

# JBG<sup>HT</sup>

## USER'S MANUAL

HEAT PUMP



ZHHS-01-10K-R290-V5-M | ZHHS-01-15K-R290-V5-M

**CAUTION!**

IT IS ESSENTIAL TO READ THE  
INSTRUCTION MANUAL BEFORE USE!

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Translation of the original manual



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## 1. IDEA OF ACTION

The principle of the heat pump is to collect heat from the so-called low-temperature lower source (-20°C to +35°C) and transfer the heat to the high-temperature upper source (CH and/or DHW system). This process is carried out with electricity supplied to the compressor drive. In systems with a heat pump, it is possible to use both the hot side (upper source), e.g. for heating purposes, and the cold side (lower source - air), e.g. for air conditioning or refrigeration.

In the heat pump settings, we can select the following modes of operation:

- CH - central heating,
- DHW - domestic hot water,
- CH + DHW - central heating + domestic hot water,

## 2. SAFETY

**Before using the device, it is essential to read the instruction manual. Failure to follow the instructions may lead to improper operation of the device, malfunction, and may cause a risk to the health and life of those operating the device.**

### 2.1. Marking system



Attention - important content. Procedure to which special attention should be paid.



Caution - moving parts



Caution - a task that requires special attention. Very important information regarding use.



Caution - harmful substance, risk of suffocation



Electricity - information about the electrical system, tasks related to connecting the device to the electrical network.



Caution – risk of explosion.



Gloves - activities that require additional personal protection.



Caution – sudden (loud) noise



A ban placed on electrical and electronic devices reminding the public not to throw items in trash containers.



Caution – automatic activation



Caution - hot surfaces.



Caution – low temperature



2.2. Wichtige Warnhinweise



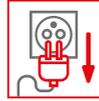
The device is not intended for use by children



Read this manual before use.



Assembly, disassembly, installation work and maintenance of the device must be performed by qualified personnel. It is forbidden to make any changes to the structure of the unit. Failure to do so may result in injury to persons or damage to the unit.



Before performing any operations on the unit, make sure that the electrical power to the heat pump unit is turned off.



The power supply to the device must be grounded. Ensure that the power supply complies with the device specifications.



The device should be kept away from environments that are flammable or corrosive.



A dedicated electrical connection should be used to power the device, otherwise, failure may occur.



Do not touch the grille of the air exhaust and outlet.



Do not direct a stream of water directly on the housing of the device.



All ventilation ducts, air inlet and outlet must not be shielded, blocked, ensure free air flow around the device.



If the power cord is damaged, take the device out of service and call a qualified person to repair it.



It is mandatory to use a suitable main switch for the heat pump. The location of the main switch and access to it must not be difficult.

### 2.3. User information and hazards

1) 1. Hazards as a result of product changes.



- Never remove, bridge or block safety devices.
- Do not tamper with safety devices.
- No changes may be made to the product, to the supply lines, to the safety valves.

2) Risk of personal injury and property damage due to improper maintenance and repair or failure to do so.



- Maintenance should be carried out annually before the heating season.
- It is forbidden to carry out any repairs or maintenance work yourself.
- Have an authorized installer perform repairs and maintenance work.
- Adhere to the designated maintenance intervals.

3) Risk related to improper use.

Improper operation can lead to damage to the heat pump, danger to people operating the device and other people in the environment.

4) Risk of burn injury.



Installation pipes may be hot during installation operation. Never touch uninsulated installation pipes

5) Risk of malfunction due to improper electrical supply.



- The electrical supply should be in accordance with the ratings shown on the nameplate.
- Power supply of the device from the power grid, 3-phase: ~400V (+10/-15%), 50Hz

6) Risk of environmental pollution from leaking refrigerant.

The product contains refrigerant R290 called natural refrigerant gas. The GWP rating of this refrigerant is 3.



- Only an installer with the proper licenses issued by the manufacturer and protective equipment may perform installation and maintenance work.
- In case of repairs, do not use sparking devices or other devices that can cause an ignition of the refrigerant.

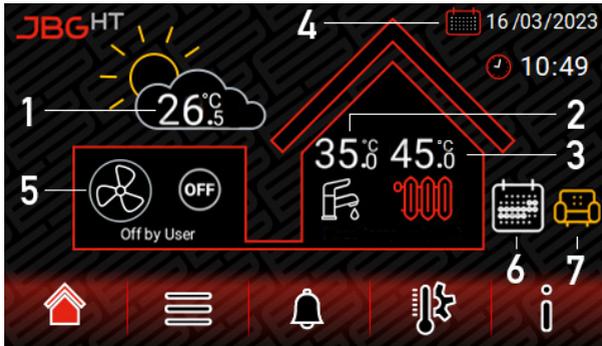


- Do not use open flames or other devices that can heat up the temperature to 370°C in the heat pump environment.
- In the event of a leak or suspected leak of refrigerant, immediately turn off the unit. Then remove any equipment from the environment that may be a potential source of fire and contact the service department.



### 3. STARTING UP THE HEAT PUMP

#### 3.1. Controller Main Screen



Visualization of pump operation:



heating mode



stop by alarm



fan operation



pump off



defrost



shutdown mode



standby mode

1 – outdoor temperature

4 – current date and time

6 – active calendar

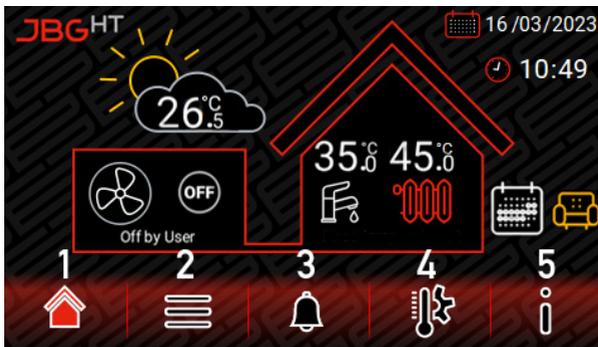
2 – DHW temperature

5 – heat pump status (mode)

7 – installation operation mode

3 – CH temperature

#### 3.2. Menu Icons



1 – home screen

3 – alarm

5 – Info (About)

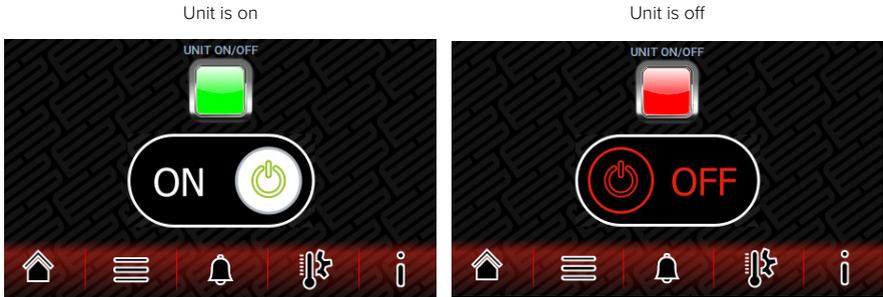
2 – options and settings

4 – CH i DHW temperature setting

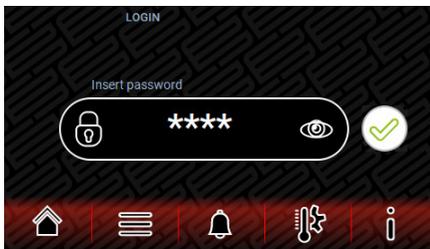


if there is a number next to the icon it means the number of active alarms

## 3.3. Turning on and off



## 3.4. Logging in



Access to the "Options and Settings" is password-protected.  
Default passwords:  
- User: 1234

## 3.5. Options and settings



Calendar CWU – DHW schedule  
Calendar CH – schedule plant  
Device – advanced settings  
Parameter – Heater settings  
Settings – Date/time and other  
Service – service technician settings

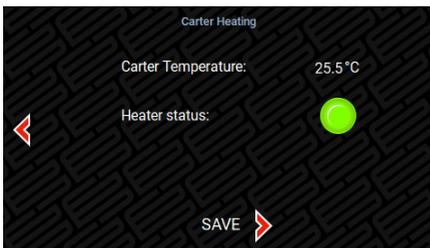
## 3.6. Quick Guide

Quick Guide is a procedure to go through during the first startup that allows you to set the basic parameters of heat pump operation. At any time, the user will be able to return to this procedure to change the settings he or she previously selected. To start the Quick Guide, go to Settings in the Options and Settings Menu, and there select the "Quick Setup" field.





Next, set the current date and time.



The next step is to heat up the crankcase. Running the heat pump without a heated crankcase can result in errors and is dangerous for the compressor.

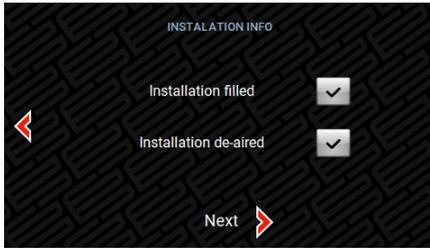


Once the compressor crankcase is warmed up, select the mode in which the heat pump will operate. There are three modes to choose from:

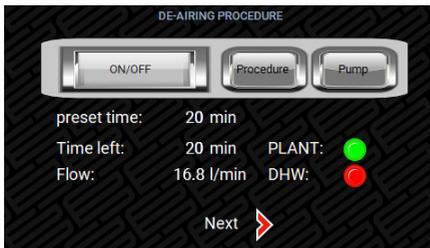
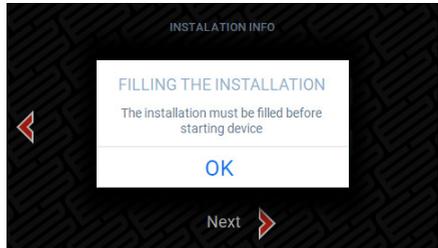
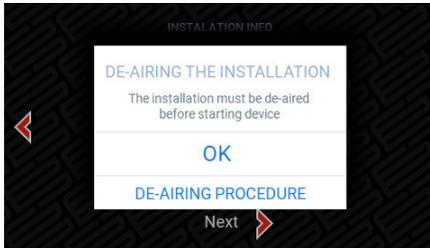
- PLANT (Central Heating)
- DHW (Domestic Hot Water)
- PLANT + DHW (Central Heating + Domestic Hot Water)



The next step is to select the temperature sensor that will be the master sensor in the control algorithms.



Before starting the heat pump, the system must be filled and vented. If these actions are not performed, the controller will not allow you to proceed to the next step until you complete these steps.



If venting has not been performed, select "Venting procedure". Then, after selecting the "START" field, the circulation pump will run in cycles:

- 5 min CH mode 100% power
- 5 min CH mode 0% power
- 5 min DHW mode 100% power
- 5 min DHW mode 0% power

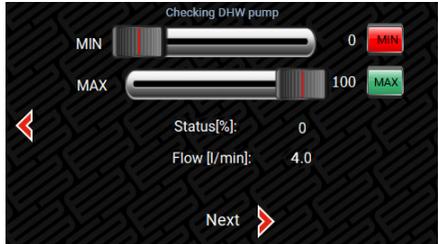
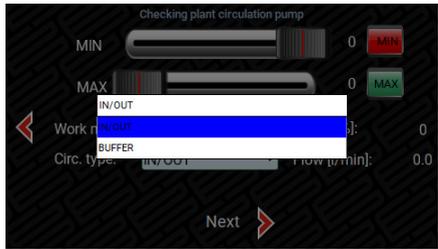
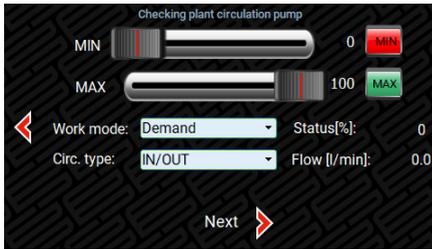
The cycles work in a loop.

The next step is to check whether the circulation pump is working properly. To do this, you force the maximum flow rate and observe the reading from the flow meter. If there is no flow, you cannot proceed further. If there is no flow, you should:

- check that the relevant valves are open
- check the correct installation of the flow meter
- check that the pressure gauge (manometer) shows the pressure in the system
- check that the green light on the circulation pump is on
- check the correctness of the electrical connection of the circulation pump and the flow meter

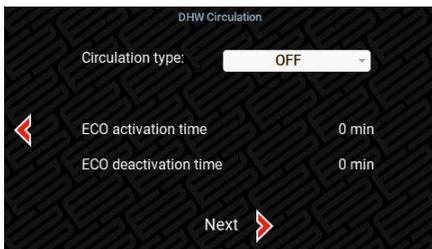
The minimum medium flow rate should be set at 9 l/min for the 10K pump and 12 l/min for the 15K pump, and the maximum flow rate should not exceed 28 l/min for the 10K pump and 35 l/min for the 15K pump. It is very important to set after which sensor the compressor regulates. For users with a buffer, it is recommended to set the regulation after the temperature of the water in the buffer. Otherwise, the Inlet/Outlet type of regulation should be selected, along with specifying that the start and ongoing regulation are to be after Outlet. The recommended mode of operation is "Always On." When the heat pump is switched to hot water heating mode, you may find that the maximum flow rate will be different from that of central heating operation. Set the appropriate minimum and maximum values for DHW mode as well.





If the user has a DHW circulation pump, its operation algorithm should be set. The following modes are available:

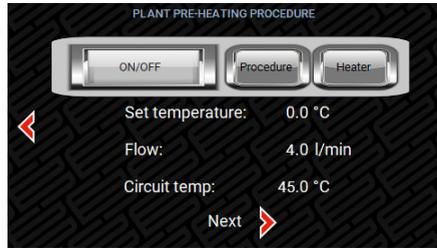
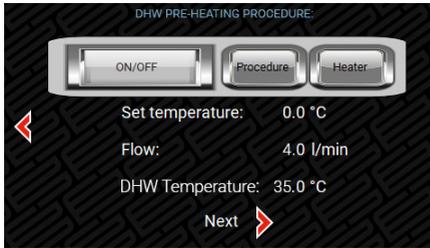
- **OFF** – always off
- **ON** – always on
- **ECO** – Ecological mode operating cyclically according to the setting of the following parameters  
 ECO switch-on time: the period of operation in ECO mode  
 ECO switch-off time: standby period in ECO mode
- **CALENDAR** – always on when DHW heating is active in the calendar
- **ECO CALENDAR** – operation as in ECO mode when DHW heating is active in the calendar



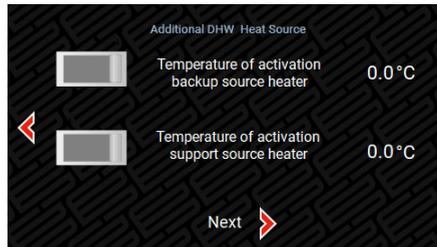
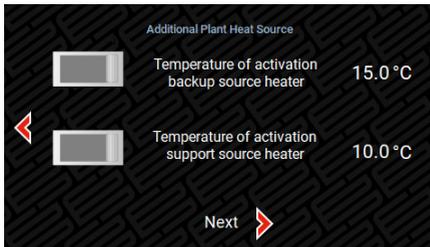
In addition, the control mode is selected. “Delta” ensures that a temperature difference of 5K is maintained between the inlet and outlet water temperatures of the exchanger, while “Fixed” gives you the option to set a constant flow rate.

## USER'S MANUAL – HEAT PUMP

Before starting the heat pump, it is necessary to ensure that the water temperature in the circuit is at a minimum of 18 degrees Celsius. For this purpose, a pre-heating procedure has been created, which allows you to heat the water in the CH and DHW circuit to the set temperature with an electric heater.



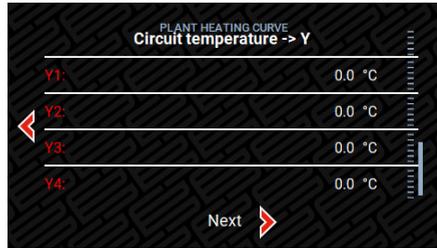
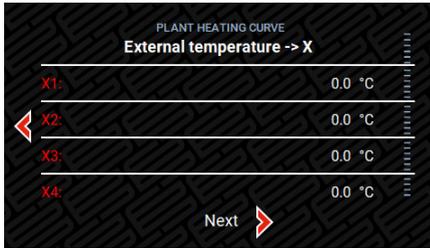
It is necessary to set the ambient temperature below which, if there is a demand, the auxiliary heat source (electric heater by default) will start. Below the booster temperature, the heater starts up for a certain period of time if the heat pump has not reached the set temperature, and in addition, the return temperature has not risen for a long time. Below the bivalent source switch-on temperature, the heater starts permanently until the demand is met.



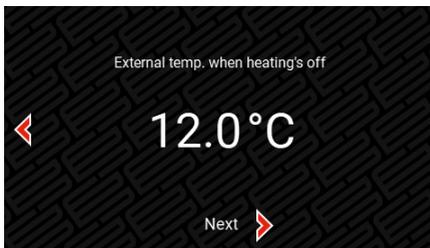
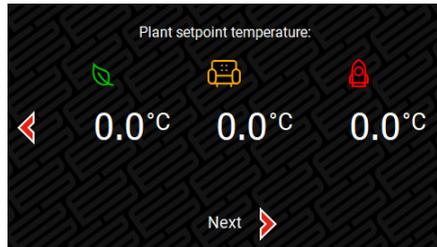
Next, you need to set the heat pump control method. There are two modes: heating curve and temperature setting.

In the "heating curve" mode, the algorithm works in such a way that four outdoor temperature points and their corresponding supply temperatures are set. This means that at a given ambient temperature, the compressor will adjust its speed to achieve the outlet temperature setpoint at that point. For ambient temperatures between the designated points, the setpoint is calculated by interpolation. The exceptions are the limit points X1 and X4, beyond which the setpoint no longer changes. The heating curve is baseline. For Pre-Comfort Comfort and Economy modes, the heating curve offset value is set, i.e. by how many kelvins for these modes the heat pump is to have a higher/lower setpoint.

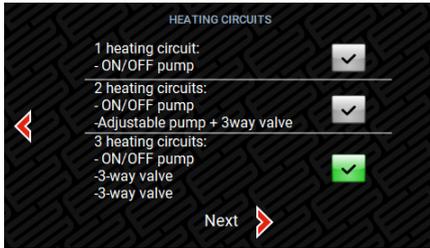




For the “temperature setpoint” mode, the CH temperature setpoints for Economy, Comfort and Pre-Comfort modes are set directly. Then, for both the “heating curve” and “temperature setpoint” modes, three fixed hot water temperature setpoints are set.

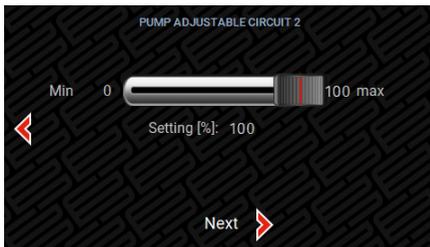
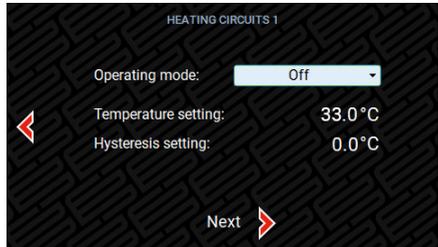
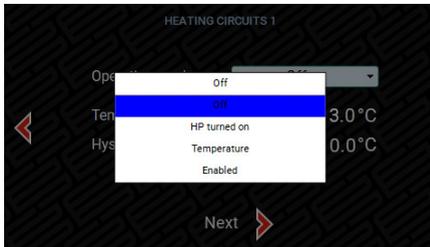


It is also necessary to set a positive limit temperature for which the heat pump will be turned on. The possibility of starting the heat pump is controlled by a relay with a hysteresis of 1°C. For example, selecting a limit temperature of 12°C, after reading 11.5°C from the outside temperature sensor, the heat pump will turn off, while start-up will be possible when the temperature drops below 12.5°C. In order for the algorithm to work, the switching conditions must be met for a certain period of time.



The next window selects how many heating circuits the user has. Depending on your choice, the appropriate windows will be displayed later.

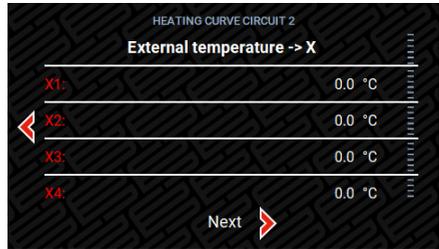
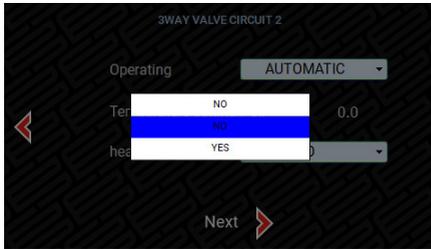
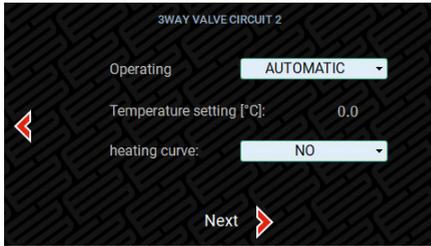
The next step is to configure the CH buffer pump (if any). This is the circulating pump after the buffer that unloads the buffer. You can set this pump to be off all the time, on all the time, on only when the heat pump is on, or make adjustments based on the temperature in the buffer. Then set the temperature you want the buffer to reach, as well as the hysteresis. If the temperature of the water in the buffer exceeds the set point, then the pump will start and unload the buffer. The process will continue until the temperature drops below the setpoint - hysteresis value.



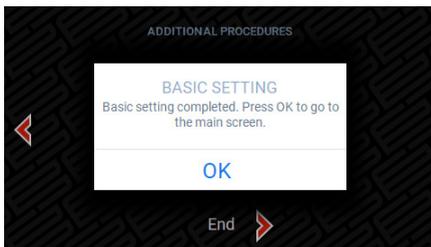
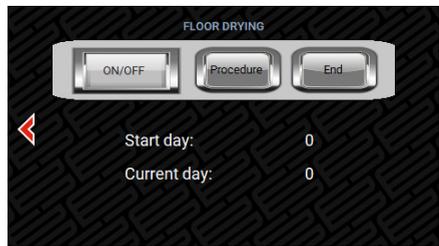
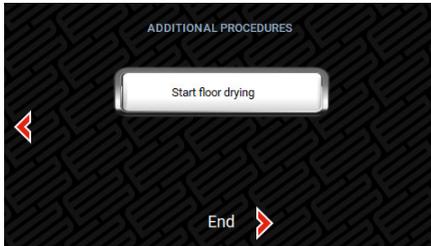
If two heating circuits have been selected, then in the next window the fixed working value of the second heating circuit pump expressed in percentage is set.

Next, the parameters for the operation of the mixing valve of the second heating circuit are set. You can set a fixed percentage of valve opening or automatic operation. In addition, it is selected whether the desired temperature of the second heating circuit is to be fixed (then it should be entered) or is to be regulated according to the heating curve. If the mode with three heating circuits is selected, then instead of the regulated pump of the second circuit, the control output is used for another mixing valve and analogous variables are set for the valve of the third circuit as for the valve of the second circuit.





After setting the parameters, the floor dehumidification option can be started before the first startup. It consists of heating for 30 days to a set temperature imposed by the algorithm. Each day the setting is changed. The mode can also be started from a day other than the first day.



After completing the whole initiation procedure, you can start the heat pump.

3.7. Time-dependent modes

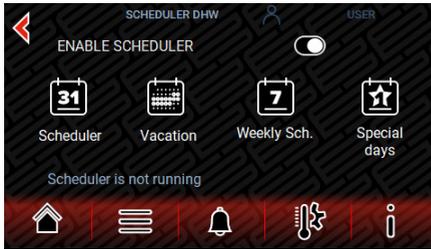


CH operation point  
Measured value

DHW operation point  
Measured value

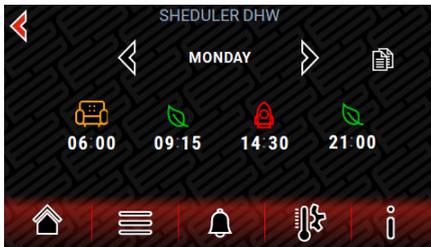
Settings should be made for the various available modes of operation.

3.7.1. CH/DHW Calendar



Calendar activation

3.7.1.1. Calendar



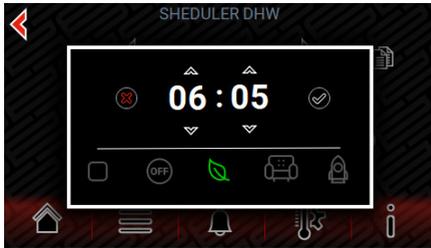
Operation modes of the installation during schedule activity:

- Inactive
- Comfort
- Off
- Boost
- Economic



**3.7.1.2. Setting a schedule**

The working day of the unit can be divided into 4 periods, for which you need to set a time interval and assign an operating mode.

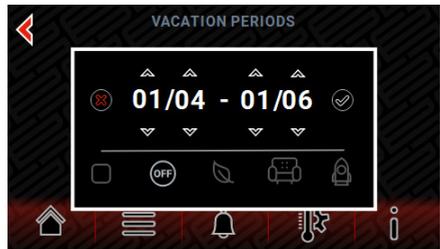


The value is changed by operating with the up and down arrows.

Confirm  and cancel .

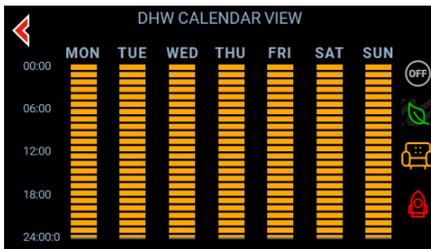
The icon  can be used to copy the settings parameters of one day to the next.

**3.7.1.3. Vacation Periods**



Setting vacation periods is implemented by selecting a date range. Within this range, the pump will operate in the selected mode, regardless of the settings of the standard calendar.

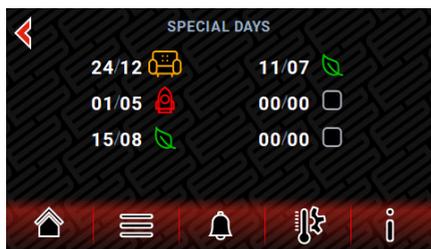
**3.7.1.4. Week view**



The weekly calendar is presented in the form of colored bars that show the mode set.

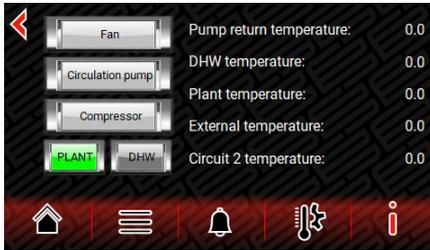
Activities are according to the colors of the mode icons on the right. Clicking on the bar of each day takes you to the day settings.

**3.7.1.5. Special days**



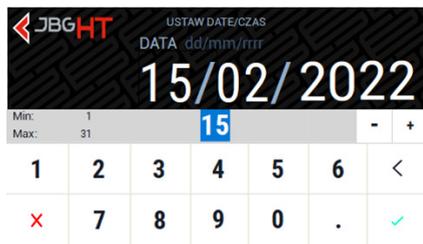
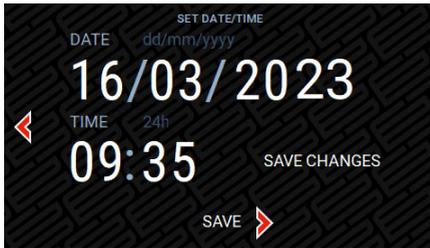
It is possible to set up to 6 special days on which the heat pump will operate in the selected mode independently of the standard operating calendar. We can freely choose the mode of operation on a given day. Clicking on the date will bring up the setting window.

## 3.7.2. Information



After entering Information from the main screen, the user can view the values of the basic parameters of the heat pump.

## 3.7.3. Date and time



## 3.7.4. Manufacturer

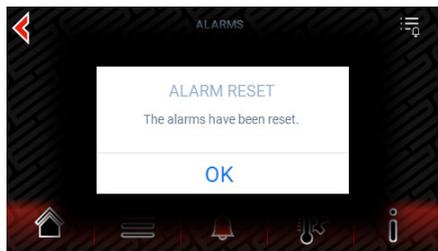
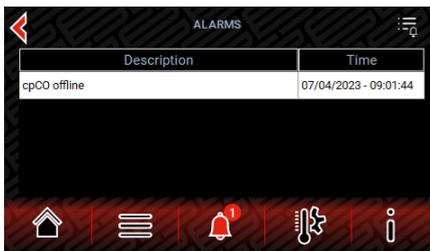
This option is for the Heat Pump Manufacturer only.

## 3.7.5. Service

This option is for the Heat Pump Service Technician only.

# 4. ALARMS

If an alarm occurs, it will be displayed on the main screen under the bell symbol. When this button is pressed, it will be displayed when and what error occurred. To reset the alarms, hold down the bell symbol for a few seconds.



## HEAT PUMP STARTUP CHECKLIST

### HEAT PUMP INSTALLATION

Was the device installed according to the instructions (according to the installer's statement?)  YES\*

#### Indoor unit:

Installation site is dry and protected from frost  YES\*

Installation spacing is maintained  YES\*

The unit has been leveled  YES\*

#### Outdoor unit:

Installation spacing is maintained  YES\*

The unit has been leveled  YES\*

Ground mounting  YES\*, height above ground: .....cm

Type of assembly: stand + rubber feet  YES / optional rubber base  YES

Acoustic separation (the water system does not transmit vibrations to the building structure)  YES\*

#### Outdoor unit – Protective Area:

Dimension of the protective area in accordance with the requirements of the installation instructions  YES\*

No openings in the building (windows, vent openings, doors, etc.)  YES\*

No open lines in the sewer system, or cavities where escaping refrigerant could accumulate  YES\*

No ignition sources (lamps, electrical sockets, lights, etc.)  YES\*

#### Condensate drainage:

No direct connection to the sewer system  YES\*

Gravel ballast/absorbent substrate  YES\*

Heating tube inserted into the condensate drain funnel and connected  YES\*

No siphons in the condensate drainage  YES\*

Condensate drain protected from frost  YES\*

Checking the free movement of condensate drainage  YES\*

\* - mandatory fields - condition for unit activation

### Heating circuit installation:

Installation in accordance with the manufacturer's recommendations  YES\*

New installation  Upgraded installation

Heating type: surface  / heaters  / other

Correctly connected supply and return pipes of central heating circuits  YES\*

Safety valve has been installed  YES\*

Outer pipes in UV- and high-temperature-resistant insulation  YES\*

Thickness of external pipe insulation according to the requirements  $\lambda \leq 0,035$  (Dz.U z 2017r. poz. 2285);  YES\*

- inner diameter of the pipe less than 22 mm - insulation thickness of 20 mm;
- inner diameter of the pipe from 22 to 35 mm - insulation thickness 30 mm;
- inner pipe from 35 to 100 mm - insulation thickness equal to the inner diameter of the pipe;
- inner pipe more than 100 mm - insulation thickness of 100 mm.

Dirt filter installed on the return of the heating system  YES\*

Installed magneto-demulsifier on the return of the heating system  YES\*

The minimum water charge necessary for proper operation and defrosting of the outdoor unit is provided.  YES\*

The minimum required water flow through the system has been ensured  YES\*, amounts to ..... [l/min]

An expansion vessel was installed, the capacity of the vessel ..... L  YES\*

Additional vent valves  YES ..... units

Shut-off valves on the supply  on the return

Drain valves on the supply \* on the return \*

Number of heating circuits  one  two

### Water in the central heating + DHW system (according to the installer's statement):

Heating water quality in accordance with the requirements of the instructions  YES\*

Heating system pressure ..... bar

Checked for leaks in the installation  YES\*

The installation was flushed prior to connecting the equipment  YES\*

Installation filled and vented  YES\*

DHW safety group installed  YES\*

Checking the correct operation of the water pump and the direction of flow  YES\*

\* - mandatory fields - condition for activation of the device



## System separation:

Heat exchanger installed  YES  NO If yes:

Type of antifreeze in the heat pump circuit: .....

Freezing point .....°C

Heat pump circuit vented (according to the installer's statement)  YES\*

Heat pump circuit pressure .....bar

Connecting the buffer in parallel  / in series

## Notes:

## ELECTRICAL INSTALLATION

All electrical connections of modules and devices were routed according to the diagram  YES\*

Electrical wires protected inside the electrical box against pulling out  YES\*

Access to the electrical system, circuit breakers and protection is provided  YES\*

Protective and grounding wires connected  YES\*

Temperature sensors connected according to the instructions  YES\*

Control wires and sensors routed at a distance of min. 100mm from power wires  YES\*

Correct 3-phase power cable used min. 5 x 2,5mm<sup>2</sup>  5 x 4mm<sup>2</sup>  \*/\*\*

The correct overcurrent circuit breakers were used for the units:

- ZHHS-01-10K-R290-V5: 16A C characteristics, 3-phase, 3L+N  YES\*
- ZHHS-01-15K-R290-V5: 25A C characteristics, 3-phase, 3L+N  YES\*

In both cases for the controller: overcurrent circuit breaker 6A characteristic B, 1-phase, 1L+N  YES\*

RCD differential protection used: 100mA, AC  YES\*

In case of option with a heater:

An overcurrent circuit breaker for the heater was used: 16A characteristic B, 3-phase, 3L+N  YES\*

## Notes:

\* - mandatory fields - condition for activation of the device

\*\* - the wire should be selected according to the parameters of the fuse used

## SETTINGS, COMMISSIONING, HANDOVER TO USER

Installation Assistant successfully completed  YES\*

Set operating mode  CH /  CH+DHW /  DHW

Set target temperature CH: heating curve  / fixed value .....°C

Set target temperature of DHW: fixed value .....°C

Additional heat source  none  volt-free contact  integrated heater

Bivalent point C.H. ....°C

DHW bivalent point .....°C

### Handover to User:

Heat pump instruction  YES\*

Safety instructions on R290 refrigerant  YES\*

Function and location of safety devices  YES\*

Information on regular maintenance and inspections  YES\*

Instructions and product documentation have been provided  YES\*

### Notes:

\* - Pflichtfelder – Voraussetzung für die Inbetriebnahme







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**Siedziba główna / Produkcja**  
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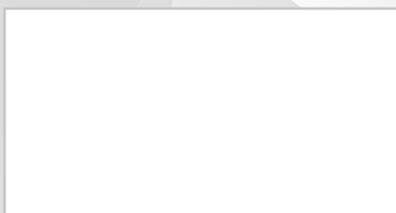
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