

# **EUROSTER 10M**

CONTROLLER OF A MIXING VALVE ACTUATOR AND A CH PUMP  
FEATURING HEATING SOURCE CONTROL



Manual version: 01.08.2023

MANUFACTURER: P.H.P.U. AS, Chumiętki 4, 63-840 Krobia, Poland

## **1. INTRODUCTION**

In order to ensure proper operation of the controller and the CH system, please read this manual carefully.

## **2. APPLICATION**

Euroster 10M controller is designed to control the heating circuit temperature (e.g., under-floor heating) using a mixing valve equipped with a 3-point controlled actuator (230 V). The temperature is controlled using the P.I. (Proportional-Integral) algorithm, which allows for quick and precise regulation for various loads.

Furthermore, the device activates the CH pump, cooperates with room thermostats and controls a gas boiler or other heating device.

## **3. CONTROLLER FUNCTIONS**

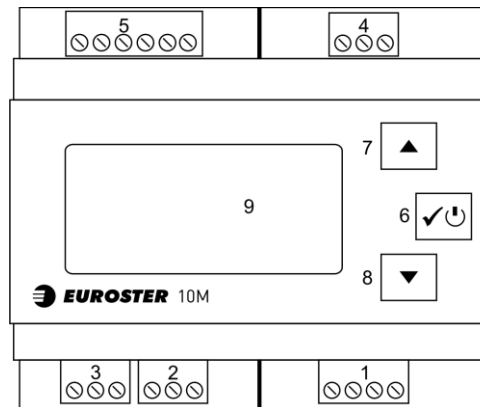
- Maintains the preset heating zone temperature
- Controls the 3-point 230 V actuator of the mixing valve
- Controls the CH pump of the heating zone
- Cooperates with a room thermostat
- Measures the heating source temperature
- Is equipped with a voltage-free output for activating the heating source
- Protects the installation against freezing
- Prevents seizure of the pump and the valve – Anti-Stop function
- Protects the heating zone against overheating – adjustable alarm temperature of a controlled zone
- Temperature reading correction
- Set of sensors included
- Installation in an electric cabinet (6 modules) on a DIN 35 mm rail.



- EUROSTER 10M controller is equipped with an Anti-Stop system that prevents the process of scale build-up on the unused pump rotor and the mixer. It automatically turns the pump and the mixer on every 14 days when the heating season is over.

Keep the controller turned on to allow the function to operate after the heating season.

#### **4. VISIBLE ELEMENTS OF THE CONTROLLER**



1. Controller's power connection – 230 V 50 Hz
2. Output for connecting the CH pump 230 V 50 Hz
3. Output for connecting mixing valve actuator (230 V 50 Hz)
4. Output for connecting heating source (change-over voltage-free contact)
5. Connector for temperature sensors and room thermostat
6. Confirm and switch-on/off button
7. Button – increase parameters
8. Button – decrease parameters
9. LCD

The display backlight turns off by default after one minute following the end of the controller operation. It is possible to switch the backlight on permanently (pt. 9)

#### **5. THERMOSTAT INSTALLATION**

##### **GENERAL SAFETY RULES**

- **Prior to the commencement of any installation works read this manual carefully! Incorrect installation and improper use may lead to serious hazards to users or other persons and result in property damage!**
- **Prior to mounting or dismantling and maintenance of the controller, make sure that it is de-energized!**
- **Dangerous voltages, hazardous to life, may be present on the controller and its cables, therefore only qualified technicians holding authorization for electrical works may be entrusted with the installation of the controller!**
- **The electric connections performed and cables used shall be adequate to the applied loads and must conform to all requirements!**
- **Do not install the controller in rooms of increased humidity, substantial dustiness or with the presence of caustic or flammable vapours, protect it against water and other liquids!**
- **Do not install any controller showing signs of mechanical damage!**
- **The controller is not a safety component of the heating system. Additional protection devices must be used in the heating systems prone to the risk of damage due to failure of the control systems!**
- **When connecting the power cables, pay particular attention to the correct connection of PE conductors.**
- **Do not misuse the controller!**
- **The device is not intended for use by children!**
- **Failure to meet the safety and maintenance rules results in loss of warranty!**

Install the controller in a place where the temperature does not exceed 40°C. Lead all necessary cables prior to mounting the controller.

Screw the electric cables to the connectors according to the description and drawing. Make sure to keep the proper designation of the cables. Screw the neutral conductors to N terminals, phase conductors to L terminals and grounding conductors to PE terminals. Use a cable with a minimum diameter of 0.75mm<sup>2</sup> for connection.

**CAUTION!**

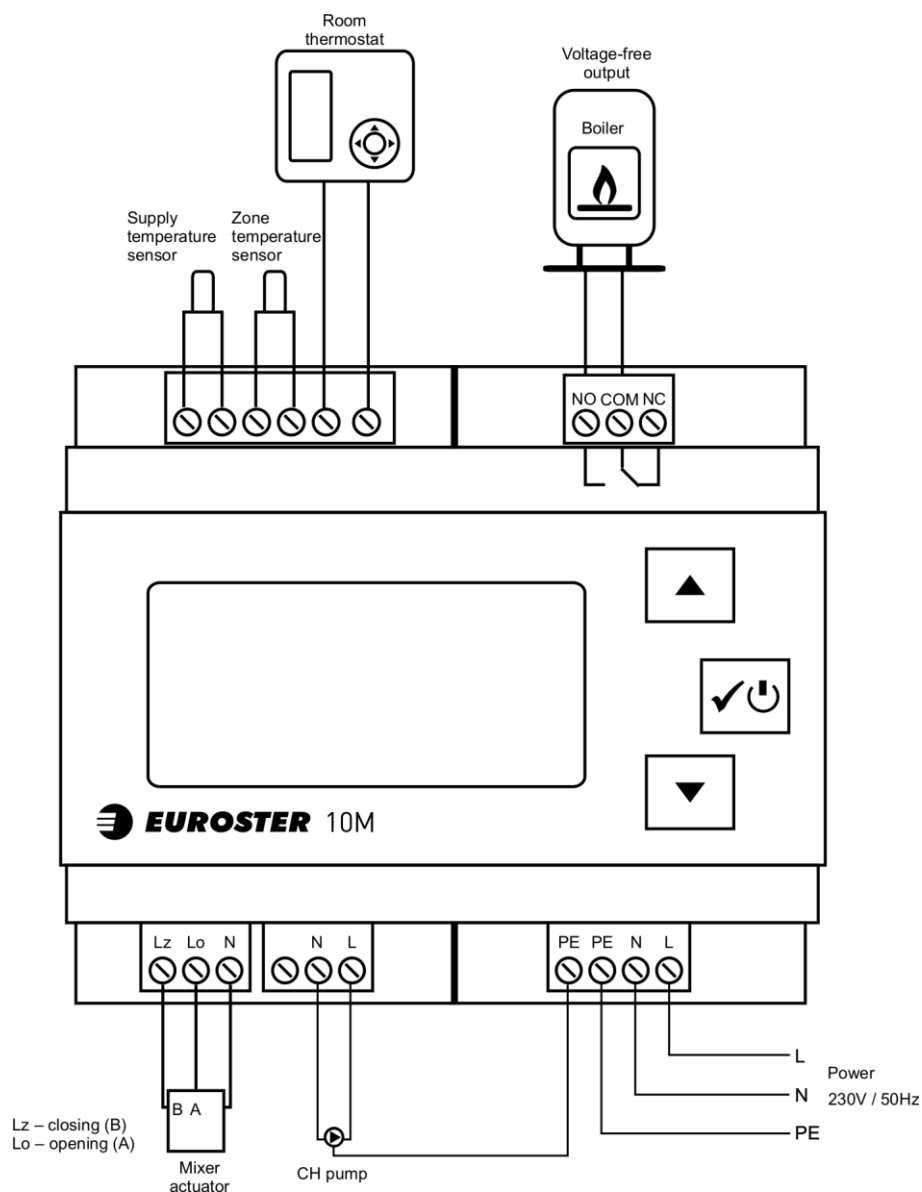
**When connecting the power cables, pay particular attention to the correct connection of PE conductors.**

**The temperature sensors are not suitable to be immersed in liquids.**

**The controller interacts only with actuators equipped with limit switches.**

**CAUTION!**

**Euroster 10M controller and a heat emitting device are connected to the “Boiler” output and must be powered from the same phase of the power system.**

**a) Connection Diagram**

**b) mounting the controller:**

- Install the controller in an electric cabinet (width of 6 modules) on a DIN 35 mm rail,
- use fasteners to fix controller cables to the wall.

**c) Connecting a Room Thermostat**

The controller can cooperate with any room thermostat with voltage-free, normally open (NO) output – e.g. any thermostat manufactured by EUROSTER.

Connection of the controller:

- Make sure that the controller is de-energized.
- Remove the jumper from the REG joint
- Lead a cable (minimum 2 x 0.5 mm<sup>2</sup> stranded wire) between the room thermostat (or the receiver – in case of connecting the wireless version) and the EUROSTER 10M controller and insulate the cables,
- Screw the cables to the joint,
- connect the cables to COM and NO contacts in the room thermostat.

**d) Connecting Temperature Sensors:**

The controller temperature sensors may be connected in any way, with no need to keep cable polarity. At installation avoid leading the sensors parallel to live cables. Moreover, make sure to provide the proper contact with measured surfaces.

- Install the heating source temperature sensor on the heating source/buffer or the uncovered outlet pipe of the CH boiler (possibly close to the boiler).
- Install the heating zone temperature sensor on the uncovered pipe downstream of the CH zone pump.
- Use the hose clips to tighten the sensors to the pipe and insulate them.

**e) BOILER output**

It is used to switch on the heating source, e.g. gas-fired boiler. It has 3 contacts marked as NO, COM and NC. They are galvanically isolated from the rest of the system. They withstand a mains voltage of 230 V and a load of 1 A.

Most commonly, boilers are equipped with the normally open connection (a jumper must be removed from the heating source), in such cases, you need to connect the 10M controller with COM and NO terminals (the controller has the COM and NO terminals).

The BOILER output is disconnected whenever the room thermostat achieves the preset temperature or the supply temperature alarm occurs.

**f) Connecting the mixer actuator**

- Connect the neutral cable of the mixer actuator to the N terminal
- Connect the cable responsible for closing the mixer (decreasing the temperature) to the Lz terminal
- Connect the cable responsible for opening the mixer (increasing the temperature) to the Lo terminal

**g) Connecting the CH pump**

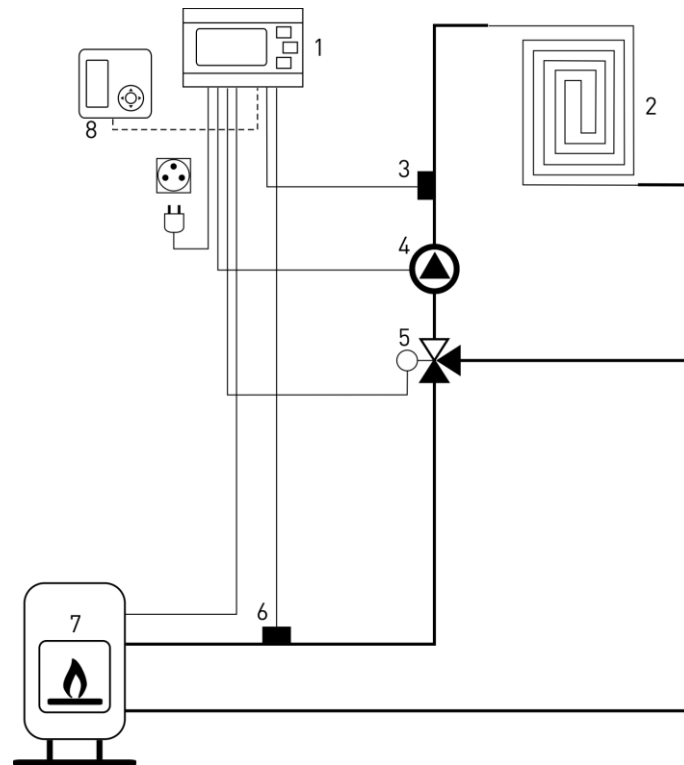
- Connect the yellow or yellow-green wire (protective conductor) to the PE terminal
- Connect the blue wire to the (N) terminal
- Connect the brown wire to the (L) terminal.

**h) Connecting the controller to 230 V 50 Hz network**

Check the wires and sensors for the correct connection. Having secured the cables against accidental breaking, connect the power cable to the 230 V 50 Hz mains socket with an earth pin.

## 6. MOUNTING TEMPLATE

The following diagram is simplified and does not cover all the elements necessary for the correct operation of the system.



1. EUROSTER 10M controller
2. Heating zone, e.g. floor heating
3. Heating zone temperature sensor
4. CH pump
5. Mixing valve with actuator
6. Heating source temperature sensor
7. Heating device, e.g. gas boiler
8. Room thermostat (option)

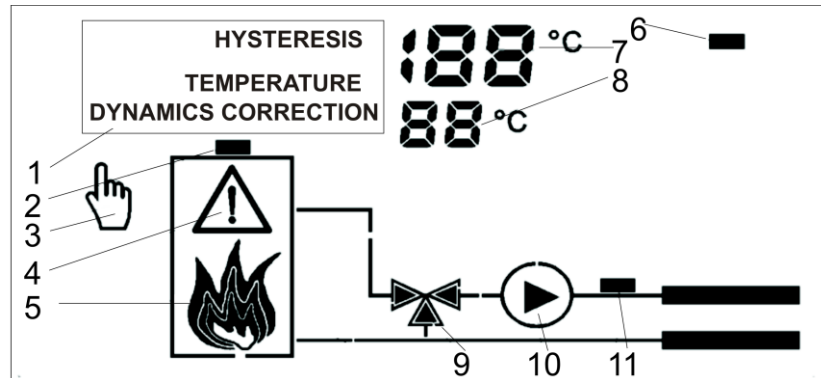
## 7. SWITCHING THE CONTROLLER ON/OFF

- After connecting the plug into the 230 V power socket, the number of program version is displayed for 2 sec.
- Anti-Stop system turns on the mixer and subsequently the pump – AS letters blink and the system status is displayed
- In order to switch the controller off hold „√“ for 3 seconds – St letters (STOP) appear, and similarly, during switching-off, the system status is displayed.

**CAUTION!!! The controller has an electronic switch, which does not guarantee a safe de-energizing of cooperating equipment. Disconnecting or short-circuiting the sensor cables during installation, in particular, may cause an emergency switch-on of the outputs. Before starting any work with the controller installation, make sure to disconnect the power supply!**

## 8. DISPLAY DESCRIPTION

Active elements of the display are presented below:



1. Name of the set parameter – displayed while previewing or changing parameters
2. Heating source (boiler) temperature sensor icon
3. Test operation icon – displayed during manual control
4. Alarm icon – blinks in case of alarm
5. Furnace status illustration – shown with active heating source (BOILER) output, disappears when the room thermostat input is open.
6. Room thermostat input status signal – active when the thermostat switches the heating on
7. Heating source (boiler) temperature / Value of the displayed parameter
8. Temperature of the controlled zone / Menu item number
9. Mixer icon – adequate segments are lit during the operation of the mixer actuator.
10. Pump icon – lit during pump operation
11. CH zone temperature sensor icon

## 9. RESTORING FACTORY SETTINGS / PERMANENT LIGHT-UP OF THE DISPLAY

Proceed as follows to restore factory settings or change the operation mode, if needed:

- While holding the **✓** button pressed, momentarily unplug and then reconnect the plug to the 230 V mains socket
- "Fd" letters (factory defaults) are displayed and 0 appears after releasing the button,
- Use **▲▼** buttons to select 0 or 1 and confirm with **✓**.  
Selecting 0 enables the change of screen backlight functions without restoring factory defaults. Selecting 1 restores factory settings.
- Then, "bl" (backlight) is displayed and 0 appears after releasing the button.
- Use **▲▼** buttons to select the required number (0 or 1). Selecting 0 results in the automatic screen backlight switch-off after 1 minute of finishing operating the controller, and selecting 1 results in the display backlight being continuously active.
- Control and correct the remaining controller settings, if necessary.
- In case of failure to confirm the changes within 5 seconds, the controller resumes operation without introducing changes.

## 10. CONTROLLER SETTINGS

After being switched on the controller shows the system status. Press **▲** to enter preview and parameter change mode.

The controller configuration is specified below: press ▲▼ buttons to select the desired parameter. The controller will show the value (at the top) and number (at the bottom). In order to change the value of the displayed parameter, press ✓ (the parameter value starts blinking), set the required value using ▲▼, and confirm the selection by pressing ✓. If the current value is to remain unchanged (cancelling changes), do not press the button, but wait 10 seconds until the setting stops blinking.

To facilitate the operation of the controller, the configuration windows have been numbered. The user can change the following parameters:

### **1. Controlled temperature**

It is the temperature of the zone that the controller aims to maintain using the mixer.

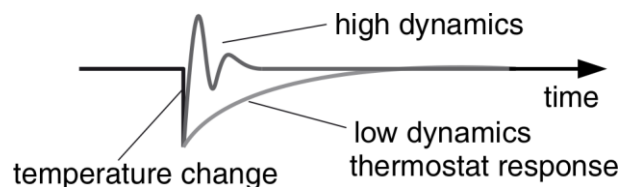
### **2. Temperature adjustment hysteresis**

It is the temperature difference for which the controller starts to close and open the valve. If the temperature of the controlled zone does not differ from the setting by more than half of the hysteresis value, the controller will not correct the mixer position. This avoids unnecessary adjustments to the mixer. You can set the hysteresis to zero – in that case, the controller will aim to maintain the temperature exactly at the preset value.

### **3. Dynamics**

This parameter characterizes the dynamics of the control. If you want the controller to instantly respond to the temperature fluctuations, increase the dynamics. This, however, may lead to overcorrection.

Examples of controller responses to a sudden drop in temperature, with dynamics settings that are too high or too low are shown below.



### **4. Pump activation temperature**

It is the temperature above which the CH pump is activated.

### **5. Pump hysteresis**

It indicates the temperature difference at which the controller turns the CH pump on and off. The conditions for turning the pump on and off are specified in section 11.

### **6. Alarm temperature of the CH zone.**

This setting allows you to establish the temperature at which the alarm procedures are activated. If the controller is used in a floor heating system, it is recommended to set it at 45 °C.

Caution! Alarm temperatures for zones should be selected carefully. Incorrect setting of temperature level may cause improper operation or major failure of the system components.

## 7. Temperature of Supply Alarm

Exceeding the alarm temperature on the system's supply triggers the alarm algorithm, which aims to cool down the boiler.

The alarm algorithm heats the zone to a temperature close to the alarm threshold. It is essential to ensure that the alarm temperature is at a safe level.

## 8. Read-out Correction – boiler temperature sensor

It is a value added to the measured temperature value. It allows for compensating the difference in readings between the sensor placed on the pipe and the thermometer installed on the boiler.

## 9. Read-out Correction –the controlled zone temperature

It is a value added to the measured temperature value. It allows for compensating the difference in readings between the sensor placed on the pipe and the heating medium.

## 10. Mixer operation/test

Allows for manual operation of the actuator. The numbers stand for the following:

1 – closing the mixer (increasing the controlled temperature)

0 – stopping the mixer

1 – opening the mixer (decreasing the controlled temperature).

To operate the mixer manually press the button and change the displayed value. After 10 seconds of inactivity or pressing the button again, the controller resumes operation according to the settings.

## 11. Pump operation/test

Displays the current status of the pump calculated by the controller (0 or 1).

To operate the pump manually press the button and change the displayed value. After 10 seconds of inactivity or pressing the button again, the controller resumes operation according to the settings.

**ATTENTION: In case the set values preclude the correct operation of the controller, the alarm icon will appear on the display, and the colliding settings will be displayed alternately. After a few seconds, the last correct configuration is restored.**

All settings are listed below:

Setting		Value			unit
Name	No.	Default	Min.	Max.	
Temp. of the controlled zone	1	35	10	70	°C
Temp. hysteresis for the controlled zone	2	4	0	10	°C
Mixer dynamics	3	10	1	64	-
Pump activation temperature	4	32	7	80	°C
Pump hysteresis	5	4	2	10	°C
Alarm temperature of the controlled zone	6	45	40	90	°C



Setting		Value			unit
Name	No.	Default	Min.	Max.	
Temperature of Supply Alarm	7	110	80	110	°C
Correction of the boiler temperature sensor read-out	8	0	-5	5	°C
Correction of the controlled zone temperature sensor read-out	9	0	-5	5	°C
Mixer operation	10	- 1)	-1 2)	1 2)	-
Pump operation	11	- 1)	0 3)	1 3)	-

1) The displayed value is calculated by the controller

2) -1 stands for mixer closure, 1 – for opening, and 0 - for stopping

3) 1 stands for activation, and 0 stands for deactivation.

## 11. CONTROLLER OPERATION

The controller controls the temperatures of the boiler and the controlled zone. Periodically, it calculates the difference between the preset and measured temperature.

If the difference between the set and measured temperature exceeds half of the hysteresis, the position of the mixer is adjusted at a speed determined by the Dynamics (3) parameter.

If the mixer has been activated to operate in the same direction for at least 100 seconds, the controller permanently turns on the mixer actuator to set it to the extreme position. After the subsequent 500 s, the mixer actuator will be switched off.

The pump is activated when the boiler temperature exceeds the setting by half of the hysteresis,  $T_{\text{boiler}} \geq T_{\text{setting}} + H_{\text{pump}} / 2$ .

The pump is deactivated when the boiler temperature drops below the setting by half of the hysteresis,  $T_{\text{boiler}} \leq T_{\text{setting}} - H_{\text{pump}} / 2$ .

## 12. ANTI-FREEZE PROTECTION

The anti-freeze protection is activated when the temperature of a given sensor drops to 4°C. If such temperature is detected by a sensor, the pump is activated and "AF" (anti-freeze) appears on the display. The protection is deactivated when the temperature rises to 6 °C.

## 13. OPERATION WITH ROOM THERMOSTAT

Turning off the room thermostat (opening the output) will cause the heating source transmitter to turn off, and the mixing valve to close, followed by switching off the pump.

The connection of a room thermostat was described in point 5c.

## 14. ANTI-STOP

Each time the controller is connected to a 230 V network (also after restoring factory settings or changing the backlight type), the Anti-Stop function immediately activates the pump and the mixing valve, later the operation is repeated every 14 days. During its operation, "AT" letters flash at the display.

To avoid the risk of overheating the circuits, the pump is turned off and the mixer is fully opened. If an alarm situation (overheating or sensor damage) occurs when the Anti-Stop system is active, the operation of the Anti-Stop system will be ceased.

## **15. TROUBLESHOOTING**

### **The device does not work**

Burnt fuse or ROM failure – send the device to the service.

### **The display and the sensor icon blink, "Sh" or "OP" letters appear**

The sensor is shorted (Sh) or opened (Op) – check the cable of the sensor, whose icon is flashing or send the device along with the sensors to the service centre.

### **The pump or mixer does not work**

The device is turned off – make sure that the proper icons are displayed. If not – check the settings. Restore factory settings (section 9).

Connection error – check.

### **Mixer operates continuously**

Dynamics (parameter no. 3) is set to too high a value – adjust the setting.

Hysteresis (parameter no. 2) is set to too low a value – adjust the setting.

## **16. SIMPLIFIED DECLARATION OF EU CONFORMITY**

P.H.P.U. AS AGNIESZKA SZYMAŃSKA-KACZYŃSKA hereby declares that the type of EU-ROSTER 10M equipment conforms to the following directives: 2014/35/EU (LVD), 2014/30/EU (EMC), 2011/65/EU (RoHS).

The complete text of the Declaration of EU conformity is available at the following Internet address: [www.euroster.pl](http://www.euroster.pl).

## **17. TECHNICAL DATA**

Controlled device: mixing valve actuator, CH circulating pump, heating source

Supply voltage: 230 V 50 Hz

Maximum output load: 100 W (each output)

Maximum power consumption: 2 W

Temperature measurement range: -30°C... +110°C

Zone temperature control range: +10°C... +70°C

Temperature control accuracy: 1°C

Hysteresis range: 2°C... 10°C

Operating temperature +5°C... +40°C

Storage temperature: 0°C... +55°C

Ingress protection rating: IP20

Installation method: protective cabinet – DIN 35 mm rail

Warranty period: 2 years

Dimensions (width/height/depth) in mm: 106 / 90 / 59

Line protection: WTA-T 3.15 A time-lag fuse (inside the device).

## **18. KIT CONTENTS**

- a) Euroster 10M controller
- b) Controller power cable: 2 m
- c) Zone temperature sensor: 3 m
- d) Boiler temperature sensor: 3 m
- e) Sensor hose clips: 2 pcs.
- f) Installation and Operation Manual with Warranty Certificate

## 19. ELECTRONIC WASTE MANAGEMENT INFORMATION



This product is designed and manufactured from high-quality materials and components suitable for reuse. If the equipment, packaging, user manual, etc. is provided with a crossed-out wheeled bin symbol, it means that the product should be selectively collected in accordance with the Directive 2012/19/EU of the European Parliament and of the Council. Such marking informs that the electrical and electronic equipment may not be disposed of together with other household waste after their service life. The user is obliged to take the used devices to a point of collection of waste electrical and electronic equipment. The entities collecting such equipment, including the collection points, shops, and municipal entities, set up an appropriate system enabling handover of such equipment. The proper disposal of waste equipment contributes to the prevention of dangerous consequences to nature and human health, resulting from the possible presence of hazardous components in the equipment and from inaccurate storage and processing of such equipment. Selective collection contributes to the recovery of materials and components used for manufacturing the equipment. A household plays an important role in contributing to reuse and recovery including recycling, of the waste equipment. The attitudes influencing the protection of the common good of a clean environment are shaped at this level. Households are also one of the larger users of small equipment and its rational management at this stage impacts the recovery of recyclables. Inaccurate disposal of this product may be penalized in accordance with national legislation.

## 20. MAINTENANCE

Before each and every heating season, the control module must be cleaned of any dust and other dirt, the cables must be checked for their technical condition and tight fixing. Do not use solvents and aggressive detergents to clean the controller, since they may damage the surface of the housing. If necessary, wipe it carefully with a soft cloth.

**WARRANTY CERTIFICATE**  
**EUROSTER 10M CONTROLLER**

Warranty terms:

1. The warranty is valid for 24 months from the device's sale date.
2. The claimed module along with this warranty certificate must be supplied to the seller.
3. Warranty claims shall be processed within 14 business days from the date the guarantor has received the claimed device.
4. The device may be repaired exclusively by the guarantor, manufacturer or by other parties clearly authorized by the manufacturer.
5. Warranty becomes void in case of any mechanical damage, incorrect operation and repairs made by unauthorized persons.
6. This consumer warranty does not exclude, restrict nor suspend any right of the buyer if the product does not meet any of the sale contract terms.

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Sale date	Serial number/date of manufacture	stamp and signature	service: telephone No. (65) 57-12-012
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**The business entity that issued this warranty certificate (the guarantor) is:**  
**P.H.P.U. AS Agnieszka Szymańska-Kaczyńska, Chumiętki 4, 63-840 Krobia, Poland**