ORIGINAL MANUAL

Kaysun

INSTALLATION, OWNER'S & TECHNICAL MANUAL

Domestic Hot Water Heat Pumps COMPAK

COMPAK KHPA 16 190
COMPAK KHPA 23 300

COMPAK KHP 16 190S
COMPAK KHP 23 300S

Dear Customer,

We congratulate you on choosing this product

For many years the company has been offering systems that provide maximum comfort, together with high reliability, efficiency, quality and safety.

The aim of the company is to offer advanced systems, that assure the best comfort, reduce energy consumption and the installation and maintenance cost for the life cycle of the system.

The purpose of this manual is to provide you with information that is useful from reception of the equipment, through installation, operational usage and finally disposal so that this advanced system offers the beat solution.

Yours faithfully.

INDEX

Before any operation carefully read the GENERAL WARNINGS

Pay particular attention to:

INSTALLER use

USER use

WARNING, identifies particularly important operations or information

PROHIBITIONS, identifies operations that must not be carried out, that compromises the operating of the unit or may cause damages to persons or things.

USER

This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.

Before cleaning, be sure to stop the operation and turn the breaker off or pull out the power plug.

Otherwise, an electric shock and injury may be caused.

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.

Do not touch the inner parts of the controller.

Do not remove the front panel.

Some parts inside are dangerous to touch, otherwise a machine malfunction may be caused.

Never use a flammable spray such as hair spray, lacquer paint near the unit, it may cause a fire.

Do not remove, cover or deface any permanent instructions, lables, or the data label from either the outside of the unit or inside of unit panels.

It is forbidden the use of the device to children and unassisted disables .

It is forbidden to touch the device if you are barefoot and with wet body parts .

It is forbidden any cleaning, before having disconnected the device positioning the system main switch on “off”.

It is forbidden to pull, remove, twist the electric cables that come out from the device even if it is disconnected from the mains supply.

It is forbidden to trample on the device and/or to put on it any type of object.

It is forbidden to throw or spray water directly on the device.

It is forbidden to insert sharpened objects by the air return and supply grilles.

It is vorbidden to open the lids of access to the internal device parts, without having before positioned the main switch of the system on “off”.

Do not turn off the power supply.

If the supply cord is damaged, it must be replaced by the manufacturer or its service agent or a similarly qualified person.

The wiring must be performed by professional technicians in accordance with national wiring regulations.

A disconnect device for all poles having a separation distance of at least 3 mm across all poles and that a residual current device (RCD) with a power greater than 10mA is incorporated into fixed wiring.

System will stop or restart heating automatically.

A continuous power supply for water heating is necessary, except service and maintenance.

Keep this manual with the wiring diagram in an accessible place for the operator.

Children should be supervised to ensure that they do not play with the unit.

Note the unit lable data so you can provide them at the assistance centre in case of intervention (see "Unit identification" section)

Provide a unit notebook that allows any interventions carried out on the unit to be noted and tracked making it easier to suitably note the various interventions and aids the search for any breakdowns.

Water temperature over 50°C can cause severe burns instantly.

Children, disabled and elderly are at highest risk of being scalded.

Feel water before bathing or showering.

Water temperature limiting valves are recommended.

If the unit has not been used for a long period of time(2 weeks or more), hydrogen gas will be produced in the water piping system.

Hydrogen gas is extremely flammable.

To reduce the risk of injury under these conditions, it is recommended that open the hot water tap for several minutes at the kitchen sink before using any electrical appliance connected to the hot water system. When hydrogen is present, there will probably be an unusual sound such as air escaping through the pipe as the water begins to flow.

There should be no smoking or open flame near the tap at the time it is open.

Ask qualified person for relocating, repairing and maintaining the unit instead of doing by yourself.

In case of breakdown or malfunction:

- immediately deactivate the unit
- contact a constructor certified assistance service.
- use original spares parts only

Ask the installer to be trained on:

- start-up / shutdown
- set points change
- standby mode
- maintenance
- what to do / what not to do in case of breakdown

GENERAL INSTRUCTIONS

Preliminaries

Read carefully the IOM and use the unit strictly according to the instructions in order to avoid personal injuries, damages to the unit, damages to property and litigations.

Our company does not assume any legal liability for any damage caused by improper use of the unit.

The positioning, hydraulic system, refrigerating, electrics and the air duct must be determined by the system designer or by experts and must take into consideration both the decidedly technical requirements as well as any local regulations in act regarding specific authorisations.

Only qualified personnel can operate on the unit, as required by the regulation in force.

Using the unit in case of breakdown or malfunction :

- voids the warranty
- may compromise the safety of the unit
- may increase time and repair costs.

Follow local safety regulations.

Keep packing material out of children's reach it may be dangerous.

Recycle and dispose of packing material in conformity with local regulations.

Risk situations

The unit has been designed and created to prevent injures to people. During designing it is not possible to plane and operate on all risk situation. Read carefully "Residual risk" section where all situation which may cause damages to things and injuries to people are reported. Installation, starting, maintenance and repair required specific knowledge; if they are carried out by inexperienced personnel, they may cause damages to things and injuries people.

Intended use

Use the unit only: domestic hot water

heating, within limits defined in the technical bulletin and on this manual. Any use other than intended does not involve the manufacturer in any commitment or obligation.

HYDRAULIC SYSTEM

Components

Selection and installation of system components must be carry out by installer.

Water quality

The water quality is determined by the following factors, avoid therefore:

- Inorganic salts
- pH
- Biological load (seaweeds etc)
- Suspended solids
- Dissolved oxygen

Water with inadequate characteristics can cause:

- pressure drop increase
- energy efficiency decrease
- corrosive symptom increase

Risk of freeze

If the unit or the relative water connections can be subject to temperatures close to 0°C adopt measures for prevent risk of freeze.

The appliance is intended to be permanently connected to the water mains and not connected by a hose-set .

The water may drip from the discharge pipe of the pressure-relief device and that this pipe must be left open to the atmosphere.

The pressure-relief device is to be operated regularly to remove lime deposits and to verify that is not blocked.

A discharge pipe connected to the pressure-relief device is to be installed in a continuously downward direction and in a frost-free environment.

ELETTRIC SYSTEM

General

The characteristics of the electrical lines must be determined by specialized personnel able to design electrical installations; moreover, the lines must be in conformity with regulations in force.
Operate in compliance with safety regulations in force .
This unit is required reliable earthing before usage, otherwise might cause injury.
If you can't make sure that your house power supply is earthed well, please don't install the unit if it does not in conformity with regulations in force.
The power supply should be an independent circuit with rated voltage.
Power supply circuit should be earthed effectively.
Do not use water pipes to earthing connection of the unit
Use single protection devices : gloves, glasses ecc.
The power cables and the protection cable section must be defined in accordance with the characteristics of the protections adopted. The serial number label reports the unit specific electrical data, included any electrical accessories.

Connection

All electrical operations should be performed by trained personnel having the necessary requirements by the regulations in force and being informed about the risks relevant to these activities. Refer to the unit electrical diagram (the number of the diagram is

shown on the serial number label). Verify that the network has characteristics conforming to the data shown on the serial number label .

Make sure that the unit supply line is selected at start.

Shelter the cables using adequate measure fairleads.

Before starting work, verify that the sectioning device at the start of the unit power line is open, blocked and equipped with sign warning.

First create the earthing connection.

After wire connection, check it again and make sure the correctness before power on.

Prior to powering the unit ensure that all the protections that were removed during the electrical connection work have been restored.

Signal lines/data-lay

⚠ Do not overpass the maximum power allowed, which varies, according to the type of signal.

Lay the cables far from power cables or cables having a different voltage and that are able to emit electromagnetic disturbances. Do not lay the cable near devices which can generate electromagnetic interferences.

Do not lay the cables parallel to other cables; cable crossings are possible, only if laid at 90°.

Connect the screen to the ground, only if there aren't disturbances .

Guarantee the continuity of the screen for the entire extension of the cable.

Respect impendency, capacity and attenuation indications.

MODIFICATION

All unit modifications will end the warranty coverage and the manufacturer responsibility. ⚠

BREAKDOWN/MALFUCTION

Disable the unit immediately in case of breakdown or malfunction. ⚠
Contact a constructor certified assistance service.
Use original spares parts only.

USER TRAINING

The installer has to train the user on :

- ON / OFF
- set points change;
- standby mode;
- Maintenance;
- what to do / what not to do in case of breakdown.

DATA UPDATE

Continual product improvements may imply manual data changes
Visit manufacturer web site for updated data.

RESIDUAL RISKS

General

In this section the most common situations are signalled. As these cannot be controlled by the manufacturer these could be a source of risk situations for people or things.

Danger zone

This is an area in which only an authorised operator may work. The danger zone is the area inside the unit which is accessible only with the deliberate removal of protections or parts thereof.

Handling

The handling operations, if implemented without all of the protection necesssary and without due caution, may cause the fall or the tipping of the unit with the consequent damage, even serious, to persons, things or the unit itself. Handle the unit following the instructions provided in the present manual regarding the packaging and in compliance with the local regulations in force.

Should the gas refrigerant leak please refer to the refrigerant "Safety sheet".

Installation

An incorrect installation of the unit could cause water leaks, condensate accumulation, leaking of the refrigerant, electric shock, bad functioning or damage to the unit itself.

Check that the installation has been implemented by qualified technical personnel only and that the instructions contained in the present manual and the local regulations in force have been adhered to. The installation of the unit in a place where even infrequent leaks of inflammable gas and the accumulation of this gas in the area surrounding the area occur could cause explosions or fires.

Carefully check the positioning of the unit. The installation of the unit in a place unsuited to support its weight and/or guarantee adequate anchorage may cause the fall or the tipping of the unit with the consequent damage to things, people or the unit itself. Carefully check the positioning and the anchoring of the unit.

Easy access to the unit by children, unauthorised persons or animals may be the source of accidents, some serious.

Install the unit in areas which are only accessible to authorised person and/or provide protection against intrusion into the danger zone .

General risks

Smell of burning, smoke or other signals of serious anomalies may indicate a situation which could cause damage to people, things or the unit itself. Electrically isolate the unit (yellow-red isolator).

Contact the authorised service centre to identify and resolve the problem at the source of the anomaly.

Accidental contact with exchange batteries, compressors, air delivery pipes or other components may cause injuries and/or burns. Always wear suitable clothing including protective gloves to work inside the danger zone.

Maintenance and repair operations carried out by non-qualified personnel may cause damage to persons, things or the unit itself.

Always contact the qualified assistance centre.

Failing to close the unit panels or failure to check the correct tightening of all of the panelling fixing screws may cause damage to persons, things or the unit itself. Periodically check that all of the panels are correctly closed and fixed. If there is a fire the temperature of the refrigerant could reach values that increase the pressure to beyond the safety valve with the consequent possible projection of the refrigerant itself or explosion of the circuit parts that remain isolated by the closure of the tap. Do not remain in the proximity of the safety valve

and never leave the refrigerating system taps closed.

Electric parts

An incomplete attachment line to the electric network or with incorrectly sized cables and/or unsuitable protective devices can cause electric shocks, intoxication, damage to the unit or fires.

Carry out all of the work on the electric system referring to the electric layout and the present manual ensuring the use of a system thereto dedicated. An incorrect fixing of the electric components cover may favour the entry of dust, water etc inside and may consequently can electric shocks, damage to the unit or fires.

Always fix the unit cover properly. When the metallic mass of the unit is under voltage and is not correctly connected to the earthing system it may be as source of electric shock and electrocution.

Always pay particular attention to the implementation of the earthing system connections. Contact with parts under voltage accessible inside the unit after the removal of the guards can cause electric shocks, burns and electrocution.

Open and padlock the general isolator prior to removing the guards and signal work in progress with the appropriate shield.

Contact with parts that could be under voltage due to the start up of the unit may cause electric shocks, burns and electrocution.

When voltage is necessary for the circuit open the isolator on the attachment line of the unit itself, padlock it and display the appropriate warning shield.

Moving parts

Contact with the transmissions or with the fan aspiration can cause injuries. Prior to entering the inside of the unit open the isolater situated on the connection line of the unit itself, padlock and display the suitable sign.

Contact with the fans can cause injuries. to removing the protective grill or the fans, open the isolator on the attachment line of the unit itself, padlock it and display the appropriate warning sign.

Refrigerant

The intervention of the safety valve and the consequent expulsion of the gas refrigerant may cause injuries and intoxication. Always wear suitable clothing including protective gloves and eyeglasses for operations inside the danger zone.

Should the gas refrigerant leak please refer to the refrigerant "Safety sheet".

Contact between open flames or heat sources with the refrigerant or the heating of the gas circuit under pressure (e.g. during welding operations) may cause explosions or fires.

Do not place any heat source inside the danger zone.

The maintenance or repair interventions which include welding must be carried out with the system off.

Hydraulic parts

Defects in ducting , the attachments or the cut-off parts may cause a leak or water projection with the consequent damages to people, things or shortcircuit the unit.

DISCONNECTION

Only authorised personnel must disconnect the unit.

Avoid leak or spills into the environment.

Before disconnecting the unit, the following must be recovered, if present:

- refrigerant gas

When awaiting dismantling and disposal, the unit can also be stored outdoors, as bad weather and rapid changes in temperature will not cause damage to the environment, if the unit's electric, cooling and hydraulic circuits are integral and closed.

DISPOSAL

CE WEEE DIRECTIVE

The manufacturer is registered on the EEE National Register, in compliance with implementation of Directive 2012/19/EU and relevant national regulations on waste electrical and electronic equipment.

This Directive requires electrical and electronic equipment to be disposed of properly.

Equipment bearing the crossed-out wheelie bin mark must be disposed of separately at the end of its life cycle to prevent damage to human health and to the environment.

Electrical and electronic equipment must be disposed of together with all of its parts.

To dispose of “household” electrical and electronic equipment, the manufacturer recommends you contact an authorised dealer or an authorised ecological area.

“Professional” electrical and electronic equipment must be disposed of by authorised personnel through established waste disposal authorities around the country.

In this regard, here is the definition of household WEEE and professional WEEE:

WEEE from private households: WEEE originating from private households and WEEE which comes from commercial, industrial, institutional and other sources which, because of its nature and quantity, is similar to that from private households. Subject to the nature and quantity, where the waste from EEE was likely to have been by both a private household and users of other than private households, it will be classed as private household WEEE;

Professional WEEE: all WEEE which comes from users other than private households.

This equipment may contain:

refrigerant gas, the entire contents of which must be recovered in suitable containers by specialised personnel with the necessary qualifications;

• lubrication oil contained in compressors and in the cooling circuit to be collected;

• mixtures with antifreeze in the water circuit, the contents of which are to be collected;

• mechanical and electrical parts to be separated and disposed of as authorised.

When machine components to be replaced for maintenance purposes are removed or when the entire unit reaches the end of its life and needs to be removed from the installation, waste should be separated by its nature and disposed of by authorised personnel at existing collection centres.

Dismantling and disposal

THE UNIT MUST ALWAYS BE SENT TO AUTHORISED CENTRES FOR DISMANTLING AND DISPOSAL.

When dismantling the unit, the fan, the motor and the coil, if operating, may be recovered by the specialist centres for reuse. All the materials must be recovered or disposed of in compliance with the corresponding national standards in force.

For further information on the decommissioning of the unit, contact the manufacturer.

UNIT INDENTIFICATION

Serial number label
The serial number label is positioned on the unit and allows to indentify all the unit features.
It has not to be removed for any reason.
It reports the regulations indications such as:

- unit type,
- serial number (12 characters)
- year of manufacture
- wiring diagram number
- electrical data
- manufacturer logo and address .

Serial number
It identifies uniquely each machine.

It identifies specific spare parts for the machine.

Assistance request
Note data from the serial number label and write them in the chart on side, so you will find them easily when needed.
In case of intervention you have to provide data.

Serie
Size
Serial number
Year of manufacture
Wiring diagram

PRELIMINARY INFORMATION

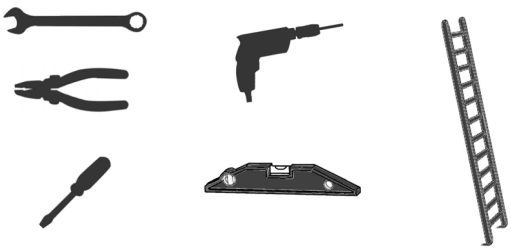
Before beginning the work, ensure you that have the final project for installing the aeraulic, hydraulic, electric,drains and positioning the units.

Operate in compliance with safety regulations in force .

Use single protection devices.

Recommended instruments

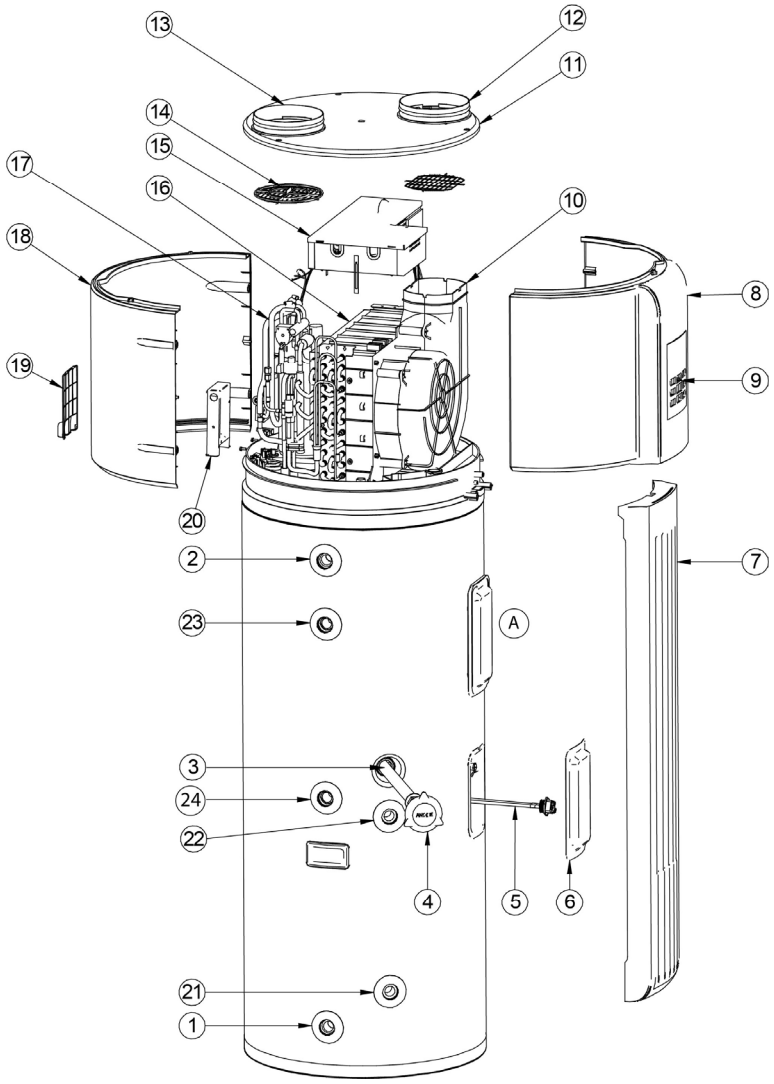
Set of Philips and flathead screwdrivers;
Cutters;
Drill;
Scissors;
Set of open spanners or pipe wrenches;
Range;
Hydraulic material for the sealing of the threads;
Electrical equipment for the connections;
Cut prevention gloves;
Tester and amperometric pliers.



BEFORE REQUESTING START-UP

- Completed aeraulic system and free of dirt
- Completed water system, circuit loading and venting
- Discharges unit connected
- Electric connections

PARTS NAMES - 190



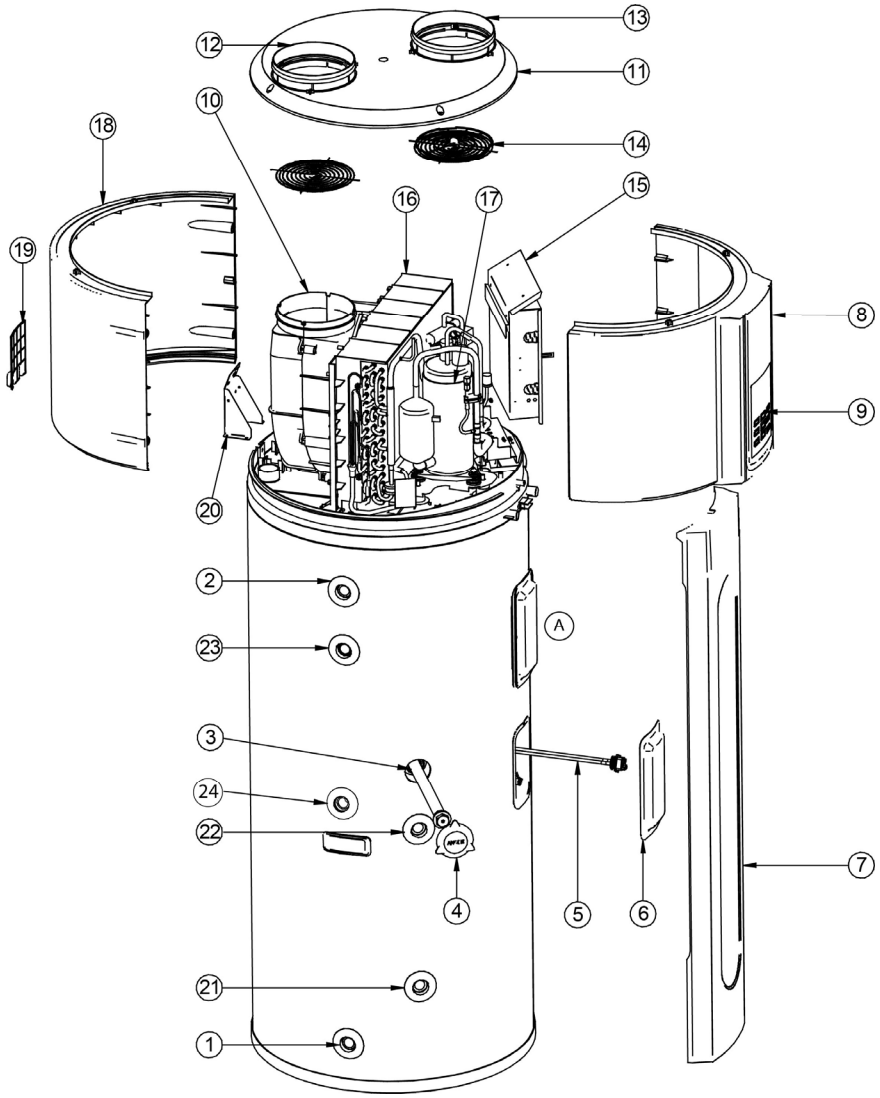
1) Water inlet 3/4” F
2) Domestic hot water outlet 3/4” F (ACS)
3) Sacrificial anode
4) Anode cap
5) Electric heater
6) Heating element cap
7) Front mask
8) Front cover
9) Unit control keypad
10) Fan
11) Top cover
12) Air outlet flange
13) Air inlet flange
14) Air filter
15) Electric panel
16) Evaporator
17) Compressor
18) Rear closure
19) Electrical connector cover
20) Electrical connections box
21) Solar inlet 3/4” F (Solar version only)
22) Solar outlet 3/4” F (Solar version only)
23) DHW recirculation (Solar version only)
24) Probe sump for solar

A - ATCO (automatic temperature Switch)
TCO (temperature Switch)

When ordering repair parts please always give the following information:
Model, serial and product number.
Parts name.

All the picture in this manual are for explanation purpose only. They may be slightly different from the unit you purchased (depand on model). Please refer to the real sample instead of the picture of this manual.

PARTS NAMES - 300



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4.1 - DELIVERY CONTROL

Before accepting the delivery you have to check:

- that the unit hasn't been damaged during transport.
- Check that the materials delivered correspond with that indicated on the transport document comparing the data with the identification label '**A**' positioned on the packaging.

In case of damage or anomaly:

- Write down on the transport document the damage you found and quote this sentence: "Conditional acceptance clear evidence of deficiencies/damages during transport".
- Contact supplier and the carrier by fax and registered mail with advice of receipt.

Any disputes must be made within the 8 days following the delivery. Complaints after this period are invalid.

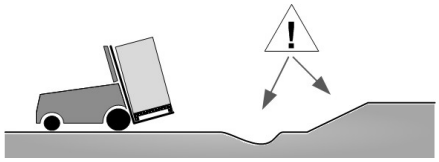
4.2 - HANDLING

The following examples are indications the choice of the means and of the handling modes will depend on factors.

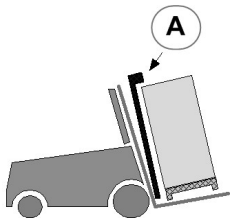
Verify the lifting equipment's load-bearing capacity: the shipped unit weighs

Unit		Shipping weight
190	kg	114
190S (with solar)	kg	131
300	kg	138
300S (with solar)	kg	158

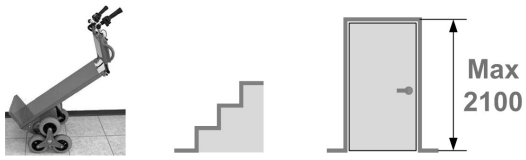
Identify critical points during handling (disconnected routes, flights, steps, doors).

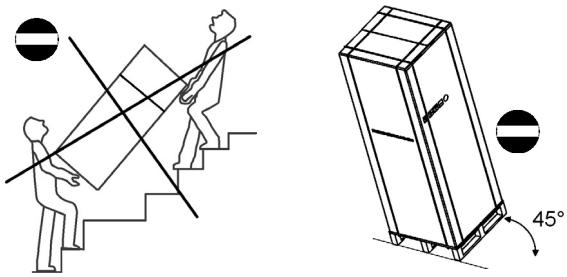


Use protection (A) to avoid the unit damaging



Stair climbing trolley.





Maximum inclination

When transporting the unit, do not carry it by holding on to the top part of the circuit.

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

In order to avoid scratch or deformation of the unit surface, apply guard boards to the contacting surface.
No contact of fingers and other things with the vanes.
While moving it, do not tip the unit to an angle less than 45° and keep it in a vertical position during installation.

If the unit has been tipped during transport, wait at least 2 hours before starting it up

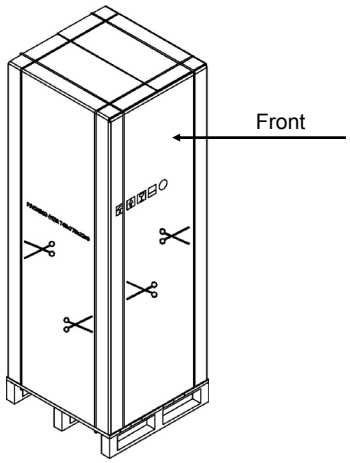
4.3 - PACKAGING REMOVING

Be careful not to damage the unit.

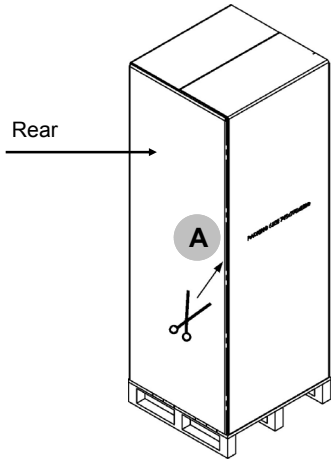
Keep packing material out of children's reach it may be dangerous.

Recycle and dispose of the packaging material in conformity with local regulations.

1 Cut the hoops



2 Cut along the joint (A)



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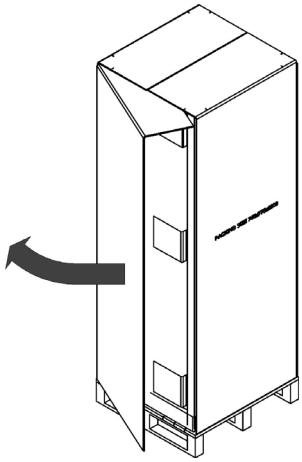
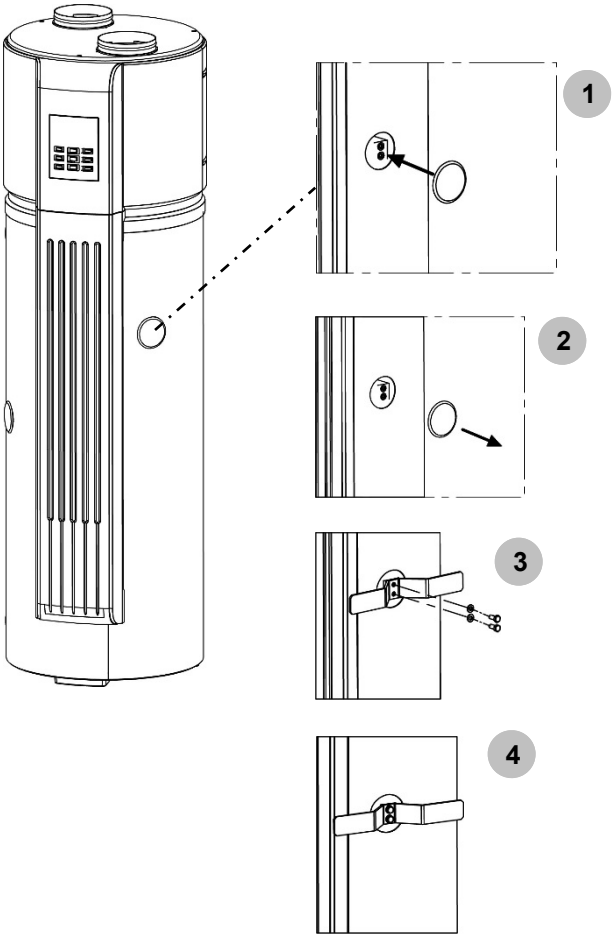


ALUMINUM VERSION ONLY



5.1 - INSTALLATION REQUIREMENTS

The installation has been implemented by qualified technical personnel only and that the instructions contained in the present manual and the local regulations in force have been adhered to.

Choose the installation place according to the following criteria:

- customer approval
- Internal
- in a dry room/compartment where the temperature cannot fall below 0 degrees
- guarantee good unit operation
- safe accessible position
- enough space for installation and maintenance shall be preserved.
- the air inlet and outlet should be free from obstacles and strong wind.
- the base surface should be flat, surface should be inclined no more than 2°and able to bear the weight of the unit and suitable for installing the unit without increasing noise or vibration.
- the operation noise and air flow expelled shall not affect neighbors.
- If the unit has to be installed on a metal part of building, make sure the well electric insulation which should meet the relevant local electric standard.
- use of air from heated rooms could penalise the heating performance of the building
- the unit must be securely fixed, elsewise, noise and shaking may be resulted.
- make sure that there's no obstacle around the unit.

The external air temperature must also be considered when installing this unit, in heat pump mode the external air temperature must be above -7°C and below 43°C. If the externalair temperature falls outside these upper and lower limits, the electrical elements will activated to meet the hot water demand and the heat pump does not operate.

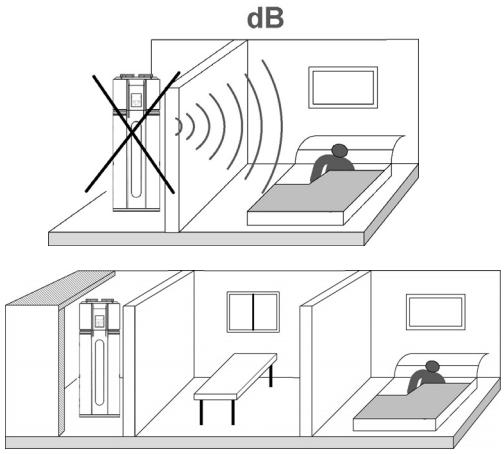
The unit should be located in an area not subject to freezing temperatures. The unit located in unconditioned spaces(i.e., garages, basements, etc.) may require the water piping, condensate piping, and drain piping to be insulated to shelter against freezing.

Installing the unit in any of the following places may lead to malfunction:

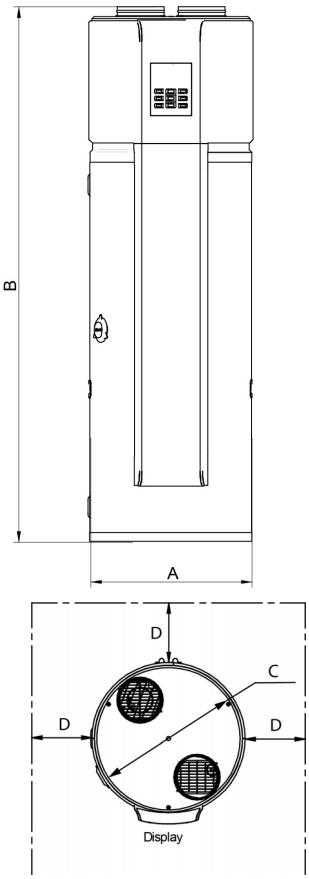
- The site contains mineral oils such as cutting lubricant
- Seaside where the air contains much salt.
- Hot spring area where corrosive gases exist, e.g., sulfide gas.
- Factories where the power voltage fluctuates seriously.
- The place with direct sunlight and other heat supplies. If there's no way to avoid these, please install a covering.
- 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.

5.2 - CONSIDER SOUND EMISSIONS

Noise levels could represent an inconvenience if installed in areas that require extreme silence, example near bedrooms.



Unit dimension / Functional spaces



Unit		190 190S (with solar)	300 300S (with solar)
Width	A	560	650
Height	B	1830	1930
Diameter	C	560	650
Functional spaces	D	= 600	= 600

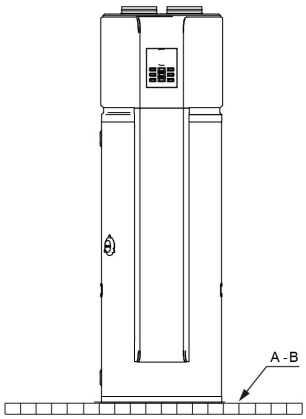
Check that the floor can support the weight of the unit in operation:

A - > 287 Kg/m^2 (190)

> 310 Kg/m^2 (190S with solar)

B - > 412 Kg/m^2 (300)

> 435 Kg/m^2 (300S with solar)

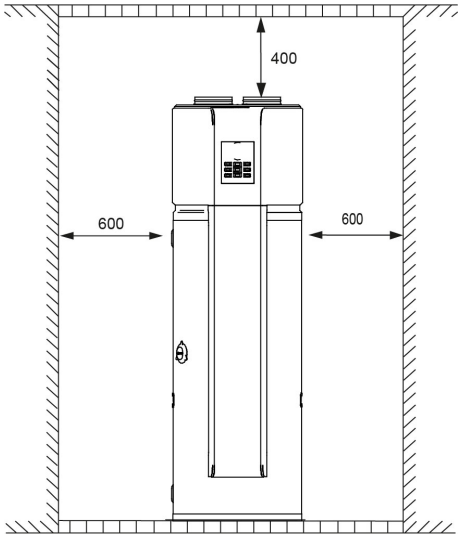


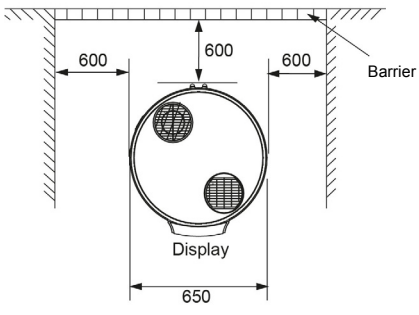
If installed in inclosed space

The unit must be located in a space >15m³, and must have unrestricted air flow.

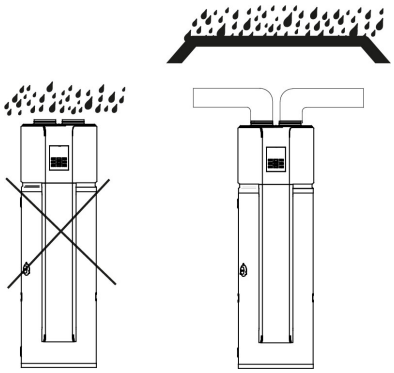
Make sure there is enough Installation space.

For optimal efficiency and serviceability, the following clearances should be maintained: 400mm on the air inlet side, 400mm on the air outlet side, 600mm in the back, and 600mm in the front.





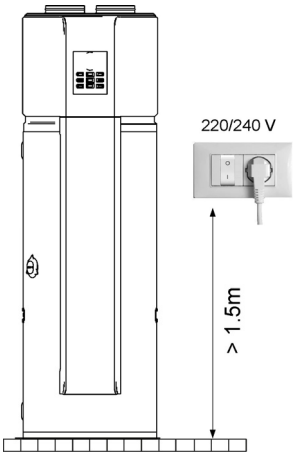
Install the unit in the indoor space, it is not allow to install the unit at the rainy space



In case of rain entering to internal components of the unit, the component might be damaged or causing physical danger.

5.5 ELECTRICAL OUTLET

The installation height of power supply should be over 1.5m, if separate the power supply from water.

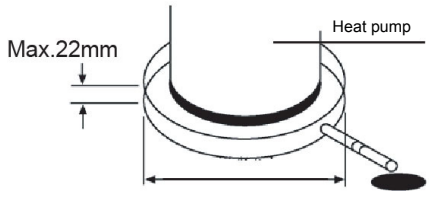


Configuration for electric power socket (schuko + On/Off switch) close to the unit

The plug must be accessible at all moment.

5.6 - CONDENSATE DRAIN

Condensate may be leaked from unit if drainage pipe is blocked, a drainage pan is recommended as shown as following figure.



50mm larger than the diameter of unit

6.1 - WATER FEATURES

Fill the storage tank (DHW) only during the unit start-up.
If the house is not immediately lived,or the unit is turned off for long periods, empty the storage tank to avoid the stagnation of the water, or with temperatures close to 0°C the risk of freeze.
See the Maintenance section for drain.

Water features

- confirming to local regulations
- Langelier (I_L) index between 0 and +0.4
- within the limits indicated by table

The water quality must be checked by qualified personnel.

Hardness

If the water hardness is high install a system suitable to preserve the unit from harmful deposits and limestone formations.

Cleaning

Before making the water connections to unit clean carefully the system with specific and effective products for removing residues or impurities that could affect the operation.
The existing systems must be free from sludgs, contaminants and protected against foulings.

Exclusions

The warranty does not cover damages caused by limestone formations, deposits and impurities from the water supply and / or failure from failed system clearing to clean system.
If necessary, fit a water softener to reduce water hardness.

Concentration limit values for preventing galvanic corrosion		
PH	7,5 ÷ 9,0	
SO_4^{--}	< 100	ppm
HCO_3^- / SO_4^{--}	> 1	
Total Hardness	8 ÷ 15	°f
Cl-	< 50	ppm
PO_4^{3-}	< 2,0	ppm
NH3	< 0,5	ppm
Free Chlorine	< 0,5	ppm
Fe_3^+	< 0,5	ppm
Mn^{++}	< 0,05	ppm
CO_2	< 50	ppm
H_2S	< 50	ppb
Temperature	< 65	°C
Oxygen content	< 0,1	ppm

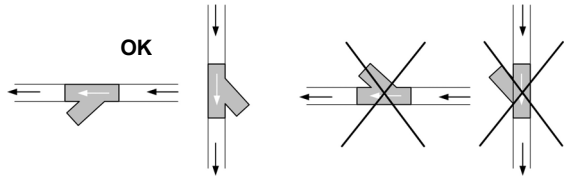
6.2 - PIPES CONNECTIONS

Connect the water outlet/inlet using pipes and couplings that are resistant to both the operating pressure and the hot water temperature, which can reach 70°C.
Do not use materials that cannot withstand high temperatures
Do not use flexible pipes for unit connection.

6.3 WATER FILTER (Provided by the customer)

The filter is extremely important: it helps to lockout any impurities in the water and avoid clogging the system and heat exchanger.
It must be installed immediately at the entrance to the water mains, in a position that is easily accessible for cleaning.
The filter should never be re-moved.

Installation



6.4 - PRESSURE REDUCER (Provided by the customer)

If the inlet water pressure is less than 0,2MPa (2bar), a pump should be installed at the water inlet.

For guarantee the safety usage of storage tank at the condition of water supply hydraulic higher than 0,65MPa (6,5bar), a pressure reducer should be installed at the water inlet pipe

A calibration pressure of 3-4 bar (0,3-0,4 MPa) is advisable.

Periodically check the pressure

6.5 - EXPANSION VESSEL (Provided by the customer)

Be provided with an expansion tank proportioned to the boiler's dimensions (you are advise to let the circulation be made by a thermo technician).
To compensate the pressure variations and/or the water hammers in the cold water network and to avoid water losses, it is recommended to install an expansion vessel
An expansion tank allows the correct system pressure to be maintained when the water temperature varies.

6.6 - SAFTEY VALVE (Provided by the customer)

Install all safety devices required by the local laws in force in the countries where the unit is installed.

The manufacturer of the heat pump shall not be held responsible for any damage caused by failure to comply with said laws.

Install the safety valve (7 Bar max) (0,7 MPa max) on the outlet of the domestic hot water, which must be connected to a suitable discharge. If this is not done and the valve trips and the room is flooded, the manufacturer of the heat pump shall not be held responsible.

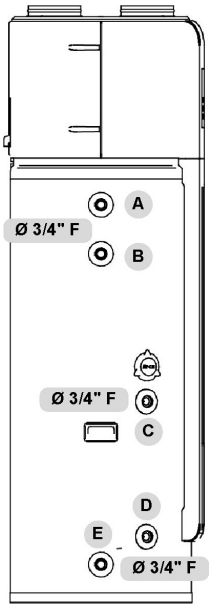
The discharge pipe connected to the safety valve must be installed and angled downwards to an adequate drain and sheltered from freezing.

The pressure-relief device is to be operated regularly to remove lime deposits and to verify that is not blocked.

See Maintenance section.

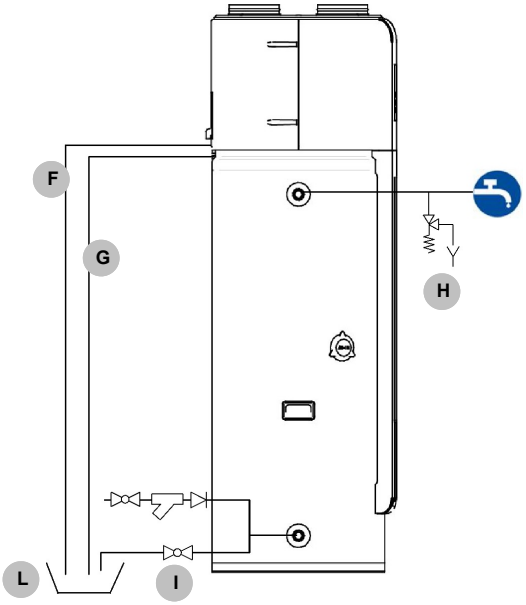
To the installation information refer to pag. 20-21

6.7 - HYDRAULIC CONNECTIONS



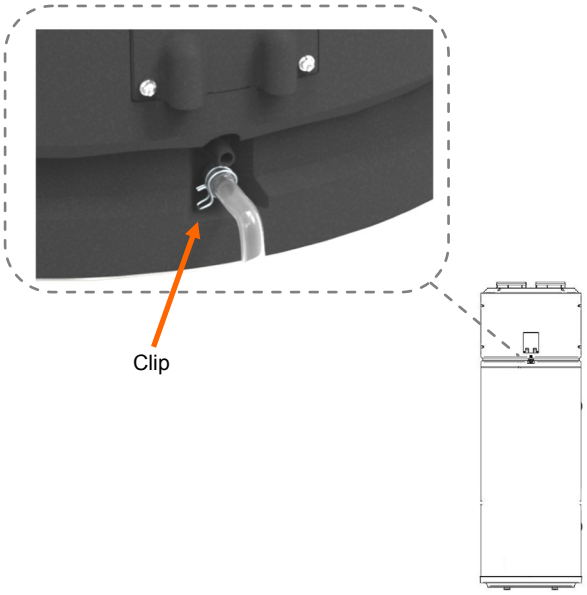
A	DHW outlet
B	DWH recirculation (only version 190S - 300S)
C	Solar outlet (only version 190S - 300S)
D	Solar inlet (only version 190S - 300S)
E	Aqueduct inlet

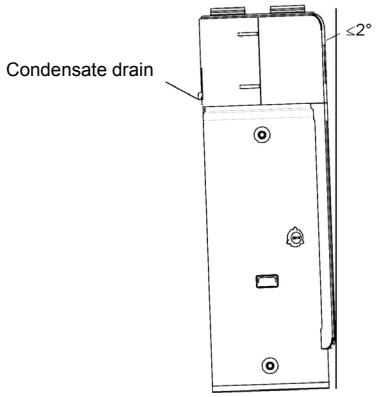
Connecting drains



F	Upper condensate outlet ø 10
G	Condensate drain ø 10
H	Domestic hot water safety valve
I	Storage tank discharge
L	Drain accumulation / drain pit

Block the condensate drain pipe with the clip supplied.





The condensate must be disposed in order to avoid damages to people and things.
To smoothly drain condensate, the unit should be installed at a horizontal floor. Otherwise, the drain vent is ensured at the lowest place.
Recommending the inclination angle of unit to the ground should be no more than 2°.
Condensate drain lines installed and piped to an adequate drain accumulation /drain pit.
Arrange the drain pipe to ensure smooth draining.
Improper drainage work may cause wetting of the building, furniture etc..

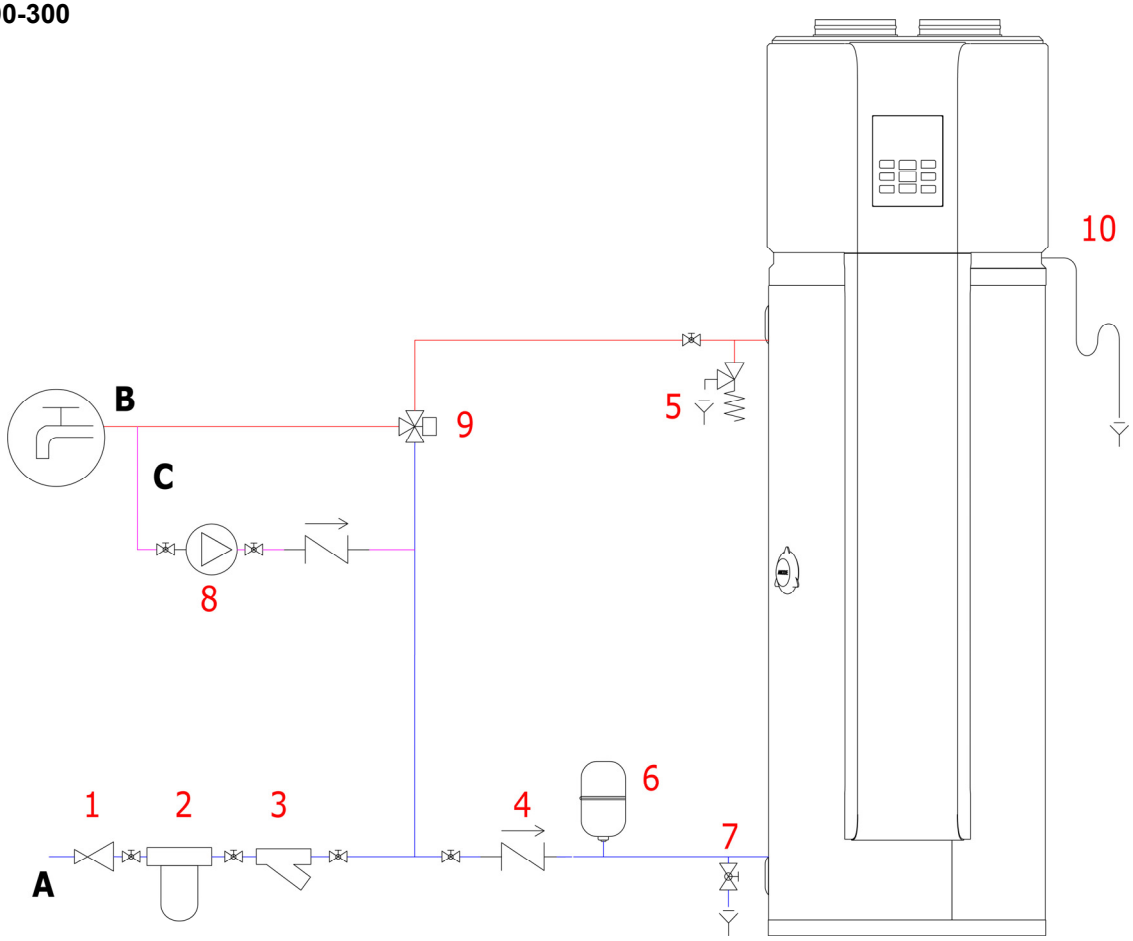
IMPORTANT: Water coming from the plastic shroud is an indicator that both condensation drain lines (F - G) may be blocked
Immediate action is required.

A discharge pipe connected to the pressure-relief (H) device is to be installed in a continuously downward direction and in a frost-free environment.

6.8 WATER SYSTEM PIPING

In case of installing the unit at a place where outside temperature below freezing point, insulation must be provided for all hydraulic components.

190-300

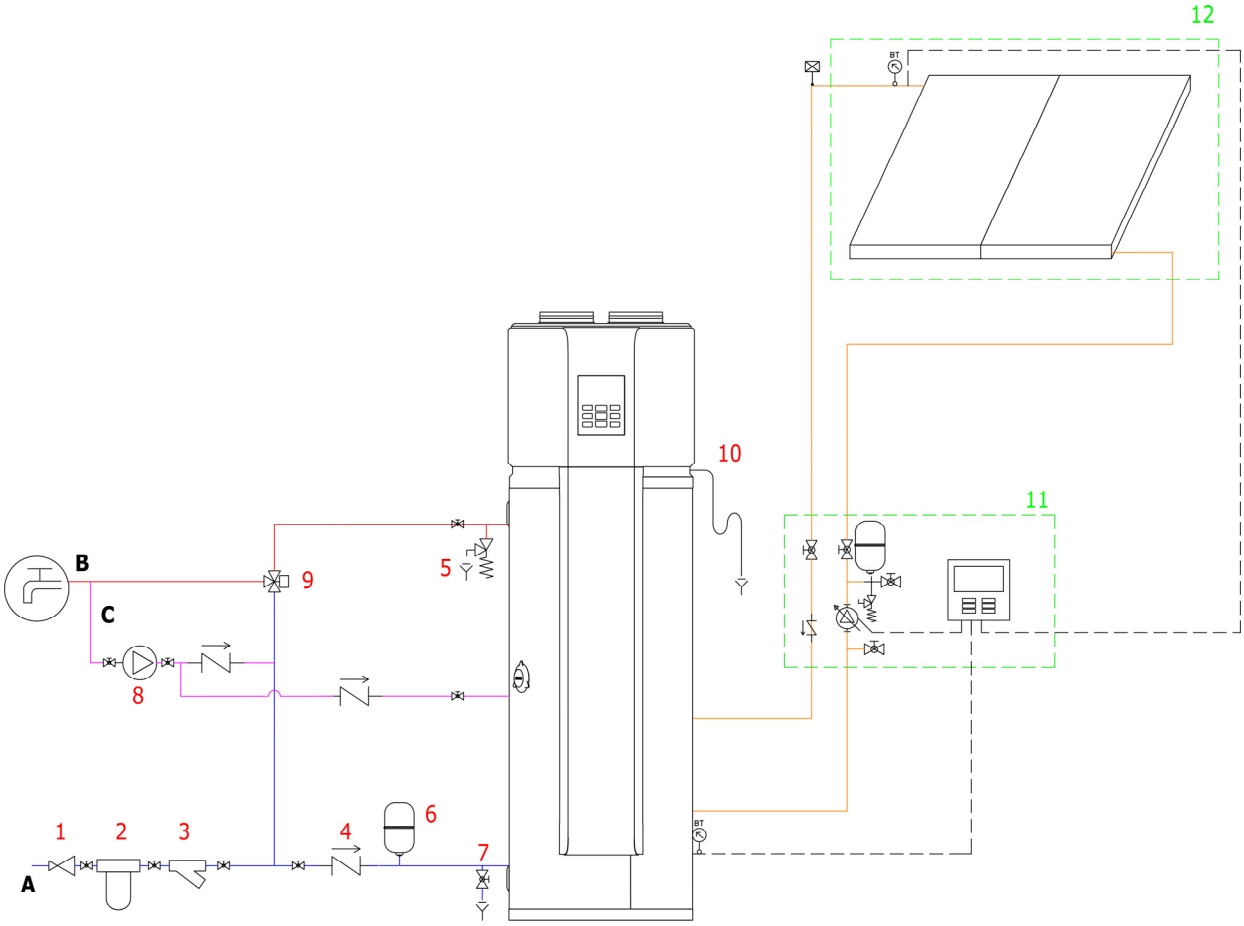


Indicative plumbing diagram
The system components must be defined by Designer and Installer (ex. expansion tanks, vents, taps, calibration/safety valves etc.)

1	Pressure reducing valve	2	Water treatment devices (water softener, etc.)	3	Filter Y
4	Non-return valve	5	Domestic hot water safety valve with discharge	6	DHW expansion vessel
7	Storage drain	8	Hot water circulator (recirculation) with check valve	9	Mixing valve thermostatic
10	Condensate drain	A	Aqueduct inlet	B	DHW
C	DHW recirculation				

Note:
Water temperature limiting valve is recommended for mixing the inlet cold water with outlet hot water to prevent burns caused by hot water
Do not use flexible pipes for unit connection.

190S-300S



Indicative plumbing diagram
The system components must be defined by Designer and Installer (ex. expansion tanks, vents, taps, calibration/safety valves etc.)

1	Pressure reducing valve	2	Water treatment devices (water softener, etc.)	3	Filter Y
4	Non-return valve	5	Domestic hot water safety valve with discharge	6	DHW expansion vessel
7	Storage drain	8	Hot water circulator (recirculation) with check valve	9	Mixing valve thermostatic
10	Condensate drain	11	Solar circulation unit (not supplied)	12	Solar panels (not supplied)
A	Aqueduct inlet	B	DHW	C	DHW recirculation

Note:
Water temperature limiting valve is recommended for mixing the inlet cold water with outlet hot water to prevent burns caused by hot water
Do not use flexible pipes for unit connection.

7.1 AERAULIC DESIGN CRITERIA

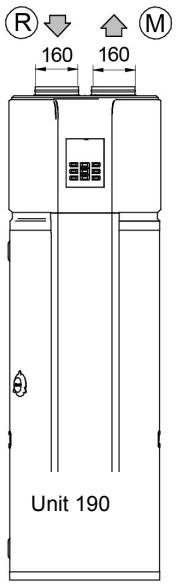
The dimensioning and the correct execution of the aeraulic connections are critical to ensure the unit operating and an appropriate level of quietness in the served area.
Pressure loss in the duct will reduce the air flow, which can cause a reduction in efficiency of the unit.
The maximum static pressure should be within 25Pa

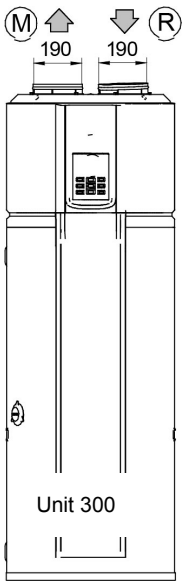
7.2 AIR DUCT CONNECTION

If the duct outlets for the outdoor air inlet and exhaust are outside of coverage, must end with a 90 ° bend downward, to prevent entry of water from the air inlet.
To perform the ductings:

- Connect the ductings fixing them to the connections with the special hookings to the circular flanges.
- The duct weight should not lie on the connection flanges.
- Put antivibration joints between ducts and units.
- The connection to the flanges and among the different duct sections must guarantee the air seal, avoiding air dispersions in supply and return that penalize the overall efficiency of the installation.
- Limit the pressure drops by optimizing the path, the type and the number of curves and branches.
- Use curves of large radius.
- For unit air outlet with duct, when unit operating, condensate will be generated aroud outside of duct.
- Thermically insulate the supply ducts to avoid heat losses and condensate.

7.3 DIMENSION CONNECTIONS

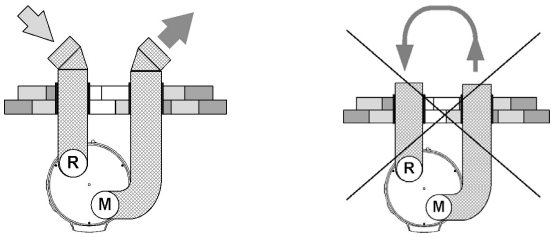




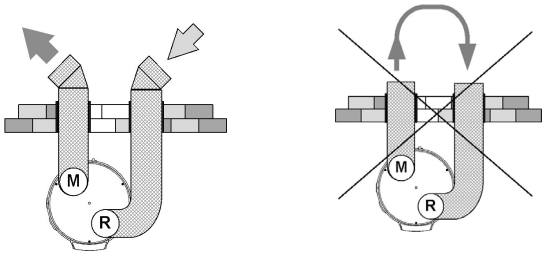
R - External air return
M - Air supply

Avoid recirculation of exhaust/return air
Use elbows with a 90° downward bend

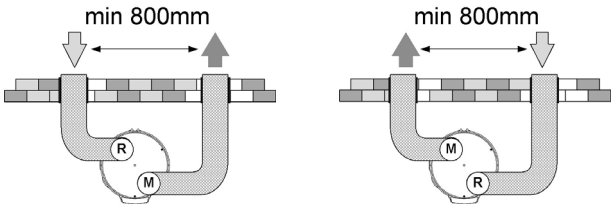
Unit 190



Unit 300



Minimum exhaust distance (M) / return distance (R)



Unit 190 Unit 300

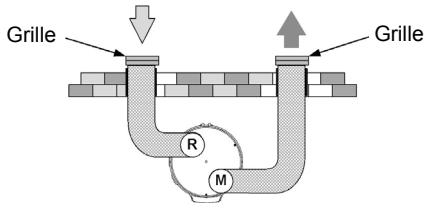
Exhaust / return grille (Provided by the customer)
External air return

- positioned in an area with a low concentration of impurities (dust, odours, exhaust fumes, etc.).

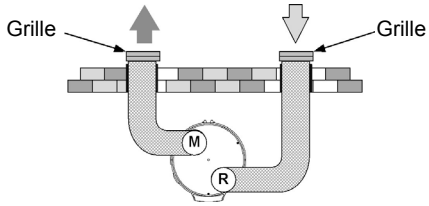
Exhaust outlet

- away from terraces, balconies, property boundary lines;
- avoid windward zones

Unit 190

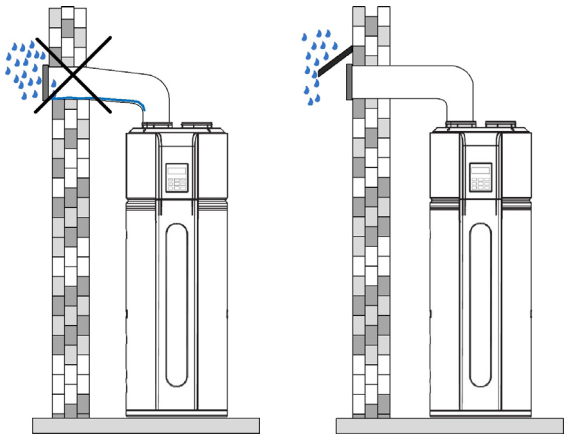


Unit 300

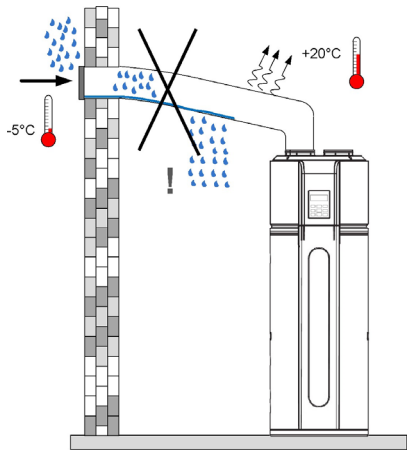


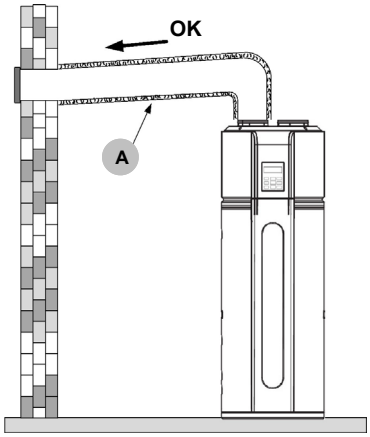
In terms of the unit connect with duct reaching to outdoor, a reliable water-resistant measure must be conduct on the duct, to prevent water from dropping into internal of the unit .

In case the water entering to internal components of the unit, the component might be damaged or causing physical danger.



The ducts should not be tilted towards unit to avoid the condensate and water return.



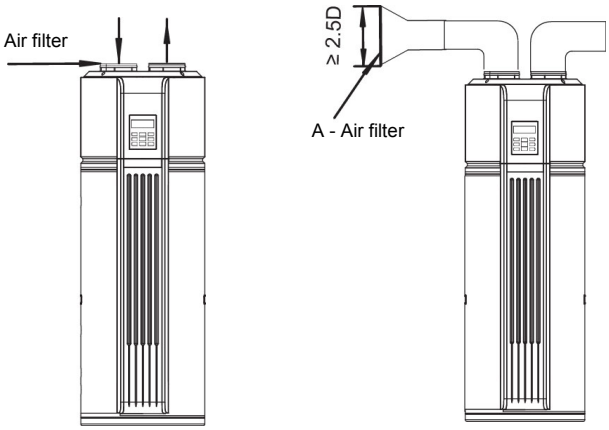


A - Insulated pipe

Air filter

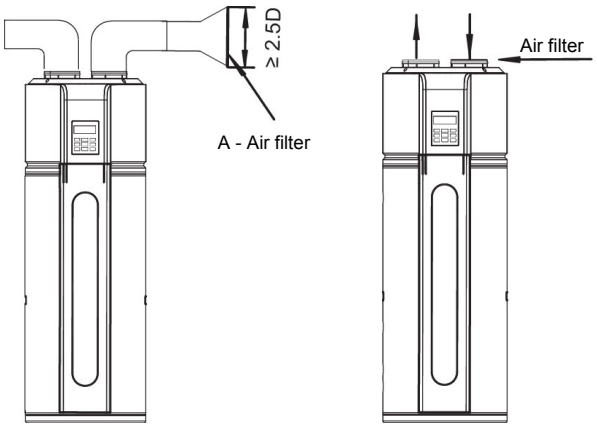
Filter installing at the unit inlet.
In terms of the unit with duct, filter in there must be put on the position of duct inlet. (Provided by the customer)

Unit 190



A - The air filter must be provided on the intake outlet of the external air or on the duct easily accessible for routine maintenance (Provided by the customer), the mesh size is about 1.2mm

Unit 300

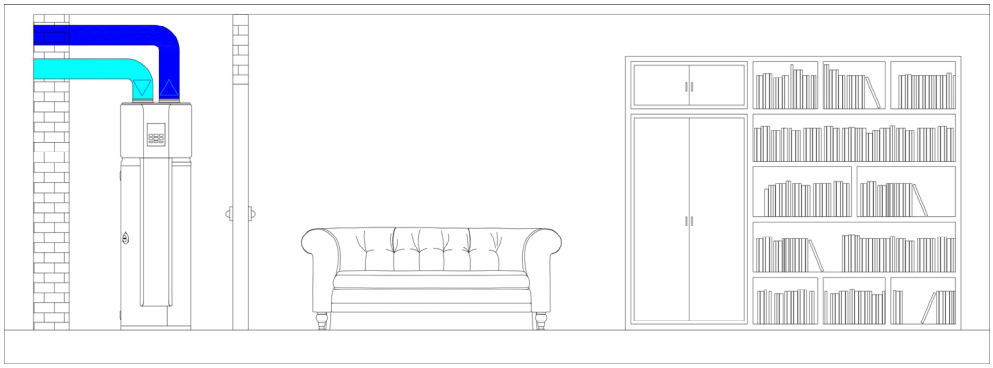


A - The air filter must be provided on the intake outlet of the external air or on the duct easily accessible for routine maintenance (Provided by the customer), the mesh size is about 1.2mm

Aeraulic Connections

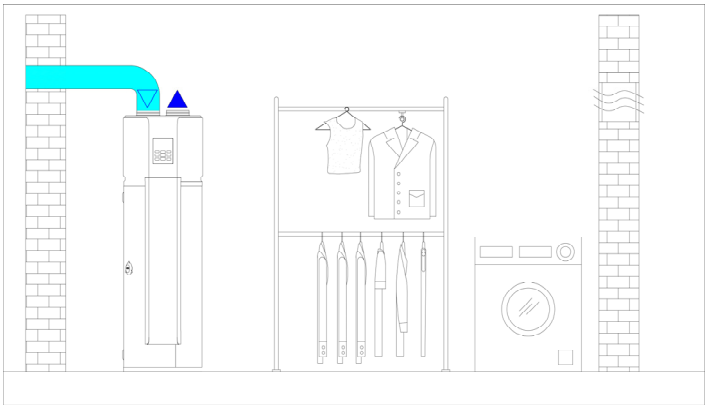
The unit must be installed inside the building, preferably in a technical room or a laundry room or a garage.
At any rate, it is always preferable to avoid installing the unit near bedrooms or in rooms that must be protected from noise.
Outdoor installation is prohibited, as well as installation in places subject to external weather.
Examples below refer to the 190 version. For the 300 version, the expulsion and intake connections are inverted.

INTAKE AND EXPULSION DUCTS (recommended)



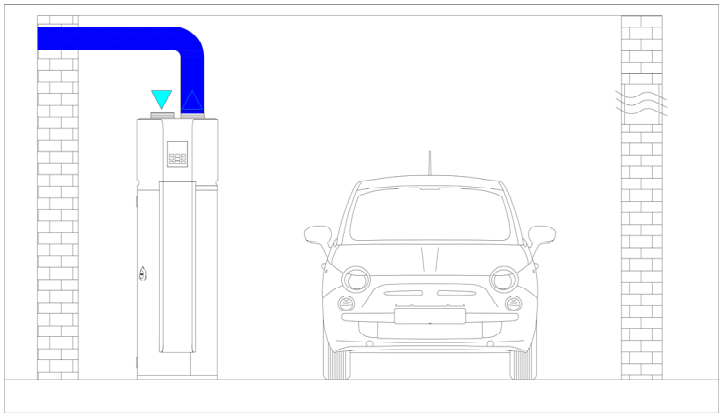
Channelling the intake and expulsion through ducts allows the unit to function with air taken from outside the house. Heat is extracted from the outdoor air, and used as a source for the heat pump.
Later this same air is expelled outside the building.
Therefore, unit operation does not cause an increase in heating requirements in the home. It is necessary to fit the system with correctly sized pipes in relation to the available pressure head supplied by the unit.

INTAKE DUCTS (conditioned)



Installation with an intake duct and free expulsion is recommended if there is a desire to use the air expelled by the unit, cold dehumidified air (5-10°C colder than the intake air), to cool the room.
The unit must be installed preferably in a room that does not require heating, because the unit releases cold air into the environment and it would increase the cost of heating that room.
The unit must be installed in a room with a minimum volume greater than 15m^2. The expulsion air flow must be guaranteed and cannot be blocked. It is necessary that the vents be correctly sized.

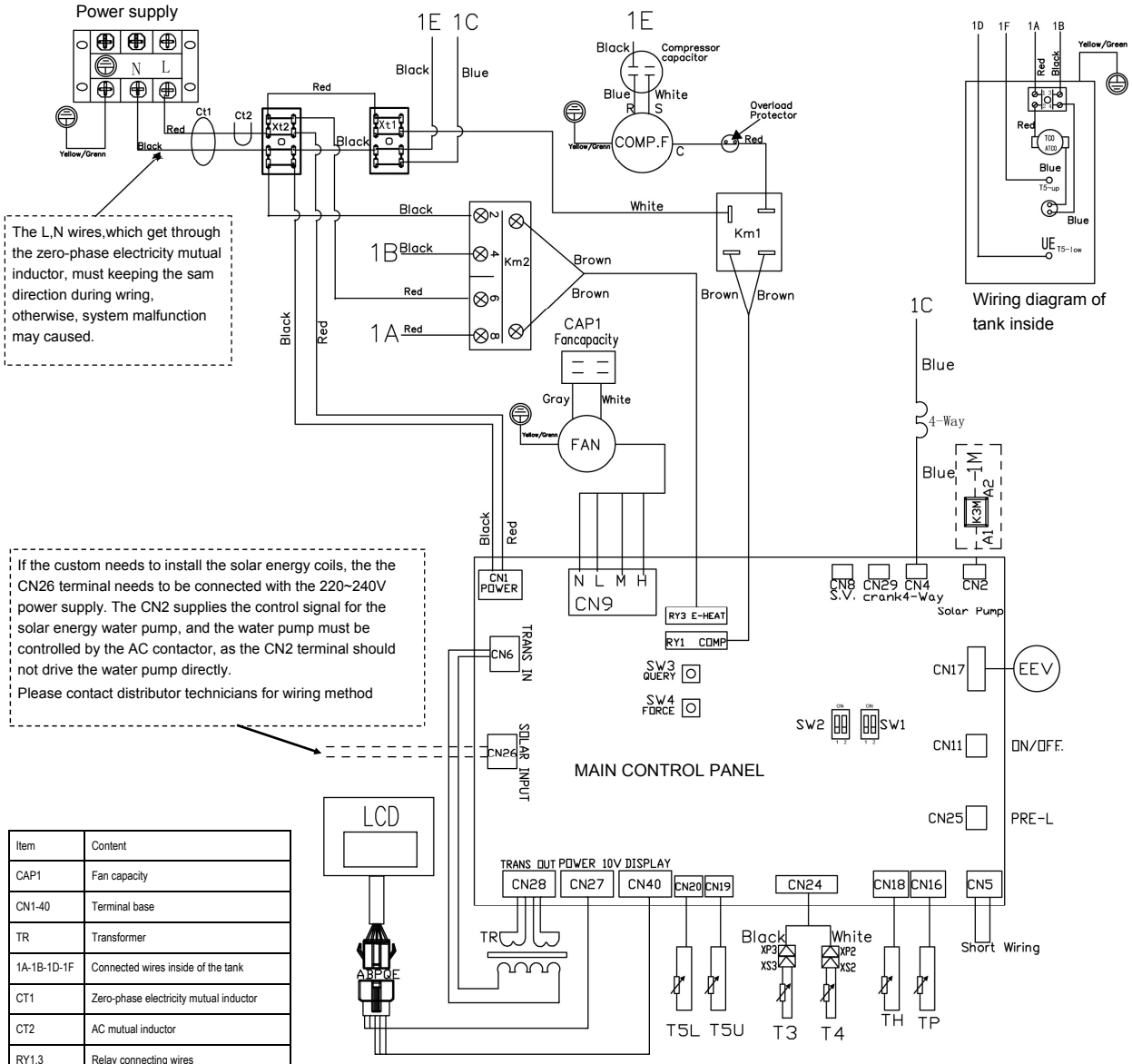
EXPULSION DUCTS (conditioned)



In this particular type of installation, the unit takes in air from the room where it is installed, extracts the heat and then expels that air outside the house.
The unit must be installed in a room with suitable openings to allow the correct flow of air into the unit, which would prevent the air pressure in the room from falling. The unit must be installed in a room with a minimum volume greater than 15m^2.

8.1 - ELECTRICAL WIRINGDIAGRAM - 190

1A/1B/1D/1F wire comes out from tank,must connect with the corresponding component.



Item	Content
CAP1	Fan capacity
CN1-40	Terminal base
TR	Transformer
1A-1B-1D-1F	Connected wires inside of the tank
CT1	Zero-phase electricity mutual inductor
CT2	AC mutual inductor
RY1,3	Relay connecting wires
KM1,KM2	Relay
TCO	Temperature protective switch
UE	Electric heater of the tank
XT1,XT2	Mid terminal base
ATCO	Automatic temperature recover switch
EVV	Electric expansive valve

T3	Evaporator temperature sensor
T4	Ambient temperature sensor
T5U	Tank temperature sensor (Upper)
T5L	Tank temperature sensor (Lower)
TP	Discharge temperature sensor
TH	Suction temperature sensor

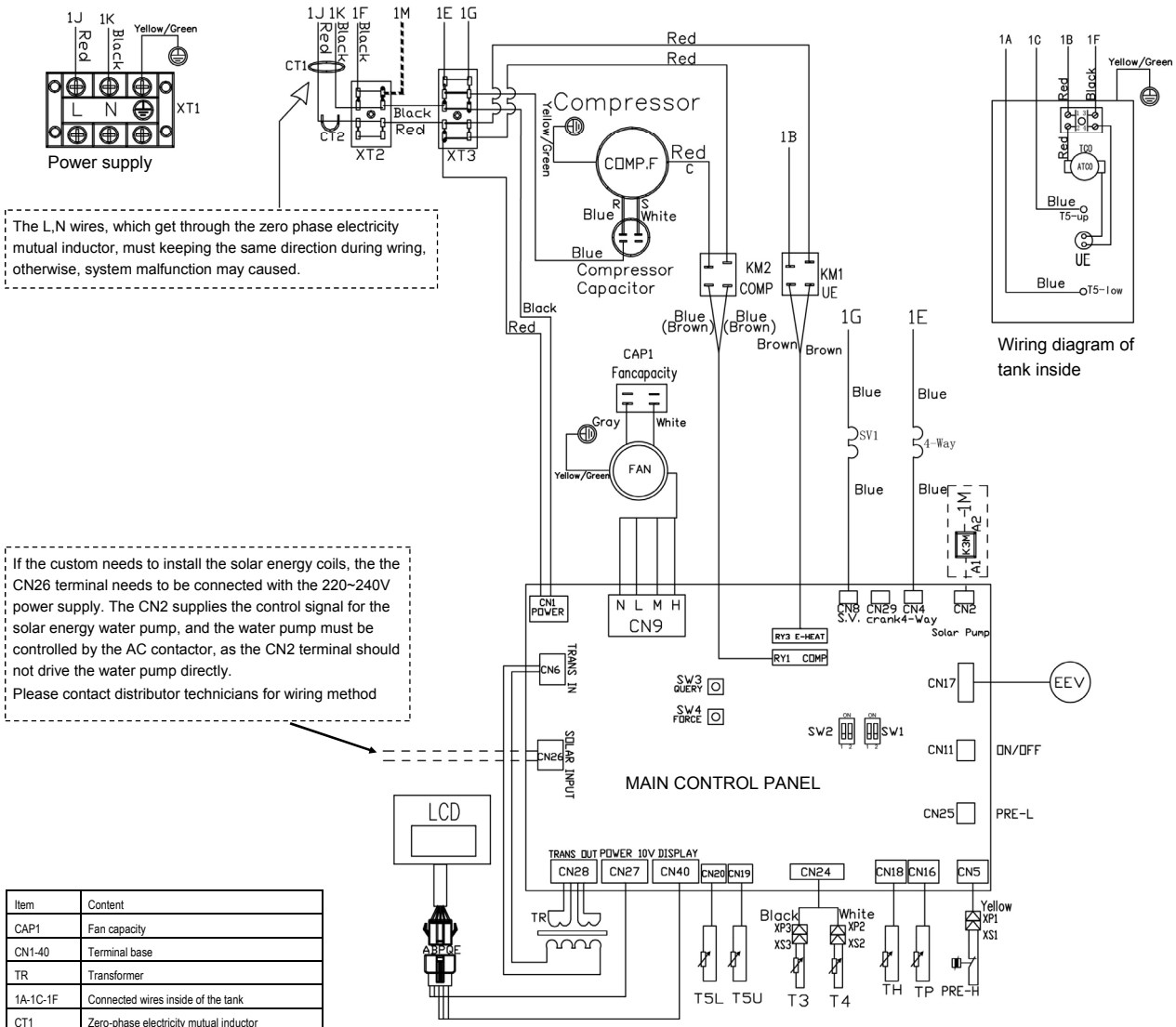
SW1	Model selection(User never allow to alter the factory settings)	
	ON	OFF
SW1_1	Without Electric Heater	With Electric Heater
SW1_2	Without Disinfect	With Disinfect

SW2	Model selection(User never allow to alter the factory settings)	
	ON	OFF
SW2_1	300L model	190L model
SW2_2	Power furquency_60Hz	Power furquency_50Hz

T3: Evaporator temperature sensor
T4: Ambient temperature sensor
T5U: Storage tank temperature sensor (Upper)
T5L: Storage tank temperature sensor (Lower)
TP: Discharge temperature sensor
TH: Suction temperature sensor

8.2 - ELECTRICAL WIRINGDIAGRAM - 300

1A/1B/1C/1F wire comes out from tank,must connect with the corresponding component.



Item	Content
CAP1	Fan capacity
CN1-40	Terminal base
TR	Transformer
1A-1C-1F	Connected wires inside of the tank
CT1	Zero-phase electricity mutual inductor
CT2	AC mutual inductor
XP1-3	Butt plug
XS1-3	Butt plug
RY1,3	Relay connecting wires
KM1-2	Relay
TCO	Temperature protective switch
UE	Upper electric heater of the tank
ATCO	Automatic temperature recovery switch
XT1,XT2,XT3	Mid terminal base
EVV	Electric exspanse valve
K3M	AC Contactor

SW1	Model selection(User never allow to alter the factory settings)	
	ON	OFF
SW1_1	Without Electric Heater	With Electric Heater
SW1_2	Without Disinfect	With Disinfect

SW2	Model selection(User never allow to alter the factory settings)	
	ON	OFF
SW2_1	300L model	190L model
SW2_2	Power furquency_60Hz	Power furquency_50Hz

T3	Evaporator temperature sensor
T4	Ambient temperature sensor
T5U	Tank temperature sensor (Upper)
T5L	Tank temperature sensor (Lower)
TP	Discharge temperature sensor
TH	Suction temperature sensor
PRE-H	High Pressure Protection Switch

T3: Evaporator temperature sensor
T4: Ambient temperature sensor
T5U: Storage tank temperature sensor (Upper)
T5L: Storage tank temperature sensor (Lower)
TP: Discharge temperature sensor
TH: Suction temperature sensor

8.3 - PCB I/O PORTS DESCRIPTION

⚠ WARNING

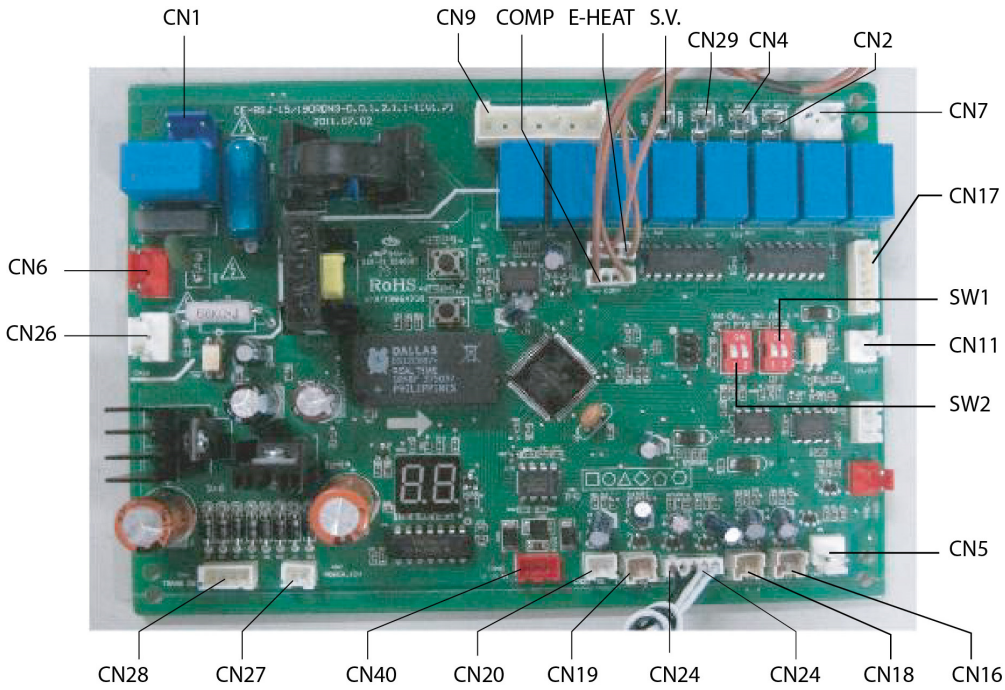
This unit is required reliable earthing before usage, otherwise might cause injury.

All electrical operations should be performed by trained personnel having the necessary requirements by the regulations in force and being informed about the risks relevant to these activities.

MIin. Diameter of Power Supply Cord (mm^2)	4
Earth Cord (mm^2)	4
Manual Switch (A) Capacity/Fuse (A)	40/30
Creepage Breaker	30 mA ≤ 0,1 sec

Please choose the power cord according to above table, and it should comply with local electric standard.
The power cord type, recommanded power cord mode is H05RN-F.
When wiring the power supply, please add additional insulation sheath at the place without rubber insulation layer.

⚠ The unit must be installed with an Creepage Breaker near the power supply and must be effectively earthed.
⚠ A creepage breaker must be installed adjacent to the power supply
⚠ Never use the wire and fuse with wrong rated current, otherwise unit may break down and cause fire furthermore.

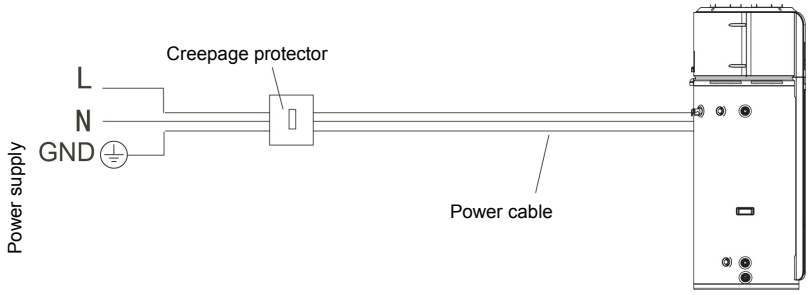


CN1	Power supply	**CN17**	Electronic expansion valve	**CN19**	T5U: upper tank water temp. sensor
CN9	Fan	**SW1**	Factory setting for Disinfect &Electric Heater model selection	**CN20**	T5L: lower tank water temp. sensor
COMP	Compressor	**CN11**	On/off	**CN40**	Display output
E-HEAT	Electric heater	**SW2**	Factory setting for 190/300 model & Power frequency 50/60Hz selection	**CN27**	Panel disply power supply
S.V.	Saftey valve	**CN5**	High pressure switch	**CN28**	Transformer output
CN29	Crankcase heather	**CN16**	Tp: compressor discharge temp. sensor	**CN26**	Solar input
CN4	4-way valve	**CN18**	Th: compressor suction temp. sensor	**CN6**	Transformer input
CN2	Solar pump	**CN24**	T4: ambient temp. Sensor (White)		
CN7	Alarm	**CN24**	T3: evaporator output temp.sensor (Black)		

8 - ELECTRICAL CONNECTIONS

Electric Connection

The power supply should be an independent circuit with rated voltage.
Power supply circuit should be earthed effectively.
Do not use water pipes to earthing connection of the unit
The wiring must be performed by professional technicians in accordance with national wiring regulations and this circuit diagram.
An all-pole disconnection device which has at least 3 mm separation distance in all pole and a residual current device (RCD) with the rating of above 10 mA shall be incorporated in the fixed wiring.
Set the electric leakage protector according to the relevant electric technical standards of the State.
The power cord and the signal cord shall be laid out neatly and properly without mutual interference or contacting the connection pipe or valve.
After wire connection, check it again and make sure the correctness before power on.



CAUTION
The earthing pole of socket must be grounded well, make sure that power supply socket and plug are dry enough and connected tightly.

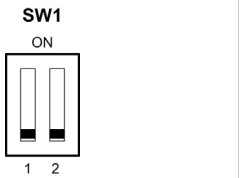
Switch setting

PCB has 2 bits of switches.

SW1	Model selection (User never allow to alter the factory settings)	
	ON	OFF
SW1 - 1	Without electric heater	With electric heater
SW1 - 2	Without disinfect	With disinfect

SW2	Model selection (User never allow to alter the factory settings)	
	ON	OFF
SW2 - 1	300	190
SW2 - 2	Power frequency 60Hz	Power frequency 50Hz

Default factory setting



8.4 - SOLAR SYSTEM (PROVIDED BY THE CUSTOMER)

Installation by a qualified technician in possession of the technical-professional requisites according to the current national and local regulations in force in the territory.

Scheme 1: the heat pump can also operate when the solar pump is in operation

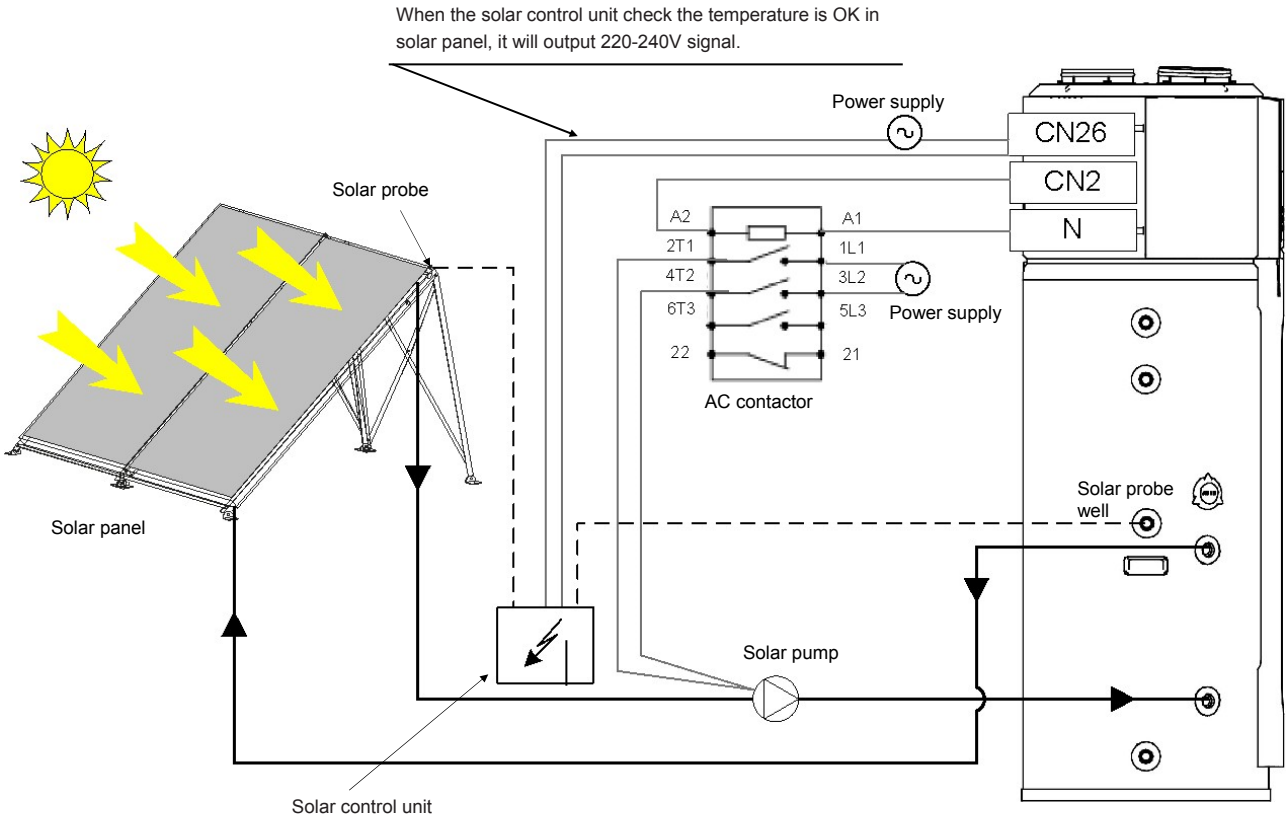
Electrical connections

CN26	Solar controller signal input	220-240 ∿
CN2	Solar pump control	220-240 ∿

Operating logic

T5U (Storage tank temp. sensor Upper)	**CN26 (in)**	**CN2 (out)**	**SOLAR PUMP**	**Unit**
≤ 60°C	220-240 ∿	220-240 ∿	ON	Enabled
≥ 65°C	0 ∿	0 ∿	OFF	Enabled

Note: solar pump must be controlled through AC contactor.
The CN2 is not allowed to drive the pump directly.



Scheme 2: the heat pump cannot operate together with the solar pump.

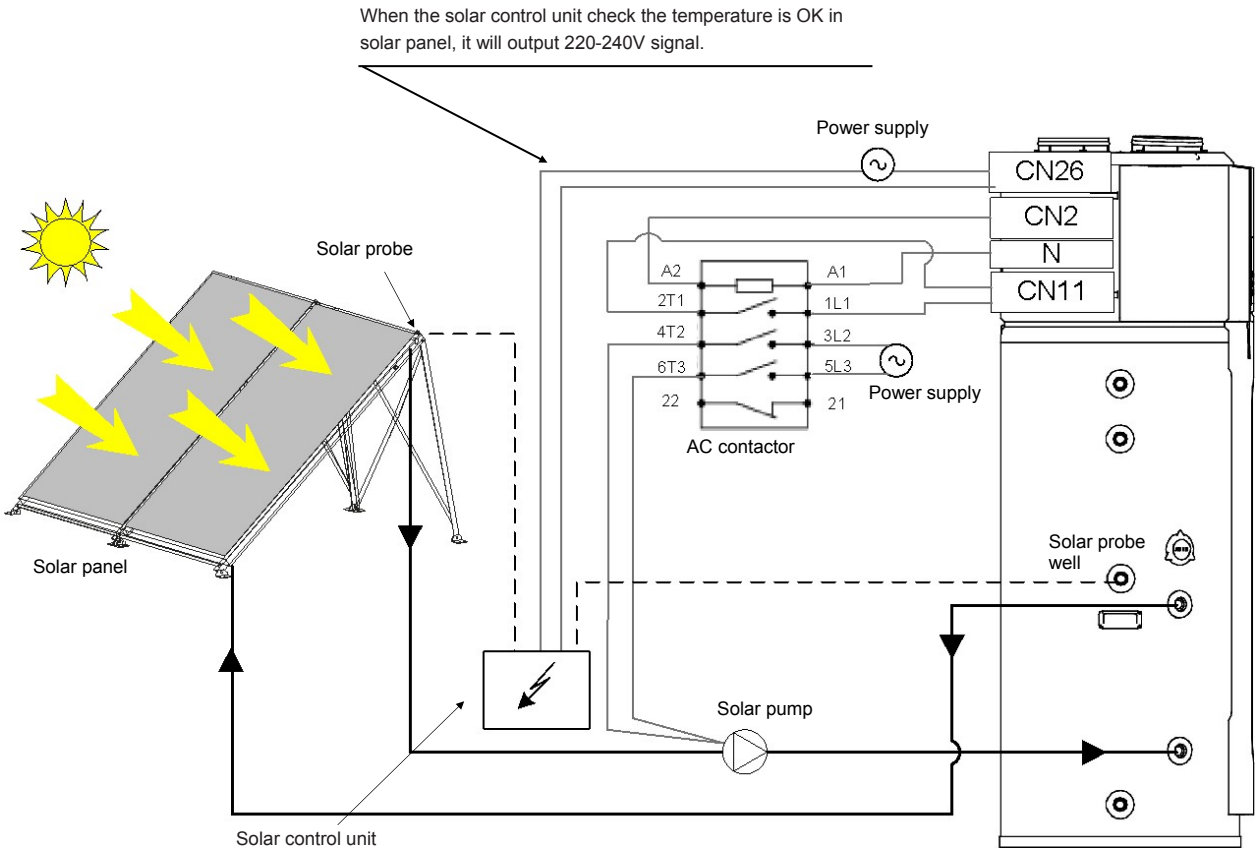
Electrical connections

CN26	Solar controller signal input	220-240 ∿
CN2	Solar pump control	220-240 ∿
CN11	Unit control	Enabled / disabled

Operating logic

T5U (Storage tank temp. sensor Upper)	**CN26 (in)**	**CN2 (out)**	**SOLAR PUMP**	**CN11**	**Unit**
≤ 60°C	220-240 ∿	220-240 ∿	ON	ON	Disabled
≥ 65°C	0 ∿	0 ∿	OFF	OFF	Enabled

Note: solar pump must be controlled through AC contactor.
The CN2 is not allowed to drive the pump directly.



9.1 PRELIMINARY INFORMATION

If the unit has been tipped during transport, wait at least 2 hours before starting it up

General

- The indicated operations should be done by qualified technician with specific training on the product.
- The service centres shall perform by request the start-up; the electrical, hydraulic connections and the remaining work on the system are provided by the installer.
- Agree upon the start-up date with the service centre sufficiently in advance .

Before checking, please verify that :

- the unit should be installed properly and in conformity with this manual.
- the electrical power supply line should be sectioned at the beginning.
- the line sectioning device is open, locked and equipped with the suitable warning signs.
- ensure no voltage is present .

After turning off the power, wait at least 5 minutes before accessing to the electrical panel or any other electrical component.

Before accessing check with a multimeter that there are no residual stresses.

Refrigerant circuit

- Visually check the refrigerating circuit: the presence of oil stains can mean leakage (caused, for example, by transport, handling or other).
- Use the pressure taps only if you need to load or unload the refrigerant circuit.

Hydraulic circuit

- Before realizing the unit connection make sure that the hydraulic system has been cleaned up and the clearing water has been drained .
- Check that the water circuit has been charged and pressurised .
- Check that the cut-off valves on the circuit are in the "OPEN" position.
- Check that no air is present in the circuit, if required, evacuate using the air bleeding valve placed at the system's high points.

Aeraulic system

Verify that:

- the rooms are clean (free from dirt)
- ducting are completed, connected and without obstructions

Electrical circuit

- Verify that the unit is connected to the ground plant .
- Check tightening of the conductors: the vibrations caused by handling and transport might cause loosing .
- Feed the unit by closing the sectioning device, but leave it on OFF
- Check the voltage and frequency net values which must be within the limits:

220-240Vac

Check that the phases unbalancing must be lower than 2%

The operating out of the limits can cause malfunctions damages and makes decay the warranty.

Verify tensions - Absorbitions

Check that the air and water temperatures are within the operating limits.

With unit at steady state, i.e. in stable and close-to-work conditions, check:

- supply voltage
- unit total absorption
- absorption of each electric load..

9.2 - GENERAL

The indicated operations should be done by qualified technician with specific training on the product.
Upon request, the service centres performing the start-up.
The electrical, water connections and the other system works are by the installer.
Agree upon in advance the star-up data with the service centre.
Before checking, please verify the following:

- the unit should be installed properly and in conformity with this manual
- the electrical power supply line should be isolated at the beginning
- the unit isolator is open, locked and equipped with the suitable warning
- make sure no tension is present

⚠ After turning off the power, wait at least 5 minutes before accessing to the electrical panel or any other electrical component.
Before accessing check with a multimeter that there are no residual stresses.

9.3 - PRELIMINARY CHECKS

⚠ **Before starting the unit, make sure that the room is free of dust and debris and that the conduits are not blocked**

The following check list is a brief reminder of the points to check and of the operations to perform to start-up the unit.
For details refer to the various chapters in the manual.

	√	**Preliminary checks**
1	☐	The flooring beneath the unit must be able to support the weight of the unit when filled with water (more than 287kg, model 190 – more than 310kg, model 190S) - (more than 412kg, model 300 - more than 435kg, model 300S)
2	☐	Located indoors (such as a basement or garage) and in a vertical position. Sheltered from freezing temperatures.
3	☐	Drain pan installed and piped to an adequate drain.
4	☐	Sufficient room to maintenance the unit.
5	☐	Sufficient air for the heat pump to function, the unit must be located in a space >15m³, and must have unrestricted air flow.
6	☐	The unit cannot be placed into any type of closet or small enclosure.
7	☐	The site location must be free from any corrosive elements in the atmosphere such as sulfur, fluorine, and chlorine. These elements are found in aerosol sprays, detergents, bleaches, cleaning solvents, air fresheners, paint, and varnish removers, refrigerants, and many other commercial and household products. In addition excessive dust and lint may affect the operation of the unit and require more frequent cleaning.
8	☐	The externalair temperature must be above -7ºC and below 43ºC. If the externalair temperature falls outside these upper and lower limits the electrical elements will be activated to meet the hot water demand.
9	☐	DHW safety valve properly installed with a discharge pipe run to an adequate drain and sheltered from freezing.
10	☐	Filter for water coming from water mains present and accessible for maintenance
11	☐	Water temperature limit valve or mixer tap (recommended) installed per manufacturer’s instructions.
12	☐	All piping properly installed and free of leaks.

12	☐	All piping properly installed and free of leaks.
13	☐	Hydraulic system filled, pressurised and drained
14	☐	Expansion tank checked / filled with nitrogen
15	☐	Condensate and safety valve drains
16	☐	Condensate drain line installation Must be located with access to an adequate drain
17	☐	Condensate drain lines installed and piped to an adequate drain
18	☐	The unit requires 220-240 VAC for proper operation.
19	☐	Wiring size and connections comply with all local applicable codes and the requirements of this manual.
20	☐	The unit and electrical supply are properly grounded.
21	☐	Proper overload fuse or circuit breaker protection installed.
22	☐	How to check the power supply socket and plug are qualified? Turn on power supply and keep the unit running for a half hour, then turn off power supply and plug out, check whether the socket and plug is hot or not.

Post Installation Review

1	☐	Understand how to use the User Interface Module to set the various modes and functions.
2	☐	Understand the importance of routine inspection/maintenance of the condensate drain pan and lines. This is to help prevent any possible drain line blockage resulting in the condensate drain pan overflowing.
3	☐	IMPORTANT: Water coming from the plastic shroud is an indicator that both condensation drain lines may be blocked. Immediate action is required.
4	☐	To maintain optimal operation check, remove and clean the air filter.

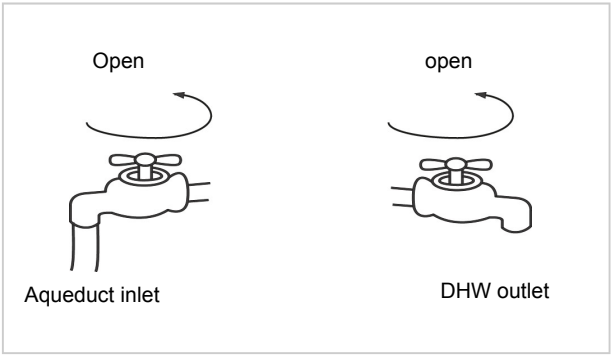
9.4 - TRIAL-RUNNING

Water effusion before operation

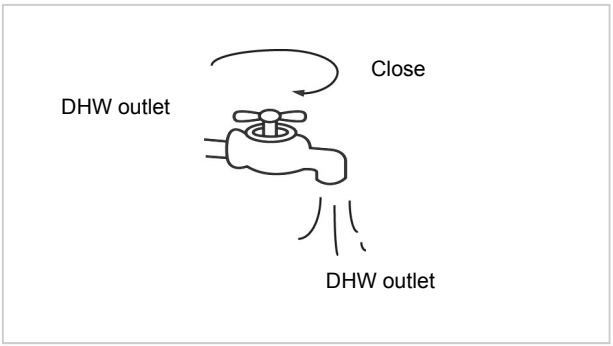
Before using this unit, please follow the steps below.

- Storage tank water filling:
  If the unit is used for the first time or used again after emptying the storage tank, please make sure that the storage tank is full of water before turning on the power

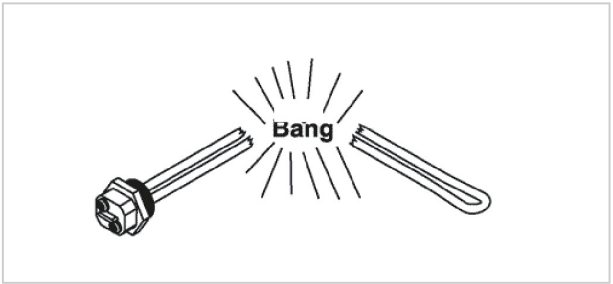
Open the cool water inlet valve and the hot water outlet valve.



When water flows out from the water outlet (DHW), the storage tank is full.
Turn off the hot water outlet valve and water effusion is finished.



Operation without water in water storage tank may result in the damage of auxiliary e-heater. Due to such damage, manufacturer will not be liable for any damages caused by this issue

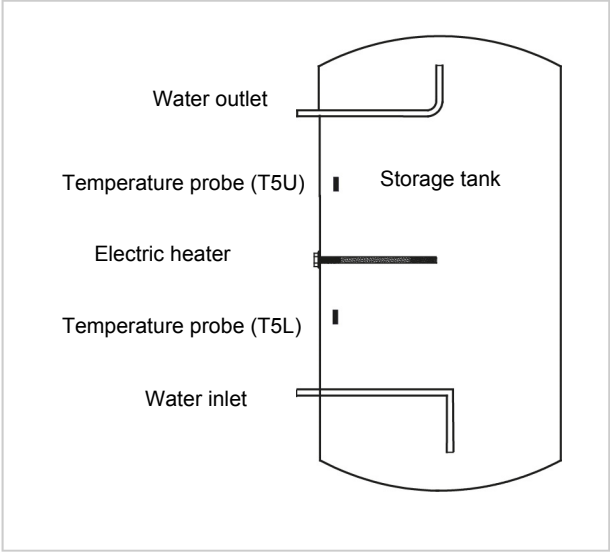


9.4 - CHECKING LIST BEFORE COMMISIONNING

1) Checking list before trial-running.
2) Correct installation of the system.
3) Correct connection of water/air piping and wiring;.
4) Condensate draining smoothly well insulation work for all hydraulic part.
5) Correct power supply.
6) No air in the water pipeline and all valves opened.
7) Effective electric leakage protector installation.
8) Sufficient inlet water pressure, between 1,5 Bar ~ 6,5 Bar (0,15 MPa ~ 0,65 MPa) (≥1,5Bar) (≥0,15MPa)

About Running

1) System Structure Figure
   Unit has two kinds of heat sources: Heat pump (compressor) and electric heater.
   Unit will automatically select heat sources to heat water to the target temperature.



2) Water Temperature Display
   The temperature shown on the display depends on the upper sensor. So it is normal that the display temperature has reached to target temperature but compressor still running, because the lower water temperature does not get to target temperature.
   Modes will be automatically selected by unit. manually mode selection is unavailable.

3) Heat source will be automatically selected by unit. But manually E-Heater operation is available.

4) Heat Source Shift

The default heating source is heat pump.
If externalis range out of heat pump, heat pump will stop running, the unit will shift automatically to activate E-heater and show the icon LA on the display, then if the externaltemperature goes into the running range of heat pump again, it will stop E-heater and shift automatically to heat pump again, and the icon LA will be extinguished.

If the target setting water temperature is higher than Max. temp(Heat pump), the unit will activate heat pump firstly to the Max. temperature, then stop heat pump, activate E-heater to continually heat water to the target temperature.

If manually activate the E-heater running mode when heat pump running, E-heater and heat pump will work together until the water temperature gets to target temperature. So if want to heat quickly, please manually activate E-heater.

NOTE
E-heater will be activated once for the current heating progress, if want to apply E-heater again please push E-HEATER.

If system occurs some malfunctions, error code "E7" and will be shown on the display, then heat pump will stop running, and the unit will activate automatically E-heater as the backup heat source, but the code "E7" and will be shown until power off.

If only use E-heater, about only 75 liters water (unit 190) will be heated or about only 150 liters water (unit 300), so must set higher target water temperature if externaltemperature is out of heat pump running range.

Defrosting During Water-heating
In heat pump running period, if the evaporator frosted in lower ambient temperature, the system will defrost automatically to keep effective performance(about 3~10min). At defrosting time, the fan motor will stop, but compressor will still run.

About TCO and ATCO

The power of compressor and E-heater will be automatically shut-off or turn on by TCO and ATCO.

If the water temperature is higher than 78°C, the ATCO will automatically shut off the power of compressor and E-heater, and reconnect it if the temperature falls down below 68°C.

If the water temperature is higher than 85°C, the TCO will automatically shut off the power of compressor and E-heater.

After that it needs to be reset manually by pressing the red button on the TCO.

Notes

While the external temperature below than -7°C, heat pump efficiency will decrease dramatically, the unit will automatically shift to E-heater mode.

9.6 - BASIC FUNCTION

How is the unit running

If unit is OFF, press ON/OFF unit will be waken, press ▲ ▼ to set target water temperature (38-70°C), press ENTER Press 3 seconds for lock/unlock unit will automatically select mode and start to heat water to target temperature.

Vacation mode

After pressing "Vaction" button, Unit will automatically heat water to 15°C for the purpose of energy saving during vacation days.

Weekly disinfect function

Under disinfection mode unit immediately start to heat water up to 70°C to kill the potential legionella bacteria inside water of storage tank,“ ”icon will light on the display screen during disinfection; Unit will quit disinfection mode if water temperature is higher than 70°C and extinguish “ ”icon.

Query function

For the convenience of maintenance and debug, query function is available by press 2 buttons together: “ E-HEATER ” + “ DISINFECT ” ,then system running parameters will be shown one by one with following sequence by each pushing of " ▲ " or " ▼ " button.

N.	Hour low bit	Min. higt bit	Min. low bit	Temp. / Days	Description
1	t	5	U	Temp.	T5U: Storage tank temperature sensor (Upper)
2	t	5	L	Temp.	T5L: Storage tank temperature sensor (Lower)
3		t	3	Temp.	T3: Evaporator temperature sensor
4		t	4	Temp.	T4: Ambient temperature sensor
5		t	P	Temp.	Tp: Discharge temperature sensor
6		t	h	Temp.	Th: Suction temperature sensor
7		C	E	Current	Compressor
8	1				Last error code
9	2				Previous 1 st error or protection code
10	3				Previous 2 st error or protection code
11					Software number

9.7 STARTING REPORT

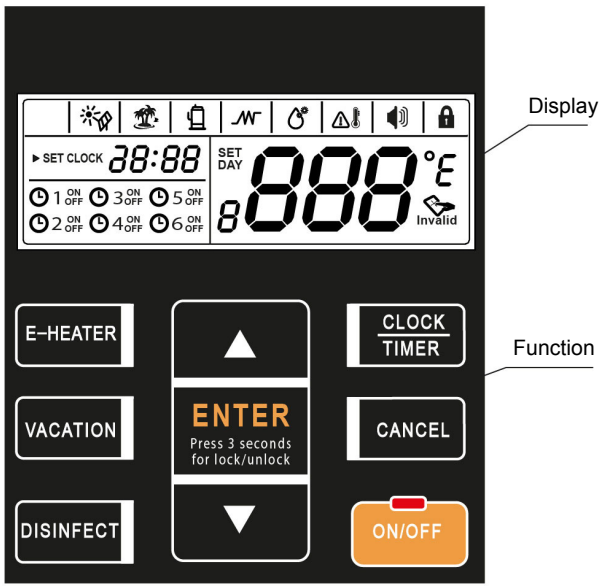
Reading the objective operating conditions is useful for checking the unit over time.
With unit of full load, namely in stable conditions and close to those of work, take the following data:

- Voltage and general absorptions with unit at full load
- Absorption of varied electrical loads (compressors, fans, etc)
- Temperature and air flow, both inlet and outlet from unit, fridge data
- The readings should be stored and made available during maintenance .

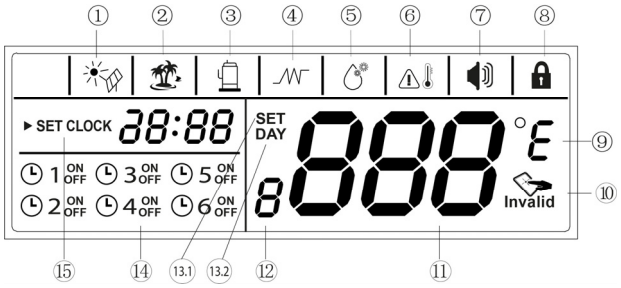
10.1 - DISPLAY

After powered on, the display lights up.

Users can operate the unit through the buttons under the display.



Display icons



1 - Outside solar heat source

If an outside solar heat source has been connected to the unit , icon will flash with 0.5 sec. frequency; otherwise will be extinguished.

2 - Vacation mode (Vacation)

Icon will be lightened if the unit is under vacation mode, will flash with 2 sec. frequency when setting vacation mode, otherwise will be extinguished.

3 - Compressor

Icon will be lightened when compressor is running, otherwise will be extinguished

4 - Electrical resistance mode (E-Heater)

Icon will be lightened if e-heater is activated, otherwise will be extinguished.

If e-heater is automatically activated by unit, will be lightened;

If e-heater is manually activated, will flash with 2 sec. frequency.

When setting e-heater manually ON/OFF, will flash with 2 sec. frequency.

5 - Anti-legionella mode (Disinfect)

Icon will be lightened when the unit is under disinfect mode, otherwise will be extinguished.

Icon will be lightened if disinfect mode is automatically activated by unit;

will flash with 0.5 sec frequency, if disinfect mode is manually activated;

will flash with 2 sec. frequency when setting disinfect mode or setting disinfect timer.

6 - High temperature Alarm

If setting water temperature is higher than 50°C, icon will be lightened, otherwise will be extinguished.

7 - Alarm

When unit is under protection/error, icon will flash with 5 sec. frequency as well as buzzer will sound 3 times every 1 minute until protection/error eliminated or press CANCEL for 1 second.

8 - Lock

If button is locked, icon will be lightened, otherwise will be extinguished.

9 - Temperature unit

If setting temperature unit as celsius, **°C** will be lightened, icon 888 will show celsius degree;

If setting temperature unit as Fahrenheit, **°F** will be lightened, icon 888 will show Fahrenheit degree.

Press E-HEATER for 10sec, it will change between **°C** and **°F**

10 - Invalid

If button is under lock mode, press any button except unlock button, this icon Invalid will be lightened.

11 - 888

Icon 888 will be lightened if screen is unlocked.
It shows water temperature on normal mode;
It shows remaining vacation days on vacation mode;
It shows setting temperature under setting mode;
It shows unit setting/running parameters, error/protection code under query mode.

12 - 8

Reserved

13.1 - Water Temperature setting (SET)

Icon **SET** will be lightened when setting water temperature or setting days for vacation.

13.2 - Date setting (Day)

Icon **DAY** will be lightened when setting days for vacation;

Icon **DAY** will be lightened when under vacation mode.

14 - Programmes (Timer)

There are six timers can be set.

If anyone of them has been set, icon  will lighten the corresponding one when screen is unlocked;

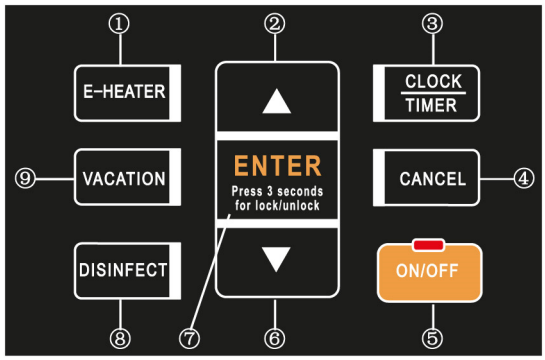
If there is none of timers has been set, will keep extinguished.

If timer is being set, icon  will flash the corresponding one with 2 sec. frequency as well lighten the timer which has been set.

15 - Clock and clock setting

Icon  shows the clock.

Whenever there is any setting for clock, **SET CLOCK** will be lightened.



Any press of button is effective only under button and display unlocked state.

1 - Manually turn e-heater ON (E-heater)

If E-heater is OFF, follow these steps below to manually turn it on.

Press	**E-HEATER**
Icon will flash.	
Press For confirm manually turning E-heater on, then E-heater is activated to Heat up water to the target temperature. After that, if need manually turn E-heater on again, please repeat these steps.	ENTER Press 3 seconds for lock/unlock
If E-heater is already ON, Press **"E-HEATER"** will lead to show invalid icon  on the display. Long pressing the "E-HEATER" key for 10 sec. then can shift to set the temperature display unit; from "°F" to "°C" or from "°C" to "F"; the default is "°C"; (when it's shifted to display "°F", it still will display "°C" while it operates spot check).	

2 - Increase / up ▲

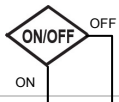
If screen is unlocked, corresponding value will increase by pushing	▲
When setting temperature, press more than 1sec., temperature value will be increased continuously	▲
When Setting clock/timer, press more than 1sec., clock/timer value will be increased continuously	▲
When setting vacation days, press more than 1sec., day value will be increased continuously	▲
Under query mode, check items will page up by pressing	▲

3 - Set Clock

Press button **CLOCK/TIMER** for 3 sec to enter clock setting. Then icon ▶SET CLOCK will be lightened and the hour value of clock will flash slowly.	CLOCK TIMER
Set the hour value of clock.	▲ ▼
Press For confirm the hour setting. Then the minute value of clock will flash slowly	CLOCK TIMER
Set the minute value of clock	▲ ▼
Press For confirm the minute setting and quit clock setting.	ENTER Press 3 seconds for lock/unlock

3.1 - Set Timer (Scheduling)

Press Enter timer setting.	CLOCK TIMER
Select timer (1 ~ 6) which needs to be set. The timer icon will flash slowly if it is selected.	▲ ▼
Confirm the selected setting timer . Then icon ▶SET CLOCK will be lightened. Then the hour value of timer will flash slowly.	CLOCK TIMER
Set the hour value of timer.	▲ ▼
Confirm the hour value of timer. Then the minute value of timer will flash slowly.	CLOCK TIMER
Set the minute value of timer.	▲ ▼
Confirm the minute value of timer. Then ON or OFF icon following the setting timer will flash slowly.	CLOCK TIMER
Set the action(ON or OFF) of the timer.	▲ ▼
Confirm the action(ON or OFF) of the timer.	CLOCK TIMER

The display screen will automatically display different value at 888 by different action. It will display the last set temperature and icon **SET** ,if the action is ON, and will display **- - -** if the action is OFF.	
Set the water temperature of the setting timer.	
Confirm and complete the timer. Then repeat this process to set another timer.	

3.2 - Cancel Timer (Scheduling)

Press Enter timer setting.	
Select timer (1 ~ 6) which needs to be cancel. The timer icon will flash slowly if it is selected.	
Confirm to cancel the timer Then repeat selecting timer and cancelling. If the timer has not been set, when press button **CANCEL** the display will show Invalid After complete cancelling timer, press button **CANCEL** for 3sec to quit timer cancelling.	
Check Timer (Scheduling)	
Press Enter timer checking.	
Select time (1 ~ 6) which needs to be checked The timer icon will flash slowly if it is selected, and the timer action (ON or OFF) and set clock will be shown. If the action is ON, target temperature will be shown. And if the action is OFF, icon **- -** will be shown.	
Press button **CANCEL** for 3 sec. or no button pressing for 30 sec. to quit timer checking.	
If there is confliction between Timer and Manually ON: 1. The moment of Manually ON has priority; 2. The moment of timer OFF has priority;	

4 - Cancel

Press To cancel setting, quit setting, clear alarm, ect…. To clear alarm buzzer, need to press for 1sec.	

5 - Start-up/shutdown

ON/OFF button and LED indicator	
If unit is standby, press Then unit will be OFF.	ON/OFF
If unit is ON, press Then unit will be OFF.	ON/OFF
If unit is OFF, press Then unit will be ON.	ON/OFF
LED indicator will be lightened if unit is ON or standby and extinguished if unit is OFF.	

6 - Decrease/down ▼

If screen is unlocked, corresponding value will decrease by pushing	▼
When setting temperature, press more than 1sec, temperature value will be decreased continuously.	▼
When Setting clock/timer, press more than 1sec, Clock/timer value will be decreased continuously.	▼
When setting vacation days, press more than 1sec, day value will be decreased continuously.	▼
Under query mode, check items will page down by pressing.	▼

7 - ENTER (Confirm/unlock)

If screen and buttons are unlocked, press to upload setting parameters after setting any parameter: ● If press within 10sec, setting parameters will be uploaded to unit; ● If press beyond 10sec, please resetting all parameters. If screen and buttons are locked, press for 3sec. to unlock them.	ENTER Press 3 seconds for lock/unlock

8 - DISINFECT (anti-legionella)

Manually turn on disinfect function Press	DISINFECT
Icon will flash.	
Confirm manually activate disinfection function . The unit will heat up water to 70°C at least for disinfection.	ENTER Press 3 seconds for lock/unlock
Disinfect Clock Setting	
Press for 3sec., to enter Disinfect clock setting.	DISINFECT

Icon ‘ ’ will flash, and icon ▸SET CLOCK will be lightened and the hour value of clock will flash slowly.	
Set the hour	▲ ▼
Confirm the hour setting. Then the minute value of clock will flash slowly.	CLOCK TIMER
Set the minutes	▲ ▼
Confirm the disinfect clock setting and quit out.	ENTER Press 3 seconds for lock/unlock
Unit will automatically start disinfect function at the above-set clock every 7 days. If user don't set disinfect clock, unit will automatically start disinfect function at 23:00 every 7 days. If unit is OFF or under disinfect mode, press DISINFECT will lead to show Invalid on the display.	

9 - VACATION

Enter vacation setting. Press	VACATION
Icon will flash	
Icon will be lightened.	SET DAY
Will show the last setting vacation days.	888
Set vacation days. The days range is 1~99 days (default as 14 days).	▲ ▼
Confirm vacation setting and quit out. The unit will immediately go into vacation mode.	ENTER Press 3 seconds for lock/unlock
In vacation mode, the setting target water temperature is 15°C as default. 888 will show the remanent vacation days. On the last day of vacation, unit will automatically start Disinfect function, and automatically reset the target temperature to the last one before vacation. If unit has already been under vacation mode or OFF, press **VACATION** will lead to show Invalid on the display.	

8.2 COMBINATION BUTTON

Clear error code	Press the two buttons at the same time to clear all stored error & protect codes, and the buzzer will buzz one time.	ENTER Press 3 seconds for lock/unlock + CLOCK TIMER
Diagnostic function	Press the two buttons at the same time for 1sec to go into diagnostic function. Under diagnostic mode user can check unit setting & running parameters by pressing ▲ ▼ buttons . Press button for 1sec. or no button CANCEL operation for 30 sec, then quit diagnostic function.	E-HEATER + DISINFECT

10.3 AUTO-RESTART

If electricity power failed, unit can memorize all setting parameters, unit will be back to the previous setting when power recover.

10.4 BUTTON AUTO LOCK

When there is no operation of button for 1 minute, button will be locked except Unlock button (ENTER Press 3 seconds for lock/unlock)

Press ENTER Press 3 seconds for lock/unlock for 3 sec., unlock buttons.

10.5 SCREEN AUTO LOCK

If there is no operation of button for 30sec., screen will be locked (extinguished) except for error code and alarm light. Press any button will unlock the screen (lighten)

10.6 SOMETHING ABOUT SELF-PROTECTION OF UNIT

When the self-protection happens, the system will be stopped and start self-check, and restart when the protection resolved. When the self-protection happens, the buzzer will buzz in every other minute, the will flash and error code will be shown at water temperature indicator.

Press CANCEL button for 1sec to stop buzz, but the and error code does not disappear until protection resolved.

In the following circumstance, self-protection may happen:

- Air inlet or outlet is blocked;
- The evaporator is covered with too much dust;
- Incorrect power supply (exceeding the range of 220-240V ±10%).

Contact service center.

10.7 WHEN ERROR HAPPENED

If some normal errors happen, unit will automatically shift to E-Eheater for emergent DHW supply.

Please contact qualified staff to repair.

If some sever error happen, unit will not start, please contact qualified staff to repair.

If some errors happen, the buzzer will buzz 3 times every other minute and the will flash fast.

Prerss CANCEL for 1 sec to stop the buzzer but the alarm icon will keep glittering.

Trouble shooting

Error	Possible reason	Solution
Cold water tapped out and display screen extinguished	Bad connection between power supply plug and socket; Setting water temperature too low; Temper sensor broken ; PCB of indicator broken.	Connect again the supply plug Setting water temp. higher; Contact service center.
No hot water tapped out	Public water supply ceased; Cold water inlet pressure too low (<0,15 Bar) (<0,015 MPa); Cold water inlet valve closed.	Waiting for public water supply recover; Waiting for inlet water pressure increase; Open water inlet valve.
Water leakage	Hydraulic pipeline joints are not sealed well.	Check and reseal all joints.

10.8 ALARMS TAB

Code	Description	Solution
E0	Error of sensor T5U (upper water temperature sensor)	Maybe the connection between sensor and PCB has released or sensor has been broken. Contact a qualified person to service the unit.
E1	Error of sensor T5L(lower water temperature sensor)	Maybe the connection between sensor and PCB has released or sensor has been broken. Contact a qualified person to service the unit.
E2	Storage tank and Wired Controller communication error	Maybe the connection between controller and PCB has released or PCB has been broken.
E4	Evaporator temperature sensor T3 error	Maybe the connection between sensor and PCB has released or sensor has been broken. Contact a qualified person to service the unit.
E5	Ambient temperature sensor T4 error	Maybe the connection between sensor and PCB has released or sensor has been broken. Contact a qualified person to service the unit.
E6	Compressor discharge temperature sensor TP error	Maybe the connection between sensor and PCB has released or sensor has been broken. Contact a qualified person to service the unit.
E8	Electric leakage error If PCB current_induction_circuit check the current difference between L,N >14mA, system consider it as "electric leakage error"	Maybe some wires have been broken or bad wire connection. Contact a qualified person to service the unit.
E9	Compressor suction temperature sensor TH error	Maybe the connection between sensor and PCB has released or sensor has been broken. Contact a qualified person to service the unit.
EE	E-heater open-circuit error IEH (Current difference E-heater on and off)<1A	Maybe the E-heater has been broken or bad wire connection after repair. Contact a qualified person to service the unit.
EF	Clock chip error	Maybe the chip has been broken, but unit can work well without clock-memory, so it is needed to reset clock when power put on again. If necessary, contact a qualified person to service the unit.
Ed	E-EPROM chip error	Contact a qualified person to service the unit.

10.8 ALARMS TAB

Code	Description	Solution
P1	System high pressure protection: Unit 300 : >=3.0Mpa active; <=2.4MPa inactive. Unit 190 : P1 error code never appear because pressure switch	Maybe because of system blocked, air or water or more refrigerant in system (after repair), water temperature sensor malfunction, ect. Contact a qualified person to service the unit.
P2	High discharge temperature protection Unit 190/300 : >115 °C Protection active; <90 °C Protection inactive	Maybe because of system blocked, air or water or less refrigerant(leakage) in system(after repair), water temperature sensor malfunction, ect. Contact a qualified person to service the unit.
P3	Compressor abnormally stopped protection The discharge temperature is not so higher than evaporator temperature after compressor running a term.	Maybe because of compressor broken or bad connection between PCB and compressor.
P4	Compressor overloaded protection (10 sec after compressor startup, Current checking starts , 1) only compressor running, if it is >10A , the compressor will be stopped and protected.) 2) Compressor + e-heater opened, if it is >IEH+10,the compressor will be stopped and protected.) Possible absorption or abnormal activation of the electrical resistance.	Maybe because of compressor broken, system blocked, air or water or more refrigerant in system(after repair), water temperature sensor malfunction, ect. Check that the resistance does not absorb current when the display is turned off. This circumstance is interpreted by the unit as a compressor anomalous absorption. Contact a qualified person to service the unit.
LA	When the ambient temp T4 is out of Heat Pump running range (-7 ~ 43 °C) Heat Pump will stop, unit will show LA on the position of clock on display until T4 back to (-7 ~ 43 °C). Only valid for the unit without e-heater. Unit with e-heater will never show "LA".	It is normal, and no necessary to repair.

The alarm codes listed above are the most common. If a alarm code not listed above is displayed, contact technical assistance.

If any of P3/P4/P2/P1 continuously appear 3 times within single heating cycle, system will consider it as “Heat Pump system error”. Contact a qualified person to service the unit.

10.9 NON-ERROR TIPS

Q: Why compressor can't start immediately after setting?

A: Unit will wait for 3 min to balance the pressure of system before start compressor again, it's a self protection logic of unit.

Q: Why sometimes the temperature shown on the display panel decreased while unit is running?

A: R. When hot water is sampled, it is mixed with cold water which is added from the low part of the accumulator.

Q:Why sometimes the temperature shown on the display decreased but unit still keep closed?

A: To avoid unit ON/OFF frequently, unit will activate heat source only when bottom storage tank temperature is lower than setting temperature for at least 6ºC.

Q:Why sometimes the temperature shown on the display will decreased dramatically?

A: Because storage tank is pressure-bearable type, if there is massive hot demand, hot water will quickly tapped out from upper part of storage tank as well as cold water will quickly tapped into bottom part of bank, if the cold water surface emerge the upper temperature sensor, temperature shown on the display will decreased dramatically.

Q: Why sometimes the temperature shown on the display is decreased a lot, but there is still a mount of hot water can be tapped?

A: Because the upper water sensor is located on the upper 1/4 storage tank, when tapping hot water out, it means there is at least 1/4 storage tank of hot water available.

Q: Why sometimes unit shows "LA" on display ?

A: The heat pump available running externalrange is -7 ~ 43°C, if externaltemperature is out of range, system will show abovementioned signal to let user notice it.

Q: Why something there is nothing shown on the display?

A: To maintain display screen lifespan within along term, when there is no button operation for 30 sec, it will extinguish the display except the LED indicator.

Q: Why sometimes the buttons are unavailable?

A: If there is no operation on panel for 1 min, unit will lock the panel, shows "  ", to unlock the panel, please press the "Enter" button for 3 seconds.

Q: Why sometimes there is some water flowed from drainage pipe of saftey valve?

A: Because the storage tank is pressure-bearable one, when water is heated inside the storage tank, water will expand, so the pressure inside of tank will increase, if pressure goes up more than 7Bar (0,7Mpa), saftey valve will activate to relief the pressure and hot water drop will be discharged correspondingly. If water drop is continually discharged from saftey valve drainage pipe, it is abnormal, please contact qualified stuff to repair.

11.1 CHECKLIST FOR RECOMMENDED REGULAR CHECKS

Disconnect the power supply before each operation.

Checks effected on……..…….....by……..…..……of the company……..

	Checking content	Checking frequency	Action
1	Air filter (inlet/outlet)	Every month	Clean the filter
2	Anode	Every 6 - 12 months	Replace it if it has been used out
3	Inner storage tank	Every half year	Clean the storage tank
4	Electric heater	Every half year	Clean the resistance
5	Saftey valve	Every year	Turn the knob
	If water doesn't flow freely when operating the handle, replace safety valve with a new one		
6	Water filter	Every year	Clean the filter
7	Expansion vessel	Every year	Check charge
8	Checking for leaks*	Every year	Check

*Refer to the local provisions for implementation; in an extremely brief and purely indicative manner, the regulation specifies the following.
Companies and technicians carrying out installation, maintenance/repair interventions, checks for losses and recovery operations must be CERTIFIED in accordance with the local regulations.
The check for losses must be carried out an an annual basis.

Check the connection between power supply plug and socket and ground wiring regularly;

The missing or lacking maintenance of the magnesium anode, can lead to the corrosion of the storage tank with a subsequent loss of water and the warranty coverage and the manufacturer responsibility fall.

It is recommended to clean the inner storage storage tank and e-heater to keep an efficient performance.

It is recommended to set a lower temperature to decrease the heat release, prevent scale and save energy if the outlet water volume is sufficient.

Clean the air filter every month in case of any inefficiency on the heating performance.
Notes/interventions suggested to the owner

11.2 GENERAL

Maintenance must be done by authorized centres or by qualified personnel

The maintenance allows to:

- maintain the unit efficiency
- reduce the deterioration speed to whom every equipment is subject over time
- assemble information and data to understand the state of the unit efficiency and avoid possible damages

Before checking, please verify the following:

- the electrical power supply line should be isolated at the beginning
- the unit isolator is open, locked and equipped with the suitable warning
- make sure no tension is present

After turning off the power, wait at least 5 minutes before accessing to the electrical panel or any other electrical component.

Before accessing check with a multimeter that there are no residual stresses.

11.3 INSPECTIONS FREQUENCY

After a long term use, check the unit base and fittings.

If damaged, the unit may sink and result in injury.

Perform an inspection every 6 months minimum.

The frequency, however, depends on the use.

In the event of frequent use it is recommended to plan inspections at close intervals:

- frequent use (continuous or very intermittent use, near the operating limits, etc)
- critical use (service necessary).

11.4 UNIT BOOKLET

It's advisable to create a unit booklet to take notes of the unit interventions.

In this way it will be easier to adequately note the various interventions and aid any troubleshooting.

Report on the booklet:

- data
- type of intervention effected
- intervention description
- carried out measures etc.

11.5 PUT AT REST

In some cold areas (under 0°C), if the system will be stopped for a long time, empty the storage storage tank in order to avoid the water freezing and damage of E-heater.

If a long period of inactivity is foreseen:

- put the unit in OFF
- wait a few minutes to allow all the actuators to reach the rest position
- Turn off the power in order to avoid electrical risks or damages by lightning strikes
- Evacuate all the water storage storage tank and the pipeline and close all the valves;

It's recommended that the starting-up after the stopping period is performed by a qualified technician, especially after seasonal stops or seasonal switch.

When restarting, refer to what is indicated in the START-UP section.

Schedule technical assistance in advance to avoid hitches and to guarantee that the system can be used when required.

11.6 COIL

Accidental contact with the exchanger flaps can cause injuries from cut: use protective gloves.

The coil must allow maximum thermal exchange, therefore, the surface must be clear from dirt and scaling.

Clean the air inlet side.

Use a soft brush or aspirator.

Check the aluminium flaps have not been damaged or folded, otherwise will be from "comb" the coil for excellent air flow.
(contact an authorised after-sales assistance centre)

11.7 STRUCTURE

Check the condition of the structure parts .

Paint so as to eliminate or reduce oxidation where needed.

Check that the paneling is correctly fastened. Poor fastening may give rise to malfunctions and abnormal noise and vibration .

11.8 SAFETY VALVE

The safety valves must be checked regularly.

Almost all losses are caused by impurities deposited inside the valve.

It's normal if some water drops from the hole of saftey valve during operation.

But, if there is a great amount of water, call your service agent for instructions.

Please beware of burn, beware of the hot water from the valve.

To clean the valve:

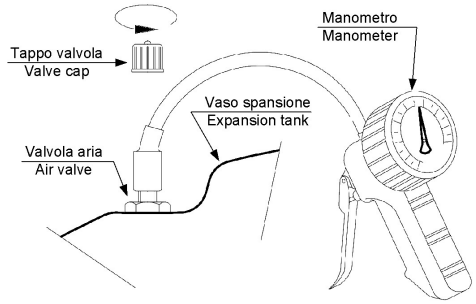
1. Manually open the valve
2. Turn the knob as indicated by the arrow on the knob itself

11.9 EXPANSION TANK

Check the expansion vessel charge (at least once a year).

First check that the expansion vessel is totally drained of water.

If you necessary load with nitrogen, take care that the pressure does not exceed the value indicated on the label.



11.10 ANODE ROD REPLANCE

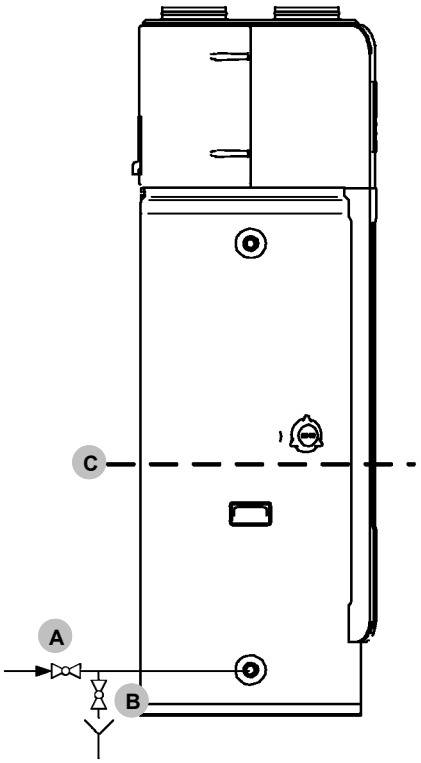
The magnesium sacrificial anodes assure the storage tank anti-corrosive protection.

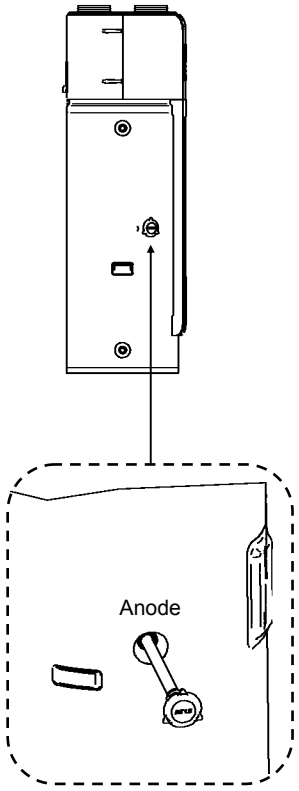
The magnesium anode is replaced when its diameter is ≤ of a third of the original anode.

- Remove power supply
- Turn off the water inlet valve (A)
- Open hot water tap for decrease the pressure of the storage tank.
- Open tap (B)
- Empty the storage up to point (C)
- Unscrew the screws and remove the cover cap.
- Get off the anode rod.
- Replace with a new one, and make sure effective sealed.
- Control that there are no water losses from the fitting.
- Put the cover cap and fix
- Open the water inlet tap (A) untill water flows out from outlet tap, then turn of water outlet tap.
- Power on then restart the unit.

The anode must be:

- Checked all 6 – 12 months
- Replaced all 2-3 years



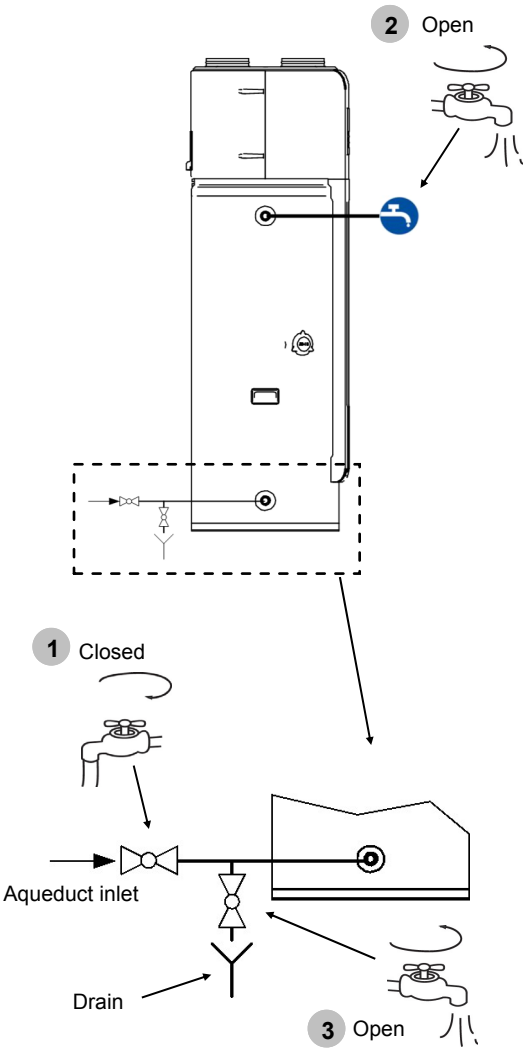


11.11 STORAGE TANK EMPTYING

If the unit needs cleaning, moving etc, the storage tank should be emptied.

Witch off the unit:

- close the cool water inlet valve (1);
- open valve the domestic hot water (DHW) outlet valve (2);
- open drainpipe (3)



Beware of your body for burns.
The outlet water temperature maybe very high when emptying

11.12 RESTART AFTER A LONG TERM STOP

When the unit is restarted after a long term stop (included trail running), it is normal that outlet water is unclean. Keep the tap on and the water will be clean soon.

11.13 FILTER CLEANING

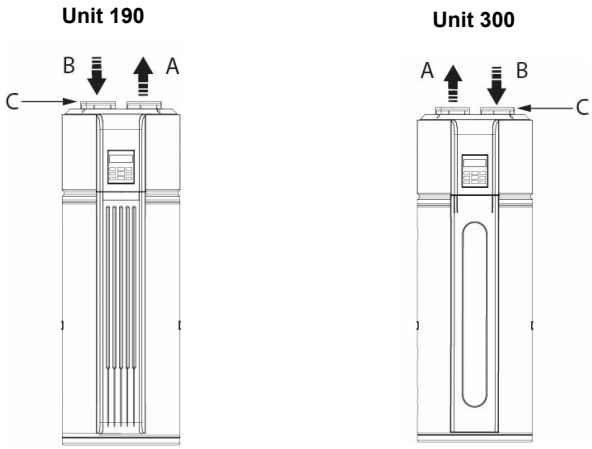
The air filter blocks dust.

If the filter is blocked, the unit will not work as well.

The operating with clogged filters leads to a reduction of the air flow, leading to malfunctions and unit shutdowns.

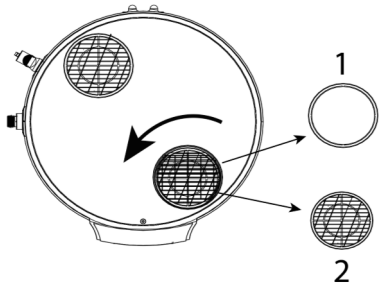
How often the filters need to be checked depends on the quality of outdoor air, unit operating hours, dust and number of persons in the rooms.

Approximately, cleaning should ideally take place between weekly and monthly. It is advisable to start with frequent checks, and to adjust the frequency based on how much dirt is discovered.



A	Air outlet
B	Air inlet
C	Air filter

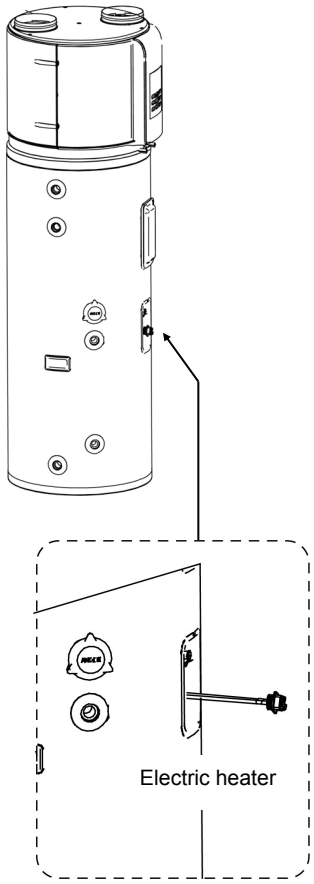
In terms of the filter set in air inlet directly (namely, air inlet without connect with canvas), the method of dismantle the filter is: anti-clockwise unscrew the air inlet (1) ring, take out the filter (2) and clean it completely, finally, remount it to the unit.

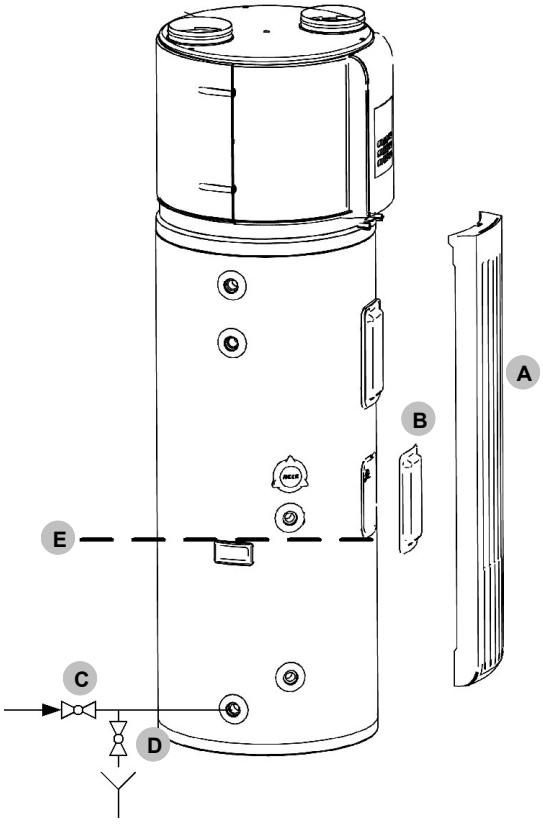


11.14 REPLACE OR CONTROL THE ELECTRIC HEATER

If the replace or control of the electric heater

- Remove power supply
- Remove frontal cover (A)
- Unscrew the screws and remove the cover cap (B)
- Turn off the water inlet valve (C)
- Open hot water tap for decrease the pressure of the storage tank.
- Open tap (D)
- Empty the storage up to point (E)
- Disconnect the cable from the electric heater
- Remove and replace the electric heater (If faulty)
- Install the electrical resistance and make sure effective sealed.
- Check that there are no water losses from the fitting
- Restore the electric connections
- Put the cover cap (B) and fix
- Put de frontal cover (A)
- Open the water inlet tap (C) untill water flows out from outlet tap, then turn of water outlet tap.
- Power on then restart the unit.





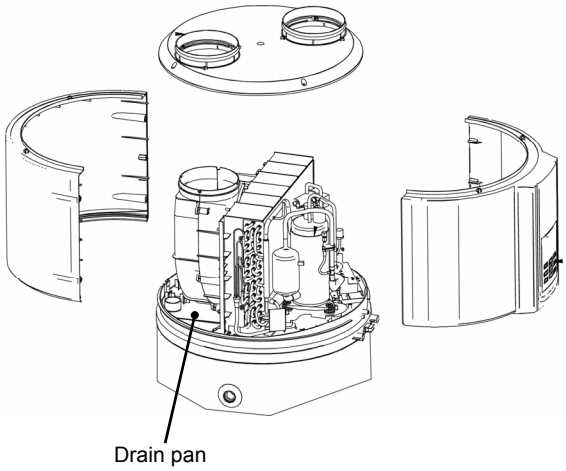
11.15 CONDENSATE DISCHARGE

Dust and deposits could cause obstructions .

In addition in the pan can proliferate microorganisms and moulds.

It is very important to provide a periodic cleaning with appropriate detergents and in case a disinfection with sanitizing products.

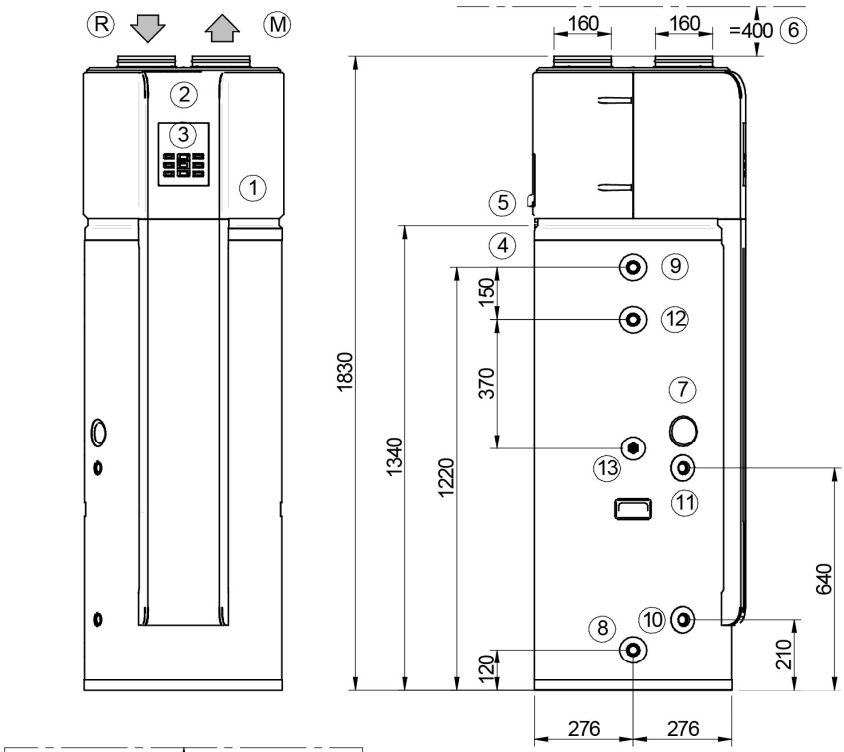
After cleaning pour water into the pan to ensure a regular flow.

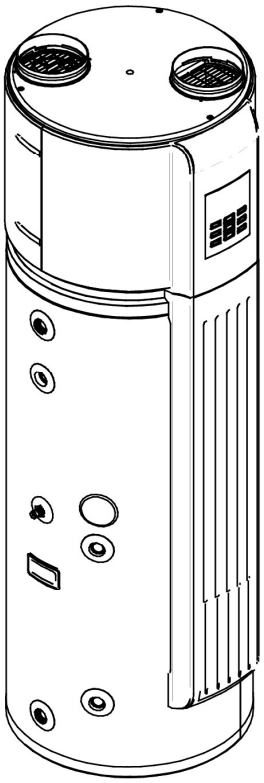


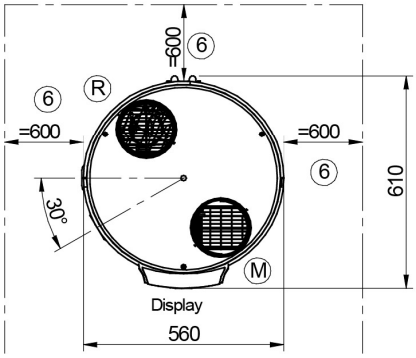
12 - TECHNICAL DATA

DIMENSIONAL

190 - 190S







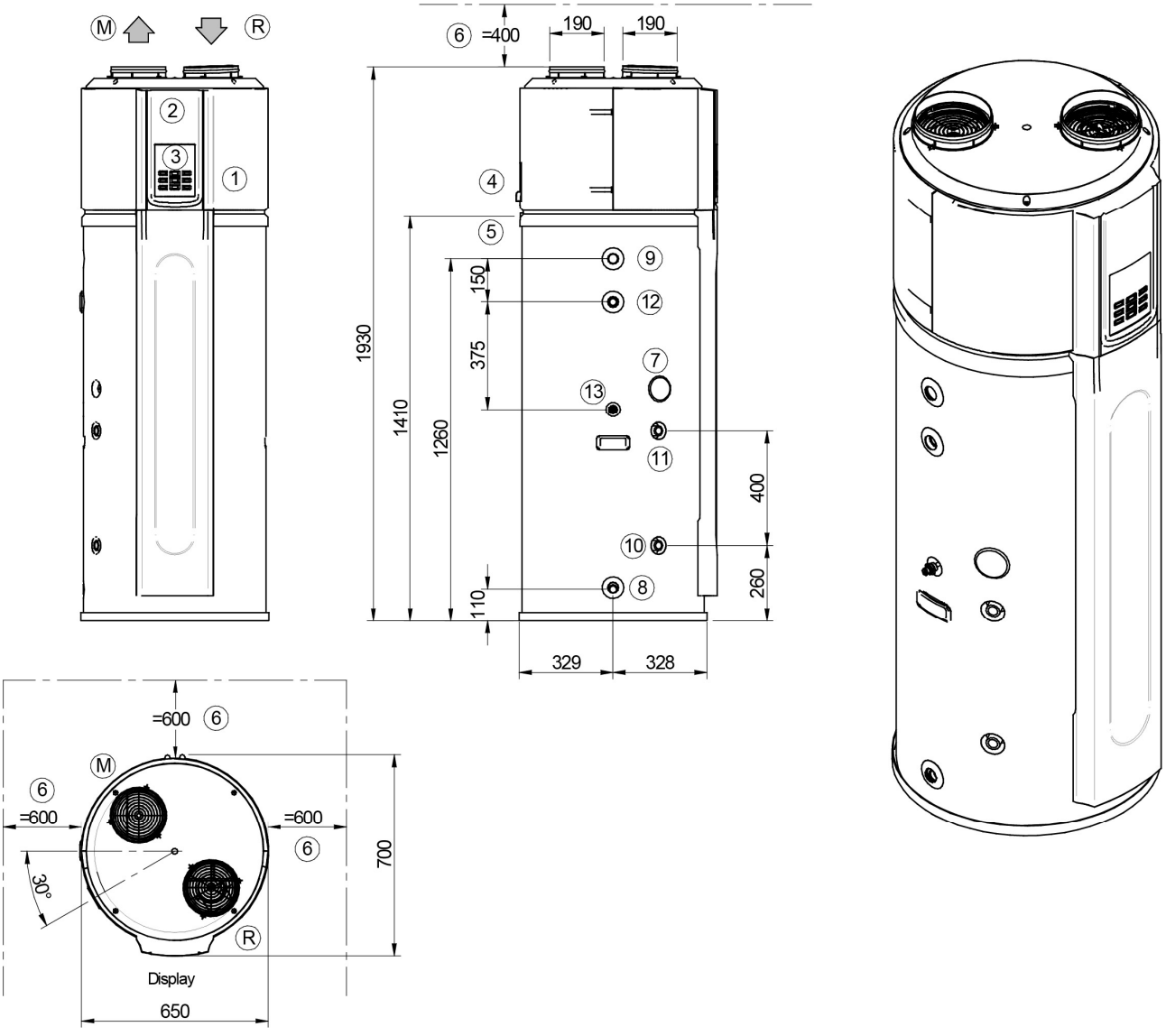
1	Compressor compartment	6	Functional spaces	11	Solar outlet 3/4” F (only 190S)
2	Electric panel	7	Magnesium anode	12	Domestic hot water recirculation (only 190S)
3	Unit keypad	8	Water inlet 3/4” F	13	Probe sump for solar
4	Electric line input	9	Water outlet 3/4”F	R	Air inlet
5	Condensate drain	10	Solar inlet 3/4”F (only 190S)	M	Air supply

Size				**190**		**190S**
Operating weight		kg		268		277
Shipping weight		kg		114		131
Shipping height		mm		2070		2070
Shipping depth		mm		680		680
Shipping width		mm		680		680

12 - TECHNICAL DATA

DIMENSIONAL

300 - 300S



1	Compressor compartment	6	Functional spaces	11	Solar outlet 3/4” F (only 300S)
2	Electric panel	7	Magnesium anode	12	Domestic hot water recirculation (only 300S)
3	Unit keypad	8	Water inlet 3/4” F	13	Probe sump for solar
4	Electric line input	9	Water outlet 3/4”F	R	Air inlet
5	Condensate drain	10	Solar inlet 3/4”F (only 300S)	M	Air supply

Size				300		300S
Operating weight		kg		398		406
Shipping weight		kg		138		158
Shipping height		mm		2200		2200
Shipping depth		mm		775		775
Shipping width		mm		745		745

GENERAL TECHNICAL

Size				190	300	190S	300S
Power and Efficiency							
Tout 15/12°C (DB/WB), Tw,in 15 °C Tw,out 45°C	Thermal power		kW	1,62	2,30	1,62	2,30
	Total power absorbed		kW	0,42	0,53	0,42	0,53
	COP			3,86	4,34	3,86	4,34
Tout 43/26°C (DB/WB), Tw,out 70°C --> 190 Tw,out 65°C --> 300	Thermal power		kW	2,31	3,25	2,31	3,25
	Total power absorbed		kW	0,546	0,627	0,546	0,627
	COP			4,23	5,18	4,23	5,18
Electric heating element			kW	3,00	3,00	3,00	3,00
Standard power supply			V	220-240/1/50			
Heating time DHW		(1)	h/min	3/53	4/22	3/53	4/22
Minimum temperature DHW			°C	7	7	7	7
Maximum temperature DHW		(6)	°C	70	70	70	70
Sound pressure level (1m)		(5)	dB(A)	36,6	38,2	36,6	38,2
Sound power level (L_{WA})			dB(A)	51	53	51	53
ErP							
Clima Average Heat pumps Water Heater (2)	Energy class of generator			A+	A+	A+	A+
	Domestic hot water profile			L	XL	L	XL
	η_{wh}		%	115	123	115	123
	Annual consumption AEC		kWh	890	1361	890	1361
	Daily consumption		kWh	4,24	6,40	4,24	6,40
	COP EN 16147			2,76	3,01	2,76	3,01
Clima Warmer Heat pumps Water Heater (3)	Domestic hot water profile			L	XL	L	XL
	η_{wh}		%	130	148	130	148
	Annual consumption AEC		kWh	785	1131	785	1131
	Daily consumption		kWh	3,72	5,32	3,72	5,32
	COP EN 16147			3,13	3,59	3,13	3,59
Clima Colder Heat pumps Water Heater (4)	Domestic hot water profile			L	XL	L	XL
	η_{wh}		%	99	95	99	95
	Annual consumption AEC		kWh	1032	1759	1032	1759
	Daily consumption		kWh	4,93	8,24	4,93	8,24
	COP EN 16147			2,36	2,32	2,36	2,32
Domestic Hot Water Accumulator							
Volume of Domestic hot water Accumulator			l	176	284	168	272
Maximum operating pressure			bar	10	10	10	10
			MPa	1	1	1	1
Material of accumulator tank				Enamel Steel			
Insulation Material				Polyurethane foam			
Insulation Thickness			mm	50	50	50	50
Refrigerant Circuit							
Compressor type				Rotary	Rotary	Rotary	Rotary
Refrigerant Gas				R-134A	R-134A	R-134A	R-134A
Quantity of refrigerant			kg	1,10	1,50	1,10	1,50
GWP			t	1430	1430	1430	1430
Tonne of CO2 equivalents			t_{CO2}	1,57	2,14	1,57	2,14
Oil quantity			ml	350	350	350	350
Type of expansion valve				Electronic	Electronic	Electronic	Electronic

12 - TECHNICAL DATA

Size		190	300	190S	300S
Ventilation					
Type of fan		Centrifugal			
Air flow	m^3/h	270	414	270	414
Available pressure head	Pa	25	25	25	25
Integration					
Solar coil surface	m^2	-	-	1,10	1,30
Solar coil material		-	-	Enamel Steel	
Maximum operating pressure	bar	-	-	10	10
	MPa	-	-	1	1

1. Inlet water temperature 15 °C, accumulator set 45°C, air on source side 15°C D.B /12°C W.B.
2. The product complies with the European Directive ErP, which includes the Commission Delegated Regulation (EU) N. 812/2013 and the Commission Delegated Regulation N. 814/2013, Average Climate, Heat Pump Water Heater
3. The product complies with the European Directive ErP, which includes the Commission Delegated Regulation (EU) N. 812/2013 and the Commission Delegated Regulation N. 814/2013, Warmer Climate, Heat Pump Water Heater
4. The product complies with the European Directive ErP, which includes the Commission Delegated Regulation (EU) N. 812/2013 and the Commission Delegated Regulation N. 814/2013, Colder Climate, Heat Pump Water Heater
5. Data referred to completely ducted unit.
6. Maximum temperature that can be reached during Anti-legionella mode(Dinsifect)

*It contains fluorinated greenhouse gases

ELECTRICAL DATA

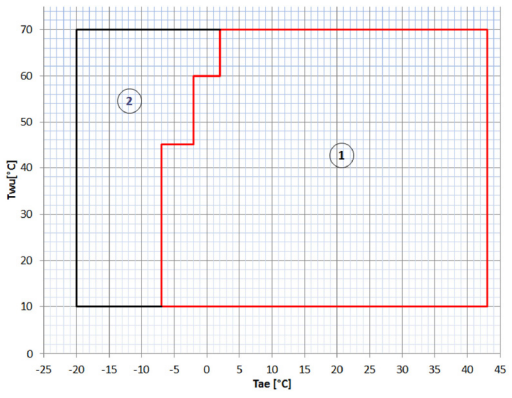
Size			190	300	190S	300S
Power supply	(1)	V	220-240/1/50	220-240/1/50	220-240/1/50	220-240/1/50
F.L.A. - Current absorbed at the maximum allowed conditions		A	16,1	16,5	16,1	16,5
F.L.I. - Power absorbed at full load (at the maximum allowed conditions)		kW	3,70	3,75	3,70	3,75
M.I.C - Maximum inrush current		A	28,7	40,2	28,7	40,2

1) Power supply 220-240/1/50 Hz
For power voltages other than the standard, contact the technical department
The units are conforming with the prescriptions of European Standards CEI EN 60204 and CEI EN 60335

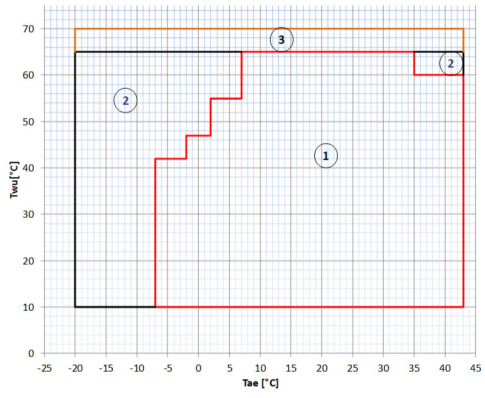
Warning: when defining the correct size, verify that all absorption is compliant with current electrical supply contracts in force in the country of installation

OPERATING LIMITS

190 - 190S



300 - 300S



1. Use range of the heat pump
2. Use range of the electrical heating element
3. Use range of the electrical heating element only in Anti-Legionella mode (Disinfect)

Twu [°C] water temperature in the accumulator
Tae [°C] air temperature at exchanger inlet

DECLARATION OF CONFORMITY EU

DICHIARAZIONE DI CONFORMITÀ UE
KONFORMITÄTSERKLÄRUNG EU
DECLARATION DE CONFORMITE EU
DECLARACIÓN DE CONFORMIDAD EU

WE DECLARE UNDER OUR SOLE RESPONSIBILITY THAT THE MACHINE
DICHIARIAMO SOTTO LA NOSTRA SOLA RESPONSABILITÀ CHE LA MACCHINA
WIR ERKLÄREN EIGENVERANTWORTLICH, DASS DIE MASCHINE
NOUS DÉCLARONS SOUS NOTRE SEULE RESPONSABILITÉ QUE LA MACHINE
EL FABRICANTE DECLARA BAJO SU EXCLUSIVA RESPONSABILIDAD QUE LA MÁQUINA

CATEGORY	HEAT PUMP – domestic hot water production
CATEGORIA	POMPA DI CALORE – produzione acqua calda sanitaria
KATEGORIE	WÄRMEPUMPE - warmwasserproduktion
CATEGORIE	POMPE À CHALEUR – production eau chaude sanitarie
CATEGORIA	BOMBA DE CALOR – producción de agua calientesanitaria

TYPE / TIPO / TYP / TYPE / TIPO

COMPAK KHPA 16 190
COMPAK KHPA 23 300
COMPAK KHP 16 190S
COMPAK KHP 23 300S

- **COMPLIES WITH THE FOLLOWING EC DIRECTIVES, INCLUDING THE MOST RECENT AMENDMENTS, AND THE RELEVANT NATIONAL HARMONISATION LEGISLATION CURRENTLY IN FORCE:**
- RISULTA IN CONFORMITÀ CON QUANTO PREVISTO DALLE SEGUENTI DIRETTIVE CE, COMPRESE LE ULTIME MODIFICHE, E CON LA RELATIVA LEGISLAZIONE NAZIONALE DI RECEPIMENTO:
- DEN IN DEN FOLGENDEN EG-RICHTLINIEN VORGESEHENEN VORSCHRIFTEN, EINSCHLIEßLICH DER LETZTEN ÄNDERUNGEN, SOWIE DEN ANGEWANDTEN LANDESGESETZEN ENTSPRICHT:
- EST CONFORME AUX DIRECTIVES CE SUIVANTES, Y COMPRIS LES DERNIÈRES MODIFICATIONS, ET À LA LÉGISLATION NATIONALE D'ACCUEIL CORRESPONDANTE:
- ES CONFORME A LAS SIGUIENTES DIRECTIVAS CE, INCLUIDAS LAS ÚLTIMAS MODIFICACIONES, Y A LA RELATIVA LEGISLACIÓN NACIONAL DE RECEPCIÓN:

☒	**2014/35/UE**	**low voltage directive** direttiva bassa tensione Bestimmungen der Niederspannungsrichtlinie directive basse tension directiva de baja tensión
☒	**2014/30/UE**	**electromagnetic compatibility** compatibilità elettromagnetica Elektromagnetische Verträglichkeit compatibilité électromagnétique compatibilidad electromagnética
☒	**2009/125/UE**	**Ecodesign** /Progettazione ecocompatibile / Ecodesign / Éco-conception / Ecodiseño
☒	**2011/65/UE**	**RoHs**

-Unit manufactured and tested according to the followings Standards:
-Unità costruita e collaudata in conformità alle seguenti Normative:
-Unité construite et testée en conformité avec les Réglementations suivantes
-Unidad construida y probada de acuerdo con las siguientes Normativas
-Gebautes und geprüftes Gerät nach folgenden Normen

EN 60335-1: 2012+A11:2014
EN 60335-2-40: 2003 + A11: 2004 +A12: 2005 + A1: 2006 + A2: 2009+A13:2012
EN 60335-2-21:2003+A1:2005+A2:2008 EN 62233:2008
EN 55014-1:2006+A1:2009+A2:2011 EN 55014-2:2015
EN 61000-3-12:2011 EN 61000-3-3:2013

-Responsible to constitute the technical file is the company n°.00708410253 and registered at the Chamber of Commerce of Belluno Italy
-Responsabile a costituire il fascicolo tecnico è la società n° 00708410253 registrata presso la Camera di Commercio di Belluno Italia
-Verantwortliche für die technischen Unterlagen zusammenstellen n°.00708410253 ist das Unternehmen bei der Handelskammer von Belluno Italien registriert
-Responsable pour compiler le dossier technique est la société n°00708410253 enregistrée à la Chambre de Commerce de Belluno en Italie
-Encargado de elaborar el expediente técnico es la empresa n ° 00708410253 registrada en la Cámara de Comercio de Belluno Italia

SANT JUST DESVERN, 20/03/2019

NAME / NOME / VORNAME / PRÉNOM / NOMBRE
EDUARDO
SURNAME / COGNOME / ZUNAME / NOM / APELLIDOS
ROMANO
COMPANY POSITION / POSIZIONE / BETRIEBSPOSITION / FONCTION / CARGO
BUSINESS UNIT MANAGER HVAC & ENERGY

Product fiche: water heaters / Scheda prodotto: scaldacqua			
Supplier's name / Nome del fornitore	1		Clivet S.p.A
Series / Serie	2		COMPAK
Model / Modello	3		COMPAK KHPA 16 190
Size / Grandezza	4		190
Declared load profile / Profilo di carico dichiarato	5		L
Class / Classe	6		A+
η_{wh}	7	%	115
Q_{HE}	8	kWh	890
Thermostat temperature settings / Impostazioni di temperatura del termostato	9		53
L_{WA_IN}	10	dB	51
Precautions / Precauzioni	11		see use and maintenance manual
Enabled smart control settings / Impostazioni con controllo intelligente attivato	12		

Legend:

[1] Supplier's name or trademark.

[2] Supplier's model identifier.

[5] Declared load profile, expressed by the appropriate letter and typical usage in accordance with Table 3 of Annex VII;

[6] Water heating energy efficiency class of the model, determined in accordance with point 1 of Annex II, whereby: for solar water heaters and heat pump water heaters, under average climate conditions;

[7] Water heating energy efficiency in %, rounded to the nearest integer and calculated in accordance with point 3 of Annex VIII, whereby: for solar water heaters and heat pump water heaters, under average climate conditions;

[8] Annual electricity consumption in kWh in terms of final energy and/or the annual fuel consumption in GJ in terms of GCV, rounded to the nearest integer and calculated in accordance with point 4 of Annex VIII, whereby: for solar water heaters and heat pump water heaters, under average climate conditions;

[9] Thermostat temperature settings of the water heater, as placed on the market by the supplier;

[10] The sound power level LWA , indoors, in dB, rounded to the nearest integer (for heat pump water heaters if applicable);

[11] Any specific precautions that shall be taken when the water heater is assembled, installed or maintained;

[12] Where the value of smart is declared as being '1', an indication that the information on water heating energy efficiency, annual electricity and fuel consumption, as applicable, relate to enabled smart control settings only;

Product fiche: water heaters / Scheda prodotto: scaldacqua			
Supplier's name / Nome del fornitore	1		Clivet S.p.A
Series / Serie	2		COMPAK
Model / Modello	3		COMPAK KHP 16 190S
Size / Grandezza	4		190S
Declared load profile / Profilo di carico dichiarato	5		L
Class / Classe	6		A+
η_{wh}	7	%	115
Q_{HE}	8	kWh	890
Thermostat temperature settings / Impostazioni di temperatura del termostato	9		53
L_{WA_IN}	10	dB	51
Precautions / Precauzioni	11		see use and maintenance manual
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Product fiche: water heaters / Scheda prodotto: scaldacqua			
Supplier's name / Nome del fornitore	1		Clivet S.p.A
Series / Serie	2		COMPAK
Model / Modello	3		COMPAK KHPA 23 300
Size / Grandezza	4		300
Declared load profile / Profilo di carico dichiarato	5		XL
Class / Classe	6		A+
η_{wh}	7	%	123
Q_{HE}	8	kWh	1361
Thermostat temperature settings / Impostazioni di temperatura del termostato	9		54
L_{WA_IN}	10	dB	53
Precautions / Precauzioni	11		see use and maintenance manual
Enabled smart control settings / Impostazioni con controllo intelligente attivato	12		

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Product fiche: water heaters / Scheda prodotto: scaldacqua			
Supplier's name / Nome del fornitore	1		Clivet S.p.A
Series / Serie	2		COMPAK
Model / Modello	3		COMPAK KHP 23 300S
Size / Grandezza	4		300S
Declared load profile / Profilo di carico dichiarato	5		XL
Class / Classe	6		A+
η_{wh}	7	%	123
Q_{HE}	8	kWh	1361
Thermostat temperature settings / Impostazioni di temperatura del termostato	9		54
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