

# OPERATING AND INSTALLATION MANUAL

## WATER HEATER WITH HEAT PUMP

**AQUA HP 250 / 2,2 kW**



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# CONTENTS

1	INTRODUCTION .....	5
1.1	SYMBOLS.....	5
1.2	PRE-INSTALLATION INFORMATION .....	5
1.3	SAFETY INFORMATION .....	6
2	SPECIFICATION .....	7
2.1	COMPONENTS .....	7
2.2	HEAT PUMP PRINCIPLE.....	8
2.3	TECHNICKÉ PARAMETRY.....	9
3	TRANSPORT .....	10
4	INSTALLATION .....	11
4.1	SAFETY AND CONTROL DEVICES.....	11
4.1.1	HIGH/LOW PRESSURE SWITCH .....	11
4.1.2	THERMAL FUSE .....	11
4.1.3	TEMPERATURE SENSOR.....	11
4.1.4	CORROSION PROTECTION .....	11
4.1.5	EXPANSION VESSEL * .....	11
4.1.6	SAFETY SYSTEM *.....	11
4.1.7	PRESSURE REDUCING VALVE * .....	12
4.2	DRAIN PAN.....	12
4.3	LOCATION .....	12
4.4	AIR INLET/OUTLET INSTALLATION .....	13
4.4.1	INSTALLATION WITHOUT DUCTS.....	13
4.4.2	INSTALLATION WITH DUCTS.....	14
4.5	PLUMBING FIXTURE.....	17
4.6	CONDENSATE.....	18
4.7	ELECTRIC CONNECTIONS .....	18
4.8	WIRING DIAGRAM .....	19
5	CONTROL AND PROGRAMMING .....	20
5.1	CONTROL PANEL.....	20
5.2	KEYS (FUNCTIONS).....	20
5.3	DISPLAY.....	21
5.3.1	DISPLAY DESCRIPTION .....	21
5.3.2	SYMBOLS.....	21

5.3.3	SYMBOLS IN THE APPLIANCE'S OPERATION .....	22
5.4	PUTTING INTO OPERATION .....	23
5.5	OPERATING MODES.....	23
5.5.1	ECO MODE .....	24
5.5.2	AUTO MODE .....	24
5.5.3	BOOST MODE.....	24
5.5.4	LAT MODE.....	24
5.5.5	TCC MODE.....	25
5.5.6	CHRONO SCHEDULING OF THE HEAT PUMP .....	26
5.5.7	CHRONO SCHEDULING OF THE RECIRCULATION PUMP .....	27
5.5.8	ADDITIONAL FUNCTIONS.....	27
5.6	ADDITIONAL FUNCTIONS.....	29
5.6.1	DISINFECTION MODE .....	29
5.6.2	VACATION MODE .....	29
5.7	MENU.....	29
5.8	CHANGING THE MODE .....	29
5.9	NUMBER OF SHOWERS AVAILABLE .....	30
5.10	CONSULTATION OF PROBE TEMPERATURES (S1, S2, S3) .....	30
6	CHECKING GOOD RUNNING CONDITION .....	31
7	DESCRIPTION OF PARAMETERS.....	31
8	ERRORS.....	34
9	PROBE CHART .....	35
10	TROUBLESHOOTING .....	36
11	SYSTEM MAINTENANCE .....	37
11.1	GENERAL INSPECTION .....	38
11.2	DRAINING WATER FROM THE TANK.....	38
11.3	MAGNESIUM ANODE.....	38
11.4	FILTER OF REDUCTION VALVE .....	39
11.5	CONDENSATE CIRCUIT .....	39
11.6	CLEANING AIR CIRCUIT .....	39
11.7	SAFETY THERMOSTAT .....	39

\* not included in the delivery

## CAREFULLY READ THIS MANUAL BEFORE INSTALLING THE WATER HEATER!

Dear Customer,

The Works Cooperative of Dražice - Machine Plant, Ltd., would like to thank you for your decision to use a product of our brand.



The product is not intended to be controlled by

- a) people (including children) with reduced physical, sensual or mental capacities, or
- b) people with insufficient knowledge and experiences unless supervised by responsible person, or unless properly instructed by such responsible person.

The manufacturer reserves the right for engineering modification of the product. The product is designed for permanent contact with drinkable water.

# 1 INTRODUCTION

Water heater with an AQUA HP air-water heat pump certainly fulfils all your expectations, and will comfortably serve you and achieve maximum energy savings for many years. The manufacturer devotes a lot of time, energy and financial resources to the development of innovations that will promote energy savings achieved by using the product. Your choice proved correct sentiment and concern about energy consumption, therefore, a matter that affects the environment. The manufacturer has been committed to constantly come up with innovative and effective products so that the rational use of energy could actively contribute to environmental protection and natural resources of the planet. This manual, the purpose of which is to inform, warn and advise in connection with the use and maintenance of this appliance, should be retained.

## 1.1 SYMBOLS



Every process that the supplier believes to be conducive to harmful danger and/or material damage will be signaled with a danger sign.

To better characterize the danger, the symbol will be followed by one of these words:

- **DANGER:** when there is the possibility of harm to the operator and/or people in the vicinity of the equipment
- **WARNING:** when there is the possibility of material damage to the equipment and/or attached materials.



All the information that the supplier believes to be an asset for better performance and preservation of the equipment, will be signaled together with the information sign.

## 1.2 PRE-INSTALLATION INFORMATION



The electrical installation of the equipment must comply with the national regulations for electrical installations in effect.

**AQUA HP** will only operate after receiving its load of coolant.

**DANGER**

The maximum water pressure into the hydraulic circuit inlet is 0.3 MPa and the minimum pressure is 0.1 MPa.

**WARNING**

The power supply is 230 V, 50 Hz, and the power supply cable is plugged into a socket with earth wiring. If the power supply cable is damaged, it must be replaced by the manufacturer, by its customer service, or by staff with similar training in order to avoid any danger.

**AQUA HP** will only operate if the storage water heater is filled with water. Heating of other fluid than drinking water is not allowed.

**Heating other than potable water is not allowed**

## 1.3 SAFETY INFORMATION



The appliance can be used by children from 8 years of age, persons with physical, sensory or mental disability or people without experience or knowledge, as long as those people were briefed on the operation of this device in a secure manner, and are familiar with the related dangers

### **DANGER**

The appliance cannot be played with by children.

Cleaning and maintenance must not be performed by children without proper supervision.

#### **When installing:**

- The installation of heat pump equipment for heating sanitary water must be carried out by staff with suitable training and qualified for this purpose;
- The device should not be installed in places that present a risk of impact, shock or explosion;
- Keep the equipment packed until you reach the place and time of installation; Make sure all hydraulic couplings are watertight before connecting the equipment to the power supply.

#### **Maintenance of the equipment:**

- Equipment maintenance should be carried out by customer service, except operations of general and continuous cleaning which could/should be carried out by the user;
- Power supply to the equipment must be disconnected during maintenance operations;
- The supplier recommends at least one annual inspection to the equipment, by a qualified technician;
- Cleaning and maintenance must not be carried out by children unless they are under supervision

#### **High pressure and temperature:**

- The principle for running this equipment is directly linked to high temperature and pressure; thus, the processes that imply contact with the equipment, must be thought out with caution to prevent the risk of burns and projection of material;

#### **Refrigerant Fluid:**

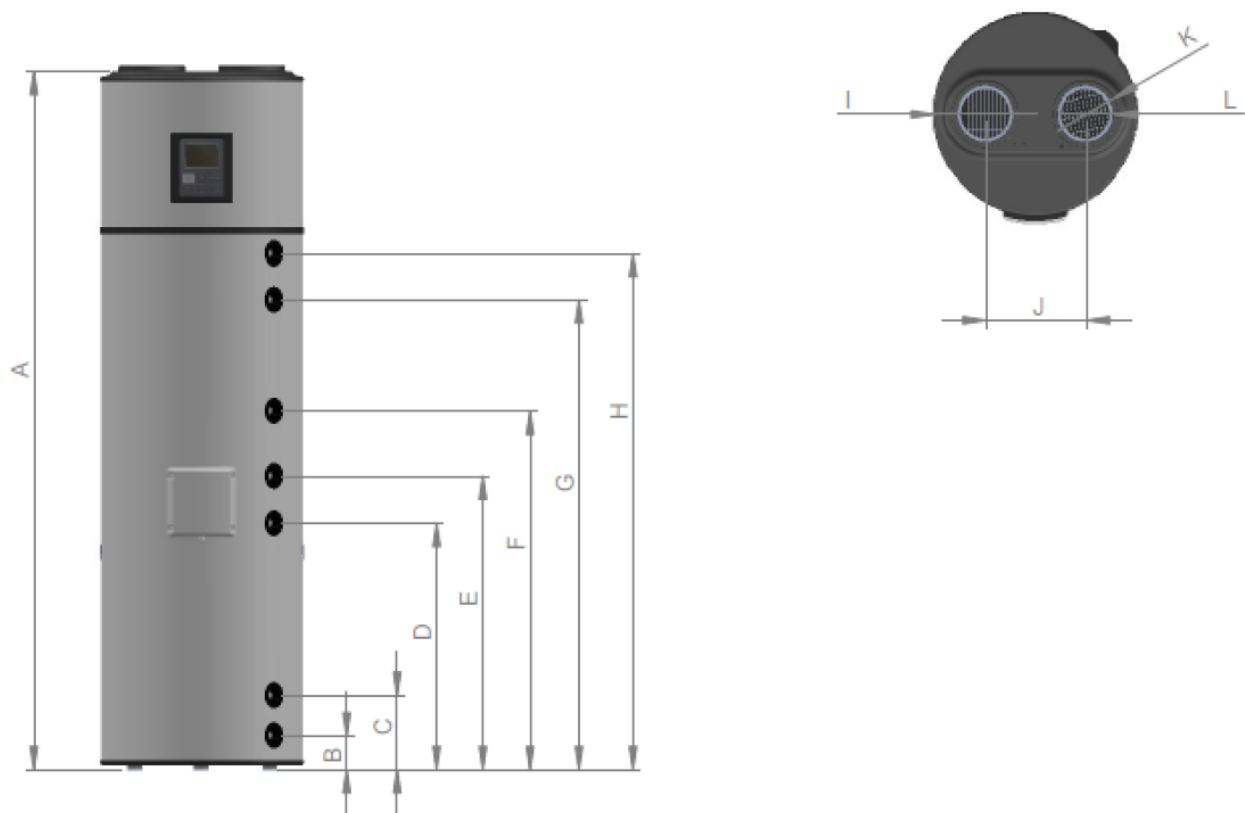
- The refrigerant fluid used in the entire process is R134a, CFC-free, non-inflammable and without harmful effects to the ozone layer;
- However, according to the law, the fluid in this equipment cannot be released into the environment;
- Handling of the fluid in the equipment must be carried out by a qualified technician.

#### **Information for the Client:**

- The Installer must inform the client about the running of the equipment, its dangers, rights and duties of the client;

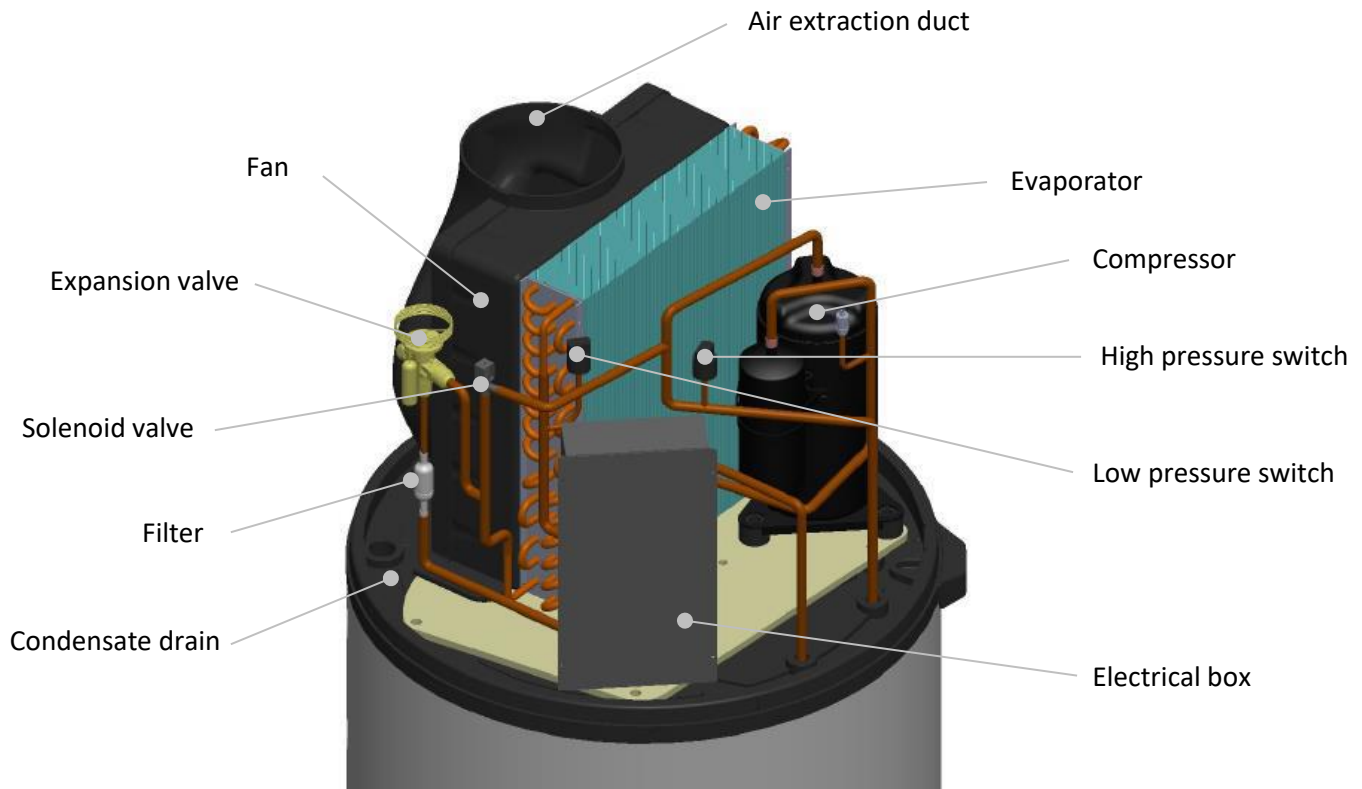
## 2 SPECIFICATION

### 2.1 COMPONENTS

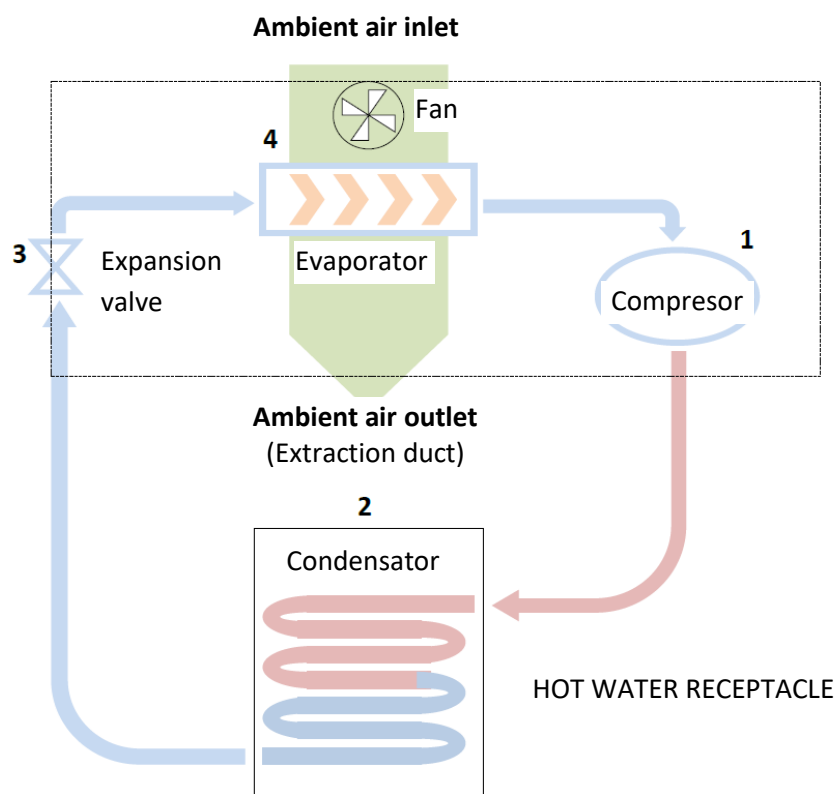


	AQUA HP	Terminal dimensions	Description of outlets
A	1970	-	-
B	99	G 1" M	C – Cold Water Inlet
C	215	G 1" M	NA
D	706	G 1" M	
E	840	G 3/4 " M	
F	1025	G 1 1/4 " M	Mg – Mg anode
G	1343	G 1/2 " F	PT – Temperature sensor
H	1475	G 1" M	H – Hot Water Outlet
I	Ø 580	-	-
J	286	-	-
K	Ø 190	-	-
L	Ø 160	-	-

A cooling system, at the top, responsible for transferring heat from ambient air to sanitary water.



## 2.2 HEAT PUMP PRINCIPLE





1. The cooling fluid (R134a) is compressed in the high efficient compressor, raising its pressure and temperature.
2. In the condenser (not in direct contact with the water), the heat energy in the cooling fluid is transmitted to the water in the water storage heater.
3. The condensate fluid (high pressure) runs from the expansion valve which is responsible for easing the its pressure.
4. The fluid absorbs heat energy from the environment by flowing through the evaporator with the help of a fan.



The R134a is a HFC fluid, thus not harmful to the ozone layer. It has great chemical and thermal stability, low toxicity, non-inflammable, and is compatible with most materials.

## 2.3 TECHNICKÉ PARAMETRY

	Unit	AQUA HP 250 / 2,2 kW
Type of Equipment		Water heater with heat pump
Hot water volume	l	250
Weight without water	kg	100
Dimensions (ø/height)	mm	580 / 1970
Material of upper part	-	Stainless steel
Tank shell material	-	Steel sheet
Insulation	-	Polyurethane foam 50 mm
Mg anode	-	1" 1/4 F
Maximum service temperature	°C	80
Maximum service pressure	bar	7
Test pressure	bar	10
Heat loss	kWh/24h	1,01
IP Protection	-	IPX1
Supply voltage	-	1 PE-N 230 V / 50 Hz
Input (medium / maximum)	W	400 / 700
Output of the electrical heating element	W	2200
Heat pump output	W	1800
Fan input	W	65
Maximum service current	A	3,2 + 9,5 (with backup electrical heating)
Recommended breaker	-	16A (sensitivity 30 mA)
Max temperature of hot water for heat pump	°C	60
Max temperature of hot water for heating element	°C	70
Coolant	-/kg	R 134a / 1,2
Load profile	-	XL
COP <sup>2)</sup>	-	3,61
Heating time <sup>2)</sup>	HH:mm	05:36
Volume of usable water 40 °C <sup>2)</sup>	l	323
Energy efficiency class <sup>2)</sup>	-	A+
Energy efficiency <sup>2)</sup>	%	149
Annual energy consumption <sup>2)</sup>	kWh . a <sup>-1</sup>	1251
Ambient temperature limit values	°C	-5 / 40
Acoustic pressure level	dB(A)	51
Acoustic pressure level at 2m	dB(A)	36
Airflow	m <sup>3</sup> /h	450
Static Pressure Fan	Pa	80
Maximum length of air technical manifold	m	40

1) A20/W10-54, according to EN16147 and applicable regulation No. 812/2013

2) According to EN12102

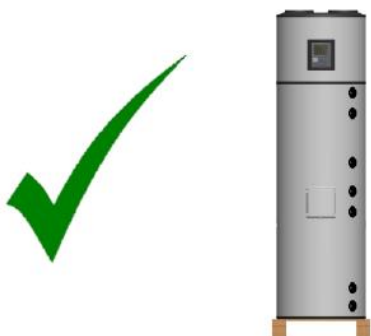
### 3 TRANSPORT



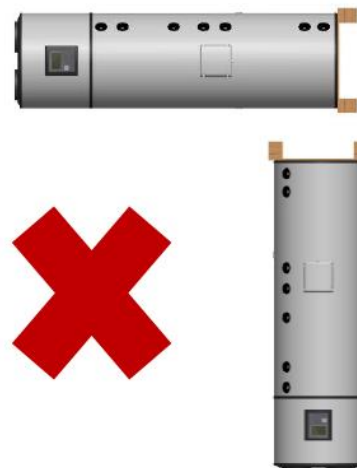
The equipment must be carried in an upright position. The equipment must be raised and lowered with extreme care, to avoid impact that could damage the material. Make sure the belts and/or transportation straps do not damage the material. Always use suitable means to transport the material (pallet lift, forklift, etc.)

#### WARNING

Correct transport position

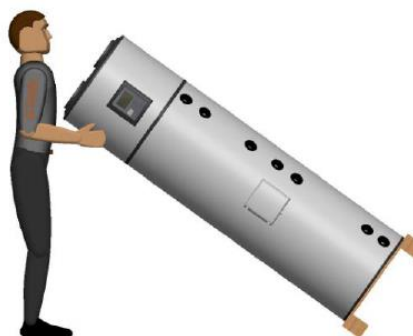
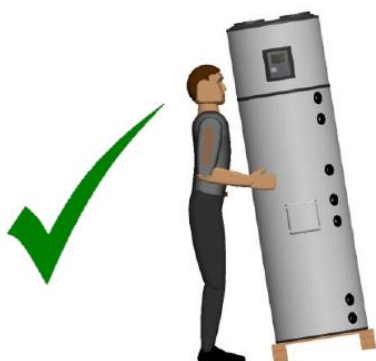


Incorrect transport position



During the transport and installation phase, do not take the equipment by the upper part.

#### WARNING



The equipment must be transported in its original package to the place of installation. The packages contain the following information symbols:

	Fragile, handle with extreme caution.		Keep the package dry.
	Make sure the arrows are always up.		Do not stack packages.

## 4 INSTALLATION

### 4.1 SAFETY AND CONTROL DEVICES

#### 4.1.1 High/Low Pressure Switch

In case of running outside the range of pressures recommended and defined by the supplier, the equipment will switch off and indicate error in the electronic panel.

#### 4.1.2 Thermal fuse

Thermal fuse is factory set by the manufacturer, and ensures that the water temperature in the hot water tank does not exceed the maximum value. If the temperature exceeds this value, the fuse shuts off backup electric heating. Turning on is performed manually by a service technician after analyzing the reasons for the switching off.

#### 4.1.3 Temperature sensor

Temperature sensor measures the water temperature in the hot water tank to control the entire system.

#### 4.1.4 Corrosion protection

In addition, the top part shell of the hot water heater is corrosion resistant (it is made of stainless steel) and the hot water tank is enameled and also contains magnesium anode which needs to be checked regularly, as recommended by the installer or service technician.

#### 4.1.5 Expansion Vessel \*

The expansion vessel is a device whose purpose is to compensate for the increase in water volume due to temperature rise.



Installing the expansion tank is recommended to save water. The recommendation of installing an expansion tank is the responsibility of the installer. It is generally installed on a cold water pipe.

#### 4.1.6 Safety system \*

The safety device allows the system to be protected against anomaly situations: cold water supply, hot water flowing back, emptying of the storage water heater and high pressure. The valve is calibrated to activate at 0.7 MPa). To drain the water in the storage water heater, you should close the supply valve and open the discharge valve. The safety valve discharge pipe must be open into the atmosphere, because the valve may drip water or even discharge water. The safety valve must be opened regularly to remove impurities and check that it is not blocked. The discharge pipe must be installed in a vertical position. The discharge pipe must be installed upright away from a cold environment.



Installing this device is recommended for the proper installation of the equipment. Installing this device is the responsibility of the installer. As a general rule it is installed in the cold water pipe.

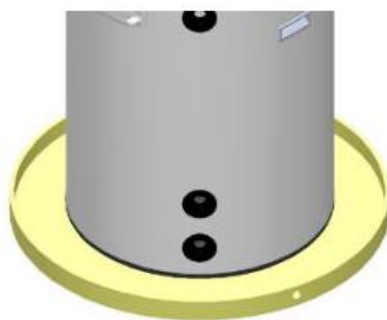
#### 4.1.7 Pressure Reducing Valve \*

The pressure reducing valve must always be installed upstream from the safety device, and ready to activate in situations when the pressure in the circuit exceeds 3 bar (0.3MPa). This valve comes with a pressure gauge.

**\* Parts that are not delivered by the manufacturer. Their delivery and installation must be performed by the installer.**

## 4.2 DRAIN PAN

The equipment should not be installed over an area where drains from the tank or its connections could cause damage in the adjacent area or on the lower floors of the structure. For the aforementioned reasons, it is recommended to place a drain pan under the equipment.

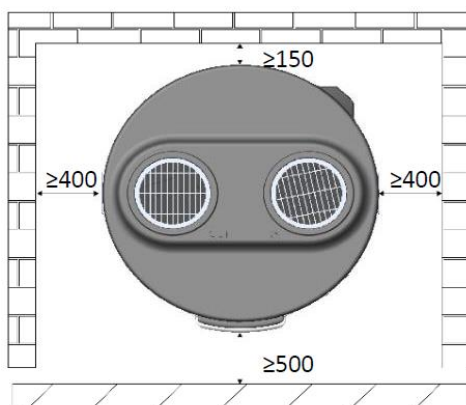


It is important that the pan has a flow channel with a minimum diameter of 3/4".

## 4.3 LOCATION

When placing the equipment in its position, bear in mind possible future interventions.

Make sure that there is at least the following free space around the equipment:

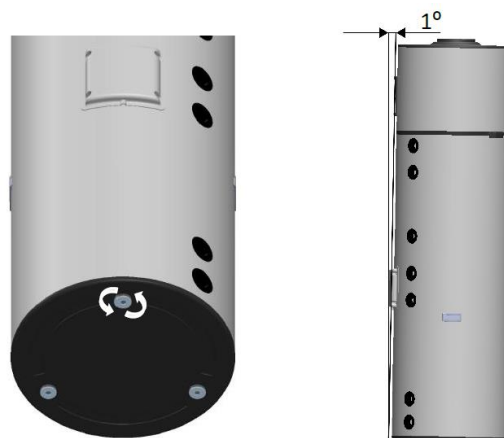


Adjust the levelling legs of the appliance. Acceptable is the tilt angle 1° rearward.



#### WARNING

If equipment tilts other than back-wards, this will cause condensates to deposit in the tank.



## 4.4 AIR INLET/OUTLET INSTALLATION



As the AQUA HP absorbs heat during its operation, the air flow (inlet/outlet) must be directed to unheated areas. The equipment will cool the room where it is placed and so if it is installed in heater rooms, the air flow must be directed to other rooms and/or the outside.

### 4.4.1 Installation without Ducts

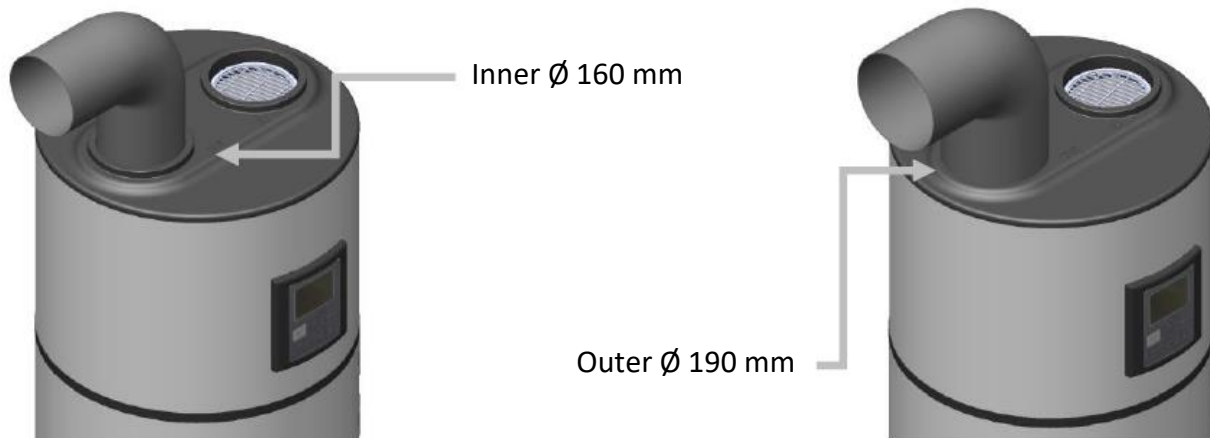
The **AQUA HP** equipment must be installed in a place that is not too heated, and may be used for dehumidifying and cooling these rooms (e.g., laundries, cellars, etc). Distance between the top of the unit and the ceiling must be no less than 600 mm.

If the distance between the unit and the ceiling is less than 600mm, two elbow-type joints must be installed as shown in the following picture.



#### 4.4.2 Installation with Ducts

The Heat Pump is prepared to install ducts with diameter of 160 mm and 190 mm, in its air intake and extraction zones:



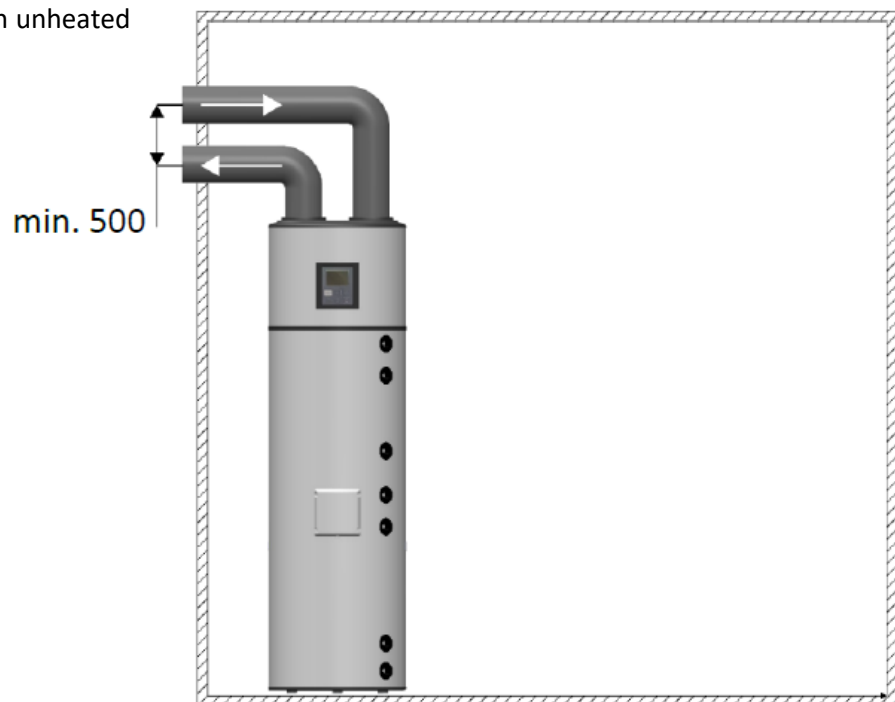
Max Length Ducts			
		Ø 160	Ø 190
Rigid duct <sup>1)</sup>	m	24	40
Flexible duct <sup>1)</sup>	m	12	20

1) Considering 90° curves and louvers at the air inlet and outlet of the equipment.

If ducts are used, directing the air flow to areas that do not require heating, there are some options:

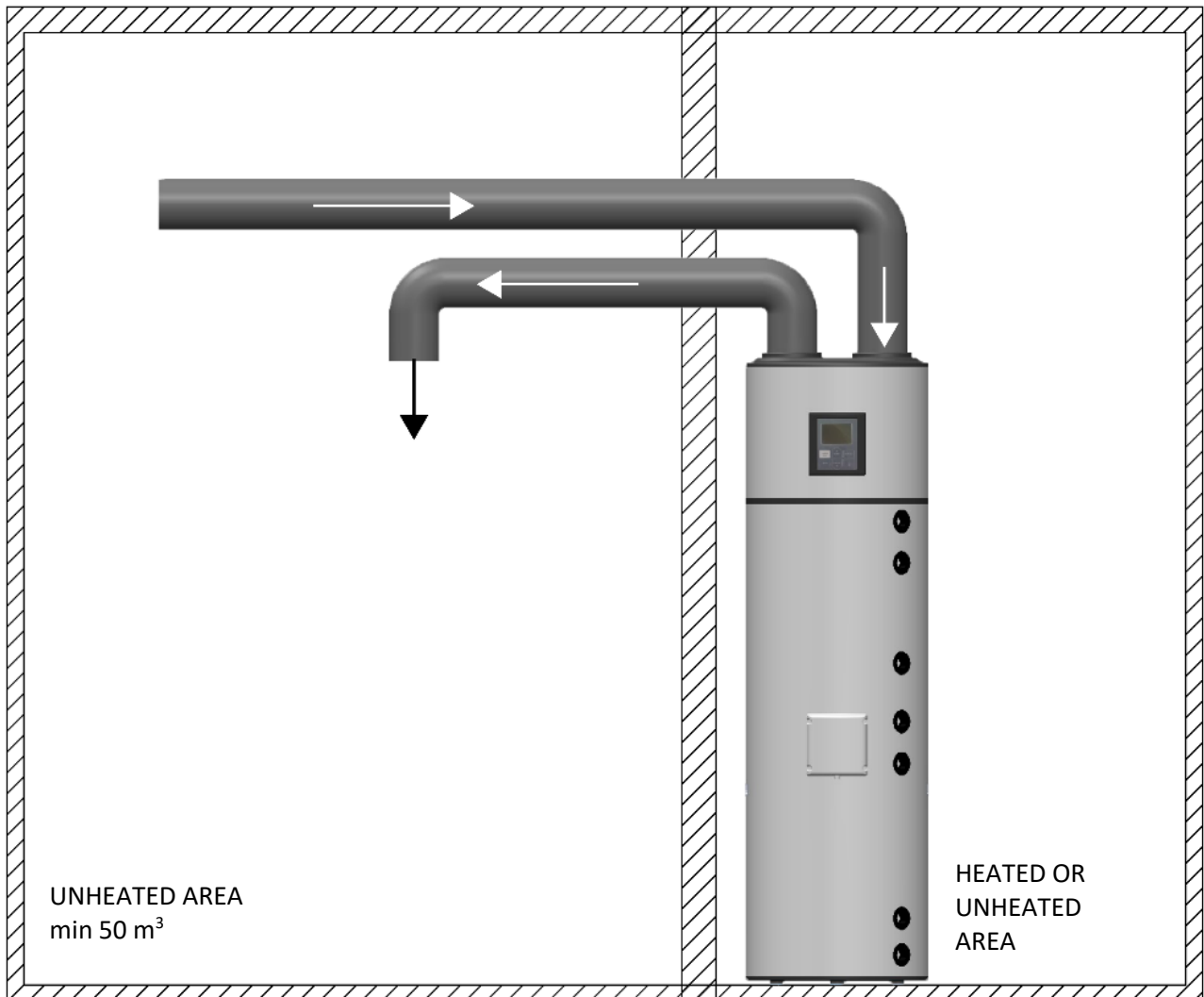
##### Using Outside Air

If outside air is used, the unit may be placed either in a heated room or in an unheated room.



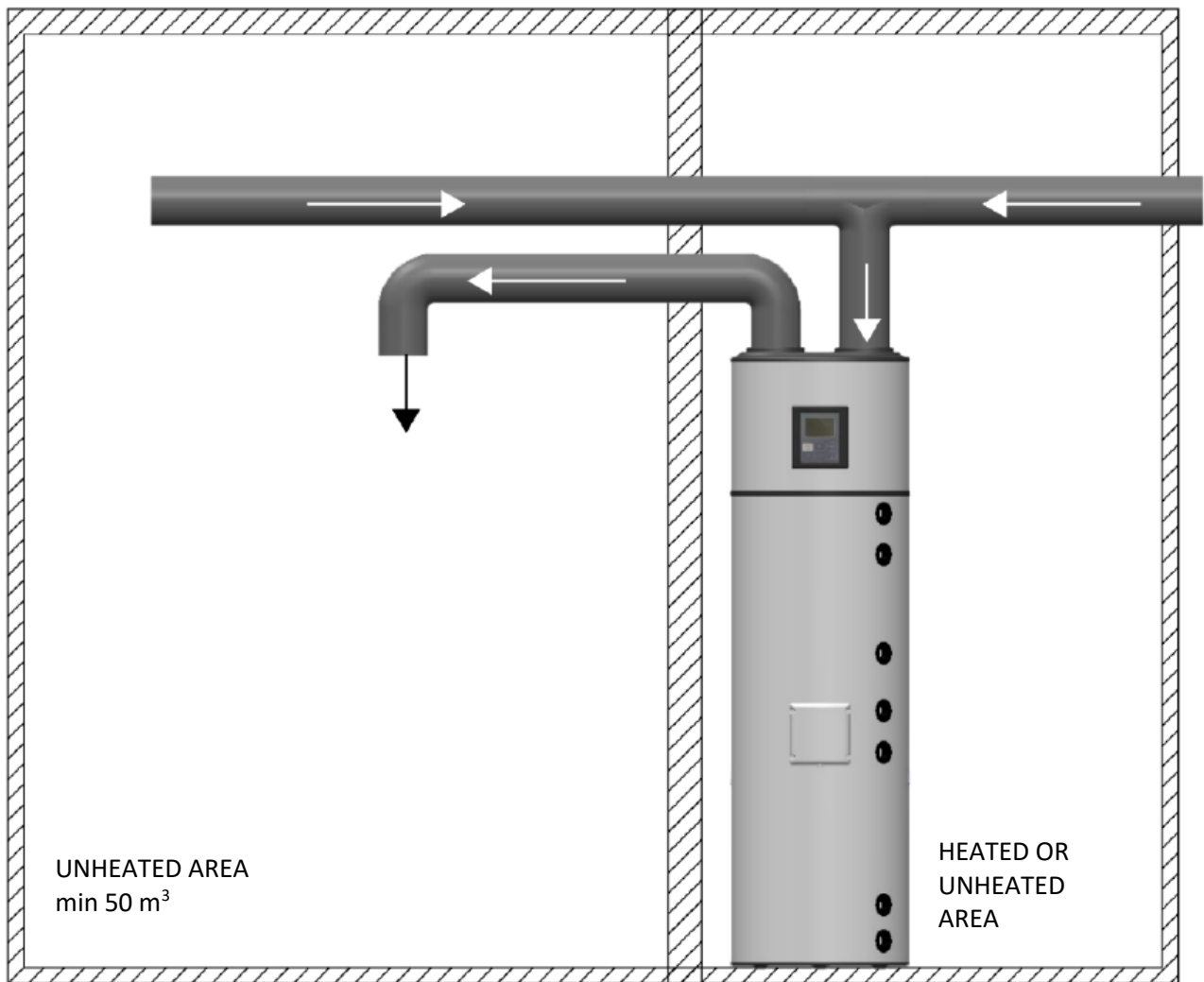
### Using Ambient Air

The monobloc unit may also be placed in a heated room, but the air flow must be directed to an unheated room. Bear in mind that because of air flow, cooling the unheated room can affect the adjacent heated rooms.



### Using Ambient and Outside Air

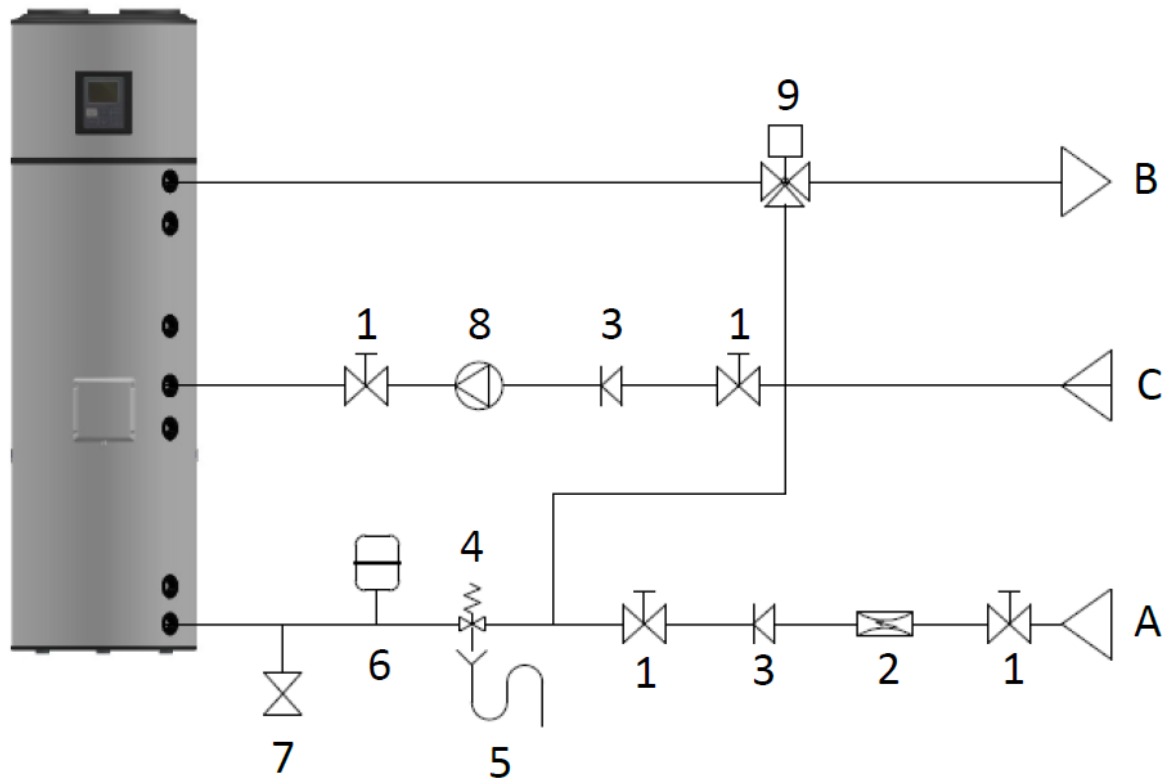
A branched duct can be used to inflate air into the equipment. So, you can get hot air in the summer, from the outside, and hot air in the winter from an unheated room.



Ducts used to direct the airflow are not included in the equipment, and it is up to the installer to install them, if necessary, to comply with the manufacturer's recommendations. Diameter of pipes must be of 160 mm or 190 mm. Pipes must not exceed 40 m in length.



## 4.5 PLUMBING FIXTURE



### EXPLANATORY NOTES

- |   |                               |
|---|-------------------------------|
| [1] Shutoff valve                             | [7] Drain Valve               |
| [2] Pressure Reducing Valve (3 bar / 0,3 MPa) | [8] Circulating pump          |
| [3] Return Valve                              | [9] Thermostatic Mixing Valve |
| [4] Safety valve (7 bar / 0,7 MPa)            | [A] Cold Water Inlet          |
| [5] Drainage Siphon                           | [B] Hot Water Outlet          |
| [6] Expansion Vessel                          | [C] Circulation               |



### WARNING

It is necessary to install a safety device at the cold water inlet of the appliance. The safety device must be in compliance with the standard EN 1487:2002, maximum pressure 7 bar (0.7 MPa). Water must not be stopped from flowing from the safety device to the deposit by any sort of accessory.

The safety device must be connected with piping whose diameter is not less than the cold water inlet coupling. The discharge must be connected to a sewage siphon or, if this is not possible, elevated to a distance of at least 20 mm from the pavement to allow visual inspection.

To prevent high pressure from main water supply, install a pressure reduction valve set to 3 bar (0.3 MPa).



The Manufacture is not responsible for damage related to not following these recommendations / warnings.



The water you use may contain impurities and/or substances damaging to the system and even harmful to your health. Make sure you use water with quality fitting for home consumption. The following table indicates some parameters that, when exceeded, must be chemically treated.

#### DANGER

#### WARNING

Hardness (°dH)	pH	Treatment
3.0 to 20.0	6.5 to 8.5	No
3.0 to 20.0	<6.5 or >8.5	Yes
<3.0 or >20.0	-	Yes

## 4.6 CONDENSATE

During operation, condensation may occur. These condensates are collected in the drip tray and drained through a hole at the back of the tray. The installer must connect the condensate hose supplied by the manufacturer and direct the condensates to the drainage system or drainage siphon.



The condensate hose must not be bent/pressed and must be placed where it best suits the proper flow of condensates

#### WARNING

## 4.7 ELECTRIC CONNECTIONS

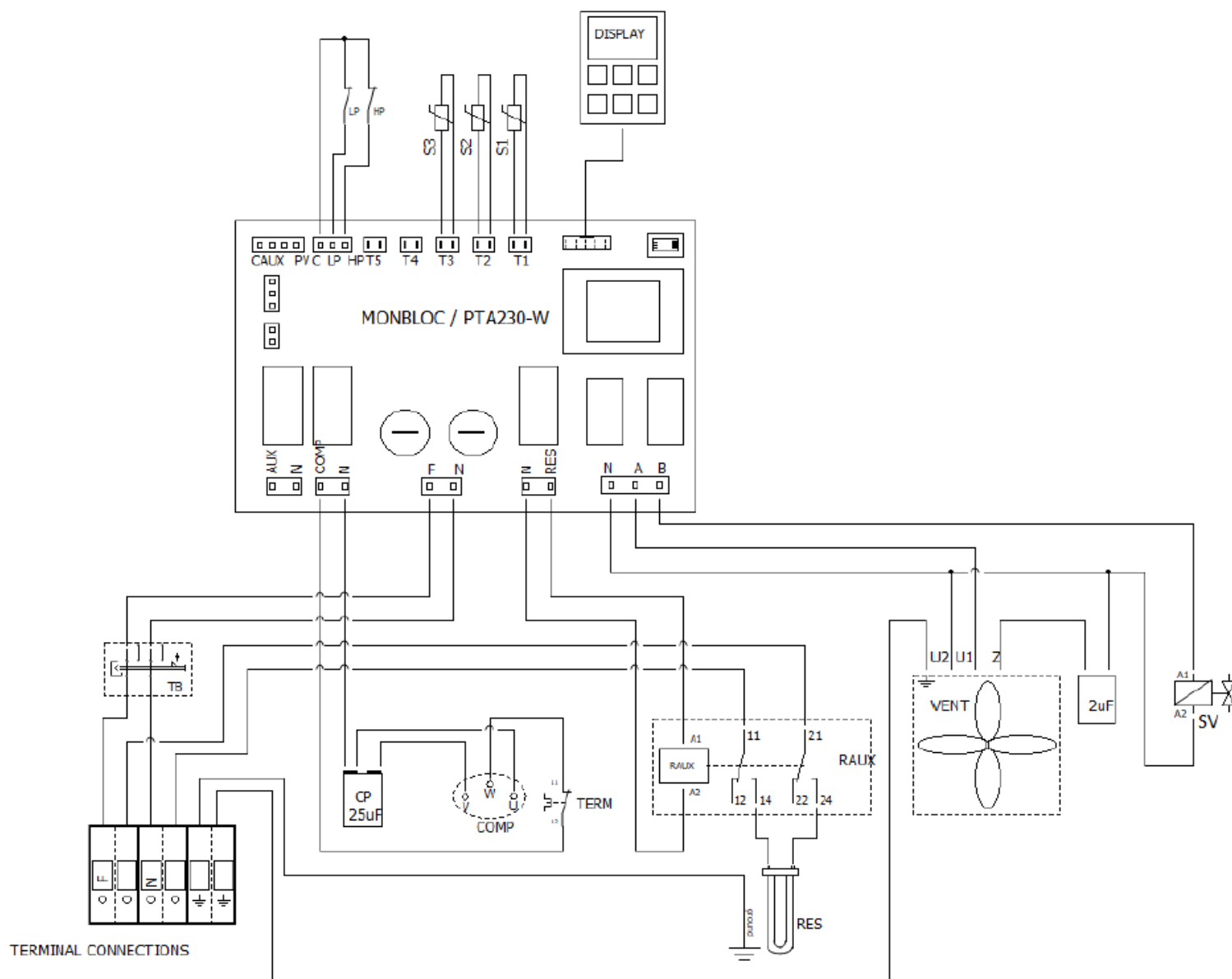
The thermodynamic equipment must be plugged to the power supply only after filling the storage water heater. The thermodynamic equipment comes with a mains cable, to be connected to an earthed monophasic voltage (1/N/PE~230V/50 Hz). The connections must comply with the standards of installation in effect in the territory or country where the thermodynamic equipment has been installed

The installation includes:

- Bipolar circuit-breaker with connection cable with section equal to or exceeding 2.5 mm<sup>2</sup>
- Protection differential circuit breaker of 30 mA

If the power supply cable is damaged, it must be replaced by the manufacturer, by its customer service, or by staff with similar training.

## 4.8 WIRING DIAGRAM



### EXPLANATORY NOTES

**RES** – Electrical backup heater (2,2 kW)

**S1** – Water temperature sensor

**S2** – Ambient temperature sensor

**S3** – Evaporator temperature sensor

**VENT** – Fan

**SV** – Solenoid valve

**N** – Neutral

**F** – Phase

**HP** – High pressure switch

**LP** – Low pressure switch

**COMP** – Compressor

**TB** – Thermal fuse

**TERM** – Compressor thermal

**9/10/11** – Phase/Neutral/Ground



**T4** – Solar thermal probe

## 5 CONTROL AND PROGRAMMING

### 5.1 CONTROL PANEL

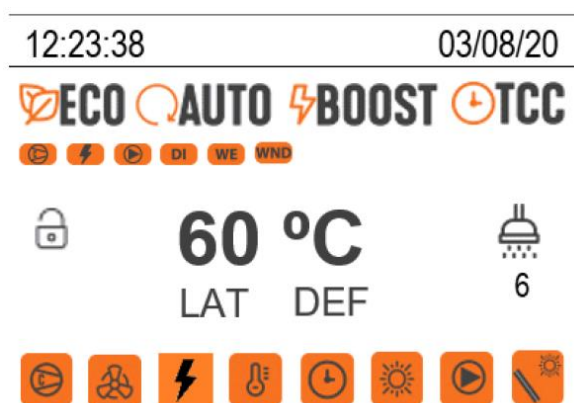
The control panel of the Thermodynamic Solar system Eco is simple and intuitive. It enables the configuration of several operating parameters according to the operating mode selected by the user. It comprises six command keys (ON / OFF / CANCEL, MENU, COMP ▲, E-HEATER ▼, DISINFECT and OK / LOCK that enable checking the running of the equipment, consult and change parameters.

### 5.2 KEYS (FUNCTIONS)
















Key	Function	Description
ON/OFF	ON/OFF Switch	Turning the controller on and off
CANCEL	(CANCEL) Termination	Function of exiting to the end menu, sub-menu or cancel function
OK / 	(OK) Confirmation	Confirming the parameters in the menus or submenus
	(LOCK) Locked / Unlocked	Locking or unlocking the keypad
MENU	MENU	Entering the menu
COMP	Compressor ON/OFF	Pressing the key allows you to turn the compressor on and off
E-HEATER	ON/OFF Electrical resistance	Pressing the key allows you to enable and disable the electrical resistance
	Changing values	Allows you to adjust the parameter value (in menu context)
	Movement across the menus/submenus	Function to browse menus and submenus (inside the menu)
DISINFECT	(DISINFECTION) Anti-Legionella	Press this button and the system automatically creates a thermal shock in water to neutralize the bacteria (Legionella)

## 5.3 DISPLAY

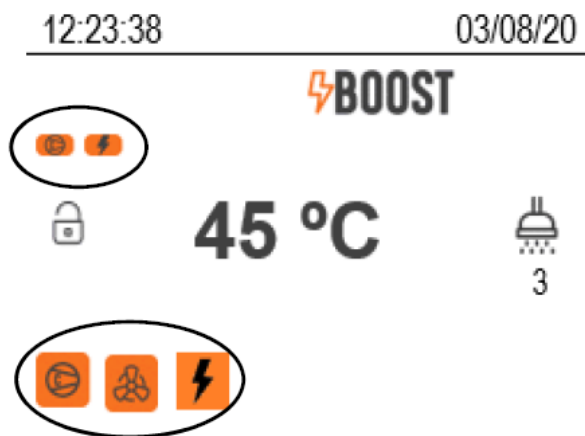
### 5.3.1 Display description



### 5.3.2 Symbols

Symbol	Description
	Appliance in ECO service mode
	Appliance in AUTO service mode
	Appliance in BOOST service mode
	Timer clock control
LAT	Low Ambient Temperature protection
DEF	Defrost
	Compressor
	Fan
	Electrical heater
	Disinfect,
	Chrono function
	Vacation mode
	Recirculation pump function
	Solar function
°C	Water temperature
	Number of baths available
	Unlocked keyboard
	Locked keyboard

### 5.3.3 Symbols in the appliance's operation

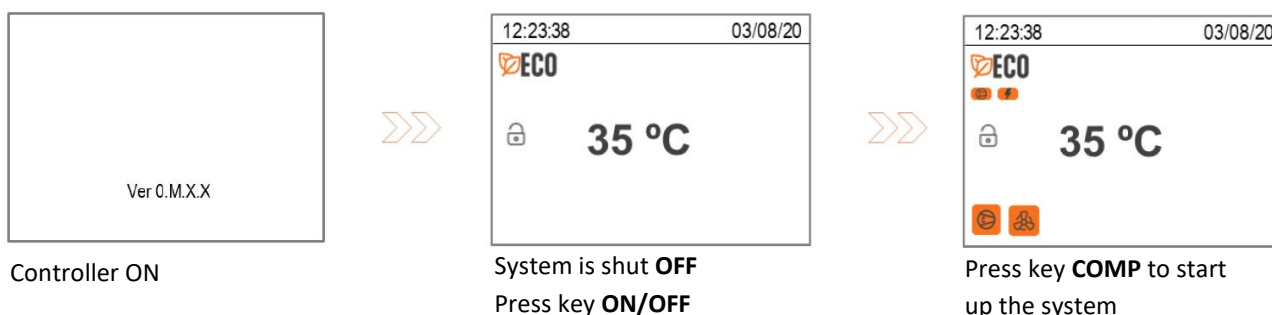


Symbol	Description
	Compressor ACTIVATED
	Compressor RUNNING
	Electrical heater ACTIVATED
	Electrical heater RUNNING
<b>TA</b> 	Electrical heater ACTIVATED when S1 < P08 and/or P07 > Temperature S3 (Auto Mode)
<b>TC</b> 	Electrical heater ACTIVATED when compressor continuous running time exceeds T05 (Auto mode)
<b>MA</b> 	Electrical heater ACTIVATED manually
	Fan RUNNING
	Disinfect RUNNING
	Chrono function ACTIVATED
<b>DI</b>	Chrono function RUNNING every day
<b>WE</b>	Chrono function RUNNING only during the week (Monday to Friday)
<b>WND</b>	Chrono function RUNNING only during the weekend (Saturday and Sunday)
	Vacation mode ACTIVATED
	Recirculation pump function ACTIVATED
	Recirculation pump function RUNNING
	Solar function ACTIVATED
<b>LAT</b>	Low Ambient Temperature protection RUNNING
<b>DEF</b>	Defrost RUNNING

## 5.4 PUTTING INTO OPERATION

Before starting, check whether the installation is set up according to the recommendations and that everything is in conformity, then you may plug your equipment to the power supply.

After switching on your equipment, you should wait a few seconds until the controller begins to work. Then you may start your equipment following these instructions:



**Note 1:** The LED on the display indicates the status of your equipment. When is blinking means that your equipment don't have any order to work, if the LED is ON and no blinking, your system is working with the order that was given.

**Note 2:** To restart the appliance, switch it off and switch on again using the key ON/OFF.

## 5.5 OPERATING MODES

The AQUA HP is programmed to work in 3 main running modes: **ECO**, **AUTO**, **BOOST**. The equipment can also work in **LAT** (protection of the compressor) and **TCC** (alternative energy source).

Mode	Symbol	Function
ECO		Normal running as Heat Pump
AUTO		Optimized management of running of Heat Pump and/or Electrical Heater (backup)
BOOST		Running of Heat Pump + Electrical Heater (backup)
LAT		Running of Electrical Heater (backup)+ Fan
TCC		Running of Heat Pump + Electrical Heater (backup)

### 5.5.1 **ECO** mode

In ECO operating mode, the equipment runs only as a Heat Pump to heat the water in the storage water heater. Thus, we could generate a greater efficiency, and savings for the user. Every time the user feels it necessary, may switch on the support electrical heater, using this mode, manually pressing the key (E-HEATER). In these circumstances the equipment will automatically change operating mode to BOOST and indicates the reason of its activation (over the electrical heater). If you switch off the electrical heater manually, the equipment will begin to run again in ECO mode.

### 5.5.2 **AUTO** mode

In AUTO operating mode, the equipment will run as a Thermodynamic System and/or electrical heater, and the operation of the electrical heater is managed in an optimized way for the purpose of keeping up the efficiency of the equipment.

The electrical heater will start every time:

- The user activates it manually (key **E-Heater**).
- The contact LP opens (low external temperature, lack of fluid, leak in the circuit, etc.).
- The time for running the compressor exceeds parameter T05\*
- The water temperature is below P08\*.

\*Parameter is adjustable (**ON/OFF**)

### 5.5.3 **BOOST** mode

In BOOST operating mode, the equipment runs as a Heat Pump + Electrical Heater, and the running of the electrical heater is simultaneous with the Heat Pump. This mode enables the user to obtain hot water in less time.

The user can change the operating mode when he wishes, he need only press simultaneously the keys MENU + OK/LOCK for 3 seconds and select the mode that suits his needs with the cursor.

### 5.5.4 **LAT** mode

The LAT mode starts when the ambient temperature is too low, in order to protect the compressor. When this mode is activated, the compressor turns off and the electrical heater starts. When the ambient temperature increases, the equipment will assume the previous mode selected.



### 5.5.5 TCC mode

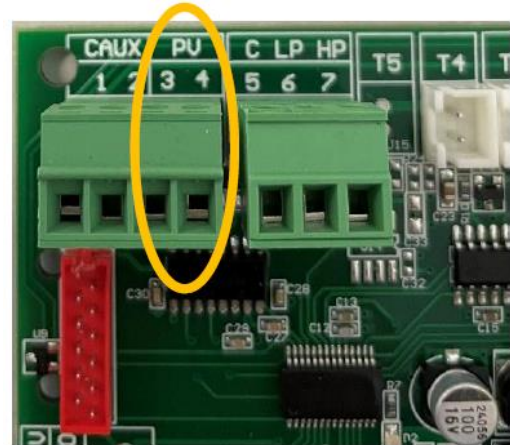
The TCC function provides the possibility of raising the water temperature when an alternative power source is available (solar photovoltaic, wind or other), increasing the efficiency of the heat pump and making the alternative power source profitable.

To this end, it is sufficient to connect a cable from the inverter to the equipment's control board. The cable connection on the control board must be made at the voltage-controlled terminals. It should be noted that this is a dry contact (no voltage), applying a voltage to this contact can cause irreversible damage to the controller.

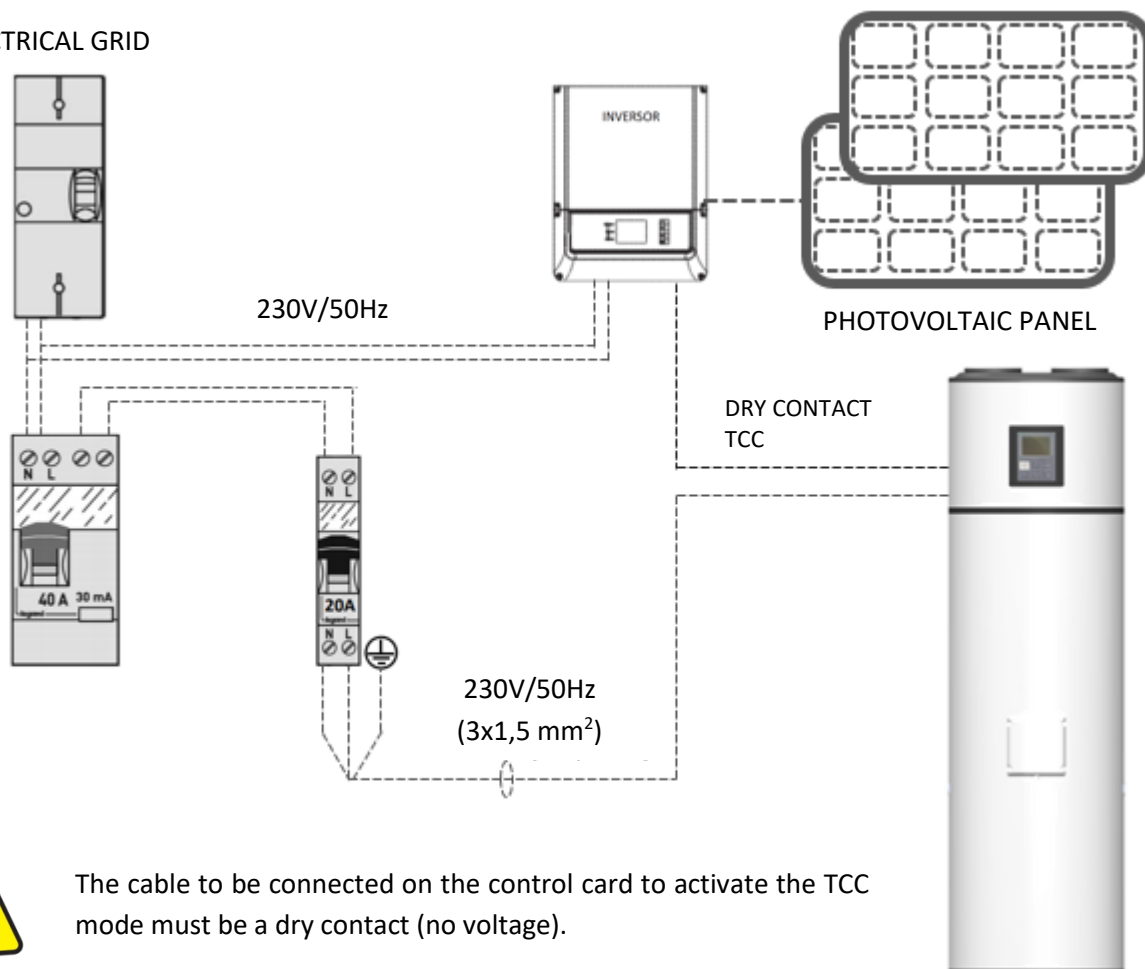
When the voltage-controlled contact closes it triggers the TCC Function and all active heat sources (Heat Pump + Electrical heater) are adjusted to new operating parameters. The compressor assumes the P01TCC/ H01TCC parameters and the electrical heater the P02TCC/ H02TCC parameters.

**Note:** When the voltage-controlled contact opens the equipment assumes the previously adopted operating mode.

The PV contact can also be used to take advantage of the bi-hourly tariff. For this a timer should be connected to the PV contact, instead of the inverter.



#### ELECTRICAL GRID



The cable to be connected on the control card to activate the TCC mode must be a dry contact (no voltage).

#### WARNING

Applying a voltage to this contact may cause irreversible damage to the controller.

### 5.5.6 Chrono scheduling of the heat pump

The heat pump has an internal clock that allows the user to set two periods of operation for the control of the equipment. These periods can be distinctly defined as weekly (Monday to Friday) or weekend (Saturday and Sunday).

Once the periods of operation have been programmed, the user must then activate them, for example:

12:23:38		03/08/20	
>ON/OFF Chrono			
Week			
ON	<input checked="" type="checkbox"/>	OFF	<input type="checkbox"/>
Weekend			
ON	<input checked="" type="checkbox"/>	OFF	<input type="checkbox"/>

**Note:** The programming is set for a 24-hour period, considering first of all the lowest hour in the table, for example:

12:23:38		03/08/20	
> Week			
1 – Period			
ON		OFF	
10:05 hh:mm		11:40 hh:mm	
2 – Period			
ON		OFF	
21:15 hh:mm		23:00 hh:mm	

In short, the following procedures should be carried out to define the operating hours:

- 1° – Enter the menu and access the parameter "Chrono Heat Pump"
- 2° – Select, for example, a weekly schedule (Monday to Friday)
- 3° – Set the operating time for each period
- 4° – Activate or deactivate.

### 5.5.7 Chrono scheduling of the recirculation pump

The heat pump has an internal clock that allows the user to set two periods of operation for the pump of recirculation. These periods can be distinctly defined as weekly (Monday to Friday) or weekend (Saturday and Sunday).

Once the periods of operation have been programmed, the user must then activate them, for example:

12:23:38		03/08/20	
>ON/OFF Chrono recirculation pump			
Week			
ON	<input checked="" type="checkbox"/>	OFF	<input type="checkbox"/>
Weekend			
ON	<input checked="" type="checkbox"/>	OFF	<input type="checkbox"/>

**Note:** The programming is set for a 24h-period, considering first of all the lowest hour of the table, for example:

12:23:38		03/08/20	
> Week			
1 – Period			
ON		OFF	
10:05 hh:mm		11:40 hh:mm	
2 – Period			
ON		OFF	
21:15 hh:mm		23:00 hh:mm	

In short, to set the operating time of the pump of recirculation the following procedures must be carried out:

- 1° – Enter the menu and access the parameter "Chrono Recirculation Pump"
- 2° – Select, for example, a weekly schedule (Monday to Friday)
- 3° – Set the operating time for each period
- 4° – Activate or deactivate

### 5.5.8 Additional functions

To configure these functions, it is necessary to enter the installer level of access (F11), access the submenu parameters (F08) and select parameter P12.

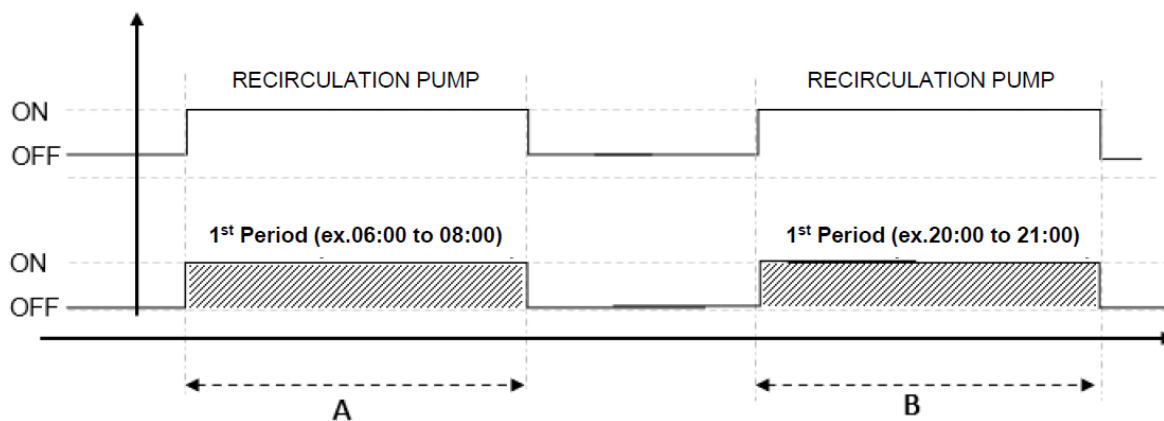
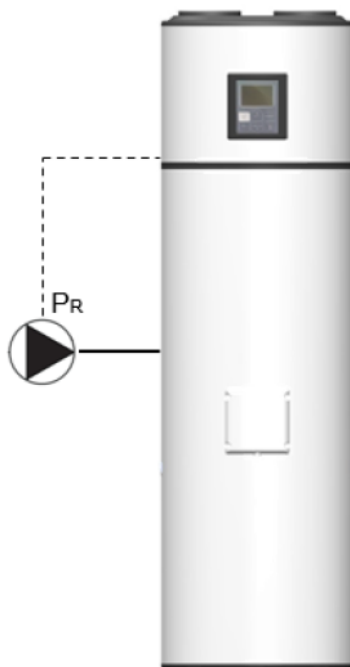
According to the value of the parameter set in parameter P12, the controller assumes the following functions.

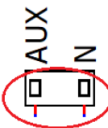
#### Parameter P12 = 4:

The heat pump controller assumes the control of a recirculation pump in parallel with the heat pump control. The pump of recirculation is driven by the hourly period set by the user and the temperature in the heat accumulator.

**NOTE:** The pump of recirculation only comes into operation when there is a defined time period, active period, and the compressor or electrical heater is active.

PR - Recirculation pump



State	Description	Connection terminals for pump connection
A e B	<p>Pump of recirculation active whenever:</p> <ul style="list-style-type: none"><li>• Temperature at probe S1 &gt; P13;</li><li>• Defined and active time period;</li><li>• Active compressor or electrical heater.</li></ul> <p>If none of these conditions are met, the pump of recirculation will not work.</p>	 <p>Terminal AUX/N</p>

## 5.6 ADDITIONAL FUNCTIONS

### 5.6.1 Disinfection Mode

The Monobloc electronic control features the Disinfect function, which consists of a water heating cycle up to 65 °C, for a period of time long enough to prevent the formation of germs inside the tank. The Disinfect function can be set automatically or manually. In automatic mode, the user has the possibility of setting the function every week or every month. When automatic mode is not activated, the user must activate it manually on the key Disinfect.

At the end of the function, the system returns to the operating mode that was selected at the beginning.

### 5.6.2 Vacation Mode

To activate the **vacation** function, you need to access the menu and set the number of days on holiday that you wish, and your equipment will automatically enter **Standby mode** until the last day of holidays. On the last day, the equipment will begin the **Disinfect** function to eliminate any formation of germs that appeared in the storage water heater during the time you were absent.

After the holidays and once the program Disinfect is over, the equipment will resume the mode selected (ECO, AUTO or BOOST).

**Note:** If you set your equipment to enter Vacation mode and turn it off with the key ON/OFF, the function becomes inactive. When you return from your holidays you must remember to switch on your equipment and cancel the days of holidays introduced (Value=0). If you do not carry out this operation, your equipment will not restart until the days of holidays selected have expired.

## 5.7 MENU

Every time it becomes necessary to alter or set new parameters in the running of the equipment, the user must access the Menu.

To access the menu, the key **MENU** must be pressed **for 3 seconds**. After access use the keys **COMP ▲** and **E-HEATER ▼**, to navigate the menus and submenus. In order to confirm values / parameters press the key **OK/LOCK**. Press the key **CANCEL** to exit the menu.

## 5.8 CHANGING THE MODE

The equipment is set by default to work in the “ECO” operating mode. If the user wishes to alter the operating mode, they must follow these procedures:

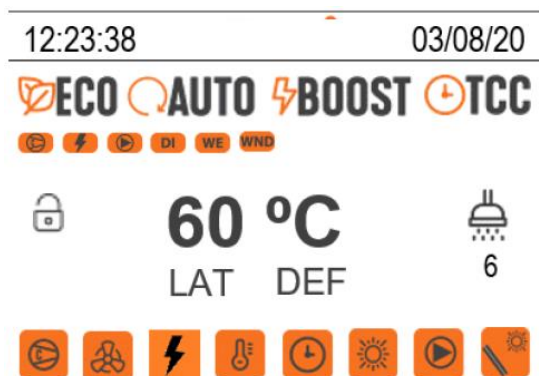
Unblock the keyboard and press the key **MENU** must be pressed **for 3 seconds**. Using keys **▲ ▼** run through menu and select F03, access submenu and select the operating mode.

**Note:** In order to change the operating mode, is not necessary to reinitiate the equipment.

## 5.9 NUMBER OF SHOWERS AVAILABLE

The user can consult the number of showers available on the home page of the graphical interface (display) by using a volume of hot water at a temperature of 40 °C or more.

On the initial page of the display, the parameter mentioned in this chapter will be displayed by resorting to the icon of a shower, with the number indicating the number of showers being positioned below.



Relevant considerations:

- The illustrative set presented above will not be visible on the display whenever the water temperature inside the tank is below 38 °C;
- The number of available showers is calculated considering that one shower is approximately equivalent to a consumption of 50L of domestic hot water;

## 5.10 CONSULTATION OF PROBE TEMPERATURES (S1, S2, S3)

As shown below, on the initial page of the display it is possible to consult the temperatures of the probes:

- **S1** – Water temperature probe
- **S2** – Room temperature probe
- **S3** – Evaporator temperature probe



In order for the user to be able to view these parameters, it is sufficient to select the keys on the display initial page ▲ ▼.

## 6 CHECKING GOOD RUNNING CONDITION

To check that your equipment is working properly put it into operation and wait at least 20 to 30 minutes and then check the following conditions:

- The air temperature at the outlet of the evaporator should be 3°C to 4°C lower than the temperature of the inlet air.

## 7 DESCRIPTION OF PARAMETERS

Code	Type	Description	Min	Max	Setting	Units
F01	Language	Portuguese English French German Italian Spanish Czech	---	---	English	---
F02	Clock	Date and Time	---	---	---	---
F03	Chrono Heat Pump	Week Weekend ON/ OFF chrono	---	---	Chrono = OFF	---
F04	Chrono Recirculation Pump	Week Weekend ON/ OFF chrono	---	---	Chrono = OFF	---
F05	Mode	Eco Boost Auto	---	---	Eco	---
F06	Holidays	Number of days	1	99	0	---
F07	Disinfect	Disinfect function inactive Disinfect function active once a week (weekly) Disinfect function active once a month (monthly)	---	---	Inactive	---
		Number of days	2	366	0	---
F08	Parameters	<b>P01</b> – Setpoint Compressor 1	10	60	52	°C
		<b>H01</b> – Gradient P01	2	20	2	°C
		<b>P02</b> – Setpoint Electrical heater	10	65	52	°C
		<b>H02</b> – Gradient P02	1	20	3	°C
		<b>P01 TCC</b> – Setpoint Compressor	10	60	55	°C
		<b>H01 TCC</b> – Gradient P01 TCC	2	20	2	°C
		<b>P02 TCC</b> – Setpoint Electrical heater	10	65	65	°C

Code	Type	Description	Min	Max	Setting	Units
F08	Parameters (continuation)	<b>H02 TCC</b> – Gradient de P02 TCC	2	20	15	°C
		<b>P03</b> – Setpoint start defrost cycle	-15	10	-8	°C
		<b>P04</b> – Temperature finish defrost cycle	-10	20	10	°C
		<b>P05</b> – Safety temperature	70	80	75	°C
		<b>P06</b> – Setpoint disinfect	60	70	65	°C
		<b>P07</b> – Temp. min Evaporator to activate electrical heater (AUTO mode)	-20	20	-5 ON	°C
		<b>P08</b> - Temp. min water to activate electrical heater (AUTO mode)	10	40	30 ON	°C
		<b>P09</b> – Air temperature to allow defrost cycle	-5	15	5	°C
		<b>P10</b> – Setpoint to activate the LAT protection mode (Low ambient temperature)	-10	10	-2	°C
		<b>H10</b> – Gradient P10	2	20	7	°C
		<b>P11</b> – Gradient to activate the Solar Thermal Pump	2	10	5	°C
		<b>P12</b> – Additional Functions	0	4	0 - inactive	---
		<b>P13</b> – Minimum water temperature to activate the recirculation pump	20	50	30	°C
		<b>T01</b> (timer) – Delay time to compressor starts running	1	20	2	min
		<b>T02</b> – Not used	-	-	-	-
		<b>T03</b> (timer) – Maximum defrost cycle time	1	10	5	min
		<b>T04</b> – Not used	-	-	-	-
		<b>T05</b> (timer) – Maximum time compressor running	6	15	12	hours
		<b>T06</b> (timer) – Delay for defrost cycle	30	360	60	s
		<b>T07</b> (timer) – Delay time to compressor starts running after LP error	1	20	10	min
		<b>T08</b> (timer) – Time between defrost cycle	10	120	30	min
		<b>T09</b> (timer) – Delay for LAT mode starts	2	20	5	min
		<b>T10</b> (timer) – Minimum time for defrost cycle	1	10	2	min
		<b>T11</b> (timer) – Delay time LP alarm	1	10	1	min
		<b>T12</b> (timer) – Delay time water flow alarm	5	120	10	sec
		<b>T13</b> (timer) – Delay time to restart the solar thermal pump	1	10	5	min



F09	INFO	Temperature Probe 1		
		Temperature Probe 2		
		Temperature Probe 3		
		Temperature Probe 4		
		P01 Setpoint compressor		
		H01 Gradient P01		
		P02 Setpoint Electrical heater		
		H02 Gradient P02		
		P05 Water temperature alarm	---	---
		P06 Setpoint anti-legionella		
		P10 Setpoint to LAT Mode starts		
		H10 Gradient P10		
		P12 Additional Functions		
		T01 Delay compressor starts running		
		T05 Maximum time compressor running		
		Next Disinfect		
		Compressor instant consumption		
		Electrical heater instant consumption		
F10	Efficiency	<b>Energy consumption</b>		
		• Compressor (instant W)		
		• Electrical heater (instant W)		
		• Compressor (daily kWh)		
		• Electrical heater (daily kWh)	---	---
		• Compressor (total kWh)		
		• Electrical heater (total kWh)		
		<b>Energy savings</b>		
		• Energy savings (kWh)		
F11	Levels of access	Installer	Password: 0022	---
		Manufacturer	Password: ****	---
F12	Test Outputs	COMP - Contact N.O, Compressor output	---	---
		RES - Contact N.O, Electrical heater output	---	---
		VE- Contact N.O, Fan output	---	---
		VS- Contact N.O, Solenoid valve output	---	---
		AUX - Contact N.O, Auxiliary contact output (recirculation pump / Solar thermal pump)	---	---
F13	Errors	Elist – Errors list	---	---
		Ereset – Delete errors list	---	---
F14	Reset	Restore all the parameters to factory values	---	---

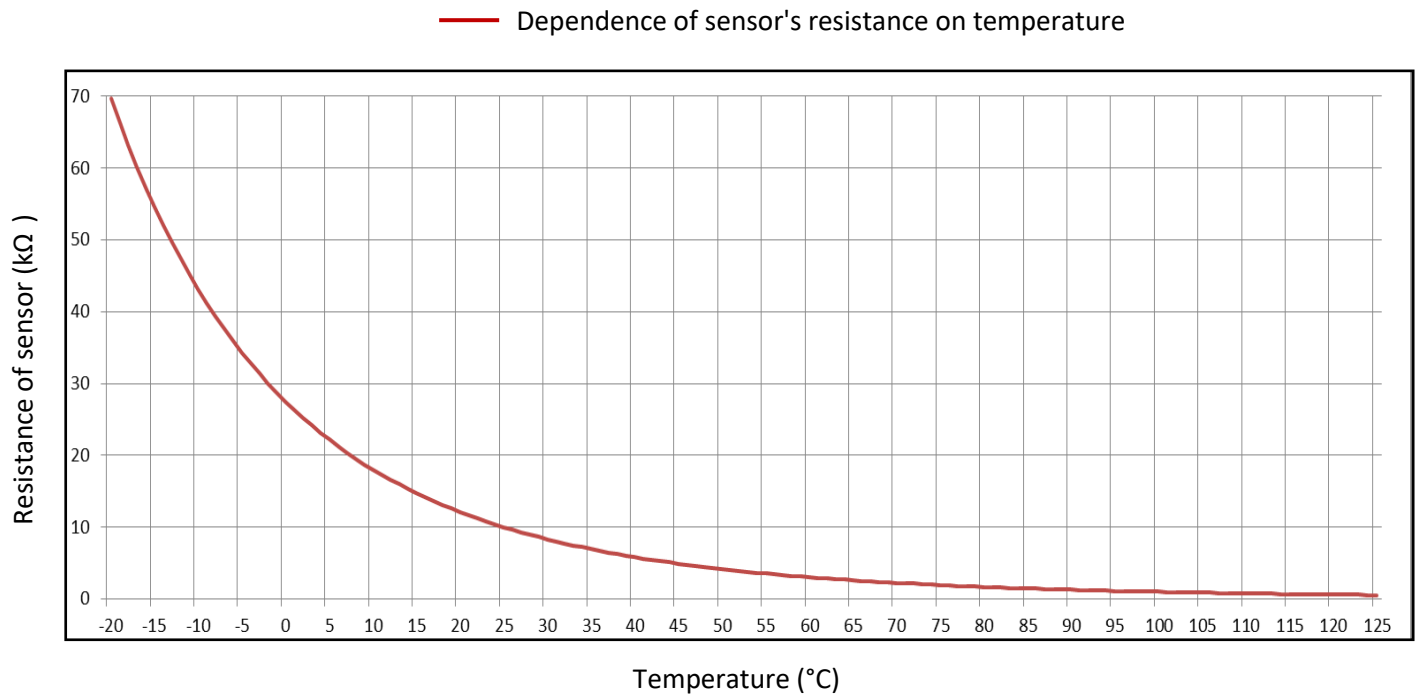
## 8 ERRORS

The installation, assembly and repair of the equipment can only be carried out by qualified technicians.

Symbol	Description	Problem / Checking
<b>Er01 – S1</b>	Probe 1 OFF.	<ul style="list-style-type: none"> <li>Lack of temperature probe. Check for probe.</li> <li>Probe disconnected from controller – Check that the connector is well attached to the electronic plate and/or the connection terminals are secure</li> </ul>
<b>Er02 – S2</b>	Probe 2 OFF.	
<b>Er03 – S3</b>	Probe 3 OFF.	
<b>Er04 – S4</b>	Probe 4 OFF.	
<b>Er11 – S1</b>	Probe 1 short circuit	<ul style="list-style-type: none"> <li>Damaged probe – Measure internal resistance of probe which is approximately 10 KΩ at the temperature of 25° C</li> </ul>
<b>Er12 – S2</b>	Probe 2 short circuit	
<b>Er13 – S3</b>	Probe 3 short circuit	
<b>Er14 – S4</b>	Probe 4 short circuit	
<b>Er20 – TA</b>	Anomaly detected in the water temperature	<ul style="list-style-type: none"> <li>Water temperature in storage water heater is too hot – Check that there is no anomaly in the electronic board, such as a damaged relay.</li> <li>Temperature probes in short-circuit – Measure internal resistance of probe, it should be approximately 10 KΩ at the temperature of 25 °C, check that the connector is well attached to the electronic plate and the connection terminals are in good condition.</li> </ul>
<b>Er21 – DF</b>	Anomaly detected in the defrost cycle (Too many defrost cycles in a short period of time)	<ul style="list-style-type: none"> <li>Measure internal resistance of probe, it should be approximately 10 KΩ at the temperature of 25 °C, check that the connector is well attached to the electronic plate and the connection terminals are in good condition.</li> <li>Low external temperatures</li> <li>Lack of refrigerant</li> <li>Leak on the fluid circuit</li> </ul>
<b>Er22 – LT</b>	Water low temperature alarm	<ul style="list-style-type: none"> <li>Water temperature in the boiler lower than 0 °C.</li> </ul>
<b>Er23 – LP</b>	Protection active system	<ul style="list-style-type: none"> <li>Low Pressure switch – Verify if the switch is well connected in the command panel.</li> <li>Low external temperatures</li> <li>Lack of refrigerant – Incomplete refrigerant charge or leak</li> </ul>
<b>Er24 – HP</b>	Protection active system	<ul style="list-style-type: none"> <li>High pressure switch – Verify if the switch is well connected in the command panel.</li> <li>Fluid circuit obstructed (expansion valve or filter).</li> </ul>
<b>Er25 – FS</b>	Protection active system	<ul style="list-style-type: none"> <li>Lack of water / water circuit obstructed in the solar thermal installation</li> </ul>
<b>LINK ERROR</b>	Communication failure between display and power board	<ul style="list-style-type: none"> <li>Connection cable between display and command panel – Check the cable is in good condition or that the plugs are correctly inserted (display and command panel)</li> </ul>

## 9 PROBE CHART

The probes installed in the equipment (S1, S2, S3 e S4) are NTC 10k $\Omega$ @25°C.



# 10 TROUBLESHOOTING

Problem	Possible Causes	How to Proceed
Failure in electronic board	Power supply failure	Check the power supply Check the corresponding circuit breaker
	Cable damaged or disconnected	Check the integrity of the electronic board's electric circuit
Low water temperature or lack of hot water	Low temperature programmed as the set-point	Adjust the temperature of the set-point. 53 °C from factory
	Error activation	Check the presence of error on electronic board and consult the table of errors
	Cable damaged or disconnected	Check the connection of equipment to the plug Check that the corresponding circuit-breaker is connected Check the integrity of the cables Check that the electrical cable is disconnected from the power board Check electric protection (fuse)
	Vacation mode ON	Turn OFF the vacation mode
	Equipment or compressor OFF	Check "5.4 Start up of the system"
	Use of large amount of hot water	Change the equipment to "BOOST" mode for a fast water heating
	Return of hot water into the cold water circuit (safety device incorrectly installed or damaged)	Shut off the cold water supply valve to switch off the safety device. Open a hot water tap. Wait 10 minutes and if you get hot water, replace the faulty plumbing and/or proceed with the correct positioning of the safety device
	ECO Mode selected and low external temperature	Change the equipment to "AUTO" mode to initiate automatic management of system
Water is too hot and/ or there is steam	Electric heater OFF	Change the equipment to "BOOST" mode for a fast water heating
	Problem with the probe	Make sure the backup electric heater has power supply
	Problem with the safety thermostat	Check error display on electronic board

Problem	Possible Causes	How to Proceed
Too much usage of the electric heater as a backup (auto mode)	Low external temperature	The running of the equipment depends on weather conditions
	Low water temperature	The running of the equipment depends on the inlet water temperature
	Low voltage installation	Make sure the installation is supplied with the indicated value for voltage
	Heat pump Error	Check the error display in the electronic board
	Evaporator blocked	Clean the evaporator
	Fan blocked	Check the status of the fan (dust, wire...)
Low hot water flow rate	Hydraulic circuit blocked	Check the condition of the hydraulic circuit
Water discharge on the safety group	Absence or incorrect sizing of expansion vessel (if leak is not continuous)	Installation and/or correct dimensioning of expansion vessel
	High mains pressure (if leak is continuous)	Check the reducing pressure valve (if installed) Install a reducing pressure valve (if not installed)
Power consumption is abnormally high and constant	Leak or obstruction in refrigerant circuit	Check that the piping is not damaged
	Dire environmental conditions	
Electrical heater not working	Safety thermostat ON	Check the condition of the thermostat
	Defective electric heater	Check the electric heater
Bad odor	Absence of siphon or siphon without water	Install and make sure the siphon has water
Undraining condensation	Drainage circuit blocked	Clean the condensation circuit
	Drain pipe blocked	Check the draing pipe
Too quick consumption of the Mg anode	Over time, the magnesium anode will be consumed. This consumption is normal, resulting of scarification to prevent corrosion of the tank. The consumption rate differs depending on the quality of your water. Is recommended to check the status of your anode at least every year.	

## 11 SYSTEM MAINTENANCE



Before undertaking any maintenance operation on the equipment, make sure it is not plugged to the power supply!

### DANGER

Wait until the fan comes to a complete stop.



Although the coolant in the cooling circuit is ecological, it must not be discharged freely into the environment.

Ecological disposal must be ensured.

## 11.1 GENERAL INSPECTION



The coolant in the device can be handled **ONLY** by a qualified refrigeration technician with valid authorization.

### **DANGER**

During the equipment's useful life, the owner should carry out a general inspection of the equipment, according to the place where the equipment is set up:

- External cleaning of equipment and surrounding areas with a wet cloth;
- Visual inspection of the whole equipment, with the purpose of detecting possible leaks and damaged devices.

## 11.2 DRAINING WATER FROM THE TANK



Remember that the water in the hot water tank may have a high temperature, and therefore a risk of scalding may be present.

Before emptying the hot water tank, allow temperature of hot water to drop to a level at which scalding can no longer occur.

### **DANGER**

After ensuring the water temperature is at a safe level that will avoid burns, follow this procedure:

- Unplug the system from the power supply
- Shut off the water supply valve and open a hot water tap
- Open the system discharge valve

## 11.3 MAGNESIUM ANODE

This equipment has a magnesium anode that together with the building material of the tank will provide an effective protection against corrosion.

The internal shielding of the tank will ensure an effective protection against corrosion contributing to a water quality within the parameters considered normal. However, the characteristics of the water change according to the installation. (See Chapter 4.5 and warranty)

In your living area, the quality of the water can be aggressive to your equipment. So together with the equipment there is a magnesium anode that wears over time, thus protecting your equipment.

The wear of the anode always depends on the characteristics of the water you use. Thus, checking the condition of the anode is very important, particularly in the first years of the installation. To check the condition of your anode, follow these steps:

- Unplug the appliance from the power supply
- Shut off water supply
- Remove pressure (for example, open a hot water tap)
- Unscrew the anode with a suitable tool
- Check the level of wear of the anode and replace it, if necessary
- If the diameter of the anode is less than 15mm, it will need to be replaced

## 11.4 FILTER OF REDUCTION VALVE

To periodically clean the filter of the reduction valve, you should:

- Shut off the water supply.
- Turn anti-clockwise until you remove tension from the spring
- Remove the handle
- Remove filter and clean

## 11.5 CONDENSATE CIRCUIT

Make sure you check the condensate draining system and the drip tray in the maintenance and cleaning service routines of your system. Clean the drip tray used as it may contain accumulated dust from the outside, which may obstruct the condensates drainage holes. Make sure the holes and the condensate outlet pipe are not obstructed.

## 11.6 CLEANING AIR CIRCUIT

Make sure the air inlet filters are not obstructed, if applicable. Inspect at least once a year. The evaporator may have deposited dust. Clean it also but be careful with its fins.



The evaporator's fins are quite thin, so there is additional risk of injuries. Take care not to damage them.

**DANGER**

## 11.7 SAFETY THERMOSTAT

The safety thermostat is deactivated whenever there is an anomaly in the system, so every time you plan to activate it, find out what happened that caused it to change its status mode.

If you were not able to determine what happened and it is still deactivated, contact customer service to have your problem solved.

13-12-2021

# Warranty

This warranty covers all defects to the confirmed materials, excluding the payment of any type of personal damage indemnity caused directly or indirectly by the materials.

The periods indicated below start from the purchase date of the apparatus, 6 months at the latest from the leaving date from our storage warehouses.

5 Years: Stainless Steel (2 + 3 years) \*

2 Years: Electrical components and Moving parts: Monobloc (except cylinder)

Manufacturer Warranty

\*The warranty extension of 3 years, against corrosion of the internal tank (Enameled / Stainless Steel), is conditioned to the submission of:

- Warranty and Check Sheet at maximum 15 days after the installation.
- Documental evidence of the magnesium anode replacement.
- Pictures of the installation where it's shown safety group, expansion vessel, hydraulic and electrical connections

In case of warranty, the parts replaced are property of the manufacturer. A repair under the warranty is not reason for an extension of its term.

## Warranty Exclusions

The warranty ceases to be effective when the apparatus is no longer connected, used or assembled in accordance with manufacturer instructions, or if there has been any form of intervention by unauthorized technicians, has the appearance of modifications and/or if the series number appears to have been removed or erased. The equipment should be installed by qualified technicians according to the rules in effects and/or the rules of the trade, or the instructions of our technical services. Further exclusions from warranty:

- Hot water tanks have been operating in water with the following indexes:
  - Active chlorine > 0.2 ppm
  - Chlorides > 50 mg/l (Inox)
  - Hardness > 200 mg/l
  - Conductivity > 600  $\mu$ S/cm (20 °)
  - PH < 5.5 or PH > 9 (Sorensen at 20 °C).
- Parts are subject to natural wear and tear - levers, switches, resistances, programmers, thermostats, etc.
- Breakdown due to incorrect handling, electrical discharges, flooding, humidity or by improper use of the apparatus.
- The warranty lapses if it is transferred to another owner, even if within the guarantee period.
- The warranty lapses if this certificate is incorrectly filled in, if it is violated or if it is returned after more than 15 days have passed since the purchase date of the apparatus.

**WARNING: The cost of technical assistance even during the warranty period shall be borne by the customer (km and time for assistance). If the damage is proven and technical assistance requested, the customer will pay for the time lost in the technical assistance.**

## General warranty terms

Viz. <http://www.dzd.cz/cs/servis/zarucni-podminky>