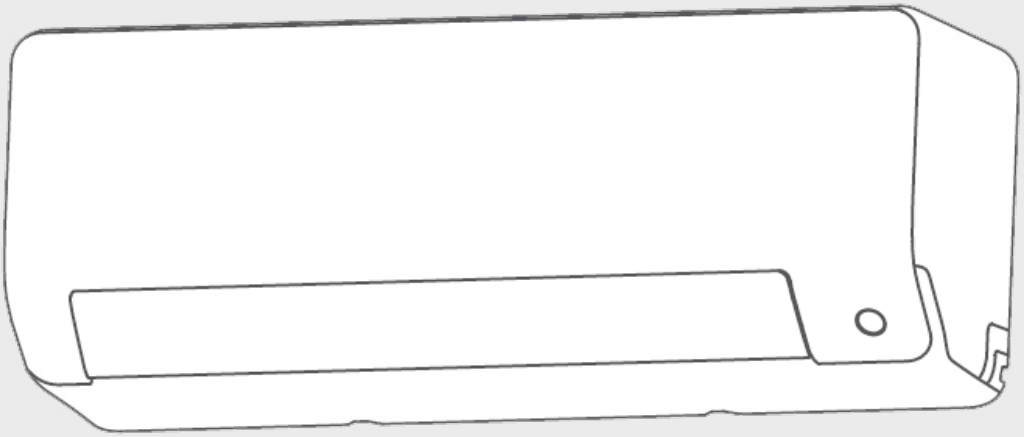
BOSCH

Installation and Operating Instructions

Wall Mounted Ductless Split Air Conditioner/Heat Pump

Climate 5000 Series - Gen 4



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Unitary Small HP
AHRI Standard 210/240
Certification applies only when the complete system is listed with AHRI.

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1 Key to Symbols and Safety Instructions

1.1 Key to Symbols

Warnings

In warnings, signal words at the beginning of a warning are used to indicate the type and seriousness of the ensuing risk if measures for minimizing danger are not taken.

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

DANGER

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

CAUTION indicates a hazardous situation which, if not avoided, could result in minor to moderate injury.

NOTICE

NOTICE is used to address practices not related to personal injury.

Important information

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

1.2 Explanation of Symbols Displayed on the Indoor Unit / Outdoor Unit

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

Table 1

1.3 Safety

Please read safety precautions before installation

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

WARNING

Improper or dangerous operation!

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.

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

Contains lead!

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

NOTICE

Improper operation, product damage!

Generation 4 Mini-Split products use R454B refrigerant and cannot be combined with models from previous Mini-Split generations (R410A refrigerant).
In addition, you must ONLY use R454B if additional refrigerant needs to be added into the system. Do NOT use any other refrigerant type.

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

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.

If connecting power to fixed wiring, an all-pole disconnection device which has at least 3mm clearances in all poles, and have a leakage current that may exceed 10mA, the residual current device(RCD) having a rated residual operating current not exceeding 30mA, and disconnection must be incorporated in the fixed wiring in accordance with the wiring rules.

CAUTION

Fire 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.

CAUTION

Contains refrigerant!

This air-conditioning unit contains fluorinated gases. For specific information on the type of gas and the amount, please refer to the relevant label on the outdoor unit itself.

Installation, service, maintenance and repair of this unit must be performed by a certified technician.

Product removal and recycling must be performed by a certified technician.

If the system has a leak-detection system installed, it must be checked for leaks at least every 12 months.

When the unit is checked for leaks, proper record-keeping of all checks is strongly recommended.

Any person who is involved with working on or breaking into a refrigerant circuit should hold a current valid certificate from an industry-accredited assessment authority, which authorises their competence to handle refrigerants safely in accordance with an industry recognized assessment specification

NOTICE

Product damage!

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 : T3.15AL/250VAC, T5AL/250VAC, T3.15A/250VAC, T5A/250VAC, T20A/250VAC, T30A/250VAC,etc.

Only blast-proof ceramic fuses can be used.

WARNING

Flammable refrigerant!

Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.

The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater).

Do not pierce or burn.

Be aware that refrigerants may not contain an odor.

CAUTION

Fire, personal injury, product damage!

Remove all static electricity before touching units.

1.3.1 For R454B refrigerant charge amount and minimum room area

The units you purchased may be one of the types in the table below. The indoor and outdoor units are designed to be used together. Please verify the unit you purchased per Table 2. The indoor unit should be installed at least 1.8m/5.9ft above from the floor, and the minimum room area of operating or storage should be as specified in Table 3.

For the units with refrigerant sensors, the minimum airflow of the indoor unit is as follows:

⚠ WARNING

Fire, property damage, personal injury, or death!

The minimum area for installation must be met. The minimum room area or minimum room area of conditioned space is based on releasable charge and total system refrigerant charge.

Capacity (Btu/h)	Model - Single Zone			
	IDU	ODU	Indoor Nominal air volume	
9K	BMS500-AAU009-1AHWXD	BMS500-AAS009-1CSXRD BMS500-AAS009-1CSXHD	550m³/hour	325CFM
12K	BMS500-AAU012-1AHWXD	BMS500-AAS012-1CSXRD BMS500-AAS012-1CSXHD	550m³/hour	325CFM
12K (115V)	BMS500-AAS012-0AHWXD	BMS500-AAS012-0CSXRD	550m³/hour	325CFM
18K	BMS500-AAU018-1AHWXD	BMS500-AAS018-1CSXRD BMS500-AAS018-1CSXHD	850m³/hour	500CFM
24K	BMS500-AAU024-1AHWXD	BMS500-AAS024-1CSXRD BMS500-AAS024-1CSXRD	1050m³/hour	620CFM
30K	BMS500-AAU030-1AHWXD	BMS500-AAS030-1CSXRD	1080m³/hour	635CFM
36K	BMS500-AAU036-1AHWXD	BMS500-AAS036-1CSXRD	1080m³/hour	635CFM

Table 2

When the unit detects a refrigerant leak, the minimum airflow of the indoor unit is shown in the table above.

Amin [ft²/m²]	hinst [ft/m]				
mc or mREL [oz/kg]	5.9~7.2 / 1.8~2.2	7.5/2.3	8.2/2.5	8.9/2.7	9.8/3.0
≤62.7/1.776			12/1.10		
63.5/1.8	60/5.53	57/5.29	52/4.86	48/4.50	44/4.05
70.5/2	66/6.14	63/5.88	58/5.41	54/5.01	48/4.50
77.6/2.2	73/6.76	70/6.46	64/5.95	57/5.51	53/4.95
84.6/2.4	79/7.37	76/7.05	70/6.49	65/6.01	58/5.41
91.7/2.6	86/7.99	82/7.64	76/7.03	70/6.51	63/5.86
98.8/2.8	93/8.6	89/8.23	81/7.57	75/7.01	68/6.31
105.8/3	99/9.21	95/8.81	87/8.11	81/7.51	73/6.76
112.9/3.2	106/9.83	101/9.4	93/8.65	86/8.01	78/7.21
119.9/3.4	112/10.44	107/9.99	99/9.19	92/8.51	82/7.66
127/3.6	119/11.06	114/10.58	105/9.73	97/9.01	87/8.11
134/3.8	126/11.67	120/11.16	111/10.27	102/9.51	92/8.56
141.1/4	132/12.29	126/11.75	116/10.81	108/10.01	97/9.01
148.1/4.2	139/12.9	133/12.34	122/11.35	113/10.51	102/9.46
155.2/4.4	145/13.51	139/12.93	128/11.89	119/11.01	107/9.91
162.2/4.6	152/14.13	145/13.51	134/12.43	124/11.51	111/10.36
169.3/4.8	159/14.74	152/14.1	140/12.97	129/12.01	116/10.81
176.4/5	165/15.36	158/14.69	145/13.51	135/12.51	121/11.26

Table 3

***Amin**: the required minimum room area in ft² /m²*

***mc**: the actual refrigerant charge in the system in oz/kg*

***mREL**: the refrigerant releaseable charge in oz/kg*

***hinst**: the height of the bottom of the appliance relative to the floor of the room after installation.*

Installation (where refrigerant pipes are allowed)

- Any person who is involved with working on or breaking into a refrigerant circuit should hold a current valid certificate from an industry-accredited assessment authority, which authorises their competence to handle refrigerants safely in accordance with an industry recognised assessment specification.
- Maintenance and repair requiring the assistance of other skilled personnel shall be carried out under the supervision of the person competent in the use of flammable refrigerants.
- That the installation of pipe-work shall be kept to a minimum.
- That pipe-work shall be protected from physical damage.
- Where refrigerant pipes shall be compliance with national gas regulations.
- That mechanical connections shall be accessible for maintenance purposes.
- Be more careful that foreign matter (oil, water,etc) does not enter the piping.
  Also, when storing the piping, securely seal the opening by pinching, taping, etc.
- All working procedure that a ects safety means shall only be carried by competent persons.
- Appliance shall be stored in a well ventilated area where the room size corresponds to the room area as specifiec for operation.
- Joints shall be tested with detection equipment with a capability of 5 g/ year of refrigerant or better, with the equipment in standstill and under operation or under a pressure of at least these standstill or operation conditions after installation. Detachable joints shall NOT be used in the indoor side of the unit (brazed, welded joint could be used).
- In cases that require mechanical ventilation, ventilation openings shall be kept clear of obstruction.
- LEAK DETECTION SYSTEM installed. Unit must be powered except for service. For the unit with refrigerant sensor, when the refrigerant sensor detects refrigerant leakage, the indoor unit will display a error code and emit a buzzing sound, the compressor of outdoor unit will immediately stop, and the indoor fan will start running. The service life of the refrigerant sensor is 15 years. When the refrigerant sensor malfunctions, the indoor unit will display the error code “FHCC”. The refrigerant sensor can not be repaired and can only be replaced by the manufacture. It shall only be replaced with the sensor specified by the manufacture.

Flammable Refrigerant

When a FLAMMABLE REFRIGERANT is used, the requirements for installation space of appliance and/or ventilation requirements are determined according to:

- the mass charge amount(M) used in the appliance,
- the installation location,
- the type of ventilation of the location or of the appliance.
- piping material, pipe routing, and installation shall include protection from physical damage in operation and service, and be in compliance with national and local codes and standards, such as ASHRAE 15, IAPMO Uniform Mechanical Code, ICC International Mechanical Code, or CSA B52. All field joints shall be accessible for inspection prior to being covered or enclosed.
- that protection devices, piping, and fittings shall be protected as far as possible against adverse environmental effects, for example, the danger of water collecting and freezing in relief pipes or the accumulation of dirt and debris;
- that piping in refrigeration systems shall be so designed and installed to minimize the likelihood of hydraulic shock damaging the system;
- that steel pipes and components shall be protected against corrosion with a rustproof coating before applying any insulation;
- that precautions shall be taken to avoid excessive vibration or pulsation;
- the minimum floor area of the room shall be mentioned in the form of a table
  or a single figure without reference to a formula;
- after completion of field piping for split systems, the field pipework shall be pressure tested with an inert gas and then vacuum tested prior to refrigerant charging, according to the following requirements:
  a. The minimum test pressure for the low side of the system shall be the low side design pressure and the minimum test pressure for the high side of the system shall be the high side design pressure, unless the high side of the system can not be isolated from the low side of the system in which case the entire system shall be pressure tested to the low side design pressure.
  b. The test pressure after removal of pressure source shall be maintained for at least 1 h with no decrease of pressure indicated by the test gauge, with test gauge resolution not exceeding 5% of the test pressure.
  c. During the evacuation test, after achieving a vacuum level specified in the manual or less, the refrigeration system shall be isolated from the vacuum pump and the pressure shall not rise above 1500 microns within 10 min. The vacuum pressure level shall be specified in the manual, and shall be the lessor of 500 microns or the value required for compliance with national and local codes and standards, which may vary between residential, commercial,and industrial buildings. - field-made
- field-made refrigerant joints indoors shall be tightness tested according to the following requirements: The test method shall have a sensitivity of 5 grams per year of refrigerant or better under a pressure of at least 0,25 times the maximum allowable pressure. No leak shall be detected.

Qualification of Workers

Any maintenance, service and repair operations must be required qualification of the working personnel. Every working procedure that aects safety means shall only be carried out by competent persons that joined the training and achieved competence should be documented by a certificate. The training of these procedures is carried out by national training organizations or manufacturers that are accredited to teach the relevant national competency standards that may be set in legislation. All training shall follow the ANNEX HH requirements of UL 60335-2-40 4th Edition. Examples for such working procedures are:

- breaking into the refrigerating circuit;
- opening of sealed components;
- opening of ventilated enclosures.

Ventilated area

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

Cabling

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

Detection of Flammable Refrigerants

Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used. The following leak detection methods are deemed acceptable for refrigerant systems. Electronic leak detectors may be used to detect refrigerant leaks but, in the case of FLAMMABLE REFRIGERANTS, the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerantfree area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed, and the appropriate percentage of gas (25 % maximum) is confirmed. Leak detection fluids are also suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.

Examples of leak detection fluids are:

- bubble method
- fluorescent method agents

If a leak is suspected, all naked flames shall be removed/extinguished.
If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut o valves) in a part of the system remote from the leak. See the following instructions of removal of refrigerant.

Removal and Evacuation

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

- safely remove refrigerant following local and national regulations; evacuate; purge the circuit with inert gas (recommended for A2L); evacuate (recommended for A2L); continuously flush or purge with inert gas when using flame to open circuit; and open the circuit.

The refrigerant charge shall be recovered into the correct recovery cylinders . For appliances containing flammable refrigerants, the system shall be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants. This process might need to be repeated several times. Compressed air or oxygen shall not be used for purging refrigerant systems.

For appliances containing flammable refrigerants, refrigerants purging shall be achieved by breaking the vacuum in the system with oxygen-free nitrogen and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum (optional for A2L). This process shall be repeated until no refrigerant is within the system (optional for A2L). When the final oxygen-free nitrogen charge is used, the system shall be vented down to atmospheric pressure to enable work to take place. The outlet for the vacuum pump shall not be close to any potential ignition sources, and ventilation shall be available.

Charging Procedures

In addition to conventional charging procedures, the following requirements shall be followed: Works shall be undertaken with appropriate tools only (In case of uncertainty, please consult the manufacturer of the tools for use with flammable refrigerants) Ensure that contamination of dierent refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them. Cylinders shall be kept upright. Ensure that the refrigeration system is earthed prior to charging the system with refrigerant. Label the system when charging is complete(if not already). Extreme care shall be taken not to overfill the refrigeration system. Prior to recharging the system it shall be pressure tested with oxygen free nitrogen (OFN). The system shall be leak tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.

When adding refrigerant, use ONLY R454B. This product cannot be used with any other type of refrigerant!

Recovery

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

The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of the flammable refrigerant. If in doubt, the manufacturer should be consulted. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition.

The recovered refrigerant shall be processed according to local legislation in the correct recovery cylinder, and the relevant waste transfer note arranged. Do not mix refrigerants in recovery units and especially not in cylinders.
If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The compressor body shall not be heated by an open flame or other ignition sources to accelerate this process. When oil is drained from a system, it shall be carried out safely.

Transportation, Marking and Storage for Units

1. Transport of equipment containing flammable refrigerants: Must be in compliance with the transport regulations.
2. Marking of equipment using signs: Must be in compliance with local regulations.
3. Disposal of equipment using flammable refrigerants: Must be in compliance with national regulations.
4. Storage of equipment/appliances: The storage of equipment should be in accordance with the manufacturer’s instructions.

Storage of packed (unsold) equipment: The storage package protection should be constructed such that mechanical damage to the equipment inside the package will not cause a leak of the refrigerant charge. The maximum number of pieces of equipment permitted to be stored together will be determined by local regulations.

2 Packing and Unpacking the Unit

2.1 Unpacking

Indoor Unit:

1. Cut the sealing tape on the carton with a knife, one cut on the left, one cut in the middle and one cut on the right.
2. Use the vice to take out the sealing nails on the top of the carton.
3. Open the carton.
4. Take out the middle support plate if it is included.
5. Take out the accessory package, and take out the connecting wire if it is included.
6. Lift the machine out of the carton and lay it flat.
7. Remove the left and right package foam or the upper and lower packaging foam, untie the packaging bag

Outdoor Unit:

1. Cut the packing belt.
2. Take the unit out of the carton.
3. Remove the foam from the unit.
4. Remove the packaging bag from the unit.

2.2 Packing

Indoor Unit:

1. Put the indoor unit into the packing bag.
2. Attach the left and right package foam or the upper and lower packaging foam to the unit.
3. Put the unit into the carton, then put accessory package in.
4. Close the carton and seal it with the tape.
5. Using the packing belt if necessary.

Outdoor Unit:

1. Put the outdoor unit into the packing bag.
2. Put the bottom foam into the box.
3. Put the unit into the carton, then put the upper packaging foam on the unit.
4. Close the carton and seal it with the tape.
5. Using the packing belt if necessary.

It is recommended to keep all packaging items in case you may need them in the future.

3 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.

WARNING

Personal injury, death, product damage!

Improper installation may result in water leakage, electrical shock and fire, or cause the equipment to fail.

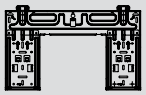
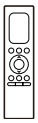
Name	Image	Quantity	Included in
Mounting plate		1	IDU
Wall anchor		5	IDU
Mounting plate fixing screw ST3.9 X 25		5	IDU
Remote controller		1	IDU
Fixing screw for remote controller holder ST2.9 x 10		2	IDU
Remote controller holder		1	IDU
Dry cell battery AAA.LR03		2	IDU
Seal		1	ODU
Drain joint			
Air Filter		1	IDU
Documentation	Owner's manual Installation manual Remote controller user manual 	1 each	IDU
Signal/power cable		1 (15ft cable)	IDU
Drain hose		1	ODU
Connecting pipe assembly	Liquid side: Φ6.35(1/4in) Liquid side: Φ9.52(3/8in) Vapor side: Φ9.52(3/8in) Vapor side: Φ12.7(1/2in) Vapor side: Φ 16(5/8in)	**Parts not included. See section 10.3 for detail.** Piping kits are available as an accessory.	N/A

Table 4

4 Installation Summary - Indoor Unit

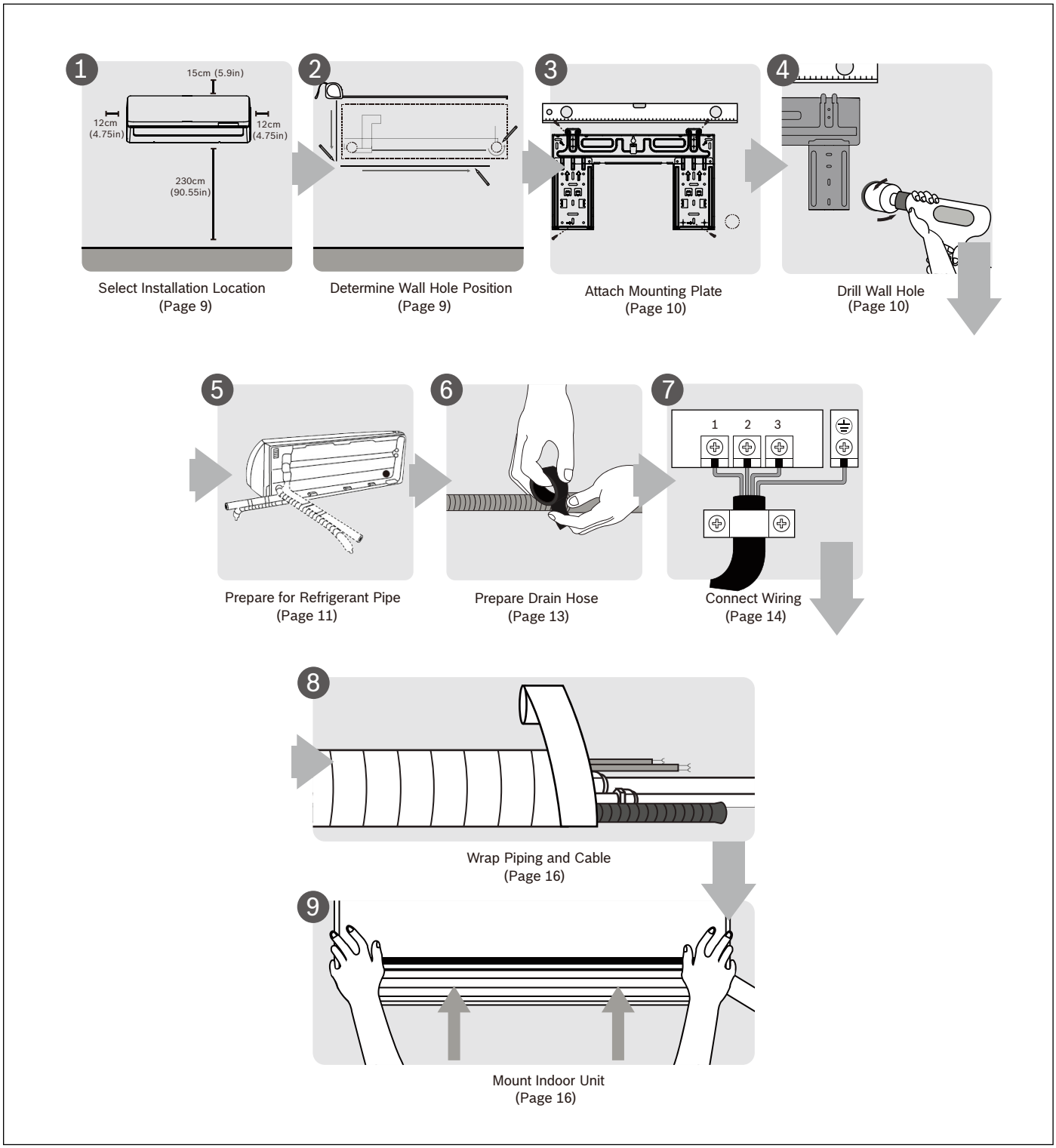
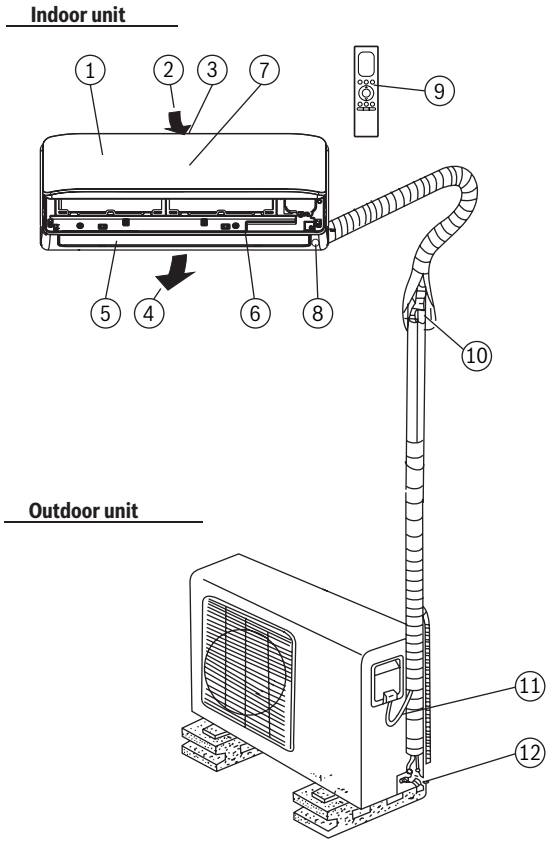


Figure 1

5 System Components



Part Descriptions

Indoor unit

1 Front panel
2. Air inlet
3. Air filter
4. Air outlet
5. Horizontal air flow grille
6. Vertical air flow louver(inside)
7. Display panel
8. ECO intelligent eye
9. Remote controller

Outdoor unit

10. Refrigerant pipe
11. Signal/power cable
12. Service valve

Display

LED display
- Displays temperature, operation features and error codes

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.

6 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 prope clearance from walls, ceiling and floor:

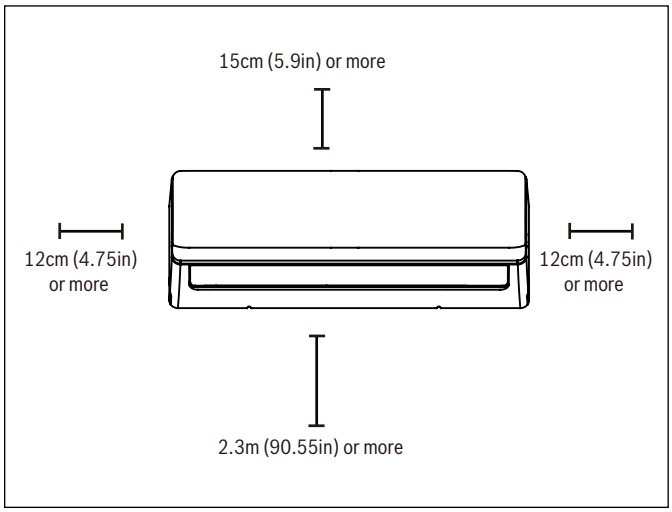


Figure 3

If back holder to prop up the unit is 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 fi lter, keep at least 10cm (3.93in) or more from the ceiling.

If back holder to prop up the unit is 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.

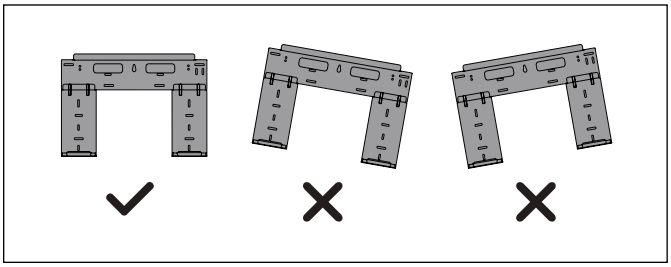
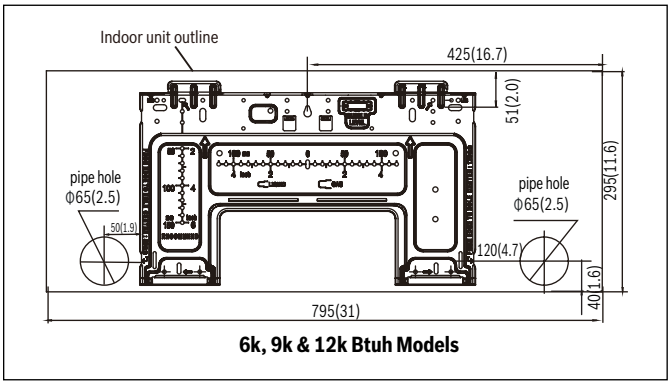


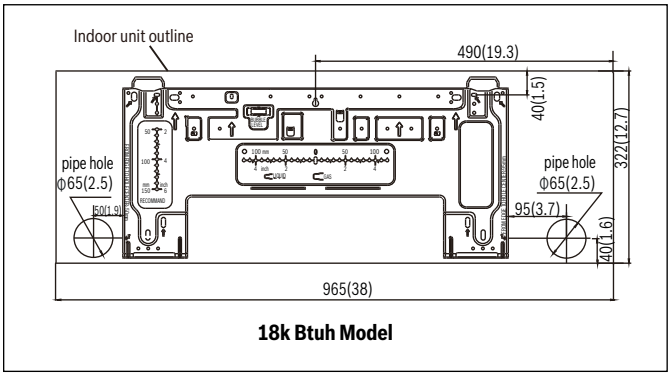
Figure 4

Mounting plate differences



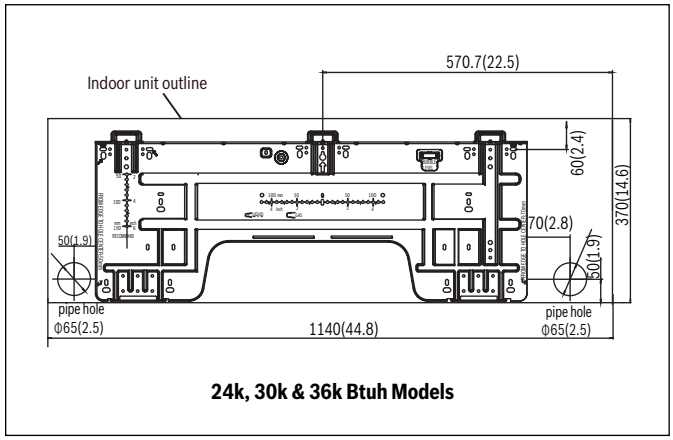
6k, 9k & 12k Btuh Models

Figure 5



18k Btuh Model

Figure 6



24k, 30k & 36k Btuh Models

Figure 7

When the gas side connective pipe is Ø16mm(5/8in) or more, the wall hole should be 3.54in (90mm).

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 2.5in (65mm) core drill, drill a hole in the wall. Make sure that the hole is drilled at a slight downward angle, so that the outdoor end of the hole is lower than the indoor end by about 0.2-0.275in (5mm to 7mm). This will ensure proper water drainage. (See Fig. 8)
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.

WARNING

Electrical shock, property damage!

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

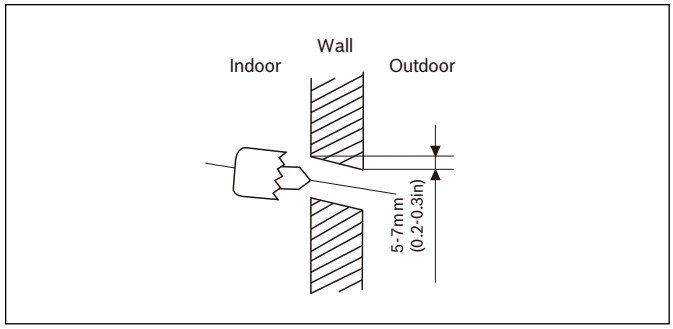


Figure 8

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 diff erent angles:

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

Refer to Figure 9 for details.

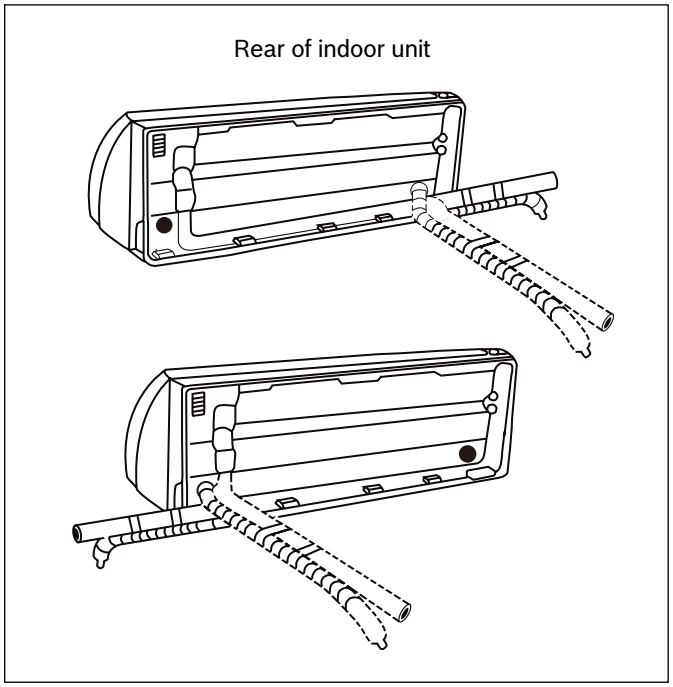


Figure 9

NOTICE

Product damage!

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.

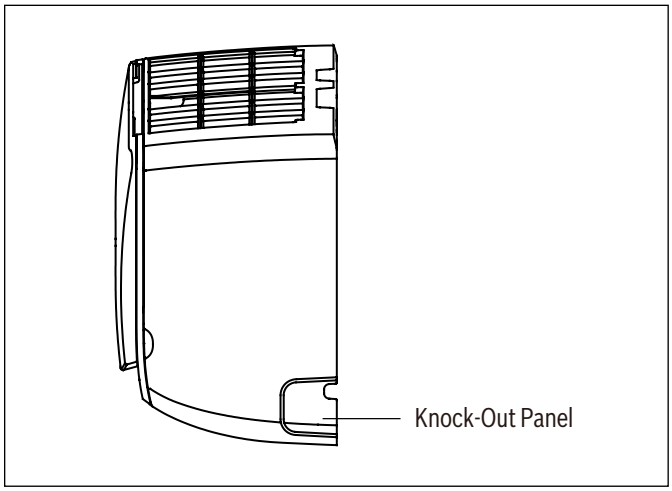


Figure 10

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.

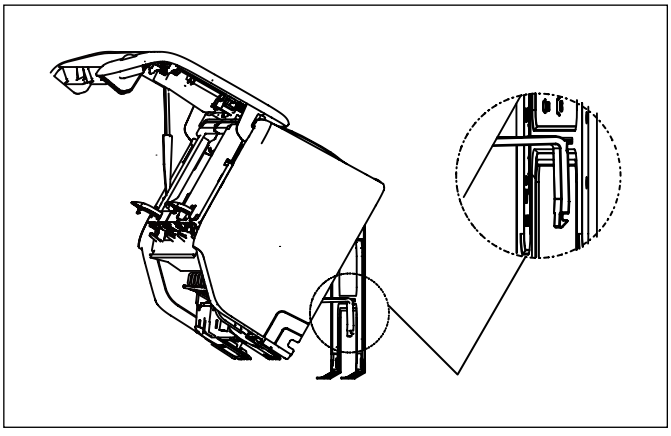


Figure 11 Unit Prop-Up Holder

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.

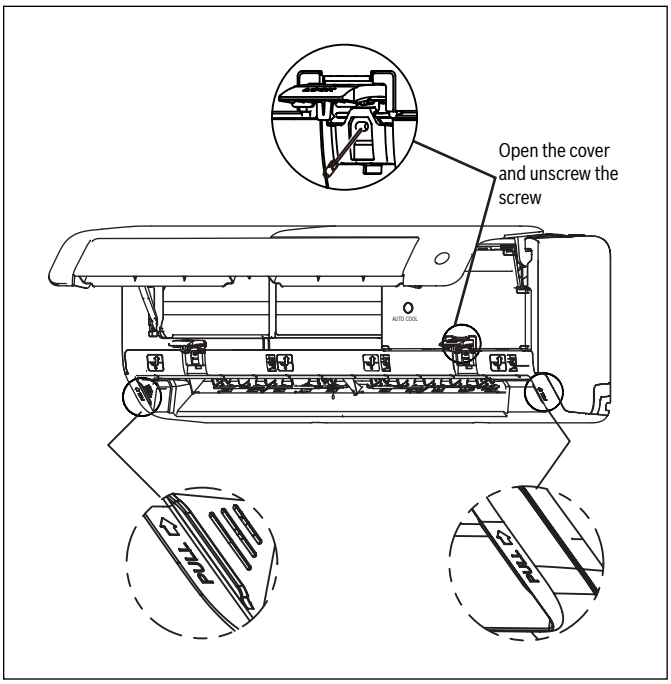


Figure 12

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.

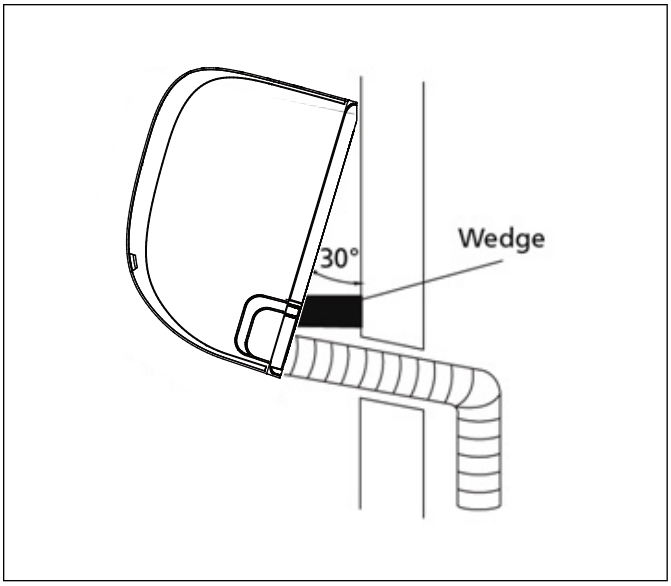


Figure 13

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. 14 & 15:

- 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

Property damage!

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

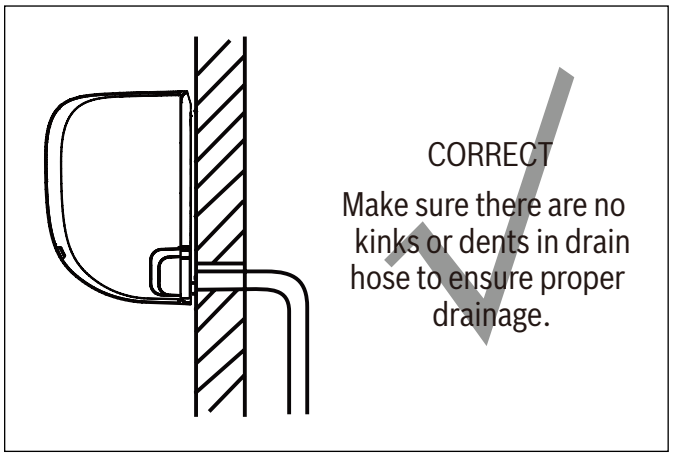


Figure 14

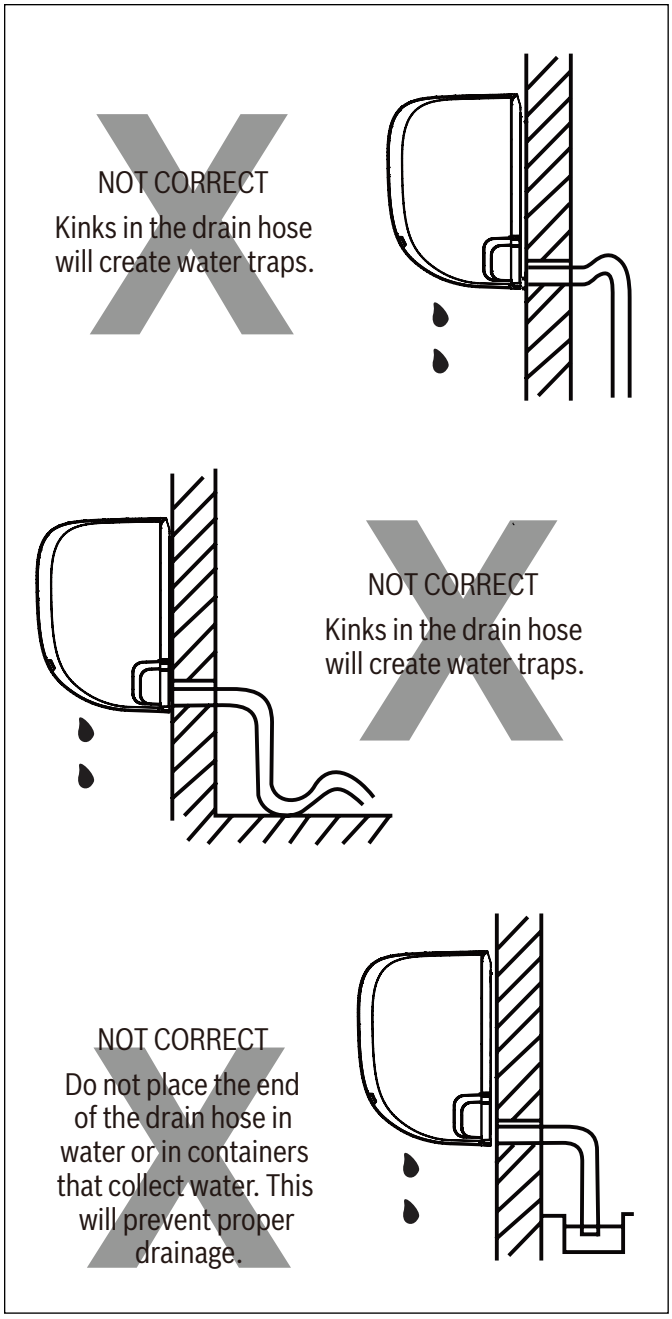


Figure 15

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

Electrical shock, property damage!

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 5

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.

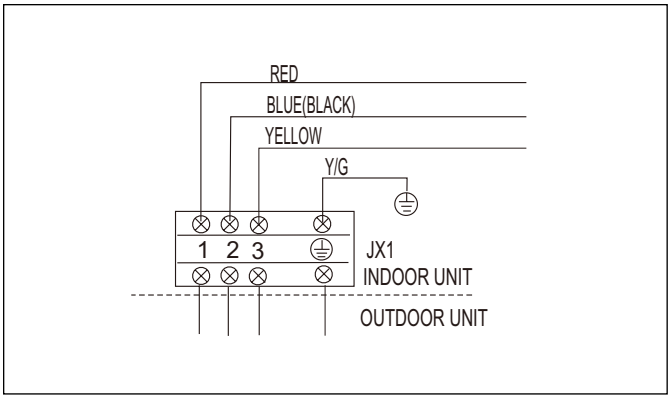


Figure 16 Wiring Schematic Example (refer to unit for actual schematic)

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.

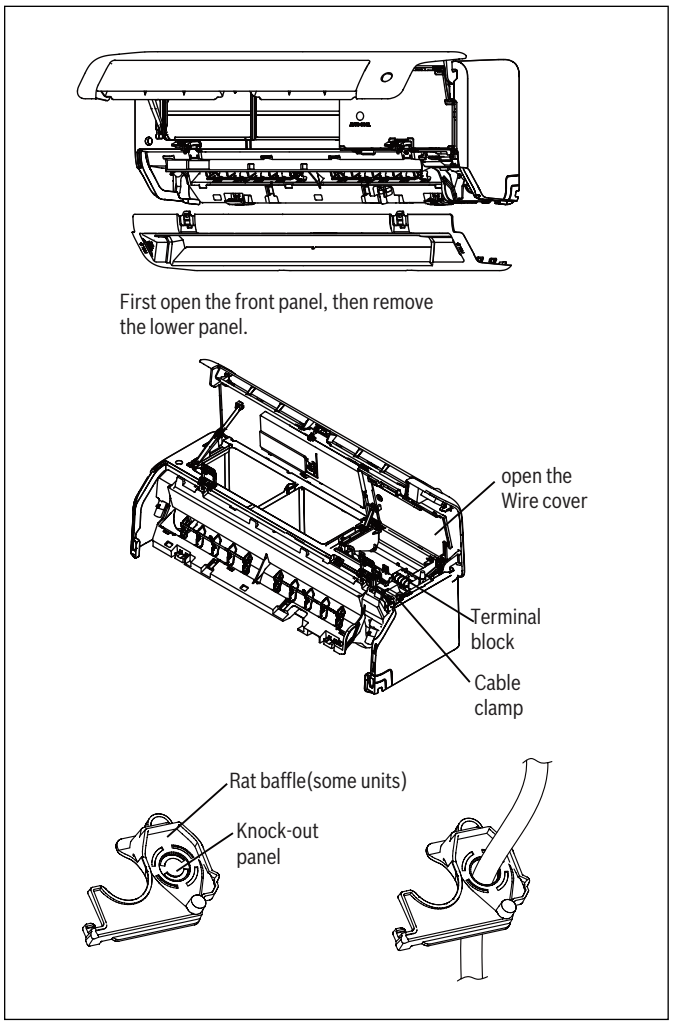


Figure 17

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 18.

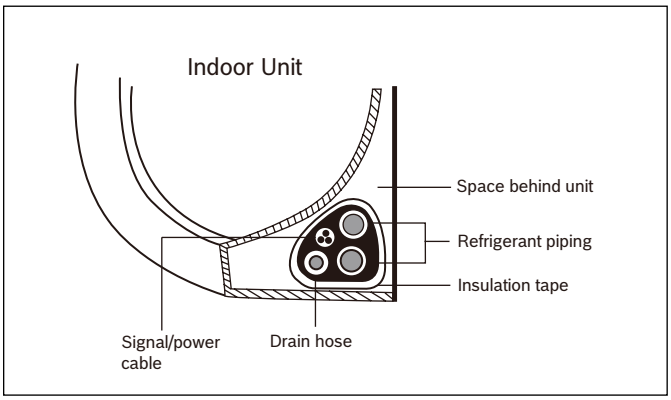


Figure 18

CAUTION

Fire hazard!

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

NOTICE

Product damage!

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 18.

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.

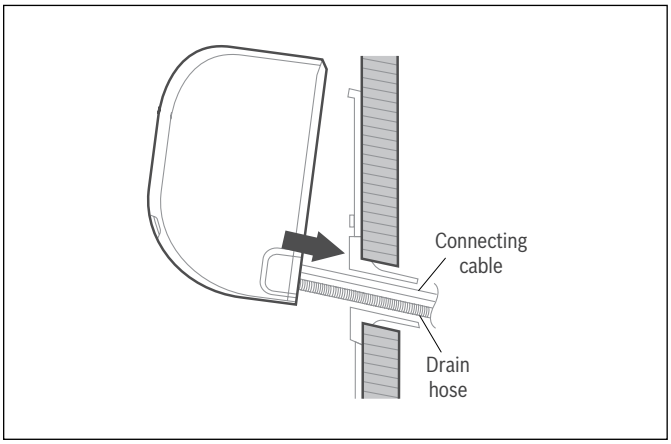


Figure 19

4. Hook the top of the indoor unit on the upper hook of the mounting plate.

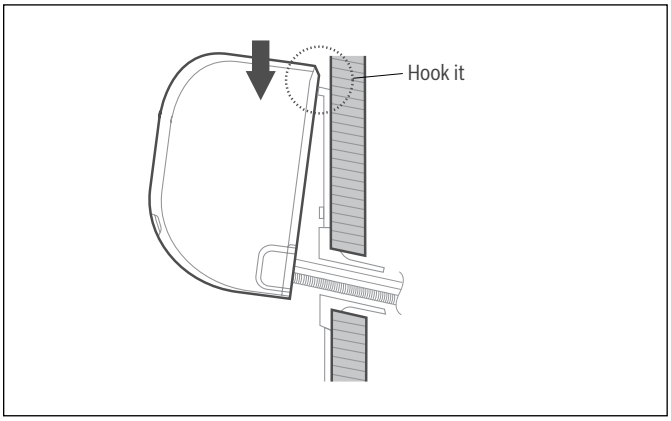


Figure 20

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.

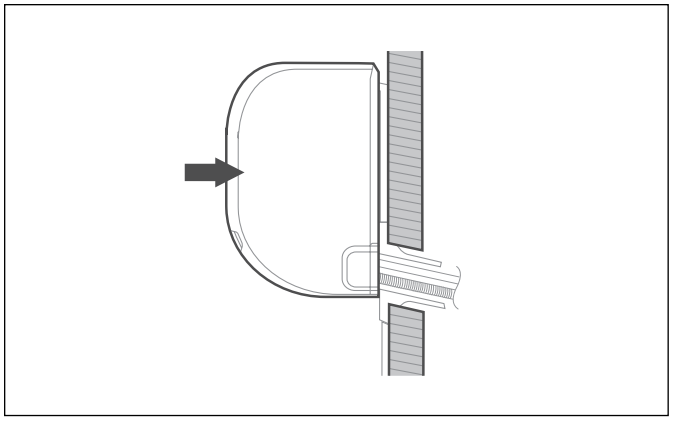


Figure 21

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.

Step 9: Preparing refrigerant connection to the outdoor unit

CAUTION

Personal injury!

Before performing the refrigerant piping connection, always wear work gloves and goggles, and remember that the connectors A and B are not allowed to face people directly.

For the units adopt the following pipe connectors, please strictly perform the piping work in accordance with the following instructions.

1. Press the cross shaped part of the push connector B for 10 - 15 seconds until the red protruding point of connector A retracts completely to de-pressurizer nitrogen from coil .
2. Remove connectors A and B, then perform the refrigerant piping connection between indoor unit and outdoor unit.

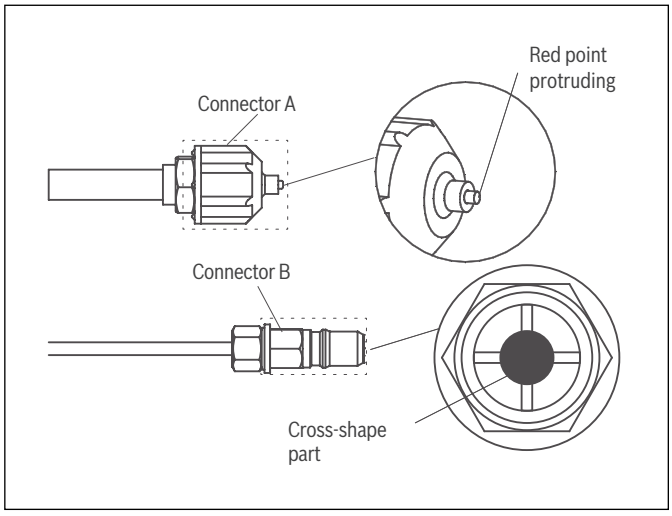


Figure 22

7 Outdoor Unit Installation

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.

7.1 Select Installation Location

NOTICE

Product damage!

If the unit is frequently exposed to heavy rain or snow:

- Build a shelter above the unit it 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 23)

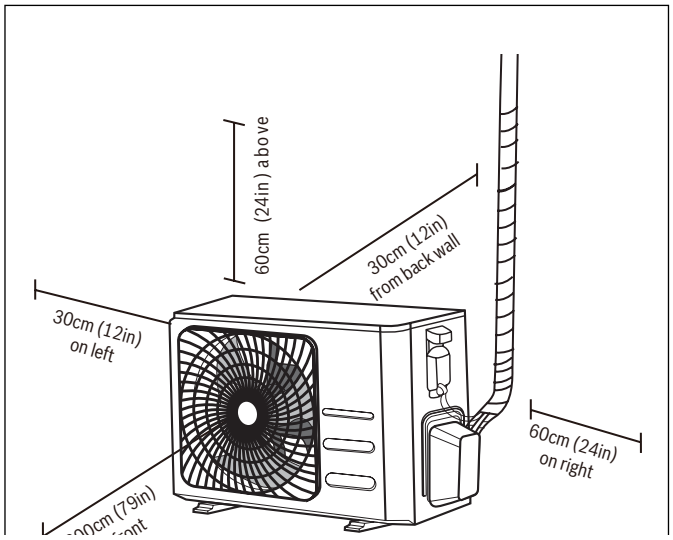


Figure 23

  - 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
  - Where snowfall is anticipated, take appropriate measures to prevent ice buildup and coil damage.
- 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

Product damage!

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 24 and 25.

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.

If the unit is frequently exposed to salty air(seaside), use outdoor unit that is specially designed to resist corrosion.

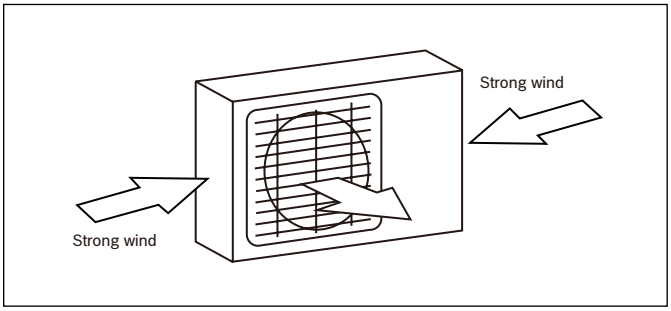


Figure 24

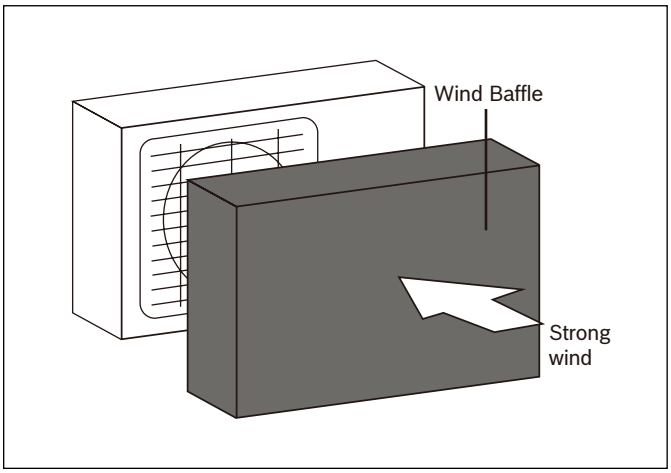


Figure 25

NOTICE

Product damage!

When operating the air conditioner in a low outdoor ambient temperature, be sure to follow the instructions described below.

- To prevent exposure to wind, install the outdoor unit with its suction side facing the wall.
- Never install the outdoor unit at a site where the suction side may be exposed directly to wind.
- To prevent exposure to wind, it is recommended to install a baffle plate on the air discharge side of the outdoor unit.
- In heavy snowfall areas, select an installation site where the snow will not affect the unit.

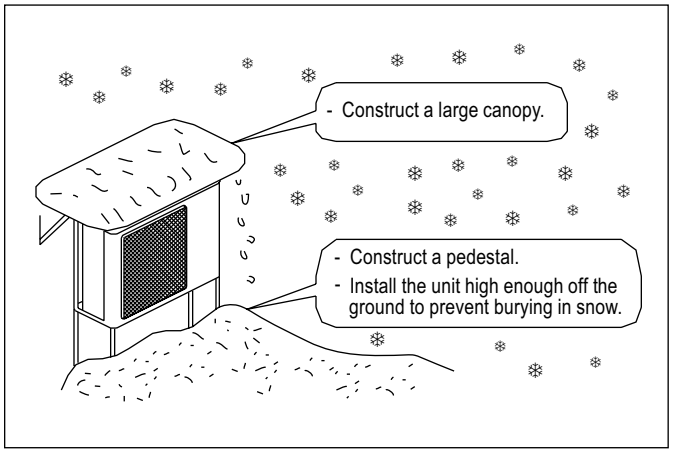


Figure 26

7.2 Install Drain Fitting

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

If the drain fitting comes with a rubber seal (see Figure 27, pos. A), do the following:

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

If the drain fitting doesn't come with a rubber seal (see Figure 27, pos. B), do the following:

1. Insert the drain fitting into the hole in the base pan of the unit. The drain fitting will click in place.
2. Connect a drain hose extension (field supplied) to the drain fitting to redirect water from the unit during heating mode.

NOTICE

Product damage!

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.

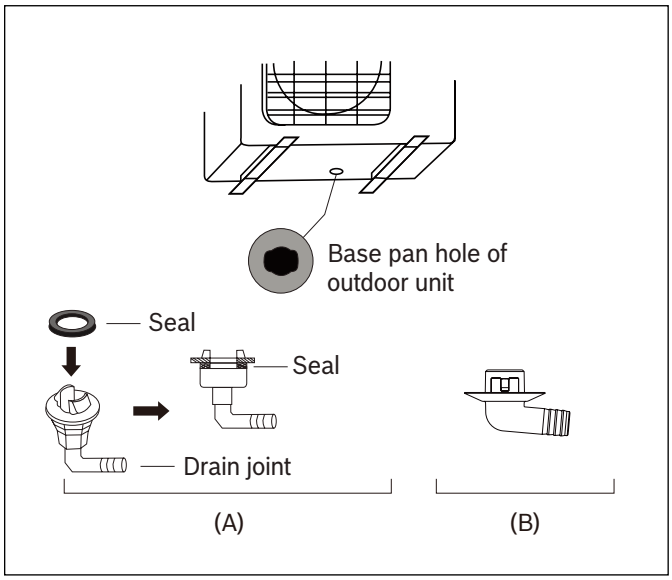


Figure 27

7.3 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).

If you are installing the outdoor unit on the ground,or a concrete mounting platform,use the following steps:

1. Mark the positions for four expansion bolts based on dimensions in the Mounting Dimensions chart and illustrations above.
2. Pre-drill holes for expansion bolts.
3. Clean concrete dust away from the holes.
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 the expansion bolts,and place outdoor unit on bolts.
7. Put a washer on each of the expansion bolts,then reinstall the nuts.
8. Using a wrench,tighten each nut until snug.

WARNING

Personal injury!

When drilling into concrete,eyeprotection is recommended at all times.

If you are installing the unit on a wall-mounted bracket, follow these steps:

CAUTION

Personal injury, property damage, product damage!

Before installing a wall-mounted unit,make sure that the wall is made of solid brick, concrete,or a similarly strong material. The wall must be able to support at least 4 times the weight of the unit.

1. Mark the position of the bracket holes based on the dimensions in the Mounting Dimensions chart on the previous page.
2. Pro-drill the holes for the expansion bolts.
3. Clean dust and debris away from the holes.
4. Place a washer and nut on the end of each expansion bolt.
5. Thread expansion bolts through the holes in the mounting brackets. Then,put the mounting brackets in position and hammer the expansion bolts into the wall.
6. Check that the mounting brackets are level.
7. If the feet of the outdoor unit have rubber pads already installed , and you are using a local dealer's wall-mounting bracket,remove them before attempting to mount the condenser to the bracket.The mounting bracket has rubber isolating pads on it that will take the place of these.
8. Carefully lift the unit and place its mounting feet on the brackets.
9. Then,bolt the unit firmly to the brackets.

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

7.4 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

Product damage!

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.

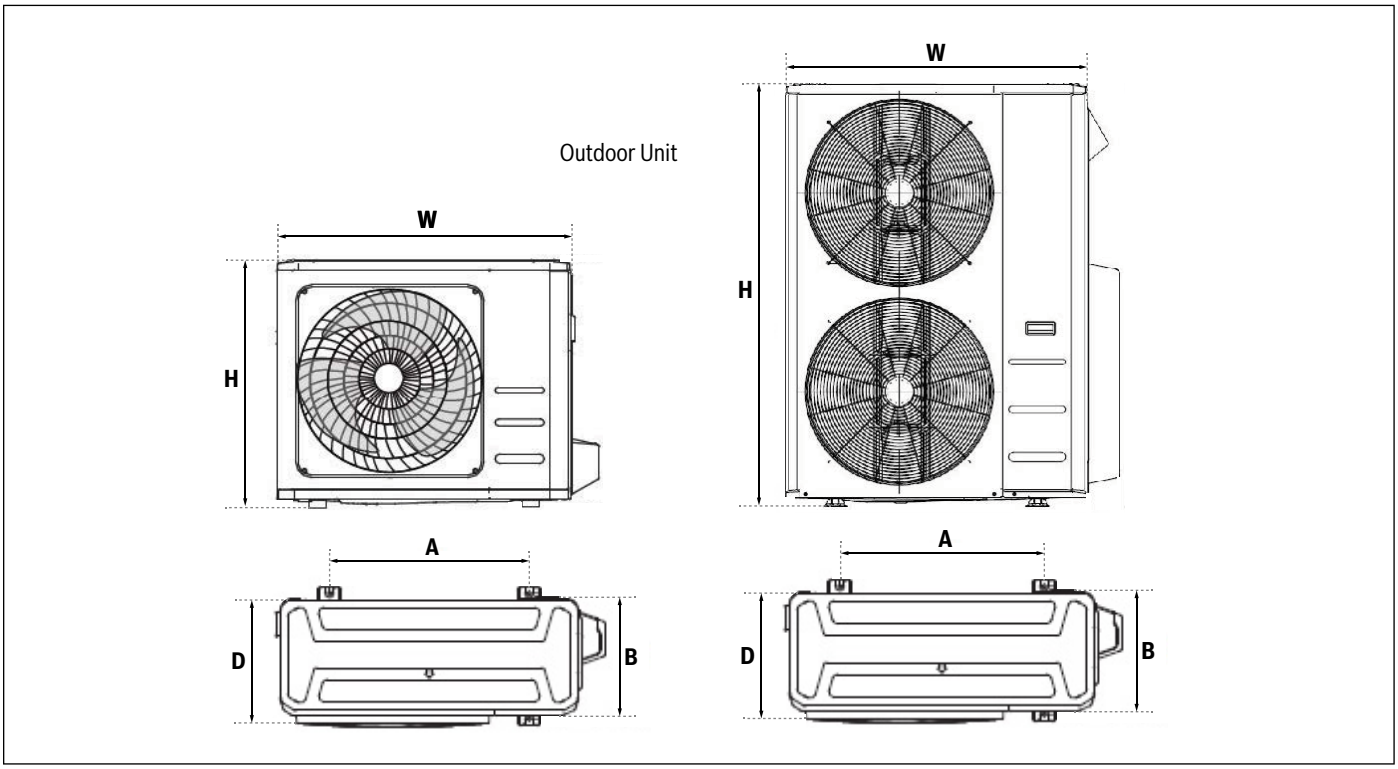


Figure 28

Outdoor Model	Outdoor Unit Dimensions in (mm)	Mounting Dimensions	
	W x H x D	Distance A mm (in)	Distance B mm (in)
BMS500-AAS012-0CSXRD, BMS500-AAS009-1CSXRD, BMS500-AAS012-1CSXRD	30.1"x 21.8"x 11.9" (765x555x303)	17.8" (454)	11.3" (286)
BMS500-AAS009-1CSXHD, BMS500-AAS012-1CSXHD	31.7"x 21.8"x 13.0" (805x554x330)	20.1" (511)	12.5" (317)
BMS500-AAS018-1CSXRD, BMS500-AAS018-1CSXHD, BMS500-AAM018-1CSXRD	35.0"x 26.5"x 13.5" (890x673x342)	26.1" (663)	13.7" (348)
BMS500-AAS030-1CSXRD, BMS500-AAS036-1CSXLD, BMS500-AAS036-1CSXRD, BMS500-AAS024-1CSXRD, BMS500-AAS024-1CSXHD, BMS500-AAM027-1CSXRD, BMS500-AAM036-1CSXRD, BMS500-AAM018-1CSXHD, BMS500-AAM027-1CSXHD	37.2"x 31.9"x 16.1" (946x810x410)	26.5" (673)	15.9" (403)

Table 6

7.5 Rows of Series Installation

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

	L	A
L ≤ H	L ≤ 1/2H	9.8in (25cm) or more
	1/2H < L ≤ H	11.8in (30cm) or more
L > H	Can not be installed	

Table 7

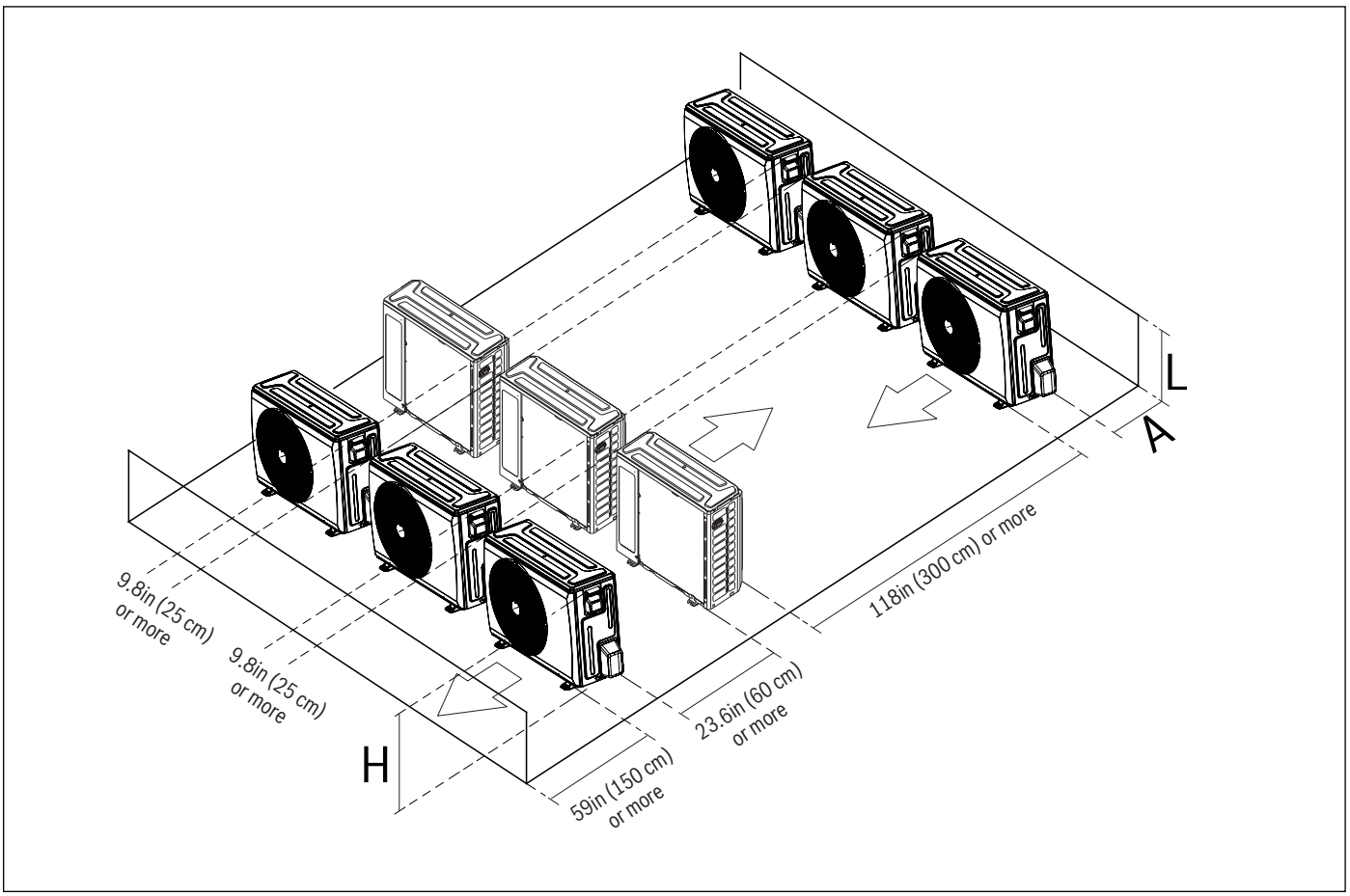


Figure 29

H: Unit height
L: Height of the wall behind the unit
A: Distance between unit and wall

8 Refrigerant Piping Connection

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 ft (m)	Max. Height Variation ft (m)
R454B Inverter Split Air Conditioner	6K, 9K, 12K	82 (25)	49.2 (15)
	18K	98.5 (30)	65.6 (20)
	24K, 30K	164 (50)	82 (25)
	36K	213 (65)	98.5 (30)

Table 8

8.1 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.30 for cut examples.

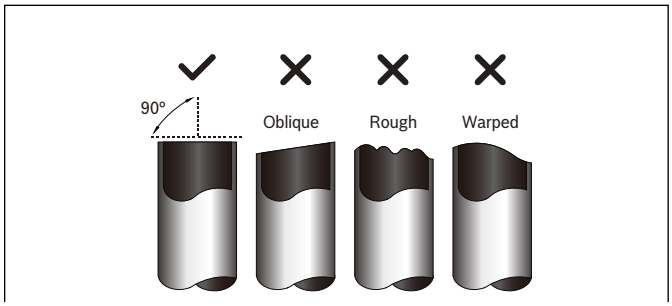


Figure 30

NOTICE

Product damage!

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

NOTICE

Oil traps - system failure !

If oil flows back into the outdoor unit's compressor, this might cause liquid compression or deterioration of oil return. Oil traps in the rising gas piping can prevent this.

- An oil trap should be installed every 20ft (6m) of vertical suction line riser (<36,000Btu/h unit).
- An oil trap should be installed every 32.8ft (10m) of vertical suction line riser (≥36,000Btu/h unit).

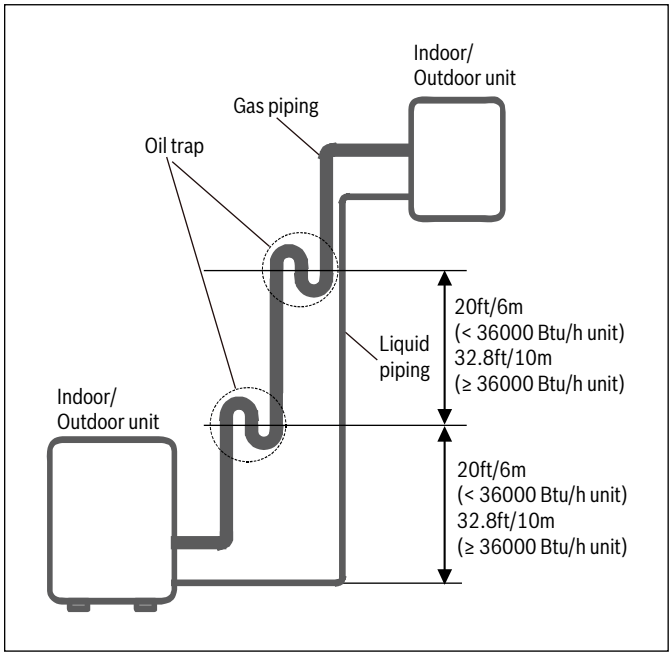


Figure 31

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.

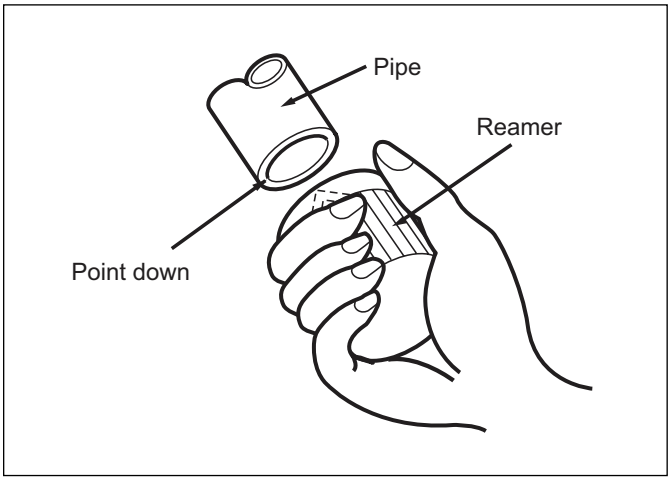


Figure 32

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 33.

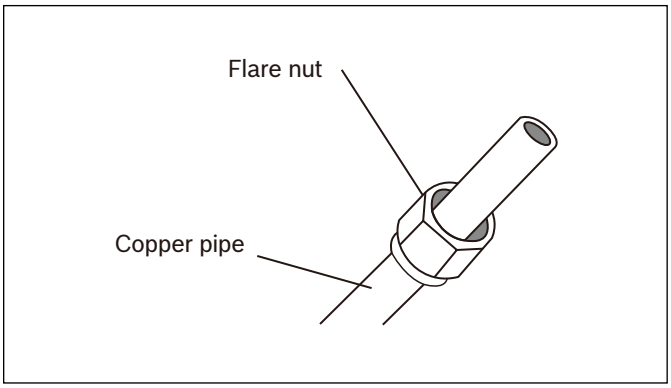


Figure 33

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 6.

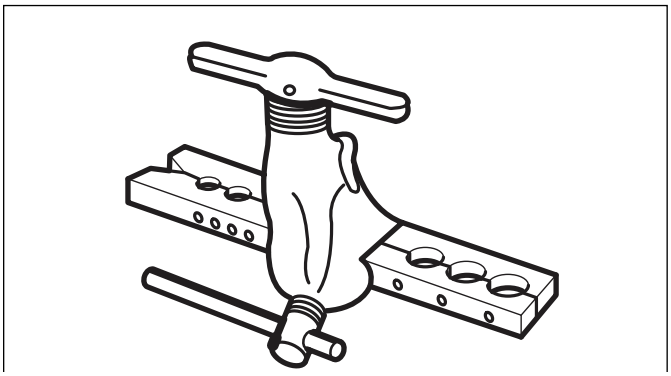


Figure 34

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")
Ø 19 (Ø 0.75")	2.0 (0.078")	2.4 (0.094")

Table 9

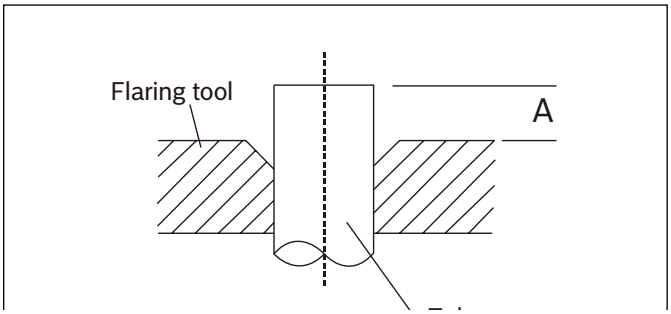


Figure 35

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 pipes

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 36.

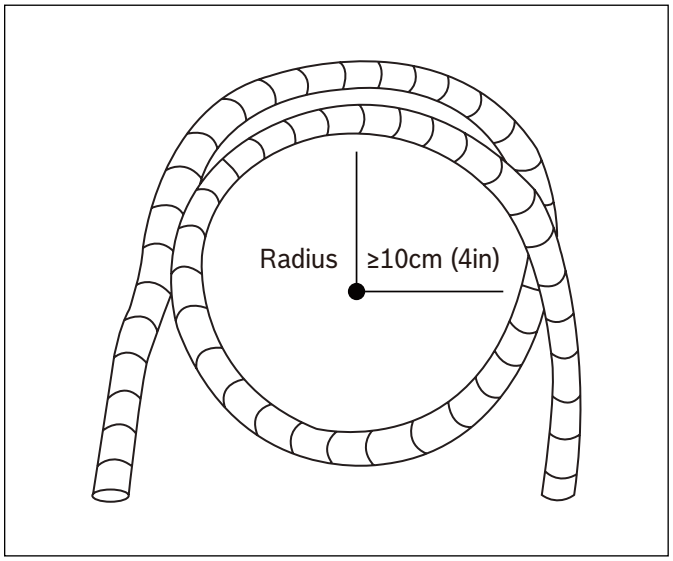


Figure 36

NOTICE

Product damage!

Make sure that no oil remains on plastic parts of the decoration panel (accessories sold separately). Oil may cause degradation and damage to plastic parts.

8.2 Connecting Piping to Indoor Unit

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. See Figure 37.

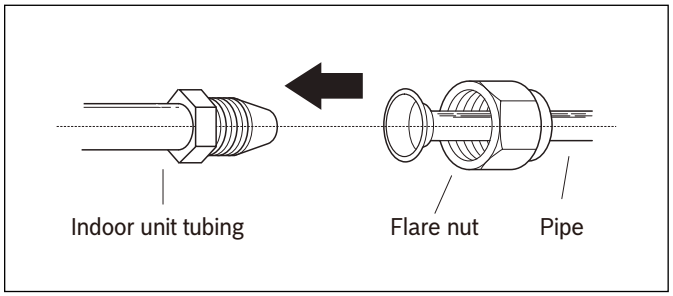


Figure 37

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 on the unit tubing, use a torque wrench to tighten the flare nut according to the torque values in the Torque Requirements Table 7. Loosen the flaring nut slightly, then tighten again.

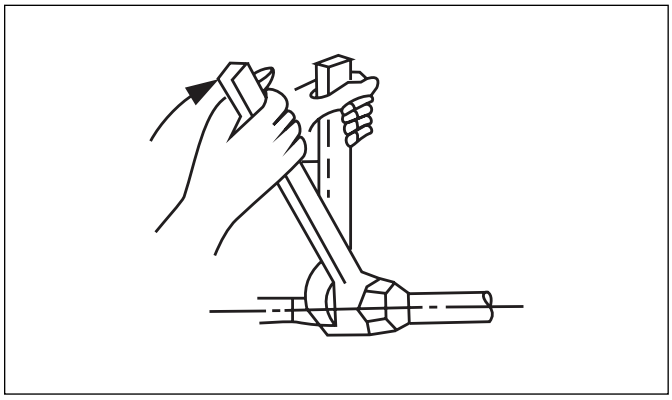


Figure 38

Torque requirements

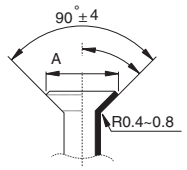
Pipe gauge mm (inch)	Tightening torque	Flare dimension (A) (Unit: mm/Inch)		Flare shape
		Min.	Max.	
Ø 6.35 (1/4)	18-20N.m (13.3 - 14.8 ft. lbs)	8.4/0.33	8.7/0.34	
Ø 9.52 (3/8)	25-26 N.m (18.4 - 19.2 ft. lbs)	13.2/0.52	13.5/0.53	
Ø 12.7 (1/2)	35-36 N.m (25.8-26.5 ft. lbs)	16.2/0.64	16.5/0.65	
Ø 15.9 (5/8)	45-47 N.m (33.2-34.7 ft. lbs)	19.2/0.76	19.7/0.78	

Table 10

NOTICE

Product damage - 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.

8.3 Connecting Tubing to Outdoor Unit

1. Unscrew and remove the cover on the side of the outdoor unit. See Figure 39.

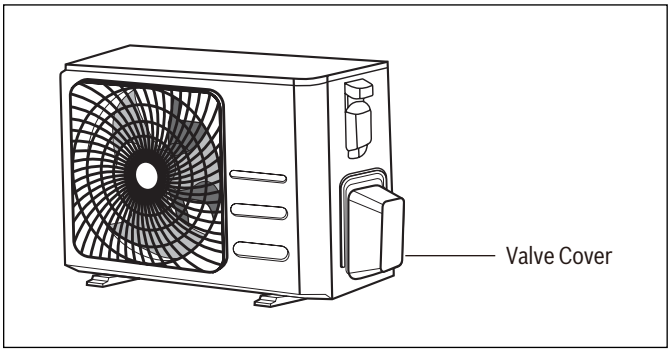


Figure 39

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 grip the nut that seals the service valve. See Figure 40.

NOTICE

Product damage - 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.

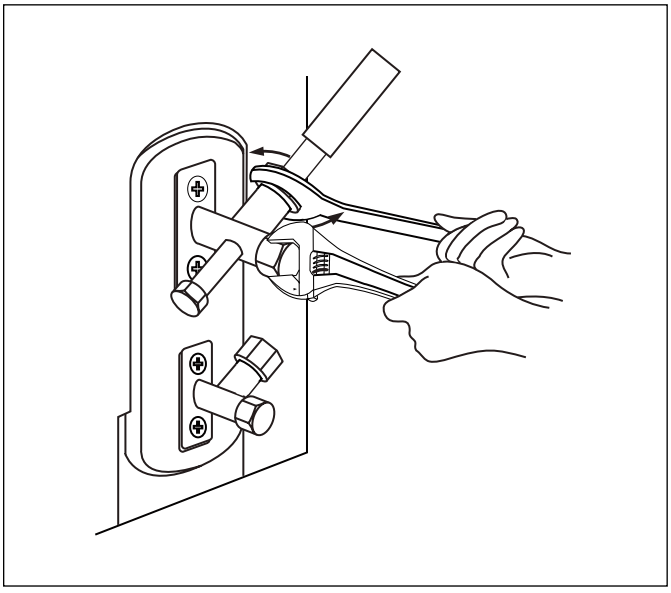


Figure 40

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.

8.4 Pipe Insulation

1. Be sure to insulate both the gas and liquid piping. Use separate thermal insulation pipes for gas and liquid refrigerant pipes. See the figure below.

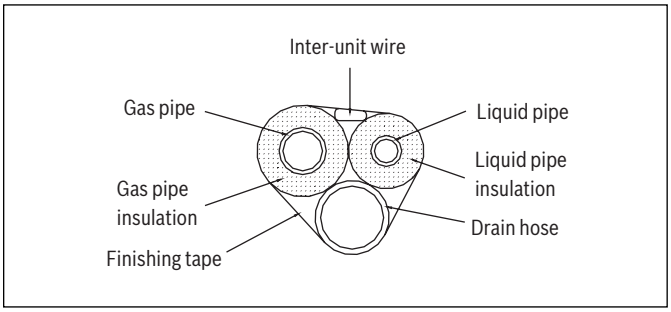


Figure 41

2. Finally, insulate as shown in the figure below.

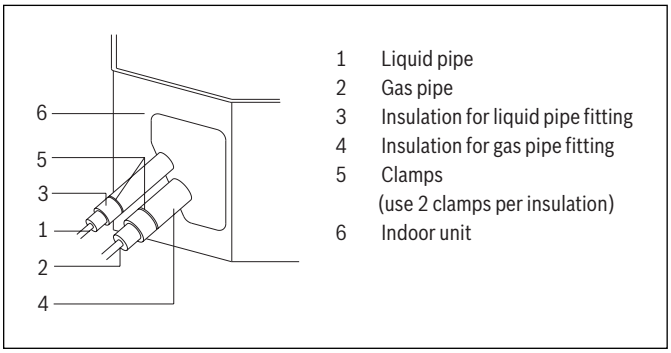


Figure 42

Piping insulation procedure

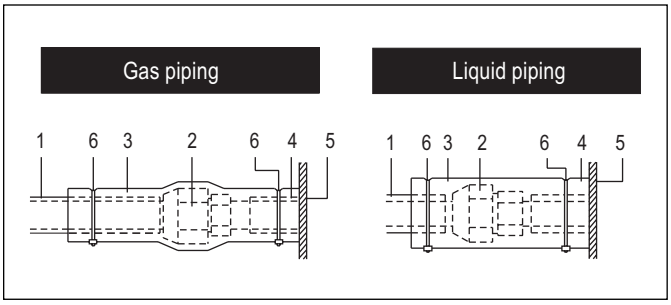


Figure 43

1. Pipe insulation material (field supplied)
2. Flare nut connection
3. Insulation for fitting (field supplied)
4. Piping insulation material (main unit)
5. Indoor unit
6. Clamp (field supplied)

CAUTION

Personal injury!

For local insulation, be sure to insulate local piping all the way into the pipe connections inside the unit. Exposed piping may cause condensation or may cause burns when touched.

9 Connecting Signal and Power Cables (Outdoor Unit)

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.

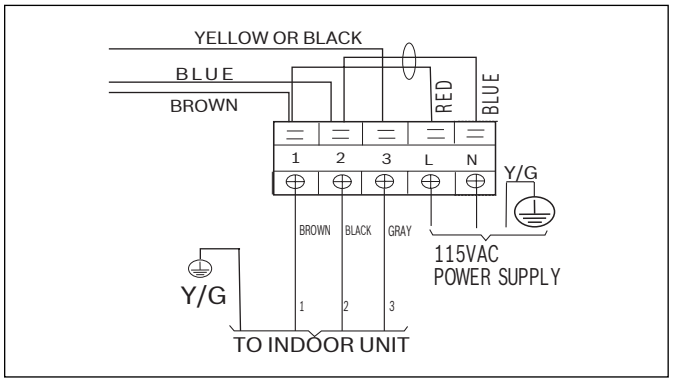


Figure 44

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:

Cable Types

- Outdoor Power Cable: SOOW type
- Signal/Power Cable: SOOW type

Minimum Cross-Sectional Area of Power Cables

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

Table 11

- 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.

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.

10 Evacuation and Charging Process

10.1 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.

10.2 Evacuation Instructions

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

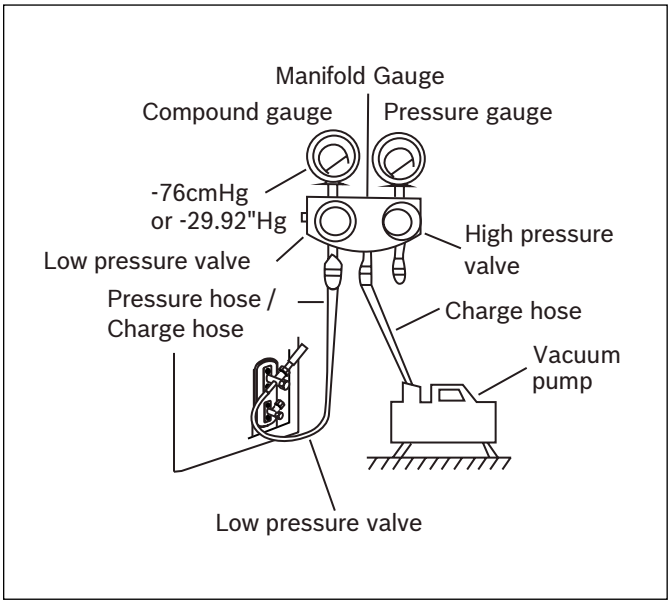


Figure 45

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.

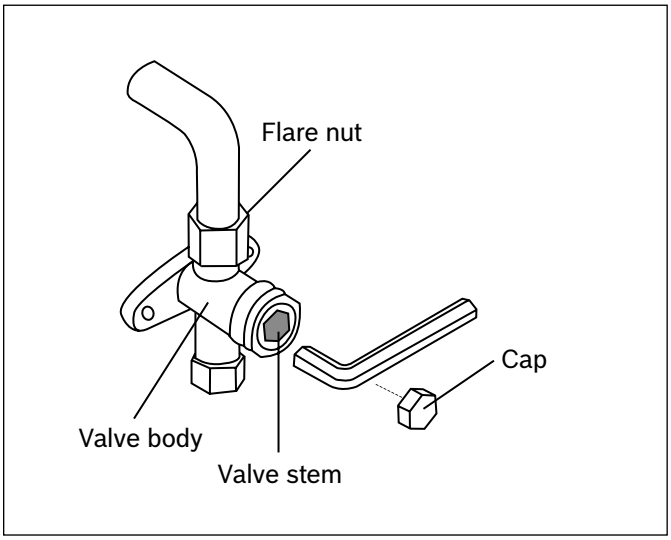


Figure 46

The above figure is for illustration purpose only.

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.

Multi Zone units: Make sure main valve is opened.

NOTICE

Product damage - open valve stems gently!

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

10.3 Adding Refrigerant

In North America, the standard pipe length is 25ft (7.5m). 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 9. For multi-zone units refer to the multi-zone installation and operation manual.

Additional refrigerant per pipe length

Connective Pipe	Air Purging Method	Additional Refrigerant	
< Standard pipe length	Vacuum Pump	N/A	
> Standard pipe length	Vacuum Pump	Liquid Side: Ø 1/4in (Ø 6.35mm) R454B: (Pipe length – standard length) x 15g/m (Pipe length – standard length) x 0.16oz/ft	Liquid Side: Ø 3/8in(Ø9.52mm) R454B: (Pipe length – standard length) x 30g/m (Pipe length – standard length) x 0.32oz/ft

Table 12

Single zone refrigerant pipe summary

Model - Single Zone		Capacity (Btu/h)	IDU		Max. Equivalent Length m(ft)	Max. Height Variation m(ft)
IDU	ODU		Liquid Line	Vapor Line		
BMS500-AAU006-1AHWXD	BMS500-AAS009-1CSXRD	6K	1/4"	3/8"	82ft (25)	49ft (15)
BMS500-AAU009-1AHWXD	BMS500-AAS009-1CSXRD, BMS500-AAS009-1CSXHD	9K	1/4"	3/8"	82ft (25)	49ft (15)
BMS500-AAU012-1AHWXD	BMS500-AAS012-1CSXRD, BMS500-AAS012-1CSXHD	12K	1/4"	3/8"	82ft (25)	49ft (15)
BMS500-AAU018-1AHWXD	BMS500-AAS018-1CSXRD, BMS500-AAS018-1CSXHD	18K	1/4"	1/2"	98ft (30)	66ft (20)
BMS500-AAU024-1AHWXD	BMS500-AAS024-1CSXRD, BMS500-AAS024-1CSXRD	24K	3/8"	5/8"	164ft (50)	82ft (25)
BMS500-AAU030-1AHWXD	BMS500-AAS030-1CSXRD	30K	3/8"	5/8"	164ft (50)	82ft (25)
BMS500-AAU036-1AHWXD	BMS500-AAS036-1CSXRD	36K	3/8"	5/8"	213ft (65)	98.5ft (30)

Table 13

CAUTION

Contains refrigerant!

This product REQUIRES the use of R454B refrigerant. All other refrigerant types, and the mixing of refrigerant types, is strictly prohibited.

DO NOT remove refrigerant out of the equipment when lineset is shorter than 10ft (3m).

Use only recommended lineset minimum length of 16ft (3m).

11 Electrical and Refrigerant Leak Checks

11.1 Electrical Safety Checks

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

Before test run

- Check grounding work
- Measure grounding resistance by visual detection and with grounding resistance tester. Grounding resistance must be less than 0.1Ω.

This may not be required for some locations. Refer to local code requirements.

During test run

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

WARNING

Electrical hazard!

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

11.2 Refrigerant Leak Checks

Perform refrigerant leak check on all joints.

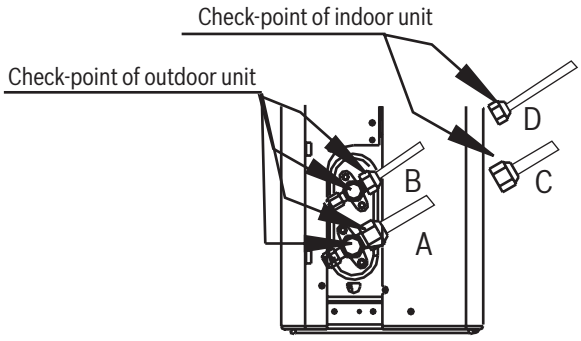
There are two different methods to check for gas leaks.

Soap and Water Method

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

Leak Detector Method

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



A: Low pressure service valve
B: High pressure service valve
C& D: Indoor unit flare nuts

Figure 47

AFTER PERFORMING GAS LEAK CHECKS

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

12 Test Run

12.1 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
- Check Grounding Work:
  Measure grounding resistance by visual detection and with grounding resistance tester.

12.2 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 leak?		
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 14

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 60°F (16°C)

You can't use the remote controller to turn on the COOL function when the ambient temperature is below 60°F (16°C). In this instance, you can use the MANUAL CONTROL button to test the COOL function.

1. Lift the front panel of the indoor unit, and raise it until it clicks in place.
2. Locate the MANUAL CONTROL button on the right-hand side panel of the unit. See Fig.48.
3. Press the MANUAL CONTROL button twice to select the COOL function.
4. Perform Test Run as normal.

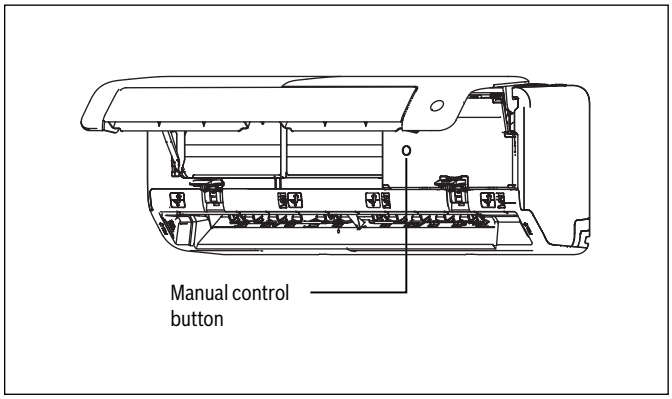


Figure 48

13 Display Codes (Indoor Unit)

When the indoor unit encounters a recognized error, then an error code will be displayed on the unit with letters first, then numbers. These error codes are described in the following table:

Display	Information
dF	Defrost
CL	Filter cleaning reminder (power on display for 15 seconds)
CL	Active clean
nF	Filter replacement reminder (power on display for 15seconds)(for some models)
FP	Heating in room temperature under 8℃ (46℉)
FC	Forced cooling
AP	AP mode of WiFi connection (not available in the US market)
CP	Remote switched off
EH 00/EH 0A	Indoor unit EEPROM parameter error
EL 01	Indoor/outdoor unit communication error
EH 02	Zero-crossing signal detection error
EH 03	The indoor fan speed is operating outside of the normal range
EC 51	Outdoor unit EEPROM parameter error
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(for multi zone)
EH 60	Indoor room temperature sensor T1 is in open circuit or has short circuited
EH 61	Evaporator coil middle temperature sensor T2 is in open circuit or has short circuited
EC 07	The outdoor fan speed is operating outside of the normal range
EC 06	Indoor PCB/Display board communication error
FH CC	Refrigerant sensor error
EH C1	Refrigerant sensor detects leakage
EH C2	Working condition of the refrigerant sensor is out of range and leakage is detected
EH C3	Working condition of the refrigerant sensor is out of range
EC C1	Other indoor unit refrigerant leakage detection (Multi-zone)
EL 0C	System lacks refrigerant
PC 00	IPM malfunction or IGBT over-strong current protection
PC 01	Over voltage or over low voltage protection
PC 02	High Temperature protection of IPM module
PC 04	Inverter compressor drive error
PC 03	Pressure protection (low or high pressure)(for some models)
FH OP	AP mode is active but there is no WiFi kit (not available in the US market) installed
--	Indoor units mode conflict (Multi-zone)

Table 15

The error code will remain displayed until the cause has been determined and resolved. Once resolved, power the unit off, wait ten seconds, and power back on to clear the error code.

For troubleshooting, please refer to the service manual.

13.1 Online Help Resources

Alternatively, please visit our Service & Support webpage to find FAQs, videos, service bulletins, and more; www.boschheatingcooling.com/service or use your cellphone to scan the code below.

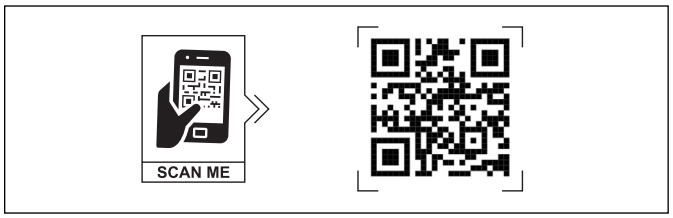


Figure 49

NOTES:

NOTES:

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