SAMSUNG

"EEE Yönetmeliğine Uygundur"
"This EEE is compliant with RoHS"

RC✳✳✳MHXGA
RC✳✳✳MHXEA

Air to Water Heat Pump Mono Outdoor Unit
installation manual

Planet First 100% Recycled Paper

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ⒺⓈⒻⒾⓅⒹⒼⓇ DB98-00000A(1)

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Contents

Safety precautions

Carefully follow the precautions listed below because they are essential to guarantee the safety of the equipment.

WARNING

- Always disconnect a power supply of Air-Water Heat Pump before servicing it or accessing components inside the unit.
- Verify that installation and testing operations shall be performed by qualified personnel.
- To prevent serious damage on the system and injuries to users, precautions and other notices shall be observed.

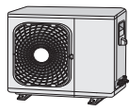
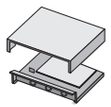
Warning

- Carefully read the content of this manual before installing the air to water heat pump and store the manual in a safe place in order to be able to use it as reference after installation.
- For maximum safety, installers should always carefully read the following warnings.
- Store the operation and installation manual in a safe location and remember to hand it over to the new owner if the air conditioner is sold or transferred.
- Store the user and installation manual in a safe location and remember to hand it over to the new owner if the air to water heat pump is sold or transferred.
- This manual explains how to install Air-Water Heat Pump. The use of other types of units with different control systems may damage the units and invalidate the warranty. The manufacturer shall not be responsible for damages arising from the use of non compliant units.
- The air conditioner is compliant with the requirements of the Low Voltage Directive (72/23/EEC), the EMC Directive (89/336/EEC) and the Directive on pressurized equipment (97/23/EEC).
- The manufacturer shall not be responsible for damage originating from unauthorized changes or the improper connection of electric and hydraulic lines. Failure to comply with these instructions or to comply with the requirements set forth in the "Operating limits" table, included in the manual, shall immediately invalidate the warranty.
- Do not use the units if you see some damages on the units and recognize something bad such as loud noisy, smell of burning.
- In order to prevent electric shocks, fires or injuries, always stop the unit, disable the protection switch and contact SAMSUNG's technical support if the unit produces smoke, if the power cable is hot or damaged or if the unit is very noisy.
- Always remember to inspect the unit, electric connections, refrigerant tubes and protections regularly. These operations shall be performed by qualified personnel only.
- The unit contains moving parts and electrical parts, which should always be kept out of the reach of children.

- Do not attempt to repair, move, alter or reinstall the unit by unauthorized personnel, these operations may cause product damage, electric shocks and fires.
- Do not place containers with liquids or other objects on the unit.
- All the materials used for the manufacture and packaging of the air to water heat pump are recyclable.
- The packing material and exhaust batteries of the remote controller(optional) must be disposed of in accordance with local regulations.
- The air to water heat pump containing a refrigerant must be disposed in authorized center or returned to retailer as special wastes.
- Wear protective gloves to unpack, move, install, and service the unit to avoid your hands being injured by the edge of the parts.
- Do not touch the internal parts (water pipes, refrigerant pipes, heat exchangers, etc) while running the units. And if you need to adjust and touch the units, have enough time for the unit can be cooled and be sure to wear protective gloves.
- In case of refrigerant leakage, try to avoid getting in contact with the refrigerant because this could result in severe wounds.
- When you install the Air to water heat pump in a small room, you must consider a proper ventilation to prevent a leakage level within the maximum permissible limit.
  - In that case, you may die from suffocation by some possibility.
- Make sure to safely dispose of packing materials. Packing materials, such as nails and other metal or wooden pallets may cause children get injured.
- Inspect the product shipped and check if damaged during transport. If the product has some damages, DO NOT INSTALL and immediately discuss about the damages with the carrier or retailer (if the installer or the authorized technician has collected the material from the retailer.)
- Our units shall be installed in compliance with the spaces described in the installation manual, to ensure accessibility from both sides and allow repairs or maintenance operations to be carried out.
  If the units installed without complying with procedures described in manual, additional expenses can be asked because special harnesses, ladders, scaffolding or any other elevation system for repair service will NOT be considered part of the warranty and will be charged to the end customer.
- Always make sure that the power supply is compliant with local safety standards.
- Verify that the voltage and frequency of the power supply comply with the specifications and input power is sufficient to ensure the operation of any other domestic appliance connected to the same electric lines.
  Always verify that the cut-off and protection switches are suitably selected.
- Always verify that electric connections (cable entry, section of leads, protections…) are compliant with the electric specifications and with the instructions provided in the wiring scheme. Always verify that all connections comply with the standards applicable to the installation of air to water heat pumps.
  Devices disconnected from the power supply should be completely disconnected in the condition of overvoltage category.
- Do not connect the earth wire to the gas pipe or water pipe, lighting rod, surge absorber, or telephone earth wire.
  If earthing is not complete, it may cause an electric shock or fire.
- Be sure to install both an earth leakage detector and circuit breaker with specified capacity in accordance with relevant local and national regulations.
  - If it is not installed properly, it may cause electric shocks and fire.
- Make sure that the condensed water runs well out of the unit at low ambient temperature. Drain pipe and cond heater can frost/ice can not grow. If drain work is not effective for releasing condensed water, it can make the units get damaged by massive ice and system can be stop , covered by ice.
- Install the power cable and communication cable of the indoor and outdoor unit at least 1m away from the electric appliance.
- Protect the unit from rats or small animals. If an animal makes a contact with the electric parts, it can cause malfunctions, smoke or fire. Please instruct the customer to keep the area around the unit clean.

Product Specifications

Product Line-up

Line-up				Remark
Heat Pump Units	Chassis			-
	Model Name	RC090MHXEA	RC120MHXEA RC120MHXGA RC140MHXEA RC140MHXGA RC160MHXEA RC160MHXGA	
Auxiliary Parts	 Control Kit	MIM-E03A		Requisite
	 Domestic Hot Water tank	Standard models: **NH200WHXEA** **NH300WHXEA** Solar connected **NH200WHXES** **NH300WHXES**		Option

Accessories

- Keep supplied accessories until the installation is finished.
- Hand the installation manual over to the customer after finishing installation.
- The quantities are indicated in parentheses.

Installation manual (1)	Drain plug (1)	Fastener-nut(1)	Rubber-cover wire(2)	Drain cap (1)
				

Product Specifications

Type		Unit	RC120MHXEA RC120MHXGA	RC140MHXEA RC140MHXGA	RC160MHXEA RC160MHXGA
Power Source		-	1P, 220~240VAC 50Hz 3P, 380-415VAC 50Hz	1P, 220~240VAC 50Hz 3P, 380-415VAC 50Hz	1P, 220~240VAC 50Hz 3P, 380-415VAC 50Hz
Nominal Capacity	7°C	kW	12.0	14.0	16.0
	2°C	kW	10.0	13.0	15.0
	-15°C	kW	12.5.	12.5	12.5
COP (A7-W35)		-	4.70	4.50	4.30
Compressor		-	Rotary Inverter	Rotary Inverter	Rotary Inverter
Condenser		-	Brazing type 72 plates	Brazing type 72 plates	Brazing type 72 plates
Evaporator		-	Φ7, FP 1.7, L950	Φ7, FP 1.7, L950	Φ7, FP 1.7, L950
Fan & Motor		-	Propeller, Φ520, 3-blade BLDC Inverter	Propeller, Φ520, 3-blade BLDC Inverter	Propeller, Φ520, 3-blade BLDC Inverter
Flow Switch		LPM	16 ± 1.5 Magnetic (decreasing)	16 ± 1.5 Magnetic (decreasing)	16 ± 1.5 Magnetic (decreasing)
Base Heater		W	150	150	150
Refrigerant		g	2,200 (R410A)	2,200 (R410A)	2,200 (R410A)
Noise (Heat/Cool, Pressure)		dB	64/62	64 / 62	64 / 62
Water Connection (In/Out)		Inch	1.0 / 1.0	1.0 / 1.0	1.0 / 1.0
Leaving Water Temperature		℃	Cooling : 5 ~ 25 Heating : 25 ~ 55	Cooling : 5 ~ 25 Heating : 25 ~ 55	Cooling : 5 ~ 25 Heating : 25 ~ 55
Operating range (Heat/Cool)		℃	-20~35 / 10~46	-20~35 / 10~46	-20~35 / 10~46
Weight (net)		Kg	112	112	112
Size (WxHxD, net)		mm	940 x 1,420 x 330	940 x 1,420 x 330	940 x 1,420 x 330

Product Specifications

Type		Unit	RC090MHXEA
Power Source		-	1P, 220~240VAC 50Hz
Nominal Capacity	7°C	kW	9
	2°C	kW	9
	-15°C	kW	7
COP (A7-W35)		-	4.1
Compressor		-	Rotary Inverter
Condenser		-	Brazing type 48 plates
Evaporator		-	Φ7, FP 1.6, L850
Fan & Motor		-	Propeller, Φ520, 3-blade BLDC Inverter
Flow Switch		LPM	16 ± 1.5 Magnetic (decreasing)
Base Heater		W	150
Refrigerant		g	1,850 (R410A)
Noise (Heat/Cool, Pressure)		dB	63/ 60
Water Connection (In/Out)		Inch	1.0 / 1.0
Leaving Water Temperature		°C	Cooling : 5 ~ 25 Heating : 25 ~ 55
Operating range (Heat/Cool)		°C	-20~35 / 10~46
Weight (net)		Kg	83
Size (WxHxD, net)		mm	940 x 998 x 330

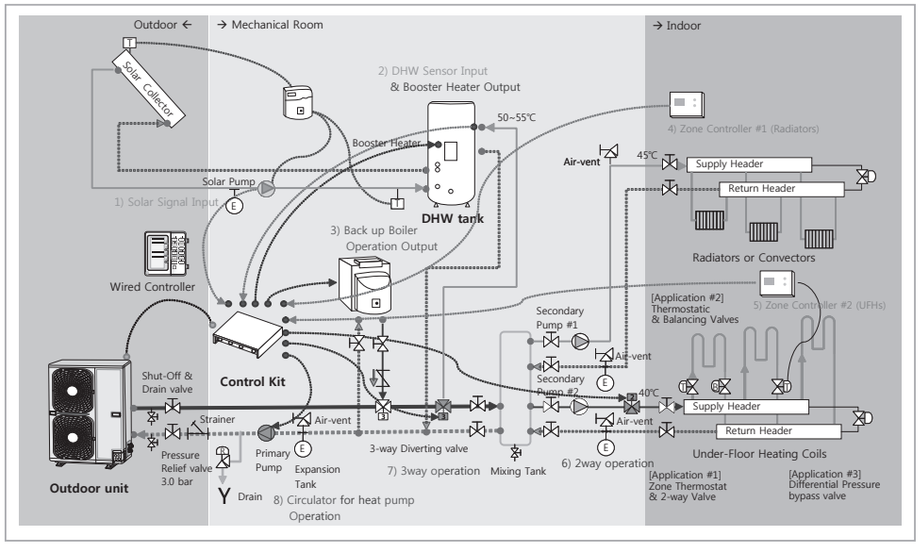
Application Examples

WARNING

- The application examples given below are for illustration purposes only.
- Always ensure that the ambient temperature around the unit has to be above 0°C around the year. If the ambient temperature around the unit falls below 0°C, the units and water pipes will freeze and burst with cold.
- When the SAMSUNG Air-to-Water Heat Pump system is used in series with another heat source (e.g. gas boiler), ensure that the return water temperature not exceed 55°C.
- The unit is only to be used in a closed water system. Application in an open water circuit can lead to excessive corrosion of the water piping.
- SAMSUNG can not be put responsible for incorrect or unsafe situations in the water system. Make sure that the boiler, radiators, convectors, solar collectors, UFHs, FCUs, additional pumps, pipings, and controls in the water system are in accordance with relevant local laws and regulations under the installer's responsibility.
- Always keep the minimum water volume even if all the valves are closed. A mixing tank or buffer tank is a good solution to maintain the flow rate balancing between a heat source and heat loads. When a mixing tank is not installed and it is closing several loops in the system by remotely controlled valves, make sure to install a differential pressure bypass valve.
- SAMSUNG shall not be held liable for any damage resulting from not observing this rule.

Application #1

Mono Outdoor + Control Kit



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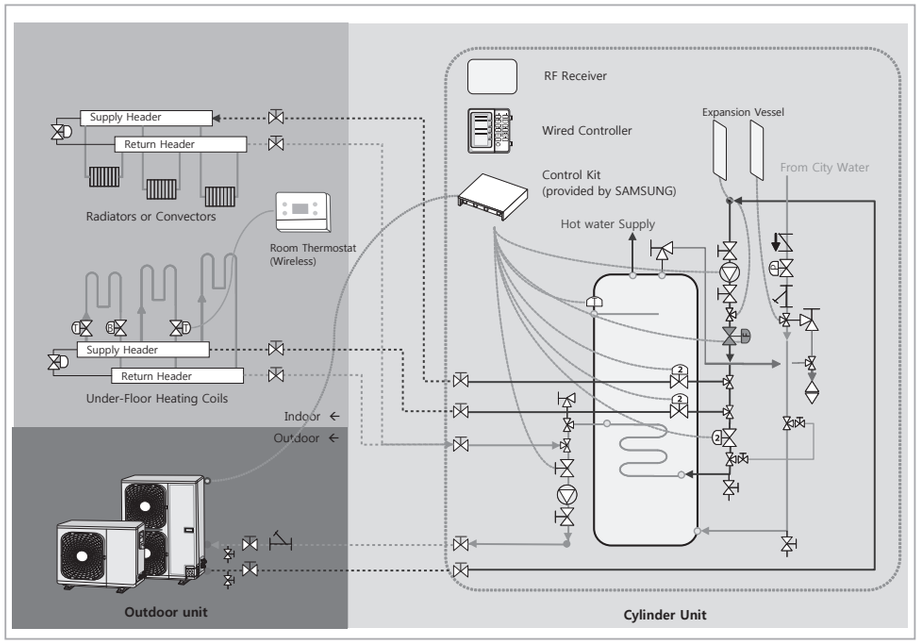
Application Examples

Application #2

Mono Outdoor + Cylinder Unit

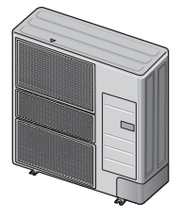


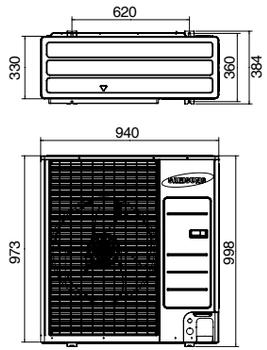
Main Components

Dimensions(Overall)

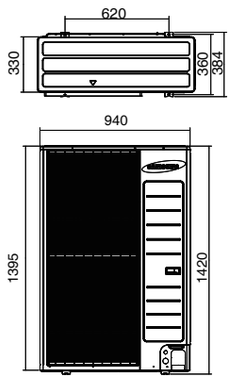
Heat Pump for R410A.

1-Fan Chassis: RC090MHX✳





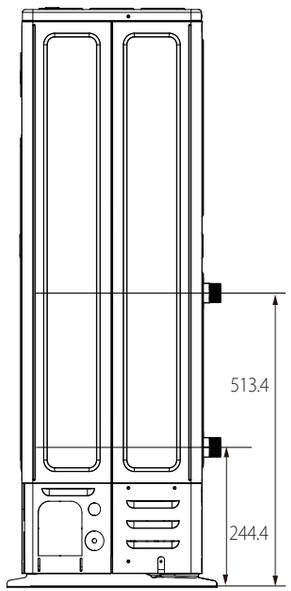
2-Fan Chassis: RC120MHX✳/RC140MHX✳/RC160MHX✳



Main Components

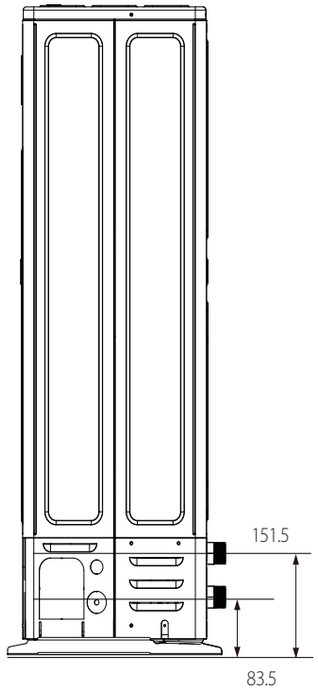
Dimensions (Water pipe)

RC090MHX✳



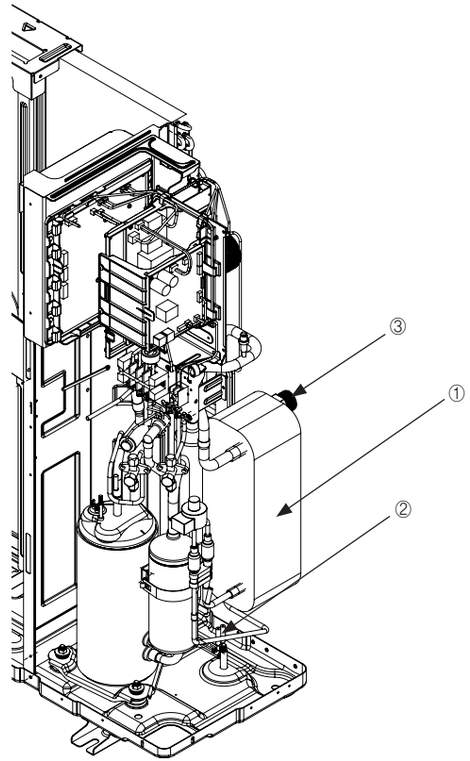
(Unit : mm)

RC120MHX✳/RC140MHX✳/RC160MHX



(Unit : mm)

Components(RC090✳)



NO.	Name	Note.
1	PHE	48P
2	Base Heater	SUS316L, 150W
3	Water fitting	BSPP 1" Male

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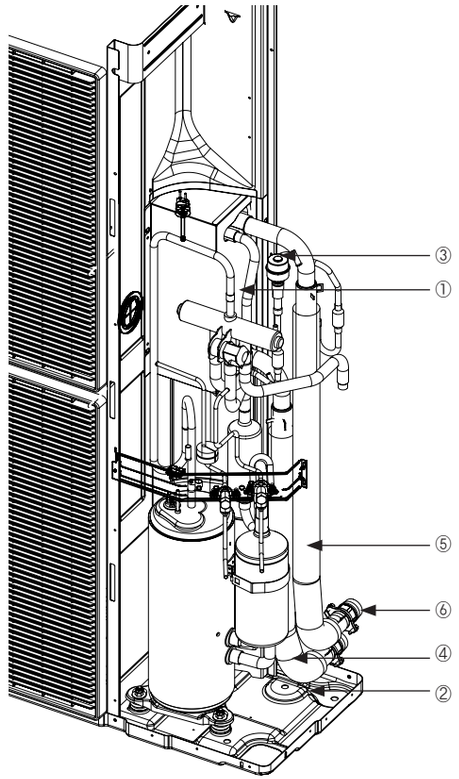
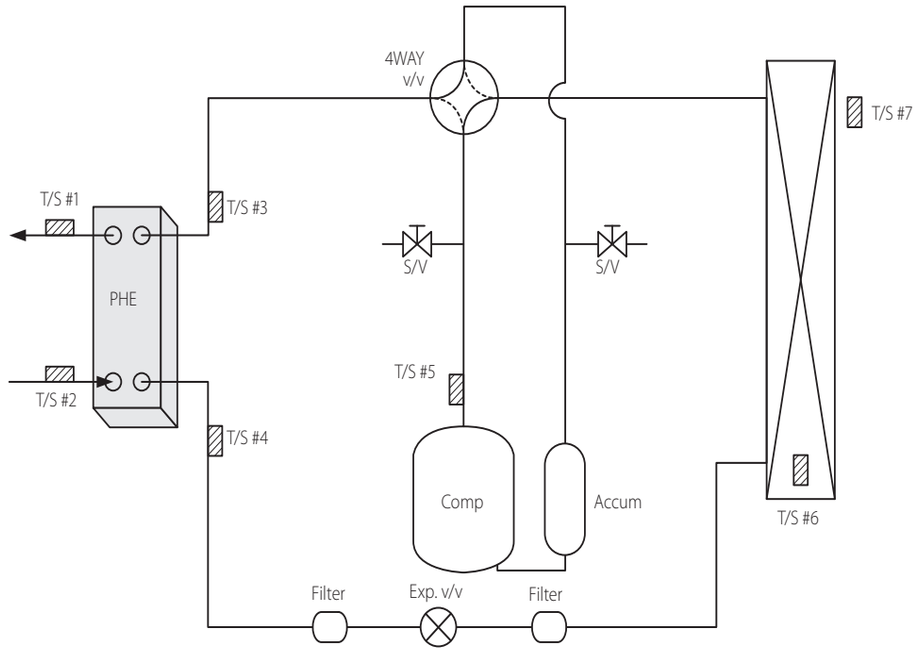
Main Components

Components(RC120✳/140✳/160✳)



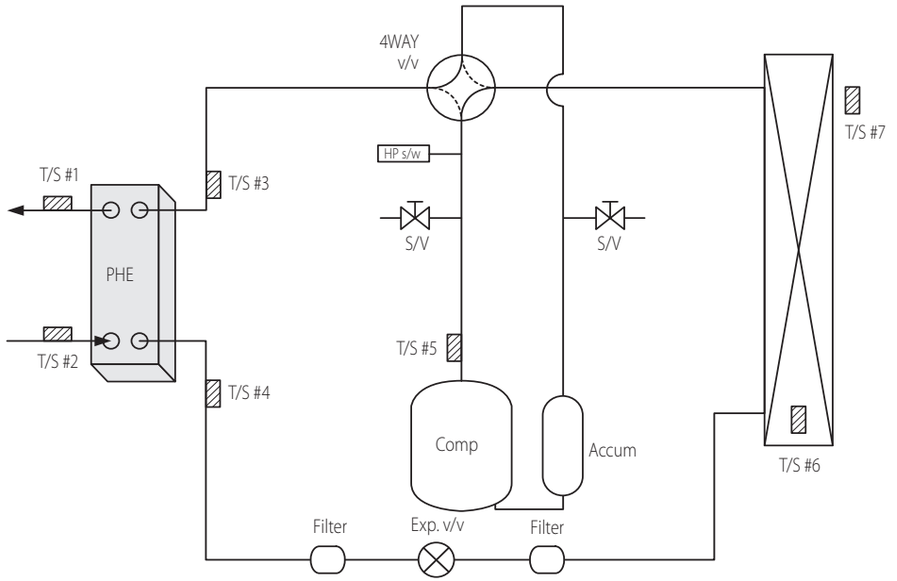
NO.	Name	Note.
1	PHE	72P
2	Base Heater	SUS316L, 150W
3	Flow switch	16LPM+/-1.5
4	Water Hose In	Rubber Hose
5	Water Hose Out	Rubber Hose
6	Water fitting	BSPP 1" Male

Functional Diagram (RC090MHX✳)



Part	Description
PHE	Plate heat exchanger
T/S #1	For water outlet temp sensor
T/S #2	For water inlet temp sensor
T/S #3	For PHE In temp
T/S #4	For PHE Out temp
T/S #5	For discharge temp
T/S #6	For Cond temp
T/S #7	For Ambient temp sensor
S/V	Service valve ¼ inch
Accum	ACCUMULATOR

Functional Diagram (RC120MHX✳/RC140MHX✳/RC160MHX✳)



Part	Description
PHE	Plate heat exchanger
T/S #1	For water outlet temp sensor
T/S #2	For water inlet temp sensor
T/S #3	For PHE In temp
T/S #4	For PHE Out temp
T/S #5	For discharge temp
T/S #6	For Cond temp
T/S #7	For Ambient temp sensor
S/V	Service valve ¼ inch
Accum	ACCUMULATOR

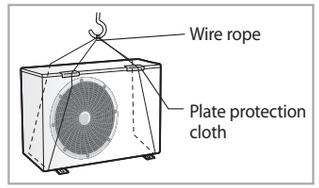
Installing the Unit

Moving the Outdoor Unit

- Select the moving route in advance.
- Be sure that moving route is safe from weight of the outdoor unit.
- Do not slant the product more than 30˚ when carrying it. (do not lay the product down sideways)
- The surface of the heat exchanger is sharp. Be carefule not to be injured while moving and installing.

Moving the Outdoor Unit by Wire Rope

Fasten the outdoor unit by two 8m or longer wire ropes as shown at the figure. To prevent from damage or scratches, insert a piece of cloth between the outdoor unit and rope, then move the unit.

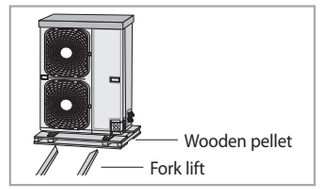


✳ The appearance of the unit may be different from the picture depending on the model.

Moving the outdoor unit with a fork lift

Insert the fork into the wooden pallet at the bottom of the outdoor unit carefully.

Be careful that the fork does not damage the outdoor unit.



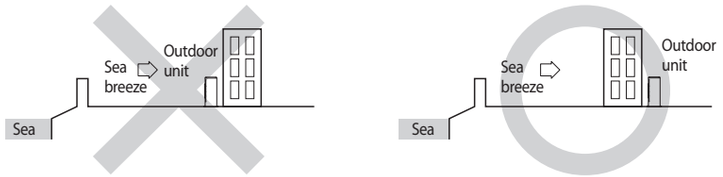
Deciding on Where to Install the Outdoor Unit

Decide the installation location regarding the following condition and obtain the user's approval.

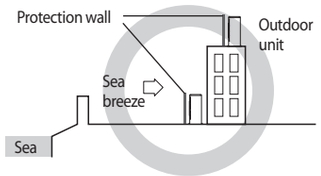
- ◆ The outdoor unit must not be placed on its side or upside down, as the compressor lubrication oil will run into the cooling circuit and seriously damage the unit.
- ◆ Choose a location that is dry and sunny, but not exposed to direct sunlight or strong winds.
- ◆ Do not block any passageways or thoroughfares.
- ◆ Choose a location where the noise of the Air to Water Heat Pump when running and the discharged air do not disturb any neighbours.
- ◆ Choose a position that enables the pipes and cables to be easily connected to the other hydrauric system.
- ◆ Install the outdoor unit on a flat, stable surface that can support its weight and does not generate any unnecessary noise and vibration.
- ◆ Position the outdoor unit so that the air flow directly stream towards the open area.
- ◆ Place the outdoor unit where there are no plants and animals because they may cause malfunction of outdoor unit.
- ◆ Maintain sufficient clearance around the outdoor unit, especially from a radio, computer, stereo system, etc.
- ◆ When installing the outdoor unit near seashore, make sure it is not directly exposed to sea breeze. If you can not find an adequate place without direct sea breeze, make sure to apply anti-corrosion coating on the heat exchanger.

Installing the Unit

- Install the outdoor unit in a place (such as near buildings etc.) where it can be prevented from sea breeze which can damage the outdoor unit.



- If you cannot avoid installing the outdoor unit by the seashore, construct a protection wall around to block the sea breeze.



▶ Protection wall should be constructed with a solid material such as concrete to block the sea breeze and the height and the width of the wall should be 1.5 times larger than the size of the outdoor unit. Also, secure over 700mm between the protection wall and the outdoor unit for exhausted air to ventilate.

- Install the outdoor unit in a place where water can drain smoothly.

❊ If you cannot find a place satisfying above conditions, please contact manufacturer. Make sure to clean the sea water and the dust on the outdoor unit heat exchanger.

◆ Do not install the Air to Water Heat Pump in following places.

- The place where there is mineral oil or arsenic acid.
  There is a chance that parts may get damaged due to burned resin.
  The capacity of the heat exchanger may reduce or the Air to Water Heat pump may be out of order.
- The place where corrosive gas such as sulfurous acid gas generates from the vent pipe or air outlet
  The copper pipe or connection pipe may corrode and refrigerant may leak.
- The place where there is a danger of existing combustible gas, carbon fiber or flammable dust.
  The place where thinner or gasoline is handled.

CAUTION

Do not install the outdoor unit in a snowy and cold area (low temperature and high humidity area - where the temperature is below -7°C and humidity is higher than 85%) because according to operation condition (defrost, etc.), ice may be formed in the drain route.
If the ice is accumulated, it may cause critical damage to the product.
ex) lakeside of cold area in winter time, seashore, alpine region and etc.

CAUTION

- This device must be installed according to the national electrical rules.
- With an outdoor unit having net weight upper than 60kg, we suggest do not install it suspended on wall, but considering floor standing one.

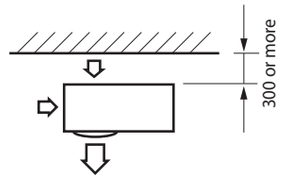
◆ If the outdoor unit is installed at a height, ensure that its base is firmly fixed in position.

◆ Make sure that the water dripping from the drain hose runs away correctly and safely.

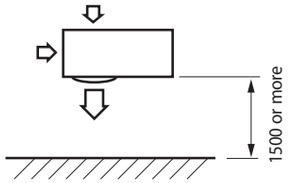
◆ When you install the outdoor unit at wayside, you should install it above 2m height or make sure that the heat from the outdoor unit shouldn't be in direct contact with passersby. (The ground for application :The revision of regulation for facility in building by the law of the Ministry of Construction and Transportation.

Space Requirements for Outdoor Unit

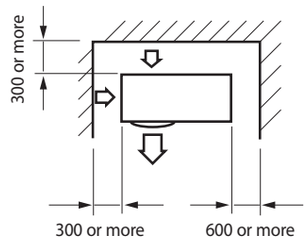
When installing 1 outdoor unit



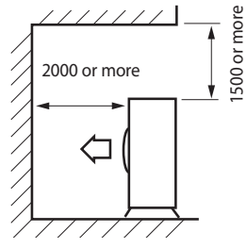
❊ When the air outlet is opposite the wall



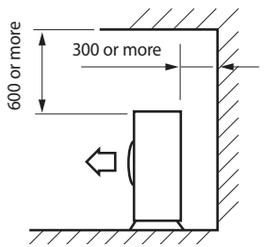
❊ When the air outlet is towards the wall



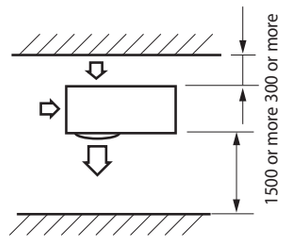
❊ When 3 sides of the outdoor unit are blocked by the wall



❊ The upper part of the outdoor unit and the air outlet is towards the wall



❊ The upper part of the outdoor unit and the air outlet is opposite the wall



❊ When front and rear side of the outdoor unit is towards the wall

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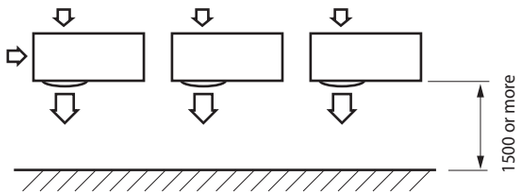
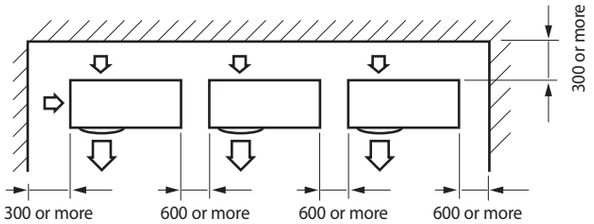
Installing the Unit

When installing more than 1 outdoor unit

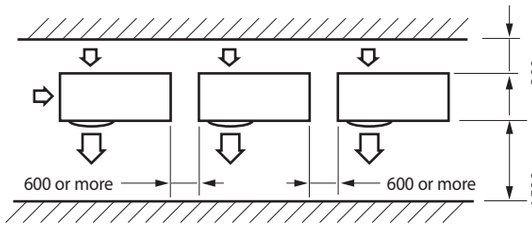
(Unit : mm)



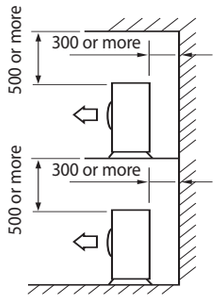
✻ When the air outlet is towards the wall



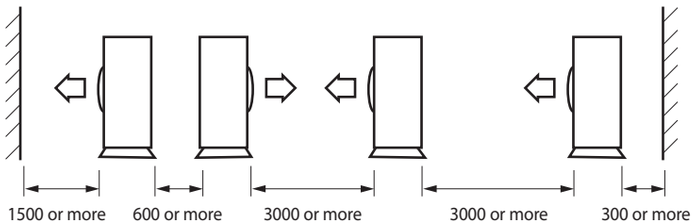
✻ When 3 sides of the outdoor unit are blocked by the wall



✻ When front and rear side of the outdoor unit is towards the wall



✻ The upper part of the outdoor unit and the air outlet is opposite the wall



✻ When front and rear side of the outdoor unit is towards the wall

CAUTION
- The units must be installed according to distances declared, in order to permit accessibility from each side, either to guarantee correct operation of maintenance or repairing products.
  The unit's parts must be reachable and removable completely under safety condition (for people or things).

Outdoor unit installation

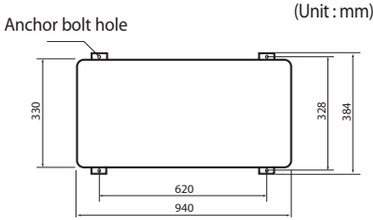
The outdoor unit must be installed on a rigid and stable base to avoid any increase in the noise level and vibration, particularly if the outdoor unit is to be installed in a location exposed to strong winds or at a height, the unit must be fixed to an appropriate support(wall or ground).

Fix the outdoor unit with anchor bolts.

NOTE
- The anchor bolt must be 20mm or higher from the base surface.

CAUTION
- When tightening the anchor bolt
  Tighten the rubber washer to prevent the outdoor unit bolt connection part from corroding
- Make a drain outlet around the base for outdoor unit drainage.
- If the outdoor unit is installed on the roof, you have to check the ceiling strength and waterproof the unit.

(Unit : mm)



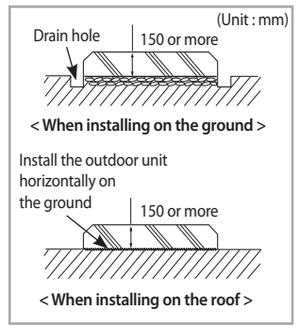
Outdoor unit support

CAUTION
- Do not install the outdoor unit on a wooden pallet palette.
- Fix the outdoor unit completely to the base. Fix the outdoor unit with anchor bolts.
- The manufacturer is not responsible for the damage occurred by not keeping standard of the installation.

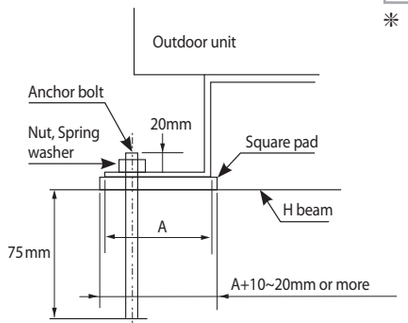
Two electronic cables must be connected to the outdoor unit.

- Install the outdoor unit higher than 150mm from the base surface and install the drain hole to connect the pipe to the drainage.
- If front fan outdoor unit is installed where average snow fall is 150mm or more, a duct should be fitted to the unit.
- The concrete foundation should be 1.5 times larger than bottom of the outdoor unit.
- When heating, condensed water may be generated. Pay attention to waterproof and drainage of the concrete foundation where the outdoor unit is installed. (An ice patch may form on the base surface in winter.)
- Install a square pad(t=20mm or more) to prevent vibration of the outdoor unit delivering to the base surface when installing the concrete for the outdoor unit.
- Place the outdoor unit on the H beam and fix it with the bolt, nut and washer.

(Unit : mm)



✻ Base mount construction



Installing the Unit

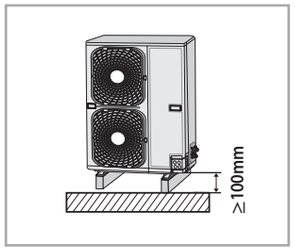
Drain work

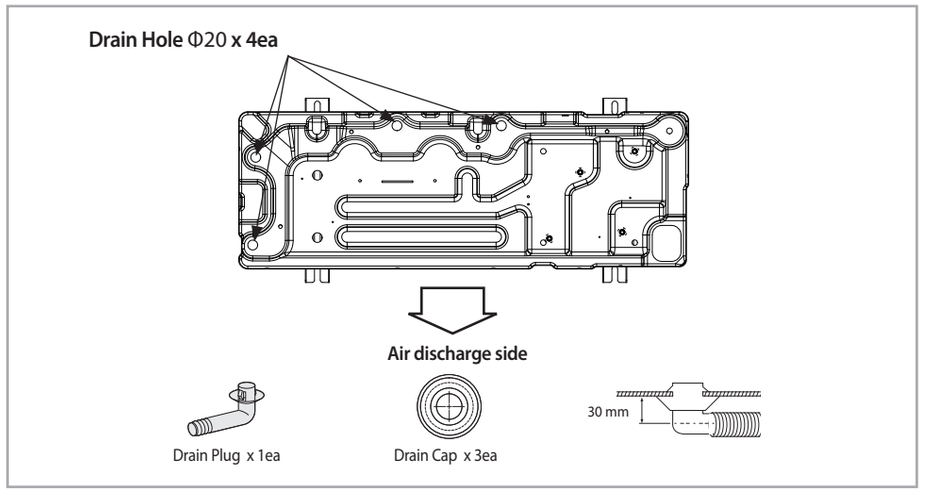
While Air-Water Heat Pump is running in heating mode, Ice can begin accumulate on the surface of condenser.
To prevent Ice growing, system go into De-frost mode and then Ice on the surface changes to water.
Dropped water from condenser shall be eliminated through running drain holes to prevent ICE growing at low temperature.

In case there is not enough space for drainage out of the unit, additional drain works are required.
Follow the description as below

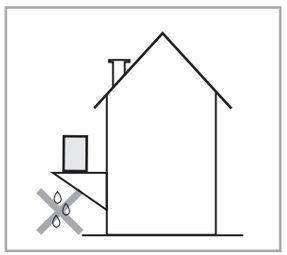
- Make space more than 100mm between the bottom of the outdoor unit and the ground for installation of the drain hose.
- Insert the drain plug into the hole on the bottom of the outdoor unit.
- Connect the drain hose to the drain plug.
- Make sure dusts or small branches should not go into the drain hose.

WARNING
- If drain works is not enough, it can lead to system performance degration and system damages.





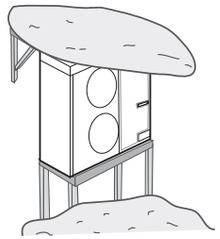
1. Prepare a water drainage channel around the foundation, to drain waste water from around the unit.
2. If the water drainage of the unit is not easy, please build up the unit on a foundation of concrete blocks, etc. (the height of the foundation should be maximum 150mm).
3. If you install the unit on a frame, please install a waterproof plate within 150mm of the underside of the unit in order to prevent the invasion of water from the lower direction.
4. When installing the unit in a place frequently exposed to snow, pay special attention to elevate the foundation as high as possible.
5. If you install the unit on a building frame, please install a waterproof plate (field supply) (within 150mm of the underside of the unit) in order to avoid the drain water dripping. (See figure)



Selecting a location in cold climates

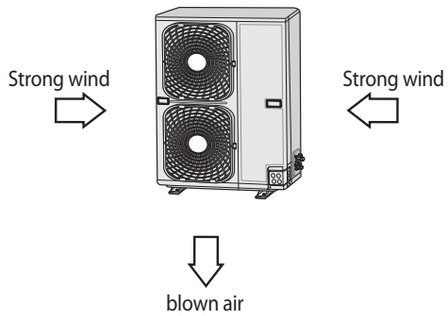
NOTE
- When operating the unit in a low outdoor ambient temperature, be sure to follow the instructions described below.

- To prevent exposure to wind, install the unit with its suction side facing the wall.
- Never install the unit at a site where the suction side may be exposed directly to wind.
- To prevent exposure to wind, install a baffle plate on the air discharge side of the unit.
- In heavy snowfall areas it is very important to select an installation site where the snow will not affect the unit. If lateral snowfall is possible, make sure that the heat exchanger coil is not affected by the snow (If necessary construct a lateral canopy).



1. Construct a large canopy.
2. Construct a pedestal.
   Install the unit high enough off the ground to prevent it being buried under snow.

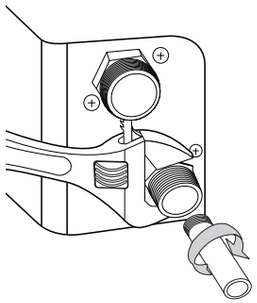
- Set the outlet side at a right angle to the direction of the wind.



Piping Work

Water connections must be made in accordance with the outlook diagram delivered with the unit, respecting the water in- and outlet. If air, moisture or dust gets in the water circuit, problems may occur. Therefore, always take into account the following when connecting the water circuit:

- **Use clean pipes only.**
- **Hold the pipe end downwards when removing burrs.**
- **Cover the pipe end when inserting it through a wall so that no dust and dirt enter.**
- **Use a good thread sealant for the sealing of the connections The sealing must be able to withstand the pressures and temperatures of the system.**
- **When using non-brass metallic piping, make sure to insulate both materials from each other to prevent galvanic corrosion.**
- **Because brass is a soft material, use appropriate tooling for connecting the water circuit. Inappropriate tooling will cause damage to the pipes.**



CAUTION

- Be careful not to deform the unit piping by using excessive force when connecting the piping. Deformation of the piping can cause the unit to malfunction.
- Always use two wrenches (spanners) for tightening or loosening the water connections, and tighten connections with a torque wrench as specified in below table. If not, connections and parts can be damaged and leaks.
- The unit is only to be used in a closed water system. If Applications are in open water circuit, it will generate Heat exchangers fouling, Corrosion, Leak.

	Name	Tightening Torque	
1	BSPP1"	350~380 kgf•cm	34 ~ 37 N•m
2	Flow switch	72~82 kgf•cm	7 ~ 8 N•m

Flushing and air-purging

When filling water, the following start-up procedure should be followed.

1. All system components and pipes must be tested for the presence of leaks.
2. Preparation of a make-up water assembly or flushing unit is recommended for installation and service.
3. Before connecting pipes to the hydro unit, flush water pipes clean to remove contaminants during hours using a flushing unit or tap water pressure if it is adequate (at 2 to 3 bar)
4. Fill water into the hydro unit by opening service valves.
5. Purge the air. (Fill with a flushing unit with sufficient capacity: avoid aerating the water)
6. Circulate for long enough to ensure that all air has been bled from the complete water piping system.

CAUTION

- After installations, commissioning should be performed by qualified representatives. Unless flushing and air-purging works are performed adequately, it might result in malfunctions.

Flushing unit (or purging cart)

Piping Work

CAUTION

◆ Before installing/commissioning the unit, make sure to check the following points;

- The maximum water pressure of the unit is 2.8 bar static pressure.
- The operating range of water temperature is 15~55 ° C at heating conditions and 5~25 ° C at cooling conditions.
- The minimum required water flow for operation is 12~16 liters/min.
  At all times the required water flow-rates should remain. Otherwise, the unit can stop due to a lack of water.
- Water quality must be according to EN directive 98/83 EC.
- If the unit and the pipes are exposed to freezing temperature, It can cause damage to the hydraulic system.
  Special care must be taken to prevent freezing of the total water system.
- The unit is designed to be used in a closed-loop system. Do not use any other components which are designed only for a open-loop system.
- Never use Zn-coated parts in the water circuit.
- All hydraulic parts including field piping must be insulated to reduce heat loss and condensation.
- It is recommended to install the make-up water assembly to feed small quantities of water to the system automatically, replacing the minor water losses and maintaining the system pressure.
- Drain taps must be provided at all low points of the system to permit complete drainage of the circuit for maintenance use.
- Make sure that the check valves are correctly installed in the system (field supply).
- Flush pipes out with clean water to remove contaminants in pipes during installation.
- The strainer(water filter) must be cleaned after flushing the pipes, and it should be cleaned periodically.
  Replace strainer when necessary.
- Charging; Charge the water until a pressure of 1.5~2.0bar by using make-up water assembly(Field supply).
  (The water pressure indicated on the manometer will vary depending on the water temperature)
  The nominal water pressure in the system should remain about 1.0 bar at all times to avoid air entering the water system.
- Air purging; Make sure that air should be vented from the system at start-up or after installing/ servicing.
  The air vent valve must be opened during charging the water (at least 2 turns) in order to remove all air in the circuit, and a make-up water assembly allows water into the system continuosly.
- In case that the water piping would be located in a higher position than the air vent of the unit, it is necessary to add an additional ones in the highest position of water circuit. The air vent should be located both where water temperatures are the highest and where the height of pipes are the highest.
- Always use materials which are compatible with water used in the system and with the materials used on the indoor unit.
- Select piping diameter in relation to required water flow and available ESP of the pump.
- Use chemical cleaning agents(Begin with acid , finish with alkali).
- Do not operate the system with closed valves because it results in damaging the heat pump.

Freeze Protection

Frost can make some damage on the hydraulic system. Itj¯s because it is installed outside house nomally. To avoid taking risks of freezing problem, special cares such as Anti-freezing fluid are required as below.
Ethylene glycol concentration can vary depeding on outdoor temperature where our system installed, fill in Ethylene glycol by mixing as below.

WARNING

Ethylene Glycol Is Toxic

Ethylene glycol is toxic if swallowed, and therefore is a hazard to animals and small children.
EG must be handled in accordance with relevant local laws and regulations.

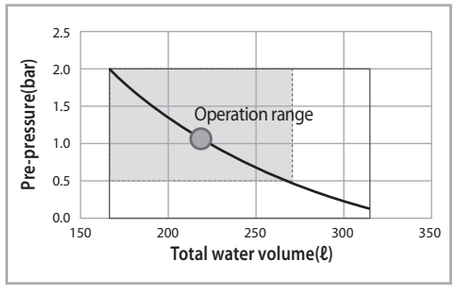
Outdoor temperature	Ethylene Glycol(%)
23°F (–5°C)	10
14°F (–10°C)	20
5°F (–15°C)	25
–10°F (–20°C)	35

Setting capacity and pre-pressure of the expansion vessel

When it is required to change the default pre-pressure of the expansion vessel(1 bar), keep in mind the following guidelines:

◆ Use only dry nitrogen to set the expansion vessel pre-pressure.

◆ Inappropriate setting of the expansion vessel pre-pressure will lead to malfunction of the system.
Therefore, the pre-pressure should only be adjusted by a licensed installer.



Installation height difference[a]	Water volume	
	< 220 Litres	> 220 Litres
<7m	No pre-pressure adjustment required.	Actions required: • Pre-pressure must be decreased, calculate according to "Calculating the pre-pressure of the expansion vessel". • Check if the water volume is lower than maximum allowed water volume
>7m	Actions required: • Pre-pressure must be increased, calculate the appropriate value following by "Calculating the pre-pressure of the expansion vessel". • Check if the water volume is lower than maximum allowed water volume	Expansion vessel of the unit too small for the installation.

(a) Installation height difference: height difference(m) between the highest point of the water circuit and the indoor unit.
If the unit is located at the highest point of the installation, the installation height is considered 0m.

Calculating the pre-pressure of the expansion vessel

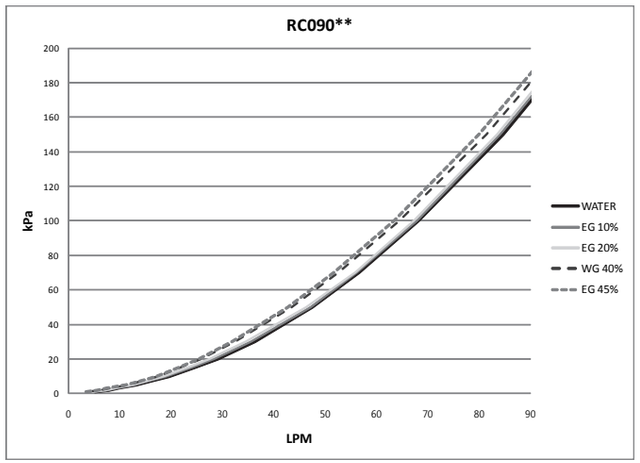
The pre-pressure(Pg) to be set depends on the maximum installation height difference(H) and is calculated as below:

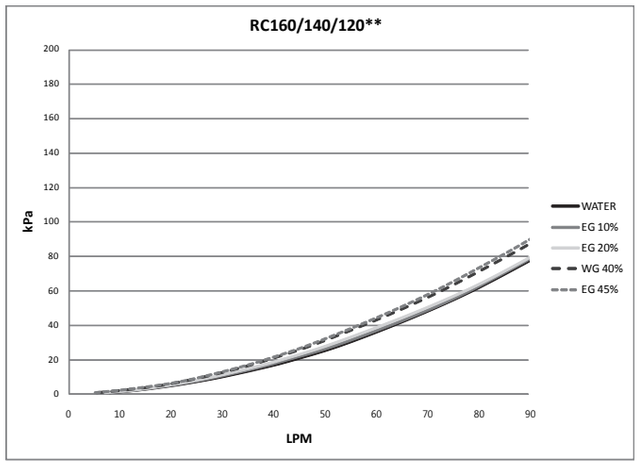
Pg=(H/10+0.3) bar

Piping Work

Unit Resistance and PHE resistance by Glycol concentrate

The unit is composed of water pipes and PHE basically.
To ensure correct operation and predict the expected performance, Flow and Resistance table can be used.
And Flow and Resistance characteristic is dependent on on Glyco concentrate.



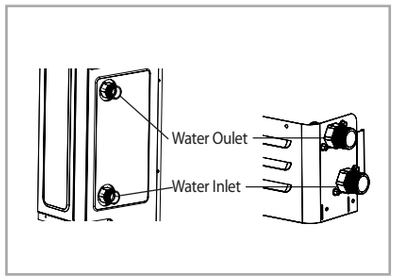


Changing Glycon concentration can cause the pressure drop of the system and it can leads to make flow rate rather slow.
Just in case performance degration, installer shall be careful of flow rate changes.

Charging Water

After installation is completed, the following procedures shall be used to charge water into the hydro unit.

- Connect water lines to water connections of Air-Water Heat Pump.
- Open the service valve in the water supply connection.
- Open the service valve in the water supply connection.
- Water pressure of supply line shall be over 2.0 bar for good charging work.
- Stop water supply when the pressure gauge of hydro unit indicates around 2.0 bar.



CAUTION

- There shall be enough space for Service works.
- Water pipe and connections shall be cleaned by using water or cleaner before operating the unit at first time.
- Considering E.S.P and water pump performance, select water plumbing specification and under floor loofs.
- Make sure to calculate the total resistance of piping system and determine the size of pipes before selecting the required head of pumps. If the pressure loss of total water system is over than designed pressure, an external water pump shall be installed on piping system in series.
- Do not connect power supply while water is charging.
- When initial installation or re-installation is required, remove air by air vent valve in water plumbings which are installed by local installers to prevent air trap in the system while charging water.
- Make sure that back flow preventer (check valves) shall be installed on main supply line to prevent from contaminating the city water.
  - It is recommended to install the make-up water assembly to prevent from contaminating the city water.
  - Check valves in the make-up water assembly can prevent running water inside hydro unit from contaminating water supplies during installation or maintenance works.

Piping Work

Pressure relief valve

MONO Unit does not have a pressure relief valve. The valve shall prevents abnomal water pressure from damaging the the system by opening at 3.0 bar .

CAUTION
- Make certain that the discharged water out of drain pan does not affect other elements.

Filter / Strainer

Installation of Filter / Strainer is mandatory for water system. The Filter or Strainer shall be located in front of inlet pipe of PHE.

While operating the system, some dust and foreign materials can circulate the system and can make the whole system not work well due to blockage of heat exchangers and corrosion in some components.

Filter mesh : #30

Piping insulation

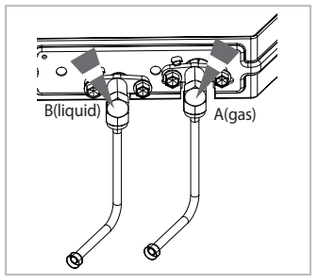
The complete water circuit, inclusive all piping, must be insulated to prevent condensation during cooling operation and reduction of the heating and cooling capacity as well as prevention of freezing of the outside water piping during winter time. The thickness of the sealing materials must be at least 9 mm with (0.035 W/mK) in order to prevent freezing on the outside water piping.

If the temperature is higher than 86°F (30°C) and the humidity is higher than RH 80%, then the thickness of the sealing materials should be at least 20 mm in order to avoid condensation on the surface of the sealing.

Pump down Procedure

Pump down will be carried out when an evaporator is replaced or when the unit is relocated in another area.

1. **Remove the cap from the low pressure side.**
2. **Turn the low pressure side valve clockwise to close and connect a pressure gauge (low pressure side) to the service valve, and open the valve again.**
3. **Set the unit to cool operation mode. (Check if the compressor is operating.)**
4. **Turn the high pressure side valve counter clockwise to close.**
5. **When the pressure gauge indicates "0" turn the low pressure side valve counter clockwise to close.**
6. **Stop operation of the air conditioner.**
7. **Close the each cap of valve.**



NOTE

Relocation of the air conditioner
- Refer to this procedure when the unit is relocated.
- Carry out the pump down procedure (refer to the details of 'pump down').
- Remove the power cord.
- Disconnect the assembly cable from the indoor and outdoor units.
- Remove the flare nut connecting the indoor unit and the pipe.
- At this time, cover the pipe of the indoor unit and the other pipe using a cap or vinyl plug to avoid foreign material entering.
- Disconnect the pipe connected to the outdoor unit. At this time, cover the valve of the outdoor unit and the other pipe using a cap or vinyl plug to avoid foreign material entering.
- Make sure you do not bend the connection pipes in the middle and store together with the cables.
- Move the indoor and outdoor units to a new location.
- Remove the mounting plate for the indoor unit and move it to a new location.

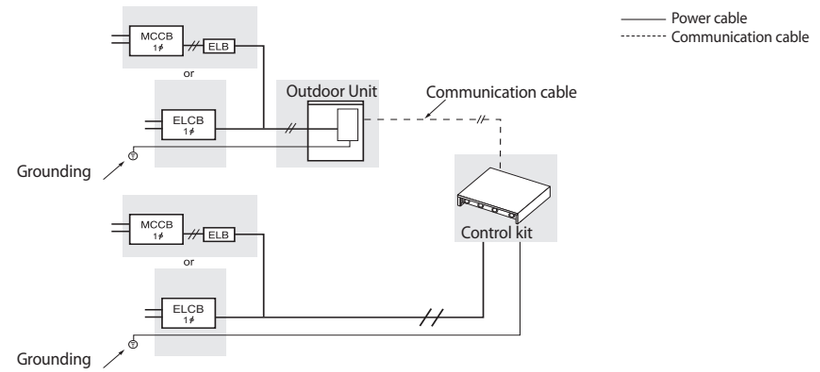
Wiring

Two electronic cables must be connected to the outdoor unit.
- The connection cord between indoor unit and outdoor unit.
- The power cable between outdoor unit and auxiliary circuit breaker.
- Specially for Russian and European market, before installation, the supply authority should be consulted to determine the supply system impendance to ensure compliance.

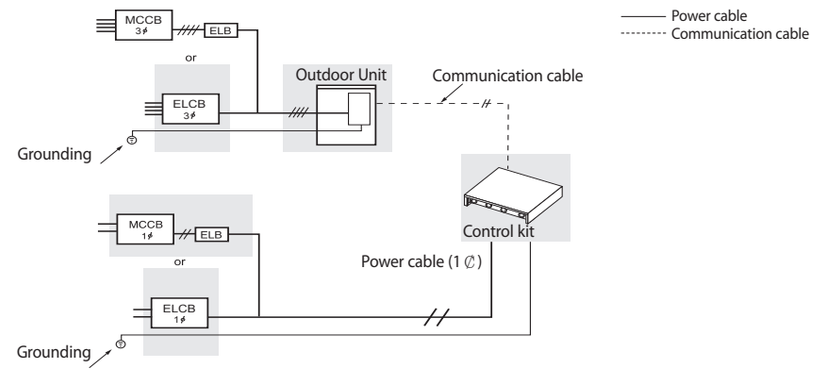
CAUTION
- During the unit installation make first refrigerant connections and then electrical connections. If unit is uninstalled first disconnect electrical cables, then refrigerant connections.
- Connect the air conditioner to grounding system before performing the electrical connection.
- When installing the unit, you shouldn't use inter connection wire.

Example of EHS System

When using ELB for 1 phase



When using ELB for 3 phase 4 wires



✻ If an outdoor unit is installed in a place in danger of an electric leak or submergence, you must install the ELB.
✳ Installation of control kit must be followed its Installation manual.

Wiring

Power Cable Specifications

Single Phase

Type of outdoor unit	Outdoor	Power supply	Power cable	MAX. LENGTH	Type GL
			mm², wires	m	A
A	RC090MHXEA	1Φ, 220-240V, 50Hz	4.0/3	<10m	30
			6.0/3	10m<L<20m	
B	RC120MHXEA	1Φ, 220-240V, 50Hz	4.0/3	< 10m	30
			6.0/3	10m<L<20m	
C	RC140MHXEA RC160MHXEA	1Φ, 220-240V, 50Hz	4.0/3	< 10m	40
			6.0/3	10m<L<20m	

- The power cable is not supplied with air conditioner.
- For power cable, use the grade H05RN-F materials in 1Φ system.
- This equipment complies with "IEC 61000-3-12".

Indoor Unit	Load	Power supply	Power cable	MAX. LENGTH	Type GL
			mm², wires	m	A
MIM-E03A	No Heater (Water Pump, Valve, Wired RMC)	1Φ, 220-240V, 50Hz	1.5 / 3	<10m	10
			2.5 / 3	10m<L<20m	10
	Booster Heater (3kw)		4.0 / 3	<10m	20
			6.0 / 3	10m<L<20m	20
	Booster Heater (~3kw) + Backup Heater (~3kw)		6.0 / 3	<10m	40
			8.0 / 3	10m<L<20m	40

- The Power cable is not supplied with the heat pump.
- For power cable, use the grade H07RN-F materials in 1Φ system.
- If you connect Backup Heater at separated power cable, you can reduce wire size. (Please refer to indoor unit installation manual)

3 Phase

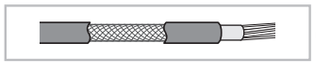
Type of outdoor unit	Outdoor	Power supply	power cable	MAX. LENGTH	Type GL
			mm², wires	m	A
A		3Φ, 380~415V, 50Hz	1.5/4	<10m	20
			2.5/4	10m<L<20m	
B	RC120MHXGA	3Φ, 380~415V, 50Hz	1.5/4	<10m	20
			2.5/4	10m<L<20m	
C	RC140MHXGA RC160MHXGA	3Φ, 380~415V, 50Hz	1.5/4	<10m	20
			2.5/4	10m<L<20m	

- The power cable is not supplied with air conditioner.
- For power cable, use the grade H07RN-F materials in 3Φ system.
- Ssc(MVA) : 3.5(Type of outdoor unit A), Ssc(MVA) : 3.8(Type of outdoor unit B and C)

Between Indoor unit and Outdoor unit Connection Cable Specifications(Common in use)

Communication Cable	Home Server
0.75mm², 2wires	0.75mm², 2wires

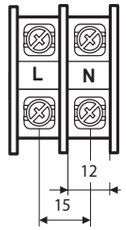
- For Indoor Power Cable, use the grade H07RN-F or H05RN-F materials.



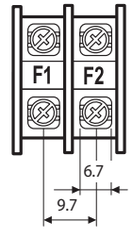
When installing the indoor unit in a computer room or network room, use the double shielded (Tape aluminum / polyester braid + copper) cable of FROHH2R type.

1-phase terminal block spec

AC power : M5 screw

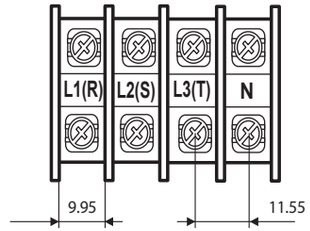


Communication : M3 screw

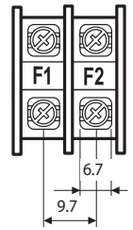


3-phase terminal block spec

AC power : M4 screw



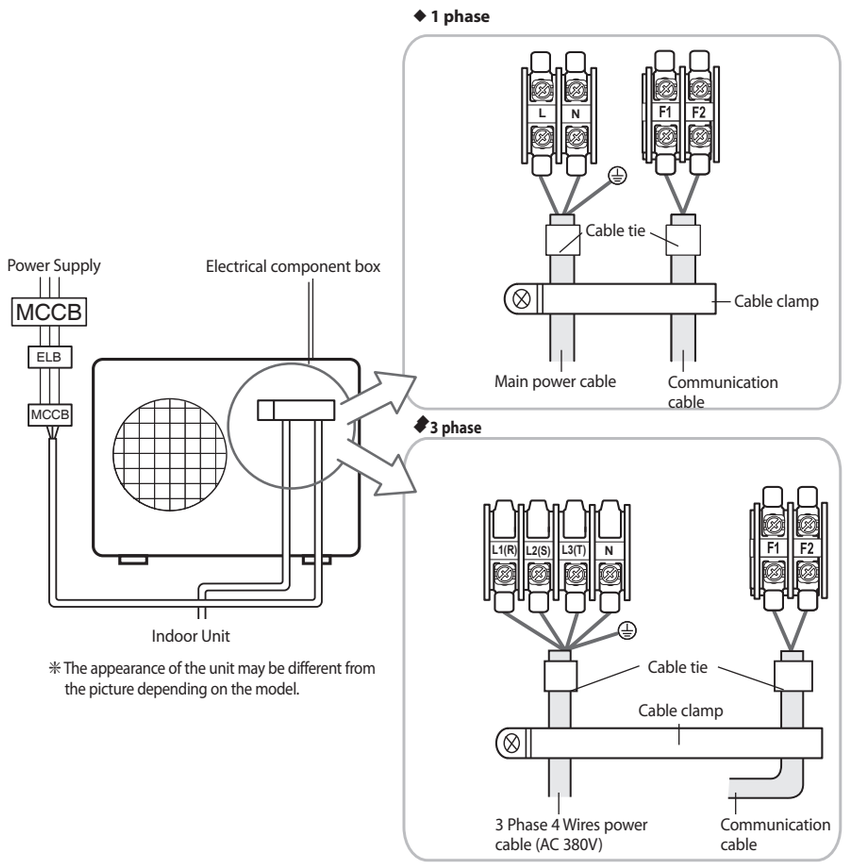
Communication : M3 screw



Wiring

Wiring Diagram of Power Cable

When using ELB for 1 phase and 3 phase



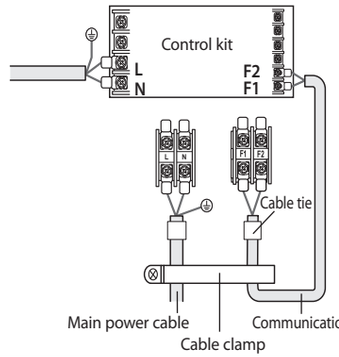
※ The appearance of the unit may be different from the picture depending on the model.

CAUTION

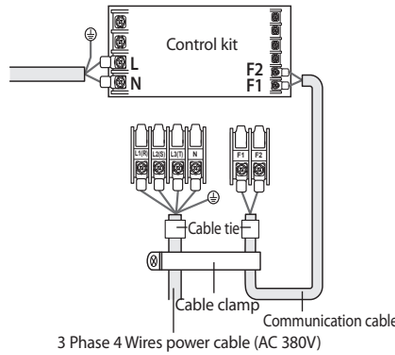
- You should connect the power cable into the power cable terminal and fasten it with a clamp.
- The unbalanced power must be maintained within 2% of supply rating.
  - If the power is unbalanced greatly, it may shorten the life of the condenser. If the unbalanced power is exceeded over 4% of supply rating, the indoor unit is protected, stopped and the error mode indicates.
- To protect the product from water and possible shock, you should keep the power cable and the connection cord of the indoor and outdoor units within ducts. (with appropriate IP rating and material selection for your application)
- Ensure that main supply connection is made through a switch that disconnects all poles, with contact gap of a least 3 mm.
- Devices disconnected from the power supply should be completely disconnected in the condition of overvoltage category.
- Keep distances of 50mm or more between power cable and communication cable.

Wiring Diagram of Connection Cord

1 phase



3 phase



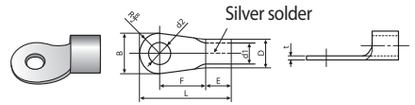
NOTE

- Lay the electrical wiring so that the front cover does not rise up when doing wiring work and attach the front cover securely.
- Ground wire for the indoor unit and outdoor unit connection cable must be clamped to a soft copper tin-plated eyelet terminal with M4 screw hole(NOT SUPPLIED WITH UNIT ACCESSORIES).

Connecting the Power Terminal

◆ Connect the cables to the terminal board using the compressed ring terminal.

◆ Cover a solderless ring terminal and a connector part of the power cable and then connect it.



Nominal dimensions for cable [mm²(inch²)]	Nominal dimensions for screw [mm(inch)]	B		D		d1		E	F	L	d2		t
		Standard dimension [mm(inch)]	Allowance [mm(inch)]	Standard dimension [mm(inch)]	Allowance [mm(inch)]	Standard dimension [mm(inch)]	Allowance [mm(inch)]	Min. [mm (inch)]	Min. [mm (inch)]	Max. [mm (inch)]	Standard dimension [mm(inch)]	Allowance [mm(inch)]	Min. [mm (inch)]
4/6 (0.006/ 0.009)	4(3/8)	9.5(3/8)	±0.2 (±0.007)	5.6(1/4)	+0.3(+0.011) -0.2(-0.007)	3.4(1/8)	±0.2 (±0.007)	6 (1/4)	5 (3/16)	20 (3/4)	4.3 (3/16)	+0.2(+0.007) 0(0)	0.9 (0.03)
	8(3/16)	15(9/16)							9 (3/8)	28.5 (1-1/8)	8.4 (1-3/16)	+0.4(+0.015) 0(0)	
10(0.01)	8(3/16)	15(9/16)	±0.2 (±0.007)	7.1(1/4)	+0.3(+0.011) -0.2(-0.007)	4.5(3/16)	±0.2 (±0.007)	7.9 (5/16)	9 (3/8)	30 (1-3/16)	8.4 (1-3/16)	+0.4(+0.015) 0(0)	1.15 (0.04)
16(0.02)	8(3/16)	16(10/16)	±0.2 (±0.007)	9(3/8)	+0.3(+0.011) -0.2(-0.007)	5.8(1/4)	±0.2 (±0.007)	9.5 (5/16)	13 (1/2)	33 (1-5/16)	8.4 (1-3/16)	+0.4(+0.015) 0(0)	1.45 (0.05)
25(0.03)	8(3/16)	12(1/2)	±0.3 (±0.011)	11.5(7/16)	+0.5(+0.019) -0.2(-0.007)	7.7(5/16)	±0.2 (±0.007)	11 (3/8)	15 (5/8)	34 (1-3/8)	8.4 (1-3/16)	+0.4(+0.015) 0(0)	1.7 (0.06)
	8(3/16)	16.5(10/16)							13 (1/2)		8.4 (1-3/16)		
35(0.05)	8(3/16)	16(10/16)	±0.3 (±0.011)	13.3(1/2)	+0.5(+0.019) -0.2(-0.007)	9.4(3/8)	±0.2 (±0.007)	12.5 (1/2)	13 (1/2)	38 (1-1/2)	8.4 (1-3/16)	+0.4(+0.015) 0(0)	1.8 (0.07)
	8(3/16)	22(7/8)							13 (1/2)	43 (1-11/16)	8.4 (1-3/16)		
50(0.07)	8(3/16)	22(7/8)	±0.3 (±0.011)	13.5(1/2)	+0.5(+0.019) -0.2(-0.007)	11.4(7/16)	±0.3 (±0.011)	17.5 (11/16)	14 (9/16)	50 (2)	8.4 (1-3/16)	+0.4(+0.015) 0(0)	1.8 (0.07)
70(0.10)	8(3/16)	24(1)	±0.4 (±0.015)	17.5(11/16)	+0.5(+0.019) -0.4(-0.015)	13.3(1/2)	±0.4 (±0.015)	18.5 (3/4)	20 (3/4)	51 (2)	8.4 (1-3/16)	+0.4(+0.015) 0(0)	2.0 (0.078)

Wiring

- ◆ Connect the rated cables only.
- ◆ Connect using a driver which is able to apply the rated torque to the screws.
- ◆ If the terminal is loose, fire may occur caused by arc. If the terminal is connected too firmly, the terminal may be damaged.

Tightening Torque (kgf • cm)		
M3	5.0~6.0	Communication : F1, F2
M4	12.0~15.0	3phase AC power : L1(R), L2(S), L3(T), N
M5	20.0~25.0	1phase AC power : L, N

⚠ CAUTION

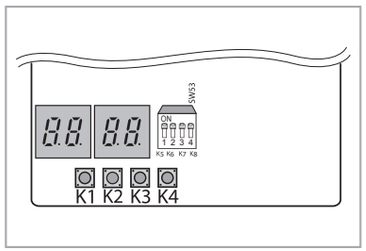
- When connecting cables, you can connect the cables to the electrical part or connect them through the holes below depending on the spot.
- Run transmission wiring between the indoor and outdoor units through a conduit to protect against external forces, and feed the conduit through the wall together with refirgerant piping.
- Remove all burrs at the edge of the knock-out hole and secure the cable to the outdoor knock-out using lining and bushing with an electrical insulation such as rubber and so on.
- Must keep the cable in a protection tube.
- Keep distances of 50mm or more between power cable and communication cable.
- When the cables are connected through the hole, remove the Plate bottom.

Testing operations

1. **Check the power supply between the outdoor unit and the auxiliary circuit breaker.**
   - ◆ 1 phase power supply : L, N
   - ◆ 3 phases power supply : R,S,T,N

2. **Check the indoor unit.**
   1) Check that you have connected the power and communication cables correctly. (If the power cable and communication cables one mixed up or connected incorrectly, the PCB will be damaged.)
   2) Check the thermistor sensor, drain pump/hose, and display are connected correctly.

3. **Press K1 or K2 on the outdoor unit PCB to run the test mode and stop.**
   - ◆ Press K1 button ➛ Start Heating test mode ➛ Press K1 button ➛ Stop ➛ Heating test mode 7-seg display : H1
   - ◆ Press K2 button ➛ Start Cooling test mode ➛ Press K2 button ➛ Stop ➛ Cooling test mode 7-seg display : H2
   - ◆ Press K1 button twice ➛Start Defrost test mode ➛ Press K1 button ➛ Stop ➛ Defrost test mode 7-seg display : H3
     Condition 1 : The outdoor temperature is under 10°C
     Condition 2 : All the temperature conditions should meet the defrost conditions



4. **After 12 minutes of stationary condition check each indoor unit air treatment :**
   - ◆ Cooling mode(indoor unit check) ➛ Inlet air temp. - Outlet air temp. : From 10°C to 12°C
   - ◆ Heating mode(indoor unit check) ➛ Outlet air temp. - Inlet air temp. : From 11°C to 14°C
   - ◆ In heating mode, the indoor fan motor can remain off to avoid cold air blown into conditioned space.

5. **How to reset the power supply of the outdoor unit and deactivate the eco mode (standby mode) :**
   - ◆ Outdoor unit type A, B, and C :
     Press [K3] button to reset the power supply of the outdoor unit and deactivate the eco mode (standby mode) ➛
     Only for RC090✳✳✳, RC100✳✳✳, RC110✳✳✳, RC125✳✳✳, RC140✳✳✳ series model.

Testing operations

6. View Mode : When the K4 switch is pressed, you can see information about our system state as below.

Short push	Display contents	SEG1	SEG2	SEG3	SEG4	Unit
1	Order frequency	1	Hundreds' digit	Tens' digit	Unit digit	Hz
2	Current frequency	2	Hundreds' digit	Tens' digit	Unit digit	Hz
3	The number of current indoor units	3	Hundreds' digit	Tens' digit	Unit digit	Hz
4	The sensor for outdoor air intake	4	+/-	Tens' digit	Unit digit	℃
5	Discharge sensor	5	Hundreds' digit	Tens' digit	Unit digit	℃
6	Eva-Mid sensor	6	+/-	Tens' digit	Unit digit	℃
7	Cond sensor	7	+/-	Tens' digit	Unit digit	℃
8	Current	8	Tens' digit	Unit digit	The first place of decimals	℃
9	Fan RPM	9	Thousands' digit	Hundreds' digit	Tens' digit	rpm
10	Target discharge temperature	A	Hundreds' digit	Tens' digit	Unit digit	℃
11	EEV	B	Hundreds' digit	Tens' digit	Unit digit	step
12	The capacity sum of indoor units	C	Tens' digit	Unit digit	The first place of decimals	kW
13	Protective control	D	0: Cooling 1: Heating	Protective control 0: No Protective control 1: Freezing 2: Non-stop defrosting 3: Over-load 4: Discharge 5: Total electric current	Frequency status 0: Normal 1: Hold 2: Down 3: Up_limit 4: Down_limit	-
14	The temperature of heat radiating plate	E	Hundreds' digit	Tens' digit	Unit digit	-
15	S/W check	F	-	-	-	-

Long push 1	Main micom version	Year (Hex)	Month (Hex)	Date (Tens' digit)	Date (Unit digit)
After short push 1	Inverter micom version	Year (Hex)	Month (Hex)	Date (Tens' digit)	Date (Unit digit)
After short push 1	E2P version	Year (Hex)	Month (Hex)	Date (Tens' digit)	Date (Unit digit)

※ Long push K4(Main micom ver.) → short push 1 more(Inv. micom ver.) → short push 1 more(E2P. ver.)

7. DIP switch option

	On (default)	Off
switch 1	Auto address	Manual address
switch 2	Base heater operating time = 15 Min.	Base heater operating time = 20 Min.
switch 3	Disable snow prevention control	Enable snow prevention control
switch 4	Enable base heater	Disable base heater

※ When snow prevention mode is in use, eco mode(standby mode)will not be functional.

Troubleshooting

The table below give indication about self diagnostic routine. Some of error code requires activities exclusively for Authorized Service Center.

Outdoor unit

If an error occurs during the operation, it is displayed on the outdoor unit PCB LED, both MAIN PCB and INVERTER PCB.

No.	LED Display			Displayed PCB Assy	Meaning	Remarks	Error Code
	Red	Green	Yellow				
-	●	◉	○	MAIN/INVERTER	Normal operation (MAIN : Indoor↔Outdoor : Green ON) (INVERTER : MAIN PCB↔INVERTER PCB : Green ON)		-
1	●	◉	○	MAIN	Unit quantity miss matching between indoor and outdoor.	Check indoor quantity setting in outdoor.	E201
2	●	●	○	MAIN/INVERTER	Abnormal state, no communication between Indoor and Outdoor Main PCB	Check electrical connection and setting	E202
	●	○	○				
3	●	●	◉	MAIN/INVERTER	1min. Time out of communcation error(Main↔ Inverter)	Check electrical connection and setting	E203
4	●	◉	○	MAIN	Outdoor temp sensor error	Check Outdoor sensor Open/Short	E221
5	●	◉	○	MAIN	Cond. temp sensor error	Check Cond. sensor Open/Short	E231
6	●	◉	○	MAIN	Discharge temp sensor error	Check Discharge sensor Open/ Short	E251
7	●	◉	○	MAIN	OLP Sensor Error	Check OLP sensor Open/Short	E320
8	●	◉	○	MAIN	Detection of Outdoor Freezing when Comp. Stop	Check Outdoor Cond.	E403
9	●	◉	○	MAIN	Protection of Outdoor Overload when Comp. Stop	Check Comp. when it start	E404
10	●	◉	○	MAIN	Discharge temperature of a compressor in an outdoor unit is overheated.		E416
11	●	◉	○	MAIN	Heating operation is not available since the outdoor air temperature is over 35°C.	Heating	E440
					Cooling operation is not available since the outdoor air temperature is lower than -5°C.	Cooling	E441
12	○	○	●	MAIN/INVERTER	Outdoor unit BLDC Fan 1 or Fan 2 error	FAN1 error	E458
						FAN2 error	E475
13	○	◉	○	MAIN/INVERTER	Comp. Starting error		E461
14	●	◉	○	MAIN	Primary Current Trip error		E462
15	●	◉	○	MAIN	Over current trip / PFC over current error	Check OLP sensor	E463
16	◉	○	○	MAIN/INVERTER	IPM(IGBT Module) Over Current(O.C)		E464
17	○	●	◉	MAIN/INVERTER	Comp. Over load error		E465
18	◉	●	○	MAIN/INVERTER	DC-Link voltage under/over error	Check AC Power or DC_Link voltage	E466
19	●	○	●	MAIN/INVERTER	Comp. wire missing error	Check Comp. wire	E467
20	●	◉	◉	MAIN/INVERTER	Current sensor error	Check Outdoor Inverter PBA	E468
21	●	◉	○	MAIN	Outdoor EEPROM error	Check Outdoor EEPROM date	E471
22	◉	◉	○	MAIN/INVERTER	IPM(IGBT Module) or PFCM Temperature sensor Error	Check Outdoor Inverter PBA	E474
23	●	◉	●	MAIN/INVERTER	PFC Overload Error	Check Outdoor Inverter PBA	E484
24	◉	◉	○	MAIN/INVERTER	IPM is over heated.	Check Outdoor Inverter PBA	E500
25	●	◉	○	MAIN	GAS Leak error	Check indoor and outdoor unit model	E554
26	●	◉	○	MAIN	Capacity miss match between indoor and outdoor	Check indoor and outdoor unit model	E556

○ Off ◉ Blink ● On

Maintenance

In order to ensure optimal availability of the unit, a number of checks and inspections on the unit and the field wiring have to be carried out at regular intervals

Before carrying out any maintenance or repair activity, always switch off the circuit breaker on the supply panel, remove the fuses or open the protection devices of the unit

Make sure that before starting any maintenance or repair activity, the power supply to the unit is switched off

The described checks must be excuted at least once a year by qulified personnel.

1. Water pressure
   - Check if the water pressure is above 0.3 bar. If necessary add water
2. Water filter
   - Clean the water filter regularly
3. Water pressure relief valve
   - Check for correct operation of the pressure relief valve.
   - If you do not hear a clacking sound, contact your local dealer.
   - In case the water keeps running out of the unit, close both the water inlet and outlet shut-off valves first and then contact your local dealer.
4. Pressure relief valve
   - Check the pressure relief valve is positioned appropriately to drain the water
5. Glycol
   - Document the glycol concentration and the pH-value in the system at least once a year
   - A Ph-valve below 8.0 indicates that a significant portion of the inhibitor has been depleted and that more inhibitor needs to be added
   - When the Ph-value is below 7.0 then oxidation of the glycol occurred, the system should be drained and flushed thoroughly before severe damage occurs
   - Make sure that the disposal of the glycol solution is done in accordance with relevant local and national legislation.

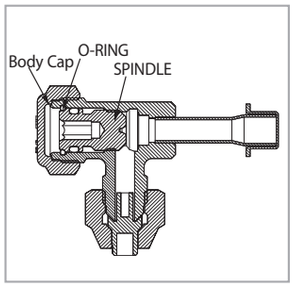
Using Service valve

To Open the Service Valve

1. **Open the cap and turn the stop valve counterclockwise by using a hexagonal wrench.**
2. **Turn it until the axis is stopped.**

NOTE
- Do not apply excessive force to the stop valve and always use special instruments. Otherwise, the stopping box can be damaged and the back sheet can leaks.
- If the watertight sheet leaks, turn the axis back by half, tighten the stopping box, then check the leakage again. If there is no leakage any more, tighten the axis entirely.

3. **Tighten the cap securely.**



To Close the Service Valve

1. **Remove the cap.**
2. **Turn the stop valve clockwise by using a hexagonal wrench.**
3. **Tighten the axis until the valve reached the sealing point.**
4. **Tighten the cap securely.**

CAUTION
- When you use the service port, always use a charging hose, too.
- Check the leakage of refrigerant gas after tightening the cap.
- Must use a spanner and wrench when you open/tighten the service valve.

Adding refrigerant

The Heat Pump unit is provided to users with basic amounts of refrigerants as initial setting values.
While using the unit or doing refrigerant piping works, there can be some loss of refrigerants compared to initial amounts.
To run the units properly, keep the amount of refrigerant which SAMSUNG designated.

Procedures as below is describing how to adding the amount of refrigerant.

WARNING
- R410A Shall be added as liquid phase.
- Adding and recharging works shall be by Service valves.

1. **Connect the manifold gauge and purge the manifold gauge.**
2. **Open the manifold gauge valve of the liquid side service valve and add the liquid refrigerant.**
3. **If you cannot fully recharge the additional refrigerant while the outdoor unit is stopped, use the key on PCB in the Heat Pump to run for recharging the remaining refrigerant.**

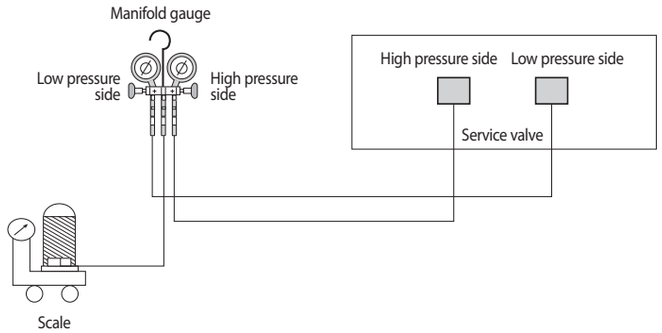
Adding refrigerants in running condition

1) Press the function key for adding refrigerant.

2) After 30 minutes of operation, open the service valve on low pressure side in Heat Pump.

3) Open the valve for low pressure side in the manifold gauge to recharge the remaining refrigerant.

4) After completing, close the valves in manifold gauge and eliminate the hoses from service valves.



Maintenance

Important information regulation regarding the refrigerant used

This product contains fluorinated greenhouse gases covered by the Kyoto Protocol. Do not vent gases into the atmosphere.

CAUTION

- Inform user if system contains 3 kg or more of fluorinated greenhouse gases. In this case, it has to be checked for leakage at least once every 12 months, according to regulation n°842/2006. This activity has to be covered by qualified personnel only. In case situation above (3 kg or more of R-410A), installer (or recognised person which has responsability for final check) has to provide a maintenance book, with all the information recorded according to REGULATION(EC) N° 842/2006 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17 May 2006 on certain fluorinated greenhouse gases.

Please fill in with indelible ink,

- ① the factory refrigerant charge of the product,
- ② the additional refrigerant amount charged in the field and
- ①+② the total refrigerant charge.

on the refrigerant charge label supplied with the product.

NOTE

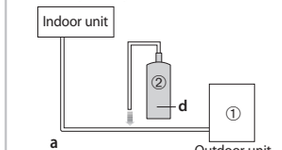
a. Factory refrigerant charge of the product: see unit name plate
b. Additional refrigerant amount charged in the field(Refer to the above information for the quantity of refrigerant replenishment.)
c. Total refrigerant charge
d. Refrigerant cylinder and manifold for charging

>> The filled-out label must be adhered in the proximity of the product charging port (e.g. onto the inside of the stop valve cover).

Refrigerant type	GWP value
R410A	1975

❊ GWP=Global Warming Potential

Contains fluorinated greenhouse gases covered by the Kyoto Protocol.



① = (a) kg
② = (b) kg
①+② = (c) kg

Memo

Memo

Memo