

EUROSTER 12M WEATHER-BASED CONTROLLER FOR THE HEATING ZONE

Manual version: 01.08.2016

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

1. INTRODUCTION

In order to take full advantage of the controller capabilities and ensure proper operation of the heating system, please read this user manual carefully.

2. APPLICATION

EUROSTER 12M is a universal weather-based controller designed for control of a heating zone equipped with a mixing valve with a three-point actuator and a central heating zone pump.

All parameters are shown on the legible graphical display, and the device is very easy to control with a knob and a button.

3. BASIC FUNCTIONS OF THE CONTROLLER

- Control of a 3-point actuator of a mixing valve
- Control of a heating zone pump
- Weather-based setting of a heating zone preset temperature
- Weekly operating schedule
- Cooperation with a room thermostat
- Switching the heating off automatically in case of external temperature increase
- Function of switching a zone on temporarily with a preset temperature (floor preheating, fast heating up of rooms)
- Zone overheating protection, frost protection
- Alarm indication
- Ability of test switch-on of outputs
- Anti-Stop system – protection of pumps against seizure
- legible, graphic, backlit LCD
- Set of temperature sensors included



EUROSTER 12M 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 10 days when the heating season is over. Keep the controller turned on to allow the function operation after the heating season.

4. VISIBLE ELEMENTS



1. 230 V 50 Hz power cable of the controller
2. 230 V 50 Hz power cable of the central heating pump

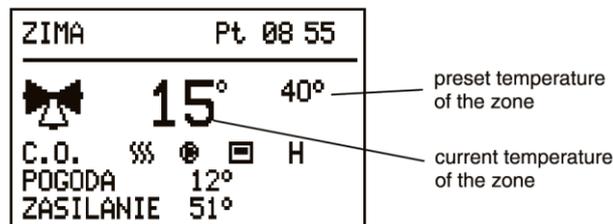
3. 230 V 50 Hz power cable of the valve actuator
4. Connection cable of a room thermostat
5. Outdoor temperature sensor cable
6. Cable of the controlled zone temperature sensor
7. Feeding temperature sensor cable
8. Power switch
9. LCD
10. Knob

a. Display

The display shows the following information:

- Current and preset temperature of the heating zone
- Current feeding temperature of the heating system
- Outdoor temperature
- Switched on devices
- Date and time
- Controller status (animation of mixer operation, heating season, alarms, etc.)

Example of screen.



b. Meaning of Display Symbols

H – operation with hourly schedule

 – pump output switched on

WINTER – heating season

AS – anti-stop system active

AF – frost protection switched on

 – automatic operation function switched on; if the heating is off, the symbol flashes

 Indicates opening of the mixer.

 Indicates closing of the mixer.

 The symbol is displayed if the mixer is neither being opened nor being closed (e.g. within the hysteresis or during gaps between turning steps resulting from the PI algorithm).

5. CONTROLLER INSTALLATION

GENERAL SAFETY RULES

- **It is necessary to read this user manual carefully prior to the commencement of the installation works. Incorrect installation and improper use may lead to a serious hazard to a user or other persons and result in material 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!**
- **Do not install the controller in rooms of increased humidity, substantial dustiness or with presence of caustic or flammable vapors, 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 in the systems with a risk of damage.**
- **In the case of failure of control systems, use additional protective equipment.**
- **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!**

Using a pair of screws, mount the controller box on a wall or any other supporting structure (screw anchors with screws are supplied with the controller). Screw the power cables to the connections of the controlled devices according to the description and the drawing. Make sure to keep the proper designation of the cables. Connect the neutral conductors to N terminals, phase conductors to L terminals and grounding conductors to PE terminals.

Using hose clips, tighten the temperature sensors to the pipes and cover them with thermal insulation. At installation, avoid leading the cables of temperature sensors parallel to live cables. Moreover, make sure to provide the proper contact with measured surfaces.

CAUTION! The controller should be installed in a place where the temperature does not exceed 40°C.

CAUTION! Do not immerse the temperature sensors in liquids nor install them at flue gas outlets to the stack.

INSTALLING TEMPERATURE SENSORS

- Install the feeding temperature sensor on the boiler in the place reserved for this purpose or at an uncovered outlet pipe of the CH boiler (possibly close to the boiler).
- Install the CH (controlled zone) temperature sensor at the mixer outlet.
- Use hose clips to tighten the sensors to the pipe and cover them with thermal insulation.

CONNECTING POWER CABLE TO THE PUMP

- Connect the yellow or yellow and green core (protective conductor) to () terminal.
- Connect the blue core to (N) terminal.
- Connect the brown core to (L) terminal.
- Check the cores for proper connection and screw the cover of the terminal box.

CONNECTING POWER CABLE TO THE VALVE ACTUATOR

- Connect the grey core to "N" (neutral conductor) terminal.
- Connect the brown core to "L" terminal (phase conductor, closing, temperature decrease).
- Connect the black core to "L" terminal (phase conductor, opening, temperature increase).
- Check the cores for proper connection and fasten the cover to the terminal box.

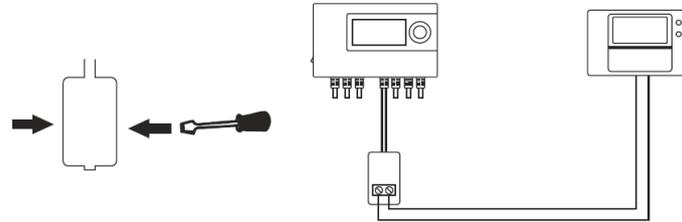
CONNECTING A ROOM THERMOSTAT

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.
- Use a flat screwdriver to press the locking clips of the housing cover.

- Open the housing and remove the jumper from the joint.
- Lead a cable (minimum 2 x 0.5 mm² stranded wire) between the room thermostat (or the receiver – in case of connecting the wireless version) and the EUROSTER 12M controller and insulate the cables.
- Screw the cables to the joint.
- Connect the cables to the COM and NO contacts in the room thermostat.
- Switch on the operation with the room thermostat in the controller menu.

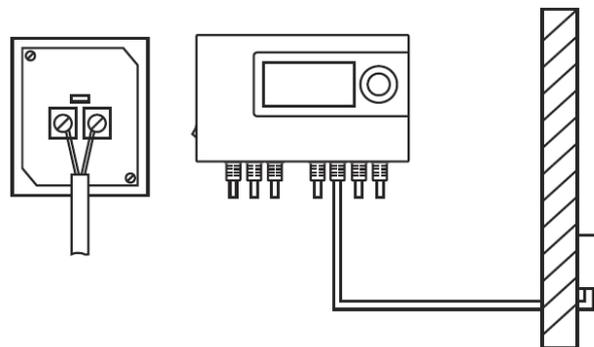


INSTALLING AN OUTDOOR SENSOR

Outdoor temperature sensor should be installed in a shaded place, preferably at the north or north-east side, away from windows and doors, at a height of approximately 2 m above ground.

Outdoor temperature sensor connection

- Make sure that the controller is de-energized.
- Use a cross-head screwdriver to unscrew 2 screws fixing the housing of the outdoor sensor.
- Remove the housing cover.
- Screw two cores of a 5 m long cable to the connection on the board (keeping cable polarization is not necessary).
- Fix the cable in the housing.
- Place the cover and tighten it with two screws.
- Mount the temperature sensor on the wall with screw anchors.



CONNECTING THE CONTROLLER TO POWER SUPPLY

- After securing the cables against accidental breaking, connect the power cable to 230V/50Hz mains socket with earth pin.

MAINTENANCE

Before each and every heating season, the controller 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 and the display. If necessary, wipe it carefully with a soft cloth.

6. SWITCHING ON AND OPERATING THE CONTROLLER

The controller is operated by means of a knob with a button. Use the power switch to turn the controller on. Once the controller is switched on a main information window is displayed and an anti-stop system is activated for 15 seconds (AS sign is displayed).

Press the knob to enter the menu. Turn the knob to select the subsequent menu items. Press the knob to select the required item. Proceed the same way to change the parameters. Exit the menu using "Exit" messages or by pressing the knob longer (for approximately 3 seconds).

7. RESTORING FACTORY SETTINGS AND CHANGING THE LANGUAGE

In order to restore factory settings perform the following steps:

- Keep the knob pressed and turn the controller off and on. A configuration window "Factory settings" will be displayed.
- If you want to restore factory settings, set YES for "RESET" parameter.
- Select the menu language.
- Store the changes by confirming the parameter "STORING/Exit".

Caution! Reset does not delete the menu language, date and time.

8. DESCRIPTION OF THE MENU PARAMETERS

The user is provided with basic settings. Advanced options are contained in "Settings" item.

Caution! It is recommended to restore factory settings before configuring a new controller.

a. Preset temperature

Enables changing the preset heating zone temperature or heating curve in case the weather-based control is on.

b. Schedule

Hourly schedule of heating zone operation. Enables switching the operation of the heating zone on/off with an accuracy of hour.

If the operating times of heating zone are selected, the pump and the mixer operate automatically.

In the situation when the hourly operating schedule is not selected (lack of heat demand), the pump operates in accordance with the selected setting "Continuous pump operation", "Time-based pump operation" or "Pump switched off".

The parameters are available in the menu: "Settings – CH Zone", item "Room thermostat".

c. Heating season

It enables switching off the central heating zone beyond the heating season (SUMMER).

d. Manual operation

Enables test switch-on of the CH pump and closing or opening of the mixer. The test lasts for one minute or until leaving the menu.

e. Temporary activation

Enables manual switch-on of the heating zone with the preset temperature and operating time. Upon expiration of the preset operating time, the controller restores automatic operation.

This function is useful, e.g. for floor preheating or, in case it is necessary to switch on the heating manually with a constant temperature for a particular period.

Temporary switch-on may be activated regardless (with priority) of the heating season – SUMMER/WINTER, selected operating schedule or signal from the room thermostat. It provides the ability to switch-on the heating at any time.

f. Date and time

This windows enable to enter current date and time. Please remember that only correct settings enable a proper operation of the schedules and controlling algorithms.

g. Settings

Contains the settings related to the operation of the heating zone and the feeding sensor.

CH ZONE

- **Mixer**

Mixer dynamics – determines the time of mixer response to changes in the zone temperature. An excessive value may cause frequent cycling of the mixer, whereas the insufficient value may cause slowness in achieving the preset temperature.

Mixer hysteresis – if the measured temperature of the zone differs from the preset one by half of the value of the preset hysteresis, then the mixer position is not corrected.

- **Alarm temperature**

The zone overheating alarm is generated if the temperature of the zone sensor exceeds the preset value of the "Alarm temperature". If the alarm temperature is maintained longer than for one minute, then the pump is switched off.

The alarm temperature should be preset as the maximum safe temperature for a particular heating zone. In the case of floor heating, it is recommended for the alarm temperature not to exceed 50°C.

Caution! Incorrect setting of temperature level may cause improper operation or major failure of the system components.

- **Weather compensator**

Using weather compensation enables to achieve thermal comfort regardless of external temperature.

Upon switching the weather compensation on, set the temperatures of the heating zone for three outside temperatures. Based on them, the controller calculates the currently required heating zone temperature.

Caution! Temperatures must meet the condition of: $T10^{\circ}\text{C} \leq T0^{\circ}\text{C} \leq T-20^{\circ}\text{C}$, otherwise the control will not work properly.

- **Room thermostat**

Enables switching on room thermostat control and includes the operating parameters in the situation if the hours are not selected in the schedule. In such case (not selected hour in the schedule or open contacts of the room thermostat), the pump operates in one of the three modes:

- Continuous — the pump operates continuously, the zone temperature is reduced by the parameter "Temperature reduction".
- Time-based operation — the pump operates with a preset operating and idle time period. In the operating time the preset temperature is reduced by the parameter "Temperature reduction".
- Switched-off — the pump is not operating, the mixer is closed.

- **Automatic operation**

Function enabling automatic switch-off if the temperature of the weather sensor (outside) exceeds the preset value of "Switch-off temperature".

The heating will be restarted if the external temperature drops below the value of "Switch-on temperature".

SUPPLY

- **Feeding sensor ON/OFF**

This item enables the controller operation with the feeding temperature sensor switched off. In that case, the CH pump and the mixer operate based on the schedule and the signal from the room thermostat.

- **Shutdown temperature**

Below this temperature, the CH pump is being switched on, and the mixer is being closed. If the feeding temperature rises above "Shutdown temperature" by 2°C, the pump is being switched on, and the mixer is being opened.

- **Alarm temperature**

Exceeding the feeding alarm temperature activates the alarm algorithm to attempt to cool down the boiler. The heating zone is heated up to the alarm temperature of the zone.

- **Correction of sensors**

Correction of temperature sensors allows to correct temperature reading errors, such as the ones resulting from improper contact between the sensor and the pipe.

9. CONTROLLER OPERATION

The temperature of the heating zone is adjusted with the PI algorithm (proportional-integral algorithm), which enables obtaining fast and accurate control for different loads. 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 exceeds half of the hysteresis value, then the mixer position is corrected with the speed determined by "Dynamics" parameter. If the mixer was switched on to operate at the same direction by at least 100 s, the controller switches the valve actuator permanently to set it in the limit position.

The CH pump is switched on if the temperature of the feeding sensor exceeds the value of the "Shutdown temperature" parameter by 2°C, and it is switched off if the temperature of the feeding sensor drops below the shutdown temperature.

The heating zone is switched off if:

- The heating season (WINTER) is switched on.
- The current time is selected in the schedule.
- The room thermostat is active or operation with room thermostat is switched off.
- Automatic operation is switched off or the mean outdoor temperature is lower than the switch-off temperature in the case of switched on automatic operation.
- The feeding temperature is higher than required or the feeding temperature sensor is switched off.

CAUTION! The temperature preset for a heating zone is not displayed if:

- The feeding sensor temperature is lower than the shutdown temperature.
- The room thermostat reached the preset temperature and switched off the zone (pump operation switched off).
- There is a stoppage set up in an operation schedule.
- The zone was switched off automatically (it is warm outside).

10. ANTI-STOP SYSTEM

Anti-Stop system activates the pump and the mixing valve directly upon each switch-on of the controller (also upon restoring factory settings), and later — every 10 days. During its operation, "AT" letters flash at the display.

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.

11. ALARM SITUATIONS

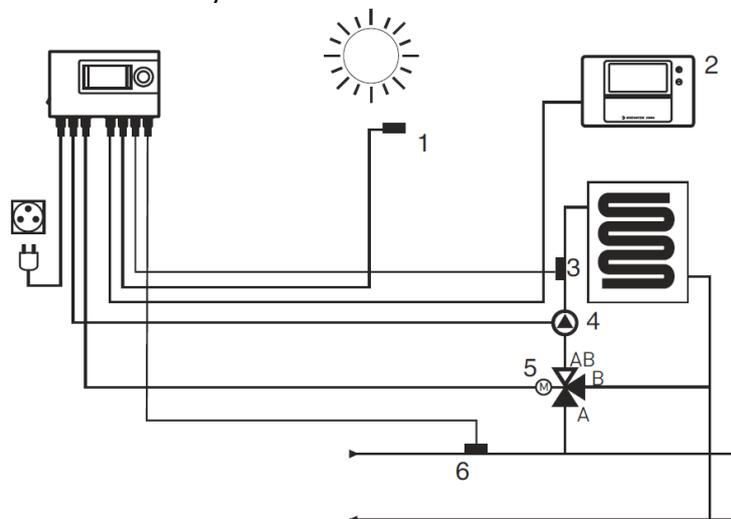
To ensure safe and reliable operation, the controller features a number of protections. The list of alarm events is shown in the table below. In case an alarm situation occurs, audible alarm is generated, and a relevant message is displayed. Upon resolution of the alarm situation, the controller automatically resumes operation.

Alarm	Message	Controller response
Feeding sensor shorted	ALARM: FEEDING shortage	Activation of an audible alarm. CH temperature operated up to the preset temperature.
Breach of the feeding	ALARM: FEEDING	Activation of an audible alarm. CH temperature operated up to the preset

sensor	breach	temperature.
Feeding sensor overheating	ALARM: FEEDING overheating	Activation of an audible alarm. Preset temperature of the heating zone is increased to the zone alarm temperature of -5°C.
Central heating zone sensor shorted	ALARM: CH shortage	Activation of an audible alarm. Pump switch-off and mixer closing.
Breach of the CH zone sensor	ALARM: CH breach	Activation of an audible alarm. Pump switch-off and mixer closing.
CH zone sensor overheating	ALARM: CH overheating	Activation of an audible alarm. Pump switch-off.
Outdoor temperature sensor shortage	ALARM: WEATHER shortage	Activation of an audible alarm. The controller operates with the temperature preset for -20°C.
Outdoor temperature sensor breach	NO	The controller operates with the temperature preset for -20°C.

12. CONNECTION DIAGRAM

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



1. Outdoor temperature sensor
2. Room thermostat
3. Heating zone temperature sensor
4. CH zone pump
5. Mixing valve with actuator
6. Feeding temperature sensor

13. TECHNICAL DATA

Controlled device: CH pump, 3-point actuator of a mixing valve with limit switches

Supply voltage: 230 V 50 Hz

Maximum pump output load: 1 A 230 V 50 Hz

Maximum mixer output load: 1 A 230 V 50 Hz
Maximum power consumption of the controller: 3W
Temperature measurement range: -30°C... +100°C
Temperature control range: +10°C... +90°C
Temperature control accuracy: 1°C
Hysteresis range: 2°C... 10°C
Visual signalization: backlit, graphic LCD
Operating temperature: +5°C... +40°C
Storage temperature: 0°C... +45°C
Ingress protection rating: IP40
Color: black
Mounting method: wall-mounted, screw anchors
Controller weight: 0.92 kg
Warranty period: 2 years
Dimensions (width / height / depth) in mm: 150 / 90 / 52
Line protection: WTA-T4A time lag fuse (inside the controller)
Length of cables:
Controller power cable: 1.5 m
CH pump power cable: 1.5 m
Mixer actuator power cable: 3 m
Connection cable of a room thermostat: 0.5 m
Outdoor temperature sensor: 5 m
CH zone temperature sensor: 3 m
Feeding temperature sensor: 1.5 m

14. KIT CONTENTS

- Euroster 12M Controller with temperature sensors
- Outdoor temperature sensor
- Sensor hose clips (2 pcs)
- Screw anchors (4 pcs)
- Mounting template
- User Manual with Warranty Certificate

15. SIMPLIFIED DECLARATION OF EU CONFORMITY

P.H.P.U. AS AGNIESZKA SZYMAŃSKA-KACZYŃSKA hereby declares that the type of EUROSTER 12M 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

ELECTRONIC WASTE MANAGEMENT INFORMATION



This product is designed and manufactured of high quality materials and components suitable for reuse.

The crossed out wheeled bin symbol located at the product means that the product is subject to selective collection in accordance with the provisions of the Directive 2012/19/EU of the European Parliament and of the Council.

The product contains an internal battery subject to the selective collection in accordance with the provisions of the Directive 2006/66/EC of the European Parliament and of the Council.

Such marking informs that the electrical and electronic equipment and batteries may not be disposed of together with other household waste after their service life. The user is obliged to take the used devices and batteries to a point of collection of waste electrical and electronic equipment and batteries. The entities collecting such equipment, including the collection points, shops, and municipal entities, set up an appropriate system enabling handover of such equipment and batteries.

The proper disposal of waste equipment and batteries contributes to prevention of consequences hazardous to the health of persons and nature, resulting from the possible presence of hazardous components in the equipments and batteries and from inaccurate storage and processing of such equipment and batteries. The guidelines regarding disposal of the batteries are included in the user manual.

A household plays an important role in contributing to reuse and recovery including recycling, of the waste equipment. The attitudes influencing protection of the common good of 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 penalised in accordance with national legislation.

REMOVAL OF INTERNAL BATTERY

Remove the internal battery by following the below steps:

- Make sure that the controller is de-energized.
- Unscrew 5 screws fixing the rear wall of the controller.
- Pry up the knob and remove it.
- Remove the front of the controller cover.
- Take out the board with the display, and the battery from the sockets.
- Cut the pin-outs connecting the battery with the printed circuit board.

WARRANTY CERTIFICATE EUROSTER 12M controller

Warranty terms:

1. The warranty is valid for 24 months from the device sale date.
2. Claimed thermostat together with this warranty certificate must be supplied to the seller.
3. Warranty claims shall be processed within 14 business days from the date the manufacturer has received the claimed device.
4. The device may be repaired exclusively by the manufacturer or by other party clearly authorized by the manufacturer.
5. Warranty becomes invalidated in case of any mechanical damage, incorrect operation and/or making any repairs by unauthorized persons.
6. This consumer warranty does not exclude, restrict nor suspend any right of the Buyer ensuing if the product would not meet any of the sale contract terms.

.....
sale date

serial number/ date of stamp
manufacture and signature

service:
tel. 65-57-12-012

Business entity that issued this warranty certificate is:

P.H.P.U. AS Agnieszka Szymańska-Kaczyńska, Chumiętki 4, 63-840 Krobia, Poland