

INSTALLATION MANUAL AIR CONDITIONER

TYPE : WALL MOUNTED LSN-LSU-90-120HYV



P/No : MFL67502101



TIPS FOR SAVING ENERGY

Here are some tips that will help you minimize the power consumption when you use the air conditioner. You can use your air conditioner more efficiently by referring to the instructions below:

- Do not cool excessively indoors. This may be harmful for your health and may consume more electricity.
- Block sunlight with blinds or curtains while you are operating the air conditioner.
- Keep doors or windows closed tightly while you are operating the air conditioner.
- Adjust the direction of the air flow vertically or horizontally to circulate indoor air.
- Speed up the fan to cool or warm indoor air quickly, in a short period of time.
- Open windows regularly for ventilation as the indoor air quality may deteriorate if the air conditioner is used for many hours.
- Clean the air filter once every 2 weeks. Dust and impurities collected in the air filter may block the air flow or weaken the cooling / dehumidifying functions.

For your records

Staple your receipt to this page in case you need it to prove the date of purchase or for warranty purposes. Write the model number and the serial number here:

Model number : _____
 Serial number : _____
 You can find them on a label on the side of each unit.
 Dealer's name : _____
 Date of purchase : _____

IMPORTANT SAFETY INSTRUCTIONS

READ ALL INSTRUCTIONS BEFORE USING THE APPLIANCE.

Always comply with the following precautions to avoid dangerous situations and ensure peak performance of your product.

WARNING

It can result in serious injury or death when the directions are ignored.

CAUTION

It can result in minor injury or product damage when the directions are ignored.

WARNING

- Installation or repairs made by unqualified persons can result in hazards to you and others.
- Installation MUST conform with local building codes or, in the absence of local codes, with the National Electrical Code NFPA 70/ANSI C1-1003 or current edition and Canadian Electrical Code Part I CSA C22.1.
- The information contained in the manual is intended for use by a qualified service technician familiar with safety procedures and equipped with the proper tools and test instruments.
- Failure to carefully read and follow all instructions in this manual can result in equipment malfunction, property damage, personal injury and/or death.

Installation

- Don't use a power cord, a plug or a loose socket which is damaged.
- Otherwise, it may cause a fire or electrical shock.
- For electrical work, contact the dealer, seller, a qualified electrician, or an Authorized Service Center.
- Do not disassemble or repair the product. There is risk of fire or electric shock.
- Always ground the product.
- There is risk of fire or electric shock.
- Install the panel and the cover of control box securely.
- There is risk of fire or electric shock.
- Always install a dedicated circuit and breaker.
- Improper wiring or installation may cause fire or electric shock.
- Use the correctly rated breaker or fuse.
- There is risk of fire or electric shock.
- Do not modify or extend the power cable.
- There is risk of fire or electric shock.
- Do not let the air conditioner run for a long time when the humidity is very high and a door or a window is left open.
- Moisture may condense and wet or damage furniture.
- Be cautious when unpacking and installing the product.
- Sharp edges could cause injury. Be especially careful of the case edges and the fins on the condenser and evaporator.
- For installation, always contact the dealer or an Authorized Service Center.
- There is risk of fire, electric shock, explosion, or injury.

- Do not install the product on a defective installation stand.
- It may cause injury, accident, or damage to the product.
- Be sure the installation area does not deteriorate with age.
- If the base collapses, the air conditioner could fall with it, causing property damage, product failure, and personal injury.
- There is a risk of fire and explosion.
- Inert gas (nitrogen) should be used when you check plumbing leaks, cleaning or repairs of pipes etc. If you are using combustible gases including oxygen, product may have the risk of fires and explosions.

Operation

- Do not store or use flammable gas or combustibles near the product.
- There is risk of fire or failure of product.

CAUTION

- Installation**
- Always check for gas (refrigerant) leakage after installation or repair of product.
 - Low refrigerant levels may cause failure of product.
 - Install the drain hose to ensure that water is drained away properly.
 - A bad connection may cause water leakage.
 - Keep level even when installing the product.
 - To avoid vibration or water leakage.
 - Do not install the product where the noise or hot air from the outdoor unit could damage the neighborhoods.
 - It may cause a problem for your neighbors.
 - Use two or more people to lift and transport the product.
 - Avoid personal injury.
 - Do not install the product where it will be exposed to sea wind (salt spray) directly.
 - It may cause corrosion on the product. Corrosion, particularly on the condenser and evaporator fins, could cause product malfunction or inefficient operation.

INSTALLATION PARTS

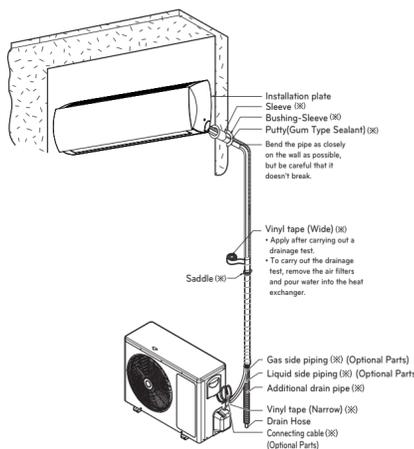
Name	Quantity	Shape
Installation plate	1 EA	
Type "A" screw	5 EA	
Type "B" screw	2 EA	
Type "C" screw	2 EA	
Remote control holder	1 EA	

Screws for fixing panels are attached to decoration panel.

INSTALLATION TOOLS

Figure	Name	Figure	Name
	Screw driver		Multi-meter
	Electric drill		Hexagonal wrench
	Measuring tape, Knife		Ammeter
	Hole core drill		Gas-leak detector
	Spanner		Thermometer, Level
	Torque wrench		Flaring tool set

INSTALLATION MAP



* The feature can be changed according to a type of model.

NOTE

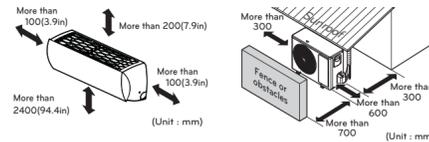
- You should purchase the installation parts.

INSTALLATION

Select the best Location

Indoor unit

- There should not be any heat or steam near the unit.
- Select a place where there are no obstacles around of the unit.
- Make sure that condensation drainage can be conveniently routed away.
- Do not install near a doorway.
- Ensure that the interval between a wall and the left (or right) of the unit is more than 100mm. The unit should be installed as high as possible on the wall, allowing a minimum of 200mm from ceiling.
- Use a metal detector to locate studs to prevent unnecessary damage to the wall.



* The feature can be changed according to a type of model.

CAUTION

- Install the indoor unit on the wall where the height from the floor is more than 2300mm.

Outdoor unit

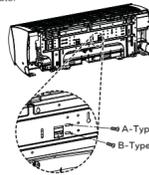
- If an awning is built over the unit to prevent direct sunlight or rain exposure, make sure that heat radiation from the condenser is not restricted.
- Ensure that the space around the back and sides is more than 300mm. The space in front of the unit should be more than 700mm of space.
- Do not place animals and plants in the path of the warm air.
- Take the weight of the air conditioner into account and select a place where noise and vibration are minimum.
- Select a place where the warm air and noise from the air conditioner do not disturb neighbors.

Indoor unit

Fixing Installation Plate

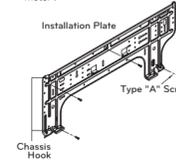
The wall you select should be strong and solid enough to prevent vibration.

- 1 Before installation, confirm the position of a screw between chassis and installation plate.



- 2 Mount the installation plate on the wall with type "A" screws. If mounting the unit on a concrete wall, use anchor bolts.

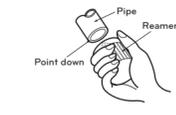
- Mount the installation plate horizontally by aligning the centerline using Horizontal meter.



- 3 Measure the wall and mark the centerline. It is also important to use caution concerning the location of the installation plate. Routing of the wiring to power outlets is through the walls typically. Drilling the hole through the wall for piping connections must be done safely.

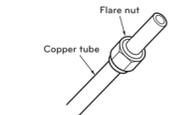
Burrs removal

- 1 Completely remove all burrs from the cut cross section of pipe/tubing.
- 2 While removing burrs put the end of the copper tube/pipe in a downward direction while removing burrs location is also changed in order to avoid dropping burrs into the tubing.



Putting nut on

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



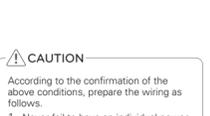
Flaring work

- 1 Firmly hold copper pipe in a bar with the dimension shown in the table below.
- 2 Carry out flaring work with the flaring tool.

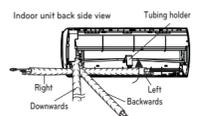
Outside diameter	inch	mm
mm		
06.35	1/4	1.1-1.3
09.52	3/8	1.5-1.7
012.7	1/2	1.6-1.8
015.88	5/8	1.6-1.8
019.05	3/4	1.9-2.1

Checking the Drainage

- 1 Open the panel of the indoor unit.
- 2 Remove the chassis cover from the unit by loosening 3 screws.



- 3 Pull back the tubing holder.
- 4 Remove pipe port cover and positioning the tubing.



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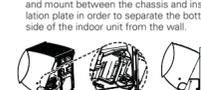
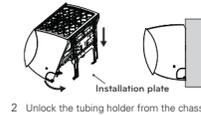
Good case

- Press on the tubing cover and unfold the tubing to downward slowly. And then bend to the left side slowly.



Installation of Indoor Unit

- 1 Hook the indoor unit onto the upper portion of the installation plate. Engage the three hooks at the top of the indoor unit with the upper edge of the installation plate. Ensure that the hooks are properly seated on the installation plate by moving it left and right.



- 2 Unlock the tubing holder from the chassis and mount between the chassis and installation plate in order to separate the bottom side of the indoor unit from the wall.



* The feature can be changed according to a type of model.

Piping

- 1 Raise the cover of terminal block.
- 2 Insert the connecting cable through the bottom side of indoor unit and connect the cable. (You can see detail contents in "Connecting the cables" section.)



Bad case

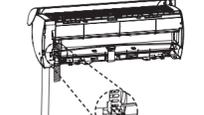
- Following bending case from right to left directly may cause damage to the tubing.



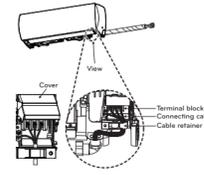
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CAUTION

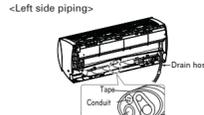
- Before bending the tubing, set the conduit like picture below by using the bracket and black screws from accessory kit.



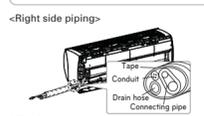
<Right side piping>



- 3 Secure the cable onto the control board with the cable retainer.
- 4 Close the cover of control box.
- 5 Tape the tubing pipe, drain hose and the conduit. Be sure that the drain hose is located at the lowest side of the bundle. Locating at the upper side can cause overflow from the drain pan through the inside of the unit.



<Left side piping>



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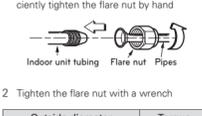
CAUTION

- Must use the elbow type (L-Type) conduit.
- Method:
1. Disassemble bracket (from indoor unit)
2. Assemble it with conduit
3. Reassemble it with indoor unit.



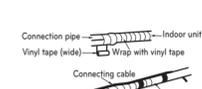
Wrap the insulation material around the connecting portion.

- 1 Overlap the connection pipe insulation material and the indoor unit pipe insulation material. Bind them together with vinyl tape so that there may be no gap.



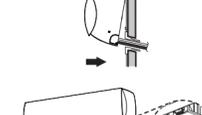
- 2 Tighten the flare nut with a wrench

Outside diameter	Torque	
mm	inch	kgf.m
06.35	1/4	1.8-2.5
09.52	3/8	3.4-4.2
012.7	1/2	5.5-6.5
015.88	5/8	6.3-8.2
019.05	3/4	9.9-12.1

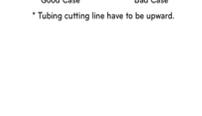
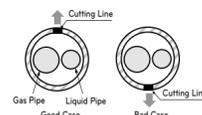
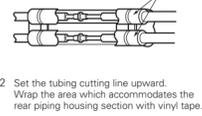
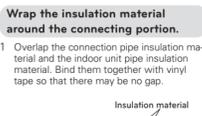
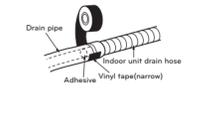
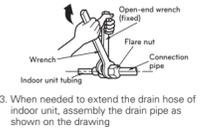


Finishing the indoor unit installation

- 1 Mount the tubing holder in the original position.
- 2 Ensure that the hooks are properly seated on the installation plate by moving it left and right.
- 3 Press the lower left and right sides of the unit against the installation plate until the hooks engage into their slots (clicking sound).
- 4 Finish the assembly by screwing the unit to the installation plate by using two pieces of type "C" screws. And assemble a chassis cover.

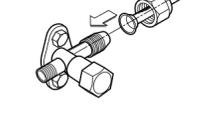
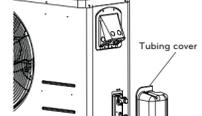


* The feature can be changed according to a type of model.



CAUTION

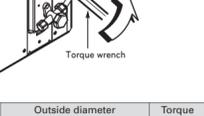
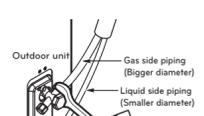
- Before finishing installation of the indoor unit, seal the hole of a wall except the pipe's ways to prevent condensate from inflow of outdoor air.



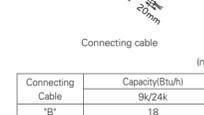
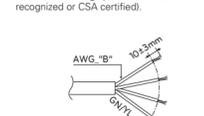
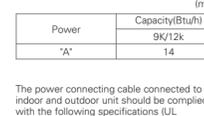
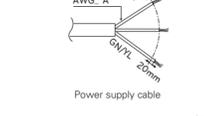
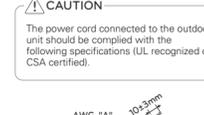
* The feature can be changed according to a type of model.



- Finally, tighten the flare nut with torque wrench until the wrench clicks. When tightening the flare nut with torque wrench, ensure the direction for tightening follows the arrow on the wrench.

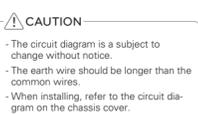


Outside diameter	Torque	
mm	inch	kgf.m
06.35	1/4	1.8-2.5
09.52	3/8	3.4-4.2
012.7	1/2	5.5-6.5
015.88	5/8	6.3-8.2
019.05	3/4	9.9-12.1



Connecting the Cables

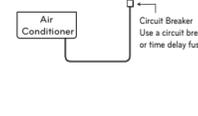
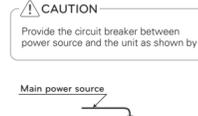
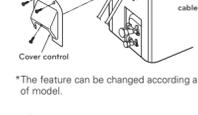
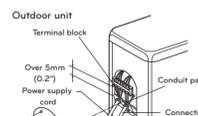
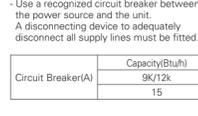
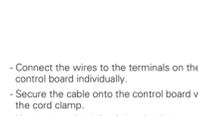
Connect the cable to the indoor unit by connecting the wires to the terminals on the control board individually according to the outdoor unit connection. (Ensure that the color of the wires of the outdoor unit and the terminal No. are the same as those of the indoor unit.)



- The circuit diagram is a subject to change without notice.
- The earth wire should be longer than the common wires.
- When installing, refer to the circuit diagram on the chassis cover.
- Connect the wires firmly so that they may not be pulled out easily.
- Connect the wires according to color codes, referring to the wiring diagram.



- Assemble it with conduit.

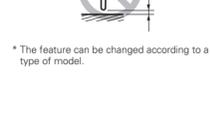


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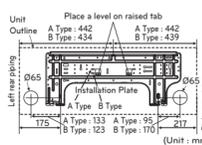
CAUTION

According to the confirmation of the above conditions, prepare the wiring as follows.

- 1 Never fail to have an individual power circuit specifically for the air conditioner. As for the method of wiring, be guided by the circuit diagram posted on the inside of control cover.
- 2 The screw which fasten the wiring in the casing of electrical fittings are liable to come loose from vibrations to which the unit is subjected during the course of transportation. Check them and make sure that they are all tightly fastened. (If they are loose, it could cause burn-out of the wires.)
- 3 Specification of power source.
- 4 Confirm that electrical capacity is sufficient.
- 5 See that the starting voltage is maintained at more than 90 percent of the rated voltage marked on the name plate.
- 6 Confirm that the cable thickness is as specified in the power source specification. (Particularly note the relation between cable length and thickness.)
- 7 Always install an earth leakage circuit breaker in a wet or moist area.
- 8 The following would be caused by voltage drop.
- Vibration of a magnetic switch, which will damage the contact point, fuse breaking, disturbance of the normal function of the overload.
- 9 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) conductors.

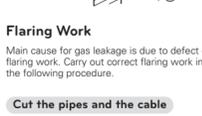


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Drill a Hole in the Wall

- Drill the piping hole with a ø65mm hole core drill. Drill the piping hole at either the right or the left with the hole slightly slanted to the outdoor side.

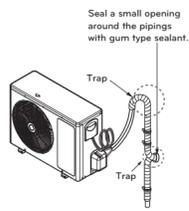


Flaring Work

Main cause for gas leakage is due of defect of flaring work. Carry out correct flaring work in the following procedure.

In cases where the outdoor unit is installed above the indoor unit perform the following:

- 1 Tape the piping and connecting cable from down to up.
- 2 Secure the taped piping along the exterior wall. Form a trap to prevent water entering the room.
- 3 Fix the piping onto the wall using saddle or equivalent



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Air Purging

The air and moisture remaining in the refrigerant system have undesirable effects as indicated below.

- Pressure in the system rises.
 - Operating current rises.
 - Cooling (or heating) 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, after evacuating the system, take a leak test for the piping and tubing between the indoor and outdoor unit.

Air purging with vacuum pump

Preparation
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.

Leak test
Connect the manifold valve (with pressure gauges) and dry nitrogen gas cylinder to this service port with charge hoses.

CAUTION

Be sure to use a manifold valve for air purging. If it is not available, use a stop valve for this purpose. The knob of the 3-way valve must always be kept close.

- Pressurize the system to not more than 150 P.S.I.G. with dry nitrogen gas and close the cylinder valves when the gauge reading reaches 150 P.S.I.G. Next, test for leaks with liquid soap.

CAUTION

To avoid nitrogen entering the refrigerant system in a liquid state, the top of the cylinder must be higher than its bottom when you pressurize the system. Usually, the cylinder is used in a vertical standing position.

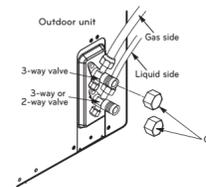
WARNING

There is a risk of fire and explosion.

- Inert gas (nitrogen) should be used when you check plumbing leaks, cleaning or repairs of pipes etc. If you are using combustible gases including oxygen, product may have the risk of fires and explosions.

Evacuation

Connect the charge hose end described in the preceding steps to the vacuum pump to evacuate the tubing and indoor unit. Confirm the "L" knob of the pressure Gauge is open. Then, run the vacuum pump. The operation time for evacuation varies with tubing length and capacity of the pump. The following table shows the time required for evacuation.



Required time for evacuation when 30 gal/h vacuum pump is used	
If tubing length is less than 10m (33 ft)	If tubing length is longer than 10m (33 ft)
10 min. or more	15 min. or more

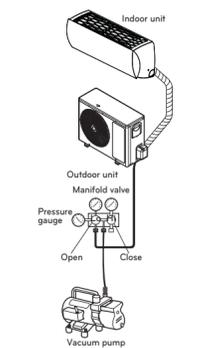
When the desired vacuum is reached, close the knob of the 3-way valve and stop the vacuum pump.

Soap water method

- Remove the caps from the 2-way and 3-way valves.
- Remove the service-port cap from the 3-way valve.
- Apply a soap water or a liquid neutral detergent on the indoor unit connection or outdoor unit connections by a soft brush to check for leakage of the connecting points of the piping.
- If bubbles come out, the pipes have leakage

Finishing the Job

- With a service valve wrench, turn the valve of liquid side counter-clockwise to fully open the valve
- Turn the valve of gas side counter clockwise to fully open the valve
- Loosen the charge hose connected to the gas side service port slightly to release the pressure, then remove the hose.
- Replace the flare nut and its bonnet on the gas side service port and fasten the flare nut securely with an adjustable wrench. This process is very important to prevent leakage from the system.

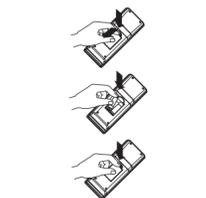


Test Running

- Check that all tubing and wiring are properly connected.
- Check that the gas and liquid side service valves are fully open.

Prepare remote controller

- 1 Remove the battery cover by pulling it according to the arrow direction.
- 2 Insert new batteries making sure that the (+) and (-) of battery are installed correctly.
- 3 Reattach the cover by pushing it back into position.



NOTE

- Use 2 AAA (1.5 volt) batteries. Do not use rechargeable batteries.
- Remove the batteries from the remote controller if the system is not used for a long time

Evaluation of the performance

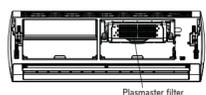
Operate the unit for 15-20 minutes, then check the system refrigerant charge.

- Measure the pressure of the gas side service valve.
- Measure the air temperature from inlet and outlet of air conditioner.
- Ensure the difference between the inlet and outlet temperature is more than 2°C.
- For reference, the gas side pressure at optimum condition is shown on table (cooling)

The air conditioner is now ready to use.

Installation of filters

- 1 Detach two nitro tapes from the plasma filter.



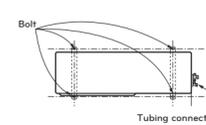
* The feature can be changed according to a type of model.

Settlement of outdoor unit

Fix the outdoor unit with a bolt and nut (10mm) tightly and horizontally on a concrete or rigid mount.

When installing on the wall, roof or rooftop, anchor the mounting base securely with a nail or wire assuming the influence of wind and earthquake.

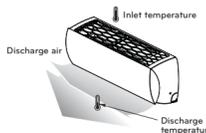
If the vibration of the unit is transmitted to the pipe, secure the unit with an anti-vibration rubber.



Pump down

This is performed when the unit is relocated or the refrigerant circuit is serviced. Pump Down means collecting all refrigerant into the outdoor unit without the loss of refrigerant.

- Measure the air temperature from inlet and outlet of air conditioner.
- Ensure the difference between the inlet and outlet temperature is more than 2°C.
- For reference, the gas side pressure at optimum condition is shown on table (cooling)



Refrigerant	Outside ambient TEMP.	The pressure of the gas side	
		GAS	LIQUID
R-410A	35°C	0.5-0.5kg/cm ² (G)	20-135 P.S.I.G.

*The feature can be changed according to a type of model.

NOTE

If the actual pressure is higher than shown, the system is most likely over-charged, and charge should be removed. If the actual pressure are lower than shown, the system is most likely under-charged, and charge should be added.

CAUTION

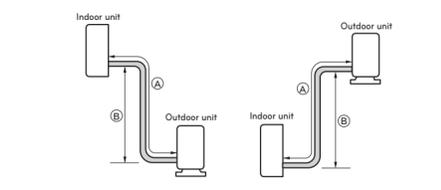
Be sure to perform Pump Down procedure in the cooling mode.

Pump Down Procedure

- Connect a low-pressure gauge manifold hose to the charge port on the gas side service valve.
- Open the gas side service valve halfway and purge the air in the manifold hose using the refrigerant.
- Close the liquid side service valve (all the way).
- Turn on the unit's operating switch and start the cooling operation.
- When the low-pressure gauge reading becomes 1 to 0.5kg/cm² G (14.2 to 7.1 P.S.I.G.), fully close the gas side valve and then quickly turn off the unit. Now Pump Down procedure is completed, and all refrigerant is collected into the outdoor unit.

Piping Length and Elevation

Capacity (W)	Pipe Size				Standard Length (m)	Max. Length ⌀ (m)	Max. Elevation ⌀ (m)	Additional Refrigerant (g/m) (after 12.5 m)
	GAS	LIQUID	GAS	LIQUID				
2.5k, 3.5k	Ø9.52	3/8	Ø6.35	1/4	7.5	20	10	20



CAUTION

Capacity is based on standard length and maximum allowable length is on the basis of reliability. Additional refrigerant must be charged after 12.5 m (there is no need to charge till 12.5 m based on reliability)

Operation ranges

The table below indicates the temperature ranges the air conditioner can be Operated within.

Mode	Indoor temperature	Outdoor temperature
Cooling	-10°C~48°C(14°F~118.4°F)	-10°C~48°C(14°F~118.4°F)
Heating	-10°C~24°C(14.0°F~75.2°F)	-10°C~24°C(14.0°F~75.2°F)

Installation guide at the seaside

CAUTION

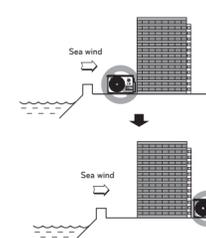
Air conditioners should not be installed in areas where corrosive gases, such as acid or alkaline gas, are produced.

Do not install the product where it could be exposed to sea wind (salty wind) directly. It can result corrosion on the product. Corrosion, particularly on the condenser and evaporator fins, could cause product malfunction or inefficient performance.

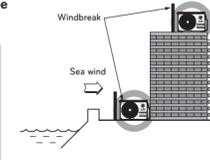
If outdoor unit is installed close to the seaside, it should avoid direct exposure to the sea wind. Otherwise it needs additional anticorrosion treatment on the heat exchanger.

Selecting the location (Outdoor Unit)

If the outdoor unit is to be installed close to the seaside, direct exposure to the sea wind should be avoided. Install the outdoor unit on the opposite side of the sea wind direction.



In case, to install the outdoor unit on the seaside, set up a windbreak not to be exposed to the sea wind.



- It should be strong enough like concrete to prevent the sea wind from the sea.
- The height and width should be more than 150% of the outdoor unit.
- It should be keep more than 70 cm of space between outdoor unit and the windbreak for easy air flow.

Select a well-drained place.

NOTE

- If you can't meet above guide line in the seaside installation, please contact LG Electronics for the additional anticorrosion.
- Periodic (more than once/year) cleaning of the dust or salt particles stuck on the heat exchanger by using water