

Installation Manual

AIR-TO-WATER HEATPUMP OUTDOOR UNIT

UD03*E5*, UD05*E5*, UD07*E5*, UD09*E5*

Required tools for Installation Works			
1 Phillips screw driver	5 Spanner	10 Measuring tape	18 N•m (1.8 kgf•m)
2 Level gauge	6 Pipe cutter	11 Thermometer	55 N•m (5.5 kgf•m)
3 Electric drill, hole core drill (ø70 mm)	7 Reamer	12 Megameter	65 N•m (6.5 kgf•m)
4 Hexagonal wrench (4 mm)	8 Knife	13 Multimeter	15 Vacuum pump
	9 Gas leak detector	14 Torque wrench	16 Gauge manifold

SAFETY PRECAUTIONS

- Read the following "SAFETY PRECAUTIONS" carefully before installation.
- Electrical work must be installed by a licensed electrician. Be sure to use the correct rating and main circuit for the model to be installed.
- The caution items stated here must be followed because these important contents are related to safety. The meaning of each indication used is as below. Incorrect installation due to ignoring of the instruction will cause harm or damage, and the seriousness is classified by the following indications.
- Please leave this installation manual with the unit after installation.

	This indication shows the possibility of causing death or serious injury.
	This indication shows the possibility of causing injury or damage to properties only.

The items to be followed are classified by the symbols:

	Symbol with white background denotes item that is PROHIBITED from doing.
	Symbol with dark background denotes item that must be carried out.

- Carry out test run to confirm that no abnormally occurs after the installation. Then, explain to user the operation, care and maintenance as stated in instructions. Please remind the customer to keep the operating instructions for future reference.

WARNING	
	Do not install outdoor unit near handrail of veranda. When installing outdoor unit at veranda of high rise building, child may climb up to outdoor unit and cross over the handrail and causing accident.
	Do not use unspecified cord, modified cord, joint cord or extension cord for power supply cord. Do not share the single outlet with other electrical appliances. Poor contact, poor insulation or over current will cause electrical shock or fire.
	Do not tie up the power supply cord into a bundle by band. Abnormal temperature rise on power supply cord may happen.
	Do not insert your fingers or other objects into the unit. high speed rotating fan may cause injury.
	Do not sit or step on the unit, you may fall down accidentally.
	Keep plastic bag (packaging material) away from small children, it may cause suffocation.
	Do not use pipe wrench to install refrigerant piping. It might deform the piping and cause the unit to malfunction.
	Do not purchase unauthorized electrical parts for installation, service, maintenance and etc.. They might cause electrical shock or fire.
	Do not modify the wiring of outdoor unit for installation of other components (i.e. heater, etc). Overloaded wiring or wire connection points may cause electrical shock or fire.
	Do not add or replace refrigerant other than specified type. It may cause product damage, burst and injury etc.
	For electrical work, follow local wiring standard, regulation and this installation instruction. An independent circuit and single outlet must be used. If electrical circuit capacity is not enough or defect found in electrical work, it will cause electrical shock or fire.
	Engage dealer or specialist for installation. If installation done by the user is defective, it will cause water leakage, electrical shock or fire.

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CAUTION	
If gauge needle does not move from 0 cmHg (0 MPa) to ~76 cmHg (~0.1 MPa), in step ③ above take the following measure: <ul style="list-style-type: none">If the leak stops when the piping connections are tightened further, continue working from step ③.If the leak does not stop when the connections are retightened, repair location of leak.Do not release refrigerant during piping work for installation and reinstallation. Take care of the liquid refrigerant, it may cause frostbite.	

5 CONNECT THE CABLE TO THE OUTDOOR UNIT

(FOR DETAIL REFER TO WIRING DIAGRAM AT UNIT)

- Remove the control board cover from the unit by loosening the screw.
- Connecting cable between indoor unit and outdoor unit shall be approved polychloroprene sheathed flexible cable (see below table), type designation 60245 IEC 57 or heavier cable.

Models	Flexible cable specification
UD03*E5* and UD05*E5*	4 x (1.5 mm²)
UD07*E5* and UD09*E5*	4 x (2.5 mm²)

Terminals on the indoor unit	1	2	3	
Colour of wires				
Terminals on the outdoor unit	1	2	3	

Terminal Board

Earth Wire must be longer than others cables for safety reason.

Holder (Clamper)

WARNING

This equipment must be properly earthed.

- Secure the cable onto the control board with the holder (clamper).
- Attach the control board cover back to the original position with screw.

WIRE STRIPPING AND CONNECTING REQUIREMENT

Wire stripping	Indoor/outdoor connecting terminal board	Conductor fully insert	Conductor over insert	Conductor not fully insert
No loose strand when insert	5 mm or more (gap between wires)	ACCEPT	PROHIBITED	PROHIBITED

(For UD07*E5* and UD09*E5* only)	
<ul style="list-style-type: none">Select required direction and apply protective bushing provided in accessories to protect cables from sharp edges.Once all wiring work has been completed, tie the cable and cord together with the binding strap so that they do not touch other parts such as the compressor and bare copper pipes.	
Outdoor Unit	DETAIL OF CONNECTING CABLE GUIDING

6 PIPE INSULATION

- Please carry out insulation at pipe connection portion as mentioned in Indoor/Outdoor Unit Installation Diagram. Please wrap the insulated piping end to prevent water from going inside the piping.
- If drain hose or connecting piping is in the room (where dew may form), please increase the insulation by using POLY-E FOAM with thickness 6 mm or above.

1 SELECT THE BEST LOCATION

- If an awning is built over the unit to prevent direct sunlight or rain, be careful that heat radiation from the condenser is not obstructed.
- Avoid installations in areas where the ambient temperature may drop below -20°C.
- Keep the spaces indicated by arrows from wall, ceiling, fence or other obstacles.
- Do not place any obstacles which may cause a short circuit of the discharged air.
- If outdoor unit installed near sea, region with high content of sulphur or oily location (e.g. machinery oil, etc.) it lifespan may be shorten.
- When installing the product in a place where it will be affected by typhoon or strong wind such as wind blowing between buildings, including the rooftop of a building and a place where there is no building in surroundings, fix the product with an overturn prevention wire, etc. (Overturn prevention fitting model number: K-KYP15C)(For UD07*E5* and UD09*E5* only)
- If piping length is over 10 m, additional refrigerant should be added as shown in the table.

Model	Piping size		Rated Length (m)		Max. Elevation (m)	Min. Piping Length (m)	Max. Piping Length (m)	Additional Refrigerant (g/m)
	Gas	Liquid	For Heat Pump Indoor Unit	For Hydromodule + Tank				
UD03*E5* and UD05*E5*	ø12.7mm (1/2")	ø6.35mm (1/4")	7	5	5	3	15	20
UD07*E5* and UD09*E5*	ø15.88mm (5/8")	ø6.35mm (1/4")	7	5	20	3	30	30
UD07*E5* and UD09*E5*	ø15.88mm (5/8")	ø6.35mm (1/4")	7	5	30	3	40	30

Example: For UD03*E5*
If piping length is 15m, the quantity of additional refrigerant should be 100g. [(15-10)m x 20 g/m = 100g]

2 INSTALL THE OUTDOOR UNIT

INSTALLATION DIAGRAM

- It is advisable to avoid more than 2 blockage directions. For better ventilation & multiple-outdoor installation, please consult authorized dealer/specialist.
- This illustration is for explanation purposes only.

Vinyl tape (Wide)

Saddle

Indoor unit/Outdoor unit connecting cable (4-CORE WIRE/1.5 mm²)
Type designation 60245 IEC 57 or heavier cable

ø6.35mm (1/4") Liquid refrigerant piping
ø12.7mm (1/2") Gas refrigerant piping

100mm or more
100mm or more
100mm or more
30mm or more

For UD03*E5* and UD05*E5*

L

E

C

D

A

B

(Anchor pitch)

Vinyl tape (Wide)

Saddle

Indoor unit/Outdoor unit connecting cable (4-CORE WIRE/2.5 mm²)
Type designation 60245 IEC 57 or heavier cable

ø6.35mm (1/4") Liquid refrigerant piping
ø15.88mm (5/8") Gas refrigerant piping

100mm or more
100mm or more
100mm or more
30mm or more

Check that the cables do not touch the compressor, etc.

For UD07*E5* and UD09*E5*

Model	A	B	C	D	E	F
UD03*E5* and UD05*E5*	540	160	20	330	430	46
UD07*E5* and UD09*E5*	620	140	15	355	450	44

(Unit : mm)

- After selecting the best location, start installation according to Installation Diagram.
- Fix the unit on concrete or rigid frame firmly and horizontally by bolt nut (ø10 mm).
- When installing at roof, please consider strong wind and earthquake. Please fasten the installation stand firmly with bolt or nails.

DISPOSAL OF OUTDOOR UNIT DRAIN WATER

- When a Drain elbow ① is used, please ensure to follow below:
 - the unit should be placed on a stand which is taller than 50 mm.
 - cover the ø20mm holes with Rubber cap ② (refer to illustration below).
 - use a tray (field supply) when necessary to dispose the outdoor unit drain water.
- If the unit is used in an area where temperature falls below 0°C for 2 or 3 consecutive days, it is recommended not to use the Drain elbow ① and Rubber cap ②, for the drain water freezes and the fan will not rotate.

UD03*E5* and UD05*E5*	UD07*E5* and UD09*E5*

3 CONNECTING THE PIPING

CONNECTING THE PIPING TO OUTDOOR UNIT

Decide piping length and then cut by using pipe cutter. Remove burrs from cut edge. Make flare after inserting the flare nut (locate at valve) onto the copper pipe. Align center of piping to valves and then tighten with torque wrench to the specified torque as stated in the table.

Model	Piping size (Torque)	
	Gas	Liquid
UD03*E5* and UD05*E5*	ø12.7mm (1/2") [55 N•m]	ø6.35mm (1/4") [18 N•m]
UD07*E5* and UD09*E5*	ø15.88mm (5/8") [65 N•m]	ø6.35mm (1/4") [18 N•m]

Be sure to use two spanners to tighten. (If the nuts are overtightened, it may cause the flares to break or leak.)

Close the tube joining area with putty heat insulator (local supply) without any gap as shown in right figure. (To prevent insects or small animal entering.) (For UD07*E5* and UD09*E5* only)

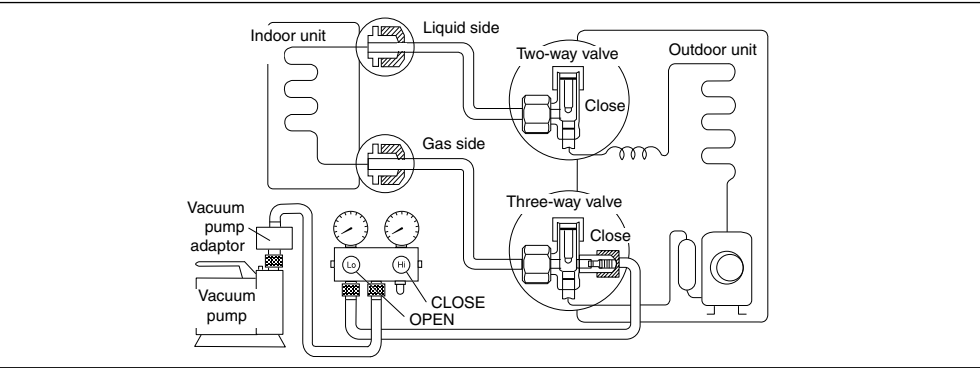
CUTTING AND FLARING THE PIPING

- Please cut using pipe cutter and then remove the burrs.
- Remove the burrs by using reamer. If burrs is not removed, gas leakage may be caused. Turn the piping and down to avoid the metal powder entering the pipe.
- Please make flare after inserting the flare nut onto the copper pipes.

				When properly flared, the internal surface of the flare will evenly shine and be of even thickness. Since the flare part comes into contact with the connections, carefully check the flare finish.
1. To cut	2. To remove burrs	3. To flare		

4 EVACUATION OF THE EQUIPMENT

WHEN INSTALLING AN AIR-TO-WATER HEAT PUMP, BE SURE TO EVACUATE THE AIR INSIDE THE UNIT AND PIPES in the following procedure.



- Connect a charging hose with a push pin to the Low side of a charging set and the service port of the 3-way valve.
 - Be sure to connect the end of the charging hose with the push pin to the service port.
- Connect the center hose of the charging set to a vacuum pump and vacuum pump adaptor.
- Turn on the power switch of the vacuum pump and make sure that the needle in the gauge moves from 0 cmHg (0 MPa) to ~76 cmHg (~0.1 MPa). Then evacuate the air approximately ten minutes.
- Close the Low side valve of the charging set and turn off the vacuum pump. Make sure that the needle in the gauge does not move after approximately five minutes.

Note : BE SURE TO FOLLOW THIS PROCEDURE IN ORDER TO AVOID REFRIGERANT GAS LEAKAGE.
- Disconnect the charging hose from the vacuum pump and from the service port of the 3-way valve.
- Tighten the service port caps of the 3-way valve at a torque of 18 N•m with a torque wrench.
- Remove the valve caps of both of the 2-way valve and 3-way valve. Position both of the valves to "OPEN" using a hexagonal wrench (4 mm).
- Mount valve caps onto the 2-way valve and the 3-way valve.
 - Be sure to check for gas leakage.