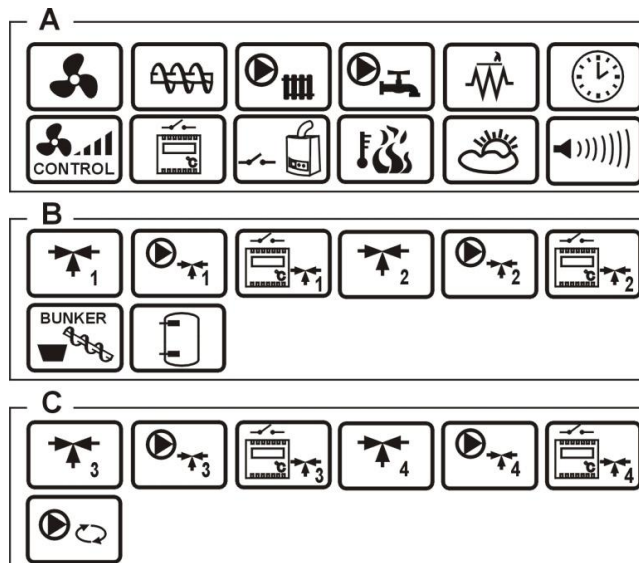




Boiler regulator ecoMAX810P3-L TOUCH

FOR PELLETT BOILERS

Individual
Fuzzy Logic



A, B, C - functions which are available in modules, respectively: A, B, C



SERVICE AND ASSEMBLY MANUAL

ISSUE: v1.1

APPLICABLE TO
SOFTWARE:

MODULE A

MODULE B

PANEL

v04.30.**

v04.30.**

v04.**.**

PRINCIPLES FOR USAGE OF INDIVIDUAL FUZZY LOGIC CONTROLLED BOILER:

- **The regulator must be programmed individually for the given type of boiler and fuel, p.26.1!**
- **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, p.26!**
- **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, p. 8.8.**
- **In some cases, the fuzzy logic mode may require additional adjustment, as per p.8.6.**

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1 RECOMMENDATIONS REGARDING SAFETY

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 used at variance with its purpose.
- 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.
- Electronic isolation of the connected devices is applied in this regulator.
- The regulator consists of two subassemblies. In the case of replacing one subassembly, make sure to maintain compatibility with the other one. More information on that issue can be found in the documentation intended for fitters.
- Keep the regulator out of reach of children.

2 General information

Boiler regulator ecoMAX 810 model P3 version L, is a modern electronic device intended to control pellet boiler operation. The regulator is a multipurpose device:

- it automatically maintains a preset boiler temperature by controlling the fuel combustion process,
- it controls timing of feeding screw and fan,
- it automatically stabilizes a preset temperature of the domestic hot water tank,
- it automatically maintains preset temperature of several independent mixer heating cycles.

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

The regulator features an Individual Fuzzy Logic function. It allows to optimize the combustion process, which is in favour of natural preservation, decreases fuel consumption and relieves the user of the necessity of adjusting the burner parameters.

Possibility of cooperation with room thermostats, separate for each heating cycles, facilitates maintaining comfortable temperature in the heated rooms. Moreover, if need arises, the device enables a reserve boiler (gas- or oil-fired).

The device has modular construction, consisting of control panel, main boiler control module (A), and module controlling mixer cycles and DHW (B).

The device is operated in an easy and intuitive way.

Regulator can cooperate with an additional control panel situated in living quarters. It can be used in a household and similar facilities, as well as in light 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.

Caution: 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 2002/96/EG 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.

REGULATOR INSTRUCTION MANUAL

ecoMAX810P3-L TOUCH

7 Structure – Main menu

Main menu	
Information	
Boiler settings	
HUW settings	
Mixer 1-4 settings*	
Work as scheduled**	
General settings:	
⇒ Clock	
⇒ Date	
⇒ Brightness	
⇒ Sound	
⇒ Language	
⇒ Software update	
⇒ WiFi*	
Manual control	
Alarms	
Service Settings	
Turn off/on the controller	

** parameter is available only after activation function by the boiler manufacturer

Boiler settings	
Preset boiler temperature	
Weather control the the boiler	
Boiler heating curve	
Curve shift	
Output modulation	
Fuel level	
Burner cleaning	
Lambda calibration*	
Night time decrease boiler	

Output modulation	
Airflow power correction 100%	
100% feeder work correction	
50% H2 hysteresis	
50% Airflow power correction	
50% feeder work correction	
30% H1 hysteresis	
Airflow power correction 30%	
30% feeder work correction	
Boiler hysteresis	
Regulation mode	
FL airfl. correction	
Minimum boiler output FL	
Maximum boiler output FL	
Stabilization time	

HUW settings	
HUW preset temperature	
HUW pump mode	
HUW cont. hysteresis	
HUW disinfection	
Automatic detection SUMMER mode	
SUMMER mode act. temperature	
SUMMER mode deact. temperature	
Night time decrease HUW	

HUW pump mode	
OFF	
Priority	
No priority	
Summer	

Mixer 1-4 settings*	
Preset mixer temp.	
Mixer room therm.	
Mixer out.temp.dep	
Mixer heating curve	
Curve shift	
Room temp.factor	
Mixer night temp red.	

*) menu for all mixer cycles is identical

Regulation mode	
Standard	
FuzzyLogic	

Manual control	
Fan	
Feeder	
Boiler pump	
Lighter	
HUW pump	
Feeder supply	
Servo	
Alarm	
Feeder 2	
Mixer1 Pump	
Mixer1 Open	
Mixer1 Close	
Mixer2 Pump	
Mixer2 Open	
Mixer2 Close	
Res.boiler	

Fuel level	
Alarm level	
Fuel level calibration	

* The specific menu items may not be visible in the absence of a sensor, module or settings.

8 Operating the regulator

This section briefly describes how the regulator should be operated.

8.1 Description of display main window

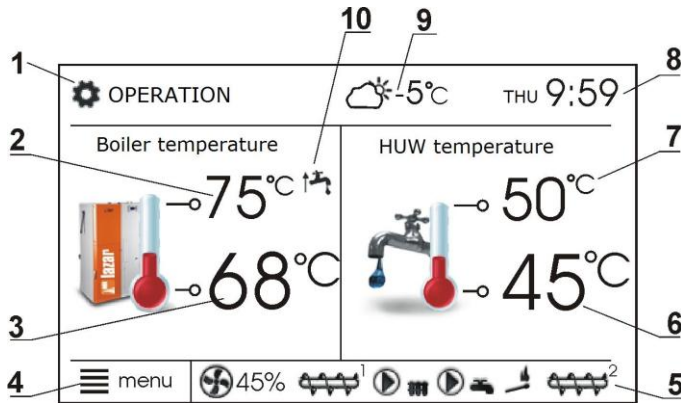
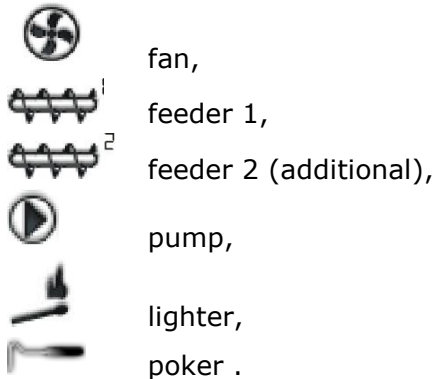


Fig. 1 Display main window

Legend:

1. Mode of regulator operation: FIRING-UP, OPERATION, SUPERVISION, BURNING OFF, R.P.OUT, STANDSTILL,
2. preset boiler temperature,
3. measured boiler temperature,
4. key to enter "Menu" list
5. Information fields:



6. measured temperature of HUW container,
7. preset temperature of HUW container,
8. clock time and weekday
9. outside temperature (weather),
10. field of functions, which modify preset boiler temperature -meaning of the symbols:



- opening of room thermostat contacts
- preset room temperature has been reached;



- of preset boiler temperature for active time intervals;



- increase of preset boiler temperature for the time of HUW container filling;



- increase of preset boiler temperature by mixer circuit;



- increase of preset temperature for buffer loading.

Both, left and right windows may display different information. By touching the screen, you may navigate between displayed information: mixer circuits (1, 2, 3, 4, 5), information window, HUW window, fuel level window.

To have the fuel level displayed, first enter the settings acc. sec. 8.20. Note: fuel level may be displayed on ecoSTER-TOUCH room control panel.

8.2 Switching on and off the boiler

Make sure fuel is present in the tank and tank hatch is closed. Now boiler may be switched on. To start the boiler - press BURNER OFF? at any place on the screen. The message: ACTIVE REGULATOR? appears.

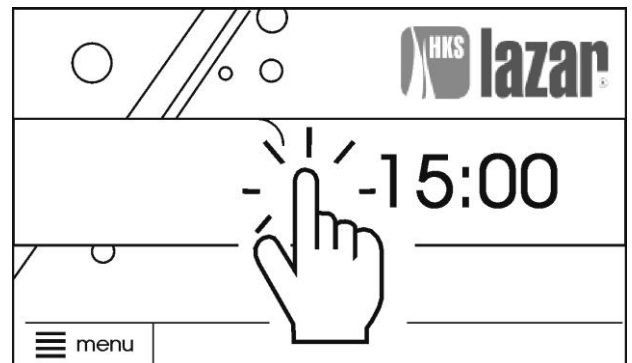


Fig. 2 Main window

Confirm the message. Boiler enters firing-up stage. There is also another method of boiler start-up. Press MENU button and find and



press button in pie menu.

To stop the boiler - press MENU button, and



find and press button in pie menu. Note: regulator enters burning off phase. Upon completion of burning off stage, the message BURNER OFF appears.

8.3 Setting preset boiler temperature

Preset boiler temperature, just like the preset mixer circuit temperature, can be set in the menu (possible settings of these temperatures are limited by the scope of their corresponding regulator service parameters).

Boiler settings > Preset boiler temp.

Mixer 1 settings > Preset mixer temp.

Mixer 2 settings > Preset mixer temp.

Mixer 3 settings > Preset mixer temp.

Mixer 4 settings > Preset mixer temp.

The value set as *Preset boiler temp.* is ignored by the regulator if the preset boiler temperature is controlled by weather sensor. Regardless of that, the preset boiler temperature is automatically increased in order to fill the hot utility water tank and feed heating mixer cycles.

8.4 FIRING-UP

FIRING-UP mode is used to automatic firing up of boiler furnace. Total time of firing-up depends on the regulator settings (feeder operation time, heater operation time, etc.) and on the boiler conditions before firing up. All parameters, which affect firing-up process are grouped in the menu:

SERVICE SETTINGS > BOILER SETTINGS

Detailed description of firing-up cycle:

- Fan turns on with the power set in the parameter of *Blowing power- firing up*,
- Small dose of fuel (approx.20% basic dose) is supplied,
- Conditions of the furnace are checked – i.e. once the exhaust temperature has reached the value of *Ex. temp. at the end of firing-up* or has increased by *Ex.temp.delta* within the time set in the parameter *Ignition test time* elapsed from the fan start, firing-up process stops. It means firing-up has been detected and regulator enters OPERATION mode. In case the criteria of furnace firing-up have not been fulfilled, regulator attempts to clean the furnace and fire it up:
- poker is activated to operate over *Poker cycle time*,
- fuel is supplied over *Feeding time*,
- fan turns on with the power set in the parameter of *Blowing power- firing up*,

- lighter switches on for *Firing-up time*. The regulator checks within this time whether fuel in the burner has been kindled. Fuel is deemed kindled once the temperature increment indicated on exhaust temperature sensor has reached the value of *Ex.temp.delta* or the exhaust temperature has increased above the value set in *Ex. temp. at the end of firing-up*. If firing-up has been successfully completed, lighter turns off and regulator enters OPERATION mode,
- Just upon entry the OPERATION mode, regulator checks whether the exhaust temperature has increased by the value of *Ex.temp.delta 2*. If NOT- regulator returns to firing-up mode. If YES- it remains in OPERATION mode.

In case the firing up has not been successfully completed, further attempts to fire-up the furnace are carried out with fuel dose (Feeding time) reduced to 10% of the dose used in first attempt.

Upon execution of three unsuccessful attempts, the alarm of *Unsuccessful boiler firing-up attempt* is produced. Boiler operation is interrupted and cannot be automatically resumed - operator's intervention is required. Once the causes of firing-up failure have been removed, re-start the boiler.

8.5 OPERATION MODE

In this mode the boiler runs automatically according *Individual Fuzzy Logic* or STANDARD algorithm. Fan operates continuously, which is shown on Fig. 3. Fuel feeder switches on periodically

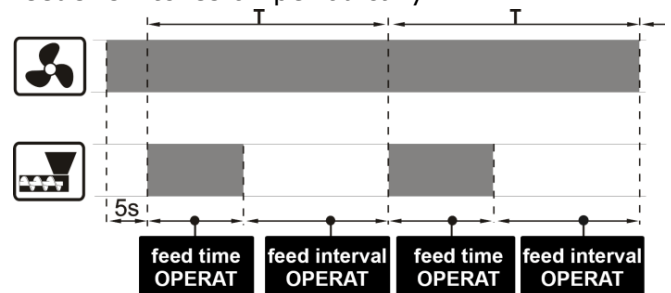


Fig. 3 Fan and feeder operation cycles.

The operation cycle is composed of feeder operation time (*feeding time*) and feeder standstill time (*feeder interval*). Power of the fan and the feeding time are determined by either regulation algorithm described below.

If a HUW container needs to be filled in OPERATION mode at pre-set boiler temperature, which is lower than the value required to its filling, the regulator will automatically increase preset boiler temperature for the time of HUW container filling

8.6 OPERATION in I.FuzzyLogic mode

This mode may be activated in the menu:

Regulation mode

Using the function of *IndividualFuzzyLogic*, settings of which are individually adapted to the given boiler allows obtaining optimum combustion process, which is more environment friendly, supports fuel savings and in most instances eliminates the need to adjust regulator parameters.

During operation with use of *Individual Fuzzy Logic* algorithm, parameters of feeder operation (Feeding Time, Feeder Interval) and blow-in output needn't be set-up. Three-stage output modulation is inactive – the regulator automatically sets feeder and fan control parameters in a stepless manner.

In *Individual Fuzzy Logic* mode, the regulator strives to eliminate the need to bring the boiler into SUPERVISION mode, and to produce exactly as much heat as CH system requires. Change-over to SUPERVISION mode occurs once the actual boiler temperature has exceeded the preset value by 5 °C.

Please note *Individual Fuzzy Logic* algorithm is adapted individually to the given boiler and fuel type and may work properly only with this boiler and fuel. Therefore *IndividualFuzzyLogic* mode has to be activated by the boiler manufacturer in accordance with sec 26.1. In case this mode has not been activated, when attempting to change the mode, a prompt 'FUNCTION NOT AVAILABLE' appears.

Change of settings of *Individual Fuzzy Logic* algorithm.

Sometimes, depending on the fuel quality, air flow has to be adjusted in *IndividualFuzzyLogic* mode.

The user may change the settings as follows:

BOILER SETTINGS > Output Modulation > FL airfl. correction

BOILER SETTINGS > Output Modulation > Min.boil.output FL

BOILER SETTINGS > Output Modulation > Max. boil.output FL

The range of setting correction has been deliberately limited. Change of **FL airfl. correction setting is not recommended if combustion process runs properly i.e. no incompletely burnt fuel particles are present.** In case of poor fuel quality, when presence of incompletely burnt fuel particles is obvious, amount of supplied air may be increased. If the fuel is very dry, causing high combustion rate and too intensive furnace burning-out, the value of *FL airfl. correction* may be reduced.



In *Individual Fuzzy Logic* regulation mode, the values of parameters related to blow-in output and feeder operation and standstill times available in menu: **BOILER SETTINGS > Output Modulation** are not used by regulator operation algorithm. These settings are used only in STANDARD mode.



When using *IndividualFuzzyLogic* control, fan baffle should be fully opened, and the boiler has to be clean. In case of required fan or feeder replacement - use identical types of both pieces of equipment.

Once the actual boiler temperature has exceeded the preset value by 5°C, the regulator automatically enters SUPERVISION mode.

8.7 Operation in the standard mode

ecoMAX810 TOUCH P-L boiler regulator is equipped with boiler output modulation function enabling gradual reduction of boiler output when approaching the preset boiler temperature. In this mode of regulation, the regulator uses output modulation algorithm. Levels of boiler output are available in menu: **BOILER SETTINGS > Output Modulation**

Each of the levels (100%, 50% or 30%) may be assigned individual values of fuel feeding time and blow-in output, which determine actual boiler output. Values of hysteresis (H1 and H2) determine when the boiler should work with selected output level. Each of these values is referred to the measured boiler temperature vs. its preset value. H1 and H2 values may be so set-up that the modulation will follow without intermediate level i.e. the boiler output will change directly from 100% to 30%.

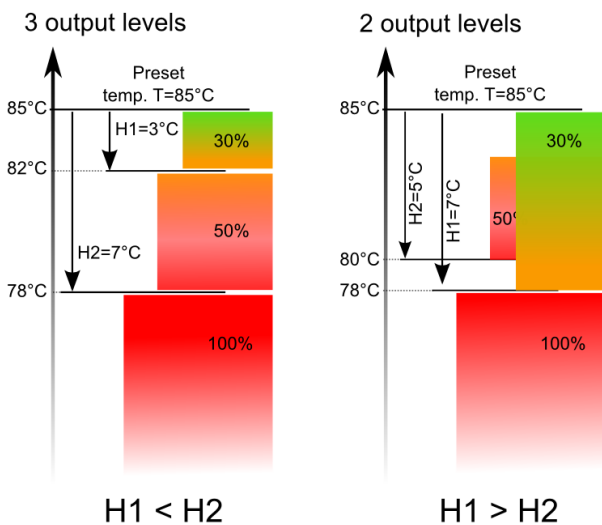


Fig. 4 Output modulation hystereses H1 and H2.

Once the actual boiler temperature has reached the preset value, the regulator enters SUPERVISION mode

8.8 SUPERVISION mode

The SUPERVISION mode occurs both during operation with STANDARD, as well as with *Individual Fuzzy Logic* control algorithm.

The regulator switches into the SUPERVISION automatically, without the user's intervention:

- in the case of Standard control mode - upon reaching preset boiler temperature,
 - during *Individual Fuzzy Logic* control - upon exceeding the preset boiler temperature by 5°C .
- In the *Individual Fuzzy Logic* mode, the regulator strives to avoid switching the boiler into the SUPERVISION mode, and to supply as much heat, as the CH system requires at the time.

In the SUPERVISION mode, the regulator supervises the furnace, so that it would not go out. For this purpose, the airflow and the feeder are activated only for a while, rarer than in the OPERATION mode. Without causing further temperature increase.

The airflow does not work continuously, it is activated cyclically together with the fuel feeder, which prevents the flame from going out during boiler standstill.

All parameters regarding boiler setup in the SUPERVISION can be found in the menu :

Service settings > Boiler settings > Supervision

Parameters of the SUPERVISION mode should be set in accordance with boiler manufacturer's recommendations. They should be chosen in such a way, that the furnace did not go out during boiler standstill (at the same time, it should not fire up too intensively, as this will trigger increase in the boiler temperature). Duration of the feeder operation and interval in the SUPERVISION mode are set using parameters:

... > **SUPERVISION > Feeding time**

... > **SUPERVISION > Feeder interval**

Airflow extension time necessary to fire-up supplied fuel is set in:

... > **SUPERVISION > Airflow oper.extend.**



Parameters should be selected in such a way, that boiler temperature would gradually decrease when this mode is active. Improper settings can cause the boiler to overheat

Airflow in the SUPERVISION mode operates with power set in the power modulation parameter 30% Airflow power.

The regulator returns to the OPERATION mode automatically after boiler temperature decreases by the value of *boiler hysteresis* in relation to the preset temperature.

Maximum boiler operation time in the supervision mode is defined by parameter:

... > Supervision > Supervision time

If after lapse of this time from the moment of the regulator's entering the supervision mode, there is no need to reactivate the boiler, the regulator will commence the process of putting the boiler out.

8.9 BURNING OFF

In BURNING OFF mode, rest of pellets is burnt and boiler is being prepared to stop or shut-down.

All parameters, which affect burning-off process are grouped in the menu:

SERVICE SETTINGS > BOILER SETTINGS > BURNING OFF

Detailed description of burning-off cycle:

- Fuel feeder stops,
- Remaining fuel is burnt – the fan turns on for the time set in *Burning-off time* with the power set in the parameter of *Air flush intensity*,
- The furnace is cleaned - poker switches on.

Upon automatic burning-off, regulator enters STANDSTILL mode.

8.10 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).

8.11 Domestic hot water settings DHW

The device controls temperature of the domestic hot water - DHW – tank, provided that a DHW 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 tank, parameter **off**,
- set DHW priority, using the **priority** parameter - in this case, the CH pump is deactivated to speed up filling of the DHW tank.
- set simultaneous operation of the CH and DHW pump, using parameter **no priority**,
- enable the **summer** function.

8.12 Setting preset DHW temperature

Preset DHW temperature is defined by parameter:

DHW settings > Preset DHW temp.

8.13 DHW tank hysteresis

Below temperature *DHW preset temp.* reduced by *DHW tank hysteresis*, the DHW pump is activated in order to fill the DHW tank.



When value of hysteresis is set too low, the DHW pump will start faster after decrease in DHW temperature.

8.14 Enabling the SUMMER function

In order to activate the SUMMER function, which enables to load the DHW tank in the summer, without the need for activating the CH system and mixer cycles, set the parameter *DHW pump operation mode* to *summer*.



The SUMMER function cannot be enabled if the DHW sensor is disconnected.



Do not enable the summer function if the DHW pump is disconnected or damaged.

The SUMMER function can be enabled automatically, on the basis of readouts from the weather sensor. This functionality is enabled with the following parameters:

DHW settings > Auto SUMMER detect.

DHW settings > Activ.temp.SUMMER

DHW settings > Deactiv.temp.SUMMER

8.15 DHW tank disinfection

The regulator has a function of automatic, periodic heating of the DHW tank to temperature of 70 °C. The purpose is to remove bacterial flora from the DHW tank.



The household members must definitely be informed about the fact of activating disinfection, as there is a hazard of scalding with hot utility water.

Once a week on Sunday night, at 02:00, the regulator increases the DHW tank temperature. After 10 minutes of keeping the tank at 70 °C, the DHW pump is deactivated and the boiler resumes normal operation. Do not enable the disinfection function if DHW support is deactivated.

8.16 Mixer circuits settings

Settings for the first mixer circuit can be found in the 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. 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)

Set parameter *Weather contr.mixer* to on. Select weather curve as per point 8.17

Using parameter *Curve translation*, set preset room temperature following the formula:

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

Example.

To obtain room temperature of 25°C, value of the heating curve translation must be set at 5°C. To obtain room temperature of 18°C, value of the heating curve translation must be set at -2°C.

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)

Set parameter *Weather contr.mixer* to on. Select weather curve as per point 8.17

The ecoSTER200 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 8.17, it may be necessary to fine-tune the heating curve translation.

In this setup, the ecoSTER200 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. coeff.* = 15.

Preset mixer temperature will be increased by $(22\text{ °C} - 20\text{ °C}) \times 15/10 = 3\text{ °C}$.

It is necessary to find appropriate value of the *Room temp. coeff.* Range: 0..50. 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!

8.17 Weather controlled operation

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 > Mixer room therm. to "0".

If a room panel ecoSTER200 is connected, it is also necessary to set the parameter *Room temp. coeff.* 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

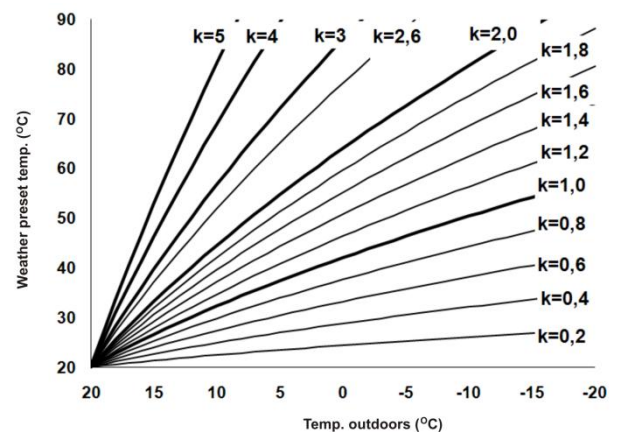


Fig. 5 Heating curves.

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.

8.18 Description of settings for night-time decreases

The regulator allows to set intervals for decreasing preset temperature of boiler, heating curves, hot utility water tank, and operation time of the circulating pump.

The intervals allow to decrease the preset temperature at specified periods of time - e.g. at night, or when the users leave the heated rooms (e.g. when the household members got to work/school). This allows to decrease the preset temperature automatically, without losing thermal comfort and with decreased fuel consumption.

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

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

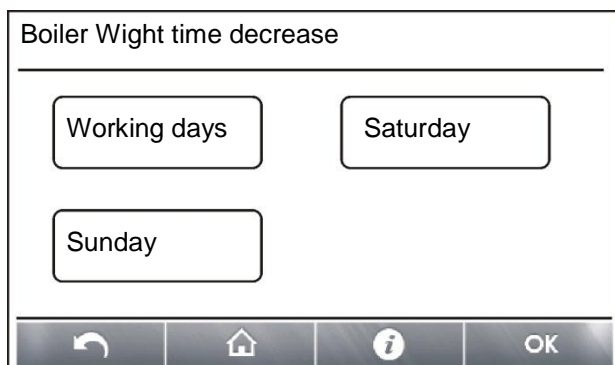



Fig. 6 Time interval setting window.

Select decrement of the set temperature and beginning and end of respective time interval. Three intervals within 24 hours are available.

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

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

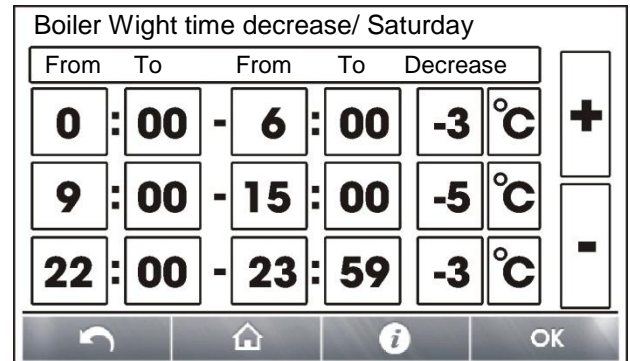





Fig. 7 Example of time interval setting

In the given example the regulator will set the decrease of preset boiler temperature by 3°C from 00:00 to 06:00, and will keep the preset value (without 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 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 at "0" even though "from..." to ..." values have been entered.

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

8.19 Circulating pump control

Note: the circulating pump functionality is available only if an additional extension mixer module is attached to the ecoMAX810 P3-L TOUCH regulator.

The settings can be found in:

DHW Settings > Night-time decrease > Circulation pumps

Setting of circulating pump control is analogical to night decrease setting. Circulating pump switches on in selected time intervals. In disregarded time intervals circulating pump will start and remain in operation for the period of time set in *Circulating Pump Operation Time*, then will stop and remain out of operation for the period of time set in *Circulating pump standstill time*.

8.20 Fuel level setup

Activating the fuel level gauge

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

Fuel level > Alarm level

to a value greater than zero, e.g. 10%

Rotate the TOUCH and PLAY knob in the main window to open the fuel level window.

Tip: the fuel level can be viewed in the room panel ecoSTER200. The room panel is not standard equipment of the regulator.

Operation of fuel level indicator

Any time upon filling fuel tank, press and hold pressed current fuel level value. Following prompt appears

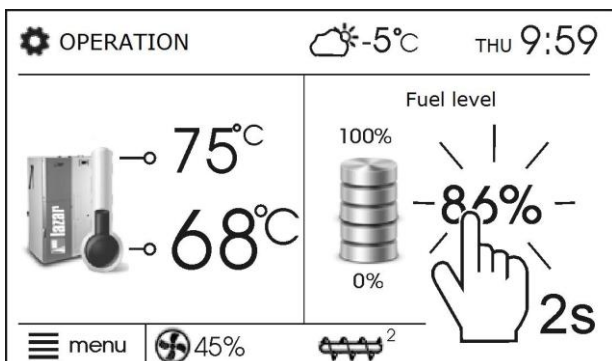


Fig. 8 Operation of fuel level indicator

"Set fuel level at 100% Once selected and confirmed YES, fuel level is set at 100%.

Note: 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% level of the fuel tank and set 100% level as described above.

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%

8.21 Operation with additional feeder

Regulator is adapted to work with fuel charging sensor, which is part of boiler fittings.

On the basis of the settings made in the schedule of additional feeder operation in menu

Schedule of extra feeder

and signals received from the fuel level sensor, the regulator controls replenishment of fuel in boiler bin.

Upon activation set by time interval of the schedule, second feeder starts to operate according the algorithm defined by the parameters and described in sec. 14.13. During operation of additional feeder, signal of bin charging sensor is used.

8.22 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.



8.23 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. Access to manual control menu is possible only in STOP mode, i.e. when the boiler is OFF.

Manual control	
Fan	ON
Feeder	OFF
Boiler pump	OFF
Lighter	OFF
HUW pump	OFF

Fig. 9 Manual control window; OFF – equipment is switched OFF, ON – equipment is switched ON.



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

of hazardous conditions.

8.24 Operation in accordance with the schedule

The boiler may be set to start in selected time intervals. Time intervals are set in:

Menu > Operation in accordance with the schedule

Note: the option of **Operation in accordance with the schedule** may be not available if the boiler manufacturer did not include this function in the given boiler.

8.25 Favourite menu

In the bottom screen bar there is a key:



. Upon activation of this key, a quick selection menu appears. To add new item to this menu - hold respective icon pressed in pie menu for a while.

To remove selected item from favourite menu - hold corresponding icon pressed and confirm REMOVE.

REGULATOR INSTALLATION AND SERVICE SETTINGS MANUAL

ecoMAX810P3-L TOUCH

9 Service - Menu structure

Service settings.
Boiler settings
CH and HUW settings
Mixer 1-4 settings*
Show advanced setup NO / YES
Restore defaults settings
Touch screen calibration

Boiler settings
Firing-up
Output modulation
Burning off
Supervision
Lambda sensor*
Thermostat selection*
Min boiler temperature
Max boiler temperature
Minimum airflow output
No fuel detection time
Ex.temp.w.no fuel
Reserve boiler*
Alarms
Boiler cooling temperature
Parameter A FL
Parameter B FL
Parameter C FL

Firing-up
Firing-up airflow
Ignition test time
Ignition test time 2
Feeding time
Firing-up time
Ex.temp.delta
Ex.temp.delta 2
Ex.temp.at the end of fired-up
Test dose

Output modulation
100% Blow-in output
100% Feeder operation
100% Feeder interval
50% Blow-in output
50% Feeder operation
50% Feeder interval
30% Blow-in output

30% Feeder operation
30% Feeder interval

Burning off
Burning off time
Air flush intensity

Supervision
Supervision time
Feed time
Feed interval
Airflow oper.extend

Lambda sensor*
Operation with Lambda sensor
Parameter A Lambda
Parameter B Lambda
Parameter C Lambda
Airflow correction range
Feed lock
Fuel detection - oxygen
Fuel detection - time

CH and HUW settings
CH pump activation temp.
CH pump standstill when load. HUW
Min. HUW temp.
Max. HUW temp.
Boiler inc. by HUW, Mixer
Extending HUW pump operation time
Exchanger
Boiler pump lock

Mixer 1-4 settings *
Mixer support
Thermostat selection
Min. mixer temp.
Max. mixer temp.
Proportional range
Integr. time const.
Valve opening time
Pump off by therm.
Mixer input dead zone

*- menu for all mixer cycles is identical

10 Hydraulic diagrams

10.1 Schema 1

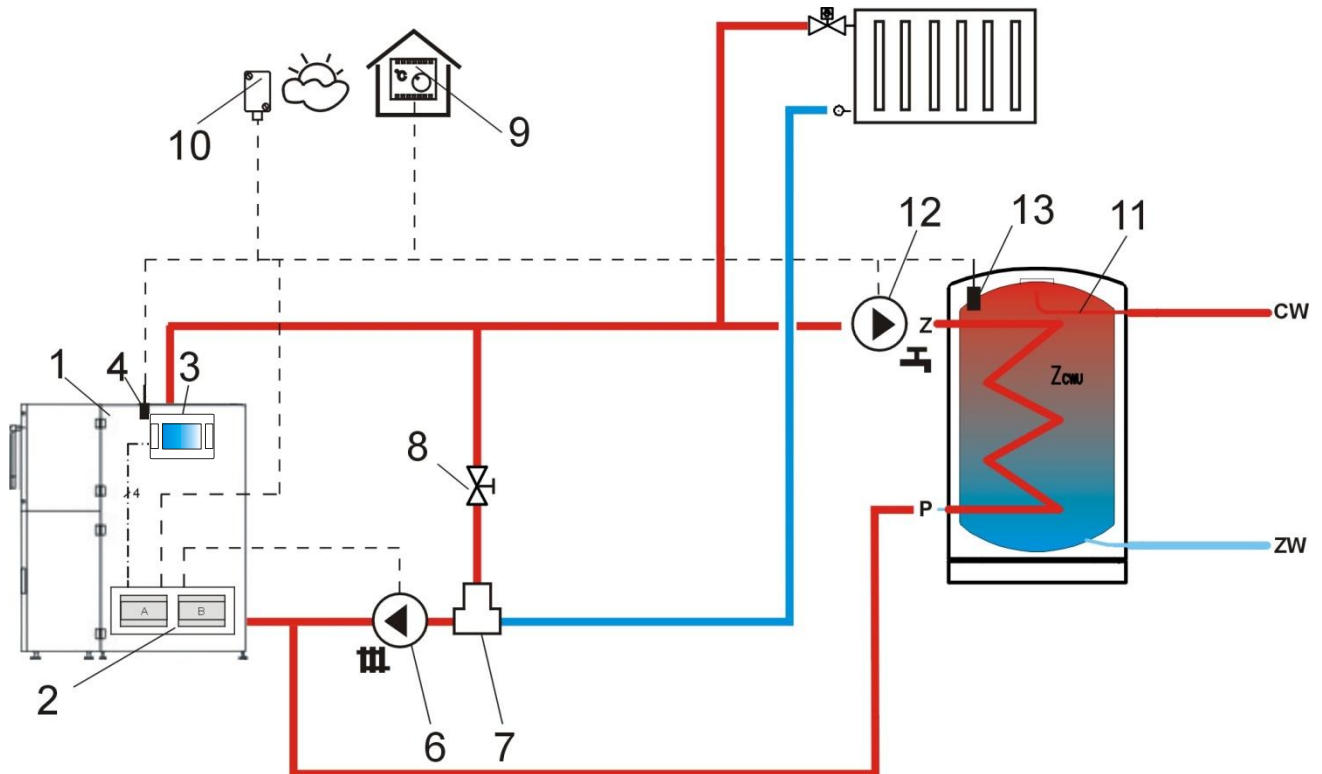


Fig. 10 **Diagram with thermostatic three-way valve which protects the temperature of return water¹**, where: 1 – boiler with feeder, 2 – ecoMAX810P3-L regulator, 3 – regulator control panel, 4 – boiler temperature sensor, 6 – central heating cycle pump, 7 – thermostatic three-way valve, 8 – throttle (poppet) valve, 9 – room thermostat, 10 – temperature sensor-weather, 11 – domestic hot water tank, 12 – domestic hot water pump, 13 – domestic hot water temperature sensor.

RECOMMENDED SETTINGS:

Parameter	Setting	MENU
Mix 1 support	OFF	MIXER 1 SERVICE SETTINGS

Short operation description: CH pump (6) and HUW pump (12) start once the boiler temperature has exceeded *CH pump activation temperature* (usually: 40°C). In case the water, which flows to the boiler is cold, thermostatic valve (7) closes. It causes the flow of boiler water in short circuit: boiler (1) – throttle valve (8) - thermostatic valve (7) – pump (6). Thermostatic valve (7) opens upon increase of boiler return temperature and directs boiler water to CH system. Once the temperature measured by the sensor (13) has dropped to below *Pre-set HUW temperature*, HUW pump (12) starts operation. HUW pump (12) stops upon completed filling of HUW container (11), i.e. when the temperature measured by the sensor (13) is equal to *Pre-set HUW temperature*.

¹The presented hydraulic diagram does not replace the central heating system design and is provided solely for the purposes of demonstration!

10.2 Schema 2

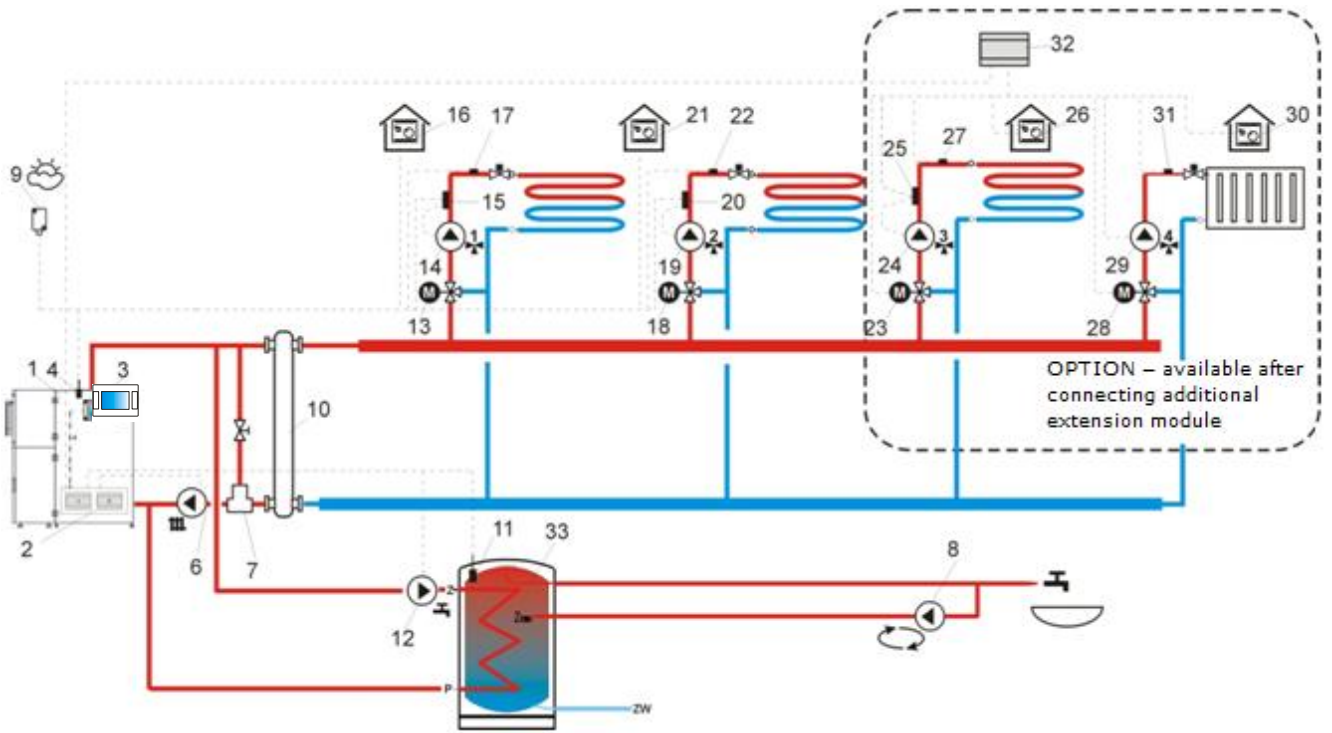


Fig. 11 **Diagram with thermostatic three-way valve which protects return water temperature, and two three-way valves which feed floor heating, as well as with two additional mixer cycles after connecting an extension module²**, where: 1 – boiler, 2 – ecoMAX810P3-L TOUCH regulator, 3 – control panel, 4 – boiler temperature sensor, 6- central heating cycle pump, 7 – thermostatic three-way valve (protecting boiler return), 8 – circulating pump, 9 –temperature sensor-weather, 10 – fluid coupling (eliminates necessity of balancing the pumps’ flows), 11 – domestic hot water temperature sensor, 12 – domestic hot water pump, 13 – mixer servo 1, 14 – mixer pump 1, 15 – external thermostat protecting floor heating 55 °C (it cuts off electricity supply for mixer pump after exceeding maximum temperature - the thermostat is not included in the regulator), 16 –room thermostat of mixer 1, 17 – mixer temperature sensor 1,18 –mixer servo 2, 19 – mixer pump 2, 20 – external thermostat protecting floor heating 55 °C, 21 – mixer room thermostat 2, 22 – mixer temperature sensor 2,23 – mixer servo 3, 24 – mixer pump 3, 25 – external thermostat protecting floor heating 55 °C, 26– room thermostat of mixer 3, 27 – mixer temperature sensor 3,28 –mixer servo 4, 29 – mixer pump 4, 30 – room thermostat of mixer 4, 31 – mixer temperature sensor 4, 32 – extension mixer module, 33 – domestic hot water tank.

SUGGESTED SETTINGS:

Parameter	Setting	MENU
Mixer support 1	Floor on	service settings -> mixer 1 settings
Max. pre-set mixer temp. 1	50 °C	service settings -> mixer 1 settings
Mixer weather control 1, 2, 3, 4	On	menu-> mixer settings 1,2,3,4
Mixer heating curve 1	0.2 – 0.6	service settings -> mixer 1 settings
Mixer support 2	Floor on	service settings -> mixer 2 settings
Max. pre-set mixer temp. 2	50 °C	service settings -> mixer 2 settings
Mixer heating curve 2	0.2 – 0.6	service settings -> mixer 2 settings
Mixer support 3	Floor on	service settings -> mixer 3 settings
Max. pre-set mixer temp. 3	50 °C	service settings -> mixer 3 settings
Mixer heating curve 3	0.2 – 0.6	service settings -> mixer 3 settings
Mixer support 4	CH on	service settings -> mixer 4 settings
Max. pre-set mixer temp. 4	80 °C	service settings -> mixer 4 settings
Mixer heating curve 4	0.8 – 1.4	service settings -> mixer 4 settings
Boiler weather control	off	service settings -> boiler settings

²The presented hydraulic diagram does not replace the central heating system design and is provided solely for the purposes of demonstration!

11 Technical data

Voltage	230V~; 50Hz;
Current consumed by regulator	$I = 0,04 A^3$
Maximum rated current	6 (6) A
Regulator protection rating	IP20, IP00 ⁴
Ambient temperature	0...50 °C
Storage temperature	0...65 °C
Relative humidity	5 - 85% without vapour condensation
Measuring range of temperature sensors CT4	0...100 °C
Measuring range of temperature sensors CT4-P	-35...40 °C
Accuracy of temperature measurements with sensors CT4 and CT4-P	2 °C
Temperature measure range for CT2S sensors	0..380 °C
Terminals	Screw terminal on the mains voltage side 2,5mm ² Screw terminals on the control side 1,5mm ²
Display	Color display 480x272 with touch panel
External dimensions	Control panel: 164x90x40 mm Executive module: 140x90x65 mm
Total weight	1,0 kg
Norms	PN-EN 60730-2-9 PN-EN 60730-1
Software class	A
Protection class	To be built into class I devices

³ This is the current consumed by the regulator (after connecting 2 executive modules and panel). Total electricity consumption depends on devices connected to the regulator.

⁴ IP20 – from the front side of the executive module, IP00 – from the side of terminals of the executive module.

12 Conditions of storage and transport

The regulator cannot be exposed to direct effects of weather, i.e. rain and sunlight. Storage and transport temperature cannot exceed the range of -15...65 °C.

During transport, the device cannot be exposed to vibrations greater than those typical of normal road transport.

13 MOUNTING REQUIREMENTS

Basic version of the equipment is composed of three modules: control panel and two working modules. All components are electrically interconnected.

13.1 Environmental conditions

Due to the risk of fire is prohibited to use the controller in explosive gas and dust environment (eg coal). Regulator should be separated using appropriate enclosure.

In addition, controller cannot be used in the presence of water vapor condensation and be exposed to water.

13.2 Installation requirements

The regulator should be installed by a qualified and authorised fitter, in accordance with the applicable norms and regulations.

The manufacturer bears no responsibility for damages caused by failure to observe this manual.

The regulator is to be built-in. The regulator cannot be used as a stand-alone device.

The temperature of the ambient and the fitting surface cannot exceed the range of 0 - 50 °C. In the basic version, the device consists of three modules, including control panel and two executive modules. All parts are electrically interconnected.

13.3 Assembly of control panel

Control panel is designed to be attached to a mounting plate. Provide appropriate heat insulation between hot boiler walls and control panel and cable harness. Space required to assemble control panel of the regulator is shown in Fig. 24. When installing follow the instructions given below.

Drill a hole in the mounting plate acc. the below drawing.

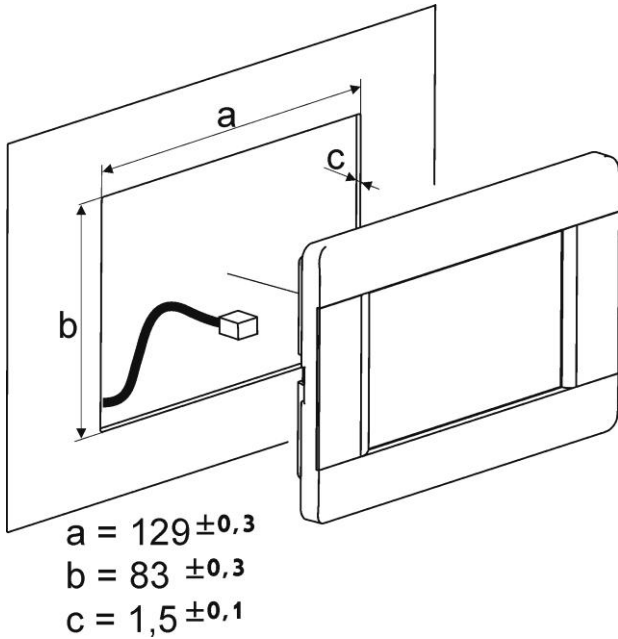
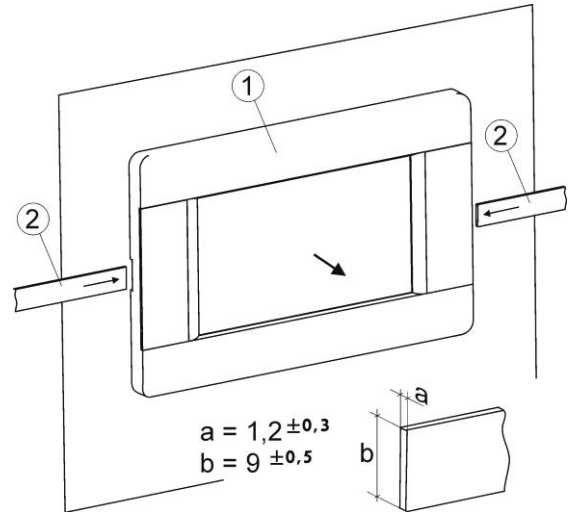


Fig. 12 Installation of control panel in mounting plate

13.4 Disassembly of control panel



To remove the control panel (1) from the housing - insert flat elements (2) into indicated slots to release housing catches and remove the panel (1).

13.5 Mounting of working module

Module housing does not assure dust- or waterproofness. To provide the required protection, appropriate module cover should be provided. Assembly shall assure IP rating appropriate to the environment conditions, in which the regulator will operate. Moreover, access of the user to live parts under hazardous voltage (e.g. terminals) shall be prevented. Standard housing may be used to accommodate the regulator. In such case the user will have access to front surface of working module. Housing may be also formed by boiler elements surrounding the whole module- see Fig. 16b. Space required for mounting a single working module is shown in Fig. 15.

The working module is designed to be mounted on standard DIN TS35 rail. Fasten the rail firmly to a rigid surface. Prior to placing the modules on the rail (1) - lift up the catches (2) using screwdriver - see Fig.15.

Now, place the modules on the rail and press the catches (2) to bring them to original position. Make sure the device is firmly fastened and cannot be easily removed from the rail without use of tools.

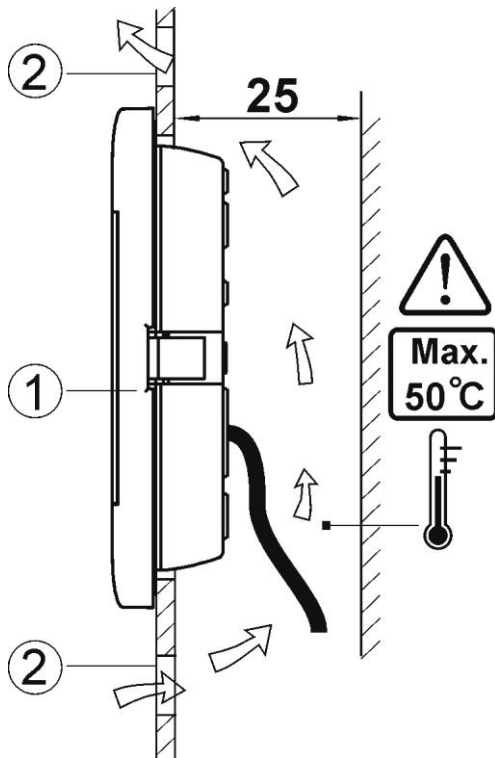


Fig. 13 Control panel mounting requirements. 1 - control panel, 2 - vent holes to provide air circulation (note: the holes may not cause downgrading of required IP rating. They are not required if permitted ambient temperature around the control panel is not exceeded.)

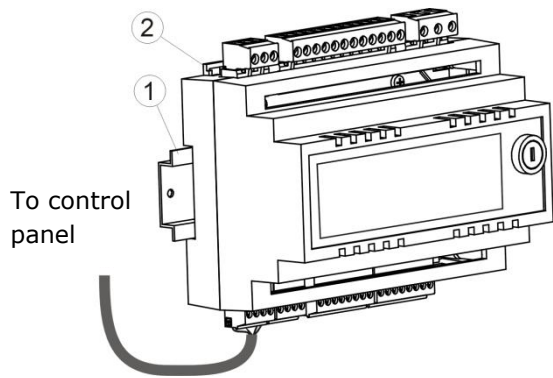


Fig. 14 On-rail-mounted regulator. 1- DIN TS35 rail, 2 - catches.

For safety reasons, assure the safe distance between live parts of working module terminals and conductive (metallic) elements of housing (min.10mm) is kept. Connecting wires should be protected from tearing and loosening or so arranged that stress transfer to wire connections with regulator terminals is prevented.

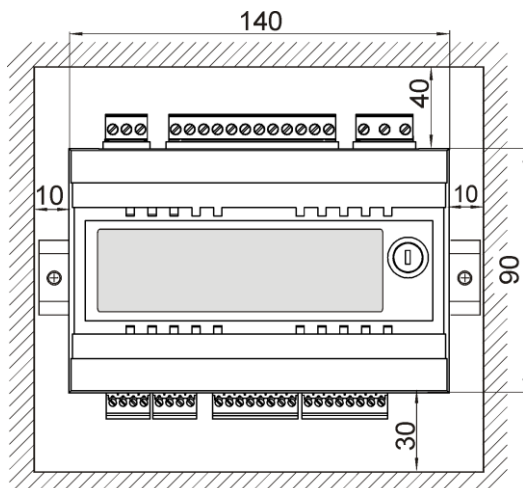


Fig. 15 Space requirements for mounting single working module

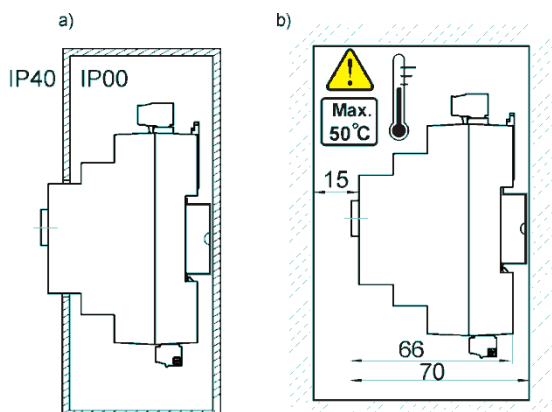


Fig. 16 Methods of module installation: a - in modular housing with access to front surface, b - in the cover without access to front surface.

13.6 IP rating

The housing of working module of the regulator provides various IP ratings, subject to the manner of assembly. Explanations - see Fig. 16a. Upon assembly carried out in accordance with this drawing, IP20 rating is provided at the front side of working module housing (this rating is specified on the rating plate). The housing has IP 00 rating at the side of connecting terminals, therefore, the terminals of working module have to be isolated and access to this section of the housing must be prevented.

To get access to the terminals, disconnect power supply, make sure terminals and wires are free of mains voltage and remove the housing of working module.

13.7 Electric connection

Regulator is suitable to work with power supply of 230VAC, 50Hz. Power supply features:

- 3-wires (with protective wires),
- compliant with applicable regulations

Note: Upon **switching-off** the regulator using keyboard, hazardous voltage may be present on its terminals. Before commencement of assembly works, disconnect external power supply and make sure terminals and wires are free of hazardous voltage.



Connecting wires should not contact surfaces temperature of which exceeds their rated operating temperature.

Terminals no.1-15 of each module are designed to connect equipment supplied with 230VAC.

Terminals 16-31 are intended to connect LV equipment (supply voltage below 12V).

Connection of external power supply of 230VAC to terminals 16-31 or to data transmission interface RS485 will cause damage to the regulator and create risk of electric shock!



Endings of connecting wires (particularly power supply ones) have to be protected from lamination using insulated clamping sleeves shown on the drawing below:

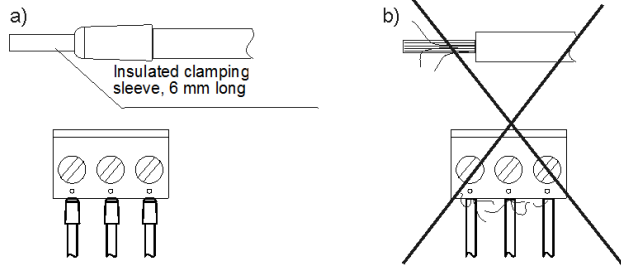


Fig. 17 Wire ending protection:
a) correct, b) incorrect

Connect power supply wires to terminals indicated with an arrow.

13.8 Protective connection

Connect protective wire of power supply cable to ground strip linked with metal boiler housing. Connect coupling to the terminal of the regulator indicated with a sign \oplus and to earthing terminals of devices connected to the regulator.

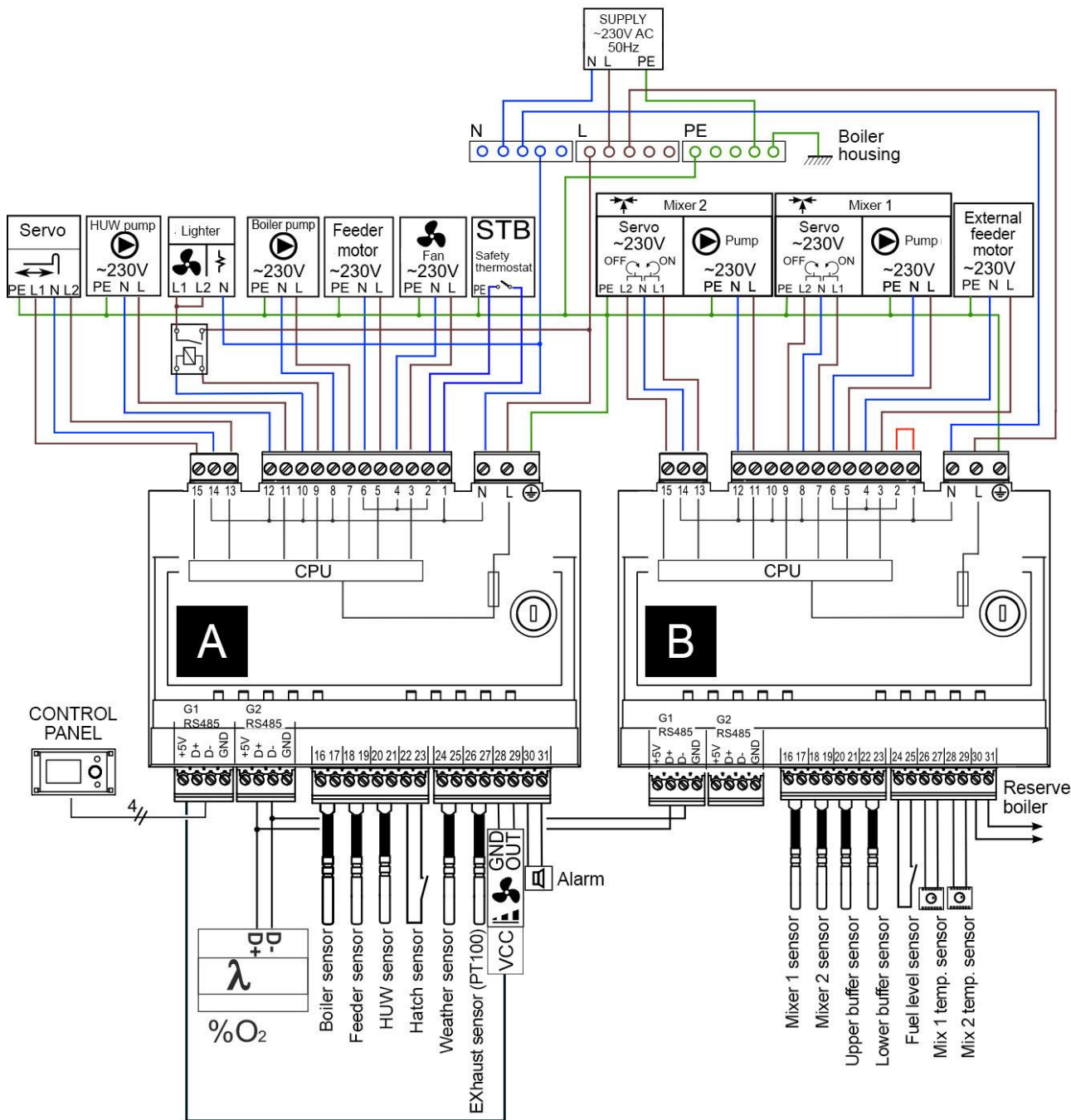


Fig. 18 Wiring diagram of sensors for A and B module.



For safety reasons, the regulator shall be equipped with the set of pins inserted to 230 VAC power supply connectors, even in case no load is connected to the given strip.

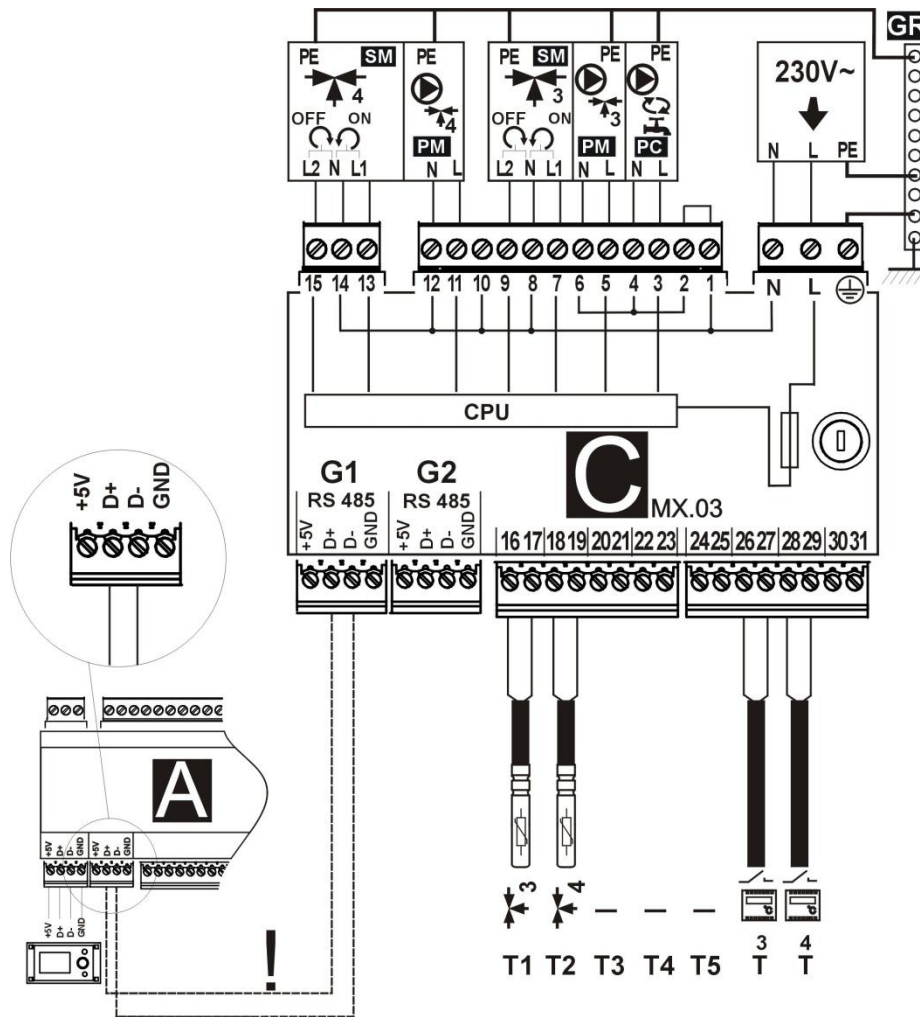


Fig. 19 Wiring diagram for module C(MX.03): T1 – mixer circuit temperature sensor (type: CT4), T2 – mixer circuit temperature sensor (type: CT4), T – room thermostat, ! – use only two wires for connection (do not make connection using four wires - risk of regulator damage), A – ecoMAX810P3-L TOUCH main regulator, P3; power supply cable 230VAC, Z – jumper (insulated electric connection), SM – mixer servo, PM – mixer pump, PC – HUW circulating pump, GR – ground strip.

13.9 Connection of temperature sensors

Regulator works with sensors -type: CT4 and CT2S only. Use of other sensors is not allowed.

Sensor wires may be extended using wires of cross-section area not less than 0.5 mm². Total length of wires of each sensor should not exceed 15 m.

Insert boiler temperature sensor into thermometer well fastened to boiler shell. Fasten feeder temperature sensor to the surface of feeder screw tube. Insert temperature sensor of HUW container into thermometer well welded to the container. The best way to mount mixer temperature sensor is to insert it into a sleeve located in the stream of flowing water, however, it is also allowed to fasten the sensor in a contact manner provided that the sensor and the pipe are properly heat-insulated.



Sensors shall be protected against loosening from surfaces they are mounted to.

Make sure thermal contact between the sensors and the surface which temperature is measured is good. Apply thermal paste to improve the contact. Pouring sensors with oil or water is not allowed.

Sensor wires should be separated from power supply wires. Otherwise, temperature indications may be erroneous. Min. distance between these wires should be 10 cm.

Do not allow sensor wires to contact hot parts of the boiler and heating system. Wires of temperature sensors are heat resistant to the temperature not exceeding 100°C.

13.10 Connection of weather sensor

Regulator works with weather sensors -type: CT4-P only. Fasten the weather sensor on the coldest wall of the building - usually it is a roofed area of north wall. The sensor should not be exposed to direct sunlight or rainfall. Install the sensor at the height of min. 2 m above ground level in the location away from windows, chimneys and other heat sources, which may interfere temperature measurements (min. distance:1.5 m).

Use cable of wire with cross section area of min. 0.5 mm² and length of up-to 25 m to connect the sensor. Wire polarization is irrelevant. Connect other cable end to regulator terminals as shown in Fig. 18.

Bolt the sensor to the wall using erection bolts. Holes for bolts are accessible upon removal of sensor housing lid.

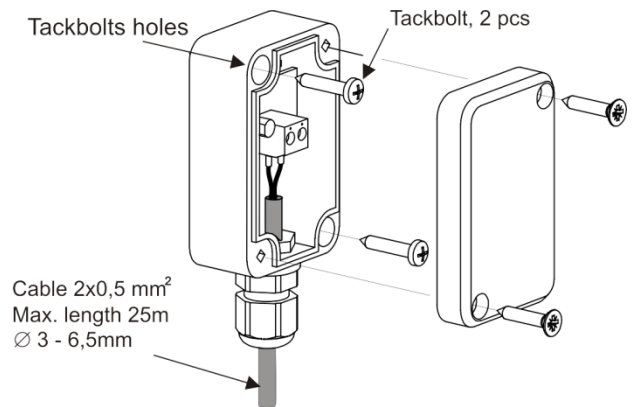


Fig. 20 Connection of weather sensor CT4-P.

13.11 Testing of temperature sensors

CT4/CT4-P/CT2S temperature sensors may be tested by measuring their resistance at the given temperature. In case of significant differences between the measured resistance and the values indicated in the table below - replace the sensor.

Regulator works with exhaust temperature sensors - type: CT2S only. To test CT2S sensor use very accurate multimeter - otherwise, only very rough testing is possible.

Once the pellet-fired boiler has been fired-up and its temperature has exceeded preset value e.g. by 25°C, ecoMAX810P3-L TOUCH regulator stops reserve boiler (supplies 6VDC voltage to terminals 30-31 of module B). Coil of U3 module relay energizes and relay contacts open. Once the boiler temperature has dropped below the value set in the parameter of *Reserve boiler deactivation temperature*, regulator stops to supply voltage to terminals 30-31, and reserve boiler switches on.



Entry of regulator to OFF mode causes the reserve boiler switches on.

It is recommended to change-over ecoMAX810P3-L TOUCH regulator to OFF mode once the pellet boiler has failed and there is a need to use reserve boiler. In OFF mode, control of CH system is disabled (mixer, HUW and boiler pumps and mixer control are inactive).

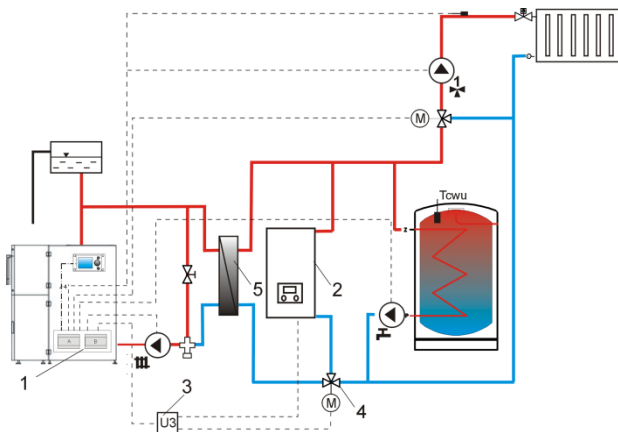


Fig. 22 Hydraulic diagram with reserve boiler; connection of open and close circuits 1 – regulator ecoMAX, 2 – reserve boiler, 3 – module U3, 4 – switching valve (with limit switches), 5 – heat exchanger - recommended settings: *HUW priority = OFF, CH pump = boiler pump = YES.*

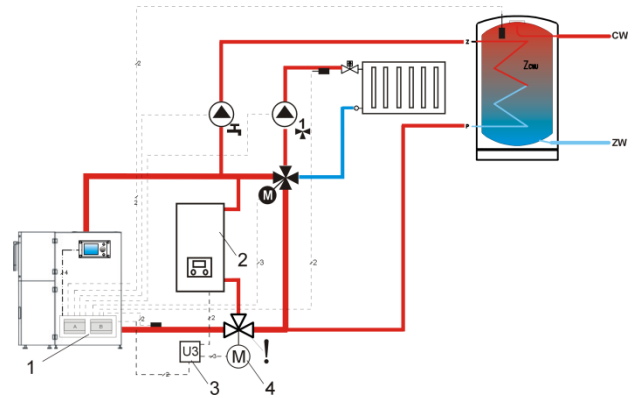


Fig. 23 Hydraulic diagram with reserve boiler and 4-way valve in close circuit. 1 – regulator ecoMAX, 2 – reserve boiler, 3 – module U3, 4 – switching valve servo (with limit switches)

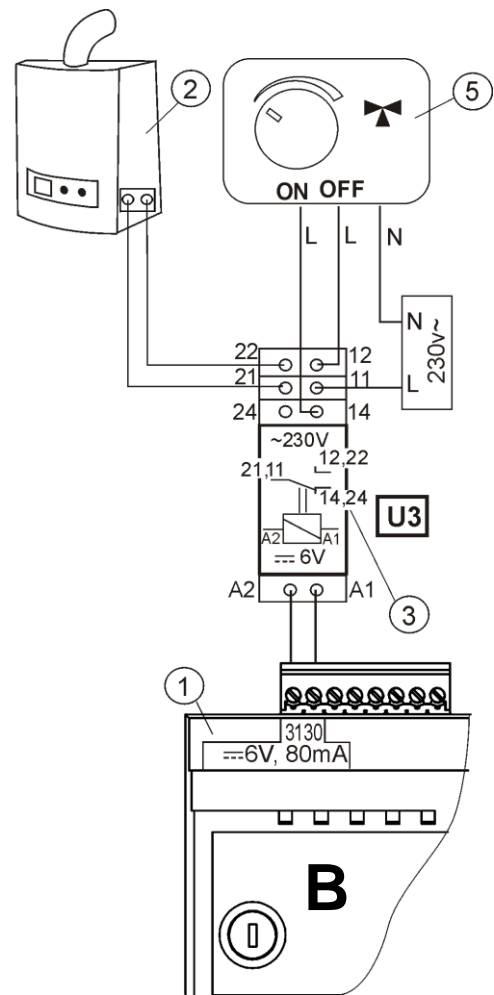


Fig. 24 Wiring diagram of control of switching valve in reserve boiler. 1 – ecoMAX810P3-L TOUCH regulator module B, 2 – reserve boiler, 3 – module U3, 5 – switching valve servo (with limit switches).

13.14 Connection of alarm announcing

Regulator may announce alarm conditions by activating external device (e.g. bell or GSM device to send SMS).

Connect alarm annunciator as shown in the figure below through relay (3) to ecoMAX810P3-L TOUCH regulator - module A (1).

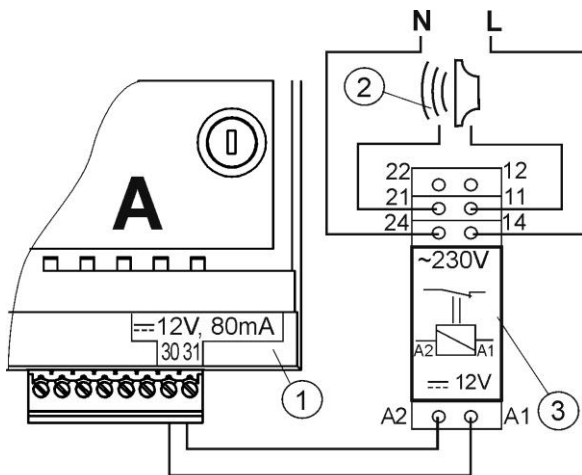


Fig. 25 Connection of external alarm annunciator. 1- ecoMAX810P3-L TOUCH regulator - module A, 2 - external alarm annunciator, 3 - relay (e.g. RM 84-2012-35-1012 RELPOL) with GZT80 RELPOL base plate.

For proper operation, set proper value of the parameter: *Active alarm signal code* in: **SERVICE SETTINGS > BOILER SETTINGS > Alarms**

When "127" has been set - in case of any alarm occurred, voltage is applied between contacts 30-31 (alarm output is ON). Setting this parameter at "0" causes the regulator to not activate the output in case of occurrence of any alarm.

Alarm output may be also set up to activate upon occurrence of one or more specifically selected alarms. The values of this parameter to be set for respective alarms are given in the table below:

Exhaust temperature sensor damage	Excess of boiler temperature	Excess of feeder temperature	CH boiler temperature sensor damage	Feeder temperature sensor damage	Unsuccessful boiler firing-up attempt	Fan damage
AL 1	AL 2	AL 3	AL 4	AL 5	AL 6	AL 7
1	2	4	8	16	32	64

Example: when this parameter is set at "8", alarm output is activated only upon occurrence of AL4 alarm. Setting "1" activates the output only in case of AL1 alarm. In case the output should signal few selected alarms (e.g. AL2 and AL4 alarms) - sum-up the values indicated in the table for individual alarms (i.e. 2 + 8 = 10) and set this parameter at this value. If any of the alarms AL1, AL2, AL3 should be announced - set this parameter at "7".

13.15 Connection of mixer

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 30 to 255 s may be used.

Description of mixer connection:

- disconnect power supply to the regulator,
- determine direction of servo closing/opening and connect electrically mixer and regulator acc. technical documentation (be careful - do not mistake direction of valve opening with its closing)
- connect mixer temperature sensor and mixer pump,
- switch on the regulator and set proper time of valve opening (indicated in servo documentation) in mixer service setting: **SERVICE SETTINGS > Mix1 settings > Valve full opening time**
- connect power supply to the regulator and switch on the regulator to start the mixer pump,
- verify whether the servo opens in correct direction (to do this - enter the menu **Info** and the tag of selected mixer or use the option to control manually equipment connected to the regulator. If the mixer does not open in correct direction - change wiring (disconnect power supply to the regulator at first).

13.16 Connection of circulating pump

Circulating pump may be connected to ecoMAX810P3-L TOUCH boiler regulator only upon installing the extension of working module.

13.17 Connection of STB temperature limiter

To avoid boiler overheating in case of regulator failure, STB or other safety temperature limiter proper for the given boiler has to be provided.

Connect STB limiter to terminals 1-2 of working module shown in Fig. 18. Once the limiter has tripped, fan and fuel feeder motor are OFF.



Safety temperature limiter should be suitable to operate at rated voltage min.230V AC and hold required certificates of approval.

In case the limiter is not installed- bridge the terminals 1-2 using insulated wire of cross-section area of min.0.75 mm² with insulation enough thick to meet safety requirements for the boiler.



Acc. recent regulations, use of safety temperature limiters is mandatory.

13.18 Connection of room control panel

Regulator may be equipped with ecoSTER-TOUCH room control panel, which may perform following functions:

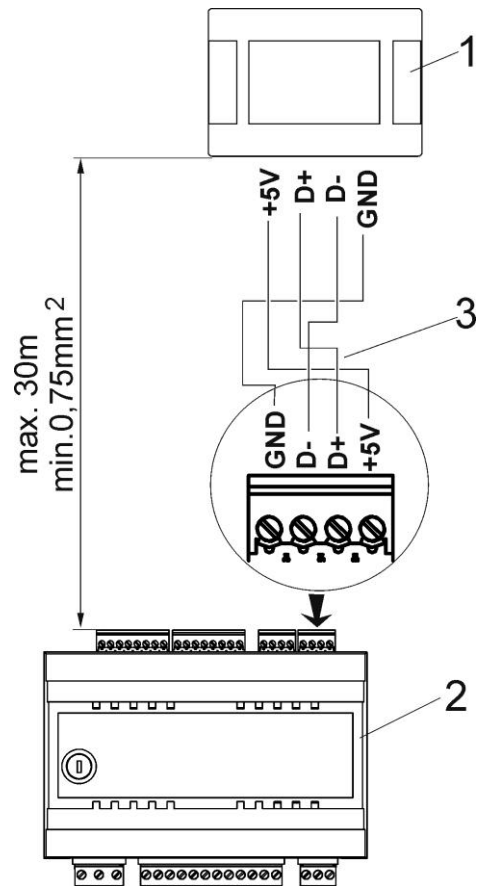
- room thermostat,
- boiler control panel
- alarm annunciator,
- fuel level indicator.



Note: Cross-section area of wires used to connect ecoSTER-TOUCH control panel should be of min. 0.75mm² and its max. length should not exceed 30 m.

This length may be longer if the wires used have cross-section area larger than 0.75mm²

4-wire connection:



2-wire connection:

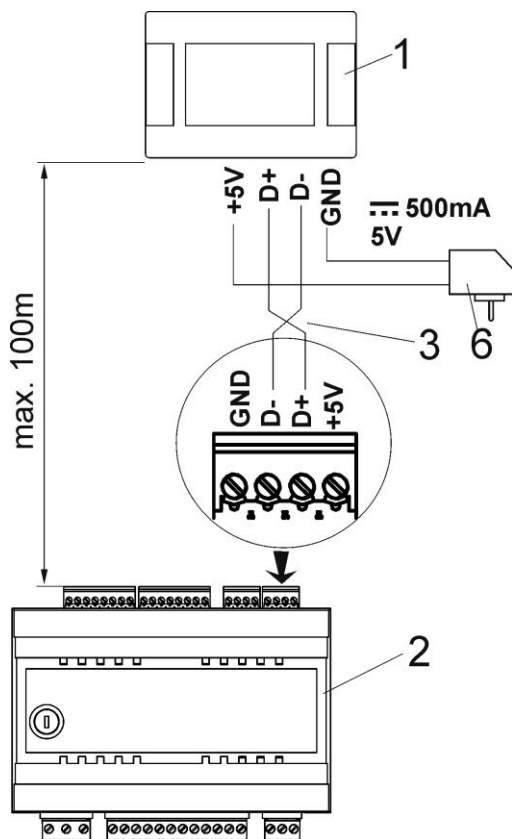
For two-wire connection, power supply of 5 V DC and rated current of min. 500 mA is required.

Points to supply ecoSTER-TOUCH:

Connect GND and +5 V to external source of supply⁵.

Connect lines D+ and D- acc. wiring diagram provided below.

⁵ PS unit is not included in the regulator supply.



14 BOILER SERVICE SETTINGS

14.1 Firing-up

All parameters, which affect firing-up process are grouped in the menu:

SERVICE **SETTINGS** >
BOILER SETTINGS > FIRING-UP

Details of the parameters, which are responsible for firing-up process are given in sec. 8.4.

14.2 Burning-off

All parameters, which affect burning-off process are grouped in the menu:

SERVICE **SETTINGS** >
BOILER SETTINGS > BURNING OFF

Details of the parameters, which are responsible for burning-off process are given in sec. 8.9.

14.3 Supervision time

It is the max. time over which the regulator remains in SUPERVISION mode. If there is no need to start heating again within this period of time, the regulator automatically proceeds to burning-off mode (see sec. 8.8).



Setting this parameter at „0” disables *SUPERVISION* mode, and regulator proceeds directly from *OPERATION* to *BURNING OFF* mode.

14.4 Feed. time SUPERV.

It is the time of fuel feeding and fan operation in *SUPERVISION* mode - see sec. 8.8.



Setting this parameter at „0” causes that only fan will be ON in *SUPERVISION* mode.



Value of this parameter may not be too high because it may lead to boiler overheating in *SUPERVISION* mode. In *SUPERVISION* mode, boiler temperature must slowly drop.

14.5 Feeder Intercal SUPERV.

It is the time of fuel feeding interruption in *SUPERVISION* mode -see sec. 8.8.



Value of this parameter may not be too small because it may lead to boiler overheating in *SUPERVISION* mode. In *SUPERVISION* mode, boiler temperature must slowly drop.

14.6 Airflow oper. extend. in SUPERVISION mode

In *SUPERVISION* mode of boiler operation, once the fuel dose has been supplied and the feeder stopped, the fan remains in operation for a time set in "*Airflow oper. extend.*" to fire-up the fuel dose supplied.



Setting this parameter at "0" causes the fan to be OFF in *SUPERVISION* mode.



Value of this parameter may not be too high because it may lead to boiler overheating in *SUPERVISION* mode. In *SUPERVISION* mode, boiler temperature must slowly drop.

14.7 Thermostat selection

SERVICE SETTINGS > BOILER SETTINGS > Thermostat selection

This option enables selection of room thermostat for boiler circuit in case ecoSTER room control panel is connected or mechanical thermostats connected to working module B are used. Following options are available:

- OFF ,
- *Standard 1* – standard NO/NC thermostat connected to terminals 26-27 of module B,
- *Standard 2* – standard NO/NC thermostat connected to terminals 28-29 of module B,
- *ecoSTER1* – thermostat 1 in ecoSTER,
- *ecoSTER2* – thermostat 2 in ecoSTER,
- *ecoSTER3* – thermostat 3 in ecoSTER.

If ecoSTER is not connected, only options related to operation with standard room thermostats are available in the menu.

14.8 Min. preset boiler temperature

This parameter is used to prevent the user to set too low value of preset boiler temperature. Boiler operation at too low temperature may cause its quick damage, corrosion, dirt, etc. The algorithms, which automatically reduce the temperature, do not cause the fall of preset boiler temperature below the minimum value configurable in this parameter.



Set this value acc. recommendation of boiler manufacturer

14.9 Max. pre-set boiler temperature

This parameter is used to prevent the user to set too high value of preset boiler temperature.

The algorithms, which automatically increase the temperature (correction acc. heating curve or to required HUV temperature), do not cause the increase of boiler temperature above the maximum value configurable in this parameter.



Set this value acc. recommendation of boiler manufacturer.

14.10 Min. blow-in output

During first start-up of the boiler, set the minimum blowing power, which may be selected by the user.

SERVICE SETTINGS > BOILER SETTINGS > Minimum blow-in output

This parameter protects the fan from damage caused by operation with too low rotary speed. Min. blowing power should be set basing upon observations of fan behaviour; some reserve should be also considered.

Upon setting e.g. 20% the user will be able to set the blowing power not less than 20%.

14.11 No fuel detection time

Lack of fuel in main boiler bin may be detected by the regulator basing upon exhaust temperature. In case the exhaust temperature has been lower than the value set in the parameter

SERVICE SETTINGS > BOILER SETTINGS > Ex.temp.w.no fuel

over the time longer than the value set in the parameter:

SERVICE SETTINGS > BOILER SETTINGS > No fuel detection time

the regulator proceeds from OPERATION do FIRING-UP. If there is no fuel in the bin, FIRING-UP process will be concluded with a message "furnace fire-up is impossible".

14.12 Maximum feeder temperature

It is the temperature at which the protection against flashback to fuel feeder trips. This function is described in sec. 22.3

Setting *Maximum feeder temperature* at "0" enables



disconnection of feeder sensor and regulator operation without this sensor. Nevertheless, this setting is not recommended because flashback prevention function is disabled.

14.13 Poker cycle time

Poker operation is set in the parameter:

SERVICE SETTINGS > BOILER SETTINGS > Poker cycle time

This parameter determines the time required to move away the poker only. Full poker cycle time is twice so long, because the poker has to return to its home position upon completion of work.

14.14 Reserve boiler

The temperature of pellet-fired boiler at which reserve boiler (e.g. gas fired boiler) will switch off is set using this parameter. Details - see sec.13.15.

14.15 Boiler cooling temp.

The temperature at which preventive boiler cooling will start. Detailed description of this procedure is provided in sec.22.2.

It is recommended to set *Boiler cooling temp.* at the value below the value at which safety temperature limiter will trip to avoid interruptions of boiler operation caused by overheating.



14.16 A, B, C parameters of Individual Fuzzy Logic

A, B and C parameters of Individual Fuzzy Logic decide how fast the boiler temperature will reach its pre-set value and affect stability in keeping the preset boiler temperature in *Individual Fuzzy Logic* mode. These parameters have no effect on combustion quality in *Individual Fuzzy Logic* mode, because it is automatically controlled.

Change of these parameters is not recommended if boiler output change rate is satisfactory.

Parameter A	The higher this value is the higher the boiler output increase rate is. The higher this value is the faster the boiler temperature approaches the preset value. Too high value may cause instability in keeping the preset boiler temperature. Available setting range: 6..8, recommended set value: 6.
Parameter B	The higher this value is the lower the boiler output increase rate is. The higher this value is the slower the boiler temperature approaches the preset value. Setting higher value gives more probability that oscillations of preset boiler temperature will not occur. Too low

	value may cause instability in keeping the preset boiler temperature. Available setting range: 20...30, recommended set value: 30.
Parameter C	Proper setting of this parameter enables improvement of stability in keeping the preset boiler temperature. Too high value set may result in large fluctuations of boiler temperature. Change of factory setting is not recommended.

15 CH AND CUW SERVICE SETTINGS

15.1 CH pump activation temperature

This parameter determines the temperature at which CH pump will be activated. Once the temperature set in the parameter *CH pump activation temperature* has been reached, the CH pump is activated. This protects the boiler from dew caused by cold water returning from the system.

Switching-on of CH pump only does not guarantee protection of the boiler from dew and from the resulting corrosion. Additional automation equipment (e.g. 4-way valve) should be used.



15.2 CH pump standstill at HUW loading

Too long time of HUW container filling at active HUW priority may lead to excessive cooling down of CH system because CH pump is switched off at these settings.

The parameter of *CH pump standstill time during HUW filling* prevents it by periodic CH pump activation during HUW container filling. CH pump starts, runs over a fixed time set at 30s, stops for the time set in this parameter and starts again.

15.3 Min HUW temperature

This parameter is used to prevent the user to set too low pre-set HUW temperature.

15.4 Max HUW temperature

This parameter defines max. temperature to which HUW container will be heated-up during discharge of excess heat from the boiler in emergency conditions. This

parameter is very important, because setting of too high value may cause the risk of burning the users with hot utility water. On the other hand, too low value of this parameter will cause that in case of boiler overheating excessive heat cannot be removed to HUW container.



When designing HUW system, possibility of regulator failure should be considered. In case of regulator failure, water in HUW container may heat-up to hazardous temperature, which may create the risk of burning.

THEREFORE, SOME OTHER PROTECTION (E.G. THERMOSTATIC VALVES) SHOULD BE USED.

15.5 Increase of boiler temperature by HUW, mixer circuit and buffer status

This parameter determines by how many degrees the preset boiler temperature will be increased to fill HUW container, buffer and mixer circuit. Temperature is increased only if required. Once the preset boiler temperature has reached sufficient value to fill HUW container, buffer and mixer circuit, the regulator stops its further increase.



The process of increasing preset boiler temperature to fill HUW container is indicated by "C" letter on main display.

15.6 HUW operations ext.

Once HUW container has been filled and HUW pump has been stopped, a boiler overheating risk may occur. It occurs in case the pre-set HUW temperature is higher than the pre-set boiler temperature. This issue refers particularly to the operation of HUW pump in SUMMER mode, when CH pump is OFF. To cool down the boiler, HUW pump operation may be extended by the time set in "*HUW pump operation extension time*".



It is not recommended to set this parameter at the value other than "0" if preset HUW temperature is lower than preset boiler temperature.

15.7 Heat exchanger

When the parameter *Heat exchanger* is set at *YES*, CH pump does not stop, when HUW priority is set nor in HUW SUMMER mode. This parameter is intended only for hydraulic systems with heat exchangers, where HUW container is installed at the side of closed circuit, and heat exchanger isolates open boiler circuit from close CH circuit. Continuous pump operation allows heat transfer from the boiler through the heat exchanger to HUW container.

16 MIXER SERVICE SETTINGS

16.1 MIXER SUPPORT

Following options are available:

OFF – mixer servo and mixer are OFF,

ON – is used when the mixer circuit supplies CH radiator system. Max. temperature of mixer circuit is not limited and mixer is fully opened during alarms e.g. boiler overheating.

Note: do not activate this option if the pipes used are not high-temperature resistant. In such conditions it is recommended to set "MIXER SUPPORT" at "Floor On."

Floor On – is used when the mixer circuit supplies underfloor heating system. Max. temperature of mixer circuit is limited to the value set in the parameter of *Max. pre-set mixer temp.*

Note: upon selection of the option of *Floor On* set the parameter *Max. preset mixer temp.* at such value, which will prevent the floor destruction and occurrence of burn risk.

Pump only – once the mixer circuit temperature has exceeded the value set in "*mixer preset value*", power supply to the mixer pump stops. Once the mixer circuit temperature has dropped by 2 °C, the pump switches on again. This option is mainly used to control the underfloor heating pump in case it works with thermostatic valve without servo. However, it is not a recommended manner of operation. It is recommended to use a standard heating circuit composed of valve, servo and mixer pump for underfloor heating. Other possible solution is the use of

mixer pump to protect boiler return temperature by means of a pump combining boiler supply and return. In such case, the use of mixer support is prevented.

16.2 Thermostat selection

This option enables changing room thermostat for the mixer circuit in case ecoSTER room control panel is connected. Following options are available:

- [Standard 1](#) – standard NO/NC thermostat connected to terminals 26-27 or 28-29 for mixer 1 and 2, respectively,
- [ecoSTER1](#) – thermostat 1 in ecoSTER,
- [ecoSTER2](#) – thermostat 2 in ecoSTER,
- [ecoSTER3](#) – thermostat 3 in ecoSTER.

If ecoSTER is not connected, regulator works with a standard room thermostat.

16.3 Min. preset mixer temperature

This parameter is used to prevent the user to set too low preset value of mixer circuit temperature. Automatic regulation (e.g. temporary reduction of temperature) does not cause the drop of preset temperature below the value set in this parameter, either.

16.4 Max. preset mixer temperature

This parameter has two functions:

- it prevents the user to set too high value of preset mixer temperature, Automatic regulation (correction acc. heating curve or to required outside temperature) does not cause the increase of preset temperature above the value set in this parameter, either.
- when the parameter "*Mixer support*" is set at "*FLOOR ON*", it determines the limit value measured by the mixer temperature sensor at which the mixer pump will stop.



For underfloor heating set this parameter at the value not exceeding 45°C - 50°C unless the manufacturer of materials used to complete the floor or CH system designer has recommended other values.

16.5 Proportional range

Note: Change of this parameter is not recommended.

It is the value of mixer stroke. The higher the value is the faster the mixer circuit achieves the preset value. Too high value of

this parameter may cause over-regulation and unnecessary servo movements, which reduce its lifetime.

Recommended settings of this parameter should be within the range of 2 – 6 [factory setting: 3].

16.6 Integr. time const.

Note: Change of this parameter is not recommended.

This parameter determines mixer standstill time in case the temperature measured by the mixer circuit sensor is close to the value preset for this circuit. The higher the value is the longer the servo standstills are. Too high value increases the time required to stabilize the preset circuit temperature by servo. Setting too low value may cause temperature over-regulation and premature wear and tear of servo.

Recommended settings of this parameter should be within the range of 80 – 140 [factory setting:110].

16.7 Valve opening time

Enter the time of full valve opening taken from the rating plate of valve servo (e.g. 140s)

16.8 Pump OFF by thermostat

Once this parameter has been set at "YES", mixer servo closes and mixer pump stops upon opening contacts of room thermostat (room heating has been completed). Performance of this operation is not recommended because the heated room may be cooled down too much.

17 SHOW ADVANCED SETUP

To display hidden parameters in menu structure set the parameter:

[Show advanced setup](#) = YES.

This parameter is available in [Menu > Service Settings](#).

An example of this parameter is:

[Mixer input dead zone](#), available in [Menu > Service Settings > Mixer Settings](#).

18 SERVICE COUNTERS

One of the pages of [Menu > Info](#) provides information of burner's operation hours,

number of ignitions, and fuel feeder's operation time.

19 RESTORE FACTORY SETTINGS

To restore factory settings - select **Restore Default Settings** and confirm the selection.

This parameter is available in:

Menu > Service Settings



When restoring default settings, service and user settings are also restored.

20 Fan rotation detection

Regulator may check fan status using rotation sensor. In case the fan has stopped (e.g. because of damage), alarm is produced - see sec.22.9.

21 Lambda sensor

Burner efficiency may be increased by connection of additional Lambda sensor. How to connect - see Fig. 19. Configure Lambda sensor operation in:

Menu > SERVICE SETTINGS > BOILER SETTINGS > Lambda sensor

If the parameter: **Operation with Lambda sensor** is set at „ON“, the regulator will work using lambda sensor indications. The amount of air supplied to the furnace will be set automatically to obtain the set value of oxygen concentration in exhaust. If this parameter is set at „OFF “ - lambda sensor indications will have no effect on regulator operation. Desired values of oxygen concentration are set in:

Menu > Service Settings > BOILER SETTINGS > Output Modulation

• 100% Blow-in output
• 100% Feeder operation
• 100% Feeder Interval
• 100% Oxygen
• 50% Blow-in output
• 50% Feeder operation
• 50% Feeder Interval
• 50% Oxygen
• 30% Blow-in output
• 30% Feeder operation
• 30% Feeder Interval
• 30% Oxygen

Description of other parameters related to lambda sensor:

Airflow correction range - determines permitted range of blowing power variation for operation with lambda sensor. Note: do not set too high values because it may adversely affect regulation process.

Parameters A, B, C Lambda affect the adjustment speed of oxygen value present in exhaust to the preset oxygen concentration value; it also affects the stability to keep the oxygen content in exhaust. Change of these parameters is not recommended if the adjustment speed and stability to keep the set oxygen concentration value are satisfactory.

Fuel detection: oxygen -this parameter enables detection of fuel lack on the basis of Lambda sensor indications. If the oxygen level has been in excess of **fuel lack detection threshold - oxygen** longer than the time set in **No fuel detection time** - regulator attempts again to fire- up the furnace, and if unsuccessfully - lack of fuel alarm will be produced.

Feeder lock - this parameter determines the oxygen concentration in exhaust below which the feeder operation will be stopped until another increase of this value.

After longer period of sensor operation, its periodic calibration may be required. Before calibration, the boiler has to be burnt-off. Proper calibration requires complete burning off the boiler furnace. To start calibration, use the following parameter:

Menu > BOILER SETTINGS > Lambda calibration

Calibration takes approx. 8 min.

22 ALARM DESCRIPTION

22.1 Exhaust temperature sensor damage

This alarm occurs in case of damage of exhaust temperature sensor and excess of its measurement range. Upon alarm occurrence, boiler operation is automatically stopped, and only CH pump remains in operation.

To reset the alarm - confirm it or switch off and on the regulator. Check the sensor and replace, if necessary.



How to check temperature sensor - see sec.13.11

22.2 Excess of max. boiler temperature

Protection against boiler overheating comprises two stages. In first instance i.e. once the *Preventive boiler cooling temp.* has been exceeded, the regulator attempts to reduce the boiler temperature by discharge of excessive heat to HUW container and by opening the mixer servos (only in case the mixer circuit = CH ON).

Once the temperature measured by HUW temperature sensor has exceeded the value set in *Max. HUW temp.*, HUW pump stops in order to protect the user from burning with hot utility water. Has the temperature dropped - the regulator returns to normal operation. In case the temperature is 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.

To reset the alarm - press Touch and Play keys or switch the power supply to the regulator off and on.



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.

22.3 Excess of max. feeder temperature

This alarm is produced once the feeder temperature has exceeded the value set in the service parameter:

SERVICE SETTINGS > BOILER SETTINGS > Max. feeder temp.

If the feeder temperature exceeds this value, the regulator activates the feeder for a fixed, set time and the poker. The fan stops and the pumps start. Once the fuel has been "pushed out", the regulator stops the feeder and does not activate it again even though the feeder temperature remains high.

Alarm may be reset only upon drop of feeder temperature. To reset the alarm - press encoder knob or switch off and on power supply to the regulator.



Flashback protection function is inactive when the feeder sensor is disconnected or damaged.



Flashback protection function is disabled when power supply to the regulator is disconnected.



ecoMAX810P3-L TOUCH regulator may not be used as the only flashback protection of the boiler. Additional automatic safety devices should be used.



Flashback protection function may be disabled - see sec. 14.12.

22.4 Boiler temperature sensor damage

This alarm occurs in case of boiler temperature sensor damage and excess of its measurement range. Upon occurrence of this alarm, CH, HUW and mixer pumps start to possibly cool down the boiler.

To reset this alarm - confirm it or switch off and on power supply to the regulator. Check the sensor and replace, if necessary



How to check temperature sensor - see sec.13.11.

22.5 Feeder temperature sensor damage

This alarm occurs in case of damage of fuel feeder temperature sensor and excess of its measurement range. Upon occurrence of this alarm, CH and HUW pumps start to possibly cool down the boiler.

To reset this alarm - confirm it or switch off and on power supply to the regulator. Check the sensor and replace, if necessary.



How to check temperature sensor - see sec.13.11.



Upon setting of *Max. feeder temp.* at "0", the regulator may operate without connected feeder temperature sensor. However, it is not a recommended manner of operation because protection of the boiler from flashback is disabled.

22.6 No communication

Control panel is connected with working module by means of digital interface RS485. In case connecting cable to this interface is damaged, a message "*Warning! No communication*" is displayed.

Regulator does not go off and works normally with previously preset parameter values, and in case of alarm occurrence it takes action related to respective alarm. Check the cable, which connects the control panel with the module and repair or replace, if necessary.

22.7 Unsuccessful boiler firing-up attempt

This alarm is produced after third unsuccessful attempt of automatic furnace firing-up. Upon occurrence of this alarm, all pumps stop to avoid excessive boiler cooling. To reset the alarm - confirm it or switch off and on the regulator. The reason of this alarm may be, among others, faulty heater or lack of fuel in the bin.

22.8 Unsuccessful attempt of container loading

It is so called "silent alarm prompt". It occurs after unsuccessful attempt to charge the fuel from additional bin (bunker). In case the attempts to fill the boiler bin have been unsuccessfully made within one full hour of second feeder operation, this prompt is displayed. It does not stop automatic boiler operation, only warning message appears on the control panel. To reset this alarm - confirm it or switch off and on power supply to the regulator.

22.9 Fan damage

In case of fan damage, a prompt "*Damaged fan*" is displayed. Burner operation stops.

Note: the function of fan rotation detection has to be enabled by the boiler manufacturer.

23 OTHERS

23.1 Power failure

In case of power failure, the regulator returns to the operation mode in which it was before the failure.

23.2 Anti-freezing protection

In case the boiler temperature has fallen below 5 °C, CH pump is activated to force boiler water circulation. It delays water freezing process, but in case of very low temperature or lack of power it may not be sufficient to protect the equipment from freezing.

23.3 Protection of pumps against clogging

The regulator performs the function of CH, HUW and mixer pump protection from clogging caused by scale deposits. For this purpose, these components are periodically (every 167 h) switched on for a few seconds. In this way the pumps are protected from immobilization caused by scale deposits. For this reason, power supply should be connected to the regulator during boiler standstill. This function is also active when the regulator was switched off using the keyboard (set at "OFF" mode).

24 REPLACEMENT OF PARTS AND COMPONENTS

When ordering spare parts and components, necessary information taken from the rating plates should be provided. In case of regulator – let us know its serial number, or, if you are unable to provide it, specify regulator model, version and year of manufacture.



Serial number of the regulator is quoted on rating plate of each working module.

24.1 Replacement of mains fuse

Mains fuses are located in each working module. They protect the regulator and other connected equipment.

In case of replacement, use 6.3 A, 5x20mm ceramic time fuse.

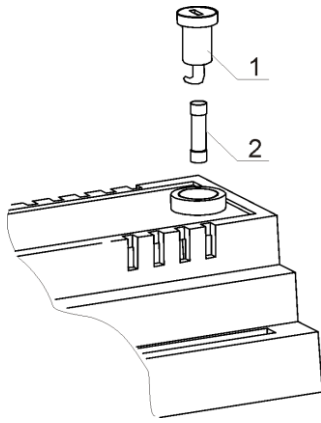


Fig. 26 Fuse replacement 1 – fuse, 2 – fuse holder

To remove the fuse, press down fuse holder using flat screwdriver and turn it in CCW direction.

24.2 Replacement of control panel

In case of required replacement of control panel only - make sure the software used in new panel is compatible with the software of working module. Compatibility is guaranteed if first component of software ID number of the panel and of the working module is the same. In following example, software is compatible because first component of its ID number ("01") is the same for both components.

Example of software ID number:

Control panel:

01.10.010.



Working module:

01.11.026.R1



Software ID number may be taken from the rating plate of respective component or from [Menu Information](#)



Incompatibility of control panel and working module may cause incorrect operation of the regulator.

24.3 Replacement of working module

The requirements are the same as for the replacement of control panel - see sec.24.2.

24.4 Software up-grade

To up-grade the software - use micro SD memory card or special interface ecoLINK II. In this section, software up-grade using memory card is described. To up-grade the software - disconnect power supply to the regulator and remove ecoTOUCH control panel from the regulator housing acc. sec. 13.1. Insert memory card into indicated slot. Memory card should contain new software in *.pfc format (two files - one with software for control panel, and the other one with software for module "A" of the regulator). Upload new software directly to memory card. Do not nest data in sub-directory. Re-install the control panel in regulator housing and connect power supply. Enter:

General settings > Software Up-grade

and up-grade the software at first in module A of the regulator, and next in the control panel.

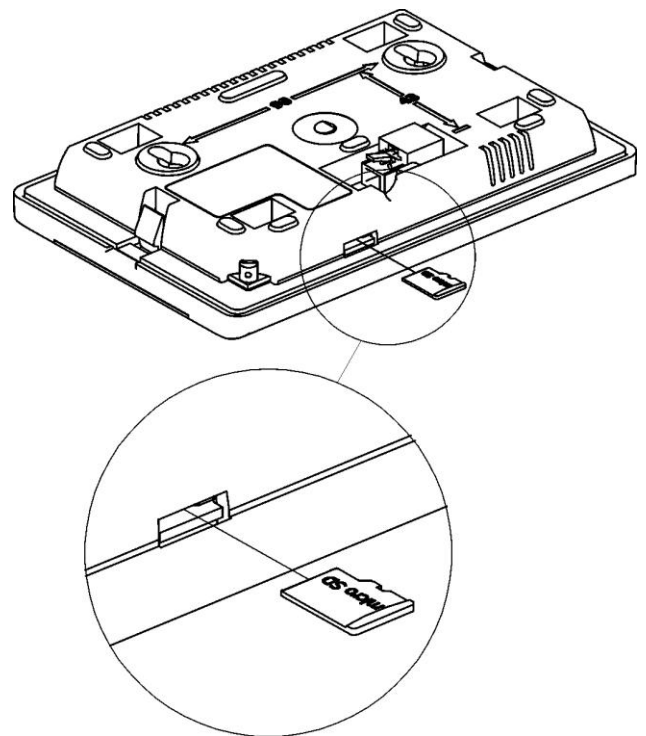


Fig. 27 Placing of microSD memory card

25 Troubleshooting

Faults	Hints
The display is blank despite connection to power supply.	Check: <ul style="list-style-type: none"> ▪ if the main fuse is burnt-out, replace if so, ▪ if the lead connecting the panel with the module is properly plugged in, and if it's not damaged.
Preset CH temperature on the display is different than the programmed one.	Check: <ul style="list-style-type: none"> ▪ if the DHW tank is not being filled, and if the preset DHW temperature is set higher than the preset boiler temperature; if so, the difference in readings will disappear after filling the DHW tank alternatively - decrease the preset DHW temperature, ▪ if the time periods are on - disable Night-time decreases.
CH pump is inoperative.	Check: <ul style="list-style-type: none"> ▪ whether the boiler temperature exceeded the parameter <i>CH activation temp.</i> - wait or decrease the <i>CH activation temp.</i> ▪ if the DHW priority, which blocks the central heating pump, is enabled - disable the priority by setting the <i>DHW mode</i> to <i>No priority</i>, ▪ whether the central heating pump is not damaged or clogged.
The fan is inoperative.	<ul style="list-style-type: none"> ▪ increase the fan speed (parameters for blow-in output), ▪ check if the safety temperature limiter STB jumper is on terminals 1-2 (the jumper should be placed only if no proper STB temperature limiter is connected), ▪ if the boiler manufacturer equipped it with a temperature limiter STB with manual return to its initial position, unlock it by removing the lid and pushing the button, in accordance with the documentation provided by the boiler manufacturer, ▪ check the fan and replace it if necessary.
Fuel feeder inoperative/ fails to feed.	<ul style="list-style-type: none"> ▪ Check if the feeder leads are properly connected to terminals ▪ If temperature limiter STB is connected to terminals 1-2, check if the circuit is not cut off due to boiler overheating, ▪ Check if the feeder motor is in working order, ▪ If you can hear the motor running, but the fuel is not fed, check the feeder in accordance with the boiler manual.
When the Individual Fuzzy Logic mode is on, the fuel is not completely burned, there are unburned particles of fuel in the ash.	<ul style="list-style-type: none"> ▪ Increase Individual Fuzzy Logic airflow correction, point 8.6, ▪ See if the unburned fuel comes from operation in the SUPERVISION mode - adjust the SUPERVISION mode parameters, ▪ Check if the unburned fuel is caused by frequent switching from SUPERVISION to OPERATION, ▪ Make sure if correct type of boiler is selected, point 26.1, ▪ Open the fan flap and/or fan return flap to the maximum, ▪ Check the ducts which feed air into the furnace, ▪ Unseal the window in the boiler room to provide sufficient amounts of air.
When the Individual Fuzzy Logic mode is on, the fuel burns out too intensively.	<ul style="list-style-type: none"> ▪ Decrease Fuzzy Logic airflow correction, point 8.6, ▪ See if the excessive burning of fuel comes from operation in the SUPERVISION mode - adjust the SUPERVISION mode as per point 8.8. ▪ Make sure if correct type of boiler is selected, point 26.1.

The temperature is measured incorrectly.	<ul style="list-style-type: none"> ▪ Check if there is good thermal contact between the temperature sensor and the measured surface, ▪ Whether the sensor lead is not placed too close to the mains cable, ▪ If the sensor is connected to the terminal, ▪ Whether the sensor is not damaged – check it in accordance with point 13.11.
in the DHW=SUMMER mode, the radiators are hot and the boiler overheats.	<ul style="list-style-type: none"> ▪ Increase the parameter <i>DHW operation extend</i>. in order to cool down the boiler.
the DHW pump is active even if the DHW tank has been filled.	<ul style="list-style-type: none"> ▪ Set the parameter <i>DHW operation extend</i> to 0.
The boiler overheats despite disabled airflow.	<ul style="list-style-type: none"> ▪ The reason can be faulty chimney installation (no protection against excessive chimney draught).
In a hydraulic system with a mixing valve and servo - the mixer fails to open.	<ul style="list-style-type: none"> ▪ The reason can be that the DHW tank is being filled with <i>DHW priority</i> enabled. Wait until the DHW is filled, or disable the <i>DHW priority</i>. ▪ The reason can be active SUMMER function. ▪ The reason can be an on-going calibration of the mixer valve, wait until the calibration is complete. Active calibration is signalled with a "CAL" message in the menu INFORMATION – MIXER INFO.

26 Regulator setup by boiler manufacturer.

CAUTION: THE INDIVIDUAL FUZZY LOGIC PROGRAM IS SELECTED INDIVIDUALLY TO THE GIVEN BOILER TYPE. MAKE SURE THAT THE FITTINGS FOR BOILERS TESTED IN THE PLUM LABORATORIES ARE COMPATIBLE WITH FITTINGS FOR SOLD BOILERS. IT IS INADMISSIBLE TO REPLACE THE FEEDER AND FAN TO OTHER TYPES AS WELL AS MAKING OTHER CONSTRUCTIONAL MODIFICATIONS WHICH CAN HAVE IMPACT ON COMBUSTION PROCESS.

26.1 Activating Individual Fuzzy Logic and changing boiler type

In order to activate the Individual Fuzzy Logic mode, enter menu:

Boiler settings > Output modulation > Regulation mode

In this menu, find and confirm Individual Fuzzy Logic mode. If the boiler operation modes list is unavailable, and clicking the aforementioned menu triggers a message "Function unavailable", it means that the regulator operates only in the STANDARD mode, Individual Fuzzy Logic control is disabled and unavailable for the given setup of a boiler.

To change the type of boiler, furnace, enter hidden menu:

Service settings > [enter special password]

The special password is made available only to boiler manufacturers and authorized fitters.

Caution: selecting an incorrect boiler type, which was not examined in the PLUM laboratories, can damage the boiler during its operation.

Settings for individual boilers require arrangements between the boiler manufacturer and the PLUM sp. z o.o. company.

In order to apply the changes, it is necessary to disconnect and reconnect the regulator mains supply.



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