

FOR SERVICE PERSONNEL ONLY

HITACHI

SANITARY HOT WATER HEAT PUMP INSTALLATION MANUAL

TANK UNIT
TAW-270NH2A



OUTDOOR UNIT
RAW-25NH2A

- Carefully read through the procedures of proper installation before starting installation work.
- The sales agent should inform customers regarding the correct method of installation.
- Please pass installation manual to customer together with operation manual, and request customer to keep them after installation.
- Refrigerant: R410A (GWP 2000)

SAFETY PRECAUTION

- Read the safety precautions carefully before operating the unit.
- The contents of this section are vital to ensure safety. Please pay special attention to the following sign.

- ⚠ **WARNING** Incorrect methods of installation may cause death or serious injury.
- ⚠ **CAUTION** Improper installation may result in serious consequence.

Be sure that the unit operates in proper condition after installation. Explain to customer the proper way of operating the unit as described in the operation manual.

WARNING

- Please request your sales agent or qualified technician to install your unit. Water leakage, short circuit or fire may occur if you do the installation work yourself.
- Please observe the instruction stated in the installation manual during the process of installation. Improper installation may cause water leakage, electrical shock and fire.
- Make sure that the unit is mounted at location which is able to provide full support for the weight of the unit. If not, the unit may collapse and impose danger.
- Observe the rules and regulations of the electrical installation and the methods described in the installation manual when dealing with the electrical work. Use power cables approved by the authorities of your country.
- Be sure to use the specified wires for connecting the tank and outdoor units. Please ensure that the connections are tight after the conductors of the wires are inserted into the terminals. Improper insertion and loose contact may cause over-heating and fire.
- Please use the specified components for installation work. Otherwise, the units may collapse or water leakage, electric shock and fire may occur.
- Be sure to use the specified piping set for R-410A. Otherwise, this may result in broken copper pipes or faults.
- When installing or removing the sanitary hot water heat pump, only specified refrigerant (R410A) shall be allowed, do not allow air or moisture to remain in the refrigeration cycle. Otherwise, pressure in the refrigeration cycle may become abnormally high so that a rupture may be caused.
- After completion of installation work, make sure that there is no refrigerant gas leaks into the room, expose to the fire in the fan-driven heater, space heater, etc., poison gas may occur.
- Unauthorized modifications to the sanitary hot water heat pump may be dangerous. If a breakdown occurs please call a qualified sanitary hot water heat pump technician or electrician. Improper repairs may result in water leakage, electric shock and fire, etc.
- Be sure to use the supplied or specified installation parts. Use of other parts may cause the unit to vibrate loosely, and may cause water leakage, electrical shock, or fire.
- Electrical work must be carried out in accordance with the installation manual and the national electrical wiring rules or code of practice. Insufficient capacity or incomplete electrical work may cause electrical shock, or fire.
- Be sure to use a dedicated power circuit. Never use a power circuit shared with another appliance.
- For wiring, use a cable long enough to cover the entire distance with no connection. Do not put other loads on the power supply, use a dedicated power circuit. Failure to do so may cause abnormal heat, electrical shock, or fire.
- Use the specified types of wires for electrical connections between the tank and outdoor unit. Firmly clamp the interconnecting wires so that their terminals receive no external stress. Incomplete connections or clamping may cause terminal overheating or fire.
- After connecting the interconnecting and supply wiring, be sure to shape the cables so that they do not put undue force on the electrical covers or panels. Install covers over the wires. Incomplete cover installation may cause terminal overheating, electrical shock, or fire.
- If any refrigerant has leaked out during the installation work, ventilate the room. The refrigerant produces a poisonous gas if exposed to flames.
- After all installation is complete, check and make sure that no refrigerant is leaking. That refrigerant produced a poisonous gas if exposed to flames.
- During pump-down operation, stop the compressor before removing the refrigerant piping. If the compressor is still running and service valve in open during pump-down, air will be sucked in when the refrigerant piping is removed, causing abnormal pressure the refrigerant cycle which will lead to breakage and even to injury.
- During installation, attach the refrigerating piping securely before running the compressor. If the compressor is not attached and the service valve is open during pump-down, air will be sucked in when the compressor is running, causing abnormal pressure in the refrigeration cycle which will lead to breakage and even to injury.
- Be sure to establish an earth. Do not earth the unit to a utility pipe, surge absorber, or telephone earth. Incomplete earth may cause electrical shock. A high surge current from lightning or sources may cause damage to the outdoor unit.
- Be sure to install an earth leakage circuit breaker. Failure to do so may cause electrical shock.
- A pressure-relief valve should be installed. Without a pressure-relief valve, the tank may be broken.

CAUTION

- A circuit breaker or a time delay fuse (16A), and a leak current breaker must be installed. Without them, the danger of electric shock exists. A main switch with a contact gap of more than 3mm has to be installed in the power supply line.
- Do not install the unit near a location where there is flammable gas. The outdoor unit may catch fire if flammable gas leaks around it.
- Please ensure smooth flow of water when installing the drain hose.
- Piping shall be suitable supported with a maximum spacing of 1m between the supports.
- Please ensure the floor where the unit is installed for waterproof and drainage. Otherwise, it may damage downstairs.
- The tank should be fixed stably at the location which can support heavy weight. Otherwise, it may fall by earthquake and so on, and cause injury.

THE CHOICE OF MOUNTING SITE (Please note the following matters and obtain permission from customer before installation).

WARNING

- Must be placed at location that can withstand the weight of its full capacity.

CAUTION

- Do not set it up the place where rain water splashes. The electric shock and a fire might occur.
- Do not install at a location where there is flammable gas, steam, oil and smoke.
- Place the tank unit and its connecting cord at least 1m away from the antenna or signal line of television, radio or telephone. This is to avoid noise interference.
- Do not set it up in the place where water in piping and in the tank freeze.
- It is necessary to set it up in the place where the waterproof and waste water treatment were done so that there is no obstacle when the water leaks by any chance.
- The water may drip from the discharge pipe of the pressure-relief valve and that this pipe must be left open to the atmosphere.
- Discharge pipe connected to the pressure-relief valve is to be installed in a continuously downward direction and in a frost-free environment.
- It is necessary to have space for the maintenance work and set it up. The space necessary for the maintenance work is specified in the following figures.
- Vertically set it up. Moreover, do not overset it.
- Do not set it up in humid place like the bathroom etc.
- Do not set it up near the septic tank.

WARNING

- The outdoor unit must be mounted at a location which can support heavy weight. Otherwise, noise and vibration will increase.

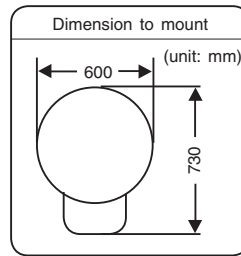
CAUTION

- It is recommended to install the unit at the place not under direct sunshine or rain, and with good ventilation, in order to keep the performance.
- In order to protect animals or plants, please prevent to blow to them directly.
- The clearances of the unit from top, left, right and front are specified in figure below. At least three of the above sides must be open air.
- Be sure that the hot air blown out of the unit and noise do not disturb the neighbourhood.
- Do not install at a location where there is flammable gas, steam, oil and smoke.
- The location must be convenient for water drainage.
- Place the outdoor unit and its connecting cord at least 1m away from the antenna or signal line of television, radio or telephone. This is to avoid noise interference.

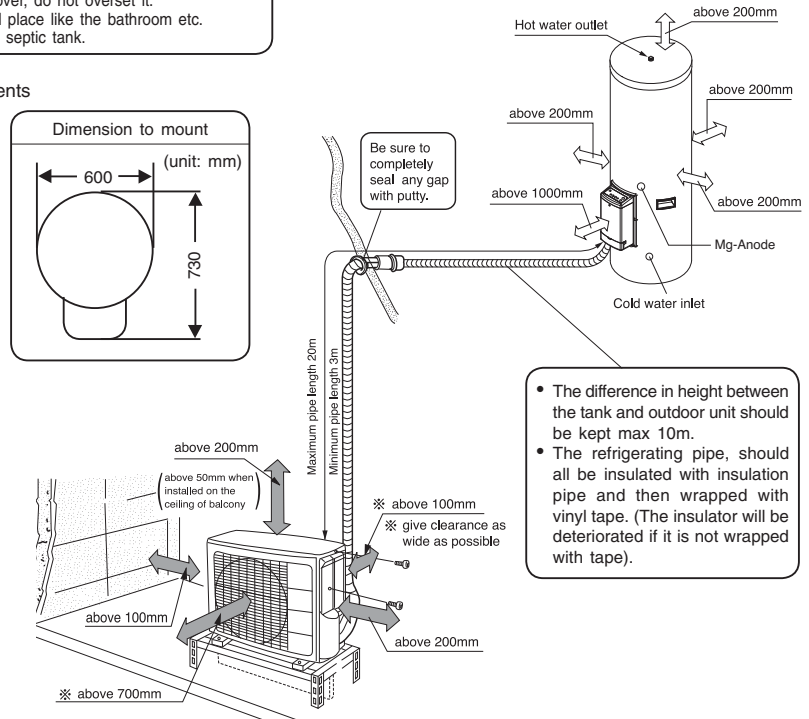
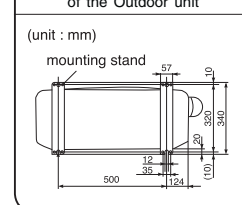
Figure showing the Installation of Tank and Outdoor Unit.

Names of Outdoor Components

No.	Item	Qty
①	Sealing material	1
②	Bush	2
③	Drain Pipe	1
④	Bush	1



Dimension of Mounting Stand of the Outdoor unit



- The difference in height between the tank and outdoor unit should be kept max 10m.
- The refrigerating pipe, should all be insulated with insulation pipe and then wrapped with vinyl tape. (The insulator will be deteriorated if it is not wrapped with tape).

WATER QUALITY

- Water that conforms to the drinking water regulation in each country must be used. Do not use water that contains impurities such as salinity, lime, etc. Like well-water.
- Please install the water softener device when the hardness of water is high. (Maximum hardness French degree 25°F)

PRESSURE-RELIEF VALVE

- Pressure-relief valve must use the following one.
- The tank has to be mounted with a pressure-relief, diameter 3/4" following standard FN36, 40. (But this may be suitable for France only)

- The pressure-relief valve is installed in the water supply line. Between the cold water inlet and pressure-relief valve, you should not install water check valves. Pressure relief valve can prevent excess water pressure which cause volumetric expansion of heated water. Pressure relief valve discharges up to 3% of the capacity of the equipment in the process of boiling the water.

PRESSURE REDUCING VALVE

- Please install the pressure reducing valve in the water supply line as much as possible when the tap water pressure becomes 3.5bar or more.

MIXER TAP

- Please install thermostat type mixer tap in each hot-water supply spot to prevent the scald accident.

PLUMBING

- Please set up the drain trap in the drainage piping. The drainage gas flows backward if there is no drain trap, the sanitary hot water pump corrodes remarkably, and it breaks down.
- Please connect it through a dielectric joint to prevent the electrolysis phenomenon.
- Please make piping parts around the tank such as pressure-relief valve and the drain valve to be easily maintained and checked.

WARNING

- A pressure-relief valve should be installed. Without a pressure-relief valve, the tank may be broken.

Please remove outer and inner cover when connecting the piping and connecting cord.

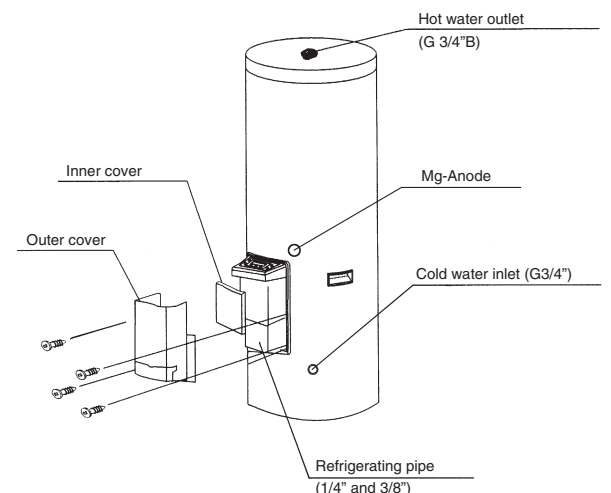
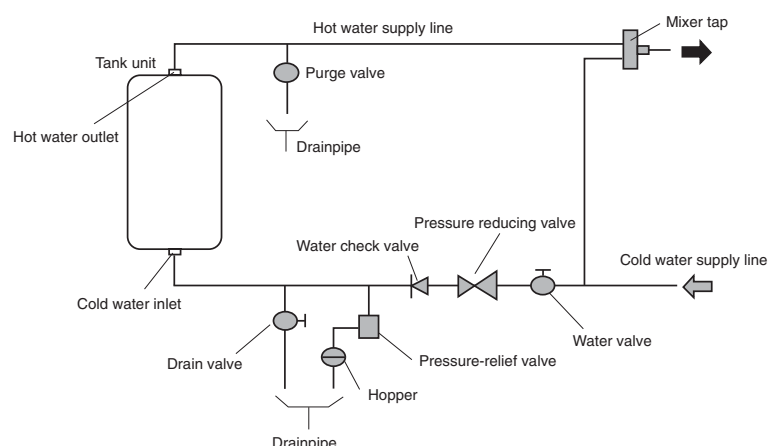
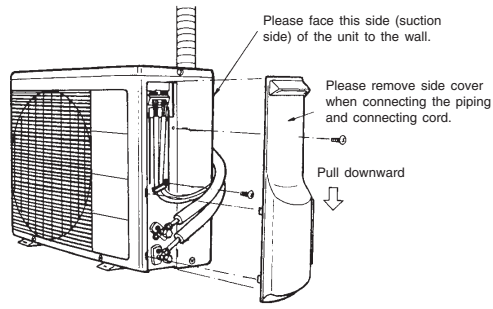


Figure showing the Installation of water piping

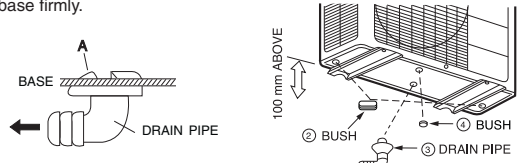


- Please mount the Outdoor unit on stable ground to prevent vibration and increase of noise level.
- Decide the location for piping after sorting out the different types of pipe available.
- When removing side cover, please pull the handle after undoing the hook by pulling it downward.



CONDENSED WATER DISPOSAL OF OUTDOOR UNIT

- There are holes on the base of outdoor unit for condensed water to exhaust.
- In order to flow condensed water to the drain, the unit is installed on a stand or a block so that the unit is 100mm above the ground as shown figure. Join the drain pipe to one hole.
- At first insert one portion of the hook to the base (Portion A), then pull the drain pipe in the direction shown by the arrow while inserting the hook into the base. After installation, check whether the drain pipe cling to the base firmly.



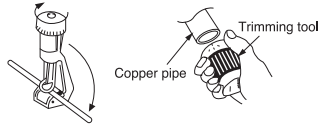
When the air conditioner is used in low temperature and in snowy conditions, water from the heat exchanger may freeze on the base surface to cause poor drainage. When using the sanitary hot water heat pump in such areas, do not install the bush. Keep a space of at least 300mm between the drain hole and the supposed snow height. When using the drain pipe, consult your sales agent.



※ For more details, refer to the installation manual for cold areas.

1 Preparation of Pipe

- Use a pipe cutter to cut the copper pipe.



CAUTION

- Jagged edge will cause leakage.
- Point the side to be trimmed downwards during trimming to prevent copper chips from entering the pipe.
- Before flaring, please put on the flare nut.



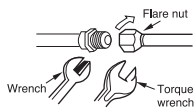
Outer Diameter (mm)	A (mm) For R410A tool
6.35	0.0 ~ 0.5mm
9.52	0.0 ~ 0.5mm

2 Pipe Connection

CAUTION

In case of removing flare nut of an Indoor unit, first remove a nut of small diameter side, or a seal cap of big diameter side will fly out due to high pressure gas inside tank. Prevent water from entering into the piping when working.

- Please be careful when bending the copper pipe.
- Applied frozen grease to the connection points and then screw in manually. After that, use a torque wrench to tighten the connection. Problem may arise if overtightened when connecting the pipe.



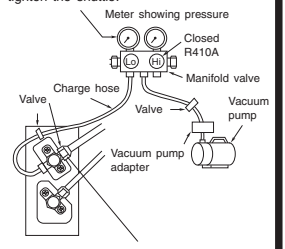
	Outer dia. of pipe	Torque N·m (kgf·cm)
Small dia. side	6.35 (1/4")	13.7 - 18.6 (140 - 190)
Large dia. side	9.52 (3/8")	34.3 - 44.1 (350 - 450)
Valve head cap	Small dia. side 6.35 (1/4") Large dia. side 9.52 (3/8")	19.6 - 24.5 (200 - 250)
Valve core cap		12.3 - 15.7 (125 - 160)

3 Removal Of Air From The Pipe And Gas Leakage Inspection

Procedures of using Vacuum Pump for Air Removal

- As shown in right figure, remove the cap of valve core. Then, connect the charge hose. Remove the cap of valve head. Connect the vacuum pump adapter to the vacuum pump and connect the charge hose to the adapter.

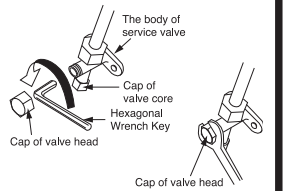
When the meter reaches -101KPa (-76cmHg) during pumping, fully tighten the shuttle.



When pumping starts, slightly loosen the flare nut to check of air sucked in. Then tighten the flare nut.

- Fully tighten the "Hi" shuttle of the manifold valve and completely unscrew the "Lo" shuttle. Run the vacuum pump for about 10-15 minutes, then completely tighten the "Lo" shuttle and switch off the vacuum pump.

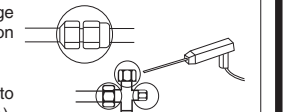
- Completely unscrew the spindle of the service valve (at 2 places) in anti-clockwise direction to allow the flow of coolant (using Hexagonal Wrench key).



- Remove the charge hose and tighten the cap of valve head. Check the cap's periphery if there is any gas leakage. The task is then completed.

Gas Leakage Inspection

Please use gas leakage detector to check if leakage occurs at the connection of Flare nut as shown on the right.



If gas leakage occurs, further tighten the connection to stop leakage. (Use the detector provided for R410A)

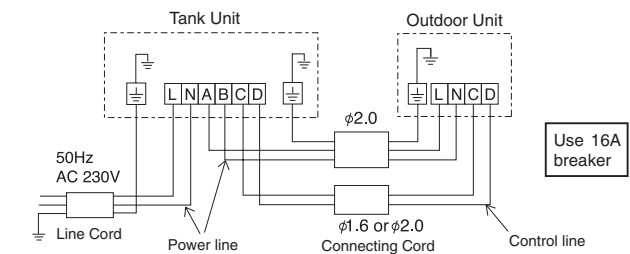
WARNING • THIS APPLIANCE MUST BE EARTHED.

This sanitary hot water heat pump can be connected either A or B power supply method according to electricity supply contract. But how to set the switch is different in A or B.

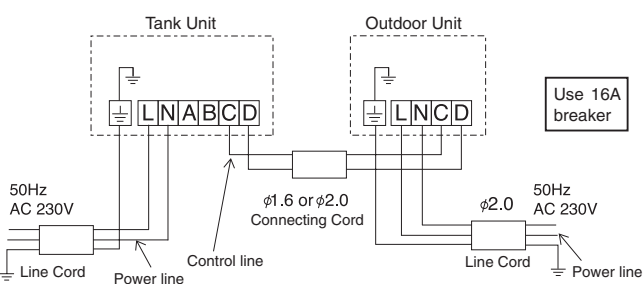
A: Full time power supply B: Off peak hours power supply

Procedures of Wiring

- In case that power is supplied to Tank Unit



- In case that power is supplied to Tank and Outdoor unit

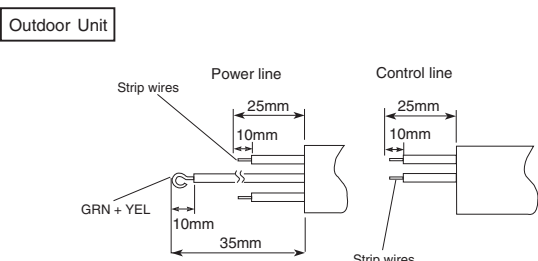
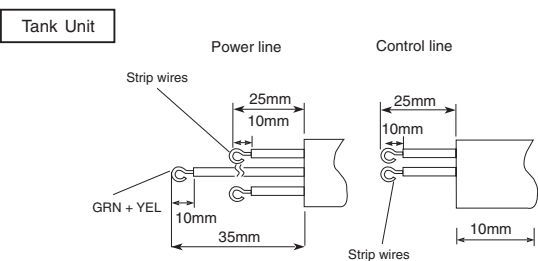


CAUTION

Please refer to the Installation Manual when connecting the wires for the tank unit and the outdoor unit.

Incorrect connection of the A, B terminals of the tank unit and the C, D terminals of the outdoor unit will damage the electrical parts of the outdoor unit.

- Processing of terminal



WARNING

- The naked part of the wire core should be 10 mm and fix it to the terminal tightly. Then try to pull the individual wire to check if the contact is tight. Improper insertion may burn the terminal. Be sure to use only power cables approved from the authorities in your country. For example in Germany: Cable type: NYM 3x1.5mm².
- Please refer to the installation manual for wire connection to the terminals of the units. The cabling must meet the standards of electrical installation.
- There is a AC voltage of 230V between the L and N terminals. Therefore, before servicing, be sure to switch off the main switch.

Checking for the electric source and the voltage range

- Before installation, the power source must be checked and necessary wiring work must be completed. To make the wiring capacity proper, use the wire gauges list below for the lead-in from a pole transformer and for the wiring from a switch board of fuse box to the main switch and tank unit and outdoor unit in consideration of the locked rotor current.

IMPORTANT

Cable length	Wire cross-section
up to 6m	1.6mm ²
up to 15m	2.5mm ²
up to 25m	2.5mm ²

- Investigate the power supply capacity and other electrical conditions at the installation location. Depending on the model of room air conditioner to be installed, request the customer to make arrangements for the necessary electrical work etc. The electrical work includes the wiring work up the outdoor. In localities where electrical conditions are poor, use of a voltage regulation is recommended.

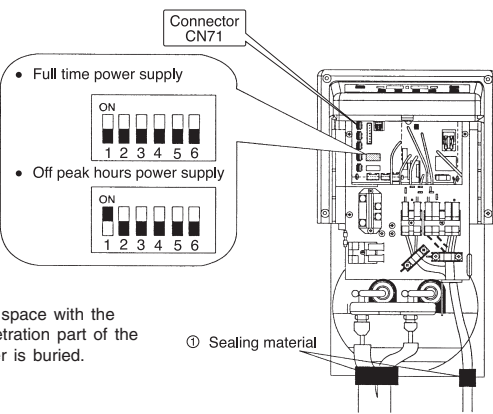
Wiring of The Tank Unit

- Please remove outer and inner cover for wire connection.

WARNING

- Please fix the connecting cord in the band. If it is not fixed, external force apply to joint, it causes heat and a fire, etc.
- The connecting cord should not touch to pipes. (It becomes high temperature.) Please install outer and inner cover surely after constructs it.

- This switch must be set before turning on the electric power.



Once turning on the electric power, the setting cannot be changed for a few minutes or for a few hours after turning off the power, until the electricity charged in the electric parts is discharged.

In case that it is necessary to change the setting of the switch after turning on the electric power, please follow the procedure below.

The method to change the setting after turning on the electric power.

- Turn off the electric power.
- Get off outer cover and inner cover from the control box.
- Pull out the connector CN71 from PWB assembly.
- Wait more than ten seconds
- Change the setting of the switch.
- Reconnect the connector CN71.
- Attach inner cover and outer cover of the control box.

Wiring of The Outdoor Unit

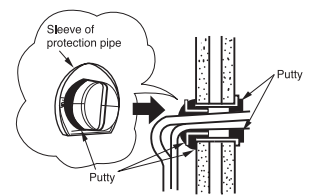
- Please remove the side cover for wire connection.

WARNING

- If you cannot attach the side cover due to the connecting cord, press the connecting cord in direction to the front panel to fix it.
- Be sure that the hooks of the side cover is fixed in certainly. Otherwise water leakage may occur and this causes short circuit or faults.
- The connecting cord should not touch to service valve and pipes. (It becomes high temperature.)
- Please fix the connecting cord in the band. If it is not fixed, external force apply to joint, it causes heat and a fire, etc.

1 Insulation And Maintenance Of Pipe Connection

- Please tie the pipe and connecting cord together with vinyl tape as shown in the figure showing the installation of tank and outdoor unit. Then fix their position with holders.
- To enhance the heat insulation and to prevent water condensation, please cover the outdoor part of the refrigerating pipe with insulation material.
- Completely seal any gap with putty.



2 Operation Test

- Please ensure that the sanitary hot water heat pump is in normal operating condition during the operation test.

- Please connect to off peak hours power supply after connecting to live power and testing.

CAUTION

- Please fill the tank full first before operation. The operation without full water in the tank might cause overheat of the unit and causes damage.

- Fill the tank with water.
 - Turn on water tap close drain valve.
 - Turn on all connected mixer tap (hot water side). It take about 20 to 30 minutes to fill up the tank. Please keep all taps open for a while in order to clean the tank and the drain pipes by running water.
 - Close all connected mixer taps (hot water side) and open all taps (cold water side). Let the cold water run for a while to clean out the tank.
 - Turn off all connected mixer taps.
 - Inspection
 - After filling the tank, check all pipe joints and the tank for leakage.
 - Check operation of pressure-relief valve.

- Turn on the circuit breaker.
 - In case that the electric power is supplied to both of tank unit and outdoor unit, please always turn on the outdoor unit side first.

If the tank side is turned on first, it may fall into error mode of "E0 03" and the unit is unable to operate.

When once the tank side is turned on first and it falls in to error mode of "E0 03" by mistake, please turn on the outdoor first, then turn on the tank side, after following measures.

- Turn off the electric power.
- Get off outer cover and inner cover from the control box.
- Pull out the connector CN71 from PWB assembly.
- Wait more than ten seconds
- Reconnect the connector CN71.
- Attach inner cover and outer cover of the control box

If error mode does not disappear after the procedure above, the machine is broken.

CAUTION

- Check the operation of leak current breaker. There is fear of an electric shock.

- Make test run.

- Reconfirm whether the water leak is found from the joint of piping and the tank. Moreover, confirm the operation of the pressure-relief valve.

CAUTION

- Please ensure that the pressure-relief valve work. If you continue to use malfunction pressure-relief valve, it may break the tank or water may leak from the valve.

- Explain to your customer the proper operation procedures as described in the user's manual.