TEMPERATURE REGULATOR FOR WOOD GASIFICATION BOILER

EKOSTER 3 CRANP KOVO

User manual

DK System

INS-029-001 130x184,5

Safety instructions and installation recommendations

The regulator is designed to work with central heating wood gasification boilers

The regulator should be installed by an authorized person.

The regulator should be connected to a socket with a protective pin.

It is required for the boiler to have its own protection against excessive increase in the boiler temperature caused by, e.g. incorrect operation of the regulator or compatible devices.

The regulator should be placed in a suitable place to prevent it from heating to a temperature higher than 40°C.

The regulator must not be exposed to the risk of flooding or to conditions that might cause condensation (e.g. due to rapid changes in the ambient temperature).

The device should be installed and operated in accordance with the assembly description as well as principles of handling electrical devices.

Blown fuses due to incorrect wiring or short circuit in the electrical system does not constitute grounds for warranty repair.

Before starting the regulator, check all electrical connections.

The regulator is protected by two 5A fuses.

Connecting power supply cables and replacing fuses should be performed with the regulator power supply turned off (the plug must be removed from the power socket). Performing these operations with the regulator's mains plug switched on may cause electric shock.

Connection cables of the regulator may only be replaced by the manufacturer or an authorized servicing facility of the manufacturer.

It is prohibited to use a damaged regulator.

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

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1. Regulator description

The EKOSTER 3 regulator is designed for controlling the operation of a wood gasification boiler, switching on the laddomat type central heating pump and warm utility water pumps in central heating installations. The regulator has the following functions:

maintaining the set boiler temperature by controlling the blow and exhaust fan
adjustable fan power and its smooth start
programmable boiler blow
automatic deactivation of control after the boiler is off
stopping operation of the fan when feeding fuel to the boiler
controlling operation of the laddomat type central heating circulation pump depending on the set temperature of its operation
possibility to enable or disable hot water priority
controlling the pump for the domestic hot water heater depending on the required temperature
protection system - mechanical thermal fuse TERMIK
COMFORT SYSTEM function, protecting the pump against limescale
protection of the installation against freezing and overheating of the boiler
signalling damage to temperature sensors
working with room thermostats

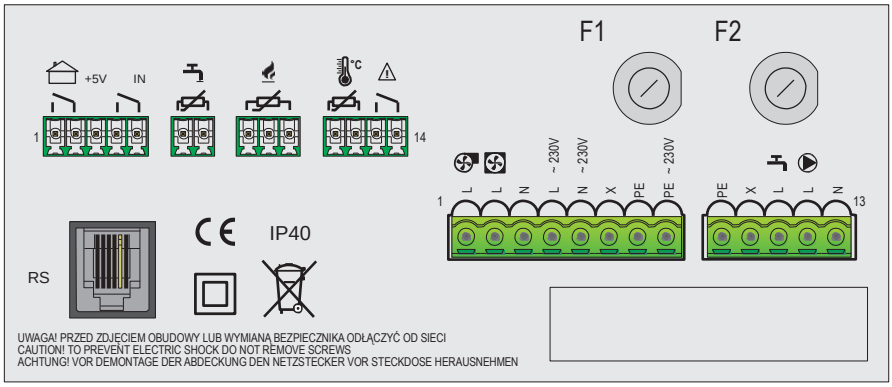
2. Housing components

1. Display
2. Signalling diodes
3. Return button / FEED
4. Up button (▲)
5. MENU button
6. Down button (▼)
7. Power switch

Description of signalling diodes

- blower fan
- exhaust fan
- laddomat pump
- domestic hot water pump

Fig.1 Front panel of the regulator



	room regulator
IN	flap and door sensor
	utility hot water sensor
	exhaust gas sensor
	boiler sensor
	thermal protection
L	L 230V output of the blower fan
L	L 230V output of the blower fan
L	L 230V output of the domestic hot water pump
L	L 230V output of the Laddomat pump
F1, F2	fuse socket
RS	service socket

Fig. 2 Outputs on the rear wall of the regulator

3. Connections

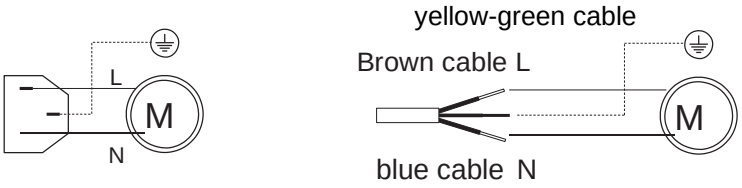


Fig. 3 Diagrams showing connection of the power cable to pumps and fans.

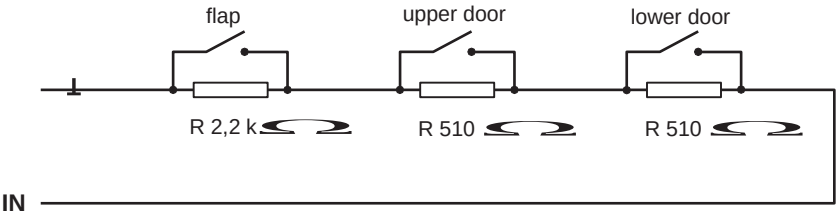


Fig. 4 Diagram showing the connection of the flap and door sensors.

Note: Opening the flap or the door is signalled by an alarm and a message on the display. The exhaust fan is switched on and the blower fan switched off.

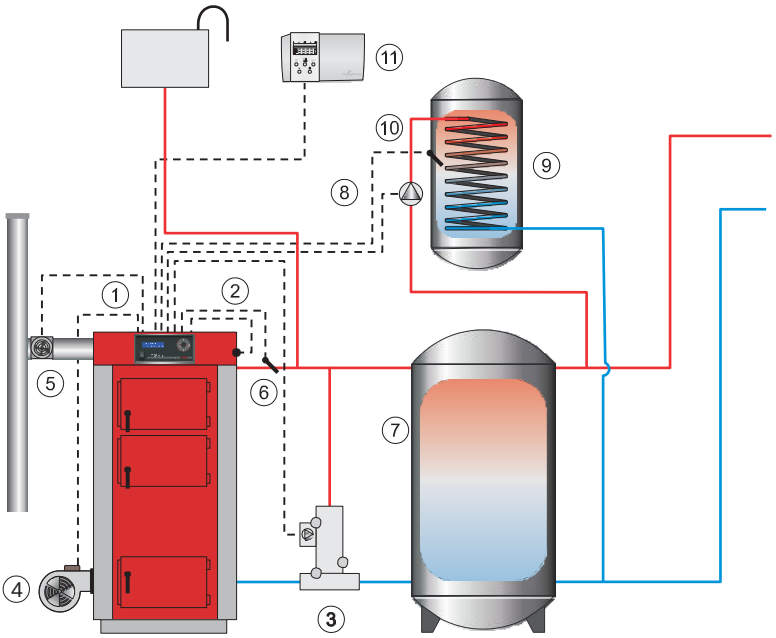
4. Regulator installation

4.1 Regulator installation - Electrical connection

1. Connect the appropriate power cables from the pumps and fans.
2. Install all the required sensors.
3. Insert the plug of the regulator power supply cable to a ~ 230 V socket.
4. Turn on the regulator with the power switch.

Note: If the display screen does not light up after switching on the regulator, check whether the power supply is live, then check the fuses and replace them if they are damaged with new 5 A ones. If, despite the fuse replacement, the display screen remains dark, contact the service centre.
Always replace the fuse with the device switched off and the plug removed from the socket.

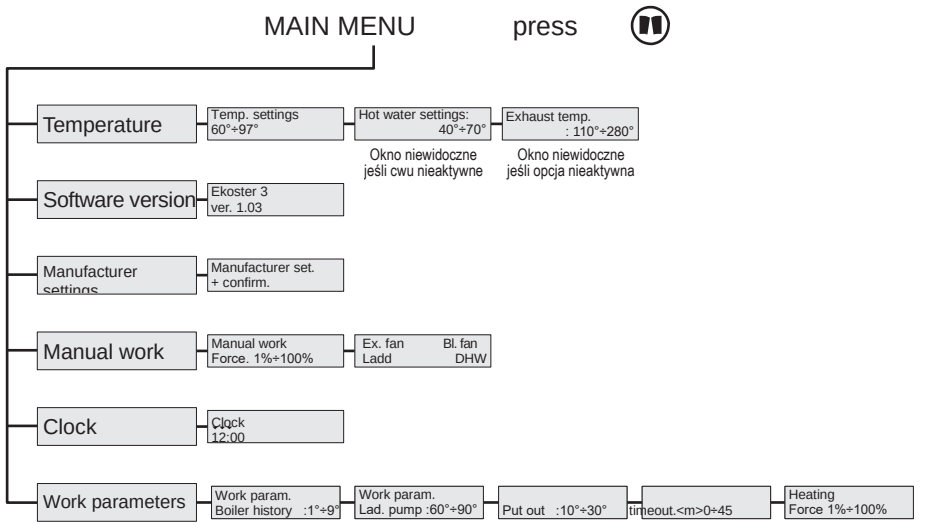
5. Connection of the regulator to the heating system



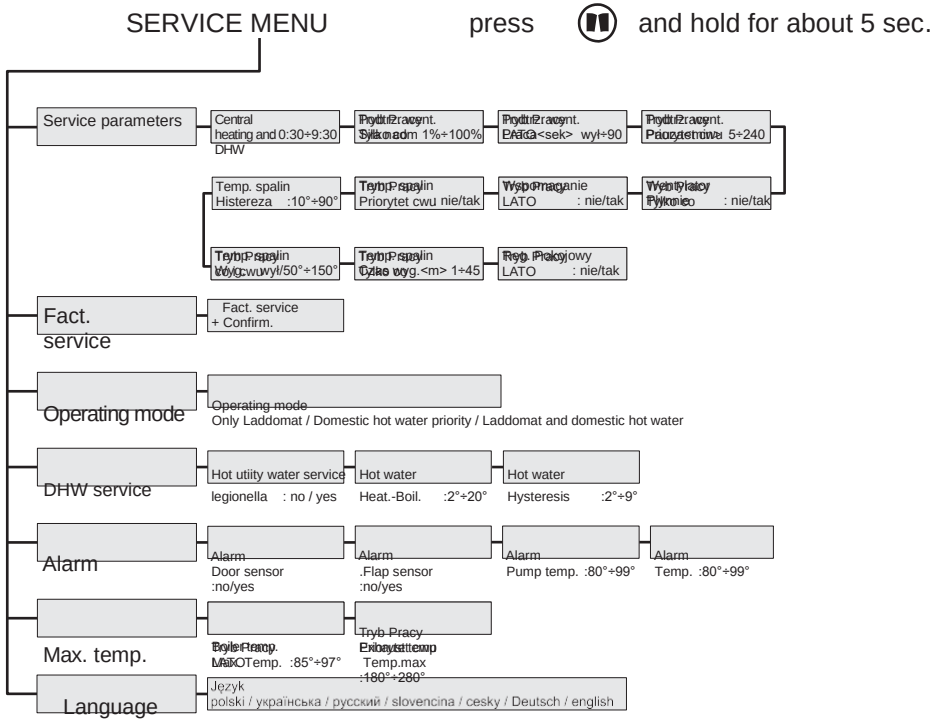
1. EKOSTER 3 regulator
2. Thermal fuse
3. Laddomat
4. Blower fan
5. Exhaust fan
6. Boiler temperature sensor
7. Accumulation tank
8. Domestic hot water pump
9. Domestic hot water tank
10. Domestic hot water heater sensor
11. Room regulator

Fig. 5 Diagram showing a heating system with an EKOSTER 3 regulator without shut-off and protection devices. The diagram should not replace a professional design project at the installation site.

6. Main menu - structure



7. Service menu - structure



8. Settings table - Main menu

	Name	Unit	Settings range	Manufacturer settings
MAIN MENU	**TEMPERATURE**			
	Boiler temp.	°C	60÷97	65
	DHW	°C	40÷70	50
	Exhaust temp.	°C	110÷280	200
	OPERATING PARAMETERS			
	boiler hysteresis	°C	1÷9	2
	laddomat pump	°C	60÷90	65
	dt temp.	°C	10÷30	10
	timeout	min	0÷45	30
	heating, blow force	%	1÷100	100

9. Settings table - Service menu

	Name	Unit	Settings range	Manufacturer settings
SERVICE MENU	**SERVICE PARAMETERS**			
	feeding	min	0:30÷9:30	1:30
	fan suport, blow force	%	1÷100	100
	fan support,operation	sec	OFF÷90	10
	fan support, pause	min	5÷240	20
	fan smooth op.	-	yes/no	no
	exhaust fan (support)	-	yes/no	no
	exhaust temp.	-	yes/no	no
	exhaust temp. - hysteresis	°C	10÷90	50
	exhaust temp. – put out	°C	OFF/50÷150	90
	exhaust temp. - timeout.	min	1÷45	15
	room regulator	-	yes/no	no
	OPERATING MODE	-	only laddomat/laddomat and dhw /dhw priority	only laddomat
	DOMESTIC HOT WATER			
	SERVICE	-	yes/no	no
	legionella	°C	2÷20	5
	boiler	°C	2÷9	5
	hysteresis			
	ALARM	-	yes/no	no
	door sensor	-	yes/no	no
	flap sensor	°C	80÷99	80
	pump temp.	°C	80÷99	85
	boiler temp.			
	MAX TEMPERATURE	°C	85÷97	90
	Boiler. max temp.	°C	180÷280	280
	exhaust. max temp.			

10. Description of home screens

HOME SCREEN 1 – basic screen

1. Current time / day of the week
2. Measured boiler temp. / Pre-set temp.
3. Work status- START / STOP/ HEATING / MAINTENANCE / FEEDING / NO FUEL
4. Signalling of temperature increase/decrease

MAIN SCREEN 2

measured exhaust and hot water temperatures (if the options are activated and sensors connected), access with the button

1. Measured exhaust gas temperature
2. DHW temperature: Set / measured

MAIN SCREEN 3

current regulator operating mode, access with the button

11. First start and setting of the clock

Turn the regulator on using the power switch - the screen will display information: regulator name and program number (e.g. ver. 1.03).

11. First start and setting of the clock (continued)

The first start-up and setting of the regulator to local and construction conditions as well as training in operation is carried out by an installation company with appropriate authorizations. The regulator is factory set and ready for operation. See "Settings table". During the first start-up, the installation company can make further settings according to customer wishes. All settings can be individually changed at any time. Power outages do not cause loss of data from the device's memory.

During the first start-up, the display will show a flashing clock and the day of the week.

To set the correct time and date, press and then with the button ▲ ▼ set the desired day of the week and accept.

Proceed likewise to set the current hour and minute.

After entering the settings and pressing the button twice, you will be taken to the main screen.

12. Setting the boiler operating parameters and heating up

Set pre-set boiler and hot water temperatures in the Main menu / Temperature.
In order to heat up:

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

When the boiler temperature rises to the level determined by the parameter "**dt**" (see section "Service menu / Service parameters / put out dt"), the regulator will switch from **START** mode to **HEATING** mode.
After reaching the desired temperature, the regulator will go into the **MAINTAINANCE** mode until the temperature drops below the boiler hysteresis - see the section **Operating parameters - HYSTERESIS.**

13. Feeding fuel to the boiler

When feeding fuel to the boiler, stop the blower by pressing the button; .The screen with show the symbol with the countdown time to restart. The time required for feeding is set in the Service Menu / Service parameters / Feeding.

Pressing the button during the countdown will exit the feeding mode and return the regulator to automatic operation.

Note: During feeding, the exhaust fan is started and the blower fan is stopped.

14. Turning off the boiler

The boiler may be stopped due to lack of fuel or termination of the put out process.
In the absence of fuel, the message "No fuel" will be displayed.

The message "No fuel" is displayed and the machine enters the Stop mode when:
1. The temperature will fall below the value specified by the dt parameter and will last for the time specified by the "put-out" parameter.
2. The exhaust gas temperature will drop below the "Exhaust gas temperature - Put-out" parameter for a longer time than the "Exhaust gas temperature - Put-out time" parameter (only if the "Exhaust gas sensor" option is enabled).

15. Main menu - Temperature

This window allows access to the pre-set bo
DHW and exhaust gas temperature settings

Enter settings: Main menu / Temperatures

15.1 Boiler pre-set temperature

The parameter defines the pre-set boiler temperature. After reaching it the fans will be turned off and the regulator will enter the "Maintenance" mode.

Range of changes: 60° ÷ 97°
Factory setting: 65°

Note: Note: If the DHW service is enabled, the value of two parameters will be added to the pre-set boiler temperature:
1. Boiler-Heater difference (default 5°C)
2. DHW hysteresis (default 5°C)

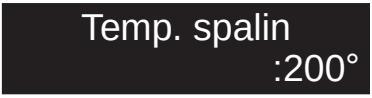
15.2 Domestic hot water temperature

The parameter specifies the DHW temperature. After reaching it the DHW pump will be turned off.
The window is invisible if DHW is inactive.

Range of changes: 40° ÷ 70°
Factory setting: 50°

15.3 Exhaust gases temperature

The parameter determines the temperature of the exhaust gas above which the fans will be turned off and an alarm with the message "T. spalin" will be triggered.
The window is invisible if the option is inactive.



Range of changes: 110° ÷ 280°
Factory setting: 200°

16. Main menu – Software version

The window informs about the version of the regulator software.

17. Main menu – Factory settings

This function is used to delete parameters set by the user and return to the factory settings.

Enter settings - **Main menu / Factory settings**

Confirm changes of parameters to factory settings with the button . ▲

Tip: The return to factory settings only applies to the parameter settings available in the Main Menu. Return to factory settings of all parameters should be done in Service menu

18. Main menu – Manual operation

This function allows to test the correct operation of individual outputs.

18.1 Manual operation – blow force

The parameter allows setting the force of the fan during MANUAL OPERATION (testing).

Range of changes: 1°÷100°
Factory setting: 50°

18.2 Manual operation – testing outputs

The window allows testing the correct operation of individual outputs: exhaust fan, blow fan, laddomat, hot water pump.

The tested output is chosen with the button , and its activation / deactivation is done by pressing . ▲ or ▼

The output currently checked is signaled by a flashing symbol on the screen and switching on - by an appropriate LED.

19. Main menu - Clock

The CLOCK function allows to change the set time and day of the week. The parameter to be changed is selected with the button and its value is changed with the buttons ▲ ▼ .

After entering the settings and pressing twice , the user is taken to the main screen.

20. Main menu – Operating parameters

The OPERATING PARAMETERS function allows to set the operating parameters of the boiler, laddomat pump and fan.

Enter settings - **Main menu / Operating parameters**

20.1 Operating parameters - Hysteresis

The parameter determines the number of Celsius degrees by which the boiler temperature must drop below the set value for the regulator to enter the HEATING mode.

Range of changes: 1°÷ 9°
Factory setting: 5°

20.2 Operating parameters – Laddomat pump

The parameter defines the temperature which, when reached, activates the laddomat pump.

Range of changes: 60°÷ 90°
Factory setting: 65°

20.3 Put-out – dt parameter

The parameter determines how much lower the boiler temperature must be than the set temperature, so that the put-out countdown begins and then the boiler stops operating - see **Adjustment of the put-out time**.

Range of changes: 10°÷30°
Factory setting: 10°

Example:
- temperature set on the boiler e: 60 °C
- "dt": 10 °C

When the temperature drops to 50 °C (60 °C - 10 °C), the regulator will count down the set time - see **Adjustment of the put-out time** - and the fans will eventually be stopped.

20.4 Put-out time

The parameter allows to set the regulator operating time (in minutes) during put-out, i.e. after the boiler temperature drops by the parameter "**dt**". After that time the boiler stops operating.

Range of changes: 0÷45 min
Factory setting: 30 min

20.5 Operating parameters - Heating – blow force

The parameter allows to set the force with which the fan will work in the HEATING mode.

Range of changes: 1% ÷ 100%
Factory setting: 100%

21. Service menu – Service parameters

21.1 Service parameters - feeding – fan pause

The parameter determines the duration of the pause in the blower fan operation required to feed fuel to the boiler.

Range of changes: 0:30 ÷ 9:30
Factory setting: 1:30

21.2 Service parameters - maintenance – blow force

The parameter allows to set the force with which the blower fan will work in the Maintenance mode.

Range of changes: 1% ÷ 100%
Factory setting: 100%

21.3 Service parameters - maintenance – fan operation

The parameter determines the fan operation time (in seconds) in the Maintenance mode.

Range of changes: off ÷ 90
Factory setting: 10

21. Service parameters - maintenance – fan pause

The parameter determines the pause time of the fan (in minutes) in the Maintenance mode.

Range of changes: 5 ÷ 240
Factory setting: 20

21.5 Operating parameters - Fan – smooth operation

The parameter enables or disables smooth operation of the fan. Turning off smooth operation will turn on the fan immediately at full set power without a smooth start.

Range of changes: yes / no
Factory setting: no

21.6 Operating parameters – Fan support

The parameter enables or disables the exhaust fan. This fan works in parallel with the blower fan (except for Feeding).

Range of changes: yes / no
Factory setting: no

21.7 Parametry pracy - Temperatura spalin

The parameter enables or disables exhaust gas temperature measurement function.
The parameter should be activated after connecting the exhaust gas sensor.

Range of changes: yes / no
Factory setting: no

21.8 Parametry pracy - Temperatura spalin - histereza

The parameter determines the value by which the exhaust gas temperature must drop after exceeding the set value in order to activate the alarm and allow the boiler to return to normal operation.

Range of changes: 10°÷90°
Factory setting: 50°

21.9 Parametry pracy - Temperatura spalin - wygaszanie

The parameter determines the value of the exhaust gas temperature. When the temperature falls below this value, the boiler will enter the "Put-out" mode and the put-out countdown time will start. After this time, the boiler will stop operating.

Range of changes: off/50°÷150°
Factory setting: 90°

21.10 Parametry pracy - Temperatura spalin - czas wygaszania

The parameter allows to set the fan operation time in the "Put-out" mode after the exhaust gas temperature drops below the set value. After this time, the boiler will stop operating.

Range of changes: 1÷45
Factory setting: 15

21.11 Parametry pracy - Regulator pokojowy

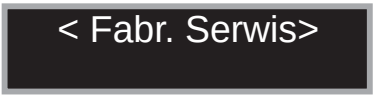
The parameter coordinates work of the room regulator with the Ekoster 3 regulator.
A signal from the room regulator switches the Laddomat pump on or off.

Range of changes: yes / no
Factory setting: no

22. Service menu – Factory settings

This function is used to delete parameters set by the user and return to the factory settings.

The change of parameters to factory settings should be confirmed with the button. ▲



23. Service menu – Operating mode

The window enables selection of the operating mode of the regulator.

Entering the settings - **Service menu / Operating mode**

Range of changes: only laddomat / laddomat and dhw / dhw priority
Factory setting: only laddomat

Tip: With the mode **"DHW priority"** or **"laddomat and DHW",** a requirement for the DHW pump to start is achieving the minimum temperature difference between the boiler and the domestic hot water heater.
DHW priority means that when the water temperature in the hot water heater falls below the set value, the boiler stops operating for the central heating and starts heating domestic hot water.

24. Service menu – Domestic Hot Water Service

This function is used to set the parameters for the DHW circuit.

24.1 DHW Service - Legionella protection

This function protects the domestic hot water installation and hot water heater against the legionella bacteria.

Enter the settings - **Service menu / DHW service / legionella**

Range of changes: yes/no
Factory setting: no

24.1 DHW Service - Legionella protection (continued)

The function only works if domestic hot water service and the "legionella protection" functions are enabled (**turned off** in factory settings). The function is activated on Monday at 1:00. The boiler is heated to the maximum permissible regulation temperature (set in the service menu) . The DHW pump operates until 1:54 provided that the boiler temperature is higher than the domestic hot water temperature. The central heating pump and circuits 3,4,5 (valve and pump) are switched off. At 2:00 the boiler returns to normal operation.

Note: When the "legionella protection" function is activated, extreme caution should be taken when drawing hot water in order to avoid burns. **Hot water can reach the temperature of about 70°**.
For complete disinfection of the hot water heater it is recommended to set the boiler temperature to min. 70°. This function is signalled by the symbol "**!**".

24.2 Temperature difference between the boiler and the domestic hot water heater

This parameter determines the minimum difference in the measured temperatures of the boiler and the domestic hot water heater that must be present in order to make heating water practical. If the difference is smaller than the set one - the domestic hot water pump will **not** be started (regardless of whether the domestic hot water priority is on or off).

Range of changes: 2°÷20°
Factory setting: 5°

Tip: A requirement for the domestic hot water pump to be started is achieving the minimum temperature difference between the boiler and the heater.
The regulator must be set to "Laddomat and DHW" or "DHW priority" operating mode. Settings in the **"Service menu / Operating mode".**

24.3 Domestic hot water pump hysteresis

The parameter specifies how much lower the temperature on the domestic hot water heater must be than the set temperature so that the domestic hot water pump is started.

Range of changes: 2°÷9°
Factory setting: 5°

25. Service menu - Alarms

The menu allows to set the value, which will trigger an alarm when exceeded.

Entering the settings- **Service menu / Alarm**

25.1 Alarm – Open door sensor

The parameter enables to activate the alarm signalling open door.

Range of changes: no / yes
Factory setting: no

25.2 Alarm - Open flap sensor

The parameter enables to activate the alarm signalling open flap.

Range of changes: no / yes
Factory setting: no

25.3 Alarm – pump temperature

The parameter allows to set the temperature above which both pumps will be started in an emergency (the domestic hot water pump will be started if the regulator works in the domestic hot water mode).

Range of changes: 80°÷99°
Factory setting: 80°

25.4 Alarm – boiler temperature

The parameter allows to set the temperature of the boiler, which exceeded will trigger the "T.kotła" and activate emergency operation of both pumps

Range of changes: 80°÷99°
Factory setting: 85°

26. Service menu – Maximum temperature

The menu enables to set the maximum boiler and exhaust gas temperature, which can be done in “Main menu / Temperatures”

26.1 Maximum temperature – Maximum boiler temperature

The parameter allows to set the maximum boiler temperature. This setting limits the maximum boiler temperature in the settings: “Main menu/ Temperatures”

Range of changes: 85°÷97°
Factory setting: 90°

26.2 Maximum temperature - Maximum exhausttemperature

The parameter allows to set the maximum exhaust gas temperature, which can be done in: "Main menu / Temperatures”

Range of changes: 180°÷280°
Factory setting: 280°

27. Service menu - Language

The setting is used to change the language of display.
Entering the settings - **Service menu / Language**

28. COMFORT SYSTEM Function

The COMFORT SYSTEM function added in the regulator prevents blocking the circulation pump with limescale deposits on the pump rotor. The regulator automatically switches the circulation pump on for 30 seconds every 24 hours, counting from its last start. Pump operation in this mode is signalled by a blinking PUMP diode. The function is activated 24 hours after turning the regulator on.

Note: In order for the COMFORT SYSTEM function to be active, after the end of the heating season the regulator must be left on

29. Protection against freezing

The regulator protects the heating system against freezing, causing both pumps to permanently switch on when the water temperature in the system drops to 4°C or lower (the domestic hot water pump will be started if the regulator works in the domestic hot water mode).

30. Alarms - description

30.1 Exceeding boiler temperature

If the boiler temperature exceeds the one set in **Alarm – boiler temperature**, a message "**T.Kotła**" will appear on the screen and an intermittent sound signal will be generated.

Clear the alarm with the button ⮌

30.2 Boiler temperature sensor damage

If the boiler temperature sensor is damaged, a message "**Cz.Kotła**" will appear on the screen (the fan operation will be stopped), and instead of the boiler temperature "-" will appear and a continuous sound signal will be generated.

Clear the alarm with the button ⮌

30.3 Domestic hot water temperature sensor damage

If the DHW temperature sensor is damaged, a message "**Cz.CWU**" will appear on the screen (the DHW pump will be stopped), and instead of the DHW temperature, "-" will appear, and a continuous sound signal will be generated.

Clear the alarm with the button ⮌

30.4 Exceeding exhaust gas temperature

If the exhaust gas temperature exceeds the value set in **Max. temp. / Exhaust temp.**, a message "**T.Spalin**" will appear on the screen and an intermittent sound signal will be generated.

Clear the alarm with the button ⮌

30.5 Damage to the exhaust gas temperature sensor

If the exhaust gas temperature sensor is damaged, the screen will show a message "**Cz.Spalin**".

Clear the alarm with the button ⮌

30.6 Thermal fuse

If the boiler temperature exceeds 90°C, the fan will be switched off in an emergency. At the same time, BEZPIECZNIK TERMICZNY (thermal fuse) message will appear on the screen and an intermittent sound signal will be generated (provided that it is turned on - see section **Alarm - sound**).

After the temperature drops below 70°C, reset the alarm signal and unlock the thermal fuse operation by pressing the button ⮌ .
If it is protected by a STB sensor, unscrew the lock nut and reset the sensor using a special button.

30.7 Open door or flap

If the door or flap is opened, an audible alarm will sound, the screen will display the message "**DRZWI OTWARTE**" ("OPEN DOOR") or "**KLAPA OTWARTA**" ("FLAP OPEN"). The blower fan will be switched off in an emergency and the exhaust fan will be switched on.

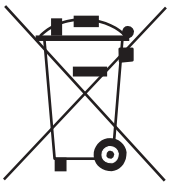
Clear the alarm with the button ⮌

31. Technical specification

Range of measured temperatures	from - 9 °C to + 99 °C
Range of setting temperatures for the boiler	from + 60 °C to + 97 °C
Temperature setting range for the hot water heater	from + 40°C to + 70°C
Temperature setting range for the laddomat pump	from + 60 °C to + 90 °C
Smooth fan start	yes
Adjustable maximum fan power	1% - 100 %
DHW pump hysteresis (difference - on - off)	from 2 °C to 9 °C
Blow adjustment (possible to completely switch off)	pause: 5 - 240 min
Adjustable boiler put-out time	0 - 45 min
Permissible load of outputs	fan: 100 W / 230 V exhaust fan: 100 W / 230 V pump laddomat: 200 W / 230 V pump dhw: 100 W / 230 V
Rated supply voltage	~ 230 V, 50 Hz
Electrical protection	2 x 5 A
Relative air humidity	< 95 %
Degree of IP protection	IP 20
Ambient temperature	from 0 °C to + 40 °C

*Note: Depending on the software version, some setting ranges may differ from the above

32. Disposing of used electrical and electronic equipment



Disposal of electrical and electronic equipment waste (used in European Union countries 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 used electrical and electronic equipment) states that this product may not be treated as municipal waste. It should be handed to an appropriate collection point for used electrical and electronic equipment. By ensuring proper disposal, you will help to prevent negative impact on the environment and human health. Recycling helps to conserve natural resources. For detailed information on recycling of this product, the system of collecting used electrical and electronic equipment and a list of processing plants, please contact our office or our distributors.

33. Notes

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