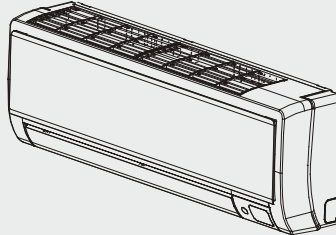
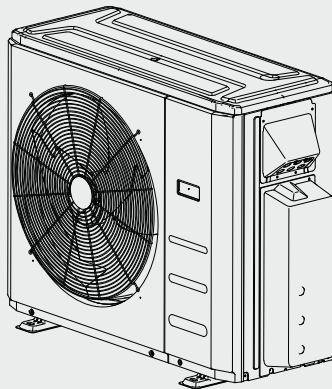
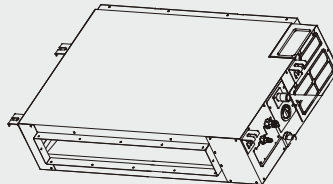
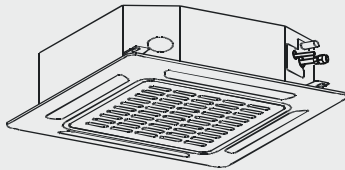




BOSCH

Installation Instructions

Multi Zone Ductless Air Conditioner / Heat Pump Climate 5000 Series



⚠ WARNING:

- ▶ 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.

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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: 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.

**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.

**WARNING: 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.

NOTICE: IMPROPER OPERATION

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

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.

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
Refrigerant pipe adaptor			Included. Varies by model. Refer to Table 2 below
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.			
Power cable for connection with external power supply			Not included (see section 9 for cable requirements)

Table 1 Accessories

Product	Model number	Model name	Adapter (inch)	Adapter quantity
Regular	8-733-956-199	BMS500-AAM018-1CSXRC	3/8"-->1/2"	2
	8-733-956-200	BMS500-AAM027-1CSXRC	3/8"-->1/2"	3
	8-733-956-201	BMS500-AAM036-1CSXRC	3/8"-->1/2"	3
			1/2"-->3/8"	1
			1/4"-->3/8"	1
			1/2"-->5/8"	1
	8-733-956-226	BMS500-AAM048-1CSXRC	1/2"-->3/8"	2
			1/4"-->3/8"	2
			1/2"-->5/8"	2
			3/8"-->1/2"	3
Max Performance	8-733-956-202	BMS500-AAM018-1CSXHC	3/8"-->1/2"	2
	8-733-956-203	BMS500-AAM027-1CSXHC	3/8"-->1/2"	2
			1/2"-->3/8"	1
			1/4"-->3/8"	1
			1/2"-->5/8"	1
	8-733-956-227	BMS500-AAM036-1CSXHC	3/8"-->1/2"	2
			1/2"-->3/8"	2
			1/4"-->3/8"	2
			1/2"-->5/8"	2
	8-733-956-204	BMS500-AAM048-1CSXHC	1/2"-->3/8"	2
			1/4"-->3/8"	2
			1/2"-->5/8"	2
			3/8"-->1/2"	3

Table 2 Flare Adapters

3 Installation Summary

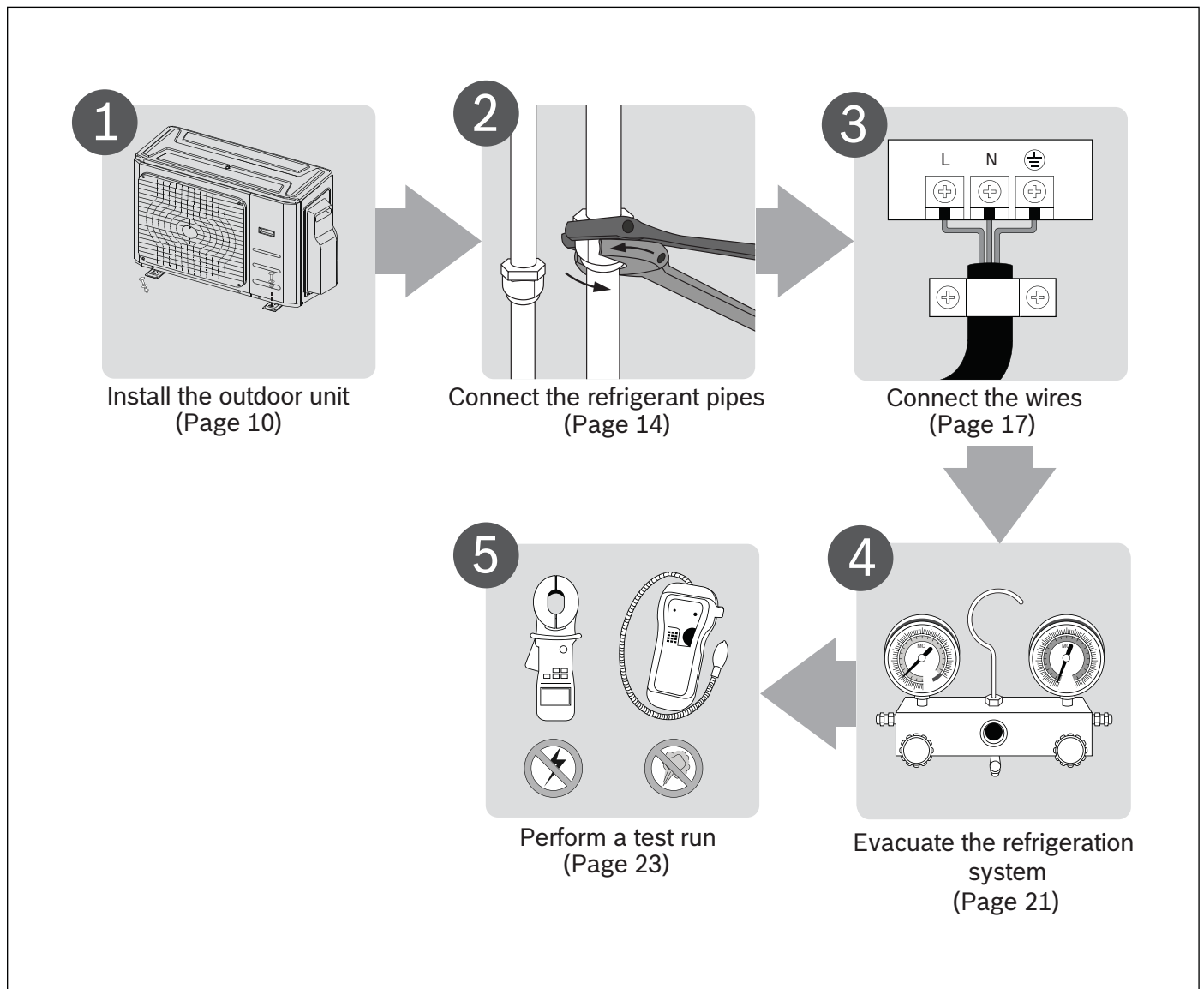


Figure 1

4 Installation Diagram

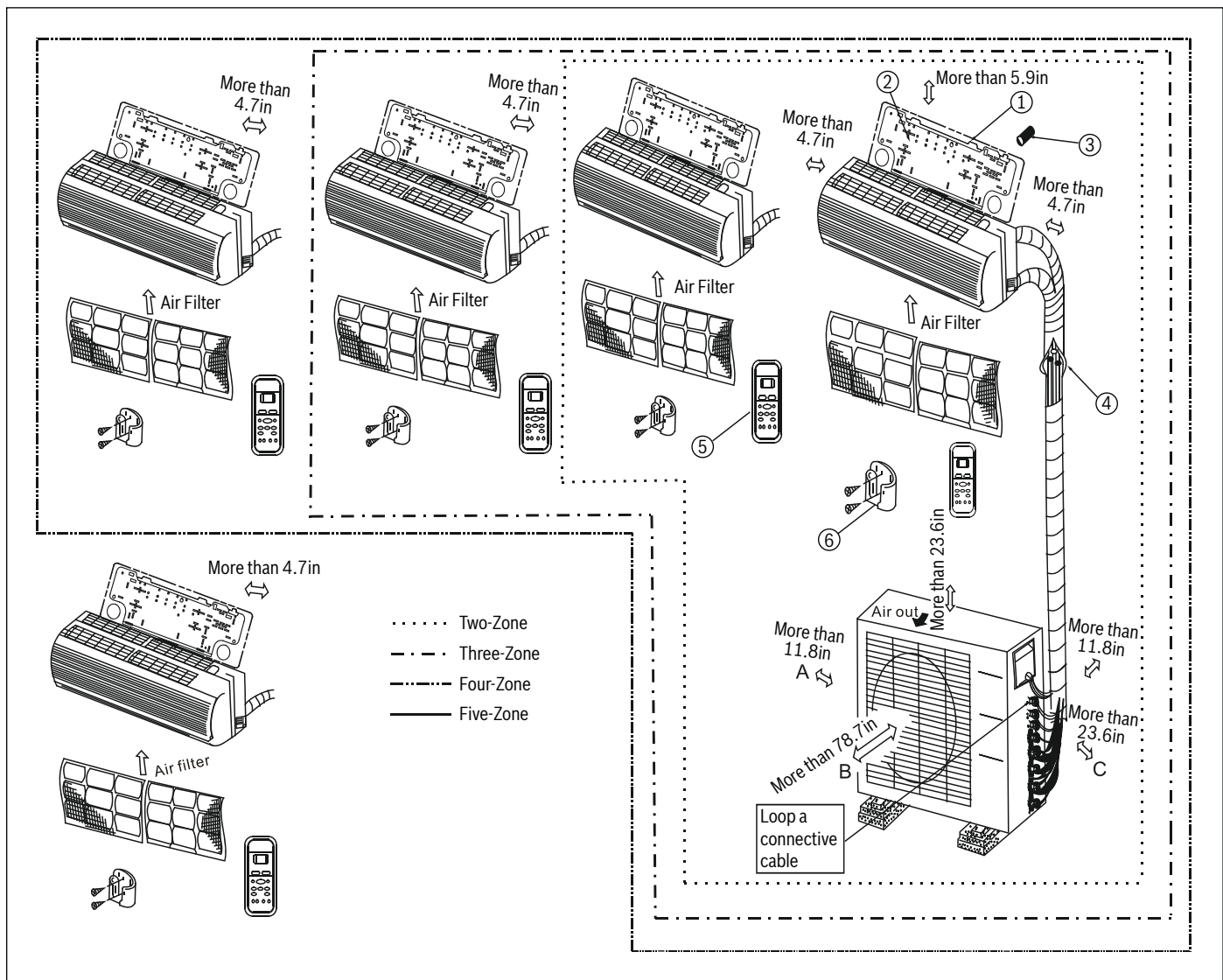


Figure 2

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

Table 3

NOTICE:

- ▶ 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.



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.

5 Specifications

Number of units that can be used together	Connected units	2-5 units
Compressor minimum run time	Stop time	3 min
Power source voltage	Voltage variation	within $\pm 10\%$ of rated voltage
	Voltage drop during start	within $\pm 15\%$ of rated voltage
	Voltage imbalance	within $\pm 3\%$ of rated voltage

Table 4

	2 Zone System	3 Zone System	4 Zone System	5 Zone System
Model	BMS500-AAM018-1CSXRC BMS500-AAM018-1CSXHC	BMS500-AAM027-1CSXRC BMS500-AAM027-1CSXHC	BMS500-AAM036-1CSXRC BMS500-AAM036-1CSXHC	BMS500-AAM048-1CSXRC BMS500-AAM048-1CSXHC
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
Standard refrigerant pipe length (ft / m)	49ft / 15m	74ft / 22.5m	98ft / 30m	123ft / 37.5m
Additional refrigerant charge (Based on the IDU liquid line size)	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 5 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):

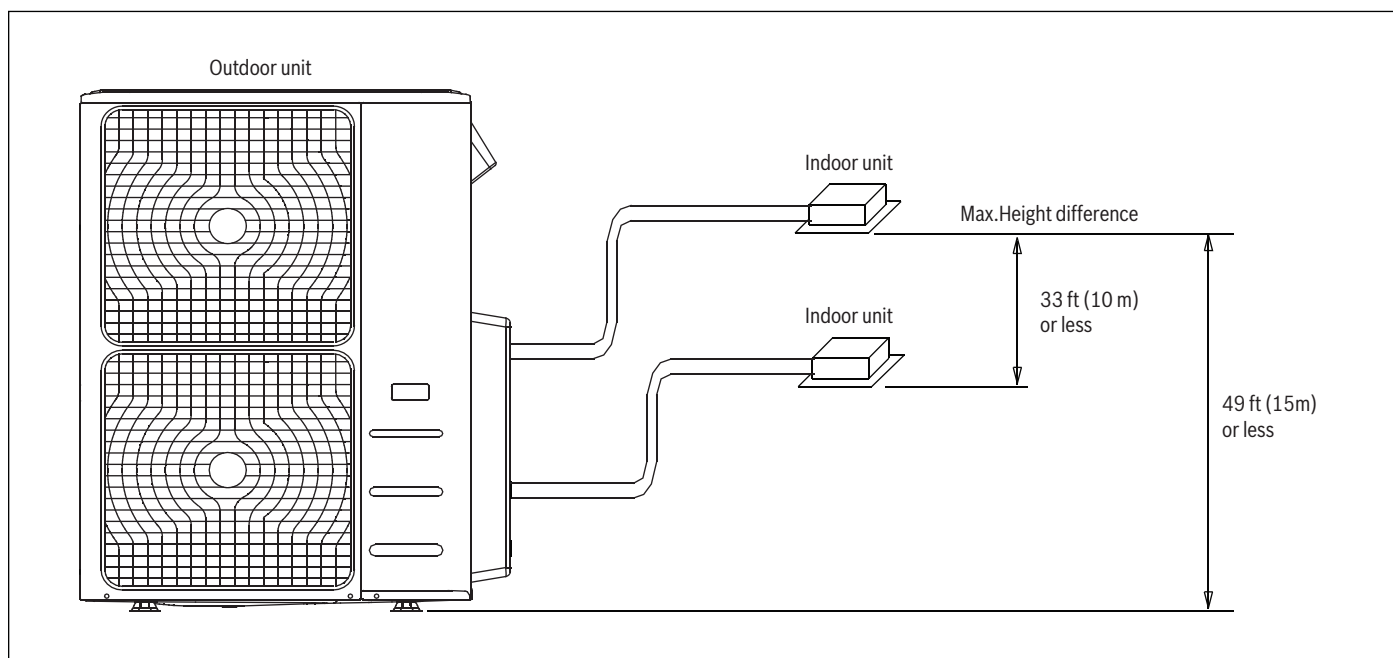


Figure 3

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)

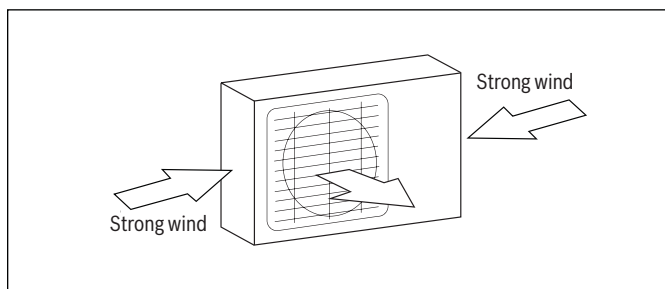


Figure 4

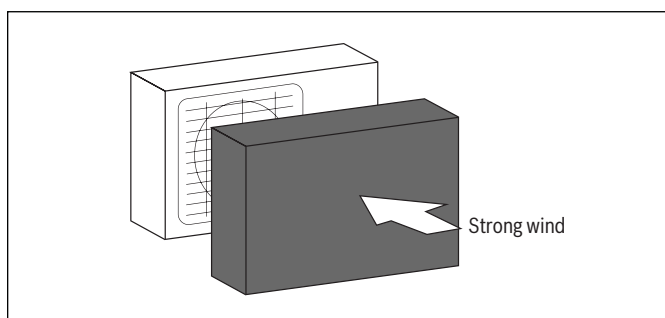


Figure 5

- ▶ 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).

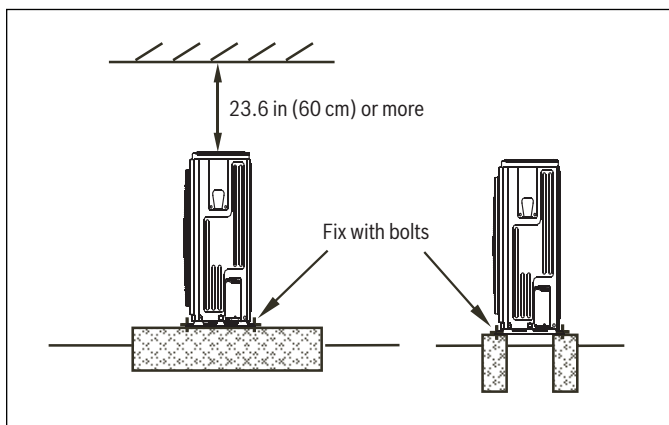


Figure 6

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-AAS012-0CSXRC BMS500-AAS009-1CSXRC BMS500-AAS012-1CSXRC	765x555x303 (30.1x 21.8x 11.9)	454 (17.8)	286(11.3)
BMS500-AAS009-1CSXHC BMS500-AAS012-1CSXHC	805x554x330 (31.7x 21.8x 13.0)	511 (20.1)	317(12.5)
BMS500-AAS018-1CSXRC BMS500-AAS018-1CSXHC BMS500-AAM018-1CSXRC	890x673x342 (35.0x 26.5x 13.5)	663 (26.1)	348 (13.7)
BMS500-AAS030-1CSXRC BMS500-AAS036-1CSXLC BMS500-AAS036-1CSXRC BMS500-AAS024-1CSXRC BMS500-AAS024-1CSXHC BMS500-AAM027-1CSXRC BMS500-AAM036-1CSXRC BMS500-AAM018-1CSXHC BMS500-AAM027-1CSXHC	946x810x410 (37.2x 31.9x 16.1)	673 (26.5)	403 (15.9)
BMS500-AAS060-1CSXLB BMS500-AAS048-1CSXLC BMS500-AAM048-1CSXRC BMS500-AAM036-1CSXHC BMS500-AAM048-1CSXHC	952x1333x415 (37.5x 52.5x 16.34)	634 (25.0)	404 (15.9)

Table 6

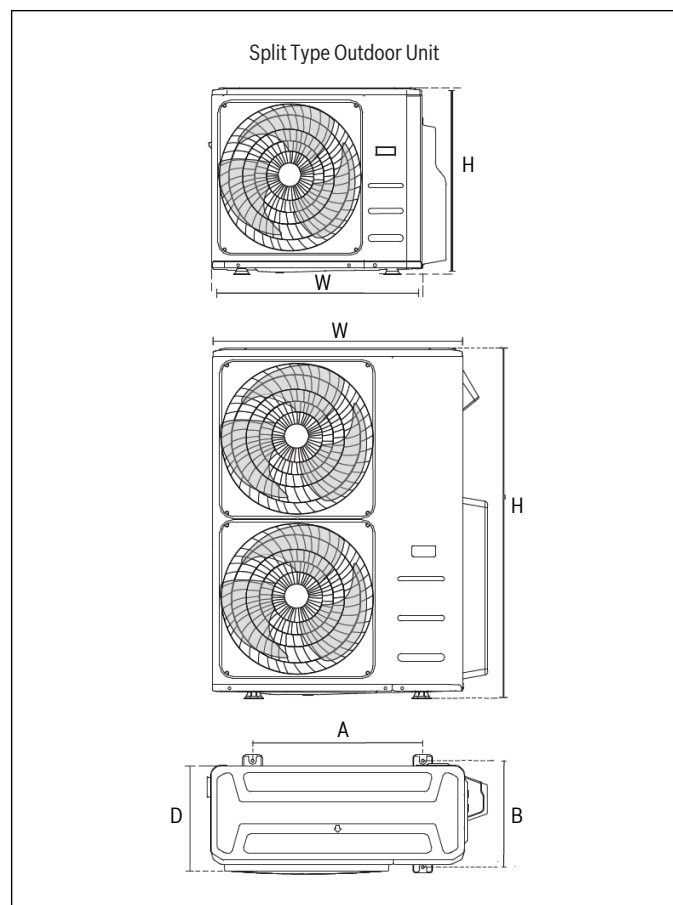


Figure 7

Series installation

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

	L	A
L ≤ 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 7

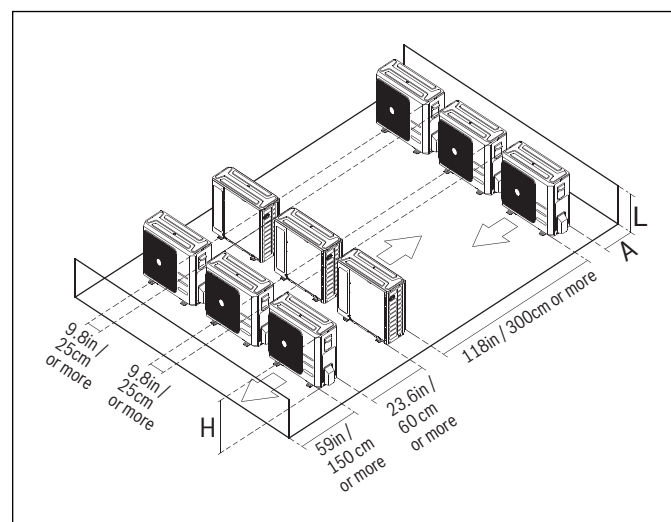


Figure 8

i 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)

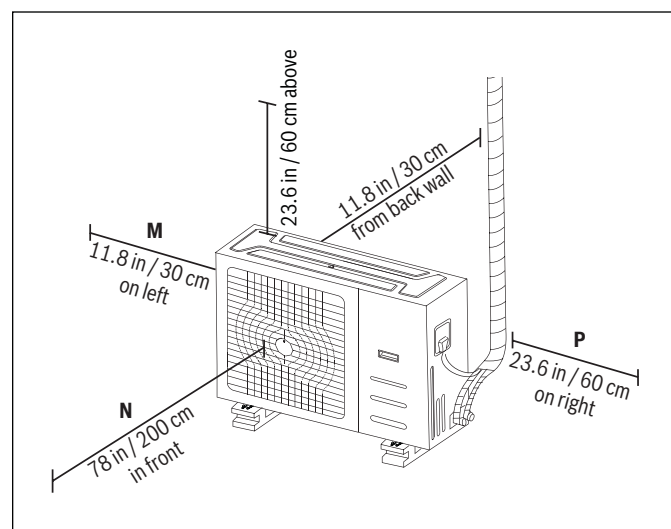


Figure 9

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. Use a 6.5 cm (2.5 in) drill bit and 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.

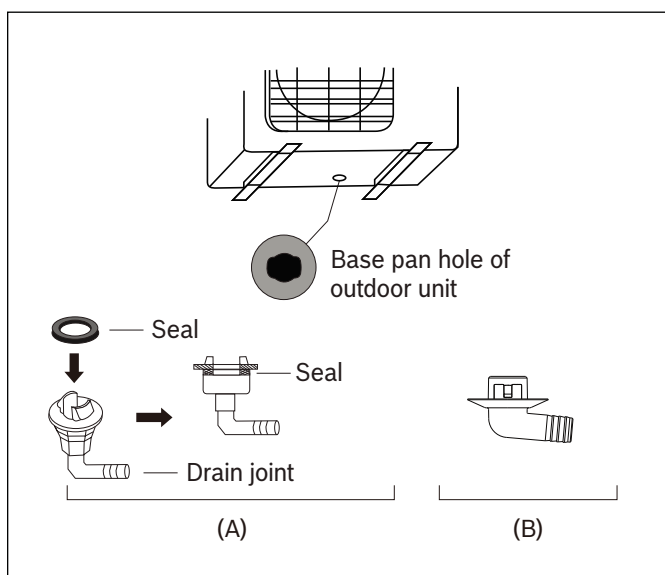


Figure 10

Connecting Multiple Capacity Indoor Units

When different capacity units need to be connected, it is recommend to connect the one has highest capacity at the bottom and the smallest unit at the top of the ODU refrigerant connection manifold. For example, if the system has one 9K, 18K, and 24K Indoor units, the 24K indoor unit should be connected via the port A. and the 9K indoor unit should be connected via the port C. (See Fig. 11)

Refrigerant pipe diameter

Indoor unit capacity (Btu/h)	Liquid line O.D. (in / mm)	Vapor line O.D. (in / mm)
6K / 9K	1/4" / Ø6.35	3/8" / Ø9.52
12k / 18k	1/4" / Ø6.35	1/2" / Ø12.7
24K / 30K / 36K	3/8" / Ø9.52	5/8" / Ø15.9

Table 8

Multi-zone condensing section refrigerant line connection sizes and maximum indoor unit

Type	Model Name	Model #	Liquid Side inch (mm)	Gas Side inch (mm)	Maximum IDU
Regular System	BMS500-AAM018-1CSXRC	8-733-956-199	2 X 1/4" (Ø6.35mm)	2 X 3/8" (Ø9.52mm)	2
	BMS500-AAM027-1CSXRC	8-733-956-200	3 X 1/4" (Ø6.35mm)	3 X 3/8" (Ø9.52mm)	3
	BMS500-AAM036-1CSXRC	8-733-956-201	4 X 1/4" (Ø6.35mm)	3 X 3/8" (Ø9.52mm) + 1 x 1/2" (Ø12.7mm)	4
	BMS500-AAM048-1CSXRC	8-733-956-226	5 X 1/4" (Ø6.35mm)	3 X 3/8" (Ø9.52mm) + 2 x 1/2" (Ø12.7mm)	5
Max Performance	BMS500-AAM018-1CSXHC	8-733-956-202	2 X 1/4" (Ø6.35mm)	2 X 3/8" (Ø9.52mm)	2
	BMS500-AAM027-1CSXHC	8-733-956-203	3 X 1/4" (Ø6.35mm)	3 X 3/8" (Ø9.52mm)	3
	BMS500-AAM036-1CSXHC	8-733-956-227	4 X 1/4" (Ø6.35mm)	3 X 3/8" (Ø9.52mm) + 1 x 1/2" (Ø12.7mm)	4
	BMS500-AAM048-1CSXHC	8-733-956-204	5 X 1/4" (Ø6.35mm)	3 X 3/8" (Ø9.52mm) + 2 x 1/2" (Ø12.7mm)	5

Table 9

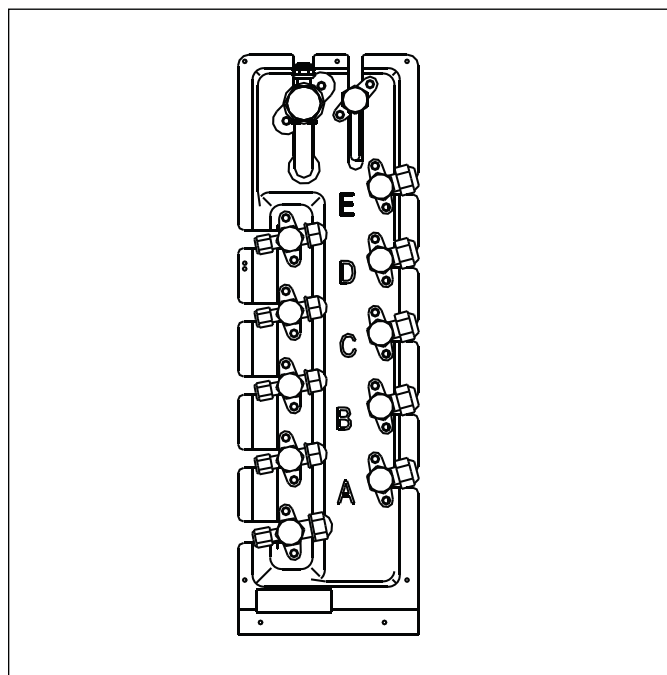


Figure 11

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.

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.

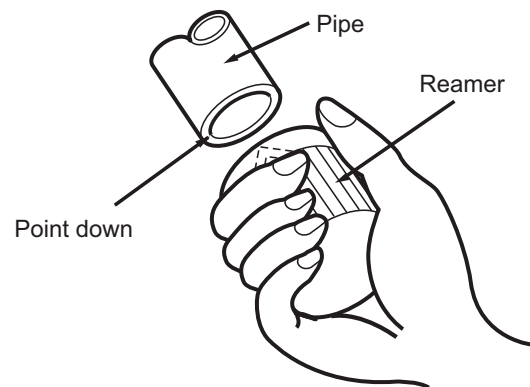


Figure 13

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.

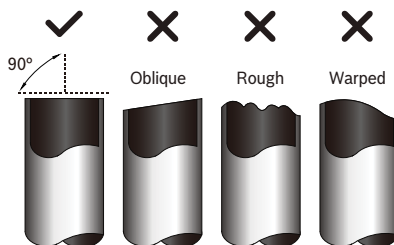


Figure 12

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.

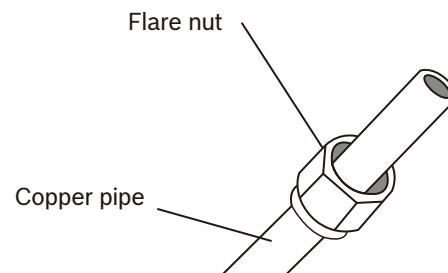


Figure 14

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 10.

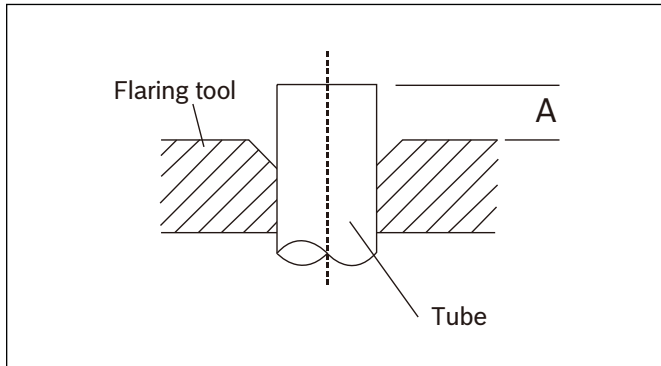


Figure 15

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 10.

Piping extension beyond flare form

Pipe gauge mm (inch)	Tightening torque N.m (ft. lbs)	Flare dimension (A) (Unit: mm/inch)		Flare shape
		Min.	Max.	
Ø 6.4 (1/4")	18-20 N.m (13.3 - 14.8 ft. lbs)	8.4/0.33	8.7/0.34	
Ø 9.5 (3/8")	25-26 N.m (18.4 - 19.2 ft. lbs)	13.2/0.52	13.5/0.53	
Ø 12.7 (1/2")	35-36 N.m (25.8-26.5 ft. lbs)	16.2/0.64	16.5/0.65	
Ø 15.9 (5/8")	45-47 N.m (33.2-34.7 ft. lbs)	19.2/0.76	19.7/0.78	

Table 10

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.

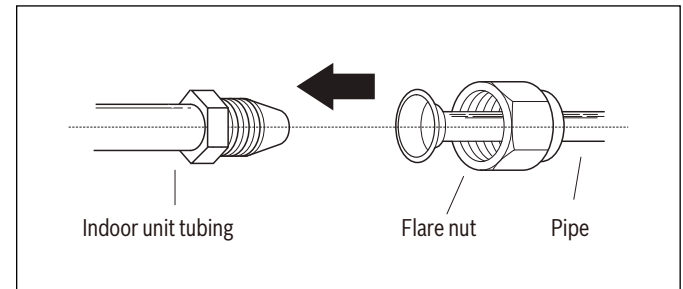


Figure 16

3. Tighten the flare nut as tightly as possible by hand.
4. Using a wrench, hold the nut on the unit tubing.
5. While firmly holding the nut, use a torque wrench to tighten the flare nut according to the torque values in table 10.

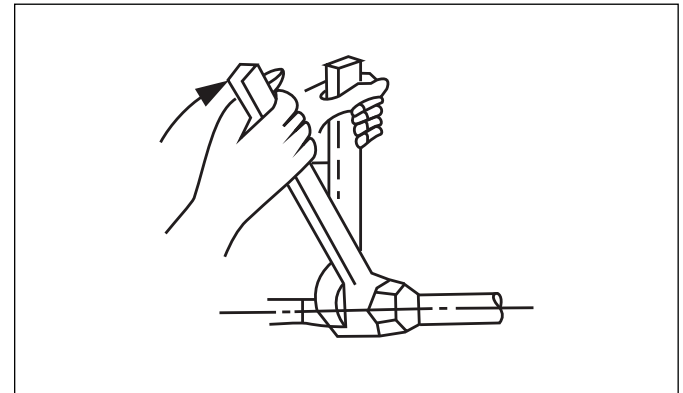


Figure 17



CAUTION:

- Ensure to insulate refrigerant pipe joints after leak check is performed. 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 refrigerant leak.

**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.

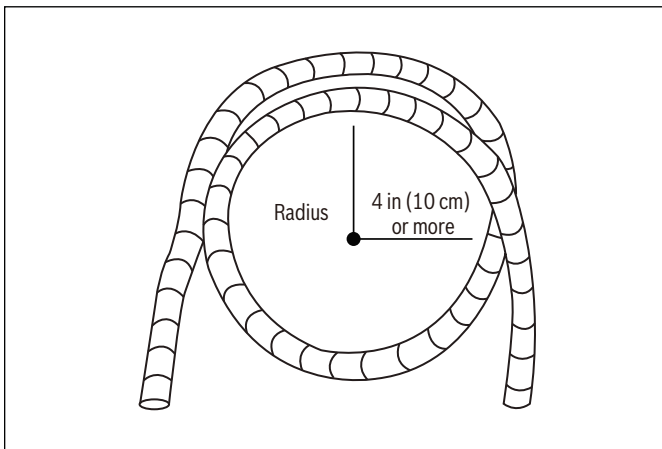


Figure 18

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. Install the refrigerant line through the wall and connect it to the outdoor unit.
8. Insulate all piping after leak check has been performed.

**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 **Evacuation and Charging Process** 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 a 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



DANGER: ELECTRICAL HAZARD

- ▶ 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 11

- 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)

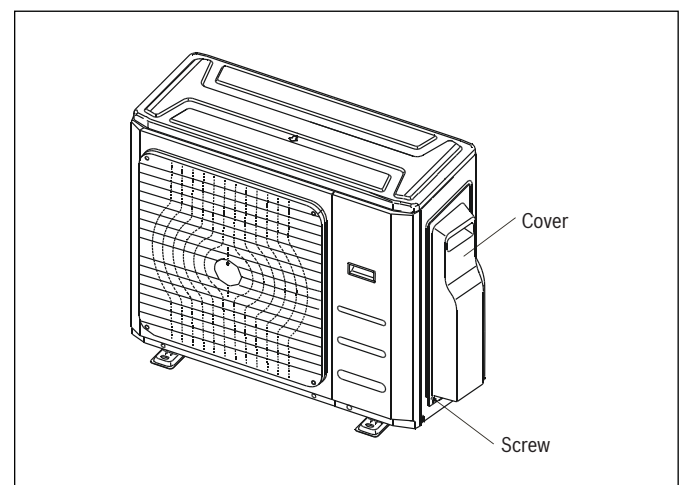


Figure 19

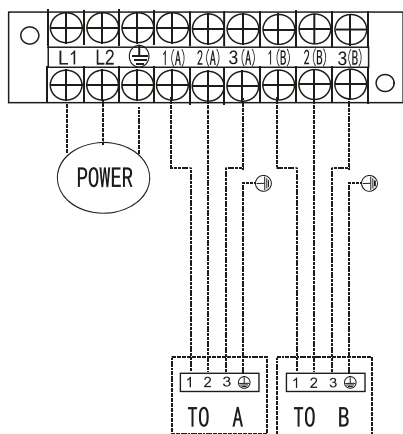
- 3. Connect the fork terminals to the terminals. Match the wire labels on the indoor unit with the labels on the outdoor unit, and firmly screw the fork terminal of each wire to its corresponding terminal.
- 4. Secure the cable with designated cable clamp.

8.2 Wiring Diagrams

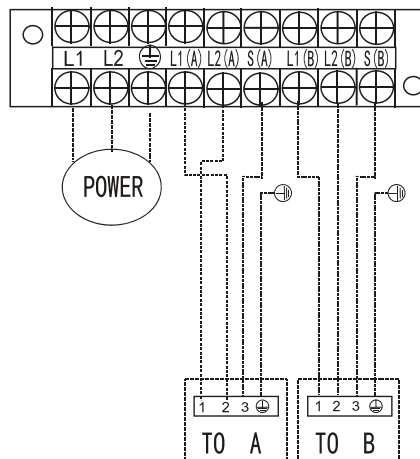


WARNING: ELECTRICAL HAZARD

- ▶ 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 1 of the outdoor unit must connect with terminal 1 on the indoor unit.



Correct



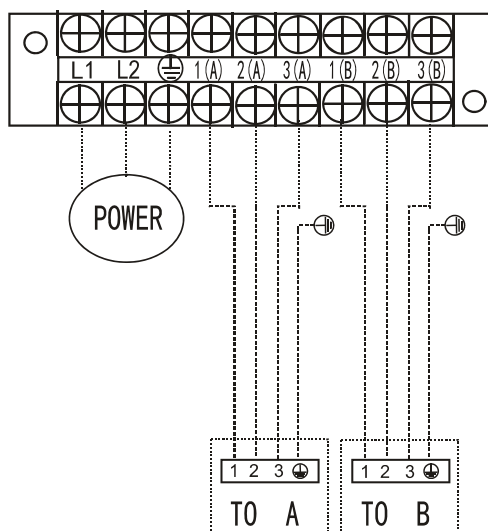
Incorrect

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

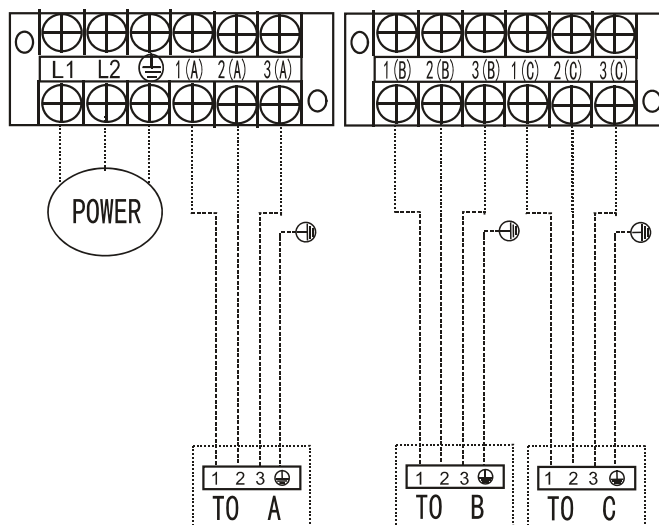
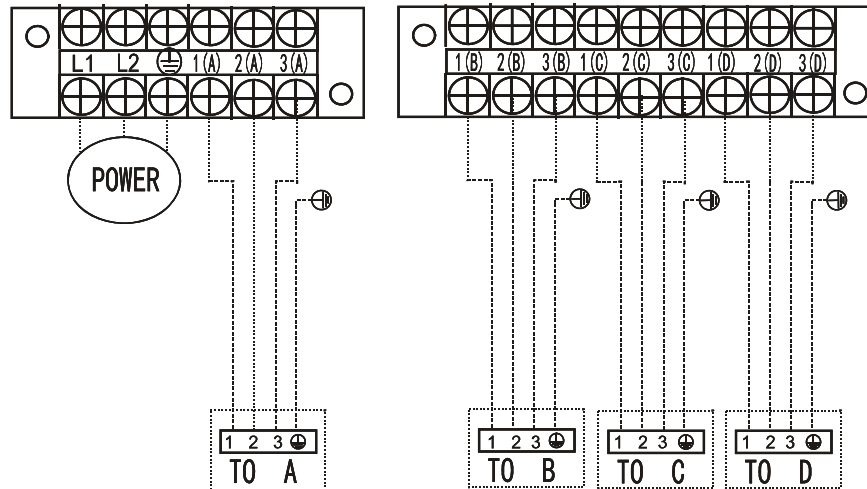


Figure 21

Four-Zone system



Five-Zone system

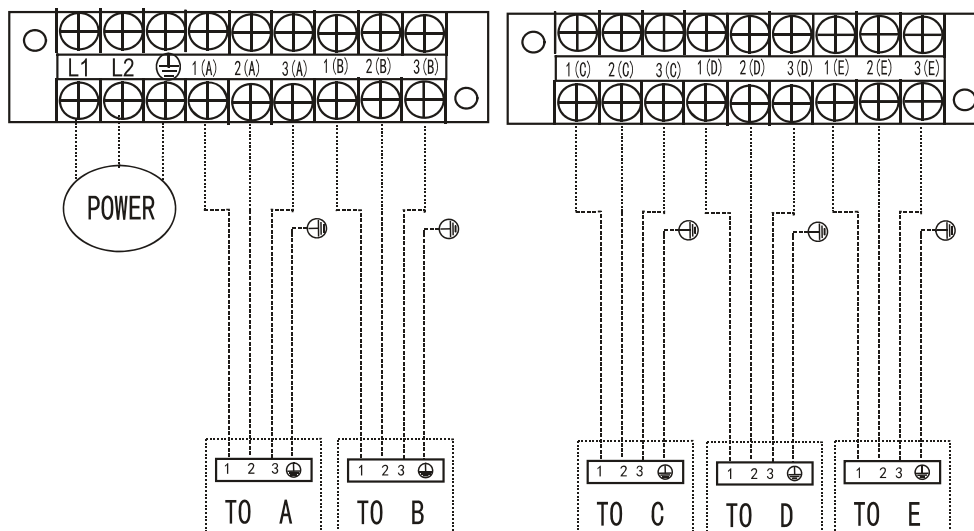


Figure 22

9 Evacuation and Charging Process

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.

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.
- ▶ Perform nitrogen leak check on all refrigerant joints.

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.

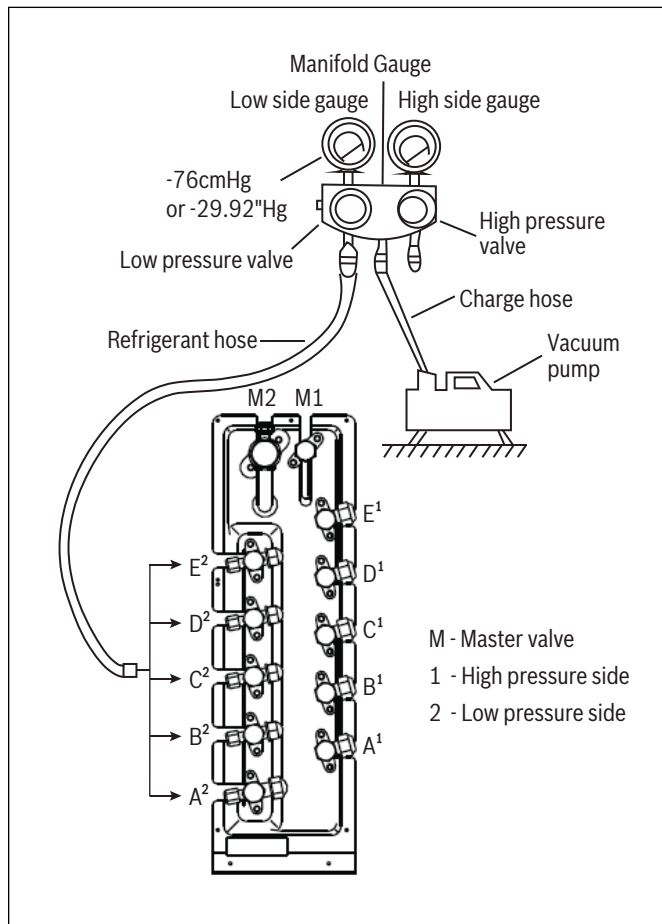


Figure 23

1. Connect the refrigeration hose from the low side manifold gauge to the master service valve port (M2), on the outdoor unit.
2. Connect charge hose from the manifold gauge to the vacuum pump.

3. Open the low pressure side and high pressure side service valves (A1, B1, C1, A2, B2, C2, etc.) if the lineset was connected.
4. Open the Low Pressure side valve on the manifold gauge. Keep the High Pressure side valve closed.
5. Turn on the vacuum pump to evacuate the system.
6. 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.
7. After the vacuum process has been achieved, close the Low Pressure side valve on the manifold gauge, and turn off the vacuum pump.
8. Wait for approximately 10 to 15 minutes, then check that there has been no change in system vacuum. It is recommended to use a micron gauge; check to make sure the system is still below 500 microns.
9. If there is a change in system vacuum, refer to Gas Leak Check section for information on how to check for leaks. If there is no change in system vacuum, remove the charge hose from the service port.

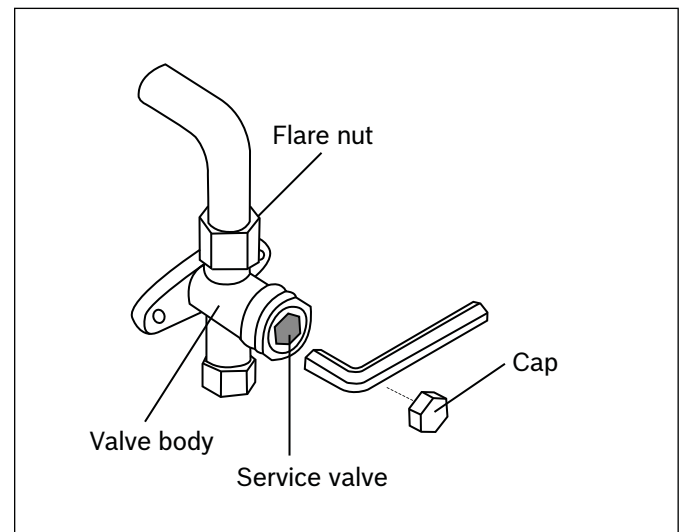


Figure 24

10. Using allen wrench, fully open both of the master valves (M1, M2) on the top.
11. Tighten valve caps on all valves (master valves, high side and low side services valves) by hand. You may tighten it further using a torque wrench if needed.

NOTICE: Open valve stems gently

- ▶ When opening service valve, turn the 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.
- ▶ DO NOT exceed the maximum allowable refrigerant length. Refer to table 4.
- ▶ 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

Type	Model Name	Model #	Standard refrigerant pipe length (ft / m)*	Additional Refrigerant charge per ft
Regular System	BMS500-AAM018-1CSXRC	8-733-956-199	49ft (15m)	Refrigerant Type: R410A For the Indoor unit with 1/4" liquid line diameter: (actual pipe length – standard length) 0.16oz/ft (15g/m) For the Indoor unit with 3/8" liquid line diameter: (actual pipe length – standard length) 0.32oz/ft (30g/m) Actual pipe length is measured based on the refrigerant liquid line only.
	BMS500-AAM027-1CSXRC	8-733-956-200	74ft (22.5m)	
	BMS500-AAM036-1CSXRC	8-733-956-201	98ft (30m)	
	BMS500-AAM048-1CSXRC	8-733-956-226	123ft (37.5m)	
Max Performance	BMS500-AAM018-1CSXHC	8-733-956-202	49ft (15m)	
	BMS500-AAM027-1CSXHC	8-733-956-203	74ft (22.5m)	
	BMS500-AAM036-1CSXHC	8-733-956-227	98ft (30m)	
	BMS500-AAM048-1CSXHC	8-733-956-204	123ft (37.5m)	

Table 12

* Calculated based on 9K IDU

9.4 Calculation Steps

Step1: Calculate the "Estimated" refrigerant pre-charge amount.



Please note this value is only used to calculate the additional refrigerant charge amount.

- ▶ Estimated Pre-charge Amount = Standard Refrigerant Pipe Length * 0.16oz/ft. (15g/m)

Step2: Calculate the required charge amount for each zone

(Refer to Table 8 for Indoor unit liquid line diameter)

- ▶ If the Zone 1 Indoor unit has 3/8inch liquid line diameter:
Zone 1 Charge Amount = Zone 1 Refrigerant Pipe Length * 0.32oz/ft (30g/m)
- ▶ If the Zone 2 Indoor unit has 1/4 inch liquid line diameter:
Zone 2 Charge Amount = Zone 2 Refrigerant Pipe Length * 0.16oz/ft. (15g/m)
- ▶ Total zone charge amount = Zone 1 charge amount + Zone 2 charge amount + Zone 3 charge amount + ... up to 5 zones.

Step3: Calculate the additional refrigerant needed

- ▶ Additional Refrigerant Amount = Total Zone Charge Amount - Estimated Pre-charge Amount

For example:

One 36K ODU (BMS500-AAM036-1CSXHC) paired with below Indoor units.

- One 9K wall mounted unit with 30ft refrigerant pipe
- One 18K Cassette unit with 30ft refrigerant pipe.
- One 24K wall mounted unit with 50ft refrigerant pipe.

1. **Step1:** Calculate the "Estimated" refrigerant charge. Please note this value is only used to calculate the additional refrigerant charge amount.
Estimated Refrigerant Charge Amount = 98ft * 0.16oz/ft. = 15.68oz
2. **Step2:** Calculate the required charge amount for each zone. Refer to table 8 for Indoor unit liquid line size
 - ▶ Zone 1: 24K wall mounted Indoor unit
 - Zone 1 Charge Amount = 50ft * 0.32oz/ft. = 16oz
 - ▶ Zone 2: 18K Cassette Indoor unit
 - Zone 2 Charge Amount = 30ft * 0.16oz/ft. = 4.8oz
 - ▶ Zone 3: 9K wall mounted Indoor unit
 - Zone 3 Charge Amount = 30ft * 0.16oz/ft. = 4.8oz
 - ▶ Total Zone Charge Amount = 16oz + 4.8oz + 4.8oz = 25.6oz
3. **Step3:** Calculate the additional refrigerant needed
Additional Refrigerant Amount = 25.6oz – 15.68oz = 9.92oz

10 Electrical and Refrigerant 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.

10.2 Refrigerant Leak Checks



Perform refrigerant leak check on all joints.

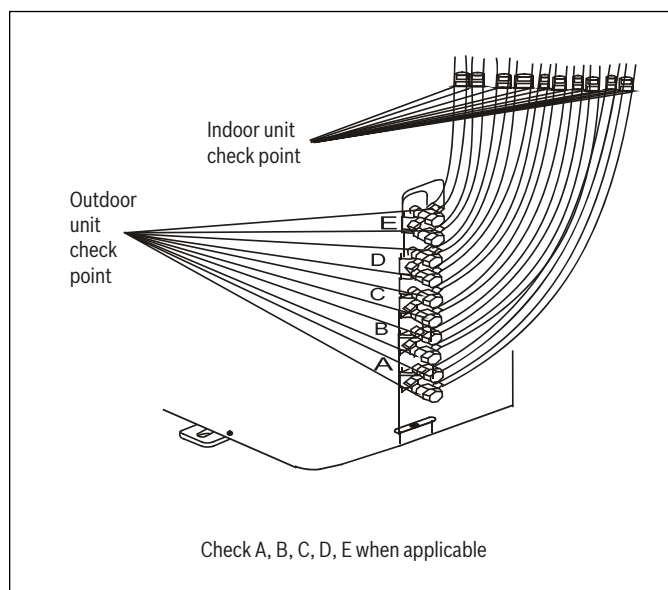


Figure 25

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 installed per Bosch manual.
- ▶ Piping and wiring are properly connected.
- ▶ Specified unit clearance has been met to prevent poor performance or product malfunction.
- ▶ Refrigeration system does not leak.
- ▶ Drainage system is unimpeded and draining to a safe location.
- ▶ Insulation is properly installed.
- ▶ Grounding wires are properly connected.
- ▶ Length of the piping and additional refrigerant stow capacity have been recorded.
- ▶ All voltage requirements are correct as specified.



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 service valves.
2. Turn on the main power switch.
3. For the Indoor Unit:
 - a. Ensure the remote control and its buttons work properly. Set the air conditioner to COOL mode.
 - 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. Check to see that the drainage system is unimpeded and draining smoothly.
 - f. Ensure there is no vibration or abnormal noise during operation.
7. 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.

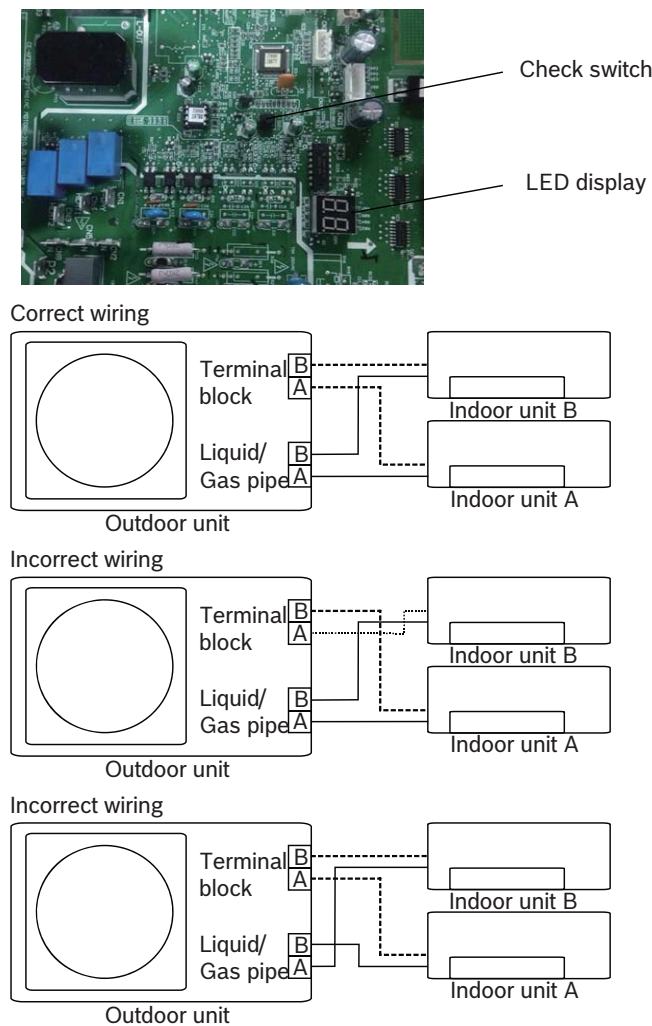


Figure 26

12.1 How To Activate This Function

1. 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.
2. 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)).
3. Check that the service valves of the liquid pipe and gas pipe are open.
4. Ensure IDU and ODU have been powered up for at least 2 minutes.
5. 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

Compressor Anti Short Cycle = 3 minutes

Anti-cold air

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

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

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 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 refrigerant equalizing which is normal.

A low hissing sound 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 during 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 past the set point. Moisture 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 to reduce and eliminate moisture.

Operation mode selection

While two or more indoor units are simultaneously operating, make sure the heat or cool modes do not conflict with each other. The heat mode claims precedence over cooling mode. 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 mode, other units cannot operate in heat mode. If one of the unit selects HEAT mode while the others are in cool mode, the other operating units will stop operation and display error code.

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



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

Issue	Possible Causes
Not heating or cooling	The Unit has a 3-minute protection feature that prevents the outdoor unit from short cycling. Heating or cooling will not start until the 3 minute anti short cycle has expired.
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 high humidity conditions, 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 abnormal sound	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 equalization.
	Abnormal 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 initially operated. This can be mitigated by covering the unit during long periods of inactivity.
The unit emits a bad odor	The air filter require's cleaning.
The outdoor unit fan does not operate	During heating or cooling 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 13

14.2 Troubleshooting Tips

When a problem occurs, please check the following points before contacting a repair company.

Problem	Possible Causes	Solution
The unit is not working	Power failure	Wait for the power to be restored
	The power switch is off	Turn on the power
	Check remote control batteries	Replace the remote control batteries
	The unit's 3-minute anti-short cycle has been activated	Wait three minutes after restarting the unit
Poor cooling performance	The heat exchanger on the indoor or outdoor unit is dirty	Clean the affected heat exchanger
	The air filter is dirty	Remove the filter and clean it according to instructions
	The air inlet or outlet of either unit is blocked	Turn the unit off, remove the obstruction and turn it back on
	Doors and windows are open	Make sure that all doors and windows are closed while operating the unit
	Excessive heat is generated by sunlight	Close windows and curtains during periods of high heat or bright sunshine
	Low refrigerant due to leak or long-term use	Check for leaks, repair if necessary and top off refrigerant
The unit starts and stops frequently	There's too much or too little refrigerant in the system	Check system refrigerant operation. Ensure charge is per specification
	There is air, incompressible gas or foreign material in the refrigeration system.	Evacuate and recharge the system with refrigerant per specification
	System circuit is blocked	Determine which circuit is blocked and replace the malfunctioning piece of equipment
	The compressor is broken	Replace the compressor
	The voltage is too high or too low	Install a voltage regulator to regulate the voltage
Poor heating performance	Cold air is entering through doors and windows	Make sure that all doors and windows are closed during use
	Low refrigerant due to leak or long-term use	Check for leaks, repair if necessary and top off refrigerant

Table 14

14.3 Error Codes

NOTICE: SYSTEM FAILURE

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

**For BMS500-AAM018-1CSXRC, BMS500-AAM027-1CSXRC,
BMS500-AAM036-1CSXRC, BMS500-AAM048-1CSXRC,
BMS500-AAM018-1CSXHC, BMS500-AAM027-1CSXHC,
BMS500-AAM036-1CSXHC**

Display	LED Status
EC 51	Outdoor EEPROM malfunction
EL 01	Indoor / outdoor units communication error
PC 40	Communication malfunction between IPM board and outdoor main board
PC 08	Outdoor unit overcurrent protection
PC 10	Outdoor unit low AC voltage protection
PC 11	Outdoor unit main control board DC bus high voltage protection
PC 12	Outdoor unit main control board DC bus high voltage protection /341 MCE error
PC 00	IPM module protection
PC 0F	PFC module protection
EC 71	Over current failure of outdoor DC fan motor
EC 72	Lack phase failure of outdoor DC fan motor
EC 07	Outdoor fan speed has been out of control
PC 42	Compressor start failure of outdoor unit
PC 43	Compressor phase protection
PC 44	Outdoor motor RPM protection (Not applicable)
PC 45	Outdoor unit IR chip drive failure
PC 46	Compressor speed has been out of control
PC 49	Compressor overcurrent failure
PC 30	High pressure protection
PC 31	Low pressure protection
PC 0A	High temperature protection of condenser
PC 06	Temperature protection of compressor discharge
PC 0L	Low ambient temperature protection
PC 02	Compressor temperature protection
EC 52	Condenser coil temperature sensor T3 is in open circuit or has short circuited
EC 53	Outdoor room temperature sensor T4 is in open circuit or has short circuited
EC 54	Compressor discharge temperature sensor TP is in open circuit or has short circuited
EC 56	Evaporator coil outlet temperature sensor T2B is in open circuit or has short circuited
EC 50	Open or short circuit of outdoor unit temperature sensor(T3,T4,T5)

Table 15

For BMS500-AAM048-1CSXHC

Display	LED Status
E0	Outdoor unit EEPROM parameter error
E2	Communication malfunction between indoor and outdoor units
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
E5	Over-voltage or under-voltage protection
E6	PFC module protection
E8	Outdoor fan speed malfunction
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
P1	High pressure protection
P2	Low pressure protection
P3	Current overload protection
P4	Temperature protection of compressor discharge
P5	Condenser high temperature protection
P6	Inverter module (IPM) malfunction
LP	Low ambient temperature protection
Ed	Communication malfunction between adapter board and outdoor main control board(only for M5OG-48HFN1-M-[X])

Table 16

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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