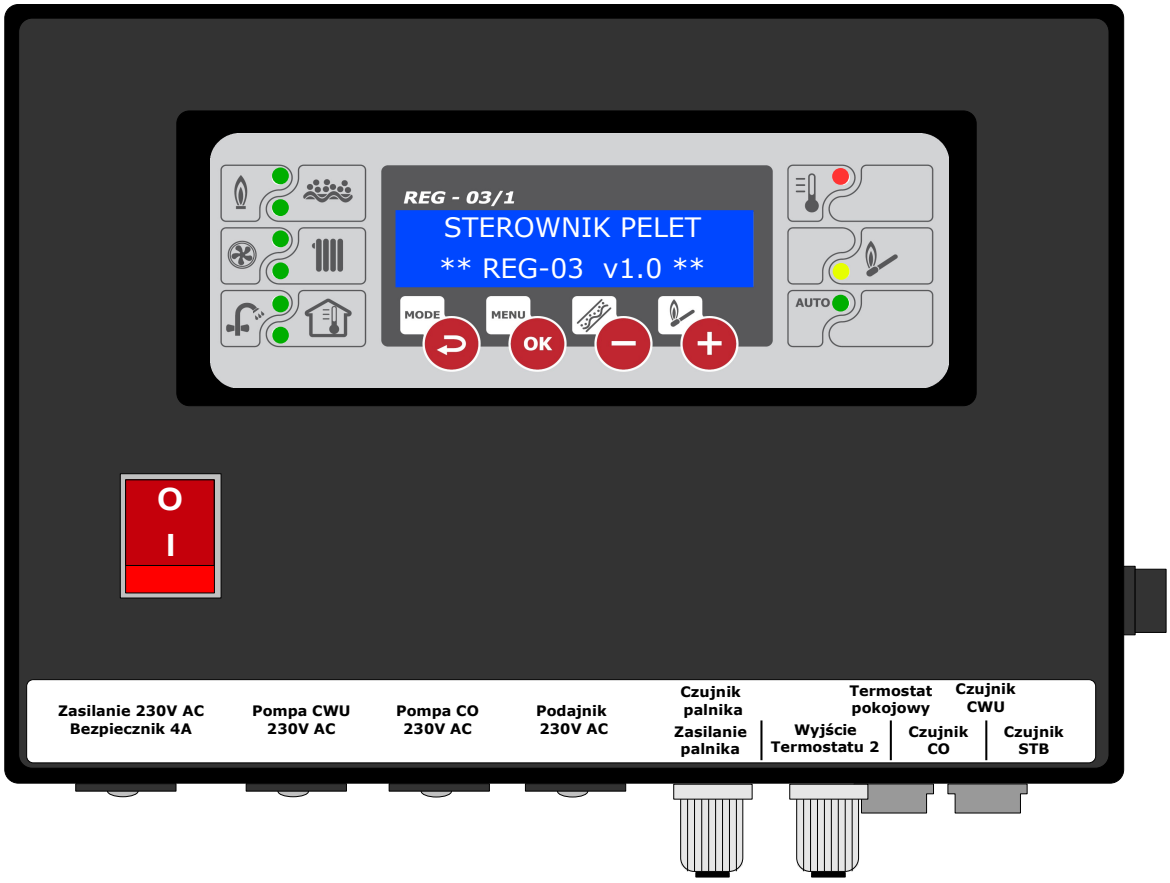
MICROPROCESOR CONTROLLER OF THE PELLET'S BURNER

REG – 03A version 1.0

INSTRUCTION OF INSTALLING AND THE MAINTENANCE



JUMAR

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Thanks you for choosing our product.
This instruction should make the installation of the driver easier and make you accustomed to the maintenance and the safe using of the device.
Before installing please read the instruction carefully and get to know the functioning of the driver.

Any questions occur, contact with the JUMAR company.

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SAFETY OF OPERATIONAL USE

- Before using read carefully the instruction.
- Installing and connecting the regulator should be done by a professional staff. All available safety requirements should be taken into consideration.
- Before switching the regulator on, the accuracy of all connections ought to be checked.
- Guarantee proper working conditions according to the device's specification.

INSTALLATION GUIDANCE

- Do not power the device from the same source of power as others devices of high power without appropriate net filters.
- Avoid putting signal wires in a direct contiguity and in parallel to energetic and powering wires.
- Avoid closeness of remotely-controlled devices, loads of high power devices with a group or phase regulation of power and other devices producing large interference of impulses.
- When switching on the feed mechanism, remember that in the installation of a building a breaker or a circuit breaker should exist. This part ought to be near the device, easy to reach by the operator and marked as a device disconnecting the mechanism.
- For problems caused by disobeying the instruction, the manufacturer is not responsible for.

TECHNICAL DATA

Sensors:	KTY-210
Measurement range:	0 – 120 °C
Measurement resolution:	0.1 °C
Time of measurements:	1 s
Data's reading:	LCD screen 2x20 signs
Steering outputs:	
• Igniter:	~230V 2A (0.8A)
• Feeder:	~230V 2A (0.8A)
• Burner's fan:	~230V 2A (0.8A)
• CH pump:	~230V 2A (0.8A)
• WUW pump:	~230V 2A (0.8A)
• Thermostat 2	Relay contacts max. 24V 2A
Protection:	
• Temperature	STB (95°C)
• Electric	Fuse 4A
Inputs:	
• Room thermostat:	Open contact
• Temperature sensors:	KTY-210
Visual signalling:	
• LED diodes	Signalling the status of outputs
• LCD screen	Messages, measurements, settings
Power supply:	~230 V 50Hz 2VA
Working temperature:	5°C - 50°C
Casing protection:	IP20

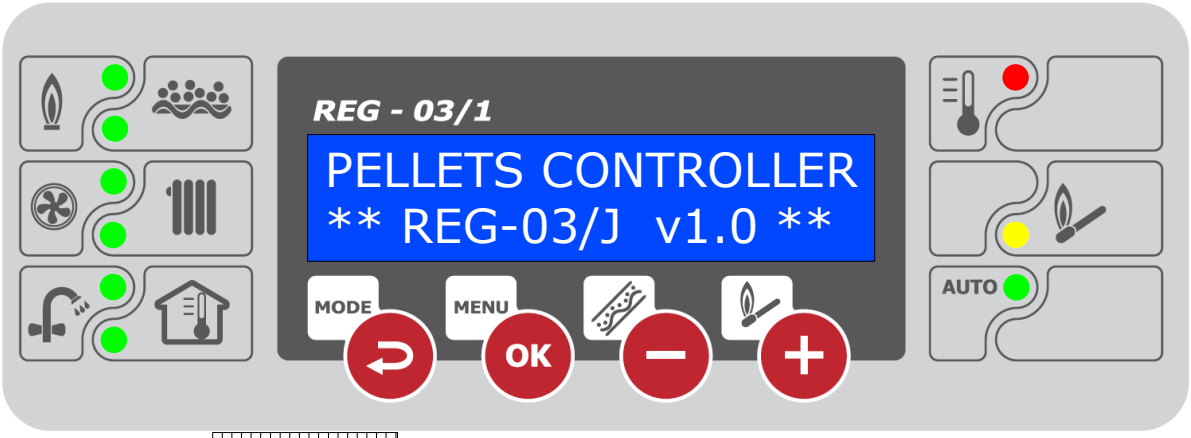
THE IMPLEMENTATION

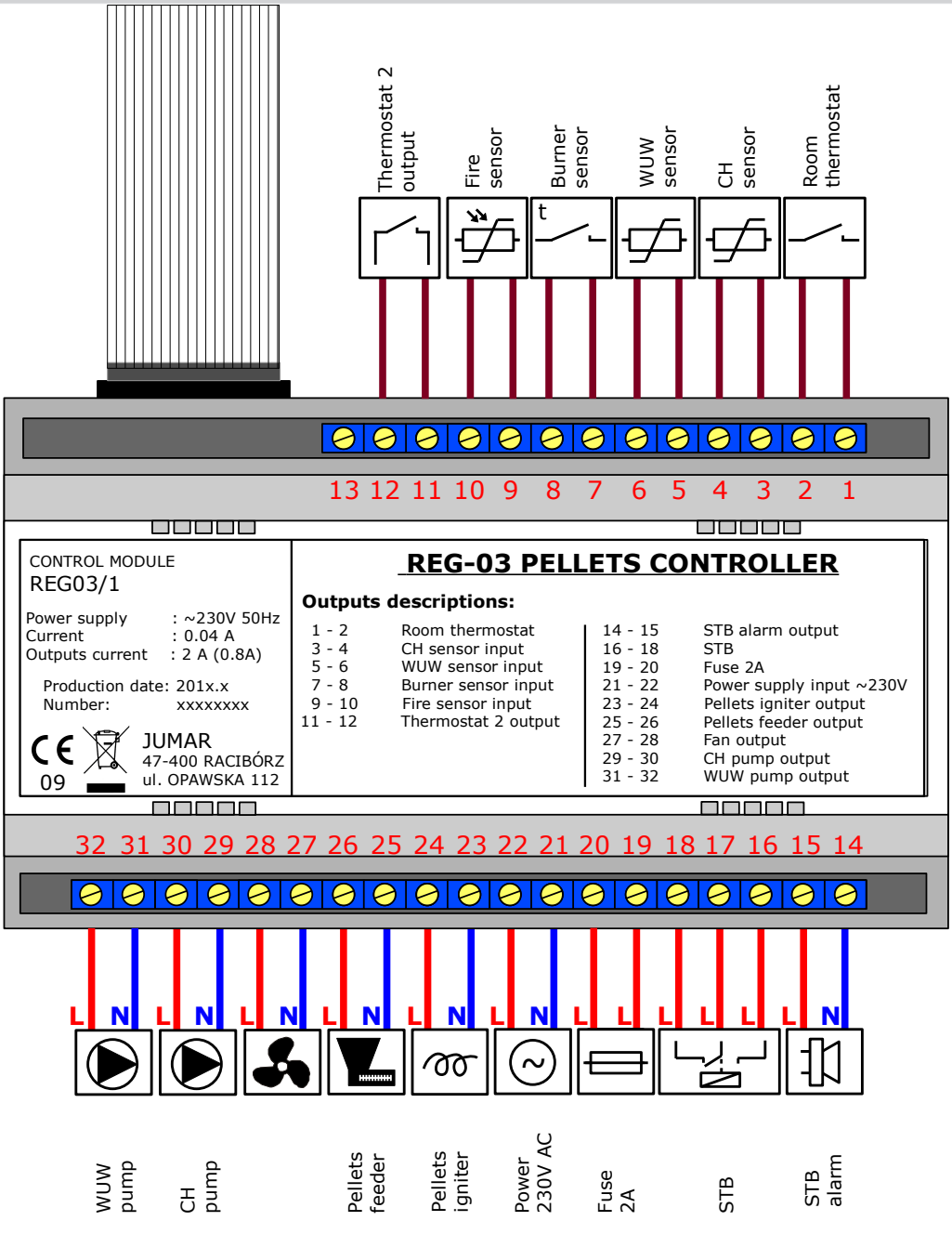
REG – 03 driver is a modern microprocessor device controlling the work of the pellet's burner. Implementation of advanced driver's algorithm and the flame sensor ensures the simplicity of maintenance and the full automatization of the burning process. The usage of a large liquid crystal display and large steering buttons assures an easy and clear interaction between the user and the device. The driver is adapted also to working with the central heatings pump and the pump of the warm useful water. Thanks to these functions, the device can be used in expanded installations of the central heating without using additional steering devices. The regulator is also equipped with an output of room thermostat which enables the change of the furnace's working parameter after reaching a particular temperature in the room.

THE PRICIPLE OF WORKING

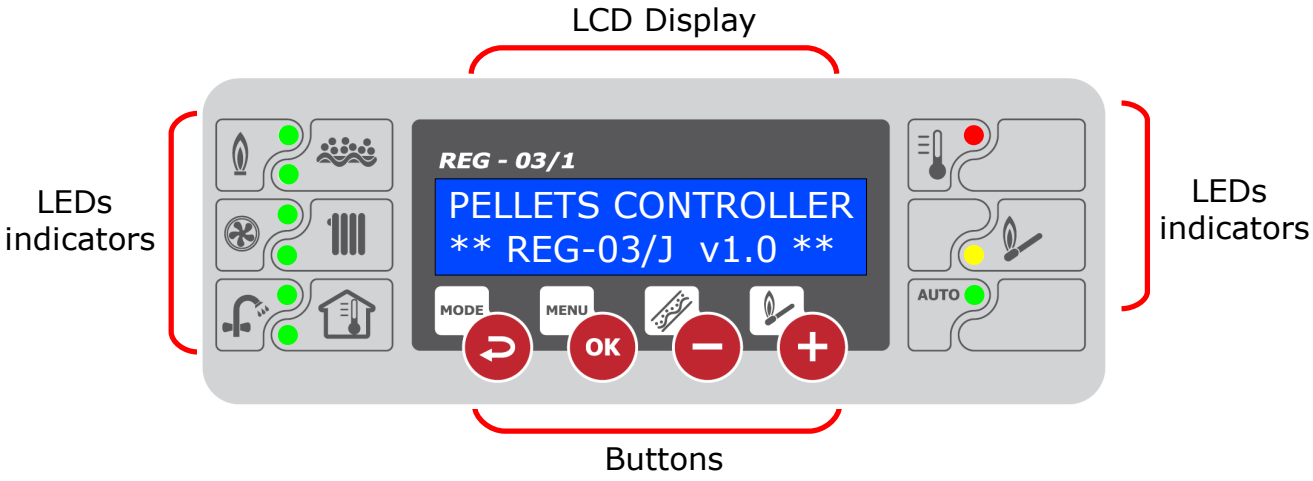
The device's work is based on providing fuel via steering the feeder appropriately and the work of a fan which steers the burning process. After reaching a particular temperature of the heating water, the driver goes into the mode of sustaining the temperature or switches the burner completely off. The ignition of fuel starts automatically with the help of igniter which is connected to this driver. The regulator operates also on the useful warm water buffer. The WUW pump starts working when the regulator detects too low temperature of the WUW buffer. It is also possible to stipulate the working mode of the WUW pump – with a priority or without it. The driver enables the control of the furnace's work thanks to the room thermostat. It is possible to steer the heating in relation to the actual temperature in the room. The regulator is also equipped with the self-control systems (detecting the malfunction of the temperature's sensors) and mechanisms monitoring the furnace's work preventing from going beyond the range of safety for the installation of the central heating.

THE CONNECTION DIAGRAM





THE DRIVER'S PANEL



Description:

- Diodes signalising the status of outputs and the working mode of the driver,
- LCD screen used for communication between the device and the user,
- Buttons steering the driver's work.

DESCRIPTION OF BUTTONS:

Leaves the settings menu or edited parameter without saving any changes in the memory. On the measurement panel, it enables the change of the driver's working mode – **"STOP"**, **"IGNITION"**, **"AUTOMATIC WORK"**.

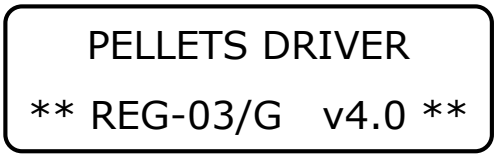
Goes to the settings menu or into the mode of changing the parameter's value. In this mode retrial pressing of the button causes the saving of changes in the driver's memory.

Goes down in the settings menu or in the changing mode it lowers the parameter's value. In the **"IGNITION"** mode, it enables activation of the filling function of the feeder.

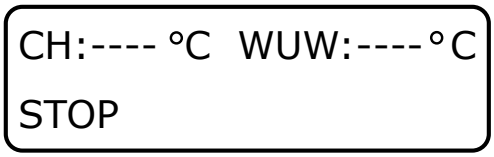
Goes up in the settings menu or in the changing mode, it increases the parameter's value. In the **"IGNITION"** mode, it enables activation of ignition functions of the burner.

THE DRIVER'S HANDLING

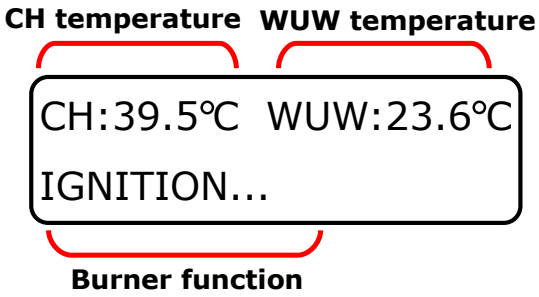
After switching the driver on, on the LCD screen appears the programme's logo defining the type of the driver, current version of software and the manufacturer's logo.



While activating, the driver carries out a test of the connected sensors. In case of one lacking, on the screen appears an appropriate message (---). The work of the driver without a heating water temperature sensor (CH) is blocked and an emergency mode is activated (CH pump is still on).



Correct connection of sensors causes displaying of actual CH furnace's temperature and the temperature of useful warm water of the WUW buffer (if the function is active). On the screen appears which function is currently used by the driver.



The driver may work in three working modes (**"STOP"**, **"IGNITION"**, **"AUTOMATIC WORK"**). The change of the working mode happens when the **"MODE/↩ "** button is pressed on the regulator's panel. Activating the **"STOP"** mode is possible in all modes after pressing the **"MODE/↩"** button for 3 seconds. This mode activates procedures connected with the burner's putting out i.e. burning off and cleaning.

While activating the driver for the first time, the **"STOP"** mode is activated. Every next time, its status is saved in the regulator's non-volatile memory. Activating the driver again, automatically causes switching on of the lately used working mode.

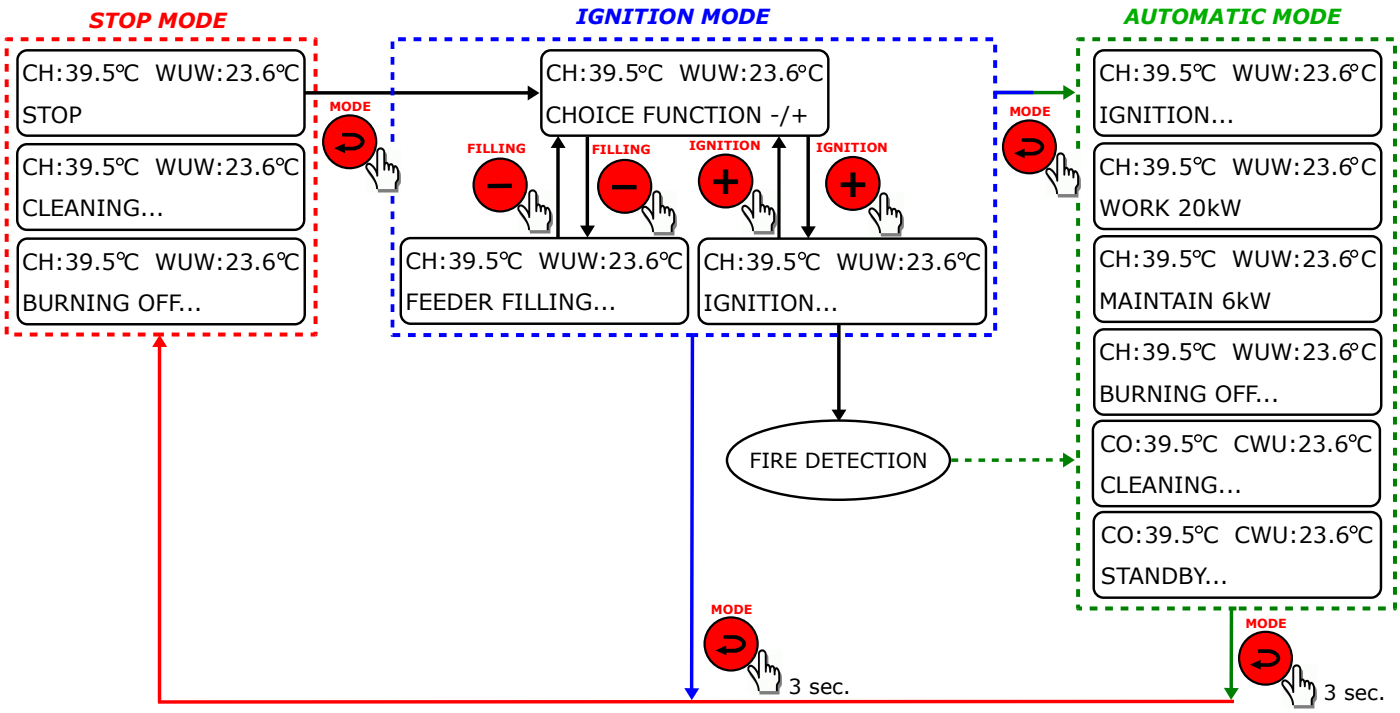
In the table beneath a short description of particular functions of the burner, activated depending on the working mode of the driver, is shown.

FUNCTION'S NAME	DESCRIPTION OF FUNCTIONS
STOP	Burner stopped.
FEEDER FILLING	Filling the feeder. Filling stops automatically after about 10 minutes.
IGNITION	Ignition of pellet. The mode would be automatically changed after detecting a flame by the sensor.
CLEANING	The cleaning of the burner from he left ashes. The cleaning function also as a blow down before ignition.
WORK	Heating the boiler up to the set temperature. Showing the actual power of the burner.
MAINTAIN	Sustaining the set temperature (if the burner's working mode is in the mode of continuous work)
BURNING OFF	Putting off the burner. Active in the **"STOP"** mode or in the temporal working mode of the burner.
STANDBY	Standby of the burner for the decline of the temperature of a hysteresis (if the burner's working mode is in the temporal mode).

In the picture, the way of moving between the particular driver's modes and the functions in the ignition mode is illustrated. In the **"STOP"** mode and in the **"AUTOMATIC WORK"** mode, the regulator steers the functions automatically and depends on the parameters set by the user. In the ignition mode, turning on the ignition functions causes activation of procedures connected with the starting of the burner. Detection of flames in the burner causes the change of the mode into **"AUTOMATIC WORK"** mode. In this mode the status of the flame is constantly monitored. The decline of the flame activates functions linked to the ignition of the pellet (if the particular burner's function requires it). The driver carries out three trials of ignition of the pellet. The lack of flame may be caused by: the lack of the pellet in the container, when the big feeder was not filled with the pellets, the flame's sensor is dirty or broken.

CAUTION!!

The flame's sensor should be cleared regularly. The smudge of dirt may be the reason of false interpretation of the burner's status, causing for example, a higher fuel consumption without full burning of the pellet.



In each mode the status of the connected sensors is monitored. The malfunction of one of the sensors while working is also marked on the LCD screen with an appropriate warning message (!!!!). Additionally, the driver starts up relevant emergency procedures fro every of the sensors in order to prevent the boiler from working beyond the safe range for the installation of the central heating.

CH:!!!! °C WUW:!!!! °C
STOP

While the device is working, the driver monitors the furnace's temperature. If the temperature of the protection of the furnace is surpassed, the procedures preventing from the overheating of the central heating installation would be started up. The user would be informed on the screen about the activation of the protecting mechanisms (text about protection and the actual temperature of the heating water):

FURNACE PROTECT 92°C
STOP

The boiler's protection can be activated when:

- working of room thermostat and simultaneously surpassing the protection temperature of the boiler,
- setting **"Summer"** function and simultaneously surpassing the protection temperature of the boiler,
- setting the **"STOP"** mode and simultaneously surpassing the protection temperature of the boiler,
- surpassing the temperature of the heating water over 90 °C.

The temperature of the burner's enclosure is also monitored. If the temperature rises over the set value, the driver would activate the procedures of the burner's protection and would show a message:

CH:39.5°C WUW:23.6°C
BURNER ALARM...

To move round the menu and to set particular parameters there are four buttons placed on the driver's panel: **"MODE/↩"**, **"MENU/OK"**, **"+"**, **"-"**. The parameters chosen by the user are divided into four groups: (A) **"CH FURNACE SETTINGS"**, (B) **"WUW BUFFER SETTINGS"**, (C) **"BURNER SETTINGS"**, (D) **"DRIVER SETTINGS"**. The division of particular parameters in groups is shown in the **"Settings' table".**

SETTINGS' TABLES

- **CH FURNACE SETTINGS** (A)

FUNCTION NO.	FUNCTION NAME	SETTING UNIT	SETTING RANGE	MANUFACTURER SETTING
1	HEATING WATER TEMPERATURE	°C	35 - 85	65*
2	CH PUMP ACTIVATION TEMPERATURE	°C	20 - 60	35*
3	CH FURNACE HYSTERESIS	°C	1 - 20	5*
4	THERMOSTAT 2 TEMPERATURE	°C	10 – 90	Off*
5	FURNACE MODE	---	Winter/Summer	Winter*

- **WUW BUFFER SETTINGS** (B)

FUNCTION NO.	FUNCTION NAME	SETTING UNIT	SETTING RANGE	MANUFACTURER SETTING
1	WUW BUFFER TEMPERATUR	°C	20 - 80	40*
2	WUW SURPLUS TEMPERATURE	°C	5 - 20	10*
3	WUW PRIORITY	---	Yes/No	No*

- **BURNER SETTINGS** (C)

FUNCTION NO.	FUNCTION NAME	SETTING UNIT	SETTING RANGE	MANUFACTURER SETTING
1	BURNER POWER (WORK)	kW	10 - 50	30*
2	BURNER POWER (MAINTAIN)	kW	2- 9	3*
3	BURNER MODE	---	Continuous/ Single	Continuous*
4	BURNER FLAME MEASUREMENT	%	---	---

- **DEVICE SETTINGS** (D)

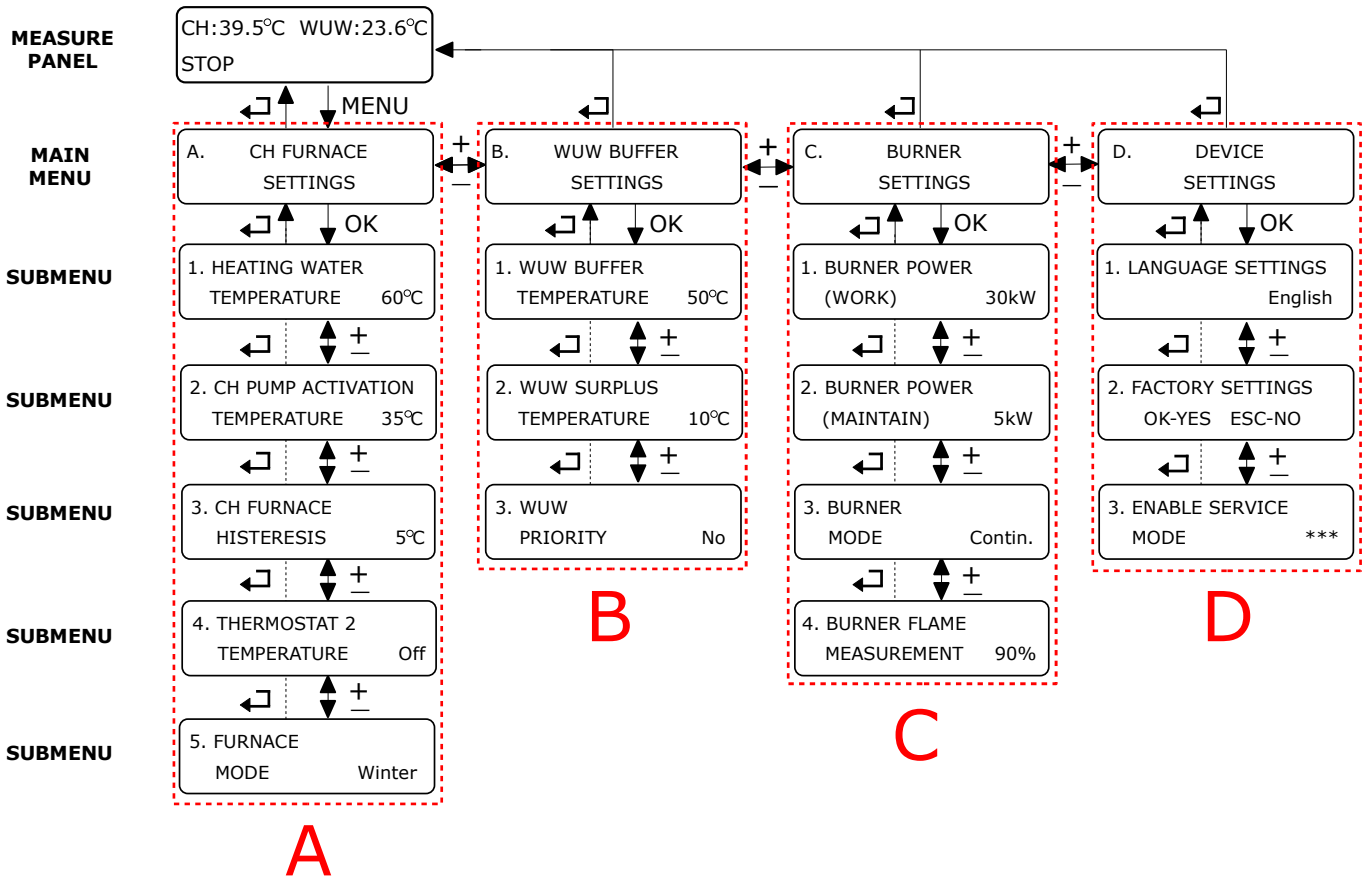
FUNCTION NO.	FUNCTION NAME	SETTING UNIT	SETTING RANGE	MANUFACTURER SETTING
1	LANGUAGE SETTINGS	---	Polish/ English/ German	English*
2	FACTORY SETTINGS	---	Yes/No	---
3	ENABLE SERVICE MODE	---	000 - 999	---

*** CAUTION!!**

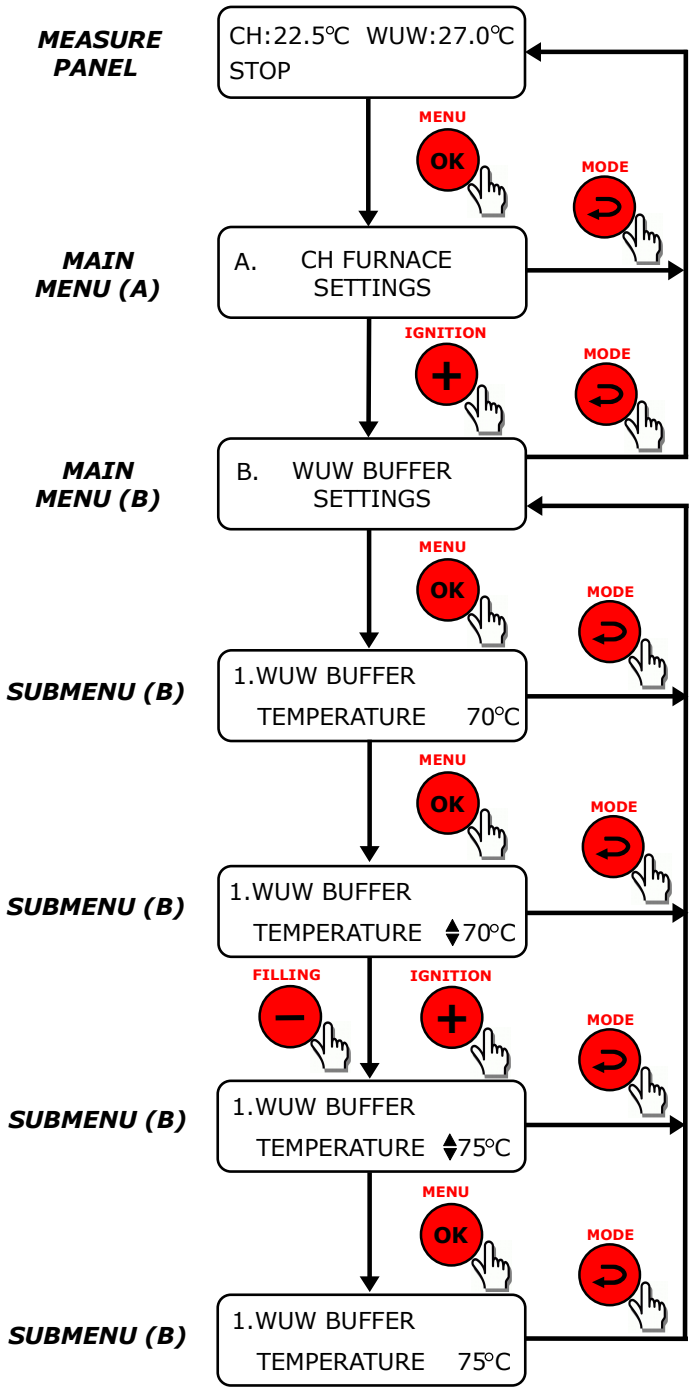
The manufacturer's settings are only the suggestions. All values depend on the kind of solid fuel, installation, the user's requirements, etc.

The producer of the driver reserves the changes of the ranges of the settings in next versions of the driver.

Use the button **"MENU/OK"** to go into the settings menu. The driver would switch into the settings mode and would show the first group of settings - **"CH FURNACE SETTINGS"**. To change the group, use the buttons **"+"** or **"-"**. In order to leave the menu, press **"MODE/ ↩ "**. To activate parameters from a particular group to choose the setting, a proper group should be chosen, then the button **"MENU/OK"** on the driver's panel should be used. On the screen ought to appear the first group of the particular group's parameters. In the picture below, the way of moving around particular groups and parameters is illustrated:



In order to make changes of the parameters, a particular parameter has to be chosen as it is illustrated in the picture below, then activating the change by pressing **"MENU/OK"** button. Using the edition mode causes appearance of arrows and the pulsation of the set value. To change the values **"+"** or **"-"** buttons ought to be pressed. Press **"MENU/OK"** so as to save the new settings. If we want to skip the saving and go back to the previous settings press **„MODE/ ↩"**. In the picture below an exemplary change of one of the parameters is shown.



DESCRIPTION OF SETTINGS

A. CH FURNACE SETTINGS

A. CH FURNACE SETTINGS

1. HEATING WATER TEMPERATURE

1. HEATING WATER TEMPERATURE 60°C

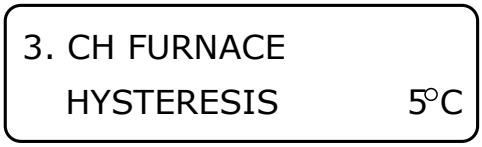
In this menu, the user sets the temperature of heating water. After reaching the chosen temperature, the driver goes into the maintain mode or switch the burner completely off. The fall of temperature beneath the chosen value (heating water temperature – CH furnace hysteresis) activates the function of the burner's work. If there is no flame in the burner, the ignition will be repeated. The temperature of the heating water is set in the bracket of 35 to 80 °C.

2. CH PUMP ACTIVATION TEMPERATURE

2. CH PUMP ACTIVATION TEMPERATURE 35°C

In this menu, the user sets the threshold temperature of starting the pump of the central heating (CH pump). The pump works according to the user's settings of the priority for useful hot water is switched off (look **"WUW buffer settings → WUW priority"**) and the input of the room thermostat is compact. The pump is also automatically switched on if one of the emergency status appears (e.g. overheating of the furnace, malfunction of the sensor, reaching the protection temperature of the furnace etc.). The temperature of starting the pump of heating water is set in the bracket of 0 to 80 °C.

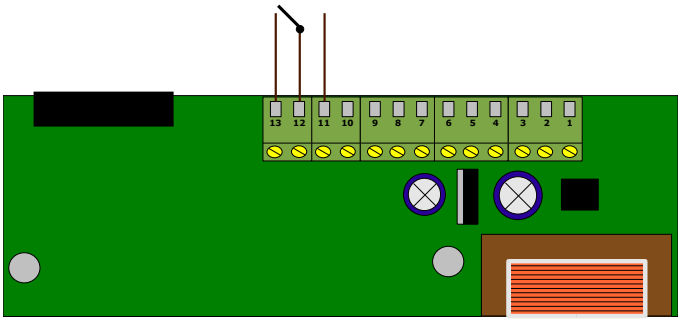
3. CH FURNACE HYSTERESIS



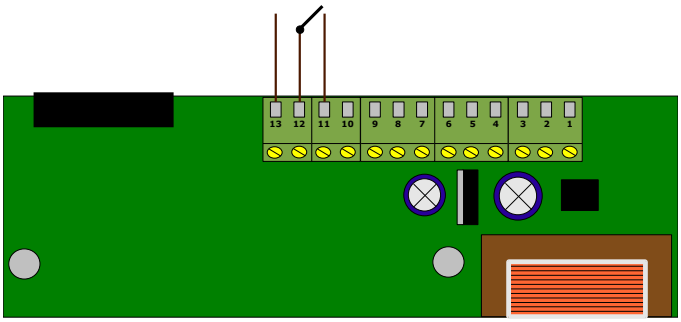
In this menu, the user sets the hysteresis of the CH furnace's temperature (the value of the furnace's temperature has to decline to start the working mode of the boiler or ignite the pellets again). Setting the hysteresis more than 5°C is reasonable only when heating the central heating buffer. In this case, it is advisable to change the burner's working mode from continuous into single (look **"Burner settings → Burner mode"**). The hysteresis of CH furnace is set in the bracket of 1 to 20°C.

4. THERMOSTAT 2 TEMPERATURE

In this menu, the user has the possibility of setting the temperature of switching the thermostatic output (relay). This function can be used, for example, to inform the additional heating device to start the work. The principle of working of the output of „**THERMOSTAT 2**" is based on the comparison of the furnace's temperature set in this parameter. After reaching this temperature, a switching of the relay comes up. The fall of temperature of the hysteresis value (look **"CH furnace settings → CH furnace hysteresis"**) will cause the return of the relay into the initial status. The temperature of thermostat 2 is set in the bracket of 10 to 90 °C. This function can also be turned off, setting the status "Off". In the picture below the status of the relay is shown, depending on the compared temperatures.



The furnace's temperature lower than was pre-set in the parameter. **„TEMPERATURE OF THERMOSTAT 2”**



The furnace's temperature larger than was pre-set in the parameter. **„TEMPERATURE OF THERMOSTAT 2”**

5. FURNACE MODE

5. FURNACE
MODE Winter

In this menu, the user sets the furnace's working mode. Summer or winter working mode can be chosen. In the winter mode, the driver heats the heating water up to the pre-set level in the parameter of the temperature of the heating water (look **”CH furnace settings → Heating water temperature”**). In the summer mode, the driver turns off the CH pump and sustains the minimal temperature of the furnace so as not to put out the pellet. Additionally, the change of the value of heating water's temperature is blocked and automatically the pre-set manufacturer's minimal value of the furnace is set. This mode is used to heat the useful warm water in the time which does not requires heating the rooms.

B. WUW BUFFER SETTINGS

B. WUW BUFFER SETTINGS

1. WUW BUFFER TEMPERATURE

1. WUW BUFFER TEMPERATURE 50°C

In this menu, the user sets the temperature of the useful warm water. After reaching the pre-set pump's temperature for the useful warm water (WUW pump) will be automatically switched off (if the WUW sensor is on). If the value **"OFF"** is set, the WUW pump is still turned off and automatically the WUW priority will be blocked (look **"WUW buffer settings → WUW priority"**) and will be changed into the value **"No".** The temperature of useful warm water is set in the bracket of „off up to 80 ºC".

2. WUW SURPLUS TEMPERATURE

2. WUW SURPLUS TEMPERATURE 10°C

In this menu, the user sets the surplus of the temperature for the useful warm water during setting the priority for the boiler with warm water (look "**WUW buffer settings → "WUW priority"**). In this case, the boiler heats up to the pre-set temperature of WUW + the pre-set excess of WUW temperature (if the furnace's temperature is lower than the pre-set temperature of WUW buffer). The surplus of the temperature of the useful warm water is set in the bracket of 5 to 20°C.

3. WUW PRIORITY

3. WUW PRIORITY	No

In this menu, the user sets the working priority of the boiler. If the priority is set on **"No"** the boiler heats the heating water and simultaneously the useful warm water. If the pre-set temperature of the useful warm water is larger than the previously set temperature of the heating water, the regulator heats the WUW buffer only up to the pre-set temperature of the heating water.. However, setting the priority on **"Yes"** heats the WUW buffer first to the temperature which was set for the WUW buffer and the excess of the WUW pump (if the furnace's temperature is lower than the pre-set temperature of the WUW buffer), then lowers the temperature of the boiler up to the chosen value and heats the heating water. The priority of the useful warm water is set in modes : yes or no.

C. BURNER SETTINGS

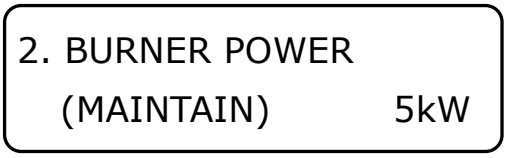
C. BURNER SETTINGS

1. BURNER POWER (WORK)

1. BURNER POWER (WORK)	30kW

In this menu, the user sets the power of the burner in the working function (the temperature of the heating water is lower than the pre-set). The burner's power is a visual value depending on the quality of the applied pellet. The power should be chosen as if the full burning of the pellet took place and there would be no decline of the embers in the burner. The power of the burner in the working mode is set from 10 to 50 kW.

2. BURNER POWER (MAINTAIN)

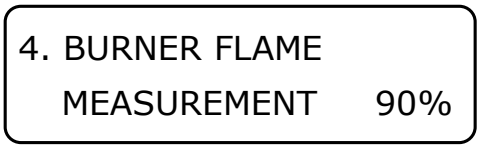


In this menu, the user sets the power of the burner in the function of maintain (the temperature of the heating water is higher than the pre-set.). The chosen power of the burner is a visual value depending on the quality of the applied pellet. The power should be chosen as if there was no decline of the embers in the burner and there was no further increase of the boiler's temperature. The burner's power in the maintain mode is set between 2 to 9 kW.

3. BURNER MODE

In this menu, the user sets the burner's working mode. The burner may work in a continuous mode (after reaching the pre-set temperature, the power is lowered according to the parameter **"Burner power (maintain)"**) or in the single mode (after reaching the pre-set temperature, the burner is put out). The single mode is recommended for heating the central heating buffer and the hysteresis of the CH boiler over 5°C.

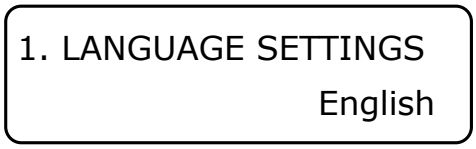
4. BURNER FLAME MEASUREMENT



In this menu, the user checks the flame's brightness in the burner. While working function, the measurement should show 70 – 99%. If the value is lower, the flame's sensor which is installed in the burner should be cleared.

D. DRIVER SETTINGS

1. LANGUAGE SETTINGS



In this menu, the user sets the language of the driver's interface. Languages such as Polish, English and German are available.

2. FACTORY SETTINGS

In this menu, the user may restore all the factory settings. To restore the factory settings, the information from the LCD screen has to be followed. After activating the restoring of the factory settings, the driver will automatically reset itself after a short time.

3. ENABLE SERVICE MODE

In this menu activation of additional service options after using an appropriate code is possible. The service code is known only to the service.

USER'S NOTES

- **CH FURNACE SETTINGS** (A)

FUNCTION NO.	FUNCTION NAME	SETTING UNIT	SETTING RANGE	USER SETTING
1	HEATING WATER TEMPERATURE	°C	35 - 85	
2	CH PUMP ACTIVATION TEMPERATURE	°C	20 - 60	
3	CH FURNACE HYSTERESIS	°C	1 - 20	
4	THERMOSTAT 2 TEMPERATURE	°C	10 – 90	
5	FURNACE MODE	---	Winter/Summer	

- **WUW BUFFER SETTINGS** (B)

FUNCTION NO.	FUNCTION NAME	SETTING UNIT	SETTING RANGE	USER SETTING
1	WUW BUFFER TEMPERATUR	°C	20 - 80	
2	WUW SURPLUS TEMPERATURE	°C	5 - 20	
3	WUW PRIORITY	---	Yes/No	

- **BURNER SETTINGS** (C)

FUNCTION NO.	FUNCTION NAME	SETTING UNIT	SETTING RANGE	USER SETTING
1	BURNER POWER (WORK)	kW	10 - 50	
2	BURNER POWER (MAINTAIN)	kW	2- 9	
3	BURNER MODE	---	Continuous/ Single	
4	BURNER FLAME MEASUREMENT	%	---	

- **DEVICE SETTINGS** (D)

FUNCTION NO.	FUNCTION NAME	SETTING UNIT	SETTING RANGE	USER SETTING
1	LANGUAGE SETTINGS	---	Polish/ English/ German	
2	FACTORY SETTINGS	---	Yes/No	
3	ENABLE SERVICE MODE	---	000 - 999	