Boiler Regulator

ecoMAX860P1-K STANDARD

ecoMAX860P1-K TOUCH

FOR AUTOMATIC SOLID FUEL FIRED BOILERS

STANDARD   TOUCH
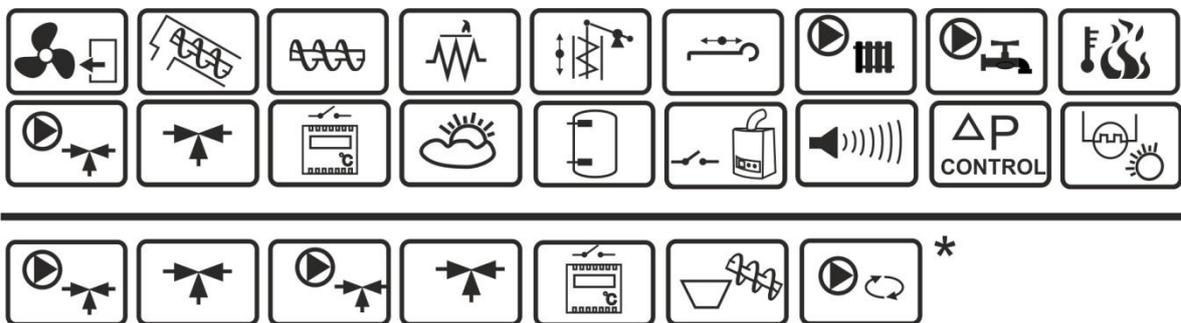
* functions available in the additional module B

Cerbos

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INSTALLATION AND OPERATING MANUAL

ISSUE: 1.1

CONTENTS

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.

⇒ Keep the regulator out of reach of children.

2   General

The regulator is a modern electronic device designed to control pellet-fired boiler operation with optical flame brightness sensor. The regulator is compatible with an air pressure sensor allowing for a precise combustion control.

It can be used to control the operation of an unregulated central heating circuit, HUW circuit and three regulated heating circuits. Preset temperature of heating circuits may be set on the basis of weather sensor read-out. A possibility to work together with room thermostats helps to maintain comfortable temperature in heated rooms. Moreover, if needed, the equipment switches on gas -or oil fired reserve boiler.

The regulator may operate in connection with additional control panel installed in rooms. Regulator is easy to operate in an intuitive manner. It may be used in households and other similar premises and in light industry 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

ecoMAX860P1-K

7   STRUCTURE – MAIN MENU

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

8 Operating the regulator

This section briefly describes how the regulator should be operated.

8.1   Description of display main window – touch version
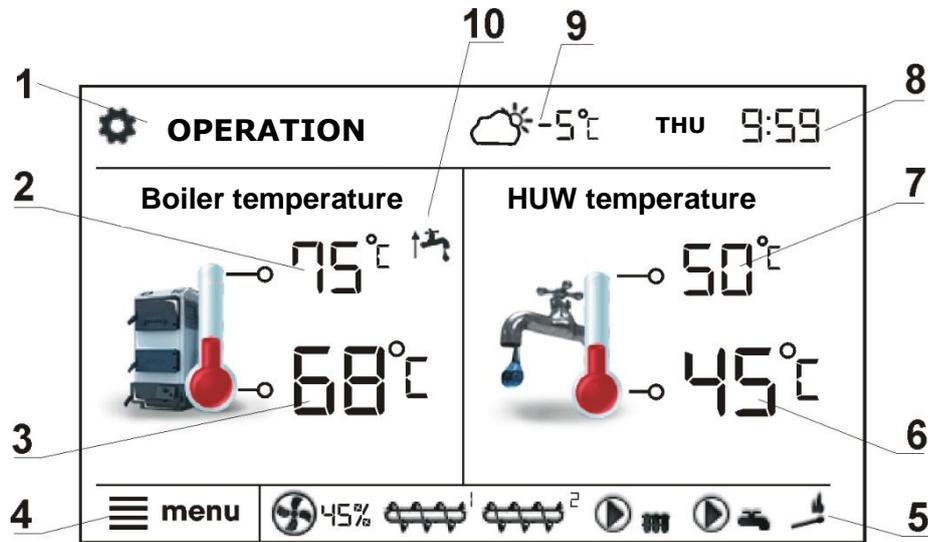
Fig. 1 Display main window.

Legend:

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

fan,

feeder 1,

feeder 2,

pump,

lighter,

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 information window, HUW window, fuel level window.

To have the fuel level displayed, first enter the settings acc. sec.8.18. Note: fuel level may be displayed on ecoSTER-TOUCH room control panel.

Switching to a reserve boiler – TOUCH
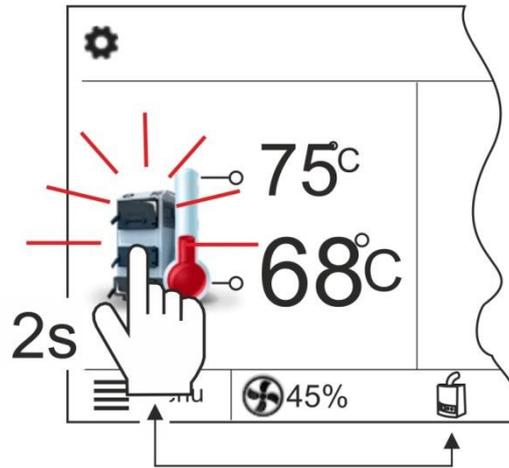
Fig. 2 Switching to the reserve boiler mode – model TOUCH

ecoMAX regulator can automatically switch between the pellet boiler and reserve boiler (gas- or oil-fired). It is, however, possible to override the regulator and switch to the reserve boiler manually. To do so, press and hold the boiler icon in the main window. A window is displayed allowing the user to select either the pallet or the reserve boiler. Select "Reserve boiler". The pellet boiler is then burned off. The reserve boiler is switched on after the pellet boiler is burned off. Details on the reserve boiler are given in sec. 12.15.

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.
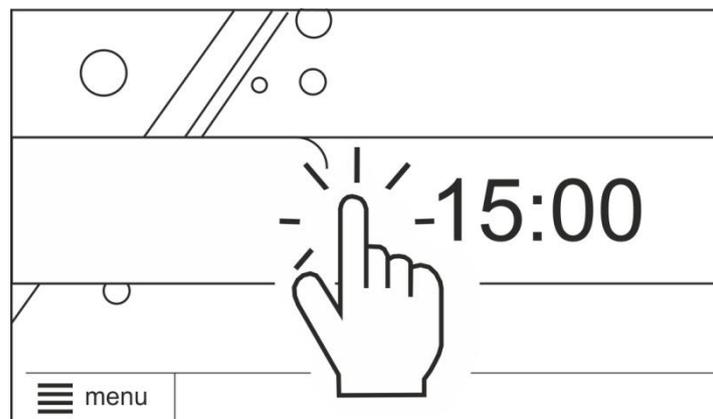
Fig. 3 Boiler activation window

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   Main window in the standard version
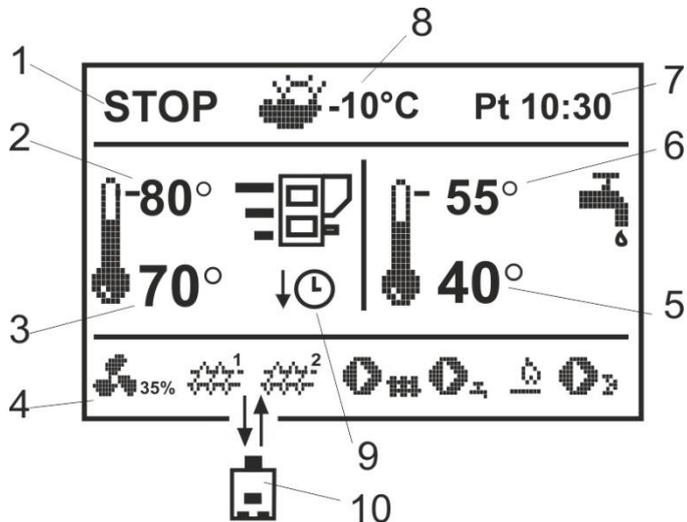
Fig. 4 Main display window

Legend

1. Mode of regulator operation: STOP, FIRING-UP, OPERATION, SUPERVISION
2. Preset boiler temperature
3. Measured boiler temperature
4. Information fields:

    35% Fan,

    Feeder 1,

    Feeder 2,

    Boiler pumps,

    Hot utility water pump,

    Mixer circuit pump,

    Lighter,

5. Measured temperature of the HUW container,
6. Preset temperature of the HUW container,
7. Clock
8. Outdoor temperature (weather)
9. Values, which modify preset boiler temperature:

   ↓▣ – symbol of a reduction of preset boiler or mixer temperature upon opening of room thermostat contacts;

   ▣ – symbol of room thermostat contacts opening (room temperature has been reached);

   ⊕ – symbol of a reduction of preset temperature for active time intervals;

   ↑🚰 – symbol of an increase of preset boiler temperature for the time of HUW container loading;

   ↑✕ – symbol of an increase of preset boiler temperature by mixer circuit;

   ↑▮ – symbol of an increase to load the heat buffer;

   ↳ – symbol of weather control on.

10. Symbol of operation in a forced reserve boiler mode. EcoMAX regulator can automatically switch between the pellet boiler and reserve boiler (gas- or oil-fired). It is, however, possible to override the regulator and switch to the reserve boiler manually. To do so, press the knob on the main screen and select "reserve boiler". The pellet boiler is then burned off. The reserve boiler is switched on after the pellet boiler is burned off. Details on the reserve boiler are given in sec. 12.15.

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8.4 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).

Menu→ Boiler settings > Preset boiler temp.
Menu→ Mixer 1,2,3,4 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.

8.5 FIRING-UP

The FIRING-UP mode is used for automatic firing-up of furnace in the boiler. Total duration of the firing-up process depends on regulator settings (feeder operation time, heater operation time, etc.) and on the boiler's status before firing-up. All parameters which influence the firing-up process can be found in menu:

Menu → Service settings >
Boiler settings > Firing-up

If firing up the furnace fails, further attempts are carried out during which the fuel dose (feeding time) is reduced to 10% of the dose in the first attempt.

Consecutive attempts are visualised by numbers next to the lighter symbol .

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

8.6 OPERATION

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

Parameters related with the Operation mode are: *Feeder operation time* and *Fan output* in:

Menu → Boiler settings → Output modulation.

8.7 SUPERVISION

The regulator automatically enters the SUPERVISION mode without any user's intervention once actual temperature has exceeded the boiler preset temperature by 5°C.

In the SUPERVISION mode, the regulator supervises the fire in the furnace so that it does not burn off. To achieve that, the burner power is kept low which together with correctly adjusted parameters prevents any increase of the temperature. Burner power in the SUPERVISION mode and other SUPERVISION parameters can be found in:

Menu → Service Settings → Burner Settings → Supervision

SUPERVISION parameters should be set in accordance with the recommendations of the boiler or burner manufacturer. They should be such values so that the fire in the furnace does not burn off during boiler standstills (and it should not burn too intensely as the boiler temperature may increase). Feeder operation and standstill times in the SUPERVISION mode are set with the following parameters: *Feeding Time SUPERVISION*, *Cycle time SUPERVISION* and *Blow-in SUPERVISION* mode.

Parameters should be so selected that the boiler temperature in this mode gradually drops. Incorrect settings may lead to boiler overheating.

The maximum boiler operation time in the SUPERVISION mode is defined by *Supervision time*. If, after this time, the

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boiler does not have to operate again after it entered the SUPERVISION mode, the regulator initiates boiler burn-off.

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

8.8   BURNING OFF

In the PUTTING OUT mode, remains of the pellet are burnt out and the boiler is prepared for standstill or deactivation.

All parameters which influence the process of putting out can be found in menu:

Service settings >
Boiler settings > Burning off

The regulator stops fuel feeding and performs periodical air flushes to burn fuel residues. When the flame brightness decreases or the maximum burning-off time elapses, the regulator enters the STANDSTILL mode.

8.9   STANDSTILL

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

A signal to start heating can be:

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

8.10   Domestic how water settings DHW

The device controls temperature of the domestic how 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:

Menu → DHW settings > DHW 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*,**

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

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

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

8.11   Setting preset DHW temperature

Preset DHW temperature is defined by parameter:

DHW settings > Preset DHW temp.

8.12   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.

8.13   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.*

⚠ 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

8.14   Mixer circuits settings

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

Menu → Mixer 1 settings

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

Settings for mixer (without weather sensor)
It is necessary to manually set the required water temperature in the heating mixer circuit using parameter *Preset mixer temp.*, e.g. at a value of 50°C. The value should allow to obtain the required room temperature.

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

Settings for mixer with weather sensor
(without room thermostat ecoSTER-TOUCH)

Set parameter *Weather contr.mixer* to *on*.
Select weather curve as per point 8.15

Using parameter *Curve translation*, set preset room temperature following the formula:
Preset room temperature = 20°C + heating curve translation.

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

Settings for mixer with weather sensor and with room thermostat ecoSTER-TOUCH

Set parameter *Weather contr.mixer* to *on*.
Select weather curve as per point. 8.15

The ecoSTER-TOUCH regulator automatically translates the heating curve, depending on the preset room temperature. The regulator relates the setting to 20 °C, e.g. for preset room temperature = 22 °C, the regulator will translate the heating curve by 2°C, for preset room temperature = 18 °C, the regulator will translate the heating curve by -2 °C. In some cases described in point. 8.15 it may be necessary to fine-tune the heating curve translation.

In this setup, the ecoSTER-TOUCH room thermostat can:
- decrease the heating cycle temperature by a constant value when the preset room temperature is reached. Analogously, as specified in the previous point (not recommended), or
- automatically, continuously correct the heating cycle temperature.
It is not recommended to use both options at the same time.

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

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

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

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

It is necessary to find appropriate value of the *Room temp. 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!

8.15   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
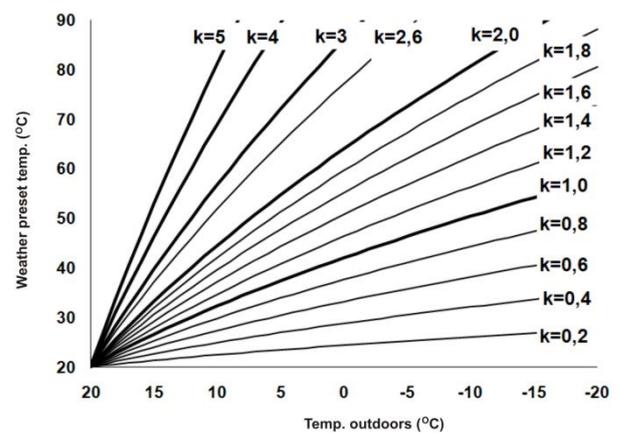
Drawing 1 Heating curves.

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.

8.16 Description of night time decrease settings

Boiler night time decreases

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

```
05:00 - 09:00  ON
15:00 - 19:00  ON
20:00 - 22:00  ON
```
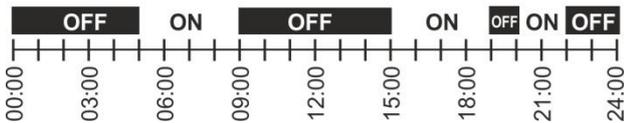
Fig. 5 Boiler night time decreases

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

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

To activate time intervals, set the parameter: *Night time decrease* for the given heating circuit to ON.
Night time decrease may be set for working days, Saturdays and Sundays.

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

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

```
00:00 - 06:00  -3 °C
09:00 - 15:00  -5 °C
22:00 - 23:59  -3 °C
```
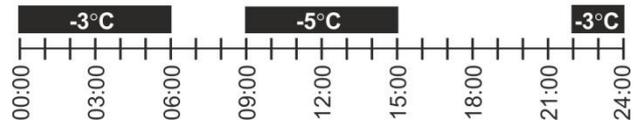
Fig. 6 Night time decreases for heating circuits

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

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

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

8.17 Circulating pump control

Note: the circulating pump functionality is available only if an additional extension mixer module.

The settings can be found in:

MENU → DHW Settings → Circulation pumps night-time decrease
and

Menu → Service settings → CH/DHW settings

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.*

8.18 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
Touch version: Any time upon filling fuel tank, press and hold pressed current fuel level value. Following prompt appears:
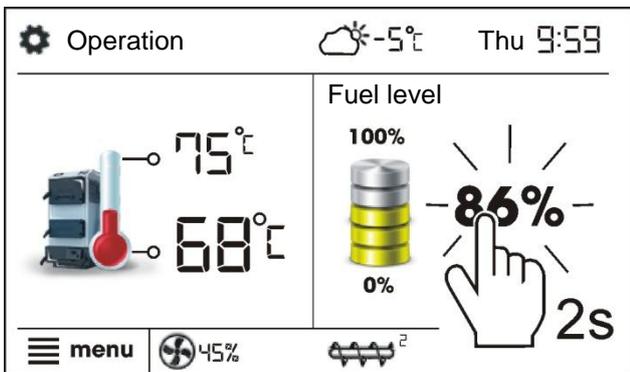
Fig. 7 Operation of fuel level indicator – Touch version

"Set fuel level at 100% Once selected and confirmed YES, fuel level is set at 100%.
Standard version: Any time upon filling fuel tank, press and hold pressed knob at set fuel level value. Following prompt appears:
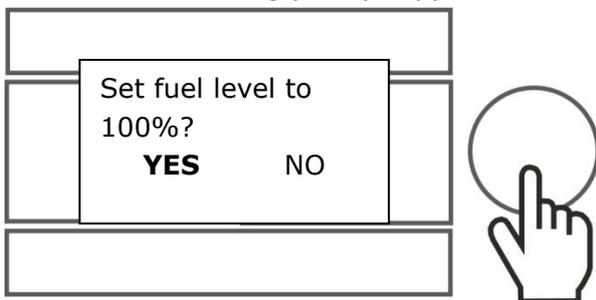
Fig. 8 Operation of fuel level indicator – Standard version

Once selected and confirmed YES, fuel level is set to 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:
Menu → 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:
Menu → BOILER SETTINGS → Fuel Level → Fuel level calibration → Fuel Level 0%
Calibration can be skipped if the *Feeder Efficiency* and *Tank capacity*, parameters are set correctly in: **Menu → Service settings → Burner settings → Operation.**

8.19 Operation with additional feeder
After the additional module B is connected, the regulator may be used with low tank fuel level sensor (fuel feed from bunker). After the sensor is activated (contacts open), the regulator activates the additional tank for the *Additional feeder - operation time* to refill the main fuel tank. This parameter can be found in: **Menu → Service settings → Burner settings**

If the *Additional feeder - operation parameter* is set to 0, the additional tank is switched off.

8.20   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.

8.21   Manual control

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

☞ Note: Access to manual control menu is possible only in the STAND-BY mode, i.e. when the boiler is OFF.

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

8.22 Favourite menu

In Touch version in the menu bar at the bottom of the screen there is a button:

⭐. 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.

8.23 Room control panel

ecoMAX860P1-K is compatible with room control panels with room thermostat feature. The STANDARD version is compatible with ecoSTER200 or ecoSTER-TOUCH panel. The TOUCH version is compatible with ecoSTER-TOUCH only.

Room control panels:

ecoSTER200

ecoSTER-TOUCH.

REGULATOR INSTALLATION AND SERVICE SETTINGS MANUAL

ecoMAX860P1-K

9 Hydraulic diagrams

9.1 Diagram 1
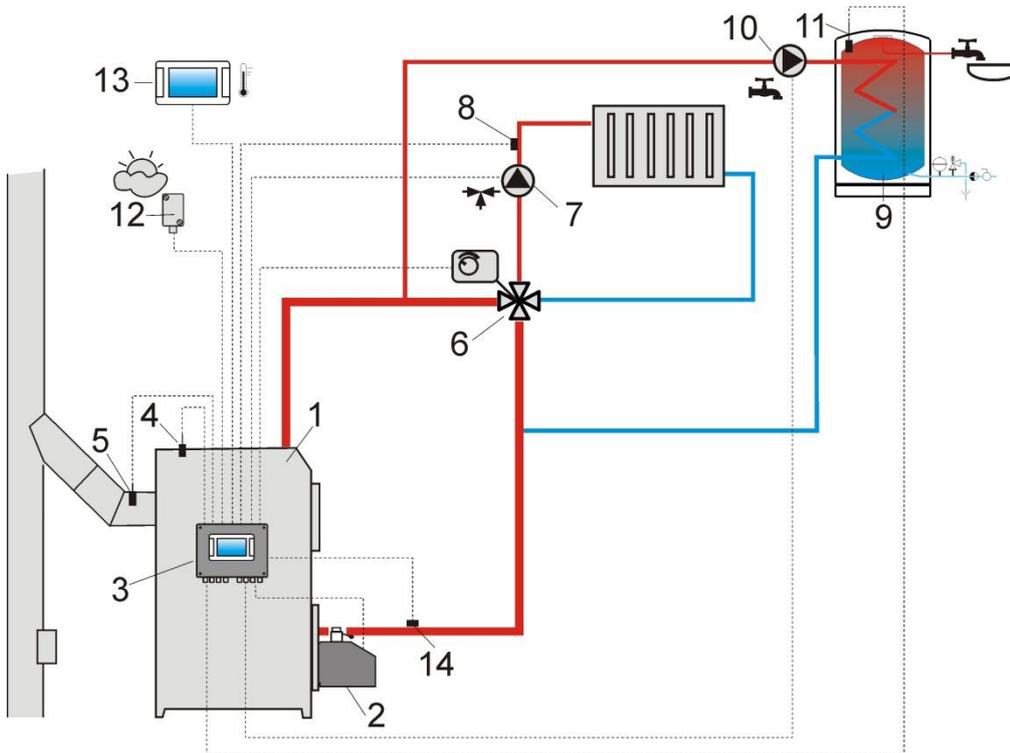
Fig. 9 **Diagram with 4-way control valve for central heating circuit[1],** where: 1 – boiler, 2 – burner, 3 – regulator, 4 – boiler temperature sensor CT4, 5 – exhaust temperature sensor CT2S (temperature monitoring only), 6 – 4-way valve servo, 7 – mixer circuit pump, 8 – mixer circuit temperature sensor, 9 – HUW container, 10 – hot utility water pump, 11 – HUW sensor, 12 – out-door temperature (weather) sensor CT4-P, 13 – ecoSTER-TOUCH room control panel or standard room thermostat, 14 – return temperature sensor (not necessary for the operation of the system).

⚠	To improve water circulation in gravitational circuit of the boiler (the circuit is indicated on the diagram with a bold line) it is necessary to: (i) use pipes and 4-way valve of large DN value, (ii) avoid using excessive number of elbows and cross section reductions, and (iii) apply other rules of gravitational circuit construction - e.g. keeping of gradients, etc. In case the return temperature sensor is of contact type -provide the sensor with heat insulation to isolate it from the environment and improve its thermal contact with a pipe by application of thermal paste. Set the preset boiler temperature at so high a value that heat output required for the mixer circuit and to heat-up return water to the boiler is guaranteed.

RECOMMENDED SETTINGS:

Parameter	Setting	MENU
Preset boiler temperature	75-80°C	menu→ BOILER SETTINGS
Min. preset boiler temperature	65°C	menu→Service Settings→ Boiler Settings
Increasing of preset boiler temp.	5-20°C	menu→Service Settings→ CH and HUW Settings
Mix1 support	CH ON	menu→Service Settings→Mixer 1 settings
Max. preset temperature of mixer 1	70°	menu→Service Settings→Mixer 1 settings
Heating curve, mixer 1	0.8 – 1.4	menu→Mixer 1 settings
Mixer 1 weather control	ON	menu→Mixer 1 settings
Mixer 1 thermostat selection	ecoSTER T1	menu→Service Settings→Mixer 1 settings

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[1]The presented hydraulic diagram does not replace central heating engineering design and may be used for information purposes only!

9.2   Diagram 2
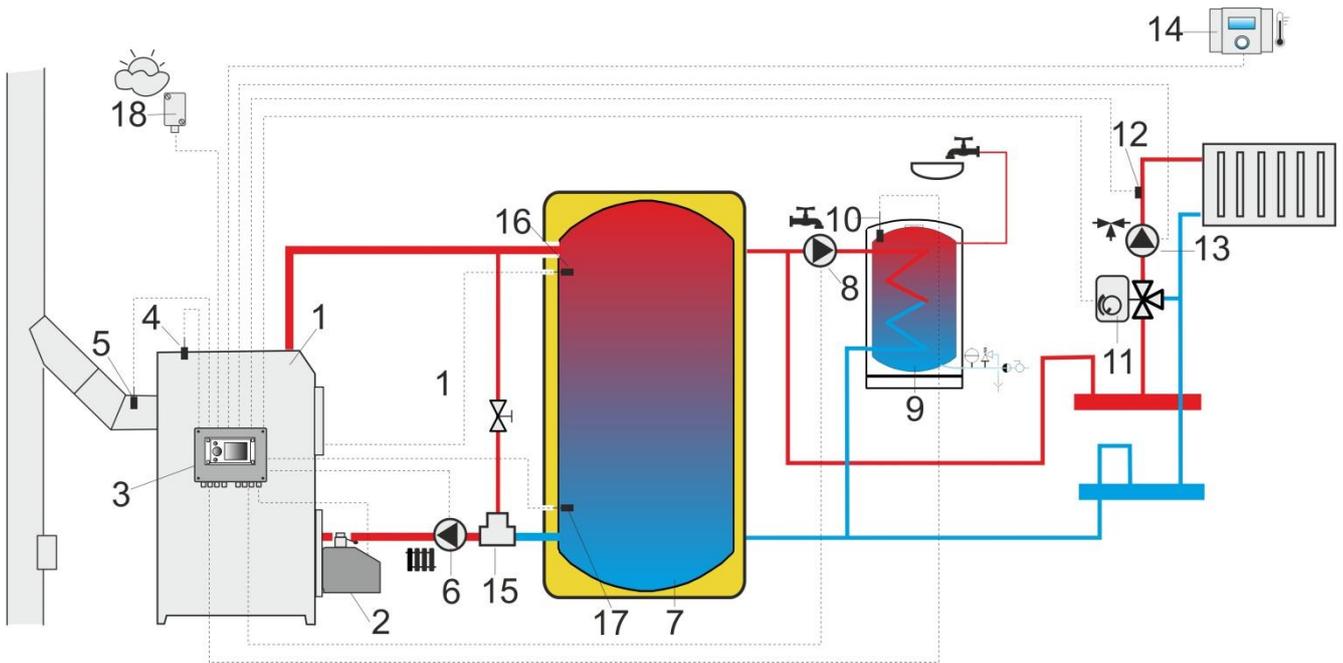
Fig. 10 **Diagram with heat buffer[2],** where:1 – boiler, 2 – burner, 3 – regulator, 4 – boiler temperature sensor, 5 – exhaust temperature sensor (temperature monitoring only), 6 – boiler pump, 7 – heat buffer, 8 – HUW pump, 9 – HUW container, 10 – HUW temperature sensor, 11 – mixing valve servo, 12 – mixer circuit temperature sensor, 13 – mixer pump, 14 – ecoSTER200 room control panel with room thermostat feature, 15 – 3-way thermostatic valve to protect return, 16 – upper sensor of buffer temperature, 17 – lower sensor of buffer temperature, 18 – out-door temperature (weather) sensor.

RECOMMENDED SETTINGS:

Parameter	Setting	MENU
Preset boiler temperature	80°C	menu→Boiler Settings
Min. preset boiler temperature	75°C	menu→Service Settings→ Boiler Settings
CH Pump Activation Temperature	55°C	menu→Service Settings→ CH and HUW Settings
Activate operation (buffer support)	ON	menu→Service Settings→ Buffer Settings
Buffer loading start temp.	50	menu→Service Settings→ Buffer Settings
Buffer loading end temp.	75	menu→Service Settings→ Buffer Settings
Mix1 support	CH ON	menu→Service Settings→Mixer 1 settings
Max. preset temperature of mixer 1	70°	menu→Service Settings→Mixer 1 settings
Heating curve, mixer 1	0.8 – 1.4	menu→Mixer 1 settings
Mixer 1 weather control	ON	menu→Mixer 1 settings
Mixer 1 thermostat selection	ecoSTER T1	menu→Service Settings→Mixer 1 settings

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[2] The presented hydraulic diagram does not replace central heating engineering design and may be used for information purposes only!

9.3 Diagram 3
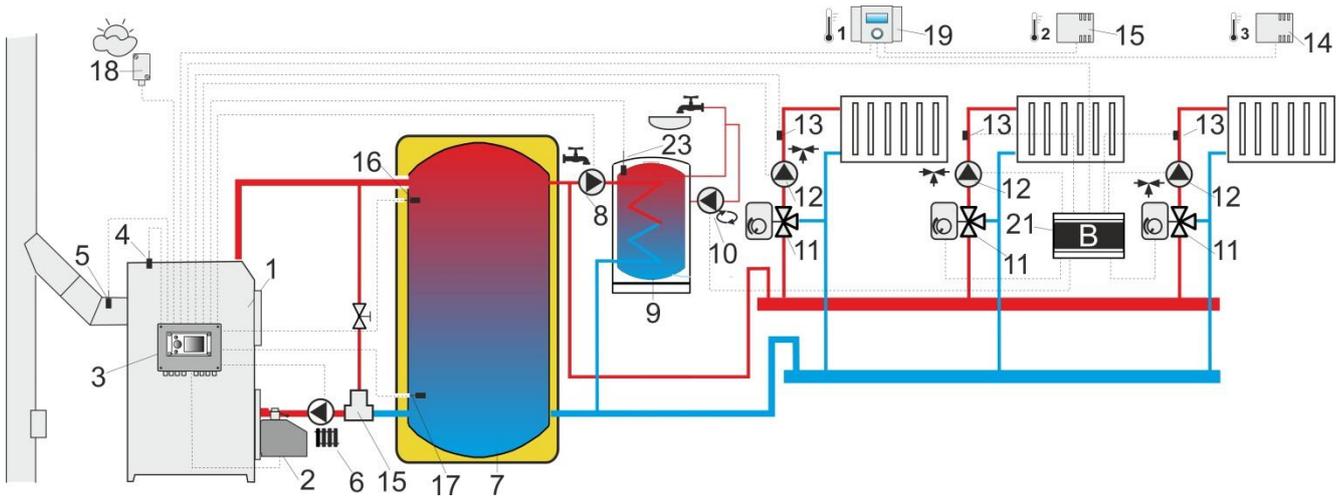
Fig. 11 **Diagram with heat buffer and 3 regulated heating circuits[3],** where:1 – boiler, 2 – burner, 3 – regulator, 4 – boiler temperature sensor CT4, 5 – exhaust temperature sensor CT2S, 6 – boiler pump, 7 – heat buffer, 8 – HUW pump , 9 – HUW container, 10 – circulating pump, 11 – 3-way valve with servo, 12 – mixer circuit pump, 13 – mixer circuit temperature sensor CT4, 14 – room sensor CT7, 15 – room sensor CT7, 16 – upper sensor of buffer temperature CT4, 17 – lower sensor of buffer temperature CT4, 18 – outdoor temperature (weather) sensor CT4-P, 19 – ecoSTER200 room control panel, 20 – standard room thermostat (with contacts), 21 – additional module B, 23 – HUW temperature sensor.

RECOMMENDED SETTINGS:

Parameter	Setting	MENU
Preset boiler temperature	80°C	menu→Boiler Settings
Min. preset boiler temperature	75°C	menu→Service Settings→ Boiler Settings
CH Pump Activation Temperature	55°C	menu→Service Settings→ CH and HUW Settings
Activate operation (buffer support)	ON	menu→Service Settings→ Buffer Settings
Buffer loading start temp.	50	menu→Service Settings→ Buffer Settings
Buffer loading end temp.	75	menu→Service Settings→ Buffer Settings
Mix 1,2,3,4 support	CH ON	menu→Service Settings→Mixer 1−4 settings
Max. preset temperature of mixer 1,2,3,4	70°	menu→Service Settings→Mixer 1−4 settings
Heating curve, mixer 1,2,3,4	0.8 – 1.4	menu→Mixer 1−4 settings
Mixer 1,2,3,4 weather control	ON	menu→Mixer 1−4 settings
Mixer 1 thermostat selection	ecoSTER T1	menu→Service Settings→Mixer 1 settings
Mixer 2 thermostat selection	ecoSTER T2	menu→Service Settings→Mixer 2 settings
Mixer 3 thermostat selection	ecoSTER T3	menu→Service Settings→Mixer 3 settings

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[3]The presented hydraulic diagram does not replace central heating engineering design and may be used for information purposes only.

10   Technical data

Voltage		230V~; 50Hz;
Current consumed by regulator		I = 0,04 A[4]
Maximum rated current		6 (6) A
Regulator protection rating		IP20
Ambient temperature		0...50 °C
Storage temperature		0...65 °C
Relative humidity		5 - 85% without steam 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
Terminals	network	screw terminals, wire cross-section area 0.75 mm^2 through 1.5mm^2, screwing torque 0.4Nm, insulation removed:
	communication	screw terminals, wire cross-section area up to 0.75mm^2 , screwing torque 0.3 Nm, insulation removed: 6 mm
Display (STANDARD)		Graphic display128x64
Display (TOUCH)		Color display 480x272 with touch panel
External dimensions		210x115x60 mm
Total weight		1.4 kg
Standards		PN-EN 60730-2-9 PN-EN 60730-1
Software class		A
Protection class		Suitable to build into Class I devices

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[4] Power consumed by the regulator itself (with 2 working modules and a control panel). Total power consumption depends on the devices connected to the regulator.

Pollution degree	2nd pollution degree acc. to PN-EN 60730-1

11   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.

12   REGULATOR INSTALLATION

12.1   Environmental conditions

Due to the risk of fire is prohibited to use the controller in explosive gas and dust enviroment (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.

12.2   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. The device consists of two modules: control panel and working module. Both elements are connected with electric wire.

12.3 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. 12. When installing follow the instructions given below.

STEP 1

A hole must be made in the mounting plate, in accordance with the drawing below.
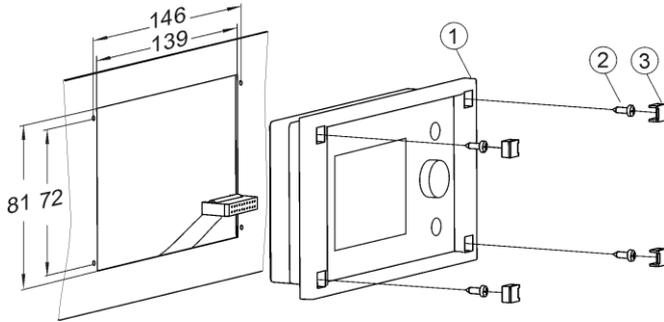
Fig. 12 Fitting the regulator in a mounting plate, where: 1 – control panel, 2 – sheet metal screw 2.9x13, 3 – hole plug.

STEP 2

Remove the lid (5), plug the cable (6) and put the lid (5) back on, securing it with screws (4). The cable should be lead out through the round groove in the enclosure.
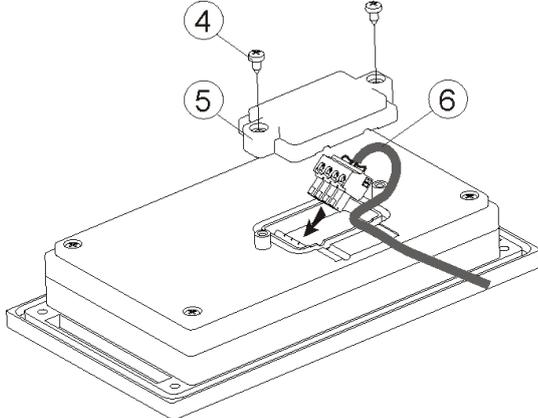
Fig. 13 Connecting lead to the panel, where: 4- B3x6 screw for thermoplastic materials, 5 – lid, 6 – lead connecting the control panel with the executive panel.

⚠ Maximum length of the lead (6) is 5m with gauge of $0,5mm^2$

STEP 3

Screw the panel to the mounting plate using sheet metal screws, insert the hole plugs.
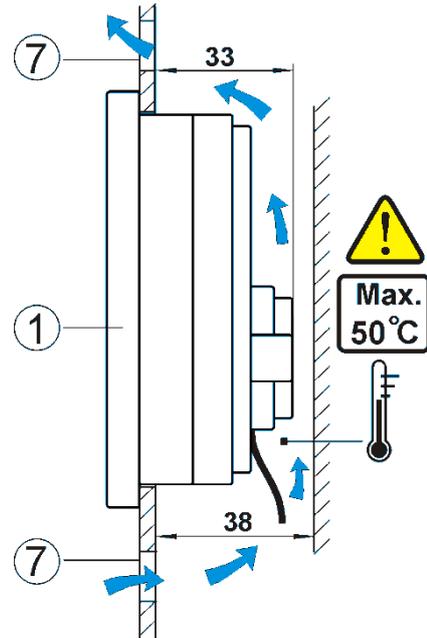
Fig. 14 Conditions of enclosing the panel, where 1 – panel, 2 –ventilation holes for air circulation (note: the holes cannot decrease the required IP protection rate; ventilation holes are not required if the limiting temperature of the panel surroundings is not exceeded; the ventilation holes do not always guarantee that the temperature of the panel surroundings will be lowered, in such case use other methods).

12.4 Assembly of TOUCH 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 the control panel of the regulator is shown in the figure below. When installing follow the instructions given below.

Drill a hole in the mounting plate acc. the below drawing.
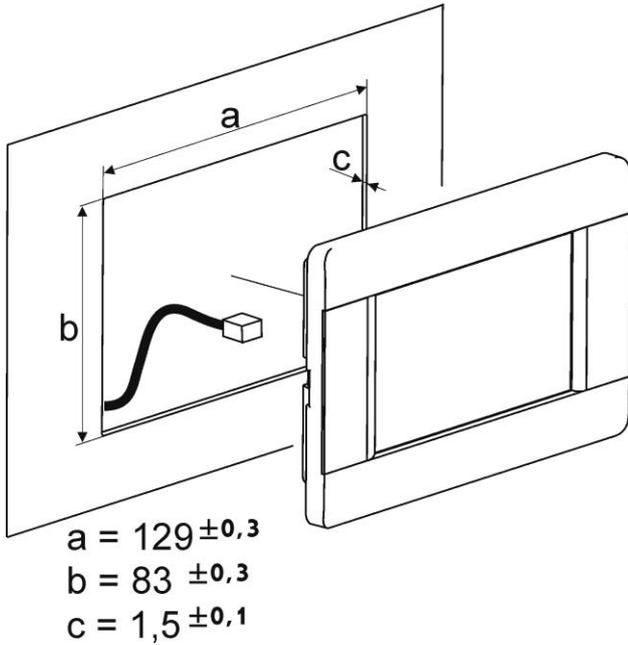
Fig. 15 Installation of control panel in mounting plate

$$a = 129 \pm 0{,}3$$
$$b = 83 \pm 0{,}3$$
$$c = 1{,}5 \pm 0{,}1$$
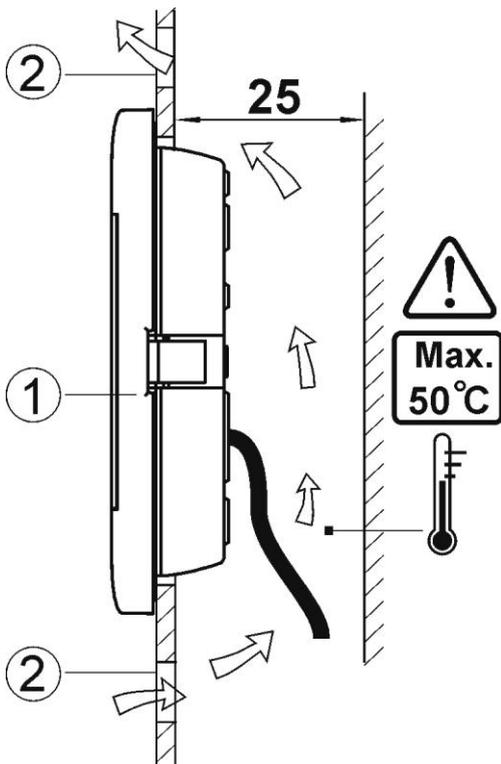
Fig. 16 Control panel mounting requirements. 1 – control panel, 2 – vent holes to provide air circulation (note: the holes may not cause downgrading of required IP rating. They are not required if permitted ambient temperature around the control panel is not exceeded.)

12.5 Disassembly of control panel

$$a = 1{,}2 \pm 0{,}3$$
$$b = 9 \pm 0{,}5$$
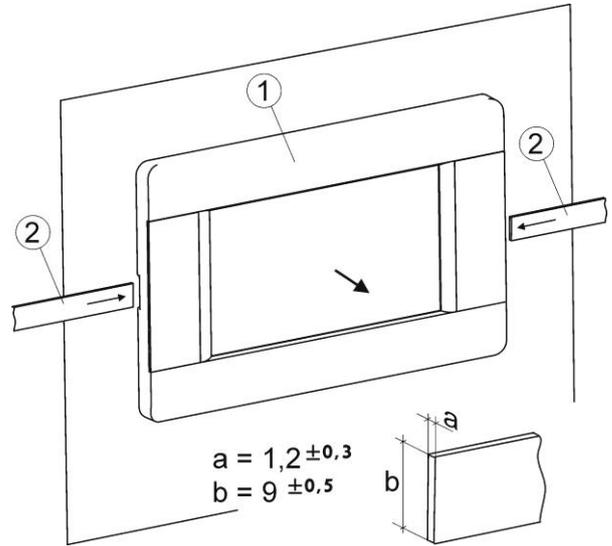
Fig. 17 Disassembly of control panel

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).

12.6 Mounting of working module

Working module has to be built-into the master equipment. Assembly should 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) should be prevented. Standard installation housing as shown in Fig. 18a may be used. 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. 18b. Space required for mounting a working module is shown in Fig. 18 and Fig. 19. Module housing does not guarantee dust-or-waterproofness. To provide the required protection, appropriate module cover should be provided.

The working module is designed to be mounted on a standard DIN TS35 rail. Fasten the rail firmly to a rigid surface. Prior to placing the module on the rail (2), lift up the catch (3), Fig. 19. Now, place the module on the rail and press the catch (3) to bring it to the original position. Make sure the device is firmly fastened and cannot be easily removed from the rail without use of tools.

For safety reasons, assure the safe distance between live parts of working module terminals and conductive (metallic) elements of housing (min.10mm) is kept.
Protect connecting wires from tearing, loosening and tensioning or built them in in such a way that no load is exerted on them.
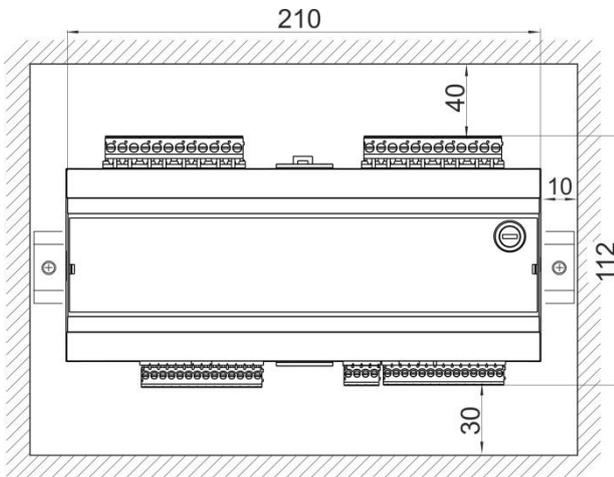
Fig. 18 Space requirements for working module mounting
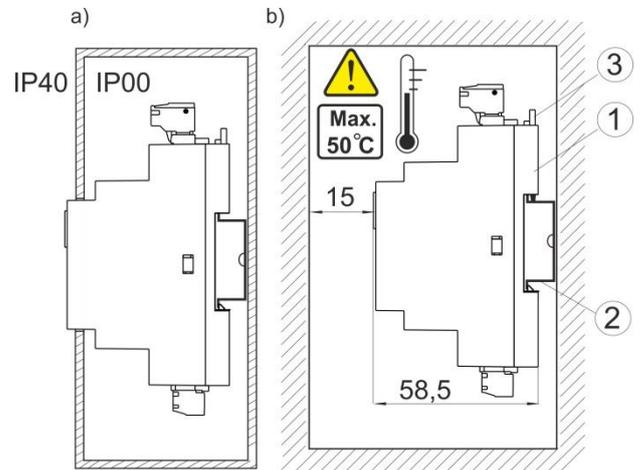
Fig. 19 Methods of module installation: a – in modular housing with access to front surface, b – in the cover without access to front surface, 1- working module, 2 – DIN TS35 rail, 3 – catch.

12.7 IP protection rate

Enclosure of the regulator's executive module provides various IP protection rates, depending on the method of installation. Fig. 18a. provides and explanation. After enclosing in accordance with this drawing, the device has protection rate IP 20 from the front side of the executive module enclosure (specified on the rating plate). From the side of the terminals, the casing has protection rate IP00, thus the terminals of the executive module must unconditionally be enclosed, in order to prevent access to this part of the casing.

If it is necessary to access the part with the terminals, disconnect the mains supply, make sure that there is no voltage on terminals and leads, and remove the executive module enclosure.

12.8 Connecting electrical system

Regulator is designed to be fed with 230V~, 50Hz voltage. The electrical system should be:
- three core (with protective wire),
- in accordance with applicable regulations.

⚠ **Caution:** After the regulator is turned off using the keyboard, dangerous voltage can occur on the terminals. Before starting any assembly works, you must disconnect the mains supply and make sure that there is no dangerous voltage on the terminals and the leads.

The connection wires should not have contact with surfaces of temperature exceeding the nominal temperature of their operation.
Terminals number 1-15 are intended only for connecting devices with mains supply 230V~.
Terminals 16-31 are intended for cooperation with low voltage devices (below 12 V).

⚠ **Connecting mains supply 230V~ to terminals 16-31 and to transmission connectors RS485 will damage the regulator and creates risk of an electric shock!**

Tips of the connected wires, especially power leads, must be secured against splitting by means of insulated clamp sleeves.

Connect power supply wires to terminals indicated with an arrow.

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

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

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 ⏚ and to earthing terminals of devices connected to the regulator, Fig. 20.

12.9 Wiring diagram
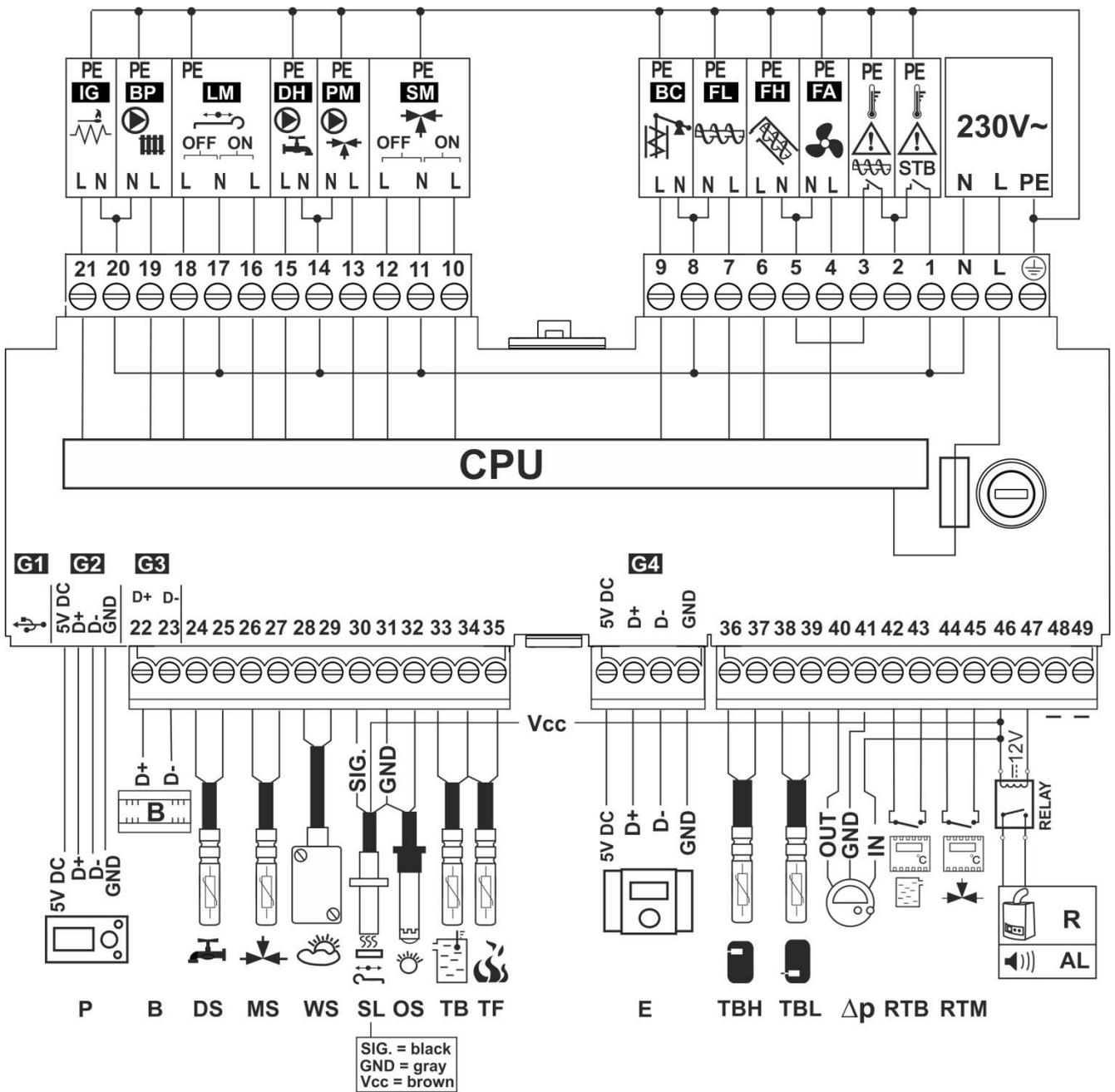
Fig. 20 **Regulator wiring diagram**, where: TB – boiler temperature sensor CT4, DS –HUW temperature sensor CT4, SL – grate servo limit switch, TBH – upper sensor of main buffer temperature, TBL – lower sensor of main buffer temperature, delP – pressure sensor, R/AL – reserve boiler control voltage output R or alarm output AL, RELAY – relay, MS – regulated circuit temperature sensor (mixer) CT4, WS – out-door temperature (weather) sensor CT6-P, TF – exhaust temperature sensor CT2S, P – STANDARD or TOUCH regulator control panel, B – module B enables control of additional heating circuits, E – ecoSTER200 room control panel with room thermostat feature (compatible with the STANDARD version only; for the TOUCH version, use ecoSTER-TOUCH), RTB – boiler's room thermostat, RTM – room thermostat for regulated mixer circuit, OS – optical flame sensor.

L N PE – power supply 230V~, FU – network fuse, STB – safety temperature limiter input, FA – fan, BP – boiler pump or buffer loading pump, DH – HUW pump, LM – grate servo, PM – mixer pump, SM – mixer servo, IG – lighter, BC – exchanger cleaning motor, CPU – control unit.
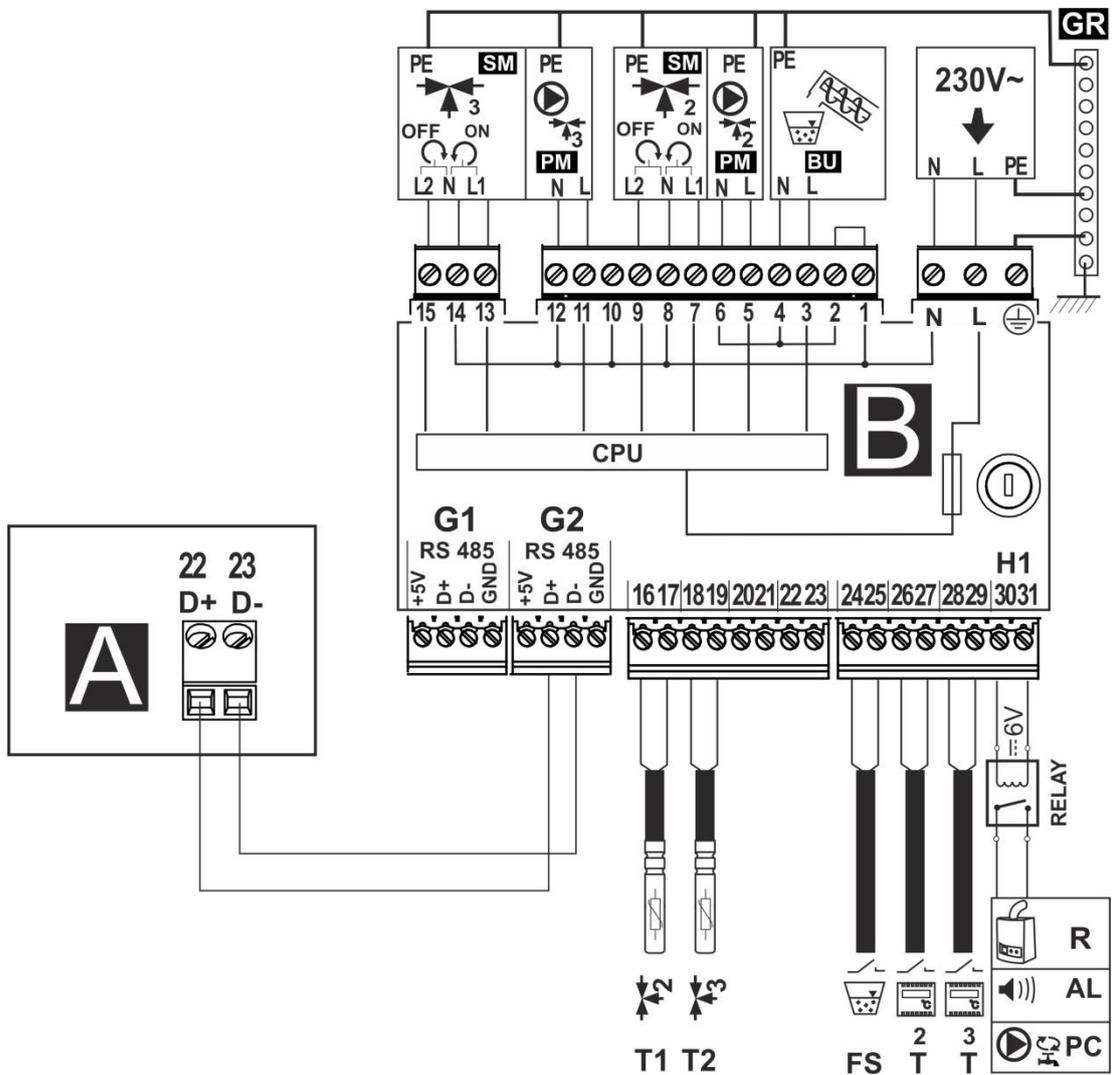
Fig. 21 **Module B wiring diagram**, where: T1 – mixer 2 temperature sensor CT4, T2 – mixer 3 temperature sensor CT4, T – room thermostat, FS – fuel level sensor for feeder BU, AL – alarm annunciator, R – reserve boiler, PC – HUW circulation pump, RELAY – relay, L N PE – power supply 230V~, PM2/3 – mixer 2/3 pump, SM2/3 – mixer 2/3 servo, BU – fuel feeder (bunker to boiler container), CPU – control unit, A – ecoMAX860P1-K regulator module A.

12.10 Connection of temperature sensors

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.

12.11 Connecting weather sensor

The regulator cooperates only with a weather sensor of the CT4-P type. The sensor should be installed on the coldest wall of the building, usually this is the northern wall, under a roof. The sensor should not be exposed to direct sunlight and rain. The sensor should be fitted at least 2 m above the ground, far from windows, chimneys and other heat sources which could disturb the temperature measurement (at least 1,5 m).

Connect the sensor using cable of 0,5 mm² cross-section, up to 25 m long. Polarity of the leads is insignificant. Connect the other end of the cable to the regulator.

Attach the sensor to the wall using tackbolts. To access the tackbolts holes, unscrew the sensor lid.
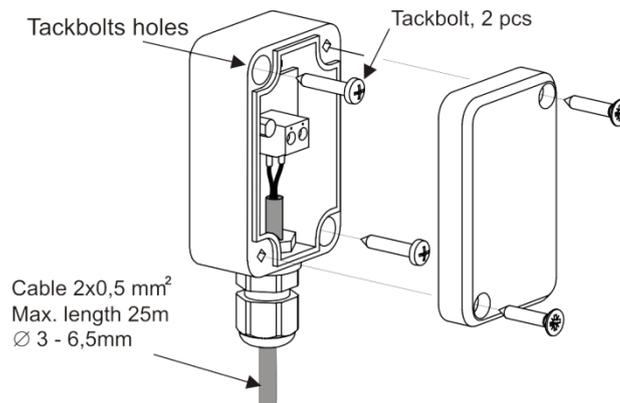
Fig. 22 Connecting weather senor CT4-P.

12.12 Checking temperature sensors

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

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

exhaust CT2S-2, CT6-P			
Temp. °C	Min. Ω	Rated Ω	Max. Ω
0	999.7	1000.0	1000.3
25	1096.9	1097.3	1097.7
50	1193.4	1194.0	1194.6
100	1384.2	1385.0	1385.8
125	1478.5	1479.4	1480.3
150	1572.0	1573.1	1574.2

12.13 Connection of mixers room thermostat

Room thermostat with open contacts reduces preset temperature of mixer circuit by the decrement set in:

Menu → Mixer 1,2,3,4,5 settings, → Mixer room thermostat

Select the value of this parameter so that once the room thermostat has responded (its contacts have opened), the temperature in the room drops.

Other settings - see sec. 8.14

When connecting the ecoSTER room control panel, make sure the **Thermostat select** parameter is set to a correct value.

Menu → Service Settings → Mixer 1,2,3,4,5 settings → Thermostat select. Details on how to connect room control panel are given in sect. 12.19.

12.14 Connection of boiler's room thermostat

Boiler circuit room thermostat may activate the burner or deactivate CH boiler pump. In order for the room thermostat to control boiler operation, set the *Thermostat select.* value to *standard* or *ecoSTER T1* (if the ecoSTER-TOUCH room control panel is connected)

Menu → Service Settings → Boiler Settings → Thermostat select.

In order for the room thermostat to control CH pump operation (without deactivating the boiler), set the *Pump off by therm.* value to *YES*.

Menu → Service Settings → Boiler Settings → Pump off by therm.

12.15 Connection of reserve boiler

The regulator can control a reserve boiler (gas- or oil-fired), eliminating the necessity of enabling or disabling this boiler manually. The reserve boiler will be enabled if the temperature of the boiler drops below parameter:

Menu → Service Settings → H-output → Reserve boiler activation temperature

Connection to a reserve boiler, e.g. oil-fired one, should only be made by a qualified fitter, in accordance with the technical documentation of this boiler.

The reserve boiler should be connected via relay to terminals 46-47
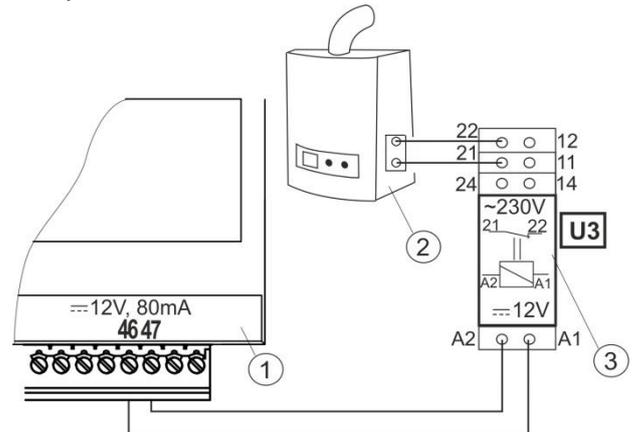
Fig. 23 Model diagram of layout for connecting a reserve boiler to the ecoMAX800P1-L regulator, where: 1- regulator ecoMAX800P1-L module B 2 – reserve boiler (gas- or oil-fired), 3 – Module U3, consisting of relay RM 84-2012-35-1006 and base GZT80 RELPOL.

Standard version of the regulator is not equipped with a relay.

⚠ You have to perform assembly and installation of the module by yourself, in conformity with the applicable standards.

Reserve boiler control is switched off upon setting the H-output function to the reserve boiler.

Menu → Service Settings → H-output → H-output function

The reserve boiler is switched on when there is no voltage on terminals 46-47. The reserve boiler is switched off when there is voltage on terminals 46-47.

☞ When the ecoMAX regulator enters the STAND-BY mode (OFF), the reserve boiler is automatically switched on. The heating system does not operate.
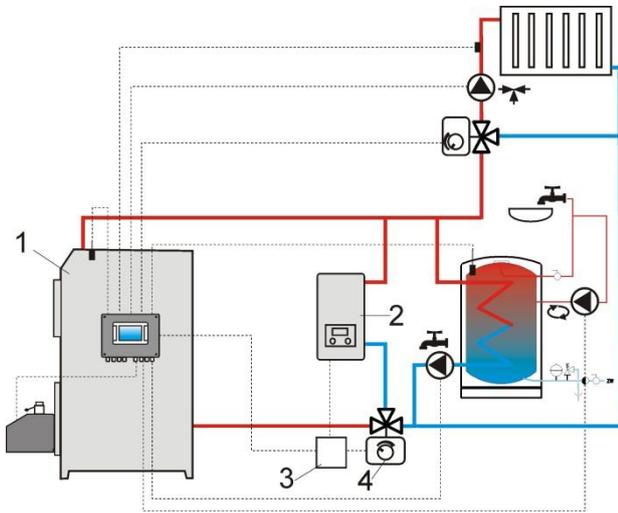
Fig. 24[5] Hydraulic diagram with reserve boiler, where: 1 – regulator, 2 – reserve boiler, 3 – relay (Fig. 25), 4 – switching valve (with limit switches).
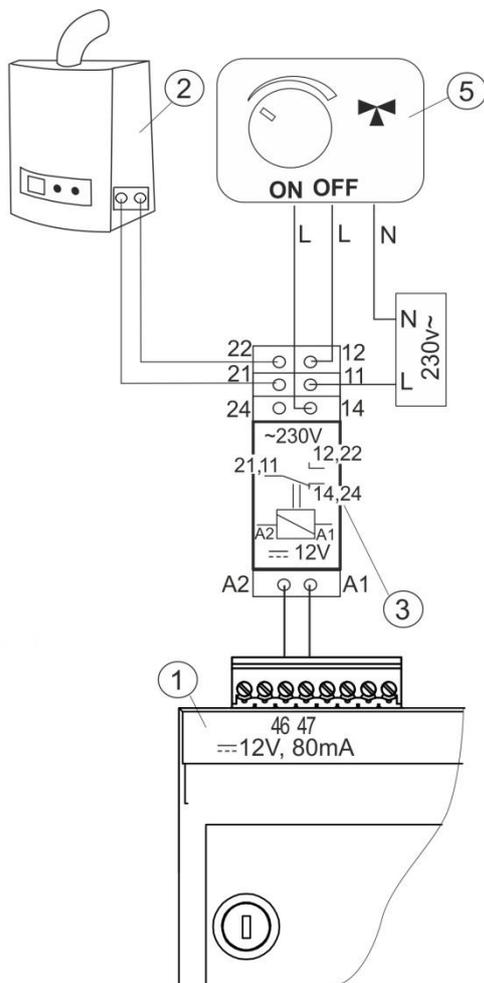
Fig. 25 Wiring diagram of control of the switching valve in the reserve boiler, where: 1 – ecoMAX860P1-K regulator, 2 – reserve boiler, 3 – relay, 5 – switching valve servo (with limit switches). Note: terminals

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22,21,24 have to be galvanically insulated from terminals 12,11,14.

12.16 Connection of alarm signalling

Regulator may announce alarm conditions by activating an external device (e.g. a bell or GSM device to send a text message). Connect alarm annunciator as shown in Fig. 26 through the relay.

Alarm signalling may be deactivated by setting the H-output function to alarms.

Menu → Service Settings → H-output → H-output function
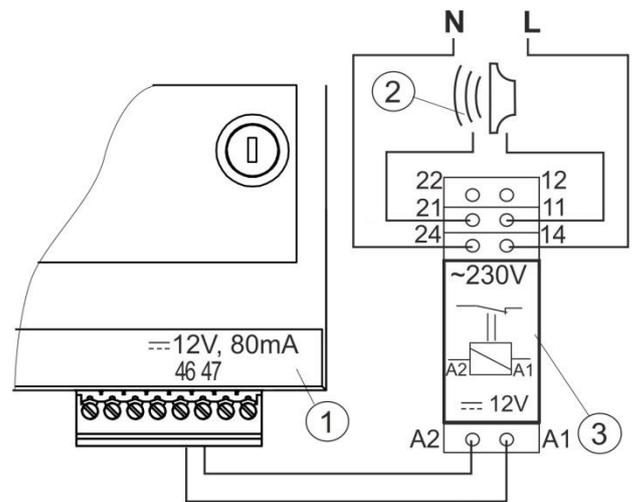
Fig. 26 Connection of an external alarm annunciator. 1- regulator , 2 – external alarm annunciator, 3 – relay.

⚠️ Have the relay installed by a qualified technician in line with current regulations.

Then, select the alarms for which the signal output should be activated for the system to operate correctly:

Menu → Service Settings → H-output → Alarms

Alarms are described in sect. 15.

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[5] The presented hydraulic diagram does not replace central heating engineering design and may be used for information purposes only.

12.17 Connection of mixer

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

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:

Description of mixer connection:

- connect mixer temperature sensor, - connect mixer pump wiring,

- switch on the regulator and select proper *mixer support* in the service menu

MENU → SERVICE SETTINGS → Mixer 1 Settings

- enter the proper *Valve Opening Time* in Service Settings (this time should be indicated on servo rating plate e.g. 120 s).

- connect power supply to the regulator and switch on the regulator to start the mixer pump,

- determine direction of servo closing/opening. For this purpose, set the selector located on the housing of the servo to manual control and find the positions in which the temperature in mixer circuit is maximum and minimum (it corresponds to the setting of the regulator of "100% ON" and "0% OFF, respectively). Note the position to verify the connections later,

- disconnect power supply to the regulator,

- connect mixer servo and regulator wiring according to valve servo manufacturer's technical documentation. Do not mistake direction of valve opening with its closing,

- connect regulator power supply and put it in the STAND-BY mode,

- check whether wires to mixer closing and opening are not interchanged. To do this,

enter MENU→ *Manual control* and open the mixer by selecting *Mix1 Open* = *ON*. When opening the servo, the temperature on mixer sensor should increase. If not, disconnect regulator power supply and switch the wires. (Note: other reason may be incorrect mechanical connection of the valve! – refer to the documentation of valve manufacturer and check whether the valve is properly connected).

12.18 Connecting temperature limiter STB

In order to prevent the boiler from overheating due to the regulator malfunction, an STB safety temperature limiter, or any other appropriate for the given boiler and heating system, should be fitted. When the STB is activated, the fan and fuel feeder motors are disabled.

⚠ The STB must have nominal operating voltage of at least ~230V, and have the applicable certifications.

12.19 Connecting room panel

The regulator can be equipped with room panel ecoSTER200, which can serve as:
- room thermostat (supporting up to 3 thermostats),
- boiler control panel,
- alarm signalling device,
- fuel level indicator.

⚠ **Note: Cross-section area of wires used to connect ecoSTER-TOUCH control panel should be:**
- 0,5mm^2 for ecoSTER200
- 0,75mm^2 for ecoSTER-TOUCH

Max. length of wires should not exceed 30 m. This length may be longer if the wires used have cross-section area larger than 0.75mm^2.

Four-conductor connection:
How to connect – see Fig. 25

Two-conductor 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 supply[6]. Connect lines D+ and D- acc. wiring diagram Fig. 25.

13 Service menu structure

Service Settings
Burner Settings
Boiler Settings
CH/DHW settings
Buffer settings*
Mixer 1 Settings*
Mixer 2 Settings*
Mixer 3 Settings*
H-output
Show Advanced Setup
Restore Factory Settings
Calibrate Touch Screen**

Burner Settings
Calibration
• Feeding
• Calibration
• Feeder Efficiency
• Energy Density
Start
• Air Flush
➢ Time
➢ Blow-in
• Flame Verification
➢ Time
➢ Blow-in
• Firing-up
➢ Attempt Time
➢ Blow-in Attempt 1
➢ Feed Attempt 1
➢ Blow-in Attempt 2
➢ Feed Attempt 2
➢ Blow-in Attempt 3
➢ Heater Oper. Ext.
• Stabilisation
➢ Test Time
➢ Blow-in
➢ Attempt Time
➢ Heater Oper. Ext.
Operation Presets
• Min. Power Oper. Time
• Tank Capacity
• Tank Multiplier
• Feeder 2 Operat
• Min Feeder 2 Operat
• Flame Loss Test Time
• Flame Loss Blow-in

(Burner Settings cont.)
• Flame Loss Blow-in Increase
• Flame Loss Fuel Increase
Burning Off
• Burning Off Max Time
• Burning Off Min Time
• Blow-in Output
Cleaning
• Servo Cycle Time
• Burner Cleaning
• Ash Container Cleaning
• Boiler Cleaning, Fuel Dose
• Boiler Cleaning Time
Supervision
• Supervision Time
• Feeding Time
• Cycle time
• Blow-in Output
Optical Sensor, Flame
Min. Blow-in Output
Min. Blow-in Output
Feeder operat time 3*

Boiler Settings
Thermostat selection
• Off
• Standard
Minimum Boiler Temperature
Maximum Boiler Temperature
Boiler Cooling Temperature
Pump OFF by Thermostat
Maximum Emission Temperature

CH and HUW Settings
CH Pump Activation Temperature
CH Pump Standstill at HUW Loading
Minimum HUW Temperature*
Maximum HUW Temperature*
Incr. Boil.Temp. for HUW and Mixer
HUW Operation Ext.*
Circulating Pump Standstill Time*
Circulating Pump Operation Time*

Buffer Settings
Buffer Activation
Preset Buffer Temperature
Delta T
Loading Start Hysteresis
Loading Stop Hysteresis
Loading Extension

---

[6] PS unit is not included in the regulator supply.

Mixer 1,2,3 Settings
Mixer Support
• Off
• CH On
• Floor On
• Pump Only
Minimum Mixer Temperature
Maximum Mixer Temperature
Proportional Range*
Integr. Time Const.*
Valve Opening Time
Pump Off by Thermostat
Mixer Input Dead Zone*

H-output
H-output Function
• Reserve Boiler
• Alarms
Reserve Boiler Activation Temperature
Alarms
H1-output Function*

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

14 SOFTWARE UPGRADE

In the STANDARD version, the software can be upgraded using a special ecoLINK II interface only. To upgrade the TOUCH version software, use micro SD memory card or the ecoLINK II interface. In this section, software upgrade in the TOUCH version using memory card is described.

Note: software may be upgraded by authorised personnel only. All electric shock preventive measures must be applied!
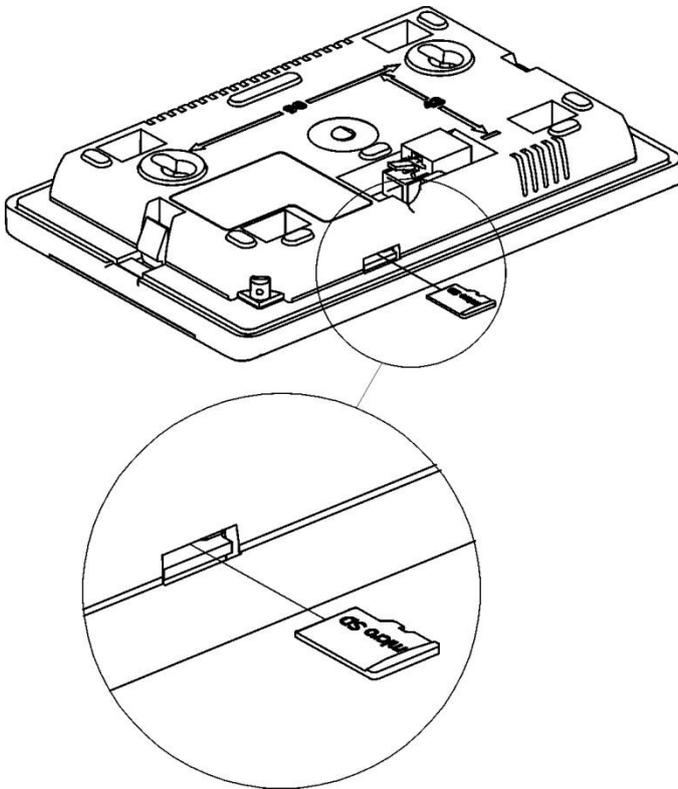
Fig. 27 Inserting a microSD card

To upgrade the software, disconnect power supply of the regulator and remove ecoTOUCH control panel from the regulator housing. Insert memory card into indicated slot. Memory card should contain new software stored in the *.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 the memory card. Do not nest data in sub-directory. Re-install the control panel in regulator housing and connect power supply. Enter:

Menu → General Settings → Software Upgrade and upgrade the software: first in the A module, then in regulator's control panel.

15 DESCRIPTION OF ALARMS

AL1	Exceeding max. boiler temperature
AL2	Damage to boiler temp. sensor
AL3	Pressure sensor failure
AL4	No fire-up
AL5	Cannot reach pressure
AL6	Burning off failure
AL7	Optical sensor failure
AL8	Line actuator blocked
AL9	Check fuel parameters and quality
AL10	Risk of water condensation
AL11	STB limiter disconnected
AL12	Feeder temperature>75°C
AL13	Exhaust temperature sensor damage

16 OTHERS

16.1   Power supply decay

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

16.2   Anti-freezing protection

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.

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

16.3   Function of protecting pumps against stagnation

The regulator protects the CH, HUW and mixer circuit pumps against stagnation. It does so by activating them periodically (every 167 h for several seconds). This protects the pumps against immobilization due to sedimentation of boiler scale. For this reason, the regulator power supply should be connected also when in the boiler is not in use. This function can be enabled also when the regulator is turned off, via keyboard (regulator in STAND-BY).

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

16.5   Replacement of control panel

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

17 Revision history

Issue 1.1 – Changed Fig. 20

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