. no sparking, adequately sealed or intrinsically safe.

5. Presence of fire extinguisher

If any hot work is to be conducted on the refrigeration equipment or any associated parts, appropriate fire extinguishing equipment must be available to hand. Have a dry powder or CO₂ fire extinguisher adjacent to the charging area.

6. No ignition sources

No person carrying out work in relation to a refrigeration system which involves exposing any pipe work that contains or has contained flammable refrigerant may use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during the time which flammable refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. NO SMOKING signs shall be displayed.

7. Ventilated area

Ensure that the area is in the open or that it is adequately ventilated before opening the system or conducting any hot work. A degree of ventilation must continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

8. Checks to the refrigeration equipment

When electrical components are changed, they must be appropriate for the purpose and meet the correct specification. The manufacturer's maintenance and service guidelines must be followed at all times. If in doubt consult the manufacturer's technical department for assistance. The following checks must be performed on installations using flammable refrigerants:

- The charge size is in accordance with the room size within which the refrigerant containing parts are installed.
- The ventilation machinery and outlets are operating adequately and are not obstructed.
- If an indirect refrigerating circuit is being used, the secondary circuits must be checked for the presence of refrigerant; marking on the equipment continues to be visible and legible.

- Marking and signs that are illegible must be corrected.
- Refrigeration pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.

9. Checks of electrical devices

Repair and maintenance of electrical components must include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, then no electrical supply must be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution must be used. This must be reported to the owner of the equipment so all parties are advised.

Initial safety checks include:

- Capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking
- No live electrical components and wiring are exposed while charging, recovering or purging the system;
- There is continuity of earth bonding.

10. Repairs to sealed components

10.1 During repairs to sealed components, all electrical supplies must be disconnected from the equipment being worked upon prior to any removal of sealed covers, etc. If it is absolutely necessary to have an electrical supply to equipment during servicing, then a permanently operating form of leak detection must be located at the most critical point to warn of a potentially hazardous situation.

10.2 Particular attention must be paid to the following to ensure that during work on electrical components, the casing is not altered in such a way that the level of protection is affected. This shall include damage to cables, excessive number of connections, terminals not made to original specification, damage to seals, incorrect fitting of glands, etc.

- Ensure that the apparatus is mounted securely.
- Ensure that seals or sealing materials have not degraded such that they no longer serve the purpose of preventing the ingress of flammable atmospheres. Replacement parts shall be in accordance with the manufacturer's specifications.

NOTE:

The use of silicon sealant may inhibit the effectiveness of some types of leak detection equipment. Intrinsically safe components do not have to be isolated prior to working on them.

11. Repair to intrinsically safe components

Do not apply any permanent inductive or capacitance loads to the circuit without ensuring that this will not exceed the permissible voltage and current permitted for the equipment in use. Intrinsically safe components are the only types that can be worked on while live in the presence of a flammable atmosphere. The test apparatus must be at the correct rating.

Replace components only with parts specified by the manufacturer. Other parts may result in the ignition of refrigerant in the atmosphere from a leak.

12. Cabling

Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects. The check must also take into account the effects of aging or continual vibration from sources such as compressors or fans.

13. Detection of flammable refrigerants

Under no circumstances may potential sources of ignition be used in searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) must not be used.

14. Leak detection methods

The following leak detection methods are deemed acceptable for systems containing flammable refrigerants. Electronic leak detectors must be used to detect flammable refrigerants, but the sensitivity may not be adequate or may need re-calibration. (Detection equipment must be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant. Leak detection equipment must be set at a percentage of the LFL of the refrigerant and must be calibrated to the refrigerant employed, and the appropriate percentage of gas (25% maximum) must be confirmed. Leak detection fluids are suitable for use with most refrigerants, but the use of detergents containing chlorine must be avoided as the chlorine may react with the refrigerant and corrode the copper pipework.

If a leak is suspected, all naked flames must be removed or extinguished. If a leakage of refrigerant is found which requires brazing, all of the refrigerant must be recovered from the system or isolated (by means of shut off valves) in a part of the system remote from the leak. Oxygen free nitrogen (OFN) must then be purged through the system both before and during the brazing process.

15. Removal and evacuation

When breaking into the refrigerant circuit to make repairs for any purpose conventional procedures must be used. However, it is important that best practice is followed since flammability is a consideration. The following procedure must be adhered to:

- Remove refrigerant.
- Purge the circuit with inert gas.
- Evacuate.
- Purge again with inert gas.
- Open the circuit by cutting or brazing.

The refrigerant charge must be recovered into the correct recovery cylinders. The system must be flushed with OFN to render the unit safe. This process may need to be repeated several times. Compressed air or oxygen must not be used for this task.

Flushing must be achieved by breaking the vacuum in the system with OFN and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum. This process must be repeated until no refrigerant is within the system.

When the final OFN charge is used, the system shall be vented down to atmospheric pressure to enable work to take place. This operation is absolutely vital if brazing operations on the pipework are to take place.

Ensure that the outlet for the vacuum pump is not close to any ignition sources and there is ventilation available.

16. Charging procedures

In addition to conventional charging procedures, the following requirements shall be followed:

- Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them.
- Cylinders shall be kept upright.
- Ensure that the refrigeration system is earthed prior to charging the system with refrigerant.
- Label the system when charging is complete (if not already).
- Extreme care shall be taken not to overfill the refrigeration system.
- Prior to recharging the system it shall be pressure tested with OFN. The system shall be leak tested on completion of charging but prior

to commissioning. A follow up leak test shall be carried out prior to leaving the site.

17. Decommissioning

Before carrying out this procedure, it is essential that the qualified personnel is completely familiar with the equipment and all its detail. It is recommended good practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample shall be taken.

If an analysis is required prior to re-use of reclaimed refrigerant, it is essential that electrical power is available before the task is commenced.

- a. Become familiar with the equipment and its operation.
- b. Isolate system electrically
- c. Before attempting the procedure ensure that:
 - mechanical handling equipment is available, if required, for handling refrigerant cylinders;
 - all personal protective equipment is available and being used correctly;
 - the recovery process is supervised at all times by qualified personnel ;
 - recovery equipment and cylinders conform to the appropriate standards.
- d. Pump down refrigerant system, if possible.
- e. If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
- f. Ensure that cylinder is situated on the scales before recovery takes place.
- g. Start the recovery machine and operate in accordance with manufacturer's instructions.
- h. Do not overfill cylinders. (No more than 80% volume liquid charge).
- i. Do not exceed the maximum working pressure of the cylinder, even temporarily.
- j. When the cylinders have been filled correctly and the process completed, ensure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.
- k. Recovered refrigerant shall not be charged into another refrigeration system unless it has been cleaned and checked.

18. Labelling

Equipment shall be labelled stating that it has been de-commissioned and emptied of refrigerant. The label shall be dated and signed. Ensure that there are labels on the equipment stating the equipment contains flammable refrigerant.

19. Recovery

- When removing refrigerant from a system, either for service or decommissioning, it is recommended good practice that all refrigerants are removed safely.
- When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct numbers of cylinders for holding the total system charge are available. All cylinders to be used are designated for the recovered refrigerant and labelled for that refrigerant (i.e special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure relief valve and associated shut-off valves in good working order.
- Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.
- The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be

suitable for the recovery of flammable refrigerants. In addition, a set of calibrated weighing scales shall be available and in good working order.

- Hoses shall be complete with leak-free disconnect couplings and in good condition. Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release. Consult manufacturer if in doubt.
- The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant waste transfer note must be arranged. Do not mix refrigerants in recovery units and especially not in cylinders.
- If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The evacuation process shall be carried out prior to returning the compressor to the suppliers. Only electric heating of the compressor body shall be employed to accelerate this process. When oil is drained from a system, it shall be carried out safely.

20. Transportation, marking and storage of units

1. Transport of equipment containing flammable refrigerants
Compliance with the transport regulations
2. Marking of equipment using signs
Compliance with local regulations
3. Disposal of equipment using flammable refrigerants
Compliance with national regulations
4. Storage of equipment/appliances
The storage of equipment should be in accordance with the manufacturer's instructions.
5. Storage of packed (unsold) equipment
Storage package protection should be constructed such that mechanical damage to the equipment inside the package will not cause a leak of the refrigerant charge.
The maximum number of pieces of equipment permitted to be stored together will be determined by local regulations.

The design and specifications are subject to change without prior notice for product improvement.
Consult with the sales agency or manufacturer for details.

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