

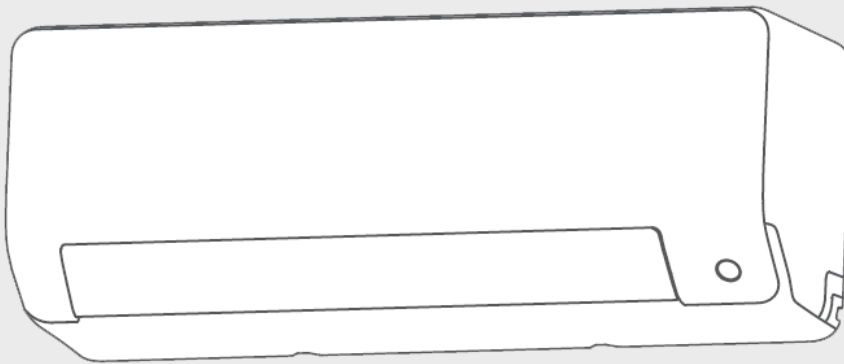


# BOSCH

Installation Instructions

## Wall Mounted Ductless Split 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.



#### **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](http://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.
- ▶ In certain functional environments, such as kitchens, server rooms, etc., the use of specially designed air-conditioning units is highly recommended.
- ▶ 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 gasses. 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.

**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 comes with 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 cause the equipment to fail.

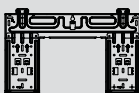









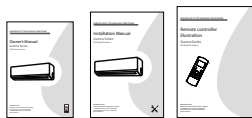


Name	Image		Quantity
Mounting plate			1
Wall anchor			5
Mounting plate fixing screw ST3.9 X 25			5
Remote controller			1
Fixing screw for remote controller holder ST2.9 x 10			2
Remote controller holder			1
Dry cell battery AAA.LR03			2
Seal			1
Drain joint			
Air Filter			1
Documentation	Owner's manual Installation manual Remote controller user manual		1 each
Signal/power cable			1 (15ft cable)
Drain hose			1
Connecting pipe assembly	Liquid side	Φ6.35( 1/4in)	<b>Parts not included. See section 8.3 for detail.</b> Piping kits are available as an accessory.
		Φ9.52( 3/8in)	
	Vapor side	Φ9.52( 3/8in)	
		Φ12.7( 1/2in)	
		Φ 16( 5/8in)	

Table 1

### 3 Installation Summary - Indoor Unit

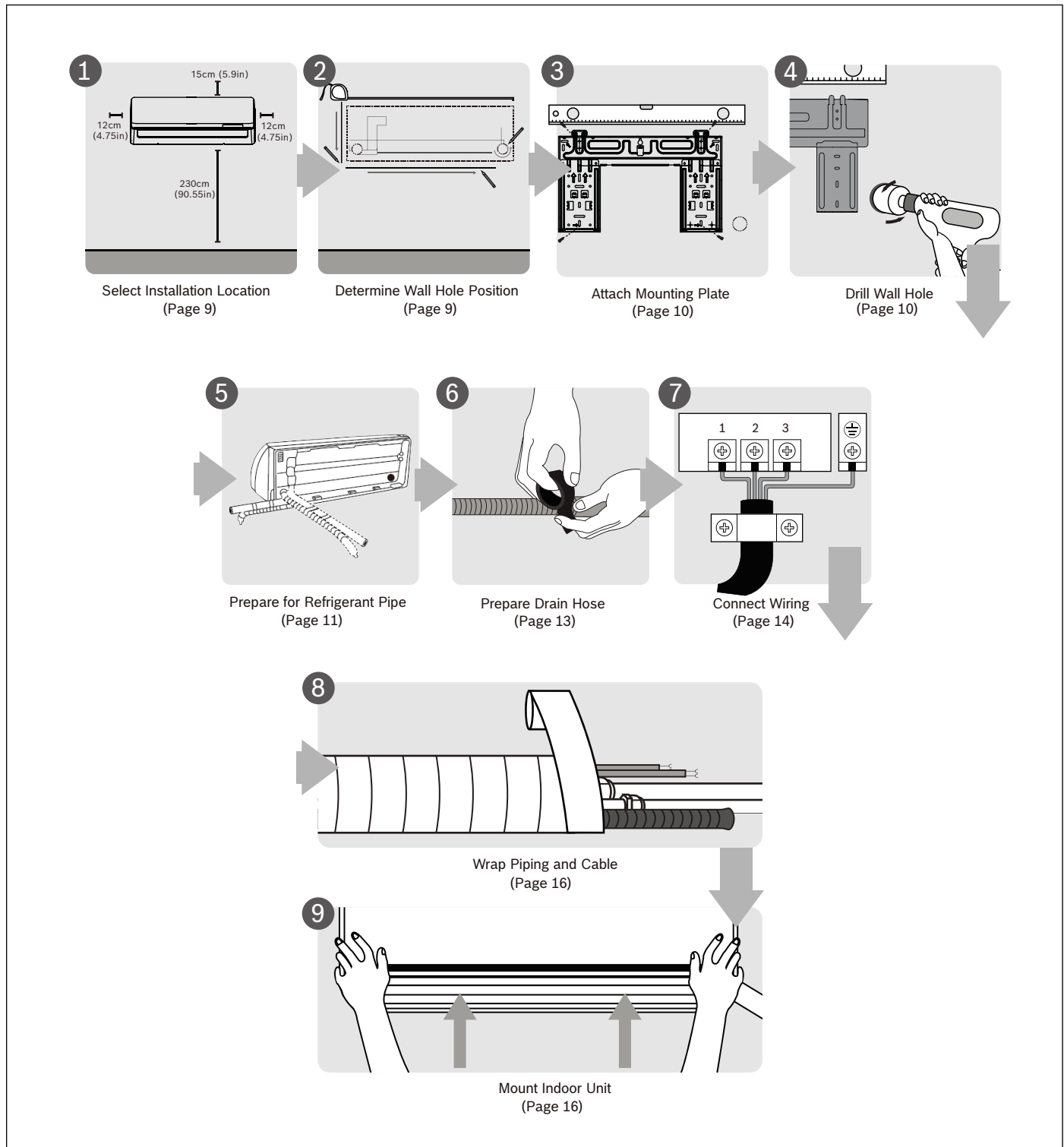


Figure 1

## 4 System Components

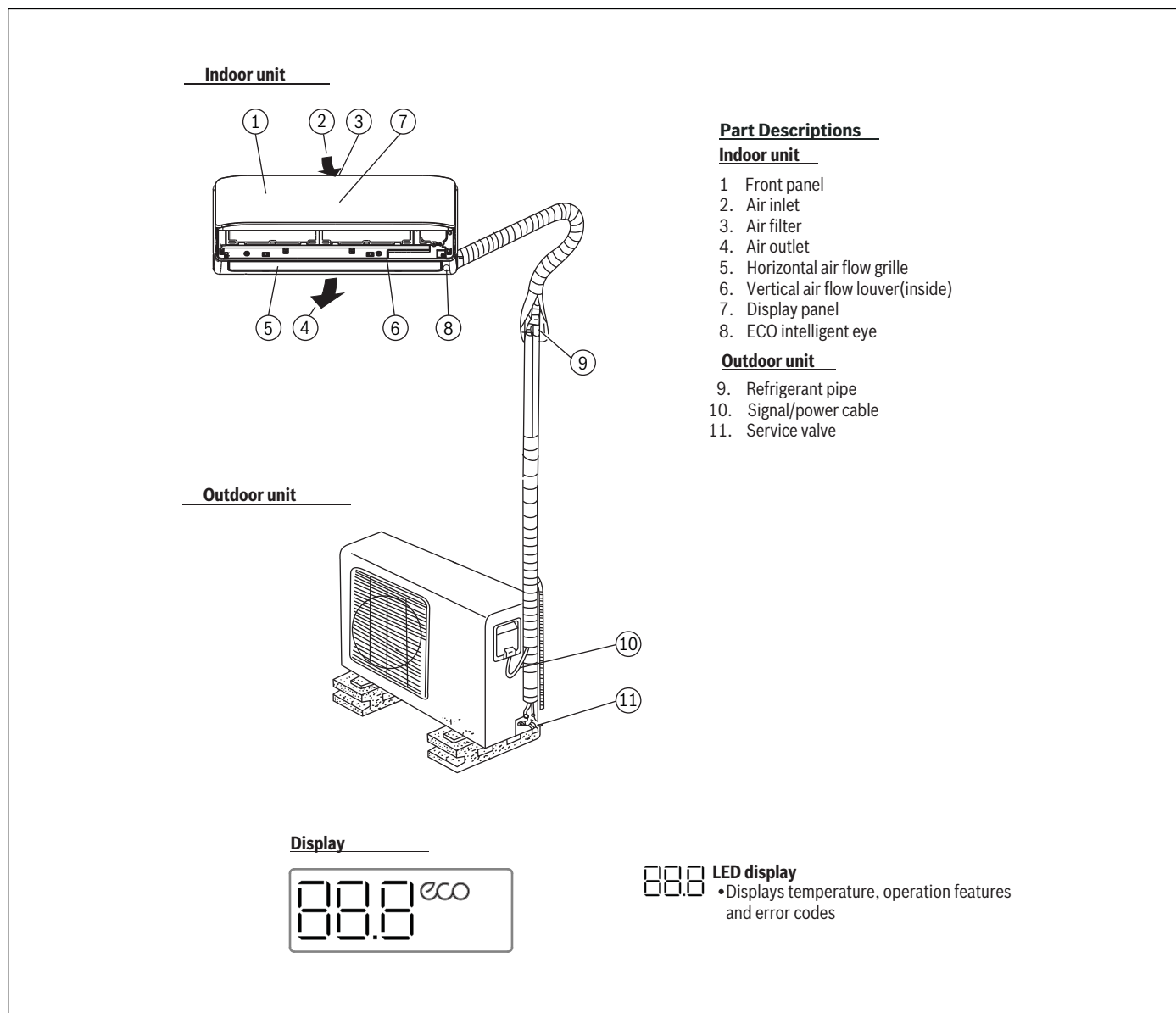


Figure 2



Illustrations in this manual are for explanatory purposes. The actual shape of your indoor unit may be slightly different. The actual shape shall prevail.



## 5 Indoor Unit Installation



### WARNING: PERSONAL INJURY, PROPERTY DAMAGE

- 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 installing the indoor unit, refer to the label on the product box to make sure that the model number of the indoor unit pairs with the model number of the outdoor unit.

### Step 1: Select installation location

Before installing the indoor unit, you must choose an appropriate location. The following are standards that will help you choose an appropriate location for the unit.

- Proper installation locations meet the following standards:
  - Good air circulation
  - Convenient drainage of condensate
  - Noise from the unit will not disturb other people
  - Firm and solid foundation—the location will not vibrate
  - Strong enough to support the weight of the unit
  - A location at least three feet from all other electrical devices (e.g., TV, radio, computer)
- DO NOT install unit in the following locations:
  - Near any source of heat, steam, or combustible gas
  - Near flammable items such as curtains or clothing
  - Near any obstacle that might block air circulation
  - Near the doorway
  - In a location subject to direct sunlight



### Note about wall hole:

While choosing a location, be aware that you should leave ample room for a wall hole (see Drill wall hole for connective piping step) for the signal/power cable and refrigerant piping that connect the indoor and outdoor units. The default position for all piping is the right side of the indoor unit (while facing the unit). However, the unit can accommodate piping to both the left and right.

Refer to the following diagram (Fig. 3) to ensure proper clearance from walls, ceiling and floor:

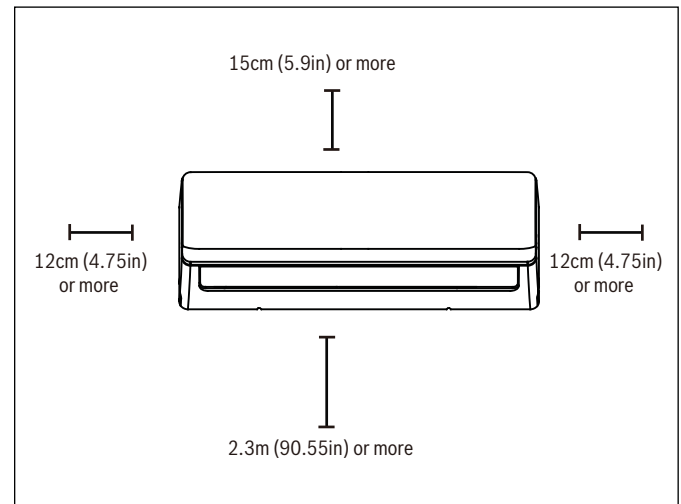


Figure 3



### If back holder to prop up the unit not necessary:

Finishing the pipe and cable connections before mounting the indoor unit on the wall. If the installation height is limited, 5cm (1.96in) from the ceiling is allowable, but this can lower product performance. To ensure enough space to install and remove the top air filter, keep at least 10cm (3.93in) or more from the ceiling.

### If back holder to prop up the unit necessary:

If connecting pipe and cable with front panel open, the minimum distance from ceiling is 22cm (8.66in) or more, if connecting pipe and cable without front panel (remove it), the minimum distance from ceiling is 11cm (4.33in) or more.

### Step 2: Mounting plate installation

The mounting plate is the device on which you will mount the indoor unit.

1. Remove the screw that attaches the mounting plate to the back of the indoor unit.
2. Place the mounting plate against the wall in a location that meets the standards in the Select Installation Location step. (See Mounting Plate Dimensions for detailed information on mounting plate sizes.)
3. Drill holes for mounting screws in places that:
  - have studs and can support the weight of the unit
  - correspond to screw holes in the mounting plate
4. Secure the mounting plate to the wall with the screws provided.
5. Make sure that mounting plate is flat against the wall.



If the wall is made of brick, concrete, or similar material, drill 5mm-diameter (0.2in-diameter) holes in the wall and insert the sleeve anchors provided. Then secure the mounting plate to the wall by tightening the screws directly into the clip anchors.

### Mounting plate dimensions

Different models have different mounting plates. In order to ensure that you have ample room to mount the indoor unit, the diagrams to the right show different types of mounting plates along with the following dimensions:

- ▶ Width of mounting plate
- ▶ Height of mounting plate
- ▶ Width of indoor unit relative to plate
- ▶ Height of indoor unit relative to plate
- ▶ Recommended position of wall hole (both to the left and right of mounting plate)
- ▶ Relative distances between screw holes

### Correct orientation of Mounting Plate

Make sure the mounting plate is level and not leaning to one side.

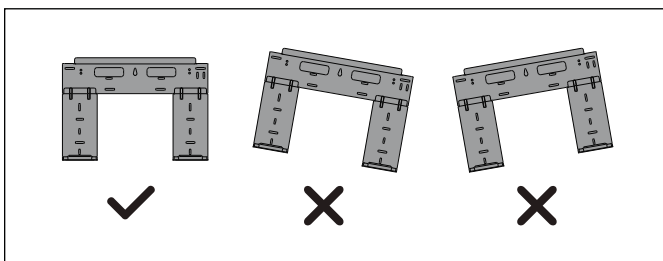


Figure 4

### Mounting plate differences

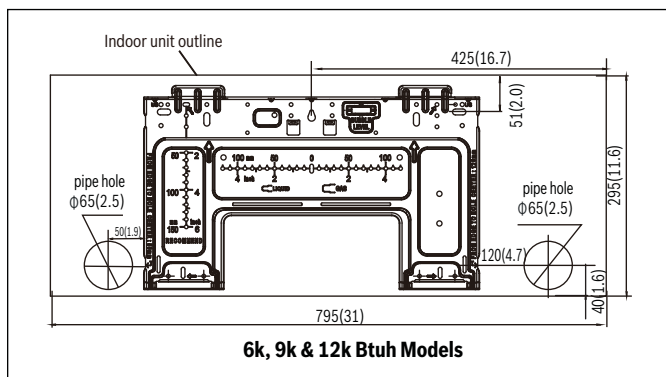


Figure 5

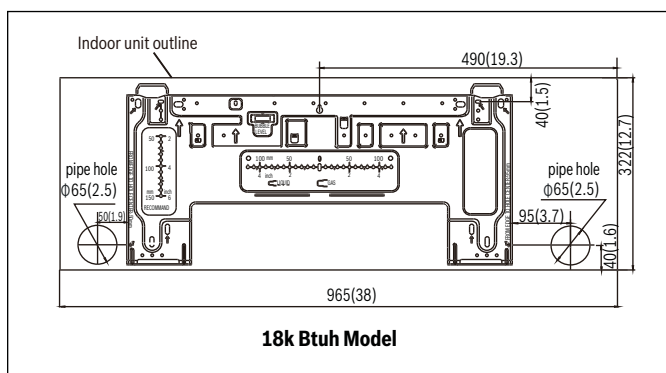


Figure 6

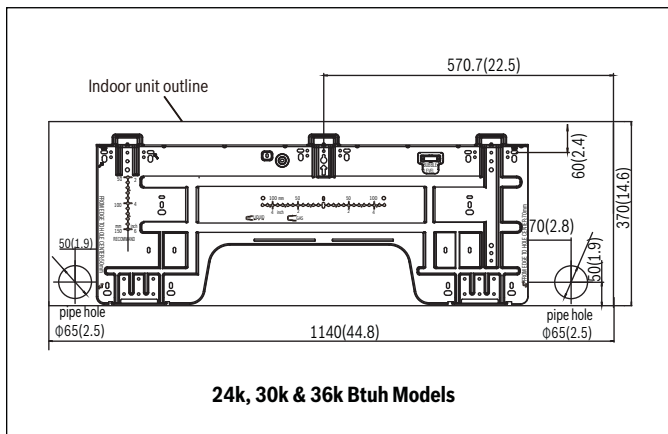


Figure 7

**i** When the gas side connective pipe is  $\varnothing 16\text{mm}$  (5/8in) or more, the wall hole should be 90mm (3.54in).

### Step 3: Drill wall hole for connection

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

1. Determine the location of the wall hole based on the position of the mounting plate. Refer to Mounting Plate Dimensions on the next page to help you determine the optimal position. The wall hole should have a 65mm (2.5in) diameter at least, and at a slightly lower angle to facilitate drainage.
2. Using a 65mm (2.5in) core drill, drill a hole in the wall. Make sure that the hole is drilled at a slight downward angle, so that the outdoor end of the hole is lower than the indoor end by about 5mm to 7mm (0.2-0.275in). This will ensure proper water drainage. (See Fig. 4)
3. Place a protective wall sleeve (not included) in the hole. This protects the edges of the hole and will help seal it when you finish the installation process.



### CAUTION: ELECTRICAL SHOCK/PROPERTY DAMAGE

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

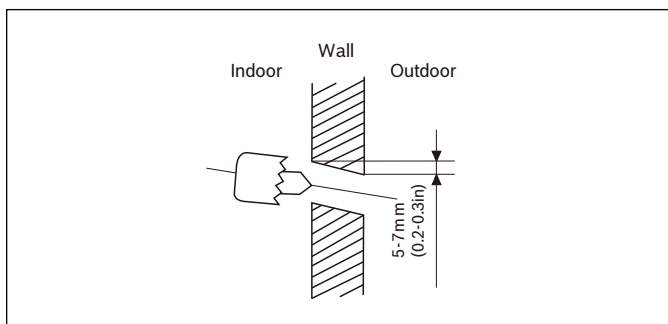


Figure 8

#### Step 4: Prepare refrigerant piping

The refrigerant piping is inside an insulating sleeve attached to the back of the unit. You must prepare the piping before passing it through the hole in the wall. Refer to the Refrigerant Piping Connection section of this manual for detailed instructions on pipe flaring and flare torque requirements, technique, etc.



Refrigerant piping can exit the indoor unit from four different angles:

- ▶ Left-hand side
- ▶ Left rear
- ▶ Right-hand side
- ▶ Right rear

Refer to Figure 9 for details.

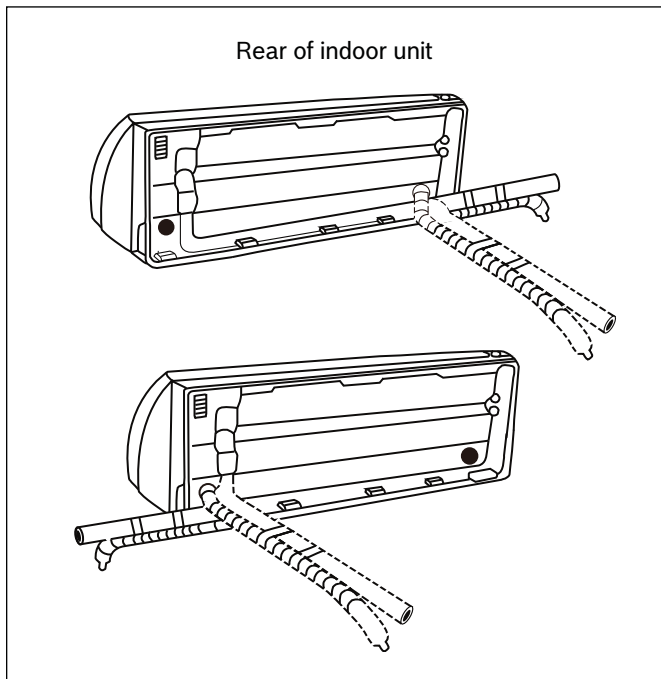


Figure 9

#### NOTICE:

- ▶ Be extremely careful not to crimp or damage the piping while bending them away from the unit. Any deformations in the piping will affect the unit's performance.

#### If there is no refrigerant piping embedded in the wall, do the following:

1. Based on the position of the wall hole relative to the mounting plate, choose the side from which the piping will exit the unit.
2. If the wall hole is behind the unit, keep the knock-out panel in place. If the wall hole is to the side of the indoor unit, remove the plastic knock-out panel from that side of the unit. (See Figure 10). This will create a slot through which your piping can exit the unit. Use needle nose pliers if the plastic panel is too difficult to remove by hand.

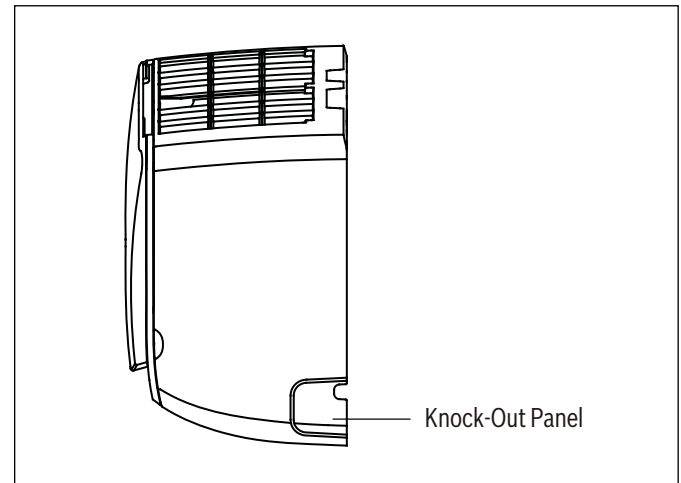


Figure 10

3. Slide the insulation back to expose the connection fittings. This serves two purposes:
  - ▶ To facilitate the Refrigerant Piping Connection process
  - ▶ To facilitate Gas Leak Checks and enable you to check for kinks in the refrigerant and condensate tubing.
4. Use the holder at the back of the unit to prop up the unit, giving you enough room to connect the refrigerant piping, signal cable, and drain hose.

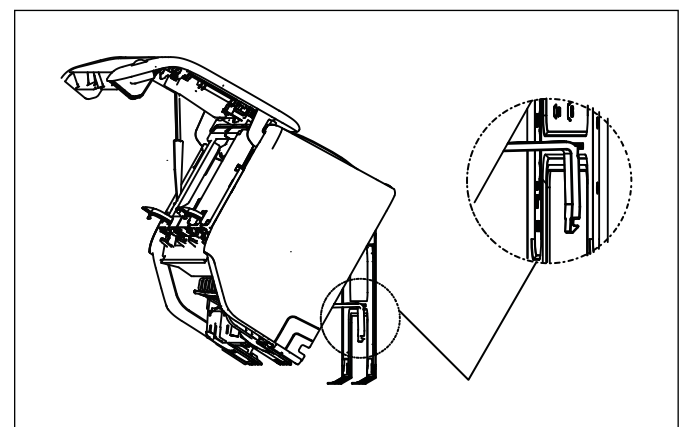


Figure 11 Unit Prop-Up Holder

5. Connect the indoor unit's refrigerant piping to the refrigerant line set that will join the indoor and outdoor units. Refer to the Refrigerant Piping Connection section of this manual for detailed instructions.
6. Based on the position of the wall hole relative to the mounting plate, determine the necessary angle of your piping.

7. Firmly hold the refrigerant piping at the base of the bend.
8. Carefully, with even pressure, bend the piping towards the hole. Do not kink or damage the piping during the process.

**If refrigerant piping is already embedded in the wall, do the following:**

1. Hook the top of the indoor unit on the mounting plate.
2. Open and fix the position of the panel, then, open the covers of the two lock blocks, unscrew the screw showed in the picture below, then hold both sides of the lower panel in the place marked "PULL", pull it upwards to release the buckles, then take the lower panel down.

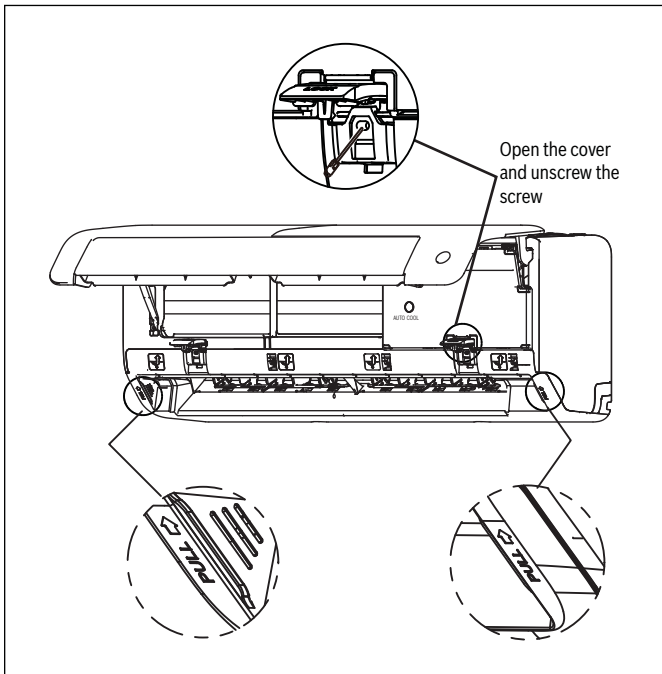


Figure 12

3. Use a bracket or wedge to prop up the unit, giving you enough room to connect the refrigerant piping, signal/power cable, and drain hose. Refer to Figure 13 for an example.

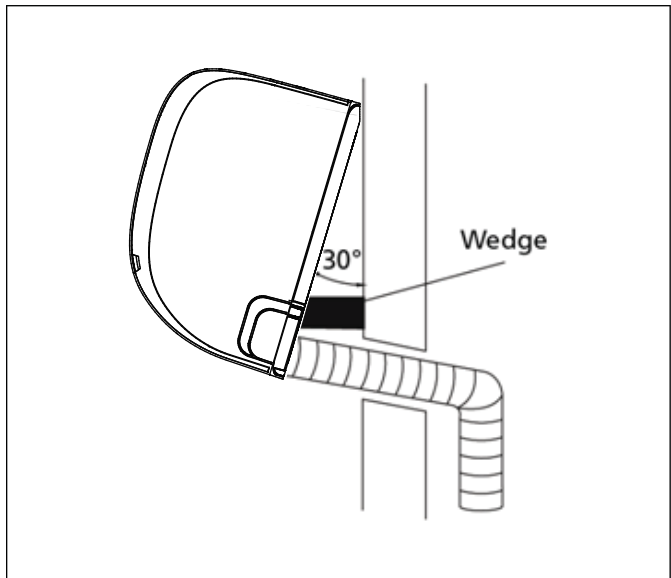


Figure 13

4. Connect drain hose and refrigerant piping (refer to Refrigerant Piping Connection section of this manual for instructions).
5. Keep pipe connection point exposed to perform the leak test (refer to Electrical Checks and Leak Checks section of this manual).
6. After the leak test, wrap the connection point with insulation tape.
7. Remove the bracket or wedge that is propping up the unit.
8. Using even pressure, push down on the bottom half of the unit. Keep pushing down until the unit snaps onto the hooks along the bottom of the mounting plate.

### Step 5: Connect drain hose

By default, the drain hose is attached to the left-hand side of unit (when you're facing the back of the unit). However, it can also be attached to the right-hand side.

1. To ensure proper drainage, attach the drain hose on the same side that your refrigerant piping exits the unit.
2. Attach drain hose extension (purchased separately) to the end of drain hose.
3. Wrap the connection point firmly with Teflon tape to ensure a good seal and to prevent leaks.
4. For the portion of the drain hose that will remain indoors, wrap it with foam pipe insulation to prevent condensation.
5. Remove the air filter and pour a small amount of water into the drain pan to make sure that water flows from the unit smoothly. If not, make adjustments and test again to see if the condensate will flow freely.



Make sure to arrange the drain hose according to Fig. 11 & 12:

- ▶ DO NOT kink the drain hose.
- ▶ DO NOT create a water trap.
- ▶ DO NOT put the end of drain hose in water or a container that will collect water.

#### NOTICE: Plug the unused drain hole

- ▶ To prevent unwanted leaks you must plug the unused drain hole with a rubber plug.

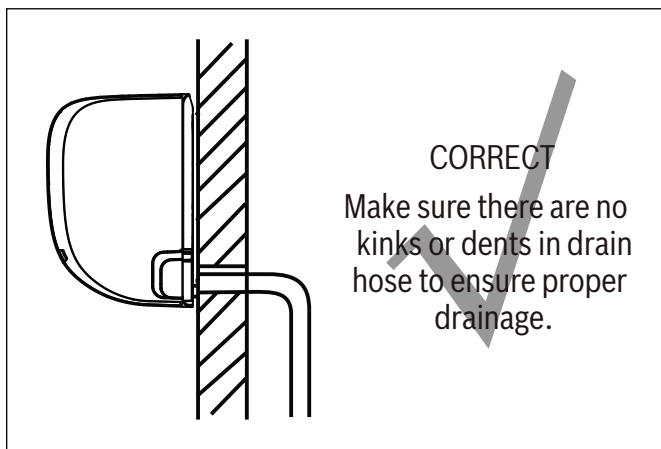


Figure 14

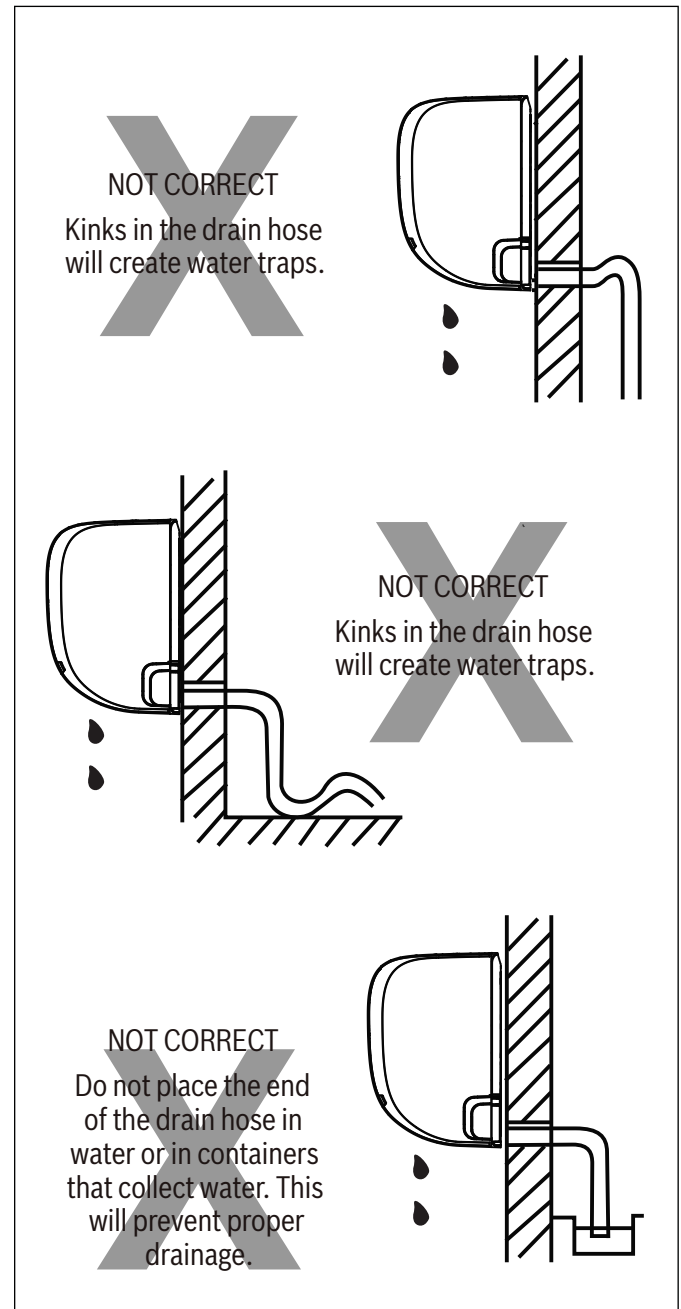


Figure 15

**Step 6: Connect signal/power cable****DANGER: ELECTRIC HAZARD**

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

**WARNING: ELECTRIC HAZARD**

- ▶ Before performing electrical work, read these regulations:
  1. All wiring must comply with local and national electrical codes, and must be installed by a licensed electrician.
  2. All electrical connections must be made according to the Electrical Connection Diagram located on the panels of the indoor and outdoor units.
  3. If there is a serious safety issue with the power supply, stop work immediately. Explain your reasoning to the client, and refuse to install the unit until the safety issue is properly resolved.
  4. Power voltage should be within 90-110% of rated voltage. Insufficient power supply can cause malfunction, electrical shock, or fire.
  5. When connecting power to fixed wiring, install a surge protector and main power switch with a capacity of 1.5 times the maximum current of the unit.
  6. When connecting power to fixed wiring, a switch or circuit breaker that disconnects all poles and has a contact separation of at least 1/8in (3mm) must be incorporated in the fixed wiring. The licensed electrician must use an approved circuit breaker.
  7. Only connect the unit to an individual branch circuit outlet. Do not connect another appliance to that outlet.
  8. Make sure to properly ground the outdoor unit. The ground cable for the indoor unit shall be in the multi-conductor cord that connects the outdoor unit to the indoor unit.
  9. Every wire must be firmly connected. Loose wiring can cause the terminal to overheat, resulting in product malfunction and possible fire.
  10. Do not let wires touch or rest against refrigerant tubing, the compressor, or any moving parts within the unit.

The signal/power cable enables communication between the indoor and outdoor units. You must first choose the right cable size before preparing it for connection.

**Minimum Cross-Sectional Area of Power Cables**

Appliance Amps (A)	AWG
10	18
13	16
18	14
25	12
30	10

Table 2

**Choose the right cable size**

The size of the power supply cable, fuse, and switch needed is determined by the maximum current of the unit. The maximum current is indicated on the nameplate located on the side panel of the unit. Refer to this nameplate to choose the right cable, fuse, or switch.



Take note of fuse specifications

- ▶ The air conditioner's circuit board (PCB) is designed with a fuse to provide overcurrent protection. The specifications of the fuse are printed on the circuit board, for example: T3.15A/250VAC, T5A/250VAC, etc.

1. Prepare the cable for connection:
  - Using wire strippers, strip the rubber jacket from both ends of signal/power cable to reveal about 40mm (1.57in) of the wires inside.
  - Strip the insulation from the ends of the wires.
  - Using wire crimper, crimp u-type lugs on the ends of the wires.
2. Open the front panel of the indoor unit.
3. Using a screwdriver, open the wire box cover on the right side of the unit.



If a quick-connect cable is attached to the indoor unit's terminal block, remove this cable and discard. This quick-connect cable is used in the manufacturer production testing process.

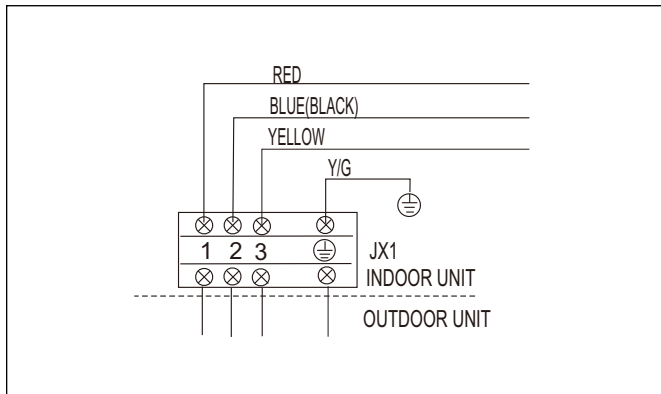


Figure 16 Wiring Schematic Example (refer to unit for actual schematic)



**WARNING: ELECTRICAL HAZARD**

- All wiring must be performed strictly in accordance with the wiring diagram located on the inside of the indoor unit's wire cover.

4. Unscrew the cable clamp below the terminal block and place it to the side.
5. Facing the back of the unit, remove the plastic panel on the bottom left-hand side.
6. Feed the signal wire through this slot, from the back of the unit to the front.
7. Facing the front of the unit, match the wire colors with the labels on the terminal block, connect the u-lug and and firmly screw each wire to its corresponding terminal.

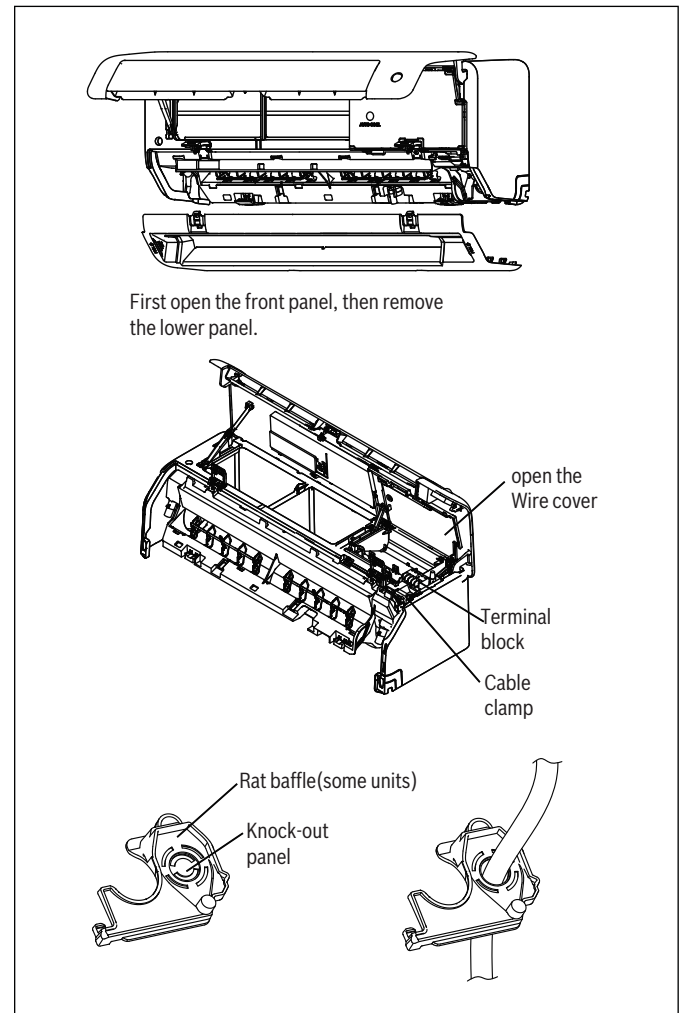


Figure 17



**WARNING: SYSTEM MALFUNCTION**

- Do not mix up live and wires not used. This is dangerous, and can cause the air conditioning unit to malfunction.

8. Make sure every connection is secure, and use the cable clamp to fasten the signal/power cable to the unit. Screw the cable clamp down tightly.
9. Replace the wire cover on the front of the unit, and the plastic panel on the back.



The wiring connection process may differ slightly between units.

### Step 7: Wrap piping and cables

Before passing the piping, drain hose, and the signal/power cable through the wall hole, you must bundle them together to save space, protect them, and insulate them.

1. Bundle the drain hose, refrigerant pipes, and signal/power cable according to Figure 15.

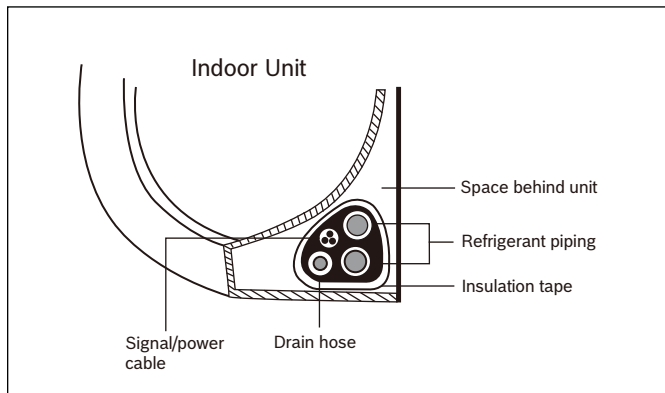


Figure 18



#### CAUTION: FIRE HAZARD

- Make sure that the drain hose is at the bottom of the bundle. Putting the drain hose at the top of the bundle can cause the drain pan to overflow, which can lead to fire or water damage.

#### NOTICE

- While bundling these items together, do not intertwine or cross the signal/power cable with any other wiring.

2. Using adhesive vinyl tape, attach the drain hose to the underside of the refrigerant pipes.
3. Using insulation tape, wrap the signal/power wire, refrigerant pipes, and drain hose tightly together. Double-check that all items are bundled in accordance with Figure 15.



Do not wrap ends of piping. When wrapping the bundle, keep the ends of the piping unwrapped. You need to access them to test for leaks at the end of the installation process (refer to Electrical Checks and Leak Checks section of this manual).

### Step 8: Mount indoor unit

If you installed new connective piping to the outdoor unit, do the following:

1. If you have already passed the refrigerant piping through the hole in the wall, proceed to Step 4.
2. Double-check that the ends of the refrigerant pipes are sealed to prevent dirt or foreign materials from entering the pipes.
3. Carefully pass the wrapped bundle of refrigerant pipes, drain hose, and signal/power wire through the hole in the wall.
4. Hook the top of the indoor unit on the upper hook of the mounting plate.
5. Check that unit is hooked firmly on the mounting plate by applying slight pressure to the left and right-hand sides of the unit. The unit should not jiggle or shift.
6. Using even pressure, push down on the bottom half of the unit. Keep pushing down until the unit snaps onto the hooks along the bottom of the mounting plate.
7. Again, check that the unit is firmly mounted by applying slight pressure to the left and the right-hand sides of the unit.



## 6 Outdoor Unit Installation

### NOTICE

- ▶ Below information only applies to the single zone application. For the instructions for the Multi ODU installation, please refer to the installation manual in the Multi-zone ODU package.

### Step 1: Select installation location

### NOTICE

- ▶ If the unit is frequently exposed to heavy rain or snow:
  - Build a shelter above the unit to protect it from the rain or snow. Be careful not to obstruct air flow around the unit.
- ▶ This unit is not designed for application in areas frequently exposed to salty air (seaside) conditions..

Before installing the outdoor unit, you must choose an appropriate location. The following are standards that will help you choose an appropriate location for the unit.

- ▶ Proper installation locations meet the following standards:
  - Meets all spatial minimum requirements shown in Installation Space Requirements ( Figure 17)

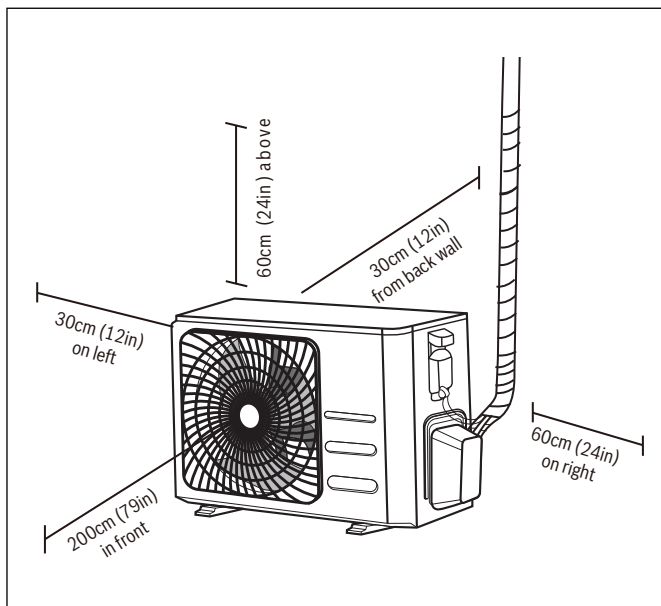


Figure 19

- Good air circulation and ventilation
- Firm and solid—the location can support the unit and will not vibrate
- Noise from the unit will not disturb others
- Protected from prolonged periods of direct sunlight or rain

- ▶ DO NOT install unit in the following locations:

- Near an obstacle that will block air inlets and outlets
- Near a public street, crowded areas, or where noise from the unit will disturb others
- Near animals or plants that will be harmed by hot air discharge
- Near any source of combustible gas
- In a location that is exposed to large amounts of dust
- In a location exposed to excessive amounts of salty air

### NOTICE

- ▶ If the unit is exposed to heavy wind: Install unit so that air outlet fan is at a 90° angle to the direction of the wind. If needed, build a barrier in front of the unit to protect it from extremely heavy winds. See Figures 18 and 19.

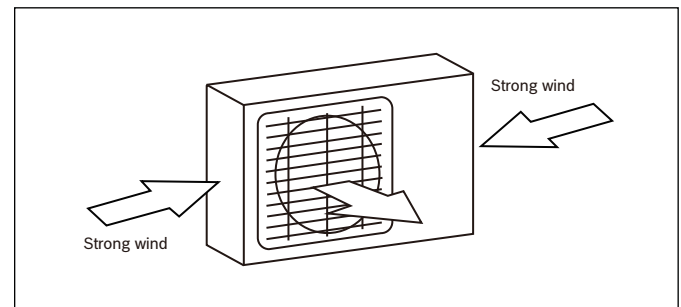


Figure 20

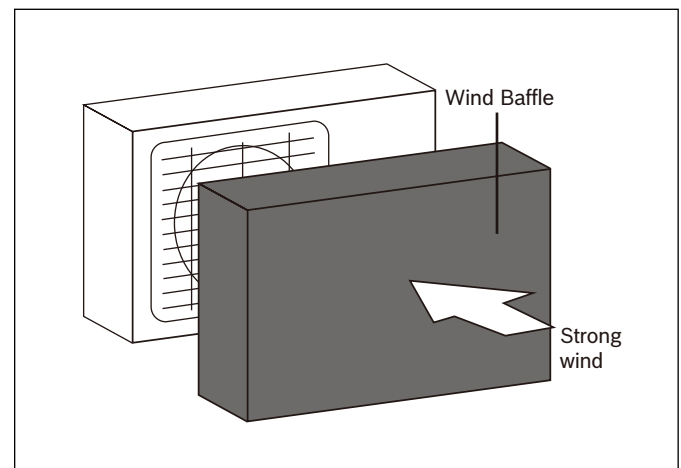


Figure 21

## Step 2: Install drain joint

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 20, 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 20, 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.

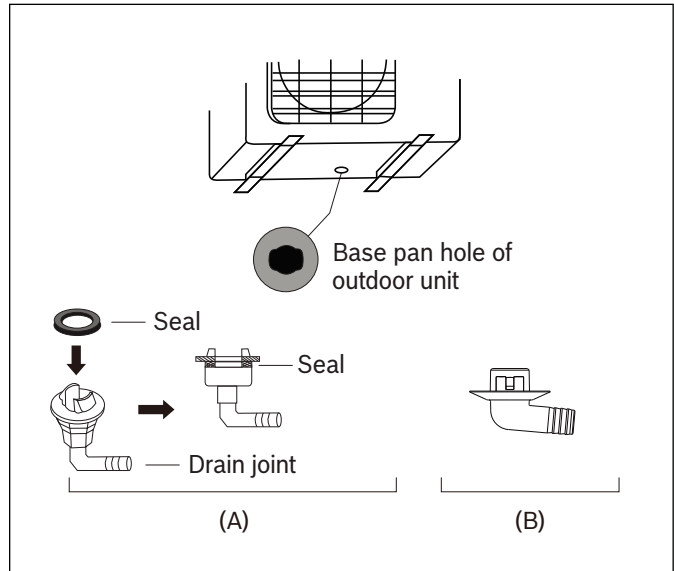


Figure 22

### Step 3: Anchor outdoor unit

The outdoor unit can be anchored to a commercially available mounting pad on the ground or to a wall-mounted bracket (both sold separately).

#### Unit mounting dimensions

The following is a list of different outdoor unit sizes and the distance between their mounting feet. Prepare the installation base of the unit according to the dimensions below.

#### NOTICE: PROPERTY DAMAGE/SYSTEM FAILURE

- ▶ Never mount this unit directly on the ground. It must be anchored according to the guidance provided in these instructions, and/or local building codes.

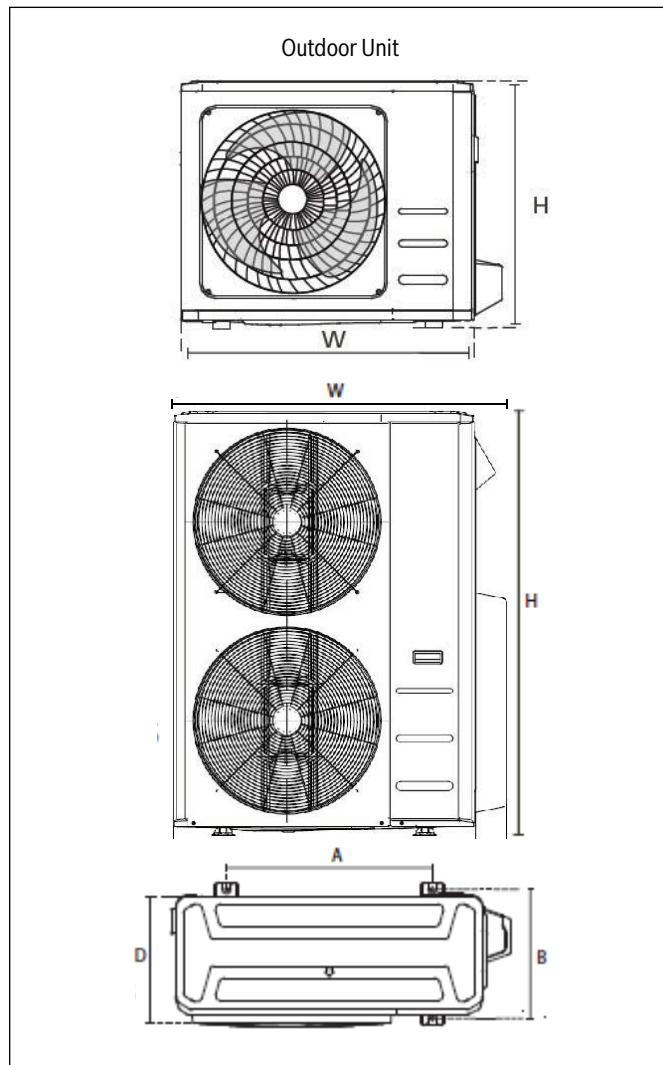


Figure 23

Outdoor Model	Outdoor Unit Dimensions mm (in)	Mounting Dimensions	
	W x H x D	Distance A mm (in)	Distance B mm (in)
BMS500-AAS012-0CSXRC, BMS500-AAS009-1CSXRC BMS500-AAS012-1CSXRC	765x555x303 (30.1"x 21.8"x 11.9")	454 (17.8")	286(11.3")
BMS500-AAS009-1CSXHC, BMS500-AAS012-1CSXHC	805x554x330 (31.7"x 21.8"x 13.0")	511 (20.1")	317(12.5")
BMS500-AAS018-1CSXRC, BMS500-AAS018-1CSXHC BMS500-AAM018-1CSXRC	890x673x342 (35.0"x 26.5"x 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 (37.2"x 31.9"x 16.1")	673 (26.5")	403 (15.9")
BMS500-AAS060-1CSXLB, BMS500-AAS048-1CSXLC BMS500-AAM048-1CSXRC, BMS500-AAM036-1CSXHC BMS500-AAM048-1CSXHC	952x1333x415 (37.5"x 52.5"x 16.34")	634 (25.0")	404 (15.9")

Table 3

If you install the unit on a concrete mounting platform, do the following:

1. Mark the positions for four expansion bolts based on dimensions in the Unit Mounting Dimensions chart.



**WARNING: PERSONAL INJURY**

- ▶ When drilling into concrete, eye protection is recommended at all times.

2. Pre-drill holes for expansion bolts.
3. Make sure mounting holes are clear of debris.
4. Place a nut on the end of each expansion bolt.
5. Hammer expansion bolts into the pre-drilled holes.
6. Remove the nuts from expansion bolts, and place outdoor unit on bolts.
7. Put washer on each expansion bolt, then replace the nuts.
8. Using a wrench, tighten each nut until snug.

If you will install the unit on a wall-mounted bracket, do the following:

**NOTICE: PROPERTY DAMAGE**

- ▶ Before installing a wall-mounted unit, make sure that the wall is made of solid brick, concrete, or of similarly strong material. The wall must be able to support at least four times the weight of the unit.

1. Mark the position of bracket holes based on dimensions in the Unit Mounting Dimensions chart.
2. Pre-drill the holes in the wall for the expansion bolts.
3. Clean dust and debris away from holes.
4. Place a washer and nut on the end of each expansion bolt.
5. Thread expansion bolts through holes in mounting brackets, put mounting brackets in position, and hammer expansion bolts into the wall.
6. Check that the mounting brackets are level.
7. Carefully lift unit and place its mounting feet on brackets.
8. Bolt the unit firmly to the brackets.



Reduce vibrations of wall mounted unit

- ▶ If allowed, you can install the wall-mounted unit with rubber gaskets to reduce vibrations and noise.

**Step 4: Connect signal and power cables**

The outside unit's terminal block is protected by an electrical wiring cover on the side of the unit. A comprehensive wiring diagram is printed on the inside of the wiring cover.

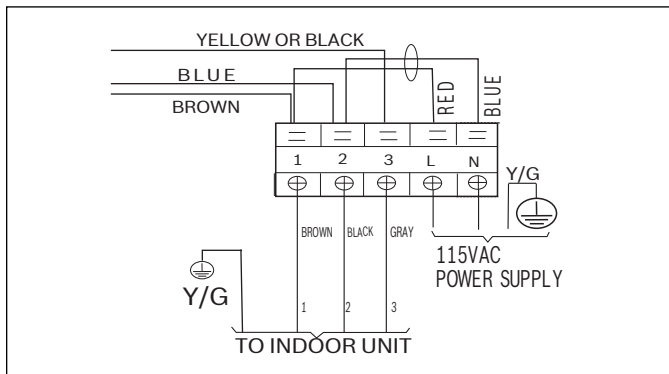


Figure 24 Wiring Schematic Example (refer to unit for actual schematic)



**WARNING: ELECTRICAL HAZARD**

- ▶ Before performing electrical work, read these regulations:
  1. All wiring must comply with local and national electrical codes, and must be installed by a licensed electrician.
  2. All electrical connections must be made according to the Electrical Connection Diagram located on the panels of the indoor and outdoor units.
  3. If there is a serious safety issue with the power supply, stop work immediately. Explain your reasoning to the client, and refuse to install the unit until the safety issue is properly resolved.
  4. Power voltage should be within 90-110% of rated voltage. Insufficient power supply can cause malfunction, electrical shock, or fire.
  5. When connecting power to fixed wiring, install a surge protector and main power switch with a capacity of 1.5 times the maximum current of the unit.
  6. When connecting power to fixed wiring, a switch or circuit breaker that disconnects all poles and has a contact separation of at least 1/8in (3mm) must be incorporated in the fixed wiring. The licensed electrician must use an approved/listed circuit breaker.
  7. Only connect the unit to an individual branch / dedicated circuit. Do not connect another appliance to that circuit.
  8. Make sure to properly ground the outdoor unit.
  9. Every wire must be firmly connected. Loose wiring can cause the terminal to overheat, resulting in product malfunction and possible fire.
  10. Do not let wires touch or rest against refrigerant tubing, the compressor, or any moving parts within the unit.


**DANGER: ELECTRICAL HAZARD**

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

1. Prepare the cable for connection:

**Minimum Cross-Sectional Area of Power Cables**

Appliance Amps (A)	AWG
10	18
13	16
18	14
25	12
30	10

Table 4

- Using wire strippers, strip the rubber jacket from both ends of signal/power cable to reveal about 40mm (1.57in) of the wires inside.
- Strip the insulation from the ends of the wires.
- Using wire crimper, crimp u-type lugs on the ends of the wires.


**WARNING: ELECTRICAL HAZARD**

- ▶ While crimping wires, make sure you clearly distinguish the Live ("L") Wire from other wires.


**WARNING: ELECTRICAL HAZARD**

- ▶ All wiring must be performed strictly in accordance with the wiring diagram located on the inside of the indoor unit's wire cover.

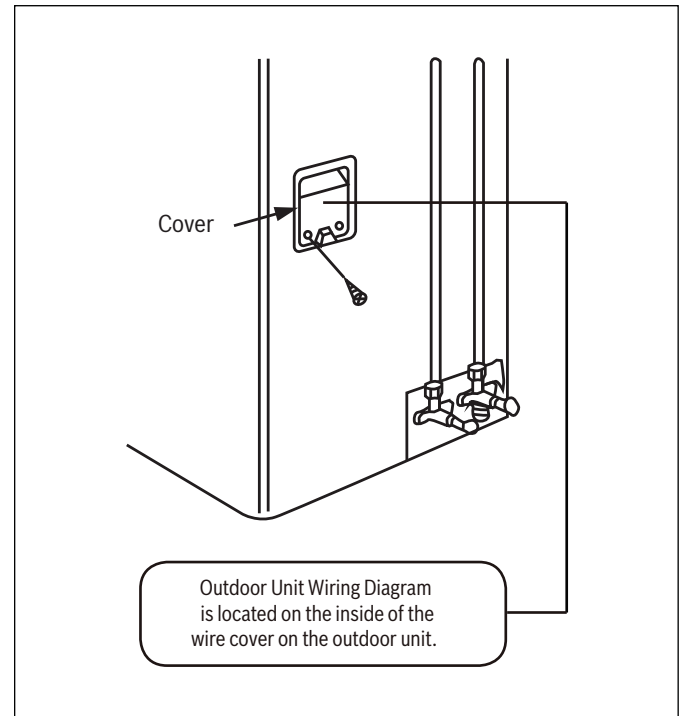


Figure 25

2. Unscrew the electrical wiring cover and remove it.
3. Unscrew the cable clamp below the terminal block and place it to the side.
4. 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.
5. After checking to make sure every connection is secure, loop the wires around to prevent rain water from flowing into the terminal.
6. Using the cable clamp, fasten the cable to the unit. Screw the cable clamp down tightly.
7. Insulate unused wires with PVC electrical tape. Arrange them so that they do not touch any electrical or metal parts.
8. Replace the wire cover on the side of the unit, and screw it in place.

## 7 Refrigerant Piping Connection



### WARNING: EXPLOSION, PERSONAL INJURY

- ▶ When connecting refrigerant piping, do not let substances or gases other than the specified refrigerant enter the unit. The presence of other gases or substances will lower the unit's capacity, and can cause abnormally high pressure in the refrigeration cycle. This can cause explosion and injury.



The length of refrigerant piping will affect the performance and energy efficiency of the unit. Nominal efficiency is tested on units with a pipe length of 5 meters (16.5ft). A minimum pipe run of 3 meters (9.8ft) is required to minimize vibration & excessive noise.

Refer to the table below for specifications on the maximum length and drop height of piping.

**Maximum length and drop height of refrigerant piping per unit model**

Model	Capacity (BTU/h)	Max. Equivalent Length m (ft)	Max. Height Variation m (ft)
R410A Inverter Split Air Conditioner	9K, 12K, 18K	30 (98.5ft)	20 (66ft)
	24K, 30K	50 (164ft)	25 (82ft)
	36K, 48K, 60K	65 (213ft)	30 (98.5ft)

Table 5

### 7.1 Connection Instructions – Refrigerant Piping

#### 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. 26 for cut examples.

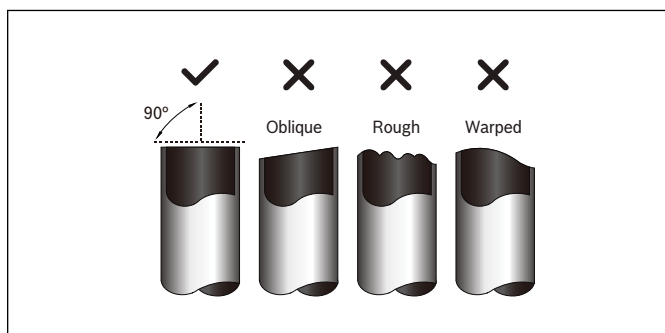


Figure 26

#### 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. See figure below.

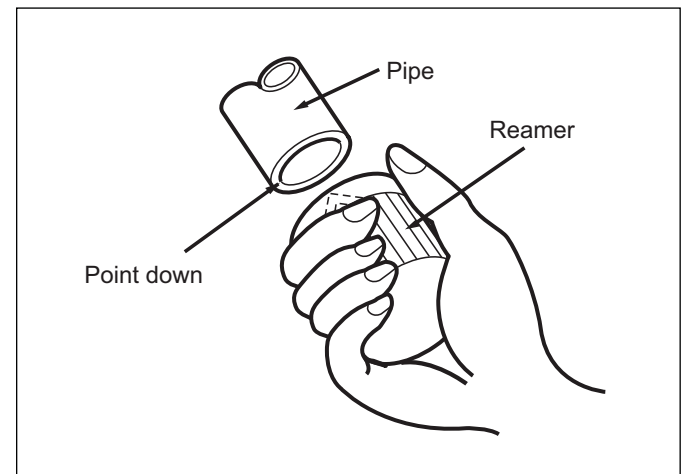


Figure 27

#### 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 28.

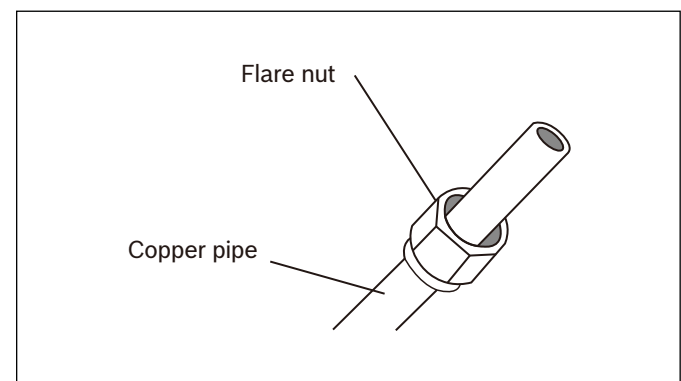


Figure 28

4. Remove tape from ends of pipe when ready to perform flaring work.
5. Clamp flare form 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 6.

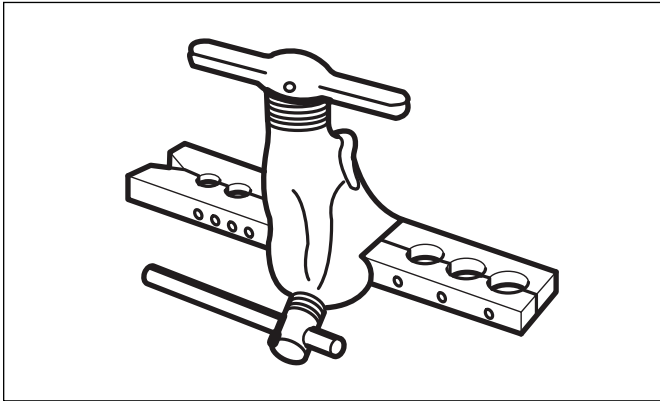


Figure 29

#### Piping extension beyond flare form

Outer diameter of tube mm (in.)	A mm (in.)	
	Min.	Max.
Ø 6.35 (Ø 0.25")	0.7 (0.0275")	1.3 (0.05")
Ø 9.52 (Ø 0.375")	1.0 (0.04")	1.6 (0.063")
Ø 12.7 (Ø 0.5")	1.0 (0.04")	1.8 (0.07")
Ø 16 (Ø 0.63")	2.0 (0.078")	2.2 (0.086")

Table 6

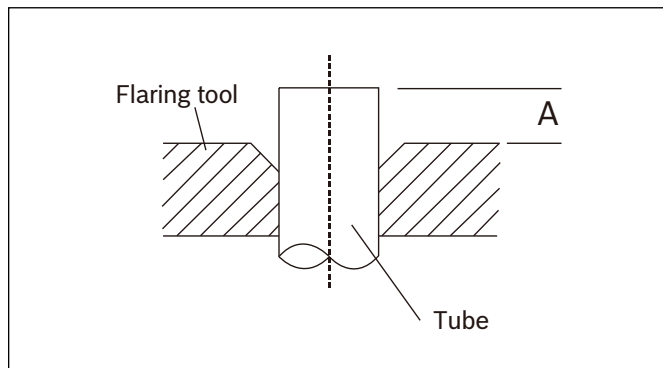


Figure 30

6. Place flaring tool onto the flaring block.
7. Turn the handle of the flaring tool clockwise until the pipe is fully flared.
8. Remove the flaring tool and flaring block, then inspect the end of the pipe for cracks and even flaring. Slide the nut up to see if the flare is of proper diameter and does not interfere with the threads in the flare nut.

#### Step 4: Connect refrigerant line set

When connecting refrigerant pipes, be careful not to use excessive torque or to deform the piping in any way. You should first connect the low-pressure (suction) pipe, then the high-pressure pipe (liquid line).



#### Minimum Bend Radius

When bending connective refrigerant piping, the minimum bending radius is 10cm (4in). See Figure 32.

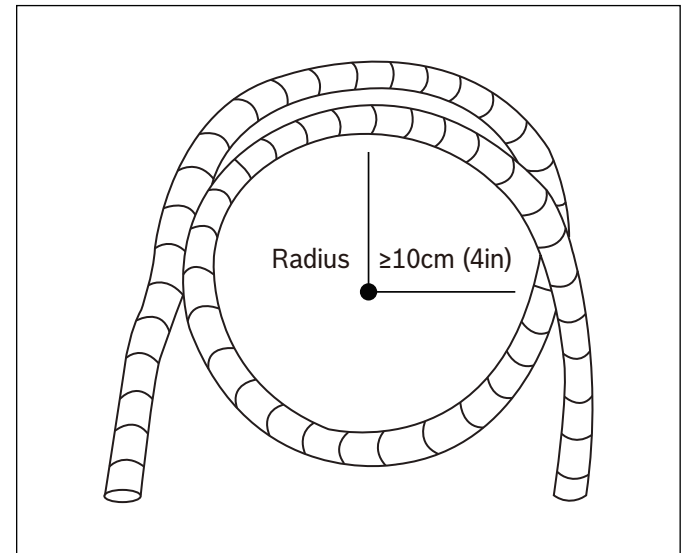


Figure 31

## 7.2 Connecting Piping to Indoor Unit

1. Align the center of the two pipes that you will connect. See Figure 32.

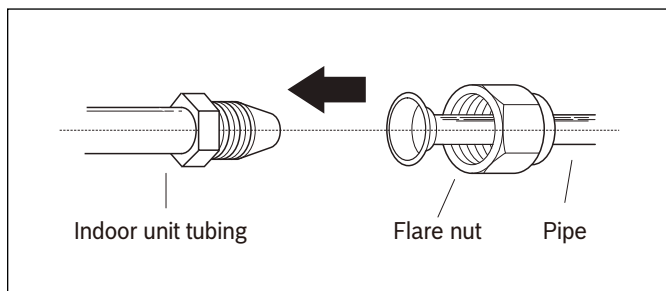


Figure 32

2. Tighten the flare nut as tightly as possible by hand.
3. Using a wrench, hold the nut on the unit tubing.
4. While firmly holding the nut on the unit tubing, use a torque wrench to tighten the flare nut according to the torque values in the Torque Requirements table below. Loosen the flaring nut slightly, then tighten again. See below.

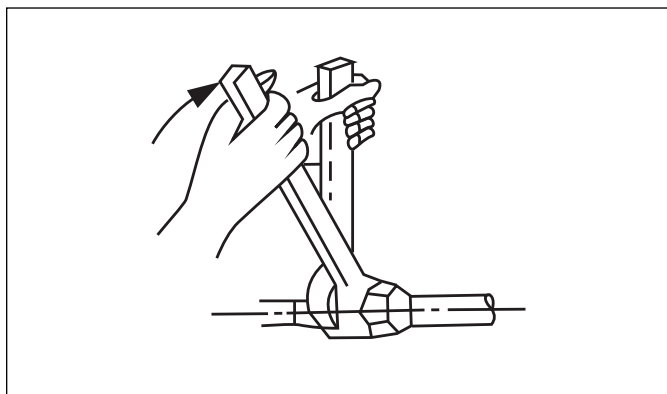


Figure 33

### Torque requirements

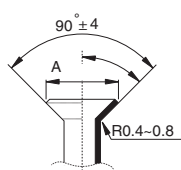
Pipe gauge mm (inch)	Tightening torque N.m (ft. lbs)	Flare dimension (A) (Unit: mm/Inch)		Flare shape
		Min.	Max.	
Ø 6.35 (1/4")	18-20 N.m (13.3 - 14.8 ft. lbs)	8.4/0.33	8.7/0.34	
Ø 9.52 (3/8")	25-26 N.m (18.4 - 19.2 ft. lbs)	13.2/0.52	13.5/0.53	
Ø 12.7 (1/2")	35-36 N.m (25.8-26.5 ft. lbs)	16.2/0.64	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 7

### NOTICE: DO NOT USE EXCESSIVE TORQUE

- Excessive force can break the nut or damage the refrigerant piping. You must not exceed torque requirements shown in the table above.

## 7.3 Connecting Tubing to Outdoor Unit

1. Unscrew and remove the cover on the side of the outdoor unit. See Figure 34.

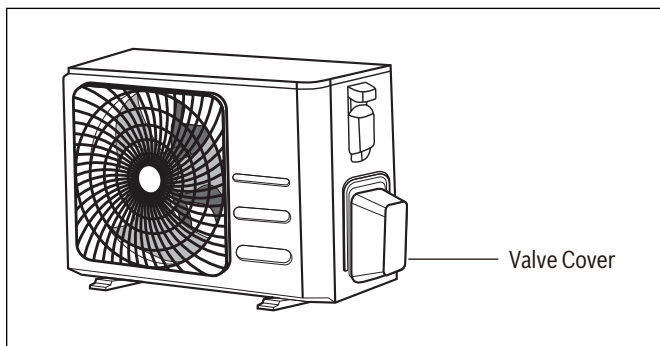


Figure 34

2. Remove protective caps from ends of valves.
3. Align flared pipe end with each valve, and tighten the flare nut as tightly as possible by hand.
4. Using a wrench, hold the body of the valve. Do not hold the nut that seals the service valve. See Figure 35.

### NOTICE: USE WRENCH TO HOLD MAIN BODY OF VALVE

- Torque from tightening the flare nut can snap off other parts of valve. Tighten by hand not by wrench.

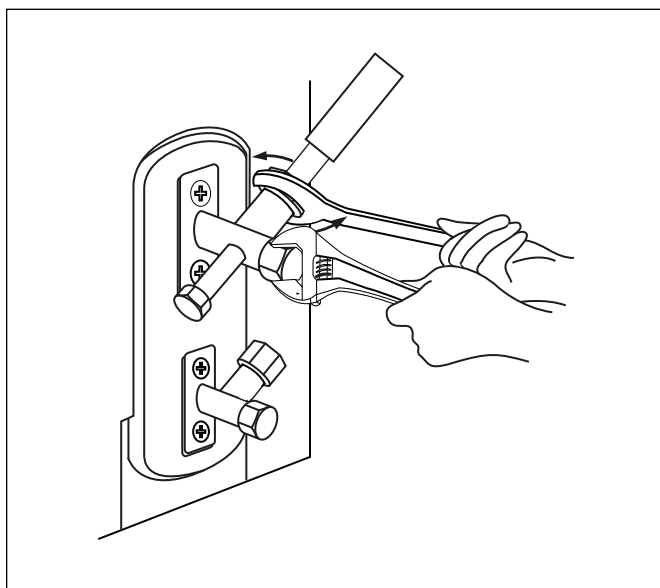


Figure 35

5. While firmly holding the body of the valve, use a torque wrench to tighten the flare nut according to the correct torque values.
6. Loosen the flaring nut slightly, then tighten again.
7. Repeat Steps 3 to 6 for the remaining pipe.



## 8 Evacuation and Charging Process

### 8.1 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.
- ▶ Perform nitrogen leak check on all refrigerant joints.

### 8.2 Evacuation Instructions

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

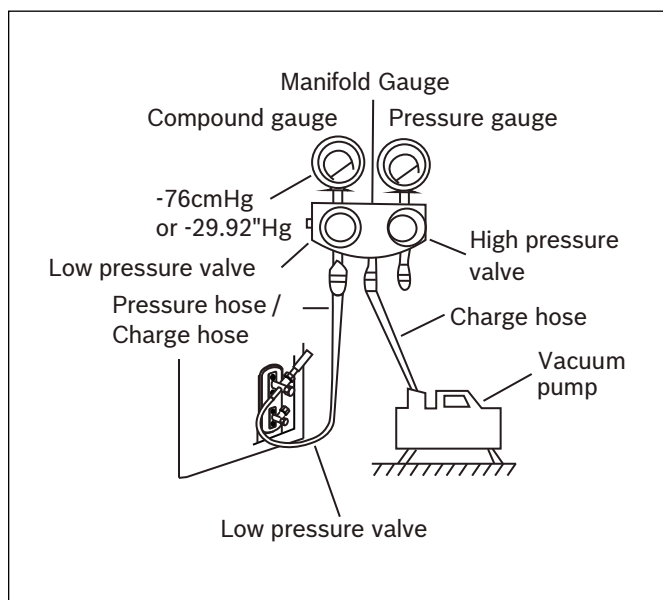


Figure 36

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.

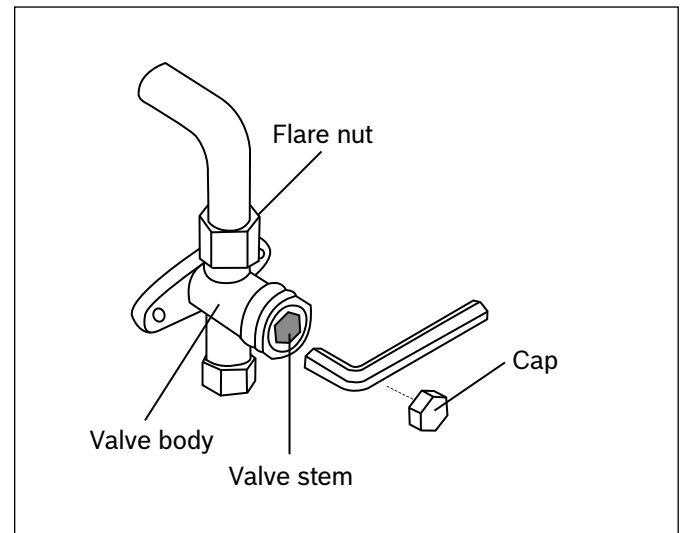


Figure 37

8. Remove the charge hose from the service port.
9. Using allen wrench, fully open both the high pressure and low pressure valves.
10. 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 service valve 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.

### 8.3 Adding Refrigerant

In North America, the standard pipe length is 7.5m (25ft). The minimum length is 10ft. The factory charge is suitable for pipe lengths of 10 - 25ft. If piping length exceeds 25ft, the additional refrigerant to be charged can be calculated using the formula in Table 8. For multi-zone units refer to the multi-zone installation and operation manual.

**Additional refrigerant per pipe length**

Connective Pipe	Additional Refrigerant	
< Standard pipe length	N/A	
> Standard pipe length	Liquid Side: Ø 6.35mm (ø 1/4")  Inverter R410A: (Pipe length – standard length) x 15g/m (Pipe length – standard length) x 0.16oz/ft	Liquid Side: Ø 9.52mm (ø 3/8")  Inverter R410A: (Pipe length – standard length) x 30g/m (Pipe length – standard length) x 0.32oz/ft

Table 8

**Single zone refrigerant pipe summary**

Model - Single Zone		Capacity (Btu/h)	Inch O.D.		Max. Equivalent Length m(ft)	Max. Height Variation m(ft)
IDU	ODU		Liquid Line	Vapor Line		
BMS500-AAU006-1AHWXC	BMS500-AAS009-1CSXRC	6K	1/4"	3/8"	30 (98ft)	20 (66ft)
BMS500-AAU009-1AHWXC	BMS500-AAS009-1CSXRC BMS500-AAS009-1CSXHC	9K	1/4"	3/8"	30 (98ft)	20 (66ft)
BMS500-AAU012-1AHWXC	BMS500-AAS012-1CSXRC BMS500-AAS012-1CSXHC	12K	1/4"	1/2"	30 (98ft)	20 (66ft)
BMS500-AAU018-1AHWXC	BMS500-AAS018-1CSXRC BMS500-AAS018-1CSXHC	18K	1/4"	1/2"	30 (98ft)	20 (66ft)
BMS500-AAU024-1AHWXC	BMS500-AAS024-1CSXRC BMS500-AAS024-1CSXRC	24K	3/8"	5/8"	50 (164ft)	25 (82ft)
BMS500-AAS030-1AHWXC	BMS500-AAS030-1CSXRC	30K	3/8"	5/8"	50 (164ft)	25 (82ft)
BMS500-AAS036-1AHWXC	BMS500-AAS036-1CSXRC	36K	3/8"	5/8"	65 (213ft)	30 (98.5ft)

Table 9



**CAUTION: CONTAINS REFRIGERANT**

- ▶ NEVER mix refrigerant types.

## 9 Electrical and Refrigerant Leak Checks

### 9.1 Electrical Safety Checks

**i** 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.

**WARNING: RISK OF ELECTRIC SHOCK**

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

### 9.2 Refrigerant Leak Checks

**i** Perform refrigerant leak check on all joints.

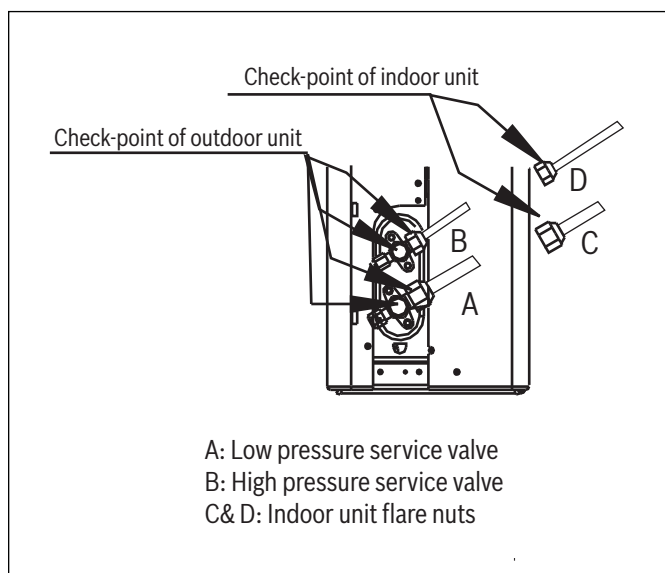


Figure 38

## 10 Test Run

### 10.1 Before Test Run

Only perform test run after you have completed the following steps:

- ▶ **Electrical Safety Checks:**  
Verify your line voltage is correct based on the specification.
- ▶ **Refrigerant Leak Checks:**  
Check all flare nut connections and confirm that the system is not leaking
- ▶ Confirm that gas and liquid (high and low pressure) valves are fully open

### 10.2 Test Run Instructions

You should perform the Test Run for at least 30 minutes.

1. Energize power at the outdoor unit.
2. Press the ON/OFF button on the remote controller to turn it on.
3. Press the MODE button to scroll through the following functions, one at a time:
  - COOL – Select lowest possible temperature
  - HEAT – Select highest possible temperature
4. Let each function run for 5 minutes, and perform the following checks:

List of Checks to Perform	Pass	Fail
No electrical leakage		
Unit is properly grounded		
All electrical terminals properly covered		
Indoor and outdoor units are solidly installed		
All pipe connection points do not leak - Outdoor (2): - Indoor (2):		
Water drains properly from drain hose		
All piping is properly insulated		
Unit performs COOL function properly		
Unit performs HEAT function properly		
Indoor unit louvers rotate properly		
Indoor unit responds to remote controller		

Table 10



#### 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 Refrigerant Leak Checks section for instructions.

5. After the Test Run is successfully complete, and you confirm that all check points in List of Checks to Perform have PASSED, do the following:
  - a. Using remote control, return unit to normal operating temperature.
  - b. Using insulation tape, wrap the indoor refrigerant pipe connections that you left uncovered during the indoor unit installation process.

#### If ambient temperature is below 63°F (17°C)

You can't use the remote controller to turn on the COOL function when the ambient temperature is below 63°F (17°C). In this instance, you can use the MANUAL CONTROL button to test the COOL function.

1. Locate the MANUAL CONTROL button on the right-hand side panel of the unit. See Fig.38.
2. Press the MANUAL CONTROL button one time to activate FORCED AUTO mode.
3. Press the MANUAL CONTROL again to activate FORCED COOLING mode.
4. Perform Test Run as normal.

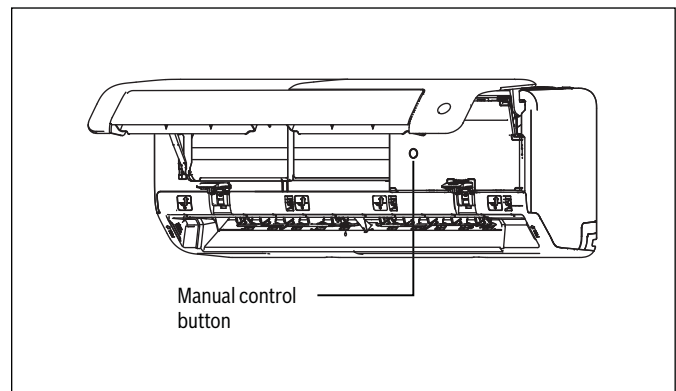


Figure 39

## 11 Display Codes (Indoor Unit)

Display*	Information
<b>dF</b>	Defrost
<b>CL</b>	Filter cleaning reminder (power on display for 15 seconds)
<b>CL</b>	Active clean
<b>FP</b>	Heating in room temperature under 8°C (46°F)
<b>FC</b>	Forced cooling
<b>RP</b>	AP mode of WiFi connection (not available in the US market)
<b>CP</b>	Remote switched off
<b>EH 00/EH 0R</b>	Indoor unit EEPROM parameter error
<b>EL 01</b>	Indoor/outdoor unit communication error
<b>EH 02</b>	Zero-crossing signal detection error
<b>EH 03</b>	The indoor fan speed is operating outside of the normal range
<b>EC 51</b>	Outdoor unit EEPROM parameter error
<b>EC 52</b>	Condenser coil temperature sensor T3 is in open circuit or has short circuited
<b>EC 53</b>	Outdoor room temperature sensor T4 is in open circuit or has short circuited
<b>EC 54</b>	Compressor discharge temperature sensor TP is in open circuit or has short circuited
<b>EC 56</b>	Evaporator coil outlet temperature sensor T2B is in open circuit or has short circuited(for free-match indoor units)
<b>EH 60</b>	Indoor room temperature sensor T1 is in open circuit or has short circuited
<b>EH 61</b>	Evaporator coil middle temperature sensor T2 is in open circuit or has short circuited
<b>EC 07</b>	The outdoor fan speed is operating outside of the normal range
<b>EH 0b</b>	Indoor PCB/Display board communication error
<b>EL 0C</b>	Refrigerant leakage detection
<b>PC 00</b>	IPM malfunction or IGBT over-strong current protection
<b>PC 01</b>	Over voltage or over low voltage protection

Table 11

\*The error codes are four digits, displayed two at a time on the LED



For troubleshooting, please refer to the services manual.

NOTES:

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