

## EUROSTER 11B UTILITY HOT WATER TANK PUMP CONTROLLER



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### 1. INTRODUCTION

Carefully study this user manual to learn how to correctly operate the **EUROSTER 11B** utility hot water tank pump controller.

### 2. FIELD OF APPLICATION

**EUROSTER 11B** is a modern microprocessor-based controller used to control utility hot water (UHW) tank pump. It turns the pump ON if tank water temperature drops excessively. Additionally, it protects the tank against chilling out in case of a low temperature or extinction of the boiler.

### 3. CONTROLLER FUNCTION

- keep constant temperature in the tank
- blocking function against tank cool down
- anti-stop function to protect pumps against stoppage
- frost protection
- tank against overheating protection
- pump operation test
- temperature reading correction



The **EUROSTER 11B** controller features the Anty-Stop function that prevents idle pump rotor against seizing. Once the heating season is over, every 14 days the function automatically turns ON the pump for 30 seconds. To that end the controller must be left powered up.

#### 4. VISIBLE CONTROLLER ELEMENTS



1. 230 V 50 Hz mains input
2. 230 V 50 Hz power supply to pump
3. Input for the UHW tank temperature sensor cable
4. Input for boiler temperature sensor cable
5. Mains switch
6. LCD display
7. Knob

Screen backlight turns off by default after a minute of finishing controller operation. Controller makes it possible to set permanent backlight. (chapter 8).

#### 5. INSTALLATION



**Hazardous voltages may be present inside the controller and on its cables. Therefore it is expressly forbidden to install the device prior to disconnecting its mains power supply. Only qualified technicians may install the controller. Do not install any devices showing signs of any mechanical damage.**

The procedure:

##### a) Mount the controller:

- using a pair of supplied nylon nail-it fasteners (anchors) mount the controller box on a wall (or any other suitable supporting structure)
- using fasteners fix controller cables to the wall.

##### b) Install temperature sensors:

- **do not immerse sensors in liquids nor install them within stream of flue gases**
- install boiler temperature sensor at the boiler point specially designed for that purpose or on an unshielded boiler outlet pipe (as close to the boiler as possible)
- install tank temperature sensor at the tank point specially designed for that purpose
- using hose clips tighten the sensors to their pipes and cover them with thermal insulation.

##### c) Hook up pump power supply cable:

- connect yellow (or yellow-green) PE wire with the  terminal
- connect blue wire with the N terminal
- connect brown wire with the L terminal.

##### d) Verify the connections:

- check up all cable connections and tighten terminal box lids.

##### e) Hook up the controller:

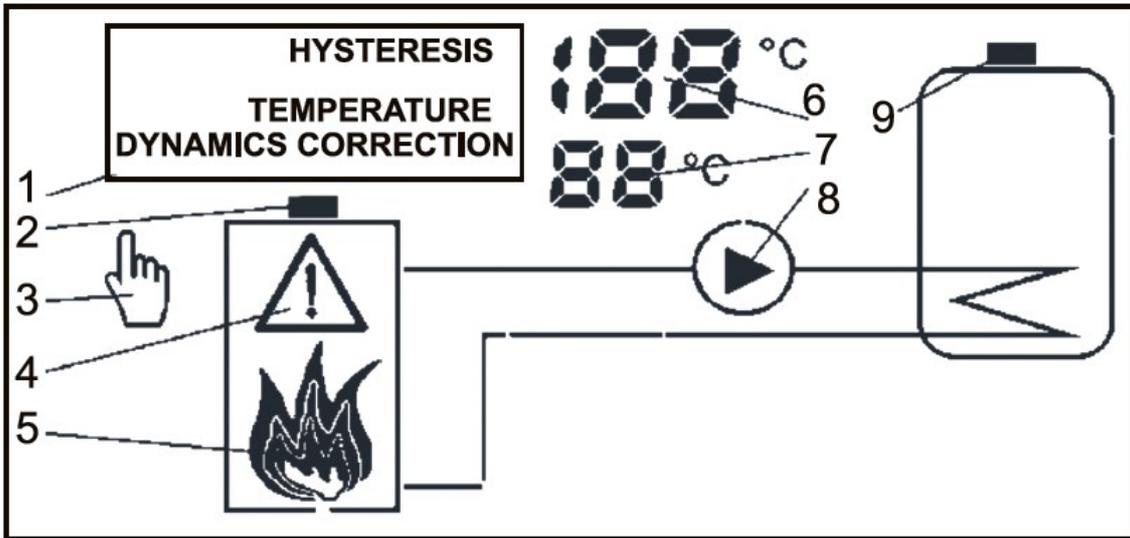
- **make sure controller cables are protected against incidental cut off**
- plug the controller power supply cable into a 230V/50Hz mains socket equipped with a grounding pin.



**The controller must not be installed in a place where the ambient temperature may exceed 40°C**

**6. CONTROLLER DISPLAY**

Elements of the controller display:



1. Name of the controlled parameter (displayed while set point value is browsed/set)
2. Heat source (boiler) temperature sensor icon
3. Manual operation mode (icon lit while the temperature is manually controlled)
4. Alarm symbol - pulsating in case of an emergency situation
5. State of the heat source (boiler) furnace – animated icon, see description below
6. Heat source (boiler) temperature / other displayed parameter value
7. UHW tank temperature / displayed parameter number
8. UHW tank pump icon lit while the pump is running
9. UHW tank temperature sensor

**Animated icon that visually presents state of the heat source (boiler) furnace is for information purposes only, it does not influence operation of the controller in any way.**

- Normal operation:  <->  supply temperature between 35°C and 90°C
- Overheating:  <->  supply temperature > 90°C
- Furnace put out:  supply temperature < 35°C

**7. TURNING THE CONTROLLER ON**

- Turn the controller mains switch (5 in section 3) into the "I" position.
  - Device firmware version No. and compilation date are sequentially displayed for 2 s.
  - "AS" letters are blinking on the display while the Anty-Stop functions turns on the mixing valve, then the pump.
  - State of the system is shown on the display.
- If the controller is being turned on for the first time set the desired controller presets (see section 8 below).

## 8. RESTORING FACTORY SETTINGS / PERMANENT SCREEN LIGHT-UP

If it is needed to restore factory settings, 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 0 or 1 and confirm.
- By selecting 0 you will be able to change screen backlight functions without restoring factory defaults. By selecting 1 you will restore factory defaults.
- 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.

## 9. FACTORY (DEFAULT) PRESETS

Proceed as follows to restore factory presets:

- Press the knob and while holding it depressed turn the controller off and on. "Fd" (factory defaults) is displayed.
- Release the knob. Digit 0 is displayed.
- Select digit 1 and accept the selection.
- Check and correct the presets if needed.

## 10. CONTROLLER PRESETS

Shortly after power supply of the controller is turned on, current state of the system is shown on the display. Turn the knob to the right to enter the preset browse/edit mode. General procedure to edit a preset:

1. Turn the knob to select the desired preset (parameter). The controller displays current value of the selected parameter (top) and its number (bottom).
2. Press the knob. The displayed parameter value starts to blink.
3. Set the desired new value and press the knob to accept it  
or  
Wait 10 seconds until the displayed parameter value stops blinking in order to abort the edit procedure (to leave the current value intact)

Configuration windows are numbered to facilitate manipulations. User may edit the following controller parameters (presets):

### 1. Tank temperature

UHW tank temperature that the controller will attempt to maintain manipulating the pump.

**ATTENTION: Too low tank temperatures (35-40°C) help to grow various bacteria within the tank, including the *Legionella* bacteria.**

### 2. Pump hysteresis

Difference between the temperature at which the controller turns the pump on and the temperature at which the controller turns it off. See section 9 below for details.

### 3. Boiler-tank temperature surplus

Heat source temperature must be higher than UHW tank temperature for two reasons: (i) to provide good heat transfer efficiency, and (ii) to compensate for heat losses between the boiler and the tank. The "Boiler-tank temperature surplus" preset tells how much the boiler temperature should exceed the tank temperature in order that the pump might be engaged. See section 9 for detailed conditions in which the pump is engaged/disengaged.

**4. Boiler temperature sensor correction**

A constant added to all values measured by boiler temperature (external) sensor to compensate for differences in respect to water temperature inside the boiler.

**5. UHW tank temperature sensor correction**

A constant added to all values measured by UWH tank temperature (external) sensor to compensate for differences in respect to water temperature inside the tank.

**6. Pump manual operation (test)**

Display current pump status commanded by the controller (0/1 = pump disengaged/engaged).

Press the knob and modify the parameter value to manually control the pump. Press the knob once more or leave it inactive for 10 seconds to resume automatic mode of control.

**ATTENTION: Should a (colliding) value making impossible correct operation of the controller be preset, then the alarm icon will appear on the display, the colliding presets will be displayed alternatively, and (after a few seconds) the last correct combination of presets will be automatically restored.**

All presets are listed below.

Parameter name	Preset value			Unit
	default	min	max	
Tank temperature	60	10	70	°C
Pump hysteresis	4	2	10	°C
Boiler-tank temperature surplus	10	3	10	°C
Boiler temperature sensor correction	0	-5	5	°C
UHW tank temperature sensor correction	0	-5	5	°C
Pump manual operation (test)	as calculated by the controller	0 (OFF)	1 (ON)	-

**11. CONTROLLER OPERATION**

The controller continuously compares tank temperature with boiler temperature and turns the pump ON if the former has dropped excessively. Detailed conditions are as follows:

- The pump is engaged if tank temperature has dropped below the preset minus half of pump hysteresis  $T_{\text{tank}} < T_{\text{preset}} - H_{\text{pump}}/2$ . The pump is disengaged if the temperature has exceeded the preset plus half of the hysteresis  $T_{\text{tank}} > T_{\text{preset}} + H_{\text{pump}}/2$ .
- The pump may be disengaged (without a risk of chilling out the tank) provided that the difference between the boiler temperature and the tank temperature is at least by 3 °C higher than the preset boiler-tank temperature surplus  $T_{\text{boiler}} - T_{\text{tank}} > T_{\text{surplus}} + 3^{\circ}\text{C}$ . The pump should run (to prevent chilling out the tank) until the difference decreases to the surplus minus 3°C,  $T_{\text{boiler}} - T_{\text{tank}} < T_{\text{surplus}} - 3^{\circ}\text{C}$ .

**Frost protection**

Frost protection function gets activated when temperature of a given sensor falls to 4°C. If boiler sensor (central heating) reaches such a temperature, central heating and hot water pumps are activated and "AF" (Anti freeze) gets displayed on the screen. In case of tank sensor (hot water) only hot water pump is being switched on. Protection is switched off, when the temperature raises above 6°C.

**Protecting the tank against overheating**

If the tank is loaded by another, supplementary heat source and if tank temperature exceeds 85°C, then the central heating loading pump will be switched on until tank temperature falls below 85°C.

**Special attention should be paid when using hot water to avoid burning.**

**12. THE ANTY-STOP FUNCTION**

Pump Anty-Stop system switches the pumps on for 30 seconds 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. If during activity of the Anty-Stop system an emergency situation occurs (overheating or damage to the sensor), operation of the Anty-Stop system will be interrupted.

### 13. TROUBLESHOOTING

#### Device is dead

Burnt mains fuse or ROM failure. Replace the fuse or have the controller serviced.

#### Sensor icon on the display blinks, "Sh" or "OP" letters next to the icon

Sensor circuit shorted (Sh) or opened (OP). Check/replace the sensor cable or ship the controller (together with the sensor) to service.

#### Pump does not operate

Turn on the controller and make sure that pump icon is displayed. If not, check the presets or restore factory ones (see section 8.). Check pump connection.

#### Controller knob operates erratically

Pulse generator failure. Have the controller serviced.

### 14. COMPATIBILITY WITH STANDARDS/CERTIFICATES

The **EUROSTER 11B** controller meets all requirements of the EMC and the LVD EU Directives. The CE Conformity Declaration is available on the <http://www.euroster.com.pl> Internet webpage.

### 15. TECHNICAL DATA

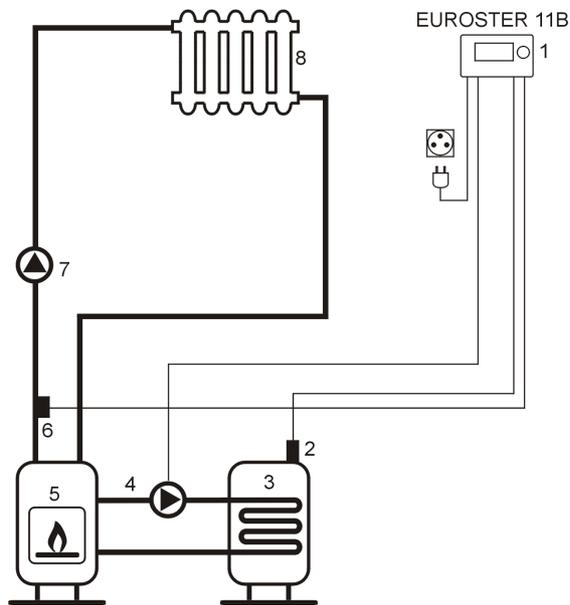
Controlled device	hot water pump
Supply voltage	230 V 50 Hz
Maximum inlet and outlet load	3 A 230 V 50 Hz
Maximum power consumption	1.6 W
Temperature measurement range	from -5°C to +120°C
Temperature adjustment range	from +10°C to +70°C
Temperature adjustment precision	1°C
Hysteresis range	2°C - 10°C
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	0.62 kg
Cable length	controller feeder cable: 1.5 m hot water pump feeder cable: 1.5 m tank temperature sensor: 5 m boiler temperature sensor: 1.5 m
Norms, approvals, certificates	Conformity with EMC and LVD directives, RoHS
Warranty period	2 years
Size (width/height/depth) mm	150/90/52

### 16. KIT CONTENTS

- a) controller box with 2 temperature sensors
- b) sensor hose clips
- c) box fasteners/anchors
- d) this Installation & Operation Manual
- e) template to drill holes for fasteners/anchors

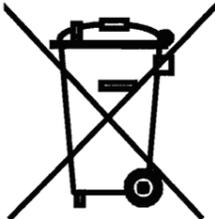
## 17. CONNECTION DIAGRAM

Diagram presented below is simplified (not every element necessary to correctly operate the system is shown).



1. **EUROSTER 11B** controller
2. UHW tank temperature sensor
3. UHW tank
4. UHW tank pump
5. CH boiler (heat source)
6. CH boiler temperature sensor
7. CH system pump
8. Radiator (heat load)

## ELECTRONIC WASTE MANAGEMENT INFORMATION



We made every effort to get as a long controller lifetime as possible. However, the device is subject to natural tear and wear. We ask you to have a controller that will not meet your requirements any more brought in to an electronic waste management facility. Electronic waste is collected free of charge by local distributors of electronic equipment.

Inappropriate management of electronic waste may lead to an unnecessary environment pollution.

Cardboard boxes should be disposed of at a paper recycling facility.

## GUARANTEE CERTIFICATE

**EUROSTER 11B**

Warranty terms:

1. Warranty is valid for 24 months from the controller sale date.
2. Claimed controller 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. Controller 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 manufacture

signature/stamp

**Business entity that issued this warranty certificate:**

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