

TEMPERATURE CONTROLLER FOR A WOOD GASIFICATION BOILER

EKOster 250

User manual



Safety instructions and installation recommendations

- ❑ The controller is designed to work with wood gasification central heating boilers.
- ❑ The controller should be installed by an authorised person.
- ❑ Connect the controller to a socket with protective earth contacts.
- ❑ It is necessary for the boiler to be equipped with its own protection against an excessive boiler temperature increase resulting from, for example, incorrect operation of the controller or cooperating devices.
- ❑ The controller is to be installed in a place where it cannot reach a temperature exceeding 40°C.
- ❑ The controller must not be exposed to water or to conditions causing steam condensation (e.g. sudden changes in ambient temperature).
- ❑ The device should be installed and operated in accordance with the installation description and appropriate rules for electrical devices.
- ❑ Blown fuses due to incorrect wiring or a short circuit in the electrical system are not grounds for a warranty repair.
- ❑ Before starting the controller, check the correctness of electrical connections.
- ❑ The controller is protected by two fuses, 1.25 A or 2.5 A, depending on the version. Information regarding the fuse can be found on the controller's rating plate.
- ❑ Connect power cables and replace fuses in the controller with power disconnected (the controller's power plug must be disconnected from the mains socket). Connecting loads and replacing a fuse with the controller's mains plug connected to a socket may result in electric shock.
- ❑ The connection cables of this controller may only be replaced by the manufacturer or its authorised service centre.
- ❑ It is forbidden to use a damaged controller.



Attention: Always replace fuses with the device switched off and its plug removed from the socket.

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1. Description of the controller

The EKOster 250 microprocessor-based central heating boiler temperature controller is designed to control airflow to central heating boilers and to activate the circulation pump in central heating systems.

The controller offers the following functions:

- ❑ maintaining a set boiler temperature by controlling airflow
- ❑ adjustable blower power (service mode) and its smooth start-up
- ❑ programmable boiler drafts
- ❑ automatic control shut-off after the boiler is extinguished
- ❑ stopping blower operation when fuel is added to the boiler / in the process of being extinguished
- ❑ controlling the central heating system's circulation pump depending on the set operating temperature
- ❑ COMFORT SYSTEM function protecting the pump against scale deposits
- ❑ protecting the system against the boiler freezing and overheating
- ❑ temperature sensor damage signalling - "Er" message
- ❑ adjustable display brightness - increased when settings are made
- ❑ co-operation with a room thermostat

2. Description of connections

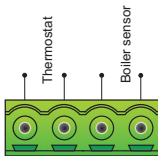


Fig. 1 Diagram of thermostat and boiler sensor connections

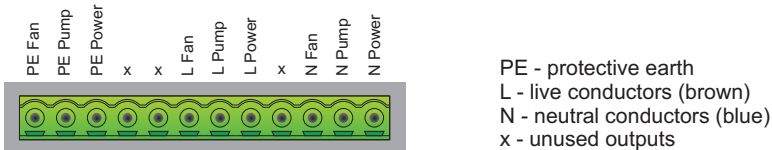


Fig. 2 Diagram for connecting the wire to the pump or fan.

3. Description of the controller's parts

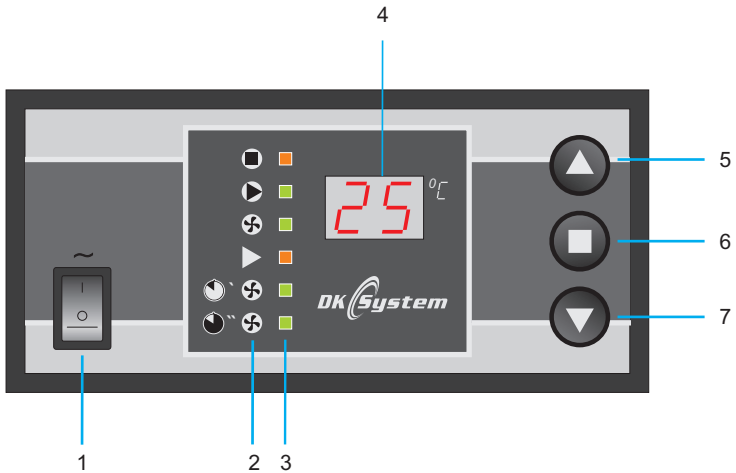
















Fig. 3 Controller elements

1. On/off switch
2. Description of signalling LEDs
3. Signalling LEDs
4. Display
5. Setting button "up"
6. MENU, START / STOP, DRAFTS button
7. Setting button "down"

		STOP	
		PUMP	
		FAN	
		START / LIGHTING	
			DRAFTS / FAN STOP TIME
			DRAFTS / FAN RUN TIME

4. Installing and connecting the controller to the electrical system

1. Connect the sockets of the power cables with the fan and the central heating pump
2. Install the boiler temperature sensor.
3. Insert the plug of the controller's power cord into a 230 V socket.
4. Switch on the controller with the on/off switch.



Attention: If the display does not light up after the controller is switched on, check if the socket is powered, then check the fuses and, if they are damaged, replace them. If the screen remains dark despite the fuses being replaced, contact DK System.

Attention: Always replace fuses with the device switched off and its plug removed from the socket.

5. Diagram for connecting the controller to the heating system

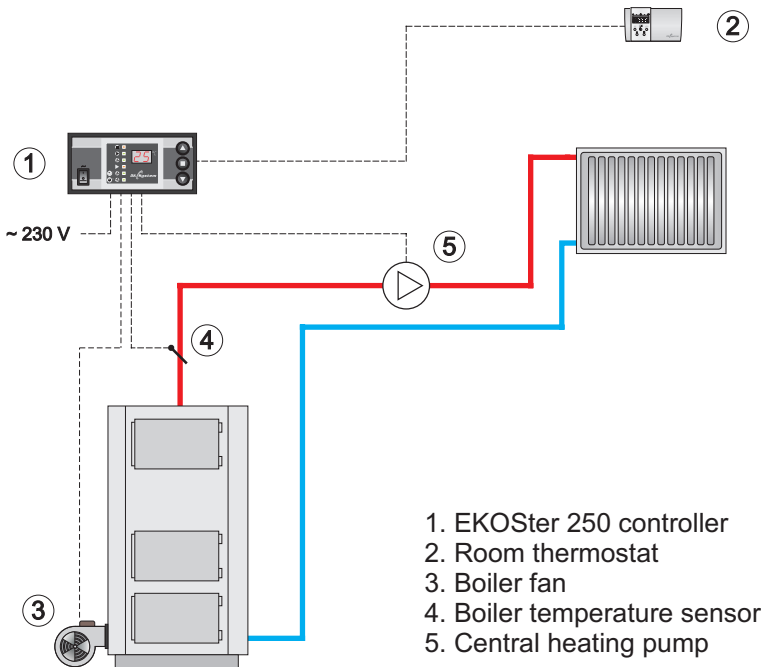


Fig. 4 Connecting the controller to the central heating system

6. Switching on the controller and starting operations

Switch on the controller using the on/off switch - at this point, the program number will be displayed on the screen and all LEDs light up. After two seconds, the display will start to show the current boiler temperature, as measured; At the same time, LEDs indicating the status of devices and their operation will be on (depending on the current situation).

7. Setting the boiler operating parameters and firing

During operation, the controller displays the current temperature measured in the boiler. Pressing the or button once leads to the preset temperature value flashing (e.g. 65); you can then change it using the same buttons: to raise the set point or to lower.

To start the boiler:

1. Fill the boiler chamber with fuel and light.
2. Close the combustion chamber door tightly.
3. Start the fan by pressing the middle button .

8. Service MENU functions

The service menu is used to set individual device parameters related to the central heating pump's and fan's operation. The service menu can be opened as follows:

1. Switch off the power using the on/off switch.
2. Switch power on again, and press and hold the button while the program version is displayed (e.g. 3.2) until the "HI" symbol appears on the display. From that moment on, the display alternates between the symbol and the value of the currently adjusted setting. The buttons allow values to be changed and the button is used to accept a given setting and moves to the next setting.

8.1 MENU functions - Fan operation hysteresis

This parameter specifies the number of degrees Celsius by which the boiler temperature must drop below the set value for the fan to turn on.

Adjustment range: from 0°C to 9°C.

Factory setting (typical): 2

8.2 MENU functions - Central heating pump operational threshold

This parameter determines the temperature above which the central heating pump is switched on and operates continuously. If the measured boiler temperature falls below this parameter's value, the central heating pump will be switched off.

Adjustment range: from 35°C to 70°C.

Factory setting (typical): 65°

ATTENTION: When the temperature is set below 65°, the controller switches to a mode of co-operation with a room thermostat.

8.3 MENU functions - Fan START / STOP

This parameter determines the number of degrees Celsius by which the temperature in the boiler must be lower than the temperature set for the fan to start (in the firing phase) or for it to switch to the residual fuel combustion mode (in the extinguishing phase). The residual fuel combustion time is 30 minutes. The fan is completely switched off after this time.

Adjustment range: from 10°C to 30°C.

Factory setting (typical): 20°

Example:

- temperature set on the boiler: 50°C


- "dt": 10°C

1. When firing up the boiler, the fan will switch to automatic operation once the temperature reaches 40°C (50°C - 10°C); the firing will continue and, after a temperature of 50°C is reached, the fan will turn off.

2. When the boiler is being extinguished, when the temperature drops to 40°C (50°C - 10°C), the controller will start counting down the set time (allowing the remaining fuel to burn during this time), after which the fan will stop working.

8.3 MENU functions - Fan START / STOP (continued)



Attention: Pressing the middle  button when the controller is in operation, causes the fan to stop; this is signalled by the red STOP LED blinking. Pressing again restarts the fan.

8.4 MENU functions - Fan power adjustment


This parameter allows the power of the operating fan to be set in increments of ten percent (e.g. 3 = 30%).
Adjustment range: from 2 to 10.

Factory setting (typical): 5



Attention: Some types of fans may not start at the lowest power values. In this case, it is recommended to increase the fan power.

9. Setting draft parameters

Drafts, i.e. the function of cyclic air supply to the furnace, support and maintain the combustion process in the boiler. Pressing the  button for 3 seconds moves to the menu used for setting this function's parameters.

9.1 Drafts - working time

The parameter specifies the fan operation time (in seconds) when the DRAFT function is active. Adjustment range: from 0 s to 90 s.

Factory setting (typical): 15



Attention: Drafts are triggered when the measured boiler temperature is higher than that set through this parameter "HI".

9.1 Drafts - working time (continued)

Example:

- temperature set on the boiler: 50°C

- "HI": 5°C

If the measured boiler temperature is higher than 45°C (50 - 5), the DRAFT function will cause cyclic fan activation for the time given in the "tP" parameter, with the pause lasting for the time in the "tA" parameter.

If the measured boiler temperature in this situation drops to 45°C, the fan will turn on automatically and continue to work until the boiler reaches the set temperature (50°C).



Attention: Setting the working time to "0" disables the DRAFT function.

9.2 Drafts - break time

The parameter states the break time in fan operations (counted in minutes) between successive drafts. Adjustment range: from 1 min to 15 min.

Factory setting (typical): 10



Attention: Above 80°C drafts are automatically turned off to prevent boiler overheating.

10. COMFORT SYSTEM function

The controller's built-in COMFORT SYSTEM prevents the circulation pump from being blocked by scale deposits on the pump's impeller. Outside the heating season, the controller automatically switches on the circulation pump for about 30 seconds, every 14 days. The pump's operation in this mode is signalled by the flashing green PUMP LED. The function starts working 1 minute after the controller is switched on. The 14-day period is counted from the last switch on of the central heating pump



Attention: The controller needs to be left connected after the end of the heating season in order for the COMFORT SYSTEM function to be active.

11. Anti-freeze function

The controller protects the heating system from freezing by activating the central heating circulation pump continuously when the water temperature in the system drops to 4°C or lower.

12. Boiler overheating protection function

The controller reduces the risk of the boiler overheating through maintaining continuous pump operation in the event of a sensor failure.

13. Additional recommendations

The appearance of "Er" on the display indicates one of the two following events:

- a temperature rise above 99°C or a temperature drop below -9°C
- damage to the sensor



In this case, check that there are no external signs of damage to the cable and its metal end on the sensor. If damage is found, replace the damaged sensor.



Attention: When the display shows the "Er" symbol, the central heating circulation pump operates continuously to prevent boiler overheating.

14. Technical data

Measured temperature range	from - 9°C to + 99°C
Temperature setting range for the boiler	from +60°C to + 97°C
Fan hysteresis (on - off differential)	from 0°C to 9°C
Temp. range for the central heating pump	from + 35°C to + 70°C
Draft adjustment (possibility of total draft switch off)	operation: 0 - 90 seconds stop: 1 - 15 minutes
Permissible load on outputs	airflow: 100 W central heating pump: 100 W
Rated supply voltage	230 V, 50 Hz
Rated load	275 VA
Blower power adjustment	20 - 100 %
Relative air humidity	< 95 %
Protection rating	IP 40
Controller dimensions	170 x 80 x 75 mm
Ambient temperature	from 0°C to + 40°C
Electric protection depending on the controller version	2 x 1.25 A or 2 x 2.5 A

15. Rules for disposal of used electrical and electronic devices



Disposal of electrical and electronic waste (as implemented in the European Union and other European countries with their own collection systems).

This symbol placed on the product or its packaging (in accordance with the Act of 29 July 2005 on electrical and electronic waste) indicates that this product cannot be treated as municipal waste. It should be delivered to an appropriate collection point for used electrical and electronic equipment. By ensuring proper disposal, you help prevent negative effects on the environment and human health. Recycling helps conserve natural resources. For detailed information on the recycling of this product, information on the collection system established for used electrical and electronic equipment, and a list of treatment facilities, please contact our office or our distributors.

16. Notes

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