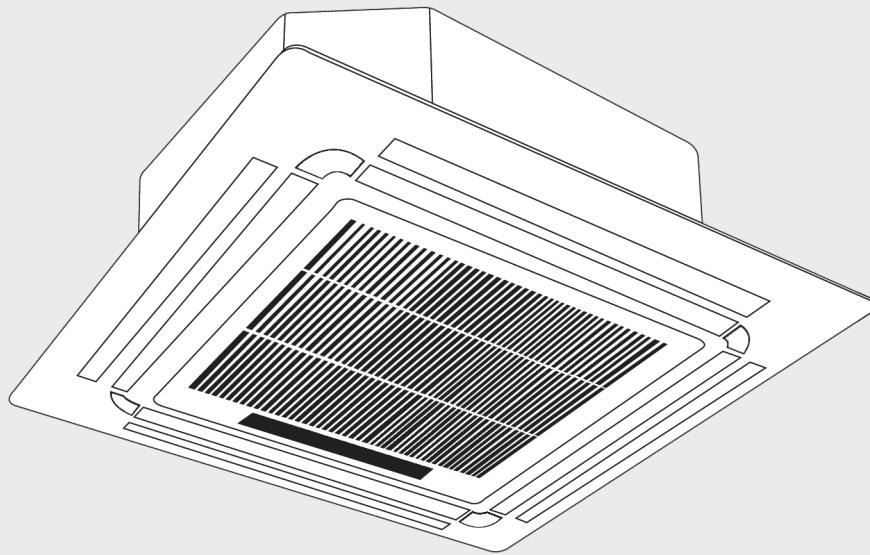




BOSCH

Installation and Operating Instructions

Four Way Cassette Ductless Split Air Conditioner/Heat Pump **Climate 5000 Series** - Gen 4



BTC 769203306 D / 05.2025



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1 Key to Symbols and Safety Instructions

1.1 Key to Symbols

Warnings

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

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



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



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



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

NOTICE

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

Important information



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

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

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

Table 1

1.3 Safety

Please read safety precautions before installation

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



WARNING
Improper or dangerous operation!
Installation must be performed by a licensed contractor, and per the instructions in the installation manual. Improper installation can cause water leakage, electrical shock, or fire.
In North America, installation must be performed in accordance with the requirement of NEC (National Electric Code) and CEC (Canadian Electric Code) by licensed and qualified personnel only.
Only contact a licensed contractor for repair or maintenance of this unit.



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



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

**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!**

Generation 4 Mini-Split products use R454B refrigerant and cannot be combined with models from previous Mini-Split generations (R410A refrigerant).

In addition, you must ONLY use R454B if additional refrigerant needs to be added into the system. Do NOT use any other refrigerant type.

1.3.1 For R454B refrigerant charge amount and minimum room area

The indoor and outdoor units are designed to be used together. Please verify the unit you purchased per Table 1. The indoor unit should be installed at least 7.6ft/2.3m above from the floor, the height of the room cannot be less than 7.3ft/2.2m, and the minimum room area of operating or storage should be as specified in the following table 2.

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

Capacity (Btu/h)	IDU	ODU	Nominal Air Flow
9K	BMS500-AAU009-1AHCXD	BMS500-AAS009-1CSXRD, BMS500-AAS009-1CSXHD	353CFM (600m³/h)
12K	BMS500-AAU012-1AHCXD	BMS500-AAS012-1CSXRD, BMS500-AAS012-1CSXHD	418CFM (710m³/h)
18K	BMS500-AAU018-1AHCXD	BMS500-AAS018-1CSXRD, BMS500-AAS018-1CSXHD	448CFM (760m³/h)
24K	BMS500-AAU024-1AHCXD	BMS500-AAS024-1CSXRD, BMS500-AAS024-1CSXHD	765CFM (1300m³/h)
36K	BMS500-AAU036-1AHCXD	BMS500-AAS036-1CSXRD, BMS500-AAS036-1CSXHD	1042CFM (1770m³/h)
48K	BMS500-AAU048-1AHCXD	BMS500-AAS048-1CSXRD, BMS500-AAS048-1CSXHD	1236CFM (2100m³/h)

Table 2

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

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

Table 3

Amin: the required minimum room area in ft² / m²

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

mREL: the refrigerant releaseable charge in oz/kg

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

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 specific 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 (ELOC) 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:
 - 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.
 - 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.
 - 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 affects 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 is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

Cabling

Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects. 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 refrigerant-free 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; evacuate; purge the circuit with inert gas (recommended for A2L); evacuate (recommended for A2L); continuously flush or purge with inert gas when using flame to open circuit; and open the circuit.

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

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

Charging Procedures

In addition to conventional charging procedures, the following requirements shall be followed: Works shall be undertaken with appropriate tools only (In case of uncertainty, please consult the manufacturer of the tools for use with flammable refrigerants) Ensure that contamination of 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.

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

Recovery

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

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

The recovered refrigerant shall be processed according to local legislation in the correct recovery cylinder, and the relevant waste transfer note arranged. Do not mix refrigerants in recovery units and especially not in cylinders.

If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The compressor body shall not be heated by an open flame or other ignition sources to accelerate this process. When oil is drained from a system, it shall be carried out safely.

Transportation, Marking and Storage for Units

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

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

2 Packing and Unpacking the Unit

2.1 Unpacking

Indoor Unit:

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

Outdoor Unit:

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

2.2 Packing

Indoor Unit:

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

Outdoor Unit:

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



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

3 Components

The air conditioning / heat pump system comes with the following components. Use all of the installation parts and components to install the system.

**WARNING**

Personal injury, death, product damage!

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

3.1 Required Installation Accessories

This indoor unit requires installation of a decorative panel. Panel installation should only be performed after wiring and piping have been completed.

Part #	Description
8733962708	Compact Cassette Grille - 9k, 12k, 18k
8733962703	Cassette Grille - 24k, 36k, 48k

Table 5

Name			Image	Quantity
Outlet pipe insulation (only for 24K, 36K, 48K)				1
Soundproof/Insulation Sheath (24K/36K/48K)				1
Soundproof/Insulation Sheath (24K/36K/48K)				1
Tie Wrap (24K/36K/48K)				6
Magnetic Ring (9K/12K/18K)				2
Metal clamp				1
Drain fitting (only for 9K, 12K, 18K)				1
Seal ring (only for 9K, 12K, 18K)				1
Tapping screws M3×10mm (on some models)				2
Drain Hose				1
Flare nut (used to make the connective pipes between indoor and outdoor units)				2
Conduit installation plate (only for 9K, 12K & 18K)				1
Remote controller				1
Remote controller holder				1
Dry battery AAA				2
Rubber block (24K/36K/48K)				1
Owner's manual			—	1
Installation manual			—	1
Connecting pipe assembly	Liquid side	Ø 6.35 (1/4in)	—	Parts not included Piping kits are available as an accessory. See section 12.3 for detail.
		Ø 9.52 (3/8in)		
		Ø 12.7 (1/2in)		
	Vapor side	Ø 9.52 (3/8in)		
		Ø 12.7 (1/2in)		
		Ø 16 (5/8in)		
		Ø 3/4 (19mm)		

Table 4

4 Dimensions

4.1 9K, 12K, 18K models

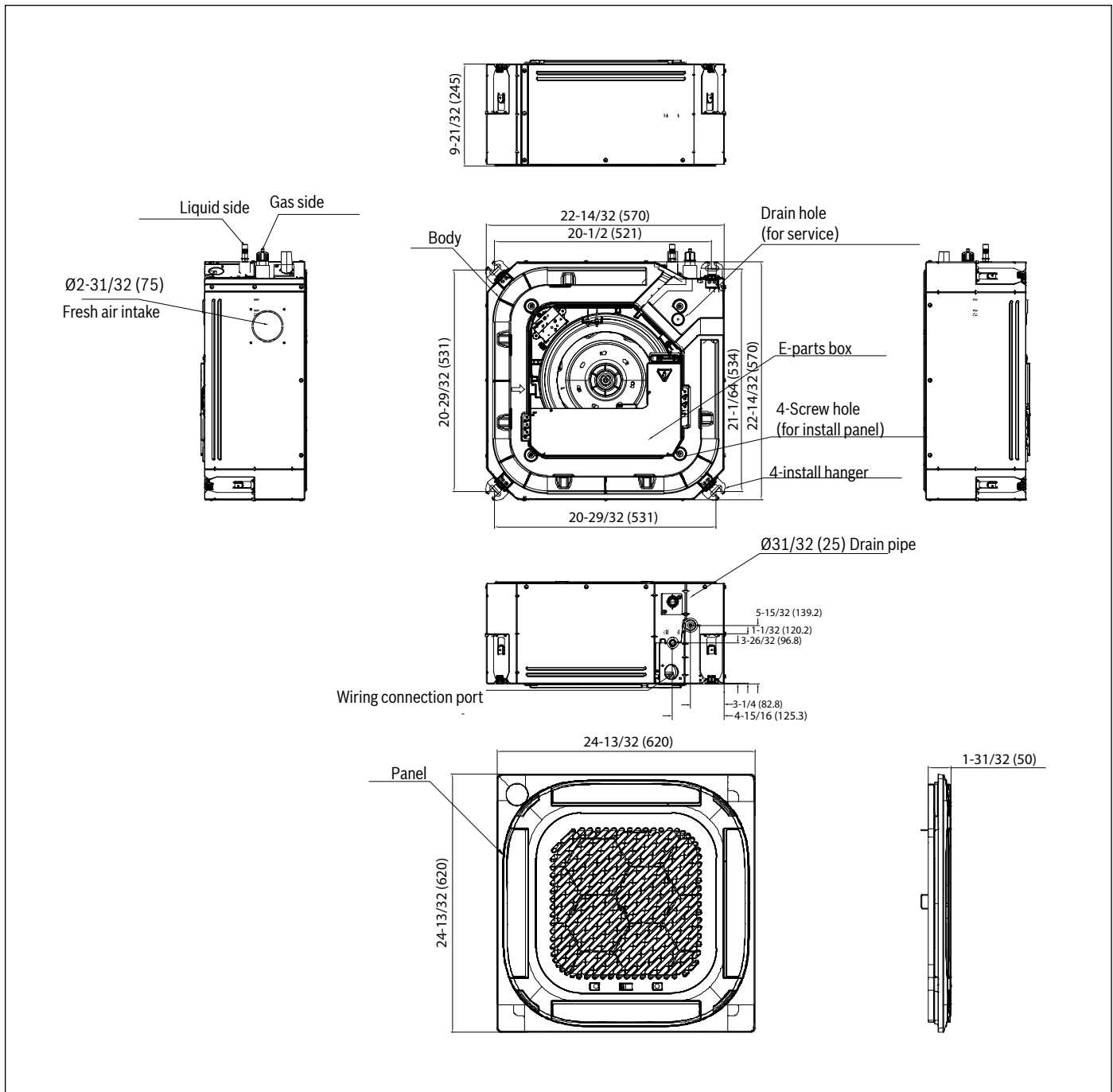


Figure 1 Dimensions in inches (mm)

4.2 24K, 36K, 48K models

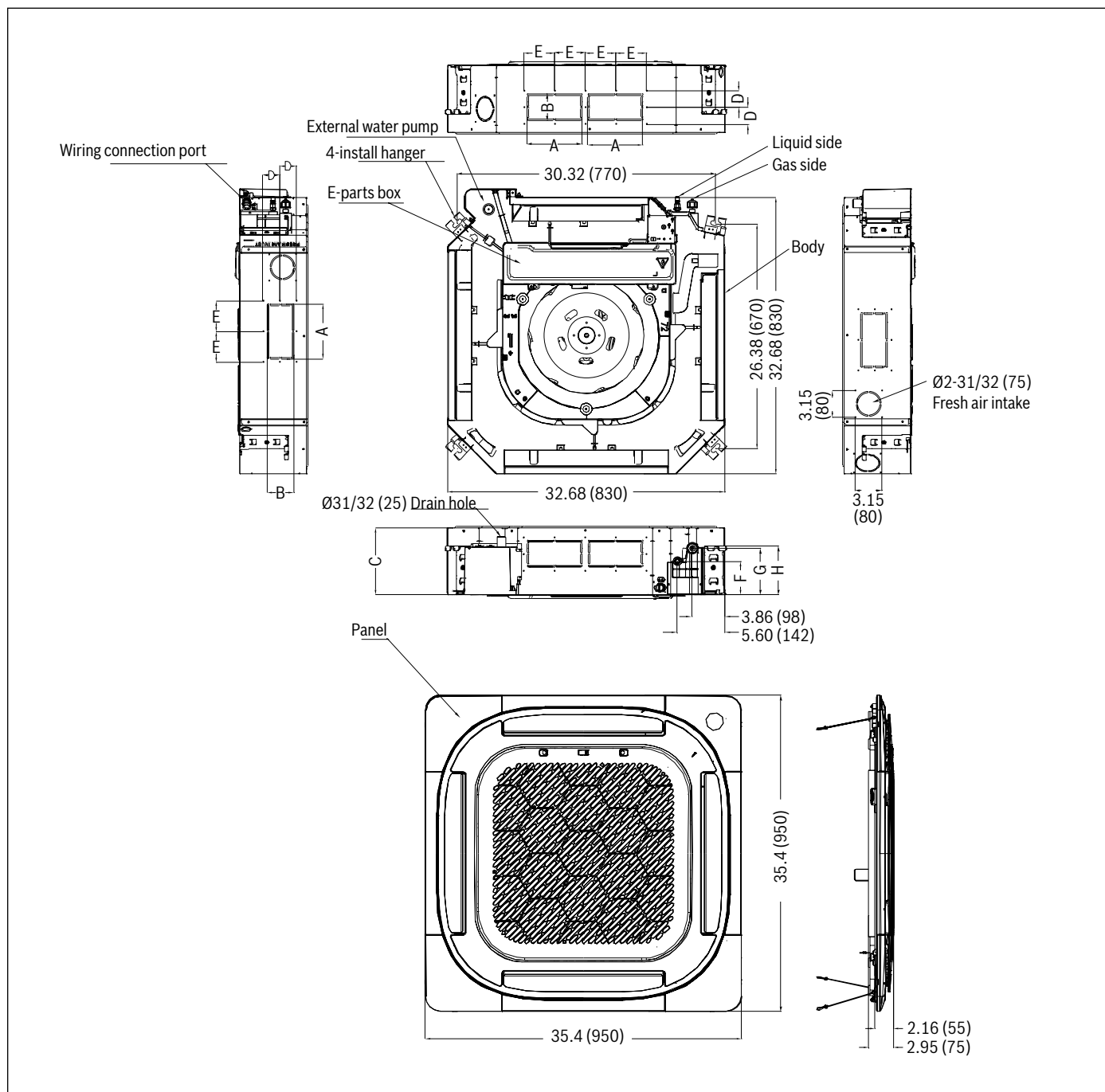


Figure 2 Dimensions in inches (mm)

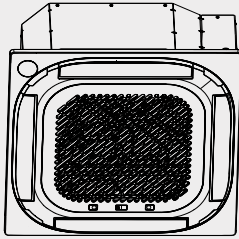
BTU/h	Unit	A	B	C	D	E	F	G	H
24	mm	165	80	205	50	92	101	139	146
	in	6.5	3.15	8.07	1.97	3.62	4	5.5	5.75
36	mm	165	100	245	60	92	101	139	146
	in	6.5	3.94	9.65	2.36	3.62	4	5.5	5.75
48	mm	165	100	287	60	92	101	139	146
	in	6.5	3.94	11.3	2.36	3.62	4	5.5	5.75

Table 6

5 Installation Summary

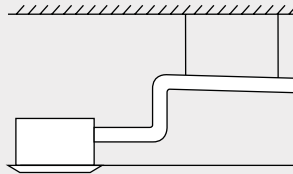
INSTALLATION ORDER

1



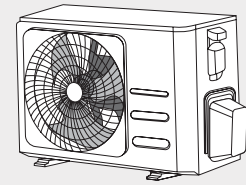
Install the indoor unit (Page 28)

2



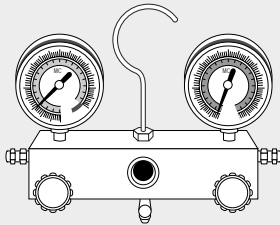
Install the drainpipe (Page 28)

3



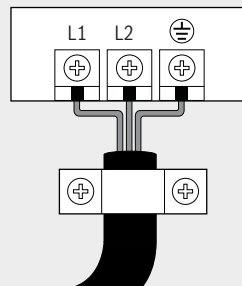
Install the outdoor unit (Page 28)

6



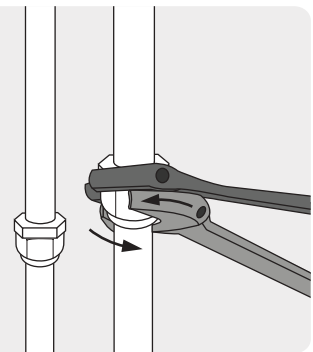
Evacuate the refrigeration system
(Page 28)

5



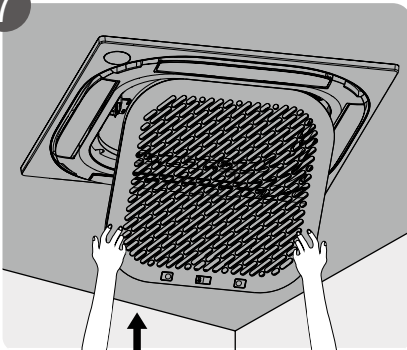
Connect the wires (Page 28)

4



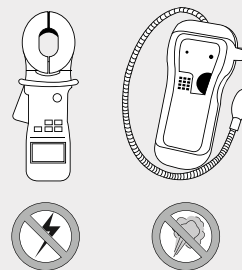
Connect the refrigerant pipes (Page 28)

7



Install the front panel (Page 28)

8



Perform a test run (Page 28)

Figure 3

6 Unit Parts

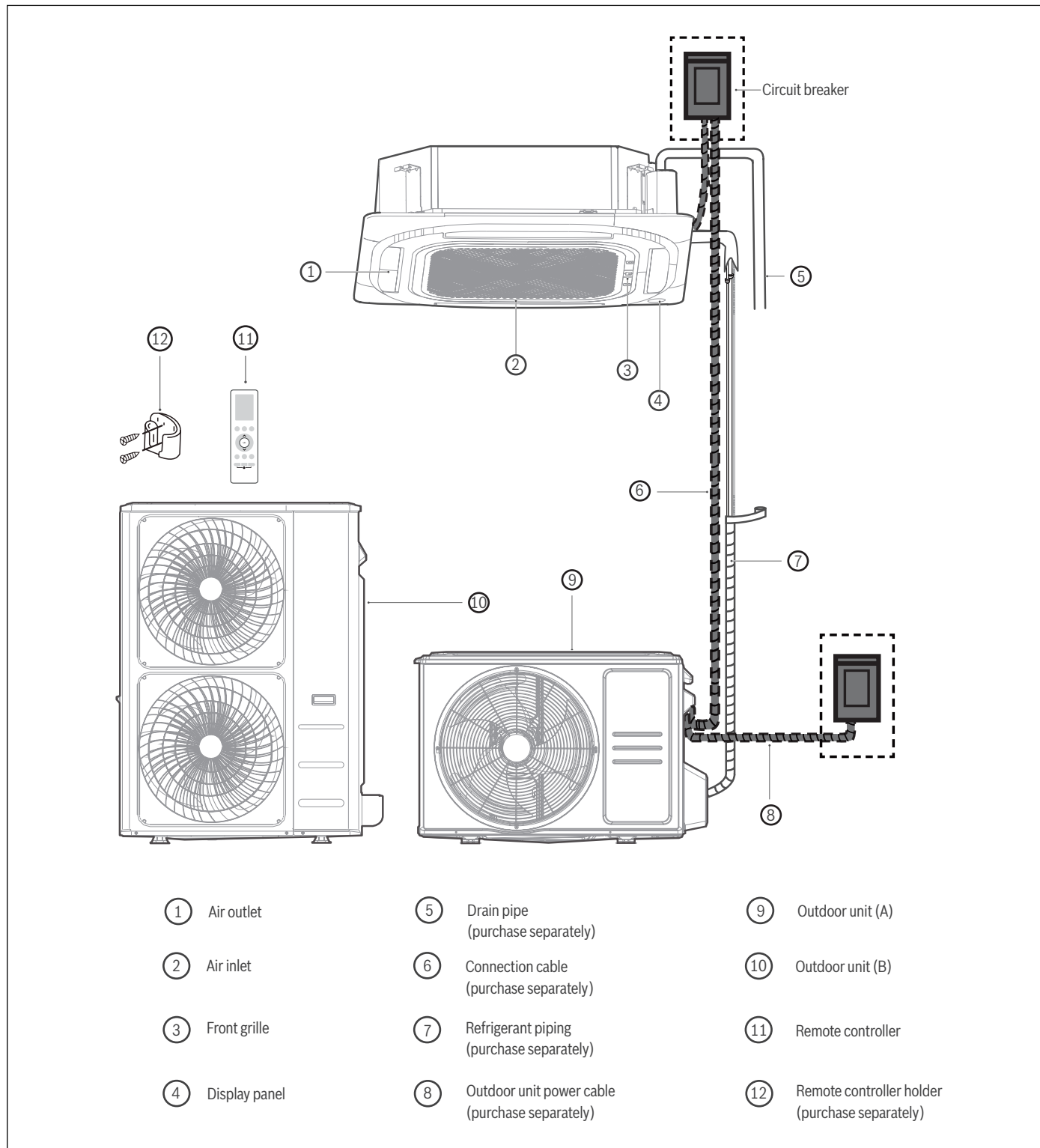


Figure 4

Front Grille varies for 9k- 18k and 24k-48k.

See 2.1 Required installation accessories for more details.



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

7 Indoor Unit Installation

7.1 Selecting Installation Location

When the conditions in the ceiling exceeds 86°F (30°C) with a relative humidity of 80%, or when fresh air needs to be introduced to the space, additional insulation is required (minimum 10 mm (0.4in) thickness, polyethylene foam).



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

Step 1: Select installation location

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

- Proper installation locations meet the following standards:
 - Good air circulation
 - Convenient drainage of condensate
 - Noise from the unit will not disturb other people
 - Firm and solid—the location will not vibrate
 - Strong enough to support the weight of the unit
 - A location at least three feet from all other electrical devices (e.g., TV, radio, computer)
 - Flat horizontal ceiling
 - Sufficient clearance for maintenance and service
 - Requires enough or exist room for the connecting pipes and drainpipes.
 - There is no direct radiation from heaters.
 - The air inlet and outlet are not blocked.
- DO NOT install unit in the following locations:
 - Near any source of heat, steam, or combustible gas
 - Near flammable items such as curtains or clothing
 - Near any obstacle that might block air circulation
 - Near the doorway
 - In a location subject to direct sunlight
 - Areas with oil drilling or fracking
 - Coastal areas with high salt content in the air
 - Areas with corrosive gas, such as sulfurous acid gas
 - Areas with strong electromagnetic waves

Step 2: Check required space

Install this unit where the height of bottom panel is more than 8.2ft (2.5m) from ground. Please refer to Figure 4.

Step 3: Install the suspension bolt

(Use either a M8-M10 size bolt or the equivalent). Use a hole-in anchor for existing ceiling, and a sunken insert, sunken anchor or other field supplied parts for new ceilings to reinforce the ceiling to hold the weight of the unit and related parts. All the above parts and field supplied.

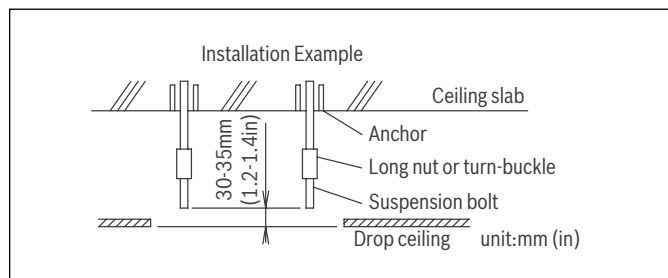


Figure 5

Recommended Distances Between the Indoor Unit and The Ceiling

The distance between the mounted indoor unit and the internal ceiling should meet the following specifications.

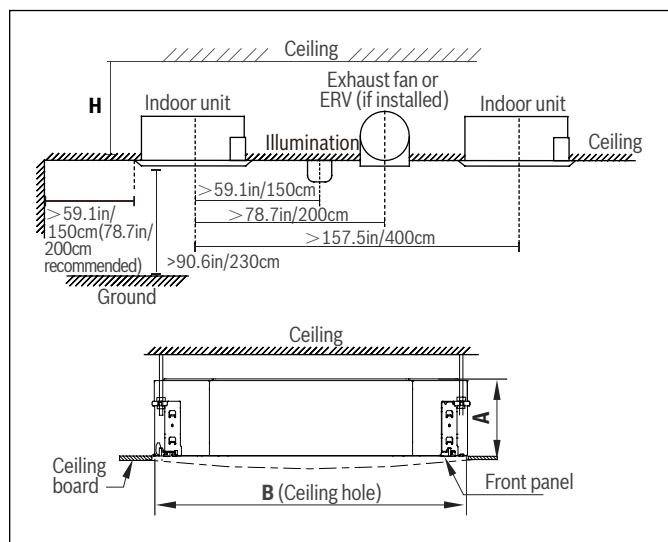


Figure 6

Model	A (in/mm)	H (in/mm)	C (in/mm)
9K - 18K	9.6/245	10.8/275 or more	23.6/600
24K	8.03/205	9.06/230	
36K	9.6/245	10.7/271	35.4/900
48K	11.3/287	12.3/313	

Table 7



WARNING

Contains refrigerant!

Do not install the unit in an area where flammable materials are present due to risk of explosion resulting in serious injury or death.



WARNING

Property damage/system failure!

If the base is not strong enough to support the weight of the unit, the unit could fall out of place and cause serious injury.

7.2 Applicable Models : 9k - 12k - 18k

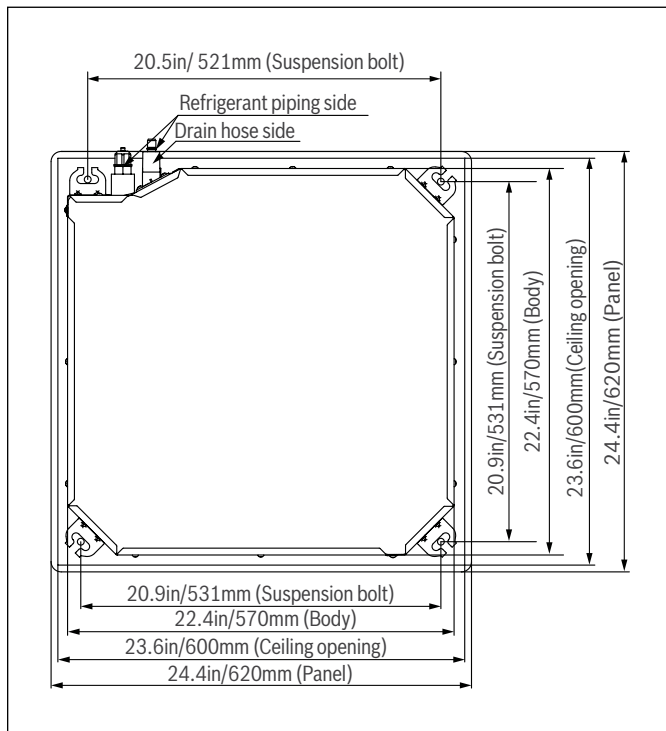


Figure 7

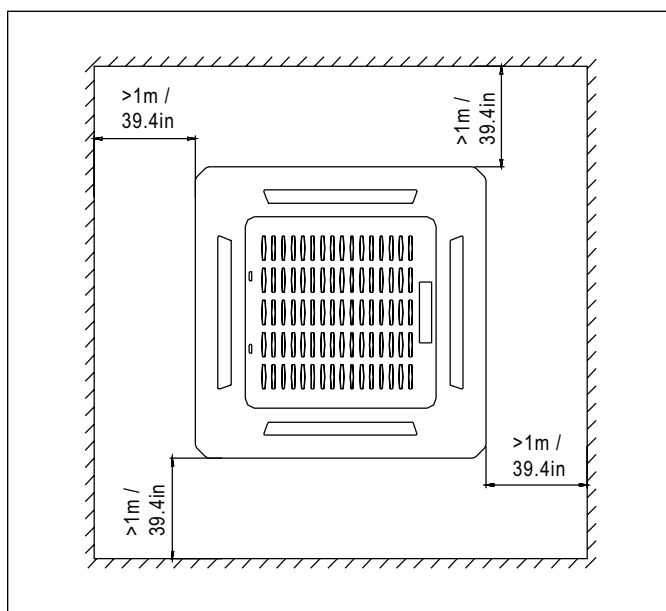


Figure 8

Adjust the position to ensure the gaps between the indoor unit and the four sides of drop ceiling are even. The indoor unit's lower part should sink into the drop ceiling for 0.9in/24mm.

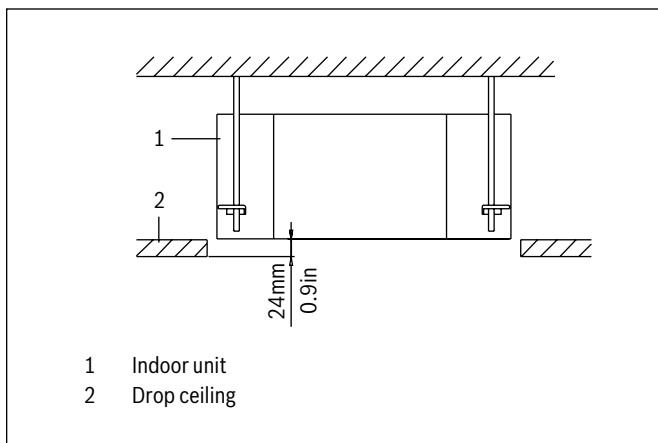


Figure 9



If the spacing between ceiling and the unit is over 0.8in / 20 mm, attach sealing material in the part or recover the ceiling.

7.3 Applicable Models : 24K - 36K - 48K

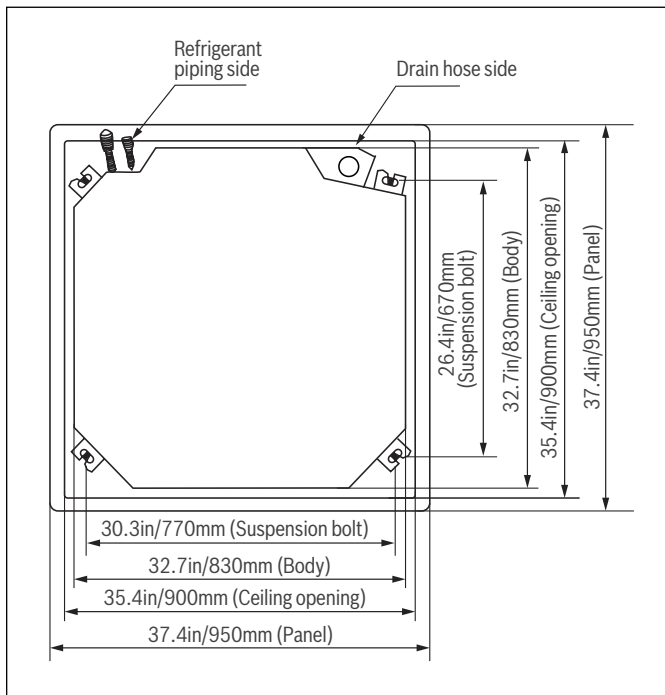


Figure 10

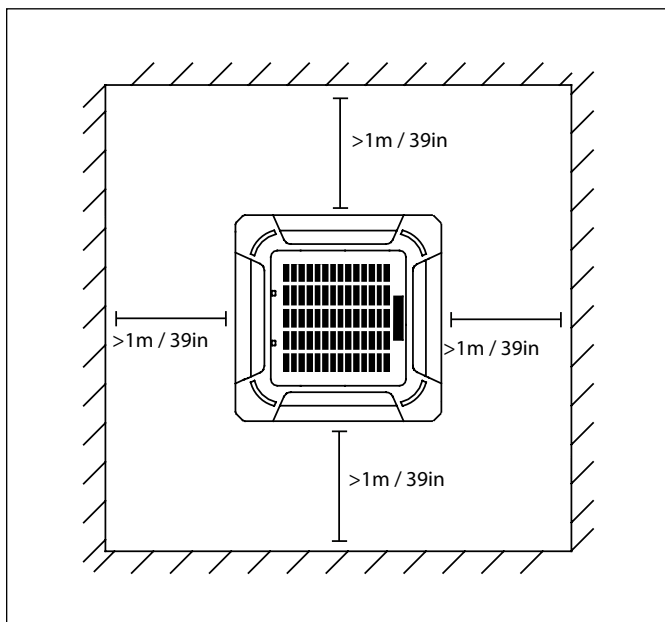


Figure 11

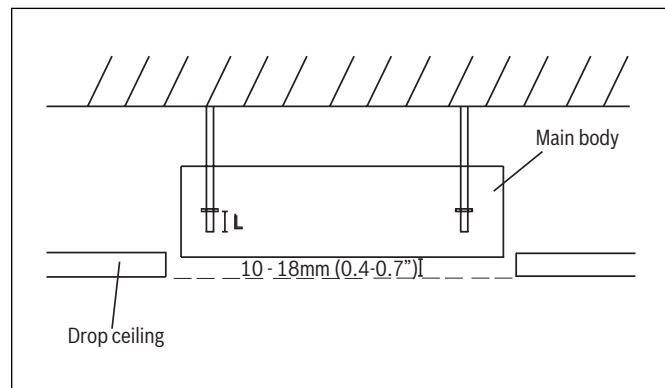


Figure 12



The bottom of the unit should be 0.4 - 0.7in (10 - 18mm) higher than the drop ceiling. Generally, L (indicated in Fig. 10) should be half the length of the suspension bolt or long enough to prevent the nuts from coming off.

7.4 Installing the Indoor Unit

Depending on the field conditions, it may be easier to install optional accessories before the indoor unit is installed (except for the decoration panel). However, for existing ceiling, install fresh air inlet component kit and branch duct before installing the unit.

Step 1: Install the indoor unit temporarily

- Attach the hanger bracket to the suspension bolt. Be sure to fix it securely by using a nut and washer from the upper and lower sides of the hanger bracket.
- To secure the hanger bracket see figure below.

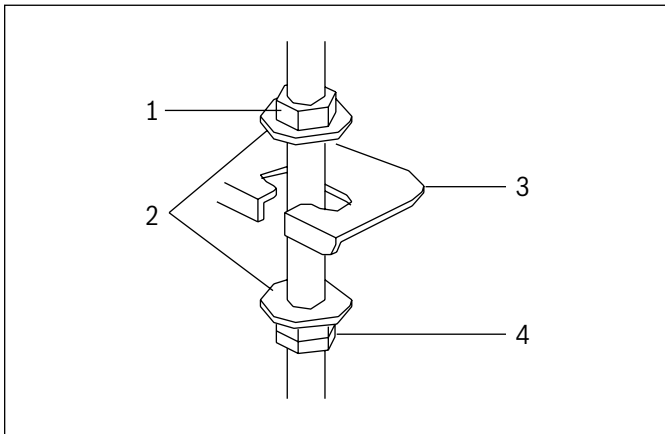


Figure 13

1. Nut (field supplied)
2. Washer (field supplied)
3. Hanger bracket
4. Double nuts (field supplied)

- Adjust the unit to the right position for installation

Step 2: Check that the unit is horizontally level

- Do not install the unit tilted. The indoor unit is equipped with a built-in drain pump and float switch. (If the unit is tilted against the direction of the condensate flow (the drain piping side is raised), the float switch may malfunction and cause water to drip.)
- Check if the unit is levelled at all four corners with a level measuring instrument or a water-filled vinyl tube as shown in figure 13.

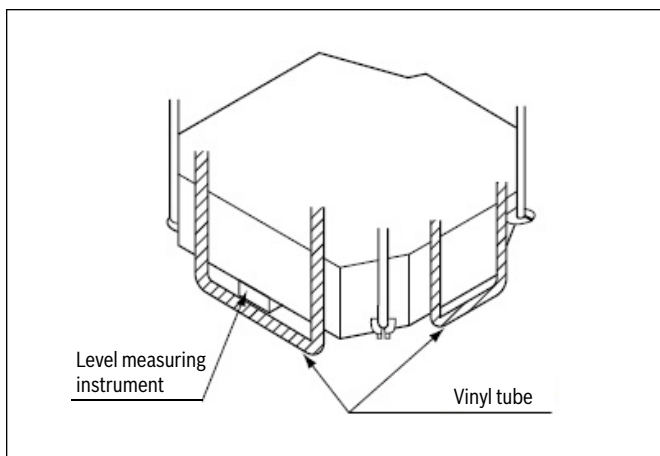


Figure 14

8 Connecting the Drain Pipe

8.1 Installation of Drain Piping

Install the drain piping as shown in figure below and take measures against condensation. Improperly rigged piping could lead to leaks and damage other products.

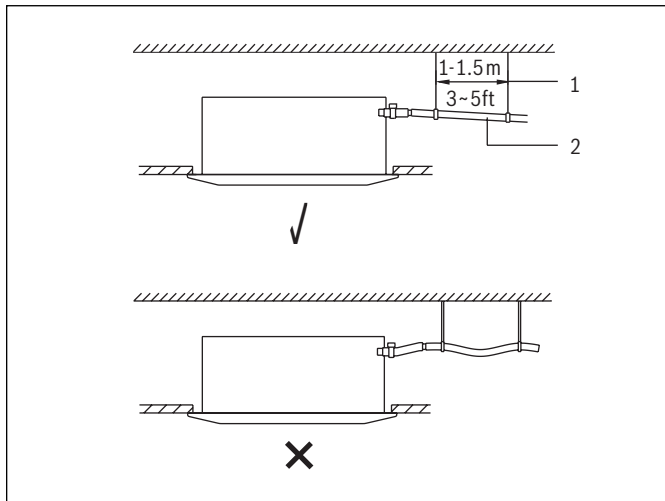


Figure 15

1. Hanging bar
2. The drain pipe should have a downward slope of at least 1/4" per foot.

8.2 Install the Drain Pipes

- Keep the drain pipe short and sloping downwards at a gradient of at least 1/4" per foot to prevent air from remaining trapped inside the pipe.
- Keep pipe size equal to or greater than that of the connecting pipe (PVC pipe, nominal diameter 0.8in/20mm, outside diameter 1in/25mm).
- Push the drain hose as far as possible over the drain socket, and tighten the metal clamp securely.

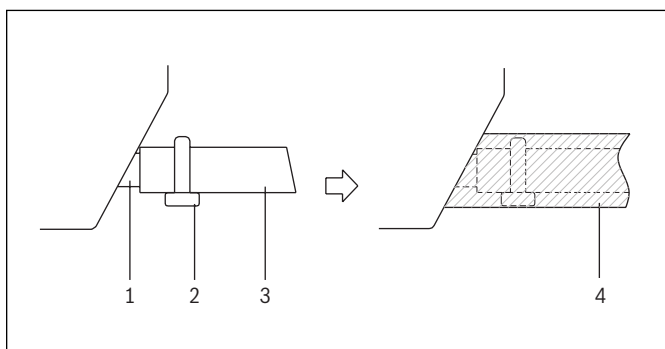


Figure 16

1. Drain socket (attached to the unit)
2. Metal clamp
3. Drain hose
4. Insulation (field supplied)

- Wrap the insulation (field supplied) over the metal clamp and drain hose to insulate. See Figure 15.
- If the drain hose cannot be sufficiently set on a slope, fit the hose with drain raising piping (field supplied).
- Make sure that heat insulation work is executed on the following 2 spots to prevent any possible water leakage due to dew condensation.
 - Indoor drain pipe
 - Drain socket.

8.3 How to Perform Drain Piping

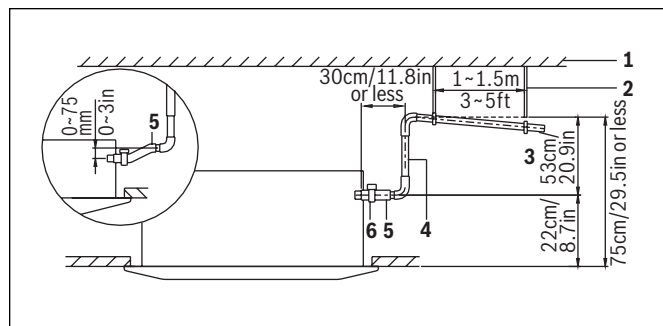


Figure 17

1. Ceiling slab
2. Hanger bracket
3. Adjustable range
4. Drain raising pipe
5. Drain hose
6. Metal clamp

- Connect the drain hose to the drain raising pipes and insulate them.
- Connect the drain hose to the drain socket on the indoor unit and tighten it with the clamp.

Precautions

- Install the drain raising pipes at a height of less than 20.9 in/530 mm.
- Install the drain raising pipes at a right angle to the indoor unit and no more than 11.8 in/300 mm from the unit.
- To prevent air bubbles, install the drain hose level or slightly tilted up (<3 in/75 mm). The incline of drain hose should be 3 in/75 mm or less to reduce the force on the drain socket. See figure 16 for detail location.
- The incline of drain hose should be 3 in/75 mm or less so that the drain socket does not have to withstand additional force.
- To ensure a downward slope of 1/4" per foot, install hanging bars every 3.3ft/1m to 4.9ft/1.5 m.
- When unifying multiple drain pipes, install the pipes as shown in figure 17. Select converging drain pipes whose gauge is suitable for the operating capacity of the unit.

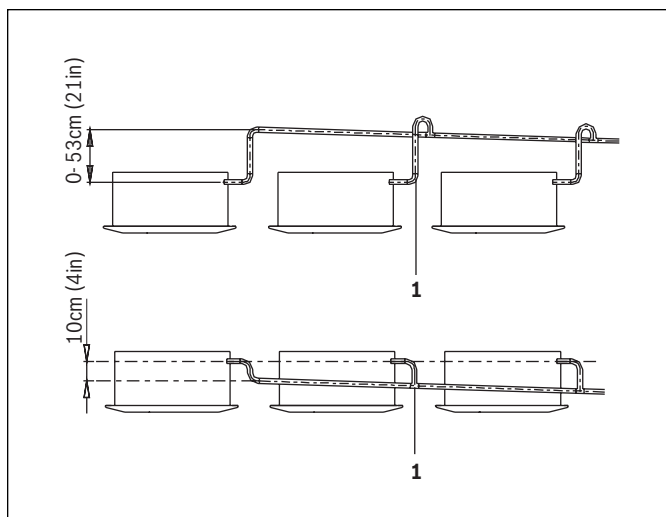


Figure 18

1. T-joint converging drain pipes

NOTICE

Property damage/system failure!

Drain piping connections. Do not connect the drain piping directly to sewage pipes that smell of ammonia. The ammonia in the sewage might enter the indoor unit through the drain pipes and corrode the heat exchanger.

To ensure no excessive pressure is applied to the included drain hose. Do not bend or twist when installing (this may cause leakage).

Installing the conduit installation plate

1. Fix the sheath connector (not supply) on the wire hole of the conduit installation plate.
2. Fix the the conduit installation plate on the chassis of the unit.

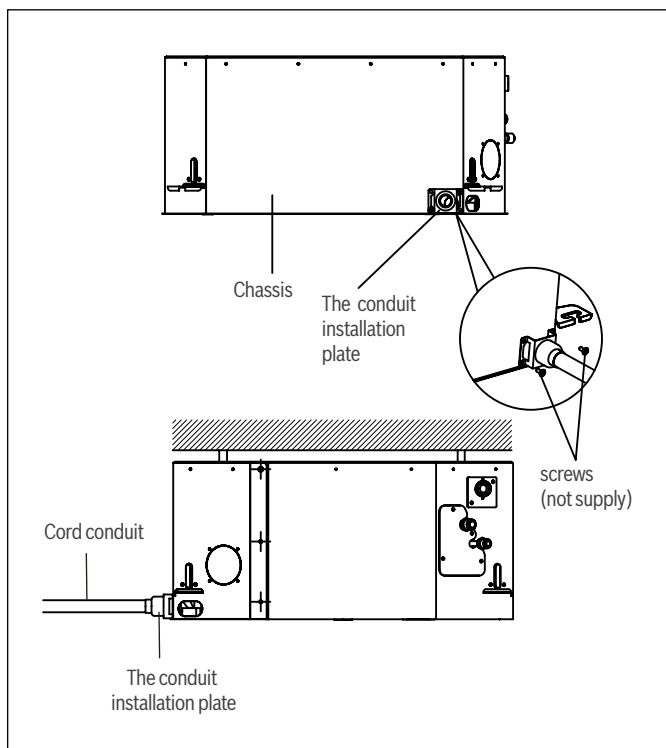


Figure 19

8.4 Testing of Drain Piping

After the piping work is finished, check if unit drains correctly.

- Put approximately 1/4gal. of water into the drain pan through the fresh air intake. Make sure not to pour water over the drain pump or any electric parts including the drain pump. Method of adding water is shown below in figure 18.

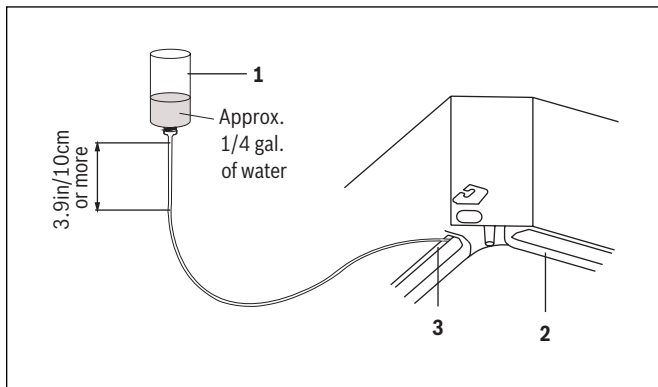


Figure 20

1. Plastic water bottle and tubing (tube should be about 3.9in/10cm long)
 2. Drain pan
 3. Fresh air intake
- When electric wiring work is finished, check drainage flow during COOL operation, explained in "Test Operation" in Section 13.

9 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.

9.1 Select Installation Location

NOTICE

Product damage!

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

- Build a shelter above the unit to protect it from the rain or snow. Be careful not to obstruct air flow around the unit.

This unit is not designed for application in areas frequently exposed to salty air (seaside) conditions.

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

- Proper installation locations meet the following standards:
 - Meets all spatial minimum requirements shown in Installation Space Requirements (Figure 19)

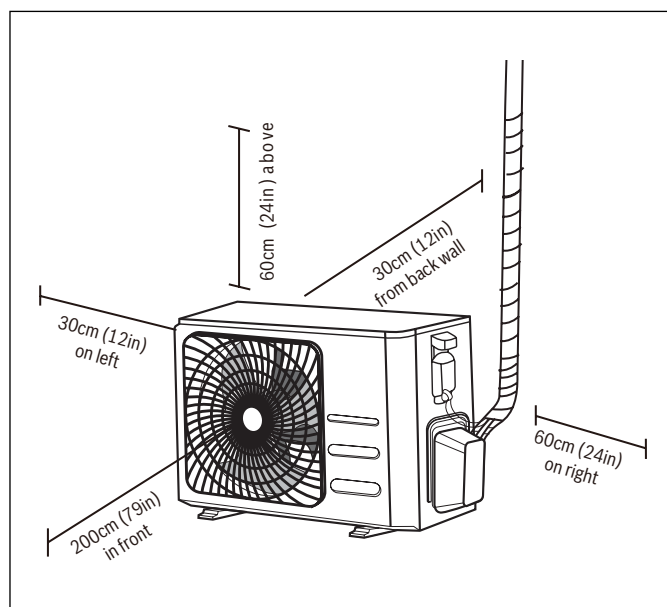


Figure 21

- Good air circulation and ventilation
- Firm and solid—the location can support the unit and will not vibrate
- Noise from the unit will not disturb others
- Protected from prolonged periods of direct sunlight or rain
- Where snowfall is anticipated, take appropriate measures to prevent ice buildup and coil damage.

- DO NOT install unit in the following locations:
 - Near an obstacle that will block air inlets and outlets
 - Near a public street, crowded areas, or where noise from the unit will disturb others
 - Near animals or plants that will be harmed by hot air discharge
 - Near any source of combustible gas
 - In a location that is exposed to large amounts of dust
 - In a location exposed to excessive amounts of salty air

NOTICE

Product damage!

If the unit is exposed to heavy wind, install unit so that air outlet fan is at a 90° angle to the direction of the wind. If needed, build a barrier in front of the unit to protect it from extremely heavy winds. See Figures 20 and 21.

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.

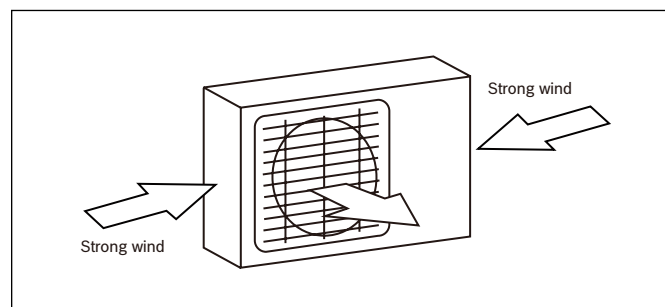


Figure 22

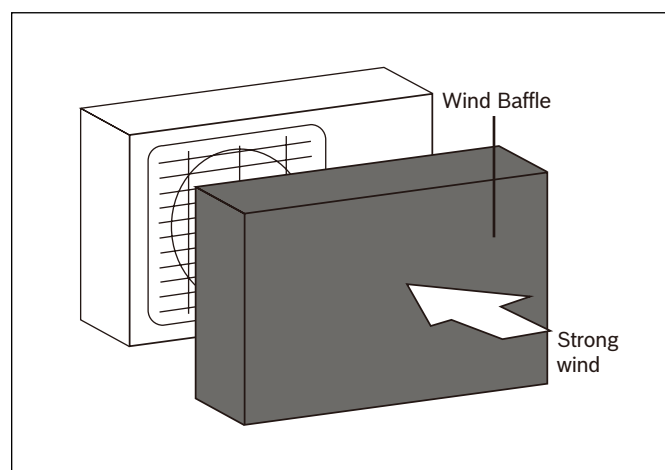


Figure 23

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.

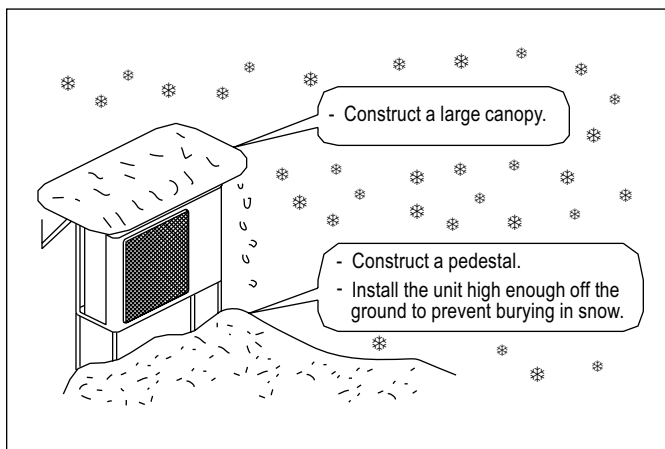


Figure 24

9.2 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 25, 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 25, 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.

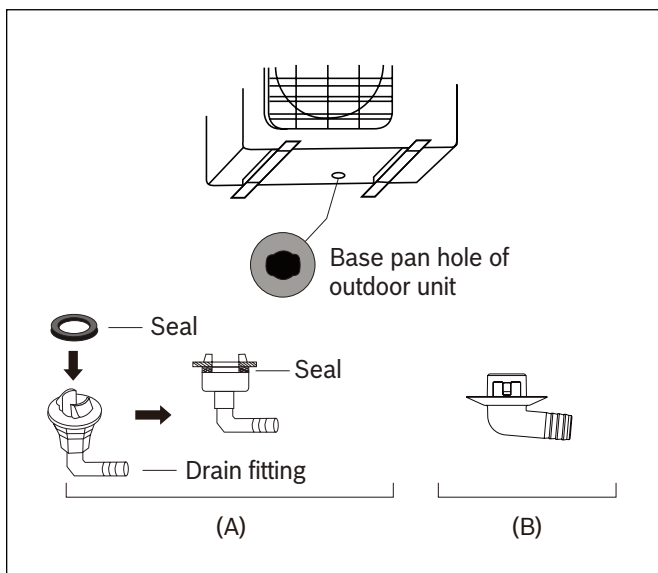


Figure 25

9.3 Anchor Outdoor Unit

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

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

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



WARNING

Personal injury!

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



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

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. Pre-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.

9.4 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.

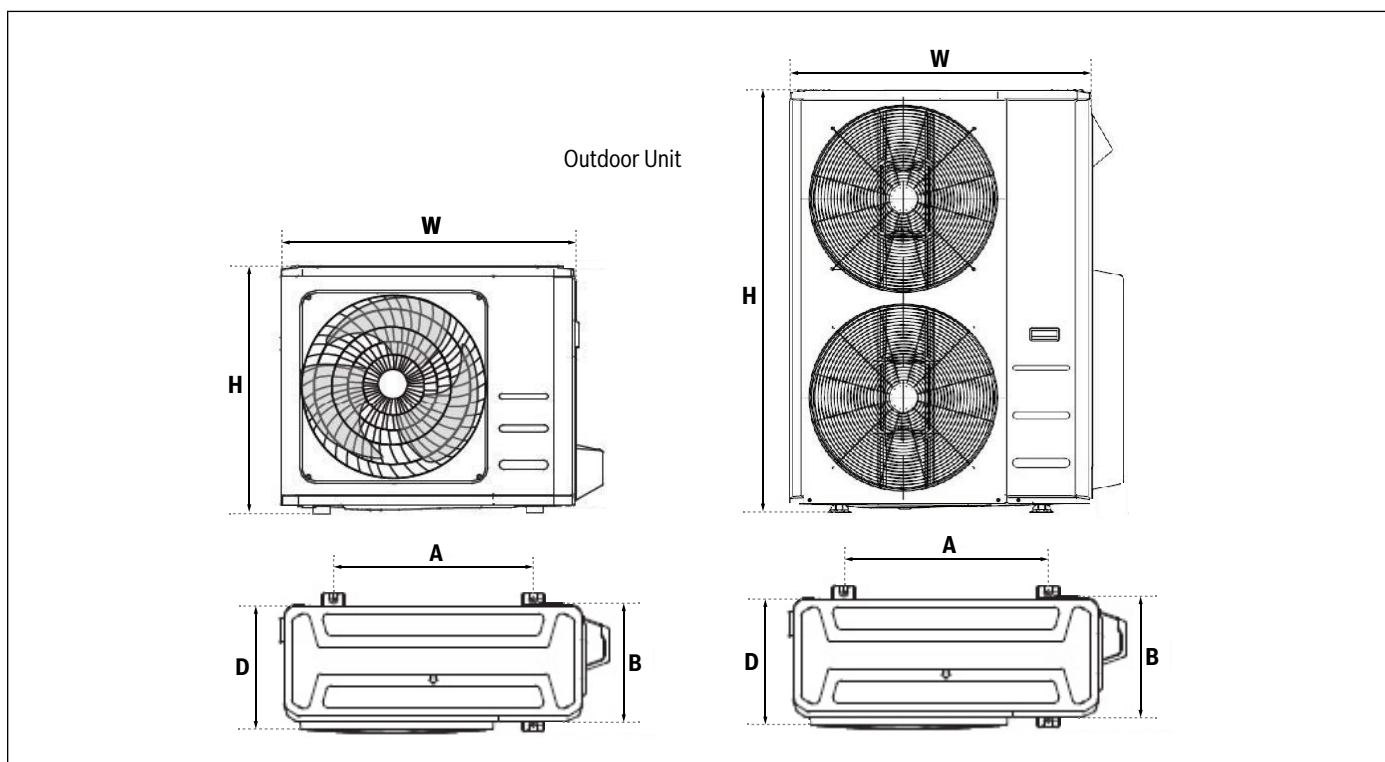


Figure 26

Outdoor Model	Outdoor Unit Dimensions in (mm)	Mounting Dimensions	
	W x H x D	Distance A in (mm)	Distance B in (mm)
BMS500-AAS009-1CSXRD, BMS500-AAS012-1CSXRD	30.1"x 21.8" x 11.9" (765x555x303)	17.8" (454)	11.3" (286)
BMS500-AAS009-1CSXHD, BMS500-AAS012-1CSXHD	31.7"x 21.8" x 13.0" (805x554x330)	20.1" (511)	12.5" (317)
BMS500-AAS018-1CSXRD, BMS500-AAS018-1CSXHD, BMS500-AAM018-1CSXRD	35.0"x 26.5" x 13.5" (890x673x342)	26.1" (663)	13.9" (354)
BMS500-AAS036-1CSXLD, BMS500-AAS036-1CSXRD, BMS500-AAS024-1CSXRD, BMS500-AAS024-1CSXHD, BMS500-AAM027-1CSXRD, BMS500-AAM036-1CSXRD, BMS500-AAM018-1CSXHD, BMS500-AAM027-1CSXHD	37.2"x 31.9" x 16.34" (946x810x420)	26.5" (673)	15.9" (403)
BMS500-AAS048-1CSXLD, BMS500-AAM048-1CSXRD, BMS500-AAM036-1CSXHD, BMS500-AAM048-1CSXHD	37.5"x 52.5" x 16.34" (952x1333x415)	25.0" (634)	15.9" (404)

Table 8

9.5 Rows of Series Installation

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

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

Table 9

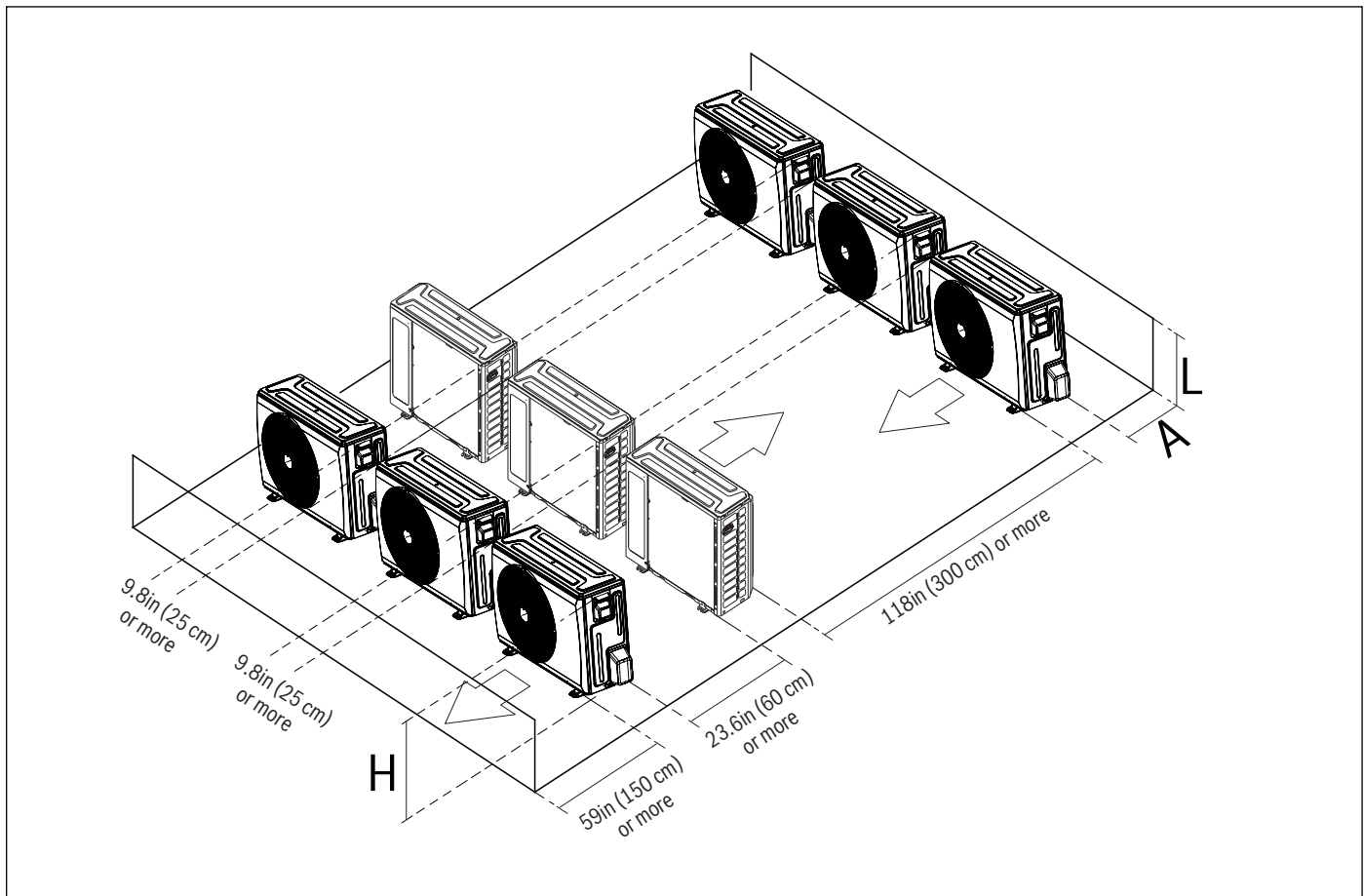


Figure 27

H: Unit height

L: Height of the wall behind the unit

A: Distance between unit and wall

10 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 10

10.1 Connection Instructions – Refrigerant Piping

Step 1: Cut pipes

When preparing refrigerant pipes, take extra care to cut and flare them properly. This will ensure efficient operation and minimize the need for future maintenance.

1. Measure the distance between the indoor and outdoor units.
2. Using a pipe cutter, cut the pipe a little longer than the measured distance.
3. Make sure that the pipe is cut at a perfect 90° angle. Refer to Fig.25 for cut examples.

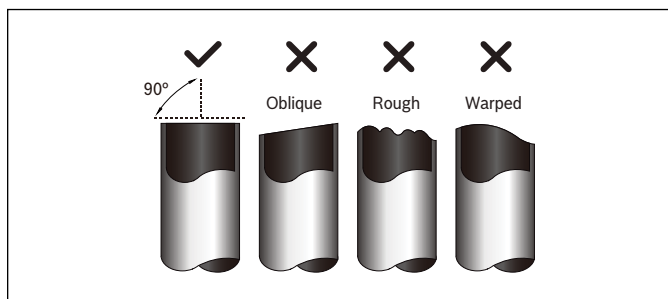


Figure 28

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).

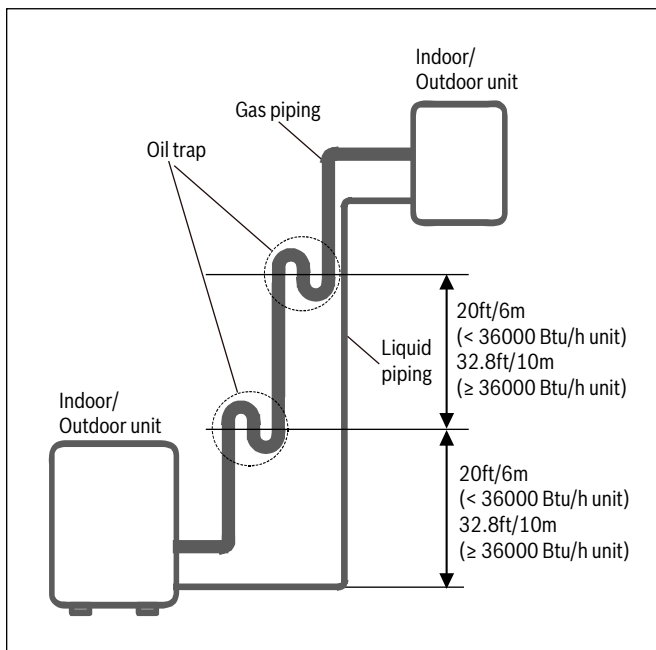


Figure 29

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.

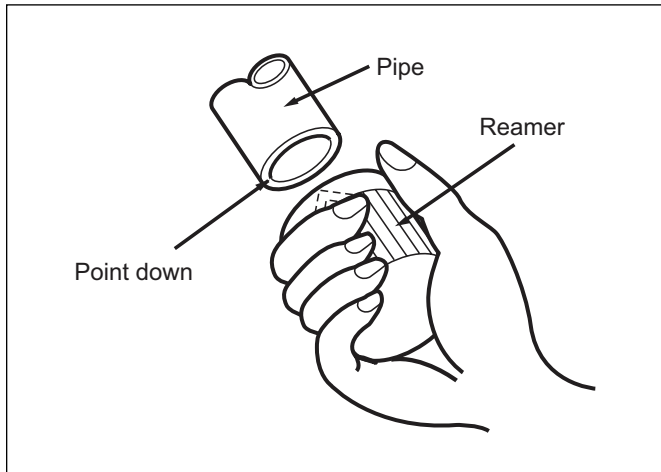


Figure 30

Step 3: Flare pipe ends

Proper flaring is essential to achieve an airtight seal.

1. After removing burrs from cut pipe, seal the ends with a piece of tape to prevent foreign materials from entering the pipe.
2. Sheath the pipe with insulating material.
3. Place flare nuts on both ends of pipe. Make sure they are facing in the proper direction, because you can't put them on or change their direction after flaring. See Figure 28.

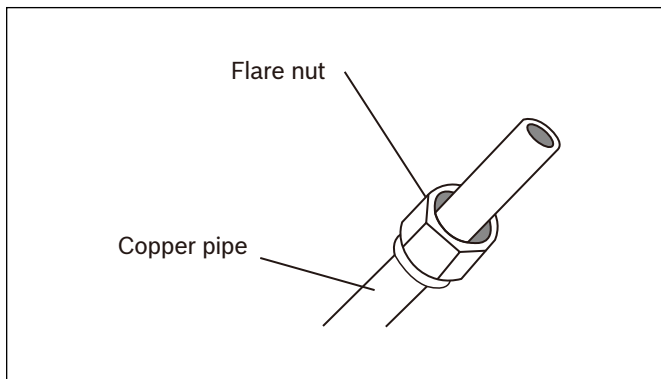


Figure 31

4. Remove tape from ends of pipe when ready to perform flaring work.
5. Clamp flaring block on the end of the pipe. The end of the pipe must extend beyond the edge of the flare form in accordance with the dimensions shown in the Table 6.

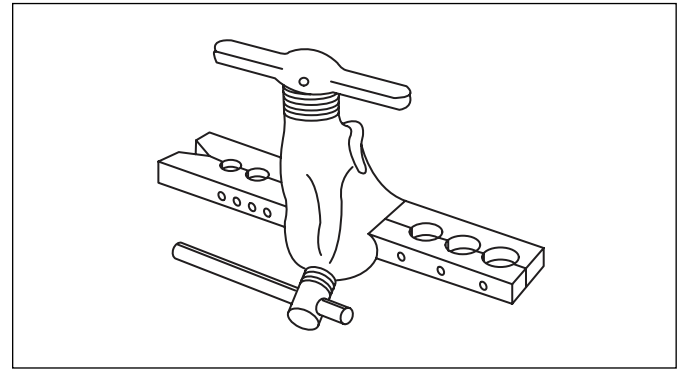


Figure 32

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 11

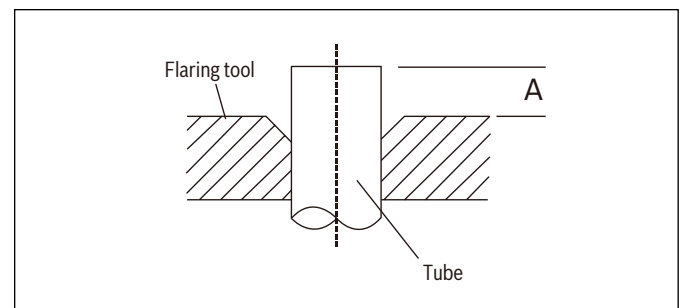


Figure 33

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

Step 4: Connect pipes

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



Minimum Bend Radius - When bending connective refrigerant piping, the minimum bending radius is 4in (10cm). See Figure 31.

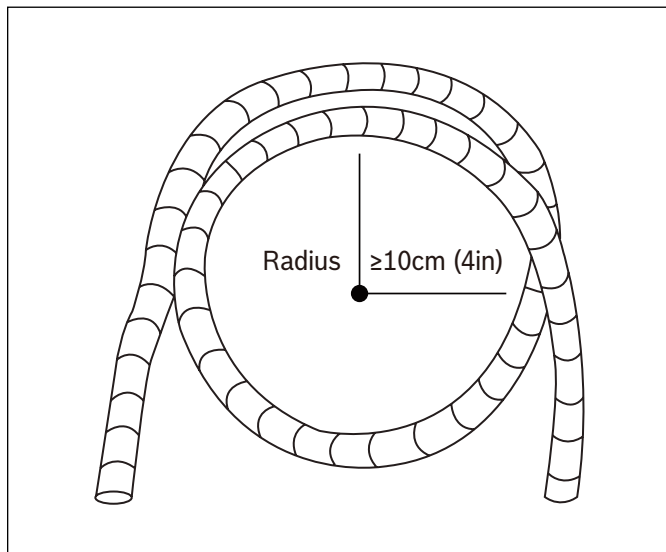


Figure 34

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.

10.2 Connecting Piping to Indoor Unit

- When connecting the flare nuts, apply a thin coat of refrigeration oil to the flared ends of the pipes.
- Align the center of the two pipes that you will connect. See Figure 32.

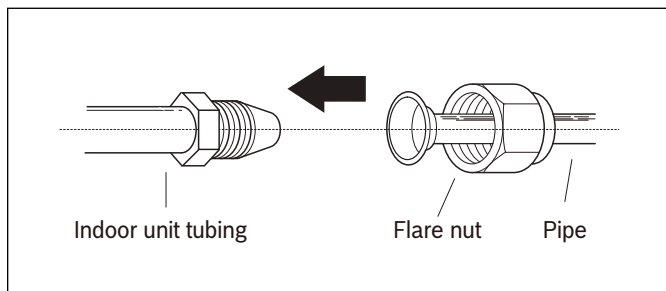


Figure 35

- Tighten the flare nut as tightly as possible by hand.
- Using a wrench, hold the nut on the unit tubing.
- While firmly holding the nut on the unit tubing, use a torque wrench to tighten the flare nut according to the torque values in the Torque Requirements Table 7. Loosen the flaring nut slightly, then tighten again.

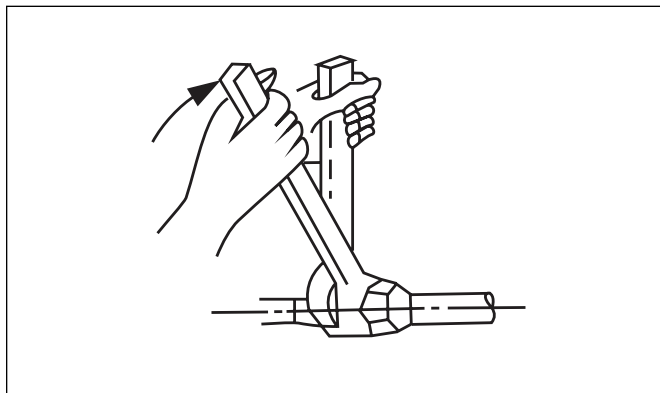


Figure 36

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 12

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.

10.3 Connecting Tubing to Outdoor Unit

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

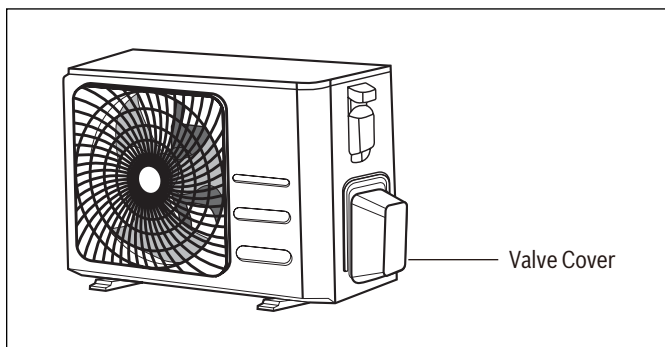


Figure 37

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 35.

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.

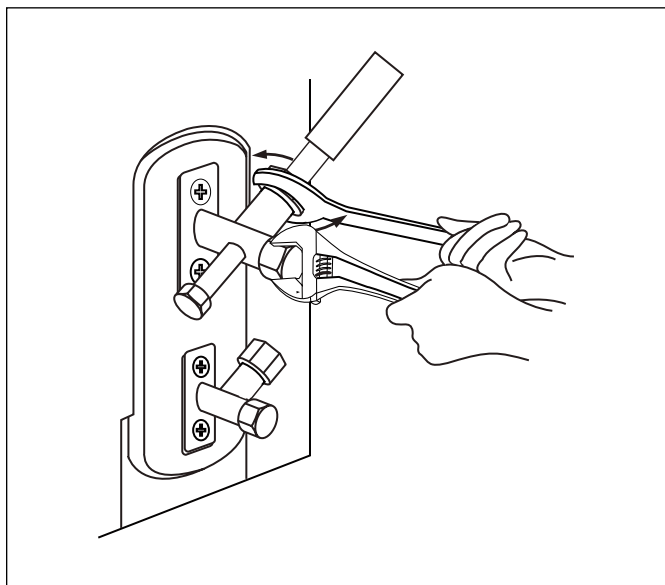


Figure 38

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.

10.4 Pipe Insulation

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

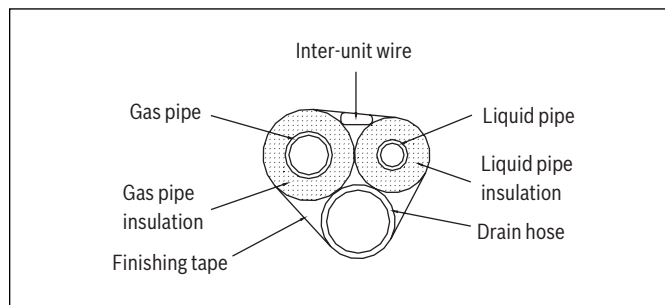


Figure 39

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

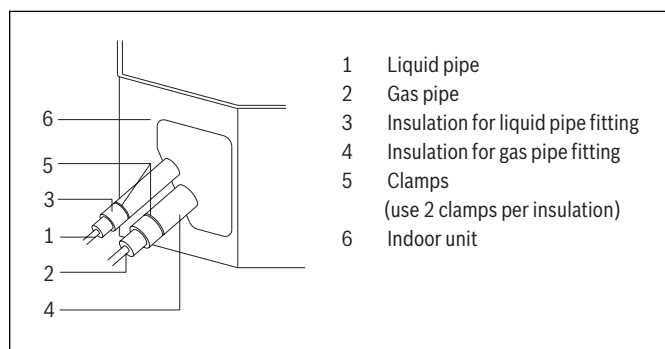


Figure 40

Piping insulation procedure

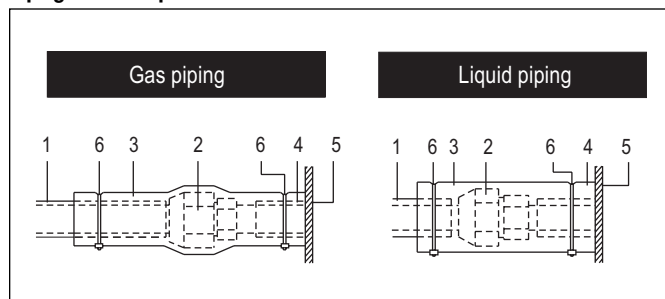


Figure 41

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.

11 Connecting Signal and Power Cables (Outdoor Unit)

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

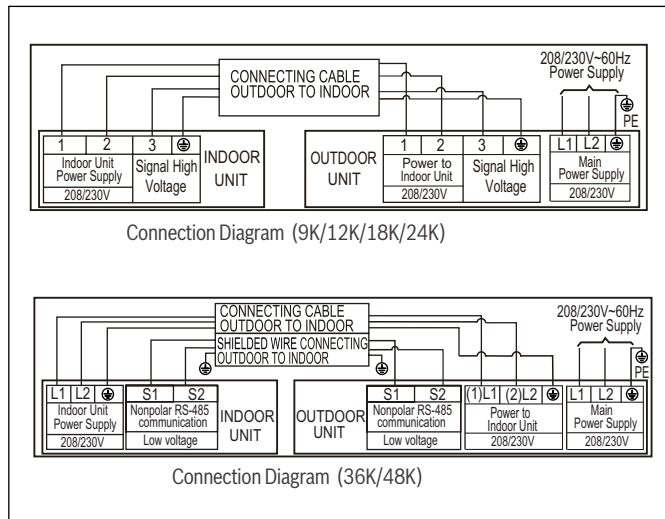


Figure 42 Wiring Schematic Example (refer to unit for actual schematic)

Circuit Breaker

When the maximum current of the air conditioner is more than 16A, a circuit breaker or leakage protection switch with protective device shall be used (purchased separately). When the maximum current of the air conditioner is less than 16A, the power cord of air conditioner shall be equipped with plug (purchased separately).

In North America, the appliance should be wired according to NEC and CEC requirements.

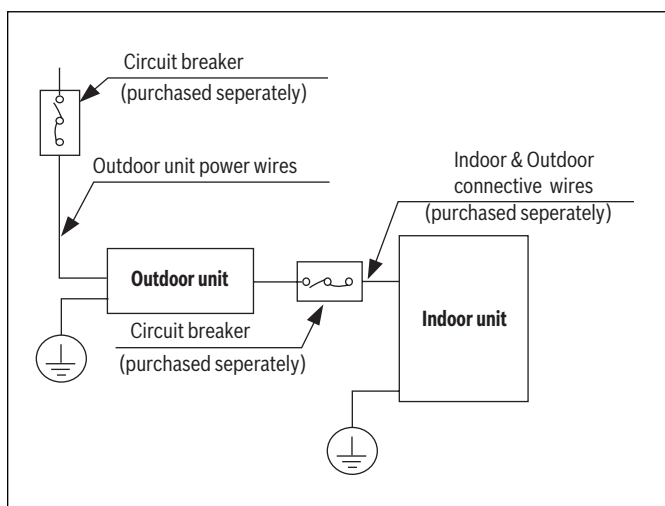


Figure 43



WARNING

Electrical hazard !

Before performing electrical work, read these regulations:

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


DANGER
Electrical hazard !

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

1. Prepare the cable for connection:

Cable Types

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

Minimum Cross-Sectional Area of Power Cables

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

Table 13

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


WARNING
Electrical hazard !

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


WARNING
Electrical hazard !

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

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

11.1 How to Connect Wiring

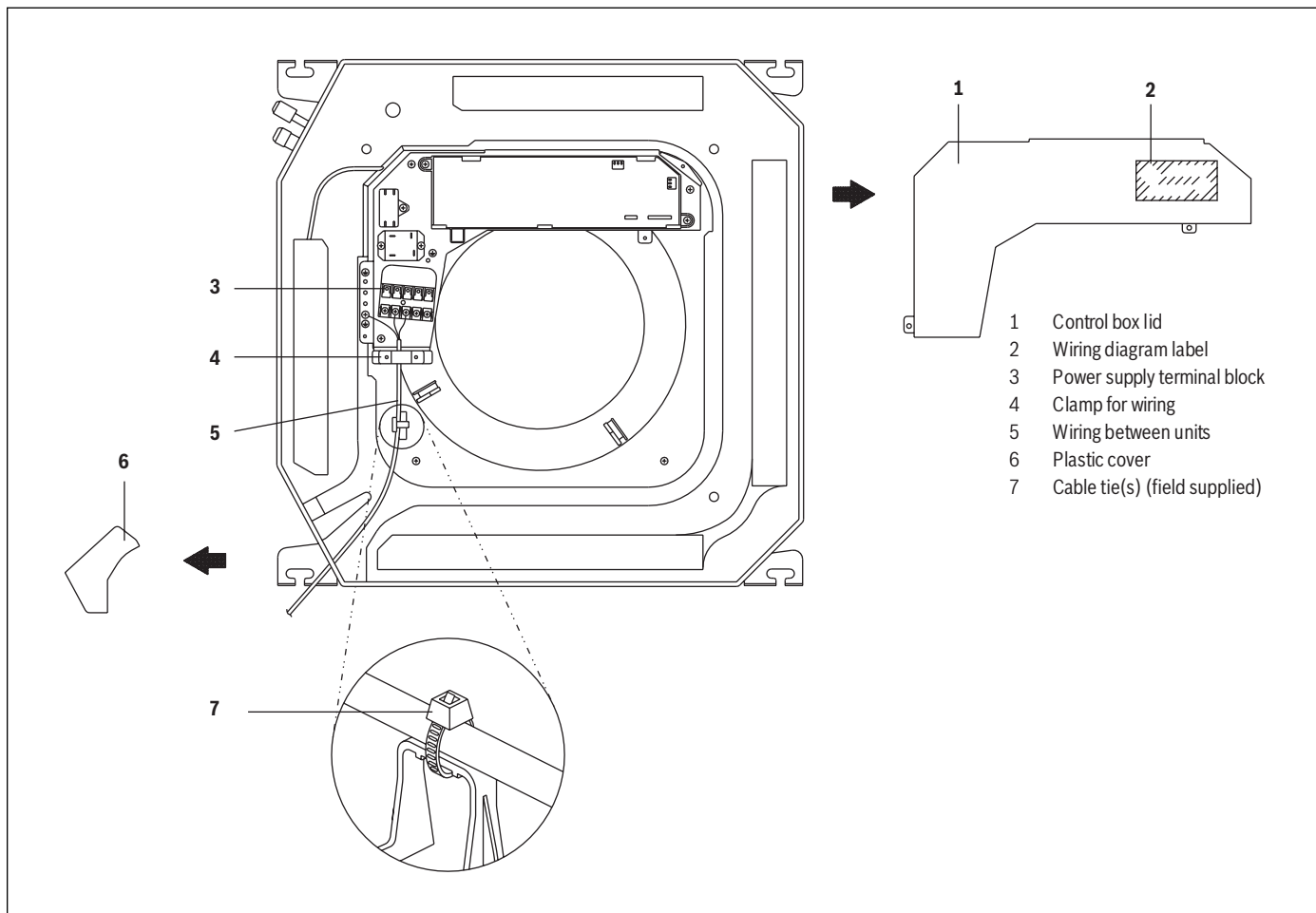


Figure 44

1. Remove the control box lid of the indoor unit.
2. Remove the cover of the outdoor unit.
3. Follow the "Wiring diagram label" attached to the indoor unit's control box lid to wire the outdoor unit, indoor unit and the remote controller. Securely fix the wires with a field supplied cable tie(s).
4. Attach the cover of the outdoor unit.

Precautions

Observe the notes mentioned below when wiring to the power supply terminal board.

- Do not connect wires of different gauge to the same power supply terminal. (Looseness in the connection may cause overheating.)
- When connecting wires of the same gauge, connect them according to the figure below.

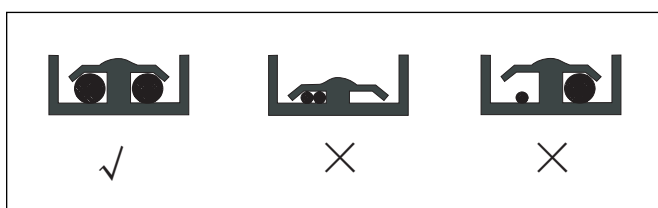


Figure 45

- Use the specified electric wire. Connect the wire securely to the terminal. Lock the wire down without applying excessive force to the terminal. (Tightening torque: 1.31N.m $\pm$ 10%).
- When attaching the control box lid, make sure not to pinch any wires.

- After all wiring connections are done, fill in any gaps in the casing wiring holes with putty or insulation material (field supplied) to prevent small animals or dirt from entering the unit from outside and causing short circuits in the control box.
- Do not connect wires of different gauge to the same grounding terminal.
- Use only specified wires and tightly connect wires to the terminals. Make sure the cover closes tight. Incomplete connections could result in overheating, and in the worst case, electric shock or fire.

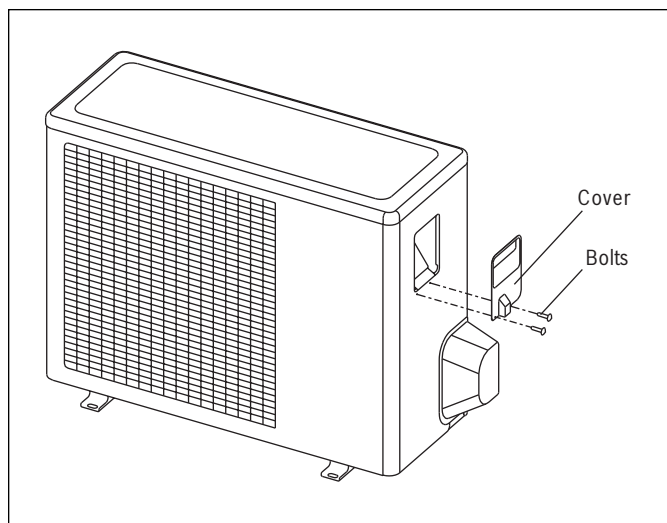


Figure 46

12 Evacuation and Charging Process

12.1 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.

12.2 Evacuation Instructions

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

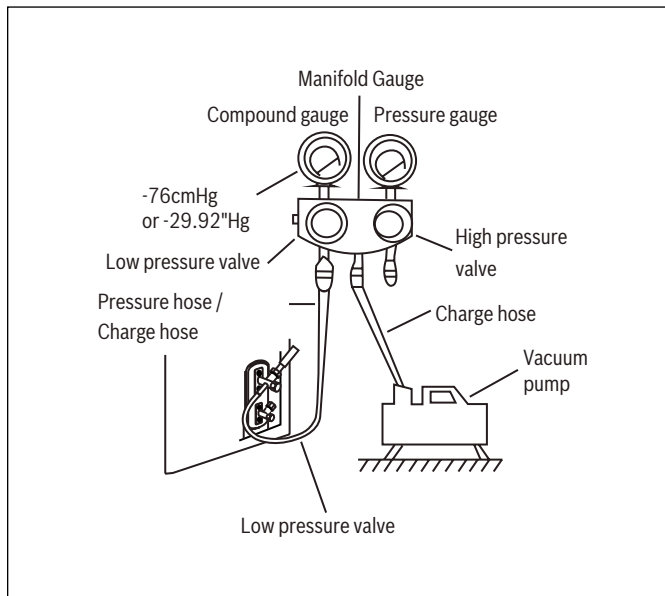


Figure 47

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.

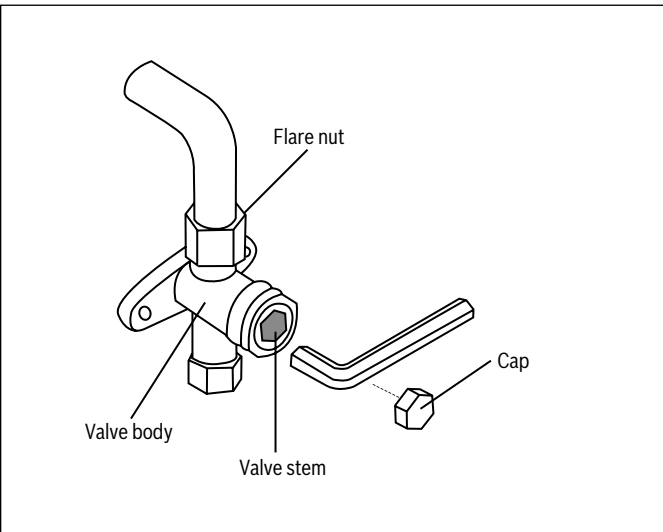


Figure 48



The above figure is for illustration purpose only.

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



Multi Zone units: Make sure main valve is opened.

NOTICE

Product damage - open valve stems gently!

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

12.3 Adding Refrigerant

In North America, the standard pipe length is 25ft (7.5m). The minimum length is 10ft. The factory charge is suitable for pipe lengths of 10 - 25ft. If piping length exceeds 25ft, the additional refrigerant to be charged can be calculated using the formula in Table 9. For multi-zone units refer to the multi-zone installation and operation manual.

Additional refrigerant per pipe length

Connective Pipe	Additional Refrigerant		
< Standard pipe length	N/A		
> Standard pipe length	Liquid Side: $\varnothing 1/4"$ ($\varnothing 6.35\text{mm}$) Inverter R454B: (Pipe length – standard length) x 15g/m (Pipe length – standard length) x 0.16oz/ft	Liquid Side: $\varnothing 3/8"$ ($\varnothing 9.52\text{mm}$) Inverter R454B: (Pipe length – standard length) x 30g/m (Pipe length – standard length) x 0.32oz/ft	Liquid Side: $\varnothing 1/2\text{in}$ ($\varnothing 12.7\text{mm}$) Inverter R454B: (Pipe length – standard length) x 0.69oz/ft (Pipe length – standard length) x 65g/m

Table 14

Single zone refrigerant pipe summary

Model - Single Zone		Capacity (Btu/h)	IDU		Max. Equivalent Length m(ft)	Max. Height Variation m(ft)
IDU	ODU		Liquid Line	Vapor Line		
BMS500-AAU009-1AHCXD	BMS500-AAS009-1CSXRD, BMS500-AAS009-1CSXHD	9K	1/4"	3/8"	25 (82ft)	15 (49.2ft)
BMS500-AAU012-1AHCXD	BMS500-AAS012-1CSXRD, BMS500-AAS012-1CSXHD	12K	1/4"	3/8"	25 (82ft)	15 (49.2ft)
BMS500-AAU018-1AHCXD	BMS500-AAS018-1CSXRD, BMS500-AAS018-1CSXHD	18K	1/4"	1/2"	30 (98ft)	20 (66ft)
BMS500-AAU024-1AHCXD	BMS500-AAS024-1CSXRD, BMS500-AAS024-1CSXRD	24K	3/8"	5/8"	50 (164ft)	25 (82ft)
BMS500-AAU036-1AHCXD	BMS500-AAS036-1CSXLD	36K	3/8"	3/4"	75 (246ft)	30 (98ft)
BMS500-AAU048-1AHCXD	BMS500-AAS048-1CSXLD	48K	3/8"	3/4"	75 (246ft)	30 (98ft)

Table 15

CAUTION
Contains refrigerant!

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

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

Use only recommended lineset minimum length of 10ft (3meters).

13 Panel Installation

NOTICE

Product damage!

DO NOT place the panel facedown on the floor, against a wall, or on uneven surfaces.

Step 1: Remove the front grille.

1. Push both of the tabs towards the middle simultaneously to unlock the hook on the grille.

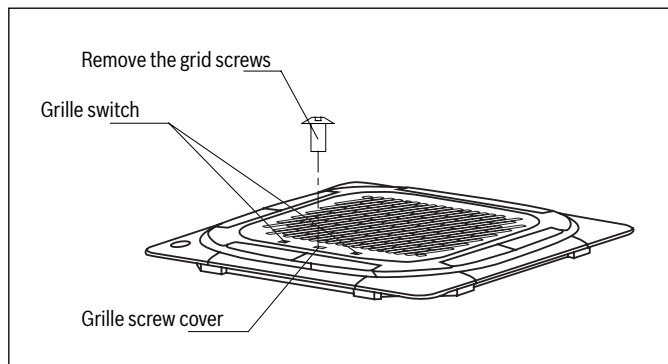


Figure 49

2. Hold the grille at a 45° angle, lift it up slightly and detach it from the main body.

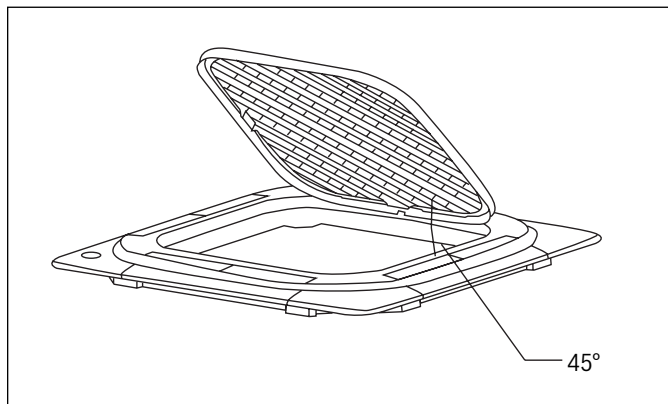


Figure 50

Step 2: The panel hook is pre-hung to the indoor unit flow guide ring, as shown.

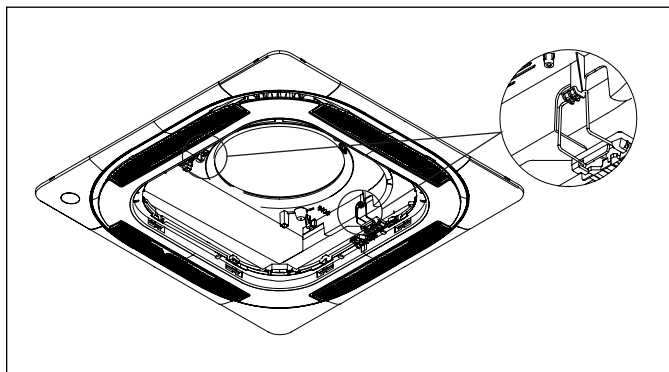


Figure 51

Step 3: Install the panel with four screws(M5), as shown.

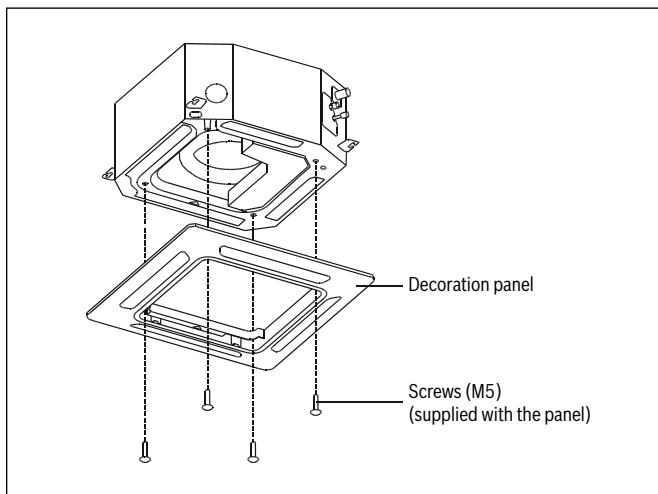


Figure 52



If the height of the indoor unit needs to be adjusted, you can do so through the openings at the panel's four corners. Make sure that the internal wiring and drainpipe are not affected by this adjustment.

NOTICE

Property damage!

Failure to tighten screws can cause water leakage.

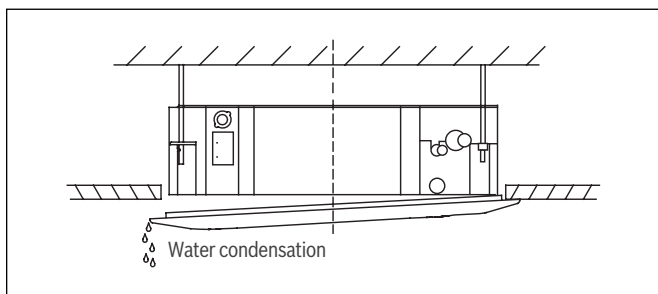


Figure 53

NOTICE

Improper operation!

If the unit is not hung correctly and a gap exists, the unit's height must be adjusted to ensure proper function. The unit's height can be adjusted by loosening the upper nut, and adjusting the lower nut.

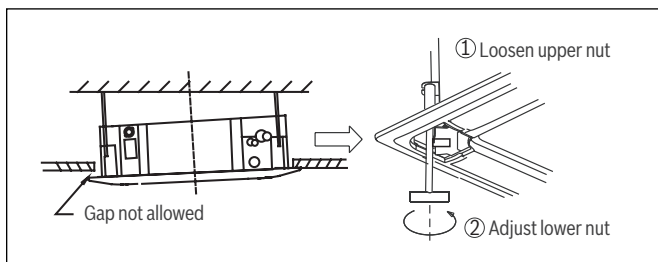


Figure 54

1. Hang the intake grille on the panel, and then connect the lead connectors of the louver motor and the control box on the panel to the corresponding connectors of the main body.

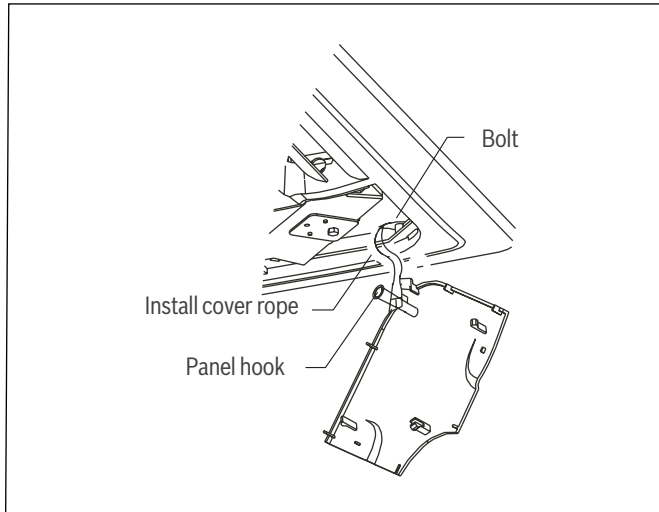


Figure 55

2. Re-installed into the style grid.
3. Reinstall the installation cover.
4. Fix the installation cover plate rope to the pillar of the installation cover plate, and gently press the installation cover plate into the panel.

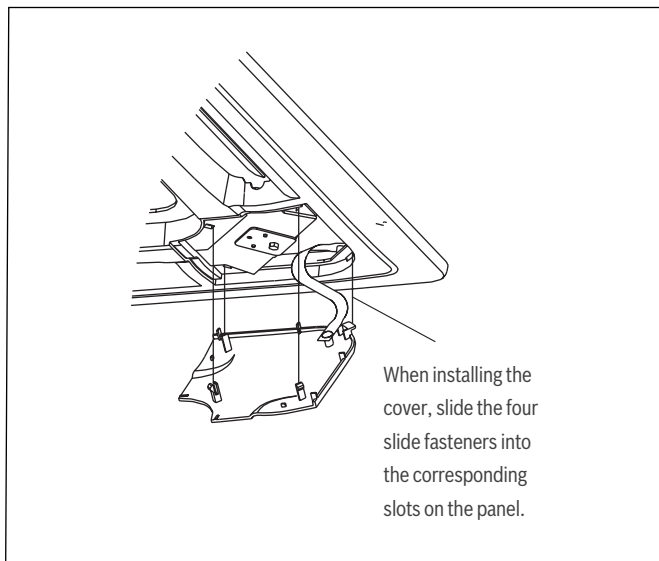


Figure 56



After installation, the butt plugs of display, swing, water pump and other wire bodies must be placed in the electric control box.

14 Electrical and Refrigerant Leak Checks

14.1 Electrical Safety Checks



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

Before test run

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



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

During test run

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



WARNING

Electrical hazard!

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

14.2 Refrigerant Leak Checks



Perform refrigerant leak check on all joints.

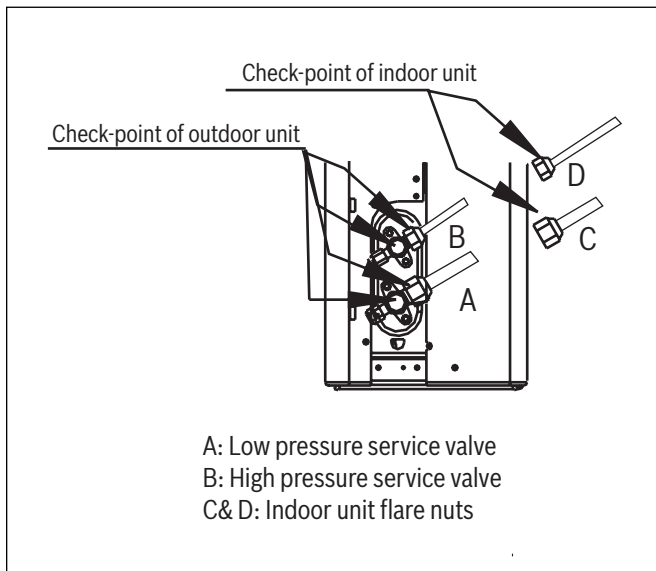
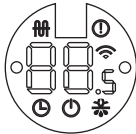


Figure 57

15 Troubleshooting

15.1 Error Codes (Indoor Unit)

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



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

Number	Display	Error Information
1	EC 07	The outdoor fan speed is operating outside of the normal range
2	EC 51	Outdoor EEPROM malfunction
3	EC 52	Condenser coil temperature sensor T3 is in open circuit or short circuit
4	EC 53	Outdoor room temperature sensor T4 is in open circuit or short circuit
5	EC 54	Compressor discharge temperature sensor TP is in open circuit or short circuit
6	EC C1	Other indoor unit refrigerant leakage detection (Multi-zone)
7	EH 00	Indoor EEPROM malfunction
8	EH 03	The indoor fan speed is operating outside of the normal range
9	EH 0A	Indoor EEPROM parameter error
10	EH 0E	Water-level alarm malfunction
11	EH 12	Main unit or secondary units malfunction
12	EH 3A	External fan DC bus voltage is too low protection
13	EH 3	External fan DC bus voltage is too high fault
14	EH 60	Indoor room temperature sensor T1 is in open circuit or short circuit
15	EH 61	Evaporator coil temperature sensor T2 is in open circuit or short circuit
16	EH A	Communication malfunction between indoor unit and external fan module
17	EHC1	Refrigerant sensor detects leakage
18	EHC2	Working condition of the refrigerant sensor is out of range and leakage is detected
19	EHC3	Working condition of the refrigerant sensor is out of range
20	EL 01	Communication malfunction between indoor and outdoor units
21	EL 0C	System lacks refrigerant
22	EL 11	Communication malfunction between main unit and secondary units
23	FH CC	Refrigerant sensor error
24	EC 56	Evaporator coil outlet temperature sensor T2B is in open circuit or short circuit(Multi- zone)
25	PC 00	IPM malfunction or IGBT over-strong current protection
26	PC 01	Outdoor unit voltage protection (low or high voltage)
27	PC 02	High temperature protection of compressor top or IPM
28	PC 03	Pressure protection(low or high pressure) (for some models)
29	PC 04	Inverter compressor drive error
30	PC 0L	Low ambient temperature protection(for some models)
31	--	Indoor units mode conflict(Multi-zone)

Table 16



For troubleshooting, please refer to the services manual.

15.2 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.

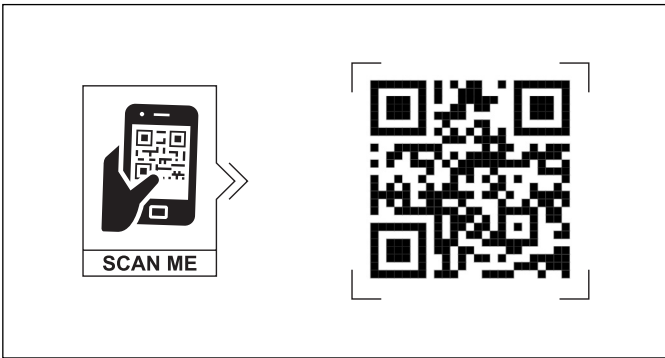


Figure 58

16 Test Run

16.1 Before Test Run

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

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

16.2 Test Run Instructions

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

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

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

Table 17

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



A protection feature prevents the air conditioner from being activated for approximately 3 minutes when it is restarted immediately after shut off .

17 Water Discharge Test

Before the test, make sure that the water discharge pipeline is smooth, and check that each connection is sealed properly.

- Conduct the water discharge test in the new room before the ceiling is paved.
- 1. Connect the power supply, and set the air conditioner to operate in the cool mode. Check the running sound of the drainage pump.
- 2. Keep cool mode running at least 10 min.
- 3. Stop the air conditioner. Wait for three minutes, and then check if there is anything unusual. If the water discharge piping layout is not correct, the excessive water flow will cause the water level error and "EE" error code will be displayed on the display panel. There may even be water overflowing from the water pan.
- 4. Continue to add water until the alarm for excessive water levels is triggered. Check if the drainage pump drains water immediately. After three minutes, if the water level does not fall below the warning level, the unit will shut down. At this time, you need to turn off the power supply, and drain away the accumulated water before you can turn on the unit normally.
- 5. Turn off the power supply, remove the water manually using the drainage plug, and put the test cap back to the original place.

NOTICE

Property damage!

The drainage plug at the bottom of the unit body is used to discharge accumulated water from the drain pan if the air conditioner malfunctions. When the air conditioner is operating normally, make sure the drainage plug is properly plugged to prevent water from leaking.

18 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.

NOTES:

NOTES:

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