

# Bosch Ducted Type (Medium & High Static) Air Conditioner / Heat Pump

Climate 5000 Series



**BOSCH**

Installation Manual





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## 1 Key to Symbols and Safety Instructions

### 1.1 Key to Symbols

#### Warnings



Warnings in this document are identified by a warning triangle printed against a grey background. Keywords at the start of a warning indicate the type and seriousness of the ensuing risk if measures to prevent the risk are not taken.

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

- ▶ **DANGER** indicates a hazardous situation which, if not avoided, will result in death or serious injury.
- ▶ **WARNING** indicates a hazardous situation which, if not avoided, could result in death or serious injury.
- ▶ **CAUTION** indicates a hazardous situation which, if not avoided, could result in minor to moderate injury.
- ▶ **NOTICE** is used to address practices not related to personal injury.

#### Important information



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

### 1.2 Safety

#### Please read safety precautions before installation

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



#### **WARNING: ELECTRICAL HAZARD**

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



#### **WARNING: INSTALLATION REQUIREMENTS**

- ▶ Installation must be performed by a licensed contractor, and per the instructions in the installation manual. Improper installation can cause water leakage, electrical shock, or fire.
- ▶ In North America, installation must be performed in accordance with the requirement of NEC (National Electric Code) and CEC (Canadian Electric Code) by licensed and qualified personnel only.
- ▶ Only contact a licensed contractor for repair or maintenance of this unit.
- ▶ Only use the included accessories, parts, and specified parts for installation. Using non-standard parts can cause water leakage, electrical shock, fire, and can cause the unit to fail.
- ▶ Install the unit in a solid location that can support the unit's weight. If the chosen location cannot support the unit's weight, or the installation is not done properly, the unit may drop and cause serious injury and/or damage.



#### **WARNING:**

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

**WARNING: ELECTRICAL HAZARD**

- ▶ For all electrical work, follow all local and national wiring standards, regulations, and the Installation Manual. The power supply to the outdoor unit requires a service disconnect at the unit. Only use a dedicated circuit. Never share a power source connected to this system. Insufficient electrical capacity or defects in electrical work can cause electrical shock or fire.
- ▶ For all electrical work, use the specified cables. Connect cables tightly, and clamp them securely to prevent external forces from damaging the terminal. Improper electrical connections can overheat and cause fire, and may also cause shock.
- ▶ All wiring must be properly arranged to ensure that the control board cover can close properly. If the control board cover is not closed properly, it can lead to corrosion and cause the connection points on the terminal to heat up, catch fire, or cause electrical shock.
- ▶ In certain functional environments, such as kitchens, server rooms, etc., the use of specially designed air-conditioning units is highly recommended.
- ▶ If the power supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons such as a licensed electrician in order to avoid a hazard.
- ▶ The product must be properly grounded at the time of installation, or electrical shock may occur.

**CAUTION: CONTAINS REFRIGERANT**

- ▶ This air-conditioning unit contains fluorinated gasses. For specific information on the type of gas and the amount, please refer to the relevant label on the outdoor unit itself.
- ▶ Installation, service, maintenance and repair of this unit must be performed by a certified technician.
- ▶ Product removal and recycling must be performed by a certified technician.
- ▶ If the system has a leak-detection system installed, it must be checked for leaks at least every 12 months.
- ▶ When the unit is checked for leaks, proper record-keeping of all checks is strongly recommended.

**CAUTION: BURN HAZARD**

- ▶ For units that have an auxiliary electric heater, do not install the unit within 1 meter (3 feet) of any combustible materials.
- ▶ Do not install the unit in a location that may be exposed to combustible gas leaks. If combustible gas accumulates around the unit, it may cause fire.
- ▶ Do not operate your air conditioner in a wet room such as a bathroom or laundry room. Too much exposure to water can cause electrical components to short circuit.

**NOTICE: PROPERTY DAMAGE**

- ▶ Install condensate drainage piping according to the instructions in this manual. Improper condensate drainage may cause water damage to your home and property.

## 2 Components

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

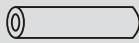



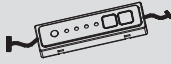
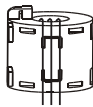
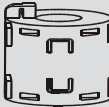
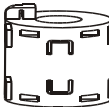


Name	Image	Quantity
Soundproof / insulation sheath		2
Drain joint		1
Seal ring		1
Copper nut (60k model only)		2
Display control unit		1
Magnetic ring for S1/S2 wire (36k & 48k models only)		1
Magnetic ring for connective cable		1
Magnetic ring for wired controller wire (9k & 12k models only)		1
Owner's manual		1
Installation manual		1

Table 1

### 3 Installation Summary

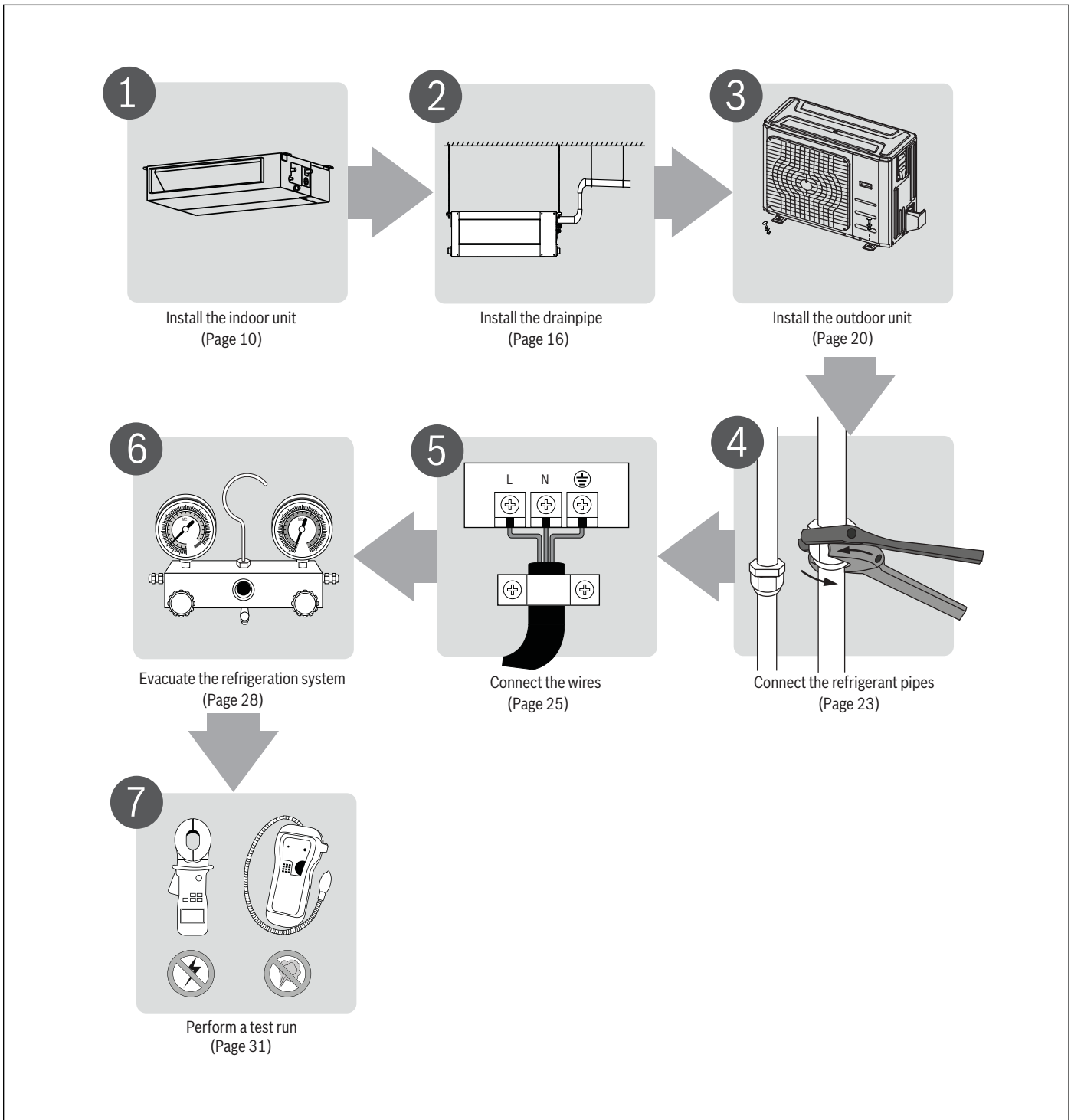


Figure 1

## 4 System Components

### 4.1 9K ~ 48K Models (Medium Static)

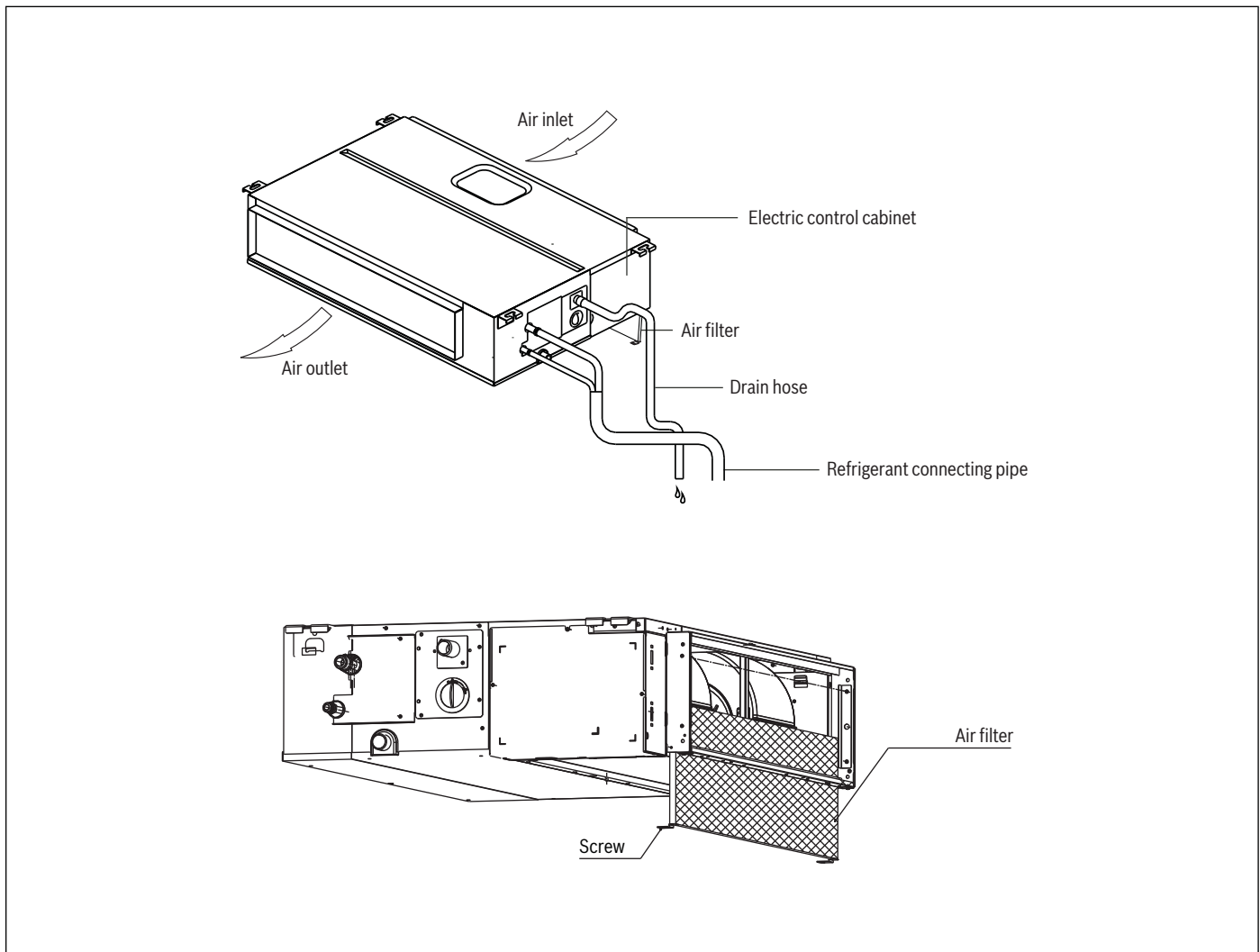


Figure 2



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



## 4.2 60K Model (High Static)

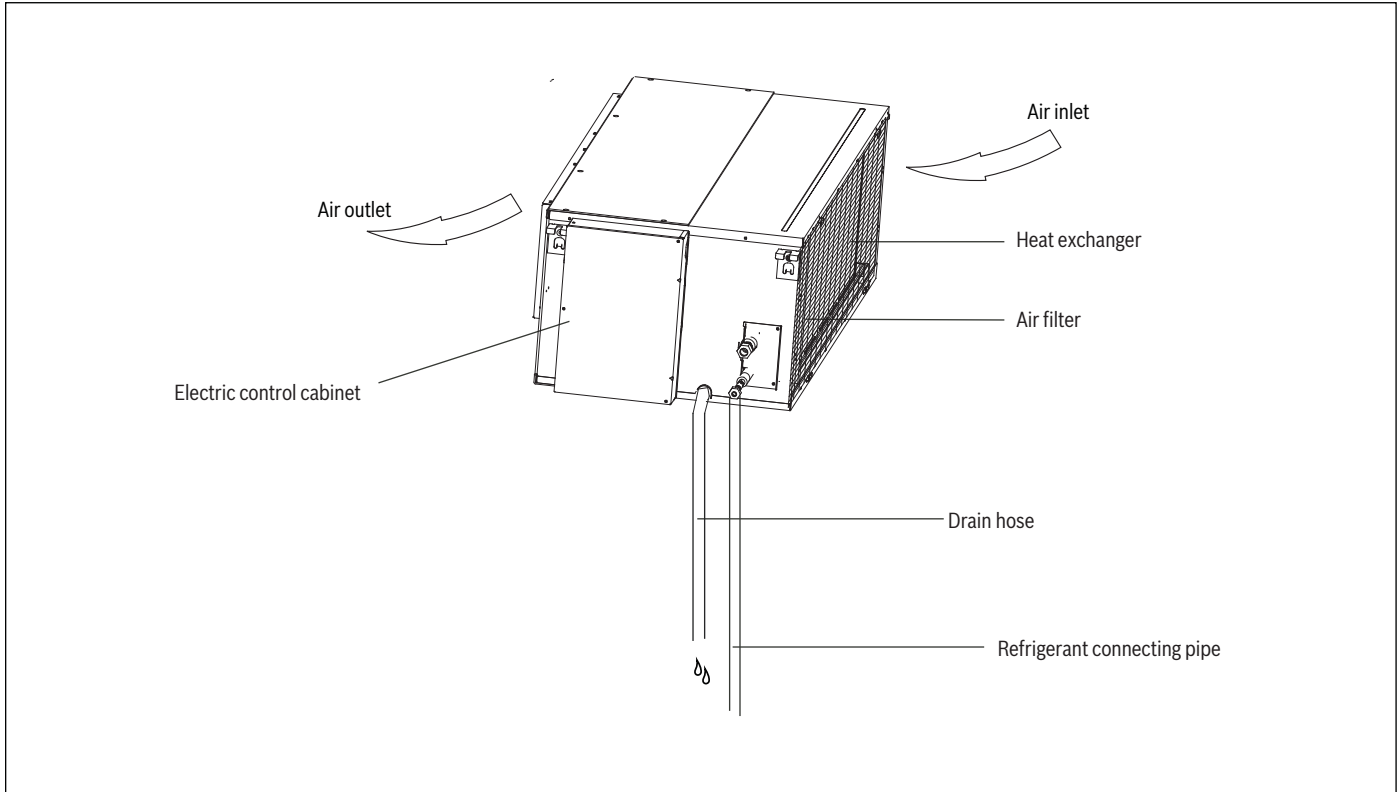


Figure 3



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

## 5 Indoor Unit Installation



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 and other parts
  - A location at least three feet from all other electrical devices (e.g., TV, radio, computer)
  
- ▶ DO NOT install unit in the following locations:
  - Near any source of heat, steam, or combustible gas
  - Near flammable items such as curtains or clothing
  - Near any obstacle that might block air circulation
  - Near the doorway
  - In a location subject to direct sunlight

### Required space for installation

9K ~ 48K Models

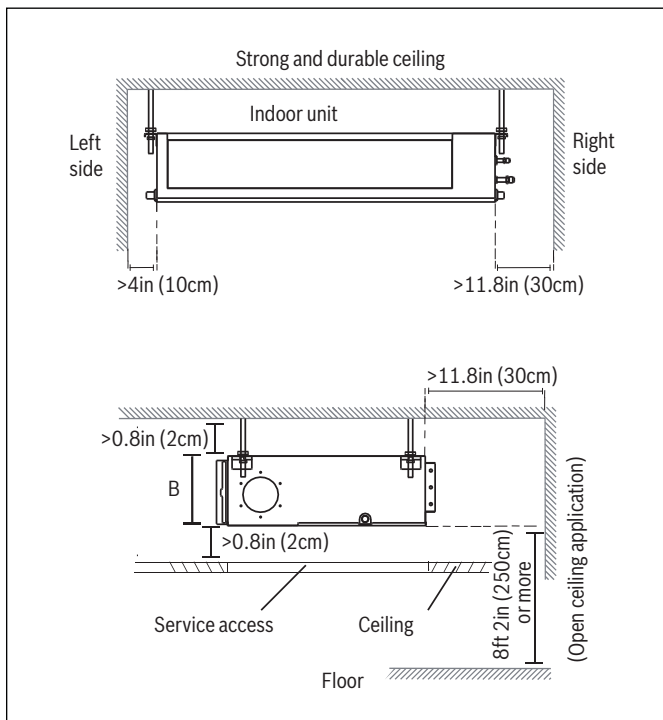


Figure 4

### Required space maintenance

9K ~ 48K Models

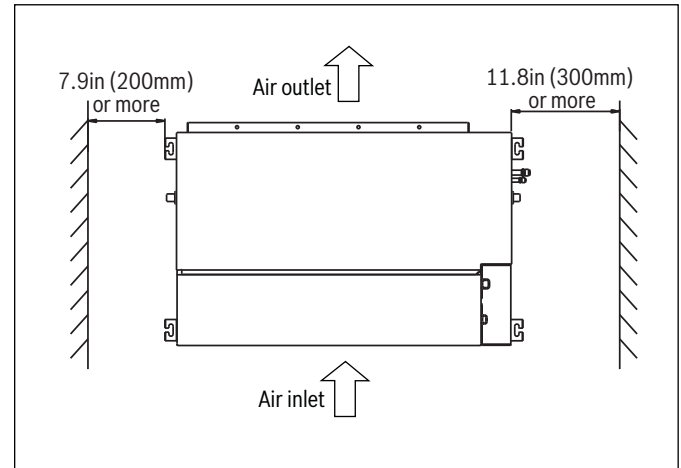


Figure 5

### Required space maintenance

60K Model

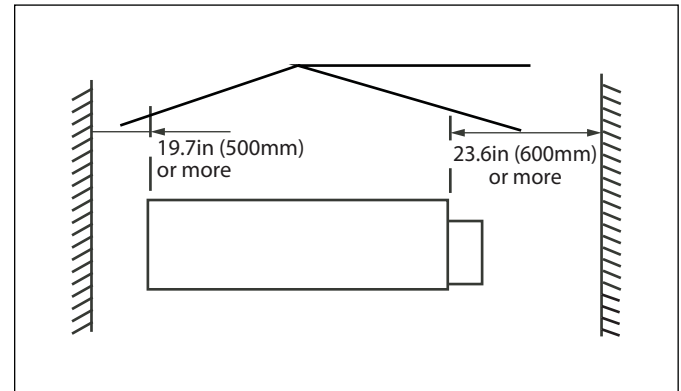


Figure 6

9k ~ 48k Model Dimensions

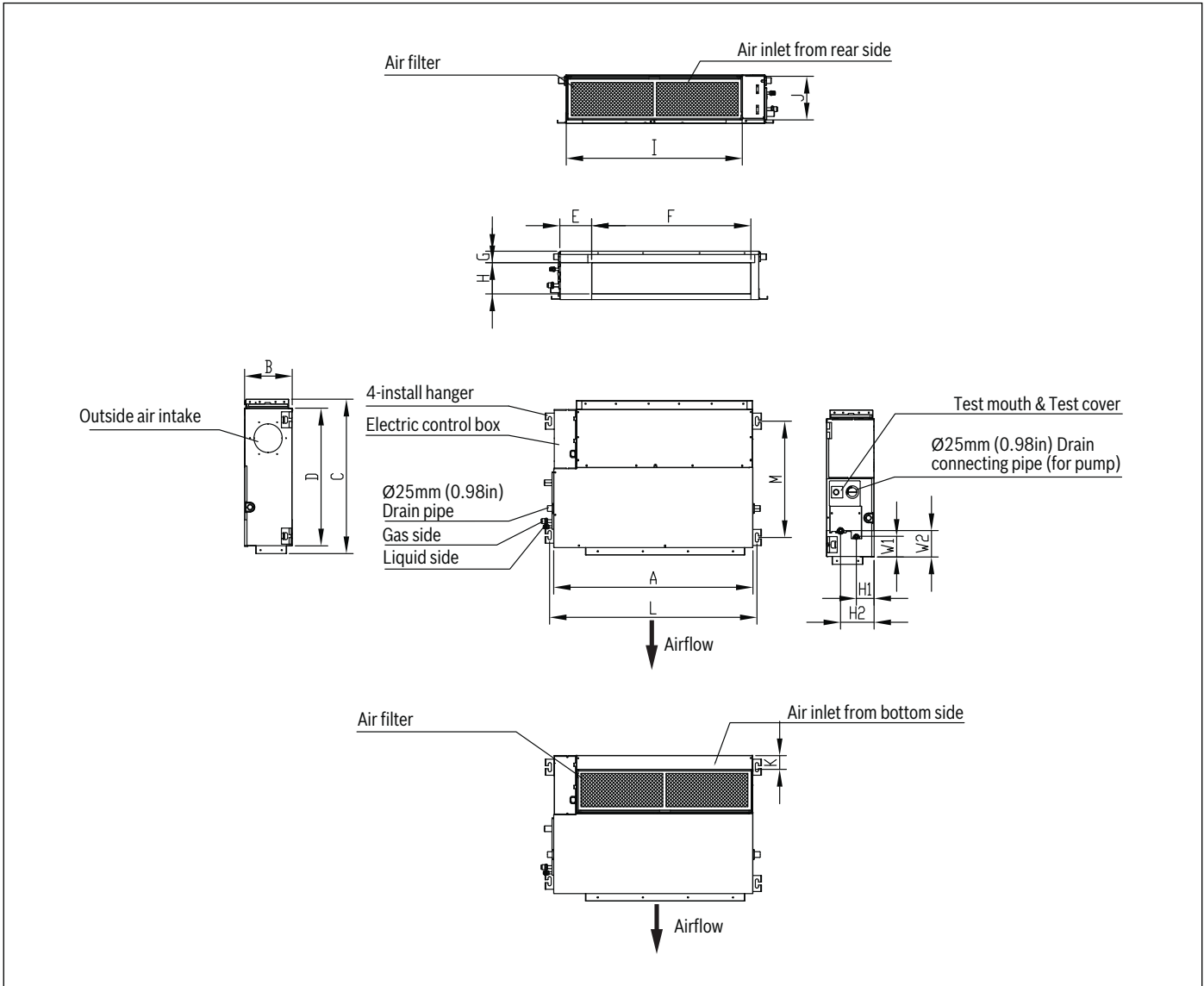


Figure 7

Model	Unit	Outline Dimension				Air Outlet Side Dimension				Air Inlet Side Dimension			Suspension Position		Refrigerant Pipe Location			
		A	B	C	D	E	F	G	H	I	J	K	L	M	H1	H2	W1	W2
9k / 12k	mm	700	200	506	450	137	537	30	152	599	186	50	741	360	84	140	84	84
	in	27.6	7.9	19.9	17.7	5.4	21.1	1.2	6.0	23.6	7.3	2.0	29.2	14.2	3.3	5.5	3.3	3.3
18k	mm	880	210	674	600	140	706	50	136	782	190	40	920	508	78	148	88	112
	in	34.7	8.3	26.5	23.6	5.5	27.8	2.0	5.4	30.8	7.5	1.6	36.2	20.0	3.1	5.8	3.5	4.4
24k	mm	1100	249	774	700	140	926	50	175	1001	228	5	1140	598	80	150	130	155
	in	43.3	9.8	30.5	27.6	5.5	36.5	2.0	6.9	39.4	9.0	0.2	44.9	23.5	3.2	5.9	5.1	6.1
36k	mm	1360	249	774	700	140	1186	50	175	1261	228	5	1400	598	80	150	130	155
	in	53.5	9.8	30.5	27.6	5.5	46.7	2.0	6.9	49.7	9.0	0.2	55.1	23.5	3.2	5.9	5.1	6.1
48k	mm	1200	300	874	800	123	1044	50	227	1101	280	5	1240	697	80	150	185	210
	in	47.2	11.8	34.4	31.5	4.8	41.1	2.0	8.9	43.4	11.0	0.2	48.8	27.4	3.2	5.9	7.3	8.3

Table 2

**60k Model Dimensions**

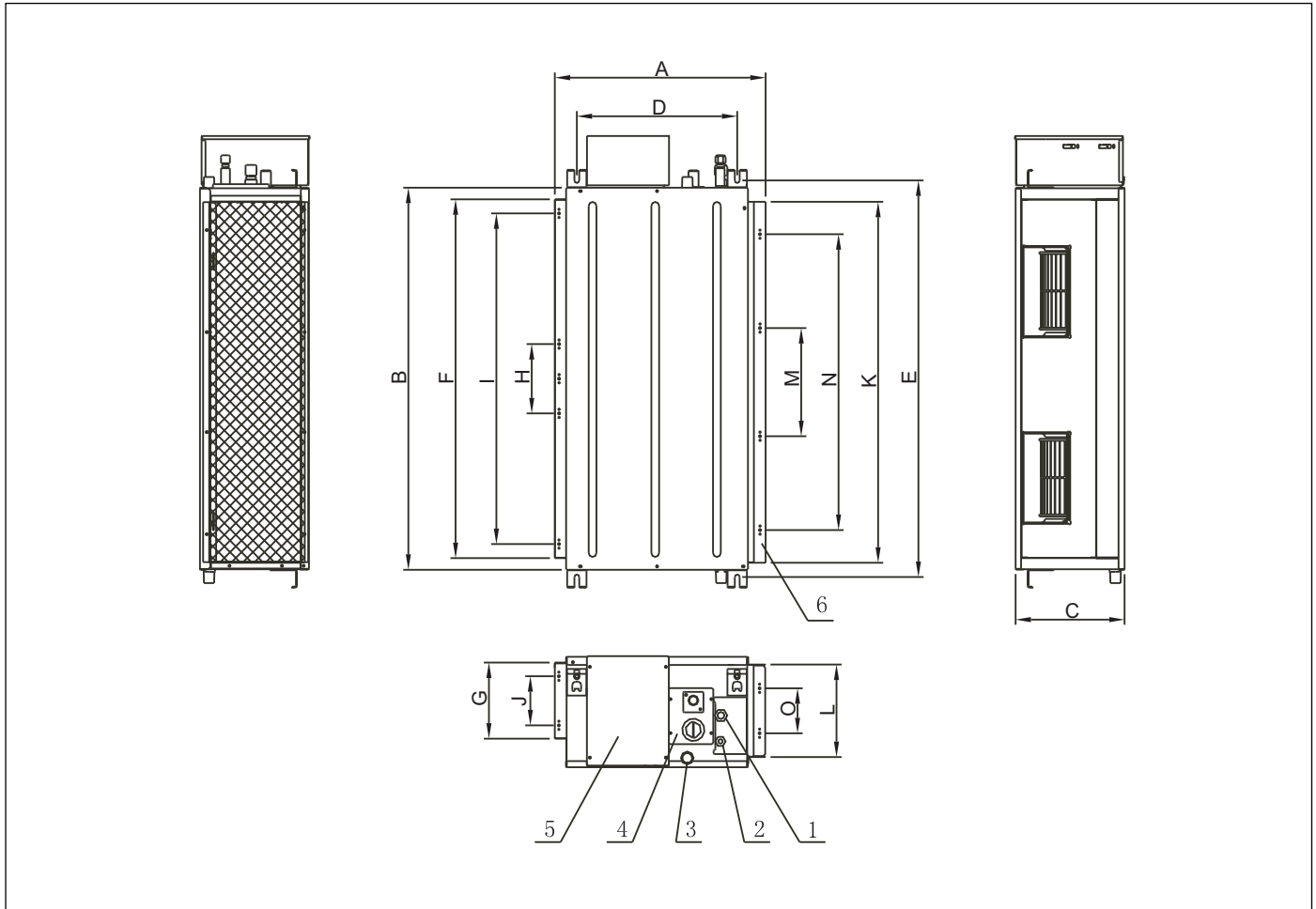


Figure 8

Model	Unit	Outline Dimension			Suspension Position		Air Outlet Side Dimension					Air Inlet Side Dimension (Same as Air Outlet Side)				
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
60k	mm	858	1400	440	700	1436	1188	385	500	1000	280	1188	385	500	1000	280
	in	33.8	55.1	17.3	27.5	56.5	46.7	15	20	39.3	11	46.7	15	20	39.3	11

Table 3

Number	Name	Description
1	Gas pipe connection	Ø19
2	Liquid pipe connection	Ø9.5
3	Drain pipe connection	OD Ø25 ID Ø20
4	Drain pump	—
5	Power supply connection	—
6	Air discharge flange	—

Table 4

**Step 2: Hang indoor unit**

**Wood:**

Secure wood mounting to the beam with screws, then install the hanging screw bolts.

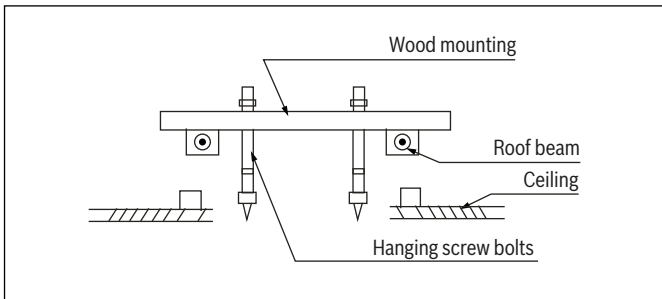


Figure 9

**New concrete:**

Inlay or embed the screw bolts.



Figure 10

**Original concrete:**

Use an embedding screw bolt, crock, and stick harness.

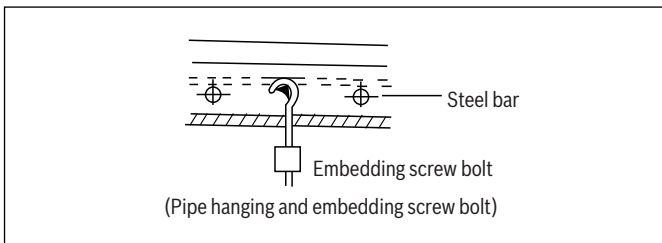


Figure 11

**Steel roof beam structure:**

Install and use the supporting steel angle.

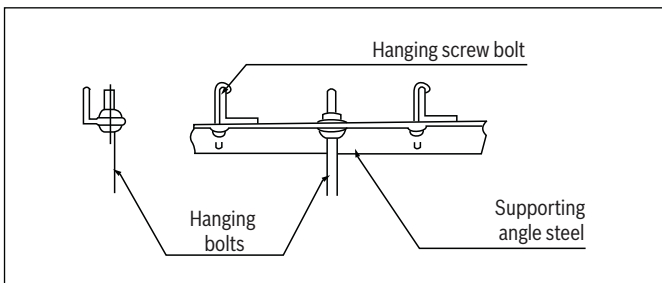


Figure 12

1. After selecting an installation location, align the refrigerant pipes, drain pipes, as well as indoor and outdoor wires with their connection points before mounting the unit.
2. Install hanging screw bolts.
3. Connect pipes and wires after installing indoor unit.
4. Drill 4 holes 10cm (4in.) deep at the ceiling hook positions. Be sure to hold the drill at a 90° angle to the ceiling.
5. Secure the bolt using the washers and nuts provided.
6. Install the four suspension bolts.
7. Mount the indoor unit with at least two people to lift and secure it. Insert suspension bolts into the unit's hanging holes. Fasten them using the washers and nuts provided.

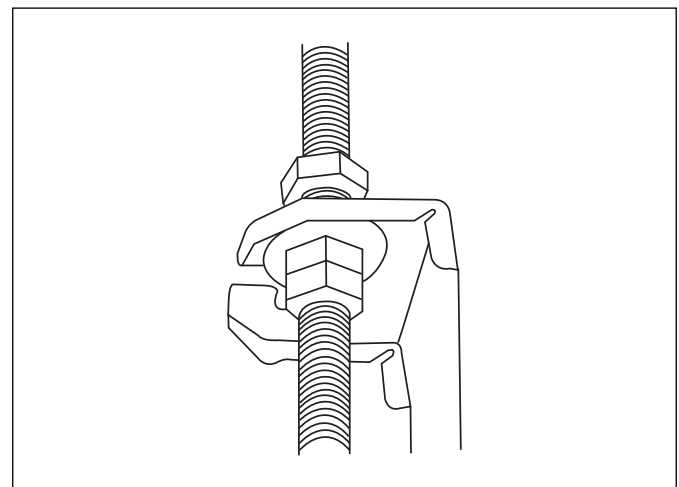


Figure 13

8. Mount the indoor unit onto the hanging screw bolts. Position the indoor unit flat using a level indicator to prevent leaks.

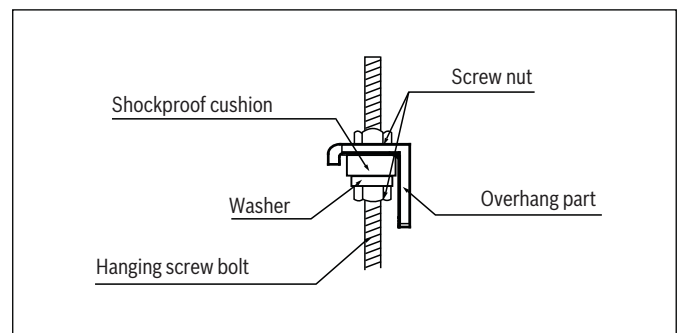


Figure 14



Confirm the minimum drain tilt is 1/100 or more.

**NOTICE: PROPERTY DAMAGE**

- ▶ The indoor unit must be completely aligned with the hole. Ensure that the unit and the hole are the same size before proceeding.

**Step 3: Installing the dust proof net and canvas air passage**

1. Install the dust proof net according to the installation manual.
2. Install the canvas air passage underneath the dust proof net.

**Step 4: Duct and accessories installation**

1. The air inlet and air outlet duct should be far enough to avoid ventilation short circuiting.
2. Attach the duct to the indoor air outlet/inlet flange by using the type ST3.9 x 10 screw.
3. Connect the duct according to the following diagram:

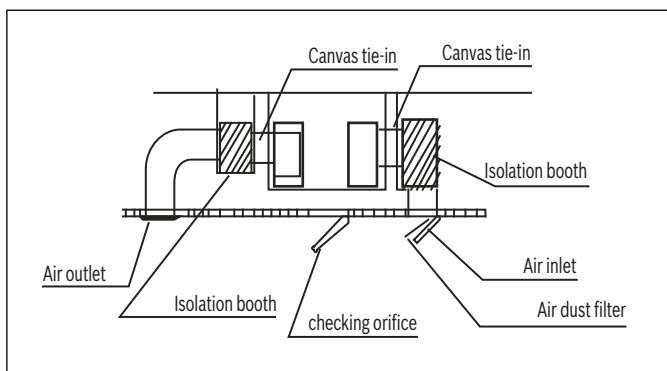


Figure 15

4. Refer to the following static pressure guidelines when installing the indoor unit.

MODEL (Btu/h)	Static Pressure (Pa/in.wg)
9k/12k	0~40/0~0.16
18k	0~100/0~0.40
24k/36k/48k	0~160/0~0.64
60k	0~200/0~0.80

Table 5

Change the fan motor static pressure according to external duct static pressure.



- ▶ Do not use indoor unit to support connecting duct's weight
- ▶ When connecting the duct, use a nonflammable canvas tie-in
- ▶ Change the fan motor static pressure corresponding to external duct static pressure
- ▶ An internal duct under-layer can be added to reduce noise

**Step 5: Adjust the air inlet direction (If required from rear to bottom, 9k ~ 48k models only)**

1. Take off the ventilation panel and flange.

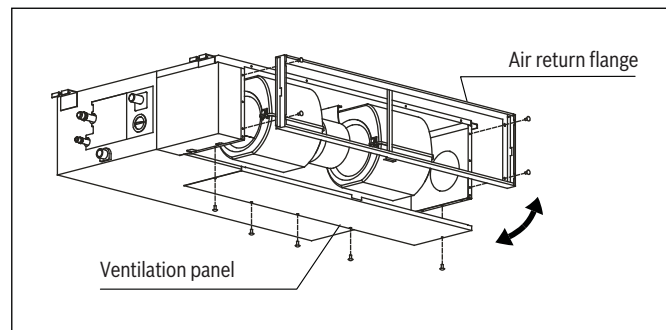


Figure 16

2. Change the mounting positions of the ventilation panel and return air flange.
3. When installing the filter, fit it into the flange as illustrated in the following figure.

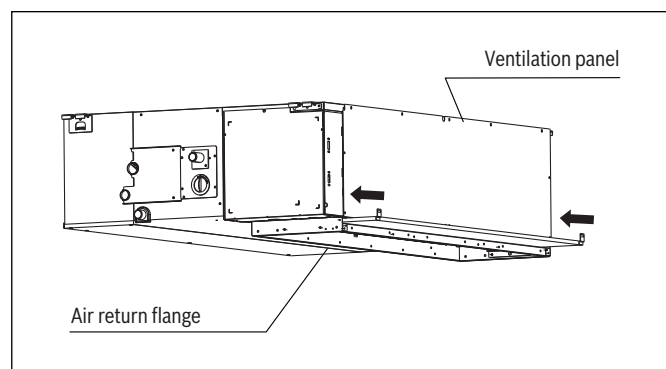


Figure 17



All the figures in this manual are for demonstration purposes only. The air conditioner you have purchased may be slightly different in design, though similar in shape.

**Step 6: Fresh air duct installation**

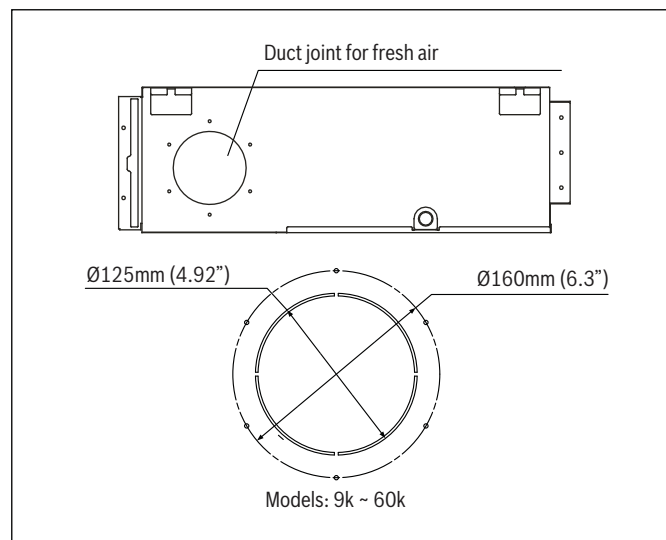


Figure 18

**Step 7: Motor and drain pump maintenance**

**9k - 48k models (the rear ventilated model is used as an example)**

**Motor maintenance:**

1. Take out ventilation panel.
2. Take out blower housing.
3. Take out motor.

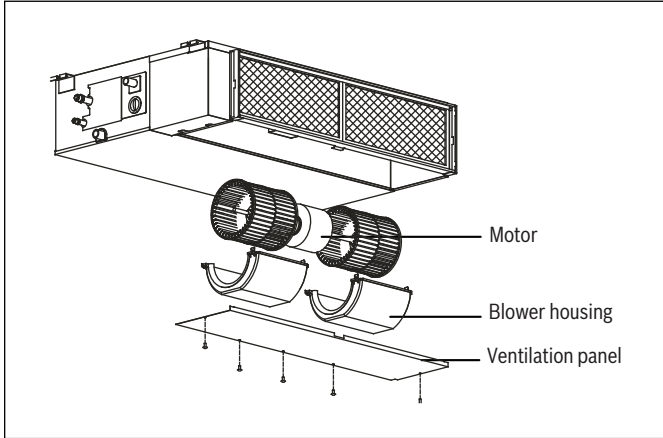


Figure 19

**Pump maintenance:**

1. Remove four screws from the drain pump.
2. Unplug the pump power supply and water level switch cable.
3. Detach the pump.

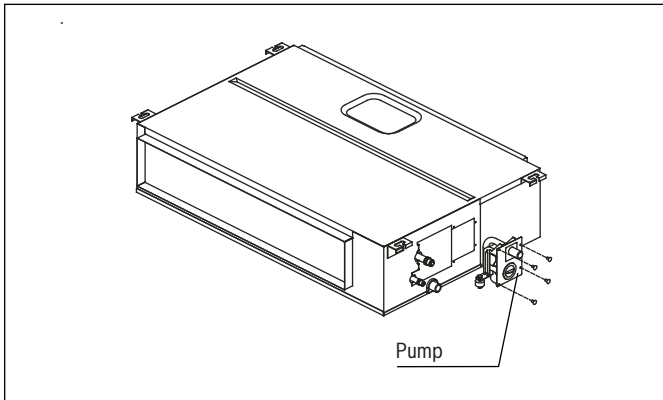


Figure 20

**60k model**

**Motor maintenance (there are three methods):**

**Method 1 - Access from top**

1. Remove the top cover as shown.

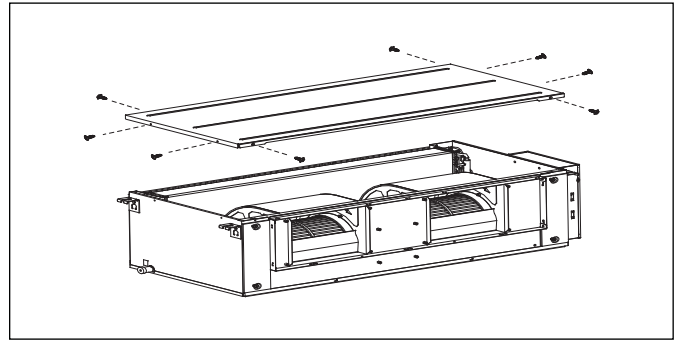


Figure 21

2. Loosen the four bolts and two screws on the front plate.

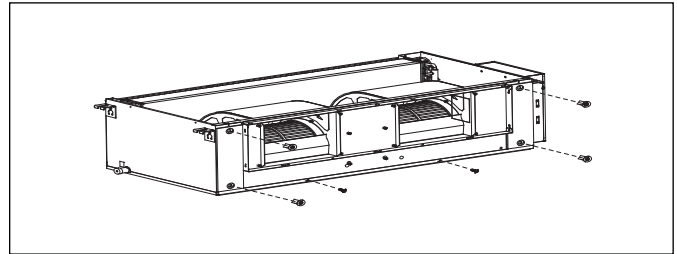


Figure 22

3. Remove the motor cord, take off the front side plate and repair the motor.

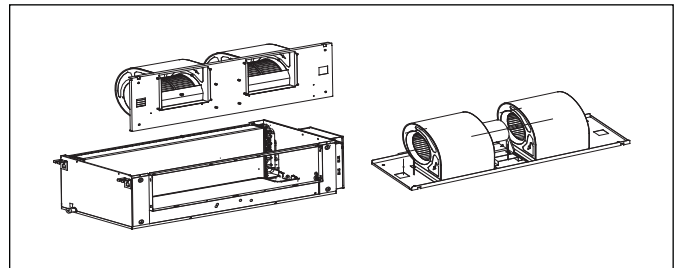


Figure 23

**Method 2 - Access from bottom**

1. Remove the bottom base cover as shown.

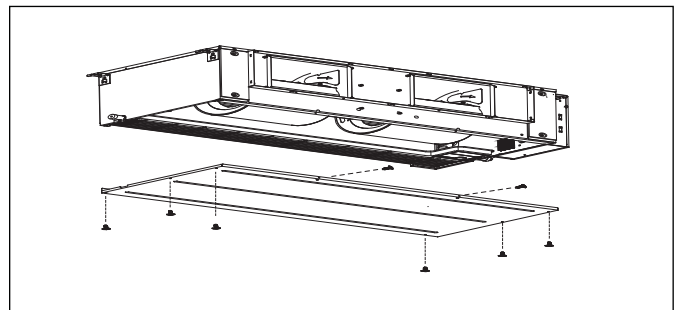


Figure 24

- Loosen the four bolts from the front plate.

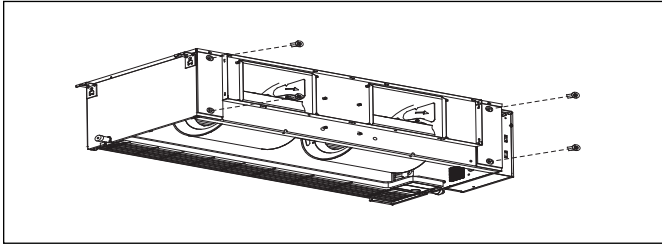


Figure 25

- Remove the motor cord, take off the front side plate and repair the motor.

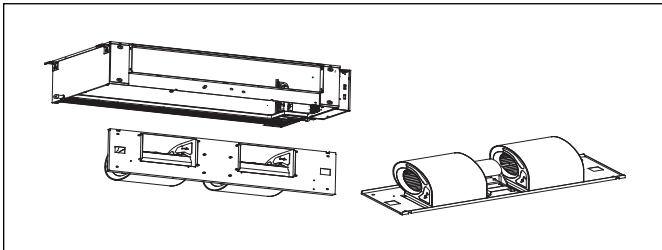


Figure 26

**Method 3 - Repair it directly (only applicable to plastic scroll and fan wheel)**

- Take off the chassis assembly and filter .
- Take off the volute.
- Take off the motor.

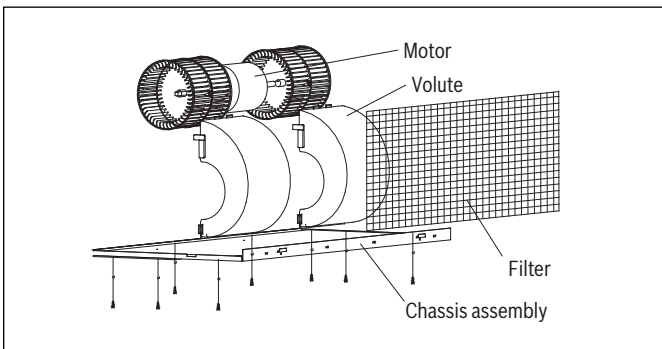


Figure 27

**Pump maintenance:**

- Remove four screws from the drain pump.
- Unplug the pump power supply and water level switch cable.
- Detach the pump.

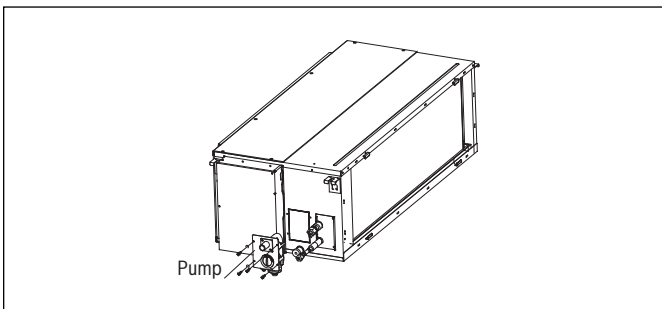


Figure 28

**Step 8: Drainpipe Installation**

The drainpipe is used to drain water away from the unit. Improper installation may cause unit and property damage.

**NOTICE: SYSTEM FAILURE**

- ▶ Insulate all piping to prevent condensation, which could lead to water damage.
- ▶ If the drain pipe is bent or installed incorrectly, water may leak and cause a water-level switch malfunction.
- ▶ In HEAT mode, the outdoor unit will discharge water. Ensure that the drain hose is placed in an appropriate area to avoid water damage.
- ▶ DO NOT pull the drain pipe forcefully. This may damage the pipe.



Installation requires a polyethylene tube (exterior diameter = 3.7-3.9cm, (1.4-1.5in) interior diameter = 3.2cm (1.2in)), which can be obtained at your local hardware store or dealer.

**Indoor Drainpipe Installation**

- Install the drainpipe as illustrated below.

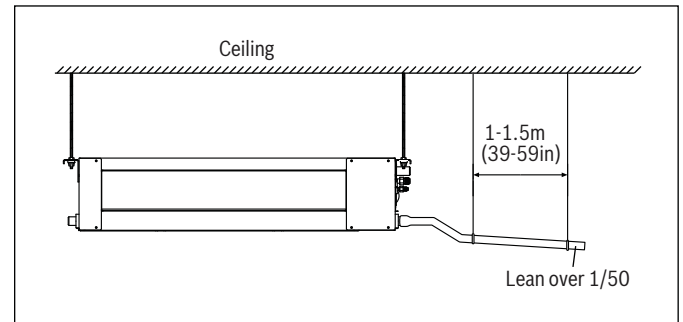


Figure 29

- Attach the mouth of the drain hose to the unit's outlet pipe. Sheath the mouth of the hose and clip it firmly with a pipe clasp.
- Cover the drainpipe with heat insulation to prevent condensation and leakage.

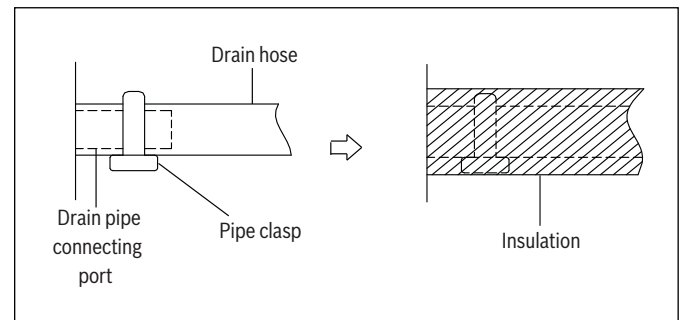


Figure 30



**NOTICE: EQUIPMENT DAMAGE**

- ▶ When using an extended drainpipe, tighten the indoor connection with an additional protection tube. This prevents it from pulling loose.
- ▶ The drainpipe should slope downward at a gradient of at least 1/100 to prevent water from flowing back into the air conditioner.
- ▶ To prevent the pipe from sagging, space hanging wires every 1-1.5m (39-59in).
- ▶ If the outlet of the drainpipe is higher than the body's pump joint, provide a lift pipe for the exhaust outlet of the indoor unit. The lift pipe must be installed no higher than 55cm (21.7in) from the ceiling board. The distance between the unit and the lift pipe must be less than 20cm (7.9in). Incorrect installation could cause water to flow back into the unit and flood.
- ▶ To prevent air bubbles, keep the drain hose level or slightly tilted up (<75mm / 3in).

4. Using a 65-mm (2.5in) core drill, drill a hole in the wall. Make sure that the hole is drilled at a slight downward angle, so that the outdoor end of the hole is lower than the indoor end by about 12mm (0.5in). This will ensure proper water drainage (See Fig. 33). Place the protective wall cuff in the hole. This protects the edges of the hole and will help seal it once you finish installation.

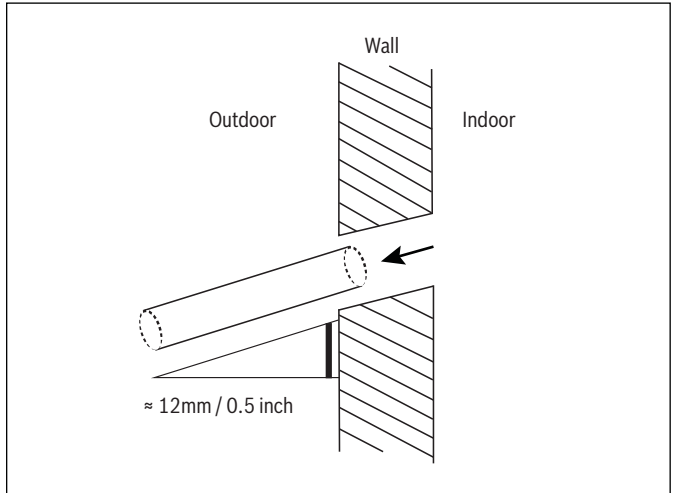


Figure 33

**NOTICE: PROPERTY DAMAGE**

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

5. Pass the drain hose through the wall hole. Make sure the water drains to a safe location where it will not cause water damage or a slipping hazard.

**NOTICE: PROPERTY DAMAGE**

- ▶ The drain pipe outlet should be at least 5cm (1.9in) above the ground. If it touches the ground, the drain pipe may become clogged and malfunction. If you discharge water directly into a sewer, make sure that the drain has a U or S pipe to catch odors that might otherwise come into the house.

**Drainpipe installation for units with a pump**

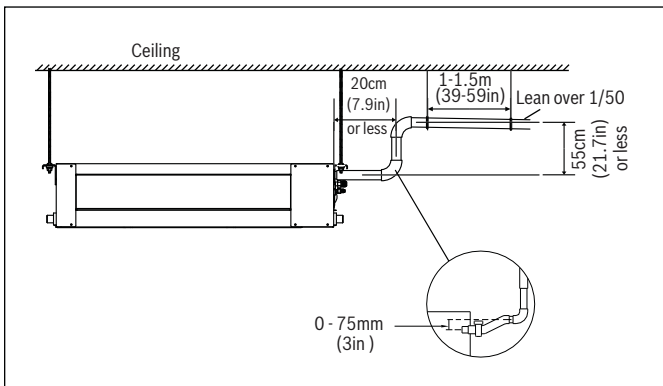


Figure 31



When connecting multiple drainpipes, install the pipes as illustrated below.

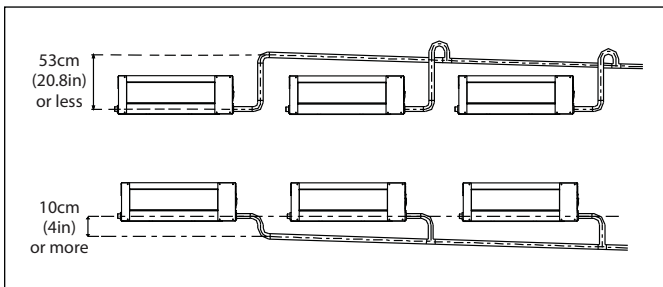


Figure 32

**Drainage test (9k ~ 48k models)**

Check that the drainpipe is unobstructed.

This test should be performed on newly built houses before the ceiling is finished.

**Units without a pump**

1. Fill the water pan with 2 liters of water.

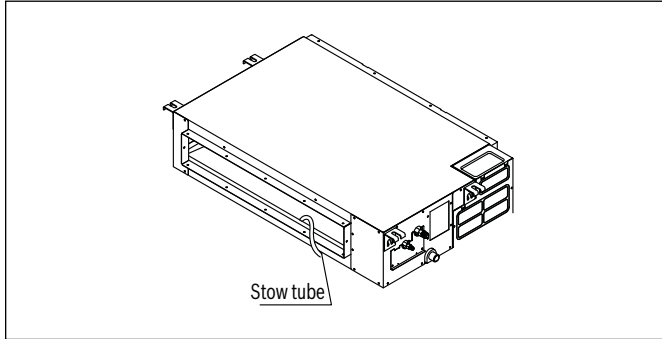


Figure 34

2. Check that the drainpipe is unobstructed.

**Units with a pump**

1. Remove the test cover.

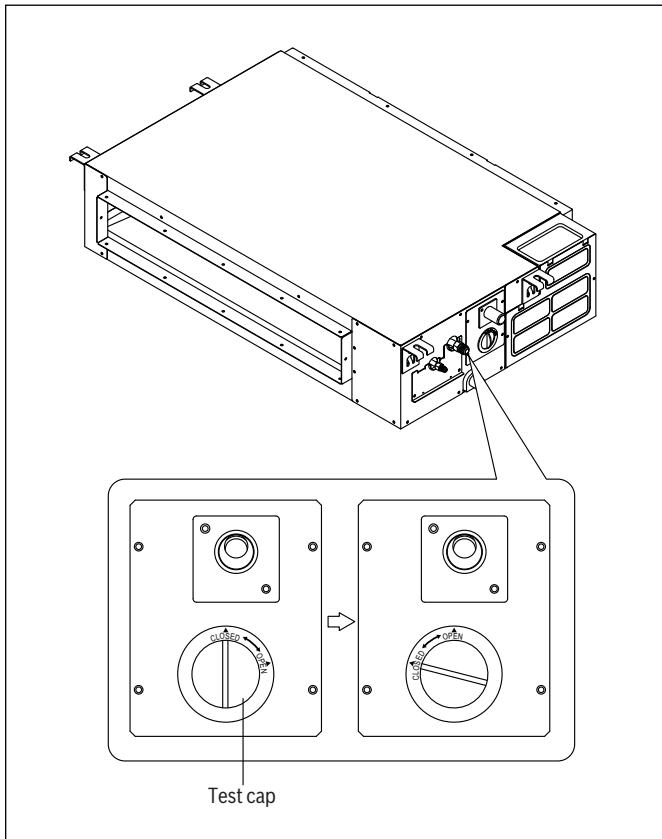


Figure 35

2. Fill the water pan with 2 liters of water.

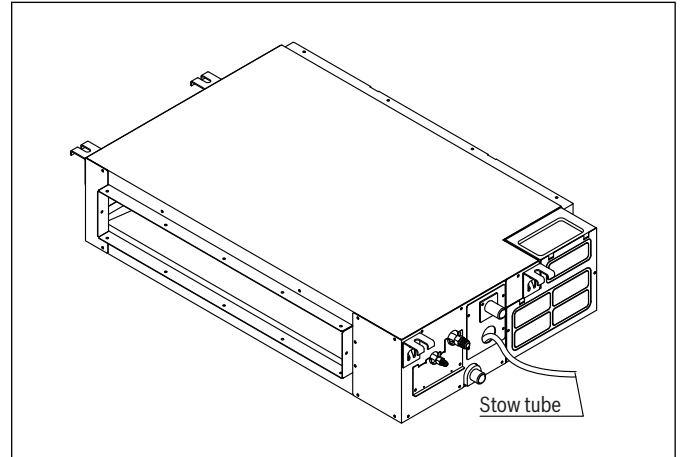


Figure 36

3. Turn on the unit in COOLING mode. You will hear the drain pump. Check whether the water is discharged properly (a 1-minute lag is possible, depending on the length of the drain pipe), Check whether water leaks from the joints.
4. Turn off the air conditioner and put the cap back on.

**Drainage test (60k model)****Units without a pump**

1. Fill the water pan with 2 liters of water.

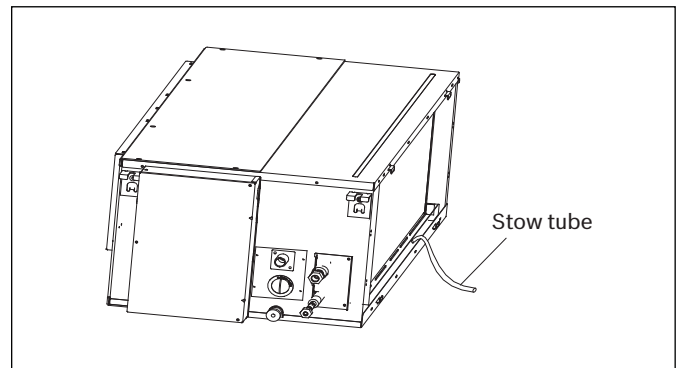


Figure 37

2. Check that the drainpipe is unobstructed.

**Units with a pump.**

1. Remove the test cover.

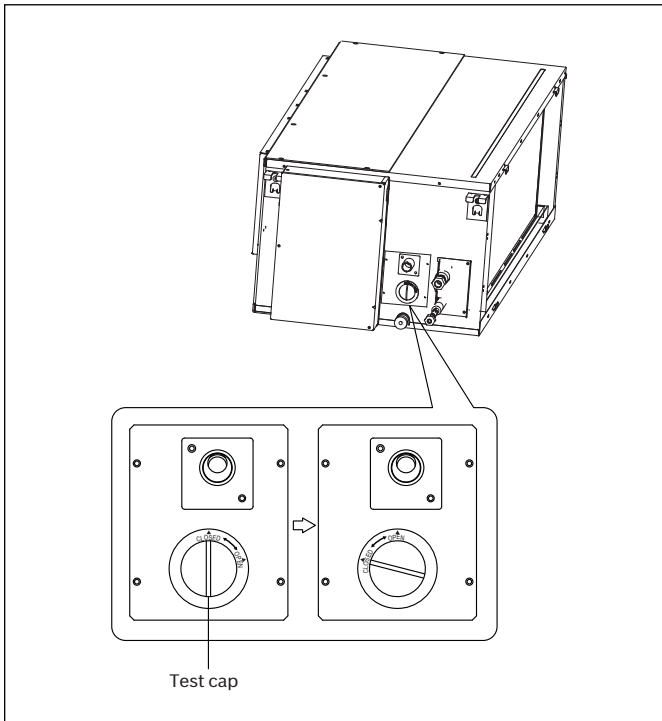


Figure 38

2. Fill the water pan with 2 liters of water.

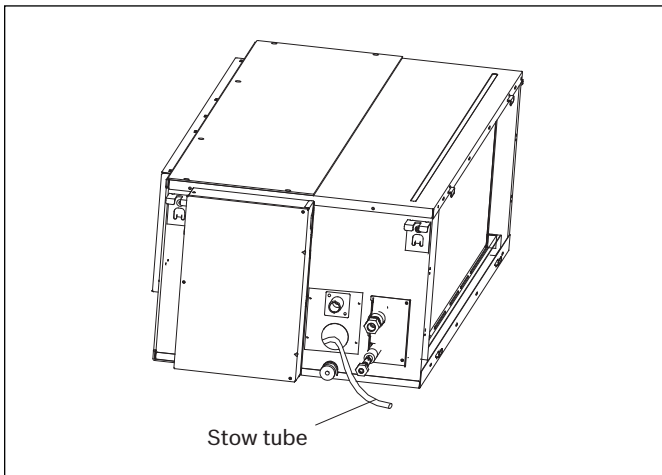


Figure 39

3. Turn on the unit in COOLING mode. You will hear the drain pump. Check whether the water is discharged properly (a 1-minute lag is possible, depending on the length of the drain pipe). Check whether water leaks from the joints.
4. Turn off the air conditioner and put the cap back on.

**If drain pump needs to be disabled**

1. Remove cover of E-Parts box.
2. Unplug the "Pump" pin to disable pump.
3. Short connect the "CN5".

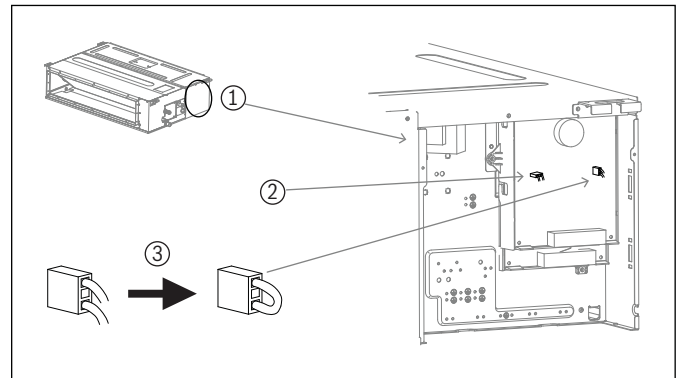


Figure 40

**Vertical Mount (9k ~ 48k models only)**

1. Disable pump.
2. Take off the cap on drain connector C.
3. Connect the drainpipe to drain connector C.

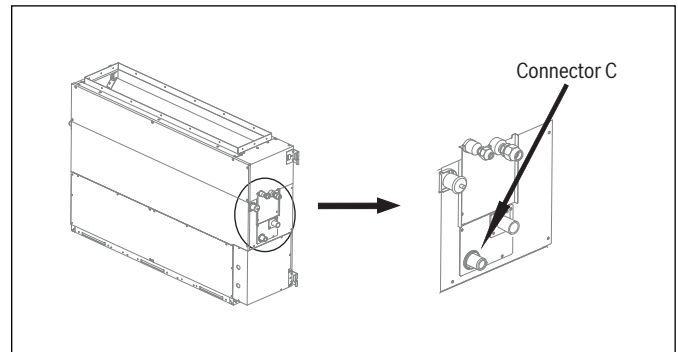


Figure 41

## 6 Outdoor Unit Installation

### Step 1: Select installation location

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 42)

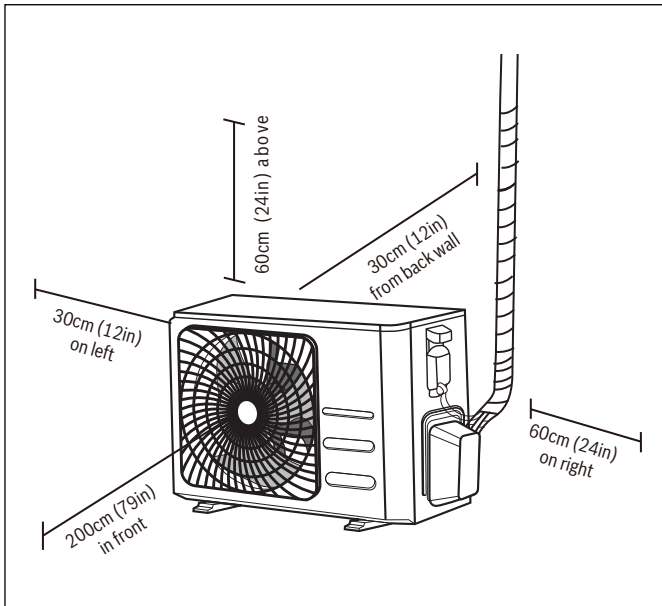


Figure 42

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

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

**NOTICE**

- ▶ If the unit is exposed to heavy wind: Install unit so that air outlet fan is at a 90° angle to the direction of the wind. If needed, build a barrier in front of the unit to protect it from extremely heavy winds. See Figures 43 and 44.

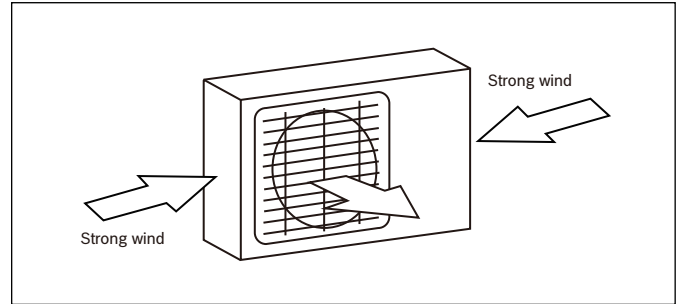


Figure 43

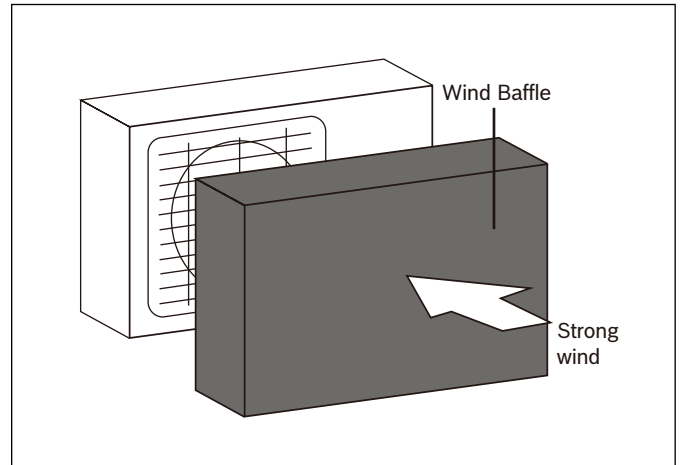


Figure 44

**NOTICE**

- ▶ If the unit is frequently exposed to heavy rain or snow:
  - Build a shelter above the unit to protect it from the rain or snow. Be careful not to obstruct air flow around the unit.



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

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

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

Model	Capacity (BTU/h)	Max. Equivalent Length m (ft)	Max. Height Variation m (ft)
R410A Inverter Split Air Conditioner	< 15,000	25 (82ft)	10 (33ft)
	15,000 to < 24,000	30 (98.5ft)	20 (66ft)
	24,000 to < 36,000	50 (164ft)	25 (82ft)
	36,000 to 60,000	65 (213ft)	30 (98.5ft)

Table 6

## Step 2: Install drain joint

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

If the drain joint comes with a rubber seal (see Figure 45, pos. A), do the following:

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

If the drain joint does not come with a rubber seal (see Figure 45, pos. B), do the following:

1. Insert the drain joint into the hole in the base pan of the unit. The drain joint will click in place.
2. Connect a drain hose extension (not included) to the drain joint to redirect water from the unit during heating mode.

### NOTICE

- In cold climates, make sure that the drain hose is as vertical as possible to ensure swift water drainage. If water drains too slowly, it can freeze in the hose and flood the unit.

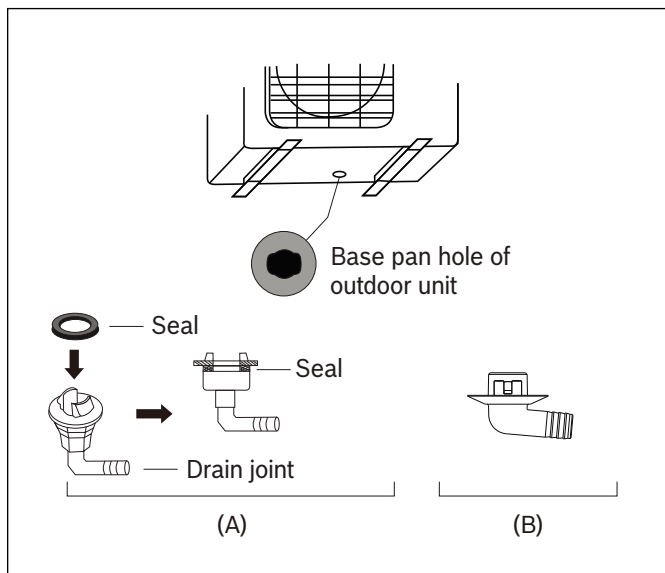


Figure 45

**Step 3: Anchor outdoor unit**

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

**Unit mounting dimensions**

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

**NOTICE: PROPERTY DAMAGE/SYSTEM FAILURE**

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

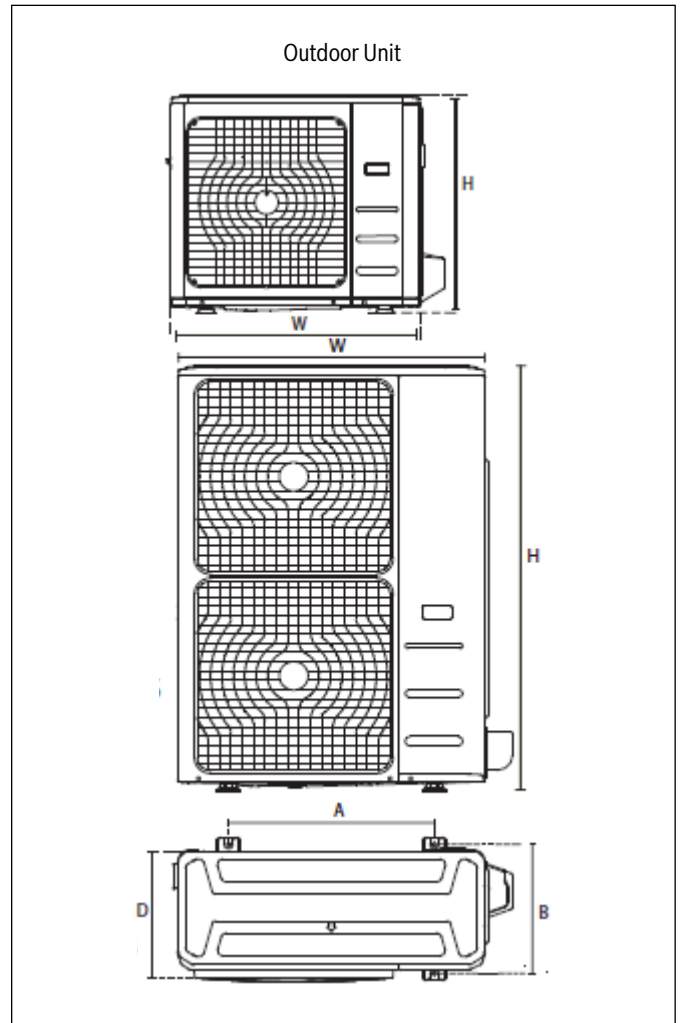


Figure 46

Outdoor Model	Outdoor Unit Dimensions (mm/in)	Mounting Dimensions	
	W x H x D	Distance A (mm/in)	Distance B (mm/in)
BMS500-AAS009-1CSXRA	770x555x300 (30.3x21.85x11.81)	487 (19.2)	298 (11.73)
BMS500-AAS012-0CSXRB, BMS500-AAS012-1CSXRA, BMS500-AAS009-1CSXHB, BMS500-AAS012-1CSXHB	800x554x333 (31.5x21.8x13.1)	514 (20.24)	340 (13.39)
BMS500-AAS018-1CSXRA, BMS500-AAS018-1CSXHB, BMS500-AAM018-1CSXRA	845x702x363 (33.27x27.6x14.3)	540 (21.26)	350 (13.8)
BMS500-AAS024-1CSXRA, BMS500-AAS024-1CSXHB, BMS500-AAS030-1CSXRB, BMS500-AAS036-1CSXRB, BMS500-AAS036-1CSXLB, BMS500-AAM027-1CSXRA, BMS500-AAM036-1CSXRA, BMS500-AAM027-1CSXHB, BMS500-AAM036-1CSXHB	946x810x410 (37.24x31.9x16.14)	673 (26.5)	403 (15.87)
BMS500-AAS048-1CSXLB, BMS500-AAS060-1CSXLB, BMS500-AAM048-1CSXRA, BMS500-AAM036-1CSXHB	952x1333x415 (37.5x52.5x16.34)	634 (24.96)	404 (15.9)

Table 7

## 7 Refrigerant Piping Connection

### 7.1 Connection Instructions – Refrigerant Piping

#### Step 1: Cut pipes

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

1. Measure the distance between the indoor and outdoor units.
2. Using a pipe cutter, cut the pipe a little longer than the measured distance.
3. Make sure that the pipe is cut at a perfect 90° angle. Refer to Fig.47 for cut examples.

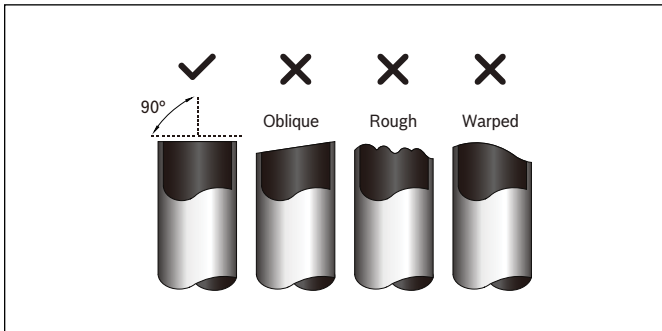


Figure 47

**NOTICE:**

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

#### Step 2: Remove burrs

Burrs can affect the air-tight seal of the 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.

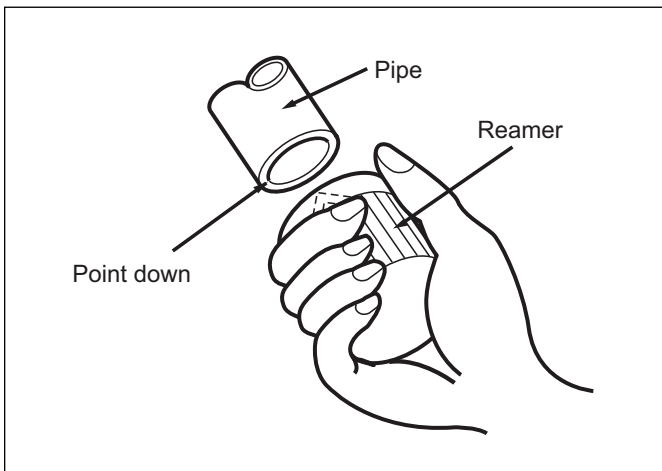


Figure 48

#### 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 49.

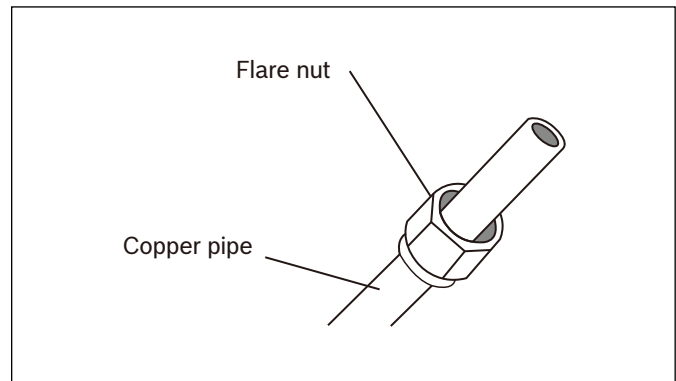


Figure 49

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 8.

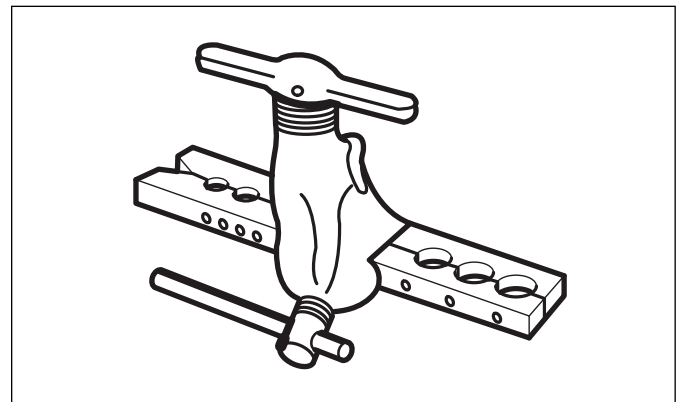


Figure 50

#### Piping extension beyond flare form

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

Table 8

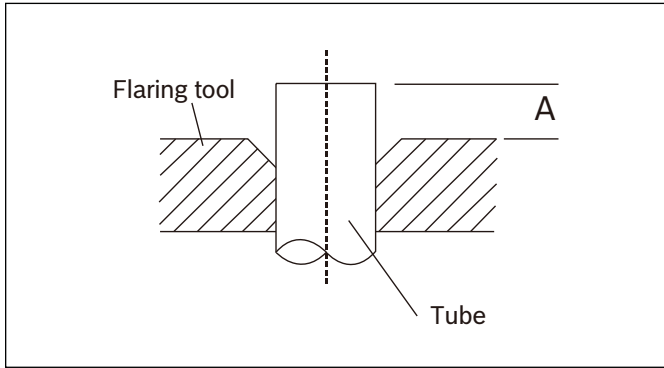


Figure 51

**Piping Extension Beyond Flare Form**

Pipe Gauge	Tightening torque (N.m / kgf.cm)	Flare dimension (B) (mm/inch)		Flare shape
		Min.	Max.	
Ø 6.4	18-20N.m (183-204kgf.cm)	8.4/0.33	8.7/0.34	
Ø 9.5	25-26 N.m (255-265 kgf.cm)	13.2/0.52	13.5/0.53	
Ø 12.7	35-36 N.m (357-367 kgf.cm)	16.2/0.64	16.5/0.65	
Ø 15.9	45-47 N.m (459-480 kgf.cm)	19.2/0.76	19.7/0.78	
Ø 19.1	65-67 N.m (663-683 kgf.cm)	23.2/0.91	23.7/0.93	
Ø 22	75-85N.m (765-867 kgf.cm)	26.4/1.04	26.9/1.06	

Table 9

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

**Step 4: Connect pipes**

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



**Minimum Bend Radius**  
When bending connective refrigerant piping, the minimum bending radius is 10cm (4in). See Figure 52.

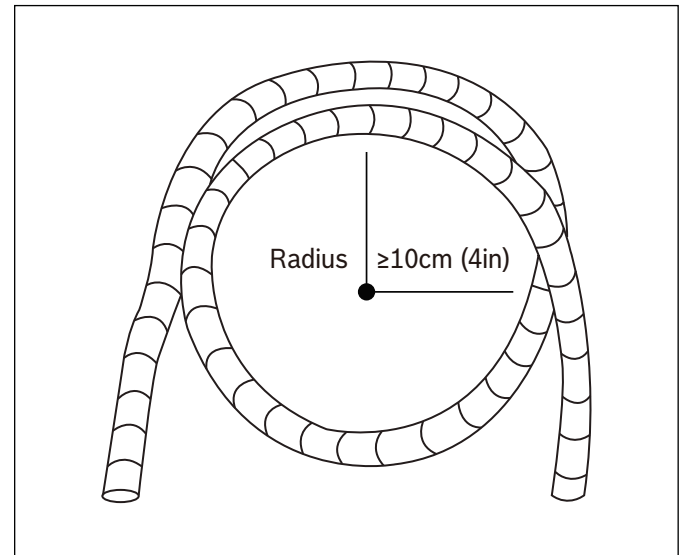


Figure 52



## 8 Connecting Signal/Power Cable



### WARNING:

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



### 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.

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

### Cable Types

- ▶ H07RN-F type

### Minimum Cross-Sectional Area of Power Cables

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

Table 10

### Choose the right cable size

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



Take note of fuse specifications

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

### Outdoor Unit wiring

1. Prepare the cable for connection:
  - Using wire strippers, strip the rubber jacket from both ends of signal/power cable to reveal about 15cm (6in) of the wires inside.
  - Strip the insulation from the ends of the wires.
  - Using wire crimper, crimp u-type lugs on the ends of the wires.
2. Open the front panel of the indoor unit.

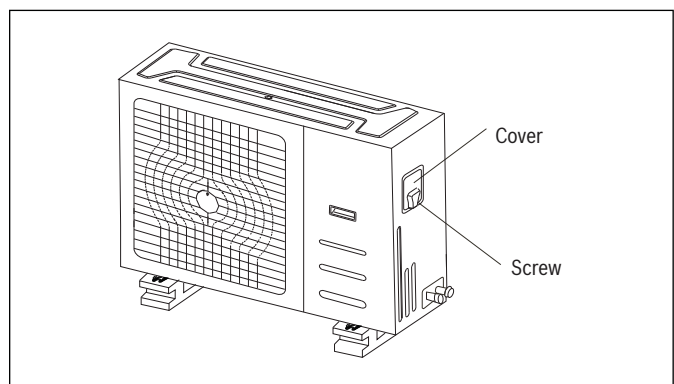


Figure 53

3. Connect the u-lugs to the terminals. Match the wire colors/labels with the labels on the terminal block. Firmly screw the u-lug of each wire to its corresponding terminal.

4. Clamp down the cable with the cable clamp.
5. Insulate unused wires with electrical tape. Keep them away from any electrical or metal parts.
6. Reinstall the cover of the electric control box.

**Indoor Unit wiring**

1. Prepare the cable for connection:
  - a. Using wire strippers, strip the rubber jacket from both ends of the signal cable to reveal about 15cm (5.9") of the wire.
  - b. Strip the insulation from the ends of the wires.
  - c. Using a wire crimper, crimp the u-lugs to the ends of the wires.
2. Remove the cover of the electric control box on your indoor unit.
3. Connect the u-lugs to the terminals. Match the wire colors/labels with the labels on the terminal block. Firmly screw the u-lug of each wire to its corresponding terminal. Refer to the Serial Number and Wiring Diagram located on the cover of the electric control box.

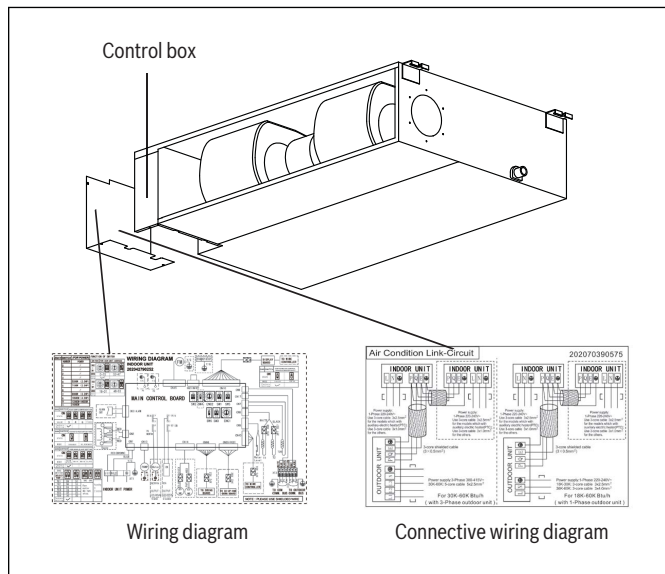


Figure 54

**Magnetic ring (if supplied and packed with the accessories)**

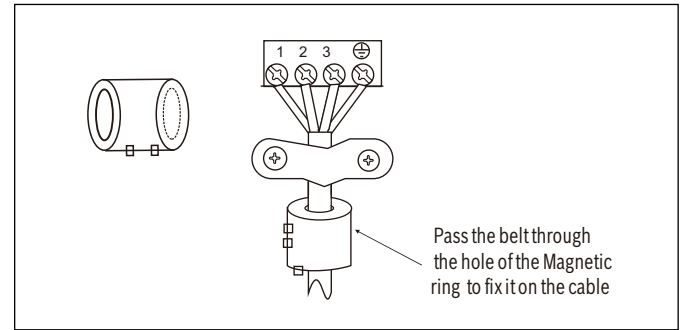


Figure 55



**CAUTION:**

- ▶ While connecting the wires, please strictly follow the wiring diagram.
- ▶ The refrigerant circuit can become very hot. Keep the interconnection cable away from the copper tube.

4. Clamp down the cable with the cable clamp. The cable must not be loose or pull on the u-lugs.
5. Reattach the electric box cover.



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

**Using the wire controller to set external static pressure (some models)**

- ▶ You can use the unit's automatic airflow adjustment function to set external static pressure.
  - ▶ Automatic airflow adjustment is the volume of blow-off air that has been automatically adjusted to the quantity rated.
1. Make sure the test run is done with a dry coil. If the coil is not dry, run the unit for 2 hours in FAN ONLY mode to dry the coil.
  2. Check that both power supply wiring and duct installation have been completed. Check that any closing dampers are open. Check that the air filter is properly attached to the air suction side passage of the unit.
  3. Set the parameters for automatic airflow adjustment. When the air conditioning unit is off, perform the following steps:
    - Press the button "COPY" for a few seconds.
    - Press "+" or "-" to select the AF.

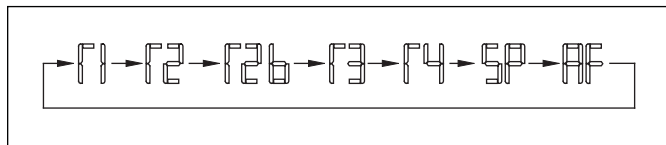


Figure 56

- Press "CONFIRM". The air conditioning unit will then start the fan for airflow automatic adjustment.

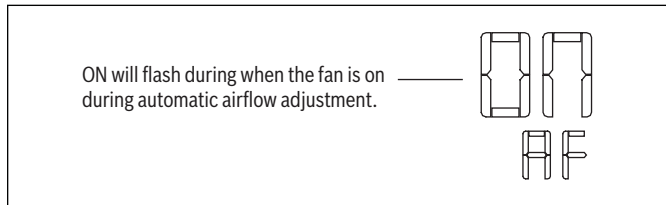


Figure 57

**NOTICE: SYSTEM FAILURE**

- ▶ DO NOT adjust the dampers when automatic airflow adjustment is active.

**NOTICE: SYSTEM FAILURE**

- ▶ If there is no change after airflow adjustment in the ventilation paths, be sure to reset automatic airflow adjustment.
- ▶ If there is no change to ventilation paths after airflow adjustment, contact your dealer, especially if this occurs after testing the outdoor unit or if the unit has been moved to a different location.
- ▶ Do not use automatic airflow adjustment with remote control, if you are using booster fans, or outdoor air processing unit via duct.
- ▶ If the ventilation paths have been changed, reset airflow automatic adjustment as described from step 3 onwards.

**i** Please refer to Wired Wall Thermostat Manual for installation guidance.

## 8 Air Evacuation

### 8.1 Preparations and Precautions

Air and foreign matter in the refrigerant circuit can cause abnormal rises in pressure, which can damage the air conditioner, reduce its efficiency, and cause injury. Use a vacuum pump and manifold gauge to evacuate the refrigerant circuit, removing any non-condensable gas and moisture from the system.

Evacuation should be performed upon initial installation and when unit is relocated.

#### Before performing evacuation

- ▶ Check to make sure that both high-pressure and low-pressure pipes between the indoor and outdoor units are connected properly in accordance with the Refrigerant Piping Connection section of this manual.
- ▶ Check to make sure all wiring is connected properly.

### 8.2 Evacuation Instructions

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

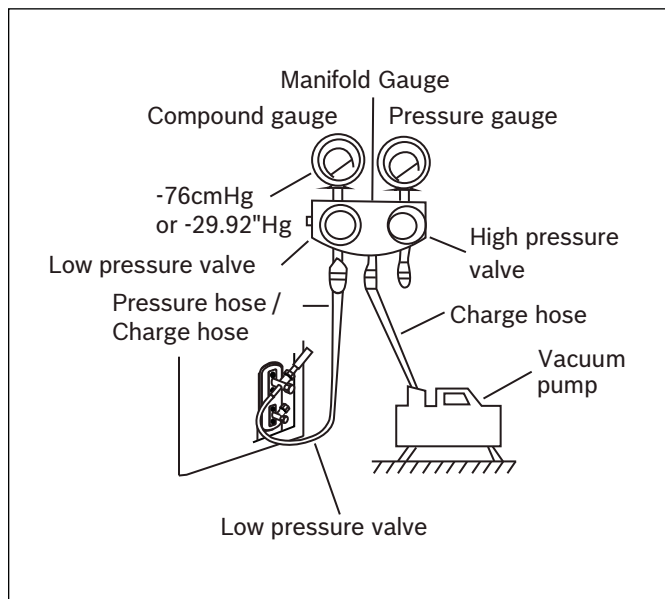


Figure 58

1. Connect the charge hose of the manifold gauge to the service port on the outdoor unit's low pressure valve.
2. Connect another charge hose from the manifold gauge to the vacuum pump.
3. Open the Low Pressure side of the manifold gauge. Keep the High Pressure side closed.
4. Turn on the vacuum pump to evacuate the system.
5. Run the vacuum until the Compound Meter reads -76cmHg / -29.92"Hg (-101 kPa). It is recommended to use a micron gauge; run the vacuum until the micron gauge reads 350 to 500 microns or less.
6. Close the Low Pressure side of the manifold gauge, and turn off the vacuum pump.

7. Wait for approximately 10 to 15 minutes, then check that there has been no change in system pressure. It is recommended to use a micron gauge; check to make sure the system is still below 500 microns.
8. If there is a change in system pressure, refer to the Gas Leak Check section for information on how to check for leaks. If there is no change in system pressure, unscrew the cap from the packed valve (high pressure valve).
9. Insert a 5mm allen wrench into the packed valve (high pressure valve) and open the valve by turning the wrench in a 1/4 counterclockwise turn. Listen for gas to exit the system, then close the valve after 5 seconds.
10. Watch the Pressure Gauge for one minute to make sure that there is no change in pressure. The Pressure Gauge should read slightly higher than atmospheric pressure.

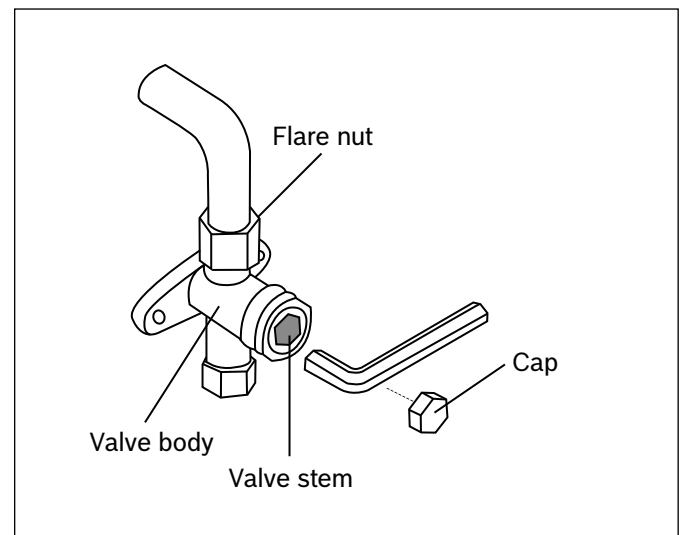


Figure 59

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

#### NOTICE: Open 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.

### 8.3 Adding Refrigerant

In North America, the standard pipe length is 7.5m (25'). The additional refrigerant to be charged can be calculated using the following formula:

#### Additional refrigerant per pipe length

Connective Pipe	Air Purging	Additional Refrigerant	
< Standard pipe length	Vacuum Pump	N/A	
> Standard pipe length	Vacuum Pump	Liquid Side: Ø 6.35 (ø 0.25")  Inverter R410A: (Pipe length – standard length) x 15g/m (Pipe length – standard length) x 0.16oz/ft	Liquid Side: Ø 9.52 (ø 0.375")  Inverter R410A: (Pipe length – standard length) x 30g/m (Pipe length – standard length) x 0.32oz/ft

Table 11



**CAUTION: CONTAINS REFRIGERANT**

▶ NEVER mix refrigerant types.

## 9 Electrical and Gas Leak Checks

### 9.1 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.



This may not be required for some locations in the US.



#### **WARNING: Risk of electric shock**

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

### 9.2 Gas Leak Checks

There are two different methods to check for gas leaks.

#### Soap and Water Method

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

#### Leak Detector Method

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

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

## 10 Test Run

### 10.1 Before Test Run

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

- ▶ Electrical Safety Checks –  
Confirm that the unit’s electrical system is safe and operating properly
- ▶ 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

### 10.2 Test Run Instructions

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

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

List of Checks to Perform	Pass	Fail
No electrical leakage		
Unit is properly grounded		
All electrical terminals are 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 12



**WARNING: CONTAINS REFRIGERANT**

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

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

## 11 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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