



Boiler regulator

ecoMAX 860P

FOR AUTOMATIC SOLID FUEL FIRED BOILERS WITH INGITION
(GUTTER AND RETORT FEEDERS)



ecoSTER200*



ecoSTER TOUCH*

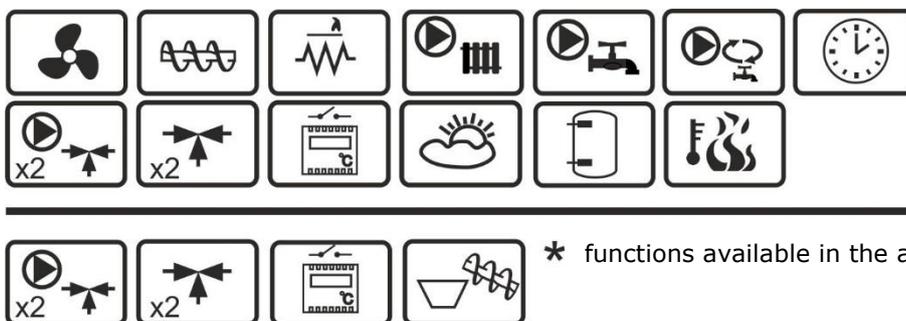


ecoNET300*



ecoNET.apk

www.econet24.com



* functions available in the additional module B

* room panel ecoSTER200/ and internet module ecoNET300 are not part of standard equipment regulator.



USER MANUAL AND INSTALLATION

ISSUE: 1.1

APPLIES TO SOFTWARE:

MODULE
v.01.XX.XX

PANEL
v.01.XX.XX



ELECTRIC DEVICE UNDER VOLTAGE!

Before any action related to the power supply (cables connection, device installation etc.) check if the regulator is not connected to the mains!

Installation should be done by a person with appropriate electrical qualifications. Improper cables connection could result in the regulator damage.

The regulator cannot be used in steam condensation conditions and cannot be exposed to water.

PRINCIPLES INDIVIDUAL FUZZY LOGIC:

- The regulator must be programmed individually for the given type of boiler and fuel!**
- It is inadmissible to change the type of gear-motor, fan, and to make other changes in the boiler fittings which can influence the burning process. The fittings should correspond to the components installed by the manufacturer!**
- It is recommended to operate boiler with maximally-opened fan flap.**
- Activation of the fuzzy logic mode does not eliminate the necessity of regulating the SUPERVISION parameters.**
- In some cases, the fuzzy logic mode may require additional adjustment.**

1. Safety requirements



Requirements concerning safety are described in detail in individual chapters of this manual. Apart from them, the following requirements should in particular be observed.

- Before starting assembly, repairs or maintenance, as well as during any connection works, please make sure that the mains power supply is disconnected and that terminals and electric wires are devoid of voltage.
- After the regulator is turned off using the keyboard, dangerous voltage still can occur on its terminals. The regulator cannot be misused.
- The regulator is designed to be enclosed.
- Additional automatics which protect the boiler, central heating (CH) system, and domestic hot water system against results of malfunction of the regulator, or of errors in its software, should be applied.
- Choose the value of the programmed parameters accordingly to the given type of boiler and fuel, taking into consideration all the operational conditions of the system. Incorrect selection of the parameters can cause malfunction of the boiler (e.g. overheating of the boiler, the flame going back to the fuel feeder, etc.),
- The regulator is intended for boiler manufacturers. Before applying the regulator, a boiler manufacturer should check if the regulator's mating with the given boiler type is proper, and whether it can cause danger.
- The regulator is not an intrinsically safe device, which means that in the case of malfunction it can be the source of a spark or high temperature, which in the presence of flammable dusts or liquids can cause fire or explosion. Thus, the regulator should be separated from flammable dusts and gases, e.g. by means of an appropriate body.
- The regulator must be installed by a boiler manufacturer in accordance with the applicable safety standards.
- The programmed parameters should only be altered by a person familiarized with this manual.
- The device should only be used in heating systems in accordance with the applicable regulations.
- The electric system in which the regulator operates must be protected by means of a fuse, selected appropriately to the applied loads.
- The regulator cannot be used if its casing is damaged.
- In no circumstances can the design of the regulator be modified.
- In the regulator there is applied electronic disconnection of connected devices (2Y type of operation according to PN-EN 60730-1) as well as micro-disconnection (2B type of operation according to PN-EN 60730-1).
- Keep the regulator out of reach of children.

2. General information

Boiler regulator ecoMAX860P is a modern electronic device intended to control boiler operation with automatic feeding of solid fuel and with the ignitors. Flame is detected via the exhaust temperature sensor.

The regulator is a multipurpose device:

- it automatically maintains a preset boiler temperature by controlling the fuel combustion process,
- it controls timing fuel feeder and fan (modulating its power),
- it automatically stabilizes a preset temperature of the domestic hot water container,
- it automatically maintains preset temperature of several independent mixer heating cycles.

The preset temperature of heating cycles and the boiler can be set on the basis of a weather sensor readouts.

The device includes the control panel with horizontal regulation of its position, the main operating unit and optional modules to control additional heating circuits.

The regulator can cooperate with an additional room panel ecoSTER200 and ecoSTER TOUCH situated in living quarters and module for the web WiFi ecoNET300.

It can be used in a household and similar facilities, as well as in lightly industrialized facilities.

3. Information about documentation

The regulator manual is a supplement for the boiler manual. In particular, except for this manual, the boiler manual should also be observed. The regulator manual is divided into two parts: for user and fitter. Yet, both parts contain important information, significant for safety issues, hence the user should read both parts of the manual.

We are not responsible for any damages caused by failure to observe these instructions.

4. Storage of documentation

This assembly and operation manual, as well as any other applicable documentation, should be stored diligently, so that it was available at any time. In the case of removal or sale of the device, the attached documentation should be handed over to the new user / owner.

5. Applied symbols

In this manual the following graphic symbols are used:



- useful information and tips,



- important information, failure to observe these can cause damage of property, threat for human and household animal health and life.

The symbols indicate important information, in order to make the manual more lucid. Yet, this does not exempt the user from the obligation to comply with requirements which are not marked with a graphic symbol!

6. Directive WEEE 2012/19/UE

Act on electrical and electronic equipment.



- Recycle the product and the packaging at the end of the operational use period in an appropriate manner.
- Do not dispose of the product together with normal waste.
- Do not burn the product.

INSTRUCTION MANUAL

ecoMAX 860P

7. STRUCTURE – MAIN MENU

Main menu	
Information	
Boiler settings	
HUW settings*	
Summer mode	[Summer/Winter]
Mixer 1-5 settings*	
General settings	
Manual control	
Alarms	
Services settings	

Boiler settings	
Preset boiler temperature	
Weather control the boiler*	
Boiler heating curve*	
Curve shift*	
Room temperature factor*	
Output modulation	<ul style="list-style-type: none"> • Max. boiler output • 100% fan speed • 100% Oxygen* • 50% fan speed • 50% H2 hysteresis • Medium boiler output • 50% fan speed • 30% H1 hysteresis • Min. boiler output • 30% fan speed • 30% Oxygen* • Boiler hysteresis • Feeder correction • FL min. boiler output • FL max. boiler output • Ignition fan speed – grate*
Heat source	<ul style="list-style-type: none"> • Burner • Grate • Auxiliary boiler*
Regulation mode:	<ul style="list-style-type: none"> • Standard • FuzzyLogic • Max kW • Avg kW • Min kW
Fuel selection	
Fuel level	<ul style="list-style-type: none"> • Alarm level • Fuel level calibration
Lambda calibration*	
Scheduled operation	<ul style="list-style-type: none"> • On [No/Yes] • Schedule
Night time decrease boiler	<ul style="list-style-type: none"> • On [No/Yes] • Reduction value • Schedule

HUW settings	
HUW preset temperature	
HUW pump mode	<ul style="list-style-type: none"> • Off • Priority • No priority
HUW container hysteresis	
HUW disinfection	
Night time decrease HUW	<ul style="list-style-type: none"> • On [No/Yes] • Reduction value • Schedule
Night time decrease circulation pump*	<ul style="list-style-type: none"> • On [No/Yes] • Schedule

Mixer 1-4 settings*	
Preset mixer temperature	
Mixer room thermostat	
Mixer weather control*	
Heating curve mixer*	
Curve translation*	
Room temperature factor*	
Mixer night time decrease	<ul style="list-style-type: none"> • On [No/Yes] • Reduction value • Schedule

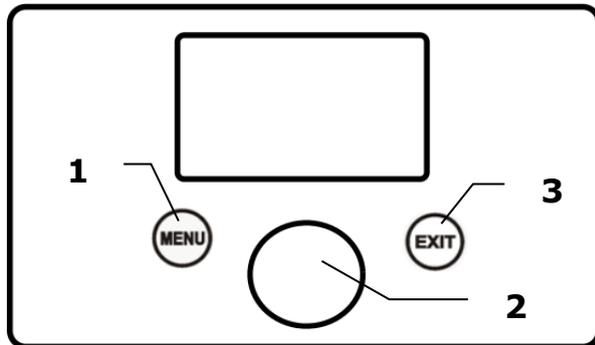
General settings	
Clock	
Date	
Screen brightness	
Sound	
Language	
Software update*	
WiFi settings*	

* unavailable if no adequate sensor or additional module is connected or the parameter is hidden.

8. Operating the regulator

The regulator turns on by pressing the knob. To start the use of boiler, fire up the boiler using the FIRING UP operation mode, then change the operation mode to OPERATION.

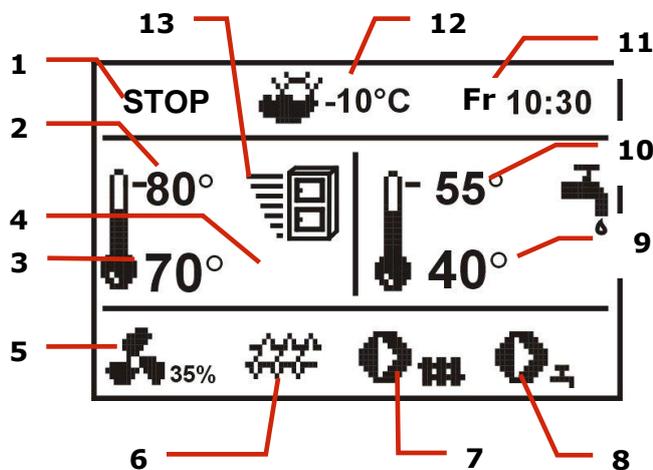
8.1 Buttons description



1. MENU button
2. „TOUCH and PLAY“ knob
3. przycisk EXIT

Turning the “TOUCH and PLAY” knob increases or decreased the edited parameter. Pushing this knob allows to enter the given parameter, or to confirm the selected value.

8.2 Main screen



1. regulator operation modes: FIRING UP, OPERATION, SUPERVISION BURNING OFF, STANDSTILL
2. preset boiler temperature
3. measured boiler temperature
4. field of factors influencing preset boiler temperature:

☐ - preset boiler temperature decrease due to thermostat disconnection (room temperature is reached)

⌚ - preset boiler temperature decrease due to activated time spans

⬆️🔧 - boiler preset temperature during loading the domestic hot water tank (HUW)

⬆️🔧 - boiler preset temperature increase from mixer circulation

⬆️🔧 - increasing preset temperature for loading buffer

⊕ - warning, HUW disinfection mode is active

🔄 - 4-way valve partially closed (active return protection)

5. fan operation symbol

6. fuel feeder operation symbol

7. boiler pump operation symbol

8. HUW pump operation symbol

9. measured temp. of domestic HUW container

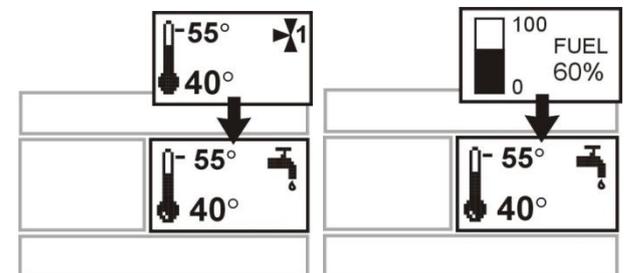
10. preset temp. of domestic HUW container

11. clock and day of the week

12. outside (weather) temperature

13. current boiler output level.

Right window on the main screen is customizable, the user can decide what information is to be presented there. It is possible to choose setup presenting info of HUW by rotating the “TOUCH and PLAY” knob.



Fuel level can be also shown in the room panel ecoSTER200 and ecoSTER TOUCH.

8.3 Setting the preset boiler temperature

Set the preset boiler temperature and preset mixer temperature in menu:

Boiler settings → **Preset boiler temp.**

Mixer 1-5 settings → **Preset mixer temp.**

Note: Preset boiler temperature will be automatically increased to enable filling HUW container and heating circuits of mixers, if required.

8.4 FIRING UP

The FIRING UP mode is used for automatic firing-up of furnace in the boiler. All parameters which influence the firing-up process can be found in menu:

Service settings → **Burner settings** → **Firing up**

If the firing-up failed, additional attempts will be made. Consecutive attempts are visualised

by numbers next to the lighter symbol . After three unsuccessful attempts, an alarm *Failed firing up attempt* is reported. In such case, the boiler operation is halted. Boiler operation cannot be continued automatically - service crew must intervene. After removing causes of impossibility to fire-up, the boiler must be restarted.

8.5 OPERATION

The fan operates continuously. Fuel feeder is activated cyclically. A cycle consists of feeder operation time and duration of feeding interval

Parameters related with the Operation mode are: *Feeder operation time* and *Fan speed* in: **Boiler settings** → **Output modulation**

8.6 Regulation mode

There are two regulation modes for stabilizing the set temperature of the boiler: Standard and FuzzyLogic

Boiler settings → **Regulation mode**

Operating in Standard mode

When the boiler temperature reaches its set value, the regulator switches to SUPERVISION mode.

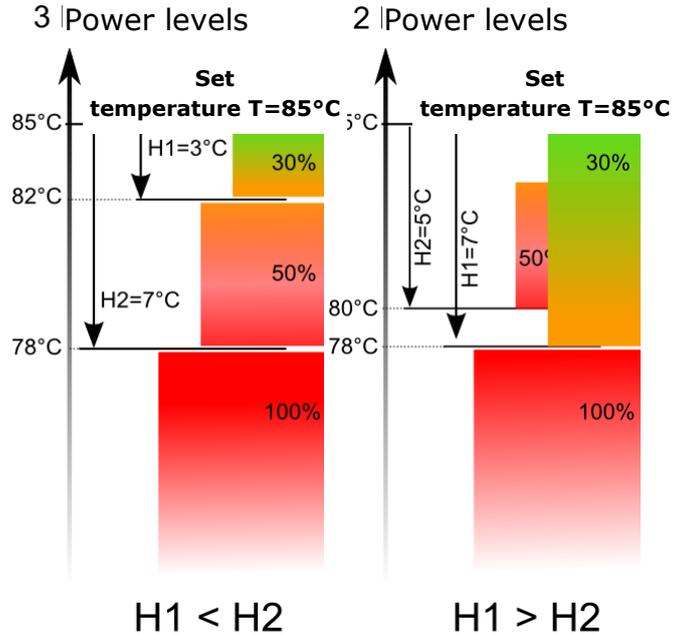
The regulator has a boiler output modulation mechanism allowing it to gradually reduce the output as the boiler temperature nears its set value

Three boiler output levels can be set: maximum, medium, and minimum. Each level can be additionally adjusted with individual fuel feeding times and fan speeds, affecting the actual output of the boiler. The output level parameters are accessible through the menu

Boiler Settings → **Output modulation**

The regulator sets the current output of the burner depending on the set temperature of the boiler and H1 and H2 hysteresis settings

It is possible to set the H1 and H2 values to modulate the output without the medium power stage, ie. reducing output from 100% to 30%, skipping the 50% output (right side of the figure below).



Operating in FuzzyLogic mode

In FuzzyLogic mode, the regulator automatically sets the output of the burner in order to maintain the set boiler temperature. The regulator uses the output settings predefined in Standard mode. This mode does not require setting the H1 and H2 hysteresis.

Note: If only the HUW is heated (Summer mode), it is recommended to set the regulator to Standard mode.

After the set temperature is exceeded by 5°C, the boiler switches to SUPERVISION mode.

8.7 SUPERVISION

In SUPERVISION mode, the fan and the feeder are switched on cyclically at larger intervals than in OPERATION mode. This is to prevent the fire from being extinguished.

Supervision parameters can be found in menu:

Service Settings → **Burner Settings** → **Supervision**

SUPERVISION parameters should be set in accordance with the recommendations of the boiler or burner manufacturer. The parameters should be adjusted to prevent the furnace from extinguishing during intervals.



Parameters should be so selected that the boiler temperature in this

mode gradually drops. Incorrect settings may lead to boiler overheating.

When the *Supervision time* expires, the regulator switches to BURNING OFF mode, unless the boiler temperature decreases and the boiler automatically switches to OPERATION mode.



For the setting *Supervision time* = 0, the regulator skips the SUPERVISION mode and enters the BURNING OFF mode.



When the *Supervision time* = 255, the regulator will work continuously in SUPERVISION mode, until the boiler temperature decreases and it automatically switches to OPERATION mode.

8.8 BURNING OFF

The extinguishing process does not occur when coal is the fuel of choice. When pellets are the fuel, they are burned off for several minutes (depending on the set time). After BURNING OFF, the regulator switches to STANDSTILL.

8.9 STANDSTILL

In the STANDSTILL mode, the boiler is put out and awaits signal to resume heating.

A signal to start heating can be:

- decrease in preset boiler temperature below the preset temperature minus the value of boiler hysteresis (*Boiler hysteresis*),
- if the boiler is set to work with a buffer - decrease in upper buffer temperature below the preset value (*Loading start temperature*).

8.10 Settings HUW preset temperature

The device controls temperature of the domestic hot water - HUW container, provided that a HUW temperature sensor is connected. If the sensor is disconnected, an information about lack thereof is displayed in the main window. The parameter:

HUW settings → **HUW pump mode** allows the user to:

- disable filling of the HUW container, parameter *Off*,
- set HUW priority, using the *Priority* parameter - in this case, the CH pump is

deactivated to speed up filling of the HUW container.

- set simultaneous operation of the CH and HUW pump, using parameter *No priority*.

8.11 Disinfection of the HUW container

The regulator has a function of automatic, periodic heating of HUW container to 70°C to eliminate bacterial flora from the HUW container.

The function is activated in the menu:

HUW settings → **HUW disinfection**



Keep the tenants informed of activating the disinfection function as there is risk of being burnt with hot usable water.

The regulator increases the HUW container temperature once a week, at 2:00 a.m. Monday. After 10 minutes of maintaining the temperature at 70°C, the HUW pump is switched off and the boiler returns to normal operation. Do not activate the disinfection function when the HUW support is off.

8.12 Setting HUW preset temperature

Preset HUW temperature is defined by parameter:

HUW settings → **HUW preset temp.**

HUW container hysteresis

When the temperature drops below the HUW set temperature - HUW container hysteresis, the HUW pump will start in order to supply the HUW container.



In low hysteresis values, the HUW pump will start faster when the HUW temperature drops.

8.13 HUW circulation pump

The settings are located in:

HUW settings → **Circulation pump night time decrease**

and

Service settings → **CH and HUW settings**

The time settings of the circulation pump are analogous to the settings of night time decrease. The pump will be off in the defined time periods. At other times, the pump will be on at *Circulation pump operation time* between every *Circulation pump standstill time*.

8.14 Enabling the SUMMER function

To enable the SUMMER function, heating the WUH tank without the need of supplying the CH installation, set the *Summer mode* parameter to on.

Menu → Summer mode



In Summer mode, all heat receivers may be shut off, so before enabling it please make sure that the boiler does not overheat.

If the weather sensor is connected, switching between SUMMER and WINTER mode may occur automatically.

8.15 Mixer circuits settings

Settings for the first mixer circuit can be found in the menu:

Menu → Mixer 1 settings

Settings for other mixers can be accessed in next menu items and they are identical for each circuit.

Settings for mixer without weather sensor.

It is necessary to manually set the required water temperature in the heating mixer circuit using parameter *Preset mixer temp.*, e.g. at a value of 50°C. The value should allow to obtain the required room temperature.

After connecting room thermostat, it is necessary to set a value of decrease in preset mixer temperature by thermostat (parameters *Mixer room therm.*) e.g. at 5°C. This value should be selected by trial and error. The room thermostat can be a traditional thermostat (No-Nc), or room panel ecoSTER200/ecoSTER TOUCH. Upon activation of the thermostat, the preset mixer circuit temperature will be decreased, which, if proper decrease value is selected, will stop growth of temperature in the heated room.

Settings for mixer with weather sensor without room thermostat ecoSTER200/ecoSTER TOUCH.

Set parameter *Mixer weather control* to on. Select weather curve. Using parameter *Curve translation*, set preset room temperature following the formula:

Preset room temperature = 20°C + heating curve translation.

Example:

In this setup, it is possible to connect a room thermostat which will equalize the inaccuracy

of selecting heating curve, if the selected heating curve value is too high. In such case, it is necessary to set the value of preset mixer temperature decrease by thermostat, e.g. at 2°C. After opening of the thermostat contacts, the preset mixer circuit temperature will be decreased, which, if proper decrease value is selected, will stop growth of temperature in the heated room.

Settings for mixer with weather sensor and with room thermostat ecoSTER200/ecoSTER TOUCH.

Set parameter *Weather contr.mixer* to on.

Select weather curve. The ecoSTER200/ecoSTER TOUCH regulator automatically translates the heating curve, depending on the preset room temperature. The regulator relates the setting to 20°C, e.g. for preset room temperature = 22°C, the regulator will translate the heating curve by 2°C, for preset room temperature = 18°C, the regulator will translate the heating curve by -2°C. In some cases described in point. 8.16 it may be necessary to fine-tune the heating curve translation.

In this setup, the ecoSTER200/ecoSTER TOUCH room thermostat can:

- decrease the heating cycle temperature by a constant value when the preset room temperature is reached. Analogously, as specified in the previous point (not recommended), or
- automatically, continuously correct the heating cycle temperature.

It is not recommended to use both options at the same time.

Automatic correction of room temperature is carried out in accordance with the following formula:

Correction = (Preset room temperature - measured room temperature) x room temperature coefficient / 10

Example.

Preset temperature in the heated room (set at ecoSTER200) = 22°C. Temperature measured in the room (by ecoSTER200) = 20°C. *Room temp. factor* = 15.

Preset mixer temperature will be increased by (22°C - 20°C) x 15/10 = 3°C.

It is necessary to find appropriate value of the *Room temp. factor*. The higher the coefficient,

the greater the correction of preset boiler temperature. If the setting is "0", the preset mixer temperature is not corrected. Note: setting a value of the room temperature coefficient too high may cause cyclical fluctuations of the room temperature!.

8.16 Weather control

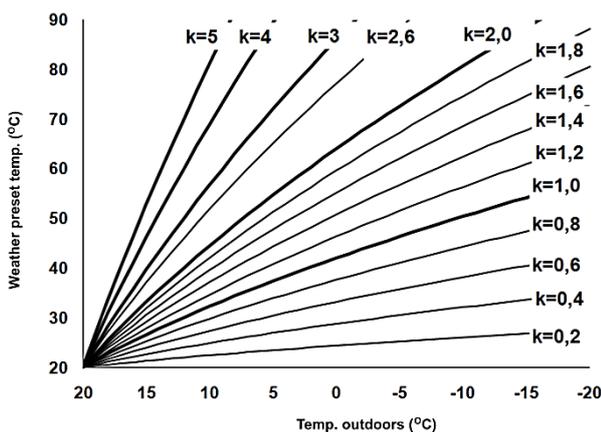
Depending on the temperature measured outside the building, both preset boiler temperature and temperatures of mixer circuits can be controlled automatically. If proper heating curve is selected, the temperature of the circuits is calculated automatically, depending on the outdoor temperature. Thus, if the selected heating curve is appropriate for the given building, the room temperature stays more or less the same, regardless of the temperature outside. Note: during trial and error selection of appropriate heating curve, it is necessary to exclude influence of the room thermostat on regulator operation (regardless of whether the room thermostat is connected or not), by setting the parameter:

Mixer 1 settings → **Room therm.** = *Off*

If a room panel ecoSTER200/ecoSTER TOUCH is connected, it is also necessary to set the parameter *Room temp. factor* to "0".

Guidelines for proper setting of the heating curve:

- floor heating 0,2 - 0,6
- radiator heating 1,0 - 1,6
- boiler 1,8 - 4



Guidelines for selection of appropriate heating curve:

- if the outdoor temperature drops, and the room temperature increases, the selected heating curve value is too high,

- if the outdoor temperature drops, and the room temperature drops as well, the selected heating curve value is too low,
- if during frosty weather the room temperature is proper, but when it gets warmer - it is too low, it is recommended to increase the *Curve translation* and to select a lower heating curve,
- if during frosty weather the room temperature is too low, and when it gets warmer - it is too high, it is recommended to decrease the *Curve translation* and to select a higher heating curve.

Buildings with poor thermal insulation require higher heating curves, whereas for buildings which have good thermal insulation, the heating curve can have lower value.

The regulator can increase or decrease the preset temperature, calculated in accordance with the heating curve, if it exceeds the temperature range for the given circuit.

8.17 Description of night time decrease settings

Boiler night time decreases

The boiler operates in selected time intervals. Outside of the selected intervals, the boiler is burned off.



Night time decreases for heating circuits, HUW container and circulation pump operation.

The intervals can be used to define time periods at which lower preset temperature may be set e.g. for a night time or when the user is not at home (e.g. he/she left for a work/school). This feature enables automatic reduction of preset temperature without compromising the heat comfort and reduces fuel consumption.

To activate time intervals, set the parameter: *Night time decrease* for the given heating circuit to ON.

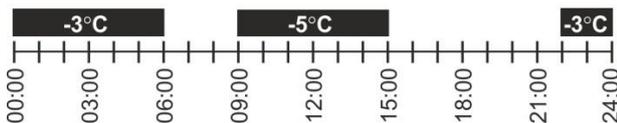
Night time decrease may be set for working days, Saturdays and Sundays.

The example of night time decrease of preset temperature from 22:00 to 06:00 next day and from 09:00 to 15:00 is given below.



Note! Setting of time intervals for 24 hours (one day) should start from 00:00!

00:00 - 06:00	-3 °C
09:00 - 15:00	-5 °C
22:00 - 23:59	-3 °C



In the given example, the regulator will set the decrease of preset temperature by 3°C from 00:00 to 06:00, and will keep the preset value (without the decrease) from 06:00 to 09:00. Then, it will set the decrease by 5°C from 09:00 to 15:00, and will keep the preset value (without the decrease) again from 15:00 to 22:00; and again will set the decrease by 3°C from 22:00 to 23:59.



Time interval is disregarded when its decrease is set to "0" even though "from... to ..." values have been entered.



Decrease of preset boiler temperature in selected time intervals is indicated by the symbol:

 on the main screen

8.18 Grate

The regulator is able to work with a Grate, where the fuel is loaded manually. The feeder is switched off, but the fan is operational. You can switch between Burner and Grate modes in:

Boiler settings → **Heat source**

Fan speeds are regulated in:

Boiler settings → **Output modulation**

Fan speed settings are different for the grate than for the burner. Other parameters are set in the service settings.



Changing modes between grate and burner can be done via the ecoNET internet module, but only after all the manually loaded fuel is burned off. In order to change modes, turn

the regulator off and on by clicking "Work mode" in the "Current information" tab.

8.19 Manual control

Regulator offers possibility to manual start of working equipment such as pump, feeder motor or fan. This feature enables checking whether the given equipment is fault-free and properly connected.



Note: Access to manual control menu is possible only when the boiler is OFF.



Note: Long-term operation of the fan, the feeder or other working equipment may lead to occurrence of hazardous conditions.

8.20 Fuel level setup

Activating the fuel level gauge.

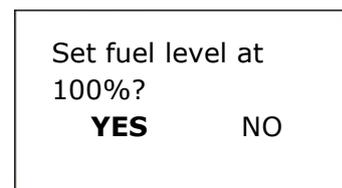
In order to enable display of the fuel level, set value of parameter:

Boiler settings → **Fuel level** → **Alarm level** to a value greater than zero, e.g. 10%

Tip: the fuel level can be viewed in the room panel ecoSTER200 and ecoSTER TOUCH.

Operation of fuel level indicator.

Each time when fuel silo is filled to required level it is necessary to press and keep the knob in main window. Following info will appear:



Once YES has been selected and confirmed, fuel level is set at 100%. Fuel may be replenished at any time without a need to wait for complete empty fuel tank. Replenish fuel always to the level corresponding to 100% and confirm achieved 100% level by keeping the knob pressed for a while!

Description of operation.

The regulator calculates the fuel level basing on the current fuel consumption. Default settings do not always correspond to the actual consumption of fuel by the given boiler, therefore, for proper operation this method requires the regulator user to perform level

calibration. No additional fuel level sensors are required.

Calibration.

To perform calibration - fill the fuel tank to the level corresponding to its full load and set the parameter:

Boiler settings → Fuel Level → Fuel level calibration → Fuel Level 100%

The indicator in the main window will be set to 100%. On-going calibration process is signalled by flashing fuel level gauge. The gauge will flash until the time of marking the point corresponding to minimal fuel level. One must systematically control the decreasing level of fuel in the bin. When the level reaches the requested minimum, set the value of the parameter:

Boiler settings → Fuel Level → Fuel level calibration → Fuel Level 0%

Calibration process can be skipped if done properly will set the parameters *Feeder efficiency* and *Tank capacity*, which can be found in:

Service Settings → Boiler settings.

8.21 Information

Information" menu allows to preview temperatures being measured and to recognize which equipment is currently ON.



Upon connection of mixers' extension module, information windows of additional mixers are displayed.

8.22 Cooperation with the room panel

The regulator can work together with ecoSTER200 and ecoSTER TOUCH remote control device, which have a built-in room thermostat. This room panel shows useful information such as: fuel level, alarm indication etc.

8.23 Cooperation with the internet module

The regulator can work with the internet module ecoNET300 that control regulator on-line via WiFi or LAN, using the Web service **www.econet24.com** and convenient application for mobile devices **ecoNET.apk**. The application ecoNET.apk can be downloaded free of charge from:



ecoMAX 860P

9. Hydraulic schemes



The presented hydraulic schemes does not replace central heating engineering design and may be used for information purposes only!

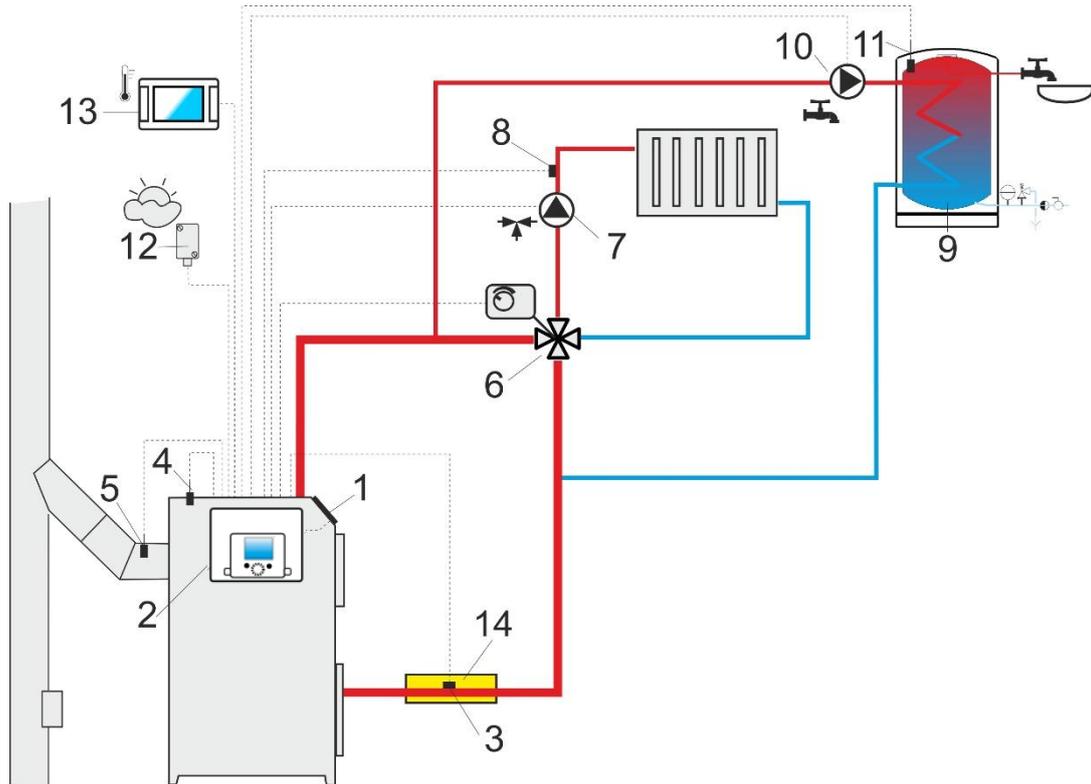


Diagram with 4-way control valve for central heating circuit, where: 1 – boiler, 2 – controller, 3 – water temperature sensor returning to the boiler CT4, 4 – boiler temperature sensor CT4, 5 – exhaust temperature sensor CT2S (temperature monitoring only), 6 – 4-way valve servo, 7 – mixer circuit pump, 8 – mixer circuit temperature sensor CT4, 9 – HUW container, 10 – HUW pump, 11 – HUW sensor CT4, 12 – outdoor temperature (weather) sensor CT6-P, 13 – ecoSTER TOUCH room control panel or standard room thermostat, 14 – thermal isolation.



In order for the valve (6) to be able to effectively increase the return water temperature, set a high set temperature of the boiler. In order to improve the water circulation in natural systems (highlighted circuit in the figure): use large nominal diameter pipes and four-way valve, avoid unnecessary angles and reductions, maintain a min. 2° horizontal pipe slope, etc. If the sensor (3) is attached to the pipe, isolate it with foam surrounding the pipe and sensor.

RECOMMENDED SETTINGS:

Parameter	Setting	MENU
Preset boiler temperature	75-80°C	menu→Boiler settings
Min. preset boiler temperature	65°C	menu→Service settings→ Boiler settings
Increasing of preset boiler temp.	5-20°C	menu→Service settings→ CH and HUW settings
Mixer 1 support	CH ON	menu→Service settings→Mixer 1 settings
Mixer 1 preset temperature	70°C	menu→Service settings→Mixer 1 settings
Mixer 1 heating curve	0.8 – 1.4	menu→Mixer 1 settings
Mixer 1 weather control	ON	menu→Mixer 1 settings
Mixer 1 thermostat selection	ecoSTER T1	menu→Service settings→Mixer 1 settings

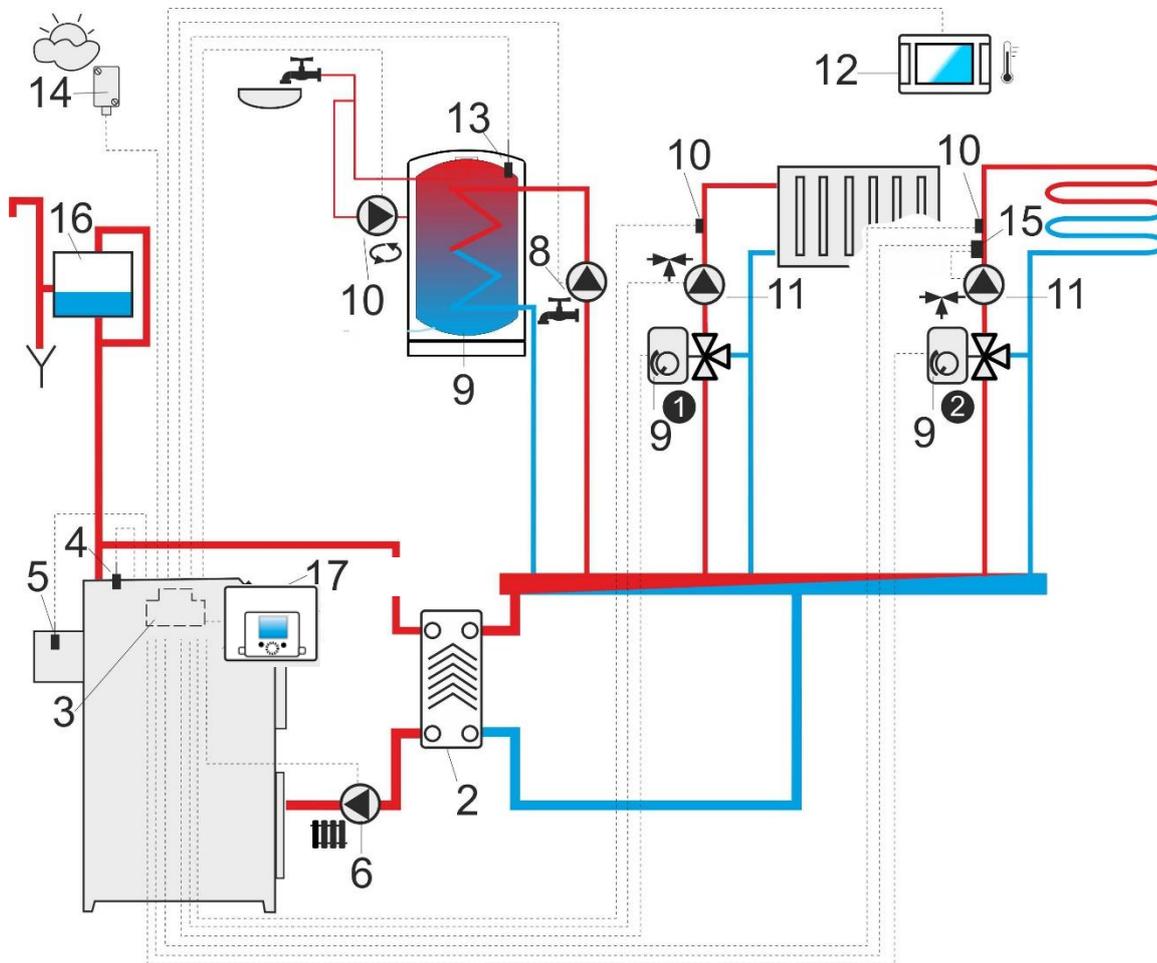


Diagram with two adjustable heating circuits and the HUW container, where: 1 - boiler, 2 - heat exchanger, 3 - controller, 4 - boiler temperature sensor CT4, 5 - exhaust temperature sensor CT2S (temperature monitoring only), 6 - boiler pump, 8 - HUW pump, 9 - HUW container, 10 - HUW temperature sensor CT4, 11 - mixer pump, 12 - ecoSTER TOUCH room control panel with room thermostat feature, 13 - HUW container temperature sensor CT4, 14 - out-door temperature (weather) sensor CT6-P, 15 - safety thermostat off the underfloor heating pump, 16 - expansion tank.

RECOMMENDED SETTINGS:

Parameter	Setting	MENU
CH pump activation temperature	55°C	menu→Service settings→CH and HUW settings
CH pump = boiler pump	YES	menu→Service settings→CH and HUW settings
Mixer 1 support	CH activated	menu→Service settings→Mixer 1 control
Max. preset temp. of mixer 1	70°C	menu→Service settings→Mixer 1 settings
Mixer 1 heating curve	0.8 - 1.4	menu→Mixer 1 settings
Mixer 1 weather control	activated	menu→Mixer 1 settings
Mixer 1 thermostat selection*	ecoSTER T1	menu→Service settings→Mixer 1 settings
Mixer 2 support	Activate floor	menu→Service settings→Mixer 2 settings
Max. preset temp. of mixer 2	45°C	menu→Service settings→Mixer 2 settings
Mixer 2 heating curve	0.3 - 0.8	menu→Mixer 2 settings
Mixer 2 weather control	activated	menu→Mixer 2 settings
Mixer 2 thermostat selection*	ecoSTER T1	menu→Service settings→Mixer 2 settings

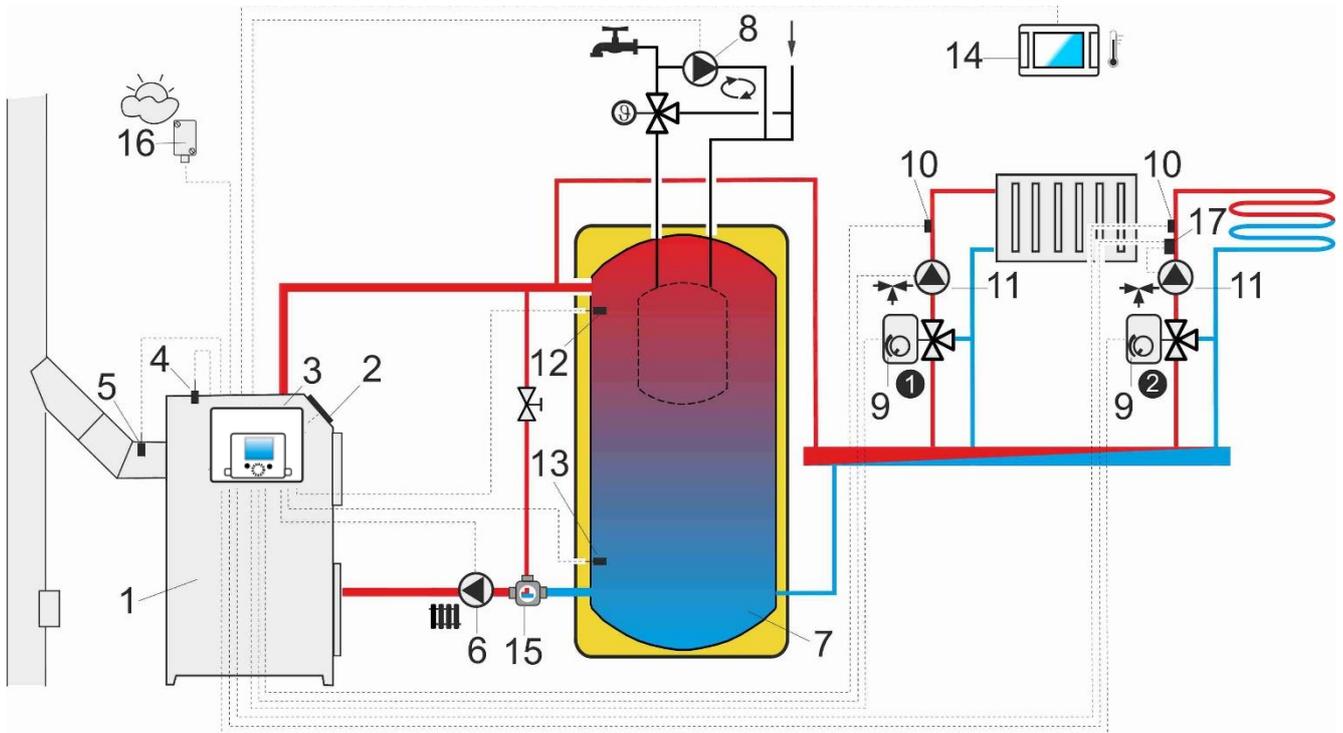


Diagram with heat buffer, where: 1 – boiler, 2 – burner, 3 – controller, 4 – boiler temperature sensor CT4, 5 – exhaust temperature sensor CT2S, 6 – boiler pump, 7 – heat buffer, 8 – HUW pump, 9 – mixing valve actuator, 10 – mixer temperature sensor CT4, 11 – mixer pump, 12 – upper sensor of buffer temperature CT4, 13 – lower sensor of buffer temperature CT4, 14 – ecoSTER TOUCH room control panel, 15 – thermostatic three-way valve to the return protection, 16 – out-door temperature (weather) sensor CT6-P, 17 – thermostat to turn off the pump.

RECOMMENDED SETTINGS:

Parameter	Setting	MENU
Boiler preset temperature	80°C	menu→Boiler settings
Min. boiler preset temperature	75°C	menu→Service settings→Boiler settings
CH pump activation temperature	55°C	menu→Service settings→CH and HUW settings
Buffer support	activated	menu→Service settings→Buffer settings
Loading start temperature	50°C	menu→Service settings→Buffer settings
Loading stop temperature	75°C	menu→Service settings→Buffer settings
Mixer 1 support	CH activated	menu→Service settings→Mixer 1 settings
Max. preset temp. of mixer 1	70°C	menu→Service settings→Mixer 1 settings
Mixer 1 heating curve	0.8 – 1.4	menu→Mixer 1 settings
Mixer 1 weather control	activated	menu→Mixer 1 settings
Mixer 1 thermostat selection*	ecoSTER T1	menu→Service settings→Mixer 1 settings
Mixer 2 support	Activate floor	menu→Service settings→Mixer 2 settings
Max. preset temp. of mixer 2	45°C	menu→Service settings→Mixer 2 settings
Mixer 2 heating curve	0.3 – 0.8	menu→Mixer 2 settings
Mixer 2 weather control	activated	menu→Mixer 2 settings
Mixer 2 thermostat selection*	ecoSTER T1	menu→Service settings→Mixer 2 settings

* When using a standard room thermostat with ON/OFF terminals instead of the ecoSTER TOUCH (14), select the *Universal* option, or when the setting is hidden, do not choose anything.

10. Technical data

Power supply	230V~, 50Hz
Current consumption by the regulator	0,2 A
Max. rated current	6 (6) A
IP rating of the regulator	IP20
Ambient temperature	T50
Ambient temperature	0...50 °C
Storage temperature	0...65°C
Relative humidity	5 - 85% without steam condensation
Temperature measurement range of sensors CT4	0...100 °C
Temperature measurement range of sensors CT6-P	-35...40 °C
Accuracy of temperature measurement using sensors CT4 and CT6-P	2°C
Connectors	Screw terminals at supply voltage side - 2.5mm ² Screw terminals at control voltage side - 1.5mm ²
Graphical display	Graphical 128x64
Overall dimensions	340x225x60mm
Total weight	1,6 kg
Standards	PN-EN 60730-2-9 PN-EN 60730-1
Software class	A
Pollution degree	2nd pollution degree

11. Storage and transport conditions

The controller cannot be exposed to immediate effects of atmospheric conditions i.e. rain or sunrays. Temperature of storage and transport should be within scope -15...+65°C.

During transport the controller cannot be exposed to vibrations bigger than typical for transport of boilers as well as direct pressure upon the clamp cover in order to protect the STB capillary, which is situated inside the clamp box for the controller version equipped with STB device.

12. REGULATOR INSTALLATION

12.1 Environmental conditions

Due to fire risk it is forbidden to use the controller in proximity of explosive gases or dust. Moreover the controller cannot be used

in conditions of water steam condensation or be exposed to effects of water.

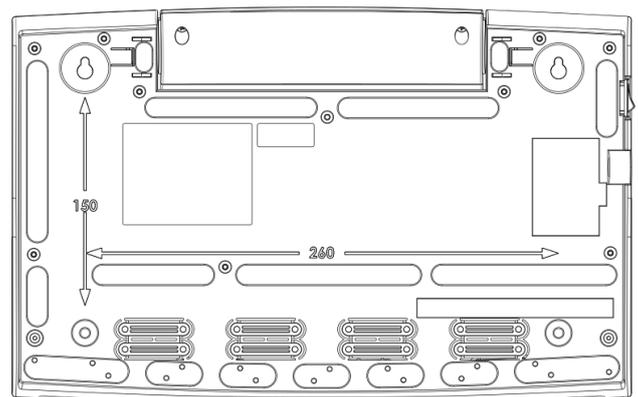
12.2 Mounting requirements

Regulator should be installed by qualified and authorized technician with observance of applicable standards and regulations. The manufacturer disclaims any liability for damage caused by non-observance of instructions specified in this manual. The regulator is intended to build into other equipment, and may not be used as a stand-alone device.

Ambient temperature and temperature of mounting base should be within the range of 0...+50°C. The regulator is composed of two modules: a control panel and an operating unit, connected with electric wire.

12.3 Module installation

The regulator casing does not provide dust and water immunity. In order to provide the protection from these factors the regulator should be enclosed with a proper casing. The regulator is to be enclosed – which means the regulator should be screwed on to the flat horizontal or vertical surface (e.g. boiler housing, room wall). To screw on the regulator use mounting holes and proper screws. Location and spacing of mounting holes are shown in the picture below. The regulator must not be used as a free-standing device.



After installation make sure that the device is properly mounted and it is impossible to detach it from the mounting surface.

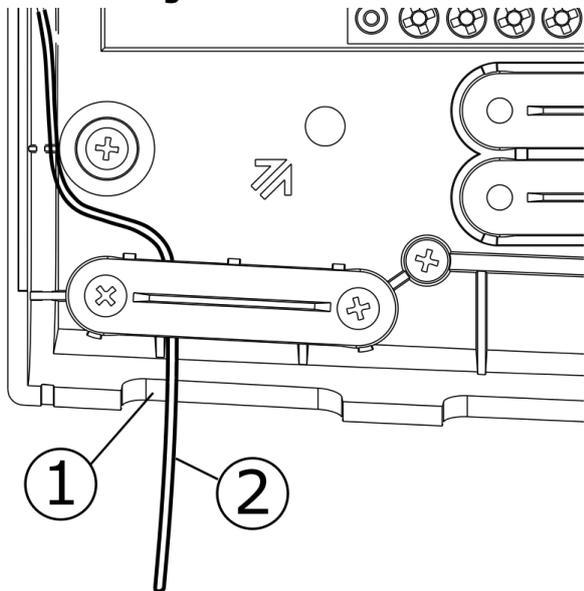


Opening of the boiler door or flue leakiness cannot expose the regulator directly to hot gases and fire from the fireplace.

In case of using the version with STB device before making the montage and wiring it is strongly recommended to take out the STB capillary from inside the clamp box using cable opening as described on the picture below.



Attention! This capillary cannot be smashed or bend with acute angle.



1- Cable opening 2 - The STB capillary cable, which was being correctly taken out from the clamp box.

12.4 IP protection rate

The regulator casing provides the IP20 protection rating. The casing on the connectors cover side provides IP00 rating, and because of that connectors must be unconditionally covered with the cover.

If there is a need to gain an access to the terminals side, it is a must to disconnect the mains voltage and make sure there is no dangerous voltage on regulator terminals.

12.5 Electric connection

The regulator is designed to be fed with 230V~, 50Hz voltage. The electrical system should be:

- three core (with protective wire PE),
- in accordance with applicable regulations.



Caution: After the regulator is turned off using the keyboard, dangerous voltage can occur on the terminals. Before starting any assembly works, you must

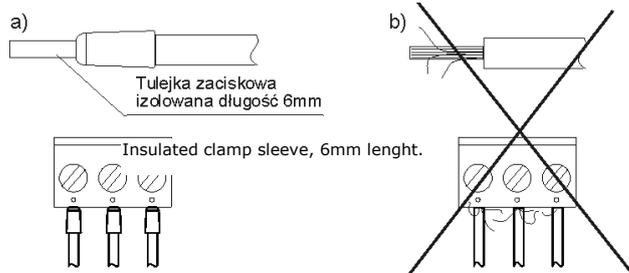
disconnect the mains supply and make sure that there is no dangerous voltage on the terminals and the leads.

Connection cables should not have contact with surfaces which temperature exceeds cables nominal operating temperature. Terminals 1-22 are designed to connect devices supplied by the mains 230V~ voltage. Terminals 25-48 are designed to work with low-voltage devices (<12V).



Connection of the 230V~ mains voltage to terminals 25-48 or to transmission terminals G2, G3, B and USB results in the regulator damage and poses a threat of electrocution.

Tips of connection cables, especially mains voltage cables should be secured from splitting by e. g. insulated clamp sleeves in accordance with the picture below: a - properly secured, b - improperly secured.



Unconditionally check if any lead of the insulated cable, or the cable itself DO NOT have electrical connection with the metal grounding strip (which is placed near to high voltage terminals of the regulator).



The feeder cable should be connected to the terminals marked with an arrow.

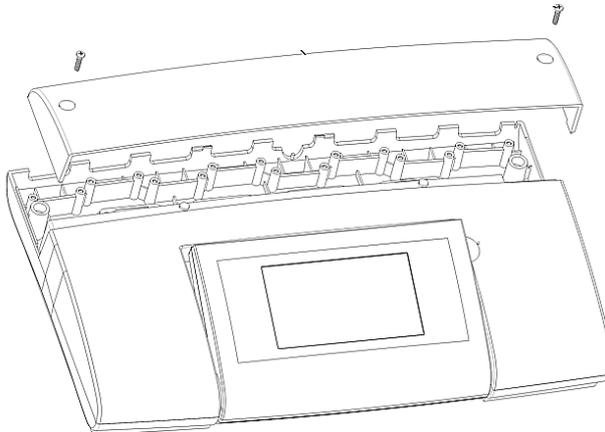
All peripherals (such like: pumps, RE-marked relays and connected recipients) may be connected only by qualified person in accordance with applicable regulations. Safety precautions to prevent electrocution shall be observed.

Regulator shall be equipped with a set of pins connected to 230V AC mains.

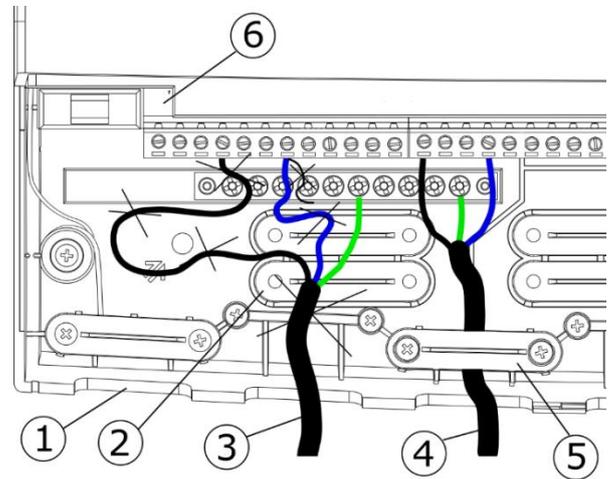
Protection lead of the power supply cable and protection leads of connected devices should be connected to the grounding strip placed

inside the casing of the regulator marked with .

Before making any connections remove the cover from the casing of the regulator as shown below.



- cables secured from splitting should be connected to screw terminals of the (6) connector.
- cables should be put through cable outlets in the casing (1) and secured from ripping or loosening by a holdfast (5 – break it out from the casing).
- cables insulation should be stripped by the minimum possible, max. 60mm. If there is a necessity to strip cable insulation more than 60mm, cable leads should be fasten together or with other leads near the connector – in order to prevent contact with unsafe parts in the case of falling out the lead from the connector.
- it is not allowed to coil excess of the cable and to leave not connected leads inside the casing of the regulator.



1 – cable outlets, 2 – holdfasts placing (should be broken out for the casing), 3 – improper cable connection (it is not allowed to coil excess of the cable inside the device and to leave cables with stripped insulation), 4 – proper cable connection, 5 – holdfast of the cable, 6 – connector.

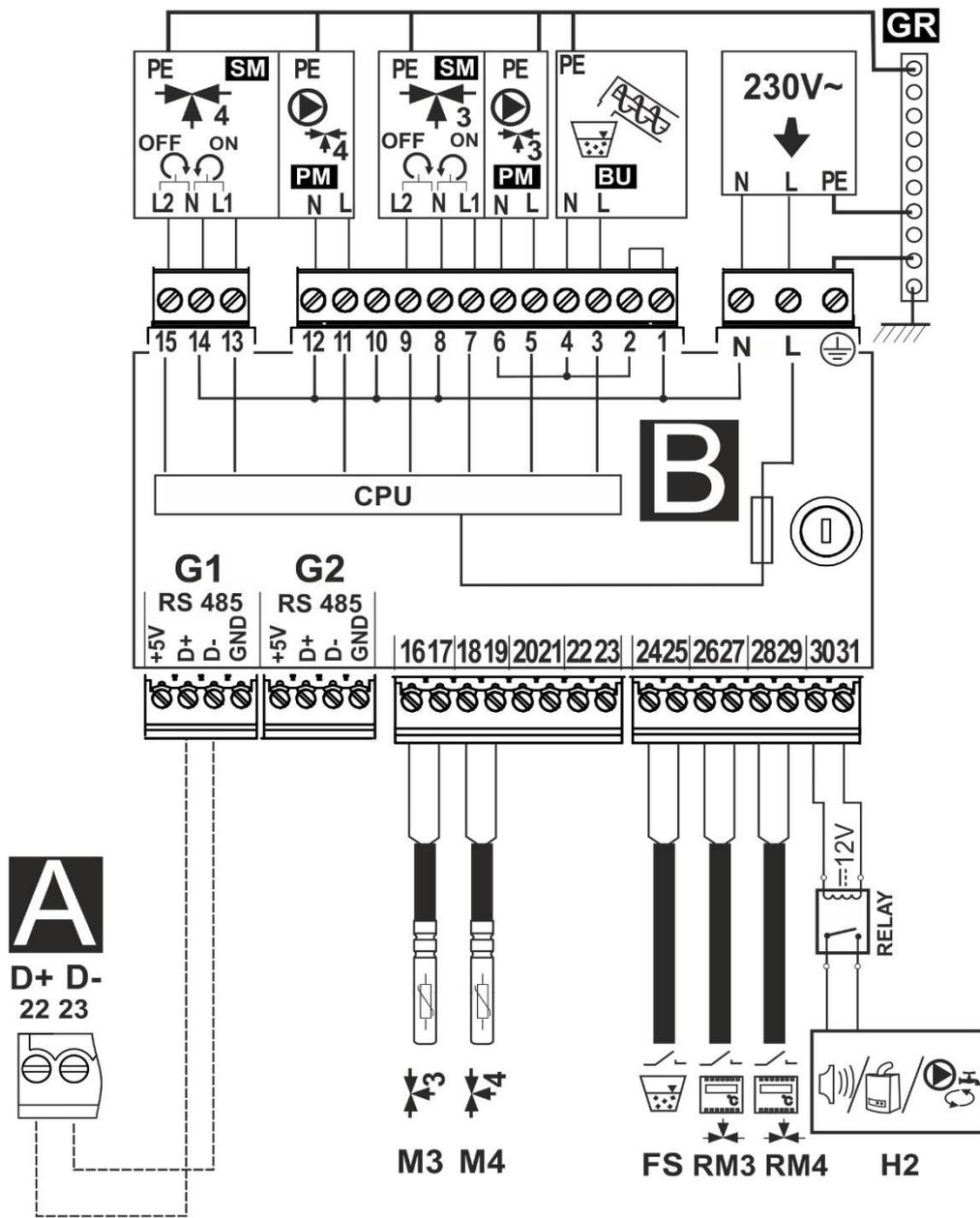


Electrical cables should be isolated from hot parts of the boiler, especially from flues.

- When the cables connection is done the cover of the connectors has to be put in place.



The connectors cover should be always screwed on to the casing of the regulator. Apart from providing safety for the user, the connectors cover also protects the interior of the regulator from hazardous environmental conditions providing a proper level of the IP protection.



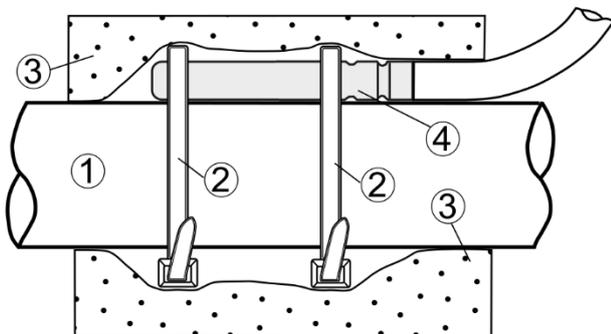
Electric scheme – additional module B: **M3** - regulated circuit (mixer 3) temperature sensor type CT4, **M4** - regulated circuit (mixer 4) temperature sensor type CT4, **FS** - fuel level sensor used with the BU feeder, **RM3** - mixer 3 room thermostat, **RM4** - mixer 4 room thermostat, **H2** - voltage output for controlling the reserve boiler, or alarm signalling, or HUW circulation pump, **RELAY** - relay.
L N PE - power supply 230V~, **PM3/PM4** - mixer 3/4 pump, **SM3/SM4** - mixer 3/4 servo, **BU** - fuel feeder from bunker to the container in the boiler, **CPU** - controlling, **A** - module A regulator.

12.6 Temperature sensors connection

The regulator is compatible only with CT4 and CT2S sensors. The use of other sensors is prohibited!

Wires of sensors can be extended by wires with diameter no smaller than 0,5mm². Total length of wires in each sensor should not exceed 15m.

The boiler temperature sensor should be installed in a thermostatic pipe installed in the boiler. Temperature sensor of hot water silo should be installed in a thermostatic pipe welded into the silo. The mixer temperature sensor should be installed in a sleeve located in stream of running water in pipe, but also it can be installed on the pipe, on condition that it is thermally isolated from the pipe.



Mounting temperature sensor: 1 - pipe, 2 - clamps, 3 - thermal insulation, 4 - temperature sensor.



Sensor must be protected from getting loose from the surfaces to which they are connected.

Good thermal contact should be maintained between sensors and the measured surface. To this purpose thermal grease should be used. It is not acceptable to lubricate sensors with water or oil. Wires of sensors should be separated from network electrical wires. In such a case wrong readings of temperature may be shown. Minimum length between those wires should be 10 cm. It is not acceptable to allow for contact between wires of sensors and hot parts of the boiler and the heating installation. Wires of sensors are resistant to temperature not exceeding 100°C.

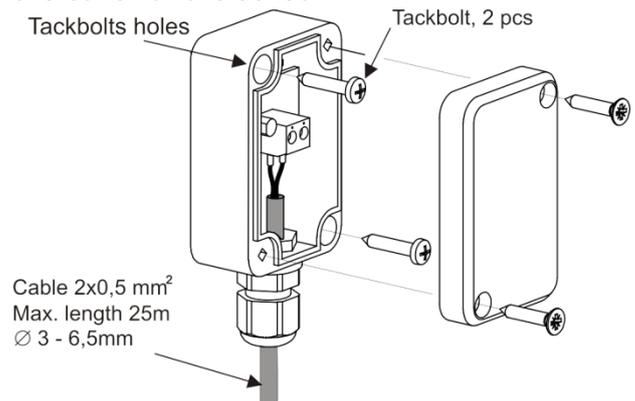
12.7 Weather sensors connection

The regulator cooperates solely with the weather sensor type CT6-P. The sensor should be installed on the coolest wall of the building. Usually it is the northern wall, under the roof.

The sensor should not be exposed to direct sunrays and rain. The sensor should be installed at least 2 m above the ground, far away from windows, chimneys and other sources of heat.

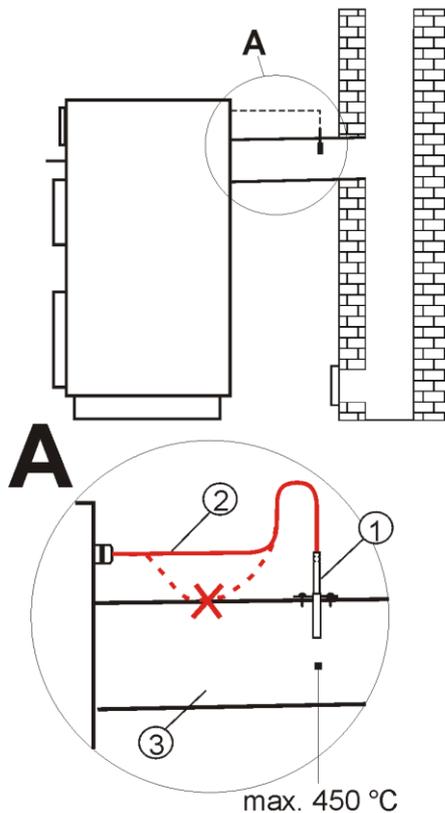
To make the connection use wire with diameter at least 0,5mm² up to 25m long. Polarization of wires is not essential. Second end should be connected to terminals of the regulator or properly to the used kind of regulator.

The sensor should be screw to the wall. Access to assembly holes is possible after unscrewing the cover of the sensor.



12.8 Connecting exhaust sensor

The exhaust sensor should be fitted in the boiler flue. The gap between the sensor and the flue should be sealed. The sensor should be installed by a qualified fitter, while observing regulations applicable for chimney systems. The emission sensor should be connected to the sensor terminals acc. to The emission sensor lead cannot touch hot elements of the boiler and the flue, the temperature of which exceeds 350°C. The emission sensor should be installed in such distance from the boiler at which it is not directly exposed to flames, and where the emission temperature does not exceed 450°C.



Connecting emission sensor: 1 – exhaust temp. sensor type CT2S, 2 – sensor lead, 3 – flue.



Caution: Opening the boiler door can cause the emission temperature to exceed the sensor's thermal resistance, which can burn the sensor out.

12.9 Checking temperature sensors

Temperature sensors CT4/CT6-P/CT2S can be checked by measuring their resistance at the given temperature. In the case of finding significant differences between the value of measured resistance and the values presented in the table below, the sensor must be changed.

CT4 (KTY81)			
Temp. °C	Min. Ω	Nom. Ω	Max. Ω
0	802	815	828
10	874	886	898
20	950	961	972
25	990	1000	1010
30	1029	1040	1051
40	1108	1122	1136
50	1192	1209	1225
60	1278	1299	1319
70	1369	1392	1416
80	1462	1490	1518
90	1559	1591	1623
100	1659	1696	1733

CT6-P (PT1000) – weather			
Temp. °C	Min. Ω	Nom. Ω	Max. Ω
-25	901,6	901,9	1000,2
-20	921,3	921,6	921,9
-10	960,6	960,9	961,2
0	999,7	1000,0	1000,3
25	1096,9	1097,3	1097,7
50	1193,4	1194,0	1194,6
100	1384,2	1385,0	1385,8
125	1478,5	1479,4	1480,3
150	1572,0	1573,1	1574,2

CT2S (PT1000) - exhaust			
Temp. °C	Min. Ω	Nom. Ω	Max. Ω
0	999,7	1000,0	1000,3
25	1096,9	1097,3	1097,7
50	1193,4	1194,0	1194,6
100	1384,2	1385,0	1385,8
125	1478,5	1479,4	1480,3
150	1572,0	1573,1	1574,2

12.10 Connection of boiler room thermostat



Note: the boiler room thermostat should be switched off if the whole central heating system of the building is supplied through a mixing valve equipped with electric servo.

The regulator may work with mechanical or electronic room thermostat, which opens the contacts once the preset temperature has been achieved.

Set-up the operation of room thermostat in:

Boiler settings → **Room thermostat** → **Thermostat selection** → **Universal**

Once the preset room temperature has been reached, thermostat opens its contacts and the display shows:



Once the temperature in the room, in which the room thermostat is installed, has reached the preset value, regulator reduces the preset boiler temperature by the value set in *Inc. p. b. temp. thermostat* and the display shows ↓ . This will cause longer breaks in boiler operation (the boiler will remain in SUPERVISION mode) and the same, temperature in heated rooms will drop.

Moreover, the boiler pump (CH pump) may be interlocked for a certain time by opening the

contacts of the room thermostat in heated rooms. To activate this function - enter:

Boiler settings → **Room thermostat** → **CH pump standstill**

and set the value of this parameter >0. Setting the value of e.g. „5” causes the pump will be stopped by the room thermostat for 5 min. When „0” is set, the CH pump will not be stopped by the room thermostat. Once this time has elapsed, the regulator switches on CH pump for a time set in *CH pump op t. th. on* e.g. 30s. This feature prevents from excessive cooling of the system caused by a pump stop.



The pump interlock by opening the contacts of the room thermostat may be activated only upon making sure the boiler will not be overheated.

12.11 Connection of mixer's room thermostat

Room thermostat connected to the operational unit affects mixer 1 circuit and/or boiler circuit. If the whole heating circuit of the building is supplied by a mixer with electric servo, room thermostat for boiler should be turned off.

Room thermostat, after disconnection of its connectors reduces preset temperature of the mixer circuit by a value set up in: *Reduce preset mixer temp. to thermostat*. This parameter is available in:

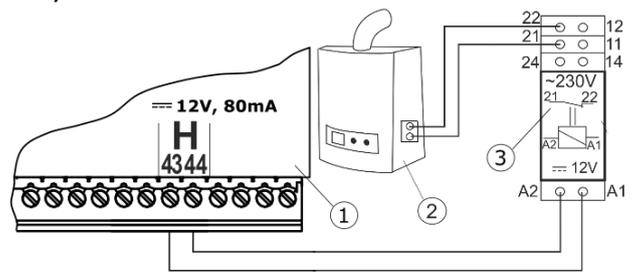
Mixer 1-5 settings → **Room thermostat**

The mixer pump does not stop upon opening contacts of the room thermostat unless other settings have been made in the Service Menu. Select the value of this parameter so that once the room thermostat has responded (its contacts have opened), the temperature in the room drops.

12.12 Connection of reserve boiler

The regulator can control a reserve boiler (gas- or oil-), eliminating the necessity of enabling or disabling this boiler manually. The reserve boiler will be enabled if the temperature of the pellet boiler drops, and disabled when the pellet boiler reaches an appropriate temperature. Connection to a reserve boiler, e.g. oil-boiler one, should only be made by a qualified fitter, in accordance with the technical documentation of this boiler.

The reserve boiler should be connected via relay to terminals 43-44.



Model diagram of layout for connecting a reserve boiler to the regulator, where: 1- regulator, 2 - reserve boiler (gas- or oil-), 3 - module U3, consisting of relay RM 84-2012-35-1012 and base GZT80 RELPOL.

In a standard version, the regulator is not equipped with the U3 module.



It should to perform assembly and installation of the module by yourself, in conformity with the applicable standards.

Set the temperatures of reserve boiler switch on/off:

Service settings → **Boiler settings** → **Reserve boiler** → **Reserve boiler-deactivation temp.**

Control of reserve boiler is off upon setting this parameter at „0”.

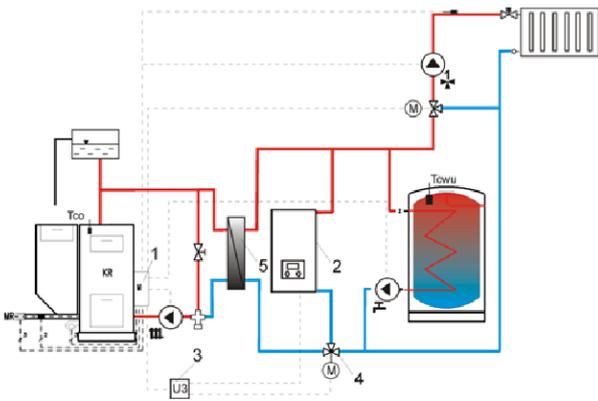
Then should set the support for output H for reserve boiler:

Service settings → **H output = Reserve boiler**

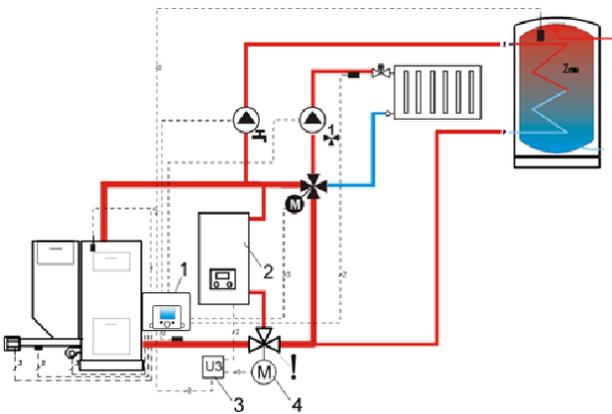
Once the boiler has been fired up, and its temperature has exceeded the preset value (e.g. 25°C), regulator switches off the reserve boiler and applies voltage 12V DC at output H, which causes release of coil of U3 module relay and opening its contacts. Once the boiler temperature has dropped below the value set in the parameter of *Reserve boiler deactivation temperature*, the regulator stops to supply voltage to the output H, and the reserve boiler switches on.



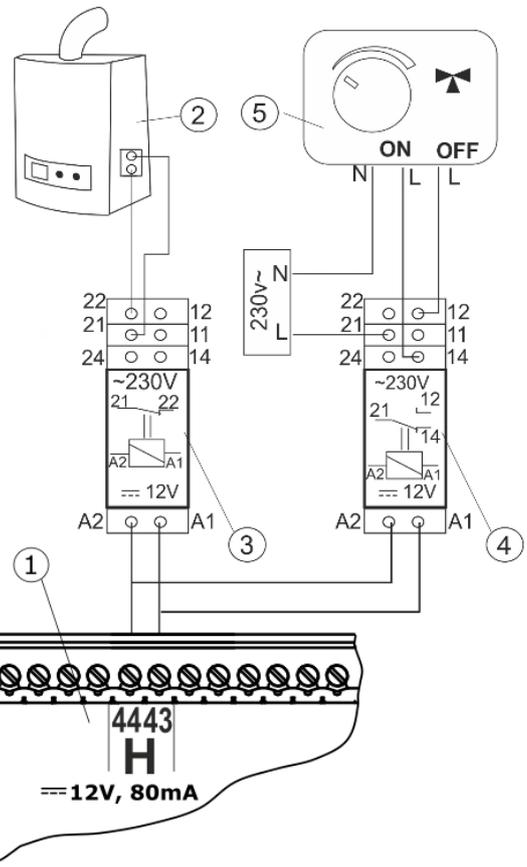
Entry of the regulator to “Boiler switch off” conditions causes the reserve boiler switches on.



Hydraulic diagram with the reserve boiler, connection of open and close circuits 1 – regulator, 2 – reserve boiler, 3 – U3 module (2 pcs), 4 – switching valve (with limit switches), 5 – heat exchanger (recommended settings: *HUW mode = No priority, Heat exchanger = ON.*)



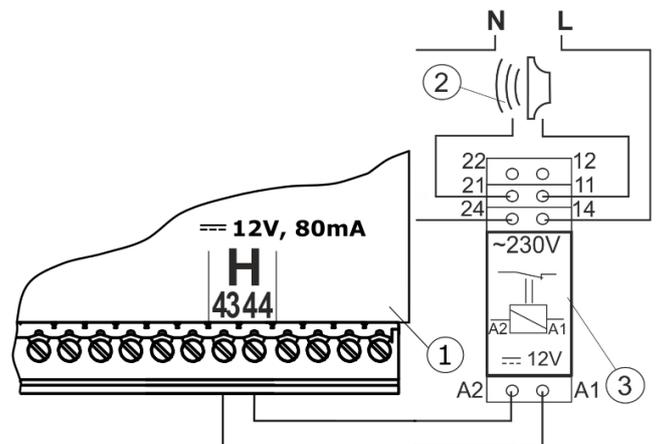
Hydraulic diagram with the reserve boiler and the 4-way valve in close circuit 1 – regulator, 2 – reserve boiler, 3 – U3 module, 2 pcs., 4 – switching valve servo (with limit switches) - to ensure free gravitational flow of water in the boiler circuit, active cross-section of switching valve (4) has to be larger than or equal to cross-section of boiler circuit pipes. Use pipes of large cross section for gravitational boiler circuit.



Electric diagram for switching valve of the reserve boiler, where: 1 – regulator, 2 – reserve boiler, 3,4 – relay RM 84-2012-35-1012 RELPOL and base GZT80 RELPOL, 5 – servo of switching valve.

12.13 Connection of alarm signaling

The regulator may announce an alarm condition by activating external device (e.g. bell or GSM device to send SMS). Alarm signaling and reserve boiler control use the same terminals, therefore, setting of the H output for alarm signaling deactivates the function of reserve boiler control. Connect alarm annunciator through U3 module.



Connection of an external alarm annunciator 1 - regulator - module A, 2 - external alarm annunciator, 3 - relay RM 84-2012-35-1012 RELPOL and base GZT80 RELPOL.

12.14 Connection of mixer servo



When connecting electric servo of the mixer take care to prevent boiler overheating, which may occur when the flow of boiler water is limited. You are advised to get familiar with the position of the valve corresponding to its maximum opening before commencement of the work so that you may ensure heat collection from the boiler at any time it is required.

The regulator works only with mixing valve servos equipped with limit switches. Use of other servos is not allowed. The servos of full turn time from 80 to 255 s may be used.

Description of mixer servo connection:

- connect mixer temperature sensor,
- switch on the regulator and select proper *Mixer support* in service menu:

Service settings → **Mixer settings** → **Mixer support**, e.g. *CH ON*.

- enter proper *Valve opening time* in Service settings (this time should be indicated on servo rating plate e.g. 120s),
- disconnect power supply of the regulator,
- determine direction of servo closing/opening. For this purpose, set the selector located on the housing of electric servo at manual control and find the positions of the valve in which the temperature in mixer circuit is maximum and minimum (it corresponds to the setting of the regulator of "100% ON" and "0% OFF", respectively). Write down these positions.
- connect mixer pump,
- wire mixer servo with the regulator,
- connect power supply to the regulator,
- check whether wires to mixer closing and opening are not interchanged. To do this, enter menu: **Manual Control** and open the mixer by selection of *Mix1 open = ON*. When opening, temperature on mixer sensor should increase. In other case, disconnect power supply to the regulator and interchange the wires (Note: other reason of this fault may be incorrect mechanical connection of the valve!
- refer to the documentation of valve manufacturer and check whether the valve is properly connected),
- calibrate % factor of mixer valve opening.

To do this, disconnect power supply of the regulator and set the selector on housing of electric servo at manual control. Turn the valve head to fully closed position, and set the selector on the housing of electric servo at AUTO again. Connect power supply to the regulator. Now, % factor of mixer valve opening has been calibrated. Note: Calibration in mixers no. 2,3,4,5 starts automatically upon connection of power supply. In case of these mixers - wait until a % factor of the mixer valve opening has been calibrated. During the calibration, servo is closed for the time set in *Valve opening time*. Running calibration is indicated by "CAL" in the menu: **Information**, tab "Mixer-Info",
- set other parameters of the mixer.

12.15 STB temperature limiter

Version with temperature limiter

When temperature of water in the boiler exceeds 95°C, power supply of the electric feeder and the fan is cut off by the safety temperature limiter. To reset the limiter it is needed to press the button placed in the side of the casing, near the power switch. Pressing of that button is only possible when temperature of water in the boiler drops.

Version without temperature limiter

If the regulator is not factory-equipped with the safety temperature limiter, the STB should be connected as an external device. The STB temperature limiter should be connected to the 1-2 terminals shown on the electric scheme. If the safety temperature of water in the boiler exceeds, the power supply of the fan and the engine of feeder will be cut off by the temperature limiter.



Safety temperature limiter should have nominal operation voltage of ~230V and should follow current regulations.



Warning: 1-2 terminals are under dangerous voltage.

12.16 DS input

There is a possibility of connecting the sensor that detects a door or fuel tank flap opening. Opening of the DS contact results in

disconnection of the fan and the feeder power supply. DS connector is under safe voltage.

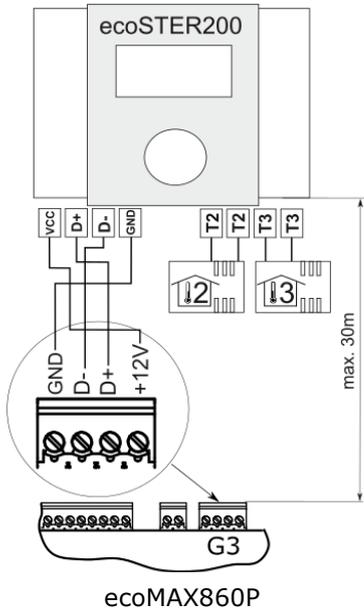
12.17 Connection of room control panel

The ecoSTER200/ecoSTER TOUCH room control panel may be installed. Main functions of the panel are following:

- room thermostat (3 thermostat units),
- boiler control,
- alarm annunciator,
- fuel level indication.

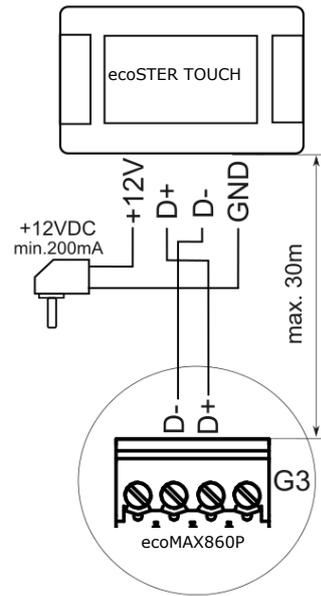
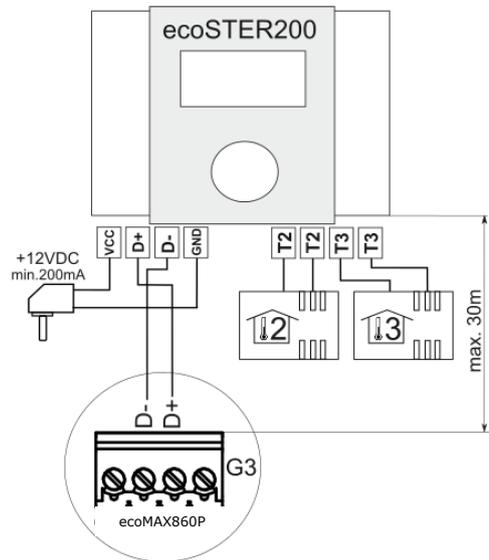
4-wire connection:

- The room panel ecoSTER TOUCH should be connected to the G3 connector of the regulator, according to the electric scheme.
- The version 2 of the room panel ecoSTER200 should be connected as shown in the picture below, together with room sensors CT7 of a thermostat 2,3.



2-wire connection:

For two-wire connection, power supply of 12V DC and rated current of min. 200mA is required. Disconnect GND and +12V wires from the module (2) and re-connect them to external power supply unit arranged near ecoSTER200 or ecoSTER TOUCH. The power supply unit is not included in the regulator supply. The max. length of wires to the ecoSTER200 or ecoSTER TOUCH control panel depends on cross-section area of a wire, and e.g. for a wire of cross-section of 0.5 mm² it should not exceed 30m. The cross-section area of the wire should not be less than 0.5 mm².

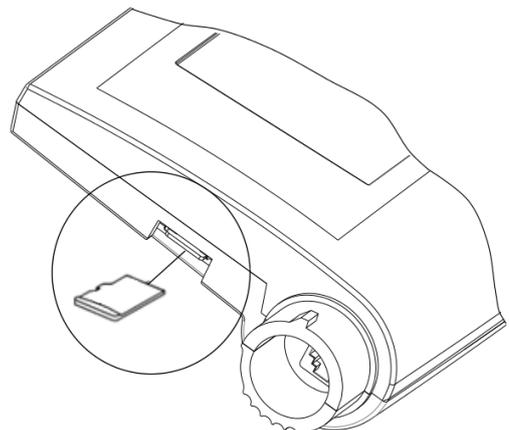


12.18 Software update

Simultaneous update of the regulator and panel software can be done using memory card only type **microSDHC**.



Software update can be performed only by a qualified person. Precautions to prevent electrocution should be observed!.



To update the software:

- disconnect power supply of the regulator.
- insert **microSDHC** memory card (other types of memory cards are not supported) to a socket in the movable casing of the panel shown above. On the memory card there should be written new software in the ***.pfc** format as a 2 files: a file with the panel software and a file with the module A software.
- Software files should be placed directly on the memory card, do not place them in any subdirectory,
- then connect power supply of the regulator and go to:

General settings → **Software update** and perform the update firstly in the A module, then in the panel, and in the end in other devices.

13. SERVICE MENU

Service settings
Burner settings
Boiler settings
CH and HUW settings
Buffer settings*
Mixer 1-5 settings*
H output
Show advanced setup
Restore default settings
Touch screen calibration

Burner settings
Firing up
<ul style="list-style-type: none"> Ignition test time Feed time Ignition end exhaust temperature Exhaust delta Ignition fan Ignition time Fan time extension Heating-up time
Operation
<ul style="list-style-type: none"> OPERATION mode cycle time Feeder efficiency Fuel caloric value Container capacity Feeder: <ul style="list-style-type: none"> Efficiency test time Feeder efficiency test Fuel weight
Burning off
<ul style="list-style-type: none"> Purge speed Burning off time
Supervision
<ul style="list-style-type: none"> Supervision time Fan speed Feed time Interval time Fan time extension
Min. fan speed
Lack of fuel detection time
Exhaust temperature when no fuel
Exhaust temperature increase time
Max. feeder temperature

Boiler settings
Grate
<ul style="list-style-type: none"> Max. ignition time Purge operation - supervision Purge interval - supervision Lack of fuel detection time Lack of fuel detection method [exhaust only/water and exhaust] Exhaust temperature - fan reduction
Return protection
<ul style="list-style-type: none"> 4-way return protection Return hysteresis

<ul style="list-style-type: none"> Min. return temperature Valve closing
Min. boiler temperature
Max. boiler temperature
Boiler cooling temperature
Parameter A,B,C FL
Thermostat select
<ul style="list-style-type: none"> Off Universal
Pump Off by thermostat

CH and HUW settings*
CH pump activation temperature
CH pump standstill when loading HUW*
CH pump standstill time by thermostat
CH activation time by thermostat
Min. HUW temperature*
Max. HUW temperature*
Increasing boiler temp. from HUW and mixer
HUW operation extension*
Circulating pump standstill time*
Circulating pump operation time*
Circulation pump starting temperature*
Heat exchanger

Buffer settings*
Buffer support
Loading start temperature
Loading stop temperature
Heating start installation

Mixer 1-5 settings*
Mixer support
<ul style="list-style-type: none"> Off CH on Floor ON Pump only
Thermostat select *
<ul style="list-style-type: none"> Off Universal ecoSTER
Min. mixer temperature
Max. mixer temperature
Proportional range*
Integration time constant*
Valve full opening time
Pump Off by thermostat
Mixer input dead zone*

H output*
H1/H2 output*
<ul style="list-style-type: none"> Off Reserve boiler Alarms
Reserve boiler – deactivation temp.*
Alarms*

* unavailable if no adequate sensor or additional module is connected or the parameter is hidden.

Manufacturer menu**
Reset counters
Reset alarms
Exhaust alarm temperature
Flame return - feed time
Flame return - detection delay
Flame return alarm - feed time
Hall sensor control
Min RPM
Max RPM

** the manufacturer menu is accessed after entering a special password.

14. SERVICE SETTINGS

14.1 BURNER

Burner settings	
Firing up	
<ul style="list-style-type: none"> Ignition test time 	Time of checking whether the burner is ignited. The regulator checks if there was a proper rise (increase) of exhaust temperature. After successfully completing the check, the regulator switches to OPERATION mode.
<ul style="list-style-type: none"> Feed time 	Fuel dosage feed time at ignition.
<ul style="list-style-type: none"> Ignition end exhaust temp. 	Exhaust temperature above which the burner is considered to be ignited. Ignition test is ignored. Note: setting a low temperature may result in switching to OPERATION mode without a sufficient flame in the furnace. Recommended value: 130-150 °C.
<ul style="list-style-type: none"> Exhaust delta 	Rise (increase) of exhaust temperature necessary to switch to OPERATION mode.
<ul style="list-style-type: none"> Ignition fan 	Fan % at ignition. Note: setting a high value will prolong the ignition process and result in failed ignition attempt.
<ul style="list-style-type: none"> Ignition time 	Time of consecutive ignition attempts. After this time, the regulator will make another ignition attempt (max. 3 attempts).
<ul style="list-style-type: none"> Fan time extension 	Between each ignition attempt, the fan works without the heater. Thanks to this, before making another ignition attempt, the possible flame in the burner has a chance to increase the exhaust temperature and cause the switch from IGNITION to OPERATION mode without the need for additional ignition attempts.
<ul style="list-style-type: none"> Heating-up time 	Igniter heating-up time before switching on the fan. This should not be set too high to prevent damage to the heater. After such time, the heater continues to work until an increase in the exhaust temperature is detected.
Operation	
<ul style="list-style-type: none"> OPERATION mode cycle time 	Complete cycle time of fuel feeding in OPERATION mode. <i>OPERATION cycle time = OPERATION feed time + feeder standstill time</i>
<ul style="list-style-type: none"> Feeder efficiency 	Efficiency of the fuel feeder in kg/h. Entered a measured amount of fuel in constant feed (feeder working constantly). The parameter does not affect the work of the burner and is used for calculating the fuel level and current boiler output.
<ul style="list-style-type: none"> Fuel caloric value 	Fuel caloric value in Kwh/kg. This parameter is only used for information. The parameter does not affect the work of the burner and is used for calculating the fuel level and current boiler output.
<ul style="list-style-type: none"> Container capacity 	Fuel container capacity used for calculating the fuel level. Entering the correct value relieves the user from the need to calibrate the fuel level. The regulator uses this data if the fuel level has not been calibrated. After calibrating the fuel level successfully, the regulator does not use this parameter.
<ul style="list-style-type: none"> Feeder 	It is possible to conduct a feeder efficiency test and to set the duration of this test. Additionally, fuel weight can be entered here. This data facilitates the adjustment of fuel oriented parameters.
Burning off	
<ul style="list-style-type: none"> Burning off time 	Fan time in order to burn off remaining fuel.
<ul style="list-style-type: none"> Purge speed 	Fan speed during burning off in %.
Supervision	
<ul style="list-style-type: none"> Supervision time 	BURNING OFF mode and then into PAUSE mode. When the parameter <i>Supervision time = 0</i> , then the controller skip the SUPERVISION mode and goes directly to BURNING OFF mode. When the parameter <i>Supervision time = 255</i> , then the controller stays in SUPERVISION mode until the boiler temperature drops down up to the level, by which the controller returns to OPERATION mode.
<ul style="list-style-type: none"> Fan speed 	Fan speed in SUPERVISION mode; too high value may cause the boiler to overheat or the flame to return to the feeder; too low value results in fuel over-filling.

<ul style="list-style-type: none"> • Feed time 	Feed time in SUPERVISION mode; too high value may cause the boiler to overheat or fuel over-filling; too low value results in fuel returning to the container.
<ul style="list-style-type: none"> • Interval time 	Feeder work cycle time in Supervision mode. <i>SUPERVISION cycle time = feed time + interval time</i>
<ul style="list-style-type: none"> • Fan time extension 	In SUPERVISION mode, after a fuel dose is supplied and the feeder is off, the continues to work for the extension period in order to ignite the fuel dose. This parameter should not be set too high as it may over heat the boiler.
Min. fan speed	Minimal fan speed in % that can be selected by the user of the regulator. This parameter is used to limit the access to the complete fan speed range in the user menu. It is not used in the fan control algorithm. The parameter should be set relatively low, allowing the fan to spin slowly and freely.
Lack of fuel detection time	Lack of fuel detection time is deduced after the exhaust temperature drops below the <i>Lack of fuel detection threshold</i> . After this time is deduced, the regulator makes 3 attempts to ignite the burner, and when this fails, it displays the "ignition failed" alarm.
Lack of fuel detection threshold	
Exhaust temperature increase time	This time is used as function preventing the extinguishing of flame in OPERATION mode. If the exhaust temperature does not exceed the <i>Lack of Fuel Detection threshold</i> after such time, an ignition test will be made.
Max. feeder temp.	This parameter determines the maximum temperature at which the alarm for exceeding the maximum feeder temperature is displayed. When this temperature is exceeded, the feeder is engaged for a predefined time, with a several-minute pause. If the temperature drops, the regulator resumes normal operation; if not, the feeder will be engaged for a longer period in order to remove embers from the feeding pipe. These times may be edited in a special menu accessible only to the manufacturer of the boiler.

14.2 BOILER

Boiler settings	
Grate	
<ul style="list-style-type: none"> • Max. ignition time 	When this time is exceeded and the exhaust temperature does not rise above the Lack of Fuel detection threshold +15°C, a failed ignition alarm will be displayed. Note: during ignition in RUST mode, the fan works at the <i>Ignition fan - grate</i> speed. This parameter is adjusted via the user menu.
<ul style="list-style-type: none"> • Purge operation - supervision 	Fan purge time when the boiler temperature exceeds the boiler's set temperature
<ul style="list-style-type: none"> • Purge interval - supervision 	Fan purge interval time when the boiler temperature exceeds the boiler's set temperature
<ul style="list-style-type: none"> • Lack of fuel detection time 	When the exhaust temperature in OPERATION mode drops below the <i>Lack of fuel detection threshold</i> , lack of fuel is detected and the fan is stopped.
<ul style="list-style-type: none"> • Lack of fuel detection method 	<u>Only exhaust</u> - lack of fuel detection occurs via the indications of the exhaust temperature sensor. This method allows to detect the lack of fuel quickly. It can only be used when there is an exhaust sensor in the flue of the boiler. <u>Water and exhaust</u> - lack of fuel detection occurs both via the indications of the exhaust temperature sensor and the water temperature sensor in the boiler. To detect the lack of fuel, both temperatures need to drop, and the water temperature in the boiler must drop below the <i>CH pump activation temperature</i> .
<ul style="list-style-type: none"> • Exhaust temperature - fan reduction 	In order to limit the chimney loss, the fan speed is reduced to the value of <i>Fan speed 30%</i> . This happens when the exhaust temperature exceeds the <i>Fan speed reduction temperature</i> .
Return protection	
<ul style="list-style-type: none"> • Return protection 4D 	This parameter turns on/off the boiler return protection function, which is being done by mixing valve together with electric actuator. Attention: do not activate this function when there is no actuator installed on the valve!
<ul style="list-style-type: none"> • Return hysteresis 	The electric actuator will return to its normal operation with <i>return temperature ≥ min. return temperature + return hysteresis</i> .

• Min. set return temperature	The boiler return temperature below which the electric actuator will close the mixing valve.
• Valve closing percentage	It is a value for opening the mixing valve during active return protection function. This value is given in percentage. This value should be set in such way, that the return temperature can raise. Attention: the return protection function will work only in case when the set boiler temperature will be set on sufficiently high value, otherwise there will be too many lock ups of the actuator. Attention: The valve is locking up with the +-1% of precision.
Min. boiler temp.	Minimal set temperature for the boiler, that can be edited by the user in user menu and also a minimal temperature, that can be automatically set by a controller e.g. from night decrease, weather control etc.
Max. boiler temp.	Maximal set temperature for the boiler, that can be edited by the user in user menu and also a maximal temperature, that can be automatically set by a controller e.g. from night decrease, weather control etc.
Boiler cooling temp.	Preventive boiler cooling temperature. When this temperature is exceeded, the regulator switches on the hot usable water pump and opens the mixer circuits in order to cool the boiler down. The regulator will turn the hot usable water pump when the temperature of this water exceeds the maximum value. The regulator will not open the mixer circuit when <i>mixer support = floor On</i> .
Thermostat select	The following options are available: <u>deactivated</u> (deactivates the effect of the room thermostat on the boiler's operation) <u>universal</u> (enables a NO-NC room thermostat on terminals 42-43, recommended for thermostats with hysteresis below 1K) <u>ecoSTER</u> (this option is available when the ecoSTER TOUCH room panel is connected, the signals on the status of the thermostat are sent from the room panel)
Pump Off by thermostat	Available options: <u>No</u> (the CH boiler pump is not switched off when the room thermostat is activated) <u>YES</u> (the CH boiler pump is switched off when the room thermostat is activated)

14.3 CH and HUW

CH and HUW settings	
CH pump activation temperature	This parameter decides on the temperature of boiler pump activation. It secures the boiler against retting, that can occur when the boiler is being cooled down with cold water from the installation. Attention: deactivation of boiler pump doesn't guaranteed, that the boiler is secure against retting and therefore corrosion. It is recommended to apply additional automatics e.g. 4-way valve or 3-way thermostatic valve.
CH pump standstill when loading HUW	It requires a HUW sensor to be plugged in. A prolonged HUW tank loading can, with HUW priority activated, lead to excessive cooling down of CH installation, because with these kind of settings the CH pump is switched off. The parameter of pause time of CH pump preventing this by periodic operation of CH pump while HUW tank loading. The CH pump will after this time activate for fixed set time of 30s.
CH pump standstill time by thermostat	When the temperature of the heated rooms is reached (the contact of the room thermostat is open), the CH pump is stopped for the <i>CH pump standstill time from the thermostat</i> , after which the <i>CH pump operation time from the thermostat</i> is activated. Note: The following conditions must be met in order to stop the pump via the room thermostat: <i>Boiler room thermostat selection</i> ≠ deactivated <i>Pump Off by thermostat</i> = YES
CH pump operation time by thermostat	
Min. HUW temperature	It requires a HUW sensor to be plugged in. This parameter can be used for limitation of possibility to choose too low value of HUW set temperature.
Max. HUW temperature	It requires a HUW sensor to be plugged in. This parameter decides on which maximum temperature will the HUW container be heated during

	dropping down excessive heat in alarm states. It is a crucial parameter because setting this for too high value can lead to the risk of users scalding with utility water. On the other hand, too low value of this parameter can lead to a situation, when during boiler overheating there will be no possibility to drop down excessive heat into the HUW tank. When projecting the HUW installation, there should be an assumption of controller malfunction. This situation can lead to dangerous level of HUW temperature, leading to user scalding. It is advised to use additional security precautions in form of thermostatic values.
Increase boiler temp. from HUW and Mixer	This parameter determines the increase of the set boiler temperature in order to load the HUW tank, buffer, and the mixer circuit. The temperature is only increased when there is a need to do so. When the set temperature of the boiler is on a satisfactory level, the regulator will not change it in order to load the HUW tank, buffer, or mixer circuit. The increase of the set boiler temperature for the period of loading the HUW tank is signalled with the letter "C" in the main window of the display.
HUW operation extension	Available after connecting a HUW sensor. When the HUW tank is fully loaded and the HUW pump is switched off, the boiler may be in danger of overheating. This occurs when the set HUW temperature is higher than the set boiler temperature. The problem is particularly prominent when the HUW pump works in "SUMMER" mode and the CH pump is deactivated. In order to cool the boiler down, the HUW pump operation can be extended by the <i>HUW operation extension time</i> value.
Circulation pump standstill time	It is the time between periods of circulation pump operation and it is defined by the parameter <i>circulation standstill time</i> (recommended setting is between 15-40 min.) The circulation pump is operating in cycles for the time of <i>circulation operation time</i> (recommended setting is between 60 and 120s.)
Circulation pump operation time	
Heat exchanger	It comes only for hydraulic installations with heat exchanger between open and closed circuit. Available options are: YES (the boiler pump is operating constantly in short circuit boiler – heat exchanger, it is not excluded e.g. from "SUMMER" function or HUW priority) NO (standard operation of boiler pump)

14.4 BUFFER

Buffer settings	
Buffer support	This parameter is used to turn on operation with the buffer. It is available after connecting an additional B module and buffer temperature sensors.
Loading start temperature	The parameter <i>Loading start temperature</i> defines the upper buffer temperature below which the process of buffer loading is being started. This process will then be finish when the bottom buffer temperature will reach defined temperature in the parameter <i>Loading stop temperature</i> .
Loading stop temperature	
Heat start installation	If the top buffer temperature drops below this value, in order to save electrical power, the mixer pumps and HUW pumps will be deactivated. This function is particularly useful when working in GRATE mode.

14.5 MIXER

Mixer 1-5 settings	
Mixer support	
• Off	The mixer actuator and pump are not in operation.
• CH On	It is being used when a mixing circuit is loading a heat installation of CH. The maximum mixing circuit temperature is not being limited, the mixer is fully opened during alarms e.g. with boiler overheating. Attention: do not use this option when the heat installation is made with

	pipes not resistant for high temperatures. In such cases it is recommended to set the mixer operation for FLOOR switched on.
<ul style="list-style-type: none"> • Floor On 	<p>It is being used when the mixer circuit is loading floor heating installation. The maximum mixer circuit temperature is limited to the value of max. mixer set temperature.</p> <p>Attention: after choosing the option – FLOOR switched on the parameter of max. mixer set temperature should be so edited, that the floor heating will be not damaged and there would be no danger of scalding.</p>
<ul style="list-style-type: none"> • Pump only 	By the moment when the mixer circuit temperature exceeds the set temperature in the parameter mixer set temperature, the mixer pump supply will be shut down. When the circuit temperature will drop by 2°C then the pump will again be switched on. This option is usually be used for control of floor heating pump in situation, when this pump is operating together with thermostatic valve without actuator.
Thermostat select*	<p>Options to choose from:</p> <p><u>Off</u>: (it cuts the influence of room thermostat upon the boiler operation.)</p> <p><u>Universal</u>: (it turns on the NO-NC room thermostat coupled to 42-43 contacts, it is required to use thermostats with 1K hysteresis.)</p> <p><u>ecoSTER</u>: (this option is available after remote control device ecoSTER TOUCH is being connected, thermostat signal is being send from room panel.)</p>
Min. mixer temperature	It is the parameter used for limitation of choosing too low value of set mixer circuit temperature by the user. Automatic regulation (e.g. periodic temperature reduction) also does not cause the reduction of set temperature value below the value given in this parameter.
Max. mixer temperature	<p>This parameter has two functions:</p> <p>_ it enables the limitation of choosing too high value of set mixer temperature by the user. Automatic regulation (correction upon heating curve, that comes from outside temperature) also does not cause crossing the set temperature above the value given for this parameter.</p> <p>_ when the <i>Mixer support = On</i>, then the mixer pump will shut down by max. mixer temperature +5°C, which protects the floor against destruction. For the floor heating it should be set for the value below 45+/-50 °C or even lower, when the thermal resistance of this floor is lower. Attention: setting too lower value of this parameter can lead to unnecessary shut down of the pump.</p>
Valve opening time	The time of valve full opening should be entered – this time can be read from the nameplate of valve actuator, e.g. 140s.
Proportionality range	This parameter affects the movement of the mixer actuator. Increasing this value results in the mixer reaching the set temperature faster. Setting this parameter to excessive values causes deregulation of the temperature and unnecessary actuator movement. The proper values is set experimentally. It is recommended to set this parameter in the range of 2-6 [3].
Constant for integration time	The greater the value of this parameter, the slower is the actuator reaction for temperature deviation. Setting too lower values can lead to unnecessary actuator movements, too high value extending the time needed to find set value of the temperature. The right value is being edited according to research results. It is recommended to set this parameter value between 100 and 180 [160].
Pump Off by thermostat	Setting this parameter to "YES" results in closing the mixer and deactivating the mixer pump after opening the room thermostat contact (the room is warm). This setting is not recommended because the heated room may cool down too much.
Mixer input dead zone	This parameter determines the value of temperature insensitivity (dead zone) of the mixer control system. The regulator controls the mixer so that the measured temperature in the mixer circuit sensor is equal to the set temperature. In order to avoid frequent actuator movements which can wear it down unnecessarily, the parameter should only be regulated when the measured temperature of the mixer circuit is lower

	or higher than the set temperature by a value exceeding the <i>Mixer input dead zone</i> .
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14.6 ADVANCED SETUP

Show advanced setup	Available options: <u>Y</u> ES (shows hidden parameters, which edition is not recommended) <u>N</u> O (hides hidden parameters).
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14.7 RESTORE DEFAULT SETTINGS

Restore default settings	Restoring the service settings will automatically lead to restoring the settings from main menu (user settings).
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15. ALARM DESCRIPTION

15.1 Max. boiler temp. excess

Protection against boiler overheating comprises two stages. In first instance i.e. once the *Boiler cooling temp.* has been exceeded, the regulator attempts to reduce the boiler temperature by activation of the boiler pump, HUW pump and opening the mixer servo (only in case mixer circuit = CH ON). Has the temperature dropped - the regulator returns to normal operation. Is the temperature still increasing (and has reached 95°C), power supply to the fuel feeder and the fan is off and permanent boiler overheating alarm with sound signal is produced. If, during boiler overheating time, temperature measured by HUW sensor is higher than *Max. HUW temp.*, HUW pump goes off. In this manner, users of hot utility water are protected from burning. The alarm is reset by switching the regulator off and on. The alarm can be reset by pressing the encoder "TOUCH and PLAY" knob or restarting the power supply.



Note: arrangement of temperature sensor outside the boiler water jacket (e.g. at the outlet pipe) is not recommended because boiler overheating may be detected with delay.

15.2 Exceeding max. feeder temperature

This alarm will occur after the feeder temperature exceeds the parameter *Max. feeder temp.* If the feeder temperature exceeds this value, the regulator will enable the feeder for a constant, programmed time and will activate the poker. The airflow is disabled and the pumps are enabled. After „pushing the fuel out“, the regulator disables the feeder and does not activate it again, even if the feeder temperature is still high. This alarm can be cancelled only after the feeder temperature decreases, by pressing the encoder "TOUCH and PLAY" knob or by restarting the regulator.



The function of protection against flame recession is inoperative if the feeder sensor is disconnected or damaged. The function of protection against flame recession

is inoperative if the regulator is not powered.



Regulator cannot be used as the only protection against flame recession in a boiler. Use additional protective automatics.

15.3 Faulty fuel feeding system

This alarm occurs when an electronic control circuit of the feeder is damaged. In that case the feeder become controlled by an electromechanical relay and because of that feature boiler operation will not stop - which is especially important during heating season. The regulator then works in the safe mode, which is indicated by a prompt „Feeder control system failure“ on the screen.

In the event of an alarm, **stop the operation of the boiler and repair immediately regulator.**

The alarm can be reset by pressing the encoder "TOUCH and PLAY" knob or restarting the power supply.

It is also possible to continue operation in emergency mode. Before continuing operation, sure that the combustion chamber does not contain excessive unburnt fuel. If so, remove the excess fuel. Ignition with excessive fuel may lead to explosion of combustion gasses!

Note: operating in emergency mode is allowed only under user supervision and until the arrival of the service team to remove the failure. If user supervision is not possible, extinguish the boiler. When operating in emergency mode, prevent the consequences of improper feeder work (feeder working constantly or not at all).



15.4 Boiler temp. sensor damaged

This alarm occurs in case of boiler temperature sensor damage and excess of its measurement range. Upon occurrence of this alarm, boiler, HUW and mixer pumps start to possibly cool down the boiler. To reset the alarm - switch OFF and ON the regulator. Check the sensor and replace it, if necessary.



Checking temperature sensors described in this manual, in point.12.9.

15.5 Feeder temp. sensor damaged

This alarm occurs in case of damage of fuel feeder temperature sensor and excess of its measurement range. To reset the alarm - switch OFF and ON the regulator. Check the sensor and replace, if necessary.



Checking temperature sensors described in this manual, in point.12.9.

15.6 Exhaust sensor temp. damaged

This alarm occurs in case of damage of exhaust temperature sensor and excess of its measurement range. To reset the alarm - switch OFF and ON the regulator. Check the sensor and replace, if necessary.



Checking temperature sensors described in this manual, in point.12.9.

15.7 Unsuccessful firing up attempt

This alarm occurs after the third unsuccessful automatic furnace firing up attempt. The reason behind this alarm occurrence can be among other things: malfunctioning igniter or ventilator, malfunction of fuel feeder system, incorrect parameter setting, insufficient fuel quality or lack of fuel in the container. The alarm can be reset by pressing the encoder "TOUCH and PLAY" knob or restarting the power supply.



Attention! Before work continuation it is required to check, if in the combustion chamber there was a large accumulation of unburned fuel. If it is the case, than it is required to remove this excessive fuel. Firing the boiler with an fuel overdose can lead to an explosion of combustible gases!.

15.8 Exhaust temperature not met. Check fuel quality

This alarm is sounded when the exhaust gases are not heated above the lack of fuel detection threshold in the exhaust temperature increase time. The alarm prevents filling the combustion chamber with unburnt fuel. Check the quality and moisture of the fuel.

The alarm can be reset by pressing the encoder "TOUCH and PLAY" knob or restarting the power supply.

15.9 Boiler overheating STB, open contact

This alarm occurs after activation of independent safety thermostat that secures the boiler against overheating. The burner will then be deactivated. After the boiler temperature will drop down it is required to unscrew an oval STB lid and then press the Reset button.

15.10 Max exhaust temperature exceeded. Sensor damage danger!

This alarm occurs only when using the GRATE and exceeding the maximum exhaust temperature. The fan is turned off. Its aim is to protect the exhaust temperature sensor from being damaged by temperatures exceeding its resistance level. When the temperature on the boiler drops, the regulator returns to normal operation.

The alarm can be reset by pressing the encoder "TOUCH and PLAY" knob or restarting the power supply.

15.11 No communication

The control panel is being linked with the rest of the electronics with RS485 digital communication link. In case a cable of this link will be damaged, an alarm will occur on the screen with the information "CAUTION!!! No communication".

The controller doesn't stop to operate and works normally with before preset parameters. It is required to check the connection cable between control panel and the module and replaced it with a new one or repair it.

15.12 Unsuccessful attempt of buffer loading

This feature has an application only after module B connection. It is a silent alarm, which informs about unsuccessful attempt of adding fuel from additional fuel container (bunker) to boiler container. In case, when during preset time of container loading, a sensor in this container will not detect the increase of fuel level, this alarm will occur. This signalisation does not shut down boiler automatic operation.

15.13 No power supply

This alarm occurs after power to the regulator, in the case of early no power supply. The

regulator returns to the mode of operation where worked before the power failure.

15.14 Fan or fan speed sensor damaged

This alarm occurs then the fan's speed sensor or the fan itself is damaged, based on the voltage capacity on the terminal controlling the sensor. The regulator switches off the fan.

16. ADDITIONAL FUNCTIONS

16.1 Power supply decay

In the cases of power supply failure, the regulator will resume the operation mode in which it was before the failure.

16.2 Anti-freezing protection

If the boiler temperature drops below 5°C, the CH pump will be enabled, thus forcing circulation of the boiler water. This will delay the process of water freezing, yet in the case of great frost or shortage of power, it will not protect the system against freezing.



Note: This function must not be the only anti-freezing protective measure! Apply other methods too. Regulator manufacturer is not liable for anti-freezing related damages.

16.3 Function of protecting pumps against stagnation

The regulator performs the function of boiler, HUW and mixer pumps and servo protection from locking caused by scale deposit. To do this, these components are periodically (every 167h) switched on for few seconds. In this way the pumps are protected from immobilization caused by scale deposits. Therefore, during boiler shut-down, power supply to the regulator should be on, and the regulator should be in STANSTILL mode.

16.4 Feeder bunker

After connect an additional module B controller can be used with the sensor low fuel level in the tank (the fuel supply from the bunker). Upon activation of the sensor (opening) at the *Additional feeder operation time* controller activates additional feeder in order to supplement the base fuel tank. This parameter can be found in:

Service settings → **Burner settings**

If the parameter *Additional feeder operation time* is set to "0" this work additional feeder is turns off.

17.REPLACEMENT OF PARTS AND COMPONENTS

17.1 Replacement of mains fuse

Mains fuse is located in the Operating Unit. It protects the regulator and other equipment. In case of replacement, use 6.3A.

In order to take out the fuse, raise the fuse holder using flat-blade screwdriver and take out the fuse.

17.2 Replacement of control panel

It is not recommended to replace only the control panel as the software in the panel must be compatible with the software in the rest of the regulator.

Registry changes:



Jacek Kucharewicz
ul. Sikorskiego 66
16-100 Sokółka
Poland

tel. +48 85 711 94 54
www.metalfachtg.com.pl