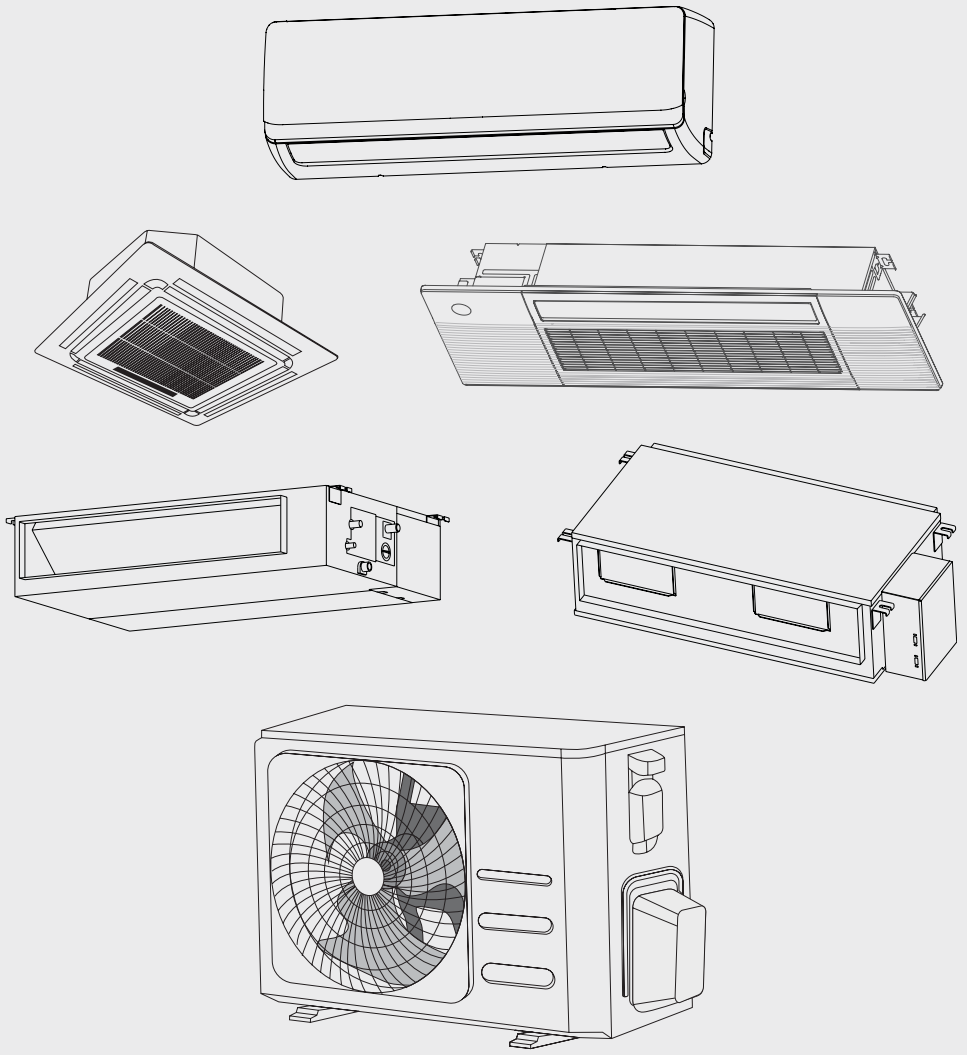
BOSCH

Installation and Operating Instructions

Multi Zone Ductless Air Conditioner/Heat Pump

Climate 5000 Series - Gen 4



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Unitary Small HP
AHRI Standard 210/240
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Table of Contents

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.

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.

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.

NOTICE

Improper operation, product damage!

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.

1.3.1 For R454B refrigerant charge amount and minimum room area

Requirments for room area limits using R454B refrigerant in unventilated areas: Our Multizone Systems are all confirmed to meet the requirement of Enhanced Tightness Refrigerating Systems. Units installed at a height not exceeding 1.8m above the ground are equipped with an A2L refrigerant sensor, which minimum room area (A_{min}) of operating or storage should be determined according to refrigerant charge (m_c) or releasable charge (m_{rel}) of system, as specified in the following table. The values on the table below are applicable for units installed between 5.9ft/1.8m and 7.2ft/2.2m.

Capacity (Btu/h)	Multizone ODU
18K	BMS500-AAM018-1CSXRD BMS500-AAM018-1CSXHD
27K	BMS500-AAM027-1CSXRD BMS500-AAM027-1CSXHD
36K	BMS500-AAM036-1CSXRD BMS500-AAM036-1CSXHD
48K	BMS500-AAM048-1CSXRD BMS500-AAM048-1CSXHD

Table 2

For releasable charge limited system:

SAFETY SHUT-OFF VALVES are used in some multiple outdoor units, as shown in the following table, for the purposes of limiting the releasable charge, which are activated by a leak detection system.

WARNING

Fire, Personal injury, product damage!

SAFETY SHUT-OFF VALVES default to fully closed position when the appliance is de-energised, so refrigerant will not be completely released even when it was dismantled. Ensure the complete release of refrigerant through one of following methods before repairing the machine.

- Method 1: Release refrigerant while the machine is powered on.
- Method 2: Remove the coil of safety shut-o valve before power-o.
- Method 3: Manually open the safety shut-o valve using a magnetic ring.

Model	Outdoor unit	Releasable charge limited system
18K Regular	BMS500-AAM018-1CSXRD	No
18K Max Performance	BMS500-AAM018-1CSXHD	Yes
27K Regular	BMS500-AAM027-1CSXRD	Yes
27K Max Performance	BMS500-AAM027-1CSXHD	Yes
36K Regular	BMS500-AAM036-1CSXRD	Yes
36K Max Performance	BMS500-AAM036-1CSXHD	Yes
48K Regular	BMS500-AAM048-1CSXRD	Yes
48K Max Performance	BMS500-AAM048-1CSXHD	Yes

Table 3

Releasable charge (m_{rel}) of a multi zone system should be calculated based on internal volume of all indoor units and connecting pipes. Each indoor units correspond to a releasable charge as shown in the following table. Add them up based on the combination of indoor units, and then add to the basic releasable charge of 204g. You will then get the total releasable charge of system.

The calculation is based on the standard connection pipe length of 24.6ft/7.5m for each indoor units, an extra releasable charge should be added for per meter exceeding 24.6ft/7.5m.

Model	Indoor unit	Releasable charge for each unit	Basic releasable charge	Extra releasable charge	Total releasable charge
6K	BMS500-AAU006-1AHWXD	393 g	204 g (Leakage at a rate of 6.8 g/s for 30 s)	0 g when connection pipe length for each indoor units are within 24.6ft/7.5 m. 20 g per meter exceeding 24.6ft/7.5 m for each 6K/9K/12K/18K units. 50 g per meter exceeding 24.6ft/7.5 m for each 24K/36K units.	Add 3 parts of releasable charge based on the combination of indoor units, you will get the total releasable charge of system.
9K	BMS500-AAU009-1AHWXD	393 g			
12K	BMS500-AAU012-1AHWXD	393 g			
18K	BMS500-AAU018-1AHWXD	482 g			
24K	BMS500-AAU024-1AHWXD	1025 g			
36K	BMS500-AAU036-1AHWXD	1025 g			

Table 4

Amin[sqft/m²]	hinst [ft/m]					
mc or mREL [oz/kg]	6.0-7.3/1.8-2.2	7.5/2.3	7.9/2.4	8.5/2.6	9.2/2.8	9.8/3.0
≤62.7/1.776		12/1.10				
63.5/1.8	60/5.53	57/5.29	55/5.07	50/4.68	47/4.34	44/4.05
70.5/2	67/6.15	63/5.88	61/5.63	56/5.2	52/4.83	48/4.50
77.6/2.2	73/6.76	70/6.46	67/6.19	62/5.72	57/5.31	53/4.95
84.6/2.4	80/7.38	76/7.05	73/6.76	67/6.24	62/5.79	58/5.41
91.7/2.6	86/7.99	82/7.64	79/7.32	73/6.76	67/6.27	63/5.86
98.8/2.8	93/8.60	89/8.23	85/7.88	78/7.28	73/6.76	68/6.31
105.8/3	100/9.22	95/8.81	91/8.45	84/7.8	78/7.24	73/6.76
112.9/3.2	106/9.83	101/9.4	97/9.01	90/8.32	83/7.72	78/7.21
119.9/3.4	113/10.45	107/9.99	103/9.57	95/8.84	88/8.2	82/7.66
127/3.6	120/11.06	114/10.58	109/10.14	101/9.36	94/8.69	87/8.11
134/3.8	126/11.68	120/11.16	115/10.7	106/9.88	99/9.17	92/8.56
141.1/4	133/12.29	126/11.75	121/11.26	112/10.4	104/9.65	97/9.01
148.1/4.2	139/12.90	133/12.34	127/11.82	117/10.91	109/10.14	102/9.46
155.2/4.4	146/13.52	139/12.93	133/12.39	123/11.43	114/10.62	107/9.91
162.2/4.6	153/14.13	145/13.51	139/12.95	129/11.95	119/11.1	111/10.36
169.3/4.8	159/14.75	152/14.1	145/13.51	134/12.47	125/11.58	116/10.81
176.4/5	166/15.36	158/14.69	152/14.08	140/12.99	130/12.07	121/11.26

Table 5

***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.*

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.

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 affects 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 (EL0C) 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 500 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 or Electrical Wiring

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 effects 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 off 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 purge the circuit with inert gas (optional 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 thesystem (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 different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them. Cylinders shall be kept upright. Ensure that the refrigeration system is earthed prior to charging the system with refrigerant. Label the system when charging is complete(if not already). Extreme care shall be taken not to overfill the refrigeration system. Prior to recharging the system it shall be pressure tested with 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.

Use ONLY R454B refrigerant with this product. All other refrigerant types, and the mixing of refrigerant types, is strictly prohibited.

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 designatedAll 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.
5. 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 Components

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

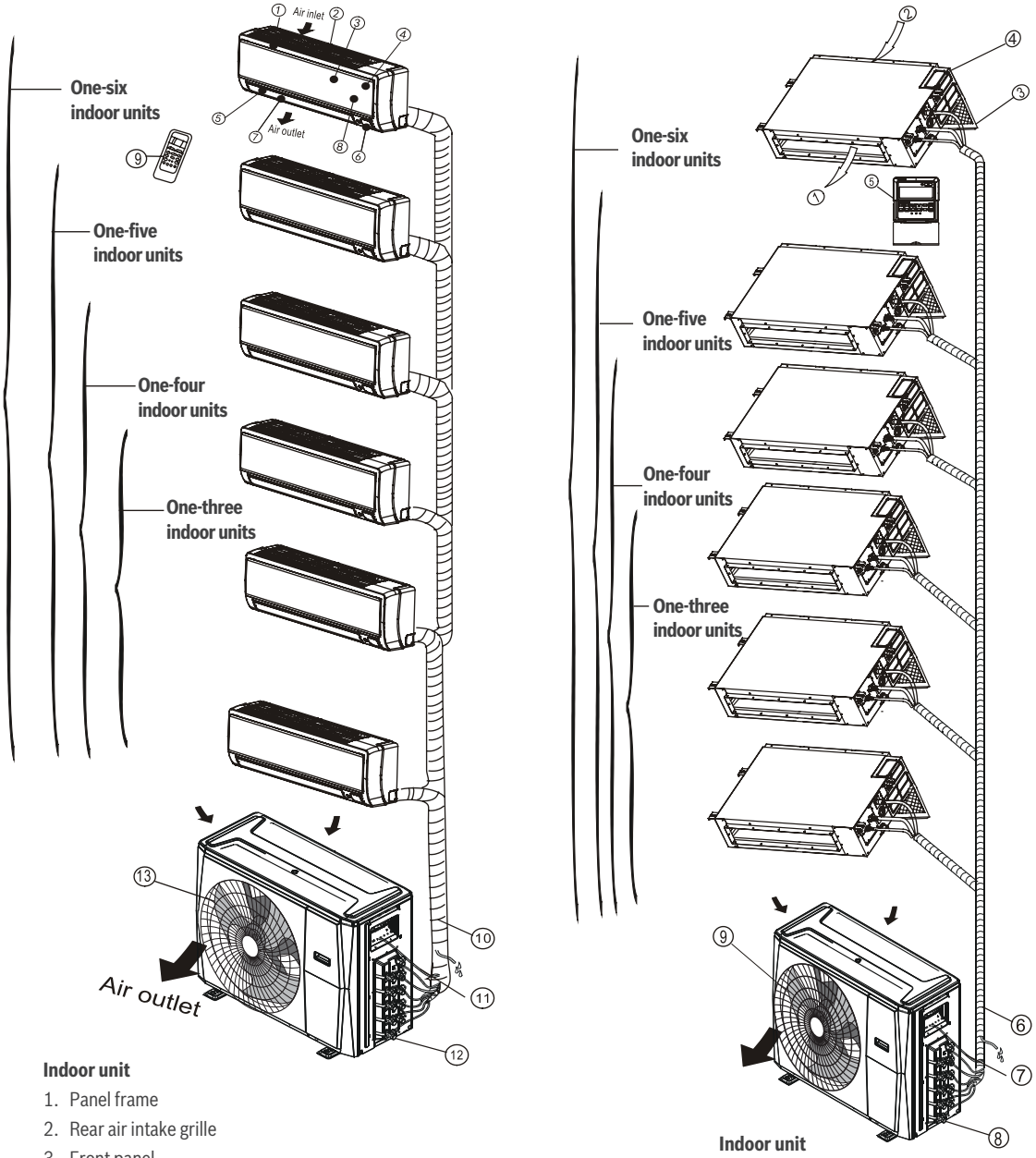
Name			Quantity
Drain joint			1
Seal ring			1
Connecting pipe assembly	Liquid side	Φ6.35 (1/4 in)	Parts not included. Piping kits are available as an accessory.
		Φ9.52 (3/8 in)	
	Gas side	Φ9.52 (3/8 in)	
		Φ12.7 (1/2 in)	
		Φ 16 (5/8 in)	
Multi-zone installation manual			1
Refrigerant pipe adaptor NOTE: Pipe sizes may vary between air handler and condensing section connections. To meet different pipe size requirements, it may be necessary to install an adapter (transfer connector) on the outdoor unit connection.			Included. Varies by model. Refer to Table 18
Power cable for connection with external power supply			Not included (see section 9 for cable requirements)

Table 6

Product	Model number	Model name	Adapter (inch)	Adapter quantity
Regular	8-733-962-695	BMS500-AAM018-1CSXRD	3/8"-->1/2"	2
	8-733-962-696	BMS500-AAM027-1CSXRD	3/8"-->1/2"	3
	8-733-962-697	BMS500-AAM036-1CSXRD	3/8"-->1/2"	3
			1/2"-->3/8"	1
			1/4"-->3/8"	1
			1/2"-->5/8"	1
	8-733-962-698	BMS500-AAM048-1CSXRD	1/2"-->3/8"	2
			1/4"-->3/8"	2
			1/2"-->5/8"	2
			3/8"-->1/2"	1
Max Performance	8-733-962-699	BMS500-AAM018-1CSXHD	3/8"-->1/2"	3
	8-733-962-700	BMS500-AAM027-1CSXHD	3/8"-->1/2"	3
			1/2"-->3/8"	1
			1/4"-->3/8"	1
			1/2"-->5/8"	1
	8-733-962-701	BMS500-AAM036-1CSXHD	3/8"-->1/2"	2
			1/2"-->3/8"	2
			1/4"-->3/8"	2
			1/2"-->5/8"	2
	8-733-962-702	BMS500-AAM048-1CSXHD	1/2"-->3/8"	2
			1/4"-->3/8"	2
			1/2"-->5/8"	2
			3/8"-->1/2"	1

Table 7

3 Product Overview



Indoor unit

1. Panel frame
2. Rear air intake grille
3. Front panel
4. Air purifying filter & Air filter(behind)
5. Horizontal louver
6. LCD display window
7. Vertical louver
8. Manual control button(behind)
9. Remote controller holder

Outdoor unit

10. Drain hose, refrigerant connecting pipe
11. Connective cable
12. Stop valve
13. Fan hood

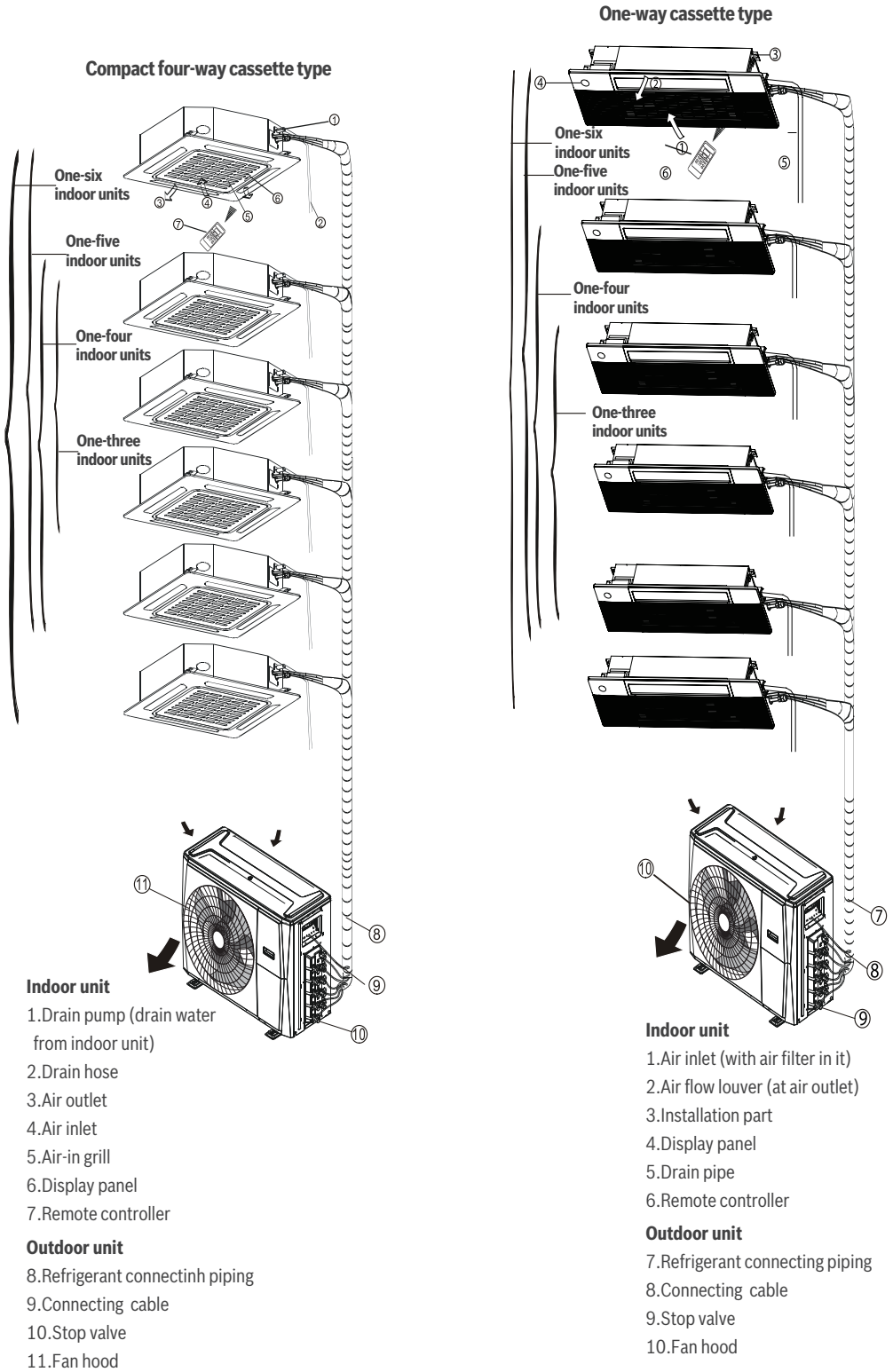
Indoor unit

1. Air outlet
2. Air inlet
3. Air filter
4. Electric control cabinet
5. Wire controller

Outdoor unit

6. Drain hose, refrigerant connecting pipe
7. Connective cable
8. Stop valve
9. Fan hood

Figure 1



Indoor unit

1.Drain pump (drain water from indoor unit)
2.Drain hose
3.Air outlet
4.Air inlet
5.Air-in grill
6.Display panel
7.Remote controller

Outdoor unit

8.Refrigerant connectinh piping
9.Connecting cable
10.Stop valve
11.Fan hood

Indoor unit

1.Air inlet (with air filter in it)
2.Air flow louver (at air outlet)
3.Installation part
4.Display panel
5.Drain pipe
6.Remote controller

Outdoor unit

7.Refrigerant connecting piping
8.Connecting cable
9.Stop valve
10.Fan hood

Figure 2

For multi-split type air conditioners, one outdoor unit can be matched to different types of indoor units. All of the pictures in this manual are for demonstration purposes only. Your air conditioner may be slightly dierent, if similar in shape.

3 Installation Summary

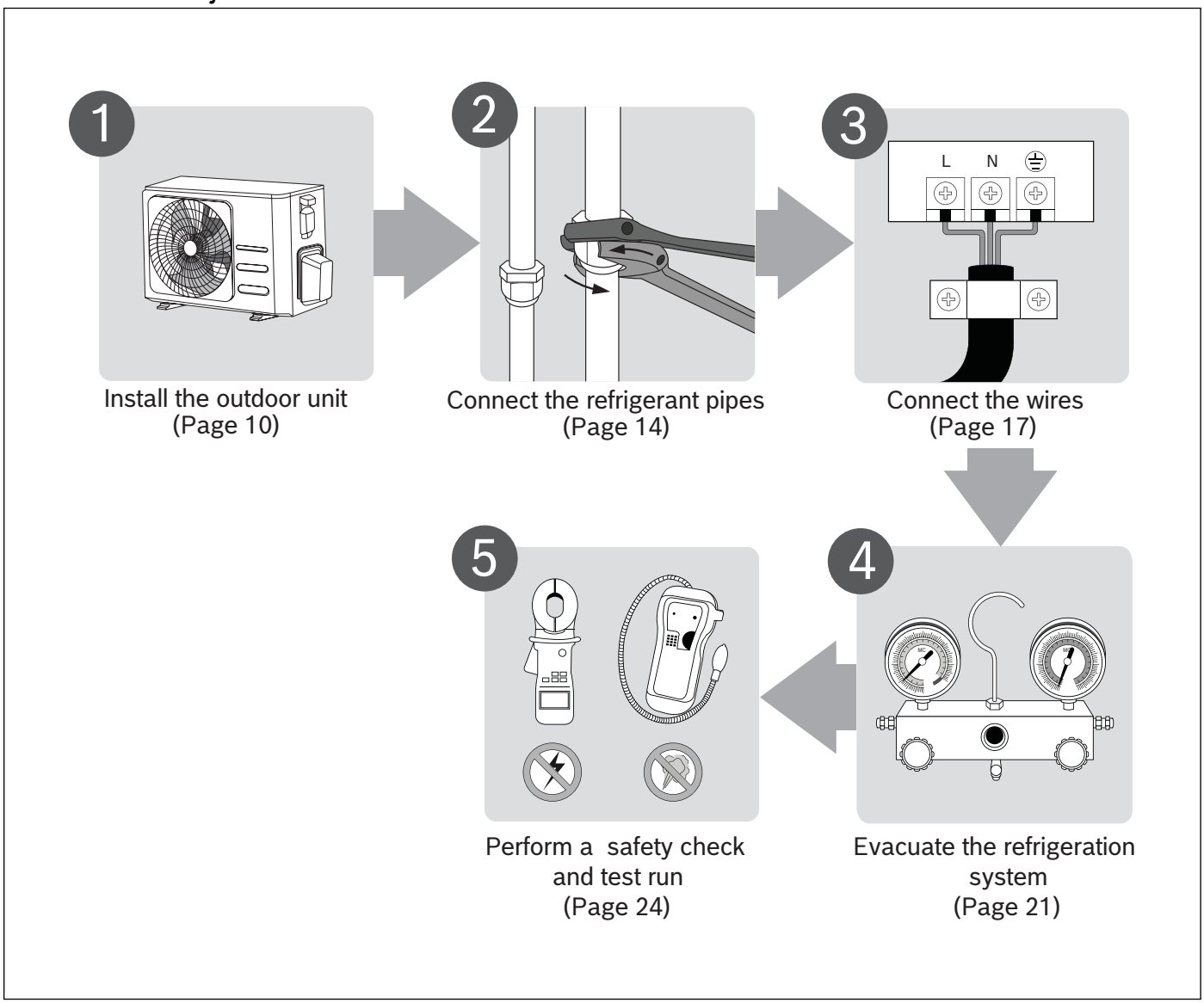


Figure 3

4 Installation Diagram

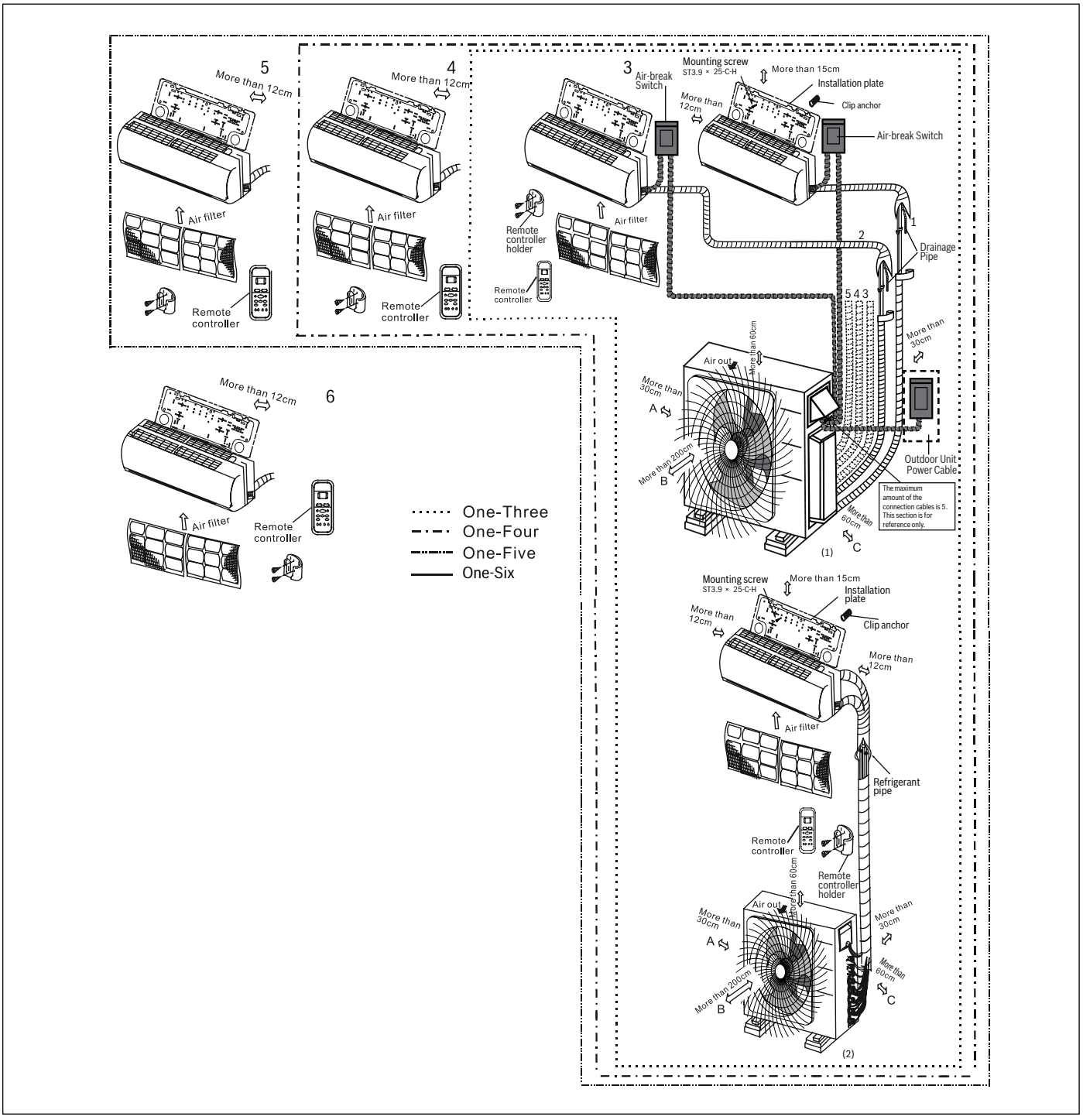


Figure 4

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

NOTICE

Product damage, property damage!

Copper lines must be independently insulated.

To prevent wall damage, use a stud finder to locate studs.

A minimum pipe run of 10 ft is recommended to minimize vibration & excessive noise.

Two of the A, B, and C air circulation pathways must be free from obstructions at all times.

5 Mulitzone Configuration Tables

Indoor Unit Combination for 18K Regular and Max Performance

Multizone Outdoor Unit Regular	Indoor Unit		
Capacity, Model # and Part #	One Zone	Two Zones	Three Zones
18K BMS500-AAM018-1CSXRD 8-733-962-695	12	6+6	6+6+6
	18	6+9	6+6+9
		6+12	6+9+9
		6+18	
		9+9	
		9+12	
		12+12	

Table 8

Multizone Outdoor Unit Max Performance	Indoor Unit		
Capacity, Model # and Part #	One Zone	Two Zones	Three Zones
18K BMS500-AAM018-1CSXHD 8-733-962-699	18	6+6	6+6+6
	24	6+9	6+6+9
		6+12	6+6+12
		6+18	6+6+18
		6+24	6+6+24
		9+9	6+9+9
		9+12	6+9+12
		9+18	6+9+18
		9+24	6+12+12
		12+12	6+12+18
		12+18	9+9+9
		12+24	9+9+12
		18+18	9+9+18
			9+12+12
			12+12+12

Table 9

Indoor Unit Combination for 27K Regular and Max Performance

Multizone Outdoor Unit Regular	Indoor Unit			
Capacity, Model # and Part #	One Zone	Two Zones	Three Zones	Four Zones
27K BMS500-AAM027-1CSXRD 8-733-962-696	18	6+6	6+6+6	6+6+6+6
	24	6+9	6+6+9	6+6+6+9
		6+12	6+6+12	6+6+6+12
		6+18	6+6+18	6+6+9+9
		6+24	6+6+24	6+6+9+12
		9+9	6+9+9	6+9+9+9
		9+12	6+9+12	6+9+9+12
		9+18	6+9+18	9+9+9+9
		9+24	6+12+12	
		12+12	6+12+18	
		12+18	9+9+9	
		12+24	9+9+12	
		18+18	9+9+18	
			9+12+12	
			12+12+12	

Table 10

Multizone Outdoor Unit Max Performance	Indoor Unit			
Capacity, Model # and Part #	One Zone	Two Zones	Three Zones	Four Zones
27K BMS500-AAM027-1CSXHD 8-733-962-700	24	6+18	6+6+6	6+6+6+6
	30	6+24	6+6+9	6+6+6+9
		9+9	6+6+12	6+6+6+12
		9+12	6+6+18	6+6+6+18
		9+18	6+6+24	6+6+6+24
		9+24	6+9+9	6+6+9+9
		12+12	6+9+12	6+6+9+12
		12+18	6+9+18	6+6+9+18
		12+24	6+9+24	6+6+9+24
		18+18	6+12+12	6+6+12+12
			6+12+18	6+6+12+18
			6+12+24	6+6+12+24
			6+18+18	6+6+18+18
			6+18+24	6+9+9+9
			9+9+9	6+9+9+12
			9+9+12	6+9+9+18
			9+9+18	6+9+9+24
			9+9+24	6+9+12+12
			9+12+12	6+9+12+18
			9+12+18	6+12+12+12
			9+12+24	6+12+12+18
			9+18+18	9+9+9+9
			12+12+12	9+9+9+12
			12+12+18	9+9+9+18
			12+12+24	9+9+12+12
			12+18+18	9+9+12+18
				9+12+12+12
				12+12+12+12

Table 11

Indoor Unit Combination for 36K Regular and Max Performance

Multizone Outdoor Unit Regular	Indoor Unit				
Capacity, Model # and Part #	One Zone	Two Zones	Three Zones	Four Zones	Five Zones
36K BMS500-AAM036-1CSXRD 8-733-962-680	24	6+18	6+6+6	6+6+6+6	6+6+6+6+6
	30	6+24	6+6+9	6+6+6+9	6+6+6+6+9
		9+9	6+6+12	6+6+6+12	6+6+6+6+12
		9+12	6+6+18	6+6+6+18	6+6+6+6+18
		9+18	6+6+24	6+6+6+24	6+6+6+9+9
		9+24	6+9+9	6+6+9+9	6+6+6+9+12
		12+12	6+9+12	6+6+9+12	6+6+6+9+18
		12+18	6+9+18	6+6+9+18	6+6+9+9+9
		12+24	6+9+24	6+6+9+24	6+6+9+9+12
		18+18	6+12+12	6+6+12+12	6+6+9+9+18
			6+12+18	6+6+12+18	6+9+9+9+9
			6+12+24	6+6+12+24	6+9+9+9+12
			6+18+18	6+6+18+18	6+9+9+9+18
			9+9+9	6+9+9+9	9+9+9+9+9
			9+9+12	6+9+9+12	9+9+9+9+12
			9+9+18	6+9+9+18	
			9+9+24	6+9+9+24	
			9+12+12	6+9+12+12	
			9+12+18	6+9+12+18	
			9+12+24	6+12+12+12	
			9+18+18	6+12+12+18	
			12+12+12	9+9+9+9	
			12+12+18	9+9+9+12	
			12+12+24	9+9+9+18	
			12+18+18	9+9+12+12	
				9+9+12+18	
				9+12+12+12	
				12+12+12+12	

Table 12

Multizone Outdoor Unit Max Performance	Indoor Unit				
Capacity, Model # and Part #	One Zone	Two Zones	Three Zones	Four Zones	Five Zones
36K BMS500-AAM036-1CSXHD 8-733-962-701	30	6+24	6+6+12	6+6+6+6	6+6+6+6+6
	36	6+30	6+6+18	6+6+6+9	6+6+6+6+9
		6+36	6+6+24	6+6+6+12	6+6+6+6+12
		9+18	6+6+30	6+6+6+18	6+6+6+6+18
		9+24	6+6+36	6+6+6+24	6+6+6+9+9
		9+30	6+9+9	6+6+9+9	6+6+6+9+12
		9+36	6+9+12	6+6+9+12	6+6+6+9+18
		12+12	6+9+18	6+6+9+18	6+6+6+12+12
		12+18	6+9+24	6+6+9+24	6+6+6+12+18
		12+24	6+9+30	6+6+12+12	6+6+9+9+9
		12+30	6+12+12	6+6+12+18	6+6+9+9+12
		12+36	6+12+18	6+6+12+24	6+6+9+9+18
		18+18	6+12+24	6+6+18+18	6+6+9+12+12
		18+24	6+12+30	6+6+18+24	6+6+12+12+12
		18+30	6+18+18	6+9+9+9	6+9+9+9+9
		24+24	6+18+24	6+9+9+12	6+9+9+9+12
			9+9+9	6+9+9+18	6+9+9+12+12
			9+9+12	6+9+9+24	9+9+9+9+9
			9+9+18	6+9+12+12	9+9+9+9+12
			9+9+24	6+9+12+18	
			9+9+30	6+9+12+24	
			9+12+12	6+9+18+18	
			9+12+18	6+9+18+24	
			9+12+24	6+12+12+12	
			9+18+18	6+12+12+18	
			9+18+24	6+12+12+24	
			12+12+12	6+12+18+18	
			12+12+18	6+12+18+24	
			12+12+24	6+18+18+18	
			12+18+18	9+9+9+9	
			12+18+24	9+9+9+12	
			18+18+18	9+9+9+18	
				9+9+9+24	
				9+9+12+12	
				9+9+12+18	
				9+9+12+24	
				9+9+18+18	
				9+9+18+24	
				9+12+12+12	
				9+12+12+18	
				9+12+12+24	
				9+12+18+18	
				9+18+18+18	
				12+12+12+12	
				12+12+12+18	
				12+12+12+24	
				12+12+18+18	

Table 13

Indoor Unit Combination for 48K Regular and Max Performance

Multizone Outdoor Unit Regular	Indoor Unit					
Capacity, Model # and Part #	One Zone	Two Zones	Three Zones	Four Zones	Five Zones	Five Zones
48K BMS500-AAM048-1CSXRD 8-733-962-698	30	6+24	6+6+18	6+6+6+6	6+6+6+6+6	6+6+6+6+6+6
	36	6+30	6+6+24	6+6+6+9	6+6+6+6+9	6+6+6+6+6+9
		6+36	6+6+30	6+6+6+18	6+6+6+6+12	6+6+6+6+6+12
		9+18	6+6+36	6+6+6+24	6+6+6+6+18	6+6+6+6+6+18
		9+24	6+9+12	6+6+9+9	6+6+6+6+24	6+6+6+6+9+9
		9+30	6+9+18	6+6+9+12	6+6+6+9+9	6+6+6+6+9+12
		9+36	6+9+24	6+6+9+18	6+6+6+9+12	6+6+6+6+9+18
		12+12	6+9+30	6+6+9+24	6+6+6+9+18	6+6+6+6+12+12
		12+18	6+9+36	6+6+12+12	6+6+6+9+24	6+6+6+6+12+18
		12+24	6+12+18	6+6+12+18	6+6+6+12+12	6+6+6+9+9+9
		12+30	6+12+24	6+6+12+24	6+6+6+12+18	6+6+6+9+9+12
		12+36	6+12+30	6+6+18+18	6+6+6+12+24	6+6+6+9+9+18
		18+18	6+12+36	6+6+18+24	6+6+6+18+18	6+6+6+9+12+12
		18+24	6+18+18	6+9+9+9	6+6+6+18+24	6+6+6+9+12+18
		18+30	6+18+24	6+9+9+12	6+6+9+9+9	6+6+6+12+12+12
		18+36	6+18+30	6+9+9+18	6+6+9+9+12	6+6+6+12+12+18
		24+24	6+18+36	6+9+9+24	6+6+9+9+18	6+6+9+9+9+9
		24+30	9+9+9	6+9+12+12	6+6+9+9+24	6+6+9+9+9+12
		24+36	9+9+12	6+9+12+18	6+6+9+12+12	6+6+9+9+9+18
			9+9+18	6+9+12+24	6+6+9+12+18	6+6+9+9+12+12
			9+9+24	6+9+18+18	6+6+9+12+24	6+6+9+9+12+18
			9+9+30	6+9+18+24	6+6+9+18+18	6+6+9+12+12+12
			9+9+36	6+12+12+12	6+6+9+18+24	6+6+9+12+12+18
			9+12+12	6+12+12+18	6+6+12+12+12	6+9+9+9+9+9
			9+12+18	6+12+12+24	6+6+12+12+18	6+9+9+9+9+12
			9+12+24	6+12+18+18	6+6+12+12+24	6+9+9+9+9+18
			9+12+30	6+12+18+24	6+6+12+18+18	6+9+9+9+12+12
			9+12+36	9+9+9+9	6+9+9+9+9	6+9+9+9+12+18
			9+18+18	9+9+9+12	6+9+9+9+12	6+9+9+12+12+12
			9+18+24	9+9+9+18	6+9+9+9+18	9+9+9+9+9+9
			9+18+30	9+9+9+24	6+9+9+9+24	9+9+9+9+9+12
			9+18+36	9+9+12+12	6+9+9+12+12	9+9+9+9+9+18
			12+12+12	9+9+12+18	6+9+9+12+18	9+9+9+9+12+12
			12+12+18	9+9+12+24	6+9+9+12+24	9+9+9+12+12+12
			12+12+24	9+9+18+18	6+9+9+18+18	
			12+12+30	9+9+18+24	6+9+12+12+12	
			12+12+36	9+12+12+12	6+9+12+12+18	
			12+18+18	9+12+12+18	6+9+12+12+24	
			12+18+24	9+12+12+24	6+9+12+18+18	
			12+18+30	9+12+18+18	6+12+12+12+12	
			18+18+18	9+12+18+24	6+12+12+12+18	
				9+18+18+18	9+9+9+9+9	
				12+12+12+12	9+9+9+9+12	
				12+12+12+18	9+9+9+9+18	
				12+12+12+24	9+9+9+9+24	
				12+12+18+18	9+9+9+12+12	
					9+9+9+12+18	
					9+9+9+12+24	
					9+9+9+18+18	
					9+9+12+12+12	
					9+9+12+12+18	
					9+12+12+12+12	
					9+12+12+12+18	
					12+12+12+12+12	

Table 14

Multizone Outdoor Unit Max Performance	Indoor Unit					
Capacity, Model # and Part #	One Zone	Two Zones	Three Zones	Four Zones	Five Zones	Five Zones
48K BMS500-AAM048-1CSXHD 8-733-962-702	30	6+24	6+6+18	6+6+6+6	6+6+6+6+6	6+6+6+6+6+6
	36	6+30	6+6+24	6+6+6+9	6+6+6+6+9	6+6+6+6+6+9
		6+36	6+6+30	6+6+6+12	6+6+6+6+12	6+6+6+6+6+12
		9+18	6+6+36	6+6+6+18	6+6+6+6+18	6+6+6+6+6+18
		9+24	6+9+9	6+6+6+24	6+6+6+6+24	6+6+6+6+6+24
		9+30	6+9+12	6+6+9+9	6+6+6+9+9	6+6+6+6+9+9
		9+36	6+9+18	6+6+9+12	6+6+6+9+12	6+6+6+6+9+12
		12+12	6+9+24	6+6+9+18	6+6+6+9+18	6+6+6+6+9+18
		12+18	6+9+30	6+6+9+24	6+6+6+9+24	6+6+6+6+9+24
		12+24	6+9+36	6+6+12+12	6+6+6+12+12	6+6+6+6+12+12
		12+30	6+12+12	6+6+12+18	6+6+6+12+18	6+6+6+6+12+18
		12+36	6+12+18	6+6+12+24	6+6+6+12+24	6+6+6+6+12+24
		18+18	6+12+24	6+6+18+18	6+6+6+18+18	6+6+6+9+9+9
		18+24	6+12+30	6+6+18+24	6+6+6+18+24	6+6+6+9+9+12
		18+30	6+12+36	6+9+9+9	6+6+9+9+9	6+6+6+9+9+18
		18+36	6+18+18	6+9+9+12	6+6+9+9+12	6+6+6+9+9+24
		24+24	6+18+24	6+9+9+18	6+6+9+9+18	6+6+6+9+12+12
		24+30	6+18+30	6+9+9+24	6+6+9+9+24	6+6+6+9+12+18
		24+36	6+18+36	6+9+12+12	6+6+9+12+12	6+6+6+9+12+24
			9+9+9	6+9+12+18	6+6+9+12+18	6+6+6+12+12+12
			9+9+12	6+9+12+24	6+6+9+12+24	6+6+6+12+12+18
			9+9+18	6+9+18+18	6+6+9+18+18	6+6+6+12+12+24
			9+9+24	6+9+18+24	6+6+9+18+24	6+6+9+9+9+9
			9+9+30	6+12+12+12	6+6+12+12+12	6+6+9+9+9+12
			9+9+36	6+12+12+18	6+6+12+12+18	6+6+9+9+9+18
			9+12+12	6+12+12+24	6+6+12+12+24	6+6+9+9+9+24
			9+12+18	6+12+18+18	6+6+12+18+18	6+6+9+9+12+12
			9+12+24	6+12+18+24	6+6+12+18+24	6+6+9+9+12+18
			9+12+30	6+18+18+18	6+6+18+18+18	6+6+9+9+12+24
			9+12+36	6+18+18+24	6+6+18+18+24	6+6+9+12+12+12
			9+18+18	9+9+9+9	6+9+9+9+9	6+6+9+12+12+18
			9+18+24	9+9+9+12	6+9+9+9+12	6+6+9+12+12+24
			9+18+30	9+9+9+18	6+9+9+9+18	6+6+12+12+12+12
			9+18+36	9+9+9+24	6+9+9+9+24	6+6+12+12+12+18
			12+12+12	9+9+12+12	6+9+9+12+12	6+6+12+12+12+24
			12+12+18	9+9+12+18	6+9+9+12+18	6+9+9+9+9+9
			12+12+24	9+9+12+24	6+9+9+12+24	6+9+9+9+9+12
			12+12+30	9+9+18+18	6+9+9+18+18	6+9+9+9+9+18
			12+12+36	9+9+18+24	6+9+9+18+24	6+9+9+9+9+24
			12+18+18	9+12+12+12	6+9+12+12+12	6+9+9+9+12+12
			12+18+24	9+12+12+18	6+9+12+12+18	6+9+9+9+12+18
			12+18+30	9+12+12+24	6+9+12+12+24	6+9+9+9+12+24
			12+18+36	9+12+18+18	6+9+12+18+18	6+9+9+12+12+12
			18+18+18	9+12+18+24	6+9+12+18+24	6+9+9+12+12+18
				9+18+18+18	6+9+18+18+18	6+9+9+12+12+24
				12+12+12+12	6+12+12+12+12	6+9+12+12+12+12
				12+12+12+18	6+12+12+12+18	6+9+12+12+12+18
				12+12+12+24	6+12+12+12+24	6+12+12+12+12+12
				12+12+18+18	6+12+12+18+18	6+12+12+12+12+18
				12+12+18+24	6+12+18+18+18	9+9+9+9+9+9
				12+18+18+18	9+9+9+9+9	9+9+9+9+9+12
					9+9+9+9+12	9+9+9+9+9+18
					9+9+9+9+18	9+9+9+9+9+24
					9+9+9+9+24	9+9+9+9+12+12
					9+9+9+12+12	9+9+9+9+12+18
					9+9+9+12+18	9+9+9+9+12+24
					9+9+9+12+24	9+9+9+12+12+12
					9+9+9+18+18	9+9+9+12+12+18
					9+9+9+18+24	9+9+12+12+12+12
					9+9+12+12+12	9+9+12+12+12+18
					9+9+12+12+18	9+12+12+12+12+12
					9+9+12+12+24	12+12+12+12+12+12
					9+9+12+18+18	
					9+9+12+18+24	
					9+9+18+18+18	
					9+12+12+12+12	
					9+12+12+12+18	
					9+12+12+12+24	
					9+12+12+18+18	
					12+12+12+12+12	
					12+12+12+12+18	
					12+12+12+12+24	
					12+12+12+18+18	

Table 15

6 Specifications

Number of units that can be used together	Connected units	1-6 units
Compressor minimum run time	Stop time	3 min
Power source voltage	Voltage variation	within ±10% of rated voltage
	Voltage drop during start	within ±15% of rated voltage
	Voltage imbalance	within ±3% of rated voltage

Table 16

	3 Zone System	4 Zone System	5 Zone System	6 Zone System
Model	BMS500-AAM018-1CSXRD BMS500-AAM018-1CSXHD	BMS500-AAM027-1CSXRD BMS500-AAM027-1CSXHD	BMS500-AAM036-1CSXRD BMS500-AAM036-1CSXHD	BMS500-AAM048-1CSXRD BMS500-AAM048-1CSXHD
Max. equivalent length for all indoor units	197ft / 60m	262ft / 80m	262ft / 80m	262ft / 80m
Max. length to farthest indoor unit	98ft / 30m	115ft / 35m	115ft / 35m	115ft / 35m
Max. height difference between indoor and outdoor unit	49ft / 15m	49ft / 15m	49ft / 15m	49ft / 15m
Max. height difference between indoor units	33ft / 10m	33ft / 10m	33ft / 10m	33ft / 10m
Additional refrigerant charge (Based on the IDU liquid line size)	Liquid side: 1/4in - 0.16oz/ft Liquid side: 3/8in - 0.32oz/ft	Liquid side: 1/4in - 0.16oz/ft Liquid side: 3/8in - 0.32oz/ft	Liquid side: 1/4in - 0.16oz/ft Liquid side: 3/8in - 0.32oz/ft	Liquid side: 1/4in - 0.16oz/ft Liquid side: 3/8in - 0.32oz/ft

Table 17 Refrigerant pipe requirements

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

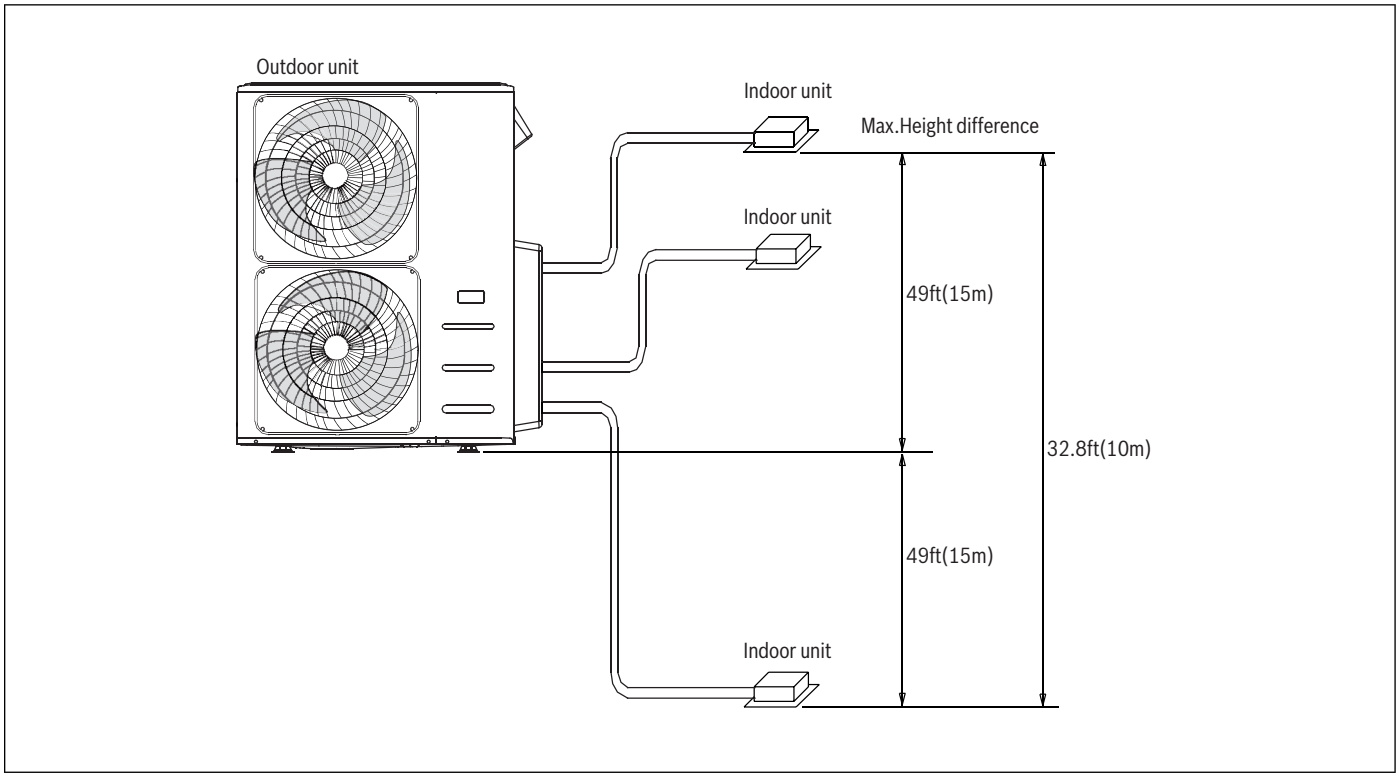


Figure 5

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 6)

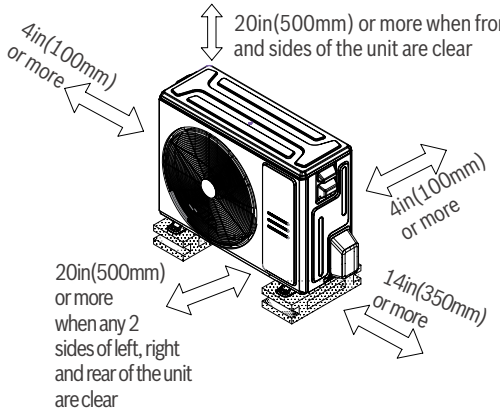


Figure 6

  - 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 Figures7 & 8.

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.

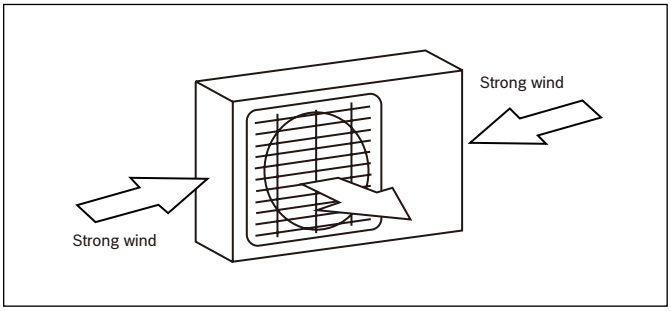


Figure 7

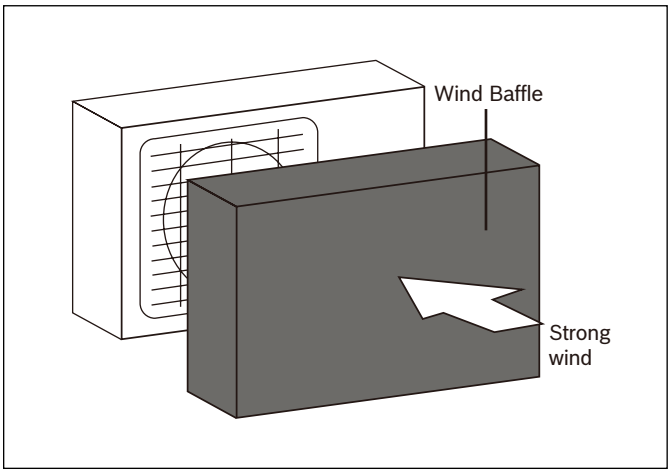


Figure 8

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.

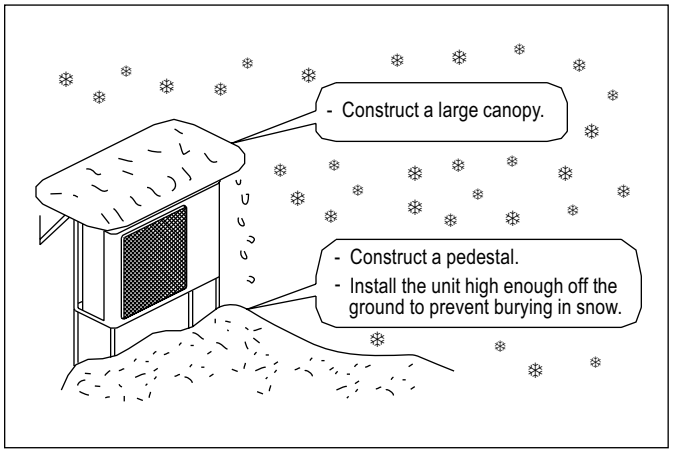


Figure 9

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 10, 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 10, 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.

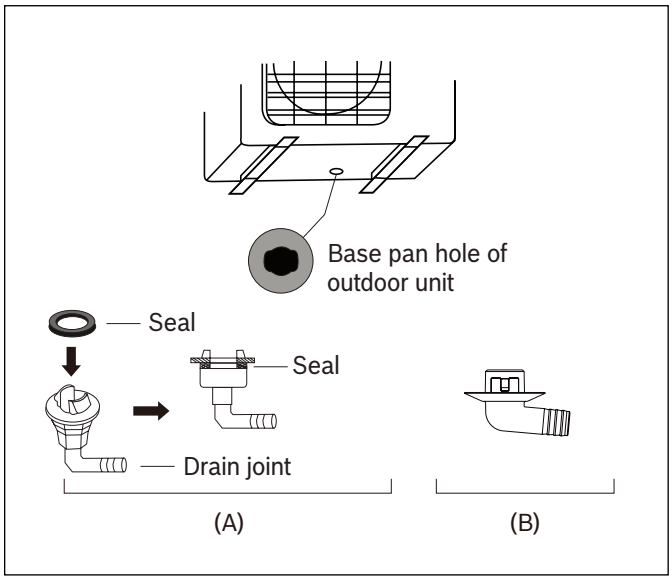


Figure 10

7.3 Anchor Outdoor Unit

NOTICE

Product damage!

Be sure to remove any obstacles that may block air circulation.

Make sure to meet minimum spatial requirement (Figure 6 & 13) to ensure there is enough room for installation and maintenance.

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,eye protection 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.

It is recommended to install the wall-mounted unit with rubber gaskets to reduce vibration and noise.

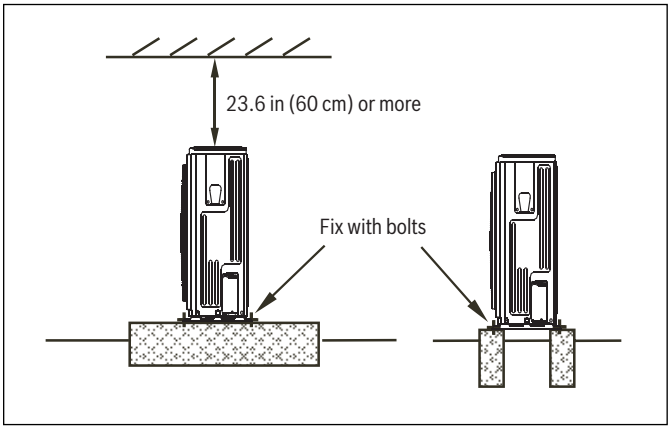


Figure 11

Drilling a hole in the wall

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

1. Determine the location of the wall hole based on the location of the outdoor unit.
2. Use a 6.5 cm (2.5 in) drill bit and drill a hole in the wall.
3. Place the protective wall cuff in the hole. This protects the edges

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

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.

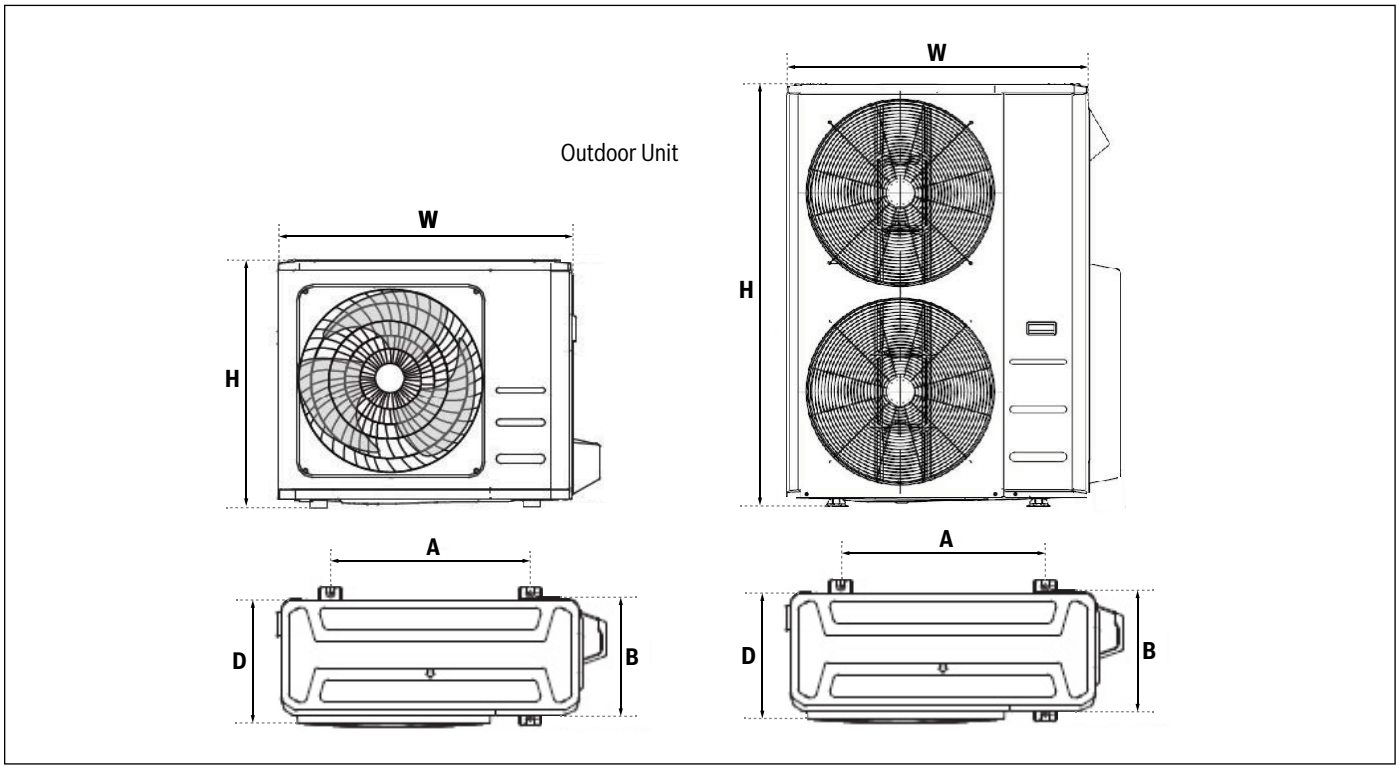


Figure 12

Outdoor Model	Outdoor Unit Dimensions in (mm)	Mounting Dimensions	
	W x H x D	Distance A in (mm)	Distance B in (mm)
BMS500-AAM018-1CSXHD, BMS500-AAM018-1CSXRD	35.0 x 26.5 x 13.6 (890 x 673 x 342)	26.1 (663)	13.9 354
BMS500-AAM027-1CSXRD, BMS500-AAM027-1CSXHD	37.44 x 38.39 x 16.34 (980 x 975 x 415)	26.5 (673)	15.9 (403)
BMS500-AAM036-1CSXRD, BMS500-AAM036-1CSXHD	37.2 x 31.9 x 16.14 (946 x 810 x 410)	26.5 (673)	15.87 (403)
BMS500-AAM048-1CSXRD, BMS500-AAM048-1CSXHD	37.5 x 52.5 x16.34 (952 x 1333 x 415)	25.0 (634)	15.9 (404)

Table 18

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 19

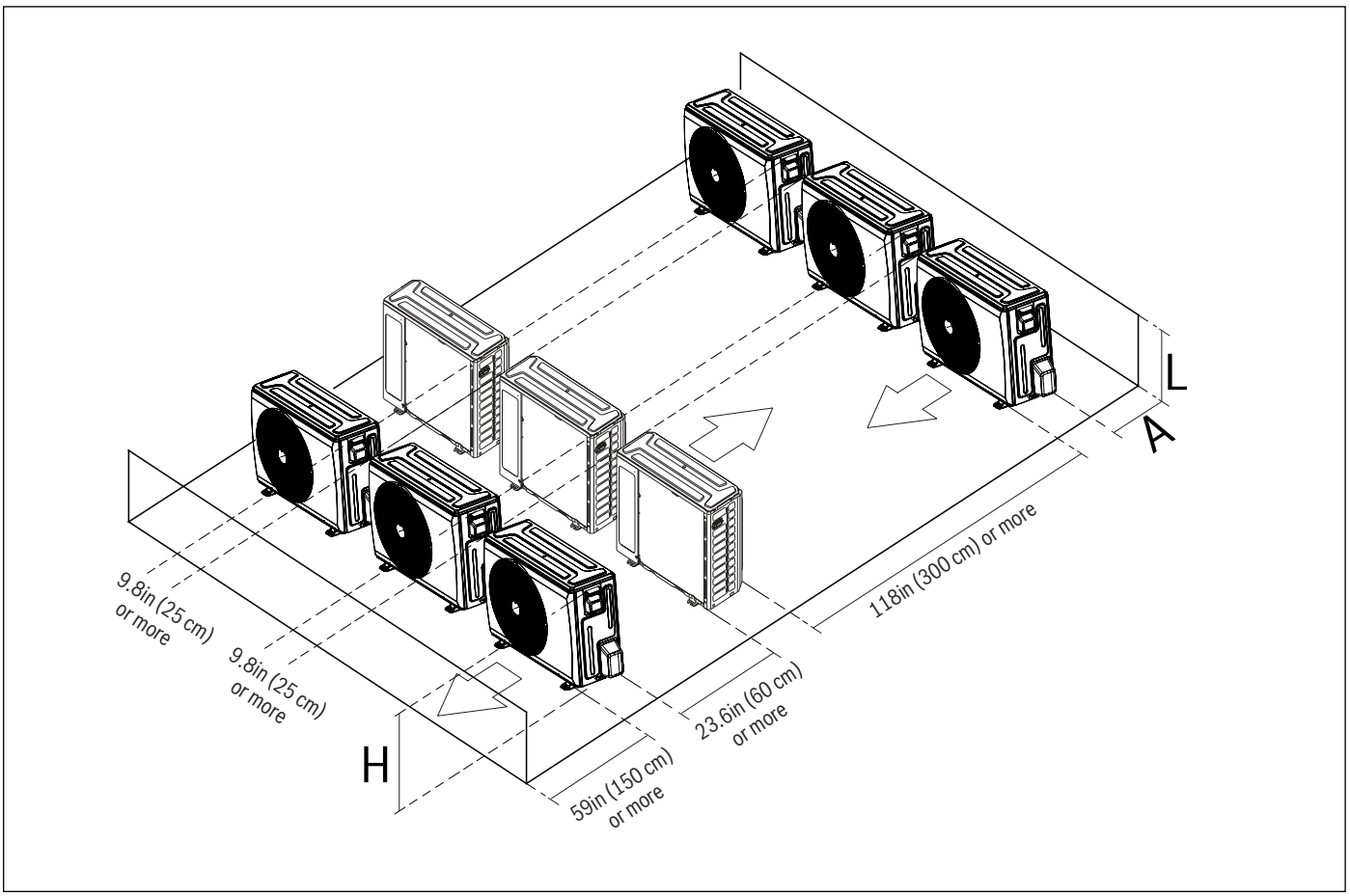


Figure 13

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

7.6 Connecting Multiple Capacity Indoor Units

When different capacity units need to be connected, it is recommend to connect the one has highest capacity at the bottom and the smallest unit at the top of the ODU refrigerant connection manifold. For example, if the system has one 9K, 18K, and 24K Indoor units, the 24K indoor unit should be connected via the port A. and the 9K indoor unit should be connected via the port C. (See Fig. 14)

Refrigerant pipe diameter

Indoor unit capacity (Btu/h)	Liquid line O.D. (in / mm)	Vapor line O.D. (in / mm)
6K / 9K	1/4" / Φ6.35	3/8" / Φ9.52
12k / 18k	1/4" / Φ6.35	1/2" / Φ12.7
24K / 30K /36K	3/8" / Φ9.52	5/8" / Φ15.9

Table 20

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

Type	Model Name	Model #	Liquid Side inch (mm)	Gas Side inch (mm)	Maximum IDU
Regular System	BMS500-AAM018-1CSXRD	8-733-962-695	3 X 1/4" (Φ6.35mm)	3 X 3/8" (Φ9.52mm)	3
	BMS500-AAM027-1CSXRD	8-733-962-696	4 X 1/4" (Φ6.35mm)	3 X 3/8" (Φ9.52mm) + 1 x 1/2" (Φ12.7mm)	4
	BMS500-AAM036-1CSXRD	8-733-962-697	5 X 1/4" (Φ6.35mm)	3 X 3/8" (Φ9.52mm) + 2 x 1/2" (Φ12.7mm)	5
	BMS500-AAM048-1CSXRD	8-733-962-698	6 X 1/4" (Φ6.35mm)	4 X 3/8" (Φ9.52mm) + 2 x 1/2" (Φ12.7mm)	6
Max Performance	BMS500-AAM018-1CSXHD	8-733-962-699	3 X 1/4" (Φ6.35mm)	3 X 3/8" (Φ9.52mm)	3
	BMS500-AAM027-1CSXHD	8-733-962-700	4 X 1/4" (Φ6.35mm)	3 X 3/8" (Φ9.52mm) + 1 x 1/2" (Φ12.7mm)	4
	BMS500-AAM036-1CSXHD	8-733-962-701	5 X 1/4" (Φ6.35mm)	3 X 3/8" (Φ9.52mm) + 2 x 1/2" (Φ12.7mm)	5
	BMS500-AAM048-1CSXHD	8-733-962-702	6 X 1/4" (Φ6.35mm)	4 X 3/8" (Φ9.52mm) + 2 x 1/2" (Φ12.7mm)	6

Table 21

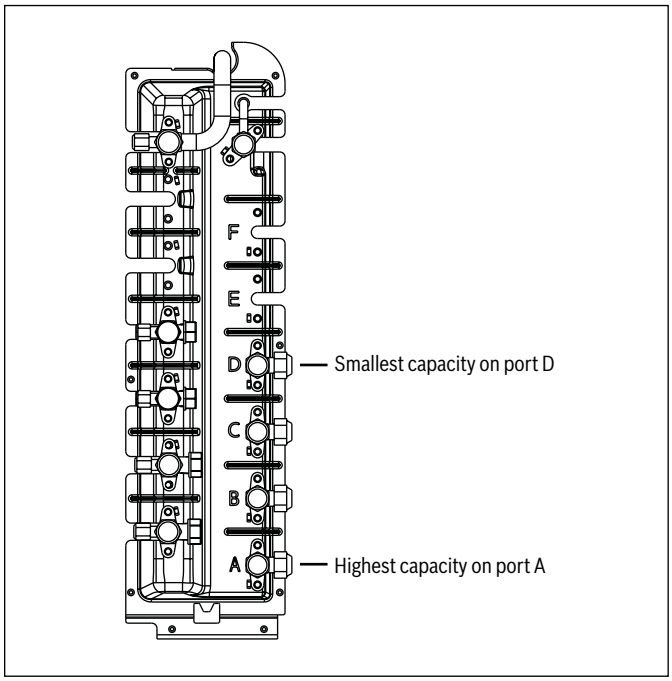


Figure 14

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 16.5ft (5m). A minimum pipe run of 9.8ft (3m) 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)
R454B Inverter Split Air Conditioner	9K, 12K	25 (82ft)	15 (49.2ft)
	18K	30 (98.4ft)	20 (65.6ft)
	24K	50 (164ft)	25 (82ft)
	36K, 48K	75 (246ft)	30 (98.5ft)

Table 22

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 below for cut examples.

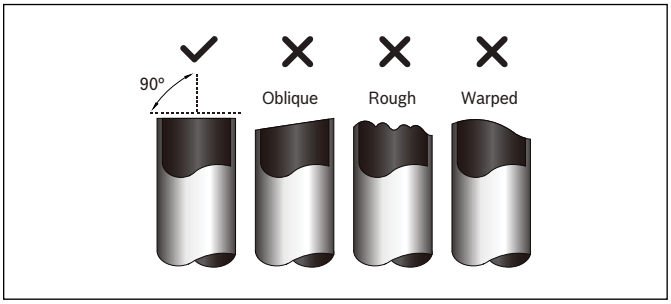


Figure 15

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).

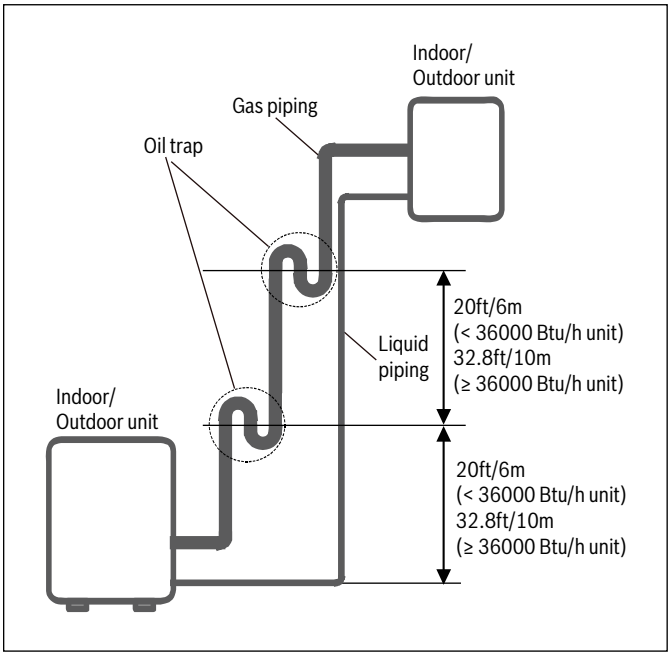


Figure 16

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.

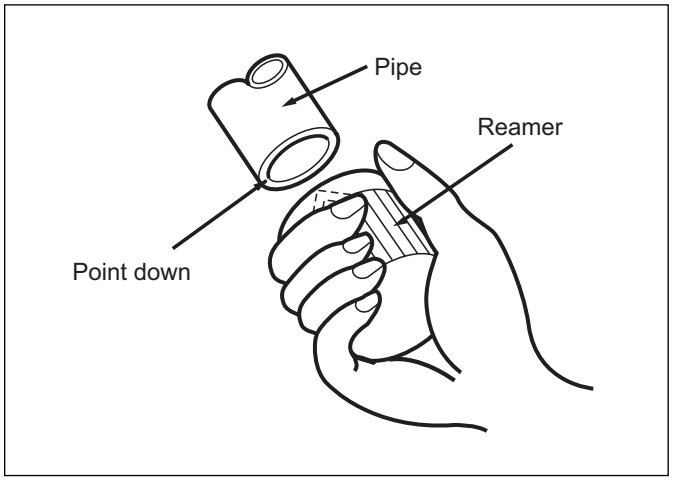


Figure 17

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.

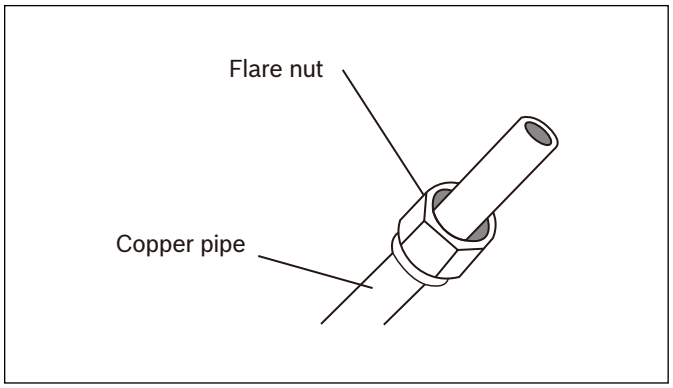


Figure 18

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 23.

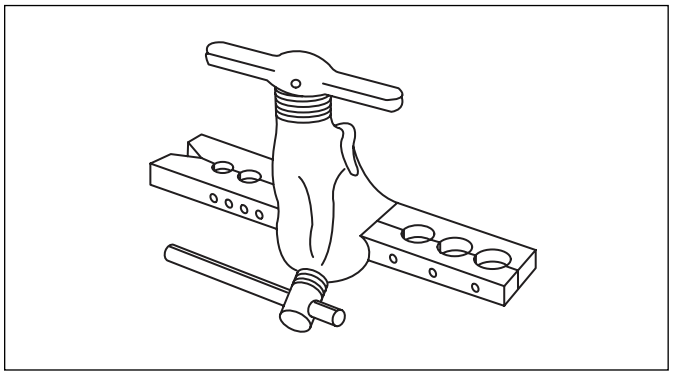


Figure 19

Piping extension beyond flare form

Outer diameter of tube mm (in.)	A mm (in.)	
	Min.	Max.
Ø 6.4 (Ø 0.25")	0.7 (0.0275")	1.3 (0.05")
Ø 9.5 (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 15.9 (Ø 0.63")	2.0 (0.078")	2.2 (0.086")

Table 23

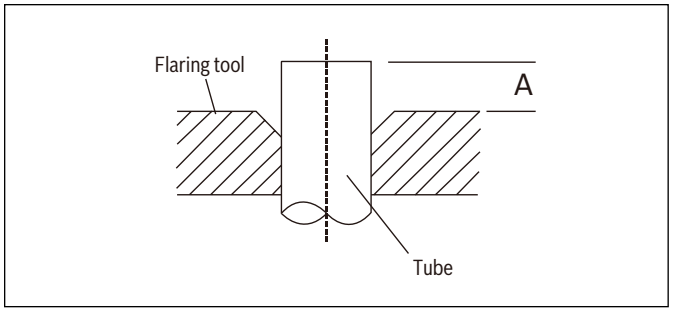


Figure 20

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 (see table 24) 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 4in (10cm).

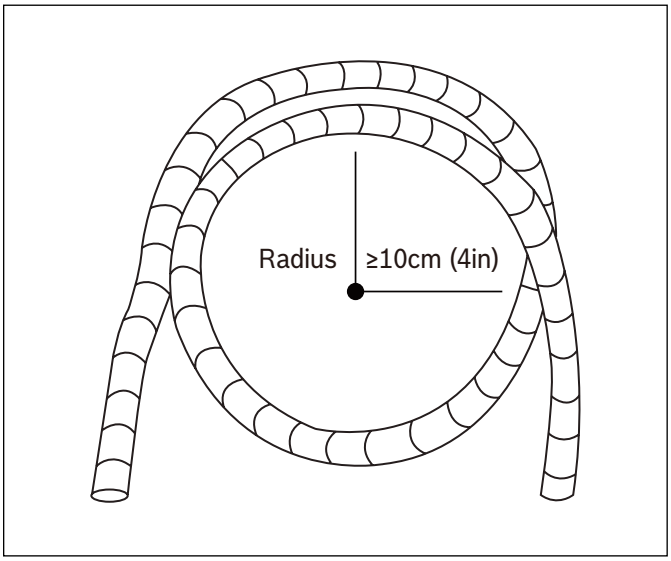


Figure 21

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.

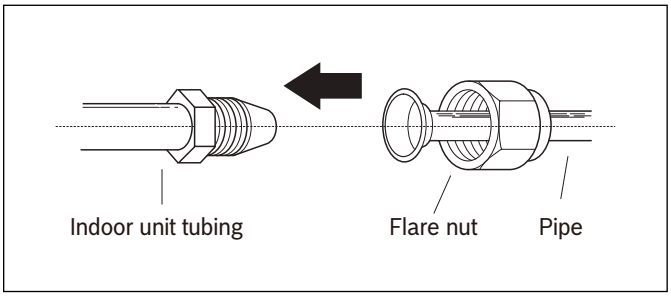


Figure 22

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 24. Loosen the flaring nut slightly, then tighten again.

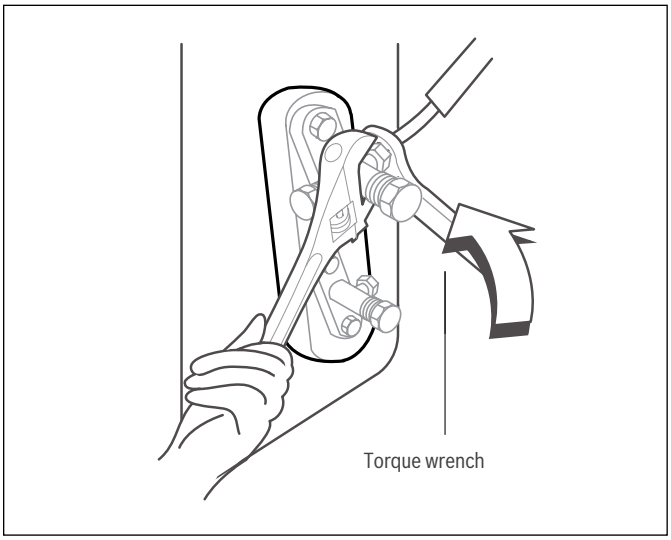


Figure 23

Torque requirements

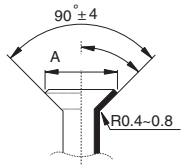
Pipe gauge mm (inch)	Tightening torque	Flare dimension (A) (Unit: mm/Inch)		Flare shape
		Min.	Max.	
Ø 6.35 (1/4)	18-20N.m (13.3 - 14.8 ft. lbs)	8.4/0.33	8.7/0.34	
Ø 9.52 (3/8)	25-26 N.m (18.4 - 19.2 ft. lbs)	13.2/0.52	13.5/0.53	
Ø 12.7 (1/2)	35-36 N.m (25.8-26.5 ft. lbs)	16.2/0.64	16.5/0.65	
Ø 15.9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

Table 24

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 valve cover on the side of the outdoor unit.

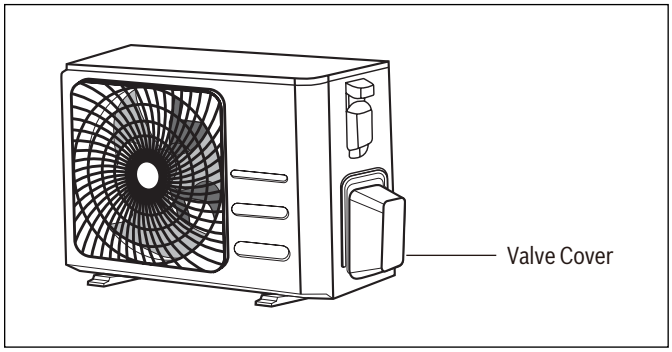


Figure 24

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 25.

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.

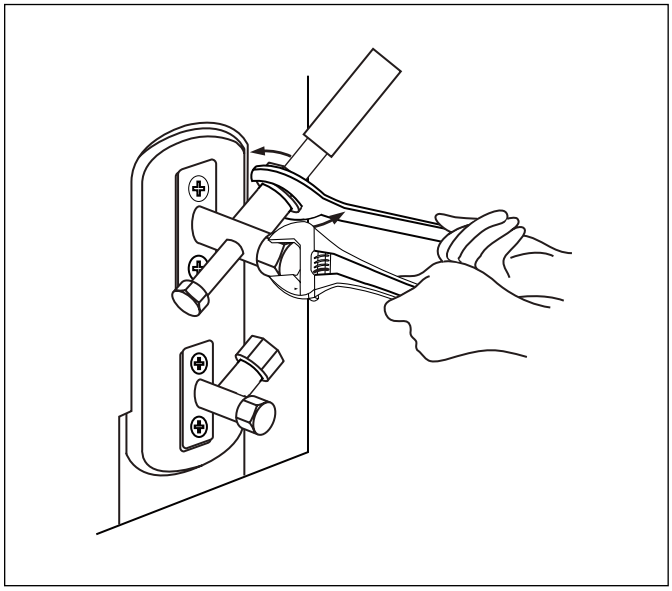


Figure 25

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.

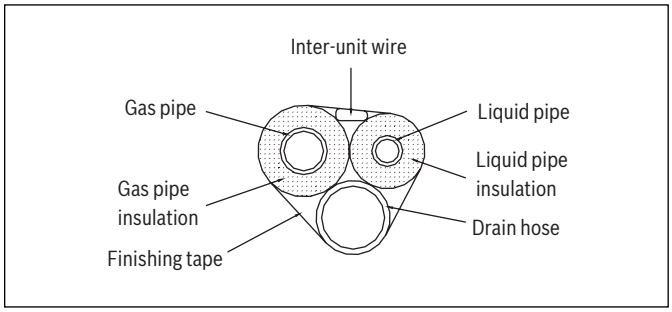


Figure 26

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

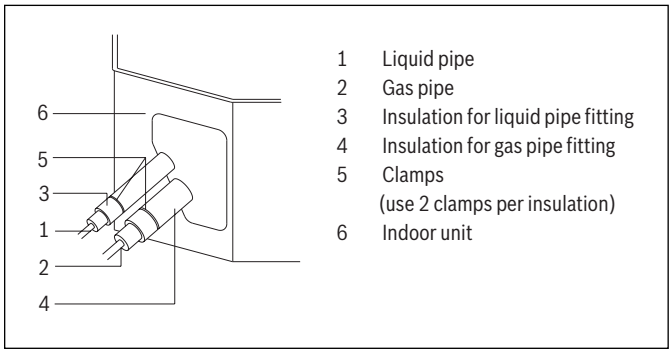


Figure 27

Piping insulation procedure

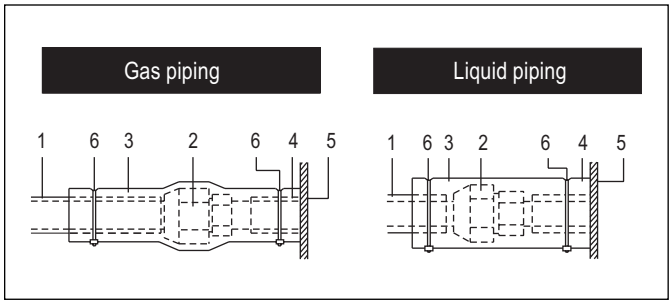


Figure 28

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 Wiring

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.

9.1 Outdoor Unit Wiring

DANGER

Electrical hazard !

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

1. Prepare the cable for connection:
   a. You must first choose the right cable size before preparing it for connection. Be sure to use H07RN-F/SOOW type cables.

Appliance Amps (A)	Cable Size - AWG
≤ 7	18
7 - 13	16
13 - 18	14
18 - 25	12
25 - 30	10

Table 25

   b. Using wire strippers, strip the rubber jacket from both ends of signal/power cable to reveal about 5.9 in (15 cm) of the wires inside.
   c. Strip the insulation from the ends of the wires.
   d. Using 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. Remove the electric cover of the outdoor unit. If there is no cover on the outdoor unit, disassemble the bolts from the maintenance board and remove the protection board.

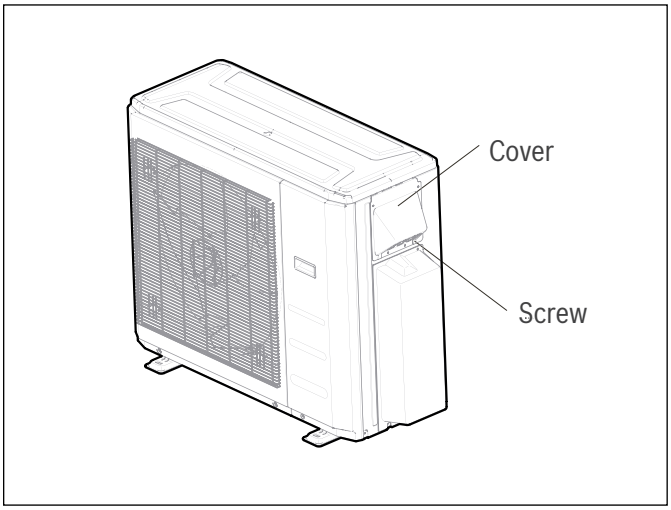


Figure 29

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

9.2 Wiring Diagrams

WARNING

Electrical hazard !

Connect the connective cables to the terminals, as identified, with their matching numbers on the terminal block of the indoor and outdoor units. For example, in the US models shown in the following diagram, terminal 1 of the outdoor unit must connect with terminal 1 on the indoor unit.

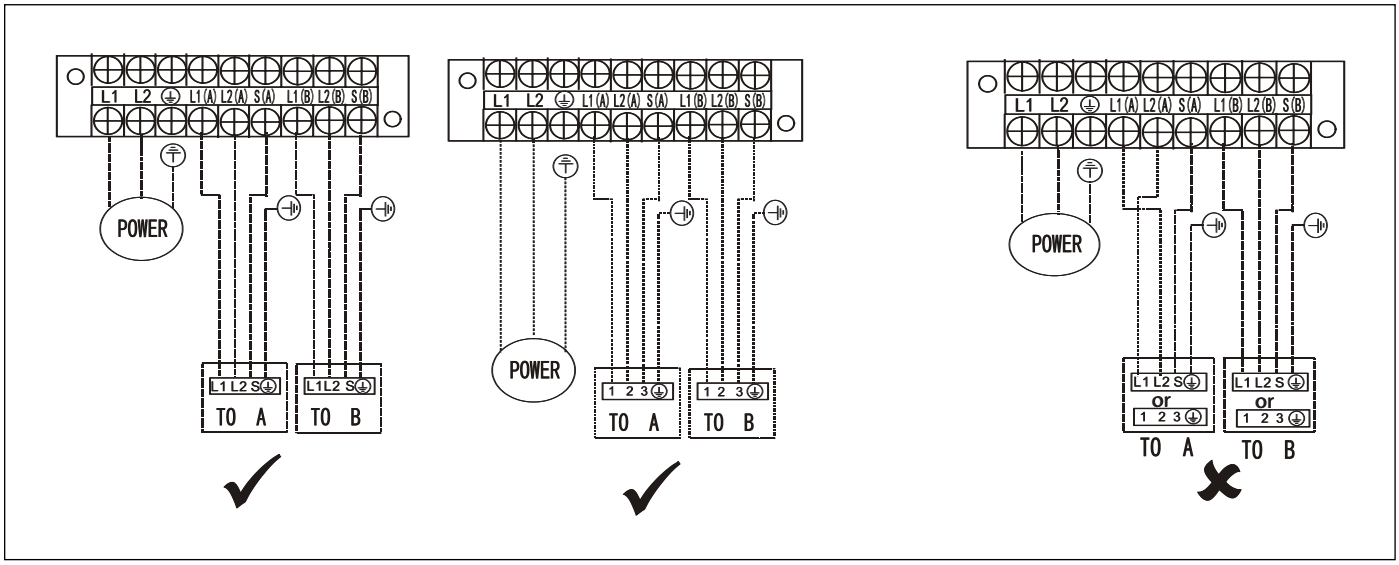
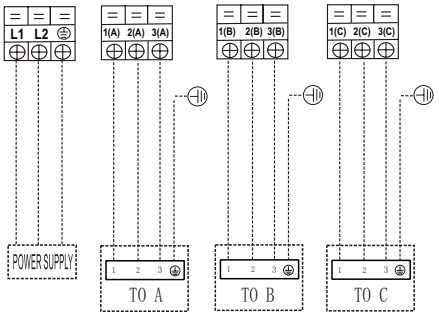


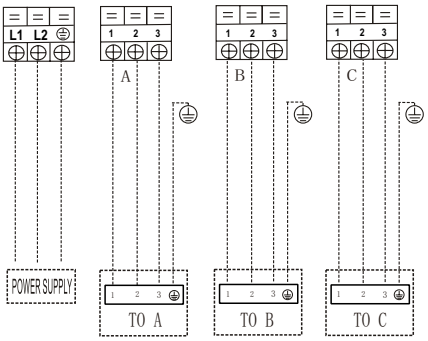
Figure 30

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

One-three models:

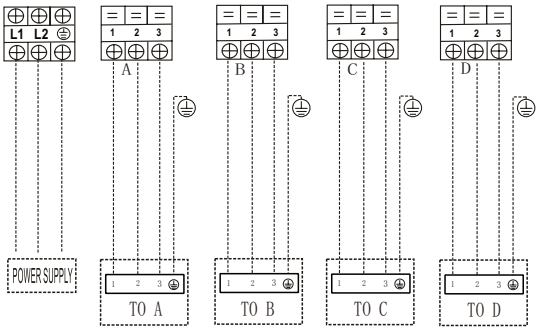


Model A

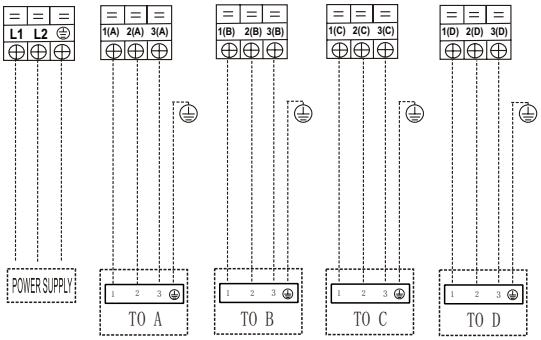


Model B

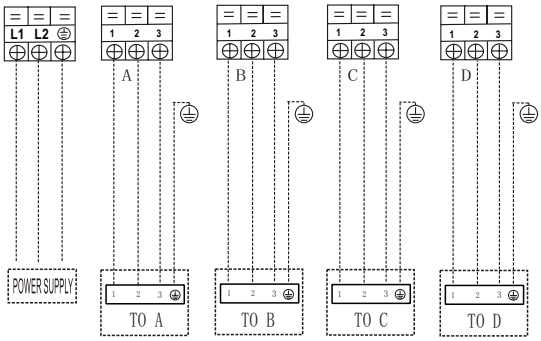
One-four models:



Model A



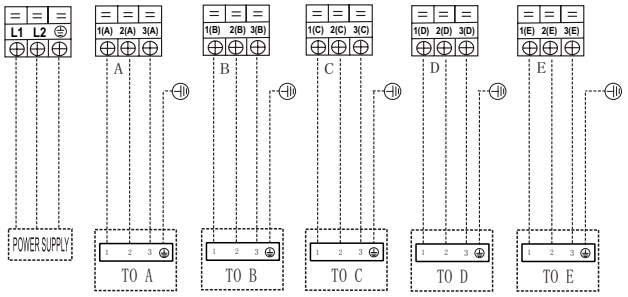
Model B



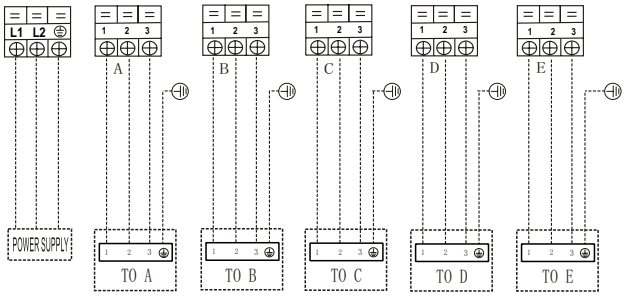
Model C

Figure 31

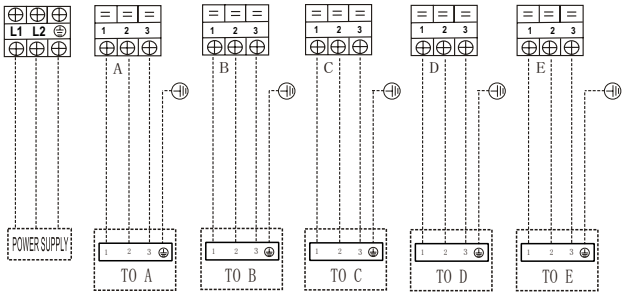
One-five models:



Model A

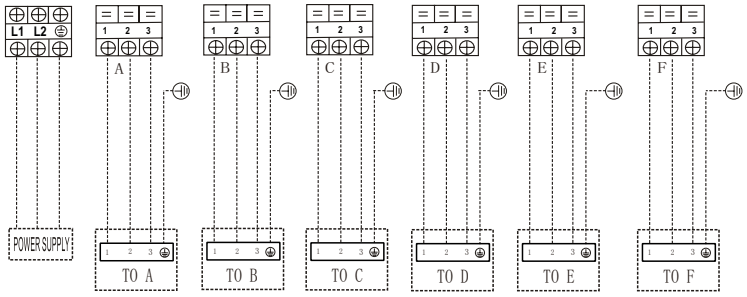


Model B



Model C

One-six models:



Model A

Figure 32

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.

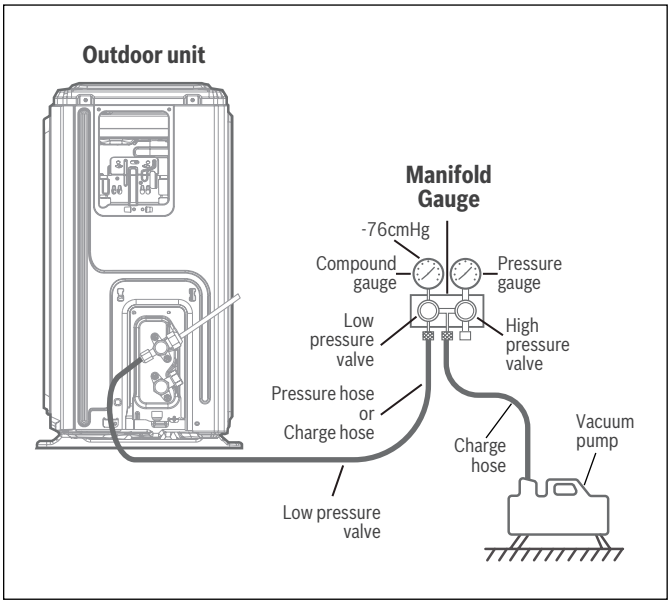


Figure 33

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. Evacuate until the micron gauge reads 350 microns, then close the valve to the vacuum pump.
6. Observe the micron gauge. Evacuation is complete if the micron gauge does not rise above 500 microns in one (1) minute. Once evacuation is complete, turn off the vacuum pump and micron gauge, and close the valves on the manifold gauge set.
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.

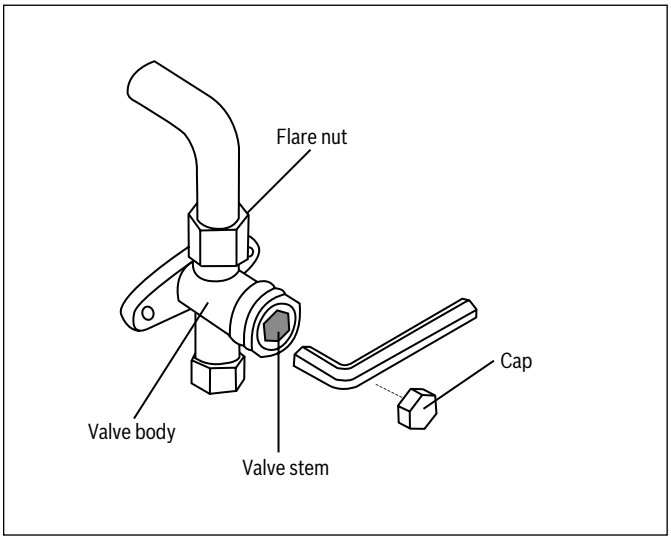


Figure 34

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. Remove the charge hose from the service port.
11. 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.

Do not use a power tool to open valves. This will cause equipment damage.

10.3 Adding Refrigerant

CAUTION

Contains refrigerant!

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

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

Additional refrigerant per pipe length

Type	Model Name	Model #	Standard refrigerant pipe length (ft / m)*	Additional Refrigerant charge per ft
Regular System	BMS500-AAM018-1CSXRD	8-733-962-695	74ft (22.5m)	Refrigerant Type: R454B For the Indoor unit with 1/4" liquid line diameter: (actual pipe length – standard length) 0.16oz/ft (15g/m) For the Indoor unit with 3/8" liquid line diameter: (actual pipe length– standard length) 0.32oz/ft (30g/m) Actual pipe length is measured based on the refrigerant liquid line only. See Section 10.4 Calculation Steps to determine the additional refrigerant amount if the Indoor units have different liquid line diameters. (Refer to table 20 for Indoor unit liquid line diameters)
	BMS500-AAM027-1CSXRD	8-733-962-696	98ft (30m)	
	BMS500-AAM036-1CSXRD	8-733-962-697	123ft (37.5m)	
	BMS500-AAM048-1CSXRD	8-733-962-698	148ft (45m)	
Max Performance	BMS500-AAM018-1CSXHD	8-733-962-699	74ft (22.5m)	
	BMS500-AAM027-1CSXHD	8-733-962-700	98ft (30m)	
	BMS500-AAM036-1CSXHD	8-733-962-701	123ft (37.5m)	
	BMS500-AAM048-1CSXHD	8-733-962-702	148ft (45m)	

Table 26

10.4 Calculation Steps

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

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

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

Step2: Calculate the required charge amount for each zone
(Refer to Table 8 for Indoor unit liquid line diameter)

- If the Zone 1 Indoor unit has 3/8inch liquid line diameter:
  Zone 1 Charge Amount = Zone 1 Refrigerant Pipe Length * 0.32oz/ft (30g/m)
- If the Zone 2 Indoor unit has 1/4 inch liquid line diameter:
  Zone 2 Charge Amount = Zone 2 Refrigerant Pipe Length * 0.16oz/ft. (15g/m)
- Total zone charge amount = Zone 1 charge amount + Zone 2 charge amount + Zone 3 charge amount + ...up to 6 zones

Step3: Calculate the additional refrigerant needed

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

For example:
One 36K ODU (BMS500-AAM036-1CSXHD) paired with below Indoor units.

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

1. **Step1**: Calculate the "Estimated" refrigerant charge. Please note this value is only used to calculate the additional refrigerant charge amount.

   Estimated Refrigerant Charge Amount = 98ft * 0.16oz/ft. = 15.68oz

2. **Step2**: Calculate the required charge amount for each zone. Refer to table 20 (if applicable) for Indoor unit liquid line size
   - Zone 1: 24K wall mounted Indoor unit
     - Zone 1 Charge Amount = 50ft * 0.32oz/ft. = 16oz
   - Zone 2: 18K Cassette Indoor unit
     - Zone 2 Charge Amount = 30ft * 0.16oz/ft. = 4.8oz
   - Zone 3: 9K wall mounted Indoor unit
     - Zone 3 Charge Amount = 30ft * 0.16oz/ft. = 4.8oz
   - Total Zone Charge Amount = 16oz + 4.8oz + 4.8oz = 25.6oz

3. **Step3**: Calculate the additional refrigerant needed

   Additional Refrigerant Amount = 25.6oz – 15.68oz = 9.92oz

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.

Perform the electrical safety check after completing installation. Cover the following areas:

Before test run

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

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

During test run

- **Electrical leakage check:** During a test operation after completed installation, the use the electroprobe and multimeter to perform an electrical leakage check. Turn off the unit immediately if leakage happens. Try and evaluate different solutions until the unit operates properly.

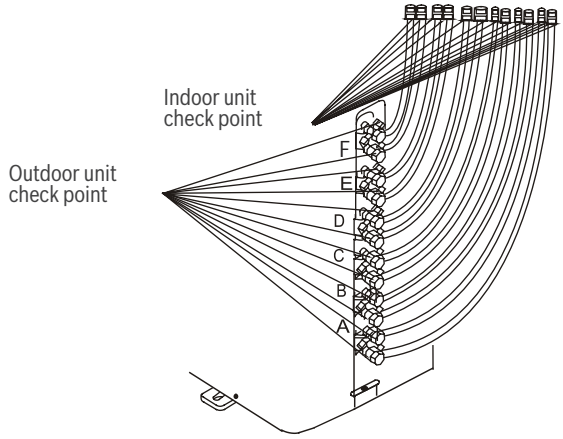
WARNING

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.



A, B,C,D are points for one-four type.
A, B,C,D, and E are points for the one-five type.
A,B,C,D,E,and F are points for the one-six type.

Figure 35

12 Test Run

12.1 Before Test Run

A test run must be performed after the entire system has been completely installed. Confirm the following points before performing the test:

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

WARNING

Property damage / personal injury!

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

12.2 Test Run Instructions

1. Open both the liquid and gas service valves.
2. Upon initial unit installation, wait one (1) hour before starting the unit if compressor crankcase heater is used and the outdoor ambient temperature is below 70 ºF.
3. For the Indoor Unit:
    a. Ensure the remote control and its buttons work properly. Set the air conditioner to COOL mode.
    b. Ensure the louvers move properly and can be changed using the remote control.
    c. Double check to see if the room temperature is registered correctly.
    d. Ensure the indicators on the remote control and the display panel on the indoor unit work properly.
    e. Check to see that the drainage system is unimpeded and draining smoothly.
    f. Ensure there is no vibration or abnormal noise during operation.
7. For the Outdoor Unit:
    a. Check to see if the refrigeration system is leaking.
    b. Make sure there is no vibration or abnormal noise during operation.
    c. Ensure the wind, noise, and water generated by the unit do not disturb your neighbors or pose a safety hazard.

CAUTION

Contains refrigerant!

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

If the unit malfunctions or does not operate according to your expectations, please refer to the Troubleshooting section of the Owner's Manual before calling customer service.

13 Automatic Wiring/Piping Correction Function

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

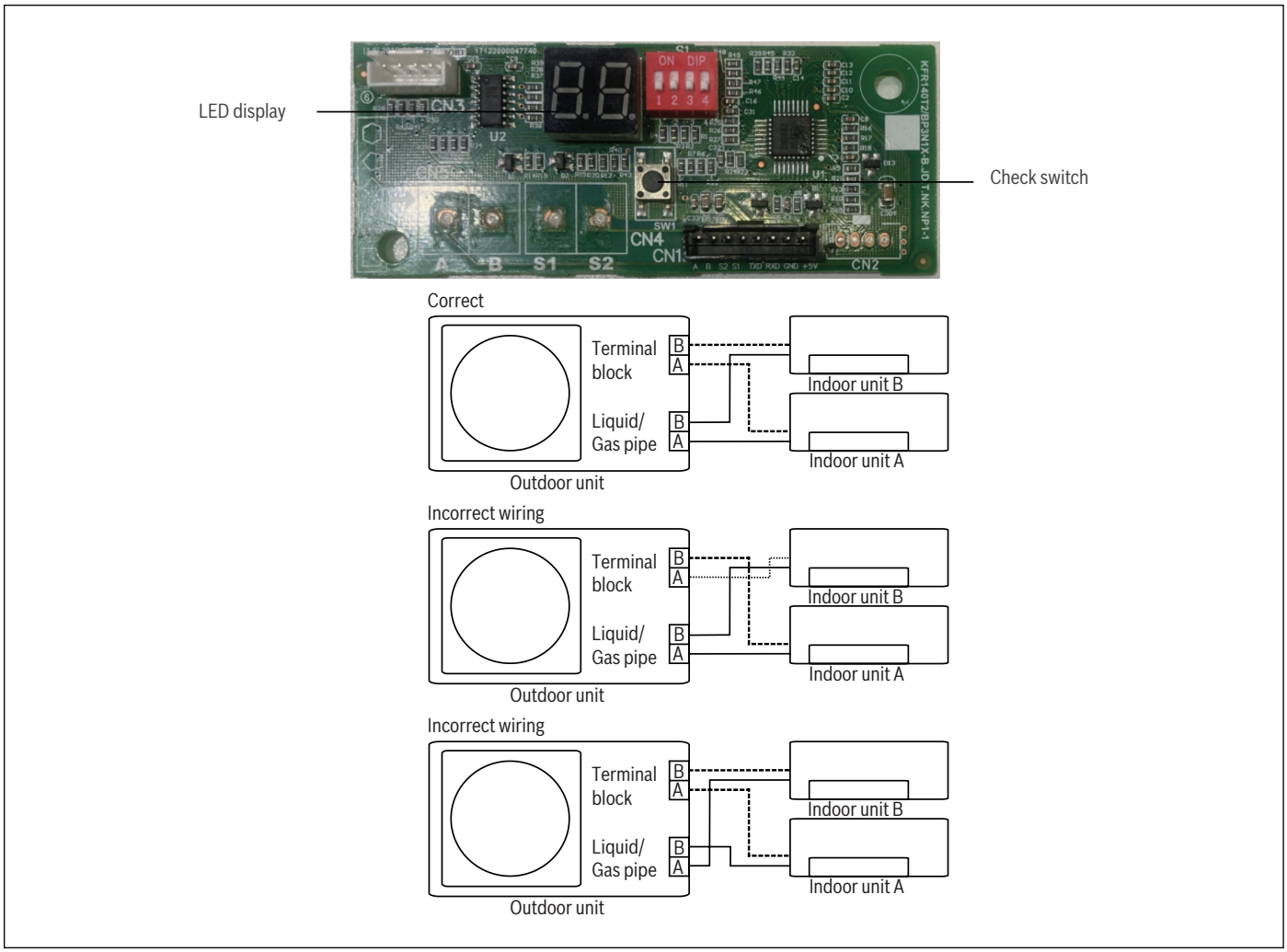


Figure 36

13.1 How To Activate This Function

1. Press the "check switch" on the outdoor unit PCB board for 5 seconds until the LED displays "CE", indicating that this function is working. Approximately 5-10 minutes after the switch is pressed, the "CE" disappears, meaning that the wiring/piping error is corrected and all wiring/ piping is properly connected.
2. Check that outside temperature is above 41°F (5°C). (This function does not work when outside temperature is not above 41°F (5°C)).
3. Check that the service valves of the liquid pipe and gas pipe are open.
4. Ensure IDU and ODU have been powered up for at least 2 minutes.
5. Press the check switch on the outdoor PCB board until the LED displays "CE".

13.2 Operating Condition

When your air conditioner is used outside of the following temperature ranges, certain safety protection features may activate and cause the unit to disable.

Operating Temperature

	COOL Mode	HEAT Mode	DRY Mode
Room Temp.	16℃~32℃(60℉~90℉)	0℃~30℃(32℉~86℉)	10℃~32℃(50℉~90℉)
Outdoor Temp.	-25℃~50℃(-13℉~122℉)	-25℃~24℃(-13℉~75℉)	0℃~50℃(32℉~122℉)
	-30℃~50℃(-22℉~122℉) For Hyper Heat models	-30℃~24℃(-22℉~75℉) For Hyper Heat models	

Table 27

FOR OUTDOOR UNITS WITH AUXILIARY ELECTRIC HEATER

When outside temperature is below 0℃ (32℉), we strongly recommend keeping the unit plugged in at all time to ensure smooth ongoing performance.

Room relative humidity less than 80%. If the air conditioner operates in excess of this figure, the surface of the air conditioner may attract condensation. Please sets the vertical air flow louver to its maximum angle (vertically to the floor), and set HIGH fan mode.

To further optimize the performance of your unit, do the following:

- Keep doors and windows closed.
- Limit energy usage by using TIMER ON and TIMER OFF functions.
- Do not block air inlets or outlets.
- Regularly inspect and clean air filters.

14 Features and Operation

14.1 Protection of the Air Conditioner

Compressor protection
Compressor Anti Short Cycle = 3 minutes

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

A) When heating has just started

B) During defrost cycle

C) Low temperature heating

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

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

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

Auto-restart
In case of power failure, the system will immediately stop. When power returns, the Operation light on the indoor unit will flash. To restart the unit, press the ON/OFF button on the remote control. If the system has an auto restart function, the unit will restart using the same settings.

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

14.2 Operation

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

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

Noise coming from the air conditioner
You may hear a low hissing sound when the compressor is running or has just stopped running. This sound is refrigerant equalizing which is normal.

A low hissing sound may be heard due to the louver restoring itself to its original position when power is first turned on. You may also hear a low "squeaking" sound when the compressor is running or has just stopped running. This is caused by heat expansion and cold contraction of the plastic parts in the unit when the temperature is changing.

Dust blowing out from the indoor unit.
This happens when the air conditioner has not been used for a long time or during its first use.

Odors emitting from the indoor unit.
This is caused by the indoor unit giving off odors permeated from building materials, furniture,or smoke.

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

Heating mode
The air conditioner draws in heat from the outdoor unit and releases it via the indoor unit during heating. When the outdoor temperature falls, heat drawn in by the air conditioner decreases accordingly. At the same time, heat loading of the air conditioner increases due to larger difference between indoor and outdoor temperature. If a comfortable temperature cannot be achieved with the air conditioner alone, it is recommended that you use a supplementary heating device.

Lightning or a car wireless telephone operating nearby may cause the unit to malfunction. Disconnect the unit from its power source and then re-connect the unit with the power source again. Push the ON/OFF button on the remote controller to restart operations.

Outdoor Unit Reverse Fan Operation function:
This feature helps keep the outdoor coil cleaner and may extend the duration between regular maintenance intervals depending on local conditions. When the unit is turned off, a 10 second delay occurs then the outdoor fan runs in reverse rotation for 70 seconds to blow off loose accumulated dust and debris.

Operation mode selection
While two or more indoor units are simultaneously operating, make sure the heat or cool modes do not conflict with each other. The heat mode claims precedence over cooling mode. If the unit initially started to operate in HEAT mode, the other units can operate in HEAT mode only. For example: If the unit initially started operates under COOL mode, other units cannot operate in heat mode. If one of the unit selects HEAT mode while the others are in cool mode, the other operating units will stop operation and display error code.

Optimal operation
To achieve optimal performance, please note the following:

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

15 Troubleshooting

WARNING

Property damage / personal injury!

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

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

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

15.1 Common Issues

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

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

Issue	Possible Causes
Not heating or cooling	The Unit has a 3-minute protection feature that prevents the outdoor unit from short cycling. Heating or cooling will not start until the 3 minute anti short cycle has expired.
	If the Operation light and PRE-DEF (Pre-heating/Defrost) indicators are lit up, the outdoor temperature is too cold and the unit's anti-cold wind is activated in order to defrost the unit.
	In Cooling-Only models: If the "Fan Only" indicators is lit up, the outdoor temperature is too cold and the unit's anti-freeze protection is activated in order to defrost the unit.
The unit changes from COOL/HEAT mode to FAN mode	The unit may change its setting to prevent frost from forming on the unit. Once the temperature increases, the unit will start operating in the previously selected mode again.
	The set temperature has been reached, at which point the unit turns off the compressor. The unit will continue operating when the temperature fluctuates again.
The indoor unit emits white mist	In high humidity conditions, a large temperature difference between the room's air and the conditioned air can cause white mist.
Both the indoor and outdoor units emit white mist	When the unit restarts in HEAT mode after defrosting, white mist may be emitted due to moisture generated from the defrosting process.
The indoor unit makes noises	A rushing air sound may occur when the louver resets its position.
	A squeaking sound may occur after running the unit in HEAT mode due to expansion & contraction of the unit's plastic parts.
	A squeaking sound is heard when the system if OFF or in COOL mode. The noise is also heard when the drain pump (optional) is in operation.
Both the indoor unit and outdoor unit make abnormal sound	Low hissing sound during operation: This is normal and is caused by refrigerant gas flowing through both indoor and outdoor units.
	Low hissing sound when the system starts, has just stopped running, or is defrosting: This noise is normal and is caused by the refrigerant equalization.
	Abnormal sound: Normal expansion and contraction of plastic and metal parts caused by temperature changes during operation can cause squeaking noises.
The outdoor unit makes noises	The unit will make different sounds based on its current operating mode.
Dust is emitted from either the indoor or outdoor unit	The unit may accumulate dust during extended periods of non-use, which will be emitted when the unit is initially operated. This can be mitigated by covering the unit during long periods of inactivity.
The unit emits a bad odor	The air filter require's cleaning.
	The unit may absorb odors from environment (such as furniture, cooking, cigarettes, etc) which will be emitted during operations.
The outdoor unit fan does not operate	During heating or cooling operation, the fan speed is controlled to optimize product operation.
Operation is erratic, unpredictable, or unit is unresponsive	Interference from cell phone towers and remote boosters may cause the unit to malfunction. In this case, try the following: • Disconnect the power, then reconnect. • Press ON/OFF button on remote control to restart operation.

Table 28

15.2 Troubleshooting Tips

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

Problem	Possible Causes	Solution
The unit is not working	Power failure	Wait for the power to be restored
	The power switch is off	Turn on the power
	Check remote control batteries	Replace the remote control batteries
	The unit's 3-minute anti-short cycle has been activated	Wait three minutes after restarting the unit
	The fuse is burned out	Replace the fuse
Poor cooling performance	Temperature setting may be higher than ambient room temperature	Lower the temperature setting
	The heat exchanger on the indoor or outdoor unit is dirty	Clean the affected heat exchanger
	The air filter is dirty	Remove the filter and clean it according to instructions
	The air inlet or outlet of either unit is blocked	Turn the unit off, remove the obstruction and turn it back on
	Doors and windows are open	Make sure that all doors and windows are closed while operating the unit
	Excessive heat is generated by sunlight	Close windows and curtains during periods of high heat or bright sunshine
	Low refrigerant due to leak or long-term use	Check for leaks, repair if necessary and top off with R454B refrigerant.
The unit starts and stops frequently	There's too much or too little refrigerant in the system	Check system refrigerant operation. Ensure charge is per specification
	There is air, incompressible gas or foreign material in the refrigeration system.	Evacuate andrecharge the system with R454B refrigerant per specification
	System circuit is blocked	Determine which circuit is blocked and replace the malfunctioning piece of equipment
	The compressor is broken	Replace the compressor
	The voltage is too high or too low	Install a voltage regulator to regulate the voltage
Poor heating performance	The outdoor temperature is lower than 7°C (44.5°F)	Check for leaks and recharge the system with R454B refrigerant
	Cold air is entering through doors and windows	Make sure that all doors and windows are closed during use
	Low refrigerant due to leak or long-term use	Check for leaks, repair if necessary and top off with R454B refrigerant

Table 29

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.

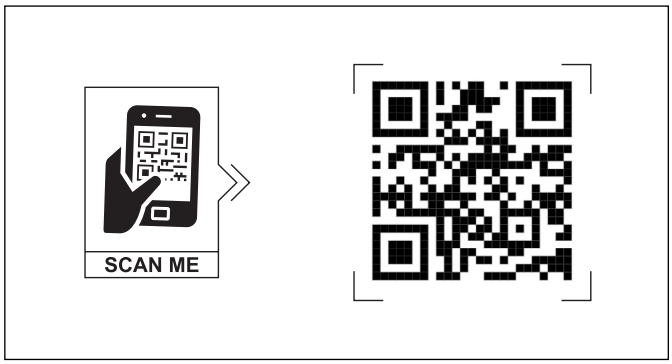


Figure 37

16 Error Codes

NOTICE

System failure!

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

Display	LED Status
dF	Defrosting
FC	Forced cooling
EC 07	Outdoor fan speed has been out of control
EC 71	Over current failure of outdoor DC fan motor
EC 72	Lack phase failure of outdoor DC fan motor
EC 50	Open or short circuit of outdoor unit temperature sensor(T3,T4.TP)
EC 51	Outdoor EEPROM malfunction
EC 52	ODU coil temp. sensor(T3) error.
EC 53	ODU ambient temp. sensor(T4) error.
EC 54	Compressor discharge temp. sensor(TP) error.
EC 55	ODU IPM module temp. sensor malfunction.
EC 56	IDU coil temp. sensor(T2B) error.
EC 57	Refrigerant pipe temp. sensor error.
EC 5A	Failure of enthalpy inlet temperature sensor
EC 5b	Failure of enthalpy outlet temperature sensor
EC 5C	Pressure sensor failure
EC 5E	Condenser temperature sensor(T3B) failure
EHC1	Refrigerant sensor detects leakage
EL 01	Indoor / outdoor units communication error
PC 00	IPM module protection
PC 02	Compressor temperature protection
PC 06	Temperature protection of compressor discharge
PC 08	Outdoor unit overcurrent protection
PC 0A	High temperature protection of condenser
PC 0F	PFC module protection
PC 0L	Low ambient temperature protection
PC 10	Outdoor unit low AC voltage protection
PC 11	Outdoor unit main control board DC bus high voltage protection
PC 12	Outdoor unit main control board DC bus high voltage protection /341 MCE error
PC 13	The AC power is cut off or the AC voltage detection circuit fails
PC 30	High pressure protection
PC 31	Low pressure protection
PC 40	Communication malfunction between IPM board and outdoor main board
PC 43	Compressor phase protection
PC 44	Outdoor motor RPM protection (Not applicable)
PC 45	Outdoor unit IR chip drive failure
PC 46	Compressor speed has been out of control
PC 49	Compressor overcurrent failure
PC AI	Condensation protection of refrigerant pipe
LC 06	High temperature protection of Invervter module (IPM)

Table 30

17 Disposal Guidelines

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

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

WARNING

Contains refrigerant !

Improper disposal of this appliance endangers your health and is bad for the environment. Hazardous substances may leak into the ground water and enter the food chain.

Disposing of this product correctly will help ensure that the waste undergoes the necessary treatment, recovery and recycling.

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