

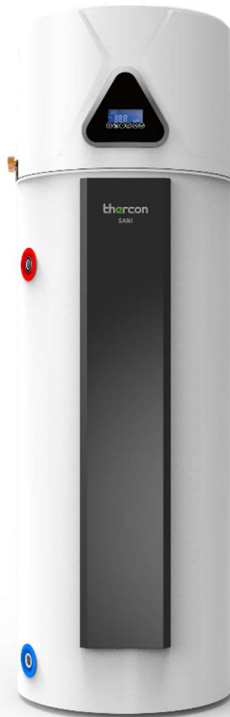
NL FR **EN**

Installation manual

SANI HP-booster

DSW200WQ

DSW270WQ



thercon

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VIDEO INSTRUCTIONS

Be sure to check out the installation and usage video instructions on the HP-booster DSW200WQ! Website: <https://thercon.manual.to/sani-hp-booster-dsw200wq-en>



PREFACE

- In order to provide customers with high-quality, strong reliable and good versatile products, this heat pump is manufactured by strict design and manufacturing standards.
- This manual includes all the necessary information about installation, debugging and maintenance. Please read the manual carefully before you install, commission or maintain the unit.
- The manufacturer of this product will not be held responsible if someone is injured or the unit is damaged, as a result of improper installation, debugging, unnecessary maintenance which is not in line with this manual.
- The unit must be installed by a qualified person.
- It is vital that the below instructions are adhered to at all times to keep the warranty:
 - The unit can only be turned on or repaired by a qualified installer or an authorized dealer.
 - Maintenance and operation must be carried out according to the recommended time and frequency, as stated in this manual.
 - Use standard spare parts only.
 - Failure to comply with these recommendations will invalidate the warranty.

SAFETY INSTRUCTIONS

The manual contains many important safety precautions for using the water source heat pump boiler. To prevent users and others from unpredictable/unanticipated damage caused by this device and to prevent damage to the device or other property, please read the manual carefully before using the device. All safety precautions come with safety warnings. Below is the meaning of each warning:

Mark Notes

Mark	Meaning
 WARNING	A wrong operation may lead to death or serious injury on people.
 ATTENTION	A wrong operation may lead to injuries or damaged material

Icon Notes

Icon	Meaning
	Prohibition. What is prohibited will be nearby this icon.
	Mandatory implementation. The listed action need to be taken.
	ATTENTION (include WARNING) Please pay attention to what is indicated.

1. Injuries do not mean hospitalization and long-term healing. It refers to injuries, burns or getting an electric shock.
2. Damaged material means lost property and data

Warning

Installation	Meaning
 Professional installer is required.	The heat pump must be installed by a qualified person, to avoid improper installation which may lead to water leakage, electrical shock or fire.
 Earthing is required.	Please make sure that the unit and power connection have good earthing, otherwise it may cause electrical shock.
 Concentration limits	When installing the unit in a small room, please take some measures to prevent the asphyxia caused by the leakage of refrigerant. Please consult the dealer for concrete measures.
Operation	Meaning
 Shut off the power	When there is something wrong or strange smell, the power supply needs to be shut off to stop the unit. Continue running may cause short circuit or fire.
Move and Repair	Meaning
 Moving	When the heat pump needs to be moved or installed again, please entrust dealer or qualified person to carry it out. Improper installation will lead to water leakage, electrical shock, injury or fire.
 Repair	It is prohibited to repair the unit by the user himself, otherwise electrical shock or fire may occur.
 PROHIBITION	When the heat pump needs to be repaired, please entrust dealer or qualified person to carry it out. Improper movement or repair on the unit will lead to water leakage, electrical shock, injury or fire.



The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater.)

ATTENTION

Installation	Meaning
 Installation Place	The unit CANNOT be installed near a flammable gas. Once there is any leakage of the gas, fire may occur.
 Fix the unit	Make sure the unit is placed on a solid surface to prevent it from falling over or tilting.
 Need circuit breaker	Make sure that there is circuit breaker for the unit, lack of circuit breaker may lead to electrical shock or fire.
Operation	Meaning
 Check the installation surface	Please check the installation surface regularly (one month), to avoid any decline or damage on the surface, which may hurt people or damage the unit.
 Switch off the power	Please switch off the power when cleaning or during maintenance.
 Prohibition	It is prohibited to use copper or iron as fuse. The right fuse must be fixed by an electrician for the heat pump.
 Prohibition	It is prohibited to spray a flammable gas onto the heat pump, as it may cause fire.

Usage	Meaning
 Check the plug	The earth electrode of the socket should have the perfect earth connection and the rating current should be at least 16A. Keep the socket and plug dry and check if they are properly connected. The ways to check are as follows: Put the plug into the socket and turn on the unit, then pull out the plug. Half an hour later and check if the plug is hot. If it is hot (more than 50 °C), please have a qualified person to replace it to avoid the burnout or fire caused by the bad contact.
 Check power socket and tapping points	In places where water splashes, the installation height of the socket should not be less than 1.8 meters to ensure that water does not splash on the socket, and should not be installed in a place where children can touch it. As the water temperature in the tank is very high (more than 50°C hot water burns the body), you should set a suitable temperature at the tap point before coming into contact with the water.
 Usage attention	If the unit has not been used more than 2 weeks, please turn on the hot water tap for a few minutes. Sometimes there may be an unusual sound like the air passes through the pipe, the sound is normal and please feel free to use.
 Power line replace	If the power line is damaged, ask the professional serviceman to use the power line provided by the manufacturer to replace it.
 Parts replace	If the parts are damaged, ask the professional serviceman to use the parts provided by the manufacturer to replace it.
 Save labels	Do not tear down any permanent instructions, labels or parameters panel of the heat pump.

DIMENSIONS

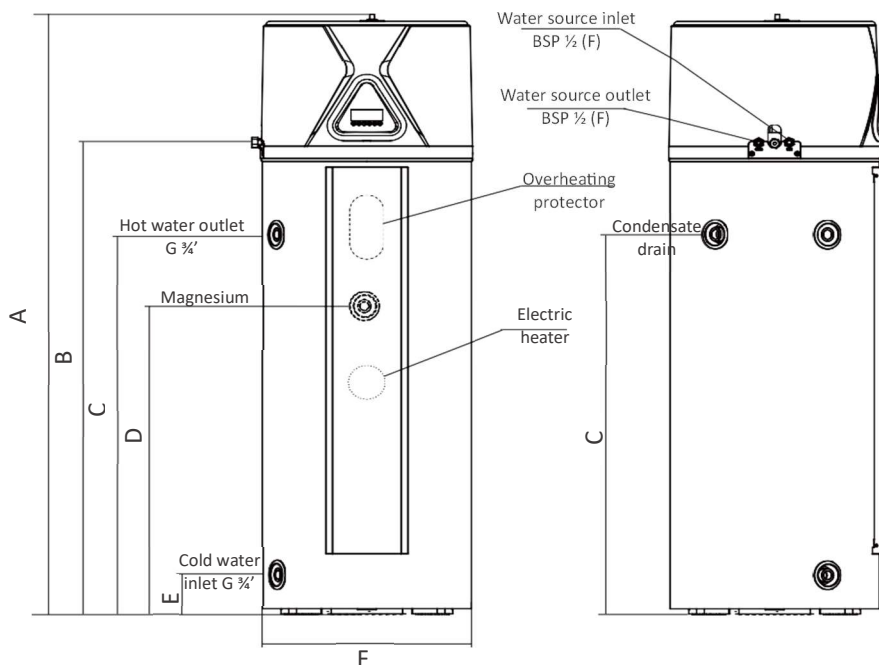


Figure 1 : Unit dimensions

Afmetingen	DSW200WQ	DSW270WQ
A	1740 mm	1880 mm
B	1385 mm	1505 mm
C	1113 mm	1208 mm
D	1013 mm	908 mm
E	115 mm	128 mm
F	Ø560 mm	Ø640 mm

TRANSPORT

Ideally, use container transport for transporting the unit. Storage should be done in a suitable and dry place. For transport over short distances, be careful and do not use an inclination angle smaller than 60° relative to the horizontal. During transport and storage, the ambient temperature should be between 0 °C and 40°C.

Transported by forklift

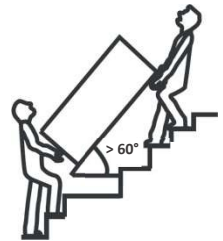
When using a forklift to transport the unit, the unit should be attached to the pallet and the pallet should be transported at minimum lift height. As the upper section is heavier, the driver should take measures to prevent tipping. To prevent damage, the unit should be placed on a level surface.

Manual transport for installation

When transporting for installation, the bottom of the unit should be placed on a pallet and a rope or strap should be used to secure the unit securely. For manual transport or transport with a forklift, the angle relative to the horizontal must be greater than 60°, as shown in the following figure.

If the inclination is inevitably less than 60°, the unit must be held vertically for at least 1 hour and only then can it be started for testing or running.

This unit is heavy, it need to be carried by two or more persons, otherwise might cause injury and damage.



SYSTEM SCHEMATICS

The heat pump must be connected to the heating circuit of the building's central heating system.

During operation, the domestic water is heated by the energy of the building's central heating system. For optimum heat pump operation, the temperature of the source water must be between 12°C and 42°C. For heat pump operation, the flow rate of the heating water must be sufficient, at least 120 l/h. The unit can control a valve or pump according to its heat demand.

If the heat pump is not within temperature or flow range, an error will occur and the electric back-up heater will be activated to heat the domestic hot water tank.

To prevent condensation, it is recommended to insulate the heating water connection pipes. The source to which the heat pump is connected must have an expansion vessel and a safety valve! The system must not contain glycol.

Take the following measures to prevent noise and vibrations being transmitted through walls and floors to rooms where this could be disturbing (bedrooms, relaxation areas):

- Use flexible connections for the water-side connections.
- Provide vibration insulation for openings in the wall.

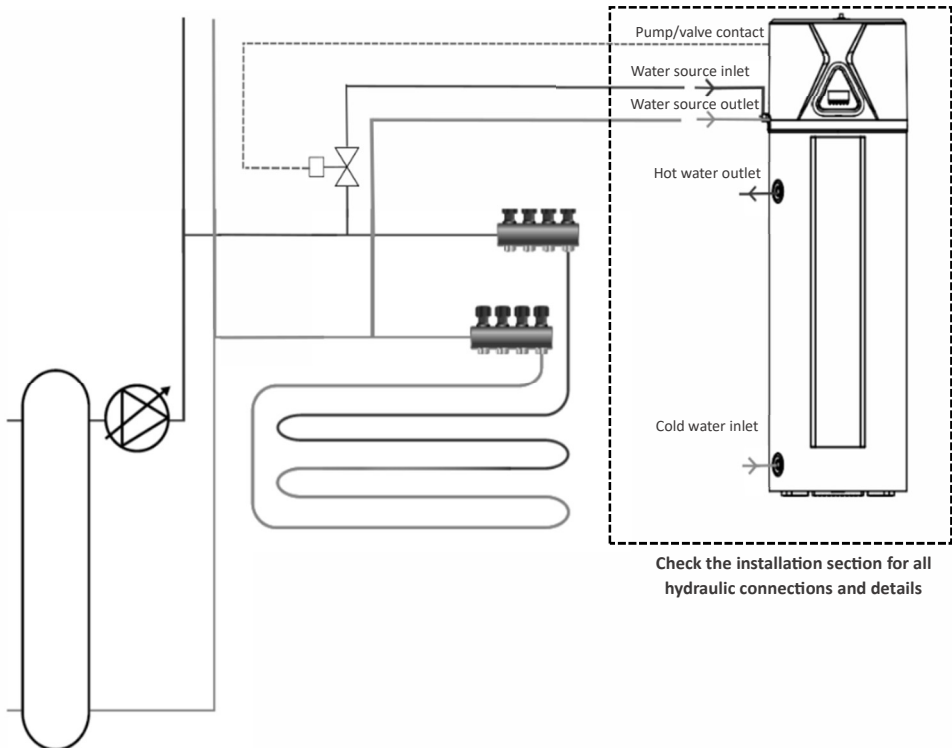


Figure 2 : Installation principle

INSTALLATION & STORAGE

Installation site requirements

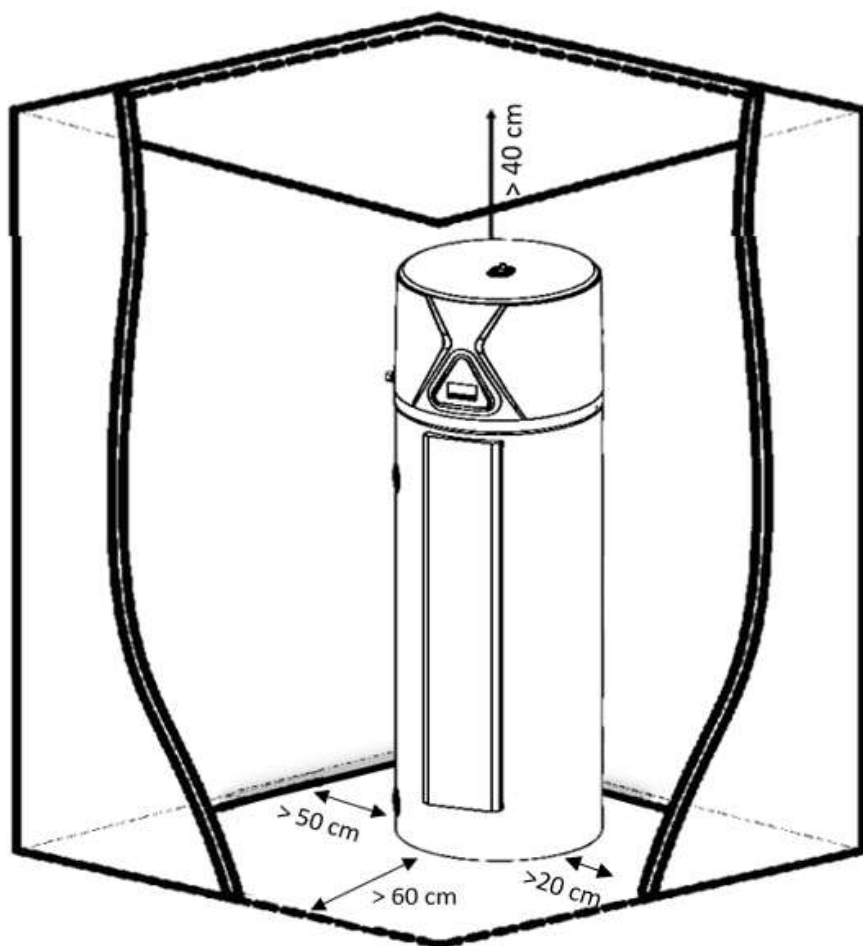


Figure 3 : Installation site

Warning: The heat pump must be installed by a qualified person to avoid improper installation which can lead to water leakage, electrical shock or fire. All working procedures affecting safety must only be carried out by authorized persons.

1. The unit must be installed in a frost-free room that meets the following criteria:
 - Room temperature between 5 and 35°C.
 - Drainage possibility for condensate and safety valve. Solid foundation (about 500 kg/m²).
2. If the installation location is draughty, place the unit in a suitable place to avoid it from falling over at all times.
3. Choose a location where there is no direct sunlight or other heat radiation. If you cannot avoid this, install sun blinds to block sunlight.
4. Provide sufficient dry and draught-free space for installation and maintenance
5. The supporting surface must be flat (horizontal angle $\leq 2^\circ$) and able to withstand the weight of the water heater. The unit must be installed vertically and may not cause excessive noise and vibration.
6. The installation site should not contain combustible gases.
7. The installation site is convenient for pipe connection and electrical wiring.
8. There shall be electrical insulation between the unit and the site if there is a metal part, and such electrical insulation shall meet the requirements of the relevant electrical standards.
9. The appliance shall be stored and installed in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater).
10. The appliance shall be stored and installed in a well-ventilated area whose dimensions correspond to the room specified for operation.
11. Spaces where refrigerant pipes shall be compliant with national gas regulations.
12. Do not pierce or burn.
13. Do not use agents to clean, other than those recommended by the manufacturer.

ATTENTION: The following installation site would lead to machine malfunction (Prior consultation is necessary if the following site is unavoidable.)

- Places where the air contains mineral oils;
- Places where the air has a high salt content, such as by the sea;
- Places where the air contains corrosive gases, such as areas with hot springs;
- Places with severe voltage fluctuations, such as a factory;
- In a car or cabin;
- Places where the air contains oil, such as in the kitchen;
- Places with strong electromagnetic waves;
- Places where the air includes flammable gas/material;
- Places where the air includes acid or alkalinity gases.

Transport of equipment containing flammable refrigerants must be compliant with the transport regulations.

Marking of equipment using signs must be compliant with local regulations.

Disposal of equipment using flammable refrigerants must be compliant with national regulations.

Storage of equipment/appliances should be in accordance with the manufacturer's instructions.

Storage of packed (unsold) equipment :

Storage package protection should be constructed such that mechanical damage to the equipment inside the package will not cause a leak of the refrigerant charge. The maximum number of pieces of equipment permitted to be stored together will be determined by local regulations.

Hydraulic connections

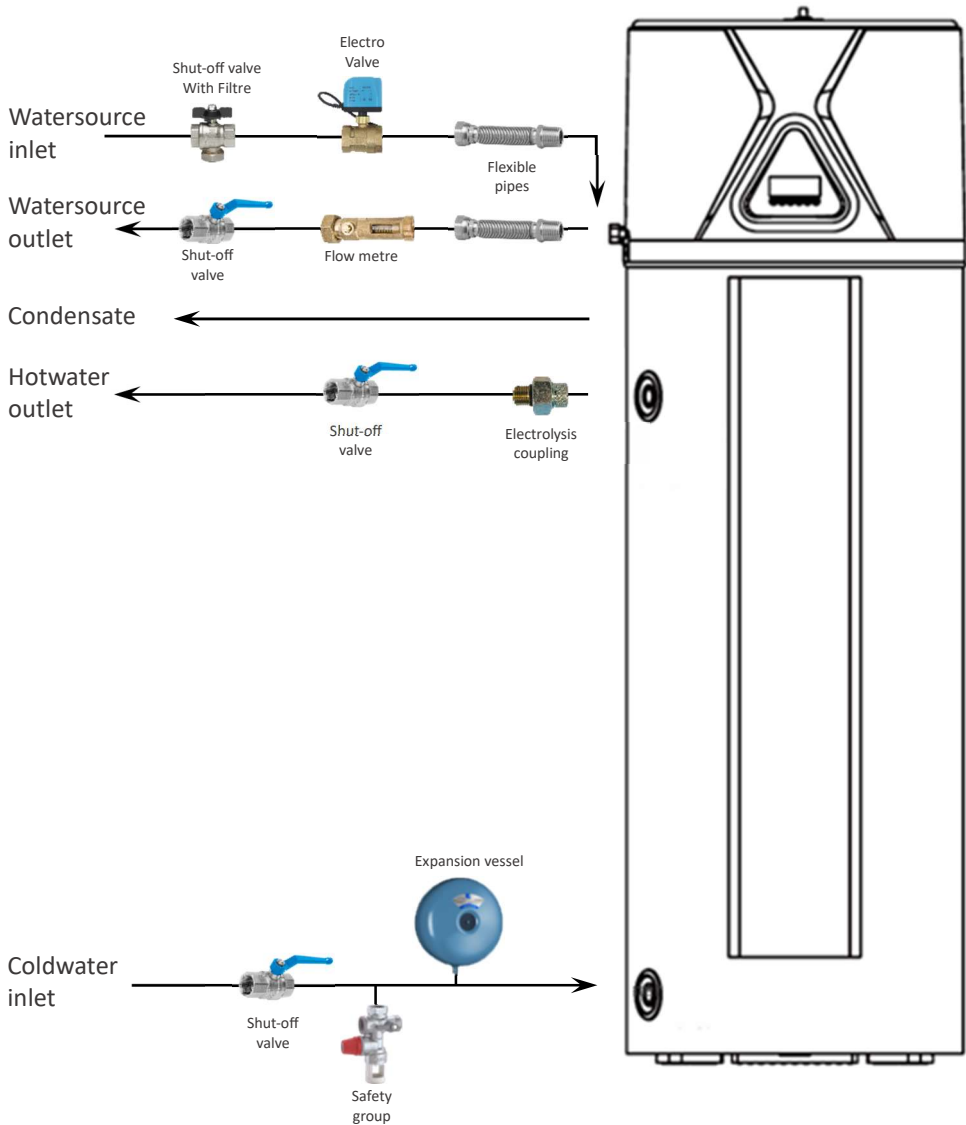


Figure 4 : Hydraulic connections and accessories

The water circuit must be installed in accordance with local norms and standards. The water used and the installation for domestic hot water and for the heat source (collective water loop), must meet the following requirements :

- The heating source should be filled with drinking water. Add an external filter on the inlet.
- The tank may only contain drinking water, with the minimum water quality explained below in the section "maintenance".
- The temperature of the source water must be between 12°C and 42°C. If the temp. goes out of range, a fault will occur and the backup heater will take over.
- Material compatibility must be ensured in the entire system. Incorrect material combinations can lead to damage due to galvanic corrosion. This requires special attention when using galvanized and copper-containing components.
- The pipe size must be adapted to the available water pressure as well as the expected pressure loss in the pipe system. Try to keep resistance in water pipes as low as possible.
- The entire piping system should be clean, free of rust spots and dirt to prevent clogging or deterioration of the pipes. After connecting the pipes, first check for leaks and then apply insulation.
- Add shut off valves and safety group, as shown in figure 4.
- The installation of water pipes have to be in accordance with the requirements of the local standard. Always install a new safety group ($\frac{3}{4}$ " and with a pressure of 0.7 MPa (7 bar)) complying with the local applicable regulations at the inlet of the boiler in a frost-free place. Connect the safety group to a drain pipe via a siphon. The drain pipe fitted under the safety valve must be mounted at an incline downwards, installed in a frost-free environment and free to the outside.
- No valve must be placed between the safety group and the boiler.
- An expansion vessel on the cold water inlet can prevent water leaking from the safety group.
- When connecting the water pipes, please prevent any pollution going into pipes.
- Use flexible connections to connect the water source, in order to prevent vibrational sound.
- Drain the condensate through the condensate drain connection using a siphon.

Filling the tank

After installing the hydraulic connections, open the cold and hot water taps and valves and fill the tank. Then a large amount of air will escape along the hot water side (this process takes 5-20 minutes). As soon as some water flows out of the tank, but no air, it means that the unit is completely filled with water and that the air has been completely out. Close all hot water taps. The hydraulic installation is completed.

Electrical connections

Before making any electrical connections, make sure the fuse is switched off and that the systems to which the equipment is to be connected comply with current standards.



The unit is equipped with a plug (230V/1F/50Hz) for the general power supply.

When the unit is connected to the electrical circuit, there must be a circuit breaker or protector for the circuit. Power supply should be installed in accordance with national wiring rules.

If the power wire has been damaged, the new wire must get the same certification as the old one, or provided by the factory.

The unit is also provided with a second cable. This can be used to control an external circulation pump or valve. The maximum connection is 690W (230V). Use the pre-wired cable.

The wire should be placed orderly, reasonable and in accordance with national wiring rules.

Commissioning

For safety reasons, the circuit may only be connected to a power supply after the device has been connected to a heat source and flow rate can be assured. The tank must also be filled with water (**see Filling the tank**) before it can be electrically powered. Once the heat pump is connected to the power supply, it's automatically switched ON. Follow the steps in sections **"Display operation"** to ensure optimal operation of the heat pump water heater.

1. Check if there is air in the heat exchanger. The device does not work normally when there is air in the heat source system. Ensure that no air is trapped in the evaporator by opening the vent until only water drips out. Collect the wastewater with a suitable container. Close the vent once the air has been completely drained.
2. Control the water flow of the heat source. As soon as the device is running in, you must check whether the water flow is sufficient. Test the flow switch by turning off the flow. Error E03 should appear! Make sure the flow is restored after testing.
3. If the appliance is controlling a pump or a valve, further effects must be taken into account as the water flow depends on pressure drops in the heat source system.

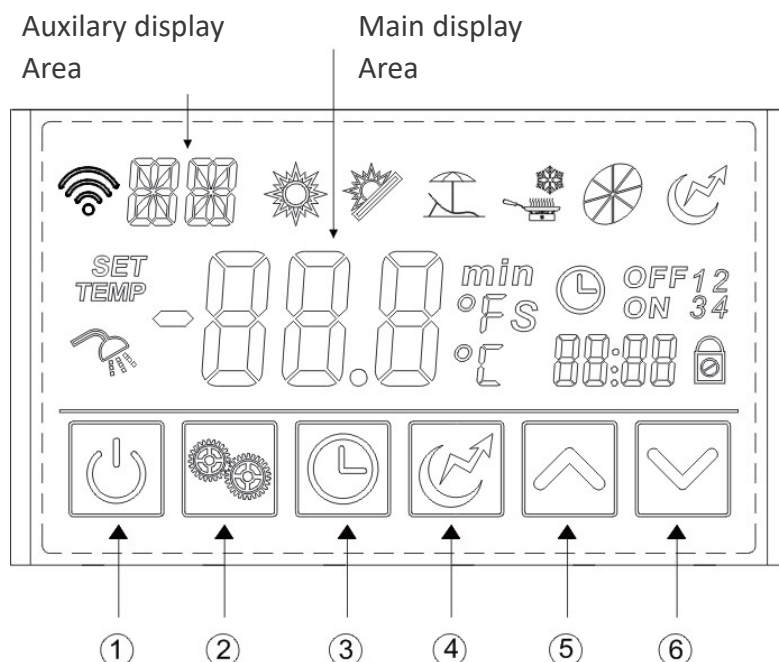
Check the installation for leaks a few days after initial setup and commissioning. A minimum flow rate of 120 l/h must be guaranteed.

SG-contact

Connect an external control to the PV contact (contact GND-DI06, see electric schematic). When the contact is closed by the external control, the target temperature of the domestic hot water is increased (default setting +5°C). Via parameter R14, you can select the offset by which the set point is increased.

DISPLAY

Display view



N°	Button	Name	Function
1		ON/OFF	Turn on/off the unit.
2		Mode	Switch unit running modes or save setting parameters.
3		Clock	Set the clock or the timer.
4		Electric Heater	Turn on/off the electric heater.

5		Up	Increase or scroll-up in parameters
6		Down	Decrease or scroll-down in parameters

Status icon.	Name	Description
	Standard Heating	The unit is in standard heating mode.
	Eco. heating	The unit is in eco. heating mode.
	Vacation	The unit is in vacation mode.
	Electric heater	The electric heater is on.
	Set temperature achieved	The water temperature has reached the target point and the unit shut off automatically.
<i>SET</i>	SET	The displayed temperature is the target temperature and is adjustable
<i>TEMP</i>	Temperature	The displayed temperature is the measured and is not adjustable
	Timer & ON	The unit will be turned on by the timer automatically.
	Timer & OFF	The unit will be turned off by the timer automatically.
<i>min</i>	Minute	The main display area displays the minutes.
<i>S</i>	Second	The main display area displays the seconds.
<i>°C</i>	Celcius	The temperature is in °C.
<i>°F</i>	Fahrenheit	The temperature is in °F.
	Lock	Keyboard is locked.

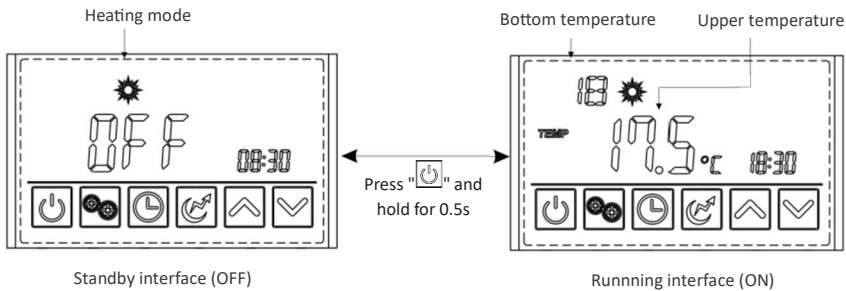
Display operation guide

Turn the unit ON/OFF

Press "  " and hold for 0.5s in the standby interface of the controller to turn on the unit. Now the main display area shows the upper water temperature of the .

Press "  " and hold for 0.5s in the running interface of the wire controller to turn off the unit. At this time the main display area shows OFF.

Note: The ON/OFF button can only be used to turn on/off the unit in standby or running interface of the wire controller.

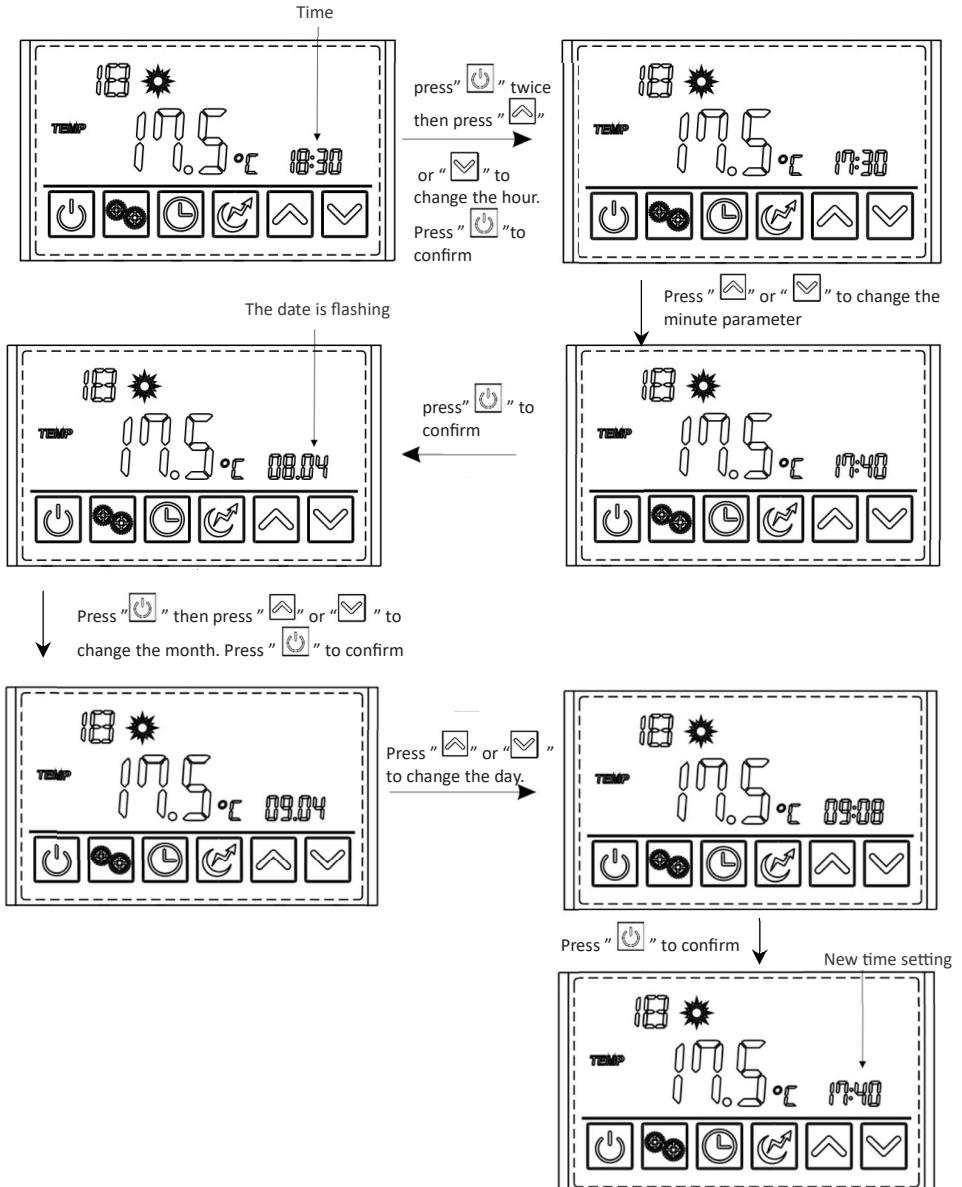


Time setting

In the standby or running interface, do as follows to set the time. When you press "  " once, the time parameter will flash. After pressing "  " again, the hour will flash then press "  " or "  " to change it. After making the changes to the parameter, press "  " to confirm, then change the minutes as well as the date in the same way.

If no operations are performed on the keypad for 10s, the controller exits the parameter modification menu by timeout and the changes are confirmed.

Example: Change the time and date from 18:30 on August 4th to 17:40 on September 8th.



Timer setting

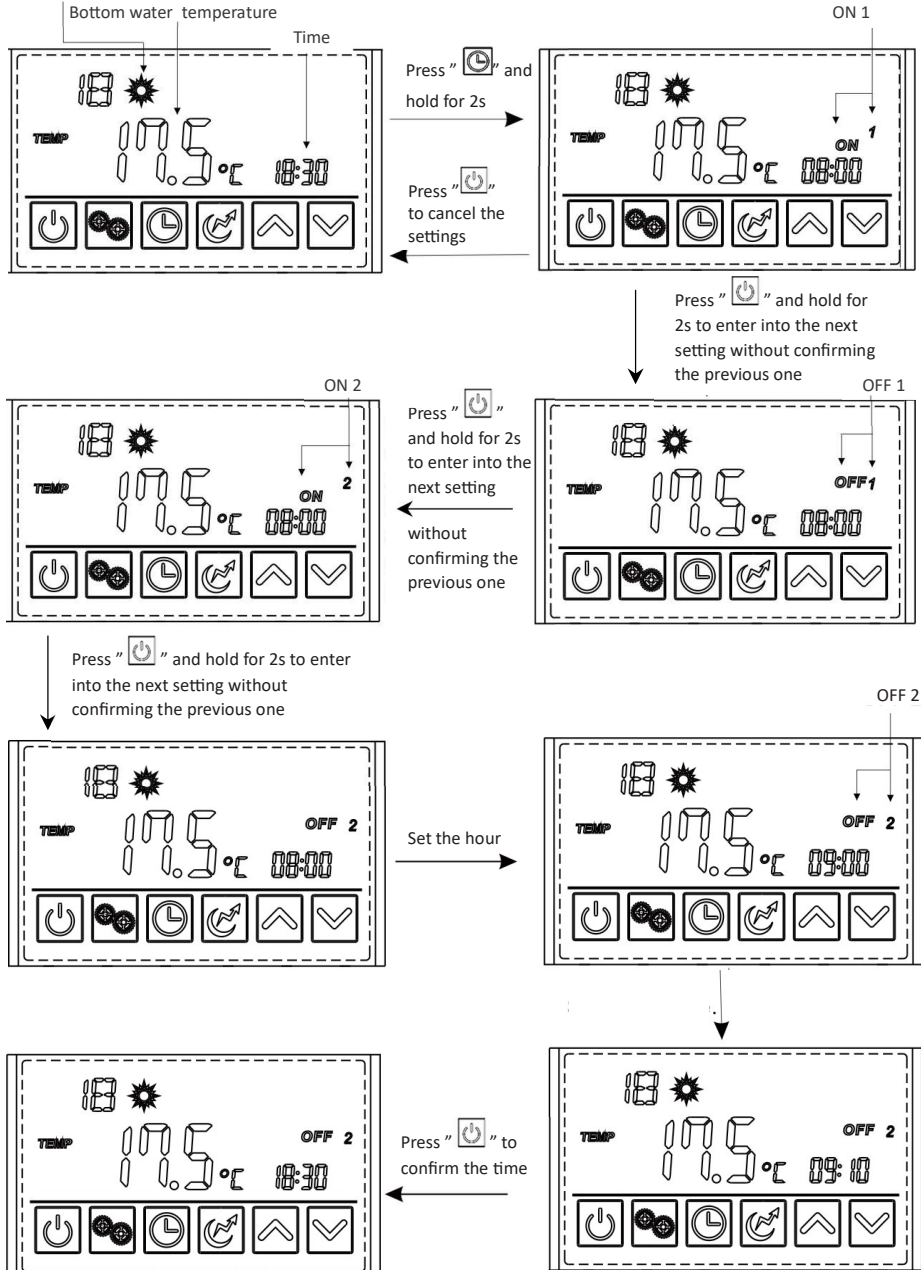
- 1) Under the **standard mode, economic mode, intelligent mode** and **high demand mode** you can enter the timer setting as follows:

Press "  " and hold for 2s, the " ON " and " 1 " will flash, and then you can set the turn-on time of timer1 as the clock setting shows. After finishing, " OFF " and " 1 " will flash, that means you can set the turn-off time of timer1. After finishing the timer1 setting, the "ON " and " 2 " will flash and you can set the turn-on time of timer2. After finishing, the " OFF " and " 2 " will flash, and then you can set the turn-off time of timer2. Press "  " again to save and to go back to the interface. If you don't need to set the timer2, you can press "  " after finishing the timer1 setting to save. You will see the " ON " and " 2 " flash. No operation for 5s, the program will get you back to the interface automatically.

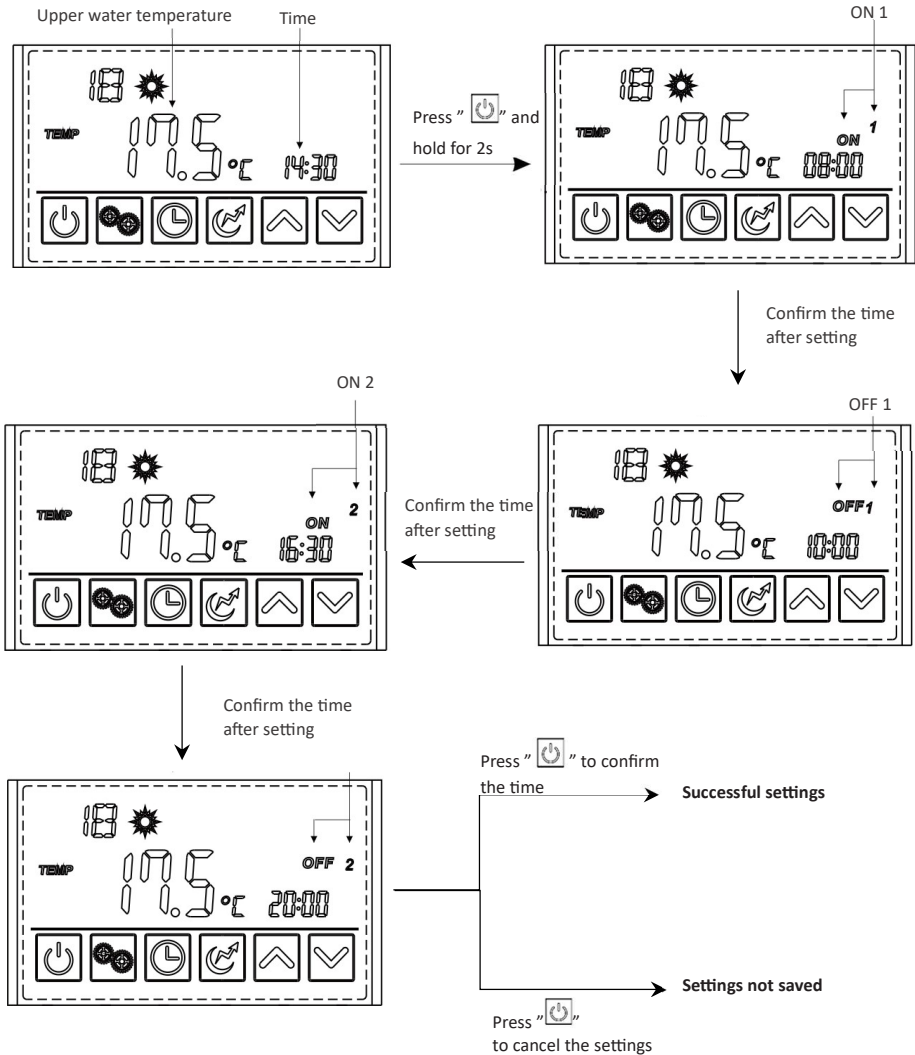
Note: When press "  " and hold for 2s, the " ON " and " 1 " will flash. It is not necessary for you to set the turn-on time of the timer1. You can sequentially press "  " for 2s to enter to the turn-off time of timer1. So does the timer2. Or press "  " or "  " to circularly display.

Timer Cancel: Press "  " and hold for 2s to enter into the interface, and then press "  " to cancel all the operation. Please see the following picture for more details.

Heating mode



Example: Running period 1: 8:00~10:00; Running period 2: 16:30~20:00.



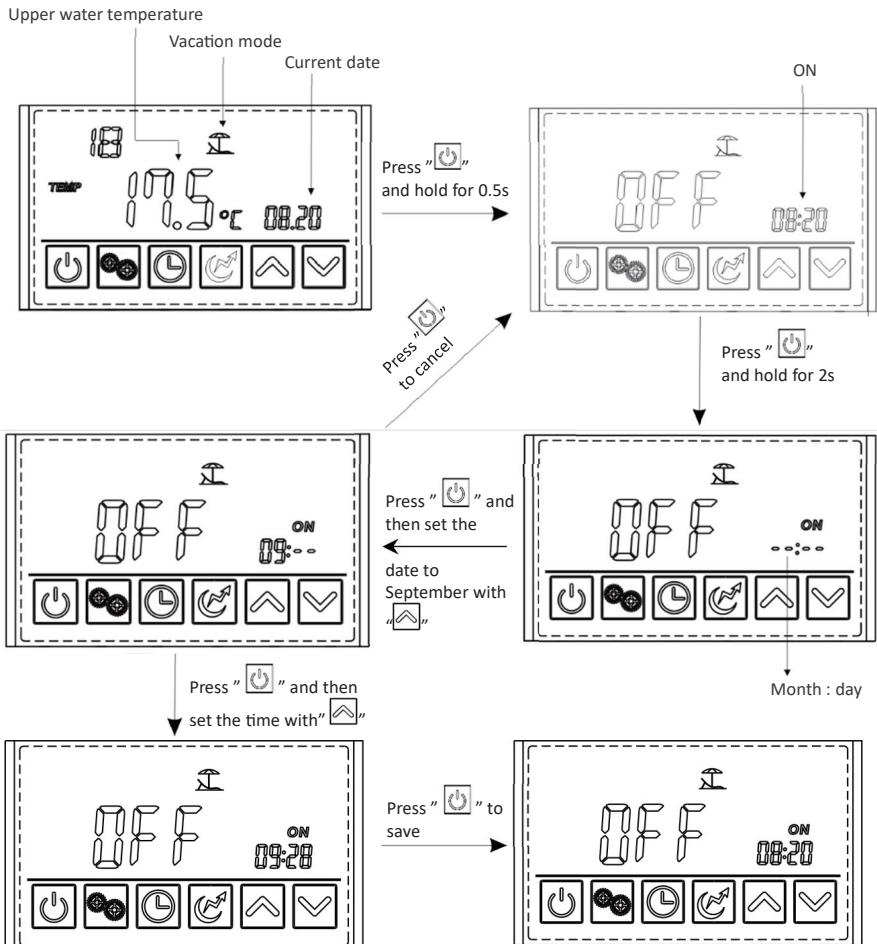
2) **In vacation mode**, you have to set the end date for the vacation mode.

Go to the vacation mode (see **mode selection**). Press "⏻" and hold for 0.5s unit to activate the "OFF" mode during the vacation period.

Press "⏻" and hold for 2s to enter into the timer setting interface.

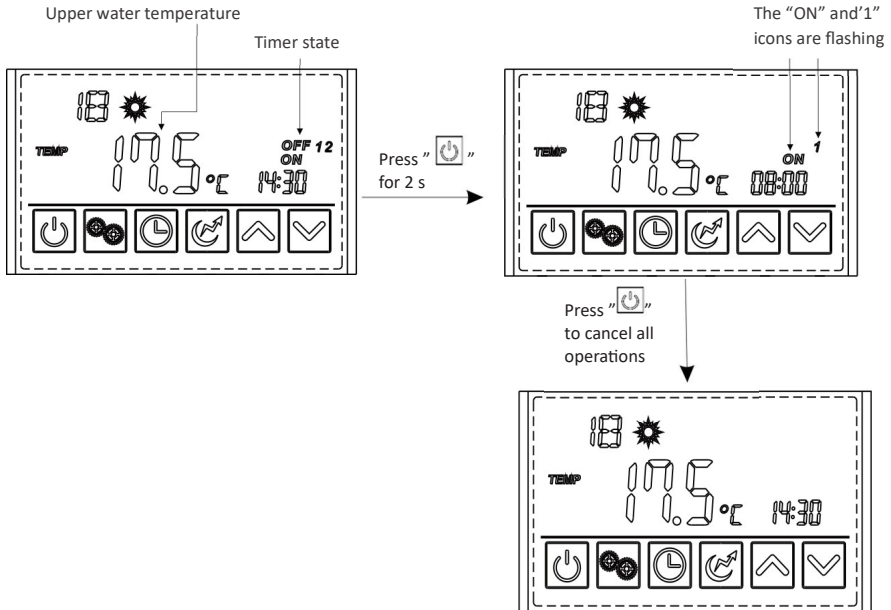
The symbol "ON" and the date parameter are flashing at this time. Then set the date in the same way as before.

Example: Set the start-up date of the unit on September 28 :



3) If you want to **cancel** the timer setting, follow this below

Press "  " for 2s to enter into the timer setting interface. Press "  " to cancel all settings.

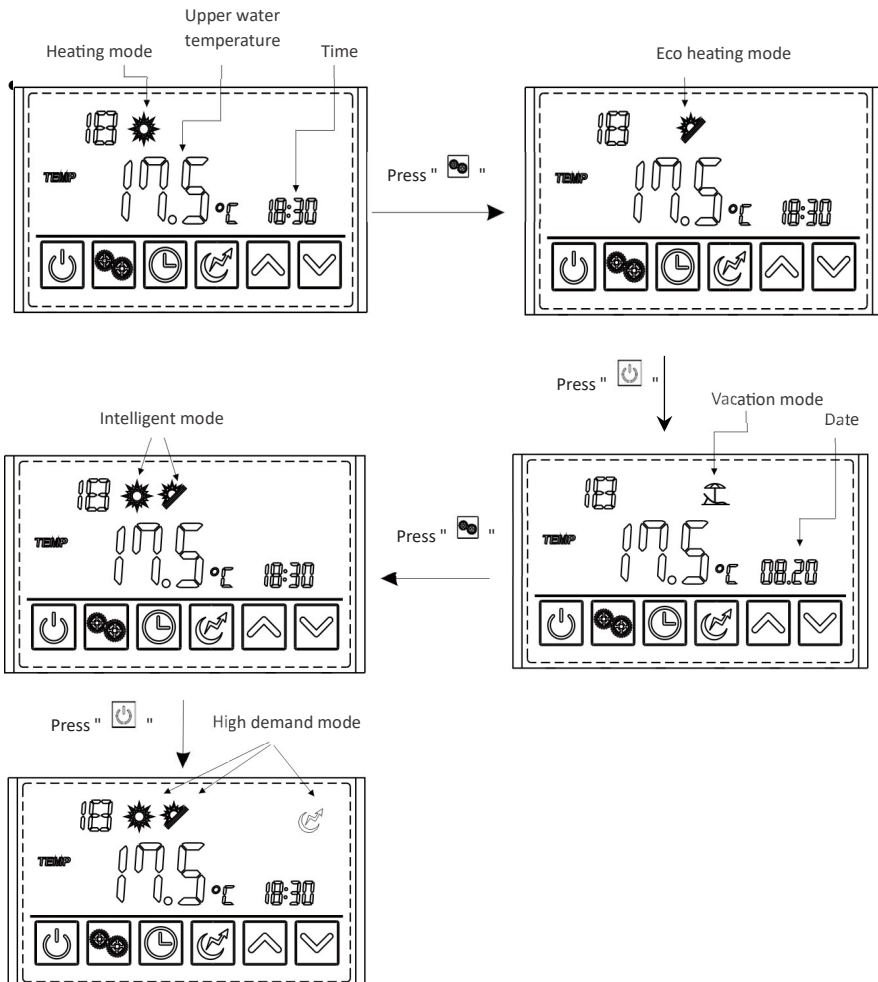


Mode selection

Press "  " to change the mode from Heating, Eco. heating, Intelligent, Vacation, or High requirement.

- **Standard Heating mode** : The heat pump system will start according to the actual temperature and target temperature. The electric heater will not start immediately. The controller will start the electric heater only if necessary (too long heating time)
- **Eco heating mode** : The heat pump system will start according to the actual temperature and target temperature. The electric heater will only switch on if the requested temperature is too high and/or an error code occurs.
- **Intelligent mode** : For this unit, the intelligent mode equals the Standard heating mode.

- **Vacation mode** : When you select vacation mode, you need to set a vacation time. The unit will keep operating the mode you set before the vacation time. Once it reached the vacation time, the heat pump will exit the vacation mode and run in the previous setting mode before vacation
- **High requirement mode** : We also call it “high demand heating mode”. In the high demand heating mode, the electric heater will start without delay, which can help the user to heat water quickly in a short time.

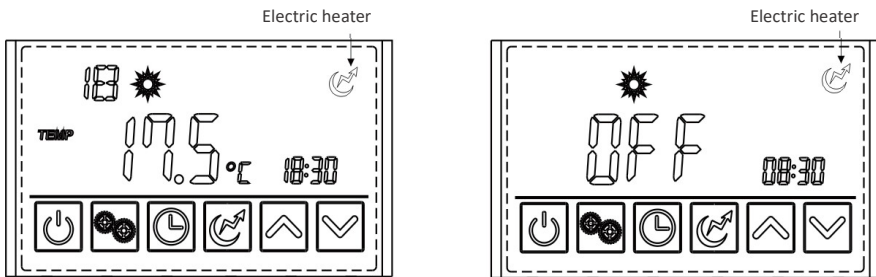


Electric heater manual activation

The electric heater can be turned on manually when the unit is heating or in standby.

- When the unit is ON, Press "  " once to turn on the electric heater and press "  " again to shut it off. The unit will now work with the electric heater and with the heatpump when it's within range.
- When the unit is turned off, press "  " to turn on the electric heating mode. At this time, the "  " is light up, and the main display alternatively shows "OFF" and the upper water. The unit will now only heat-up with the electric heater. Short press on "  " again to turn off the electric heating mode, and the main display area shows "OFF".

When manually activated, the electric heater will be activated for one heating cycle.



Target temperature checking and setting

In the standby or running interface, press "  " or "  " once to check the target temperature of the outlet water.

Press "  " or "  " again to change the target temperature.

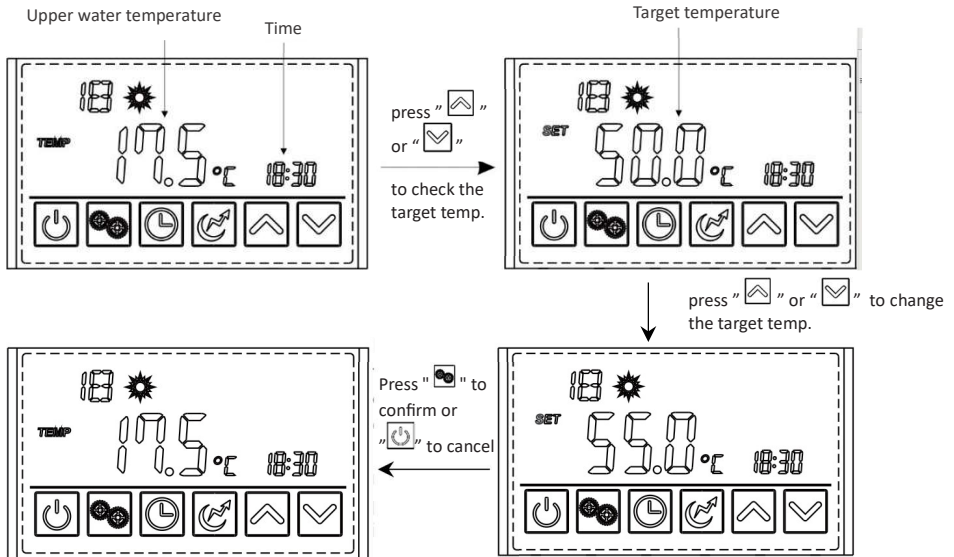
After making the changes to the parameter, press "  " to confirm or "  " to cancel the changes and return to the previous interface.

If no operations are performed on the keypad for 5s, the controller exits the parameter modification menu by timeout and the changes are confirmed.

Example: Change the target temperature from 50°C to 55°C when the actual outlet water temperature is 17.5°C.

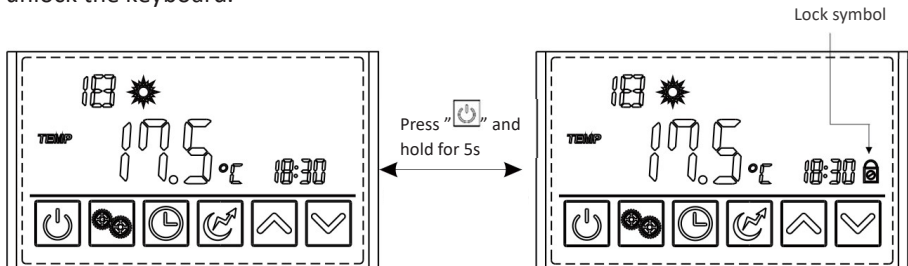
It's recommended to use a setting of at least 55°C.

If the target temperature is too high for the heatpump, the back-up heater will continue to heat the tank till target temperature.



Keyboard locking

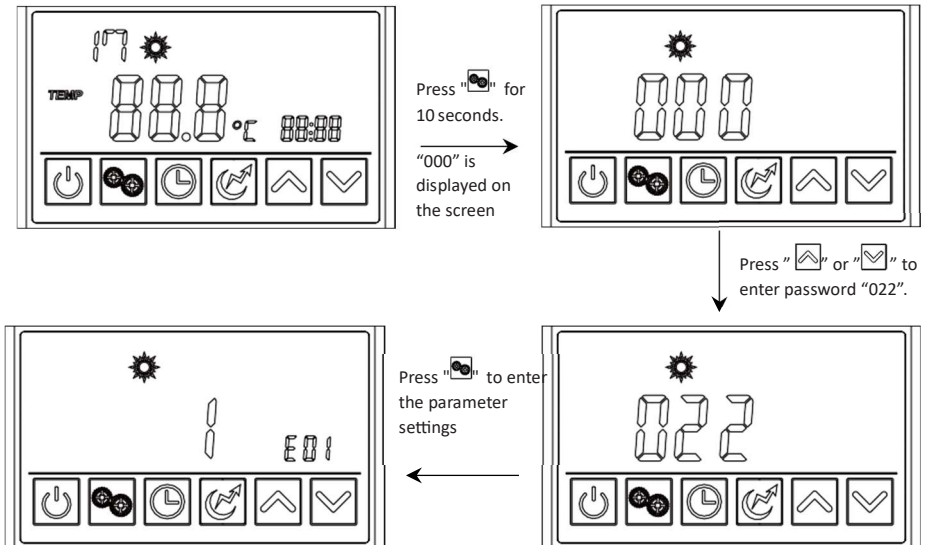
Press "⏻" and hold for 5s to lock the keyboard. Press "⏻" and hold for 5s again to unlock the keyboard.



Parameter settings

Press "  " for 10 seconds to enter the password setting screen. Enter password "22" by pressing "  ". Press "  " to confirm. Press "  " or "  " to scroll in the parameter menu.

Enter a parameter by pressing Press "  ", change it with "  " or "  " and confirm with the "  ".



Parameter	Description	Standard value	Range
g01	Anti-legionella temperature	62 °C	60~70°C
g02	Anti-legionella running time	30 min	0-90 min
g03	The time of the anti-legionella function	14 h	0~23h
g04	Cycle time of the anti-legionella function	7 d	7~99d
H30	Unit address	21	
H99	Adjust main interface displayed temperature	0	0-disable/1-enable
r03	Temperature hysteresis	5 °C	1~20°C
r04	Enable target temperature of electric heater	0	0-No/1-Yes
r05	Target temperature of electrical heater	55 °C	30~90°C
r06	Delay time of starting up the electrical heater	200 min	0~450min
r14	Increase of target temp. with SG-contact	5°C	-10-20°C

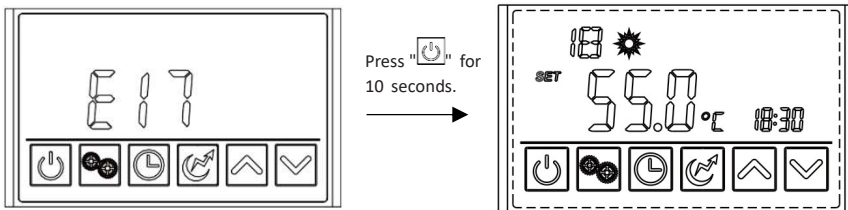
Error and noise signal reset

If an error occurs, the backup heater automatically takes over to ensure hot water at all times. If a fault occurs for >24h, a sound signal will occur to warn the user that there is a fault and that the backup heater is taking over

Press "  " for 3 seconds to mute the sound which indicates there is an error and that the back-up electric heater is taking over.



Press "  " for 10 seconds to reset the error manually



MAINTENANCE AND WORKING PROCEDURES

WARNING:

Servicing shall be performed only as recommended by the manufacturer. The local connection must be made according to the manufacturer's instructions. The power cable connection must be comply with the local rules.

If you need to remove or reinstall the unit, please ask a qualified person to avoid improper installation which will lead to water leakage, electrical shock or fire. The heat pump should be maintained by a qualified person to avoid improper maintenance which will lead to water leakage, electrical shock or fire.

ATTENTION:

- The area around the unit should stay dry, clean and well-ventilated to maintain good effect of heat transfer and energy saving.
- Check the parts of the unit and the pressure of the system regularly (once 1 year).
- Once every 3 months, the source flow must be interrupted and restarted to trigger the flow switch.
- If there is any unusual phenomena, repair and replace it immediately. Check if the electrical wiring is not firm enough and the electrical element has any unusual action and smell. If so, repair and replace it immediately. Do not make the unit power off if the unit is not used for a long time. We will not be responsible for any damage caused by the frost of parts due to the long time power off.
- Check if the power socket and plug have a good contact, perfect earthing and thermal protections.
- In a cold area (below 5°C), if you do not use the unit for a long time, please drain the water in the tank to avoid the damage due to freeze.
- It is recommended that the set temperature can be set lower when there is enough hot water for daily life to save energy and extend the service life of water heater. Attention, it's recommended to use at least 55°C set temperature.
- The safety cable specification is 5A/250VAC, and must meet the explosion- proof requirements.
- Be aware that refrigerants may not contain odor.
- Water quality shall meet the following conditions :

Total Dissolved Solids (TDS) mg/L or ppm	Hardness (°fH)	Saturation index (Langelier)	PH
Max 2500*	9-20	+0.4to-1.0 @65°C	6.5 to 9.5
*For TDS levels up to and including 800mg/liter the magnesium based anode is to be used. It is recommended that the magnesium anode is checked annually. This is the anode fitted during manufacture of the cylinder. For TDS levels greater than 800mg/liter and not exceeding 2500mg/liter the magnesium-based anode is to be used. Frequently inspection of magnesium anode is recommended. This anode Can be fitted by an authorized person. The Warranty does not apply if the TDS exceeds 2500 mg/liter.			

Information on maintenance and servicing

1) Checking the area

Prior to beginning work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimized. For repair to the refrigerating system, the following precautions shall be made before working on the system.

2) Work procedure

Work shall be carried out under a controlled procedure so as to minimize the risk of a flammable gas or vapor being present while the work is being performed.

3) General work area

All maintenance personnel and others working in the area must be instructed on the nature of the work being carried out. Work in confined spaces shall be avoided. The area around the workspace shall be sectioned off. Ensure that the conditions within the area have been made safe by control of flammable material.

4) Checking for presence of refrigerant

The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially flammable

atmospheres. Ensure that the leak detection equipment being used is suitable for use with flammable refrigerants, i.e. non-sparking, adequately sealed or intrinsically safe.

5) **Presence of fire extinguisher**

If any hot work is to be conducted on the refrigeration equipment or any associated parts appropriate fire extinguishing equipment must be provided. Have a dry powder or CO2 fire extinguisher nearby.

6) **No ignition sources**

No person carrying out work in relation to a refrigeration system which involves exposing any pipe work that contains or has contained flammable refrigerant shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which flammable refrigerant can possibly be released to the surrounding space. Before work takes place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. "No Smoking" signs shall be displayed.

7) **Ventilated area**

Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably discharge it externally into the atmosphere.

8) **Checking the refrigeration equipment**

Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times the manufacturer's maintenance and service guidelines shall be followed. If in doubt consult the manufacturer's technical department for assistance.

The following checks shall be applied to installations using flammable refrigerants

- The charge size is in accordance with the room size within which the refrigerant containing parts are installed;
- The ventilation equipment and outlets are operating adequately and are not obstructed;
- If an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant;
- Marking to the equipment continues to be visible and legible. Markings and

signs that are illegible shall be corrected;

- Refrigeration pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against corrosion.

9) **Checking the electrical devices**

Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used. This shall be reported to the owner of the equipment so all parties are advised. Initial safety checks include checking the discharging of the capacitor: this operation must be carried out in complete safety :

- Prevent sparking;
- That no live electrical components and wiring are exposed while charging, recovering or purging the system;
- That there is continuity of earth connection.

Repairs to sealed components

- 1) During repairs to sealed components, all electrical supplies shall be disconnected from the equipment being worked upon prior to any removal of sealed covers, etc. If it is absolutely necessary to have an electrical supply to the equipment during servicing, then a permanently operating form of leak detection shall be located at the most critical point to warn for a potentially hazardous situation.
- 2) Particular attention shall be paid to the following to ensure that by working on electrical components, the casing is not altered in such a way that the level of protection is affected. This shall include damage to cables, excessive number of connections, terminals not made to original specification, damage to seals, incorrect fitting of glands, etc. Ensure that the unit is mounted securely. Ensure that seals or sealing materials have not degraded such that they no longer serve the purpose of preventing the ingress of flammable atmospheres. Replacement parts shall be in accordance with the manufacturer's specifications.

NOTE: The use of silicon sealant may inhibit the effectiveness of some types of leak detection equipment. Intrinsically safe components do not have to be isolated prior to working on them.

Repair to intrinsically safe components

Do not apply any permanent inductive or capacitance loads to the circuit without ensuring that this will not exceed the permissible voltage and current permitted for the equipment in use.

Intrinsically safe components are the only types that can be worked on while live in the presence of a flammable atmosphere. The test equipment shall be at the correct rating. Replace components only with parts specified by the manufacturer. Other parts may result in the ignition of refrigerant in the atmosphere from a leak.

Cabling

Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects. The check shall also take into account the effects of aging or continuous vibration from sources such as compressors or fans.

Detection of flammable refrigerants

Under no circumstances shall potential sources of ignition be used in the search of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used.

Leak detection methods

The following leak detection methods are considered acceptable for systems containing flammable refrigerants.

Electronic leak detectors shall be used to detect flammable refrigerants, but the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed and the appropriate percentage of gas (25 % maximum) is confirmed.

Leak detection fluids are suitable for use with most refrigerants but the use of

detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.

If a leak is suspected, all naked flames shall be removed/ extinguished. If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak. Oxygen free nitrogen (OFN) shall then be purged through the system both before and during the brazing process.

Removal and evacuation

When breaking into the refrigerant circuit to make repairs - or for any other purpose - conventional procedures shall be used. However, it is important that best practice is followed since flammability is a risk. The following procedure should be followed:

- Remove refrigerant
- Purge the circuit with inert gas
- Evacuate: Purge again with inert gas
- Open the circuit by cutting or brazing

The refrigerant charge shall be recovered into the correct recovery cylinders. The system shall be "flushed" with OFN to render the unit safe. This process may need to be repeated several times. Compressed air or oxygen shall not be used for this task. Flushing shall be achieved by breaking the vacuum in the system with OFN and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum. This process shall be repeated until there is no refrigerant left in the system. When the final OFN charge is used, the system shall be vented down to atmospheric pressure. This operation is absolutely vital if brazing operation is to be carried out on the pipework.

Ensure that the outlet for the vacuum pump is not close to any ignition sources and there is ventilation available.

Charging procedures

In addition to conventional charging procedures, the following requirements shall be followed :

- Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them.
- Cylinders shall be kept upright.

- Ensure that the refrigeration system is earthed prior to charging the system with refrigerant.
- Label the system when charging is complete (if not already).
- Extreme care shall be taken not to overfill the refrigeration system. Prior to recharging the system, it shall be pressure tested with OFN. The system shall be leak tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out before leaving the site.

Decommissioning

Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its details. It is good practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of reclaimed refrigerant. It is essential that electrical power is available before the task is commenced.

- a) Become familiar with the equipment and its operation.
- b) Isolate the system electrically.
- c) Before attempting the procedure ensure that :
 - Mechanical handling equipment is available, if required, for handling refrigerant cylinders
 - All personal protective equipment is available and being used correctly
 - The recovery process is supervised at all times by a competent person
 - Recovery equipment and cylinders conform to the appropriate standards
- d) Pump down refrigerant system, if possible.
- e) If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
- f) Make sure that cylinder is situated on a scale before recovery takes place.
- g) Start the recovery machine and operate in accordance with manufacturer's instructions.
- h) Do not overfill cylinders. (No more than 80 % volume liquid charge).
- i) Do not exceed the maximum working pressure of the cylinder, even temporarily.
- j) When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.
- k) Recovered refrigerant shall not be charged into another refrigeration system unless it has been cleaned and checked.

Labelling

Equipment shall be labelled stating that it has been de-commissioned and emptied of refrigerant. The label shall be provided by a date and signed. Ensure that there are labels on the equipment stating the equipment contains flammable refrigerant.

Recovery

When removing refrigerant from a system, either for servicing or decommissioning, it is good practice that all refrigerants are removed safely.

When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge is available. All cylinders to be used are designated for the recovered refrigerant and labelled for that refrigerant (i.e. special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.

The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of flammable refrigerants. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition. Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release. Consult manufacturer if in doubt.

The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant Waste Transfer Note arranged. Do not mix refrigerants in recovery units and especially not in cylinders.

If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The evacuation process shall be carried out prior to returning the compressor to the suppliers. Only electric heating to the compressor body shall be employed to accelerate this process. When oil is drained from a system, it shall be carried out safely.

TECHNICAL DATA

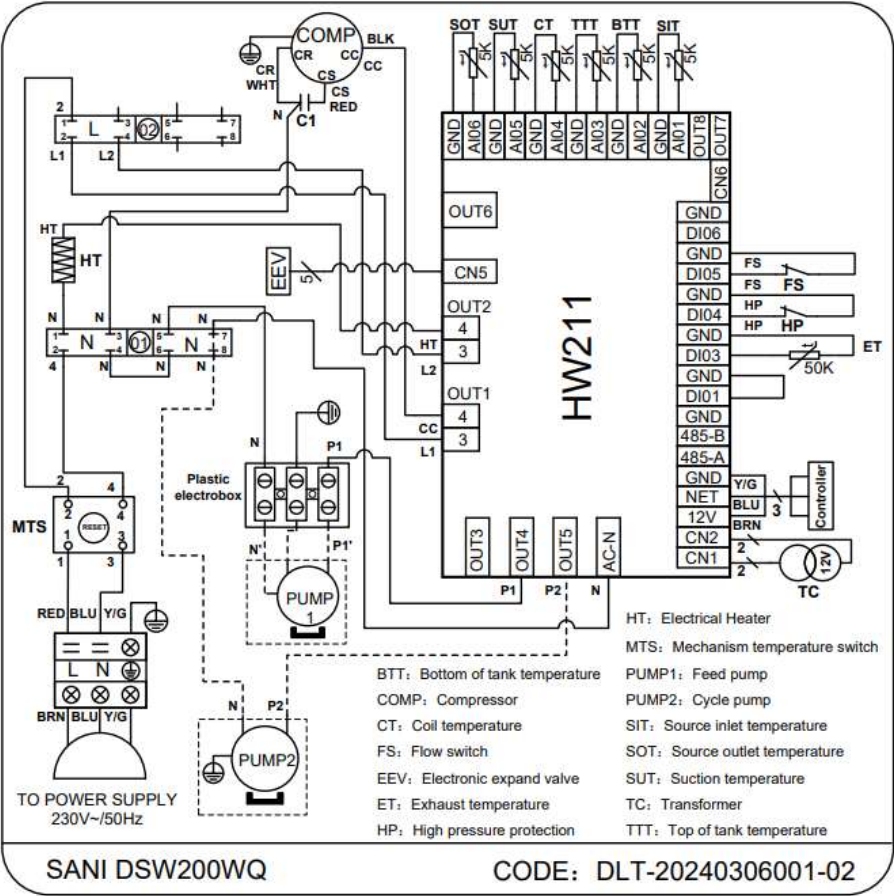
Model		DSW200WQ	DSW270WQ
Power Supply	/	230V~50Hz	230V~50Hz
Moisture Resistance	IPX	IPX1	IPX1
Electrical Shockproof	I	I	I
Heating Capacity	kW	1.65	1.65
Heating Power Input	kW	0.37	0.37
Heating Current Input	A	1.6	1.6
Auxiliary E-heater	kW	1.5	1.5
Max. Power Input	kW	2.2	2.2
Max. Current Input	A	9.3	9.3
Refrigerant / Refrigerant mass	g	R290/150g	R290/150g
CO2-equivalent	kg	0,45	0,45
Rated Outlet Water Temperature	°C	55	55
Water Inlet/Outlet Size	inch	3/4"	3/4"
Water Source Inlet/Outlet Size	inch	1/2"	1/2"
Compressor		Rotary	Rotary

Measurement conditions: Instant heating: Ambient temperature 10°C, Water source inlet 20°C Water source outlet 17°C, Water inlet 15°C Water outlet 55°C.

Model		DSW200WQ	DSW270WQ
Tapping profile (1)		L	XL
Energy class (1)	IPX	A+	A+
Energy efficiency (1)	%	149,7	140,4
COP (1)		3,646	3,402
Annual energy consumption (1)	kWh	684	1193
Heating-up time (1)	h:min	6:26	10:04
V40 (1)	L	249	394
Reference hot water temperature	°C	55	55
Sound power	dB(A)	47,2	48
Range tank pressure	MPa	0,15-0,7	0,15 / 0,7
Max tank temperature with HP	°C	62	62
Max tank temperature with HP + BH	°C	75	75
Weight (empty/full)	kg	81 / 281	107 / 385
Corrosion protection tank		Geëmailleerd Magnesium anode	Geëmailleerd Magnesium anode
Temperature range water source	°C	12-42	12 - 42
Temperature range installation (ambient)	°C	5-35	5 - 35
Flow range of the water source	L/h	120-200	120 - 200
COP (W25/W10-55°C)		5,29	4,56
Heating-up time (W25/W10-55°C)	h:min	4:12	7:30

(1) At a water source temperature of 10°C and a water tank temperature of 10°C, heated to 55°C, following EN16147.

WIRING DIAGRAM



FAILURE LIST & TROUBLE SHOOTING

Non-error tips

- 1) Why is the compressor not running when I start up the unit?
Answer: After powering on the unit, the compressor will not run immediately. There is a built-in self-protection feature that delays the compressor's start by 3 minutes after the last shutdown.

- 2) Why does the outlet water temperature on the display increases slowly sometimes?
Answer: Initially, there is a temperature difference between the upper and lower layers of the water in the tank. As the temperature becomes more uniform throughout the tank, the outlet water temperature will begin to rise more quickly.

- 3) Why the outlet water temperature on the display decreases when the unit is ON.
Answer: If the upper water temperature is much higher than the bottom water temperature, the water temperature will decrease a little because of convection between hot water and cold water in the tank.

- 4) Why does the unit not start up to heat when the outlet water temp decreases?
Answer: The water temp can decrease due to heat loss if the hot water in the tank is not used for a certain period. To prevent frequent cycling on and off, the unit will only start heating once the water temperature has dropped by more than 5°C.

- 5) Why does the outlet water temperature decrease a lot abruptly?
Answer: The temperatures of hot water and cold water in the tank are different. The cold water may go to the upper sensor when the hot water have been used up.

- 6) Why is there still hot water available when the water outlet temperature on the display drops significantly?
Answer: The upper sensor is located near the top of the tank, so even when the outlet water temp on the display drops, about 1/5 of the hot water is still available.

- 7) Why is the heating time so long?
Answer: The unit has a small heating capacity, which results in long heating times. Normally, the heating time is 2~6 hours according to the inlet water temp, and water consumption.

Error codes

Display	Malfunction Description	Corrective action
P01	Bottom water temp. sensor failure (sensor is open or short circuit)	Check or change the bottom water temp. sensor (BTT)
P02	Top tank water temp. sensor failure (sensor is open or short circuit)	Check or change the upper water temp. sensor (TTT)
P03	Water inlet temp. sensor failure (sensor is open or short circuit)	Check or change the water inlet temp. sensor (SIT)
P05	Coil temp. sensor failure (sensor is open or short circuit)	Check or change the coil temp. sensor (CT)
P07	Suction temp. sensor failure (sensor is open or short circuit)	Check or change the suction temp. sensor (SUT)
P59	Water outlet temp. sensor failure (sensor is open or short circuit)	Check or change the water outlet temp. sensor (SOT)
P81	Discharge overheating protection	Check for leaks or blockages in the refrigerant circuit.
E01	High pressure protection (The exhaust pressure is high, high pressure switch action)	Check the high pressure switch or check if the refrigerant system is blocked.
E03	Water flow failure (Insufficient or no water flow over the heat exchanger)	Check the water flow and working of the flow switch
E04	Discharge overheating protection	Check for leaks or blockages in the refrigerant circuit
E07	Anti-freeze protection	Check if the water flow volume is normal.

E08	Communication failure (Wired remote control with master signal failure)	Check the connection line between the wired remote control and motherboard.
E09	Frost protection	The ambient temperature and/or water temperature is too low.
E10	Discharge overheating protection, 3 times	Check if the refrigerant system has leak points or is blocked.
E11	Water outlet temperature too low ($\leq 4^{\circ}$)	Check the water temperature of the heat source
E12	Water inlet temperature too high ($> 43^{\circ}\text{C}$)	Check the water temperature of the heat source
E15	Suction temperature (SUT) too low, anti-freezing protection	Check the flow of the water source and the working of the flow-switch.
E16	Coil temperature (CT) too low.	Too little refrigerant
E17	Anti-legionella setting not reached after 9h	Too much water is tapped during anti-legionella function or The back-up heater is not controlled or is not working.

NOTES

[illegible]

AFTER-SALES CONTACT:

www.thercon.be

Comissioning date:

Installer or customer service
details