

## EUROSTER 11M

### Operation and assembly manual



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#### 1. INTRODUCTION

In order to guarantee correct operation of central heating controller and installations one should familiarize oneself with the present user manual.

#### 2. INTENDED USE

**EUROSTER 11M** is a modern, microprocessor controller for regulating temperature with the use of mixing valve, equipped in limit switches.

Depending on configuration, it regulates temperature in heating circuit (e.g. floor heating) or boiler return temperature. It also controls central heating pump operation by switching it off when the boiler is damped.

Temperature is regulated with the use of PI algorithms (proportional - integral) which allows for fast and accurate regulation for varied loads.

In temperature regulation mode for the heating circuit, the controller can cooperate with any room regulator which has a no-voltage output, normally open (NO) i.e. all EUROSTER regulators).



The **EUROSTER 11Z** controller has been equipped in an ANTY STOP system to prevent formation of deposits on motors of unused pumps. After finishing heating season it automatically launches the mixer and the pumps every 14 days. In order for the system to work out of season, the controller must be left on.

#### 3. CONTROLLER FUNCTION

- keeps constant water temperature: in the central heating circuit or in boiler return
- possibility of connecting room regulator
- Anty-Stop function to protect pumps and valve against stoppage
- frost protection
- pump operation test
- temperature reading correction

#### 4. EXTERNAL VIEW



1. Controller power supply cable, 230 V, 50 Hz
2. Power supply cable for central heating pump, 230 V 50 Hz
3. Power supply cable for the mixing valve actuator, 230 V 50 Hz with limit switches.
4. Cable for the temperature sensor for the regulated circuit - heating or return
5. Boiler temperature sensor cable
6. Mains switch
7. LCD screen
8. Knob

Screen backlight turns off by default after a minute of finishing controller operation. Controller makes it possible to set permanent backlight. (chapter 9).

#### 5. CONTROLLER ASSEMBLY



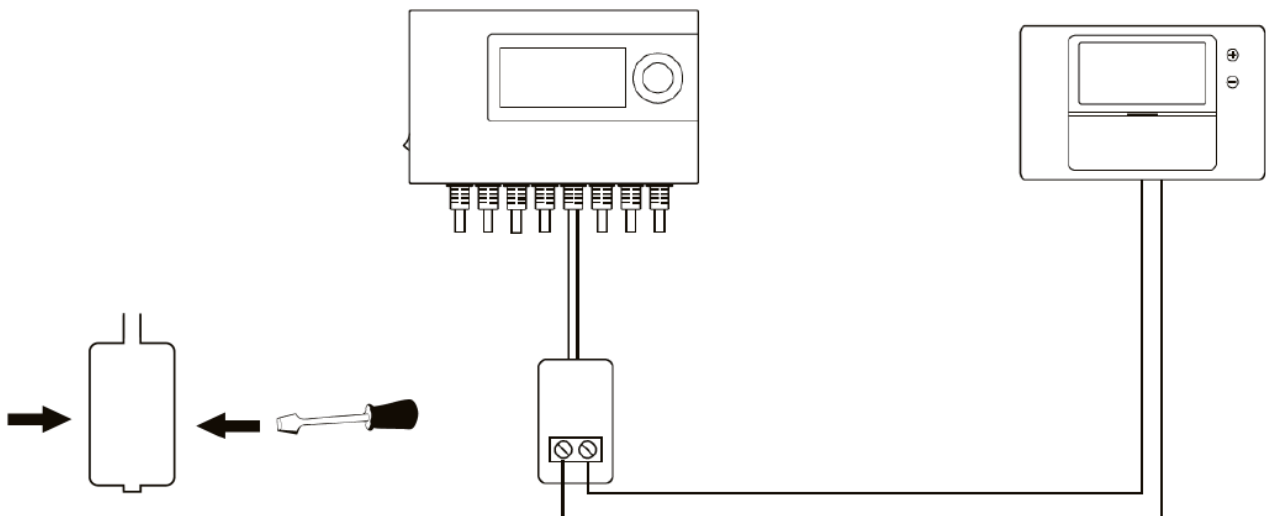
**On outlet cables of the controller there is voltage at life hazard level therefore energy supply should be switched off during installation and only qualified people should perform assembly. Do not assemble a controller with mechanical damage.**

##### a) connection of room regulator (only in heating circuit temperature regulation system - set 1)

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:

- ensure 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 2x0.75 mm<sup>2</sup> stranded wire) between the room thermostat (or the receiver – in case of connecting the wireless version) and Euroster 11M and insulate the cables
- screw the cables to the joint
- connect the cables to COM and NO contacts in the room thermostat.



##### b) fixing the controller:

- fix the controller on a wall and other support with the use of two screws (rawbolts with screws come with the regulator),
- attach the cables lead out of the controller to the wall with the use of grips.

**c) fixing sensors:**

- **sensors must not be immersed in liquids and installed on exhaust fume outlets to the chimney,**
- install central heating sensor on the boiler in an appropriate place or in an uncovered part of central heating pipe (as close to the boiler as possible),
- install another sensor on mixer input
- press the sensors to the pipe with the use of bands.

**d) connecting supply cables to the pump:**

- connect yellow or yellow-green conductor (protective cable) to the clamp ( $\perp$ ),
- connect blue conductor to the clamp (N),
- connect brown conductor to the clamp (L),

**e) connecting supply cables to the actuator:**

- connect grey conductor to the clamp (N),
- connect brown conductor to the clamp (L - closing, lowering temperature),
- connect black conductor to the clamp (L - opening, rising temperature),

**f) checking the connection:**

- check whether the cables have been connected correctly and turn clamp box covers.

**g) connecting the controller:**

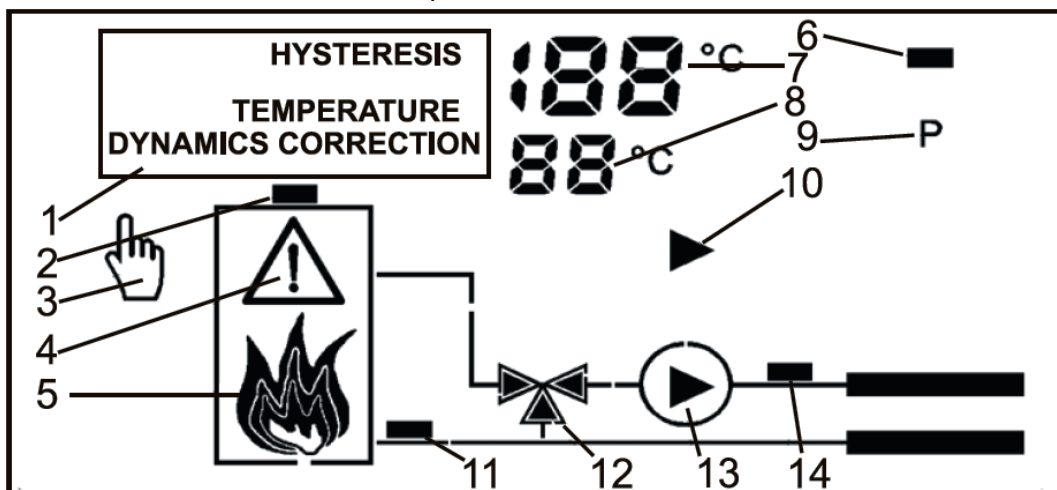
- **after securing cables against accidental rupture,** feeder cable should be connected to 230V/50Hz socket with an earthing pin.



**Ambient temperature in controller installation place should not exceed 40°C.**

**6. SCREEN DESCRIPTION**

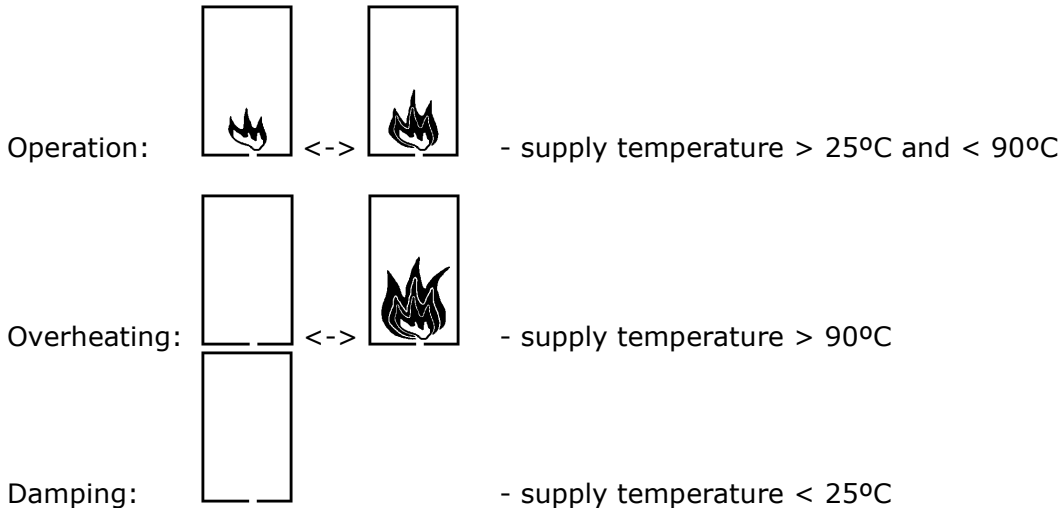
Active LCD screen elements have been presented below:



1. Names of the set parameter - displayed during setting monitoring or changing
2. Heat source (boiler) temperature sensor symbol
3. Manual operation symbol - on during manual control
4. Alarm symbol - pulsating in case of an emergency situation
5. Furnace condition presentation (heat source temperature) - description below
6. Signalling of room regulator input condition - only in the "heating circuit" mode; on if the regulator switches on heating
7. Heat source (boiler) temperature / Values of the presented parameter
8. Regulated circuit temperature / Menu item number
9. Symbol of controller operation in return temperature regulation mode
10. Pump symbol - on during pump operation, only in "return" mode
11. Return temperature sensor symbol - only in the "return mode")

12. Mixer symbol - relevant segments are on during operation of mixer actuator
13. Pump symbol - on during pump operation, only in "heating circuit" mode
14. Central heating temperature sensor symbol - only in "heating circuit" mode

**Animated presentation of furnace condition only serves information purposes - it does not influence controller operation.**



## 7. TURNING THE CONTROLLER OFF

- Set power switch (6.) into position I.
- After turning off software version and compilation date are displayed for 2 seconds.
- ANTY STOP system for switching on the mixer and then the pump - AS displayed on the screen.
- System condition is being displayed on the screen.
- After starting it for the first time, set required operation mode (chapter 8.) and correct controller settings (chapter 10.).

## 8. OPERATION MODE SETTINGS

**EUROSTER 11M** operates in one of the two modes: heating medium temperature regulation (e.g. in floor heating) or return temperature stabilization. Operation mode is changed when restoring factory settings (chapter 9.), provided for each of the modes.

- **Set 1** intended for system with heating medium temperature regulation
- **Set 2** intended for system with return temperature regulation

## 9. RESTORING FACTORY SETTINGS / PERMANENT SCREEN BACKLIGHT

If it is needed to restore factory settings or change operation mode, the following steps should be taken:

- Keep the knob pressed and turn the controller on and off.
- "Fd" (Factory defaults) will appear on the screen, once the knob is released, 0 will appear.
- Use the knob to select required settings (0, 1 or 2) and confirm.
- By selecting 0 you will be able to change screen backlight functions without restoring factory defaults. Selecting 1 restores factory settings and sets operation in heating medium control mode, selecting 2 restores settings and sets operation in return temperature control mode.
- Next, "bl" (Backlight) will appear on the screen, once the knob is released, 0 will appear.
- Use the knob to select 0 or 1 and confirm. Selecting 0 will result in automatic screen backlight switch off after 1 minute of finishing controller operation, and selecting 1 will result in permanent screen backlight.
- control and possibly correct the remaining controller settings.

In case of lack of confirmation within 5s the controller resumes operation as if no changes

have been introduced.

## 10. CONTROLLER SETTINGS

After being switched on the controller shows system condition. Turning the knob right result in entering setting overview and change mode.

Controller configuration follows a method specified below: Chose the required parameter by turning the knob. The controller will show the value (at the top) and number (at the bottom). In order to change value of the shown parameter, push the knob (parameter value will start pulsing), set the required value and confirm selection by pressing the knob. If the value should not be changed (cancellation of changes), do not push the knob, but wait 10 seconds for the setting to stop pulsing.

Setting windows have been number for convenience.

User can change the following parameters:

### 1. Regulated temperature

This is the temperature that the controller is trying to keep with the use of a mixer. This can be the temperature of heating circuit or return temperature.

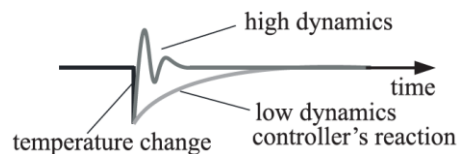
### 2. Temperature regulation hysteresis

This is temperature difference at which the controller starts closing and opening the valve. If temperature of the regulated circuit does not differ from the settings by more than half hysteresis, the controller will not correct mixer position. Thanks to this it is possible to avoid unnecessary mixer rotation. Hysteresis can be set to zero - the controller will then attempt to keep temperature exactly equal to the set temperature.

### 3. Dynamics

This parameter characterizes regulation dynamics. If fast controller reaction to temperature changes is important, dynamics should be increased. This can, however, result in over-regulation.

Example reaction of the regulator to sudden temperature drop with too big and too small dynamics has been presented below.



### 4. Pump switch on temperature

This is boiler temperature at which central heating pump is switched on.

### 5. Pump hysteresis

It refers to temperature difference at which the controller switches the central heating pump on and off. Conditions for pump switching on and off have been described in detail in chapter 11.

### 6. Circuit alarm temperature

Settings allow to set a temperature at which alarms procedures are launched. If the controller works in floor installation we recommend to set it at 45 C.

### 7. Reading correction - boiler temperature sensor

This is the value which is added to the measured temperature. it allows for correction of readings between the sensor placed on the pipe and the thermometer on the boiler.

### 8. Reading correction - regulated circuit temperature

This is the value which is added to the measured temperature. it allows for correction of temperature difference between the sensor placed on the pipe and heating medium.

### 9. Mixer operation / test

It allows for manual control of the actuator. The numbers have the following meaning:

- 1 - closing the mixer (reducing regulated temperature),

0 - stopping the mixer

1 - opening the mixer (raising regulated temperature)

Pressing the knob and change in the displayed value allows for manual control of the mixer. After 10 s of inactivity or after pressing the knob again, the controller resumes operation according to its settings.

### 10. Pump operation / test

it shows current pump condition, calculated by the controller (0 or 1).

Pressing the knob and change in the displayed value allows for manual control of the pump. After 10s of inactivity or after pressing the knob again, the controller resumes operation according to its settings.

**REMARK: In case of setting values that make it impossible for the controller to work correctly, an alarm symbol is displayed on the screen and the colliding settings are displayed one after the other. After several seconds last correct configuration is restored.**

A list of all the settings has been shown below.

**1** - operation in floor temperature regulation mode,

**2** - operation in return temperature regulation mode,

Setting	Value								unit
	no		name		minimum		maximum		
	1	2	1	2	1	2	1	2	
Regulated circuit temperature	1	1	35	40	10	20	70	70	°C
Temperature hysteresis of the regulated circuit	2	2	10	10	0	0	10	10	°C
Mixer dynamics	3	3	10	10	1	1	64	64	-
Pump switch on temperature	4	4	40	40	20	20	80	80	°C
Pump hysteresis	5	5	4	4	2	2	10	10	°C
Regulated circuit alarm temperature	6	-	45	-	40	-	90	-	°C
Reading correction - boiler temperature sensor	7	6	0	0	-5	-5	5	5	°C
Reading correction - regulated circuit temperature	8	7	0	0	-5	-5	5	5	°C
Mixer operation	9	8	- 1)	- 1)	-1 2)	-1 2)	1 2)	1 2)	-
Pump operation	10	9	- 1)	- 1)	0 3)	0 3)	1 3)	1 3)	-

1) Value calculated by the controller is shown

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

3) 1 mean switching on, 0 – switching off

### 11. CONTROLLER OPERATION

The controller constantly monitors boiler and regulated circuit temperature. From time to time it calculates the difference between set and measured temperature.

If the difference between the set and measured temperature exceeds half of the hysteresis, mixer location is corrected with a speed specified in the **dynamics (3.)** parameter.

if the mixer has been switched on in the same direction for at least 100 s, the controller switches off mixer actuator to set it in limit position. After another 500s the mixer actuator will be switched off.

The pump will be switched on, if temperature exceeds settings by half of the set hysteresis value  $T_{\text{boiler}} \geq T_{\text{set cent.heat.}} + H_{\text{pump}}/2$

The pump will be switched off, if temperature drops below settings by half of the set hysteresis value  $T_{\text{boiler}} \leq T_{\text{set cent.heat.}} - H_{\text{pump}}/2$

#### Frost protection

Frost protection function gets activated when temperature of a given sensor falls to 4°C. If the sensor reaches such a temperature, pump is activated and "AF" (Anti freeze) gets displayed on the screen. Protection is switched off, when the temperature raises above 6°C.

## 12. OPERATION WITH ROOM REGULATOR

In central heating circuit regulation mode the **EUROSTER 11M** controller can cooperate with any room regulator which has a no-voltage output, normally open (NO) i.e. any EUROSTER controller.

Regulator switch off (outlet divergence) will result in closing the mixing valve and subsequently in switching the pump off.

Methods for connecting room regulator have been described in point 5.a.

## 13. ANTY-STOP

Pump anty-stop system switches the pump and mixing valve on immediately after each controller switch on (also after restoring to factory default or change of backlight mode) and then every 14 days. During its operation "AS" keeps pulsating on the screen.

In order to prevent the risk of circuit overheating, the procedure is as follows:

- The pump is switched off and the mixer fully opened
- The mixer is closed; after 50s the pump is switched on.

If during the activity period of the ANTY STOP system, an emergency situation (sensor overheating or damage) occurs, operation of the ANTY STOP system will be interrupted.

## 14. TYPICAL DAMAGES AND REPAIR METHODS

### Device is not working

Burnt fuse or memory software fault - send the device to service.

### Screen and sensor symbol blinking, "Sh" or "OP" appears

Short sensor (**Short**) or open sensor (**OP**en) - check sensor cable for which a symbol is pulsating or send the device together with the sensor for service.

### Pump or mixer is not working

Device switched off - make sure that relevant symbols on the device are visible. If not, check the settings. Restore to factory settings (chapter 9).

Connection error - check.

### Continuous mixer operation

Dynamics (setting 3.) set to a too high value - correct settings.

Hysteresis (setting 2.) set to a too small value - correct settings.

### Knob works in an unforeseeable manner

Pulse generator damage - send device to service.

## 15. NORMS AND CERTIFICATES

The **EUROSTER 11M** controller conforms with UE directives: EMC and LVD.

CE conformity declaration has been published and made available at:

<http://www.euroster.com.pl>

## 16. TECHNICAL DATA

Controlled device	mixing valve actuator, central heating pump
Supply voltage	230 V 50 Hz
Maximum inlet and outlet load	3 A 230 V 50 Hz
Maximum power consumption	1.6 W
Temperature measurement range	from -5°C to +110°C
Temperature adjustment range	from +20°C to +70°C from +10°C to +70°C (circuit temperature regulation mode)
Temperature adjustment precision	1°C
Hysteresis range	2°C - 10°C
Visual signalling	backlit LCD screen

Operation temperature	from +5°C to +40°C
Storage temperature	from 0°C to +65°C
Protection level	IP40
Colour	black
Assembly method	wall, rawbolts
Controller weight with cables	0.76 kg
Cable length	controller feeder cable: 1.5 m central heating pump feeder cable: 1.5 m valve actuator feeder cable: 3 m regulated circuit temperature sensor: 3 m boiler temperature sensor: 3 m
Norms, approvals, certificates	conformity with EMC and LVD directives, RoHs
Warranty period	2 years
Size (width/height/depth) mm	150/90/52

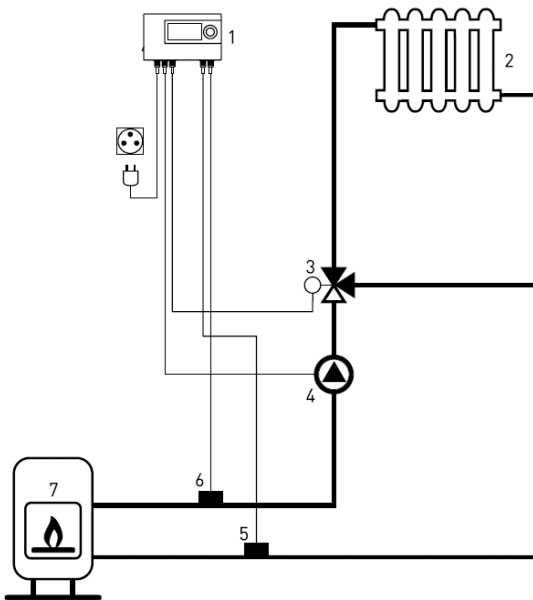
**17. COMPOSITION OF THE SET**

1. sensor with 2 temperature sensors
2. sensor bands
3. rawbolts
4. instructions
5. fixing scheme

**18. CONNECTION SCHEME**

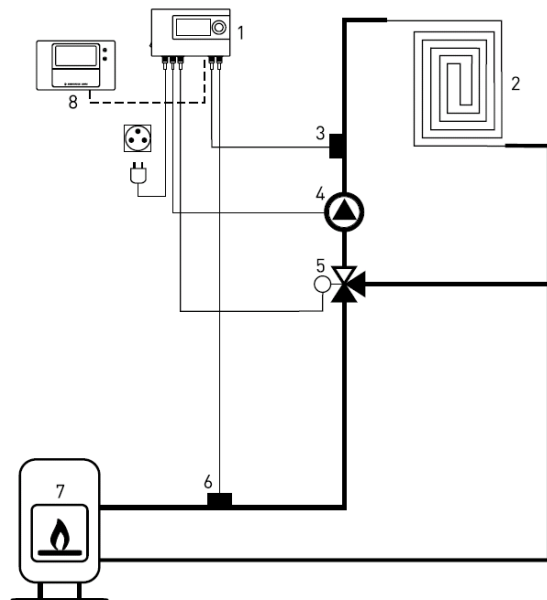
The scheme presented is simplified and does not include all the elements necessary for correct installation operation.

**In return regulation system:**



1. **EUROSTER 11M** controller
2. Heat receiver - heater
3. Mixing valve with an actuator
4. Central heating pump
5. Return temperature sensor
6. Heat source temperature sensor
7. Central heating boiler

**In temperature medium regulation system:**



1. **EUROSTER 11M** controller
2. Heat recipient - circuit
3. Central heating circuit temperature sensor
4. Central heating pump
5. Mixing valve with an actuator
6. Heat source temperature sensor
7. Central heating boiler
8. Room regulator (optional)



**19. INFORMATION ON ELECTRONIC WASTE MANAGEMENT**

We did our best to make our controller work as long as possible. The device is subject to natural wear and tear. If it does not meet your requirements any longer, please bring it to electronic waste collection point. Local electronic equipment distributors offer free waste collection services.

Incorrect management of electronic waste result in environmental pollution. Cardboard packages should be collected as scrap paper.

**WARRANTY CARD  
EUROSTER 11M controller**

Warranty conditions:

1. Warranty is granted for 24 months counted from sales day.
2. In case of a complaint, the controller together with warranty card should be delivered to sales point.
3. A warranty claim will be answered within 14 business days of the date of receipt of the device by the manufacturer.
4. Only the manufacturer or a body acting upon explicit authorization of the manufacturer is entitled to make any repairs.
5. Warranty loses its validity in case of mechanical damage, inappropriate operation and repairs made by unauthorized persons.
6. Warranty for sold consumptions products does not exclude, or limit, or suspend buyer's rights resulting from nonconformity of product with the agreement.

.....  
sales date

serial no / production date

company stamp and signature

**Warranty granting body:**

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