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	WHTC-E Thermoregulator User's Guide	Revision: 01.02 Date: 06.08.2026
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Introduction

The WHTC-E thermoregulator is designed for reliable and efficient temperature control of domestic and industrial water heaters. The WHTC series devices ensure precise regulation, increased energy efficiency and safe system operation. This document provides the necessary information for the installation, setup, operation and maintenance of the WHTC series thermoregulators.

Transportation requirements and storage instructions

Each individual thermoregulator is manufactured and transported in packaging, that provides protection against mechanical impacts. Air, sea, and land transport are permissible. The device does not contain a battery, and no special transportation measures related to batteries are required.

The device must be stored in compliance with the specified ambient temperature and humidity requirements. Storage of the device with connected power and signal cables is not allowed. Transportation requirements of ambient temperature and relative humidity:

Parameter	Minimum Value	Default Value	Maximum Value
Temperature, C°	-25	+25	+80
Relative humidity, %Rh	0	40	90

SAFETY REQUIREMENTS

⚠ **The installation of the device must be performed solely by qualified personnel, in accordance with the installation requirements described in this manual, as well as the applicable general rules and electrical safety standards;**

⚠ **During installation, the conditions for protecting the device from external influences must be complied, including the permissible ambient temperature range, relative humidity, and the degree of contamination (dust).**

⚠ **During installation and electrical connection, the device must be disconnected from the supply voltage. Connection while the power is on is not permitted;**

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1. Main components

The main view of the device is shown in Fig. 1. All main components are labeled.

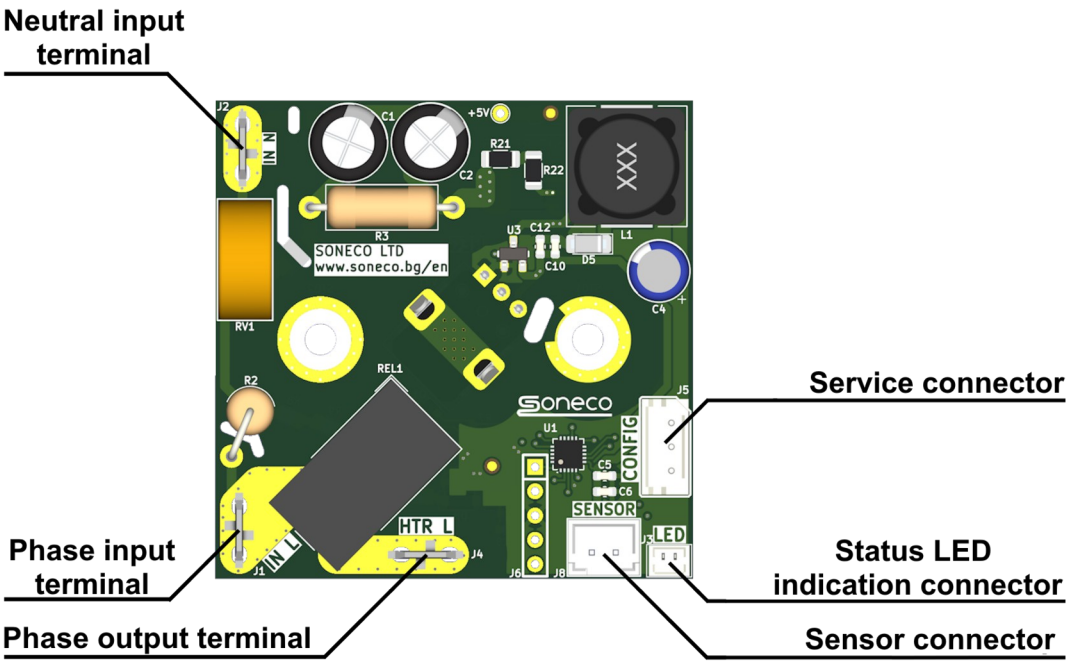


Fig. 1

1.1. Neutral input terminal

Terminal for connecting the regulator to the neutral conductor of the 230VAC 50/60Hz power supply.

1.2. Phase input terminal

Terminal for connecting the regulator to the line (phase) conductor of the 230VAC 50/60Hz power supply.

1.3. Phase output terminal

Terminal for connecting the heater to the regulator device.

1.4. Service connector

Connector for performing service actions, such as changing configuration settings and device firmware updates.

1.5. Status LED indication connector

Connector for connecting the LED status indication.

1.6. Sensor connector

Connector used to connect the temperature sensor to the regulator.

2. Installation

2.1. Mechanical installation

Fig. 2

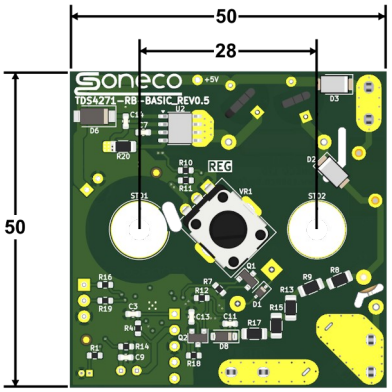


Fig. 3

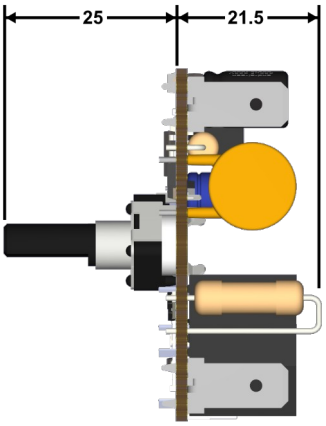


Fig. 4

The regulator features two mounting bushings located on both sides of the potentiometer (shown in Fig. 2), used to secure the device to the housing using M4 mounting screws.

2.2. Temperature sensors connection

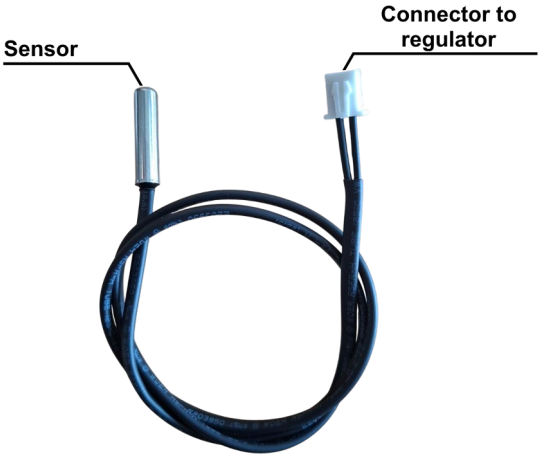


Fig. 5

The temperature sensor is connected to the regulator by means of a connector, which is plugged into the mating connector on the device labeled "SENSOR".

2.3. Connecting to the heater

The output terminal get connected as follows:

Terminal	Connection
"HTR L"	Connect to one of the heater's terminals.

*The connection is shown in Fig. 7

2.4. Connecting the LED status indicator

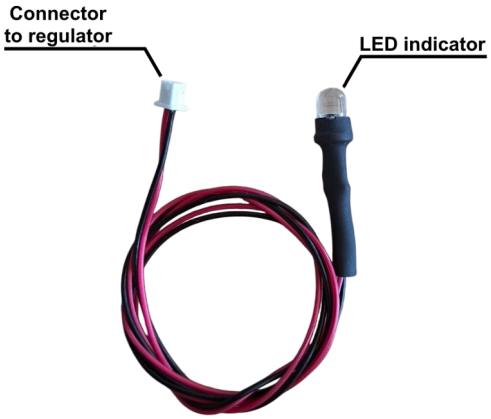


Fig. 6

The LED status indicator is connected to the regulator using a connector that plugs into the matching connector on the device labeled "LED"

2.5. Connecting to the supply voltage

For the correct operation of the device, a minimum voltage of 90VAC is required. The connection of the power supply terminals is as follows:

Terminal	Connection
"IN L"	Connect to the phase terminal of the supply grid
"IN N"	Connect to the neutral terminal of the supply grid

!!! Note: The device is not grounded; it connects only to the phase and neutral terminals of the mains.

*The connections are shown in Fig. 7

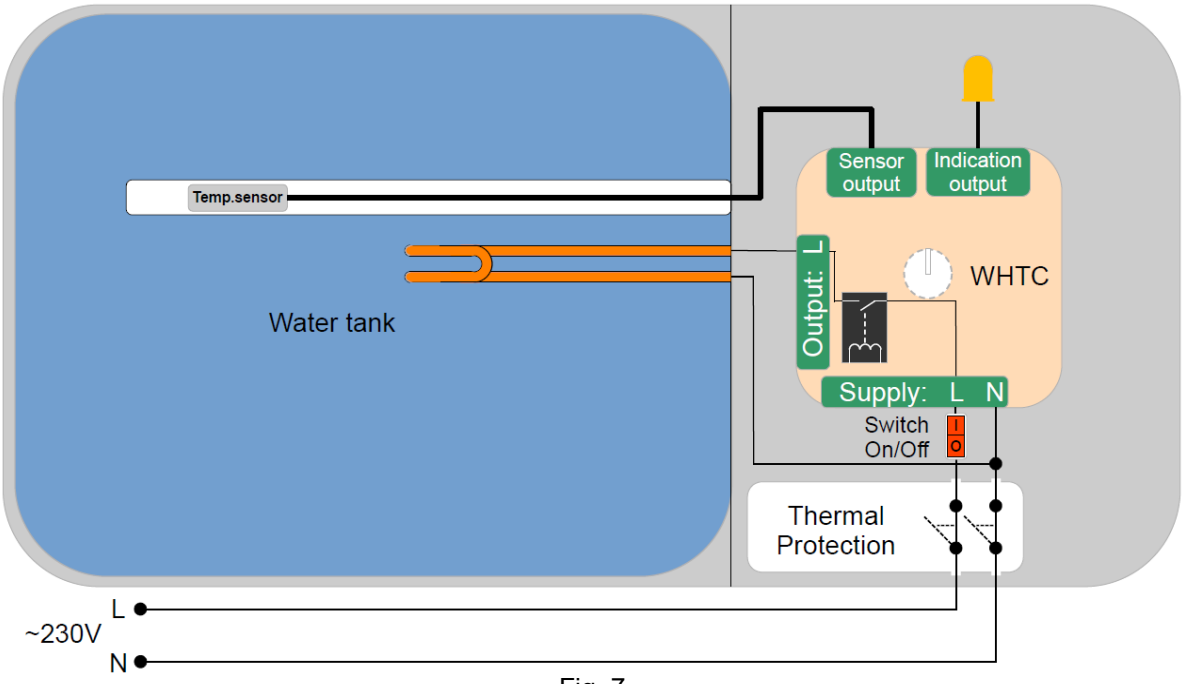


Fig. 7

3. Operating modes

3.1. Standby mode

The device enters Standby mode if the corresponding setting has been factory configured by rotating the potentiometer to the left-most position. In this mode the device continues to measure the water's temperature, but it does ***NOT*** turn the heater on in any circumstance. The device will ***NOT*** leave this mode until it is intentionally made to manually using the potentiometer.

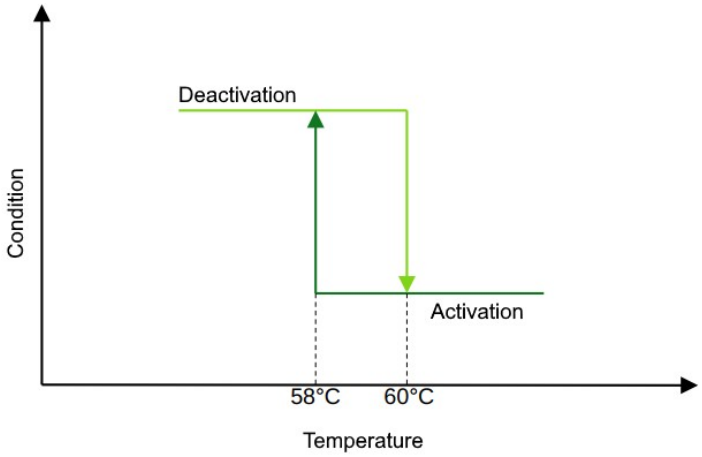
3.2. Manual mode

When the supply voltage is applied, the regulator enters normal operation mode. In this mode, the device reads the temperature in the water tank and controls the heater to regulate the water temperature according to the set temperature.

The regulator measures the water temperature and switches on the heater when it drops by an amount equal to the set operating hysteresis below the temperature set via the potentiometer.

The temperature can be set within the range of +40°C to +80°C.

When the measured temperature rises to the level of the set temperature, the heater is deactivated. When the measured temperature drops below the level of the set temperature minus the temperature hysteresis, the heater is activated.



At a set temperature of +60°C and a hysteresis of -2°C

The device indicates the heater's operation via the LED status indicator, which remains lit continuously when the heater is working and turns off when the heater is switched off.

3.3. Antibacterial mode

The regulator enters this mode periodically and automatically at a set time interval to disinfect the water tank.

The period and duration of this mode can be changed during the service configuration of the device.

The indication for this mode consists of rapid, uniform flashing of the LED status indicator.

3.4. Fault mode

This is an automatic mode that the device enters upon detecting a fault in the regulator or sensor board. The regulator monitors a set of faults, and in this mode, it stops the heater and indicates the error type through a specific number of blinks of the LED indicator. Exiting the fault mode is performed by turning off and restarting the device, and if the cause of the fault is still present, the device will re-enter the fault mode.

Number of flashes	Malfunction	Criteria
1	Fault in the sensor on the sensor board	Open circuit on the temperature sensor detected
2		Short circuit on the temperature sensor detected
3	Controller malfunction	General fault
4	Freezing of water tank	Measured temperature is below 0°C
5	Lack of water in the water tank	Temperature rise speed out of a certain range dependent of heater power and water tank volume

4. Factory configuration of the device

The factory configuration is performed via a connection to a personal computer using the ***"WHTC Configuration Cable".*** The service configuration application allows the configuration of the parameters required for the proper operation of the device during integration into a specific water tank.

Fig. 8

The ***"WHTC Configuration Cable"*** is used to establish a connection between the regulator and a personal computer. It features two ports – a USB port and a configuration port. The USB port of the configuration cable connects to one of the computer's USB ports. The configuration port of the cable connects to the service interface connector of the regulator.

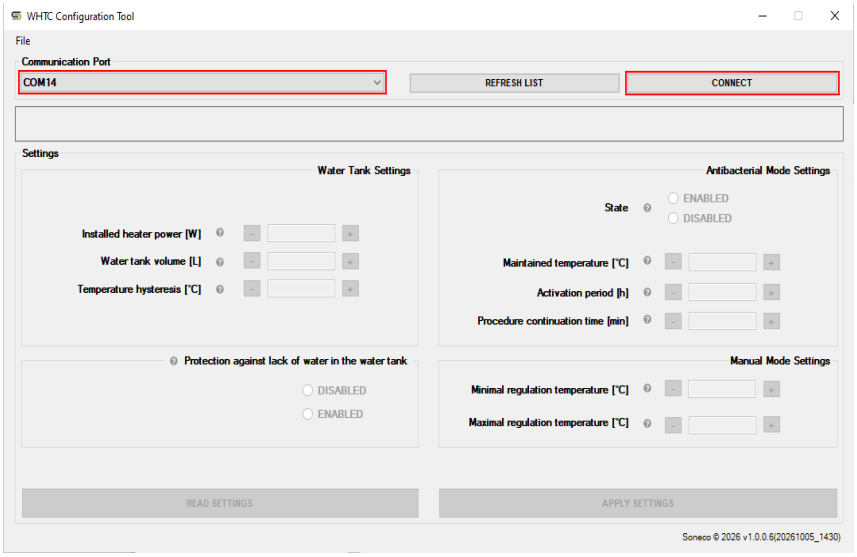


Fig. 9

Launch the application ***"WHTC Configuration Tool.exe"***. Select the corresponding COM port from the drop-down menu in the "Communication Port" field, then press the ***"CONNECT"*** button, located on the right side of the application. Upon successfully establishing a connection, the status indicator at the bottom—which was previously empty—will turn green and display the text ***"Connected to port COMx"***, where "x" is the COM port number.

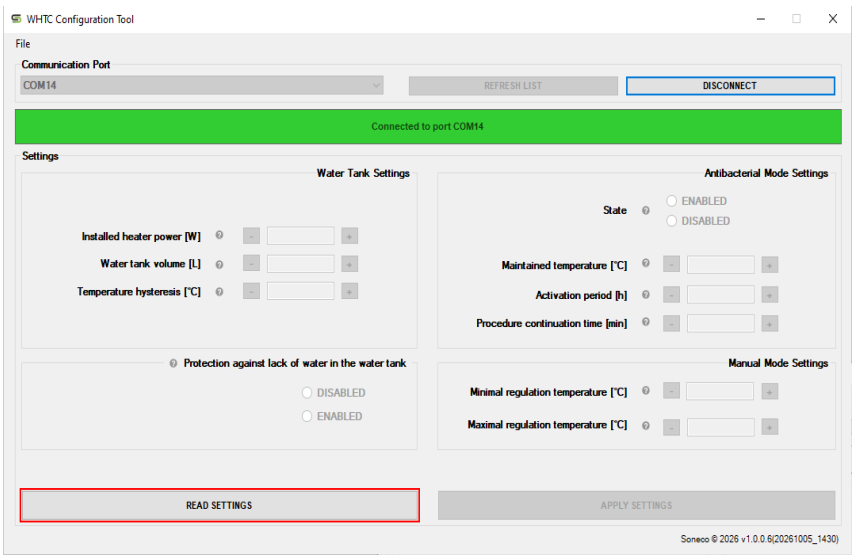


Fig. 10

Upon a successful connection between the device and the personal computer, press the ***"READ SETTINGS"*** button. The software will then display the current configuration of the device.

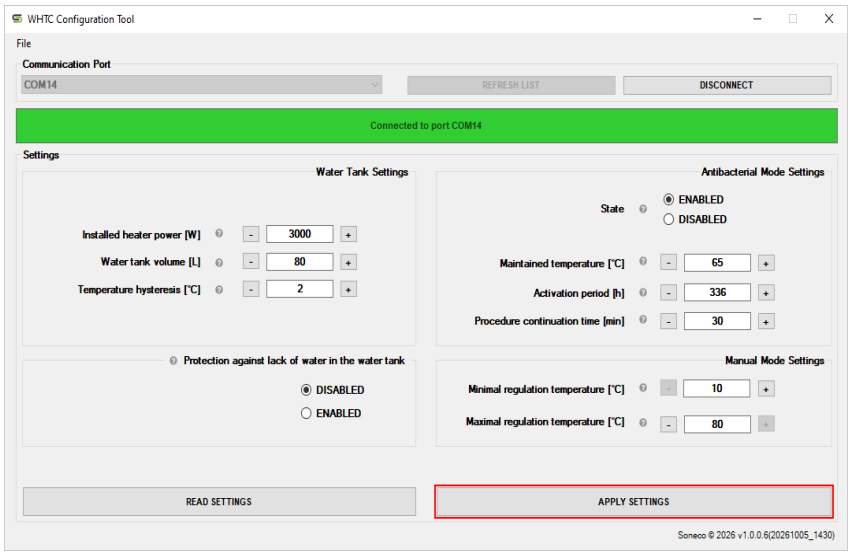


Fig. 11

After setting the desired parameters, press the ***"APPLY SETTINGS"*** button. Upon successfully saving the settings, a pop-up window will appear with the text ***"SUCCESS!: Settings were applied successfully!"***

4.1. Configuration settings description

Setting	Description
Water Tank Settings	
Installed heater power [W]	The nominal power of the installed heater, measured in watts. This is a required parameter for the correct detection of potential malfunctions.
Water tank volume [L]	The volume of the water tank in liters. This is a required parameter for the correct detection of potential malfunctions
Temperature hysteresis[°C]	The temperature value used for controlling the heater. When the measured temperature falls below the level of the set temperature minus the temperature hysteresis, the heater is activated.
Protection against lack of water in the water tank	
Protection against lack of water in the water tank	When the protection against lack of water in the water tank is enabled, the device monitors the rate of temperature rise, while the heater is active. Under normal conditions, with water present, the rate of temperature increase is determined by the specific parameters of the water tank and the heating element. However, if there is no water in the tank, the temperature rises many times faster. In such a case, the controller immediately deactivates the heater and triggers a "No Water" error, which is indicated by the status LED flashing a specific number of times. The device remains in this error state until the next power cycle (reboot). If the dry conditions persist after a restart, the protection will trigger again.

Setting	Description
Antibacterial Mode Settings	
State	When the antibacterial mode is enabled, the device automatically triggers it after a specific period to eliminate unwanted bacteria. This occurs if, during that period, the water temperature in the tank has not naturally exceeded the required disinfection temperature through regular use.
Maintained temperature [°C]	The temperature value that the controller must maintain during an active antibacterial cycle.
Activation period [h]	The Activation Period defines the timeframe during which, if the water temperature in the tank has not naturally reached the set disinfection level, a new automatic disinfection cycle is triggered.
Procedure continuation time [min]	The duration for which the set disinfection temperature will be maintained before the cycle is considered complete.
Manual Mode Settings	
Minimal regulation temperature [°C]	The temperature value set for manual regulation corresponds to the lef-end position of the adjustment potentiometer /if the anti-freeze mode is not enabled/. When the potentiometer is turned to the left-most position /counter-clockwise/, the controller sets the maintenance temperature to match this specific value.
Maximal regulation temperature [°C]	The temperature value set for manual regulation corresponds to the right-end position of the adjustment potentiometer. When the potentiometer is turned to the right-rnd position /clockwise/, the controller sets the maintenance temperature to match this specific value. **In manual mode, the setpoint temperature is linear relative to the rotation angle of the adjustment potentiometer. At the middle position, the setpoint temperature is the average value between the configured minimum and maximum manual temperatures.

4.2. Configuration parameters

Configuration parameter	Minimum value	Default value	Maximum value	Option to enable/disable
Water container parameters				
Installed heater power, W	0	2000	6000*	NO
Water tank volume, L	1	80	1000	NO
Temperature hysteresis, °C	-0.1	-2	-10	NO

*The device can actively control a heater with a power rating of up to 3000W. If it is necessary to control a higher-power heater, an external switching element (such as a contactor or external relay) must be used. This setting is used exclusively to define the specific parameters of the water tank, ensuring the correct operation of the active safety functions.

Configuration parameter	Minimum value	Default value	Maximum value	Option to enable/disable
Protection against lack of water in the water tank				
Protection against lack of water in the water tank	-	ENABLED	-	YES
Antibacterial mode settings				
State	-	ENABLED	-	YES
Maintained temperature, °C	+60	+65	+75	NO
Activation period, h	1	336	10000	NO
Procedure continuation time, min	10	30	180	NO
Manual mode settings				
Minimal regulation temperature, °C	+40	+40	+80	NO
Maximal regulation temperature, °C	+40	+80	+80	NO

5. Firmware update

The firmware update for the regulator is performed via a connection between the device and a personal computer using the ***"WHTC Configuration Cable".*** The application allows for updating the device's functionality.

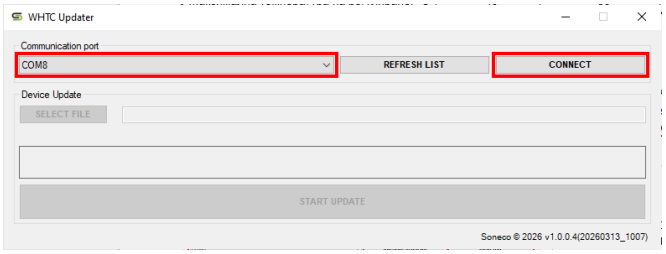


Fig. 12

Launch the application ***"WHTC Updater.exe"***. Select the corresponding COM port from the drop-down menu in the "Communication Port" field, then press the ***"CONNECT"*** button located on the right side of the application. Upon successfully establishing a connection, the status indicator above the ***"START UPDATE"*** button—which was previously empty—will turn green and display the text "Connected to port COMx", where "x" is the COM port number.

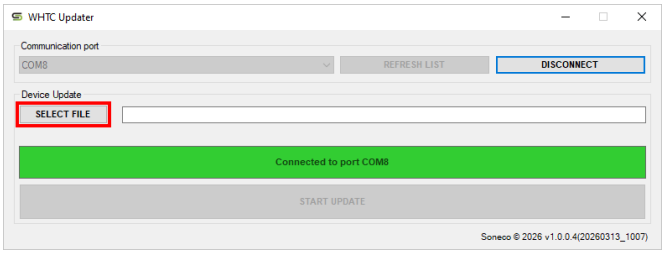


Fig. 13

Upon a successful connection between the device and the personal computer, press the ***"CHOOSE FILE"*** button in the "Device Update" field and select the update file with the ***".ebin"*** extension.

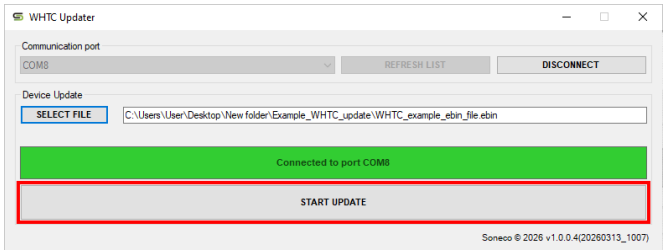


Fig.14

Once the file is selected, the ***"START UPDATE"*** button will become active; use it to begin the firmware update process. During the procedure, the status indicator will show the progress of the update. Upon successful completion, the indicator will display: ***"SUCCESS: The device was updated successfully!"***

6. Conformity with directives, regulations and harmonized standards

Directive	Description	Standards
2014/35/EU	Directive of The European Parliament and of The Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits	**LVD standards**
		EN 6033501:2012 + AC:2014 + A11:2014 + A13:28 + A1:2019 + A14:2020 + A2:2019 + A15:2021
		EN 60335-2-21:2021+A1:2022
2014/30/EU	Directive of The European Parliament and of The Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility	**EMC standards**
		EN IEC 55014-1:2021
		EN IEC 55014-2:2021
		EN IEC 61000-3-2:2019 + A1:2021
		EN 61000-3-3:2013 +A1:2019 + A2:2022

Directive	Description
2011/65/EU	Directive of The European Parliament and of The Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment
2009/125/EU	Directive of The European Parliament and of The Council of 21 October 2009 establishing a framework for the setting of ecodesign requirements for energy-related products

Regulation	Description
№ 814/2013	COMMISSION REGULATION (EU) № 814/2013 of 2 August 2013 implementing Directive 2009/125/EU of the European Parliament and of the Council with regard to ecodesign requirements for water heaters and hot water storage tanks

7. Ordering codes

Ordering code	Description
WHTC-E	WHTC-E Thermoregulator
WHTC-E-TSP1	Temperature sensor probe
WHTC-CONF-CAB	WHTC configuration cable

Document revision history

Revision	Date	Description
01.01	13.03.2026	Initial revision
01.02	06.08.2026	Full overhaul of the information in the documentation