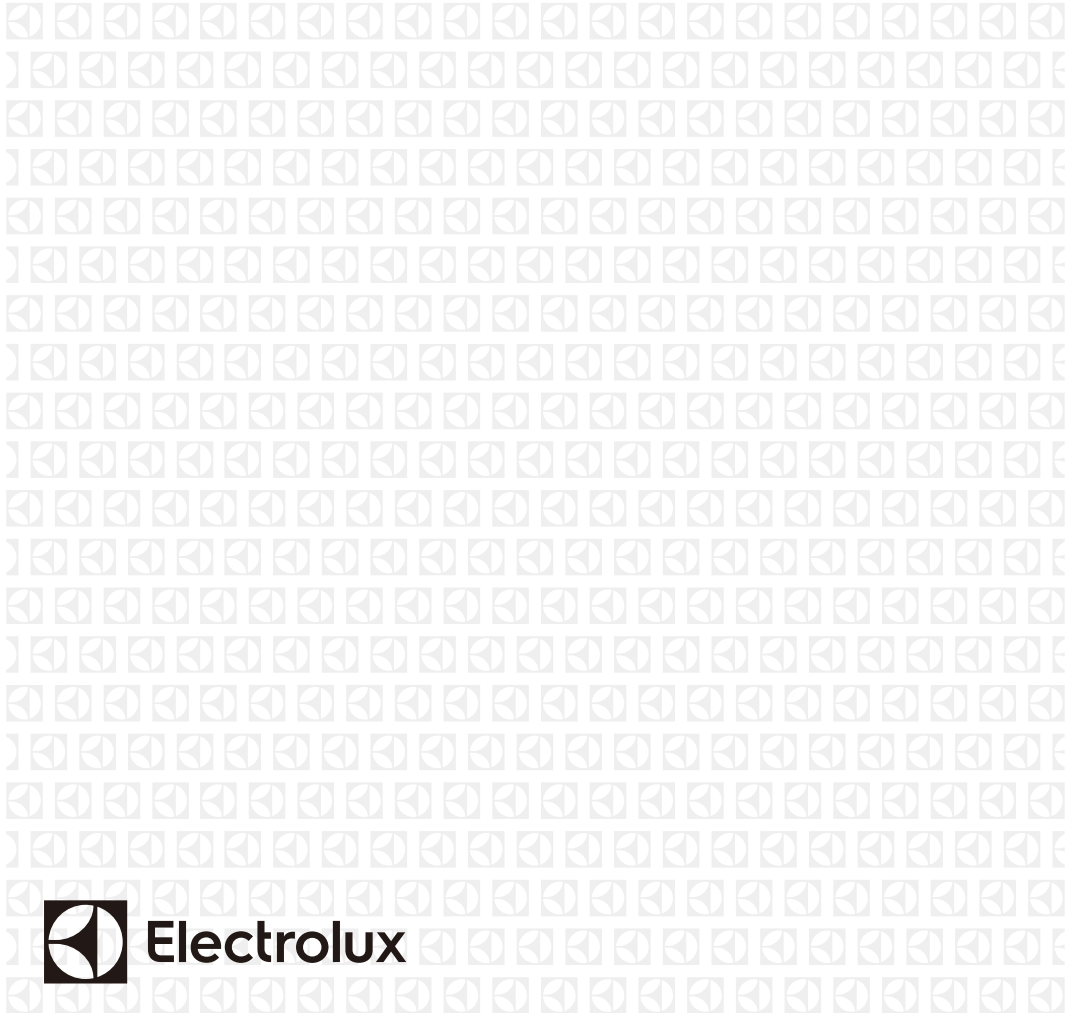


ESV09CRS-B2
ESV12CRS-B2
ESV09CRR-C6
ESV09CRR-C7

ESM09CRR-B3
ESM12CRR-B3
ESM18CRR-B3



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3. PRODUCT INSTALLATION	8
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CUSTOMER CARE AND SERVICE

We recommend the use of original spare parts.
When contacting Service, ensure that you have the following data available.
The information can be found on the rating plate. Model, PNC, Serial Number

-  Warning / Caution-Safety information.
-  General information and tips
-  Environmental information.

Subject to change without notice.

1. SAFETY INSTRUCTIONS

Before the installation and use of the appliance, carefully read the supplied instructions. The manufacturer is not responsible if an incorrect installation and use causes injuries and damages. Always keep the instructions with the appliance for future reference.

1.1 Children and vulnerable people safety



WARNING!

Risk of suffocation, injury or permanent disability.

- This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved.
- Children shall not play with the appliance.
- Cleaning and user maintenance shall not be made by children without supervision.
- Installation work must be performed in accordance with the national wiring standards and the electricity suppliers service rules by authorised personnel only.
- If the unit is to be moved to another location or disposed of, only a suitably qualified person is permitted to undertake such work.
- If you notice an unusual situation, such as a burning smell, please switch off the power to the air conditioner and contact the brand service agent. If this abnormal status continues the air conditioner may be damaged or even cause electric shock or fire.
- Do not operate the air conditioner with wet hands. This may cause electric shock.
- Do not damage or cut off the power cord or other wires. If this occurs, please have it repaired or replaced by an accredited technician.
- Do not connect this air conditioner to a multi outlet power board.
- Please switch off the power supply to the air conditioner if it is not to be used for an extended period. Otherwise, it will accumulate dust and may cause a fire.

1.2 Installation and Use



WARNING!

Risk of suffocation, injury or permanent disability.

- Contact an authorised installer for installation of this unit.
- Contact an authorised service technician for repair or maintenance of this unit.
- The socket outlet required to supply power must be connected and commissioned by a licenced contractor.
- If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.
- Before cleaning the air conditioner, please disconnect the power supply in order to eliminate the possibility of electric shock.
- The power supply should be matched with the air conditioner. Air conditioners provided with a supply cord should be connected directly to a power outlet with a suitable safety switch. Air conditioners that are hard wired must be connected to a suitable safety circuit breaker.
- Please ensure that the power supply to the air conditioner is stable and meets the requirements set out in the installation manual.
- Always ensure the product is installed with appropriate earthing.

2. BEFORE INSTALLATION

2.1 Tools needs for installation

- | | |
|----------------------------|-----------------------|
| 1. Level gauge | 10. Gas-leak detector |
| 2. Screw driver | 11. Vacuum pump |
| 3. Electric drill | 12. Gauge manifold |
| 4. Hole core drill | 13. Pipe expander |
| 5. Flaring tool set | 14. Multimeter |
| 6. Specied torque wrenches | 15. Pipe cutter |
| 7. Spanner (half union) | 16. Measuring tape |
| 8. A glass of water | 17. Other tools |
| 9. Hexagonal wrench | |

2.2 Accessories

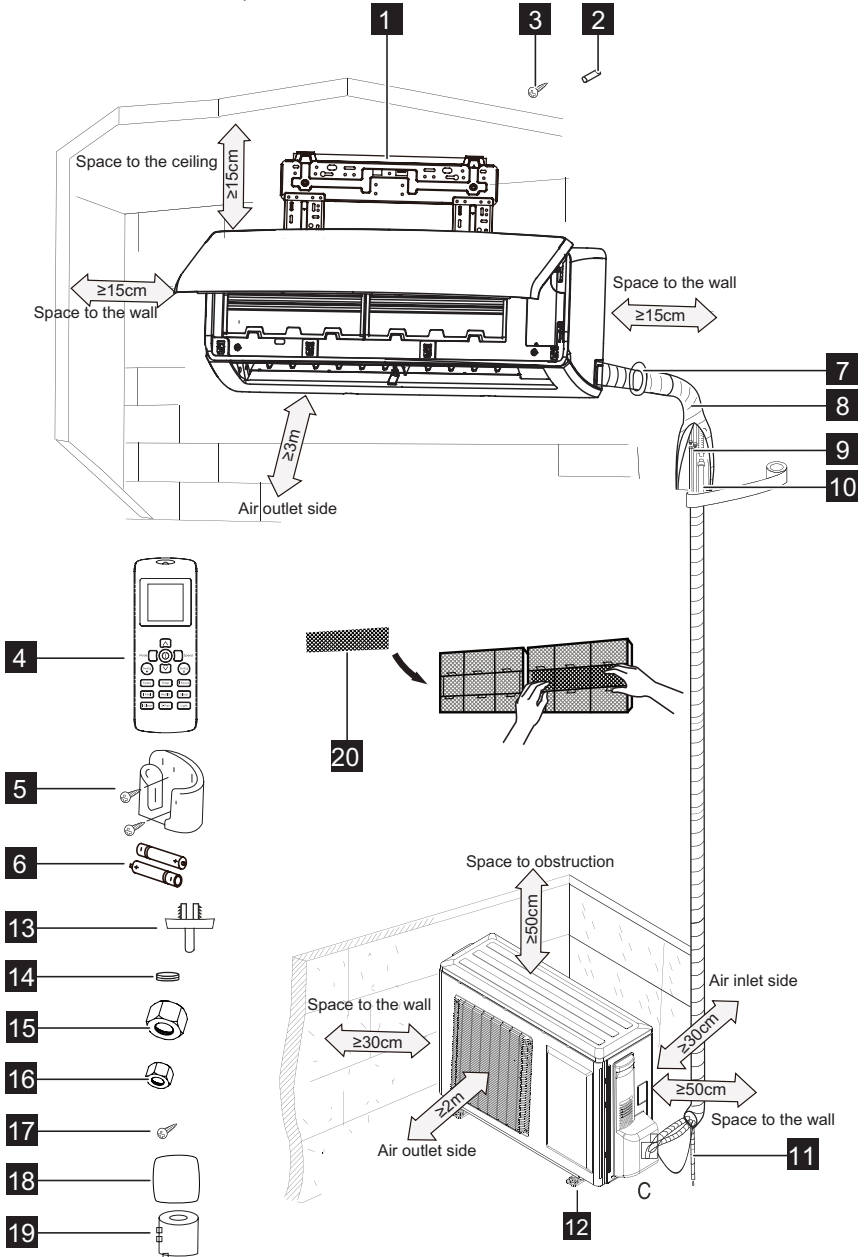
Number	Name of Accessories	Quantity
1	Indoor unit mounting plate	1
2	Clip anchor	Varies by models
3	Self-tapping screws (for mounting plate)	Varies by models
4	Remote controller	1
5	Remote controller Holder / Screws	Optional
6	Battery (AAA 1.5V)	2
7	Piping hole cover	Optional
8	Pipe insulation belt	1
9	Refrigerant piping (Liquid/Gas pipe)	Optional
10	Signal cable	Optional
11	Drain hose	1
12	Cushion	Optional
13	Drain connector (Heat Pump model only)	Optional
14	Drain plug (Heat Pump model only)	Optional
15	Flare nut (for gas pipe)	Optional
16	Flare nut (for liquid pipe)	Optional
17	Handle screw (for outdoor unit)	Optional
18	Wall mud	Optional
19	Magnetic ring	Optional
20	Healthy filter** (Packed in the plastic bag)	Varies by models

Note:

The accessory parts may vary from each model, please refer to the actual parts. Other necessary parts for the installation, besides the above mentioned, must be provided by the customer/installer.

** Please install the Healthy filter like Active carbon filter, Bio-Hepa filter, Vitamin C filter, Silver ion filter or any other filters with the dust filter in the indoor unit. For some models, we already have the Healthy filters installed in the indoor unit.

2.3 Product Description



NOTE

All the pictures in this manual are for explanation purposes only. The actual shape of the indoor unit you purchased may be slight different on front panel and display window. The actual shape shall prevail.

2.4 Installation site

- Do not install the unit in areas with:
 - strong heat sources;
 - vapours or flammable gases;
 - contamination with oil particles;
 - high frequency electromagnetic equipment (e.g. welding equipment or medical devices);
 - high salinity (e.g. close to coastal areas);
 - sulphuric gas (e.g hot water springs);
 - poor air quality.

Indoor unit

- Maintain the minimum installation distances specified in this document. Do not block the air inlet or the air outlet.
- Do not use the unit in places with extremely high humidity.
- Install the indoor unit out of reach of children.
- The wall must be strong enough to support the weight and vibration of the unit.
- Install the indoor unit at least 230 cm above the floor surface.
- Leave sufficient space for cleaning and maintenance.
- The air filter should remain accessible.
- Leave at least 1 m distance between the unit and other electrical appliances.
- Install the indoor unit in a place where the condensate water can be easily drained.
- Install at a location protected from direct sunlight.

Outdoor unit

- Maintain the minimum installation distances specified in this document.
- Do not block the air inlet or the air outlet.
- Install the outdoor unit out of reach of children.
- Install the outdoor unit where there is sufficient ventilation.
- Install the outdoor unit where produced noise and airflow will not disturb neighbors or animals.
- Install the outdoor unit in a dry place.
- Install the outdoor unit in a place not exposed to direct sunlight or strong wind.
- Install the outdoor unit in a place can support the weight and vibration of the unit.
- Leave sufficient space for cleaning and maintenance.

Safety precautions for electrical appliances

- Use a dedicated mains circuit.
- The unit must be properly grounded.
- Install a Residual-current device (RCD) to protect against personal injury in case of leakage currents.
- The installation must comply with local electrical safety regulations and with other relevant local regulations.
- The unit must be installed in accordance with national wiring regulations.
- Do not subject the mains cable to force.
- The distance between the unit and heat sources is at least 1.5 m.

NOTE

- Make sure that the live wire, the neutral wire and the ground wire in the mains socket are properly connected.
- Inadequate or incorrect electrical connections can cause electric shock or fire.

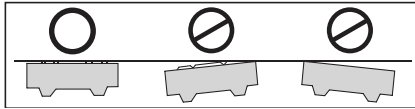
3. PRODUCT INSTALLATION

3.1 Indoor unit installation

3.1.1 Installing the Wall Mounting Plate

1. Install the wall mounting plate horizontally over the structural parts on the wall using the spaces indicated on the plate, as shown in Fig.3.1.1.
2. In the case of tiled, concrete or similar walls, create 5mm diameter holes. Place anchor supports for the appropriate assembly screws.
3. Install the wall mounting plate to the wall with screws.

Fig.3.1.1



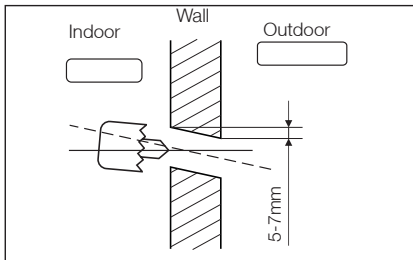
NOTE:

- Fit the wall mounting plate and drill holes in the wall according to the wall structure and corresponding mounting points on the wall mounting plate.
- Refer to **Appendix(1)** for type details about the mounting plates.

3.1.2 Drilling the Hole

1. Determine the position of the hole for the pipes using the wall mounting plate and drill the pipe hole so that it is tilted slightly downward.
2. Always use a pipe cover with an opening when drilling.

Fig.3.1.2



3.1.3 Connective pipe

1. For the left-hand and right-hand piping, remove the pipe cover from the side panel. The pipe cover can be kept as it may be used when relocating the air conditioner to any other place.
2. For the rear-right-hand and rear-left-hand piping, install the piping as shown in Fig.3.1.3-1. Bend the connective pipe to be laid at a height of 43mm or less from the wall. Fix the end of the connective pipe.

Fig.3.1.3-1

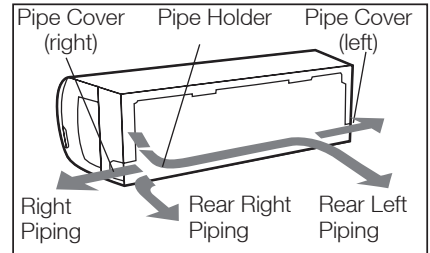
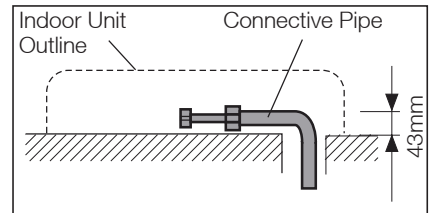


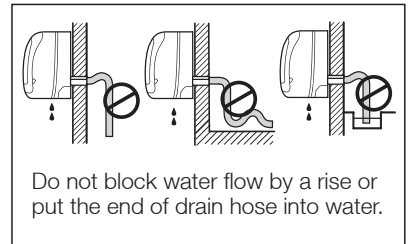
Fig.3.1.3-2



3.1.4 Drainage

1. Run the drain hose sloping downward. Do not install the drain hose as illustrated in Fig.3.1.4.

Fig.3.1.4



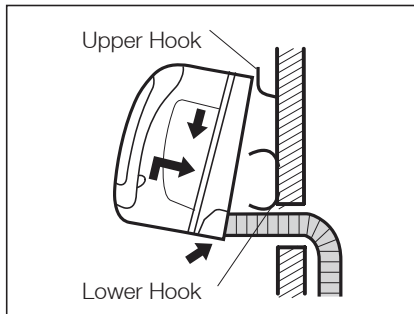
Do not block water flow by a rise or put the end of drain hose into water.

- When connecting extension drain hose, insulate the connecting part of extension drain hose with a shield pipe, do not let the drain hose slack.

3.1.5 Fastening the Indoor Unit

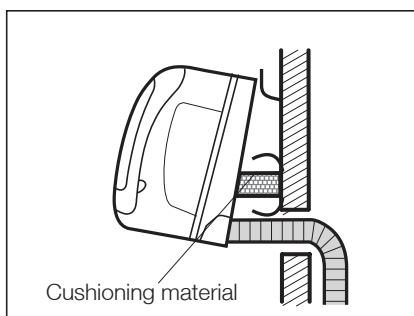
- Pass the piping through the hole in the wall.
- Put the upper claw at the back of the indoor unit on the upper hook of the wall mounting plate, move the indoor unit from side to side to see that it is securely hooked.

Fig.3.1.5-1



- Piping can easily be made by lifting the indoor unit with a cushioning material between the indoor unit and the wall.

Fig.3.1.5-2

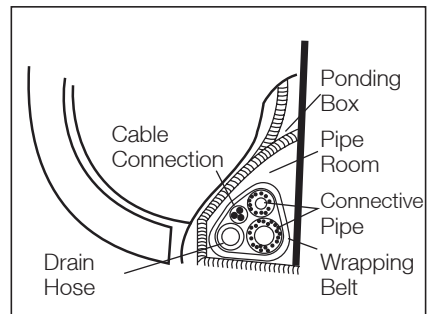


- Push the lower part of the indoor unit up on the wall, Then move the indoor unit from side to side, up and down to check if it is hooked securely.

3.1.6 Piping and wrapping

- Bundle the tubing, connecting cable, and drain hose with tape securely and evenly as shown in the Fig.3.1.6.
- Because the condensed water from rear of the indoor unit is gathered in ponding box and is piped out of room, do not put anything else in the box.

Fig.3.1.6



NOTE:

- Connect the indoor unit first, then the outdoor unit.
- Be careful not to let the drain hose slack.
- Both of the auxiliary piping should be heat insulated.
- Be sure that the drain hose is located at the lowest side of the bundle. Locating at the upper side may cause drainage overflow inside the unit.
- Never intercross nor intertwist the power wire with any other wire.
- Run the drain hose sloped downward to drain out the condensed water smoothly.

3.2 Outdoor unit installation

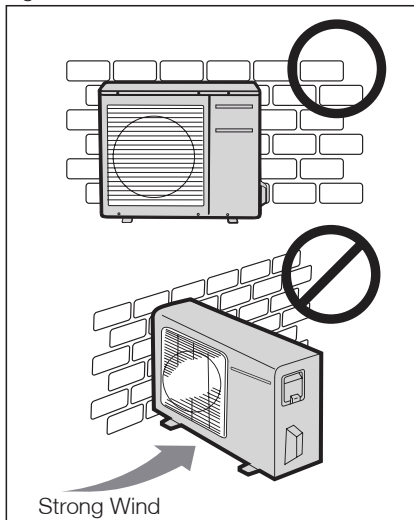
3.2.1 Securing of Outdoor Unit

- Install the outdoor part of the unit on a flat surface to avoid excess noise and vibration. A condenser pad is recommended.
- Direct the air vent toward an area

without obstacles.

3. Install the unit at the site where it is exposed to as little wind as possible, especially not in areas where it is frequently windy.
4. If the installation site is exposed to heavy winds, such as in coastal areas, place the unit along the widest part of the wall or use protective plates.
5. Be sure there is no obstacle which blocks exhausting air, including shrubs or bushes.

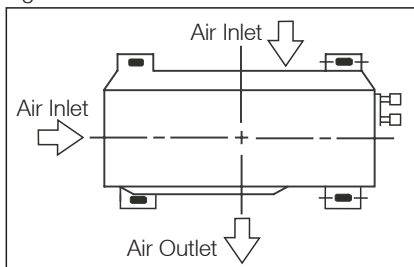
Fig.3.2.1-1



NOTE:

- Settlement of outdoor unit. Anchor the outdoor unit tightly and horizontally on a concrete or flat mount with a bolt and nut 10mm diameter (Purchased separately).

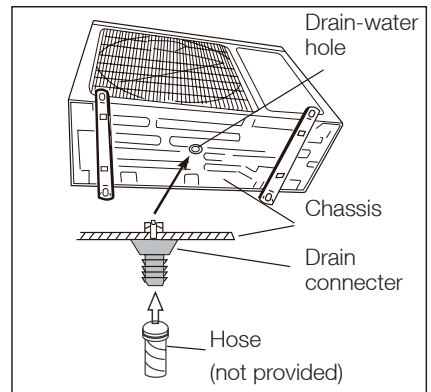
Fig.3.2.1-2



3.2.2 Condensate drainage of outdoor unit (only for heat pump model)

1. During heating operation, the condensate and defrosting water should be drained out reliably through the drain hose.
2. Install the outdoor drain connector in the drain-water hole on the chassis of outdoor unit, and attach the drain hose to the connector so that the waste water formed in the outdoor unit can be drained out.
3. The drain-water hole must be plugged. Whether to plug other holes will be determined by the installer according to actual conditions.
4. In case of a drain hose, the unit must be installed on a base more than 3cm height.

Fig.3.2.2



NOTE:

- For some heat pump models, no drain connector provided due to enough drain-water hole designed.

3.3 Refrigerant piping connection

NOTE:

- Keep original bend so no kinking of the tube occurs.

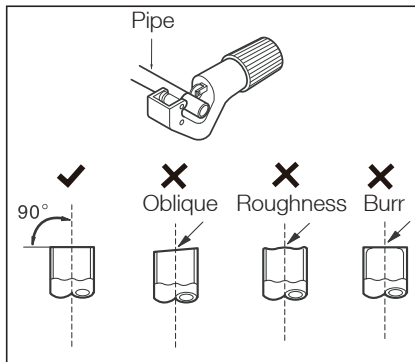
3.3.1 Flaring work

Main cause for refrigerant leakage is due to defect in the flaring work.

Carry out correct flaring work using the following procedure:

1. Cut the pipes and the cable.
 - Use the piping kit accessory or pipes purchased locally.
 - Measure the distance between the indoor and the outdoor unit.
 - Cut the pipes a little longer than the measured distance.
 - Cut the cable 1.5m longer than the pipe length.

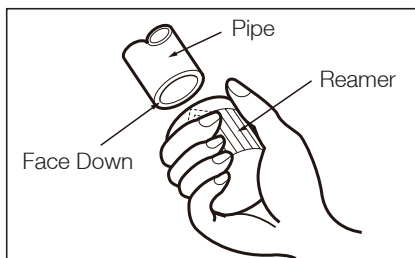
Fig.3.3.1-1



2. Burr removal

- Completely remove all burrs from the cut cross section of pipe/tube.
- Put the end of the copper tube/pipe in a downward direction as you remove burrs in order to avoid dropping burrs into the tubing.

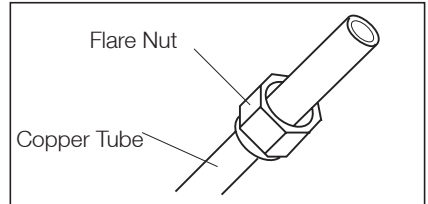
Fig.3.3.1-2



3. Put nut on

- Remove flare nuts attached to indoor and outdoor unit, then put them on pipe/tube after completed burr removal. (It is not possible to put them on after flaring work.)

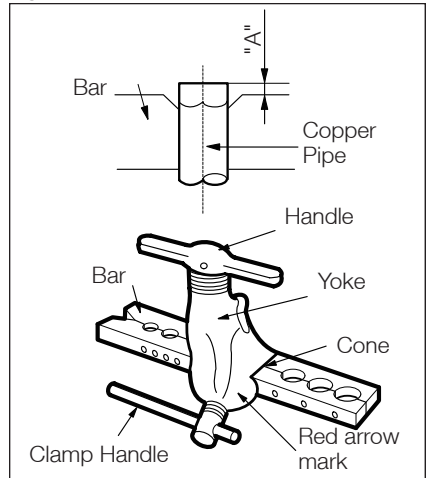
Fig.3.3.1-3



4. Flaring work

- Carry out flaring work using flaring tool as shown below.

Fig.3.3.1-4



- Firmly hold copper pipe according to the dimension shown in the table below.

Outer diam. (mm)	A (mm)	
	Max.	Min.
Φ6.35 (1/4")	1.3	0.7
Φ9.52 (3/8")	1.6	1.0
Φ12.70 (1/2")	1.8	1.0
Φ15.88 (5/8")	2.4	2.2

3.4 Piping Connection

3.4.1 Indoor Unit

1. Connecting the indoor unit tubing to the connection piping:

- Align the centers of the pipes and sufficiently tighten the flare nut with your hands first.

Fig.3.4.1-1

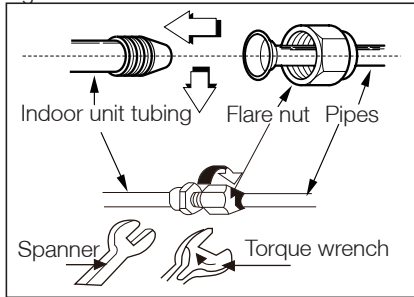
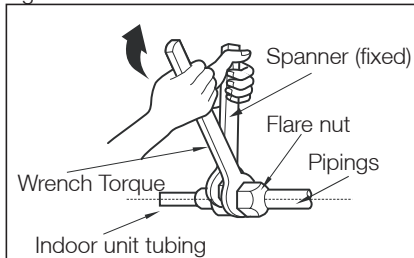


Fig.3.4.1-2



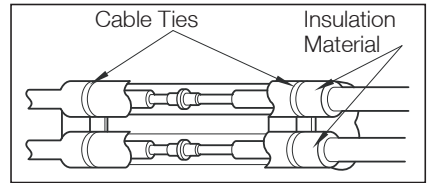
- Then tighten the flare nut with spanner and torque wrench by referring the following table:

Outer diam. (mm)	Torque (N.m)	Additional Torque (N.m)
Φ6.35 (1/4")	15.7 (1.6kg.m)	19.6 (2.0kg.m)
Φ9.52 (3/8")	29.4 (3.0kg.m)	34.3 (3.5kg.m)
Φ12.70 (1/2")	49.0 (5.0kg.m)	53.9 (5.5kg.m)
Φ15.88 (5/8")	73.6 (7.5kg.m)	78.6 (8.0kg.m)

2. Wrap the insulation material around the connecting portion:

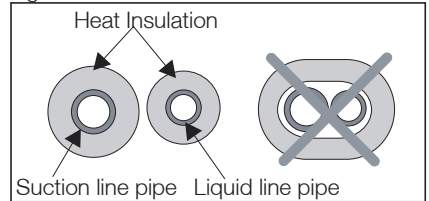
- Cover the indoor unit pipe and the connection pipe with the heat insulation material. Bind them together with vinyl tape so that there is no gap.

Fig.3.4.1-3



- Ensure to isolate separately the suction pipe from the liquid pipe.

Fig.3.4.1-4



- Wrap the insulated pipes with vinyl tape in the rear section for pipe housing. Fasten the power cable to the pipes with vinyl tape.

Fig.3.4.1-5

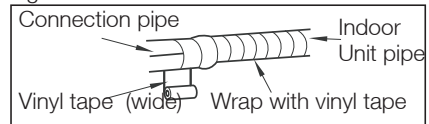
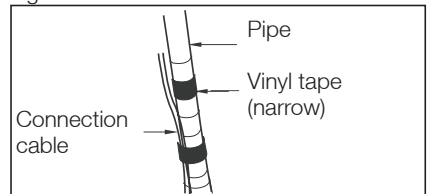
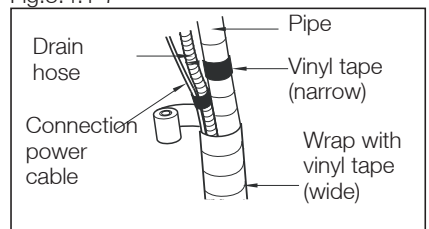


Fig.3.4.1-6



- Wrap the piping, drain hose and power cable tightly with vinyl tape so that they can fit into the rear piping housing section.

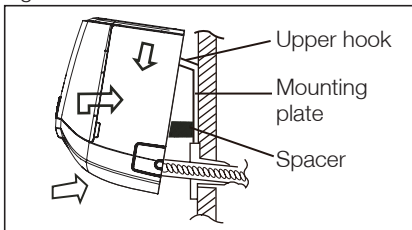
Fig.3.4.1-7



3. Hang the indoor unit:

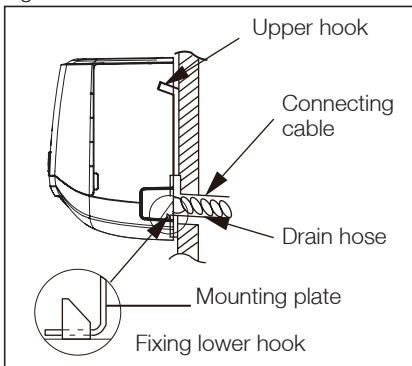
- Remove the spacer.
- Hook the indoor unit onto the upper portion of the mounting plate (Engage the hooks of the mounting plate into the openings at the rear top of the indoor unit).
- Ensure that the hooks are properly seated on the mounting plate by moving the indoor unit in all directions.

Fig.3.4.1-8



- Press the lower left and right sides of the unit against the mounting plate until the hooks engage into their slots (clicking sound).

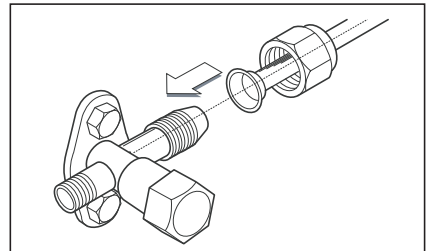
Fig.3.4.1-9



3.4.2 Outdoor Unit

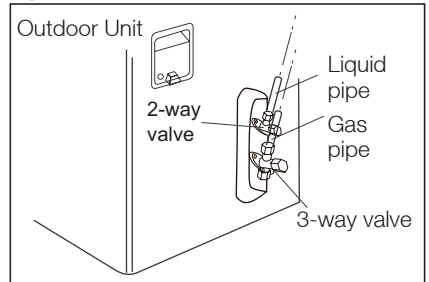
1. Align the centers of the pipes and sufficiently tighten the flare nut with your hands.

Fig.3.4.2-1



2. Then, tighten the flare nut with torque wrench until the wrench clicks.

Fig.3.4.2-2



- Make sure to follow the torque table value as below table:

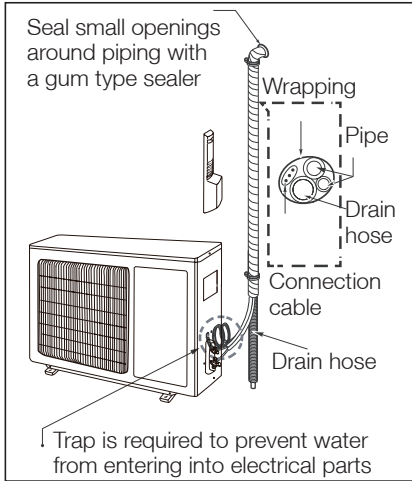
Outer diam. (mm)	Torque (N.m)	Additional Torque (N.m)
Φ6.35 (1/4")	15.7 (1.6kg.m)	19.6 (2.0kg.m)
Φ9.52 (3/8")	29.4 (3.0kg.m)	34.3 (3.5kg.m)
Φ12.70 (1/2")	49.0 (5.0kg.m)	53.9 (5.5kg.m)
Φ15.88 (5/8")	73.6 (7.5kg.m)	78.6 (8.0kg.m)

3.4.3 Piping Formation

1. Form the piping by wrapping the connecting portion of the indoor unit with insulation material and secure it with narrow vinyl tape and wide vinyl tape.
 - If you want to connect an additional drain hose, the end of the drain hose outlet should be routed above the ground. Secure the drain hose appropriately.
2. In cases where the outdoor unit is installed below the indoor unit level:

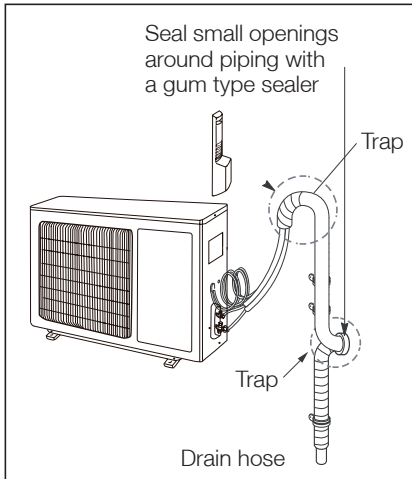
- Wrap the piping, drain hose and connecting cable from the down to up.
- Secure the wrapped piping along the exterior wall using saddle or equivalent.

Fig.3.4.4-1



3. In cases where the outdoor unit is installed above the indoor unit level:
 - Wrap the piping and connecting cable from the down to up.
 - Form a trap to prevent water from entering the room.
 - Secure the wrapped piping along the exterior wall using saddle or equivalent.

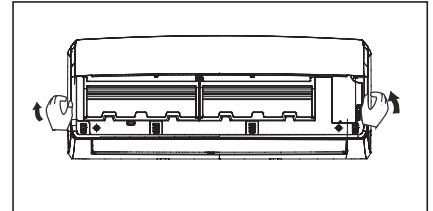
Fig.3.4.4-2



3.4.4 Checking the Drainage

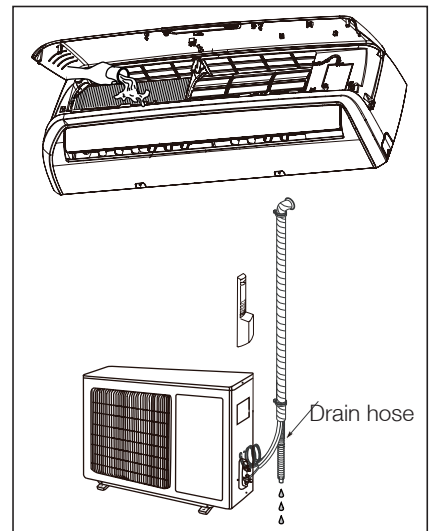
1. Open and lift the indoor unit front panel.
 - Hold the lower part of the left and right sides of the panel, pull it against you and lift it stops with support.

Fig.3.4.4-1



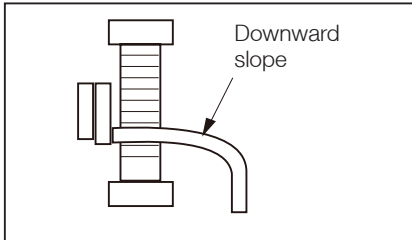
2. Check the drainage
 - Carefully pour a glass of water on the evaporator.
 - Ensure the water flows through the drain hose of the indoor unit without any leakage and goes out the drain exit.

Fig.3.4.4-2



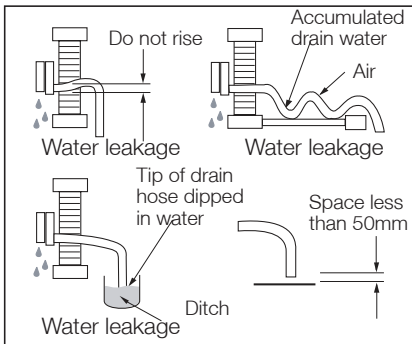
3. Dain piping
 - The drain hose should point downward for easy drain flow.

Fig.3.4.4-3



- Do not place drain piping as indicated below:

Fig.3.4.4-4



3.5 Electrical Installation

3.5.1 Safety Precautions

Electrical safety rules before starting the installation:

1. A dedicated power supply circuit and breaker should be provided for the products which are not supplied with a service cord and plug in accordance with local electrical safety regulations.
2. The circuit breaker must have the functions of magnetic tripping and heat tripping to prevent short circuit and overload.
3. The appliance shall be installed in accordance with national wiring regulations.
4. A circuit breaker with proper capacity must be installed.
5. In case of problems in power supply, the air conditioner must not be installed

before the customer fixes the problem.

6. Be sure the power supply matches the air conditioner.
7. Ensure the live wire, neutral wire and earth wire in the power socket are properly connected.
8. Inadequate or incorrect electrical connections may cause electric shock, fire or some electrical parts to malfunction.
9. Before performing any electrical work, turn off the main power to the system.

NOTE:

- Refer to **Appendix(2)** for correlative specs about the Electrical Installation.

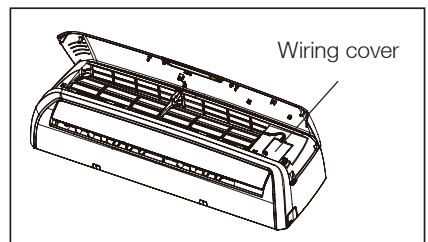
Earthing Requirements

1. The unit must be reliably earthed and connected to the special earth device by the qualified electrician.
2. The yellow-green wire in air conditioner is the earthing wire which can not be used for other purposes. Improper earthing may cause electric shock.
3. The earth resistance should accord to the national wiring regulation.
4. The user's power must have reliable earthing terminal. Do not connect the earthing wire with the following:
 - Water pipe
 - Gas pipe
 - Contamination pipe

3.5.2 Installation of Indoor Electric Wires

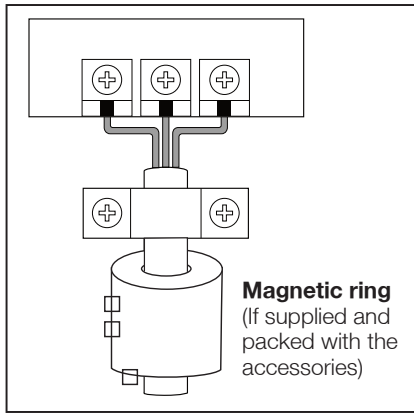
1. Open the front panel and remove the wiring cover.

Fig.3.5.2-1



2. Route the power connection cable and signal control wire (for heat pump model only) from back of the indoor unit and pull it toward the front through the wiring hole for connection.
3. Pass the wires through the hole of the Magnetic ring (If supplied).
4. Connect and screw the wires onto the terminal block as identified by their colors.
5. Wrap wires that are not connected with insulating tape so that they do not touch any electrical or metal parts.
6. Secure the wires firmly with the cable clamp.
7. Put the wiring cover back.
8. Reinstall the front panel.

Fig.3.5.2-2



NOTE:

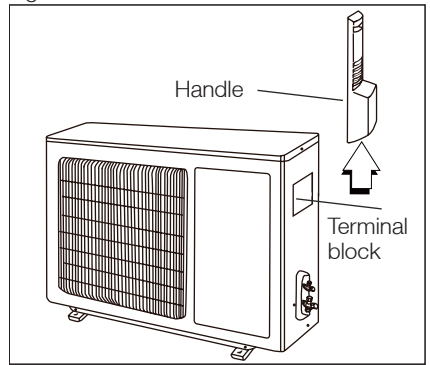
- The wiring diagram as shown just for reference only, please refer to the label sticker on the unit for correct connection.
- All wires between indoor and outdoor units must be connected by a qualified electric contractor.
- If the length of the power cord is not enough, please contact your supplier for new power cord. Lengthen the power cord by yourself is not allowed.
- After tightening the screws, pull the wire slightly to confirm whether it's firm or not.

- Do not connect two power cables together to supply power to the air conditioner.
- Do not extend the power cable conductor by cutting.

3.5.3 Installation of Outdoor Electric Wires

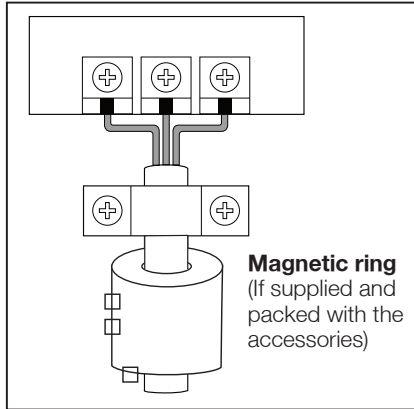
1. Remove the handle on the right side plate of outdoor unit.

Fig.3.5.3-1



2. Take off wire cable clamp. Pass the wires through the hole of the Magnetic ring (If supplied).
3. Connect and screw the power connection cable and signal control wire (for heat pump model only) onto the terminal block following corresponding identification numbers and colors on the terminal blocks of indoor and outdoor units.
4. To prevent water from entering, make a trap ("U") in the connection wires as shown in Fig.3.6.1.
5. Wrap wires that are not connected with insulating tape so that they do not touch any electrical or metal parts.
6. Fix the power connection wires with wire clamps.
7. Reinstall the handle.

Fig.3.5.3-2

**NOTE:**

- The wiring diagram as shown just for reference only, please refer to the label sticker on the unit for correct connection.

After confirming the above conditions, prepare the wiring as follows:

- The screws which fasten the wiring to the terminal block may come loose from vibrations during transportation.
- Check and make sure all screws are well fixed.
- Be sure the circuit capacity is sufficient.
- Ensure the starting voltage is maintained at over 90% of the rated voltage marked on the nameplate.
- Confirm that the cable thickness is as specified in the power source specification.
- Always install a Residual Current Device (RCD) in wet or moist area.
- The following may be caused by voltage drop: Vibration of a contactor, which will damage the contact point, fuse blowing, disturbance of the normal function of the overload.
- The means for disconnection from a power supply shall be incorporated in the fixed wiring and have an air gap contact separation of at least 3mm in each active (phase) conductor.

3.6 Air Purging and Leakage Test

Air and moisture in the refrigeration system have undesirable effects as indicated below:

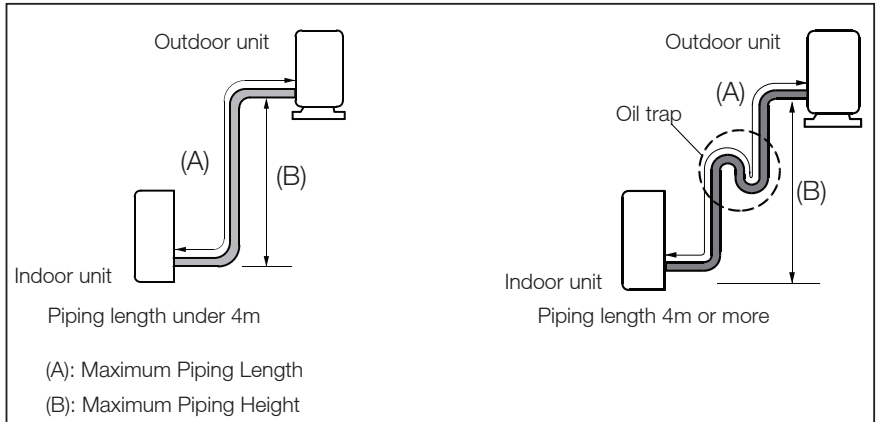
- Pressure in the system rises.
- Operating current rises.
- Cooling or heating (only for models with heating function) efficiency drops.
- Moisture in the refrigerant circuit may freeze and block capillary tubing.
- Water may lead to corrosion of parts in the refrigeration system.

Therefore, the indoor unit and tubing between the indoor and outdoor unit must apply leakage test and be evacuated to remove any noncondensables and moisture from the system.

3.6.1 Air Purging With Vacuum Pump

1. Check that each tube (both liquid and gas side tubes) between the indoor and outdoor units have been properly connected and all wiring for the test run has been completed. Remove the service valve caps from both the gas and the liquid side on the outdoor unit. Note that both the liquid and the gas side service valves on the outdoor unit are kept closed at this stage.
2. When relocating the unit to another place, perform evacuation using vacuum pump.
3. Make sure the refrigerant added into the air conditioner is in liquid form in any case.
4. Except for inverter model, Systems having the outdoor unit mounted above the indoor unit (e.g. basement installations) have the following additional requirement: For systems with elevation of 7.5m refrigerant lines must be oil trapped between 2.5m and 5m of elevation. For systems with elevation of greater than 7.5m, refrigerant lines must be oil trapped at least every 5m of elevation. (no oil trap

Fig.3.6.1



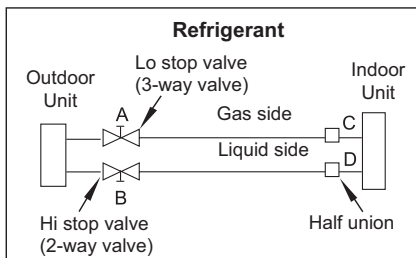
needed when outdoor unit installed at a lower place than indoor unit).

5. Refer to **Appendix(3)** for correlative specs about the Pipe length and additional refrigerant amount for split type air conditioner.

3.6.2 Caution in handling the packed valve integrated in the outlets of outdoor unit

1. Operation of opening packed valve:
Open the valve stem until it hits against the stopper. Do not try to open it further.
2. Operation of closing packed valve:
Securely tighten the valve stem with a special tool. Then securely tighten the valve stem cap with a spanner or the like.

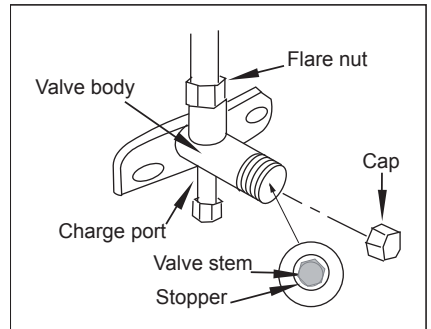
Fig.3.6.2-1



NOTE:

- There is a charging port integrated in the low side outlet, but not in the high side outlet. The low side outlet is shown in the sketch map below.

Fig.3.6.2-2



3.6.3 When using the vacuum pump

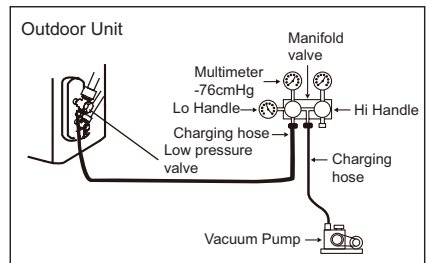
For method of using a manifold valve, refer to its operation manual.

1. Completely tighten the flare nuts at connection point A, B, C and D. Connect valve core removal tool to the charging port, then connect vacuum hose to valve core tool. Open the schrader valve.

NOTE:

- The schrader valve is inside the charging port.
2. Connect the other charge hose of manifold valve to the vacuum pump.
 3. Fully open the Low Side handle of the manifold valve.
 4. Operate the vacuum pump to evacuate. After starting evacuation, slightly loose the flare nut of the Low Side valve on the gas pipe side and check if the air is entering (Operation noise of the vacuum pump changes and a compound meter indicates 0 instead of minus), then tighten the flare nut. The procedure verifies if there are blocks inside the tubes.
 5. Make evacuation for 15 minutes or more and check that the compound meter indicates $-7\text{-}3/5 \times 10$ Microns Hg (-1×10 Pa). After the evacuation is completed, fully close the Low Side handle of the manifold valve and stop the operation of the vacuum pump.
 6. Turn the stem of the packed valve B about 45° counter clockwise for 6~7 seconds after the gas comes out, then tighten the flare nut again. Make sure the pressure display in the pressure indicator is a little higher than the atmospheric pressure. This procedure verifies if the refrigerant goes through the tubes correctly.
 7. Close the schrader valve, then remove the valve core tool. Replace the charging port cap.
 8. Fully open the packed valve stems B and A.
 9. Securely tighten the cap of the packed valve.

Fig.3.6.3

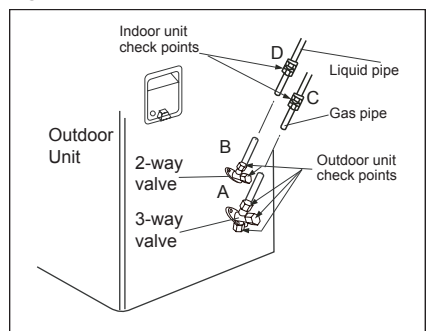


4. TEST AND RUNNING

4.1 Gas Leakage Check

1. Soap water method
 - Apply a soap water or a liquid neutral detergent on the indoor unit connection or outdoor unit connections (A: Low side valve, B: High side valve, C and D are ends of indoor unit connection) by a soft brush to check for leakage of the connecting points of the piping. If bubbles come out, the pipes have leakage point.

Fig.4.1



2. Leak detector

- Use the leak detector to check for leakage.

4.2 Electrical Safety Check

Perform the electric safety check after completing installation:

1. Earthing work
 - After finishing earthing work, measure the earthing resistance by visual detection and earthing resistance tester.
2. Electrical leakage check (performing during test running)
 - During test operation after finishing installation, the service person can use the electric probe and multimeter to perform the electrical leakage check. Turn off the unit immediately if refrigerant leakage happens. Check and find out the solution ways till the unit operate properly.

4.3 Operation Test

1. Before Operation Test
 - Do not switch on power before installation is finished complete.
 - Electric wiring must be connected correctly and securely.
 - Stop valves of the connection pipes should be fully opened.
 - All the impurities such as scraps and waste must be cleared from the unit.
2. Operation Test Method
 - Switch on power and press “ON/OFF” button on the remote controller to start the operation.
 - Press the button to select the COOL, HEAT (if applicable), FAN or any other mode to check if all the functions work well.
 - When the ambient temperature is lower than setting temperature, the unit can not be set on the remote controller to work in COOL mode. Please use the Emergency Operation mode which is used only when the remote is unavailable or in case of maintenance.

4.4 Pump Down

When relocating or disposing of the air conditioner, pump down the system following the procedure as below so that no refrigerant is released into the atmosphere.

- Connect the hose of manifold valve to the charge port of stop valve on the gas pipe side of the outdoor unit.
- Close the stop valve on the gas pipe side almost completely.
- Fully close the stop valve on the liquid pipe side.
- Turn on the unit in COOL mode.
- Fully close the stop valve on the gas pipe side when the pressure gauge shows 1 - 0.5 kgf/cm² (100 ~ 50 kPa).
- Stop the operation by turn the unit off and all the refrigerant gas has been collected in the outdoor unit.

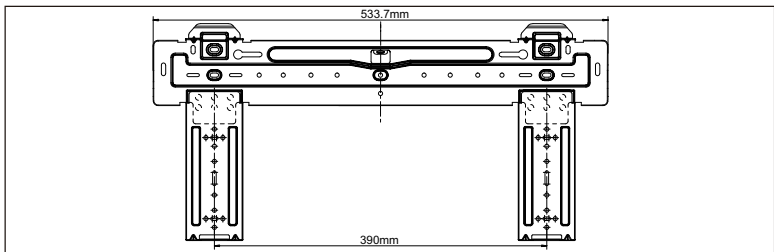
4.5 Check After Installation

Items to be checked	Possible malfunction
Has the unit been fixed firmly?	The unit may drop, shake or emit noise.
Have you done the refrigerant leakage test?	It may cause insufficient cooling (heating)
Is thermal insulation sufficient?	It may cause condensation.
Is water drainage satisfactory?	It may cause water leakage.
Is the voltage in accordance with the rated voltage marked on the nameplate?	It may cause electric malfunction or damage the unit.
Is the electric wiring or piping connection installed correctly and securely?	It may cause electric malfunction or damage the parts.
Has the unit been securely earthed?	It may cause electrical leakage.
Is the power cord specified?	It may cause electric malfunction or damage the parts.
Is the air inlet or outlet blocked	It may cause insufficient cooling (heating)
Are the stop valves of the connection pipes fully opened?	It may cause insufficient cooling (heating)

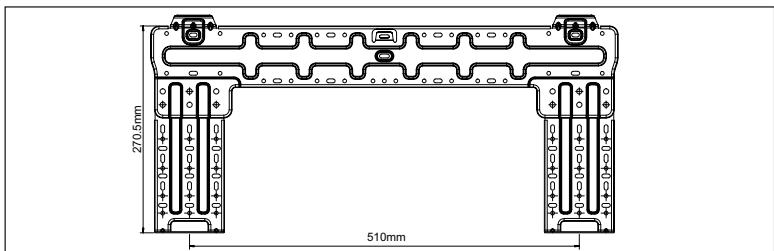
5. APPENDIX

Appendix(1)

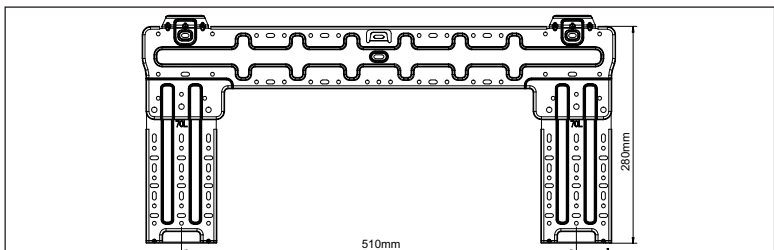
Outdoor Unit Dimension (mm)	Indoor Unit Dimension (mm)	Mounting Plate Type
660*500*240	750*285*200	A
665*420*280	750*285*200	A
730*545*285	750*285*200	A
800*545*315	750*285*200	A
730*545*285	837*296*205	A
800*545*315	837*296*205	A
800*545*315	952*310*227	B
825*655*310	952*310*227	B
900*700*350	1082*330*233	C



Type A



Type B



Type C

Appendix(2)

Minimum Cross-Sectional Area of Power and Power Cables	
Rated Current of Appliance (A)	Nominal Cross-Sectional Area (mm ²)
>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

Cable Types:

Indoor power cable:
H05VV-F (if applicable)

Power cable:
H07RN-F or H05RN-F

The size of the power supply cable, signal 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.

Appendix(3)

Models	Gas Pipe Diameter (mm)	Liquid Pipe Diameter (mm)	Standard Length (m)	Maximum Length (m) (A)	Maximum Height (m) (B)	Additional Refrigerant (g/m)
ESV09CRS-B2 ESV12CRS-B2 ESV09CRR-C6 ESV09CRR-C7	Ø9.52 (3/8")	Ø6.35 (1/4")	5	15	10	12

The Minimum length pipe is 3m

Additional refrigerant required for pipe length greater than standard 7.5m installation can be calculated using the following equation:

$$M = (F - 7.5) \times R$$

Where:

M = Mass of additional refrigerant (g)

F = Final installed connecting pipe length (m)

R = Additional refrigerant required per meter of connecting pipe (g/m) (refer to the above table)

Example:

If the total length (A) for 9K model is 10m, then the additional refrigerant need to fill by M:

$$M = (10 - 7.5) \times 12 = 30g$$

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