

Bosch Multi Zone Ductless Air Conditioner / Heat Pump

Climate 5000 Series



BOSCH

Installation Manual



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1 Key to Symbols and Safety Instructions

1.1 Key to Symbols

Warnings



Warnings in this document are identified by a warning triangle printed against a grey background. Keywords at the start of a warning indicate the type and seriousness of the ensuing risk if measures to prevent the risk are not taken.

The following keywords are defined and can be used in this document:

- ▶ **DANGER** indicates a hazardous situation which, if not avoided, will result in death or serious injury.
- ▶ **WARNING** indicates a hazardous situation which, if not avoided, could result in death or serious injury.
- ▶ **CAUTION** indicates a hazardous situation which, if not avoided, could result in minor to moderate injury.
- ▶ **NOTICE** is used to address practices not related to personal injury.

Important information



This symbol indicates important information where there is no risk to people or property.

1.2 Safety

Please read safety precautions before installation

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



WARNING:

- ▶ In certain functional environments, such as kitchens, server rooms, etc., the use of specially designed air-conditioning units is highly recommended.



WARNING: ELECTRICAL HAZARD

- ▶ Do not modify the length of the power supply cord or use an extension cord to power the unit.
- ▶ Do not share the electrical outlet with other appliances. Improper or insufficient power supply can cause fire or electrical shock.



WARNING: INSTALLATION REQUIREMENTS

- ▶ Installation must be performed by a licensed contractor, and per the instructions in the installation manual. Improper installation can cause water leakage, electrical shock, or fire.
- ▶ In North America, installation must be performed in accordance with the requirement of NEC (National Electric Code) and CEC (Canadian Electric Code) by licensed and qualified personnel only.
- ▶ Only contact a licensed contractor for repair or maintenance of this unit.
- ▶ Only use the included accessories, parts, and specified parts for installation. Using non-standard parts can cause water leakage, electrical shock, fire, and can cause the unit to fail.
- ▶ Install the unit in a solid location that can support the unit's weight. If the chosen location cannot support the unit's weight, or the installation is not done properly, the unit may drop and cause serious injury and/or damage.
- ▶ 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.

**WARNING:**

- ▶ This product can expose you to chemicals including Lead and Lead components, which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

NOTICE: PROPERTY DAMAGE

- ▶ Install condensate drainage piping according to the instructions in this manual. Improper condensate drainage may cause water damage to your home and property.

**WARNING: ELECTRICAL HAZARD**

- ▶ For all electrical work, follow all local and national wiring standards, regulations, and the Installation Manual. The power supply to the outdoor unit requires a service disconnect at the unit. Only use a dedicated circuit. Never share a power source connected to this system. Insufficient electrical capacity or defects in electrical work can cause electrical shock or fire.
- ▶ For all electrical work, use the specified cables. Connect cables tightly, and clamp them securely to prevent external forces from damaging the terminal. Improper electrical connections can overheat and cause fire, and may also cause shock.
- ▶ All wiring must be properly arranged to ensure that the control board cover can close properly. If the control board cover is not closed properly, it can lead to corrosion and cause the connection points on the terminal to heat up, catch fire, or cause electrical shock.
- ▶ If the power supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons such as a licensed electrician in order to avoid a hazard.
- ▶ The product must be properly grounded at the time of installation, or electrical shock may occur.

**CAUTION: CONTAINS REFRIGERANT**

- ▶ 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 outdoor unit itself.
- ▶ Installation, service, maintenance and repair of this unit must be performed by a certified technician.
- ▶ Product removal and recycling must be performed by a certified technician.
- ▶ If the system has a leak-detection system installed, it must be checked for leaks at least every 12 months.
- ▶ When the unit is checked for leaks, proper record-keeping of all checks is strongly recommended.

**CAUTION: BURN HAZARD**

- ▶ For units that have an auxiliary electric heater, do not install the unit within 1 meter (3 feet) of any combustible materials.
- ▶ Do not install the unit in a location that may be exposed to combustible gas leaks. If combustible gas accumulates around the unit, it may cause fire.
- ▶ Do not operate your air conditioner in a wet room such as a bathroom or laundry room. Too much exposure to water can cause electrical components to short circuit.

2 Components

The air conditioning / heat pump system installation requires the following components. Use all of the installation parts and components to install the air conditioner. Improper installation may result in water leakage, electrical shock and fire, or equipment failure.

Name			Quantity
Drain joint			1
Seal ring			1
Connecting pipe assembly	Liquid side	Φ6.35 (1/4 in)	Parts not included. Piping kits are available as an accessory.
		Φ9.52 (3/8 in)	
	Gas side	Φ9.52 (3/8 in)	
		Φ12.7 (1/2 in)	
		Φ 16 (5/8 in)	
Multi-zone installation manual			1
Transfer connector NOTE: Pipe sizes may vary between air handler and condensing section connections. To meet different pipe size requirements, it may be necessary to install an adapter (transfer connector) on the outdoor unit connection.			Not included, but may be required - 1 per indoor unit
Magnetic ring (Hitch on the connective cable between the indoor unit and outdoor unit after installation.)			Not included, but recommended to use 1 per cable.
Power cable for connection with external power supply			Not included (see section 9 for cable requirements)

Table 1

3 Installation Summary

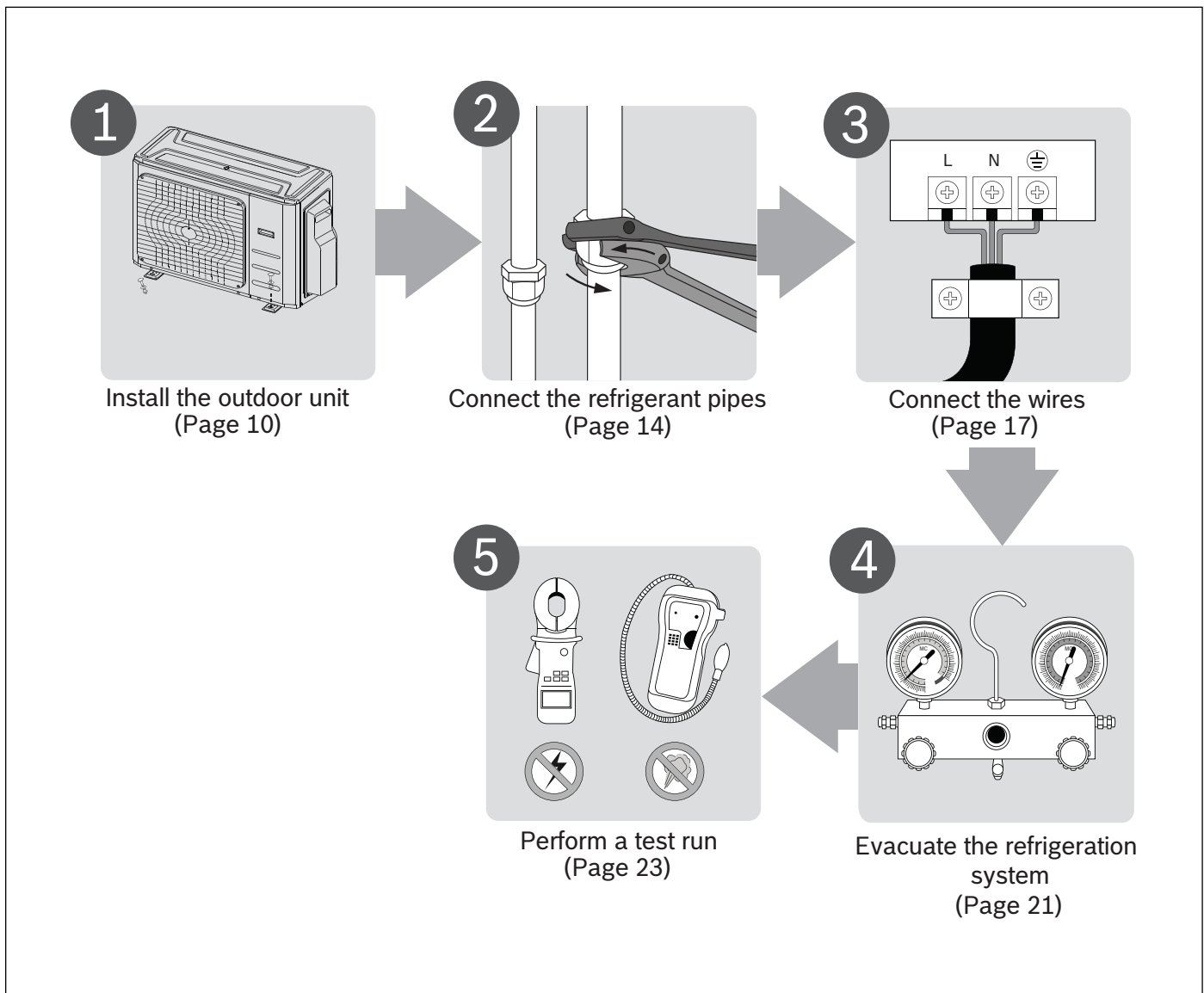


Figure 1

More than 4.7in

More than 4.7in

More than 4.7in

More than 5.9in

More than 4.7in

Air Filter

Air Filter

Air Filter

Air Filter

5

6

More than 23.6in

More than 11.8in A

More than 11.8in

More than 23.6in C

More than 78.7in B

Loop a connective cable

Two-Zone

Three-Zone

Four-Zone

Five-Zone

Number	Name
1	Installation plate
2	Mounting screw
3	Clip anchor
4	Signal/Power cable & Drain pipe
5	Remote control
6	Remote control holder

i Diagram shown using Wall Mounted Indoor unit only. Indoor unit can be changed with Four-Way Cassette, Concealed Ducted type indoors or mixed based on applications. Please refer to Installation Manual from Indoor Unit for Indoor unit installation procedures.

- ▶ Copper lines must be independently insulated.
- ▶ To prevent wall damage, use a stud finder to locate studs.
- ▶ A minimum pipe run of 10 ft is recommended to minimize vibration & excessive noise.
- ▶ Two of the A, B, and C air circulation pathways must be free from obstructions at all times.

5 Specifications

Number of units that can be used together	Connected units	2-5 units
Compressor stop/start frequency	Stop time	3 min or more
Power source voltage	Voltage fluctuation	within $\pm 10\%$ of rated voltage
	Voltage drop during start	within $\pm 15\%$ of rated voltage
	Interval unbalance	within $\pm 3\%$ of rated voltage

Table 3

	2 Zone System	3 Zone System	4 Zone System	5 Zone System
Model	BMS500-AAM018-1CSXRA BMS500-AAM018-1CSXHB	BMS500-AAM027-1CSXRA BMS500-AAM027-1CSXHB	BMS500-AAM036-1CSXRA BMS500-AAM036-1CSXHB	BMS500-AAM048-1CSXRA
Max. equivalent length for all indoor units	131ft / 40m	197ft / 60m	262ft / 80m	262ft / 80m
Max. length to farthest indoor unit	82ft / 25m	98ft / 30m	115ft / 35m	115ft / 35m
Max. height difference between indoor and outdoor unit	49ft / 15m	49ft / 15m	49ft / 15m	49ft / 15m
Max. height difference between indoor units	33ft / 10m	33ft / 10m	33ft / 10m	33ft / 10m
Refrigerant precharge (total pipe length)	49ft / 15m	74ft / 23m	98ft / 30m	123ft / 37m
Additional refrigerant charge	Liquid side: 1/4in - 0.16oz/ft	Liquid side: 1/4in - 0.16oz/ft	Liquid side: 1/4in - 0.16oz/ft Liquid side: 3/8in - 0.32oz/ft	Liquid side: 1/4in - 0.16oz/ft Liquid side: 3/8in - 0.32oz/ft

Table 4 Refrigerant pipe requirements

When installing multiple indoor units with a single outdoor unit, ensure that the length of the refrigerant pipe and the drop height between the indoor and outdoor units meet the requirements illustrated in the following diagram (indoor units may be located above or below the outdoor unit as long as they meet these height difference requirements):

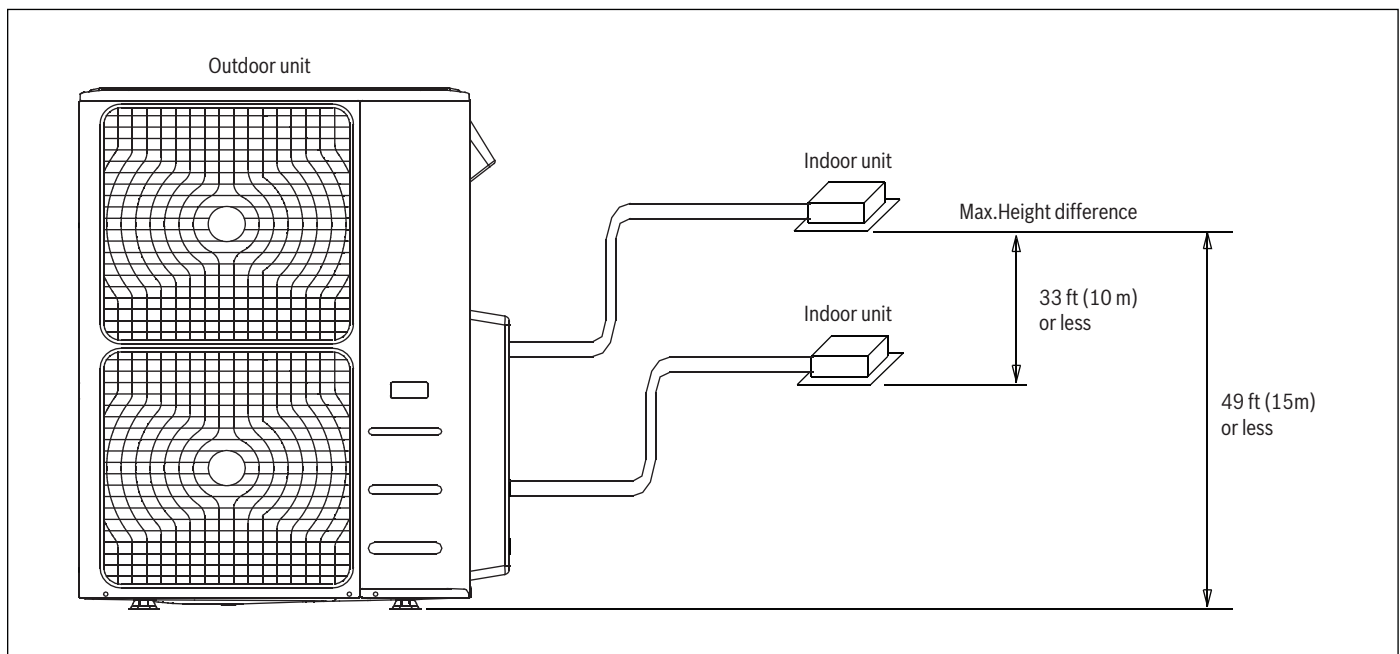


Figure 3

6 Outdoor unit installation

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.
- ▶ 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.4 & 5)

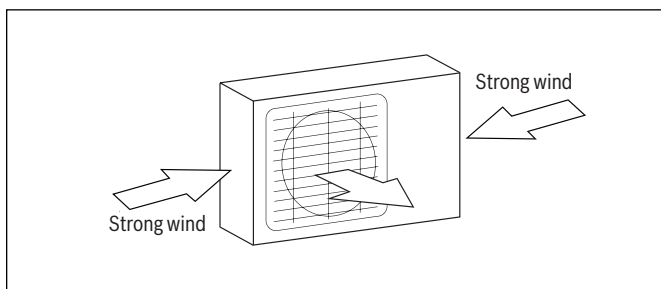


Figure 4

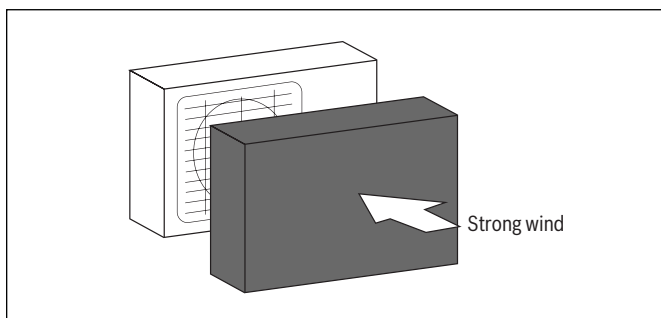


Figure 5

- ▶ Install the indoor and outdoor units, cables and wires at least 3 ft from televisions or radios to prevent static or image distortion. Depending on the radio waves, a 3 ft distance may not be enough to eliminate all interference.

Step 2: Install outdoor unit.

NOTICE:

- ▶ Be sure to remove any obstacles that may block air circulation.
- ▶ Make sure to meet minimum spatial requirement (Figure 8 & 9) to ensure there is enough room for installation and maintenance.

Fix the outdoor unit with anchor bolts (M10).

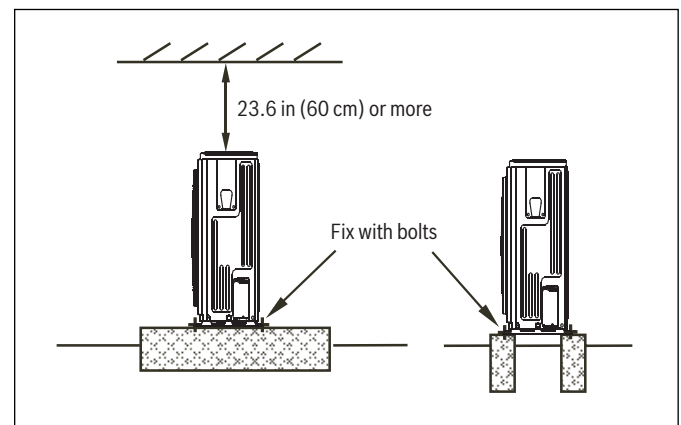


Figure 6

Split type outdoor unit mounting dimensions

Outdoor Model	Outdoor Unit Dimensions mm (in.) W x H x D	Mounting Dimensions mm (in.)	
		Distance A	Distance B
BMS500-AAM018-1CSXRA	845x702x363 (33.27x27.6x14.3)	540 (21.26)	350 (13.8)
BMS500-AAM027-1CSXRA, BMS500-AAM027-1CSXHB, BMS500-AAM036-1CSXRA, BMS500-AAM036-1CSXHB	946x810x410 (37.24x31.9x16.14)	673 (26.5)	403 (15.87)
BMS500-AAM036-1CSXHB, BMS500-AAM048-1CSXRA	952x1333x415 (37.5x52.5x16.34)	634 (24.96)	404 (15.9)

Table 5

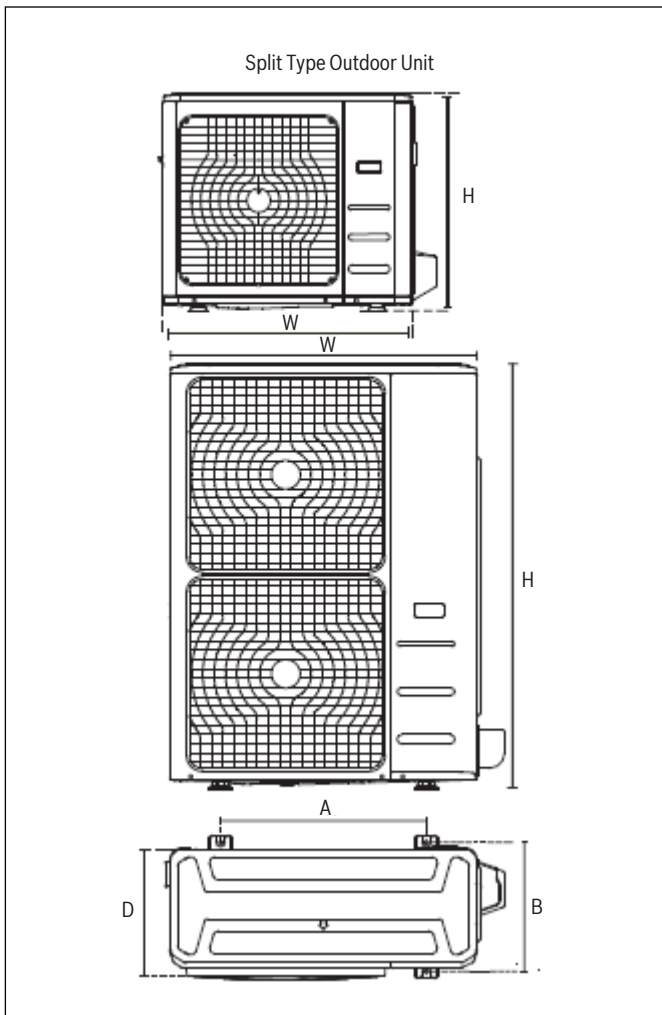


Figure 7

Series installation

The relations between H, A and L are as follows:

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

Table 6

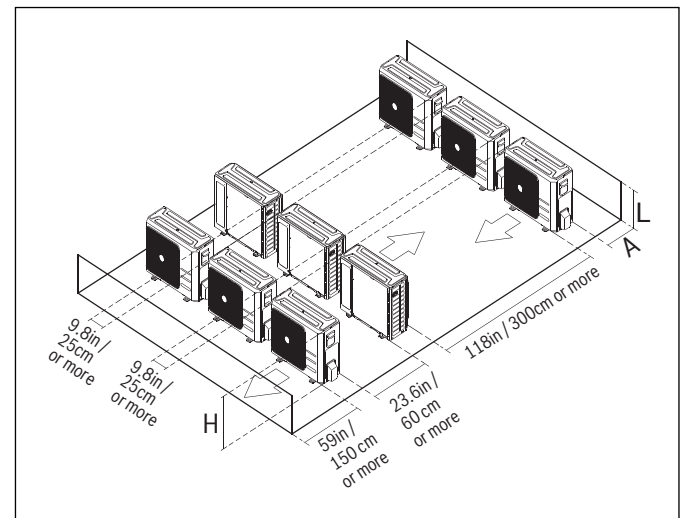


Figure 8



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. 9)

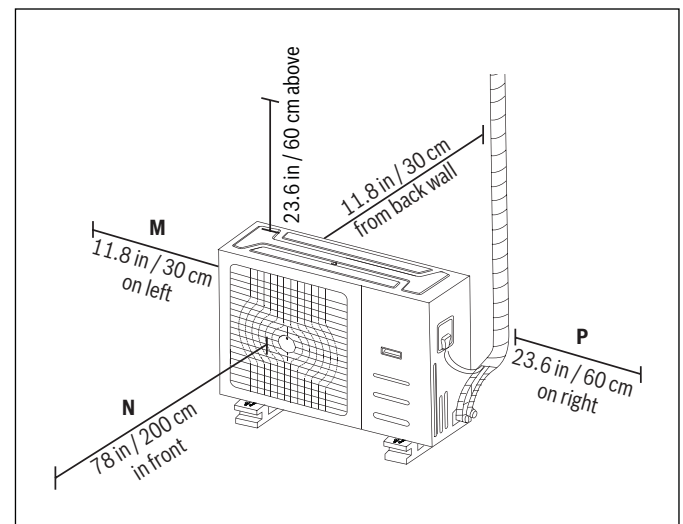


Figure 9

Drain joint installation

Heat pump units require a drain joint. Before bolting the outdoor unit in place, you must install the drain joint at the bottom of the unit. Note that there are two different types of drain joints depending on the type of outdoor unit.

If the drain joint comes with a rubber seal (see Figure 10, pos. 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 doesn't come with a rubber seal (see Figure 10, pos. 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 during heating mode.

NOTICE

- In cold climates, make sure that the drain hose is as vertical as possible to ensure swift water drainage. If water drains too slowly, it can freeze in the hose and flood the unit.



CAUTION: SLIPPING HAZARD

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

Drilling a hole in the wall

You must drill a hole in the wall for the refrigerant piping, and 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 6.5 cm (2.5 in) drill bit, drill a hole in the wall.



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 helps seal it when you finish the installation process.

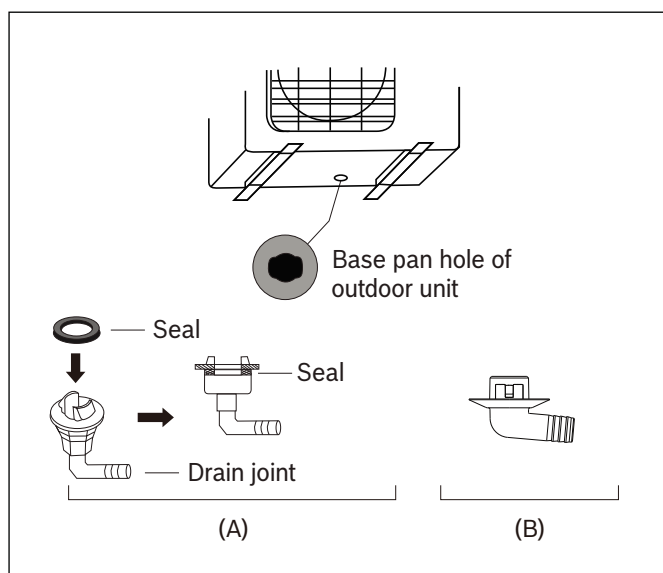


Figure 10

Connecting a 24k Btuh Indoor Unit

A 24K Btuh indoor unit can only be connected to an A system connection point. If there are two 24K Btuh indoor units, they can be connected with the A and B connection points. (See Fig. 11)

Connective pipe sizes

Indoor unit capacity (Btu/h)	Liquid (in / mm)	Gas (in / mm)
9k	1/4" / $\Phi 6.35$	3/8" / $\Phi 9.52$
12k / 18k	1/4" / $\Phi 6.35$	1/2" / $\Phi 12.7$
24k	3/8" / $\Phi 9.52$	5/8" / $\Phi 15.9$

Table 7

Multi-zone condensing section refrigerant line connection sizes

Type	Model Name	Model #	Liquid Side (in / mm)	Gas Side (in / mm)
Regular System	BMS500-AAM018-1CSXRA	8733942703	2 X 1/4" / 2 X $\Phi 6.35$	2 X 3/8" / 2 X $\Phi 9.52$
	BMS500-AAM027-1CSXRA	8733942704	3 X 1/4" / 3 X $\Phi 6.35$	3 X 3/8" / 3 X $\Phi 9.52$
	BMS500-AAM036-1CSXRA	8733942705	4 X 1/4" / 4 X $\Phi 6.35$	4 X 3/8" / 4 X $\Phi 9.52$
	BMS500-AAM048-1CSXRA	8733942706	5 X 1/4" / 5 X $\Phi 6.35$	3 x 3/8" + 2 x 1/2" / 3 x $\Phi 9.52$ + 2 x $\Phi 12.7$
Max Performance	BMS500-AAM018-1CSXHB	8733953119	2 X 1/4" / 2 X $\Phi 6.35$	2 X 3/8" / 2 X $\Phi 9.52$
	BMS500-AAM027-1CSXHB	8733953120	3 X 1/4" / 3 X $\Phi 6.35$	3 X 3/8" / 3 X $\Phi 9.52$
	BMS500-AAM036-1CSXHB	8733953121	4 X 1/4" / 4 X $\Phi 6.35$	3 x 3/8" + 1 x 1/2" / 3 x $\Phi 9.52$ + 1 x $\Phi 12.7$

Table 8

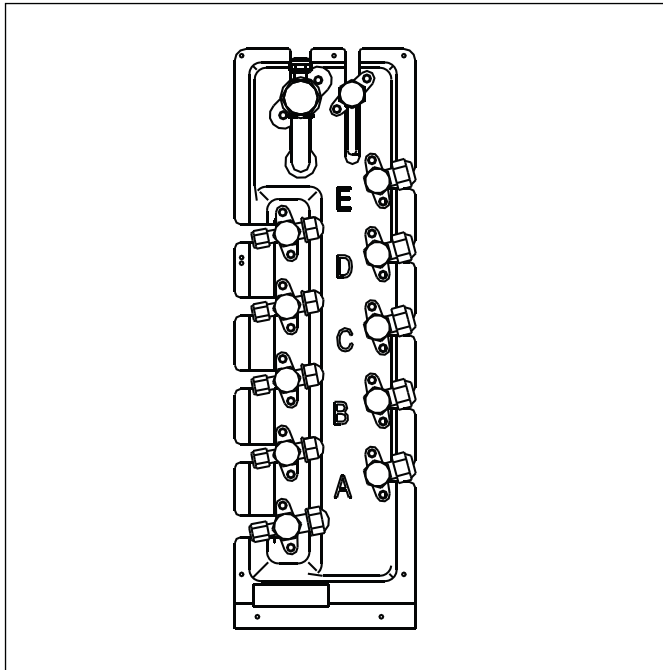


Figure 11

7 Refrigerant Piping Connection



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.

7.1 Connection Instructions – Refrigerant Piping

NOTICE:

- ▶ 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.

Step 1: 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.

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.
3. Make sure that the pipe is cut at a perfect 90° angle. Refer to Fig.12 for cut examples.

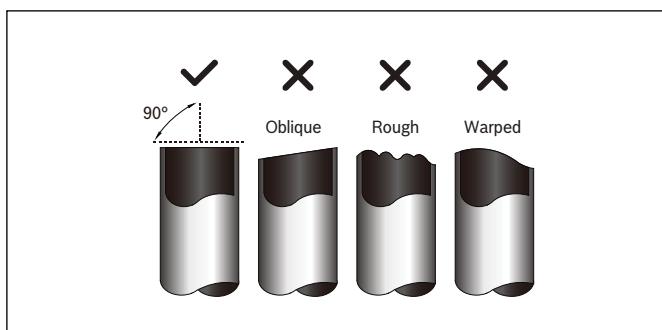


Figure 12

NOTICE:

- ▶ Be extra careful not to damage, kink, or deform the pipe while cutting. This will drastically reduce the heating efficiency of the unit.

Step 2: Remove burrs

Burrs can affect the air-tight seal of 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.

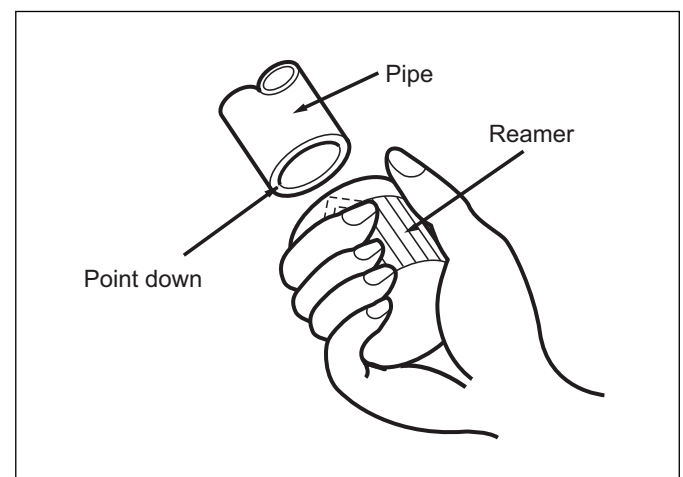


Figure 13

Step 3: Flare pipe ends

Proper flaring is essential to achieve an airtight seal.

1. After removing burrs from cut pipe, seal the ends with a piece of 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 proper direction, because you can't put them on or change their direction after flaring. See Figure 14.

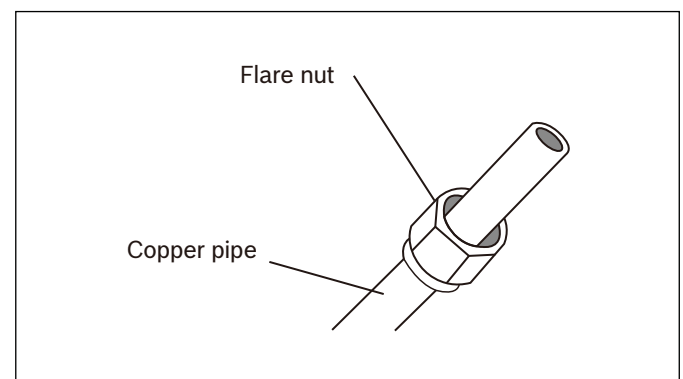


Figure 14

4. Remove tape from ends of pipe when ready to perform flaring work.
5. Clamp flaring block on the end of the pipe. The end of the pipe must extend beyond the edge of the flare form in accordance with the dimensions shown in the Table 9.

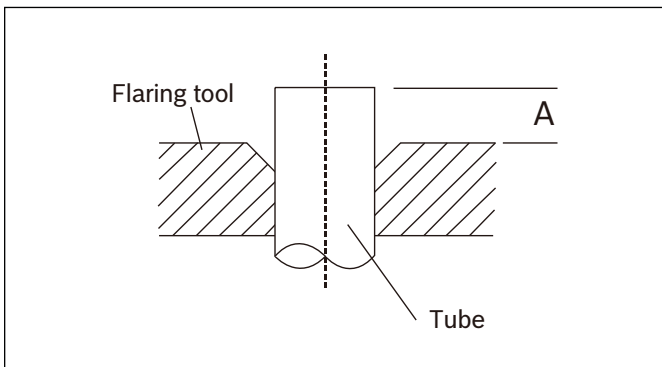


Figure 15

6. Place flaring tool onto the flaring block.
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 9.

Piping extension beyond flare form

Outer diameter of tube in. (mm)	Tightening Torque lb ft (N•m)	Max. Tightening Torque lb ft (N•m)	Fig. 15, A in. (mm)	
			Min.	Max.
1/4" (6.4)	11.0 (15.0)	11.8 (16.0)	0.0275 (0.7)	0.05 (1.3)
3/8" (9.5)	18.4 (25.0)	19.2 (26.0)	0.04 (1.0)	0.063 (1.6)
1/2" (12.7)	25.8 (35.0)	26.6 (36.0)	0.04 (1.0)	0.07 (1.8)
5/8" (15.9)	33.2 (45.0)	34.7 (47.0)	0.078 (2.0)	0.086 (2.2)

Table 9

8. Remove the flaring tool and flaring block, 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.

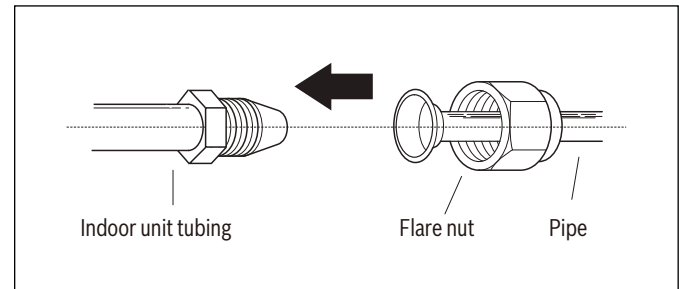


Figure 16

3. Tighten the flare nut as tightly as possible by hand.
4. Using a wrench, 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 9.

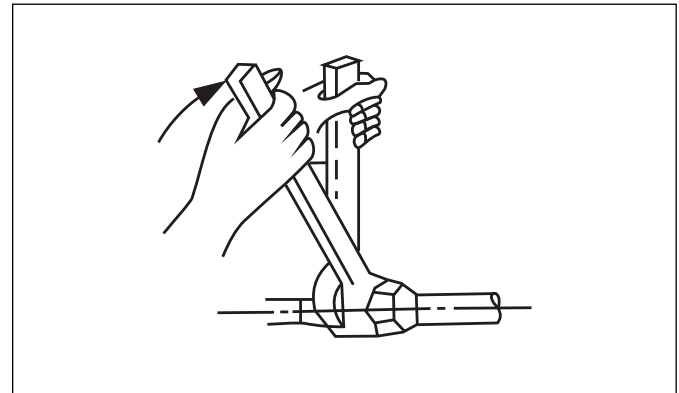


Figure 17



CAUTION:

- Ensure to wrap insulation around the piping. Direct contact with the bare piping may result in burns or frostbite.

NOTICE:

- Make sure the pipe is properly connected. Over tightening may damage the bell mouth and under tightening may lead to leakage.

**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.

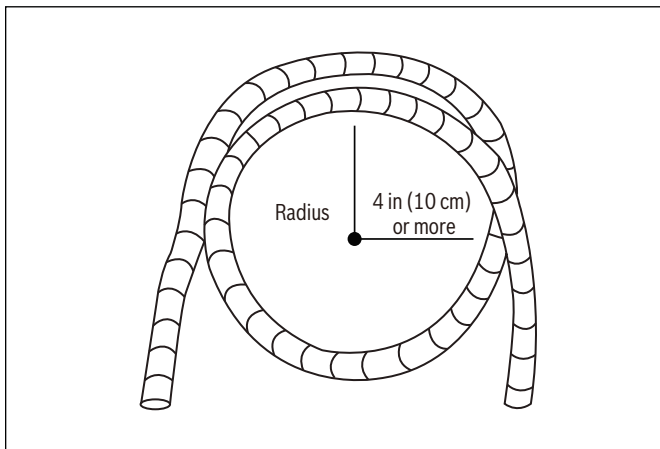


Figure 18

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



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: CONTAINS REFRIGERANT**

- 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).

8 Wiring



WARNING: ELECTRICAL HAZARD

- ▶ Be sure 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 a qualified technician. 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.
- ▶ 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 supply connection is made through a switch that disconnects all poles, with contact gap of at least 0.12 in (3 mm).
- ▶ DO NOT modify the length of the power cord or use an extension cord.



WARNING: ELECTRICAL HAZARD

- ▶ Connect the outdoor wires before connecting the indoor wires.
- ▶ Make sure you ground the unit. The grounding wire should be away from gas pipes, water pipes, lightning rods, telephone or other grounding wires. Improper grounding may cause electrical shock.
- ▶ DO NOT connect the unit with the power source until all wiring and piping is completed.
- ▶ Make sure 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.

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 right cable size before preparing it for connection. Be sure to use H07RN-F/SOOW type cables.

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

Table 10

- b. Using wire strippers, strip the rubber jacket from both ends of signal/power cable to reveal about 5.9 in (15 cm) 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.



WARNING: ELECTRICAL HAZARD

- ▶ While connecting the wires, please strictly follow the wiring diagram.

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. 19)

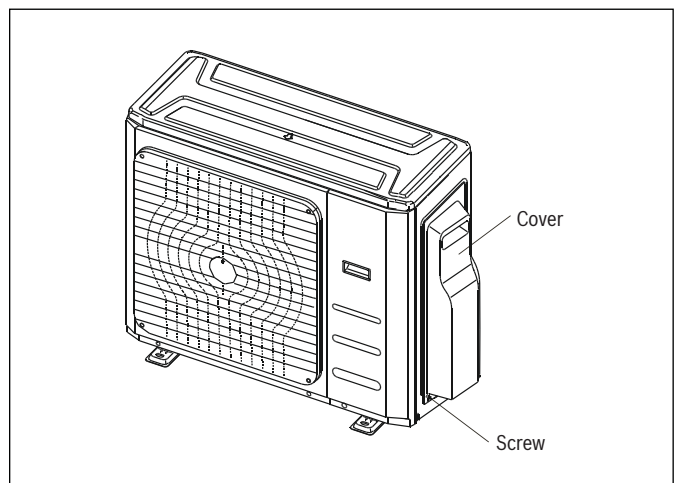


Figure 19

3. 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.
4. Clamp down the cable with designated cable clamp.

8.2 Wiring Diagrams



WARNING: ELECTRICAL HAZARD

- ▶ Connect the connective cables to the terminals, as identified, with their matching numbers on the terminal block of the indoor and outdoor units. For example, in the US models shown in the following diagram, Terminal L1(A) of the outdoor unit must connect with terminal L1 on the indoor unit.

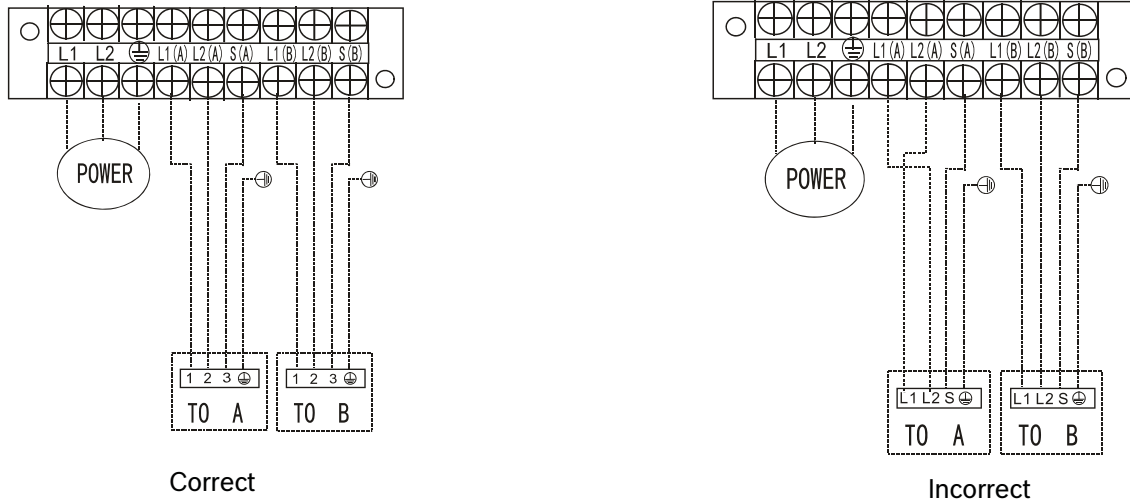


Figure 20



Refer to the following figures for unit wiring. Run the main power cord through the lower line-outlet of the cord clamp.

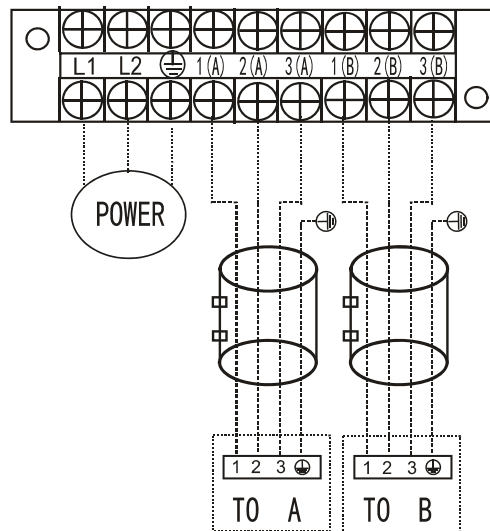
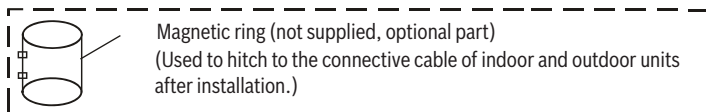
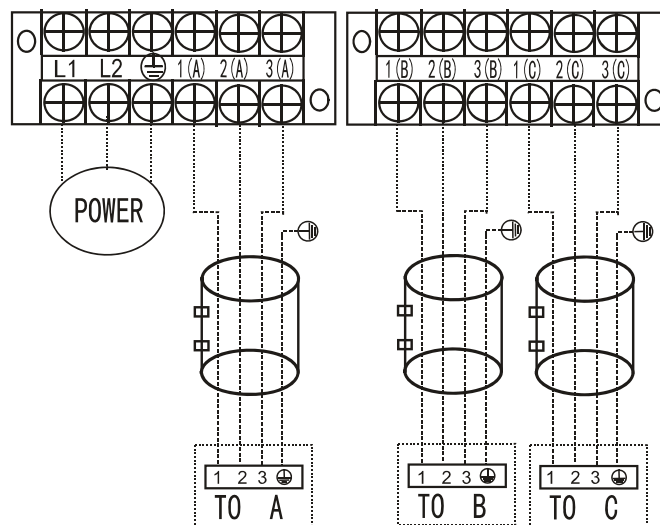
Two-Zone system**Three-Zone system**

Figure 21

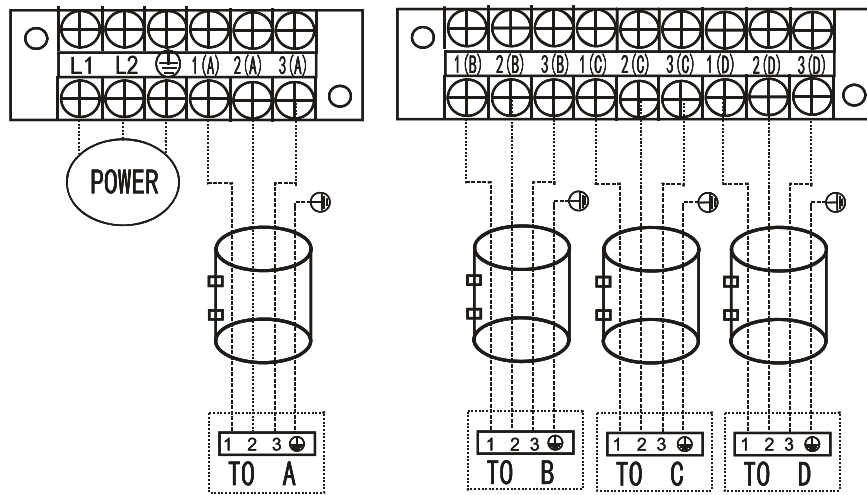
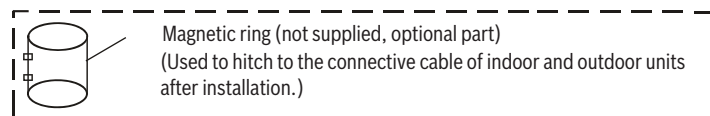
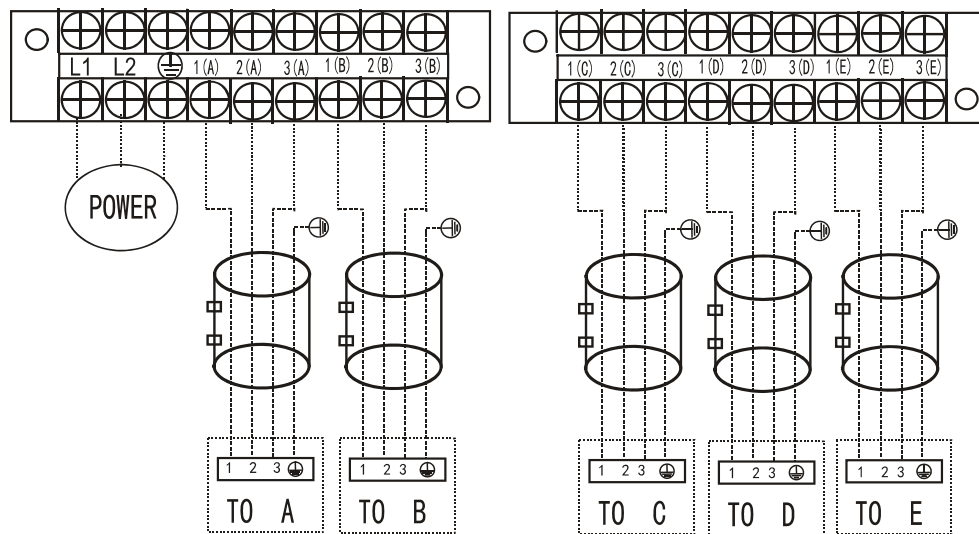
Four-Zone system**Five-Zone system**

Figure 22

9 Air Evacuation

9.1 Preparations and Precautions

Air and foreign matter in the refrigerant circuit can cause abnormal rises in pressure, which can damage the air conditioner, reduce its efficiency, and cause injury. Use a vacuum pump and manifold gauge to evacuate the refrigerant circuit, removing any non-condensable gas and moisture from the system.

Evacuation should be performed upon initial installation and when unit is relocated.

Before performing evacuation

- ▶ Check to make sure that both high-pressure and low-pressure pipes between the indoor and outdoor units are connected properly in accordance with the Refrigerant Piping Connection section of this manual.
- ▶ Check to make sure all wiring is connected properly.

9.2 Evacuation Instructions

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

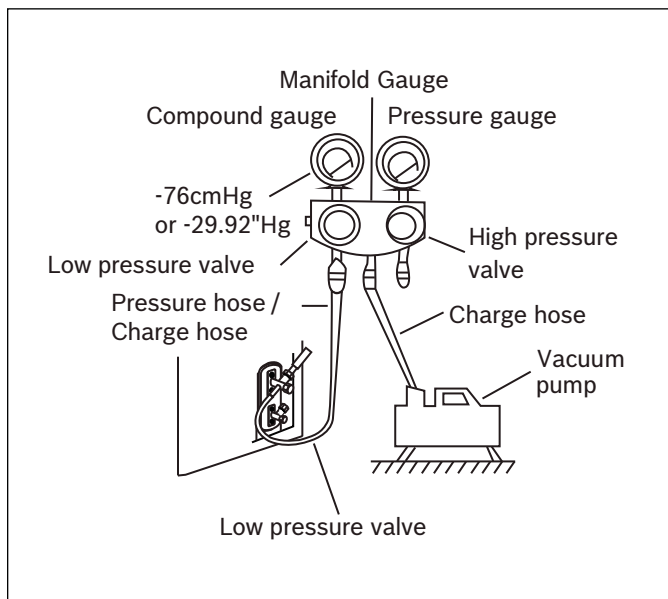


Figure 23

1. Connect the charge hose of the manifold gauge to 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 until the Compound Meter reads -76cmHg / -29.92"Hg (-101 kPa). It is recommended to use a micron gauge; run the vacuum until the micron gauge reads 350 to 500 microns or less.
6. Close the Low Pressure side of the manifold gauge, and turn off the vacuum pump.

7. Wait for approximately 10 to 15 minutes, then check that there has been no change in system pressure. It is recommended to use a micron gauge; check to make sure the system is still below 500 microns.
8. If there is a change in system pressure, refer to Gas Leak Check section for information on how to check for leaks. If there is no change in system pressure, unscrew the cap from the packed valve (high pressure valve).
9. Insert a 5mm allen 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.
10. Watch the Pressure Gauge for one minute to make sure that there is no change in pressure. The Pressure Gauge should read slightly higher than atmospheric pressure.

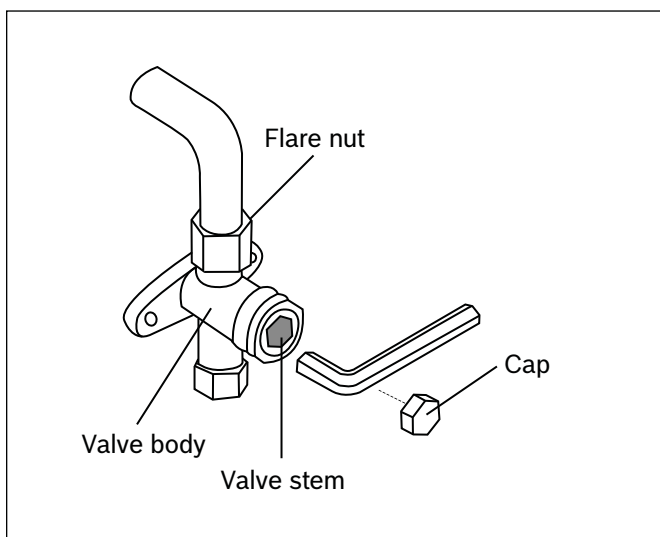


Figure 24

11. Remove the charge hose from the service port.
12. Using hexagonal wrench, fully open both the high pressure and low pressure valves.
13. Tighten valve caps on all three valves (service port, high pressure, low pressure) by hand. You may tighten it further using a torque wrench if needed.

NOTICE: Open valve stems gently

- ▶ When opening valve stems, turn the hexagonal allen wrench until it hits against the stopper. Do not try to force the valve to open further.

9.3 Adding Refrigerant


CAUTION: CONTAINS REFRIGERANT

- ▶ 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 its functionality.
- ▶ 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.

Depending on the length of connective piping or the pressure of the evacuated system, you may need to add refrigerant. Refer to table below for refrigerant amounts to be added:

Additional refrigerant per pipe length

Connective Pipe	Air Purging	Additional Refrigerant	
< Standard pipe length	Vacuum Pump	N/A	
> Standard pipe length	Vacuum Pump	Liquid Side: Ø 6.35 (ø 0.25") (Pipe length – standard length) x 15g/m (Pipe length – standard length) x 0.16oz/ft	Liquid Side: Ø 9.52 (ø 0.375") (Pipe length – standard length) x 30g/m (Pipe length – standard length) x 0.32oz/ft

Table 11

10 Electrical and Gas Leak Checks

10.1 Electrical Safety Checks

After installation, confirm that all electrical wiring is installed in accordance with local and national codes / regulations, and according to the Installation Manual. All testing must be performed by a licensed electrician.

Before test run

- ▶ The insulated resistance must be more than 2MΩ.
- ▶ After finishing grounding work, measure the grounding resistance by visual detection and using the grounding resistance tester. Make sure the grounding resistance is less than 4Ω.



Refer to local code requirements.

During test run

- ▶ Check for electrical leakage
- ▶ During the Test Run, use an electroprobe and multimeter to perform a comprehensive electrical leakage test. If electrical leakage is detected, turn off the unit immediately and call a licensed electrician to find and resolve the cause of the leakage.



WARNING: Risk of electric shock

- ▶ All wiring must comply with local and national electrical codes, and must be installed by a licensed electrician.

10.2 Gas Leak Checks

There are two different methods to check for gas leaks.

Soap and Water Method

Using a soft brush, apply soapy water or liquid detergent to all pipe connection points on the indoor unit and outdoor unit. The presence of bubbles indicates a leak.

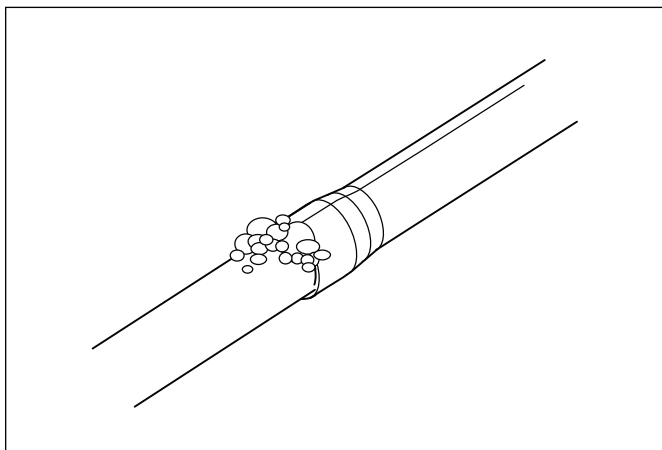


Figure 25

Leak Detector Method

If using leak detector, refer to the device's operation manual for proper usage instructions.

After confirming that all pipe connection points DO NOT leak, replace the valve cover on the outside unit.

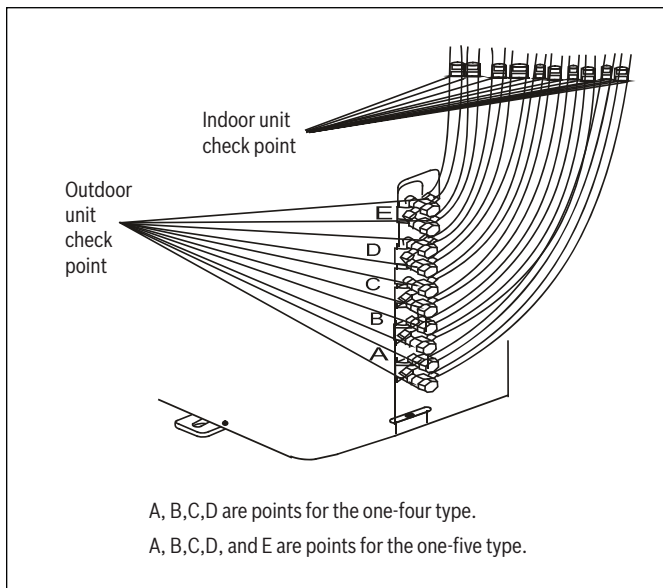


Figure 26

11 Test Run

11.1 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:

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



WARNING: PROPERTY DAMAGE / PERSONAL INJURY

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



WARNING: CONTAINS REFRIGERANT

- ▶ During operation, the pressure of the refrigerant circuit will increase. This may reveal leaks that were not present during your initial leak check. Take time during the Test Run to double-check that all refrigerant pipe connection points do not have leaks. Refer to Gas Leak Check section for instructions.



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.

11.2 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 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.
8. 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.

12 Automatic Wiring/Piping Correction Function

Climate 5000 models now feature automatic correction of wiring/piping errors.

Press the "check switch" on the outdoor unit PCB board for 5 seconds until the LED displays "CE", indicating that this function is working. Approximately 5-10 minutes after the switch is pressed, the "CE" disappears, meaning that the wiring/piping error is corrected and all wiring/piping is properly connected.

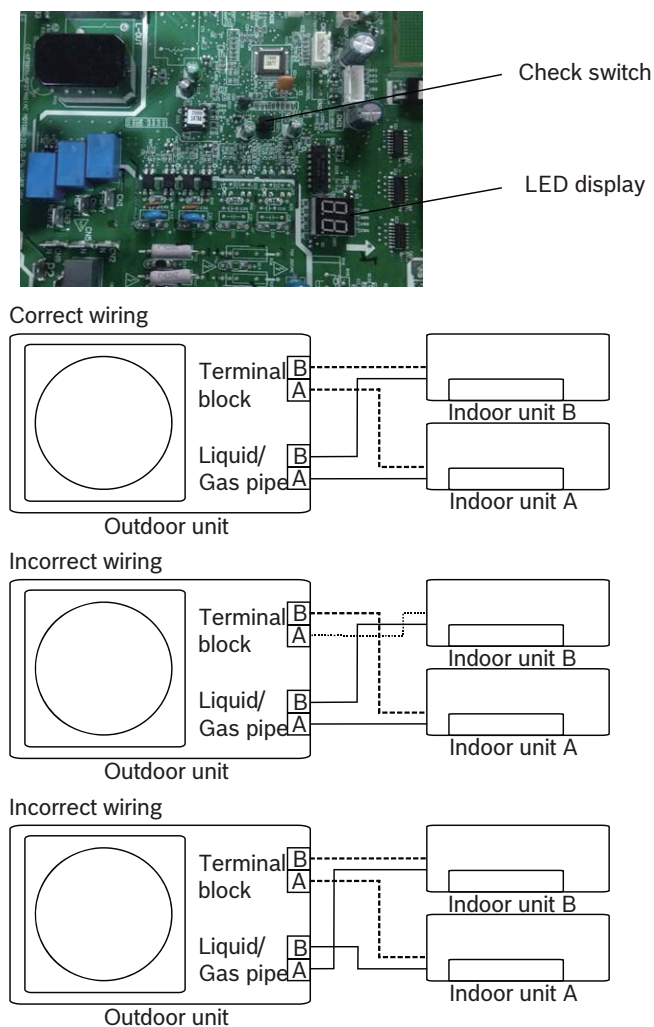


Figure 27 Figure 26

12.1 How To Activate This Function

1. Check that outside temperature is above 41°F (5°C).
(This function does not work when outside temperature is not above 41°F (5°C)).
2. Check that the stop valves of the liquid pipe and gas pipe are open.
3. Turn on the breaker and wait at least 2 minutes.
4. Press the check switch on the outdoor PCB board until the LED displays "CE".

13 Features and Operation

13.1 Protection of the Air Conditioner

Compressor protection

The compressor cannot restart for 3 minutes after it stops.

Anti-cold air

The unit is designed not to blow cold air on HEAT mode, when the indoor heat exchanger is in one of the following three situations and the set temperature has not been reached.

- A) When heating has just started
- B) During defrost cycle
- C) Low temperature heating

The indoor or outdoor fan will stop running when defrosting.

Defrost Cycle

Frost may be generated on the outdoor unit during a heat cycle when outdoor temperature is low and humidity is high resulting in lower heating efficiency in the air conditioner.

Under these conditions, the air conditioner will stop heating operations and start defrosting automatically.

The time to defrost may vary from 4 to 10 minutes, depending the outdoor temperature and the amount of frost buildup on the outdoor unit.

Auto-Restart

In case of power failure, the system will immediately stop. When power returns, the Operation light on the indoor unit will flash. To restart the unit, press the ON/OFF button on the remote control. The unit will restart with the same settings as before it lost power.

13.2 Operation

White mist emerging from the indoor unit

A white mist may be generated due to a large temperature difference between air inlet and air outlet on COOL mode in places with high relative humidity.

A white mist may be generated due to moisture created in the defrosting process when the air conditioner restarts in HEAT mode operation after defrosting.

Noise coming from the air conditioner

You may hear a low hissing sound when the compressor is running or has just stopped running. This sound is the sound of the refrigerant flowing or coming to a stop.

You may also hear a low "squeaking" sound when the compressor is running or has just stopped running. This is caused by heat expansion and cold contraction of the plastic parts in the unit when the temperature is changing.

A noise may be heard due to the louver restoring itself to its original position when power is first turned on.

Dust blowing out from the indoor unit.

This happens when the air conditioner has not been used for a long time or during its first use.

The air conditioner turns to FAN ONLY mode from COOL or HEAT mode.

When the indoor temperature reaches the set temperature setting, the compressor will stop automatically, and the air conditioner turns to FAN only mode. The compressor will start again when the indoor temperature rises on COOL mode or falls on HEAT mode to the set point. Droplets of water may form on the surface of the indoor unit when cooling occurs in relatively high humidity (generally higher than 80% relative humidity). Adjust the horizontal louver to the maximum air outlet position and select HIGH fan speed.

Operation mode selection

While two or more indoor units are simultaneously operating, make sure the modes do not conflict with each other. The heat mode claims precedence over all other modes. If the unit initially started to operate in HEAT mode, the other units can operate in HEAT mode only. For example: If the unit initially started operates under COOL (or FAN) mode, the other units can operate under any mode except HEAT. If one of the unit selects HEAT mode, the other operating units will stop operation and display "--" (for units with display window only) or the auto and operation indication light will flash rapidly, the defrost indication light will turn off, and the timer indication light will remain on (for units without a display window). Alternatively, the defrost and alarm indication light (if applicable) will light up, or the operation indication light will flash rapidly, and the timer indication light will turn off (for the floor and standing type).

Optimal operation

To achieve optimal performance, please note the following:

- ▶ Adjust the direction of the air flow so that it is not blowing directly on people.
- ▶ Adjust the temperature to achieve the highest possible level of comfort. Do not adjust the unit to excessive temperature levels.
- ▶ Close doors and windows in COOL mode or HEAT mode.
- ▶ Use the TIMER ON button on the remote controller to select a time you want to start your air conditioner.
- ▶ Do not place any object near the air inlet or air outlet, as the efficiency of the air conditioner may be reduced and the air conditioner may stop running.
- ▶ Clean the air filter periodically, otherwise cooling or heating performance may be reduced.
- ▶ Do not operate unit with horizontal louver in closed position.

14 Troubleshooting



WARNING: PROPERTY DAMAGE / PERSONAL INJURY

If ANY of the following conditions occurs, turn off unit immediately!

- ▶ The power cord is damaged or abnormally warm
- ▶ You smell a burning odor
- ▶ The unit emits loud or abnormal sounds
- ▶ A power fuse blows or the circuit breaker frequently trips
- ▶ Water or other objects fall into or out of the unit

DO NOT ATTEMPT TO FIX THESE YOURSELF! CONTACT AUTHORIZED SERVICE PROVIDER IMMEDIATELY!



If a problem persists, contact a local dealer or your nearest customer service center. Provide them with a detailed description of the unit malfunction as well as your model number.

14.1 Common Issues



CAUTION: SYSTEM FAILURE

- ▶ Most of following problems are not a malfunction, but please contact an Authorized Service Provider if the problem is uncertain.

Issue	Possible Causes
Unit does not turn on when pressing ON/OFF button	The Unit has a 3-minute protection feature that prevents the unit from overloading. The unit cannot be restarted within three minutes of being turned off.
The unit changes from COOL/HEAT mode to FAN mode	The unit may change its setting to prevent frost from forming on the unit. Once the temperature increases, the unit will start operating in the previously selected mode again.
	The set temperature has been reached, at which point the unit turns off the compressor. The unit will continue operating when the temperature fluctuates again.
The indoor unit emits white mist	In humid regions, a large temperature difference between the room's air and the conditioned air can cause white mist.
Both the indoor and outdoor units emit white mist	When the unit restarts in HEAT mode after defrosting, white mist may be emitted due to moisture generated from the defrosting process.
The indoor unit makes noises	A rushing air sound may occur when the louver resets its position.
	A squeaking sound may occur after running the unit in HEAT mode due to expansion & contraction of the unit's plastic parts.
Both the indoor unit and outdoor unit make noises	Low hissing sound during operation: This is normal and is caused by refrigerant gas flowing through both indoor and outdoor units.
	Low hissing sound when the system starts, has just stopped running, or is defrosting: This noise is normal and is caused by the refrigerant gas stopping or changing direction.
	Squeaking sound: Normal expansion and contraction of plastic and metal parts caused by temperature changes during operation can cause squeaking noises.
The outdoor unit makes noises	The unit will make different sounds based on its current operating mode.
Dust is emitted from either the indoor or outdoor unit	The unit may accumulate dust during extended periods of non-use, which will be emitted when the unit is turned on. This can be mitigated by covering the unit during long periods of inactivity.
The unit emits a bad odor	The unit may absorb odors from the environment (such as furniture, cooking, cigarettes, etc.) which will be emitted during operations.
	The unit's filters have become moldy and should be cleaned.
The fan of the outdoor unit does not operate	During operation, the fan speed is controlled to optimize product operation.
Operation is erratic, unpredictable, or unit is unresponsive	Interference from cell phone towers and remote boosters may cause the unit to malfunction. In this case, try the following: <ul style="list-style-type: none"> ▶ Disconnect the power, then reconnect. ▶ Press ON/OFF button on remote control to restart operation.

Table 12

14.2 Error Codes



CAUTION: SYSTEM FAILURE

- If below error codes appear, please turn off the system and contact an Authorized Service Provider.

ODU Display	Possible Causes	Indoor Display
E0	Outdoor unit EEPROM parameter error	F4
E2	Communication malfunction between indoor and outdoor units	E1
E3	Communication malfunction between IPM board and outdoor main control board	—
E4	Outdoor temperature sensor (coil sensor T3, ambient sensor T4, Compressor discharge sensor T5, indoor coil outlet pipe sensor T2B) malfunction	F2/F1/F3/F6
E5	Over-voltage or under-voltage protection	P1
E6	PFC module protection	—
E8	Outdoor fan speed malfunction	F5
F1	No. A Indoor unit coil outlet temp. sensor malfunction	—
F2	No. B Indoor unit coil outlet temp. sensor malfunction	—
F3	No. C Indoor unit coil outlet temp. sensor malfunction	—
F4	No. D Indoor unit coil outlet temp. sensor malfunction	—
F5	No. E Indoor unit coil outlet temp. sensor malfunction	—
F6	No. F Indoor unit coil outlet temp. sensor malfunction	—
P0	High temperature protection of compressor top	P2
P1	High pressure protection	P6
P2	Low pressure protection	P6
P3	Current overload protection	F0
P4	Temperature protection of compressor discharge	—
P5	Condenser high temperature protection	—
P6	Inverter module (IPM) malfunction	P0
LP	Low ambient temperature protection	—

Table 13

15 Disposal Guidelines

Components

Many parts in the Air Conditioner can be fully recycled in the end of the product life. Contact your city authorities for information about the disposal of recyclable products.

Refrigerant

At the end of the service life of this appliance and prior to its environmental disposal, a person qualified to work with refrigerant circuits must recover the refrigerant from within the sealed system.



WARNING: CONTAINS REFRIGERANT

- ▶ Improper disposal of this appliance endangers your health and is bad for the environment. Hazardous substances may leak into the ground water and enter the food chain.
- ▶ Disposing of this product correctly will help ensure that the waste undergoes the necessary treatment, recovery and recycling.

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