

Please read this manual carefully before installation and keep it for future reference.  
If used as MULTI unit, please refer to the Installation & operation manuals packed with outdoor unit.

# Installation Manual



**MRCOOL®**  
**COMFORT MADE SIMPLE**

## Olympus Series Mid-Static Duct Air Handlers

Please keep this manual where the operator can easily find it. Inside, you will find helpful hints on how to use and maintain your unit properly.

For more info visit [www.mrcool.com](http://www.mrcool.com)

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# Safety Precautions



## Read Before Using

**Incorrect usage may cause serious damage or injury.**

The seriousness of potential damage or injuries is classified as either a **WARNING** or **CAUTION**.



**WARNING**

This symbol indicates that ignoring instructions may cause death or serious injury.



**CAUTION**

This symbol indicates that ignoring instructions may cause moderate injury to your person, damage to your unit, or other property.



This symbol indicates that you should **NEVER** perform the indicated action.



## **WARNING**






- Installation must be performed in accordance with the requirement of NEC and CEC by authorized personnel only.
- Be sure only trained and qualified service personnel install, repair, or service the equipment.
- Improper installation, repair, and maintenance may result in electrical shocks, short-circuit, leaks, personal injury, loss of life, fire or other damage to the equipment.
- Strictly install according to this installation manual. If installation is defective, it can cause water leakage, electrical shock, or fire.
- When installing the unit in a small room, take measures to keep refrigerant concentration from exceeding allowable safety limits in the event of refrigerant leakage. Contact the place of purchase for more information. Excessive refrigerant in a closed space can lead to oxygen deficiency.
- Use the listed parts and accessories for installation. Otherwise, incorrect parts can cause the unit to fall, leak water, cause electrical shock, or produce fire.
- Install at a strong and firm location that is able to withstand the unit's weight. A weak location or improper installation can cause the unit to fall or cause injury.
- The appliance must be installed 7.5ft / 2.3m above floor.
- The appliance shall not be installed in the laundry room.
- Before obtaining access to terminals, all supply circuits must be disconnected.
- The appliance must be positioned so that the plug is accessible.
- The enclosure of the appliance shall be marked by words or symbols identifying the direction of fluid flow.
- Read this manual thoroughly before starting up the units.
- For electrical work, follow the local and national wiring standards, regulations, and these installation instructions. An independent circuit and single outlet must be used. If electrical circuit capacity is not enough or electrical work is defective, it can cause electrical shock or fire.
- Use the specified cable, connect tightly, and clamp the cable so that no external force will be acted on the terminal. If connection is not perfect, it can cause overheating or fire at the connection.

# Safety Precautions

## **WARNING**

- Wiring routing must be properly arranged so that the control board cover is fixed properly. If the control board cover is not fixed perfectly, it can cause overheating at the terminal connection point, fire, or electrical shock.
- If the supply cord is damaged, it must be replaced by the manufacturer, service agent, or other qualified person in order to avoid a hazard.
- An all-pole disconnection switch with a contact separation of at least 0.12in in all poles should be connected in fixed wiring.
- When completing piping connection, take proper precautions to avoid air substances entering the refrigeration cycle. Otherwise, it can cause lower capacity, abnormally high pressure in the refrigeration cycle, explosion, and/or injury.
- Do not modify the length of the power supply cord, use an extension cord, or share the single outlet with any other electrical appliances. Otherwise, it can cause fire or electrical shock.
- If the refrigerant leaks during installation, ventilate the area immediately. Toxic gas may be produced if the refrigerant comes in contact with fire.
- The temperature of refrigerant circuit will be high, please keep the interconnection cable away from the copper tube.
- After completing the installation work, check that the refrigerant does not leak. Toxic gas may be produced if the refrigerant leaks into the room and comes into contact with a source of fire, such as a heater, stove or cooker.
- After completing the installation, make sure that the unit operates properly during the start-up operation. Please instruct the customer on how to operate the unit and keep it maintained. Also, inform customers that they should store this installation manual along with the owner's manual for future reference.



## **CAUTION**

- Ground the air conditioner.
- Be sure to install an earth leakage breaker. Failure to install an earth leakage breaker may result in electrical shock.
- Connect the outdoor unit wires first, then connect the indoor unit wires.
-  **DO NOT** connect the ground wire to gas or water pipes, lightning rod, or a telephone ground wire. Inappropriate grounding may result in electrical shocks.
-  **DO NOT** allow children to play with the air conditioner. Children or impaired individuals should be supervised around the unit at all times.
-  **DO NOT** connect the air conditioner with the power supply until the wiring and piping is done.
-  **DO NOT** operate your air conditioner in a wet room such as a bathroom or laundry room.
-  **DO NOT** install the air conditioner in any of the following circumstances:
  - There is petrolatum existing.
  - There is salty air surrounding (near the coast).
  - There is caustic gas (the sulfide, for example) existing in the air (near a hot spring).
  - The volt vibrates violently (in factories).
  - In buses or cabinets.
  - In kitchen where it is full of oil gas.
  - There are strong electromagnetic waves existing.
  - There are inflammable materials or gases.
  - There is acid or alkaline liquid evaporating.
  - Other special conditions.

## INSPECTING THE UNIT

At delivery, the package should be checked and any damage should be reported immediately to the service agent.

When handling the unit, take into account the following:

1.  The unit is fragile; handle with care.
2.  Keep the unit upright in order to avoid compressor damage.
3. Choose the path along which the unit is to be brought inside before packing in the unit.
4. If possible, move this unit as originally packaged. When lifting the unit, always use protectors to prevent belt damage and pay attention to the unit's center of gravity.

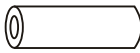




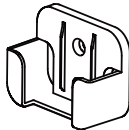

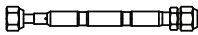
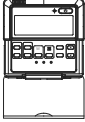
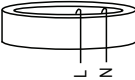
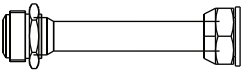
## INSTALLATION INFORMATION

- Before attempting installation, read this "installation manual" thoroughly.
- The air conditioner must be installed by qualified persons.
- When installing the indoor unit or its tubing, please follow this manual as strictly as possible.
- If the air conditioner is installed on a metal part of the building, it must be electrically insulated according to the relevant standards for electrical appliances.
- After installation work is complete, perform thorough checks before turning on the power.
- This manual may be subject to change without notice due to product improvements.

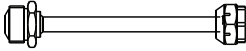





## INSTALLATION ORDER

1. Select the location
2. Install the indoor unit
3. Install the outdoor unit
4. Install the connecting pipe
5. Connect the drain pipe
6. Wiring
7. Test operation

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

PART	LOOKS LIKE...	QUANTITY	
<b>Soundproof / Insulation Sheath</b>		2	
<b>Binding Tape</b>		1	
<b>Remote Control</b>		1	
<b>Batteries</b>		2	
<b>Mounting Screw (ST2.9 x 10 - C-H)</b>		2	Optional Parts
<b>Remote Control Holder</b>		1	
<b>Seal Sponge</b>		1	
<b>Orifice</b>		1 (on some models)	
<b>Wire Controller</b>		1 (on some models)	
<b>Magnetic Ring</b> (Twist the electric wires L and N around the magnetic ring to five circles)		1	
<b>Transfer Connector</b> (For the outdoor unit)		1 (on some models)	

# Accessories

PART	LOOKS LIKE...	QUANTITY
<b>Transfer Connector</b> (For the indoor unit) (Size could vary per model)		1 (on some models)
<b>Cord Protection Rubber Ring</b>		1 (on some models)
<b>Connecting Wire For Display (2M)</b>		1 (on some models)
<b>Drain joint</b> (Drainpipe Fitting)		1
<b>Seal ring</b> (Drainpipe Fitting)		1
<b>Manuals</b>		Installation Manual User Manual Wire Controller Manual Remote Control Manual

## NOTE

The pictures and illustrations included in this manual are for explanation purpose only. The actual shape may vary from the air conditioner you purchased (depending on model).

## Select Installation Location

### **! WARNING**

Keep the indoor unit, outdoor unit, power supply wiring, and transmission wiring at least 3.3 feet away from televisions and radios. This is to prevent electrical interference.

(Noise may be generated depending on the conditions under which the electronic wave is generated, even if 3.3ft distance is kept.)

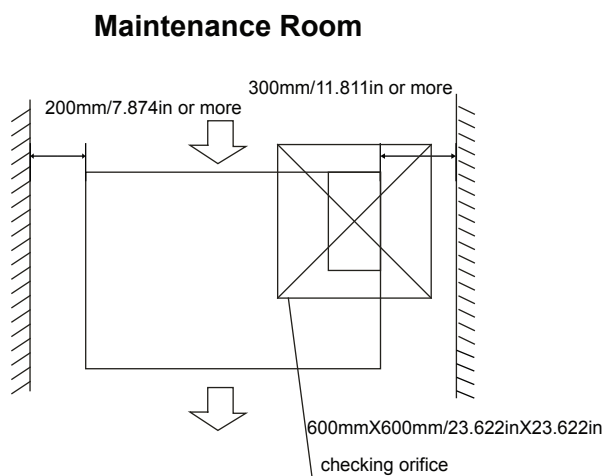
The indoor unit should be installed in a location that meets the following requirements:

- There is enough room for installation and maintenance.
- The ceiling is horizontal and can endure the weight of the indoor unit without any vibration.
- There will be no obstructions blocking internal or external air flow.
- Good air circulation.
- The connecting pipe and drain pipe could be extracted out easily.
- There is no direct radiation from heaters.

## Install Indoor Unit

### 1 Installing $\varnothing 10/\varnothing 0.394$ in hanging screw bolts. (4 bolts)

- Refer to the corresponding figures on the next page for positioning 4 screw bolts.
- Evaluate the ceiling construction and install unit with  $\varnothing 10 / \varnothing 0.394$ in hanging screw bolts.
- Consult construction personnel for specific procedures.
- Keep the ceiling flat. Secure the roof beam to avoid possible vibration.
- Install the main body before performing the pipe and line operation in the ceiling. Before starting the installation procedure, determine the direction of the pipes to be extracted. Position the refrigerant pipes, drain pipes, and indoor & outdoor lines to the connection places before actually attaching the unit to the ceiling.
- Hanging Screw Bolt installation:
  - Cut off the roof beam.
  - Strengthen the place that has been cut off, and consolidate the roof beam.



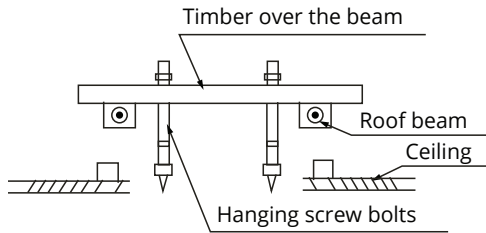
### NOTE

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



## Wooden Construction

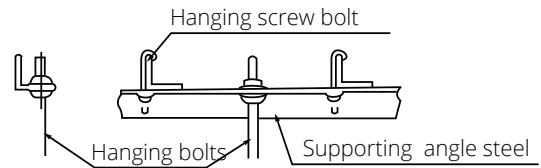
Put the square timber transversely over the roof beam, then install the hanging screw bolts. (Refer to **Fig.3.2**)



**Fig.3.2**

## Steel Roof Beam Structure

Install the hanging screw bolts and the supporting angle steel according to **Fig.3.5**.



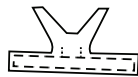
**Fig.3.5**

## New Concrete Bricks

Inlay or embed the screw bolts. (Refer to **Fig. 3.3**)



(Blade shape insertion)



(Slide insertion)

**Fig.3.3**

## Overhanging The Indoor Unit

1. Overhang the indoor unit onto the hanging screw bolts with block.
2. Ensure the indoor unit is flat and level by using the level indicator to prevent damage caused by leakage.

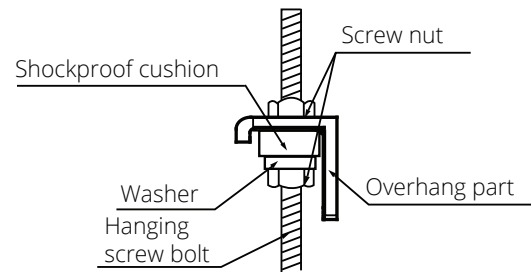
## For Original Concrete Bricks

Use the embedding screw bolt, crock and stick harness according to **Fig.3.4**.



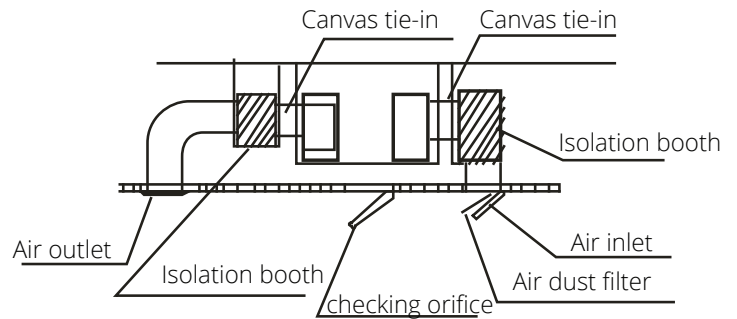
(Pipe hanging and embedding screw bolt)

**Fig. 3.4**



**Fig.3.6**

1. Install the filter (optional) according to air inlet size.
2. Install the canvas tie-in between the body and duct.
3. Air inlet and air outlet duct should be apart far enough to avoid air passage short-circuit.
4. See **Fig 4.1** for the recommended duct connection.
5. Refer to the table below for static pressure installation information. Adjust the fan motor static pressure to correspond to external duct static pressure.



**Fig.4.1**

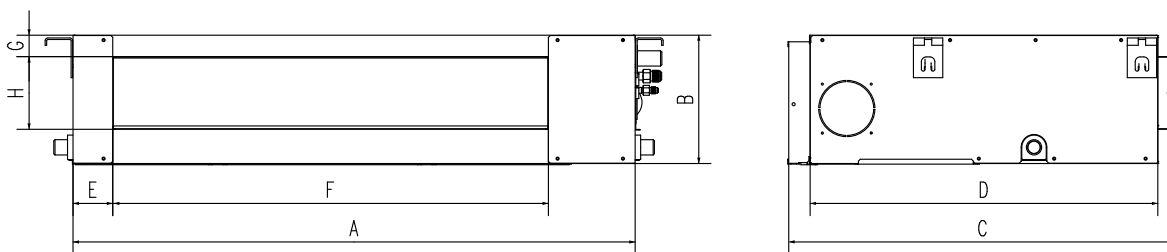
MODEL (Btu/h)	Static-Pressure (Pa)
12	30
18	70
24	70
30-36	80
42-60	100

## NOTE

1. **DO NOT** put the connecting duct weight on the indoor unit.
2. When connecting duct, use inflammable canvas tie-in to prevent vibration.
3. Insulation foam should be wrapped outside the duct to avoid condensation and internal duct under layer should be added to reduce noise under special circumstances.

## Dimension and air outlet size

Unit: in



**Fig.4.2**

## Air inlet size

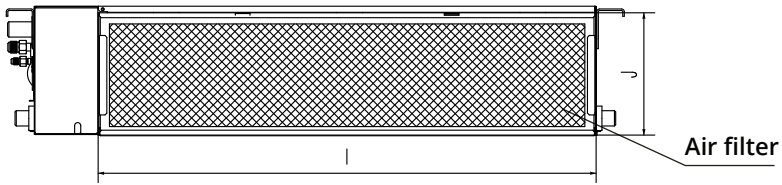


Fig. 4.3

## Position size of descensional ventilation opening

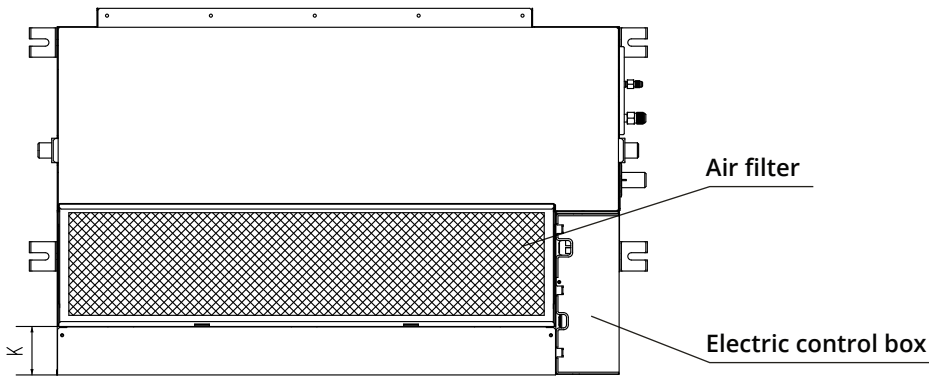


Fig. 4.4

## Size of mounted hook

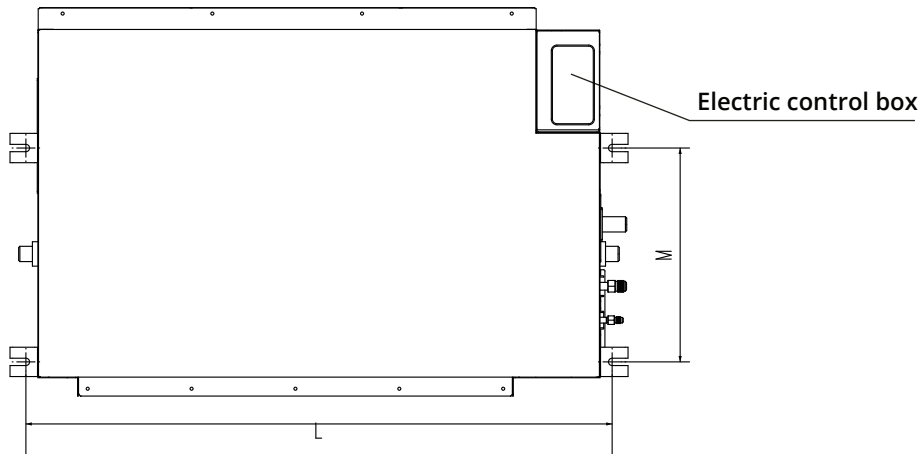


Fig. 4.5

# Duct and Accessories Installation

Unit: in

	Outline dimension				air outlet opening size				air return opening size			Size of mounted lug	
	A	B	C	D	E	F	G	H	I	J	K	L	M
12	27.56	8.27	25	22.44	2.56	19.41	1.38	4.69	23.43	7.87	3.15	29.13	13.78
12~18	36.22	8.27	25	22.44	2.56	28.07	1.38	4.69	32.09	7.87	3.15	37.8	13.78
24	36.22	10.63	25	22.44	2.56	28.07	1.38	7.05	32.09	10.24	0.79	37.8	13.78
36 small mode	36.22	10.63	25	22.44	2.56	28.07	1.38	7.05	32.09	10.24	0.79	46.46	19.29
30~36	44.88	10.63	30.51	27.95	2.56	36.73	1.38	7.05	40.75	10.24	1.77	48.82	19.69
42~60	47.24	11.81	34.06	31.5	3.15	38.11	1.58	8.03	43.07	11.34	1.77	48.82	19.69

## How to adjust the air inlet direction?

(From rear side to under-side.)

1. Take off the ventilation panel and flange, and cut off the staples at side rail.

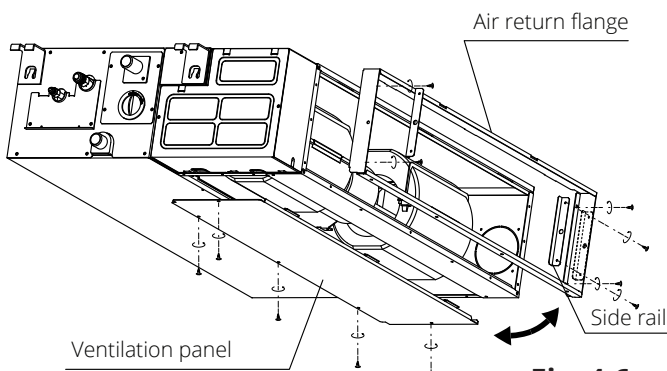


Fig. 4.6

3. When installing the filter mesh, plug it into the flange inclined from the air return opening, and then push up.

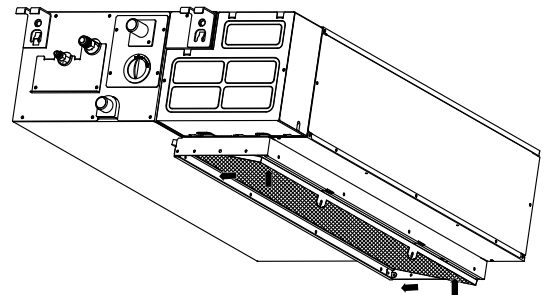


Fig. 4.8

2. Stick the attached seal sponge as indicated in the following figure. Afterwards, change the mounting positions of the air return panel and air return flange.

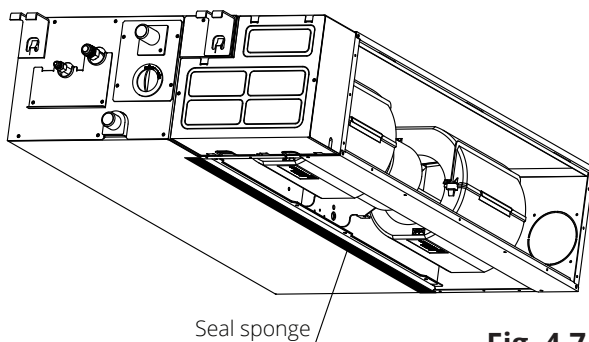


Fig. 4.7

4. When the installation is complete, insert filter mesh to the flange positional holes using fixing blocks.

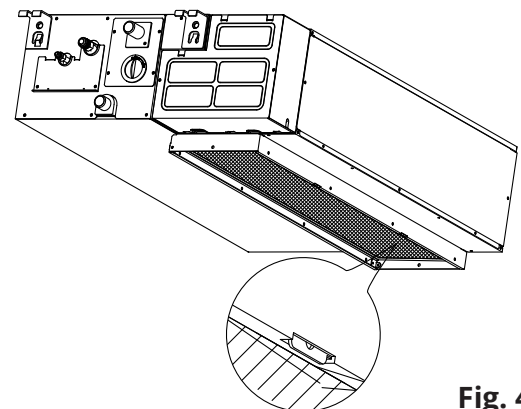
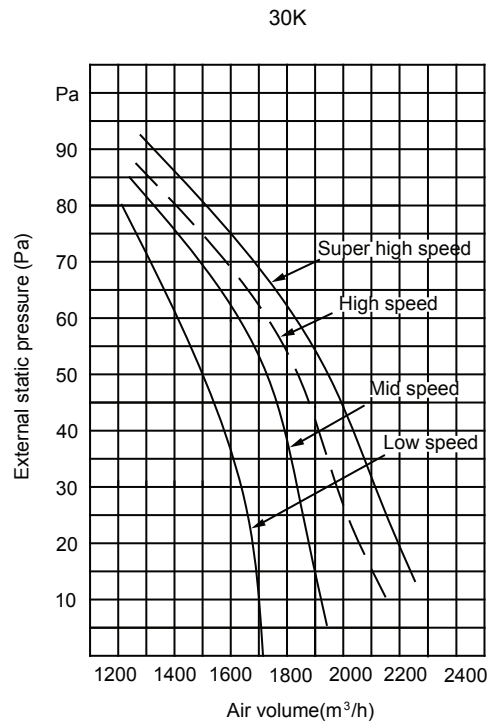
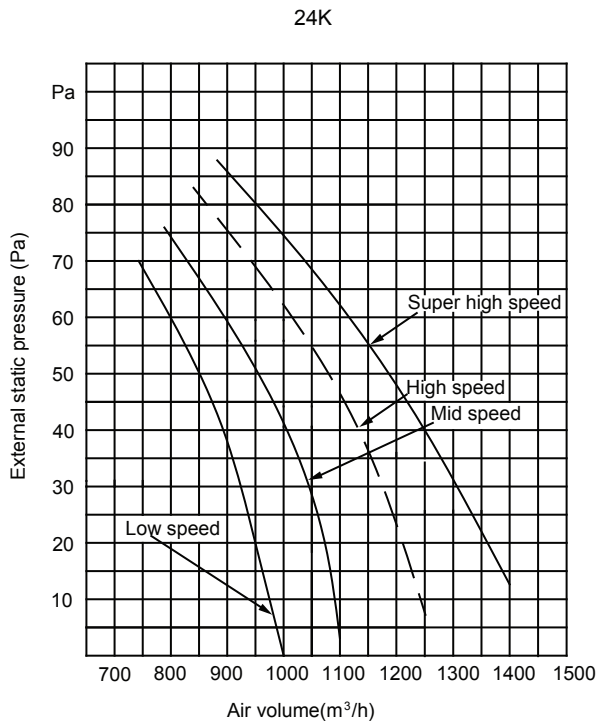
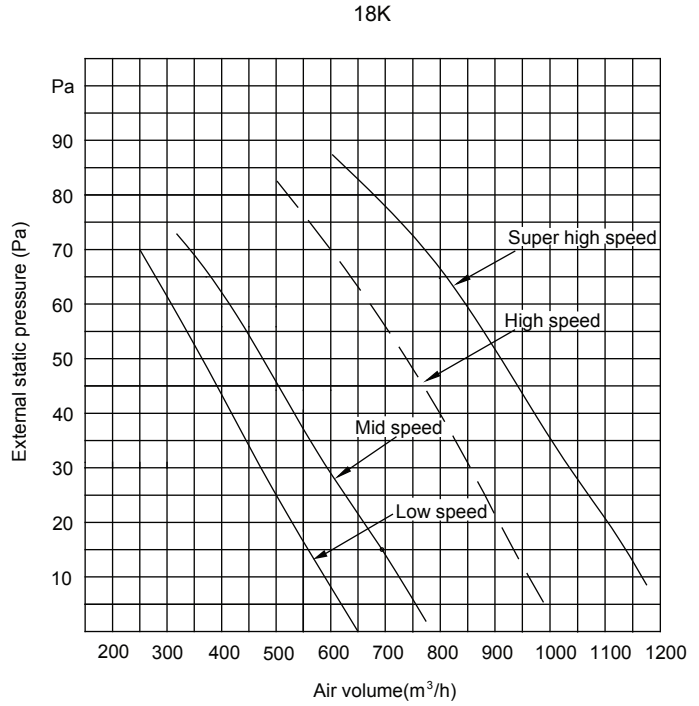
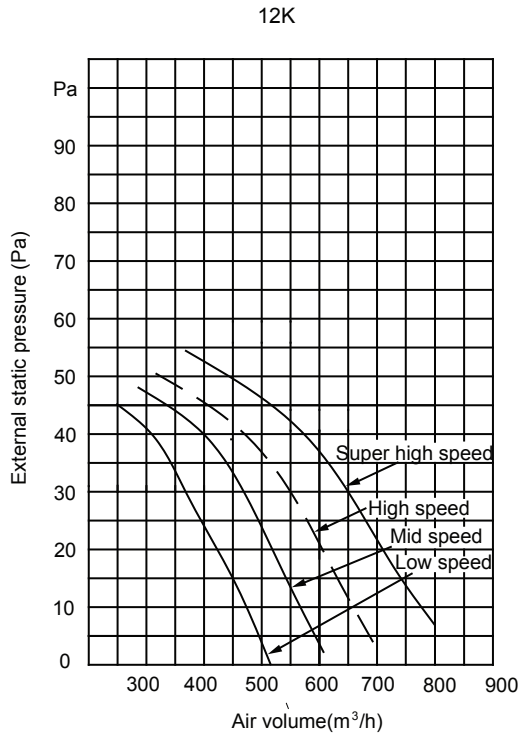


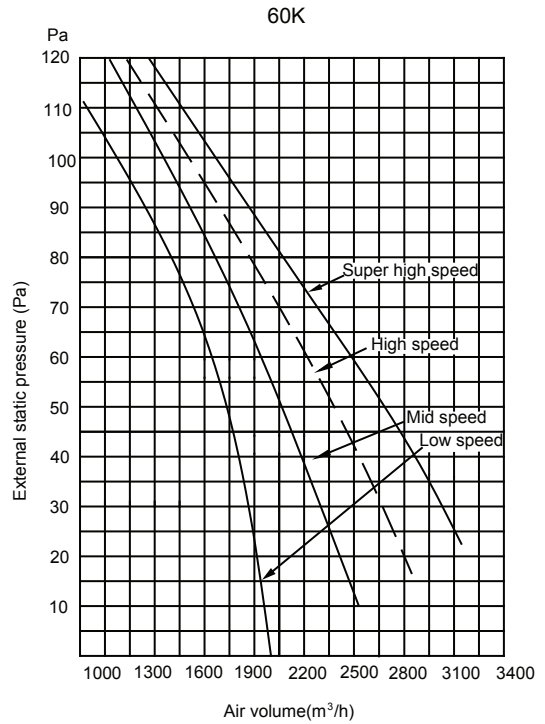
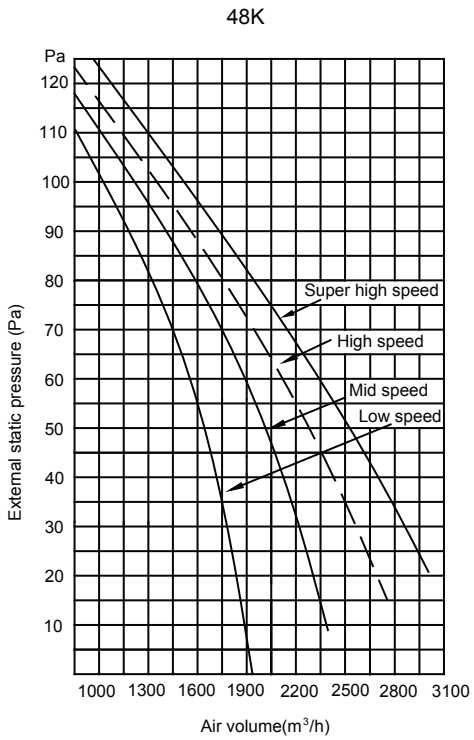
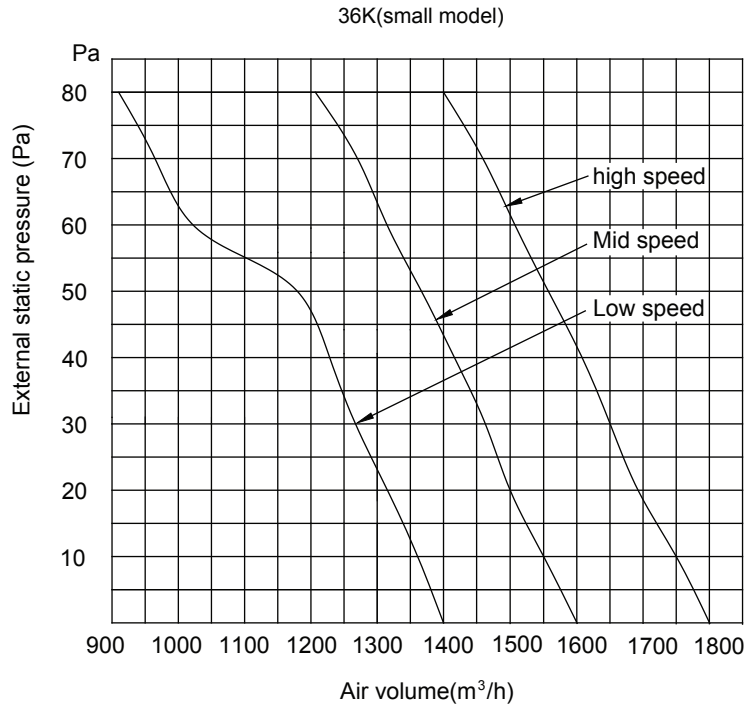
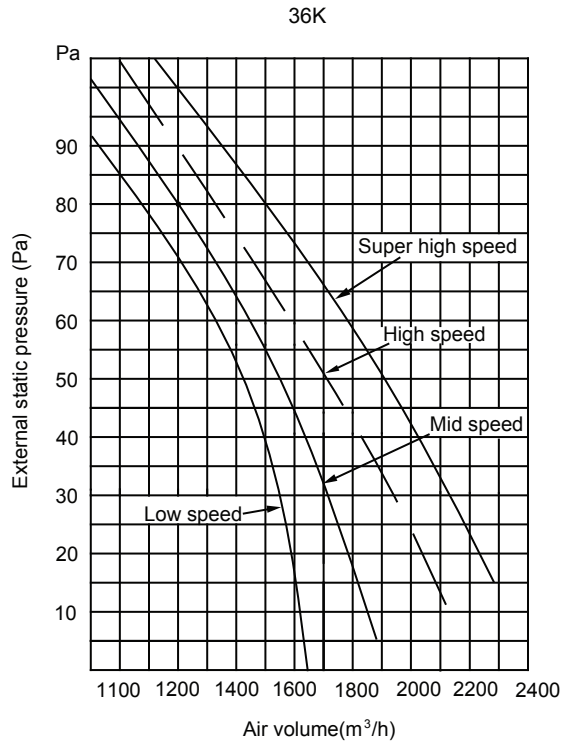
Fig. 4.9

## Fan Performances

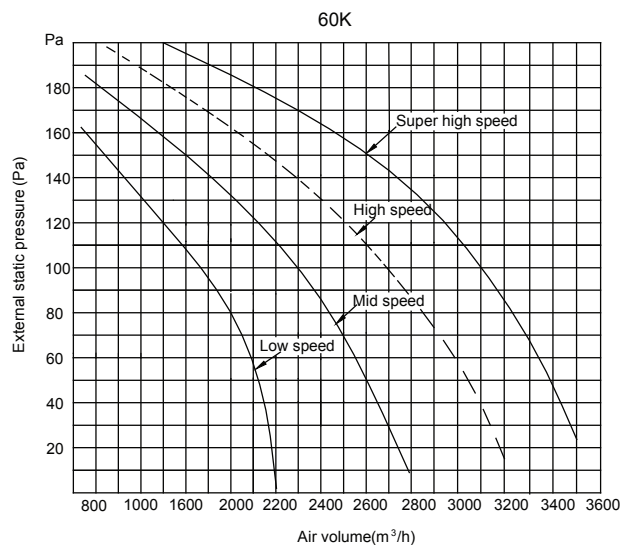
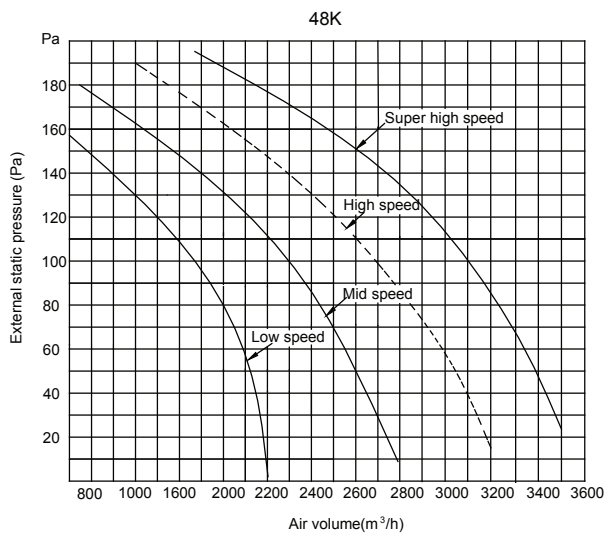
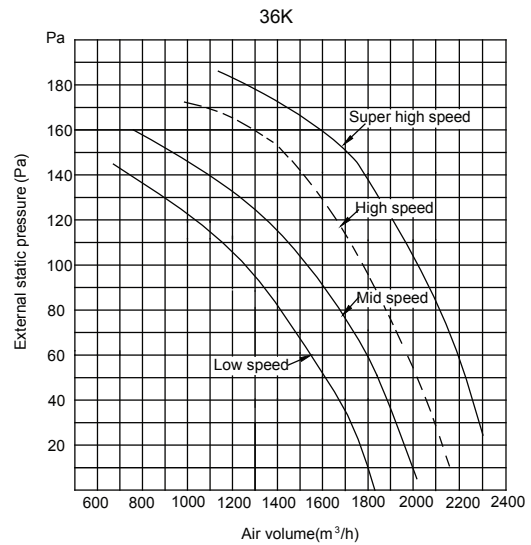
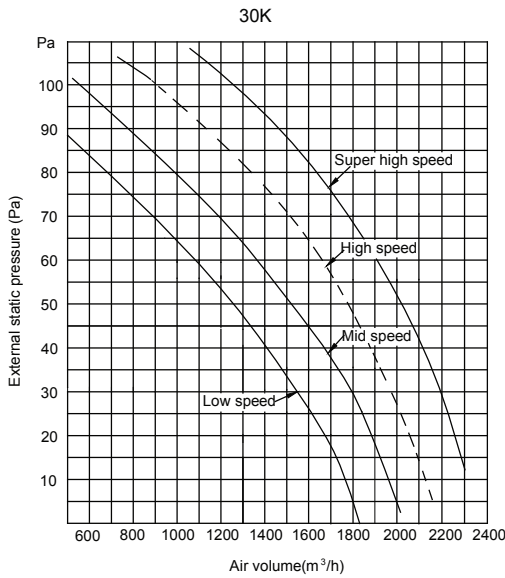
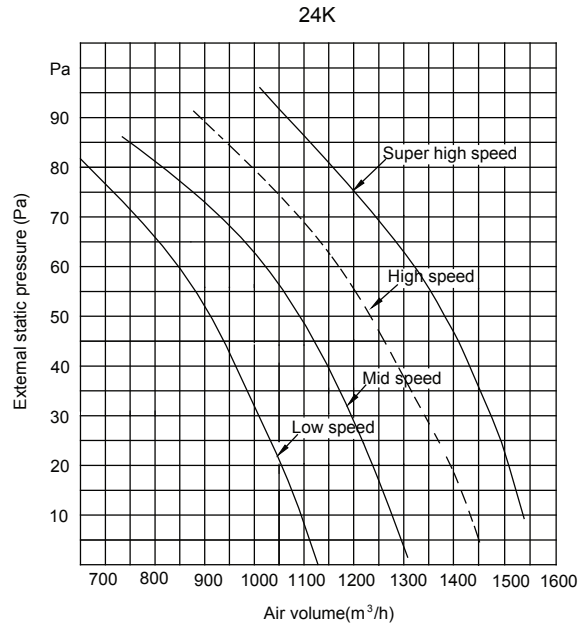
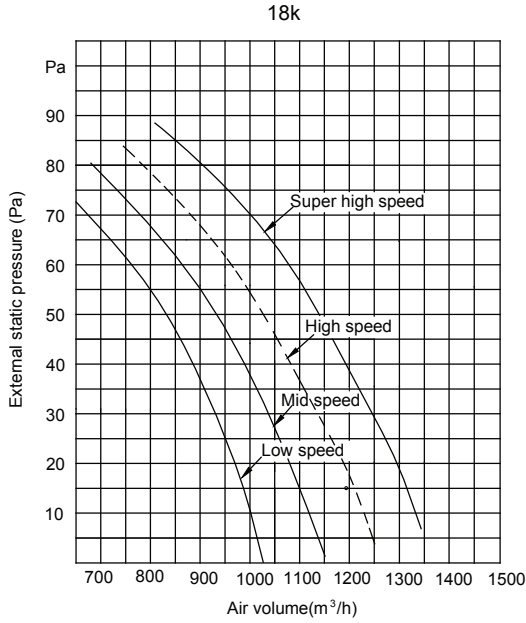
Static pressure curve(middle static pressure duct)



## Fan Performances



## Fan Performances

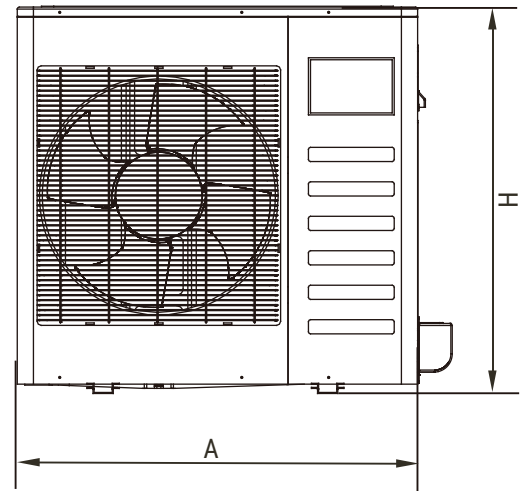


## Installation Location

The outdoor unit should be installed in a location that meets the following requirements:

- There is enough room for installation and maintenance.
- The air outlet and the air inlet are not impeded.
- It must be a dry and well ventilated place.
- The support is horizontal, flat, and can stand the weight of the outdoor unit.
- Noise will not disturb your neighbors.
- It is easy to install the connecting pipes or cables.
- Determine the air outlet direction where the discharged air is not blocked.
- There is no danger of fire due to leakage of inflammable gas.
- The piping length between the outdoor unit and the indoor unit may not exceed the allowable piping length.
- In the case that the installation place is exposed to strong wind such as a seaside, make sure the fan operating properly by putting the unit lengthwise along the wall or using a dust shield.(Refer to **Fig.5.3**)
- If possible, do not install the unit where it is exposed to direct sunlight.
- If necessary, install a blind that does not interfere with the air flow.
- During heating mode, water drains off the outdoor unit. Position the drainage appropriately from the drain hole to an appropriate place where it will not interfere with other people or equipment.
- Select the position where it will not be subject to snow drifts, accumulation of leaves or other seasonal debris. If unavoidable, please cover it with a shelter.
- Locate the outdoor unit as close to the indoor unit as possible.
- If possible, please remove any nearby obstacles that could create poor performance from low air circulation or vibration.
- The minimum distance between the outdoor unit and obstacles described in the installation chart does not mean that the same is applicable to the situation of an airtight room. Leave open two of the three directions (M,N,P) (Refer to **Fig.5-5**)

## Figure of Body Size



Split Type Outdoor Unit

Fig 5.1

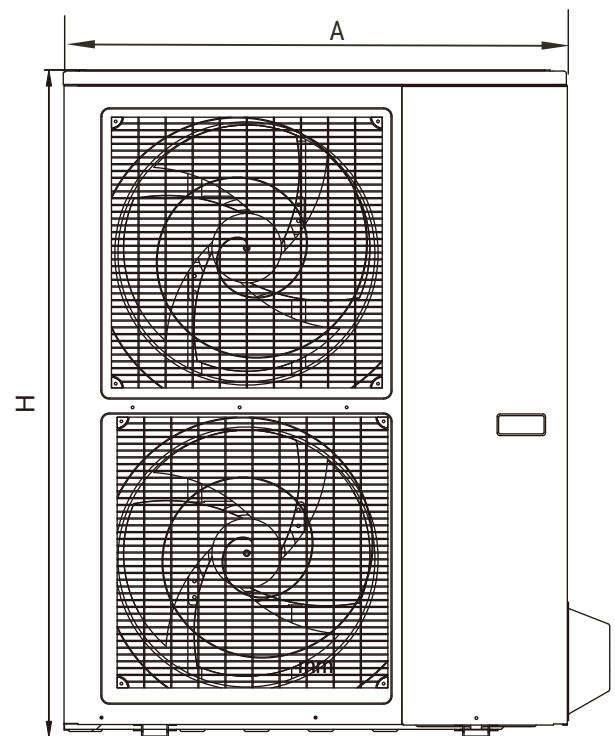


Fig.5.2

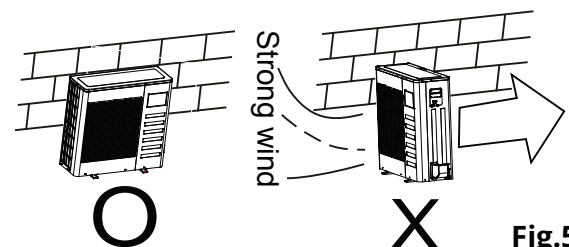


Fig.5.3



# Outdoor Unit Installation

## NOTE

All the illustrations are for explanatory purposes only. They may vary slightly than the unit you purchased (depending on model). The actual unit shall prevail.

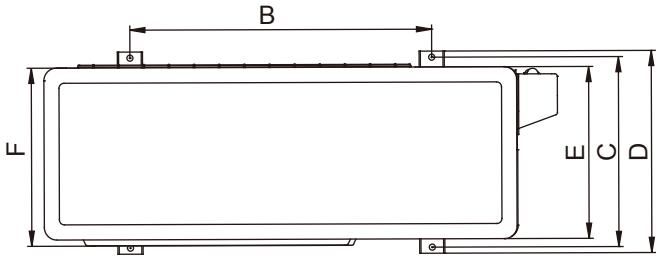


Fig.5.4

## Vertical Discharge Type Outdoor Unit

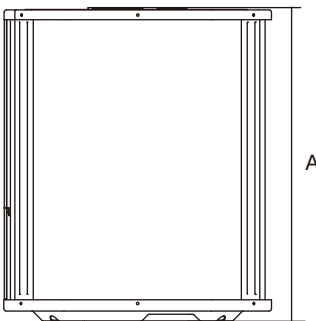


Fig.5-5

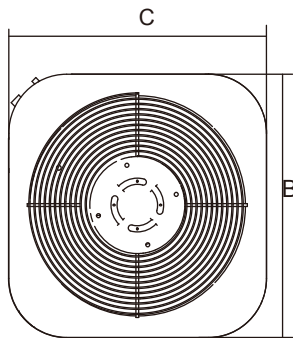


Fig.5-6

## Centrifugal Fan Type Outdoor Unit

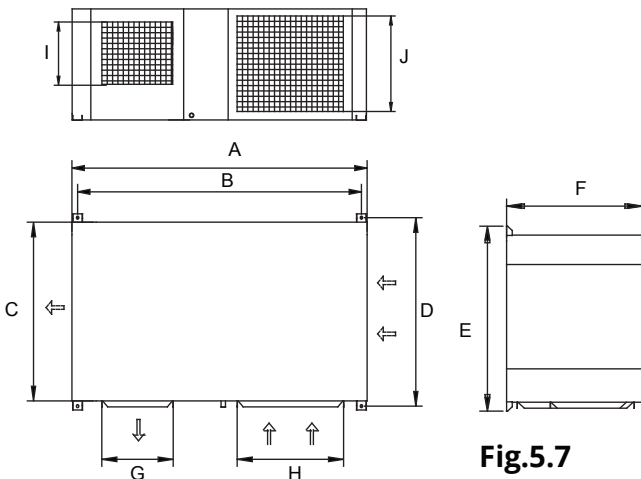


Fig.5.7

Table 5-1

Unit: inches

MODEL	A	B	C	D	E	F	H	REMARK
09~36	30.71	21.58	10.5	11.81	9.5	9.84	21.26	Fig.5-2
	30.32	19.17	11.73	12.68	10.24	11.81	21.85	Fig.5-2
	31.5	20.24	11.42	13.39	14.37	12.4	13.11	Fig.5-2
	33.27	21.26	13.78	14.8	13.19	13.39	27.56	Fig.5-2
	29.92	20.87	11.42	12.4	10.63	11.22	23.23	Fig.5-2
	33.27	22.05	13.19	14.17	12.28	12.6	27.56	Fig.5-2
	31.89	21.61	12.8	13.78	12	12.2	21.97	Fig.5-2
	37.21	25.2	15.95	17.64	15.16	15.6	31.9	Fig.5-2
	35.43	23.23	13.11	13.98	11.9	12.4	33.86	Fig.5-2
	38.98	24.57	14.41	15.59	13.39	13.6	38	Fig.5-2
42~60	35.43	23.23	14.88	15.75	13	13.78	46.06	Fig.5-3
	36.93	24.96	15.91	17.64	14.5	15.43	53.9	Fig.5-3
	37.24	26.5	15.87	17.91	15.95	16.54	31.9	Fig.5-2
	37.4	24.96	15.91	17.64	15.04	16.14	52.48	Fig.5-3
	38.98	24.57	14.41	15.59	13.4	13.6	38	Fig.5-2
	36.93	24.96	15.91	17.64	14.5	15.43	53.9	Fig.5-3
35.43	23.23	14.88	15.75	13	13.78	46.06	Fig.5-3	

Table 5-2

Unit: inches/mm

MODEL	DIMENSIONS			REMARK
	A	B	C	
18	24.92in/633	21.81in/554	21.81in/554	Refer to Fig.5-5 Fig.5-6
24	24.92in/633	21.81in/554	21.81in/554	
36	29.88in/759	21.81in/554	21.81in/554	
36	24.92in/633	23.62in/600	23.62in/600	
48	29.88in/759	27.95in/710	27.95in/710	
60	33.19in/843	27.95in/710	27.95in/710	

# Outdoor Unit Installation

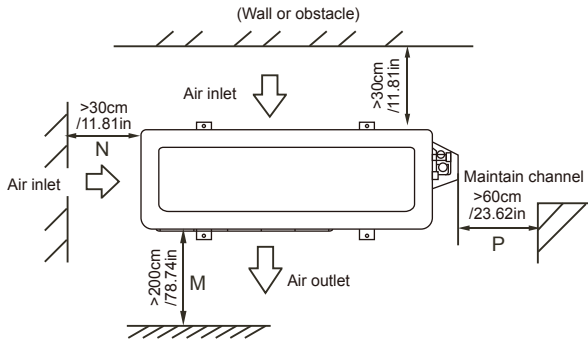
**Table 5-3**

unit: in

MODEL	A	B	C	D	E	F	G	H	I	J
18	46.22	44.1	26.8	28.35	29.53	18.7	11.81	16.93	10.43	15.47
24	46.22	44.1	26.8	28.35	29.53	18.7	11.81	16.93	10.43	15.47
30	54.37	52.28	27.64	29.13	30.32	20.5	13.23	19.7	11.65	17.44
36	54.37	52.28	27.64	29.13	30.32	20.5	13.23	19.7	11.65	17.44
48	54.88	52.68	30.83	32.28	33.47	22.36	15.67	22.6	13.47	18.23
60	54.88	52.68	30.83	32.28	33.47	22.36	15.67	22.6	13.47	18.23

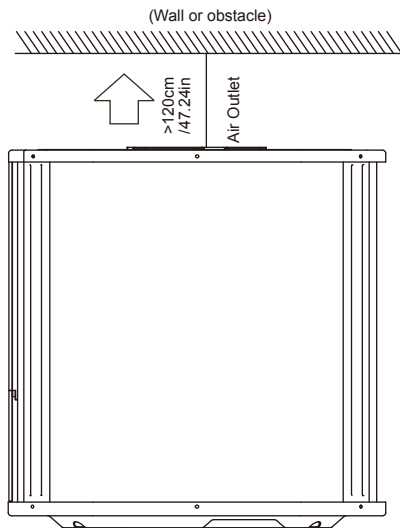
## Space Of Installation And Maintenance

### Split Type Outdoor Unit

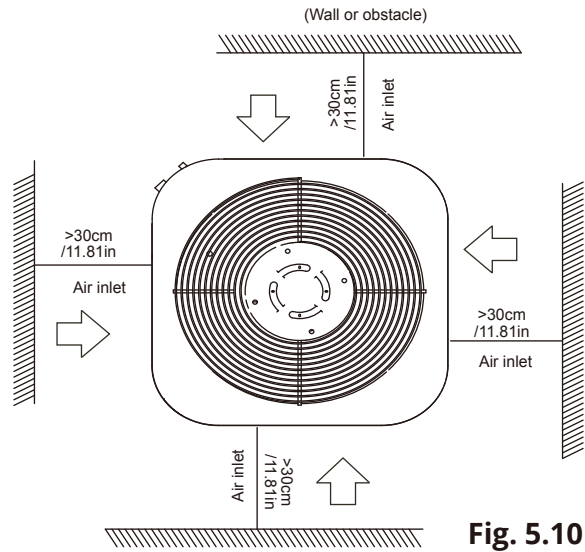


**Fig. 5.8**

### Vertical Discharge Type Outdoor Unit



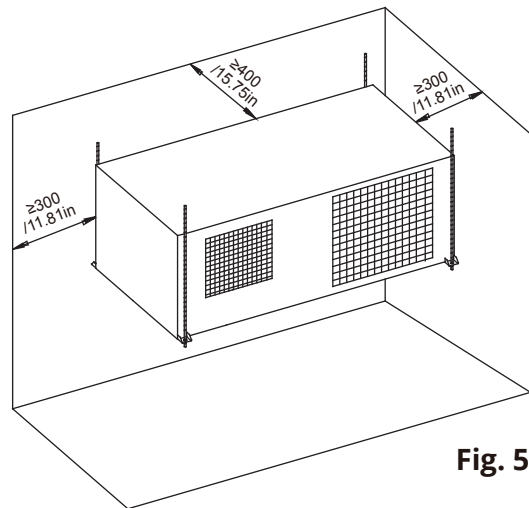
**Fig. 5.9**



**Fig. 5.10**

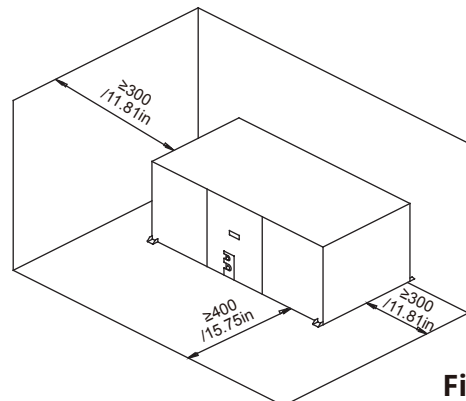
### Centrifugal Fan Type Outdoor Unit

a) Suspending from the ceiling



**Fig. 5.11**

b) Floor installation



**Fig. 5.12**

# Outdoor Unit Installation

## Available Configuration For Centrifugal Fan Type Outdoor Unit

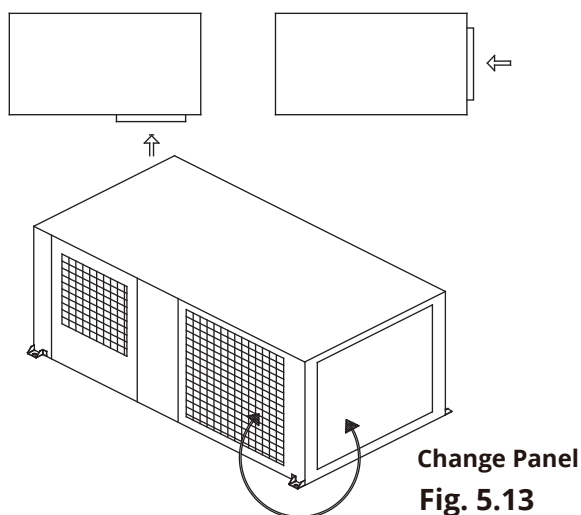
Four different outdoor unit configurations are available based on adjusting the panel and fan positions.

### NOTE

Keep in mind that the unit fan weight is approximately 30kg/1058oz. The unit as well as the relevant equipment is enclosed with the vinyl cover during installation work.

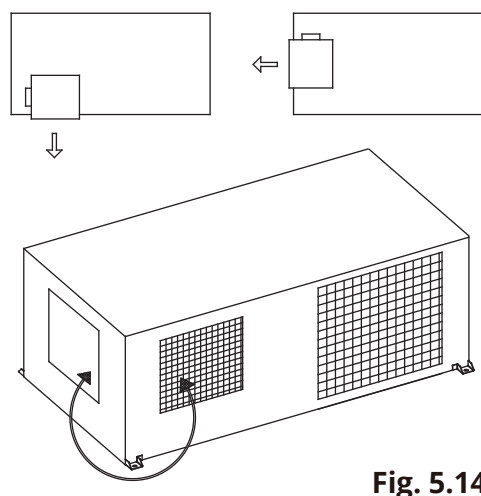
### Air Inlet Modification

Modifying the air inlet is only necessary to interchange the position of the indicated panels. Both panels use screws to be fixed to the unit chassis.



### Air Outlet Modification

Modifying the air outlet is also necessary to interchange panels for the unit. The fan outlet panel is attached to the fan structure, which must be mounted as indicated below.



## Moving And Installation

- Since the unit's center of gravity is not located at its actual physical center, be careful when lifting it with a sling.
- Do not hold the outdoor unit by the inlet as this could deform the unit.
- Do not touch the fan with hands or other objects.
- Do not angle the unit more than 45°, and do not lay it on its side.
- Make concrete foundation according to the specifications of the outdoor units. (Refer to **Fig.5-16** on the following page)
- Fasten the feet of this unit with bolts firmly to prevent it from collapsing in case of earthquake or strong wind. (Refer to **Fig.5-15**)

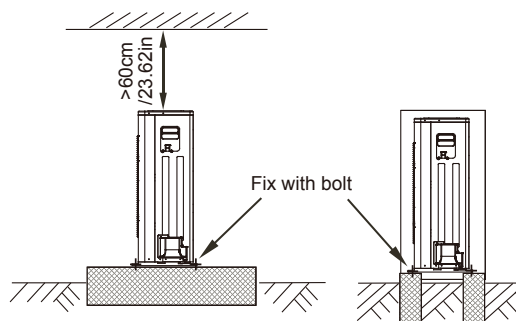


Fig.5.15

# Outdoor Unit Installation

## Concrete Foundation

1. It is recommended that the foundation is flat and 100-300mm /3.94-11.81in higher than ground level.
2. Install drainage around the foundation.
3. When installing the outdoor unit, secure the unit using M10 anchor bolts.
4. When installing the unit on a roof or a veranda, drain water sometimes turns to ice during cold weather. Avoid draining to an area that people often use, because it could create a slippery hazard.

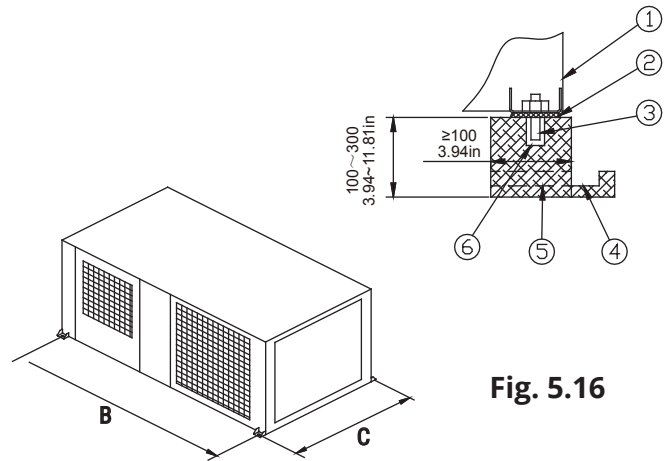


Fig. 5.16

Table 5-4

No	Description
①	Outdoor Unit
②	Vibration-proof rubber
③	Anchor Bolt M10
④	Drainage (Wide 100/3.94in×Depth 150/5.9in)
⑤	Drainage
⑥	Mortar Hole (Φ100/3.94in×Depth 150/5.9in)

Table 5-5

unit: in/mm

MODEL	B	C
18~24	44.1in/1120	28.35in/720
30	52.67in/1338	32.28in/820
36	52.67in/1338	32.28in/820
48~60	52.67in/1338	32.28in/820

## Suspended Unit

1. Suspend the unit as **Fig 5.17** indicates.
2. Ensure that the ceiling can support the outdoor unit's weight indicated on the specification label plate.

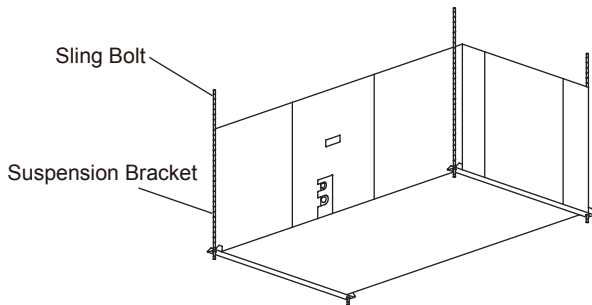


Fig.5.17

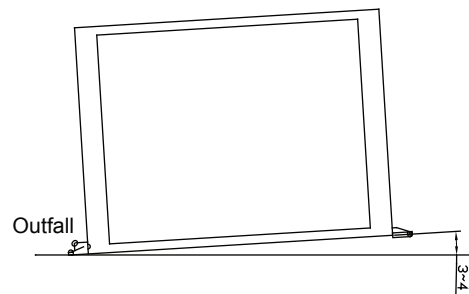


Fig.5.18

### NOTE

- Make sure a 3-4° angle is kept between the unit and the floor when the unit is installed in a low temperature or humid environment.
- Make sure any ice on the chassis of the outdoor unit can be dealt with when the unit is installed in colder temperatures or a humid environment.
- The outdoor unit should be installed using a mounting rack 30cm / 11.81in high. The environmental temperature should be above 0°. The machine must be installed indoors.

## ! CAUTION

- All field piping must be provided by a licensed refrigeration technician and must comply with the relevant local and national codes.
- Avoid letting air, dust, or other impurities enter into the piping system during installation.
- Insulation pipe should be used with the gas and liquid piping. Otherwise, condensation may occur.

## Preparation

Before installation, make sure the height difference, the length of refrigerant pipe, and the number of bends between the indoor unit and outdoor unit meet the following requirements:

**Table 6-1** unit: ft/m

THE TYPE OF MODELS	MODEL	THE LENGTH OF REFRIGERANT PIPE	THE MAX HEIGHT DROP
50Hz T1 condition/R22 Split type air conditioner	12K	49.21ft/15	26.25ft/8
	18K-24K	98.42ft/30	32.8ft/10
	30K-42K	164.04ft/50	65.62ft/20
	48K-60K	164.04ft/50	82.02ft/25
50Hz Vertical discharge air conditioner /60Hz T1 condition/R22 Split type air conditioner and Vertical discharge air conditioner	12K	49.21ft/15	26.25ft/8
	18K-24K	98.42ft/30	32.8ft/10
	30K-60K	98.42ft/30	65.62ft/20
	48K-60K	164.04ft/50	82.02ft/25
R410A inverter Split type air conditioner and Centrifugal fan outdoor unit	12K	32.8ft/10	16.4ft/5
	18K-24K	82.02ft/25	39.37ft/12
	30K	82.02ft/25	49.21ft/15
	36K	98.42ft/30	65.62ft/20
	48K-60K	164.04ft/50	82.02ft/25
R410A Split type air conditioner and Centrifugal fan outdoor unit	12K	49.21ft/15	26.25ft/8
	18K-30K	82.02ft/25	49.21ft/15
	36K	98.42ft/30	65.62ft/20
	48K-60K	164.04ft/50	82.02ft/25
50Hz/60Hz T3 condition (outdoor unit down)	18K-24K	82.02ft/25	32.8ft/10
	30K	98.42ft/30	49.21ft/15
	36K	98.42ft/30	65.62ft/20
	42K-60K	164.04ft/50	82.02ft/25
50Hz/60Hz T3 condition (outdoor unit up)	18K-24K	82.02ft/25	49.21ft/15
	30K	98.42ft/30	65.62ft/20
	36K	98.42ft/30	82.02ft/25
	42K	164.04ft/50	98.42ft/30
	48K-60K	164.04ft/50	114.83ft/35
The unit with quick joint	12K-18K	16.4ft/5	16.4ft/5

The outdoor unit is charged with rated refrigerant amount in the factory. Additional charge refers to the table below:

**Table 6-2**

Liquid Tube(mm)		R410A	R22
Ø6.35	orifice in the indoor unit	0.022kg/m×(L-5)	0.030kg/m×(L-5)
	orifice in the outdoor unit	0.011kg/m×(L-5)	0.015kg/m×L
Ø9.53	orifice in the indoor unit	0.060kg/m×(L-5)	0.065kg/m×(L-5)
	orifice in the outdoor unit	0.030kg/m×(L-5)	0.030kg/m×L
Ø12.7	orifice in the indoor unit	0.110kg/m×(L-5)	0.115kg/m×(L-5)
	orifice in the outdoor unit	0.060kg/m×(L-5)	0.060kg/m×L
Ø15.9	orifice in the indoor unit	0.170kg/m×(L-5)	0.190kg/m×(L-5)
	orifice in the outdoor unit	0.085kg/m×(L-5)	0.095kg/m×L
Ø19.0	orifice in the indoor unit	0.250kg/m×(L-5)	0.290kg/m×(L-5)
	orifice in the outdoor unit	0.125kg/m×(L-5)	0.145kg/m×L

## NOTE

The table above refers to the liquid tube. The number of bends is up to the length of the max height drop. Usually, each 32.8ft/10m needs a bend.

# Installing The Connecting Pipe

## Procedure For Connecting Pipe

1. Measure the required length of the connecting pipe.
2. Connect the indoor unit first, then the outdoor unit.
3. Bend the tubing in the proper way. Do not twist the pipe.  
(See Fig.6.1)
4. Apply refrigerant oil on the surfaces of the flare pipe and the joint nuts, and then wrench it for 3~4 rounds by hand before fastening the flare nuts.  
(See Fig. 6.2)
5. Be sure to use two wrenches simultaneously when you connect or disconnect the pipes. (See Fig. 6.3 & Fig. 6.4)
6. Originally, the outdoor unit's service valves should be completely closed. To connect, first loosen nuts, and then connect the flare pipes within 5 minutes. If the nuts have been loosened for longer, dust and other impurities may enter the pipe system and may cause malfunction.
7. Expel the air (Refer to the Refrigerant Piping Section) after connecting the refrigerant pipe with the indoor unit and the outdoor unit. Then fasten the nuts at the service valves.
8. Bend the small wall thickness of the connecting pipe.
  - Cut out a proper concave at the bending part of the insulating pipe.
  - Expose the pipe (cover it with tape after bending).
  - To prevent twisting or deformation, bend the pipe at a proper radius.

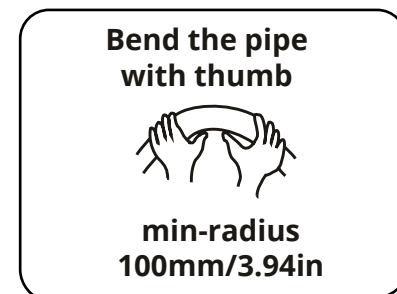


Fig. 6.1

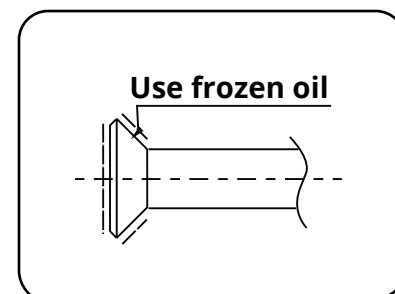


Fig. 6.2

### NOTE

The bending angle should not exceed 90°. The bending position is preferably in the middle of the bendable pipe.

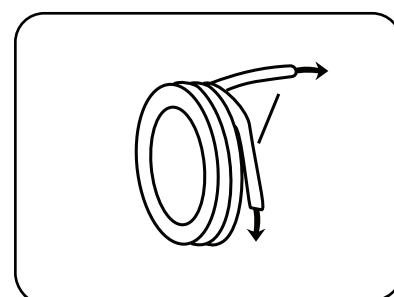
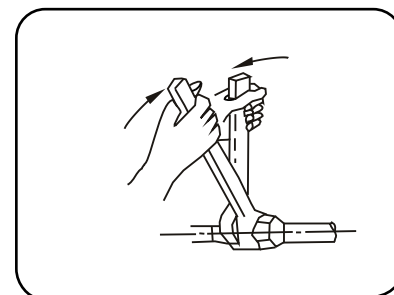
Do not bend the pipe more than three times. Be sure to use the same insulating materials when you buy the brass pipe. (More than 0.35in/9mm thick)

## Place The Pipe

- Drill a hole in the wall (to fit snugly with the wall sleeve), then attach the fittings such as the wall sleeve and its cover.
- Bind the connecting pipe and cables together tightly with binding tapes.
- Pass the bound connecting pipe through the wall sleeve from the outside. Make sure the pipe is allocated properly not to damage the copper tubes.

## Connect The Pipes

- Open the outdoor unit's service valves and expel the air with a vacuum pump or refrigerant.
- Check for any refrigerant leakage. Test all the joints with a leak detector or soapy water.
- Cover the connecting pipe joints with the insulation foam and bind them well with tape to prevent potential leakage.



## Length And Drop Height

**Table 7-1**

		PERMITTED VALUE		PIPING
Pipe length	Total pipe length (Actual)	18K+18K	98.42ft/30m	L+L1+L2
		24K+24K/ 30K+30K	164.04ft/50m	
	(farthest from the line pipe branch)	49.21ft/15m		L1,L2
	(farthest from the line pipe branch)	32.8ft/10m		L1-L2
Drop height	Indoor unit-outdoor unit drop height	65.8ft/20m		H1
	Indoor unit to indoor unit drop height	1.64ft/0.5m		H2

Reduced length of the branching tube is the 0.5m/1.64ft of the equivalent length of the pipe.

## Joint Pipe Sizes - Indoor Unit

**Table 7-2**

Capacity of indoor unit (A)	SIZE OF MAIN PIPE(MM)		
	Gas side	Liquid side	Available branching pipe
18K	Φ12.7/0.5in	Φ6.35/0.25in	CE-FQZHN-01C
24K	Φ15.9/0.626in	Φ9.5/0.375in	CE-FQZHN-01C
30K	Φ15.9/0.626in	Φ9.5/0.375in	CE-FQZHN-01C

Size of joint pipes for 410A indoor unit

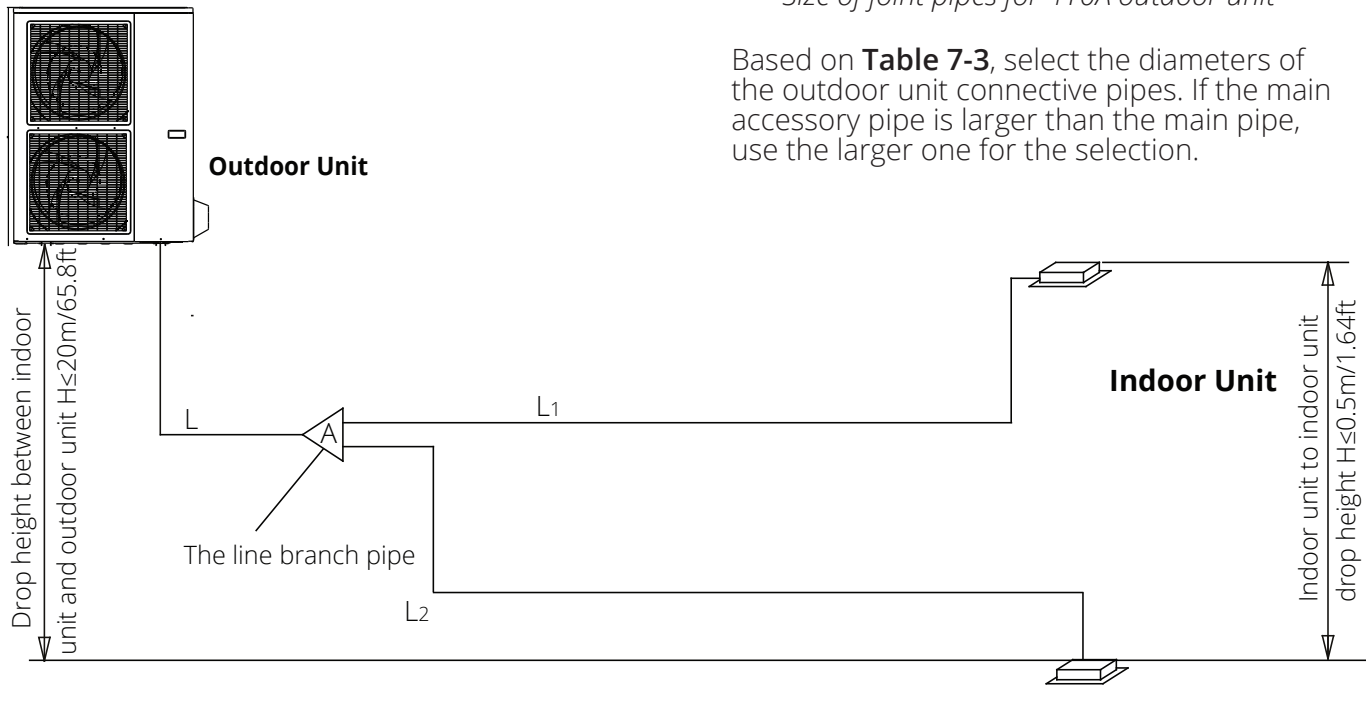
## Joint Pipe Sizes - Outdoor Unit

**Table 7-3**

MODEL	SIZE OF MAIN PIPE(MM)		
	Gas side	Liquid side	The 1st branching pipe
36K	Φ15.9/0.626in	Φ9.5/0.375in	CE-FQZHN-01C
48K	Φ15.9/0.626in	Φ9.5/0.375in	CE-FQZHN-01C
60K	Φ15.9/0.626in	Φ9.5/0.375in	CE-FQZHN-01C

Size of joint pipes for 410A outdoor unit

Based on **Table 7-3**, select the diameters of the outdoor unit connective pipes. If the main accessory pipe is larger than the main pipe, use the larger one for the selection.



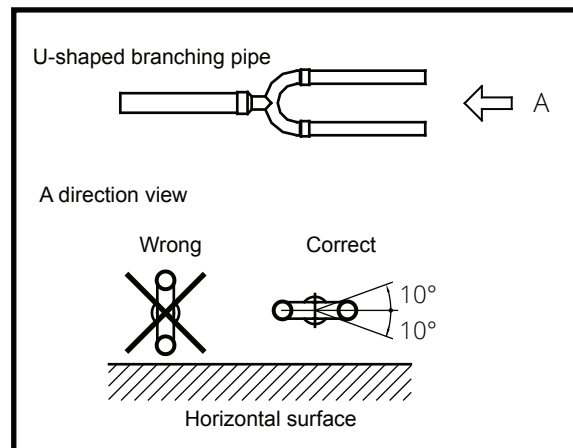
**Fig.7-1**

## Branching Pipe Installation

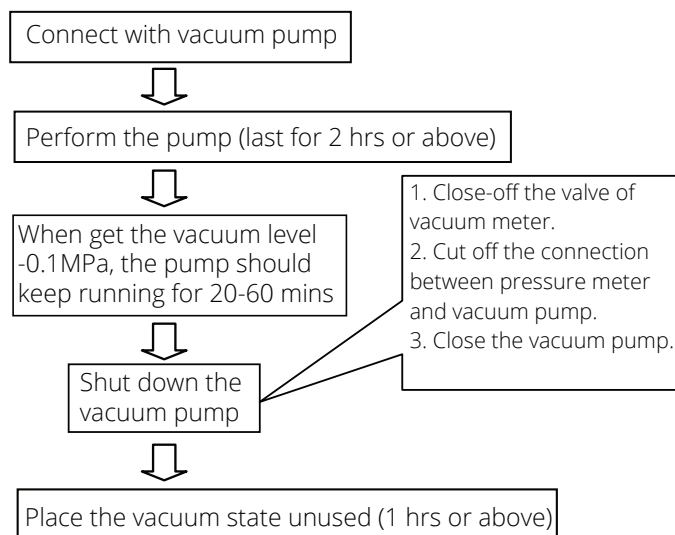
The branching pipe must be installed horizontally, Any angle error should not be larger than 10°. Otherwise, a malfunction could occur. (See **Fig. 7.2**)

## Vacuum With Vacuum Pump

1. Use the vacuum pump with vacuum levels lower than -0.1MPa and air discharge capacity above 40L/min.
2. It is not necessary to vacuum the outdoor unit. Do not open the outdoor unit gas or liquid pipe shut-off valves.
3. Make sure the vacuum pump result is -0.1MPa or below after 2 hours of operation. If the pump operated 3 hours or more and did not achieve a -0.1MPa or below result, please check whether water or gas leaked inside of the pipe.



**Fig.7-2**



**Fig.7-3**

### **!** CAUTION

- ⊘ Do not mix up different refrigerants or abuse tools and measurements that make direct contact with refrigerants.
- ⊘ Do not use refrigerant gas for air vacuuming.
  - If vacuum level could not get to -0.1MPa, please check whether there was a leak. If no leakage is found, please operate the vacuum pump again 1 or 2 hrs.

## Refrigerant Amount To Be Added

Calculate the added refrigerant according to the diameter and length of the liquid side pipe of the outdoor/indoor unit connection. The refrigerant is R410A. (See **Table 7-4**)

**Table.7-4**

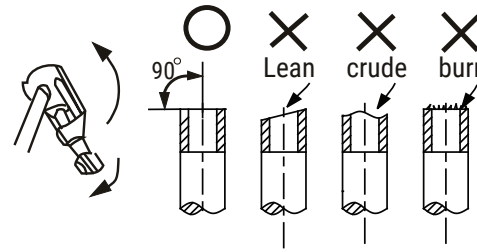
PIPE SIZE ON LIQUID SIDE	REFRIGERANT TO BE ADDED PER METER
Φ6.35/0.25in	0.015kg/0.033lb
Φ9.52/0.375in	0.030kg/0.066lb



## Expel The Air

### 1. Flaring

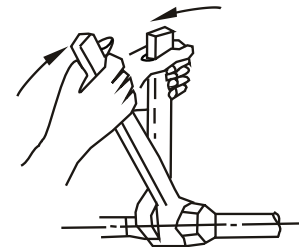
- Cut a pipe with a pipe cutter. (Refer to **Fig.8-1**)
- Insert a flare nut into a pipe and flare the pipe.



**Fig. 8.1**

### 2. Fasten The Nut

- Arrange the connecting pipes at the proper position, wrench the nuts by hand, and then fasten with two wrenches simultaneously. (Refer to **Fig. 8.2**)



**Fig. 8.2**

## ! CAUTION

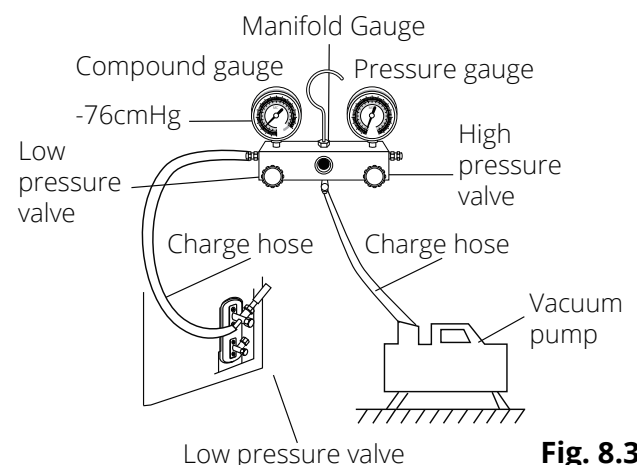
Using too much torque can harm the bellmouthing and using too small torque can cause leakage. Refer to **Table 8-1** to determine proper torque pressure.

### 3. Expel The Air With A Vacuum Pump

- Loosen and remove the nuts of service valves A and B, and connect the charge hose of the manifold valve with the maintenance terminator of service valve A. (Be sure that service valves A and B are both closed)
- Connect the joint of the charge hose with the vacuum pump.
- Open the Lo-lever of the manifold valve completely.
- Turn on the vacuum pump. When the pumping begins, slightly loosen the nut of service valve B to check whether the air comes in (the sound of the pump changes, and the indicator of compound meter turns below zero). Then, fasten the nut.
- When the pumping has finished, close the Lo-lever of the manifold valve completely and turn off the vacuum pump. After pumping for 15 minutes, please confirm that the multimeter indicator is on  $-1.0 \times 10^{-5} \text{Pa}$  ( $-76 \text{cmHg}$ ).
- Loosen and remove the nuts of service valves A and B to open service valve A and B completely, and then fasten nuts.
- Disassemble the charge hose of service valve A, and fasten the nut.

**Table 8-1**

Pipe gauge	Tightening torque	Flare dimension		Flare shape
		min (mm)	max	
Ø6.35/0.25in	14.2~17.2 N.m (144~176 kgf.cm)	0.327in/8.3	0.343in/8.7	
Ø9.52/0.375in	32.7~39.9 N.m (333~407 kgf.cm)	0.472in/12.0	0.488in/12.4	
Ø12.7/0.5in	49.5~60.3 N.m (504~616 kgf.cm)	0.606in/15.4	0.622in/15.8	
Ø15.9/0.626in	61.8~75.4 N.m (630~770 kgf.cm)	0.732in/18.6	0.748in/19.0	
Ø19.1/0.725in	97.2~118.6 N.m (990~1210 kgf.cm)	0.902in/22.9	0.917in/23.3	



**Fig. 8.3**

# Refrigerant Piping Installation

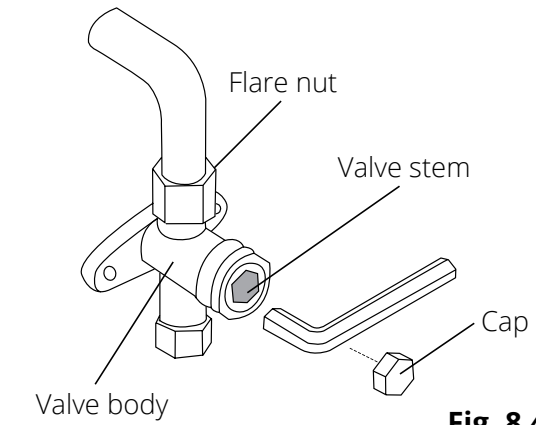
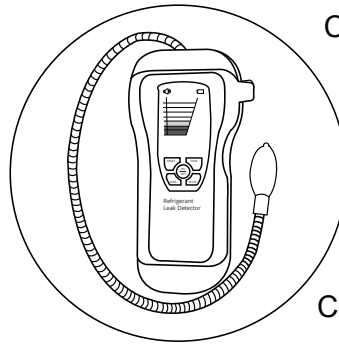
## **CAUTION**

Both service valves should be open before test operation. Each air conditioner has two service valves of different sizes.

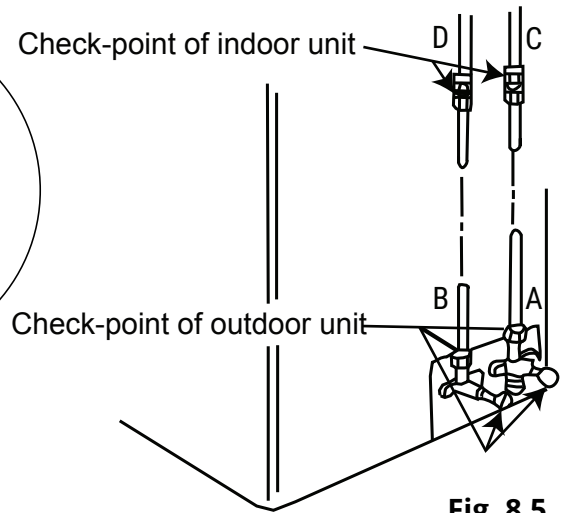
## Check for Leakage

Check all the joints with a leak detector or soapy water. (Refer to Fig.8-5 as a reference illustration)

- A. Lo-stop valve
- B. Hi-stop valve
- C. Joints connecting pipe to indoor unit.
- D. Joints connecting pipe to outdoor unit.



**Fig. 8.4**

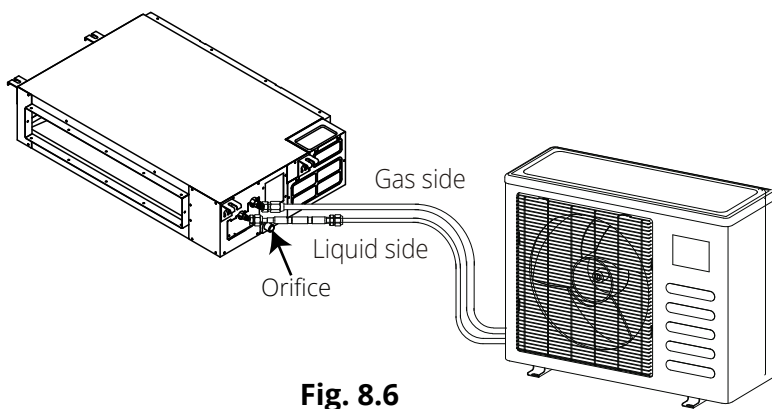


**Fig. 8.5**

## Insulation

- Be sure to completely insulate all exposed parts of the flare pipes.
- Incomplete insulation may cause condensation.

## Connective Diagram



**Fig. 8.6**

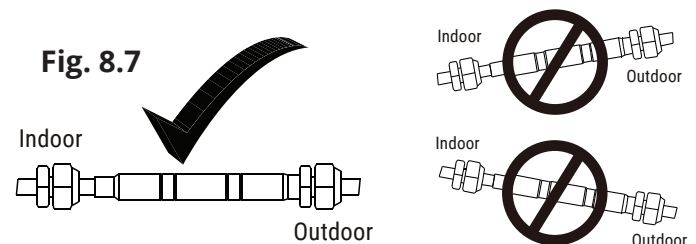
## Mark The Data Plate With The Orifice Installed

(For Some Models)

- Purchase the appropriate fittings according to the requirements shown in the manual.
- Refer the diagram when installing.

## **CAUTION**

For ensuring throttled efficiency, please mount the throttle as horizontally as possible. (See Fig. 8.7)



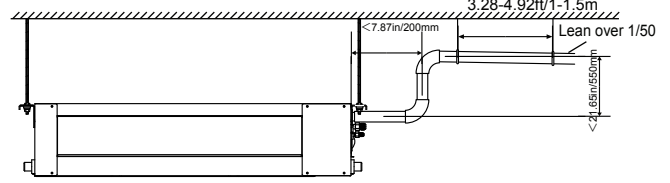
## Install The Drain Pipe To The Indoor Unit

- Use a polyethylene tube as the drain pipe (out-dia. 1.14-1.22in /29-31mm, in-dia. 0.984in/25mm). It can be purchased from your local hardware store.
- When extending the drain pipe, tighten the connector with water-proof tape to prevent leakage.
- Angle the drain pipe downward outdoors (outlet-side) at a degree of over 1/50 to avoid water flowing back. Avoid any bulges or kinks in the line.
- Do not drag the drain pipe violently. One support point should be set every 3.28~4.92ft/1~1.5m to prevent the drain pipe from yielding. You can also tie the drain pipe with the connecting pipe to fix it.
- If the outlet of the drain pipe is higher than the body's pump joint, the pipe should be arranged as vertically as possible. The lift distance must be less than 21.65in/550mm, otherwise the water can not be lifted completely and can cause overflow. (Only available for a unit with pump.)
- The end of the drain pipe should be over 1.969in/50mm higher than the ground, and do not immerse it in water. If you discharge the water directly into sewage, be sure to make a U-form aqua seal by bending the pipe up to prevent any smelly gas from entering the house through the drain pipe.

## Drainage Test

1. Remove the test cover, and add approximately 2000ml water to the water pan.
2. Operate the air conditioner in "**COOLING**" mode. The drain pump will create a distinct sound. Check that the water is discharged properly (1 minute lag is possible, according to the length of the drain pipe).
3. Check the joints for any leaks.
4. Power off the air conditioner and recover the cap.
5. Stow 2000ml water to the water pan through the stow tube, and check whether the drainpipe is unhindered. See **Fig. 9.3** and **Fig. 9.4** (on the next page) for tube locations for units with or without pump.

The drain pipe installation for the unit with pump.



The drain pipe installation for the unit without pump.

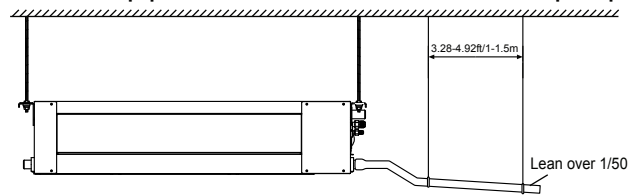
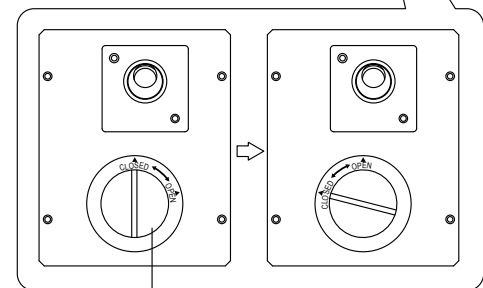
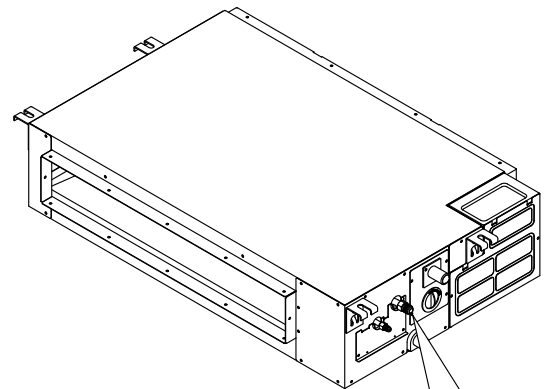


Fig. 9.1

### NOTE

- Check whether the drainpipe is unhindered.
- New built house should have this test done before paving the ceiling.



Test cap

Fig. 9.2

# Connecting The Drain Pipe

Unit With Pump

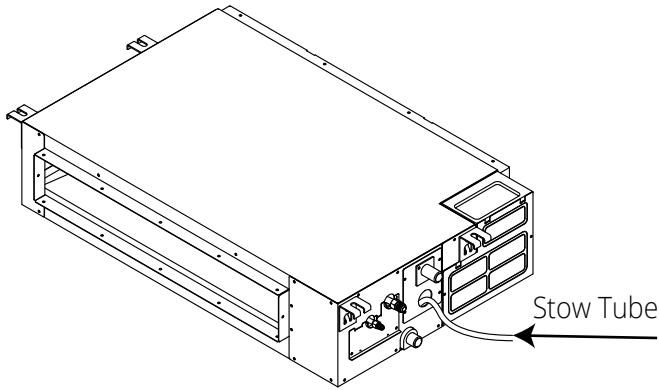


Fig. 9.3

Unit Without Pump

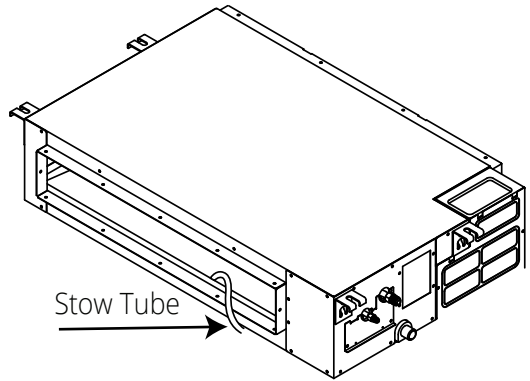


Fig. 9.4

## Install the drain joint of the outdoor unit (For Heat Pump Models)

Fit the seal into the drain joint, and then insert the drain joint into the base pan hole of the outdoor unit rotating 90° to securely assemble them. Connect the drain joint with an extension drain hose (Locally purchased) to avoid condensate draining from the outdoor unit during the heating mode.

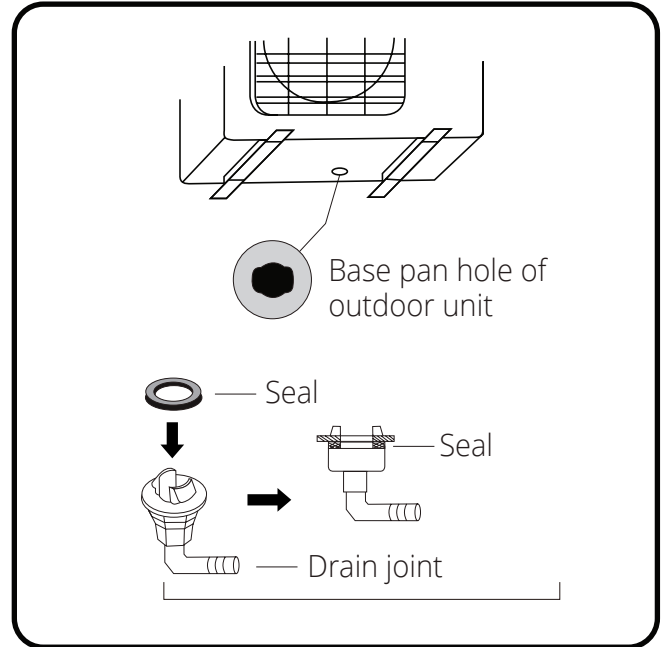


Fig. 9.5

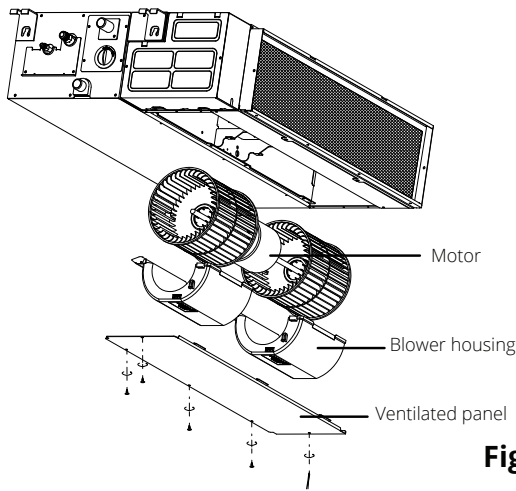
### NOTE

The illustrations in this manual are for explanation purposes only. There may be slight differences according to the model you purchased.

## Motor and Drain Pump Maintenance

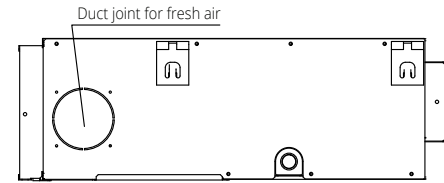
### Motor Maintenance

1. Take off the ventilated panel.
2. Take off the blower housing.
3. Take off the motor.



**Fig.10.1**

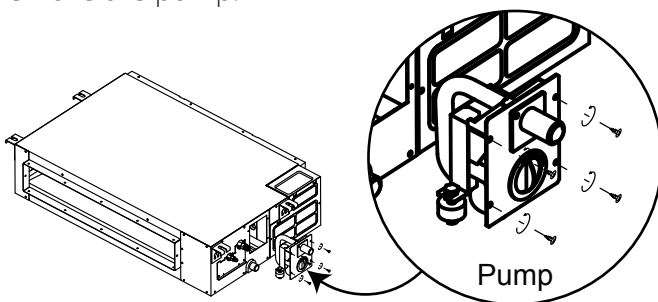
### Dimensions



MODEL	
12-24	30-60
<p>Ø90mm/3.54in 3.15in/80mm</p>	<p>Ø125mm/4.92in Ø160mm/6.3in</p>


### Pump Maintenance

1. Screw off the four screws from the drain pump.
2. Turn off pump power supply and unplug the water level switch cable.
3. Remove the pump.



**Fig.10.3**


## ! CAUTION

- The capacity of the system and the network address of the air-conditioner can be set by the switches on the indoor Main Control Board.
  - Before setting, turn off the power. After setting, restart the unit.
-  **DO NOT** modify settings when the power is **ON**.

## Horsepower Code Setting

The capacity of the indoor unit has been set in the factory according to the table below.

**Table 11-1**

ENC1	Toggle switch Code	Capacity(kw)
	4	5.3
		5.6
	5	7.1
	7	9.0
	8	10.5
	9	14.0
	16.0	

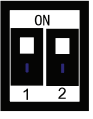


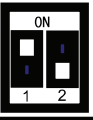


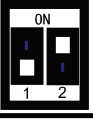


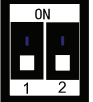


### NOTE

Only qualified personnel can adjust the settings.

## Network Address Set

Each air-conditioner in a network has only one network address to distinguish it from other units. The address code of the air-conditioner in LAN is set by code switches S1 & S2 on the Indoor Unit's Main Control Board, and the set range is 0-63.

**Table 11-2**

Toggle switch set			Network address code
S1	S2		
			00~15
			16~31
			32~47
			48~63



## BEFORE PERFORMING ELECTRICAL WORK, READ THESE REGULATIONS

1. Before performing any electrical or wiring work, turn off the main power to the system.
2. All wiring must comply with local and national electrical codes, and must be installed by a licensed electrician.
3. All electrical connections must be made according to the Electrical Connection Diagram located on the panels of the indoor and outdoor units.
4. 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.
5. Power voltage should be within 90-100% of rated voltage. Insufficient power supply can cause malfunction, electrical shock, or fire.
6. Circuit, including any switches, should have a capacity 1.5 times the maximum unit current (amps).
7. The qualified technician must use an approved circuit breaker or switch that disconnects all poles and has a contact separation of at least 1/8in (3mm).
8. Do not connect another appliance to the same circuit.
9. Make sure to properly ground the air conditioner.
10. Every wire must be firmly connected. Loose wiring can cause the terminal to overheat, resulting in malfunction and possible fire.
11. Do not let wires touch or rest against refrigerant tubing, the compressor, or any moving parts within the unit.

## Connect the Signal Cable

1. Prepare the cable for connection:

### USE THE RIGHT CABLE

- Outdoor power cable is not provided
- See table below for gauge requirements
- Indoor power / signal cable from outdoor unit is provided (see Indoor Unit Installation)

### Minimum Cross-Sectional Area of Power and Signal Cables

#### North America

Model Series	Appliance Amps (A)	AWG
9K & 12K	15	14
18K	20	12
24K	25	10

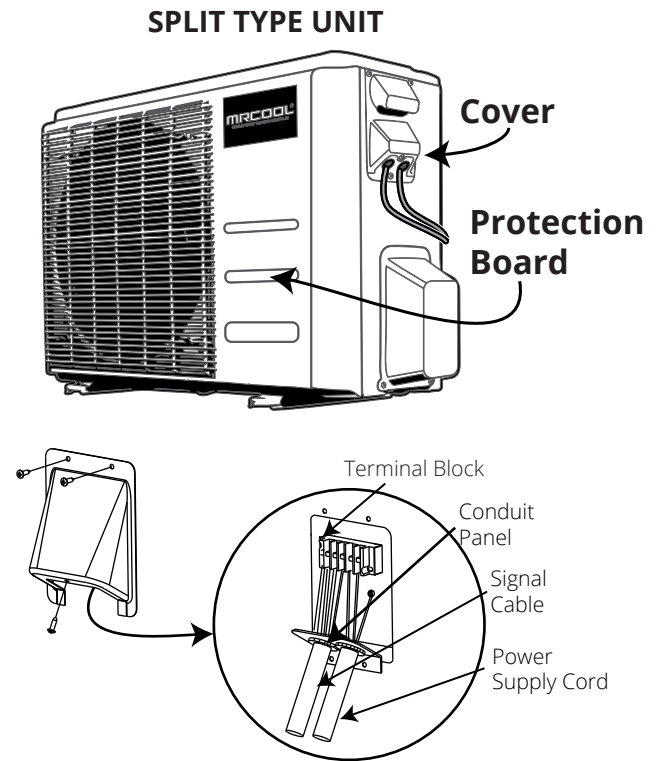
#### Other Regions

Rated Current of Appliance (A)	Nominal Cross-Sectional Area (mm <sup>2</sup> )
> 3 and ≤ 6	0.75
> 6 and ≤ 10	1
> 10 and ≤ 16	1.5
> 16 and ≤ 25	2.5
> 25 and ≤ 32	4
> 32 and ≤ 40	6

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

# Electrical Wiring

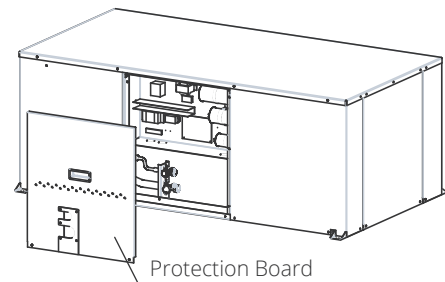
2. Unscrew the electrical wiring cover and remove it.
3. Unscrew the cable clamp below the terminal block and place it to the side.
4. Match the wire colors / labels with the labels on the terminal block, and firmly screw the u-lug of each wire to its corresponding terminal.
5. After checking to make sure every connection is secure, loop the wires around it 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.



*Outdoor Unit Wiring Diagram is located on the inside of the wire cover on the outdoor unit.*

**Fig. 12.1**

**SPLIT TYPE UNIT**



**Fig.12.2**

**NOTE**

The illustrations in this manual are for explanation purposes only. There may be slight differences according to the model you purchased.



## The Specification of Power (Indoor Power Supply)

MODEL		18	24	30~36	42~48	60
POWER	PHASE	1Phase	1Phase	1Phase	1Phase	1Phase
	FREQUENCY AND VOLT	208-240V	208-240V	208-240V	208-240V	208-240V
CIRCUIT BREAKER/FUSE(A)		20/16	40/25	50/30	60/45	60/50

MODEL		30~36	42~60	30~36	42~60
POWER	PHASE	3Phase	3Phase	3Phase	3Phase
	FREQUENCY AND VOLT	380-420V	380-420V	208-240V	208-240V
CIRCUIT BREAKER/FUSE(A)		25/20	25/20	40/25	45/35

## The Specification of Power (Outdoor Power Supply)

MODEL		12~18	24	30~36	42~48	60
POWER	PHASE	1Phase	1Phase	1Phase	1Phase	1Phase
	FREQUENCY AND VOLT	208-240V	208-240V	208-240V	208-240V	208-240V
CIRCUIT BREAKER/FUSE(A)		20/16	40/30	60/40	70/55	70/60

MODEL		30~36	42~60	30~36	42~60
POWER	PHASE	3Phase	3Phase	3Phase	3Phase
	FREQUENCY AND VOLT	380-420V	380-420V	208-240V	208-240V
CIRCUIT BREAKER/FUSE(A)		25/20	25/20	40/25	45/35

## The Specification Of Power (Independence Power Supply)

MODEL		18	24	30~36	42~48	60
POWER (indoor)	PHASE	1Phase	1Phase	1Phase	1Phase	1Phase
	FREQUENCY AND VOLT	208-240V	208-240V	208-240V	208-240V	208-240V
CIRCUIT BREAKER/FUSE(A)		20/16	20/16	20/16	20/16	20/16
POWER (outdoor)	PHASE	1Phase	1Phase	1Phase	1Phase	1Phase
	FREQUENCY AND VOLT	208-240V	208-240V	208-240V	208-240V	208-240V
CIRCUIT BREAKER/FUSE(A)		20/16	40/25	50/30	60/45	60/50

MODEL		30~36	42~60	30~36	42~60
POWER (indoor)	PHASE	1Phase	1Phase	1Phase	1Phase
	FREQUENCY AND VOLT	208-240V	208-240V	208-240V	208-240V
CIRCUIT BREAKER/FUSE(A)		20/16	20/16	20/16	20/16
POWER (outdoor)	PHASE	3Phase	3Phase	3Phase	3Phase
	FREQUENCY AND VOLT	380-420V	380-420V	208-240V	208-240V
CIRCUIT BREAKER/FUSE(A)		25/20	25/20	40/25	45/35

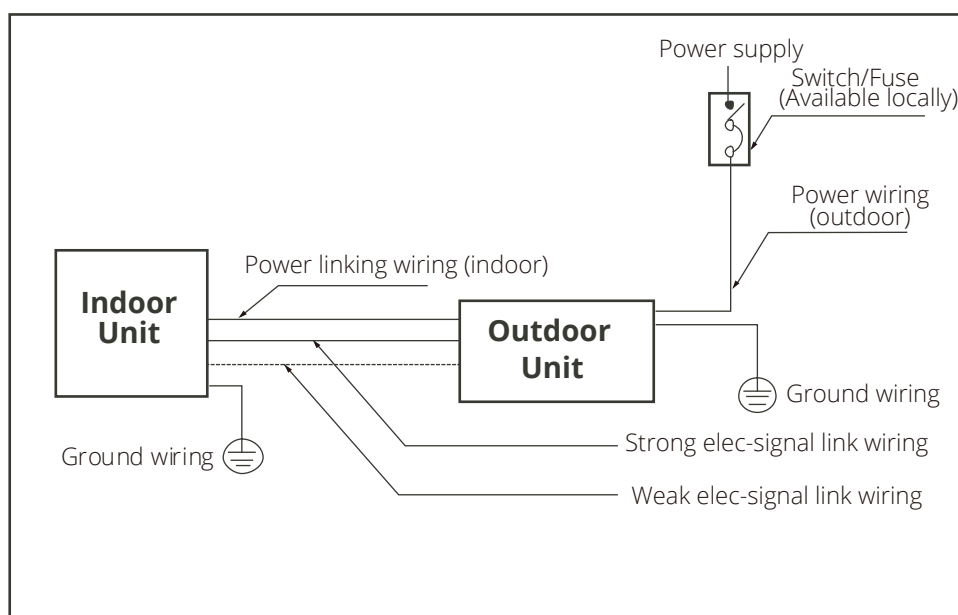
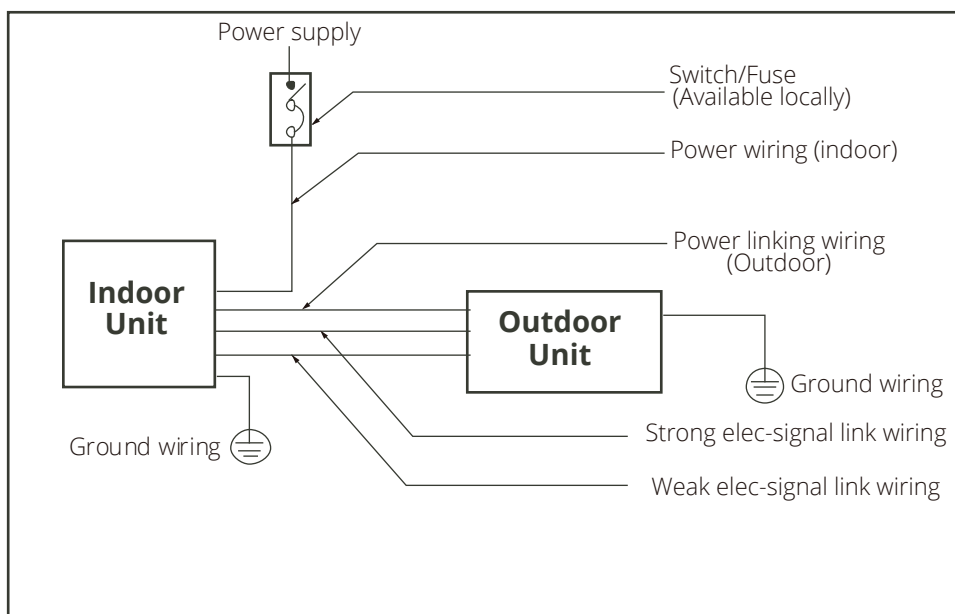
## The Specification Of Power - Invert Type Air Conditioner (Independence Power Supply)

MODEL		18	24	30~36	42~48	60
POWER (indoor)	PHASE	1Phase	1Phase	1Phase	1Phase	1Phase
	FREQUENCY AND VOLT	220-240V	220-240V	220-240V	220-240V	220-240V
CIRCUIT BREAKER/FUSE(A)		15/10	15/10	15/10	15/10	15/10
POWER (outdoor)	PHASE	1Phase	1Phase	1Phase	1Phase	1Phase
	FREQUENCY AND VOLT	208-240V	208-240V	208-240V	208-240V	208-240V
CIRCUIT BREAKER/FUSE(A)		30/20	30/20	40/30	40/35	50/40

MODEL		30~36	42~60	30~36	42~60
POWER (indoor)	PHASE	1Phase	1Phase	1Phase	1Phase
	FREQUENCY AND VOLT	220-240V	220-240V	220-240V	220-240V
CIRCUIT BREAKER/FUSE(A)		15/10	15/10	15/10	15/10
POWER (outdoor)	PHASE	3Phase	3Phase	3Phase	3Phase
	FREQUENCY AND VOLT	380-420V	380-420V	208-240V	208-240V
CIRCUIT BREAKER/FUSE(A)		30/20	30/25	50/40	50/40

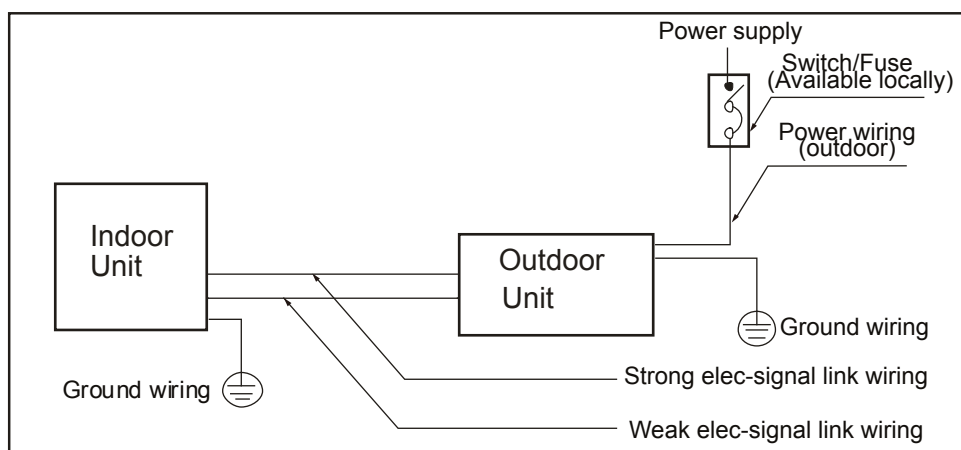
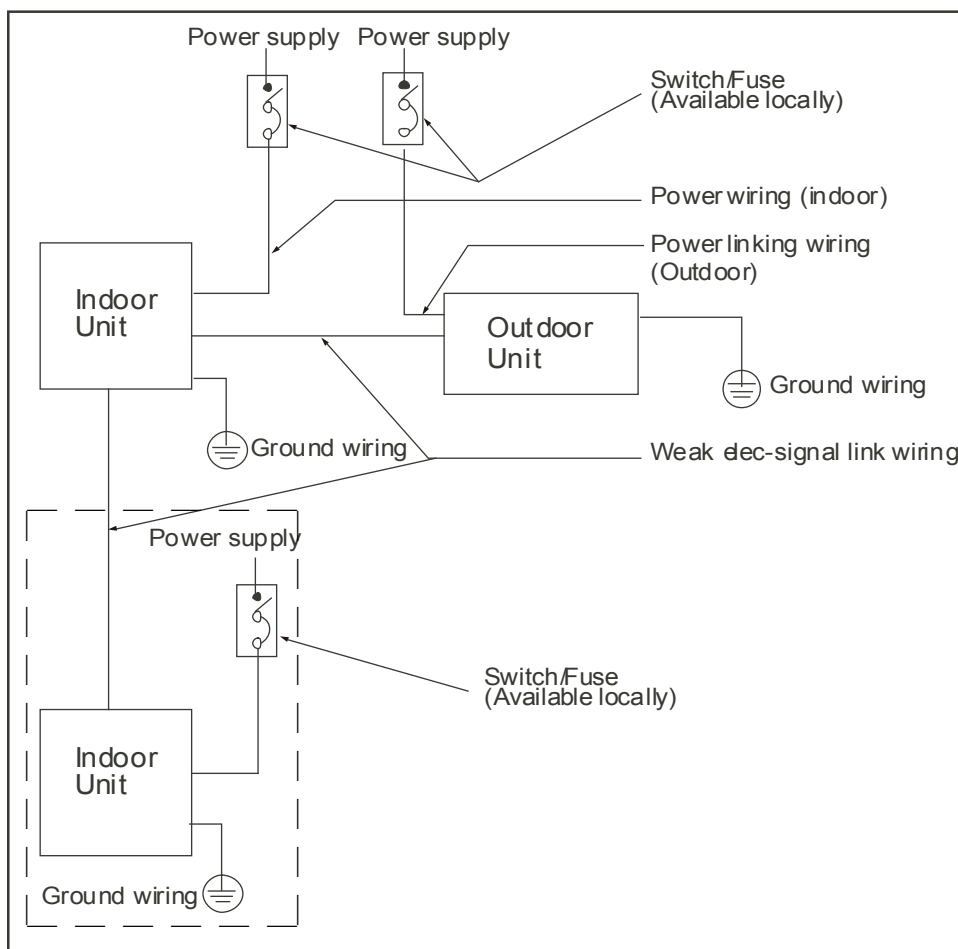
## ! CAUTION

- The power supply is included and can be applied to the table. Before obtaining access to terminals, all supply circuits must be disconnected.
- Ground the air conditioner properly to avoid issues with the anti-interference function.



## ! CAUTION

- A disconnection device with an air gap contact separation in all active conductors should be incorporated while connecting wiring according to the National Wiring Regulation.
- Refer to the corresponding chart during wiring procedures to prevent damage. The signs of the indoor terminal block in the some of following figures may be replaced by L N L1 N1.
- Ground the air conditioner properly to avoid issues with the anti-interference function.



1. Test operation must be carried out after the installation is complete.
2. Please confirm the following points before performing test operation:
  - The indoor unit and outdoor unit are installed properly.
  - Tubing and wiring are correctly completed.
  - The refrigerant pipe system is leakage-checked.
  - The drainage is unimpeded.
  - The heating insulation works well.
  - The ground wiring is connected correctly.
  - The length of the tubing and additional charge amounts have been recorded.
  - The power voltage matches rated voltage of the air conditioner.
  - There is no obstacle blocking the outlet and inlet of the outdoor and indoor units.
  - The gas-side and liquid-side service valves are both completely open.
  - The air conditioner is pre-heated by turning on the power.
3. Begin test operation. Set the air conditioner in cooling mode with the remote controller, and check the following points. If there is any malfunction, please resolve it according to the chapter "**Troubleshooting**" in the "**Owner's Manual**".

## Indoor Unit

- a. Whether the buttons on the remote controller works well.
- b. Whether the air flow louver moves normally.
- c. Whether the room temperature is suitably adjusted.
- d. Whether the indicator lights function normally.
- e. Whether the temporary switch on the unit works well.
- f. Whether the drainage is normal.
- g. Whether there is abnormal vibration or noise during operation.
- h. Whether the air conditioner works well in heating mode (heat pump model).

## Outdoor Unit

- a. Whether there is abnormal vibration and noise during operation.
- b. Whether the exhaust air, noise, or condensate negatively influence your neighborhood.
- c. Whether there is any refrigerant leakage during operation.

## CAUTION

A three minute delay is normal when restarting the unit for compressor protection.

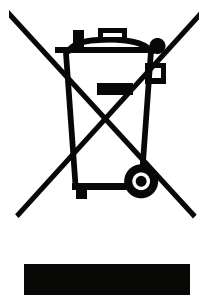
This appliance contains refrigerant and other potentially hazardous materials. When disposing of this appliance, the law requires special collection and treatment. DO NOT dispose of this product as household waste or unsorted municipal waste.

When disposing of this appliance, you have the following options:

- Dispose of the appliance at a designated municipal electronic waste collection facility.
- When buying a new appliance, the retailer will receive the old appliance free of charge.
- The manufacturer will receive the old appliance free of charge.
- Sell the appliance to certified scrap metal dealers.

## Special notice

Disposing of this appliance in the forest or other natural surroundings endangers your health and is bad for the environment. Hazardous substances may leak into the ground water and enter the food chain.





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# Olympus Series

## Mid-Static Duct Air Handlers

The design and specifications of this product and/or manual are subject to change without prior notice. Consult with the sales agency or manufacturer for details.