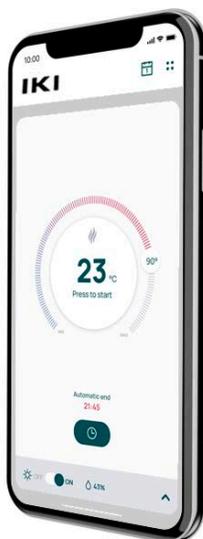


IKI

powered by



UKU WiFi

ENG

**CONTROL SYSTEM
OF ELECTRIC SAUNA HEATER**

3-22

FR

**SYSTÈME DE COMMANDE
DE CHAUFFE-SAUNA ÉLECTRIQUE**

23-42



IPX4





4041 0799
Printed matter

UKU WiFi/LOCAL

HEATER CONTROL CONSOLE

Installation And User Instructions

ATTENTION! The following instructions for electrical works must be carried out by a certified electrician.

ATTENTION! Main module can be used with heaters up to 11 kW.

ATTENTION! This appliance is not intended for use by people (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

ATTENTION! Children should be supervised to ensure that they do not play with the appliance.

ATTENTION! The installation instructions for appliances for public saunas that do not have a timer shall state that a pilot lamp showing that the heater is switched on is to be installed in the attendant's room. For installation in public saunas, a separate timer compliant with UL 60730-1 and UL 60730-2-7 along with CSA E60730-1 and CSA E603730-2-7 standards must be used.

The devices set includes:

- UKU control panel;
- Main module ($6\frac{7}{8} \times 9\frac{27}{32} \times 2\frac{15}{16}$ in / 175 x 250 x 75 mm);
- Temperature sensor;
- Door sensor;
- Temperature and door sensor cables (197+197 in/5+5 m; 2×28 AWG);
- UKU control panel cable (118 in/3 m; 4×22 AWG).

ATTENTION! Keep this operating manual near the device so that at any time you can get safety and important information for using the device.

BEFORE INSTALLATION

- **Before installation read the operation manual thoroughly. This way you can use all the benefits of the device and prevent damage.**
- Only a licensed electrician may install the device.
- Installation and maintenance of the device are only allowed when it is not under voltage.
- For unique problems that are not covered in the installation manual, contact your vendor to ensure safety.
- It is not permitted to alter or rebuild the control device without authorization.
- The manufacturer has the right to make improvements to the device. The latest version of the operation manual can be found on the webpage (www.huumsauna.com)
- Make sure supply conductors are properly sized per tables, new wiring is recommended. Install on a dedicated circuit.
- It is recommended to connect the unit to the mains without a GFCI breaker.
- UKU control system allows the sauna temperature to be set between 104-230°F / 40 and 110°C

Symbols used in the installation manual:

WARNING! Not following these instructions may lead to serious or fatal injuries.

CAUTION! Not following these instructions may lead to minor to semi-serious injuries or cause damage to objects.

ATTENTION! Also, follow the special safety requirements given in the individual chapters. Dispose the packaging material according to the applicable disposal rules and regulations.

In the guide, the following details of the sauna are marked with numbers:

- 1 UKU control panel
- 2 Main module
- 3 Door sensor
- 4 Temperature sensor
- 5 Heater (not included)
- 6 Vaporizer (not included)
- 7 Light (not included)

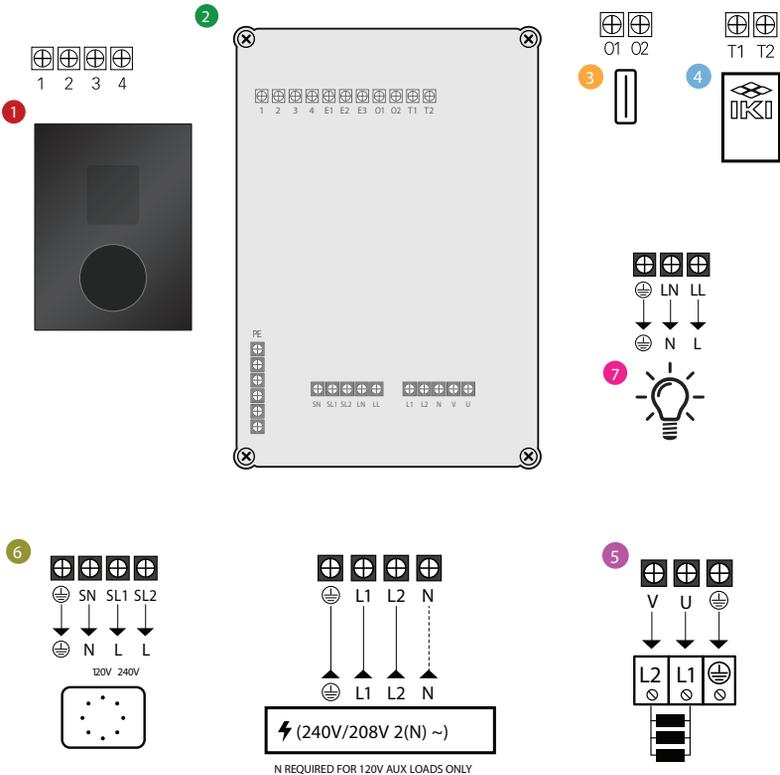
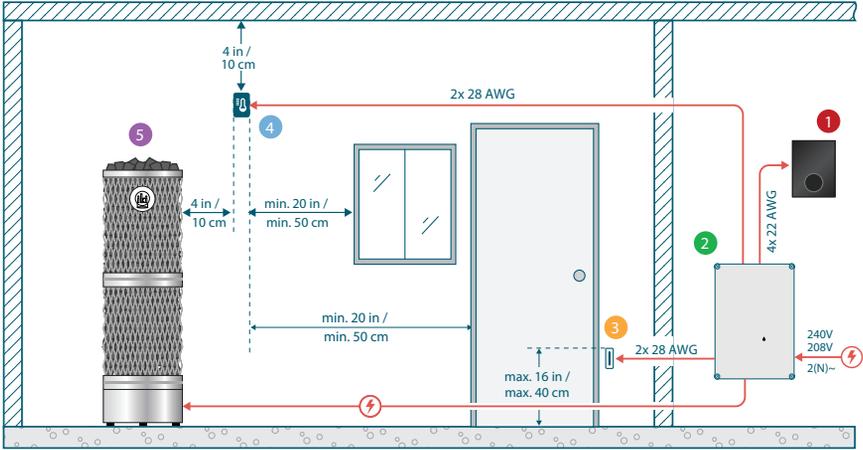


Figure 1. Electrical connections of the heater.

INSTALLING UKU ELECTRICAL CONTROL DEVICE

- Before installation disconnect the electric heater from the power supply in the panel.
- The control panel **1** must be installed outside of the sauna room, at the user's eye level next to the door.
- If your main module **2** supports the use of the WiFi connection it must be installed where sufficient reception is available.
- The main module must be installed in a dry location. The device has a protection degree of IPX4. Power cables must be secured using the provided cable glands.
- To prevent damage to the main module, a room temperature of 122°F (50°C) and relative humidity of 95% must not be exceeded.
- Before powering the control panel, it must be made sure that the main module is sealed so that no humidity can access the inside.

CAUTION! The main module must be permanently connected. A circuit breaker must be installed to disconnect all poles from the mains. The power cables of the main module must meet the requirements of UL 62 in the US and CSA 49 in Canada, with a minimum temperature rating of 140°F (60°C). The gauge of the cables depends on the power of the heater; refer to the heater manual for guidance. Always let the correct cable size be approved and installed by a qualified electrician.

ATTENTION! Crimping the power cable ends is mandatory. The compression of the metal sleeve ensures that the wire threads are held in place, minimizing the risk of loose connections that can cause electrical faults or pose safety hazards.

ATTENTION! A method to disconnect all poles from the mains (a circuit breaker) must be installed on the power circuit.

ATTENTION! Measure the lengths of the cables and determine the locations of the cables and the parts of the device (Figure 1).

CONTROL PANEL 1

WARNING! To avoid over-threading the screw threads, tighten the screws only by hand. Do not use electric screwdrivers.

- The cable of the control panel should not exceed 20 m / 65 ft.
- The cable of the control panel should not be routed parallel to the high current cables.

Control panel with glass case

The control panel with glass case is recessed into the wall. Before installation, make a recess in the wall with dimensions of $2^{5/16} \times 4^{9/64} \times 1^{1/16}$ in (65 x 105 x 27 mm) in the desired place.

Installation steps:

- Remove the protective film of the glass and the control panel button.
- Remove the glass. The glass is fixed with magnets.
- Connect the cable following the numbering.
- Choose fasteners according to the material of the wall.
- Attach the control panel to the wall.
- Carefully place the glass back on the control panel housing.
- Install the button.

ATTENTION! If the wall where you install the glass control panel contains conductive materials (such as metal insulation) that could come into contact with the screws securing the cables on the back cover of the panel, cover the screw heads with insulating tape to prevent a short circuit.

In sauna rooms, where the recessing of the control panel is not possible due to construction or surface finish, it can be attached to the wall using the control panel mounting frame. The mounting frame is an additional product that you can ask your IKI distributor.

MAIN MODULE 2

- The main module can be used with heaters up to 11 kW. For more powerful models, you need to use an extension box.
- The main module should be installed outside of the sauna/steam room and placed in a weatherproof housing to protect it from direct contact with water, snow, and condensed water. The main module is capable of functioning in temperatures as low as -40°F (-40°C) ; however, it is important to note that the display may experience slowdowns at these extreme temperatures.
- If installing outside is not possible, the main module can be mounted inside the sauna room. It should not be positioned higher than 4 inches (10 cm) and must be at least 6 feet (180 cm) away from the heater, ideally under the sauna bench. The maximum working environment temperature for the main module is 122°F (50°C).
- When mounting the main module, please make sure that you are always able to open the access panel.
- Do not attach the main module to the ceiling or inclined surfaces.
- The screw holes for fixing the main module to the wall are located under the fixing screws of the device cover.
- Fix the main module on the wall in an upright position using four screws, ensuring that the cable openings face downwards. Screws are not included.
- Connect the cables of the UKU control panel, temperature sensor, and door sensor through a cable glands to the enclosure and main module, see figure.
- Connect the power cable (240V/208V 2(N) ~) through the cable glands to the main module.

WARNING! If the cable glands are not used, the IP class of the device does not apply!

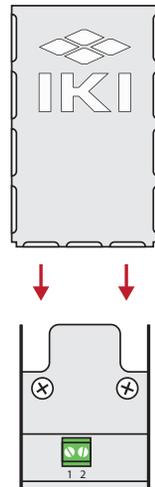
DOOR SENSOR 3

The door sensor kit includes a sensor, magnet, and magnet fixing tape.

- The length of the cable between the sensor and the main module should not exceed 32 ft (10m).
- Install the sensor on the handle side of the door frame, at a maximum height of 16 in (40 cm) from the floor. When installed higher, the temperature may affect the performance of the magnet and the durability of the magnet tape.
- It is important to ensure that the door passes directly by the sensor in the door.
- Use a 13/64 in (5mm) diameter drill when installing a door sensor recessed in the door frame.
- Drill a hole and install the sensor.
- Connect the cable to terminals O1 and O2 in the main module. Connect the other end of the cable to the cables attached to the door sensor.
- Install the door sensor magnet to the door leaf using the provided double-sided tape.
- When closing the door, the sensor and the magnet should remain slightly displaced, and the distance between them should not exceed 0.4 in (10 mm).

TEMPERATURE SENSOR WITH OVERHEATING PROTECTION 4

- The length of the cable between the temperature sensor and the main module should not exceed 32 ft (10m).
NB! The temperature sensor should not be located above the heater, but 4 in (10 cm) from the outer edge of the heater.
- The temperature sensor must be 4 in (10 cm) from the ceiling.
- The temperature sensor must be at least 20 in (50 cm) from the corners of the steam room and air openings (ventilation, door, window).
- If the heater is located in the center of the sauna room, the sensor can be installed on the ceiling. It should remain 4 in (10 cm) away from the edge of the heater.
- Connect the cable to the temperature sensor's screw connectors, see figure.
- The temperature sensor consists of the rear and front case halves. Attach the back side to the wall with two screws, ensuring it is straight.
- Install the front half as shown in the figure on the right.



STEAMER 6

- The maximum power of the steamer is:
 - 1250W, 120V/60Hz;
 - 2500W, 240/60Hz.
- Connect **SL** (phase) **SN** (neutral) to the outputs of the steamer. To connect, see the figure.
- After connecting the steamer, turn on the steamer function in the control panel settings. See the “**Humidity settings**” section of the operation manual page 16.

ATTENTION! When connecting the control system with an electrical heater with a steamer function ensure that the water tank is always filled with water. When the water tank is empty, the steamer function is disabled and there is a risk that the heating element may burn out.

ATTENTION! The steamer cannot be used with target temperature above 194°F (+90°C).

VENTILATION DEVICE / LAMP 7

- It is possible to connect a lamp or a ventilation device to the outputs **LL** (phase) **LN** (neutral) of the main module. To connect, see the figure 1.
- The maximum power of an incandescent lamp/ventilation device is 120V 100W and with LED lights 120V 50W.
- After connecting the device, turn on the “**Vent/Lamp**” function in the control panel settings, see the corresponding section on page 14 in the operation manual.
- If the lamp or ventilation device is connected and the corresponding function is active in the menu, you can turn the connected device on and off using the control panel.

Connecting the UKU WiFi controller to the network

- The WiFi modem complies with 802.11 b/g/n standard.
- The main module supports only 2.4 GHz WiFi networks.
- The connection will fail if your 5 GHz or 6GHz network is with the same name as 2.4 GHz one.

ATTENTION! The main module doesn't support WiFi network names and passwords longer than 20 characters.

- To enter the control panel menu settings, hold down the panel button for **9 seconds**.

- Go to **“WiFi settings”** and select **“SSID”** from there. You can confirm the options by clicking on the button.
- In the opened menu, find the **WiFi network** to which you want to connect your sauna control system.
- If you have selected a WiFi network, please **enter its password**.
- After entering the password, click connect and follow the instructions on the screen.
- In the operation manual, information on connecting the sauna to the mobile application has been provided in the chapter **“IKI mobile application”** on page 11.

IKI mobile application

The UKU Wi-Fi can be controlled through the control panel or via a smart-phone using the dedicated IKI mobile application. This feature enables users to operate the sauna remotely, even when away from home.

Download the **IKI** application from the application page of your mobile phone's operating system by **searching “HUUM IKI”**:

- IOS – App Store
 - Android – Google Play
-
- Create an user account in the application.
 - Connect the control system ID (2XXXXX) with your account. The ID of the control system is also the ID of your sauna, you can find it on the sticker located in the upper right corner of the main module cover. The code is also provided on the cover.
 - Check whether the functions of the mobile application (e.g. selection of sauna temperature and heating time, heating on and off) work and reach the sauna. The function should start within 60 seconds of selecting the command in the menu. In case the functions of the mobile application are not activated, contact us at: support@huumsauna.com.
 - The number of user accounts linked to one sauna is not limited.

TESTING

ATTENTION! Only a certified electrician can carry out the tests!

WARNING! Tests must be carried out while the power is on.
Risk of electric shock!

WARNING! Before starting the test, check that the heater is installed according to the manufacturer's instructions.

1. Check the power terminals of the circuit breaker and the main module.

Bad connections may cause a fire. Switch the power on from the switchboard by using the circuit breaker. The screen will flash for a moment. The device is ready for use.

2. Check the door sensor

Close the steam room door. Turn on the controller and set the temperature. Turn on the heating. The heater starts heating and the heating elements start glowing red. The relays should activate. Open the steam room door. The relays should disconnect within 5-10 seconds and the message **"Door open"** appears on the screen. Close the door. The relays activate again, the message disappears and heating continues.

3. Check the temperature sensor

- If the error message "Temperature sensor error!" is displayed on the screen of the control panel, check the temperature sensor cable connections on both the sensor side and the main module side. If the error message does not disappear, the temperature sensor needs to be tested.

To test the temperature sensor, connect it to the main module using a shorter wire. This is necessary to rule out the possibility of a faulty wire. If the same error message still appears, proceed to the next testing method.

- The final and most thorough testing method is measuring the resistance of the temperature sensor. It should be around 1,1 kOhm at 68°F (20°C). If the resistance is correct, the fault is in the cable or connections. If there is no resistance, the sensor is damaged and must be replaced. For a replacement sensor, please contact the reseller who sold you the control system.
- In other cases, to test, turn off the circuit breaker of the sauna for a minute and then turn it back on. The control panel should be switched off and display the current temperature when switched on.
- Adjust the target temperature of the sauna to 122°F (50°C). Turn on the sauna. If the control panel indicates that the sauna has reached the desired temperature, make sure after 30 minutes that the desired temperature remains noticeably the same. Turn off the heating.

CONTROL PANEL USER MANUAL

- Before use, make sure that you have made the necessary connections according to your control system model. (see “**Connecting UKU WiFi control system to the network**” on page 10.)
- A short single press of the button turns the control panel on and starts or stops the heating. The display remains active throughout the heating period.
- You can set the maximum possible heating time of the heater in the menu of the control panel on the wall. In case of private saunas the choice of heating time is **3** or **6 hours**, in case of semi-public saunas **12 hours** and in case of public saunas **18 hours**. By using the mobile application you can choose the heating time yourself, but its length cannot exceed the settings of the control panel.
- The current sauna temperature is displayed in the middle of the screen.
- The target sauna temperature is indicated by a number in the upper right corner of the screen. Turn the button to select the target temperature.
- Press the button to start heating. During heating the heating symbol is displayed above the temperature on the screen. ().
- To enter the control panel settings menu, hold down the button for **9 seconds**.
- Select “**Back**” for each function to exit the menu.

Timer

- To activate the timer function, press and hold the button for **6 seconds**.
- When the desired time is selected, a single short press on the button switches the timer on. The function of the timer will not activate unless you press the button!

Control panel settings menu

The following parameters can be set in the menu:

WiFi settings – changing WiFi settings, selecting a suitable network and connecting to it.

- Press and hold the button for **9 seconds** to enter the control panel settings menu.
- Go to the “**WiFi settings**” option. The necessary steps for selecting the WiFi network and establishing the connection have been described in the section “**Connecting UKU WiFi control system to the network**” on page 10.

Lamp settings – settings for controlling devices connected to the control system (e.g. ventilation, sauna lamp).

1. Vent/Lamp

- To control devices connected to the control system from the control panel, this function should be turned on (**On**).
- Press the button for **9 seconds** to enter the menu.
- Find the “**Lamp: On/off**” function in the menu and make the choice that suits you.
- If the function is active, you can turn the relevant device on or off with **two quick button presses** using the control panel.

2. Door switch

If the function is activated, the device connected to the control system (e.g. ventilation, sauna lamp) turns on automatically for a user-defined time period of **10, 15 or 20 minutes** when the sauna door is opened.

- Press the button for **9 seconds** to enter the menu.
- Find the “**Door switch**” function in the menu and choose a suitable period of **10, 15 or 20 minutes**.

ATTENTION! The devices are connected to the outputs LL (phase) LN (neutral) of the main module of UKU control system. The maximum power of the device is 100 W, 120 V/60 Hz.

Heating settings

1. Temperature unit

- The function allows you to choose the measurement unit of the sauna temperature: C (Celsius) or F (Fahrenheit).
- Press the button for **9 seconds** to enter the menu.
- Find the “**Temperature unit**” function in the menu and select the appropriate unit of measurement.

2. Heating time

- Allows you to set the heating time, after which the control system automatically turns off the heater.
- Press the button for **9 seconds** to enter the menu.
- Find the “**Heating time**” function in the menu and set the heating time according to your sauna type:

Private saunas 3h or 6h
Semi-public saunas 12h
Public saunas 18h

- When using the control panel on the wall, the heater follows the heating time specified in the settings, but the user can also stop the heating earlier.
- When changing the heating time to more than **6 hours** (max heating time for private saunas), the user should confirm that it is a **semi-public sauna** (max heating time 12h) or a **public sauna** (max heating time 18h).

3. Max temp/Min temp

- The function allows you to set the minimum and maximum temperature range of the sauna.
- By default, these values are **min 104°F (40°C)** and **max 230°F (110°C)**.
- Press and hold the button for **9 seconds** to enter the settings menu.
- Find the “**Min temp**” function in the menu and select the appropriate temperature.
- Repeat the same to set “**Max temp**”.

ATTENTION! The limitations set in the control panel menu cannot be overridden in the mobile application.

Humidity settings – sauna steamer settings.

1. Steamer

- To control the steamer connected to the control system from the control panel, the function should be activated (**On**).
- Press the button for **9 seconds** to enter the menu.
- Find the “**Steamer: On/Off**” function in the menu and make the appropriate selection.
- To adjust the humidity level in the sauna, push the button down and turn it to the **right (higher humidity)** or to the **left (lower humidity)**. You can make this selection in the main view of the control panel.
- The intensity of the steamer is displayed in the lower left corner of the screen (e.g. within 0-99).
- The steamer works only when the sauna is in heating mode.

The control system regulates the steam generator using a formula, so the actual humidity in the sauna may vary depending on the characteristics of the sauna.

ATTENTION! Without a humidity sensor, the steamer can only be used in the steam rooms with a target temperature of up to 194°F (90°C).

Hum. start temp

Defines how many degrees before reaching the target temperature the humidifier starts working.

Default: 10°C. Possible range: 0-20°C. Selecting 0 means the steam generator starts working when the target temperature is reached in the sauna.

- Press the button for **9 seconds** to enter the menu.
- Find the “**Steamer settings**”
- Find the “**Hum. start temp**” function in the menu and select the appropriate degree. To make your selection, turn the knob, then confirm the selection by pressing the button.

Hum. display style

- Press the button for **9 seconds** to enter the menu.
- Find the “**Steamer settings**”

Find the “**Hum. display style**” function in the menu and select the desired style by clicking. You can choose between two options: % of maximum allowed and Relative humidity. To make your selection, press the button.

% of maximum allowed

You can set the maximum allowed percentage of relative humidity at the given target temperature. The maximum relative humidity in the sauna is specified by the standard.

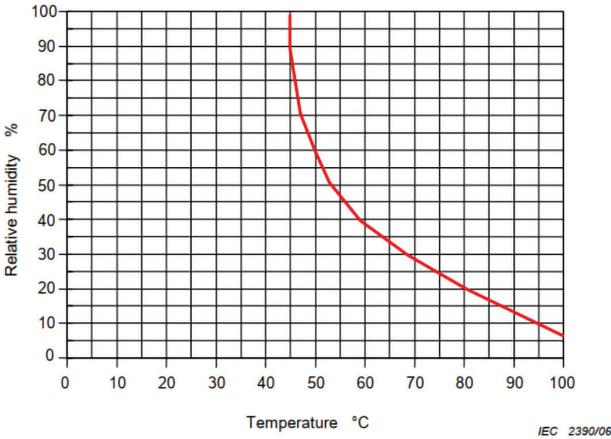


Figure 2. Temperature/relative humidity characteristic during normal operation.

Relative humidity

You can select the relative humidity for your sauna. The maximum relative humidity in the sauna is specified by the standard and varies according to the target temperature. The higher the temperature, the lower the permissible relative humidity in the sauna. Refer to the accompanying chart (figure 2).

2. Steamer safety

- This function notifies you when the steamer has run out of water.
- Press the button for **9 seconds** to enter the menu.
- Find the “**Steamer safety: On/Off**” function in the menu and make the appropriate selection.
- When the main module detects that the water has run out, the steamer turns off.
- It is not necessary to use the setting if the steamer already has a built-in water level sensor.

Safety settings - setting up the safe use of the sauna.

1. Remote start safety

To confirm the safety of your sauna for remote heating activation, press and hold the button for 3 seconds until the safety confirmation prompt appears.

- By answering yes, remote (from the phone app) launch is enabled. It is indicated by a gray heating icon (☰) on the control panel screen.
- If you do not answer or the answer is no, the system will not allow you to start heating from the phone app.
- Once you've confirmed the safety of the sauna, it will be considered safe until the door is opened again.

ATTENTION! In the settings menu it is possible to turn off the test question each time. By doing this the, customer assumes full responsibility for the safety of the sauna.

- Press the button for **9 seconds** to enter the menu.
- Find the function "**Remote start safety: Enabled/Disabled**" in the menu and make a suitable choice.

2. Overheating pause On/Off

We have upgraded our sauna control system to enhance safety and extend the heater's lifespan by introducing a mandatory pausing mechanism during heating. This pause algorithm addresses situations where the heater's power is insufficient for the specific sauna room, causing the heater to operate at full capacity continuously. By implementing these pauses, the system reduces the risk of overheating surfaces near the heater, ensuring a safer and more durable sauna experience.

Turns on/off the mandatory pauses to prevent overheating of the heater.

The pause logic:

1. 90 minutes of heating.
2. 10 minutes of pause.
3. An additional 10 minutes of pause or pause until the temperature drops by 10 degrees from the start of the pause.
4. 45 minutes of heating.
5. 10 minutes of pause.
6. An additional 5 minutes of pause or pause until the temperature drops by 10 degrees from the start of the pause.
7. Repeat steps 4-6.
8. When the desired temperature is reached, the logic stops.

Safety break On/Off

Turns on/off the logic that shuts off the heater when abnormal heating behavior is detected. The logic - if the temperature does not rise by 86°F (30°C) within 60 minutes of heating, the heater will shut off. This only works if the initial temperature of the sauna is below 104°F (40°C) when heating starts.

Child lock

- The child lock function adds security and prevents unauthorized people from operating the heater without supervision.
- To enter the menu, hold down the button on the control panel for **9 seconds**.
- Find the **“Child lock: on/off”** function in the menu and make the appropriate selection.
- If the function is activated, the child lock is applied automatically when the screen of the control panel turns off.
- To remove the child lock and activate the screen, while pushing down the button, turn it a **quarter turn to the right**, then **back to the beginning**, then a **quarter turn to the left** and **back to the beginning**.

Settings password

- If necessary, it is possible to protect the settings menu with a password.
- You can turn on the function and set the password in the settings menu.
- To enter the menu, hold down the button on the control panel for **9 seconds**.
- Find the **“Settings password: on /off”** function in the menu and make a suitable choice.
- Set a password.
- If the function is on, the user will be asked for a password every time when entering the menu. By default, this feature is turned off.

ATTENTION! Once you have set a password, store it securely. If you forget or lose your password, contact the user support at: support@huumsauna.com

Using the mobile application

- You can **download the IKI mobile application** to your phone:
 - IOS – App Store
 - Android – Google Play

You can find information about creating an account and connecting the sauna to the application in the section “**mobile application**” on page 11.

In the mobile application you can:

- Set the desired sauna temperature and heating time (the last time setting remains in the memory).
- Turn the sauna on and off.
- Control sauna steamer and lighting functions.
- Get notifications when the target temperature is reached and the sauna is ready.
- Set the sauna heating times up to two months in advance.

Instructions for navigation can be found inside the application. The buttons (!) provide detailed additional information.

GENERAL SAFETY INFORMATION FOR THE USER

- All included sensors must be installed with the control system.
- When the overheating protection is applied 266°F (130°C), the sauna must be inspected and the safety of the sauna should be ensured. When the overheating protection is activated, the error message **“Temperature sensor error”** appears on the screen. If the overheating protection is triggered, it indicates that the temperature sensor is permanently damaged. For a replacement temperature sensor, please contact the local reseller.
- It is not allowed to modify or rebuild the device without permission.
- If you encounter any issues not addressed in this manual, please contact the reseller from whom you obtained the device for assistance.
- The manufacturer has the right to make software updates to the device. You can find the latest version of the operation manual on our website: huumsauna.com

INTENDED USE

- Before heating, always make sure that there are no objects on the heater. Non-flammable objects can also cause overheating and fire hazards.
- After ensuring that the sauna room is safe, close the sauna room door. It should remain closed during heating as heating with the door open is ineffective; the heat escapes from the room.
- To use the remote control, ensure in advance that the heater is in working order and there are no objects on it. If **“Remote start safety”** is enabled (page 18), confirm the safety prompt. Also, ensure that the sauna room door is closed.
- The device is not intended for use by people with limited physical, sensory or mental abilities (including children) or by people with insufficient experience and/or insufficient knowledge, excl. if they are supervised by a person responsible for safety or have received instructions for use from such persons.
- Make sure that children do not play with the device.
- For longer breaks in use, turn off the sauna's current protection at the switchboard.
- Old equipment contains recyclable materials. Do not throw old devices in the household waste, but investigate the possibilities of disposal of devices at the waste stations in your area or at the local municipality.

WARRANTY

General:

- The warranty only applies to the products that have been installed and used in accordance with the operation manual.
- The length of the warranty period is **5 years** from the moment of purchase (**on the basis of the purchase receipt**).
- The warranty does not cover the defects caused by normal wear and tear or improper use of the product.
- The warranty does not extend to the temperature sensor, which is considered an expendable part.
- The warranty only covers the replacement or repairs of defective parts and does not extend to other direct and/or indirect expenses (e.g. transport, electrician costs) and/or damage caused due to a defect or failure of the product.

The warranty does not apply to the defects caused by the following reasons:

- defects caused by transport and other accidental damage;
- defects caused by careless or unintended storage, use of the product, or overloading;
- modifications made to the product;
- use of replacement parts that are not approved by the manufacturer (e.g. temperature sensor);
- use of products that are incompatible with the device;
- the product is not complete;
- the product's warranty period has expired.