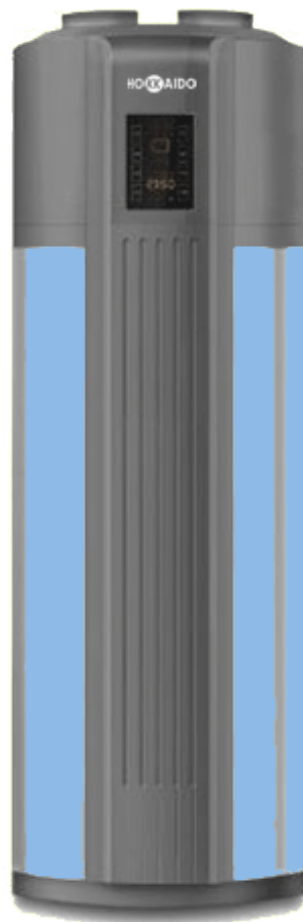


# WATER HEATER

## INSTALLATION & USER'S MANUAL

Model  
HWMI 300 A



**HOKKAIDO**

### WARNING!

PLEASE READ CAREFULLY THIS MANUAL BEFORE INSTALLING THE WATER HEATER

# HO **KK** AIDO

TERMAL S.R.L. Via della Salute, 14 -- 40132 -- Bologna -- ITALY

**EN** EUROPEAN REGULATIONS CONFORMITY FOR THE MODELS:

Water Heater: **HWMI 300 A**

#### CE

All the products are in conformity with the following European provision:

- Low Voltage Directive 73/23/EEC
- Low Voltage Directive 2006/95/EC
- Electromagnetic Compatibility 89/336/EEC
- Electromagnetic Compatibility 2004/108/EC

#### ROHS

The products are fulfilled with the requirements in the directive 2002/95/EEC of the European parliament and of the council on the Restriction of the use of Certain Hazardous Substances in Electrical and Electronic Equipment (EU RoHS Directive)

#### WEEE

In accordance with the directive 2002/96/CE of the European parliament, herewith we inform the consumer about the disposal requirements of the electrical and electronic products.

#### **DISPOSAL REQUIREMENTS:**



Your Water Heater is marked with this symbol.

This means that electrical and electronic products shall not be mixed with unsorted household waste. Do not try to dismantle the system yourself: the dismantling of this kind of system, treatment of the refrigerant, of oil and of other part must be done by a qualified installer in accordance with relevant local and national legislation. Water Heater must be

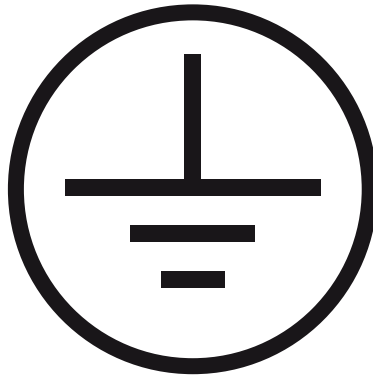
treated at a specialized treatment facility for re-use, recycling and recovery. By ensuring this product is disposed of correctly, you will help to prevent potential negative consequences for the environment and human health. Please contact the installer or local authority for more information.

President  
Giorgio Giatti



## WARNING

This Unit is required reliable earthing before usage, otherwise might cause death or injury.



Please ask Authorized Technical Service for reliable earthing connection.

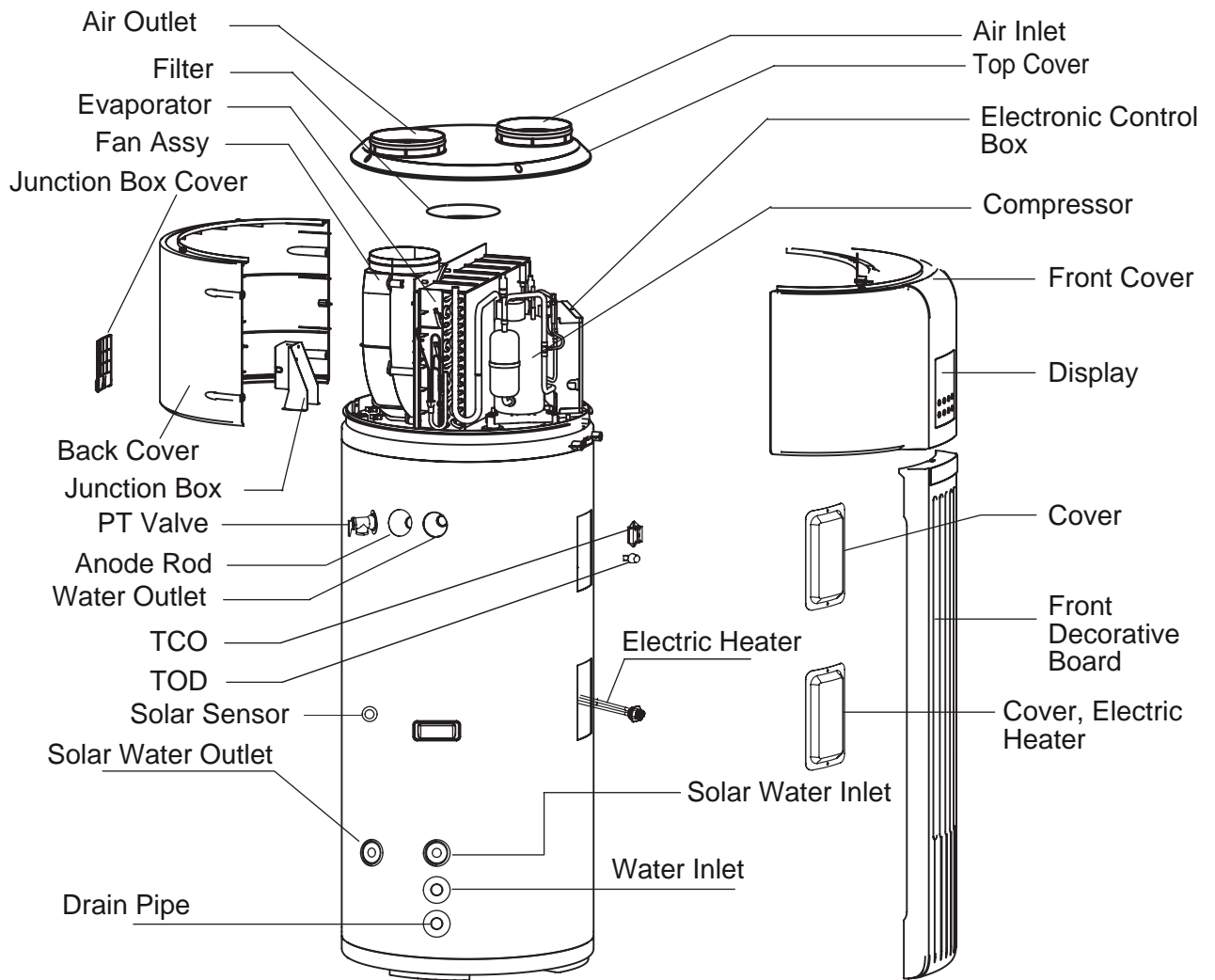
Your safety is the most important thing we concerned!

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# PRODUCT'S OUTLINE

## PARTS NAMES



### NOTE

All the pictures in this Manual are for explanation purpose only. They may be slightly different from the Water Heater you purchased (depends on Model).

## 1. PRECAUTIONS

To prevent injury to the User or other people and property damage, the following instructions must be followed. Incorrect operation due to ignoring of instructions may cause harm or damage.

The safety precautions listed below are divided in two categories: "WARNING" and "CAUTION".

In both cases, safety instructions are very important and must be followed carefully.



### WARNING

Failure to observe a warning may result in death or serious injury.



### CAUTION

Failure to observe a caution may result in injury or damage to the equipment.



### WARNING

- The Water Heater Unit must be earthed effectively.
- A creepage breaker must be installed near the power supply.
- Do not tear off the labels on the Units for the purpose of warning/reminding and warranty.



### WARNING

- Ask the Authorized Technical Service for installation of Water Heater Unit. Improper installation may result in water leakage, electric shock or fire.
- Ask the Authorized Technical Service for the repair and maintenance. Improper repair and maintenance may result in water leakage, electric shock and fire.
- In order to avoid electric shock, fire or injury, if any abnormality is detected - such as smell of fire - turn off the power supply and call Authorized Technical Service for instructions.
- Never use the wire and fuse with wrong rated current. Use of wrong wire or fuse may cause the Unit to break down or a fire.
- Do not insert fingers, rods or other objects into the air inlet or outlet. When the fan is rotating at high speed, it will cause injury.
- Never use a flammable spray such as hair spray, lacquer paint near the Unit. It may cause a fire.
- Never touch the air outlet or the horizontal blades while the swing flaps is in operation. Fingers may be caught or the Unit may break down.
- Never put any objects into the air inlet or outlet. Objects touching the fan which rotates at high speed can be dangerous.
- The appliance must be installed in accordance with national wiring regulations.
- The appliance must not be used by children without supervision.
- If the supply cord is damaged, it must be replaced by the Manufacturer or by the Authorized Technical Service, in order to avoid the hazard of electric shocks.
- An all-pole disconnection device which has at least 3mm separation distance between its contacts shall be incorporated in the fixed wiring, according to national rules.
- DISPOSAL: Do not dispose this Product as unsorted municipal waste. Collection of such waste separately for special treatment is necessary. Do not dispose of electrical appliances as unsorted municipal waste: use separate collection facilities. Please contact your local government for information regarding systems available.
- If electrical appliances are disposed of in landfills or dumps, hazardous substances can leak into the groundwater and get into the food chain, damaging your health and well-being.

## PRECAUTIONS & ACCESSORIES



### CAUTION

- The earth pole of terminal must be earthed, and the rated current must be more than 10A. Make sure that power supply terminal and power supply plug are dry enough and have a good connection.  
Method: Turn on power supply, run the Unit for half an hour then turn it off and check whether the power supply plug is hot or not. If it is hot (more than 50°C) please change it with a new and eligible one, or it may result in a electric shock or fire.
- Do not use the Water Heater Unit for other purposes different from that it has been conceived.
- Before cleaning, be sure to stop the operation and turn the breaker off or pull out the power cord. Otherwise, an electric shock and injury may be caused.
- Please pay attention because water too much hot (more than 50°C) inside the Water Heater may cause serious injuries.
- In order to avoid injuries, do not remove the fan guard on the Outdoor Unit.
- Do not operate the Water Heater Unit with wet hands. An electric shock may be caused.
- The installation height of power supply should be over 1.8m, to prevent any sprinkling of water from reaching the Unit.
- In the water inlet side, the One Way valve must be installed.
- It is normal if some water drops from the hole of PT valve during operation. In case of a great amount of water, please contact the Authorized Technical Service for instructions.

After a long term use, check the Unit stand and fittings. If damaged, the Unit may fall and result in injury.

Arrange the drain hose to ensure smooth drainpipe. Improper drainpipe may cause wetting of the building, furniture, etc.

Do not touch the inner parts of the controller.  
Do not remove the frontal panel. Some parts inside are dangerous to touch, and this may cause malfunctions to the appliance.

Do not turn off the power supply.  
System will stop or restart heating automatically. A continuous power supply for water heating is necessary, except when repairing and maintenance are carried out.

## 2. ACCESSORIES

Table 2-1

Accessory name	Q.ty	Sharp	Purpose
User & Installation Manual	1		Instructions for installation & use (this Manual)
Y-shaped filter	1		To filtrate inlet water
One Way valve	1		Prevent water from flowing back
Adaptor	1		Drain condensate water

## 3. INSTALLATION LOCATION

- Enough space must be kept for easy installation and maintenance.
- The air inlet and outlet must be free from obstacles and strong wind.
- The bearing surface should be flat and able to bear the weight of the Unit. It must not increase noise or vibration.
- The operation noise and air flow expelled shall not affect neighbours.
- The appliance must not be installed in places where flammable gas may leak.
- Installation location must be convenient for piping and wiring.
- If the appliance is installed in indoor space, it might cause a temperature drop and noise disturbance. Please take preventive measures for this.
- If the Unit needs to be installed on a metal holder, make sure they are insulated well and in accordance with local standards.



### CAUTION

- Installing the equipment in any of the following places may lead to malfunctions of the equipment itself (if it is inevitable, consult the Supplier).
- The site contains mineral oils such as cutting lubricant.
- Seaside, where the air contains much salt.
- Sites where there are corrosive gases.
- Factories where the power voltage fluctuates seriously.
- Inside a car or cabin.
- Place like kitchen where oil permeates.
- Place where strong electromagnetic waves exist.
- Place where flammable gases or materials exist.
- Place where acid or alkali gases evaporate.
- Other special environments.

### • Precautions before installation

- Decide the correct way of conveying the equipment.
- If the Unit has to be installed in a metal part of the building, electric insulation must be carried out, and the installation must meet the relevant technical standards for electric devices.

### • Installation space

- Before installing the Unit, reserve the space for maintenance shown in the following Figures.

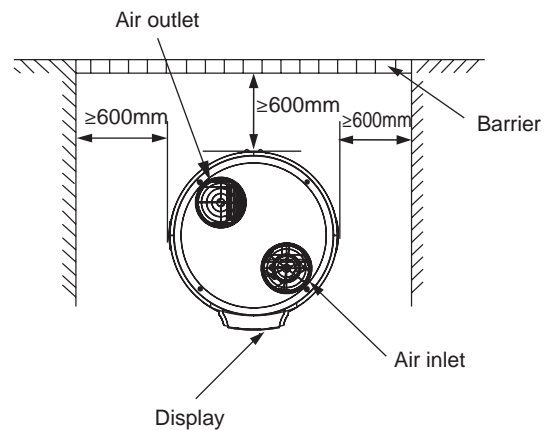


Fig. 3-1

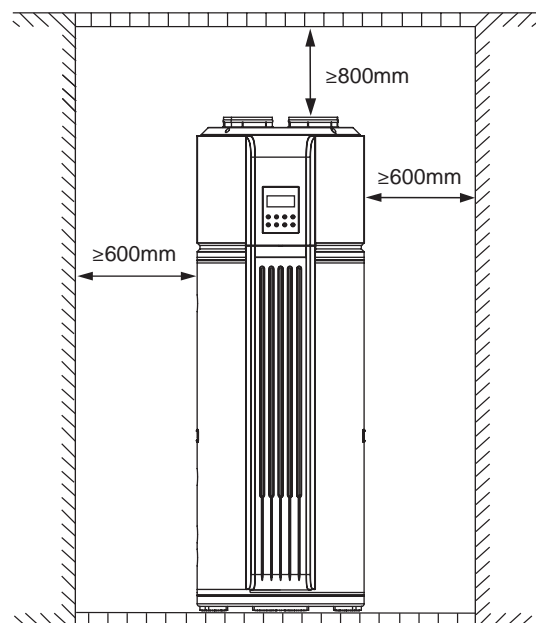


Fig. 3-2



## 4. INSTALLATION



### WARNING

- Water Heater Units must be installed only by Authorized Technical Service.  
The User must never try to install the appliance by himself.  
Incorrect installation may result in water leakages, electric shock or fire.
- The equipment must be installed far from direct sunlight and from other heat appliances. If this is not possible, please install a covering.
- The Unit must be securely fixed, in order to avoid noise and vibration.
- Make sure there is no obstacle around the Unit.
- In places where there is strong wind like seashore, fix the Unit in a location protected from the Unit.

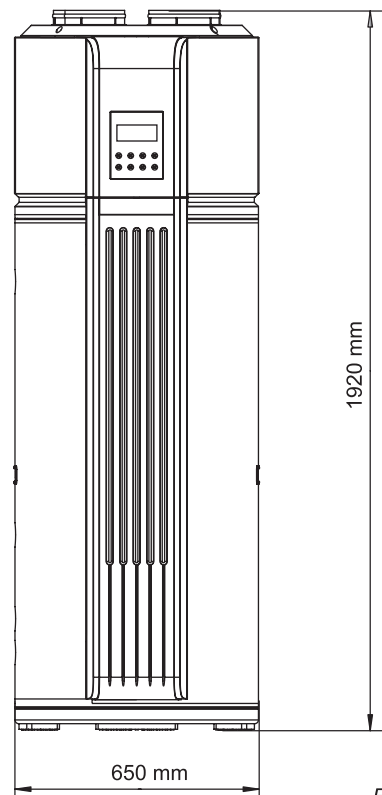


Fig. 4-1

Fig. 4-1

- **Carry the Unit to the installation site by observing the rules and limits set by Manufacturer**

- In order to avoid scratching or deforming the Unit's surface, apply guard boards to the contacting surface.
- Avoid contact of fingers or of other objects with the vanes.
- Don't incline the Unit more than 45° in moving, and keep it vertical when installing.
- This system is very heavy: it needs to be carried by 2 or more persons, otherwise it might cause injury and damage.

### • Install the Unit

- The circulating air for every Unit should be more than 700m<sup>3</sup>/h.
- Make sure there is enough installation space.
- Outline dimensional drawings: see Fig. 4-1 and Fig. 4-2.

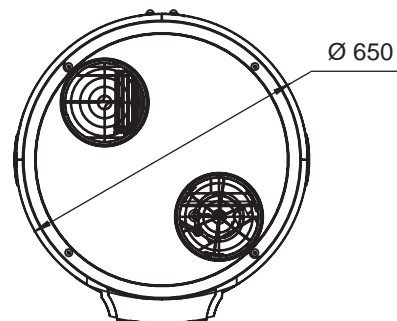


Fig. 4-2

## 5. PIPELINE CONNECTION

### • Pipeline Connection Drawing

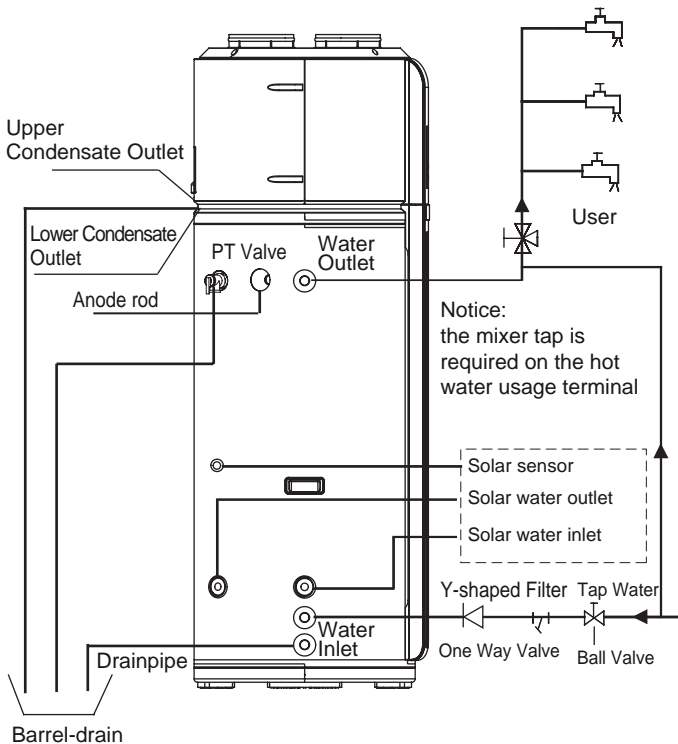


Fig. 5-1



### CAUTION

When installing the main Unit, please set a drain valve at the drain orifice of the Unit itself.

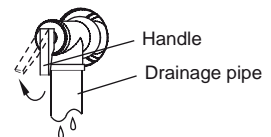
### • Pipeline Connection Explanation

- Installation of the water inlet or outlet pipes: the specifications of the water inlet or outlet thread is RC3/4" (internal thread). Pipes must be heat-resistant and durable.
- Installation of the pipe for PT valve: the specifications of the valve connecting thread is RC3/4" (internal thread). After installation, it must be confirmed that the drainpipe outlet is exposed in the air. When flexible drainpipe is jointed to the pressure relief orifice of this valve, it must be confirmed that the flexible drainpipe is downwards vertically and exposed in the air.



### NOTE

- A safety valve should be installed at the water inlet of the Unit.
- Arrange water pipes and connected fittings as it is shown in Fig. 5-1. In case of installation in a place where outside temperature is below freezing point, insulation must be provided for all hydraulic components.
- The handle of PT Valve should be pulled out once per half year, to make sure that there is no jam of the valve. Please beware of burn, because of the high temperature of water. The drainage pipe should be well installed, in order to avoid freezing up in cold weather.



EXPLOSION

- Do not press the handle of PT Valve.
- Do not dismantle the PT Valve.
- Do not block off the Drainage pipe. If you do not comply with the above instructions, explosions and injuries may occur.

- Installation of the One Way Valve: the specifications of the One Way Valve thread in accessories is RC3/4". It is used to prevent backflow of water.
- Installation of the Y-shaped Filter: the specifications of the Y-shaped filter thread in accessories is RC3/4". It is used to filtrate inlet water.
- After installation of all pipes, turn on the cool water inlet and hot water outlet and start effusing the tank. When there is water normally flowing out from water outlet, the tank is full. Turn off all valves and check all pipes. If there is any leakage, please repair.
- If the inlet pressure is less than 0.15MPa, a pressure pump should be installed at the water inlet. For guaranteeing the long safety using age of tank at the condition of water supply higher than 0.65MPa, a reducing valve should be mounted at the water inlet pipe.
- Since during the drainage, water leakages may take place, it is recommended to use a water collector, as it is shown in Fig. 5-2.

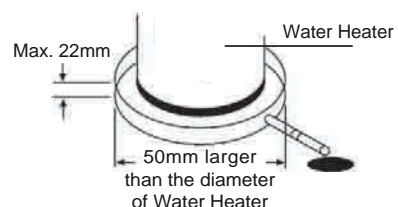


Fig. 5-2

# INSTALLATION

- **Duct Connection Way**

- Air inlet and outlet do not need to connect with canvas.

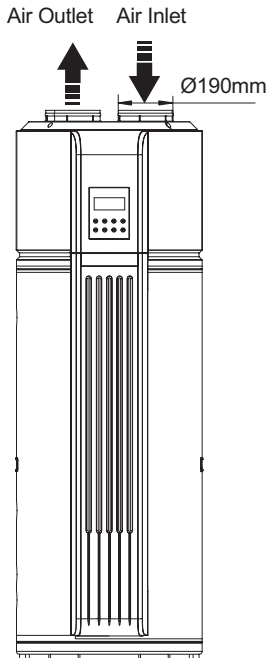


Fig. 5-3

- Note: Upon connection of canvas, airflow rate and capacity in heat pump system decrease.

- Air inlet without canvas, air outlet connect to canvas:  $A \leq 10m$ .

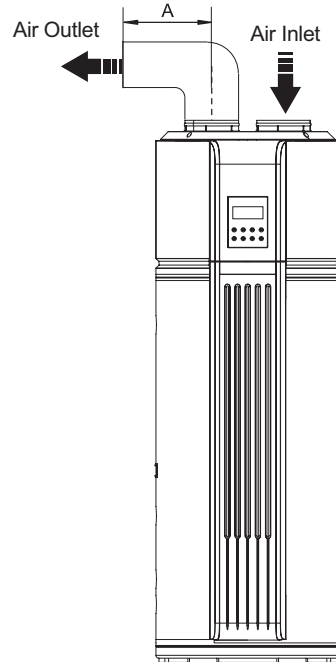


Fig. 5-5

This type of duct connection is recommended if the appliance is installed inside a room where temperature is higher than outdoor temperature.

- Air inlet and outlet need to connect with canvas:  $A+B \leq 10m$ .

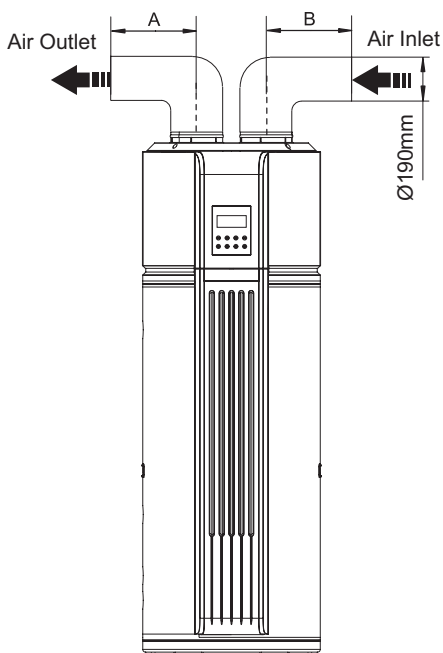


Fig. 5-4

- Air inlet connect to canvas, air outlet without canvas:  $A \leq 10m$ .

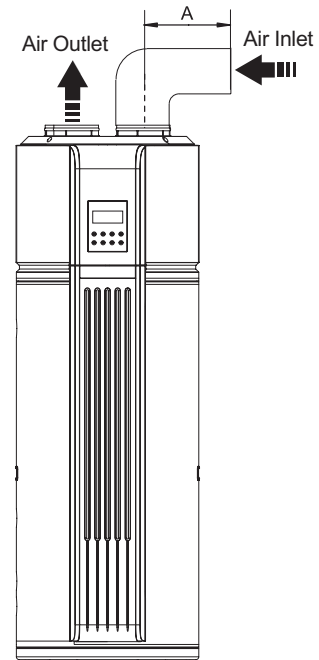


Fig. 5-6

This connection way is advantageous in summer.

# INSTALLATION

## • Canvas Duct Description

Canvas Duct	Dimension(mm)	Straight-line pressure drop (Pa/m)	Straight-line length (m)	Bent pressure drop (Pa)	Bent's qty.
Round canvas duct	Ø190	≤2	≤10	≤2	≤5
Rectangle canvas duct	190x190	≤2	≤10	≤2	≤5
Other shaped canvas duct	Refer to above data				

Note: In case of need, canvas duct to be connected at air outlet better than at inlet.



### NOTE

- Upon connected canvas, airflow rate and capacity in heat pump system will decrease.
- In case main Unit is connected with canvas, the diameter of the duct must be  $\geq 190\text{mm}$ , total length of the ducts must not be longer than 10m or the maximum static pressure must not exceed 50Pa.  
Warning! The duct must have no more than 5 bends.
- In case main Unit is connected with canvas, when Unit is operating, condensate dew may form at the outside of air outlet canvas. Please pay attention to the discharge of condensate water. We suggest you to wrap the thermal insulated layer at the outside of air outlet canvas.

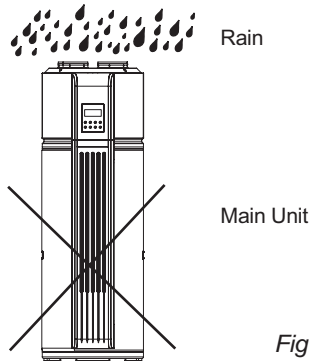


Fig. 5-7

- Warning! If case of rain entering internal components of main Unit, the components might be damaged or injuries might be caused to persons (Fig. 5-7).
- It is recommended to provide a weather shed in case ducts are exposed to rain or snow (Fig. 5-8).

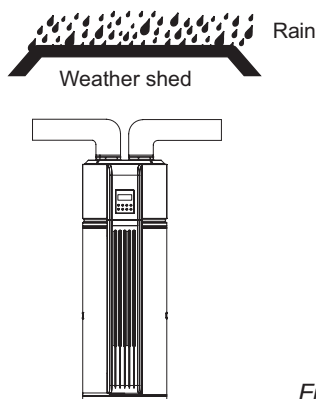


Fig. 5-8

- Install filter inside the Unit.  
In case main Unit is connected with canvas, install filter at the air inlet of duct and then install the duct (Fig. 5-9 and Fig. 5-10).

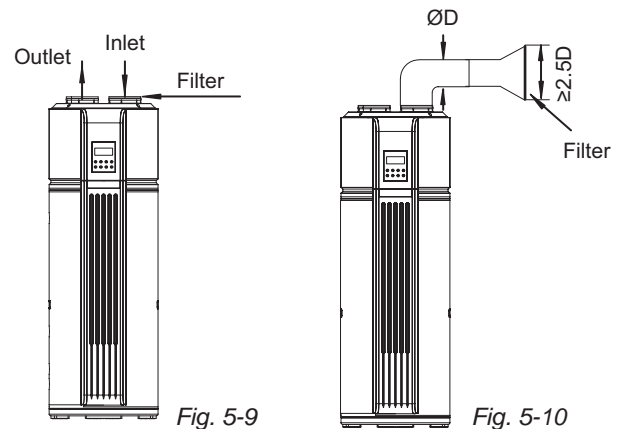


Fig. 5-9

Fig. 5-10

- To fluently drain condensate water from evaporator, please install the main Unit at a horizontal floor. If the equipment is tilted, make sure the inclination is on side of drain vent. The inclination angle as regards the ground must be no more than  $2^\circ$ .

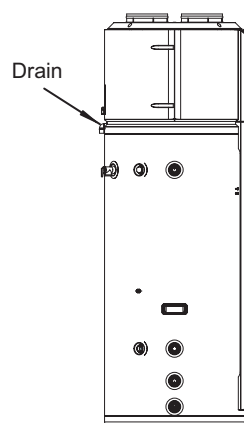


Fig. 5-11

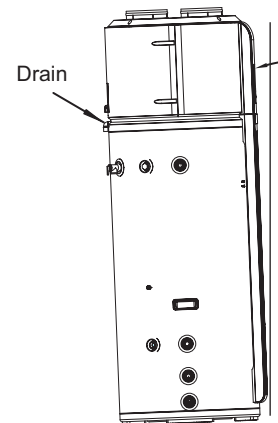


Fig. 5-12

## 6. ELECTRIC CONNECTION



### CAUTION

- The power supply for the Unit must correspond to the rated voltage.
- Earthing must be included in the power circuit. And it must be connected with the effective external ground wire.
- The wiring must be performed by Authorized Technicians according to the circuit diagram.
- Set the electric leakage protector according to the current electric technical standards.
- The power cord and the signal cord must be properly laid out, without mutual interference or contacting the connection pipe or valve.
- After wire connection is finished, check it again and make sure the correctness before supplying power.



### WARNING

For safety, a Creepage Breaker must be installed on the Unit near the power supply. Moreover, the Unit must be effectively earthed.

### 6.1 Specifications of Power Supply

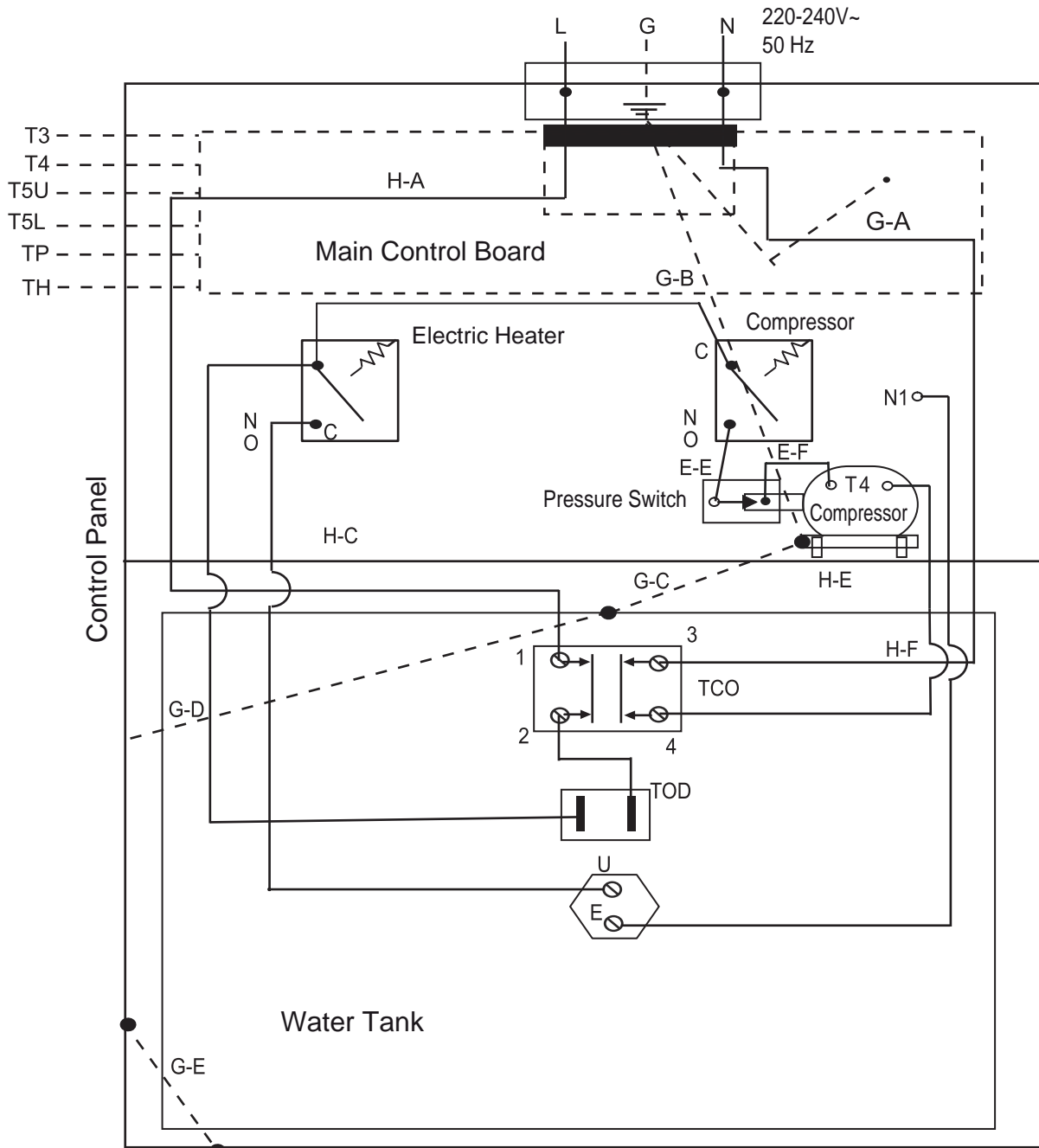
Table 6-1

Model Name	HWMI 300A
Power Supply	220-240V~50Hz
Min. Diameter of Power Supply Line (mm <sup>2</sup> )	2.5
Earth wire (mm <sup>2</sup> )	2.5
Manual Switch(A) Capacity/Fuse	15/5
Creepage Breaker	30 mA 0.1sec

Please choose the power cable according to the above table and according to local electric standard.

# WIRING

## 6.2 Wiring Diagram



- T3: Tube Temp. Sensor
- T4: Ambient temp. Sensor
- T5L: Tank Temp. Sensor (lower)
- T5U: Tank Temp. Sensor (upper)
- TP: Discharge Temp. Sensor (upper)
- TH: Return air temperature sensor
- Earthing

Fig. 6-1

## 7. OPERATION INSTRUCTION

### 7.1 Operation steps

Before using this Unit, please follow the steps below.

Filling the Water Tank: if Unit is used for the first time or used again after emptying the tank, please make sure that the tank is full of water before turning on the power.

Method: see Fig. 7-1.

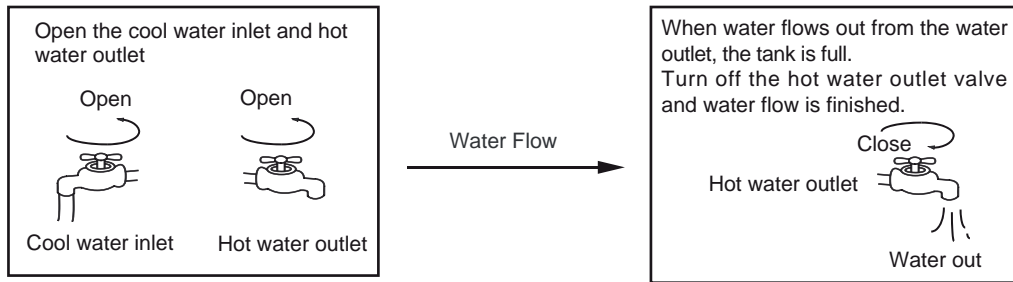


Fig. 7-1



### CAUTION



Operation without water in water tank may result in damage of auxiliary e-heater.

Due to such damage, the Supplier is not responsible for the quality issue.

After powered on, the display lights up. User can operate the Unit through the buttons for selecting different modes which are displayed.



### CAUTION



If water temperature exceeds 50°C, this may cause serious burns and death.

If water temperature is very high, special care should be paid to children, disabled and aged people.

Emptying: if Unit needs to be cleaned, moved, etc., water tank must be emptied.

Method: see Fig. 7-2.

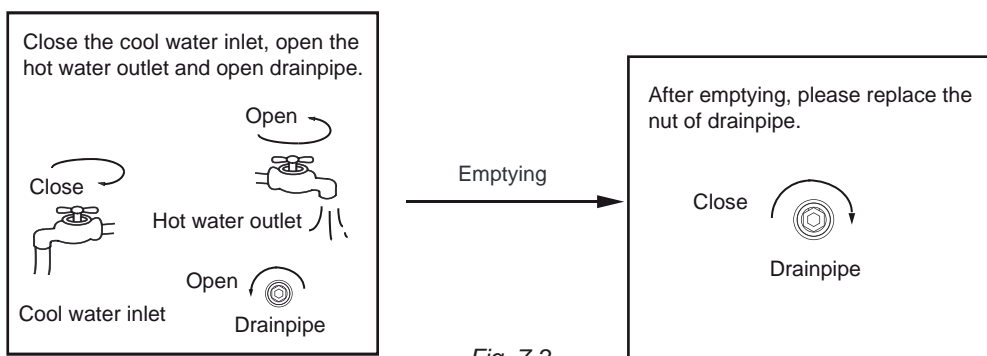
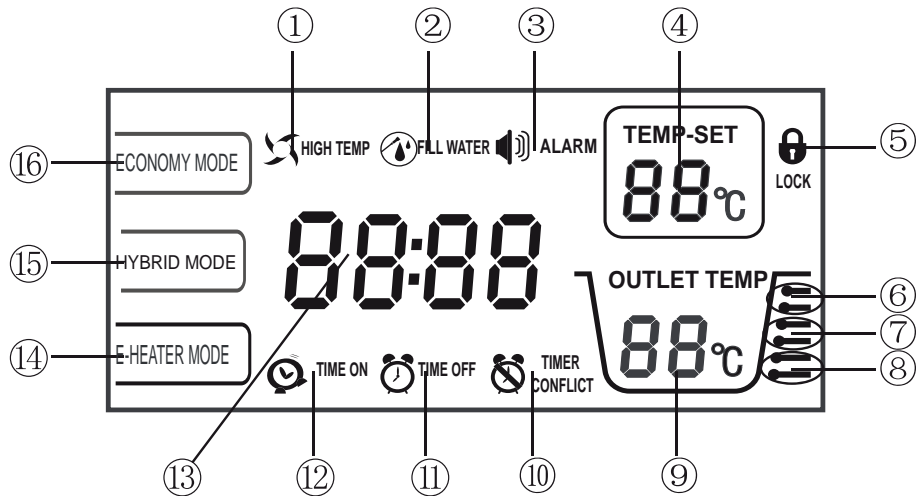


Fig. 7-2

## OPERATING INSTRUCTIONS

### • Display

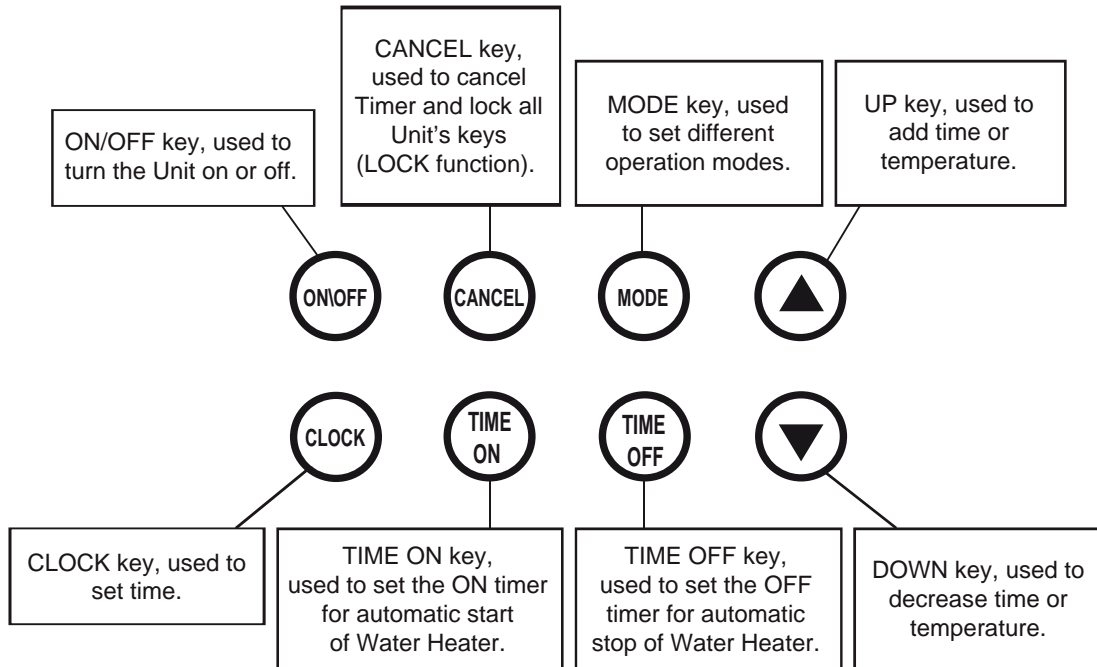


①	HIGH TEMP indicator: When the setting temp. exceeds 50°C, it lights up to remind you that the outlet temperature is too high.
②	FILL WATER indicator: When the power supply is turned on, it lights up to remind you that the water tank must be filled up.
③	ALARM indicator: It flashes in case of malfunction or in case of a protection intervention.
④	TEMP SET indicator: It shows the setting temperature or Error Codes and Protection Codes.
⑤	LOCK indicator: When the Indoor Unit is locked, it always lights.
⑥	Water temperature indicator: When the actual water temperature exceeds 60°C, it lights up.
⑦	Water temperature indicator: When the actual water temperature exceeds 50°C, it lights up.
⑧	Water temperature indicator: When the actual water temperature exceeds 40°C, it lights up.
⑨	OUTLET TEMP indicator: It displays water temperature of the upper part of the tank, which can be used. It always lights.
⑩	TIMER CONFLICT indicator: It lights up in case there is a conflict between Timer settings by control panel and Timer settings by a wired controller.
⑪	TIME OFF indicator: It lights up when timing off mode is set.
⑫	TIME ON indicator: It lights up when timing on mode is set.
⑬	CLOCK indicator: It displays present time.
⑭	E-HEATER MODE indicator: It lights up when User sets the E-Heater mode.
⑮	HYBRID MODE indicator: It lights up when User sets Hybrid mode.
⑯	ECONOMY MODE indicator: It lights up when User sets Economy mode.



## OPERATING INSTRUCTIONS

### • Buttons



### • Preparation before running the Unit

When you run the Unit for the first time, all the indicators on the Unit will light for 3 seconds, while the buzzer will ring twice.

After no operation for 1 minute, all indicators will go out automatically except FILL WATER indicator (flashing) and WATER TEMP indicator (lighting, it shows tank's temperature).

When the tank is full, please press the ON/OFF key: the FILL WATER indicator will stop flashing and you can set your desired operation modes. When setting is completed, please press ON/OFF key again and the FILL WATER indicator will go out. And then run the Unit.

When the Unit is running, if no selection is carried out or no malfunction occurs for 20 seconds, the backlight of the display will go out automatically except operation mode, outlet temperature and LOCK indicator.

If there is no operation for 1 minute, the Unit will lock automatically (LOCK function).

# OPERATING INSTRUCTIONS

## • LOCK/UNLOCK

In order to prevent wrong operation, a special lock function has been designed.

If there is no operation for 1 minute, the Unit will be locked automatically, and display shows the Lock indicator.

When the Unit is locked, no keys can be operated.

To unlock Unit, please proceed as follows:

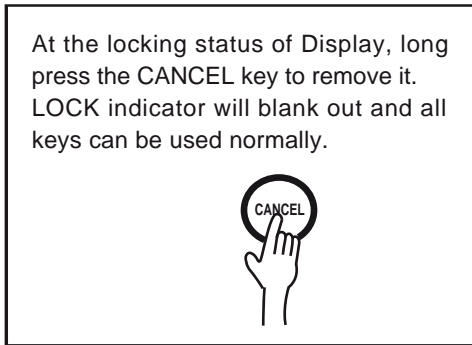


Fig. 7-3

## • Clock Set

The clock is for a 24-hour system and the initial time is 00:00.

To make a better use of this Unit, it is recommended to set the time for accurate local time.

Every time Unit is disconnected, the clock will be reset to 00:00 and it will need to be adjusted again.

Method for time set:

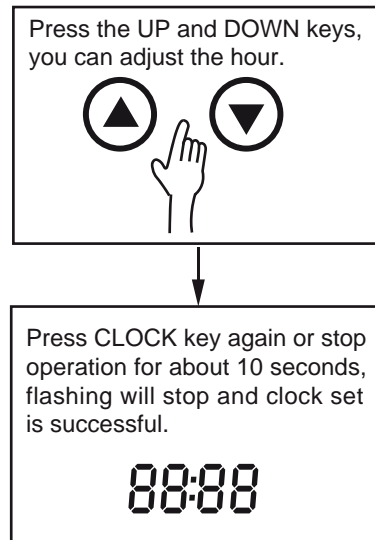
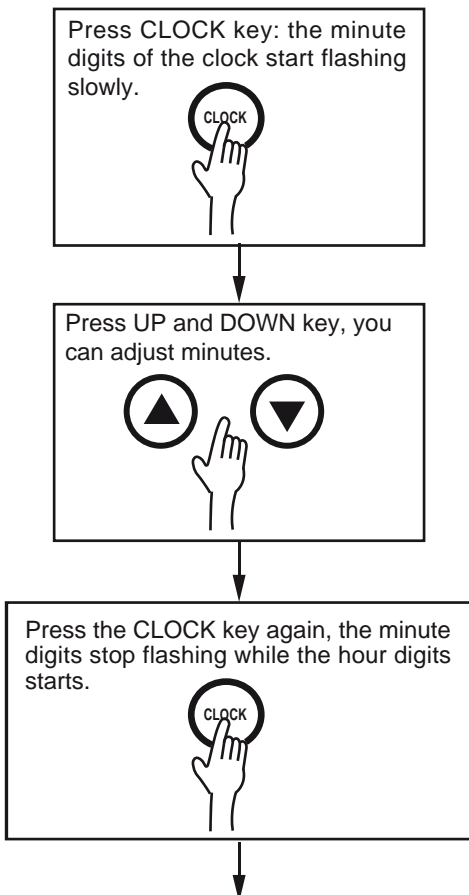


Fig. 7-4

## • Mode Selection

Unit has three operation modes: Economy Mode, Hybrid Mode and E-heater Mode.

**ECONOMY Mode:** The Unit heats water only by compressor drive according to heat-pump principle. Used when the ambient temperature is high.

**HYBRID Mode:** The Unit heats water not only by compressor drive but also by electric heater. Used when the ambient temperature is low or a large amount of hot water is needed.

**E-HEATER Mode:** The Unit heats water only by electric heater. Used when the ambient temperature is very low.

By default, the Unit operates in HYBRID Mode.

To change operation mode:

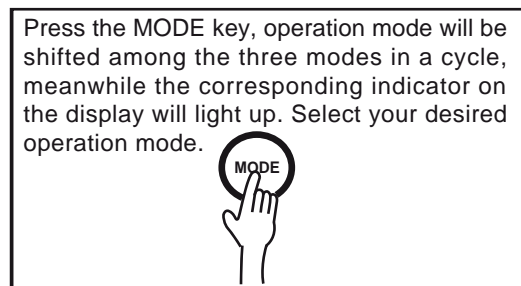


Fig. 7-5

## • Temperature Set

Temperature displayed is the water temperature in the upper part of the tank.

Default is 55°C.

The Economy mode setting range is 38~60°C.

The Hybrid and E-heater mode setting mode setting mode is 38~70°C.

In the following page, method for setting temperature is shown.

# OPERATING INSTRUCTIONS

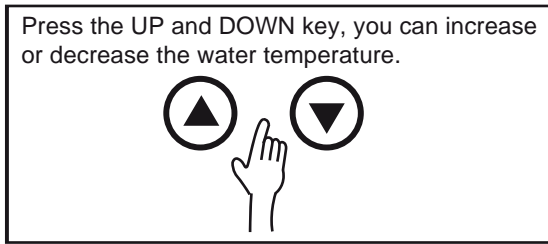


Fig. 7-6

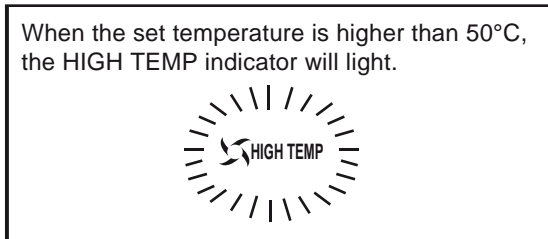


Fig. 7-7

## • Timer

User can set up a time for automatic start/stop of the Water Heater, by Timer function. Time can be set by min. steps of 10 minutes, in a 24-hour system.

Method for programming automatic start (TIME ON):

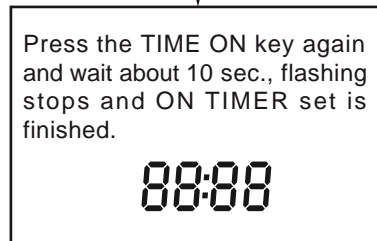
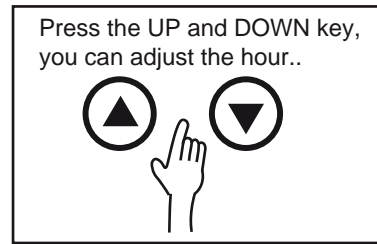
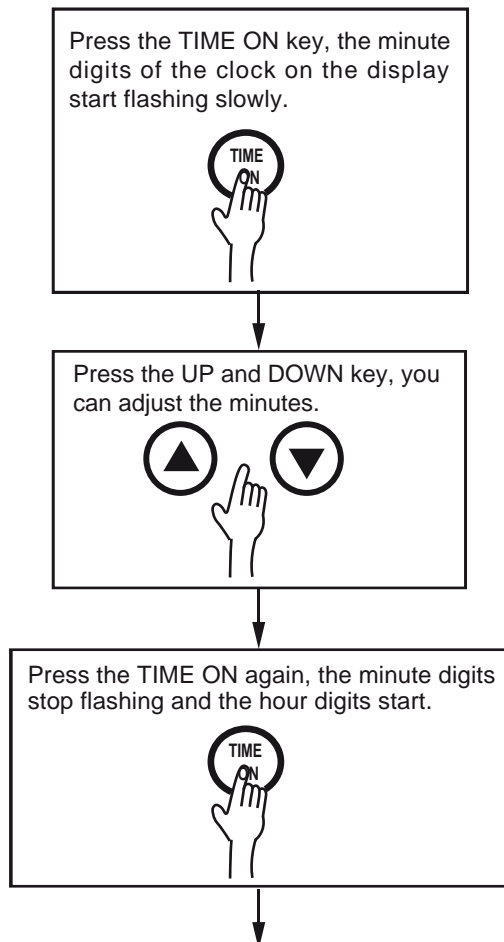


Fig. 7-8

To cancel TIME ON:

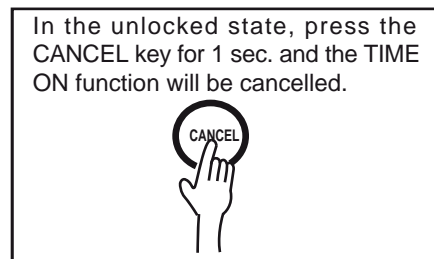


Fig. 7-9

Programming the automatic start followed by automatic stop of Water Heater (TIME ON and TIME OFF in sequence):

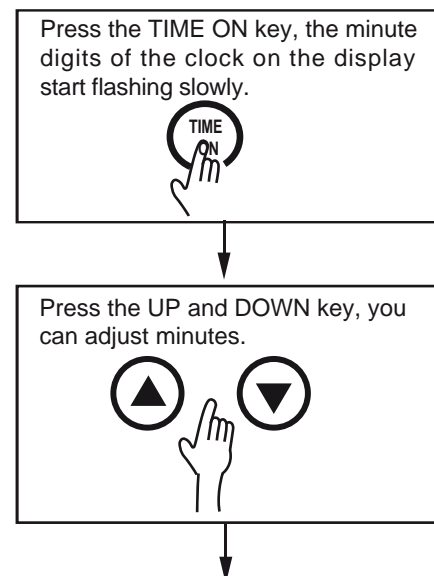
User can set his desired time for automatic start and stop of Water Heater.

When the start time is earlier than the stop time, the Unit will run between the set time.

When the start time is later than the stop time (for ex. start at 06:00, stop at 04:00), the Unit will run between the start time today and the stop time next day.

When User sets up the same time for start and stop, the Water Heater will start according to the set start time and will automatically stop after 10 minutes.

Method for setting TIME ON/TIME OFF:



## OPERATING INSTRUCTIONS

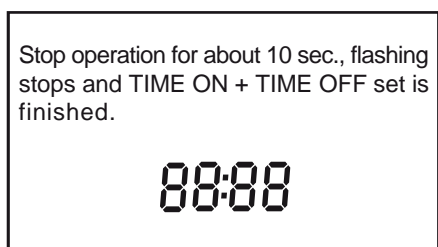
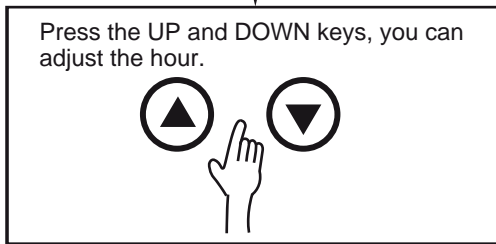
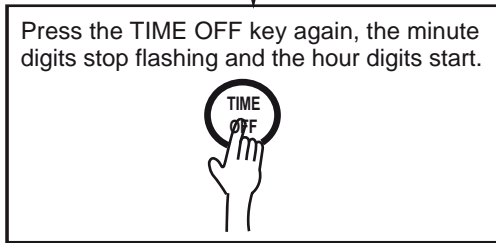
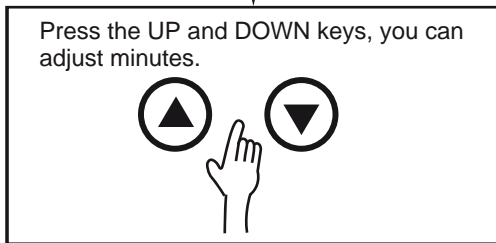
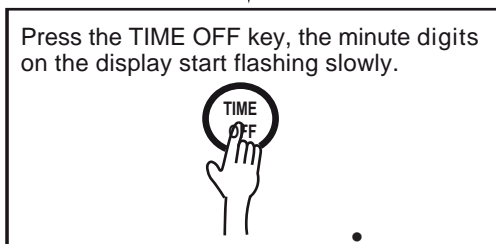
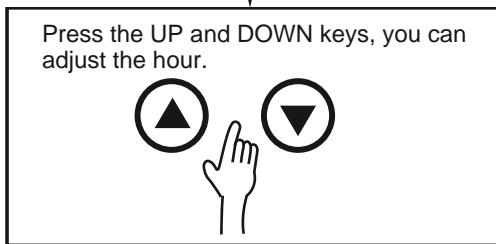
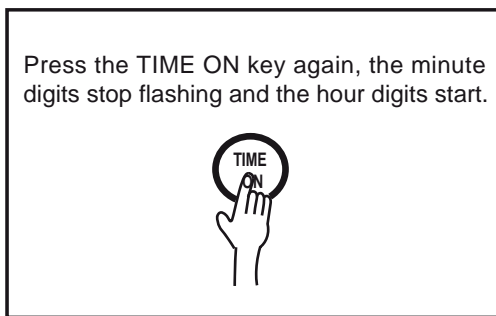


Fig. 7-10

To cancel TIME ON/OFF set:

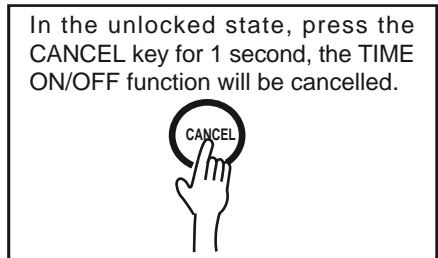


Fig. 7-11



### NOTE

- Time ON and Time OFF cannot be set to the same time. If they are the same, the stop time will delay 10 minutes automatically.  
For example, Time ON and Time OFF set to 01:00 at the same time, stop time will be to 01:10 automatically.
- Time OFF function cannot be used alone. The key can be used only after set the Time ON.
- **Warning!** In case of a blackout, when power supply is restored, the Water Heater will automatically restart with previous settings, but Timer settings will be cancelled, so it is necessary to set Timer again.

### • Power ON and Power OFF

After selecting the desired settings, press ON/OFF button and the Water Heater will start according to the settings.

To stop the appliance, press again ON/OFF button.

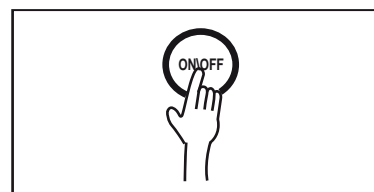


Fig. 7-12

### • Operation status

The LA error code from the screen of set Temperature will appear and reminds User when ambient temperature does not meet the operation conditions of heat pump Unit (5~43°C).

User can switch the Economy mode to E-heater mode to reach a higher volume of hot water if needed.

The Unit will return operation pre-status automatically when the ambient temperature meets the operation conditions of heat pump mode and the error LA will disappear at the same time.

# OPERATING INSTRUCTIONS

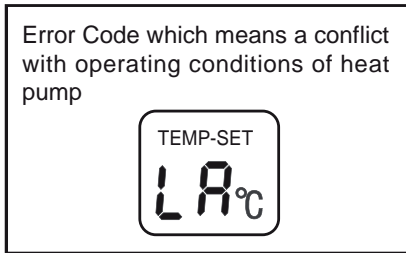


Fig. 7-13

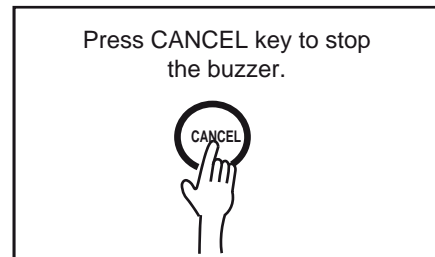
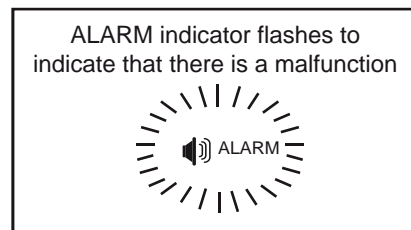


Fig. 7-16

- In case of continuous operation for 20 hours and ambient temperature does not meet the operation conditions of heat pump (-7~43°C range), LA code will be displayed and ALARM indicator will flash.

In this case, it is possible to select E-HEATER mode only.

Please switch to E-heater mode manually to ensure that normal operation of appliance is restored (LA code will disappear and ALARM indicator will stop flashing).

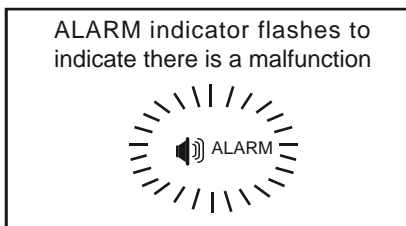


Fig. 7-14



Fig. 7-17

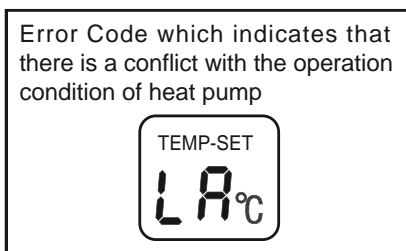


Fig. 7-15

- If there is a malfunction, error code will be displayed in the screen of set Temperature. If you press CANCEL button, LA error code will be displayed for another 1 minute, then display will show temperature value.

- If a malfunction occurs while system works in Economy mode, operation may keep on if E/heater mode is selected. When some error happens, though the system could be used in some circumstances, it could not reach the expected efficiency. Please contact the Authorized Technical Service.

- Error Code Explanation: see further on, Table 10/2.

## • Error Display

- If some errors happen, the buzzer will buzz 3 times every other minute and the ALARM indicator will flash quickly. Press CANCEL button for several seconds to stop the buzzer, but ALARM indicator will keep on flashing.



## WARNING



- Whatever intervention on Water Heater must be carried out by Authorized Technical Service, as there is danger of electric shocks.

## 8. RUNNING AND CAPABILITY

### 8.1 Trial Running

Before running, please check the following items first:

- Correct installation of the system;
- Correct connection of pipeline and wiring;
- Leakage of the refrigerant pipeline tested;
- Efficient drainpipe;
- Complete insulation protection;
- Correct earthing;
- Correct power supply;
- No obstacle outside the air inlet and outlet;
- No air in the water pipeline and all valves opened;
- Effective electric leakage protector;
- Sufficient inlet water pressure (  $\geq 0.15\text{MPa}$  )

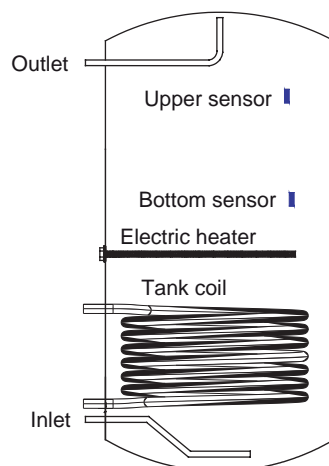
### 8.2 Operating Capability

#### • Water Heater Operating Capability

Three heating elements are included in the Unit: one heat pump, one electric heater and a solar coil. All these three heating elements do not work together.

This Unit has two temperature sensors, which are installed at the upper 1/4 and bottom 1/2 of Unit.

The upper sensor tests the water temperature in the upper part of Unit (shown by display); the bottom sensor tests the water temperature in the bottom part of Unit and controls the ON/OFF of Unit itself (the temperature value is not displayed).



- **ECONOMY Mode:** In this mode, according to the water temperature setting, only heat pump works. (Water outlet temperature range 38~60°C, running temperature -7~43°C).
- **HYBRID Mode:** In this mode, the system will adjust the working capabilities of e-heater and heat pump according to the tank water temperature. (Water outlet temperature range 38~70°C, running temperature -30~43°C).
- **E-HEATER Mode:** In this mode, the compressor and the fan motor will not run but the e-heater works only. (Water outlet temperature range 38~70°C, running temperature -30~43°C).

## TRIAL RUNNING & CAPABILITY



### NOTE

In E-Heater mode, only half tank of water, i.e. 150L, could be heated every time.

#### • Defrosting during Water-heating

- In the Economy Mode and Hybrid Mode, if the evaporation frosts in a cold circumstance, the system will defrost automatically to keep effective performance (3~10min.).

#### • Ambient Temperature

- The system's operation temp. is within -30°C~43°C and below are the operation temperature for each mode.
- Economy Mode: -7°C~43°C



### NOTE

This mode should be used at the ambient temperature maintaining at -7°C~43°C. If ambient temperature is below -7°C, the energy efficiency would become low obviously, therefore we recommend you to use the E-Heater mode at this circumstance.

- Hybrid Mode: -30°C~43°C
- E-Heater Mode: -30°C~43°C

#### • Mode Selection

Different mode is designed to meet different demand and the following are recommended selections.

- Economy Mode: -7°C~43°C, a continuous hot water demand below 250L(60°C);
- Hybrid Mode: -30°C~43°C, a continuous hot water demand between 300L~350L(60°C);
- E-heater Mode: -30°C~43°C, a continuous hot water demand between 150L~200L(60°C);

#### • Self-Protection Apparatuses

- In case of intervention of self-protection, the system stops and self-check starts. The system restarts when malfunction is solved.
- In case of intervention of self-protection, the buzzer will buzz every minute, ALARM indicator flashes and display shows error code and water temperature alternatively. Press CANCEL button for 3 seconds to stop the alarm. When malfunction is solved, error code is no more displayed.

- In the following circumstances, self-protection starts:

- 1) Air inlet or outlet is obstructed;
- 2) The evaporation is covered with too much dust;
- 3) Incorrect power supply (exceeding the range of 207~253V).



### NOTE

In case of intervention of self-protection, disconnect the appliance and restart it after malfunction has been solved.

#### • Water Temperature Display

- The temperature on the display is the water temperature in upper part of water tank (over 1/4) which you will use, but not that of all the water.
- The 6 indicators beside the water temperature on the display are the lower part water temperature. When the temperature is higher than 40°C, the blue indicator will light up; if temperature is higher than 50°C, the blue and yellow indicators light up; if temperature is higher than 60°C, the blue, yellow and red indicators light up; in the end, when all indicators light up, the water temperature has reached the set point.
- In water using, the temperature of the lower part may decrease while the upper part still keeps a high temperature. The system will start heating the lower part: this is normal.

#### • Error Display

- When common error happens, the system enters Standby Mode and could still work, but not so efficient as normal. Please contact the Authorized Technical Service.
- When serious error happens, the system will be unable to carry on. Please contact the Authorized Technical Service.
- When error happens, the buzzer will buzz 3 times every minute, ALARM indicator flashes and the display indicates the error code and water temperature alternatively. Press CANCEL button for 3 seconds to stop the alarm.

#### • Restart after a Long Stop

When the system is restarted after a long time (trial running included), it is normal if the outlet water is unclean. Keep the tap on and it will be clean soon.

## 9. MAINTENANCE

### • **Ordinary maintenance of Water Heater**

- Check the connection between power supply plug and socket, and ground wiring regularly.
- In some cold sites (below 0°C), if the system will be stopped for a long time, all the water should be released for preventing the risk of freezing of inner tank and damages to e-heater.
- It is recommended to clean the inner tank and e-heater regularly to keep an efficient performance.
- Check the anode rod every half year and change it if it is necessary. For more details, please contact Authorized Technical Service.
- It is recommended to set a lower temperature to decrease the heat release, prevent scale and save energy if the outlet water is sufficient.
- Clean the air filter every month in order to avoid decrease in heating performance and malfunctions.
- If air filter has been set in air inlet directly (namely, air inlet without connection with canvas), the method of dismantle the filter is the following: anti-clockwise the air inlet ring, take out the filter and clean it completely, and finally remount it to the Unit.
- Before shutting the system down for a long time, please:
  - Shut down the power supply;
  - Release all the water in water tank and the pipeline and close all the valves;
  - Check the inner components regularly.

### • **How to Change the Anode rod**

- Turn off the power, and turn off the water inlet valve.
- Open hot water tap, and decrease the pressure of the inner container.
- Open the temperature pressure valve, and drain out the water, until there is no water flowing out.
- Get off the anode rod according to instructions.
- Replace the anode rod with a new one, and make sure it is effectively sealed.
- Open cold water valve until hot water flows out, and turn off the hot water tap.
- The system can be restarted for normal operation.



## 10. DIAGNOSTIC

### • Non-error Malfunction

#### • 3-minutes Protection

After a blackout, when power is supplied again, it is necessary to wait 3 minutes before Unit may restart (for protecting compressor).

#### • In case of intervention of a self-protection, please check the following:

- When the Power indicator lights up, if the system is forced to run while startup requirements have not been met;
- If the air outlet or inlet is blocked, or strong wind blows to air outlet.

#### • Defrosting

When it is humid and cold, the evaporate may defrost and the water-heating capacity decreases.

The system will stop heating water and start defrosting, at the end of which water-heating will be restarted.

- During defrosting, fan stops working, four-way valves reverses the flow direction, and compressor keeps working.
- The defrosting time varies from 3 min. to 10 min., according to the ambient temperature and the frost.

#### • Temperature Display

- When the system stops, a decrease of the temperature is normal. When it decreases to some point, the system will restart automatically;
- During water-heating, the displayed water temperature might still decrease or not increase for a period of time because of the heat exchange of the water. When the whole tank of water has reached the set temperature, the system will stop automatically.

### • Malfunctions and Solutions

Table 10-1

Malfunction	Cause	Solutions
Outlet water is cold. The display is dark.	<ul style="list-style-type: none"> <li>• Bad connection of power supply plug and socket;</li> <li>• Outlet water is set an a low temperature;</li> <li>• Outlet water temperature controller is damaged;</li> <li>• Circuit board of indicator is damaged.</li> </ul>	<ul style="list-style-type: none"> <li>• Reconnect the plug;</li> <li>• Set outlet water an a higher temperature;</li> <li>• Contact Authorized Technical Service.</li> </ul>
No hot water from the outlet.	<ul style="list-style-type: none"> <li>• Tap water has been cut away;</li> <li>• Water pressure is too low;</li> <li>• Inlet valve has been closed.</li> </ul>	<ul style="list-style-type: none"> <li>• It'll return to normal after water is supplied;</li> <li>• Use it when the pressure is higher;</li> <li>• Open the inlet water valve.</li> </ul>
Water leakage	The joints on the pipeline are not sealed well.	Check and reseal all the joints.

### • Authorized Technical Service

In case of malfunction or error, it is recommended to stop Unit's operation and to disconnect the appliance. Please contact the Authorized Technical Service.

## DIAGNOSTIC & ERROR CODES

- **Table of Error Codes**

Table 10-2

Display	Malfunction Description
E0	Error of sensor T5U
E1	Error of sensor T5L
E2	Tank and Wired Controller communication error
E4	Evap. pipe temperature sensor error
E5	Ambient temperature sensor error
E6	Discharge pipe temp. sensor error
E7	Heat Pump system error
E8	Electric leakage protection
E9	TH sensor condenser failure
P1	System high pressure protection
P2	Discharge pipe temperature overhigh protection
P3	No current flowing in Compressor
P4	Compressor overloaded protection
P8	No current flowing in electric heater
P9	Upper e-heater overloaded protection
LA	Ambient temp. is not fit for heat pumps, change the mode to E-HEATER.

- In case of malfunction, please contact Authorized Technical Service.

## *AUTOMATIC RESTART AFTER A BLACKOUT*

- When a power failure occurs during operation, the Water heater stops immediately.
- When power is restored, the Water Heater will automatically restart after 3 minutes have elapsed since power is restored. This means it is not required to press the "ON/OFF" button.
- Operation settings will be the same as before the blackout.

### **WARNING!**

**However, it is necessary to program TIMER again, as in case of a blackout, TIMER settings for automatic start or start/stop of the Water Heater are cancelled.**



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