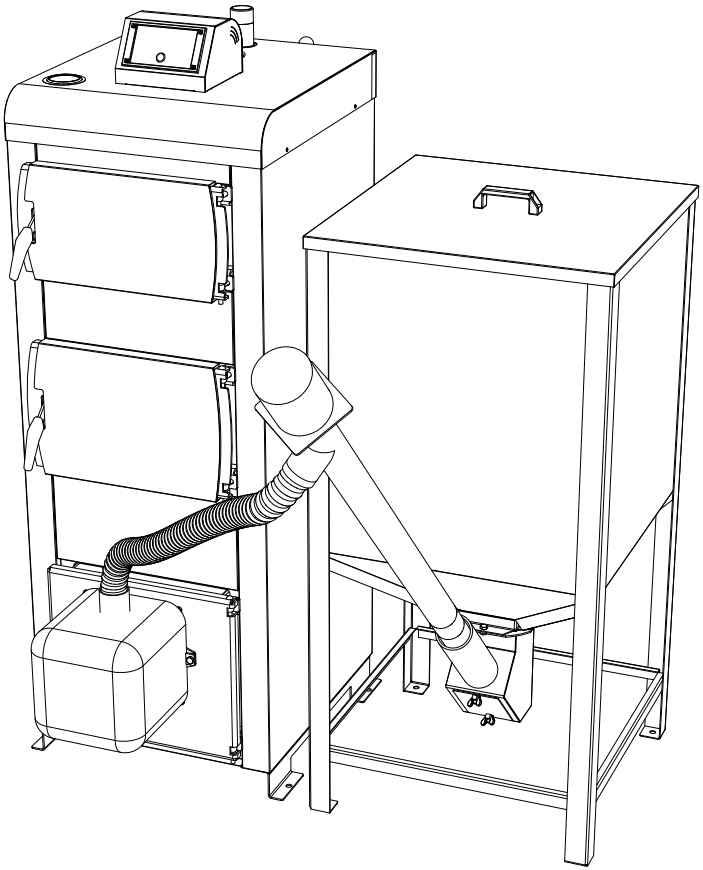
PEREKO®

ciepło jest żółte

Operation and maintenance manual for

KSR Beta Pelet

series boilers with feeders



Thank you for purchasing PEREKO heating boiler. This documentation applies to the KSR Beta Pelet series boilers with fuel feeder - wood pellet. The manual contains all necessary information and recommendations concerning operation.

Please carefully read this document before start-up of the boiler. Observance of the guidelines contained in the manual will ensure safety and prevent against misuse of the equipment and its faulty operation.

Manual for the controller, which should be read and understood, is enclosed in the set of documents for the boiler supported by electronics. Documentation and manuals should be kept and stored in a way allowing using them also during servicing of the equipment.

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1. INTRODUCTION

1.1. Obligations of the user and guidelines concerning safety

To assure operational safety and maintain optimum operation of the equipment:

- read the manual of the boiler, controller, feeder and observe their guidelines,
- the manual should be kept and stored in a safe place in the boiler room allowing using it during any moment of boiler operation,
- ensure that it is never operated by children or persons who have not read the contents of the manual and adults with disabilities preventing them from the safe operation,
- the system should be made in compliance with the applicable regulations and in accordance with the rules and recommendations contained in the manual,
- before setting and connecting the boiler check whether all components are in good working order and whether the boiler has a complete equipment for servicing and cleaning,
- the boiler should be cleaned on regular basis, at least once per week, removing a layer of deposited soot and ash, which reduces the efficiency of the boiler,
- ensure continuous access to the equipment,
- avoid exceeding water temperature in boiler over 95°C,
- maintain operating pressure not exceeding 1.5 bar.

NOTE! Boiler installation in accordance with the applicable standards and regulations and first start-up should be carried out by a qualified installer.

1.2. Selection of correct power of the boiler

Nominal power of purchased boiler (that is maximum thermal efficiency, which can be reached during continuous use maintaining the efficiency declared by the producer) should be selected in a way corresponding the real demand for thermal energy even in case of occurrence of very low temperatures.

Do not purchase boiler with power higher than this planned in the design. Selecting boiler with too high power will result in higher fuel consumption and lack of full control over the combustion process and therefore higher operation costs, while too small boiler will not ensure sufficient power necessary to heat up the building.

Approximate boiler power can be calculated using a *power calculator* on our website *www.pereko.pl* Furthermore, you should also consider: thickness of walls and insulation, the thermal permeability of first fix joinery (including: tightness of windows and doors, type of window panels used) and climatic zone, where the heated building is located.

2. TECHNICAL DESCRIPTION

2.1. Intended use

Steel heating boilers KSR BETA PELET are intended for installation in the central heating water systems in single-family houses, garages, maintenance rooms etc. These boilers belong to a group of low-temperature boilers and are not subject to registration in the regional Office of Technical Inspection. They are intended for operation in water distribution piping of the gravity hot-water systems or in open systems with forced circulation, which are equipped with protections in compliance with the requirements PN-91/B-02413 applying to the protections of the open water heating system (considering the Regulation of the Minister of Infrastructure, Journal of Laws of 2009 no. 5 item 461).

2.2. Design description

2.2.1. The set includes

- Boiler body (on pallet)
- Charging hopper (on pallet)
- Burner with feeder (packed in cardboard box)

2.2.2. Water casing

KSR BETA PELET heating boilers are made of steel sheet P265GH intended for production of the pressure equipment operating in the elevated temperatures. Heat exchanger sheets are welded from both sides and body sheets are reinforced with supports. Location of convection ducts allows cleaning through the upper doors. Ash and soot are removed through bottom doors. Design solution, that is the use of three-draught design of the furnace, ensures efficient reception of heat.

2.2.3. Doors

The boiler is equipped with top doors intended for cleaning, central inspection doors and bottom doors, with pellet burner and they are intended for removal of ash formed during the combustion process.

2.2.4. Water jacket

The water jacket is a space filled with heating medium - water. The structure is made of steel sheet P265GH for pressure equipment intended for operation at elevated temperatures.

2.2.5. Thermal insulation panels

Insulation panels fixed on the surface of the water casing limits heat losses to the environment. They are made of aesthetic panels made of a zinc-plated metal sheet, painted with powder paint ensuring high anti-corrosion protection. The modules are lined with a mineral wool from the inside, which is used as an insulation material.

2.2.6. Electronic controller

Microprocessor controller, installed in upper front part of the boiler allows programming temperature of boiler operation and programming changes of temperature of its operation at any time. The controller is also responsible for the so-called blowing of the furnace chamber. The controller is also equipped with operation control sensor and sensor of emergency boiler shutdown after exceeding water temperature 95°C. Detailed information you will find in the "User's manual of microprocessor temperature controller", enclosed in the boiler documentation.

2.2.7. Set of feeder with burner

The unit consists of two modules: burner driven by the motoreducer, which is installed in the bottom doors or on the side of the boiler and pellet feeding tube with drive and transport screw. Its task is to take the fuel from the container and feed it automatically to burner part. Unit design allows quick assembling and disassembling.

2.2.8. Water connections

Water connections are intended for connection of boiler to the central heating system. Size of supply and return connection - G 1 1/2" internal thread.

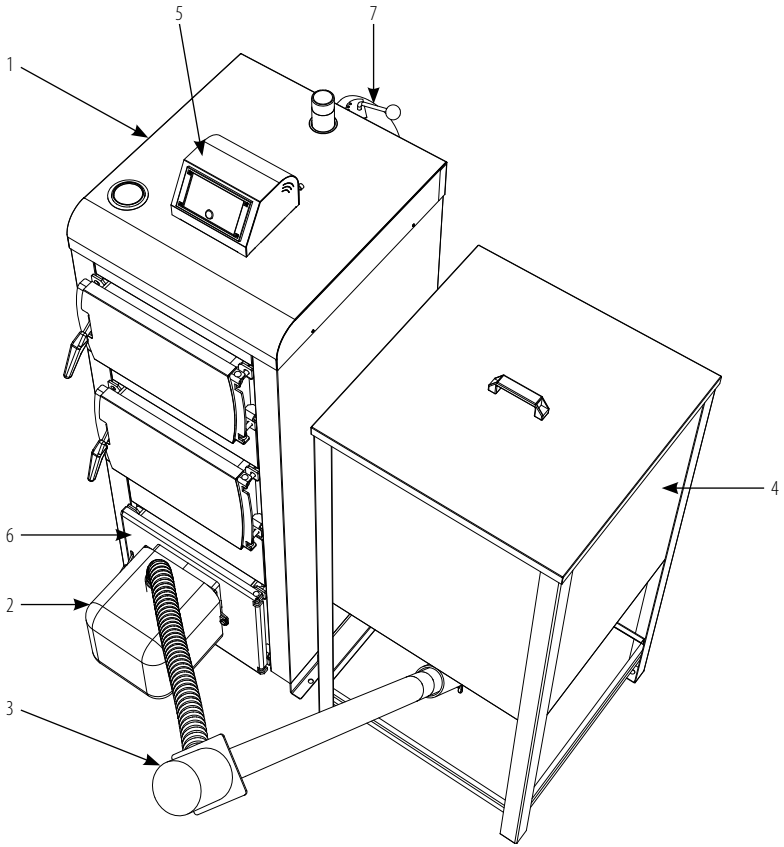
2.2.9. Flue with a damper

Flue with rotary flue gas damper is an integral part of the boiler, which discharges flue gas towards the chimney flue.

2.2.10. Flue gas swirlers

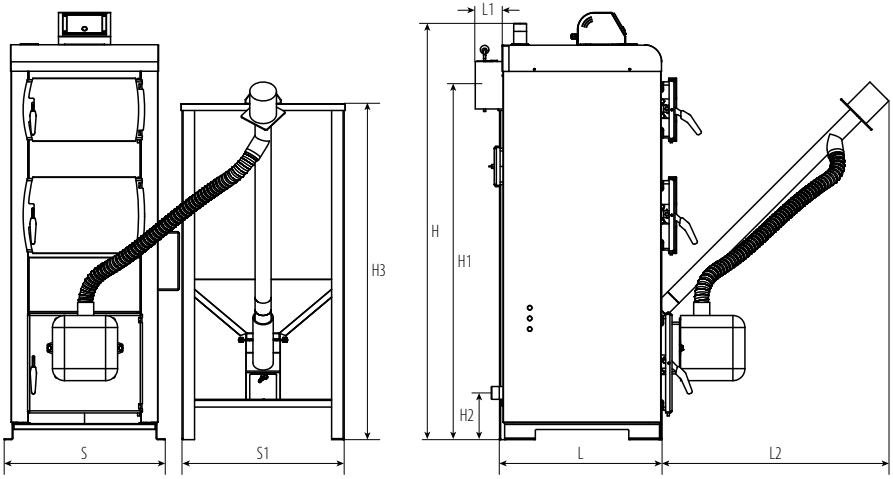
Flue gas swirlers are located inside the convection ducts to swirl flue gas stream, what has an influence on the increase of efficiency and the boiler power. The swirlers should be removed in case of weak chimney draught.

2.3. Boiler design diagram



1. Boiler body;
2. Pellet-fired burner
3. Feeding unit
4. Charging hopper
5. Electronic controller
6. Ash-pan doors
7. Flue

2.4. Operation and technical parameters



Parameter		Unit	Model		
			16	20	28
Dimensions	D	[mm]	∅159		∅180
	E	[mm]	348 × 198		348 × 248
	L1	[mm]	110		
	L2	[mm]	800		
	L	[mm]	490	520	590
	H	[mm]	1285	1390	1560
	H1	[mm]	1070	1160	1330
	H2	[mm]	175		
	H3	[mm]	1250		
	S	[mm]	490		550
	S1	[mm]	610		
Primary fuel		—	wood pellet		
Thermal power range*		[kW]	4.8 – 16	6 – 20	8.4 – 28
Area of heated rooms**		[m^2]	≤ 290	≤ 364	≤ 509
Heated rooms volume		[m^3]	≤ 725	≤ 909	≤ 1273
Charging capacity of container		[dm^3]	300		
Boiler water capacity		[dm^3]	56	63	89
Heat exchanger material		—	steel P265GH [PN-EN 10028]; thickness 5 and 6 mm		
Maximum operating pressure		[bar]	1,5		
Wymagany min. ciąg kominowy***		[Pa]	20		25
Supply / Power		[V/W]	230 / 50		
Boiler weight without water		[kg]	268	304	397
Energy-efficiency rating		—	A+		
5 CLASS acc. to PN EN 303-5:2012		—	yes		
The boiler meets the ECODESIGN		—	yes		
The boiler meets the requirements of the REGULATION OF THE MINISTER OF DEVELOPMENT AND FINANCE of 1 August 2017			yes		
Warranty		—	10-year warranty for tightness of welds 6 years warranty for tightness of heat exchanger 2 years warranty for components		

*maximum water temperature in the boiler – 95°C; **for rooms height 2.5 m and insulation with styrofoam 15 cm (q = 55 W/m^2); ***PN-EN 12809, PN-EN 303-5:2002;

2.5. Fuel

Wood pellet is a primary fuel used in the KSR Beta Pelet: PN-EN ISO 17225-2:2014 – class A1. Fuel used for combustion in the pellet-fired boiler should have sufficient calorific value > 17 MJ/kg, be dried (moisture content ~ 10%) and have size recommended by the producer (6±1 mm and 8 ±1 mm). Use of moist or too large fuel can lead to locking in the feeder and serious failure of the boiler. Ash content should be lower than 0.5%, the unfavourable chemical composition of the fuel can result in sintering and formation of large amounts of dust and soot and increased fuel consumption. Times given in the table on page 14 apply only to operation with suitable fuel.

2.6. Equipment

Prior to the boiler setting you should check the presence of additional tools and operation of the instrumentation. The complete set should include: burner with a feeding system, fuel container, electronic controller, brush, hook, ash shovel, drain cock, fuel swirlers.

3. BEFORE START-UP

3.1. Boiler room

- It should be a separate room with height not lower than 2.2 m in the newly constructed building (in the already existing buildings the allowable height equals to 1.9 m).
- It should have artificial lighting installed and have natural lighting as far as practicable.
- It should have gravity ventilation in good working order, including:
  1. air-supply duct in the external wall with cross-section not lower than 50% of chimney cross-sectional area on height maximum 1 m over the flooring or not lower than 200 cm^2 for boilers with power up to 25 kW or 400 cm^2 for boilers over 25 kW,
  2. 2. separate air-exhaust duct on the internal wall with cross-section not lower than 140x140 mm with an outlet located under the boiler-room roof near the chimney.

NOTE! It is forbidden to use mechanical exhaust ventilation in the room where the boiler was installed.

- Floor gully and floor with 1% slope towards the outlet should be planned in the central part of the room.
- Flooring and walls in the whole room should be made of non-combustible materials.
- The doors to the boiler room should open outwards.

3.1.1. Method for boiler setting

The boiler requires non-flammable flooring, in form of a foundation, but it is allowed to place it on non-flammable wall base with height not lower than 50 mm. The boiler should be placed in a way ensuring free access to the equipment, allowing its cleaning and maintenance. Therefore, while setting the boiler it is recommended to maintain minimum distances from the individual walls:

- distance from the front of the boiler to opposite boiler room wall should not be smaller than 2 m,
- the distance of boiler side from the wall of the boiler room should be lower than 1 m,

- the distance of rear part of the boiler from the wall of the boiler room should be equal to at least length of the connection, that is 0.25 m.

3.2. Connection to chimney

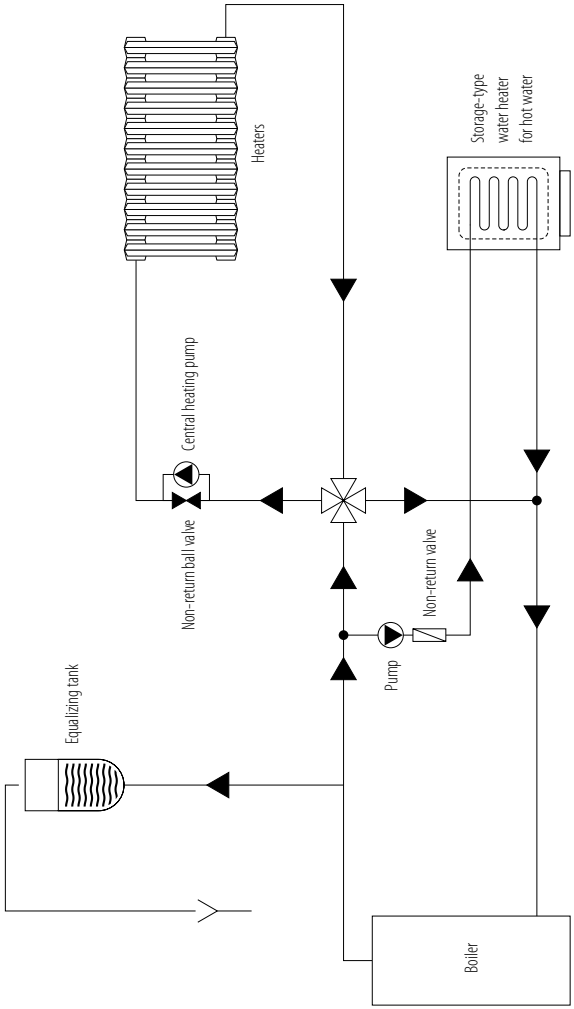
1. It is necessary to prepare stand-alone, tight chimney flue, which will be used for flue gas from the boiler.
2. The flue should be placed at least 1.5 m over the roof ridge to avoid the occurrence of backdraught. The intersection of the flue should be appropriately selected for the boiler power and height of the chimney. Approximate calculations of chimney height and intersection can be carried out using a chimney intersection calculator available on the website www.pereko.pl Regardless of the results of the calculations the minimum intersection of masonry chimney should not be lower than 14 x 14 cm! The intersection of non-insulated steel chimneys should be bigger by 20% and the chimneys made from steel pipes should be about 15-20% higher than brick chimneys.
3. Check condition of the chimney (preferably by a chimney sweep) before connecting the boiler to the chimney and check whether the chimney is free from connections of the heating elements.
4. The boiler should be connected with chimney using a connector. It is not recommended to use the connection at a straight angle because it will cause a loss in the chimney draught. Flue with chimney should be joined with a connector made of steel sheet of thickness 3 mm (to be purchased from the boiler producer). We put it on the outlet from the flue, fix on the chimney and seal with high-temperature silicone. The connector should be directed slightly upwards from 5° to 20°. If boiler flue will have a length over 400 mm then it is recommended to insulate it with a thermal insulation.

NOTE! Boilers should be installed in compliance with the applicable Regulation of the Minister of Infrastructure (Journal of Laws of 2002 no. 75 item 690 and Journal of Laws of 2009 no. 56 item 461.) In addition, it is recommended to use chimney liner resistant to corrosion: chemical, pitting, intercrystalline and surface.

3.3. Connection of central heating and domestic hot water system

3.3.1. Open water installations

KSR Beta Pelet boilers are intended for feeding water distribution piping in the open central heating systems with gravity or forced circulation of water. The system, where the boiler will be operated, should meet the requirements of the Polish Standard PN-91/B-02414 Heating and district heating - Protection of open water heating installations - Requirements.



Exemplary diagram of the open central heating system with four-way valve and hot water heater

3.3.2. Closed installations water distribution systems

KSR BETA PELET heating boilers with automatic fuel charging with nominal power up to 300 kW can be used in closed water heating systems provided that:

1. the system has been equipped with membrane expansion vessel;
2. a device intended for removal of heat excess, that is two-function cooling valve REGULUS DBV-1, was installed
3. the safety valve 1.5 bar was installed.

NOTE! Correct selection of protections and suitable expansion diaphragm vessel having influence on safety level of the system and the boiler. The above equipment should be rigorously inspected minimum twice per year. The first inspection should be carried out during seasonal start-up of the boiler with the water distribution system.

3.3.3. Four-way valve

Design of the heating system should take into account protection of the boiler against the return of too cold water from the system. It is recommended to use four-way mixing valve what allows the increasing temperature of water returning to the boiler.

Four-way valve mixes hot water from the supply with cooler water returning from the heating cycle and therefore:

- protects the boiler against low-temperature corrosion and premature wear,
- improves the efficiency of heating of tap water in the DHW storage tank,
- allows smooth adjustment of the temperature of the heating water with respect to the needs of the heating system,
- improves the efficiency of operation of the whole system.

Designing of the correct diagram of the system for the house and its execution should be entrusted to a person with appropriate qualifications. Central heating systems may differ and therefore it is necessary to stick to the guidelines included in the central heating design. Below you will find an exemplary connection diagram of the boiler to the central heating and domestic hot water system in the open installation with gravitational or forced water circulation.

3.4. Connection of the boiler to electrical system

Boiler room should be equipped with electrical system with rated voltage 230/50Hz in compliance with the applicable regulations. The system should be terminated with plug-in socket equipped with protective conductor contact with connected protective conductor terminal PE to protect against electric shock.

3.5. Filling the system with water

3.5.1. Filling the boiler with water before first start-up

1. Flush heating system and boiler before filling it with water to remove all contaminations.
2. Fill the system with water through the drain cock using the flexible hose. Water intended for feeding the heating boiler should meet the requirements of the PN-93/C-04607 standard. Quality of water filling the central heating system influences its durability therefore this water should be free from the contaminations, oil and aggressive chemical substances. Water hardness should not exceed 2°tn (1°tn = 0.71 mval/l). Too hard water causes deposition of sediment in the boiler and heating system what decreases efficiency and may damage the boiler.
3. Water refilling process in the system should be stopped when the system is full. In such case the water will flow out from the signalling pipe of the expansion vessel, which is located at the highest point of the system. Additional measuring instrument – pressure gauge, will indicate approx. 0.8-1.2 bar. Refilling should take several seconds to make sure that the water flows down from the vessel.
4. Close boiler drain cock and disconnect flexible hose from the boiler when the system is filled.

3.5.2. Refilling system with water

Heating system with open container allows direct contact of heating water with the air what results in evaporation and necessity to refill it.

NOTE! It is forbidden to add cold water to the hot system. Adding water to hot components of the boiler may damage it and is synonymous with loss of warranty.

The system can be refilled with water only when the boiler is cold. Firing up should be restarted after filling the system.

3.5.3. Draining water from the system

It is not recommended to drain the water from the system after the heating season because it increases the risk of occurrence of the corrosion and formation of boiler scale. The exception is a time needed to carry out necessary repair and long-term standstills of the boiler during strong frosts. In the latter case it is recommended to drain the water from the system to avoid freezing and therefore damages and refilling it when the frost is over.

4. SERVICE MANUAL

4.1. Safe operating conditions

To maintain safe operating conditions for the boiler you should:

- Execute heating system correctly in compliance with the requirements of the standards: PN 91/B-02413, applying to the protection of open water heating installations, considering the Regulation of the Minister of Infrastructure, Journal of Laws of 2009, no. 56, item 461.
- Fill the system with water correctly. Do not refill the system with cold water during operation of the hot boiler.
- It is forbidden to operate the boiler if the water level in the system is below the level indicated in the central heating system user manual.
- Never use flammable liquids, e.g. petrol, for firing up.
- Do not extinguish the fire in the furnace by pouring it with water.
- Use suitable equipment and protective clothing (gloves, goggles, head protection, shoes) during work with the boiler and take special care during servicing of non-insulated components (e.g. doors), which may heat up to high temperatures resulting in risk of burn injuries.
- Do not stay on the side of the boiler during the opening of the doors and pay attention to flames.
- Take care of cleanness in the boiler room, ensure proper ventilation and remove corrosive and flammable materials located nearby.
- The boiler should be cleaned only when it does not work.
- Use mobile lamps supplied with a voltage lower than 24V during works connected with servicing of the boiler.
- Take care of the good condition of the boiler and hydraulic system.
- Take care of boiler cleanness.

4.2. Before first firing up

Before the first start-up, please check:

1. The correctness of installation and connection to electrical system:
   a. the actuator of the four-way valve (if any),
   b. central heating pump, domestic hot water pump, floor pump (if any),
   c. the sensor in the boiler,
   d. fan,
   e. feeder.
2. Heating system:
   a. its tightness, whether there are no leaks of water from the boiler or system,
   b. whether the water is not frozen in the conductors and expansion vessel,
   c. whether water level and its pressure are correct and sufficient (pressure gauge depending on the height of the building should indicate from 0.8 to 1.2 bar). If the pressure is too low, you should add water by pouring it to the cold boiler.
3. Cleaning hole, which should be tight.
4. The correctness of boiler connection to the chimney.
5. Carry out measurements of chimney draught.

4.3. Firing up in the in KSR Beta series boilers

1. Fill the fuel container with suitable fuel (wood pellet).
2. Switch on the controller (see Controller User's Manual) and switch to manual operating mode.
3. Check operation of the individual equipment: operation of the fan, feeder, activation of the central heating pump, domestic hot water pump and a floor pump.
4. Turn off the fan. In manual mode the feeder starts feeding the fuel for approx. 2-3 min. Wait until pellet starts falling down in the flexible hose of the feeder.
5. Set feeder on the electronic controller to "automatic mode" after feeding the fuel (see Controller User's Manual).
6. Set required parameters (boiler operation time, feeding time, break in fuel feeding and blowing speed) after 10 minutes in accordance with specified values given in the user's manual for controller and feeder.

NOTE! Doors with burner should be tightly closed during automatic operation of the boiler.

NOTE! The temperature on the boiler should not be set below 57°C! It increases a risk of occurrence of a "dew point" what considerably low-temperature corrosion in the heat exchanger. Maintaining a temperature of feeding water below 57°C with simultaneous use of incorrect solid fuels leads to accelerated wear and tear of the boiler and decreases its efficiency.

Whole combustion process will be controlled by the controller when the boiler is fired up (see *Controller User's Manual*), maintaining the set temperature of water in the boiler and taking into account building demand for heat.

4.3.1. Approximate output parameters of the controller

The controller is pre-configured, but its output parameters are changed, depending on fuel used (pellet) and may require individual adjustment. They should be adjusted depending on heat demand, type and quality (calorific value) of pellet or depending on the development of the heating system. Selecting correct parameters ensures economical combustion of fuel.

4.4. Refueling

The container should be refuelled regularly to maintain continuous operation of the boiler. If there is no fuel, the controller will shutdown whole system and will signal lack of the fuel.

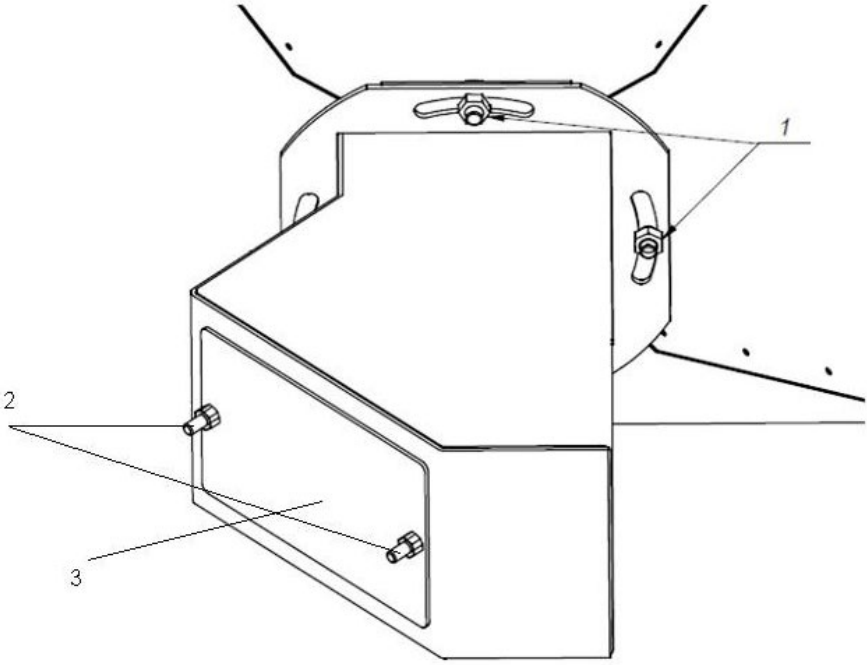
NOTE: Make sure that there are no contaminants, which can lock operation of the feeder (debris, rocks, parts of wood metal).

4.5. Stop of boiler operation

Switch to shutdown mode, where the controller stops the feeder and executes cyclic blowing to post-combust fuel residues. When fuel brightness decreases the controller switches to STANDSTILL mode and waits for the signal to start operation.

4.6. Adjustment of hopper chute

Adjustment of hopper chute allows directing feeding pipe towards the burner. Loosen the nuts for this purpose (item 1) and then direct chute to the given side (right or left). After setting the chute it should be re-tightened.



1. Wing nut
2. M8 screw
3. Cleaning hole

4.7. Cleaning and maintenance

Maintaining cleanness of the boiler is a necessary condition for its effective, trouble-free operation. Even small layer of deposit will cause a decrease of heat transfer from flue gas and reduces boiler efficiency as a result. The accumulated deposit can be also a reason for boiler damage.

Therefore, the boiler should be regularly and precisely cleaned at least once a week. Remove soot from the combustion chamber and vertical smoke tubes using wire brush after extinguishing and cooling down of the boiler. Remove soot through side cleaning holes once a month.

4.8. Emergency stop of boiler operation

The boiler should be stopped always in case of:

1. water leakage from the boiler,
2. temperature increase over 90°C,
3. the necessity to refill evaporated water in the system and heaters.

To stop operation of the boiler you should carry out operations listed in "*Stop of boiler operation*". If it is necessary to stop the boiler quicker you should take out heat from igniter using a metal shovel to a metal container, remove heat from the boiler-room and extinguish it with water there.

NOTE! Do not extinguish glowing fuel with water in the boiler room!

5. BOILER OPERATION DISTURBANCES – BEFORE CALLING THE SERVICE

The customer will bear the costs of travel and work of the sere technician in case of the unjustified calling of producer's service. Therefore, before you call the producer's service please read the section concerning the most often occurring disturbances in boiler operation and methods of dealing with them.

Symptom	Cause	Repair
Smoking outwards	insufficient chimney draught	remove leaks in chimney, flue or boiler doors
	insufficient chimney height	lift chimney to height min. 1.5 m over roof ridge
	too small chimney's intersection	adjust damper of the flue, decrease blowing force
	very low atmospheric pressure	use fan supporting chimney draught
	contamination of chimney flue	clean ducts
Low thermal efficiency of the boiler	combustion of low heat fuel	replace fuel with high heat fuel
	no supply of air to the boiler-room	facilitate correct air supply through the window or air supply duct
	failure of forced draught fan or controller	re-set parameters in compliance with the user's manual or replace with a new one - in good working order
	contamination of gas passes in smoke tubes chamber	clean passes, adjust the damper
Moistening and tar deposits inside the boiler (symptoms similar to leak)	low temperature maintained in the boiler	use boiler in temp. min. 57°C
Leak	for evaluation of the producer	repair by PEREKO service
Too high chimney's draught	—	adjust chimney draught with a damper in boiler flue
Fuel suspends in the container	Too moist fuel	Remove fuel from the container and dry it
Screw-conveyor feeder does not start	no supply	check supply
	controller switched off	check the main switch of the controller
Smoking from container	incorrect setting of fuel feeding time	set correctly the time for fuel feeding on the controller
	moist fuel	check and dry the fuel
Too high fuel consumption	incorrect setting of parameters	the assistance of the producer's
	bad quality of fuel	replace fuel
Fuel does not burn completely	too short time between fuel feeding	set the correct interval between successive fuel feeding
	bad quality of fuel	replace fuel

6. WARRANTY TERMS AND CONDITIONS

1. Envo sp. z o.o. with registered office in Starachowice ul. Radomska 76 is a producer of PEREKO boilers.
2. The warranty card is invalid without a date, stamp and signatures of the producer, retail outlet and the seller.
3. Copies shall not be issued if the warranty card is lost.
4. The warranty card or purchase invoice is the only documents authorising the purchaser for free warranty repair.
5. The beginning of the warranty period for the PEREKO boiler is the date of purchase confirmed by a proof of purchase.
6. The producer provides a warranty for the operation of the heat exchanger for 60 months and 24 months for the components.
7. The producer provides a warranty for tightness of welding connections for 10 years.
8. Warranty for tightness of welding joints is not synonymous with warranty for tightness of the whole boiler and is applicable in case of leaks only on welding joints.
9. The producer reserves the right to make improvements or modifications without prior notice.
10. The warranty is prolonged by a period from the date of the notice of boiler repair to the date of its execution. Execution of the repair is confirmed in the warranty card and report from visit intended for removal of fault.
11. The producer will consider the claim within 14 days from the date of the notice.
12. During the warranty period the boiler can be replaced with a new one if the Producer (based on the decision of the authorized expert) decides it cannot be repaired.
13. Quality claims concerning the boiler should be made in sales location or directly to the producer.
14. The warranty does not cover boiler connection, clamping grips, heat doors, sealing cord located in the external doors and tools for servicing and cleaning.
15. Warranty for electronic temperature controller (regulator), fan and automatic coal feeding system is provided by their producer and it is enclosed to set of boiler documents.
16. The user shall bear the costs of travel and work of the service technicians in case of unjustified claim and groundless calling the producer's service.
17. The above manual for the feeder boilers is the property or ENVO sp. z o.o. It should not be copied and use by the other economic entity or natural person without written consent from the owner. All rights reserved.

NOTE! The producer does not accept any liability for effects of incorrect installation, incorrect operation of the boiler, non-observance of the recommendations included in the user's manual or incorrect maintenance of the equipment.

The warranty becomes void in case of:

1. Use of protections incompatible with PN-91/B-02413.
2. Incorrect connection in closed system acc. to the Journal of Laws of 2009, no. 56 item 461.
3. Incorrect transport and storage of the boiler.
4. Starting the boiler without sufficient amount of water.
5. Damages resulting from overheating of the boiler.
6. Repairs during the warranty period by person and companies without authorization from the producer.
7. Damages resulting from non-observance of assumptions contained in the manual.
8. Exceeding allowable working pressure 1.5 bar.
9. Mechanical damages or intervention in the boiler structure by non-authorized persons.
10. Corrosion of steel components resulting from maintaining too low temperature of water - below 57°C with simultaneous use of incorrect, moist fuel.
11.

SERVICE ASSISTANCE

Date	Comments	Signature

WARRANTY CARD

for hot water heating boiler used in the central heating system

Serial number .....

Type .....

Production date .....

QC mark .....

Warranty for tightness of welding connections of water casing in the boiler is provided for 10 years, 60 months for tightness of the heat exchanger and 24 months for the other components.
The beginning of the warranty period for the PEREKO boiler is the date of purchase confirmed by a proof of purchase.

.....
Sign and stamp of the producer

.....
Date of retail sale

.....
Sign and stamp of commercial unit

Producer:

Envo sp. z o.o.,

27-200 Starachowice, ul. Radomska 76, POLAND

www.grupaenvo.pl

Technical support

tel. +48 (41) 274 53 53, fax +48 (41) 274 53 26

e-mail: serwis@pereko.pl,

mobile +48 602 315 512, 604 953 459, 660 726 577

www.pereko.pl

pellasX®
PELLET BURNERS

OPERATION AND INSTALLATION MANUAL

Net Control
internet module

Remote control of regulators

RoHS CE

SAFETY

CONNECTION

SETTINGS

SERVICE

This sign indicates relation to safety issues.

This sign indicates relations to module functional features.

Always turn boiler off before connecting the device.

Do not use the device for other than intended use .

Verify if boiler controller software is adapted to cooperate with Net Control internet module.

Connecting the module not in accordance with the manual or improperly can result in inappropriate operation of the controller or interruption of its operation.

Device can be started and connected only by a person who read this manual.

In any circumstances do not modify construction of the device.

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INFORMATION

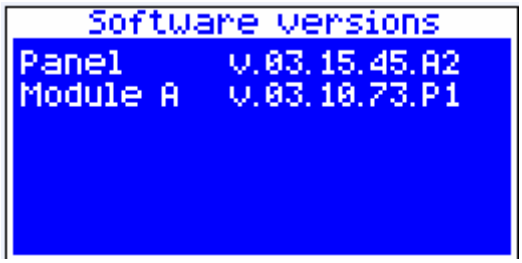
Net Control enables boiler operation remote control via Internet or a local network. User can remotely monitor operation of the boiler and modify operation parameters of the boiler controller with the use of a tablet or mobile phone.

Essential features of the module:

- ✓ Net Control integrated WWW server enabling remote control of operation of the boiler within a local network without Internet access,
- ✓ cooperation with www.econet24.com external server provides access to boiler controller via Internet,
- ✓ supports Wi-Fi wireless networks,
- ✓ preview of current operation parameters of the boiler in readable and clear "tiles",
- ✓ visualization via readable hydraulic diagram indicating current operation of the hydraulic system,
- ✓ preview and edition options of most (user and service) parameters of the controller,
- ✓ registration of operation parameters and alarm conditions of the controller,
- ✓ possibility of e-mail notifications concerning alarm conditions of the controller.

COOPERATION OF Net Control with CONTROLLERS

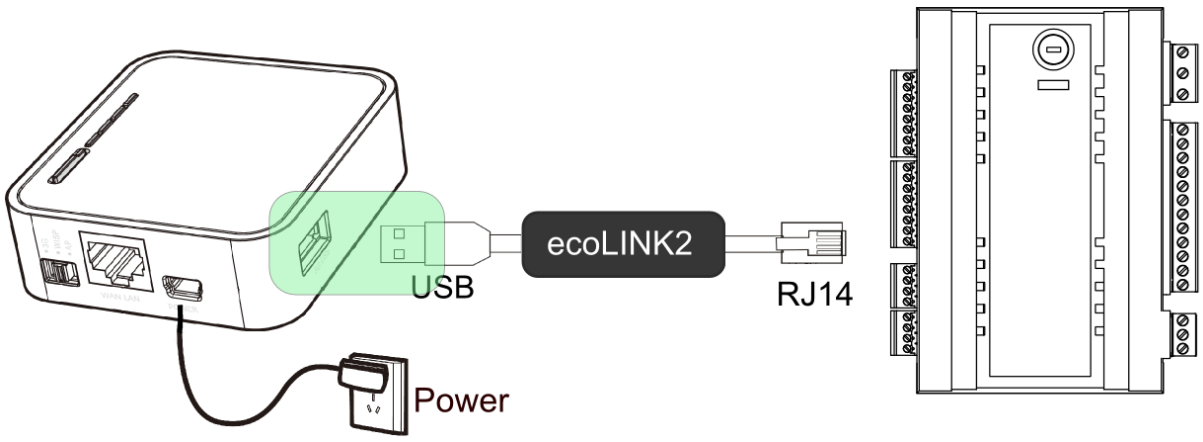
Net Control internet module will cooperate only with boiler controllers with installed software supporting Net Control.



Check regulator software version before connecting a module with the controller.
In the controller menu select tab:
MENU → **Information** → **Software versions**
User can contact with the boiler or controller manufacture in order to verify whether a particular type of boiler controller will be cooperating with Net Control according to data concerning controller software versions.

CONNECTING WITH MODULES CONTROLLERS

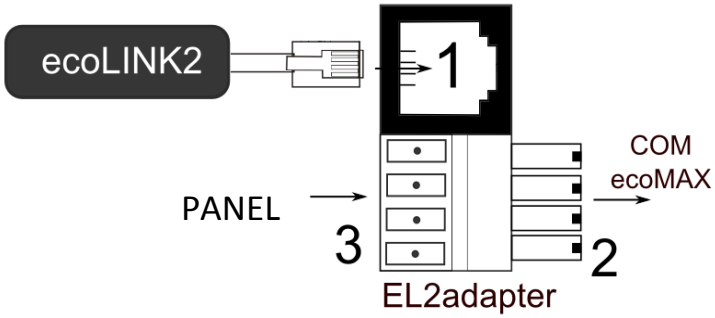
In order to connect the Net Control module with the controller, **ecoLINK2** interface is required which is a part of the set.



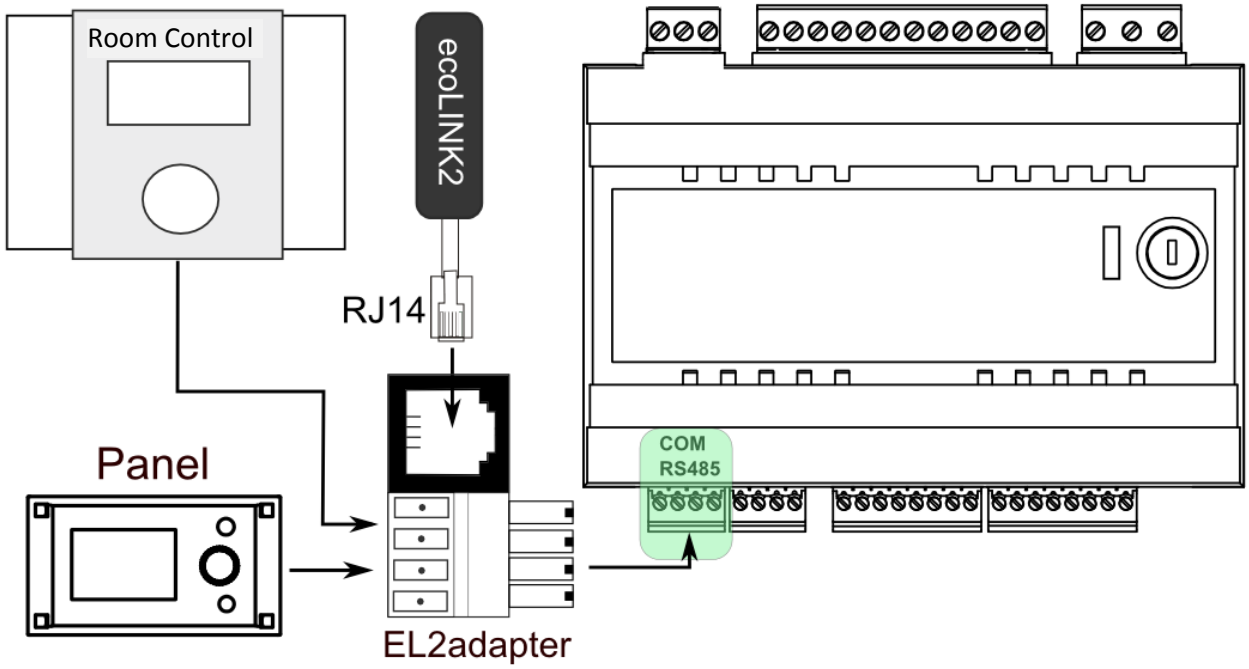
The Net Control internet module has to be connected with boiler controller with the use of ecoLINK2 interface. In case of some types of controllers it is necessary to use an appropriate adapter. ecoLINK2 interface and adapter are a part of the Net Control set.
Further parts of the manual contain methods of connecting a module with particular types of controllers.

CONNECTING WITH ecoMAX800 CONTROLLERS

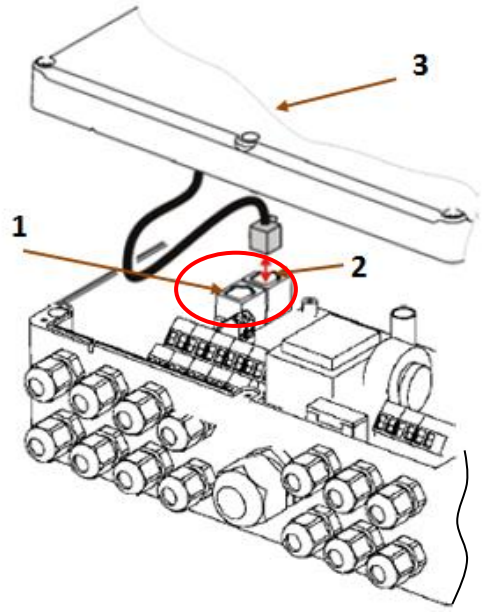
This chapter applies to **ecoMAX800 P1, P2, R2, T2, D1, D2** controllers. It is not applicable to **ecoMAX800R1** and **ecoMAX800T1**. In case of ecoMAX800 series, a **EL2adapter** must be used in order to connect ecoLINK2.
The following diagram shows a connection method.



EL2adapter, where
1- Socket for RJ14 ecoLINK2 interface,
2- A plug for controller module COM transmission socket,
3- Socket for a control panel plug (together with Room Control room panel).



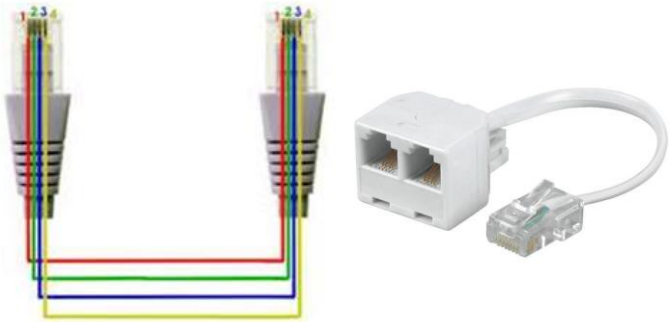
CONNECTION WITH R.Control, S.Control SERIES CONTROLLERS



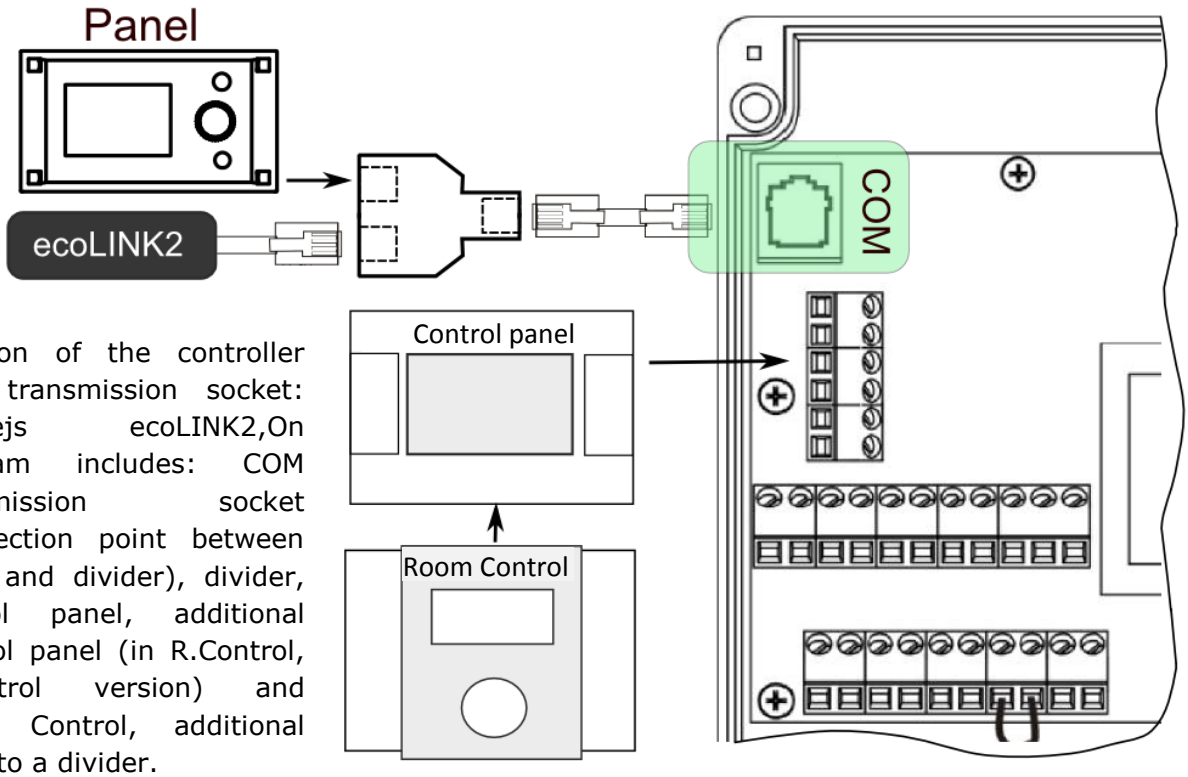
Controller modules are equipped with an additional COM transmission socket to connect RJ14 plug of ecoLINK2 interface without using any adapters. Just unscrew the controller housing and put the plug into a **COM** socket.
1 –**COM** socket (place of plugging a RJ14 interface plug),
2 – a socket with connected plug of the control panel,
3 – controller housing cover (possible place where a control panel can be assembled)

Modules controllers are equipped with just one COM transmission socket in RJ14 standard which a control panel (located inside or outside the controller housing) is connected to. Using one RJ14 socket in the module requires connecting an additional divider (telephone RJ14 tee separator) and additional cable.

Standard divider, RJ14 telephone divider, where:
1- connection of RJ14 ecoLINK2 interface plug,
2- connection of the control panel plug,
3- Connection of an additional cable with two RJ14 terminals.



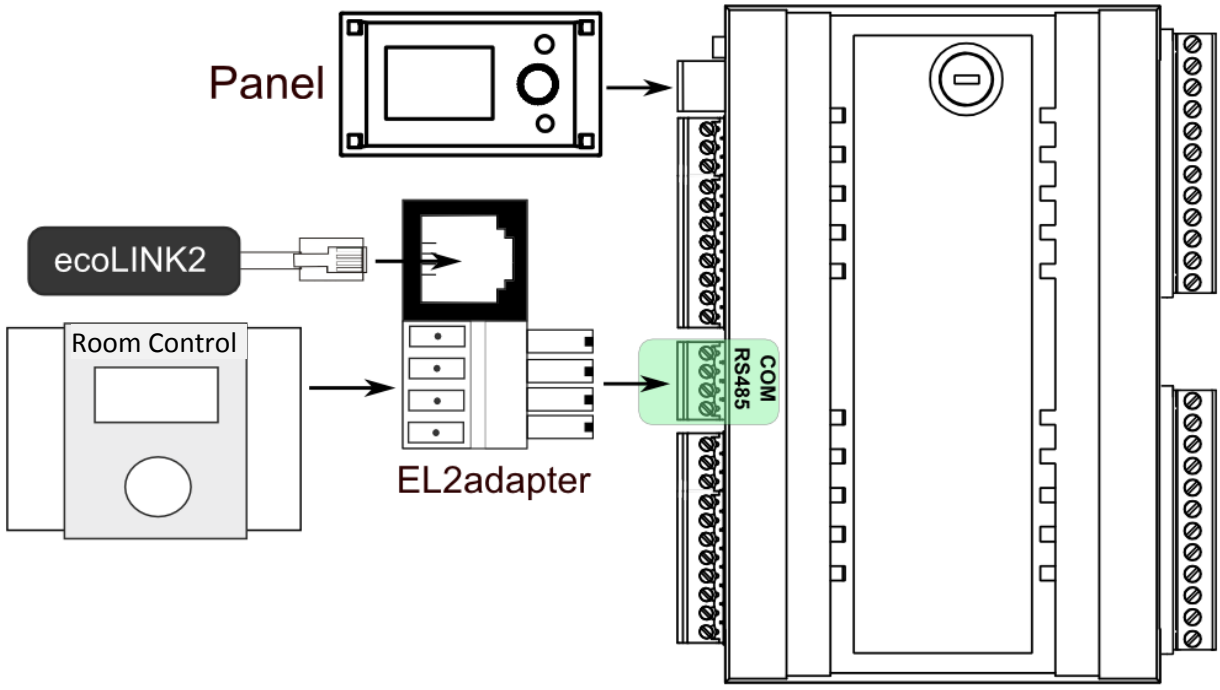
Standard RJ14 telephone cable with an option of connecting wires and a method of connecting into the divider.



Location of the controller COM transmission socket: interfejs ecoLINK2,On Diagram includes: COM transmission socket (connection point between cable and divider), divider, control panel, additional Control panel (in R.Control, S.Control version) and Room Control, additional cable to a divider.

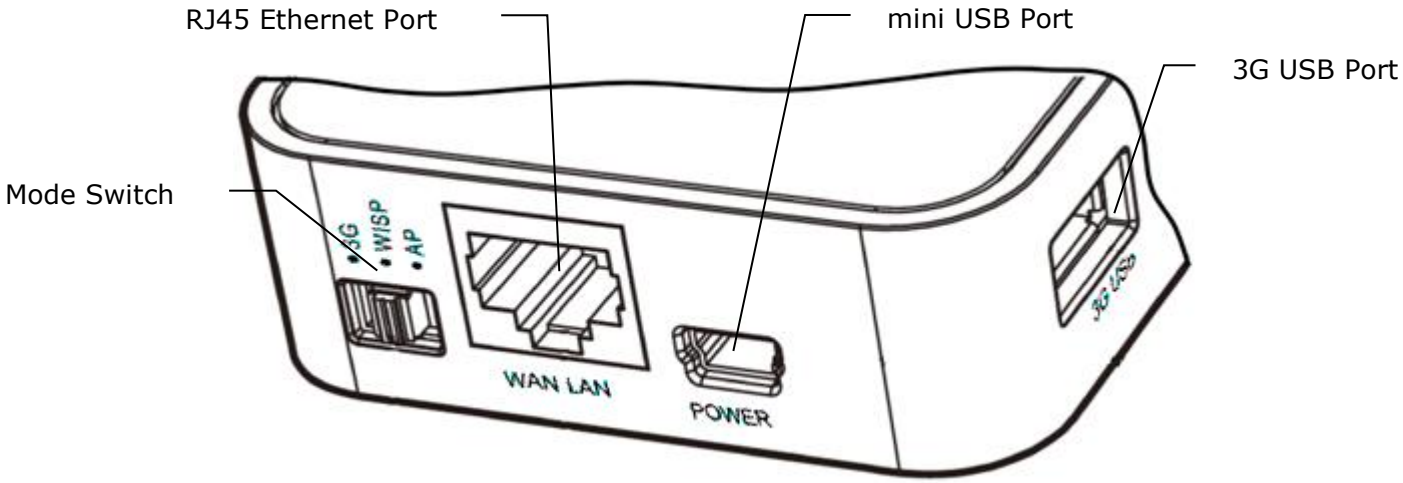
CONNECTION WITH ecoMAX860 CONTROLLER

In case of ecoMAX860 series, a **EL2adapter** must be used in order to connect ecoLINK2. The following diagram shows a connection method.

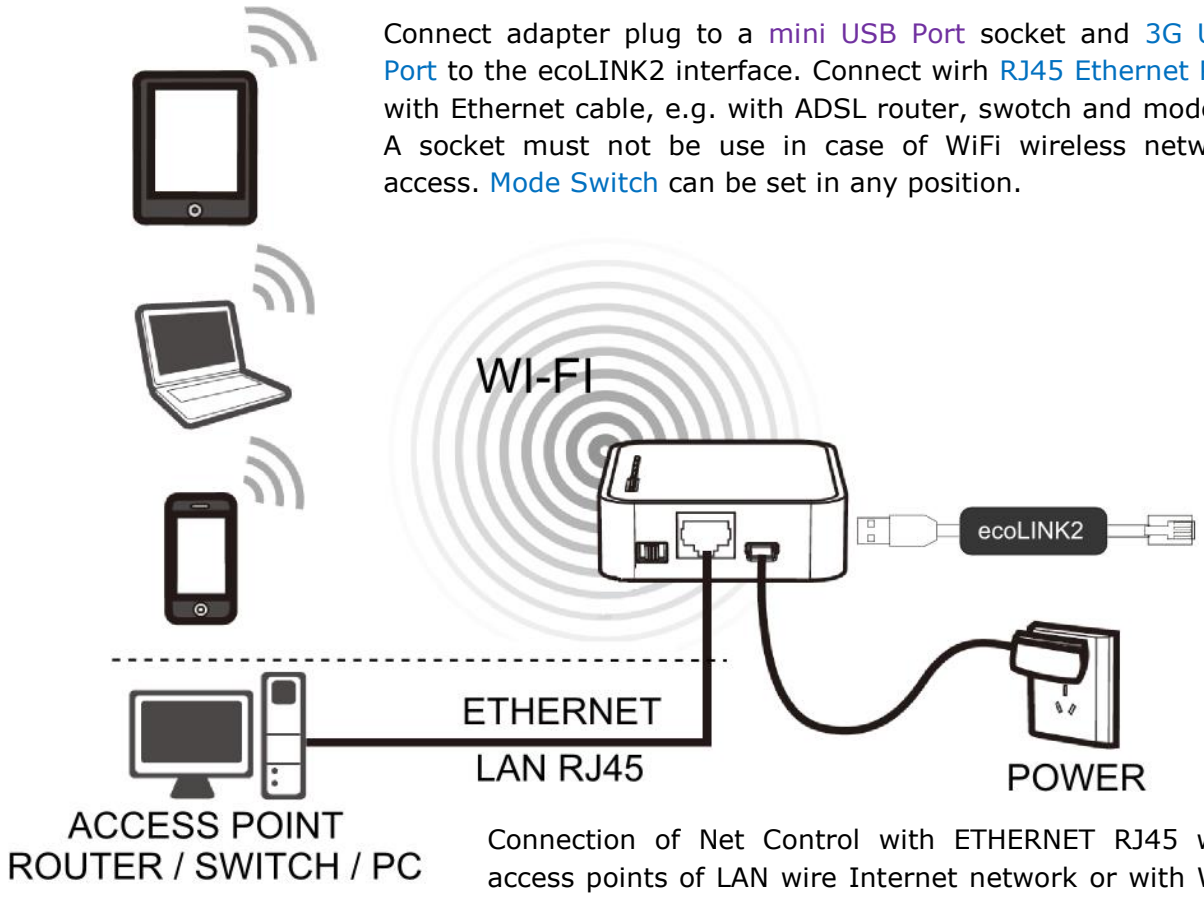


CONNECTION WITH INTERNET NETWORK

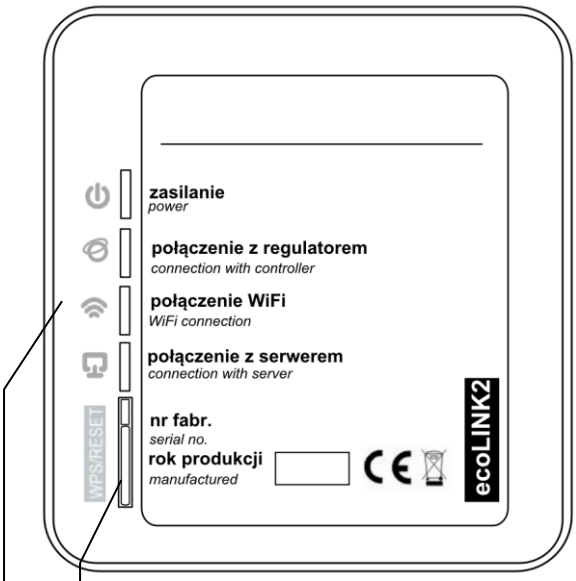
Net Control requires constant access to a wire LAN or wireless WiFi network in a place of installation of the boiler controller.



Connect adapter plug to a mini USB Port socket and 3G USB Port to the ecoLINK2 interface. Connect wirh RJ45 Ethernet Port with Ethernet cable, e.g. with ADSL router, swotch and modem. A socket must not be use in case of WiFi wireless network access. Mode Switch can be set in any position.



Connection of Net Control with ETHERNET RJ45 with access points of LAN wire Internet network or with WiFi wireless network.



Deleting user name and password and restoring default settings. User: admin, password: admin. Works only in local version.

LED indicators of module operation condition.

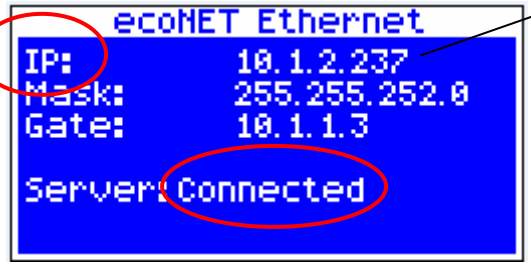
LED	Condition	Net Control operation condition
Power	on	Power on
	off	Power off
Connection with a controller	on	Active connection of the controller.
	off	No connection with boiler controller.
Connection with WiFi	on	Connection to a programmed wireless network is on.
	off	No connection with wireless network.
Connection with a server	on	Connection with Net Control24.com external server is on.
	off	No connection for Net Control24.com external server.

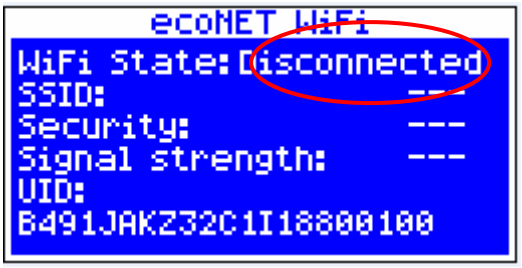
After the power is on, Net Control requires app. 1 minute in order to load the operational system. Then, the module begins to work and indicates its condition with LED indicators. In a connection between Net Control module with a boiler controller is active, a "connection with controller" indicator lights up. New functions for managing Net Control module are added to the main menu.

MENU → Information → Net Control WiFi
MENU → Information → Net Control Ethernet
MENU → Main settings → WiFi

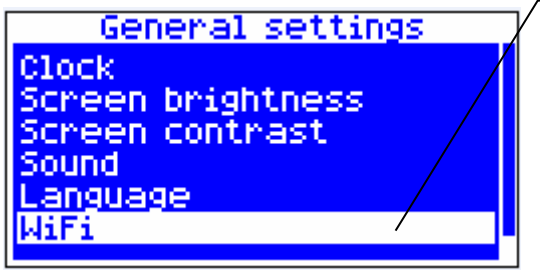
Net Control requires active DHCP server of Access Point (e.g. router) because manual IP assignment for Net Control internet module is not supported. More information can be obtained from router configuration software or network administrator.

In case of connection with a chosen Access Point via wireless network, user has to know the settings of WiFi network which the module will be connected to: network name (SSID), protection type, access password).



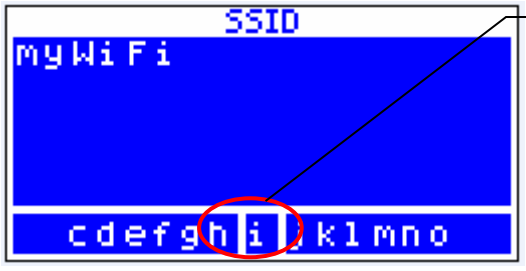


In case of connection with LAN wire network, a **Net Control Ethernet** tab will be available in controller menu from which the **IP** number, mask and gate can be read out and Net Control24.com connection condition can be checked. It is required to save the displayed **IP** number (e.g. IP: 10.1.2.237). This number in a form of: http://10.1.2.237 is entered into the address field from the level of LAN network. A boiler controller menu management website wil be activated.

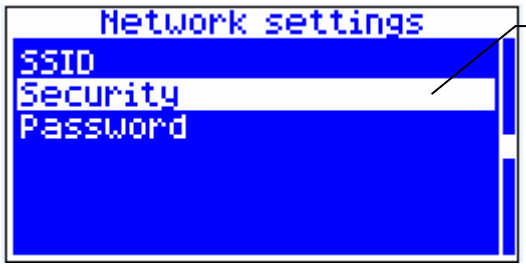


It is necessary to enter network parameters in **General settings** menu of the control panel in order to make a wireless connection via WiFi.
To do this, select:
MENU → **General settings** → **WiFi**

Select **SSID** in **Network Settings**. It is a name of the local wireless network which has to be the same for all devices working in this network (SSID can be, e.g.: myWiFi).



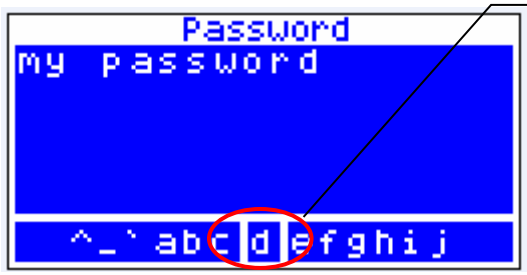
User can select letters / signs from the list with the use of the control panel "TOUCH and PLAY". Selected name is confirmed with (ENTER). (Backspace) symbol deletes previous character, and (Space) provides a space between the characters.



In **Network settings** select **Security.**

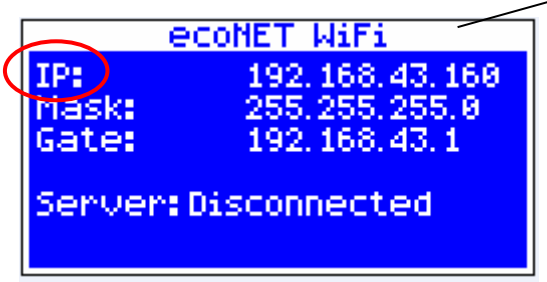
Select and confirm encryption type in WiFi network (most often selected type is **WPA2**).

Go to **Password** tab



Enter Wi-Fi access password using letters / characters available on the list and a knob on the controller panel. Confirm with ↵ (ENTER).

Filling data correctly results in Net Control connected to a Wi-Fi network.



In **MENU** → **Information** → **Net Control WiFi**, user can readout an **IP** number, Mask, gate and Net Control24.com connection condition (required: **Server: Connected**). **IP** number is used for opening a boiler controller website from a level of LAN network.

Wi-Fi network parameters (SSID, protection type and password) can be also configured from a level of Net Control website after previously connecting it to a LAN wire network.

LOGGING TO THE MODULE FROM A LEVEL OF LOCAL LAN NETWORK

WWW server incorporated in Net Control module enables remote management of boiler operation on LAN local network without any access to the Internet.
Enter : *http://module IP address* in the address field of the internet browser.

Where: can be read out from the boiler controller menu:
MENU → **Information** → **Net Control Ethernet** or **Net Control WiFi**.

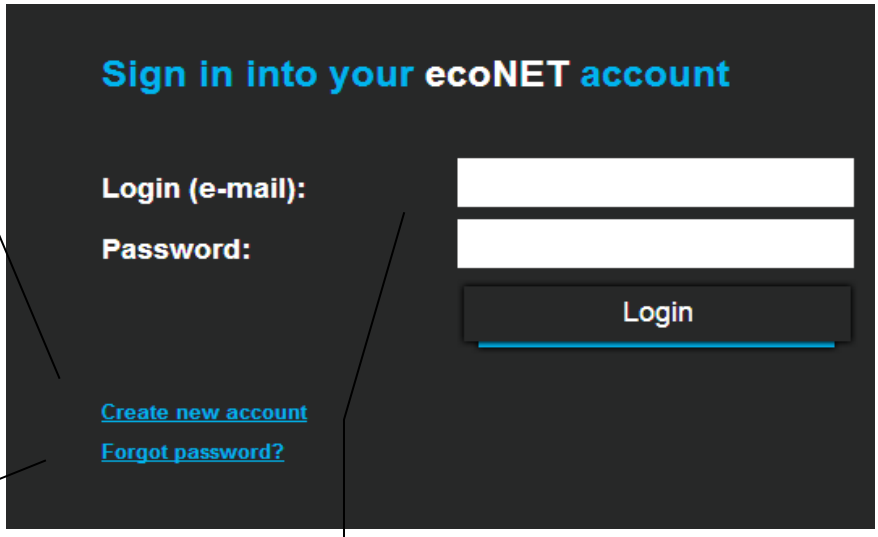
Activated page will ask for user and password. Default settings are:
User: **admin**
Password: **admin**

After correct login, a www for managing the boiler controller operation.
More information concerning managing this site is included in further parts of this manual.

In order to guarantee safety by preventing unauthorized persons from direct access to the controller, it is recommended to change default login settings (username password). To do this, enter "Device settings" on WWW for controller operation management and in "User" section click "Change password.

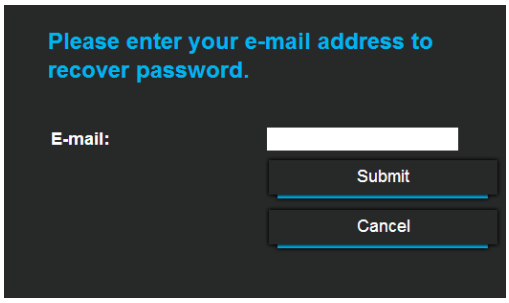
LOGGING INTO Net Control ACCOUNT

Net Control internet module cooperates with external server which is available under www.econet24.com. This provides access to the boiler controller via Internet.
In order to log into an account on an external server, enter www.econet24.com into an address field of the web browser.



In case of first logging, select:
Create new account

Reminding a password for existing account:



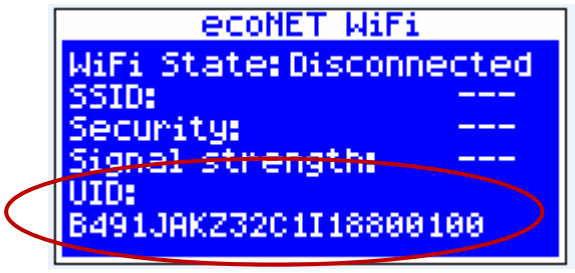
Select **Forgot your password?**, enter e-mail address and press **Send**.

Enter your **login (e-mail)** and **password** in order to log into your Net Control account.

In case of first logging, user has to create a new account. Following conditions must be met:

- Boiler controller has to be connected to a power supply and properly connected to Net Control internet module.
- Net Control module should be connected to the Internet and be logged into the external server (*"server connection"* indicator is active).

From **Net Control WiFi** tab in the boiler controller main panel, read the **UID** number (unique ID of the controller):
MENU → **Information** → **Net Control WiFi**



Fill in the form with user data and password.

Obligatory fields:
E-mail, Password, Password (again), UID identifier of the controller..

In a form field:

- ✓ *Regulator not available, try other UID or check if regulator is connected to the Internet*). **UID** number of boiler controller is required (in case of improper number or a lack on Internet connection), a following command will be displayed *Regulator not available, try other UID or check if regulator is connected to the Internet*). Net Control24 server verifies whether UID number is correct.
- ✓ *Regulator label* – enter a name of your controller.
- ✓ *Advanced user (Edit service parameters)* – This option enables to change service parameters of the controller from a level of www site. After checking this option a password for service settings is required.

- ✓ *Remote access to the controller by the service and the producer* – enables to access and edit controller parameters via service and boiler manufacrurer.
- ✓ *Enable sending alarm notices on e-mail)* –In case an alert occurs, an alarm message including alarm contents will be sent. On previously entered e-mail address.
- ✓ *Regulator installation address (Similar as user address)* – Check this field if the controller address is the same as residential address.

Net Control account can be created only after reading terms and conditions of operation and checking: *I agree with these terms and conditions*.

Press **[Register]**.

A WEBSITE FOR MANAGING OPERATION OF THE BOILER CONTROLLER

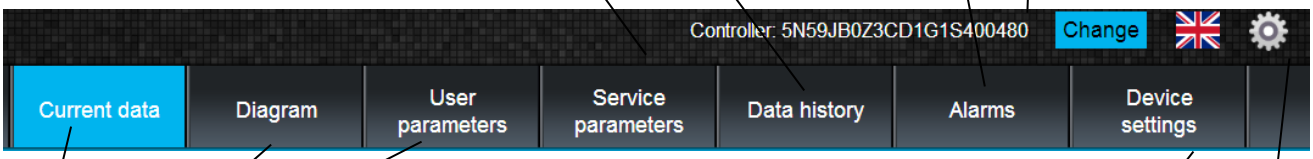
Description of menu on a website for managing operation of the boiler controller:

Data archive of selected controller operation parameters.
Tab available only in a **service version**.

List of boiler controller alarms.

Change enables to choose another type of the controller.

Readout and modification of all parameters of the boiler controller and CH/HUW installation.



Detailed readout and modification of operation parameters of the boiler controller.

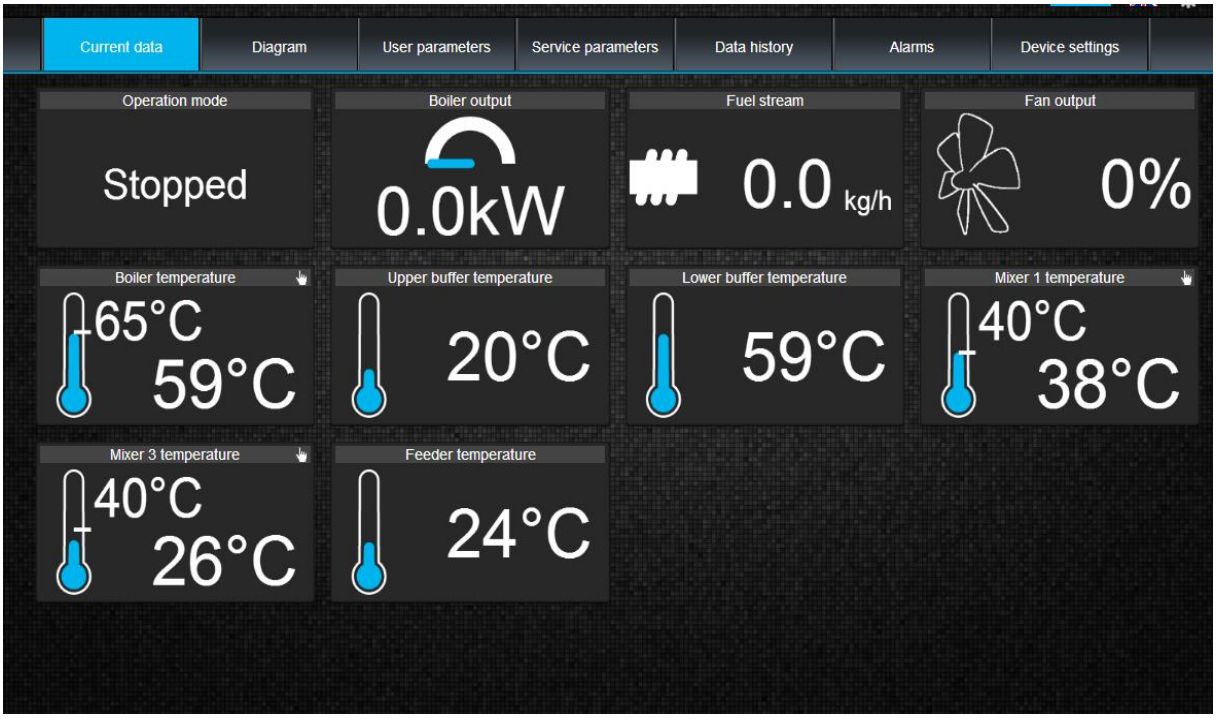
Information concerning boiler controller and additional modules, possibility of changing address and service password.

Graphical representation of hydraulic diagram of installation with current operation condition readout for its particular elements.

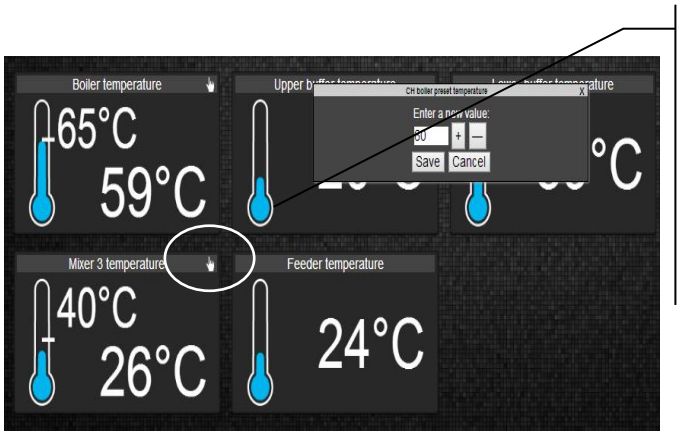
Modification of user data, boiler installation address, password and deleting Net Control account. Modification of readout refreshing time. Adding a new controller.
Tab available only in **server version**.

Current readout of the boiler controller operation condition data and possibility of changing its parameters.

User is required to know the operation of the R.Control, S.Control boiler in order to modify its values.

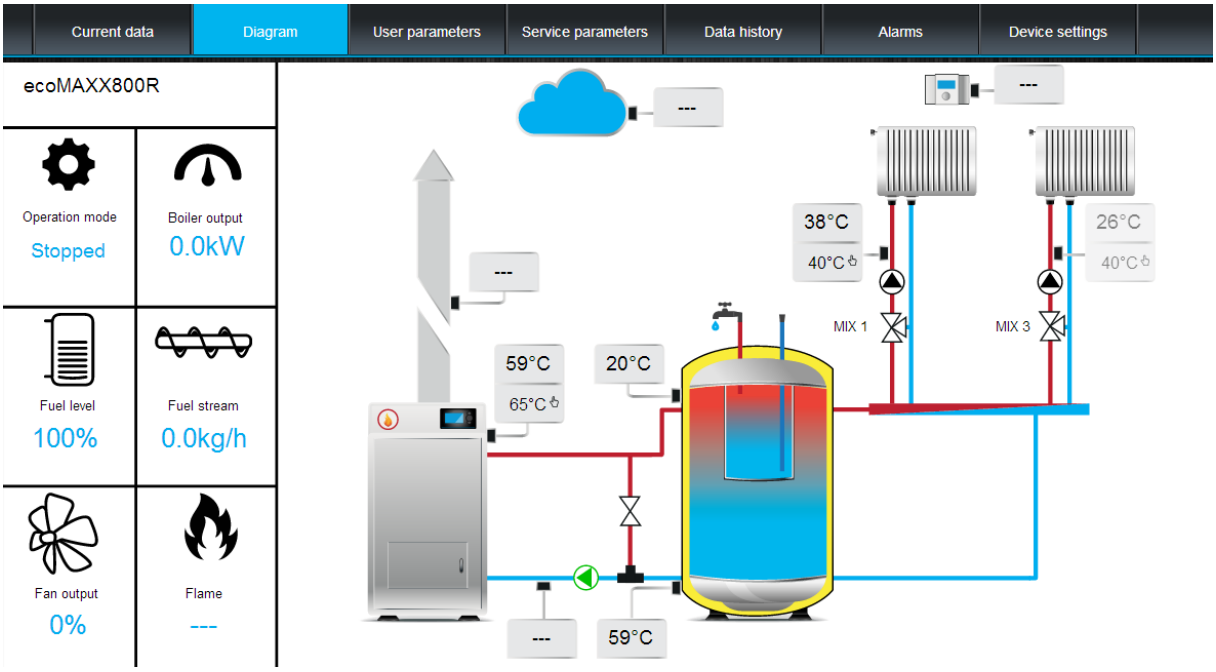


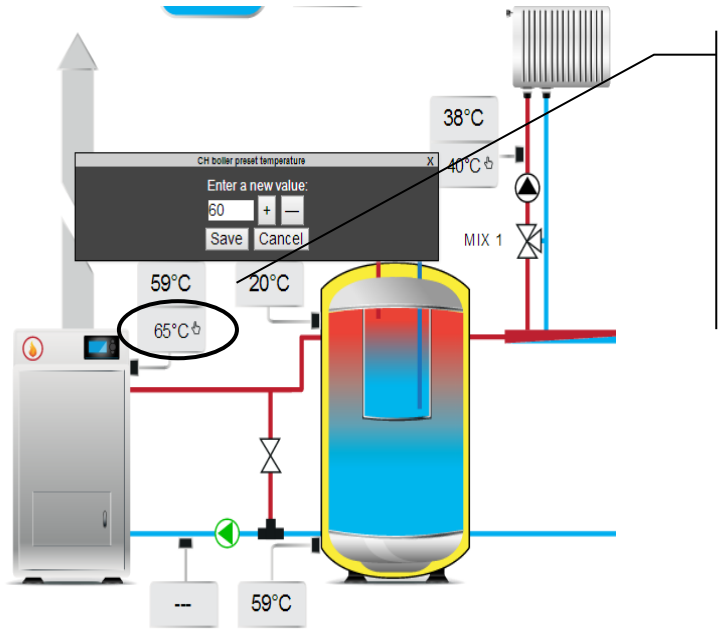
"Current Data" tab includes tiles with values of basic boiler operation parameters. Parameter refreshing time is preset by the user (tab: *Settings*).



A parameter to be modified is indicated by symbol. Click a tile and **Modify value** window will appear. Enter new value, e.g. *Boiler temperature* and confirm with **[Save]**.

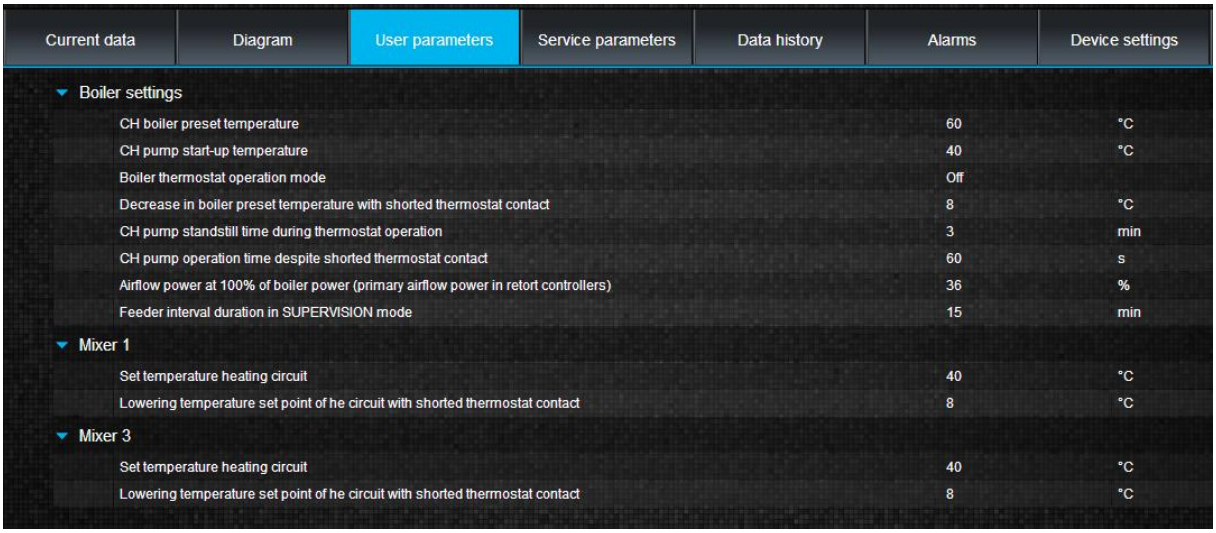
"Diagram" tab includes graphical connection diagram between boiler and heating system in the building with readouts of parameters from sensors in particular points of the installation.





A parameter to be modified is indicated by symbol. Click a tile and **Modify value** window will appear. Enter new value, e.g. *Boiler temperature* and confirm with **[Save]**.

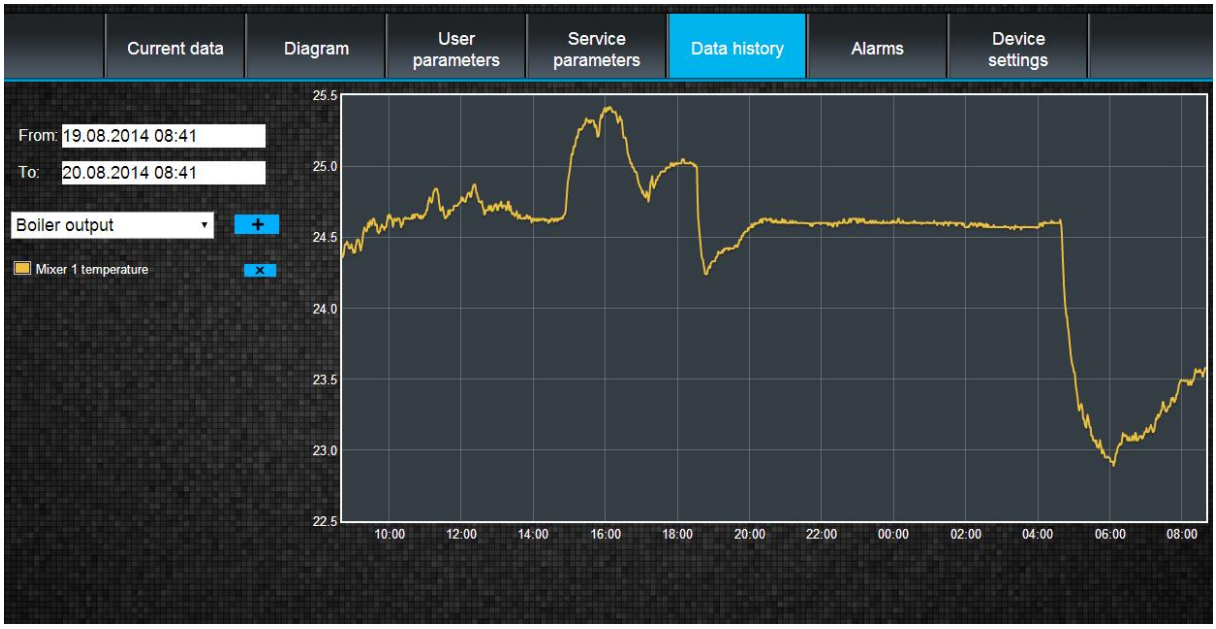
Basic parameters of controller operation are displayed in "User parameters" tab. These parameters are grouped and all can be modified by the user.

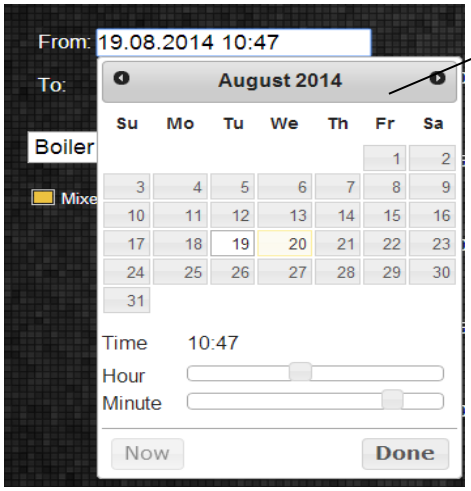


Click on a name of selected group of parameters, e.g. *Boiler settings* and open a list of available parameters. Select a parameter to be modified, enter new value in additional window and confirm with **[Save}.**

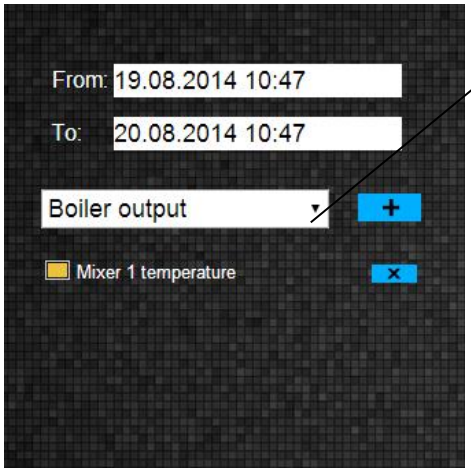
"Service parameters" tab enables to readout and modify service parameters of the boiler regulator. In order to do this, enter a password for service parameters in a "Device settings" tab in "Advanced user password" field.

"Data history" tab, only in **server version**, enables to readout registered parameters concerning operation of the whole heating system in a selected time and present it in the form of a graph.





Choose a time period for data readout by clicking **From:** or **To:** (select date and time in a calendar). Confirm with **Done**.



Select parameters from a drop-down list **[▾]** and confirm with **[+]** in order to add parameters to be visualized. Clear parameters with **[X]** button.

In “Alarms” tab:

- ✓ user can read a list of registered alarms and other events sent by the boiler controller.
- ✓ a type of alarm, event and period of its occurrence is displayed.

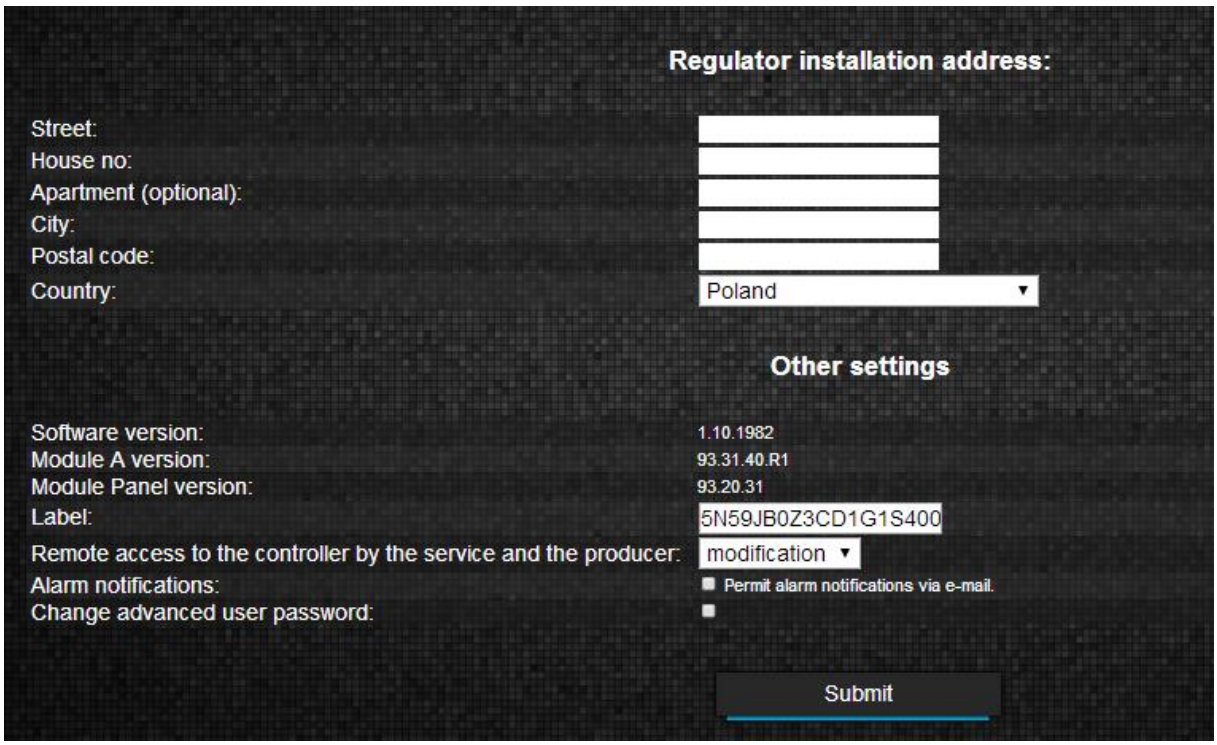
	Alarm	From:	To:
1	No power	2014-05-03 16:11:00	2014-05-03 16:12:53
2	No power	2013-10-12 08:23:00	2014-05-03 16:03:28
3	No power	2014-04-10 09:04:00	2014-04-12 03:46:23
4	Sensor fault feeder	2014-04-10 05:48:34	2014-04-10 05:49:47

Log into www.econet24.com in order to display all logs of alarm conditions from the beginning of operation of the controller. Logging into a local LAN network gives a possibility to see only 100 newest logs.
Alarm notices can be sent on e-mail. It enables the user to react fast in order to restore normal operation of the boiler controller.

"Device settings" tab in **server version** enables to:

- ✓ change the boiler regulator installation address, label name, service access and advanced user password,
- ✓ readout a software version in the controller module and additional modules or panels,
- ✓ update internal Net Control software,

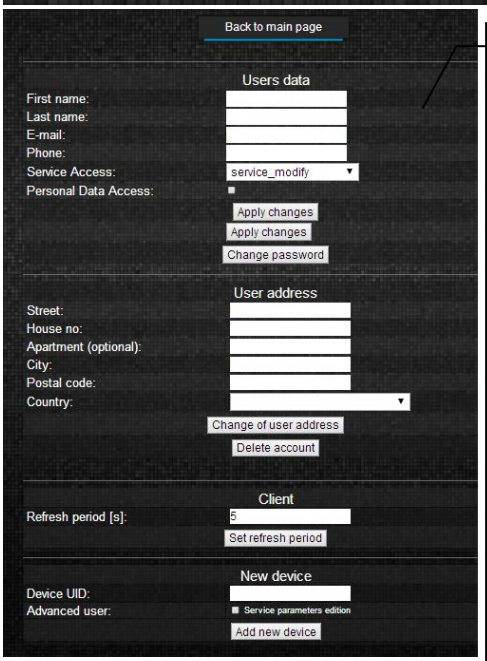
Enter new data in a form and press **[Submit]**.



Net Control24 server periodically checks availability of new software version for the Net Control module. In Device settings tab it displays information concerning a new software version. All the user needs to do is to press **[Update]**.

Software update process can be shorter or longer depending on the speed of Internet connection. Do not disconnect the device from a power supply during update process because it will cause its damage.

Icon for modifying personal data of the Net Control account. Update or modification of address data, deletion of account, adding a new device.
Changes are applicable only to **server version**.

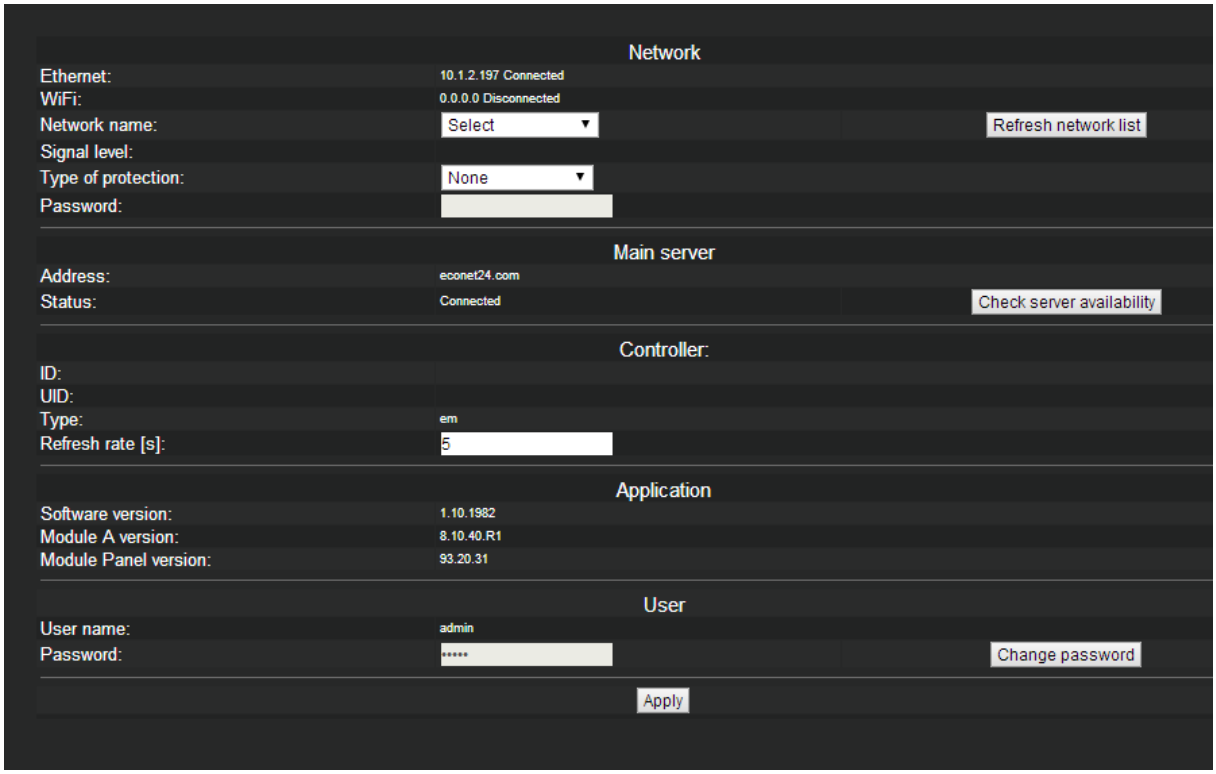


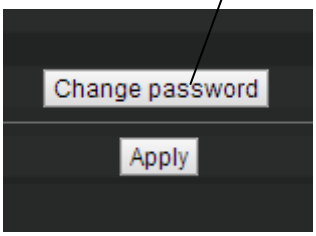
Depending on what type of changes are made, choose an appropriate button and enter new data in selected fields.
All changes should be accepted with the following buttons: **[Save changes], [Change password], [Change user address], [Set refreshing time]**.
User can enter a new ID number and add a new device to the Net Control account. In *Advanced user* field: user can select an option to advanced parameter edition called *Service parameters edition*. In order to do this, the user has to enter a password for service parameters in the boiler controller. To delete the Net Control account, select **[Delete account]**.

In "Settings" tab in **local version** user can**:**

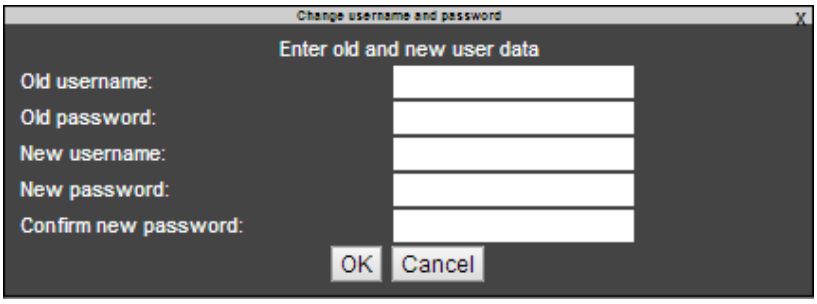
- ✓ read the IP address and status of Ethernet or WiFi network (Connected/Disconnected),
- ✓ read the WiFi signal strength [%],
- ✓ display information concerning IP address of the main Net Control24 server, its status and availability. After pressing "Check server availability" button, user can check if the external server is available from a level of Internet browser (excluding Net Control module),
- ✓ read information concerning selected controller: identifier, UID number, software version in controller module, additional modules and panels,
- ✓ update software to Net Control (procedure similar as in server version),
- ✓ change login parameters: login and password.

When changing WiFi network, click **[Refresh network list]**, select *Network name*, and used *Type of security* (e.g. WPA2 Personal) and enter *Password* to a selected network.
In *Refresh rate [s]* user can define the interval in which server will readout data from the boiler.
All modifications must be confirmed by **[Apply]**.





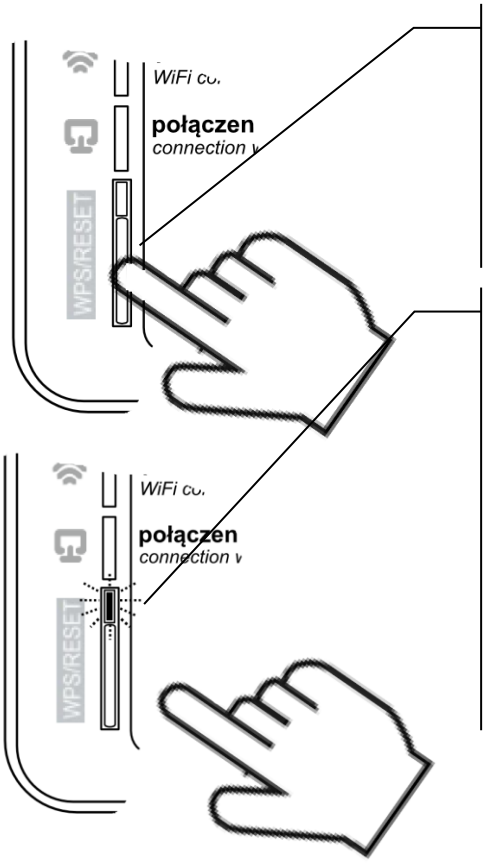
[Change password] key enables to change login data (user name and password) to the Net Control Internet module.



Enter old and new data into fields. Save changes by clicking **[OK]**.

In case the user has forgotten his password for logging in the Net Control Internet module, it is possible to restore default data with the use of a button on the Net Control housing.

Default username and password (user: **admin**, password: **admin**)can be restored with the use of WPS/RESET button located near indicators on the Net Control housing.



Net Control module has to be connected to power supply:

1. Push WPS/RESET button during normal module operation,
2. Hold this button pressed for at least 10 seconds,
3. Release the WPS/RESET button,
4. A LED indicator near the button should flash several times,
5. Wait for app. 2 minutes,
6. The module will automatically start up and connect with the Internet.
7. Default username and password will be restored (user: **admin**, password: **admin**)

P R O D U C E R
PELLAS X Sp. z o.o. Sp.k.
Poland, 64-920 Piła
ul. Szybowników 39/10
tel.: +48 67 213 80 40
NIP: PL764-266-44-90
info-en@pellasx.eu
www.pellasx.eu

pellasX®
PELLET BURNERS

OPERATION AND INSTALLATION MANUAL

Room Control TOUCH
room panel

for R.Control TOUCH and S.Control TOUCH regulators

RoHS CE

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1. General information and safety

- Incorrect electrical connection between the room panel and boiler controller may result in damage to both devices.
- Assembly has to be carried out by a qualified installer.
- Use additional precautions in order to prevent the effects of controller malfunctions and software leading to loss of property and dangerous consequences, e.g. freezing of water in the hydraulic system.
- Room panel manual is a supplement for boiler controller documentation.
- User should read the manual thoroughly (we bear no responsibility for damages caused by non-observance of this manual).
- Keep this manual for future reference.

Symbols used in this manual:

Additional tips and information.

Important information, which can be crucial in terms of possible damage to property or health/life threat.

Applied standard: **WEEE 2002/96/EC (The Directive on waste electrical and electronic equipment)**.

2. Application

Room panel:

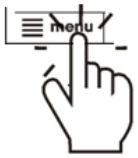
- mainly serves the function of programmable room thermostat
- controls the temperature inside compartments in a simple way.
- serves the function of an additional control panel for the boiler controller; displays all parameters of the boiler controller with a touch panel or remote screen
- internal temperature sensor enables reading and programming temperature with an accuracy of 0.1°C.
- can be programmed in 7-day cycle with an accuracy of 0.5h which is equal to 48 changes of temperature during one day.
- can operate in a set of max. 3 identical room panels with a function of changing parameter settings between these panels and independent screen preview.

Room panel can be used in a household or similar environments and in slightly industrialized buildings.

3. Operation

3.1 Operation of the panel

Device is equipped with a screen and TOUCH panel.



Press corresponding symbols on the screen in order to select position from the menu.

Some of the symbols:

≡Menu - selection of the main Menu;

- / **+** - decrease/increase the value of the selected parameter;

˅ / ˄ - scroll the parameters list up/down;

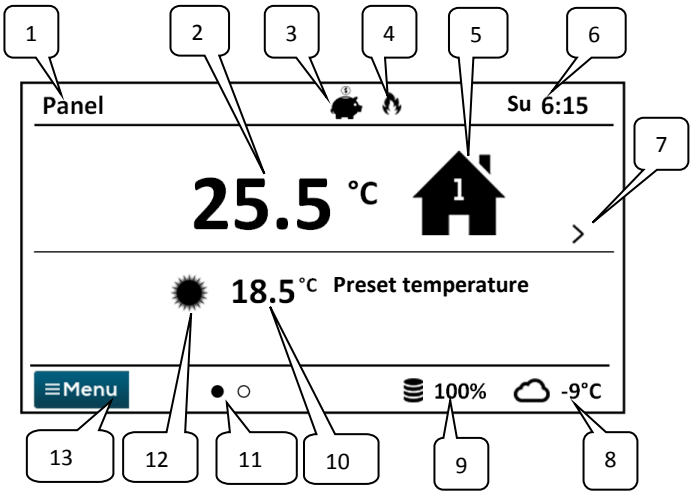
↶ - exit a chosen Menu position or cancel a parameter setting;

⌂ - return back to the main screen;

✓ - enter the Menu position or confirm the setting of the selected parameter;

ⓘ - Menu information concerning the selected Menu position;

3.2 Main screen



1. Name of the device defined by the user.
2. Current measured temperature inside the compartment.
3. Room thermostat work mode:
   - *Schedule*,
   - *Economy*,
   - *Comfort*,
   - *Out of home*,
   - *Airing*,
   - *Party*,
   - *Holidays*,
   - *Antifreeze*,
   - *Loading HUW*
4. Active thermostat signaling (heating).
5. Symbol of the selected device:
   - Boiler,
   - Room panel,
   - Number of the panel which the current main screen is displayed for,
   - Loading HUW.
6. Clock and weekday
7. Main screen change button.
8. Current external temperature (available only with a weather sensor connected to the boiler controller).
9. Current level of fuel inside the boiler feeder.
10. Current preset temperature inside the compartment.
11. Number of available main screens with the indication of which is currently displayed.
12. Current preset day or night temperature indicator.
13. Access to main Menu.

3.3 Operation modes

Menu → Operation made → ……..

3.3.1 Schedule

Preset room temperature is determined in accordance with a time schedule. *Preset night temperature* (economic) or *Preset day temperature* (comfort) is set in the following menu: **Temperature settings → Night temperature/Day temperature**.

symbol is displayed on the screen.

3.3.2 Economy

Controller works with a constant *Preset economic temperature*, set in the following menu: **Temperature settings → Night temperature**

symbol is displayed on the screen.

3.3.3 Comfort

Controller works with a constant *Preset comfort temperature*: **Temperature settings → Day temperature**

symbol is displayed on the screen.

3.3.4 Out of home

Existing temperature setting can be exchanged for a preprogrammed period of 1÷60h with economic temperature set in the following menu: **Temperature settings → Night temperature**

After this mode is activated, its duration has to be set within a range of 1÷60h, in 1h increments. After this period, the controller switches to the mode in which it has been

operating before the *Outside home* mode was set.

symbol is displayed on the screen.

3.3.5 Airing

Selection of this mode will result in closing the mixing valves and switching the circulating pumps off in the boiler controller for a preprogrammed period of 1÷60min.
After this mode is activated, its duration has to be set within a range of 1÷60h, in 1h increments. After this period, the controller switches to the mode in which it has been operating before the *Airing* mode was set.

symbol is displayed on the screen.

3.3.6 Party

Existing temperature setting can be changed to any temperature setting for a preprogrammed period of 1÷48h.
After this mode is activated, a required temperature and its duration has to be set within a range of 1÷60h, in 1h increments. After this period, the controller switches to the mode in which it has been operating before this mode was set.

symbol is displayed on the screen.

3.3.7 Holidays

Existing temperature setting can be changed by entering one constant temperature, which will be valid for a preprogrammed period of 1÷60h. This function is useful in case of a holiday trip.
After this mode is activated, a required temperature and its duration has to be set within a range of 1÷60 days, in 1 day increments. After this period, the controller switches to the mode in which it has been operating before this mode was set.
Activation of this mode will additionally result in setting a preset temperature of hot utility water on the boiler controller to 8°C.

symbol is displayed on the screen.

3.3.8 Antifreeze

Controller works with a constant preset temperature set in the following menu: **Temperature settings → Antifreeze temperature**
Activation of this mode will additionally result in setting a preset temperature of hot utility water on the boiler controller to 8°C

symbol is displayed on the screen.

3.3.9 Loading HUW

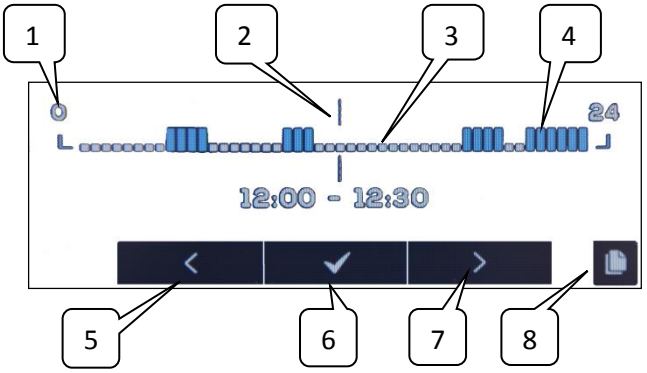
This mode enables loading the HUW tank once.
After this mode is activated, its duration has to be set within a range of 1÷60h, in 1h increments. During the period in which this mode is active, night temperature decreases set in schedules for the HUW tank and circulation pump are inactive.

3.4 Schedule

Menu enables programming time schedules for room thermostats, hot utility water tank and operation of HUW circulating pump. It is possible to set time schedules for every weekday separately with an accuracy of 0.5h (48 changes of temperature during one day). The controller enables setting two temperature levels: day (comfort) and night (economic).

Schedules can be edited in:
Menu → Schedule → ...

- Select a weekday for which the schedule will be set / modified.
- Schedule edition window will be displayed.



1-time period line, 2-currently edited time period, 3 – night temp., 4 – day temp, 5,7-time period selection, 6-temp. selection., 8-entering schedules copying menu.
In order to set the required time period:

- Set the indicator "2" to a starting hour of time zone with the use of **<** , **>** buttons,

- Set the comfort (day) or economic (night) temperature with the use of ✔ button.
- Set the indicator "2" to an ending hour of time zone with the use of **<** , **>** buttons,
- Press ✔ button in order to finish editing the zone,
- The aforementioned actions can be repeated for other time period, if required
- Press button in order to display window for copying the set schedule to any weekday.

3.5 Temperature settings

Enables changing *preset temperatures* inside the compartment:

- *Day temperature (comfort)*,
- *Night temperature (economic)*,
- *Anti-freeze temperature*.

3.6 Boiler

Boiler – enables remote access to boiler controller menu which the room panel is connected to. It is possible to preview and edit all parameters and alarms available in the boiler controller.

3.7 HUW

HUW **-** enables setting a preset temperature and work mode of the hot utility water tank.

3.8 Summer/Winter

Summer/Winter - enables changing the "Summer/Winter" work mode in the boiler controller.

3.9 Boiler on/off

Boiler on/off – enables remote activation or deactivation of the boiler controller from the room thermostat.

Menu positions: *Boiler*, *HUW, Summer/Winter* and *Boiler on/off* are optional and available only in case of connecting the Room Control TOUCH panel to the controller with compatible software.

3.10 Boiler controller remote screen

If the boiler controller is equipped with a standard control panel (version with a knob), the Room Control TOUCH room panel will display a precise graphic image of the controller main screen (remote screen) on one of the main screens. Menu position is selected by pressing **<** |✔| **>** symbols on the screen. For safety reasons, not all controller menu positions will be available.

3.11 Notifications concerning controller alarms

Room panel displays the alarms transmitted by the boiler controller and reports them using a sound signal. Touch the screen in order to turn off the active alarm. The alarm will not be deleted. For safety reasons, this can be done only via the boiler controller.

3.12 Settings

Menu → Settings → .....

3.12.1 Hysteresis

This parameter defines temperature hysteresis inside the compartment. Boiler controller will begin heating when temperature inside the compartment drops below the current preset temperature minus hysteresis. Heating will end up when the current preset temperature inside the compartment is reached.

3.12.2 Temperature correction

Enables entering a correction of thermostat measured temperature within a range of -4.0°C to +4.0°C.

3.12.3 Screen brightness

Enables setting screen backlight brightness in [%] separately for a day (6:00-22:00), night (22:00-6:00) and the current edition of settings.

3.12.4 Changing the language

Enables changing the language of the room thermostat.

3.12.5 Parental lock

This function activates itself after few minutes of inactivity. symbol is then displayed on the screen next to the clock. Touch and hold the screen for a few seconds in order to unlock the panel.

3.12.6 Software update

Enables updating the software with the use of a microSDHC memory card (inserted into a slot in the panel enclosure) in all connected devices: boiler controller, additional modules, control panels and room panels.

3.12.7 Service settings

You must enter service password in order to enter the settings.

- *Hotel mode* – disables editing other room thermostats and access to this device menu. User can execute only basic settings.
- *Visibility in other panels* – enabling options of preview and edition of this device from other room thermostats.
- *Restore default settings* – returning to default settings.
- *Touch panel calibration* – enables calibrating the touch panel.

3.12.8 Sound

Activation/deactivation of sound in alarms and notifications sent by the boiler controller.

3.12.9 Clock

Setting the current time. Panel has a function of time synchronization with other room thermostats and boiler controller.

Time synchronization will take place when time difference between thermostats/controller exceeds 10s.

Time change from the level of one room panel will result in a time change in remaining panels and boiler controller itself. The panel connected to a power source receives time setting from the boiler controller.

Programmed schedule operates on the basis of internal memory of the room panel and is not deleted in absence of power supply.

3.12.10 Date

Setting the current date. After the date is set, day of the week will be set automatically. Synchronization function is also applied here and it works similarly as in case of changing time settings.

3.12.11 Panel

Enables assigning an individual address and name to the panel.

- *Panel address* – User can select addresses 1, 2 or 3. This parameter enables changing address of the room panel If several room panels are connected to one boiler controller.

In order for the system to operate correctly, particular room panels must be assigned different addresses.

- *Name* – user can enter their own name of the room panel, e.g. attic, living room,

etc. It facilitates determining location of the panel inside the building and changing preset temperature in a distant room. This name will be additionally visible on screens of other room panels.

Selected panel *Address* (at 2 or 3 connected panels) is displayed on the main screen as (further digits 2,3). *Name* is displayed (also for other panels) in the upper bar of the screen (on the left).

3.12.12 Information

Information concerning software versions used in the boiler controller panels and additional modules.

It is recommended to use the same software version for all connected room thermostats.

4. ASSEMBLY

4.1 Technical data

Power supply/consumed current	+12VDC/150mA
Protection class	IP20
Work/storage temperature	0..50/0..65 °C
Temperature measurement/regulation range	0..50/5..35 °C
Hysteresis	0.2..5 °C
Relative humidity	5 - 85%, without condensation
Display	graphic, touch
Dimensions	148x97x23 mm
Weight	0.2 kg
Standards	PN-EN 60730-2-9 PN-EN 60730-1
Software class	A

4.2 Exploitation conditions

- do not expose the device to direct influence of atmospheric conditions (rain, sunlight) nor vibrations stronger than typical occurring during wheel transportation.
- do not use the device in vapor condensation conditions and protect it from water.
- storage and transportation temperature should not exceed the range of -15…65 °C.
- install the device only in dry residential room.

4.3 Assembly requirements

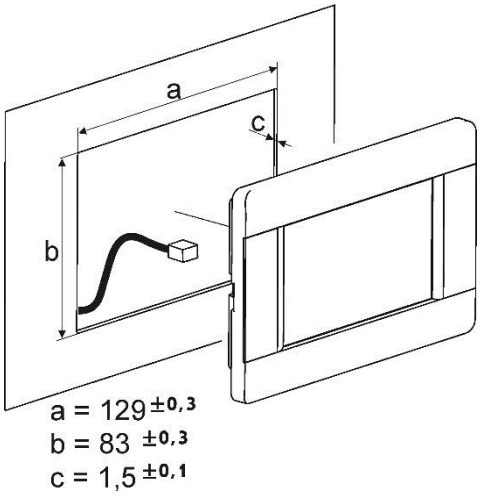
Recommendations:

1. Panel is intended for wall installation inside compartments.
2. Assemble the panel at a height of approx. 1.5 m above the floor.
3. Avoid highly insolated areas with poor air circulation, near heating devices and in direct vicinity of doors and windows – temperature measurement is disturbed by external conditions.
4. Panel should be installed by a qualified installer.

Manufacturer bears no responsibility for damages caused by non-observance of this manual.

4.4 Assembly description

- Drill holes in the wall (apply rawlplugs in case of masonry wall) and screw the screws in. Distance between holes is given on the back side of the room panel (90x43mm).
- Execute electrical connection between the panel/panels and the boiler controller serving as its power source with the use of electrical wire.
- Wire can be flush or wall mounted.
- Do not lead the connection wire along with wires of electrical network in the building. Wire cannot be located near devices emitting strong electromagnetic field.

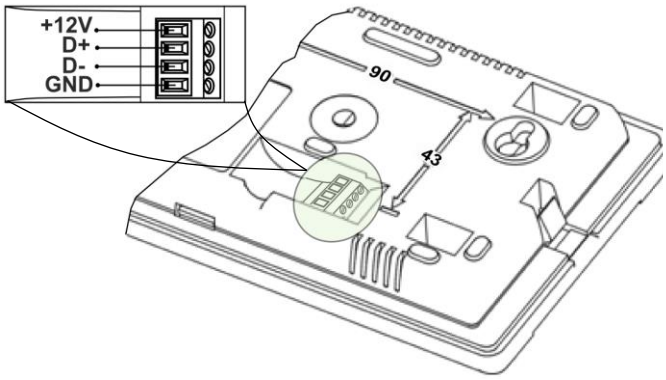


4.5 Electrical connection with controller module

Recommended supply voltage of the room panel is **+12VDC**.

Panel can be supplied with +5÷12V. However, it is not recommended due to voltage losses in long connection wires.

4-wire cable with a max. length of **30m** and cross-section of ≥ **0.5 mm²** is required to connect to the controller module terminals.
Terminal signal outputs in the rear side of the panel:



Be careful to connect the poles correctly. Incorrect connection may cause damage to devices.

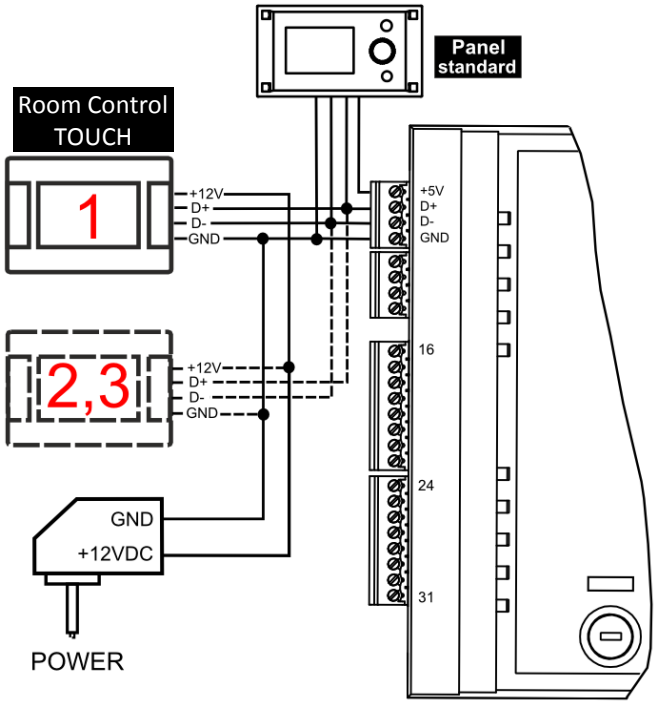
Depending on the type of boiler controller, room panel can be supplied directly from the boiler controller module terminals. If not, use an additional power adaptor **+12VDC**, **I≥0.5A**.

Depending on the boiler controller software version, it can cooperate with only one or max. three Room Control TOUCH room panels.

Further chapters describe the method of connecting the Room Control TOUCH room panel/panels to various series boiler controller modules.

4.5.1 Connection with ecoMAX800P1, P2, D1, D2 and ecoMAXX800R2, T2

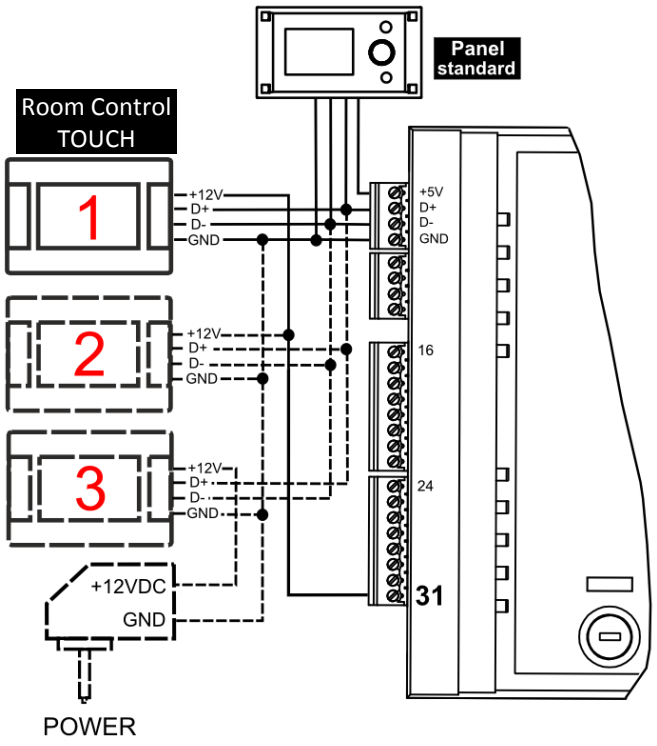
All 1,2,3 room panels require application of an additional power adapter **+12VDC**, **I≥0.5A**.



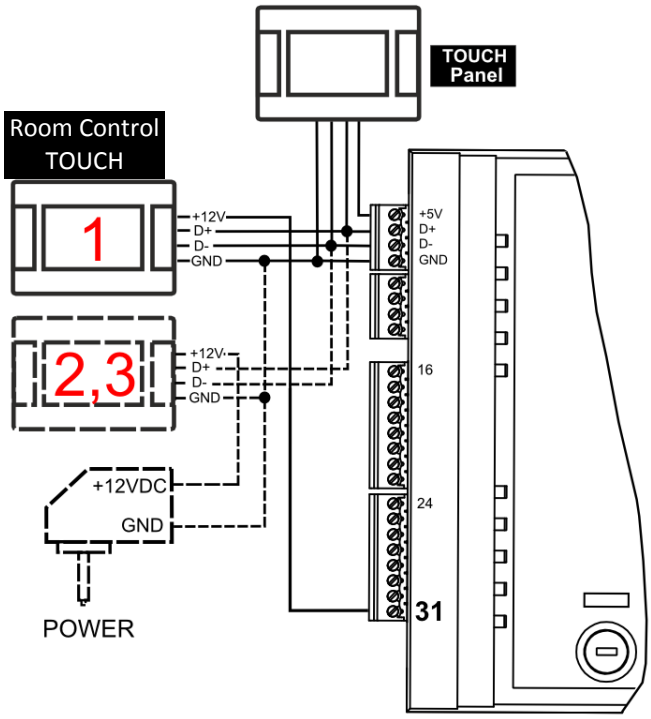
4.5.2 Connection with ecoMAX800 P3, D3 and ecoMAXX800 R3, T3

Controller module can supply up to 2 colored TOUCH type panels simultaneously.

If the boiler controller is equipped with a standard control panel (version with a knob), two Room Control TOUCH room panels can be supplied directly from the controller module (**terminal 31**). Third panel has to be supplied by the additional power adapter **+12V**, **I≥0.5A**.

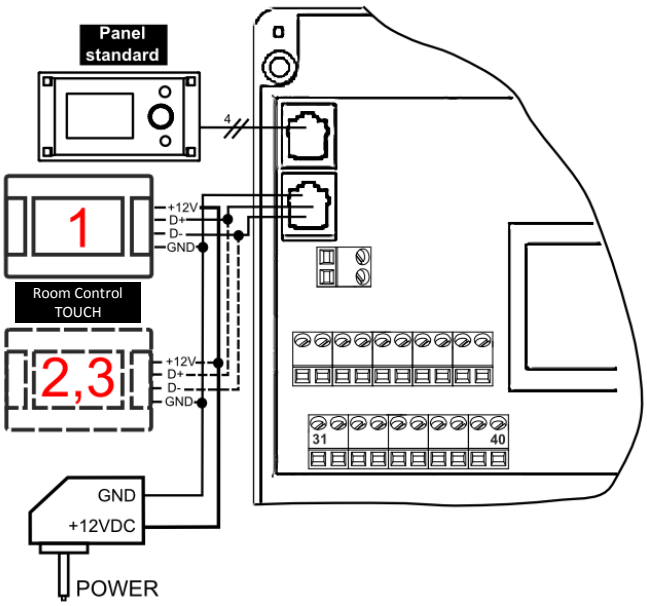


If the boiler controller is equipped with ecoTOUCH control panel (colored with a touch panel), only one Room Control TOUCH room panel can be supplied directly from the controller module (**terminal 31**). Panels 2 and 3 have to be supplied by the additional power adapter **+12V**, **I≥0.5A**.



4.5.3 Connection with R.Control

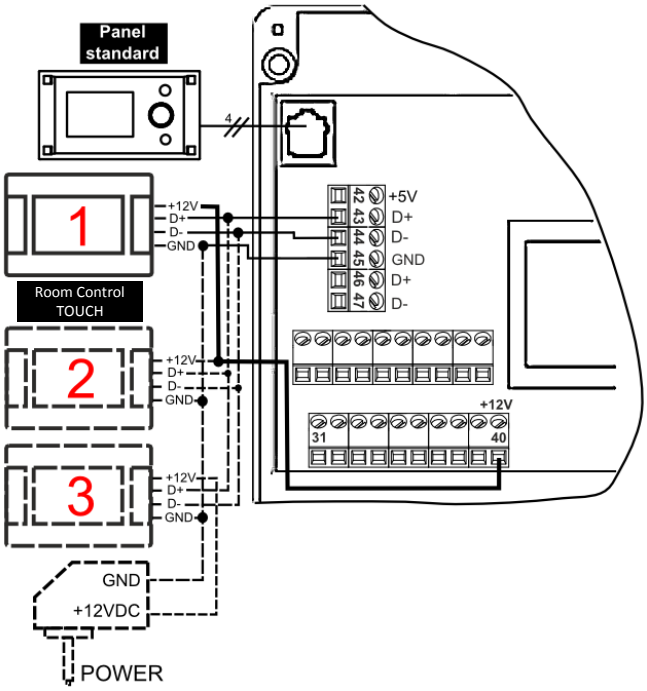
All 1,2,3 room panels require application of an additional power adapter **+12VDC**, **I≥0.5A**.



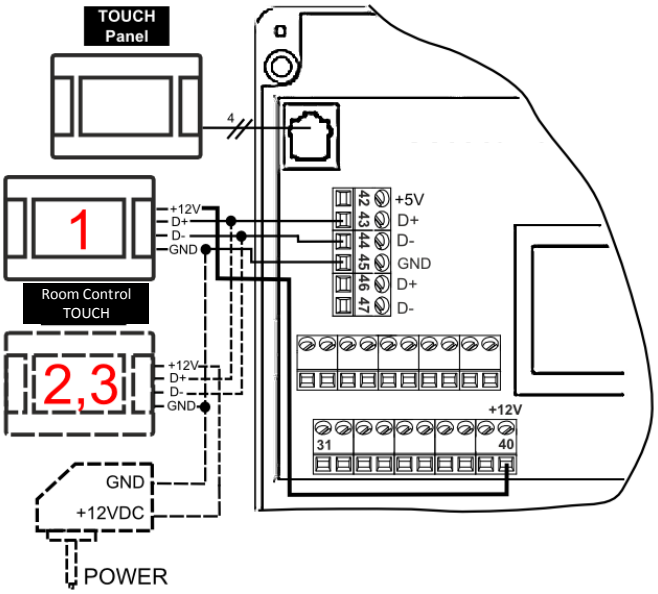
4.5.4 Connection with S.Control

Controller module can supply up to 2 colored TOUCH type panels simultaneously.

If the boiler controller is equipped with a standard control panel (version with a knob), two Room Control TOUCH room panels can be supplied directly from the controller module (**terminal 40**). Third panel has to be supplied by the additional power adapter **+12V**, **I≥0.5A**.



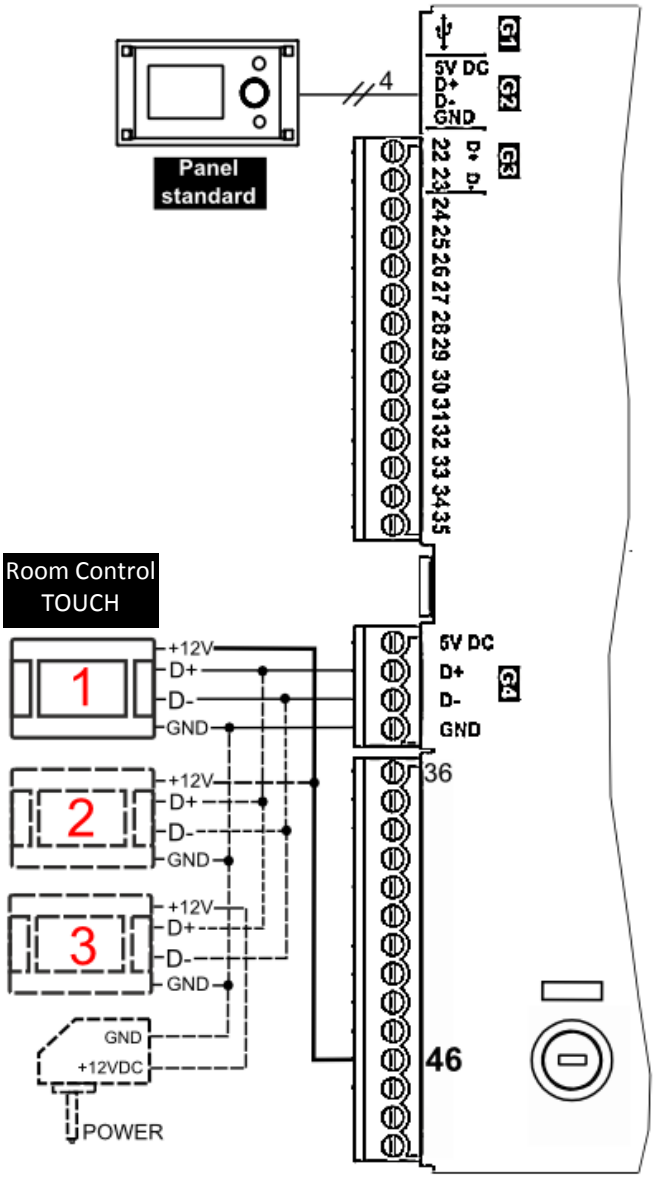
If the boiler controller is equipped with ecoTOUCH control panel (colored with a touch panel), only one Room Control TOUCH room panel can be supplied directly from the controller module (**terminal 40**). Panels 2 and 3 have to be supplied by the additional power adapter **+12V**, **I≥0.5A**.



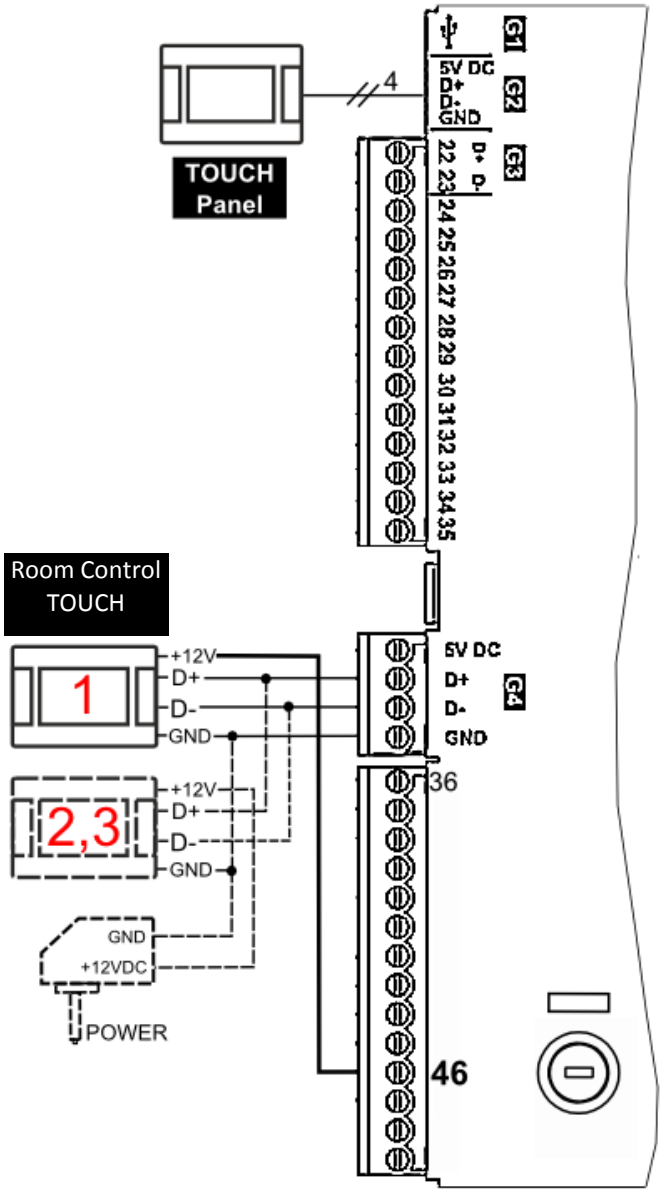
4.5.5 Connection with ecoMAX860P1, D1

Controller module can supply up to 2 colored TOUCH type panels simultaneously.

If the boiler controller is equipped with a standard control panel (version with a knob), two Room Control TOUCH room panels can be supplied directly from the controller module (**terminal 46**). Third panel has to be supplied by the additional power adapter **+12V**, **I≥0.5A**.



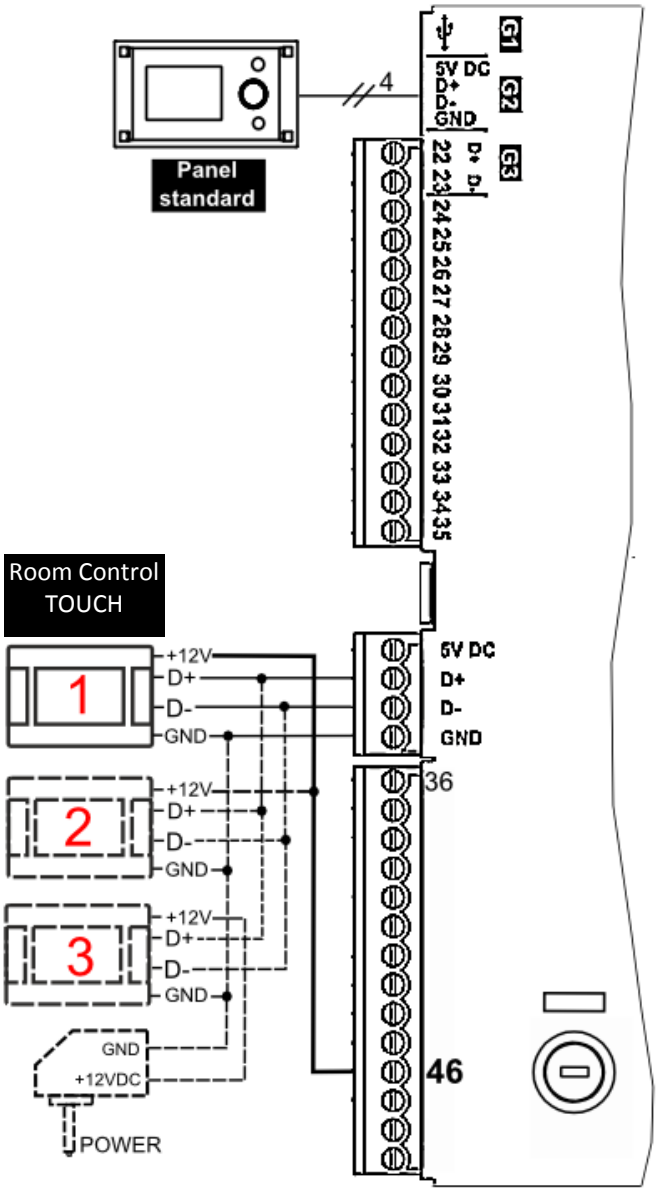
If the boiler controller is equipped with ecoTOUCH control panel (colored with a touch panel), only one Room Control TOUCH room panel can be supplied directly from the controller module (**terminal 46**). Panels 2 and 3 have to be supplied by the additional power adapter **+12V**, **I≥0.5A**.



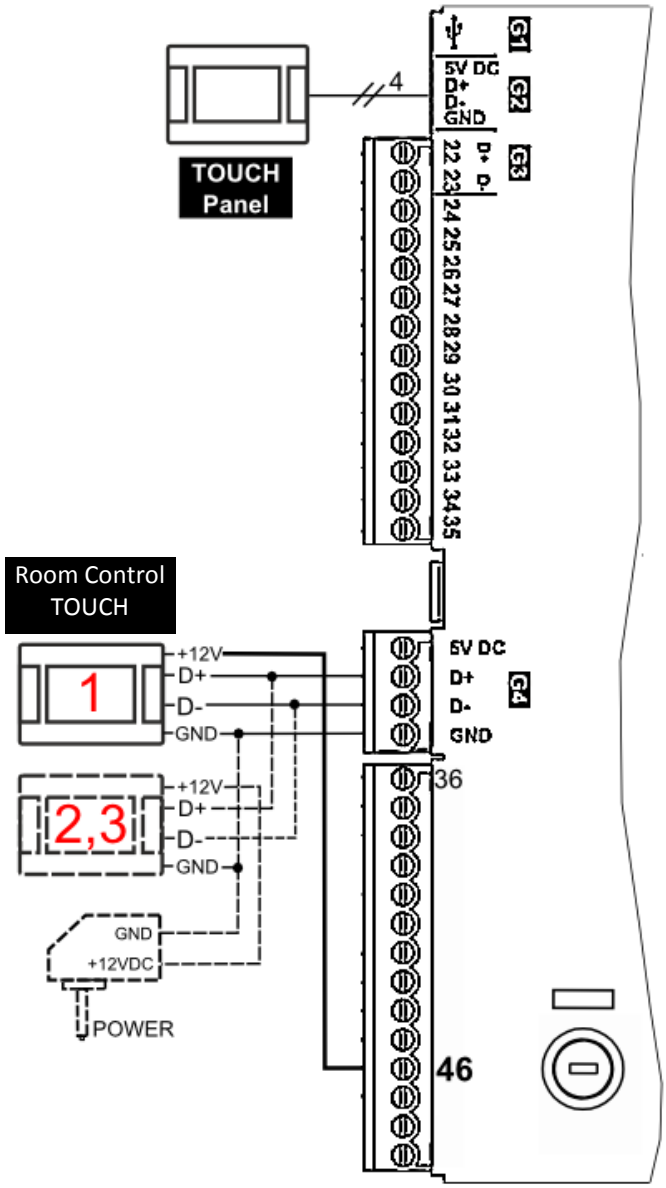
4.5.6 Connection with ecoMAX860P2, D2

☞ Controller module can supply up to 2 colored TOUCH type panels simultaneously.

If the boiler controller is equipped with a standard control panel (version with a knob), two Room Control TOUCH room panels can be supplied directly from the controller module (**socket G4**). Third panel has to be supplied by the additional power adapter **+12V**, **I≥0.5A**.



If the boiler controller is equipped with ecoTOUCH control panel (colored with a touch panel), only one Room Control TOUCH room panel can be supplied directly from the controller module (**socket G4**). Panels 2 and 3 have to be supplied by the additional power adapter **+12V**, **I≥0.5A**.



5 Modifications register

V1.1 – change layout and device name – Room Control TOUCH

P R O D U C E R
PELLAS X Sp. z o.o. Sp.k.
Poland, 64-920 Piła
ul. Szybowników 39/10
tel.: +48 67 213 80 40
NIP: PL764-266-44-90
info-en@pellasx.eu
www.pellasx.eu

pellasX
PELLET BURNERS

OPERATION AND INSTALLATION MANUAL

Room Control
room panel

for R.Control and S.Control regulators

RoHS CE

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1. Safety

Incorrect electrical connection of the room panel with S.Control, R.Control regulator can cause damage both to the Room Control room panel and S.Control, R.Control regulator. Therefore, installation has to be done by a qualified installer.
Additional protective measures should be taken in order to prevent results of malfunction of the regulator or of errors in its software which could result in a loss of property or other dangerous consequences, i.e. freezing of water in hydraulic system.

2. Purpose

Room Control room panel is a modern electronic device mainly used as a programmable room thermostat. The regulator provides very simple and effective way to control indoor temperature. Temperature sensor included in the regulator enables reading and programming temperature with the accuracy of 0,1°C. Regulator can be programmed in a 7-day cycle with the accuracy of 0,5 hour. Therefore, there is a possibility of 48 temperature changes per day. User can preset different time zones for each day of the week.

After connecting two additional temperature sensors, the Room Control room panel provides temperature control in three independent rooms.

The Room Control room panel also has a function of additional panel for boiler regulator control.
It can be used in household and similar facilities, as well as in slightly industrialized facilities.

3. Information about documentation

The Room Control room panel manual is a supplement for the corresponding S.Control, R.Control regulator. In particular, except for this manual, the regulator manual should also be observed. 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 moving or selling the device, the attached documentation should be forwarded 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 and installer from the obligation to comply with requirements which are not marked with graphic symbols!

6. WEEE 2002/96/EC Directive Act on electrical and electronic equipment

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

7. Operating manual

7.1 Switching the panel on

To switch the panel on, press TOUCH&PLAY button.

7.2 Switching the panel off

To switch the panel off, push the button in a main window of one of the thermostats, hold it for at least 3s and select "Switch off" (from the list.

Switching the Room Control room panel off does not result in switching the S.Control, R.Control boiler off.

7.3 Panel blockade

In order to lock the panel, push the button in a main window of one of the thermostats, hold it for at least 3s and select "Lock" from the list. When the panel is locked, a key symbol is displayed in a main window next to a clock.

In order to unlock the panel, hold the button for at least 4 seconds.

7.4 Operation.

The panel is equipped with TOUCH&PLAY button which facilitates the operation. This button is operated by turning and pushing.

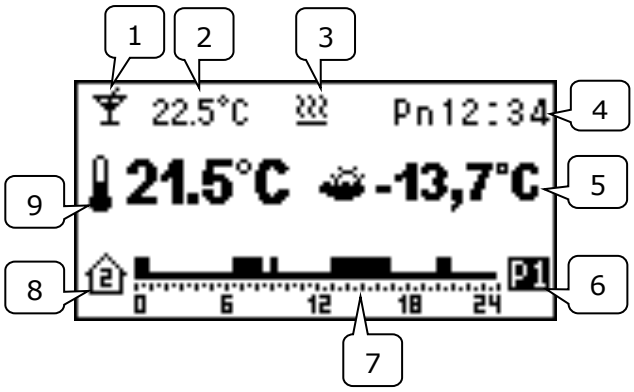
Push the button shortly to edit a particular parameter. In order to exit the parameter edition mode or particular menu, hold the button for at least 2s. Modify the edited value by turning the button right or left.

The Room Control panel operation is easy and intuitive. When the panel displays main window, turn the button right or left in order to change displayed main window: 1, thermostat 2. thermostat 3, boiler. If temperature sensors of thermostats 2 and 3 are not connected, the mains screens of thermostats 2 and 3 are not available.

Push the button shortly to display menu. Type of displayed menu will be according to a currently displayed main screen. For example, if you select the room thermostat 1 on the main screen, entering to menu will result in displaying settings for the first thermostat and common settings. When the main window for boiler settings is displayed, entering to menu will result in displaying boiler settings, etc.

For example, in order to change settings of thermostat 3, display the main screen of thermostat 3 by turning the button and push the button shortly in order to enter the settings menu of this thermostat.

7.5 Main screen



1. Current operation mode of room thermostat:
   - *Schedule*
   - *Economic*
   - Comfort
   - *Output*
   - *Airing*
   - *Party*
   - *Holiday*
   - *Anti-freeze*
   - *ON*
2. Current preset room temperature.
3. Indication of active thermostat (heating).
4. Clock.
5. Current external temperature (only available when a weather sensor is connected to the boiler regulator).

6. Currently selected profile.
7. Graphic presentation of programmed time zones (schedule).
8. Number of thermostat for which this main screen is displayed.
9. Current, measured room temperature.

7.6 Operation modes

7.6.1 Operation mode with a schedule

In this mode, the regulator presets the temperature in rooms according to a time schedule. In the main window, in a place for displaying operation mode, a clock icon is displayed. To set this mode, select:

MENU → Operation mode → Schedule

Programming a schedule is described in 7.8.1

7.6.2 Economic mode

In this mode, the regulator works with constant economic preset temperature, set in the following parameter:
MENU → Temperature Settings → Night temperature
In the main window, in a place for displaying operation mode, a quarter moon icon is displayed. In order to activate this mode, select:
MENU → Operation Mode → Economic

7.6.3 Comfort mode

In this mode, the regulator works with constant comfort preset temperature set in the following parameter:
MENU → Temperature Settings → Day temperature
In the main window, in a place for displaying operation mode, a sun icon is displayed. In order to activate this mode, select:
MENU → Operation mode → Comfort

7.6.4 "Output" Mode

This mode enables to replace the existing temperature setting for a period of 1 to 60 hours with an economic temperature set in the following parameter:
MENU → Temperature Settings → Night temperature. In order to activate this mode, enter the MENU and select:
Operation mode → Output
Screen for editing the duration of this mode will be displayed. After setting the required duration and confirming by pushing the button, the "Output" operation mode is activated; in this mode, the economic temperature is set to a preset duration.
Note: Time will be counted by full hours. It means that the first hour will not be a full hour - it will be a number of minutes left to a current full hour.
For example, if the manual mode is set to 17:45 for a duration of 4 hours, a real duration of the party mode will be 3h 15 min.
When a preset time elapses, the regulator switches to a previous mode. In the main window, in a place for displaying operation mode, an open door icon is displayed.

7.6.5 Airing mode

Selecting the airing mode in thermostat 1 will close mixers and switch off central heating pump in the boiler regulator for 1 to 60 minutes. In order to activate this mode, enter the MENU and select:
Operation mode → Airing
Screen for editing the duration of this mode will be displayed. After setting the required duration and confirming by pushing the button, the Airing operation mode is activated.
Note: Time will be counted by full minutes. It means that the first minute will not be a full minute - it will be a number of seconds left to a current full minute.
When a preset time elapses, the regulator switches to a previous mode. In the main window, in a place for displaying operation mode, an open window icon is displayed. During this mode, a thermostat contact remains opened.

7.6.6 Party mode

Party mode enables to replace the existing temperature setting for a period of 1 to 48 hours with any temperature. In order to activate this mode, enter the MENU and select:
Operation mode → Party
The preset room temperature edition window will be displayed. Set the required temperature by turning the button right or left. Push the button to confirm and save the

set temperature value; the mode duration time edition window will be displayed. After setting the required duration and confirming by pushing the button, the Party operation mode is activated; in this mode, the temperature is set to a preset duration.
Note: Time will be counted by full hours. It means that the first hour will not be a full hour - it will be a number of minutes left to a current full hour.
For example, if the manual mode is set to 17:45 for a duration of 4 hours, a real duration of the party mode will be 3h 15 min.
When a preset time elapses, the regulator switches to a previous mode. In the main window, in a place for displaying operation mode, a glass icon is displayed.

7.6.7 Holiday mode

Holiday mode enables to replace the existing temperature setting for a period of 1 to 99 days with a constant temperature. This function is particularly useful in case of holiday departure:
In order to activate this mode, enter the MENU and select:
Operation Mode → Holiday
The preset room temperature edition window will be displayed. Set the required temperature by turning the button right or left. Push the button to confirm and save the set temperature value. Next, the Holiday mode duration time edition window will be displayed. After setting the required duration and confirming by pushing the button, the Holiday operation mode is activated; in this mode, the temperature is set to a preset duration.
Note: Time will be counted by full days. It means that the first day will not be a full day - it will be a number of hours left to a current full day.
For example, if the manual mode is set to 17:45 for a duration of 14 days, a real duration of the Holiday mode will be 13 days 6 hours and 15 minutes.
When a preset time elapses, the regulator switches to a previous mode. In the main window, in a place for displaying operation mode, a suitcase icon is displayed.

7.6.8 Anti-freeze mode

In this mode, the regulator works with constant preset temperature, set in the following parameter:
MENU → Temperature Settings → Anti-freeze temperature
In the main window, in a place for displaying operation mode, a snowflake icon is displayed.
Selecting the anti-freeze mode in thermostat 1 will set the hot utility water temperature in the S.Control, R.Control boiler regulator to 8°C.

7.7 Profiles

The Room Control room panel enables programming four profiles of schedules. The following set of parameters is recorded for each profile:

- schedule for all weekdays
- night temperature (economic)
- day temperature (comfort)
- anti-freeze temperature
- hysteresis

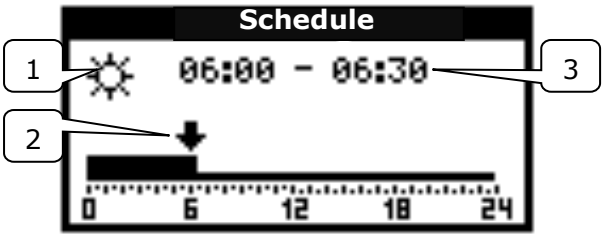
Profile changing mechanism is very useful if there is a need of cyclical changes in schedule; for example when user works on various shifts. Then, by selecting a profile, you can rapidly switch between several programmed schedules without a necessity of editing them.

7.8 Schedule

Regulator can be programmed in 7-day cycle with an accuracy of 0,5 hour. Therefore, there is a possibility of 48 temperature changes per day.
Regulator enables programming two levels of temperature: day (comfort) and night (economic). Regulator enables programming various time zones individually for each weekday.

7.8.1 Programming schedules

In order to program a schedule for a particular thermostat, display the main screen of this thermostat (pt. 7.4) and select: **MENU → Schedule**
Then, choose a weekday for which you want to establish or modify a schedule. After selecting a weekday, a window for editing a schedule is displayed.



1. Preset temperature: comfort or economic
2. Arrow indicating currently edited time interval
3. Currently edited time interval.

In order to set required time interval, you should:

- by turning the button, set the arrow on a time zone starting hour
- by pushing the button, set the comfort or economic temperature (it is indicated by displaying a sun or moon symbol in the upper left corner of edition window)
- turn the button and set the arrow on a time zone ending hour
- finish the edition of a particular zone by pushing the button
- if needed, repeat the steps above for other time interval - in order to exit a schedule window, push and hold the button for at least 2 seconds

After exiting the schedule editing mode, a window is displayed which enables you to assign currently edited schedule to any day of the week.

Select weekdays for which the currently edited schedule is to be assigned and then, select "Save and exit".

7.9 Preset room temperature

Preset night (economic) temperature is set in:

MENU → Temperature settings → Night temperature

Preset day (comfort) temperature is set in:

MENU → Temperature settings → Day temperature

Preset anti-freeze temperature is set in:

MENU → Temperature settings → Anti-freeze temperature

7.10 S.Control, R.Control boiler regulator menu

In order to display the S.Control, R.Control (2) boiler regulator main screen, turn the button right when the thermostat main screen is displayed. Push the button shortly to display the boiler regulator menu. This menu is similar as in S.Control, R.Control boiler regulator and therefore, the instructions of boiler regulator have to be followed.

The Room Control room panel displays alarms reported by the S.Control, R.Control boiler regulator. In case when generation of sound alarm is activated (pt. 7.11.6), pushing the button will result in deactivation of acoustic signal.

However, the alarm will not be cancelled. For safety reasons it could be done only by the boiler regulator.

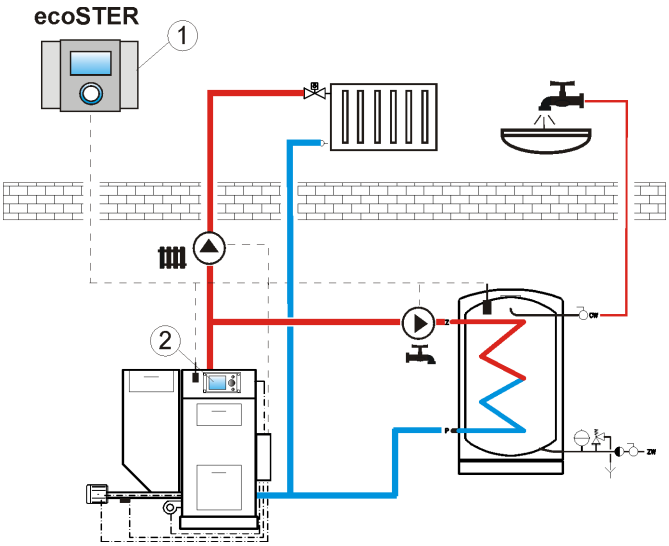


Diagram of cooperation of Room Control with S.Control, R.Control, where 1 - Room Control, 2 - S.Control, R.Control boiler regulator.

7.11 Settings

In order to enter the setting menu, select:

MENU → Settings

7.11.1 Weather sensor

This parameter is used only in case when there is an external temperature (weather) sensor connected to the boiler regulator. Set this parameter to display measured external

temperature in the main window of all thermostats.

7.11.2 Thermostat settings

This parameter enables or disables operation of particular Room Control thermostats.

Enabling or disabling thermostat 2 or 3 is possible only in case when there are additional external temperature sensors connected to the Room Control room panel.

When thermostat 2 or 3 is disabled, its main screen is not displayed.

7.11.3 Hysteresis.

This parameter defines hysteresis of room temperature. It decides of room temperature at which the room thermostat will inform the boiler regulator to heat. The boiler regulator will start heating when the room temperature drops under the *current preset temperature minus hysteresis*. It will finish heating when the current preset room temperature is reached.

7.11.4 Temperature correction

This parameter enables to make corrections of measured thermostat temperature within a range of -3.0°C to +3.0°C.

Warning! The changes are not visible immediately. Wait 5 minutes to adjustment was taken into account.

7.11.5 Language change

In order to change menu language, select:
MENU → Settings → Language
and select required language from the list.

7.11.6 Sound alarm

This parameter decided whether during the alarm there will be a sound signal generated in the Room Control panel.

7.11.7 Clock settings

In order to set time and date, select:
MENU → Settings → Clock
According to set date, the device will automatically set an appropriate weekday.

The Room Control panel is equipped with a system clock which is independent of the boiler regulator clock, and therefore both clocks have to be set on the same hour.

Programmed schedule works according to the scoSTER200 panel clock.

7.11.8 Brightness screen setting

The panel has the ability to set three separate levels of screen brightness separately for day, night and when editing parameters. To adjust the brightness for the selected level, go to the **MENU → Settings → Brightness**, and then set [%] intensity.

The panel based on the internal system clock settings independently activates the programmed level of brightness in daylight hours and night.

7.11.9 Information

In this window you can obtain information concerning software version of the Room Control panel and connected S.Control, R.Control boiler regulator.

8. Instructions for panel assembly

8.1 Technical data

Power source	+5V..12VCC
Current consumed by the device	I = 0.1 A
Protection level of the regulator	IP20
Ambient temperature	0...50 °C
Storage temperature	0...65 °C
Temperature measurement range	0...50 °C
Temperature regulation range	5...35 °C
Hysteresis	0.2…5 °C
Relative humidity	5– 85% without condensation
Terminals	Elastic clamps 0.25– 2.5mm^2
Display	Graphic 128x64
External dimensions	164x90x40 mm
Complete weight	0.2 kg
Standards	PN-EN 60730-2-9 PN-EN 60730-1
Software class	A

8.2 Storage and transportation conditions

Panel cannot be directly exposed to weather conditions, i.e. rain and solar radiation. Storage and transportation temperature should be within a range of -15…65 °C.
During transportation, the panel cannot be exposed to vibrations which are higher than typical for normal transporting conditions.

8.3 Environmental conditions

The panel should be installed in a dry residential compartment.
Moreover, the regulator cannot be used in condensation conditions and be exposed to water.

8.4 Assembly requirements

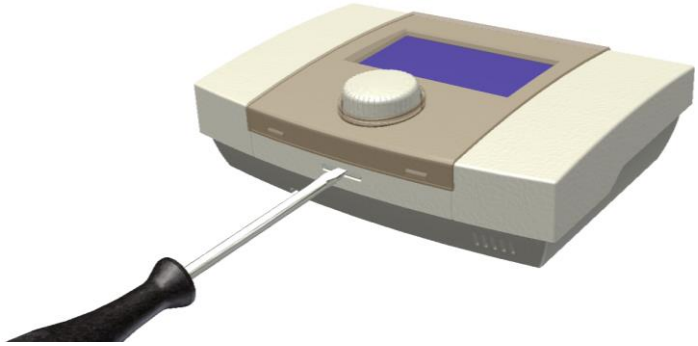
In order to guarantee a maximum operation efficiency of the regulator, follow the recommendations concerning a place of device assembly:

1. The panel is purposed for on-wall assembly inside rooms.
2. The panel should be assembled on a height app. 1.5 m over the floor level.
3. Avoid places which are strongly sunlit, close to heating devices, in direct vicinity of doors and windows, where a temperature measurement could be easily interfered by external conditions.
4. Avoid places with weak air circulation.

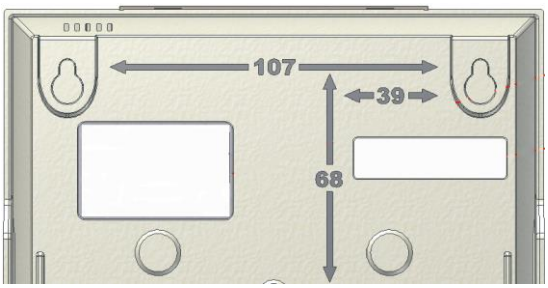
The panel should be installed by a qualified installer.
The manufacturer does not bear any responsibility for damages caused by failure to observe this manual.

8.5 Instructions for assembly

Open the casing as shown on the figure below:



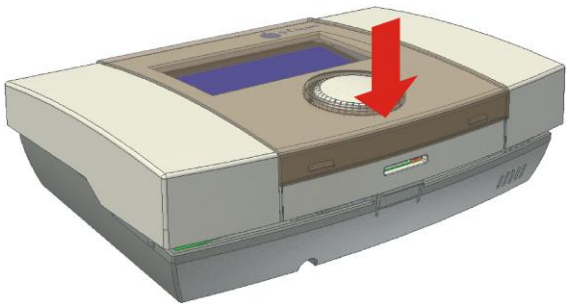
Drill holes in a wall. If a wall is made of bricks, use rawlplugs. Screw in the screws.



Perform electrical connections between the Room Control panel with the S.Control, R.Control regulator. The Room Control panel is supplied by the S.Control, R.Control regulator and does not require any supply source. Cable can be both bricked in a wall or routed on a wall surface. Do not lead connection cable together with cables of electrical network in the building. Do not lead the cable in a vicinity of devices emitting strong electromagnetic field.

Do not mix up cable poles. It can result in damaging the devices.

Closing the casing. Push the cover in a place indicated by the red arrow until you hear a clear click.



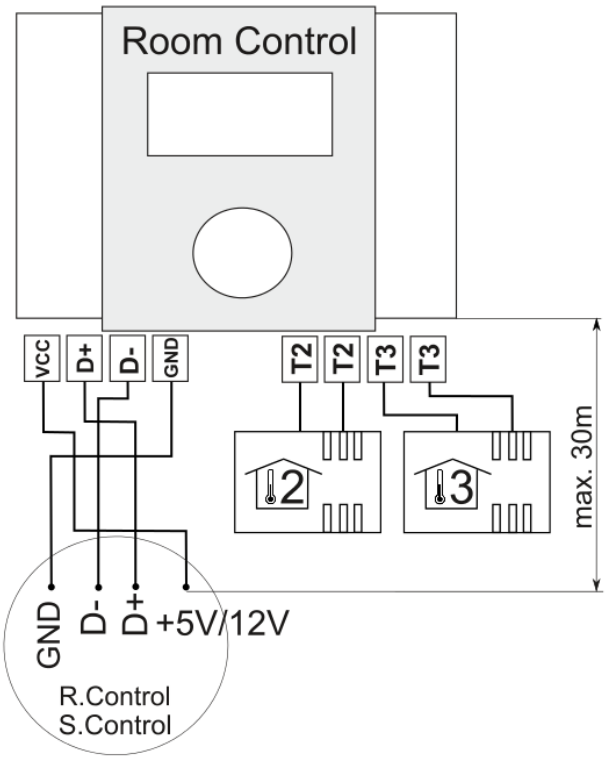
8.6 Electrical connection to the module controllers S.Control, R.Control

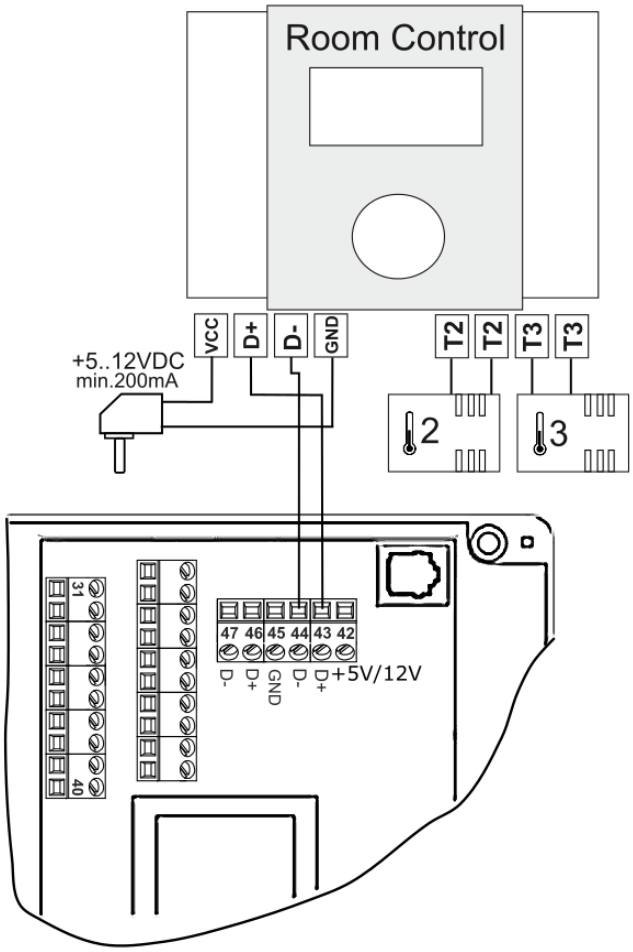
Room Control room panel can be supplied with **+5V** or **+12V**, depending on the module type S.Control. It can be powered directly from the terminal regulator module or an external power supply from **+5V** to **+12VDC /min.200mA**, which is not included with the room panel. The regulator modules R.Control is powered only with the RJ14 jack module.
Maximum length of the cable connecting the room panel with S.Control, R.Control

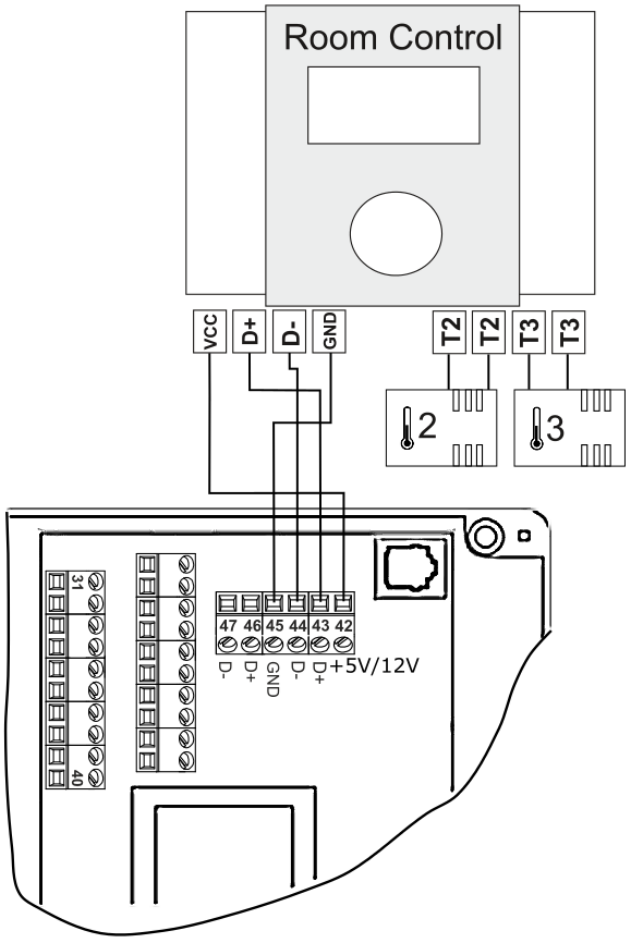
regulator cannot exceed **30 m**, and its cross-section area cannot be lower than **0.25 mm²**; it is recommended to use **0.5 mm²** cable.

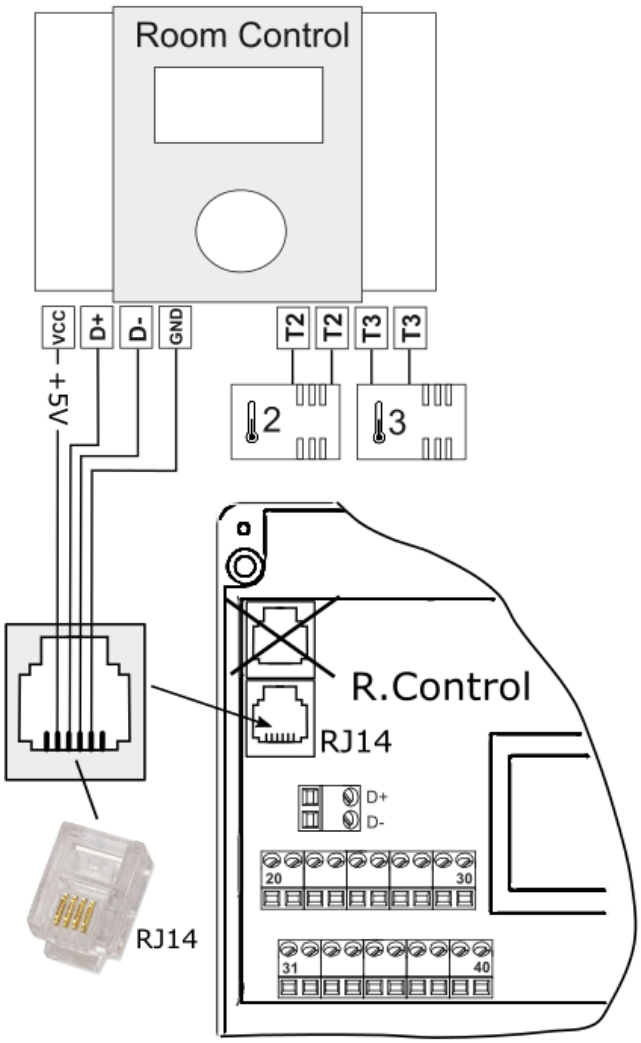
The length of uninsulated tip of the cable should be within **8÷10mm**. Cable is inserted into a terminal by pushing a button on this terminal with a flat screwdriver, inserting the cable and releasing the button.

Below are the wiring scheme thermostats with room sensors 2 and 3 type **CT7**.









8.7 Assembling sensors of thermostat 2 and 3

After connecting two additional temperature sensors, the Room Control room panel provides independent temperature regulation in three rooms. Regulator cooperates with CT7 type room temperature sensors. Use a cable with a cross-section of at least 0.25 mm^2 to connect sensors. Recommended cross-section is 0.5 mm^2. Cable should not be longer than 20 m. Sensor cables should be separated from power cables (~230V). If not, incorrect temperature readings can occur. Minimum distance between sensor cables and power cables should be at least 10 cm.

In order to guarantee a maximum operation efficiency of the regulator, follow the recommendations concerning a place of sensor assembly:

1. Sensors should be assembled on a height app. 1.5 m over the floor level.
2. Avoid places which are strongly sunlit, close to heating devices, in direct vicinity of doors and windows, where a temperature measurement could be easily interfered by external conditions.
3. Avoid places with weak air circulation, e.g.: behind furniture.

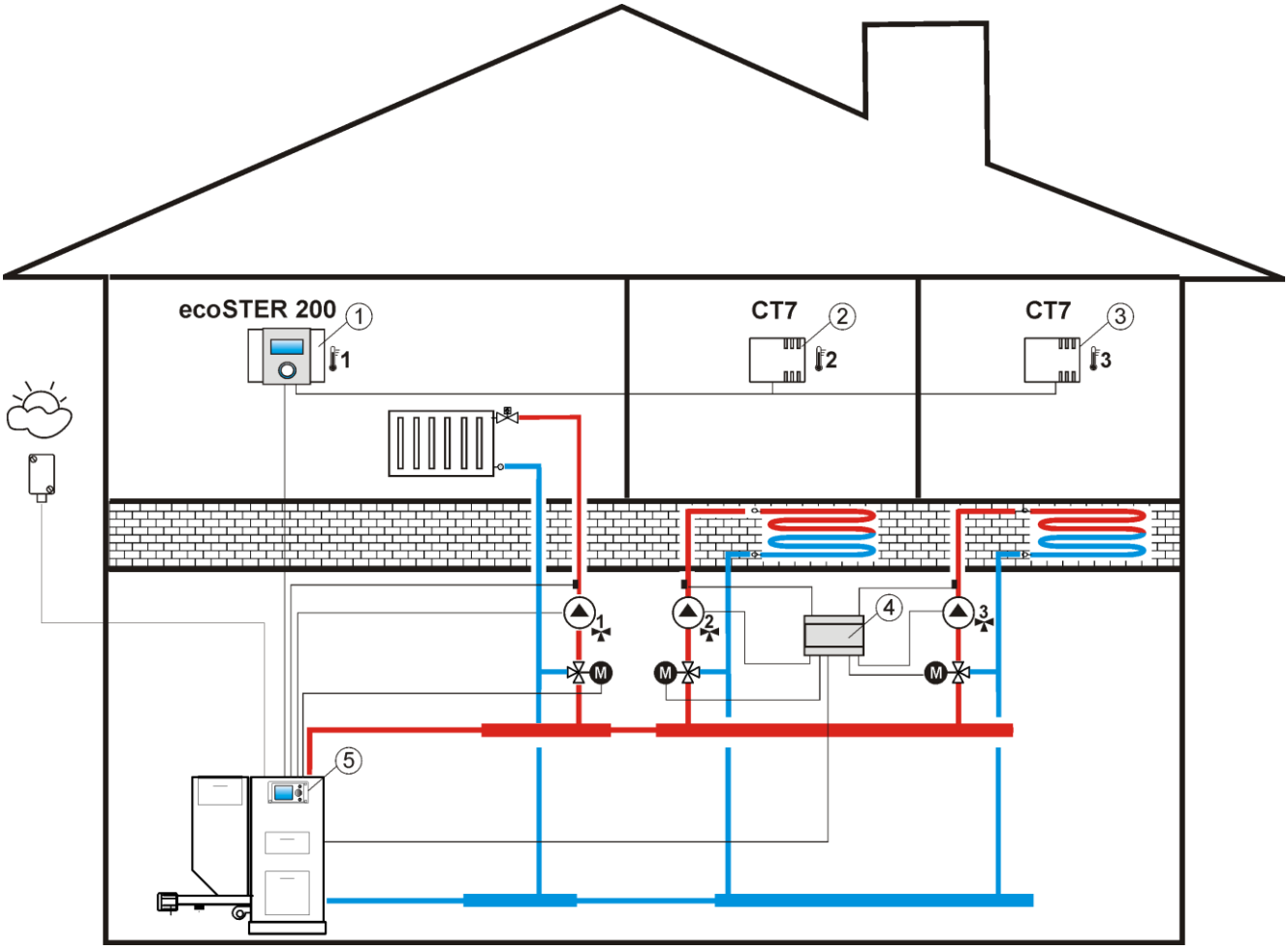


Fig. 8.1[1] Diagram of cooperation between Room Control and S.Control, R.Control, where: 1 - Room Control, 2 - room sensor of thermostat 2 type CT7, 3 - room sensor of thermostat 3 type CT7, 4 – module B (extends the system by 2 heat circulations), 5 - S.Control, R.Control controlle

[1] Diagram does not replace a project of installation and can be used only for reference.

P R O D U C E R
PELLAS X Sp. z o.o. Sp.k.
Poland, 64-920 Piła
ul. Szybowników 39/10
tel.: +48 67 213 80 40
NIP: PL764-266-44-90
info-en@pellasx.eu
www.pellasx.eu

pellasX®
PELLET BURNERS

OPERATION AND INSTALLATION MANUAL

S.Control
burner controller

for boilers fuelled with pellets

RoHS CE

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1. SAFETY PRECAUTIONS

Safety requirements are described in following sections of this user's manual. Apart from them please obey requirements described below.

- Before installing, mending or maintenance and during any connecting works it is absolutely necessary to disconnect the network power and to make sure if the connections and wires are not electrically powered
- After disengaging the controller by keyboard there may still be a dangerous electrical power on its connections.
- The controller must be used in accordance with its destination
- The controller must be covered with the box
- Additional automatic device must be used to protect the boiler, central heating and hot water installations against the results of controller breakdown or faults in its hardware.
- It is essential to adjust parameters to the given boiler time and to the fuel type. All the conditions of usage the installation must be considered. Faults in adjusting the parameters may cause boiler emergency mode (overheating, backfire to the feeder, etc.)
- The controller is for boiler producers. The boiler producer before its use should check if the cooperation between the controller and the boiler is correct and is not dangerous.
- The controller is not a spark-safe device. It means that in emergency mode may be the source of a spark or high temperature which together with dust or flammable gases can cause fire or explosion.
- The controller must be installed by the boiler producer, in accordance with valid norms and regulations
- Modification of programmed parameters should only be carried by a person acquainted with this user's manual
- The controller can only be used in heating installations made in accordance with valid norms and regulations
- The electrical circuit in which the controller works should be protected with a fuse proper for voltage used.
- The controller can not be used with damaged cover box
- On no condition can any alterations to the controller's construction be made
- The controller is equipped with an electronic disconnector of connected devices (working type 2Y in accordance to PN-EN 60730-1) and microdisconnector (working type 2B in accordance to PN-EN 60730-1).
- Children should not be allowed access to the controller.

2. GENERAL INFORMATION

The controller is intended to control the operation of a pellet boiler using an optical flame brightness sensor. The controller is of a compact design and it is easy to install.
It can control the work of central heating and hot water circuits and also control the work of 5 mixing heating circuits. The required temperature of heating circuits can be set on the basis of data obtained from the main sensor. The possibility of cooperation with room thermostats, separate for each heating circuit is beneficial for maintaining comfortable temperature in heating rooms. Moreover, the device turns on the spare boiler (gas or oil one)
The controller can cooperate with additional room panel located in living rooms and additional module of lambda λ sensor and internet module.
Handling of the controller is easy and intuitive. The controller can be used within the household and in small industrial buildings.

3. DATA REFERRING TO DOCUMENTATION

The user's manual of the controller is a complementation of boiler documentation. In particular it is necessary to apply the boiler documentation. The user's manual of the controller is divided into two parts: for the user and for the installer. However in both parts vital information concerning safety is included. That is why the user should get acquainted with both parts of the user's manual.
We do not take responsibility for damages caused by failing to observe the following user manual.

4. DOCUMENTATION STORAGE

We advise you to keep carefully this user manual of installation and maintenance and all other valid documentation, for immediate use when needed. In case of removal or selling the device all the documentation should be handed to new user or owner.

5. SYMBOLS AND MARKINGS USED

Following graphic symbols and markings are used in the user manual:

-for relevant information and tips,

-for vital information related with issues of property damage, health and life risk of humans or domestic animals,

Attention: by these symbols vital information is marked. It is to allow easy understanding of the user manual. User and installer is however required to observe recommendations not expressed by graphic symbols!

6. WEEE 2002/96/EG ELECTRICITY AND ELECTRONICS BILL

- The packaging and product is to be utilized at the end of using period by a proper recycling company.
- The product can not be disposed together with ordinary wastes.
- The product can not be burned.

USER MANUAL OF THE CONTROLLER

S.Control

7. USER MENU STRUCTURE

Main menu
Information
Boiler settings
HUW settings*
Summer/ Winter
Mixer 1-5 settings*
Night time decrease
Chmney sweep mode
• On/Off mode
• Preset power: MIN, MED, MAX
• Work time
General settings
Manual control
Alarms
Service settings
Turn on/off the controller
Exit

Boiler settings
Preset boiler temperature
Weather control boiler *
Heating curve *
Curve shift *
Thermostat selection
• Off
• Universal
• ecoSTER T1, T2, T3*
Output modulation
• Max. burner power
• Blow-in revision- max. power
• Oxygen revision- max. power*
• H2 Hysteresis
• Medium burner power
• Blow-in revision- medium power
• Oxygen revision- medium power*
• H1 Hysteresis
• Minimum burner power
• Blow-in revision- min. power
• Oxygen revision- min. power
• Boiler hysteresis HK
• Blow-in/ grate output*
• Exhaust fan blow-in/ grate output*
• Vacuum - grate*
Operation mode
• Pellet
• Grate
Regulation mode
• Standard
• FuzzyLogic
Fuel type
• Pellet
• Agropellet
Cleaning level*
• Normal
• Increased
• Intensive
Fuel level
• Alarm level
• Fuel level calibration
Burner cleaning
Lambda probe calibration*

HUW settings
Preset HUW temperature
HUW pump mode
• Off
• Priority
• No priority
HUW cont. hysteresis
HUW disinfection

Summer/Winter
SUMMER mode
• Winter
• Summer
• Auto*
Activation temperature SUMMER*
Deactivation temperature SUMMER*

Mixer settings 1-5*
Preset temperature
Thermostat selection
• Off
• Universal
• ecoSTER T1, T2, T3*
Reduction from thermostat
Weather control*
Heating curve*
Curve shift *
Room temp. factor*

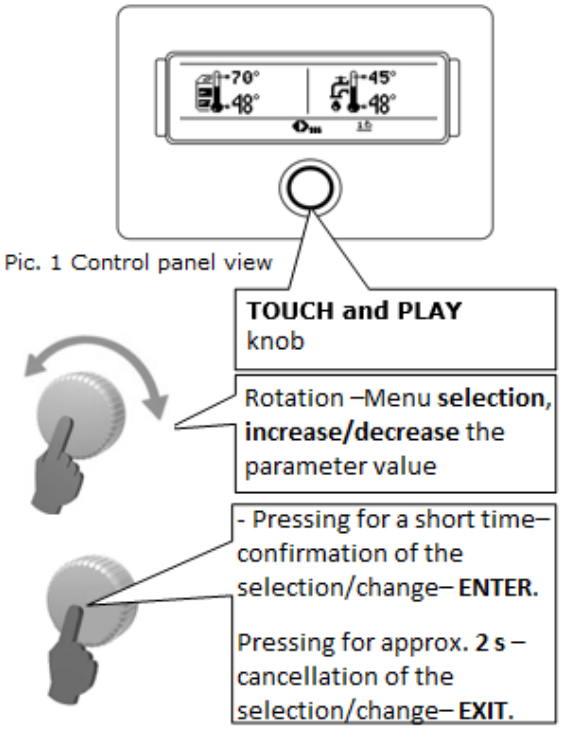
Night time decrease
Boiler, Mixer 1-5*, HUW tank*, Circulation pump*
• On/Off
• Decrease value
• Schedule

General settings
Clock
Screen brightness
Screen contrast
Sound
Language
WiFi*

*Not available if proper sensor or additional module is not connected or the parameter is hidden.

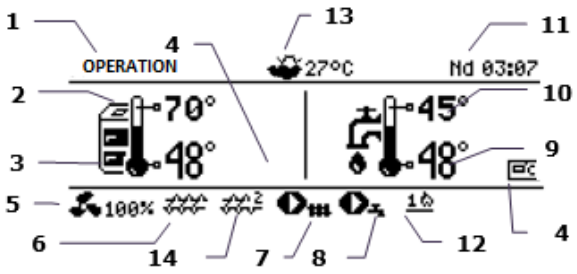
8. CONTROLLER MAINTENANCE

8.1 BUTTONS DESCRIPTION



Pic. 1 Control panel view

8.2 MAIN DISPLAY WINDOW DESCRIPTION

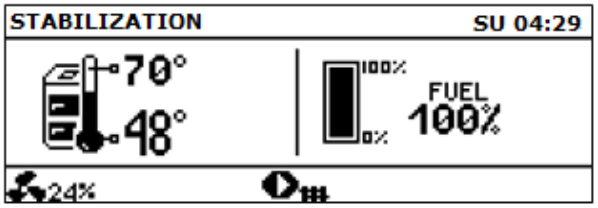


Pic. 2 Main display window.

1. Controller's working modes: FIRE UP, OPERATION, SUPERVISION, BURNING OFF, CLEANING, PAUSE, CHAMNEY SWEEP
2. Boiler preset temperature,
3. Boiler measured temperature,
4. Functions having influence on preset boiler temperature. Following symbols signal respectively:
   - Preset boiler temperature decrease due to thermostat disconnection;
   - Preset boiler temperature decrease due to activated time spans;
   - Boiler preset temperature during loading the hot water boiler (HUW);
   - Boiler preset temperature increase from mixer circulation;
   - weather control switch on for boiler circulation,
   - Preset temperature increase to load the buffer.
5. Symbol signalling blowing operation,
6. Symbol signalling fuel feeder operation,
7. Symbol signalling central heating (CH) pump operation,
8. Symbol signalling central heating pump operation (HUW),
9. Measured temperature of hot water boiler (HUW),
10. Preset hot water (HUW) boiler temperature,
11. Clock and weekday
12. Part of the screen coshared between two icons: match – symbolizes operating heater, and the digit next to it stands for a number of fire up attempts;
    Rake – symbolizes activating automatics of furnace cleaning,
13. External (weather) temperature,
14. Additional feeder (connected to module B).

Example informations (optional knob) are presented in the right panel of the main screen:

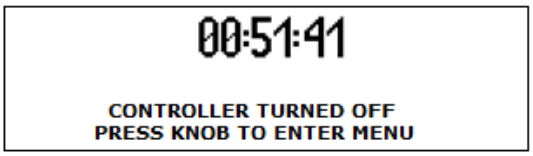
The fuel level view is presented if the fuel level parameter is properly preset. Additionally, the fuel level can be visible in the Room Control and Room Control TOUCH room panel.
Attention: fuel level can be seen in room panel Room Control.



Pic. 3 auxiliary window displaying fuel level.

8.3 CONTROLLER START UP

After connecting the power the controller shows the settings put before connecting the electricity. If the controller has not operated before – it will start up in „stand by" mode.



In this mode the screen is dimmed, actual time and information: *Boiler on* is displayed.
In this mode protecting pumps against going stale function is in operation. It is executed by temporary switching them on. Therefore it is advised to keep the electrical power to the controller on when the boiler is not in use. And the controller should be in "stand by" mode. It is possible to start up the boiler (pressing the encoder knob and selecting „switch on") or setting parameters of its operation (MENU button) without connecting it to the electrical power. After making sure that fuel is in the container, and the hatch is closed – the boiler can be switched on.

8.4 Settings preset 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 1-5 settings → Preset temp.

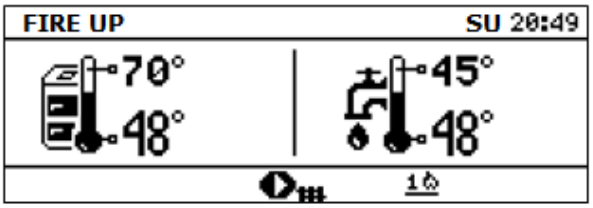
The value set as *Preset boiler temp.* is ignored by the regulator if the preset boiler temperature is controlled by weather sensor. Regardless of that, the preset boiler temperature is automatically increased in order to fill the hot utility water tank and feed heating mixer cycles.

8.5 FIRING UP

FIRING UP mode is for automatic firing up of furnace in boiler. Total time of firing up process is depended on controller's settings (feeder operation time, heater operation time, etc.) and on boiler's condition before firing up. Parameters influencing firing up process are in the menu:

Service settings → Boiler settings → Firing up

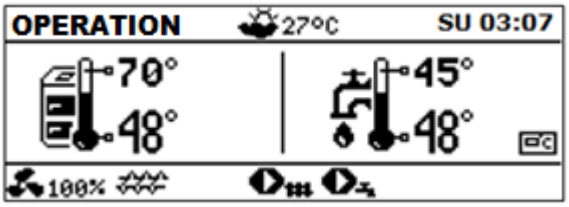
In case of failed attempt of firing up the furnace, another attempts are taken during which amount of fuel (feeding time) is reduced to 10% of first attempt's dose.



Pic. 4 Signaling FIRING UP mode and number of attempt

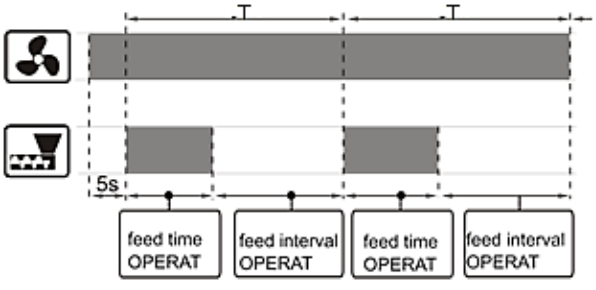
After three failed firing up attempts an alarm Failed firing up attempt is reported. Boiler's operation is then stopped. It is not possible to automatically continue boiler's operation. Service intervention is required. After finding and solving the cause of firing up failure the boiler should be fired up again.

8.6 WORK



Pic. 5 Main window view while operating.

The fan operates constantly – see Pic. 6. Fuel feeder is engaged periodically. One period consists of feeder operating time and pause in feeding time.



Pic. 6 Fan and feeder operation periods.

There are two regulation modes responsible for stabilization of boiler preset temperature: *Standard and Fuzzy Logic*:

Boiler settings → Regulation mode

- **Standard mode operation**

If the boiler's temperature reach preset one then the controller switches to SUPERVISION mode.

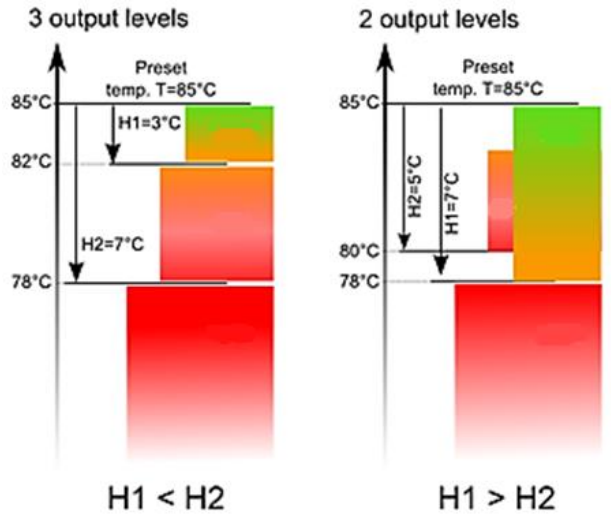
Controller is equipped with boiler's power modulation mechanism – which allows for gradual power reduction when approaching the preset temperature.

There are three power burner levels: maximal, medium, minimum. Values of the individual power levels can be set in the below menu:

Boiler settings → Output modulation

The controller determines the burner power to be used by the boiler depending on the preset boiler temperature and the pre-defined hysteresis values *H2 hysteresis*, *H1 hysteresis* and settings parameters: *Blow-in revision – max./med./min. power*.

It is possible to configure H1 and H2 values so that the modulation will be done with no medium power level, i.e. by changing the level from maximum directly to minimum and skipping the medium power value (right part of the illustration).



Pic. 7 Hystereses H1 and H2 of power modulation

- **Operation in Fuzzy Logic mode**

In Fuzzy Logic mode the controller automatically regulates burner power to allow boiler operation in such a way to maintain its temperature on preset level. The controller uses power levels defined in Standard mode. In this mode the parameters *Hysteresis H2* and *Hysteresis H1* do not have to be set.

The Fuzzy Logic mode unlike the Standard mode is not faulty in respect of failing to reach the preset boiler temperature due to incorrect adjustment of *Hysteresis H2* and *Hysteresis H.* It also allows for quicker reach the preset temperature.

☞ Attention: If the boiler operates without heat buffer and controller is switched into SUMMER mode than Standard mode operation of the controller is recommended.

After exceeding the preset temperature by 5ºC the controller switches into SUPERVISION mode.

8.7 SUPERVISION

SUPERVISION mode is applicable either in regulation in STANDARD and Fuzzy Logic mode.

The controller switches into SUPERVISION mode automatically without user's intervention: - in Standard regulation mode - after reaching the boiler preset temperature, - in Fuzzy Logic steering – after exceeding boiler preset temperature by 5ºC.

In SUPERVISION mode the controller oversees the furnace, keeping it from burning off. To do so, the burner operates with very low power, what together with properly adjusted parameters do not cause further increase in temperature. Burner's power in SUPERVISION mode and other parameters of Supervision are grouped in menu:

Service settings → Burner settings → Supervision

Maximum time of boiler's operating in supervision mode is defined in parameter *Supervision time*. If after this time (in Supervision mode) there is no need to restart the boiler then the controller starts the process of boiler's burning off.

☞ For setting *Supervision time* = 0 the controller omits SUPERVISION mode and goes directly to BURNING OFF.

8.8 BURNING OFF

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

All parameters which influence the process of burning off can be found in menu:
Service settings → Burner 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 PAUSE mode.

8.9 PAUSE

In the PAUSE 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 CHAMNEY SWEEP

The controller has a special mode CHIMNEY SWEEP mode during the duration of the run are also all the possible heat receivers used in heating and boiler begins to heat up to a specified MIN, MED, MAX power level in:
Chimney sweep mode → Preset power
This function is used to test and adjust the boiler.

8.11 GRATE

Some boilers have an additional grate to burn other fuels such as wood waste, etc. To activate the grate, move the parameters available in the:
Boiler settings → Operation mode
from "pellet" to "grate". In the grate mode fuel feeder is turned off. The combustion process is regulated only the fan blower and exhaust. The parameters for the fans are: *Blow-in/ grate output* and *Exhaust fan blow-in/ grate output*. Fan power, when working with grate, is set in:
Boiler settings → Output modulation
considering the set permissible pressure formed in the parameter *Vacuum - grate*.
The values of parameters such as:
Boiler settings → Preset boiler temp
Boiler settings → Output modulation → Boiler hysteresis
Service settings → Burner settings → Other → Fuel detection time
are individually adjusted for the "grate". This allows you to define different properties of boiler operation for operation modes "grate" and "pellets".
When using the grid an alarm "No fuel" can appear. This alarm occurs when a temperature drops below the value of the parameter:
Service settings → CH and HUW settings → CH activation temp.
and then for a period of 10 minutes there has been no growth.

8.12 Hot water settings

The controller regulates temperature of the container of hot water HUW, providing that the temperature sensor is connected. When the sensor is disconnected – the information about it is displayed in the main window. By selecting:
HUW settings → HUW Pump mode the user is able to:

- deactivate feeding the container, parameter *Off*,
- setting HUW priority, by parameter *Priority* – then CH pump is deactivated to feed the HUW boiler quicker,
- set simultaneous operation of CH and HUW pump with the parameter *No priority*.

8.13 Hot water temperature settings

Preset temperature HUW is defined by parameter:
HUW settings → Preset HUW temperature

8.14 Hysteresis of hot water container

Below temperature *Preset temperature HUW – HUW cont. hysteresis* the HUW pump will activate to feed the HUW container.

By small hysteresis value HUW pump will activate faster after HUW temperature decrease.

8.15 SUMMER FUNCTION START UP

To activate SUMMER function which allows feeding the HUW tank during summer, without necessity to activate CH installation and mixers periods, it is required to set the *SUMMER mode* for *Summer.*

Summer/Winter → SUMMER mode

In SUMMER mode, all heat consumers can be switched off so before turning it on, make sure that the boiler will not overheat.

If the weather sensor is connected SUMMER function can be activated automatically with the *Auto* parameter with additional settings at which the function is to be switched on / off depending on the outside temperature of the set parameters: *Activation temp. SUMMER, Deactivation temp. SUMMER*.

8.16 Hot water feeder disinfection

The controller can automatically, periodically make HUW container warm up to 70ºC. It is done to remove bacterial flora.

It is absolutely important to inform all the inmates about activating the disinfection function. There is a danger of scalding with HUW hot water.

Once a week at night between Sunday and Monday at 2 a.m. the controller increases temperature of HUW container. After 10 minutes of keeping the container at 70ºC the HUW pump is deactivated and the container returns to its normal operation. It is not advisable to activate disinfection function while the service of HUW is deactivated.

8.17 Mixer circle settings

Settings of first mixer circle are in the menu:

Mixer 1 settings

Settings for other mixers are in following sections of the menu and are identical in each cycle.

- **Mixer settings without weather sensor**

It is required to set manually desired temperature in mixer's heating cycle using parameter *Preset mixer temperature,* e.g. 50ºC. Such should be a value to provide required room temperature.

After connecting a room thermostat, value of decline in preset mixer temperature from thermostat should be set. (parameters *Mixer room thermostat* e.g. 5ºC. This value should be chosen experimentally. A room thermostat can be a traditional one or a room panel Room Control and Room Control TOUCH. After activating the thermostat, mixer preset temperature will be reduced. When this value is reduced correctly then room temperature increase will be stopped.

- **Mixer with weather sensor setting without room panel Room Control**

Set parameter *Mixer weather control* in position on. Adjust weather curve according to point 8.18**.** Using parameter *parallel curve movement* set required room temperature according to formula:

Required room temperature = 20°C + heating curve parallel movement.

Example:

To reach room temperature 25°C value of heating curve movement must be set for 5°C. To reach room temperature 18°C value of heating curve parallel movement must be set for -2°C.

In this configuration a thermostat can be connected. It will level inaccuracy of heating curve adjustment in case when its value will be too big. In such case value of decrease of preset mixer room temperature from thermostat should be set i.e. for 2°C.After disconnecting thermostat plugs preset mixer cycle temperature will be reduced. By correct adjustment of this reduction will stop temperature increase of temperature in heated room.

- **Mixer with weather sensor and room panel Room Control and Room Control TOUCH**

Set parameter *Mixer weather control*. In position on. Adjust weather curve according to point 8.18. Controller automatically moves the heating curve depending on preset room temperature. The controller relates adjustments to 20ºC, i.e. for preset room temperature = 22ºC the controller will move

heating curve by 2ºC, for preset room temperature = 18ºC the controller will move heating curve by -2ºC. In some cases described in point 8.18 it can be necessary to adjust heating curve movement.
In this configuration room thermostat is able to:

- reduce temperature of heating cycle by a constant value, when preset temperature in a room will be reached. Similarly like it was described in previous point (not recommended), or
- automatically, constantly correct heating cycle temperature.

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

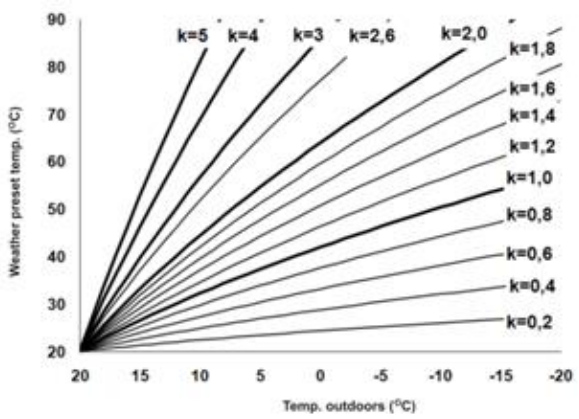
Automatic correction of room temperature is done according to formula:
Correction = (preset room temperature – measured room temperature) x room temperature factor / 10

Example:
Preset temperature in heating room (set in Room Control) = 22ºC. Measured temperature in room (using Room Control) = 20ºC. *Room temperature factor* = 15
Preset mixer temperature will be increased by (22ºC – 20ºC) x 15/10 = 3ºC. Correct value of parameter must be found *Room temperature factor*. The bigger value of factor the bigger correction of preset boiler temperature factor. When set on value "0" preset mixer temperature is not corrected. Attention: setting too high value of room temperature factor may cause cyclic room temperature fluctuations.

8.18 Weather control

Depending on measured outside temperature, automatically controlled can be either preset boiler temperature and mixer cycles temperatures. By correct adjustment of heating curve temperature of heating circuits is counted automatically depending on value of external temperature. Thanks to that by choosing proper heating curve for given building, room temperature remains approximately the same – no matter what outside temperature.
In case of connected room panel Room Control set additionally *Room temperature factor* = 0
Guidelines for correct heating curve settings:

Floor heating	0,2 – 0,6
Radiator heating	1,0 – 1,6
Buffer	1,8 - 4



Pic. 8 Heating curves.

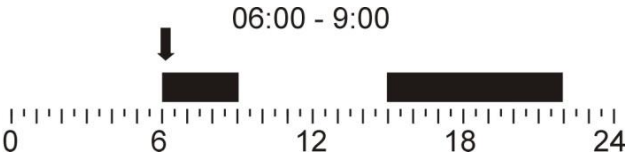
Tips for choosing proper heating curve:

- If by falling outer temperature room temperature is increasing, then value of chosen heating curve is too big,
- If by decreasing outer temperature, room temperature is also decreasing, then value of chosen heating curve is too low,
- If by frosty weather room temperature is appropriate and in warmer time is too low – it is recommended to increase parameter *Curve shift* and then choose lower heating curve,
- If by frosty weather room temperature is too low and in warmer time too high – it is recommended to reduce parameter *Curve shift* and choose higher heating curve.

Buildings which are poorly isolated require setting heating curve with higher values, and for better isolated buildings heating curve will have lower value.
Preset temperature, counted according to heating curve can be decreased or increased by controller when it goes beyond scope of limits of temperatures for given cycle.

8.19 Night decrease settings description

Night time decreases for boiler, heating circuits, HUW tank 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. Decrease of preset boiler temperature in selected time intervals is indicated by the symbol on the main screen.
To activate time intervals, set the parameter: *Night time decrease* for boiler or the given heating circuit to *On*. The parameter *Decrease value* set the temp. the reduction, one for all time intervals.
Decrease night can be defined separately for every day of the week set *Schedule*.
Select the lowering of the temperature set point and the beginning and end of a given time interval.



Pic. 9 Bar graph, time intervals-24h.

The time interval is ignored when set to lower value,, 0 "even if the time in the range of hours.

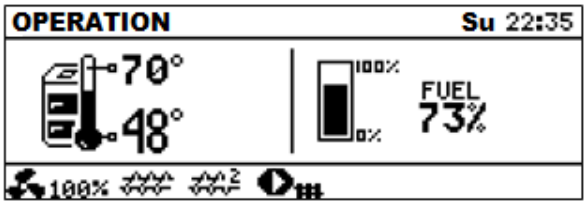
8.20 Circular pump control

Functionality of circular pump is available after connecting to Output H controller or additional module C.
Should be set the support *Outputs H mod A* or *Output H mod B/C* to support the circulation pump in:
Service settings → Output H mod A, Output H mod B/C = Circulation pump
Settings are in:
Night time decrease→ Circulation pump
and
Service settings→ CH and HUW settings
Settings of time control of circular pump are analogical to settings of night reductions. In defined time periods circular pump is deactivated into *Circulation standstill time*. In omitted periods the circular pump is switched into position *Circulation operation time*.

8.21 Fuel level configuration

- **Fuel level indicator activating**

To activate displaying fuel level following parameters are to be set
Boiler setting→ Fuel level→ Alarm level
On value bigger than "0", i.e. 10%
Twisting "TOUCH and PLAY" knob in main window fuel level is displayed in main window. Tip: fuel level can also be seen in room panel Room Control/ Room Control TOUCH.



Pic. 10 Additional window with fuel level view.

- **Fuel level indicator service**

Each time when fuel container is filled to required level it is necessary to press and keep the knob [about 2 s] in main window. Following info will appear:

Pic. 11 Fuel level operation.

After choosing and accepting „YES" fuel level will be set for 100%. Attention: Fuel can be refilled anytime, that means it is not needed to wait till the container is empty. However fuel should be filled up to the level corresponding to 100% and set the controller level by pressing knob.

- **Description of activity**

The controller measured fuel level on the basis of its current consumption. Factory settings will not always correspond to actual fuel consumption , so to work correctly this method needs level calibration by controller's user. No additional fuel sensors are required.

- **Calibration**

Fill the container to the level which corresponds to full level of fuel, then set value of parameter:

Boiler settings – Fuel level – Fuel level calibration – Fuel level 100%

In main window the indicator will be set on 100%. The calibration process is marked with a pulsating fuel level indicator. The indicator will pulsate until programming point referring to minimum fuel level. Decreasing level of fuel in the container should be monitored constantly. When fuel level reaches expected minimum, parameter value should be set this way:

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

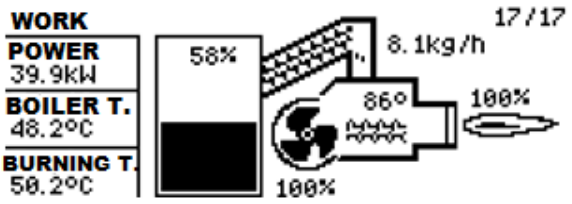
8.22 Cooperation with additional feeder

After connecting additional B module the controller can cooperate with low fuel level sensor in container. After activating sensor, for *Additional feeder time* controller will connect auxiliary feeder to refill basic fuel level. This parameter can be found in:

Service settings → Burner settings → Other

8.23 INFORMATION

Graphical layout of the system operation, preview of parameters and operation modes, mixer settings, WiFi/Ethernet web module parameters, service counters and versions of the controller programmes are visible in the Information menu.

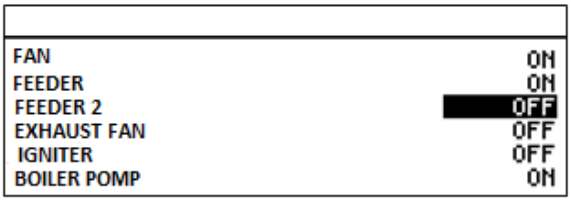


Pic. 12 System visualisation including current reading of the operating parameters.

8.24 MANUAL CONTROL

In the controller it is possible to manually activate devices like i.e. pumps, feeder engine, or blower engine. It enables to check if the device is operating correctly and if it is connected properly.

Attention: Entering manual control is possible only in STAND-BY mode, when container is switched off



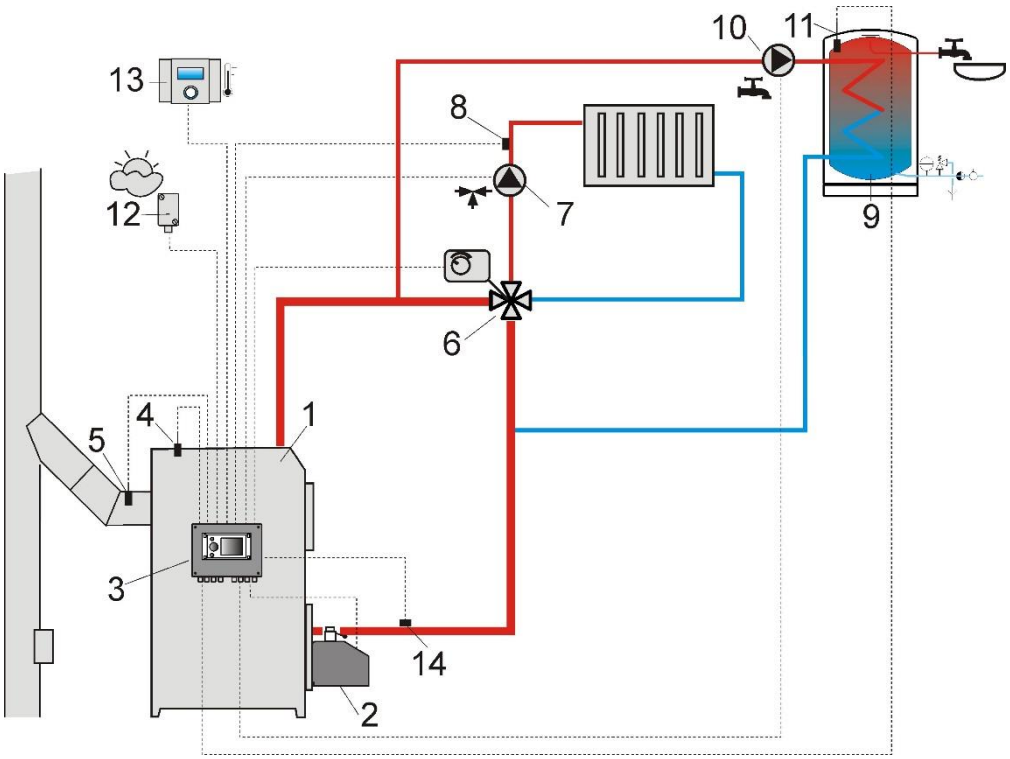
Pic. 13 Manual control window view, when OFF – means that the device is off, ON – activated.

Attention: long lasting activating of fan, feeder or other device may cause danger.

S.Control

9. HYDRAULIC SCHEMES

9.1 SCHEME 1



Pic. 14 **Scheme with 4 way steering valve controlling central heating circuit[1],** where: 1 – boiler, 2 – burner, 3 – controller, 4 – boiler temperature sensor CT4, 5 – fumes temperature sensor CT2S (only a preview of temperature), 6 – servomotor of 4 way valve, 7 – mixer cycle pump, 8 – mixer cycle temperature sensor, 9 –hot water container, 10 – hot water pump, 11 – hot water temp. sensor CT4, 12 – weather temperature sensor CT4-P, 13 – room panel Room Control or standard room thermostat, 14 – return temperature sensor CT4 (it is not necessary to operate the system).

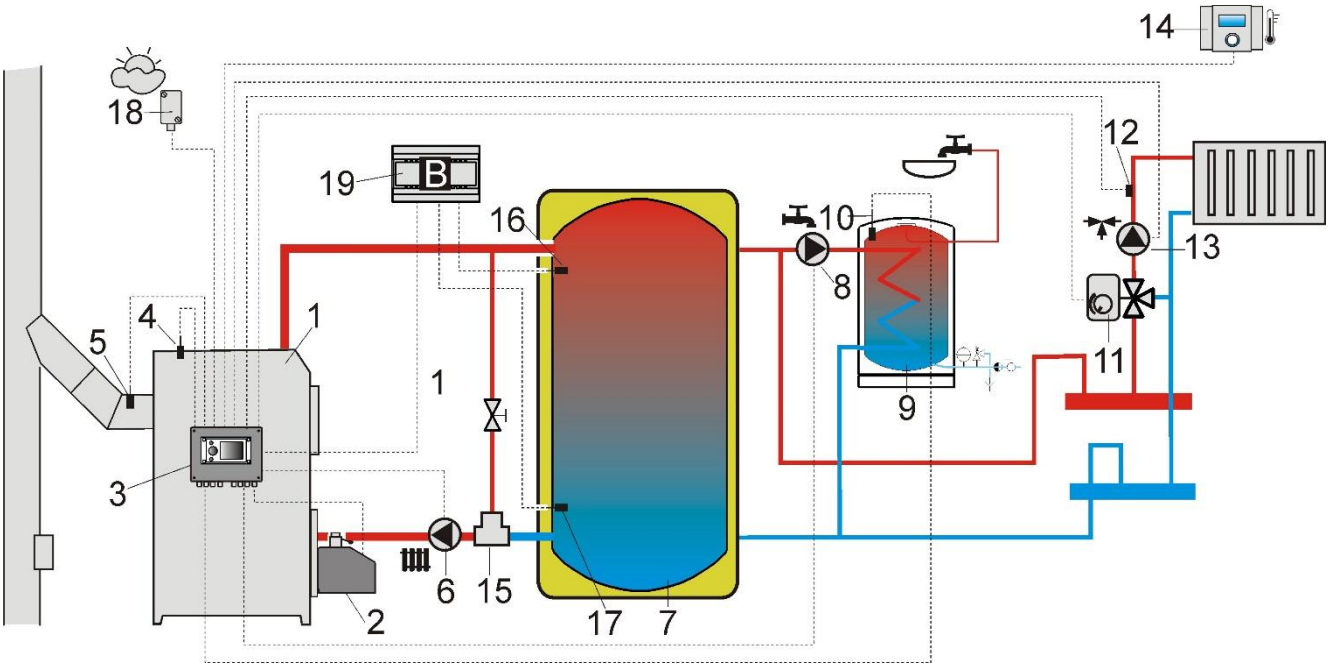
⚠	To improve water circulation in gravity cycle it is necessary to use large nominal profiles DN of a pipe and 4 way valve, not to use large amount of knees and profile narrowings. Use other rules referring to gravity installations. If return sensor is installed closely, it is necessary to isolate it thermally from surroundings and improve thermal contact with pipe. Preset container temperature must be set so high to ensure thermal power for mixer cycle when at the same time heating water returning to the boiler.

RECOMMENDED SETTINGS:

Parameter	Setting	MENU
Preset boiler temperature	75-80°C	boiler settings
Mixer service 1	CH activated	service settings→ mixer settings 1
Max. mixer temperature 1	70°C	service settings→ mixer settings 1
Mixer heating curve 1	0.8 – 1.4	mixer heating 1
Mixer weather control 1	activated	mixer setting 1

[1]Shown hydraulic scheme does not replace the project of central heating and serves only as a sample!

9.2 SCHEME 2



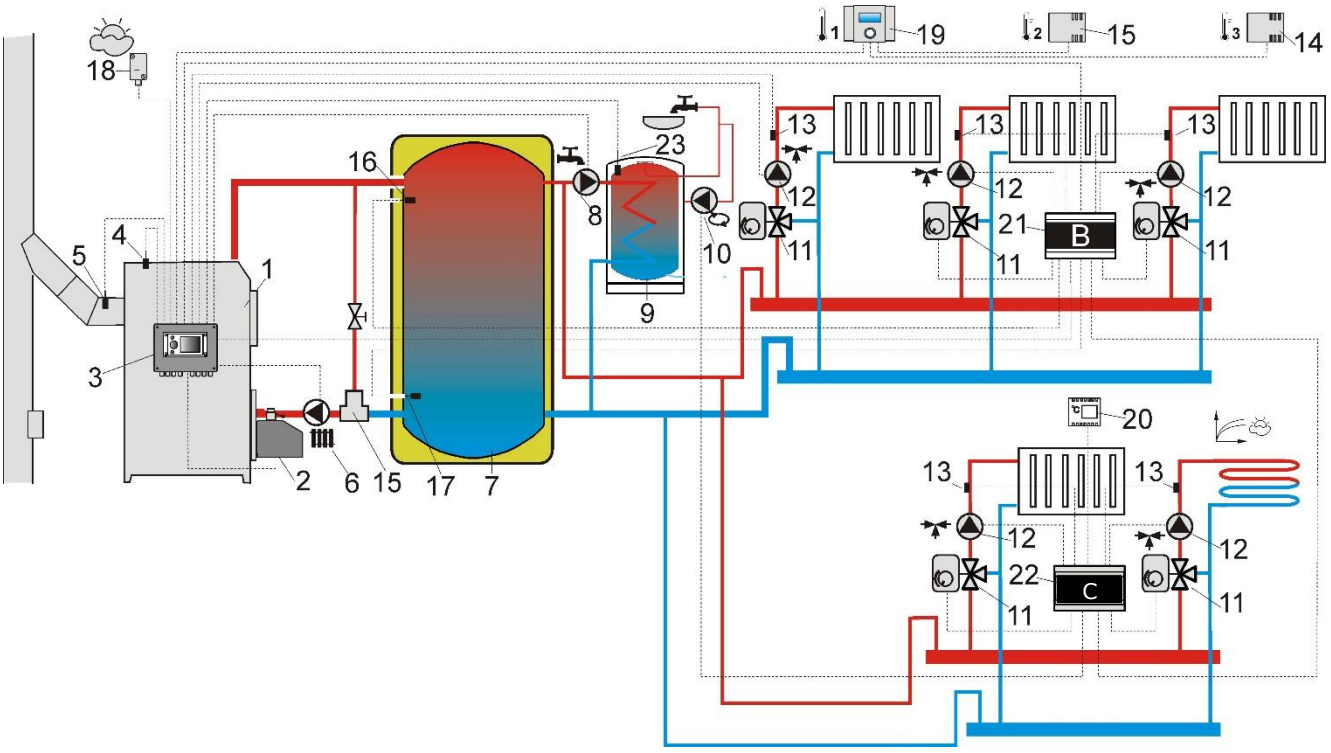
Pic. 15 **Scheme with heating buffer[2],** where:1 – boiler, 2 – burner, 3 – controller, 4 – boiler temperature sensor CT4, 5 – fumes temperature sensor CT2S (only a preview of temperature), 6 – boiler pump, 7 – heating buffer, 8 – hot water pump, 9 – hot water container, 10 – hot water temperature sensor CT4, 11 – servomotor of mixing valve, 12 – room mixer temperature sensor CT4, 13 – mixer pump, 14 – room panel Room Control with room thermostat function, 15 – thermostatic 3 way valve for return protection, 16 – buffer higher temperature sensor CT4, 17 – buffer lower temperature sensor CT4, 18 – weather temperature sensor CT4-P, 19 – additional module B.

RECOMMENDED SETTINGS:

Parameter	Setting	MENU
Preset boiler temperature	80°C	boiler settings
CH activating temperature	55°C	service settings→ CH and HUW settings
Buffer support	activated	service settings→ buffer settings
Loading start temperature	50°C	service settings→ buffer settings
Loading stop temperature	75°C	service settings→ buffer settings
Mixer service 1	activated CO	service settings→mixer settings 1
Max. mixer temperature 1	70°C	service settings→mixer settings 1
Mixer heating curve 1	0.8 – 1.4	mixer settings 1
Mixer weather control 1	activated	mixer settings 1
Mixer thermostat selection 1	ecoSTER T1	service settings→ mixer settings 1

[2] Shown hydraulic scheme does not replace the project of central heating and serves only as a sample!

9.3 SCHEME 3



Pic. 16 **Scheme with heating buffer and 5 mixing heating circuits[3],** where: 1 – boiler, 2 – burner, 3 – controller, 4 – boiler temperature sensor CT4, 5 – fumes temperature sensor CT2S, 6 – boiler pump, 7 – heating buffer, 8 – hot water pump, 9 – hot water container, 10 – circular pump, 11 – 3 way valve with servomotor, 12 – mixer cycle pump, 13 – mixer cycle mixer sensor, 14 – room sensor CT7, 15 – room sensor CT7, 16 – higher sensor of buffer CT4 temperature, 17 – lower sensor of buffer CT4 temperature, 18 – weather temperature sensor CT4-P, 19 – room panel Room Control with room thermostat function, 20 – standard room thermostat, 21 – additional module B, 22 – additional module C, 23 – hot water room temperature.

RECOMMENDED SETTINGS:

Parameter	Settings	MENU
Boiler preset temperature	80°C	boiler settings
CH start temperature	55°C	service settings→ HUW and CH settings
Buffer suport	Active	service settings→ buffer settings
Loading start temperature	50°C	service settings→ buffer settings
Loading stop temperature	75°C	service settings→ buffer settings
Mixer service 1,2,3,4	active CH	service settings→mixer settings 1…4
Max. mixer temperature 1,2,3,4	70°C	service settings→mixer settings 1…4
Mixer heating curve 1,2,3,4	0.8 – 1.4	mixer settings 1…4
Mixer weather control 1,2,3,4	active	mixer settings 1…4
Mixer thermostat selection 1	ecoSTER T1	service settings→ mixer settings 1
Mixer thermostat selection 2	ecoSTER T2	service settings→ mixer settings 2
Mixer thermostat selection 3	ecoSTER T3	service settings→ mixer settings 3
Mixer thermostat selection 4	universal	service settings→ mixer settings 4
Mixer service 5	Activate floor	service settings→mixer settings 5
Max. mixer temperature 5	50°C	service settings→mixer settings 5
Mixer heating curve 5	0.2 – 0.6	mixer settings 5
Mixer weather control 5	active	mixer settings 5

[3]Shown hydraulic scheme does not replace the project of central heating and serves only as a sample!

10. TECHNICAL DATA

Power		230V~; 50Hz;
Current consumed by controller		0,04 A
Maximum nominal current		6 (6) A
Controller's level of protection		IP20
Outer temperature		0...50 °C
Storage temperature		0...65 °C
Relative humidity		5 - 85% without condensation of water steam
Measuring scope of sensors' temperature CT4		0...100 °C
Measuring scope of sensors' temperature CT4-P		-35...40 °C
Accuracy of measuring temperature with sensors CT4 and CT4-P		2 °C
Clamps	For network and signal	Screw clamps, wire profile up to 2,5mm^2, tighten moment 0,4Nm, isolation lenght 7mm
	protecting	Screw clamps, wire profile up to 2,5mm^2 , tighten moment 0,5Nm, isolation lenght 6mm
Display		Graphic LCD
Dimensions		224x200x80 mm
Weigth		1,4 kg
Norms		PN-EN 60730-2-9 PN-EN 60730-1
Software class		A
Protection class		For installing to devices class I
Level of contamination		2 wg PN-EN 60730-1

11. STORAGE AND TRANSPORT CONDITIONS

The controller can not be exposed to immediate effects of atmospheric conditions i.e. rain or sunrays. Temperature of storage and transport should be within scope -15…65ºC.

During transport the controller can not be exposed to vibrations bigger than typical for transport of boilers.

12. CONTROLLER INSTALLATION

12.1 ENVIRONMENTAL CONDITIONS

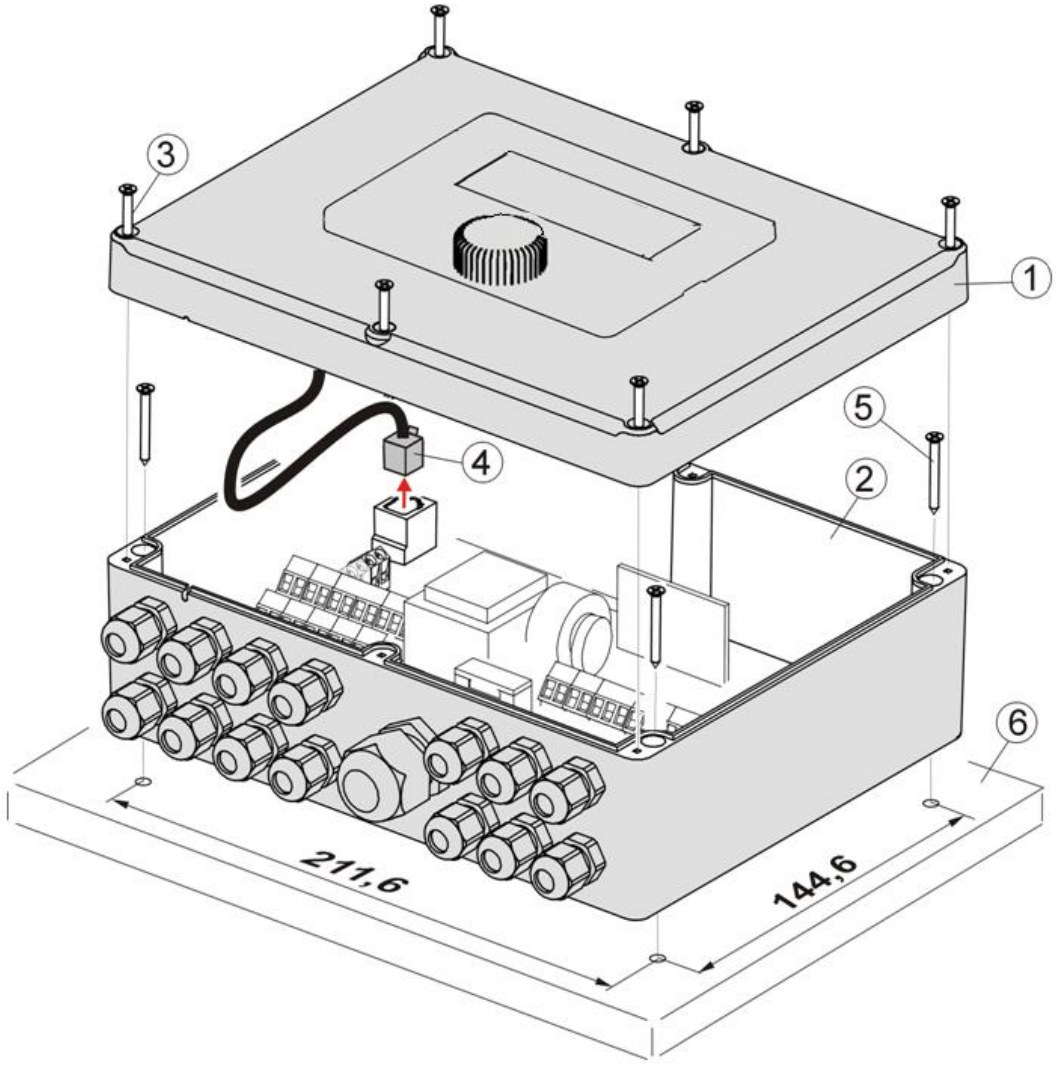
Due to fire risk it is forbidden to use the controller in proximity of explosive gases or dust. Moreover the controller can not be used in conditions of water steam condensation or be exposed to effects of water.

12.2 INSTALLATION REQUIREMENTS

The controller should be installed by a qualified and authorized installer, in accordance with current norms and regulations. The producer is not responsible for damages caused by failing to observe valid law and this user manual. The controller is designed to be built-in. This means that it is attached to flat and stable part of a boiler or a wall. It can not be used as a separate device. Leave free space at each partition of the controller (save for assembly partition) at least 50mm. Leave free space allowing for setting wires without bending them, at least 100mm from back partition of the controller. Outer temperature and assembly surface should be within scope of 0 – 50ºC.

12.3 INSTALLATION

The controller is adapted to be installed on flat assembly surface. In order to screw it to assemble surface please undo the screws (3) and carefully lift the cover (1), then undo the plug (4). Then remove the cover (1) in a safe place. Using screws (5) stuck through holes in the cover (2) screw the controller to assembly surface (6).



Pic. 17 Embedding controller on assembly surface, where: 1 – cover, 2 – base, 3 – screw for cover, 4 – plug, 5 – screw for assembly surface, 6 – assembly surface.

12.4 ELECTRIC CIRCUIT CONNECTION

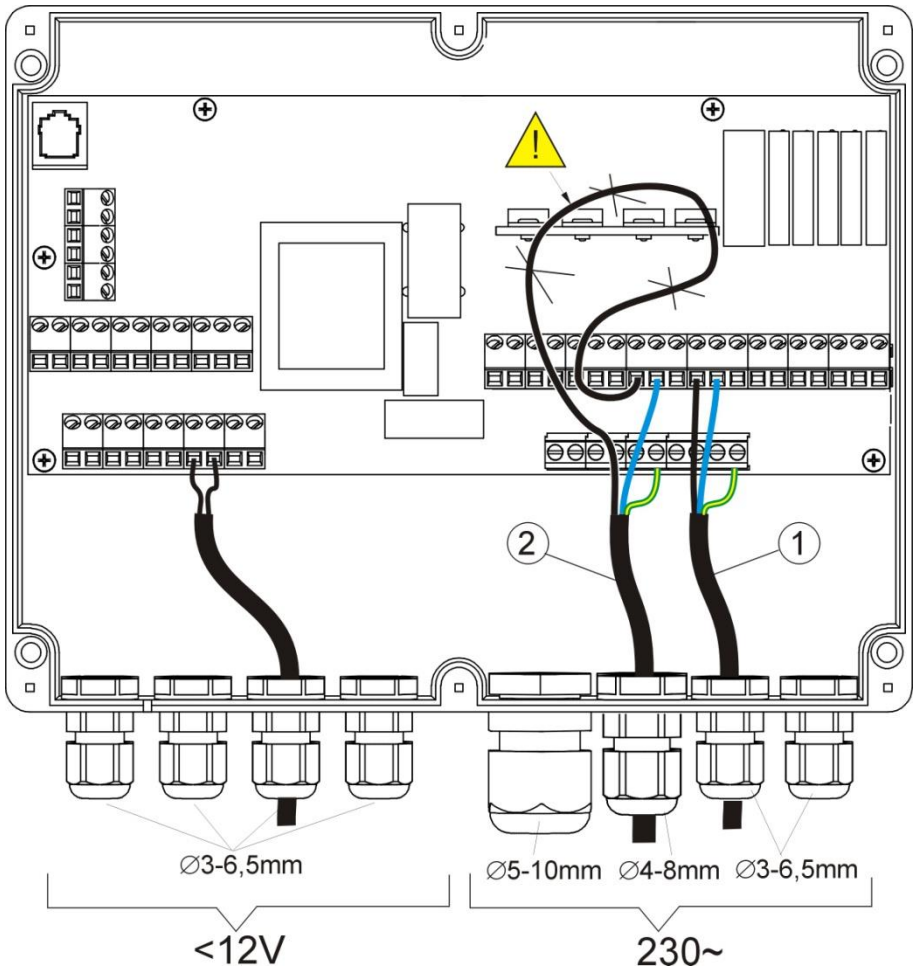
The controller is adapted to current 230V~, 50Hz. Features of installation:

- 3 way (with protecting wire),
- made according with valid law.

Attention: After deactivating the controller with the keypad, there still can be a dangerous voltage on the connections. Before starting assembly works it is obligatory to disconnect the electrical power and make sure that there is no danger electrical power on claps and wires.

Connecting wires should not touch with surfaces with temperatures exceeding nominal temperature of their work. Claps on the right side of the device are marked as L, N, 1-19 are designed to connect devises powered with current 230V~.
Claps 20-40, D+, D- and RJ are designed to cooperate with low voltage devices (below 12V).

Connecting current 230V to claps 20 – 40 and transmission connections causes damage to the controller and brings danger of electrical shock!



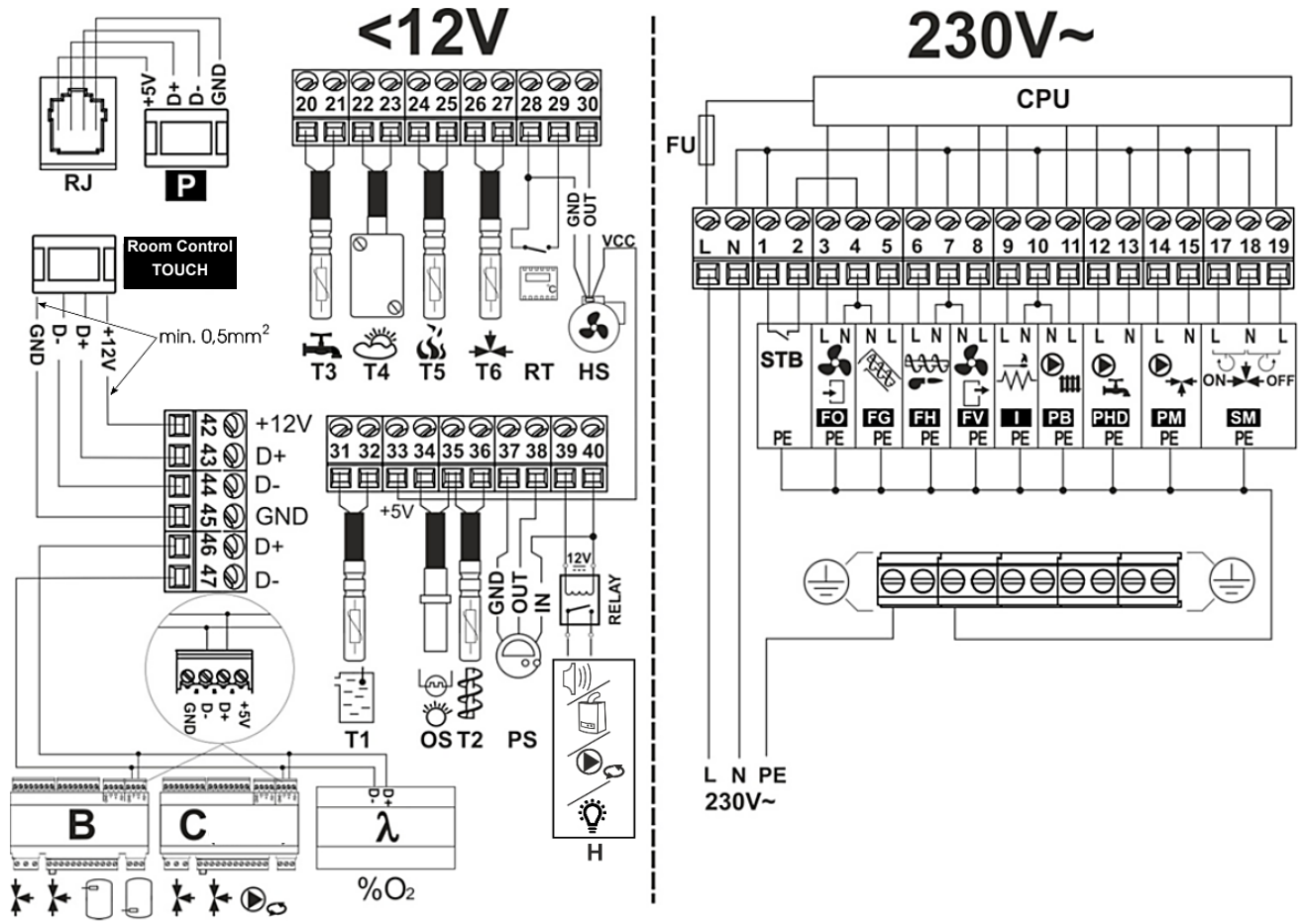
Pic. 18 Wire connection, where 1 – correctly connected wire, 2 – incorrectly connected wire (it is not acceptable to twist wires inside the device)

Wires inside the controller should be led through cable glands. Cable glands should be screwed. Make sure that glands are correctly screwed by pulling wire. Length of isolation of external tire of wires should be minimal, maximum 60mm. If it is necessary to longer isolate the wire tire they should be connected with each other or other wires close to the connector. In this case when a wire gets loose from the connector it is not in contact with dangerous parts. It is not acceptable to twist wires and leaving unconnected wires inside the controller risk of contact with hot parts and parts with dangerous voltage.

12.5 SAFETY CONNECTIONS

Safety wires are to be connected with terminals marked with this symbol ⏚.

12.6 ELECTRIC SCHEME



Pic. 19 **Controller wiring diagram,** where: **T1** – CT4 boiler temperature sensor, **OS** – optical flame sensor, **T2** – feeder temperature sensor NTC, **PS** - vacuum sensor, **H** – voltage output to signaling alarms or signaling controller operation mode or control the reserve boiler or control the circulation pump, **T3** - CT4 hot water temperature sensor, **T4** – CT4-P weather temperature sensor, **T5** – CT2S fumes temperature sensor, **T6** – CT4 mixer temperature sensor, **RT** – boiler room thermostat input, **HS** – fan revolution sensor, **P** – control panel, **Room Control TOUCH** – room panel with a room thermostat feature (replaces RT), **D-D+** - connector for additional modules, **B** – module adds the control of another two mixers and a heat buffer, **C** – module adding the control of another two mixers and circulating pump, **λ** – Lambda probe module.

L N PE - 230V AC mains power supply, **FU** – mains fuse, **STB** – safety temperature limiter input, **FO** – burner blower, **FG** – main feeder, **FH** – burner feeder or rotary grate cleaning mechanism, **FV** – boiler exhaust fan, **I** – igniter, **PB** – boiler or buffer pump, **PHD** – hot water pump, **PM** – mixer pump, **SM** – mixer cylinder, **CPU** – control.

12.7 TEMPERATURE SENSORS CONNECTION

Wires of the sensors can be extended by wires with diameter not smaller than 0,5mm^2. Total length of wires in each sensor should not exceed 15m.

Boiler temperature sensor should be installed in thermostatic pipe installed in boiler. Temperature sensor of hot water container should be installed in thermostatic pipe welded into the container. Mixer temperature sensor should be installed in sleeve located in stream of running water in pipe, but also it can be installed on the pipe, on condition that it is thermo isolated from the pipe

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

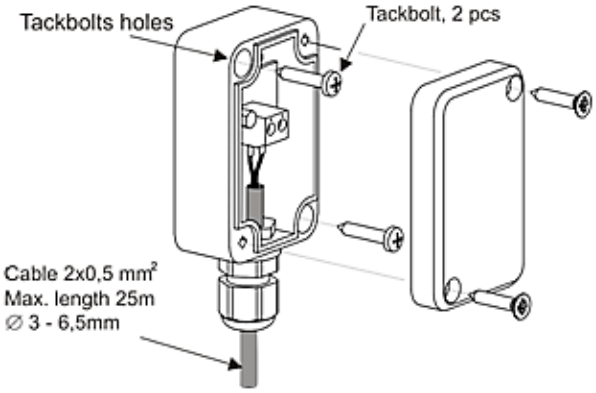
Good thermo contact should be maintained between sensors and measured surface. To this purpose thermoleading paste should be used. It is not acceptable to lubricate sensors with water or oil. Wires of sensors should be separated from network electrical wires. In such a case wrong readings of temperature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

12.8 WEATHER SENSORS CONNECTION

The controller cooperates solely with weather sensor type CT4-P. The sensor should be installed on the coolest wall of the building. Usually it is the northern wall, under the roof. The sensor should not be exposed to direct sunrays and rain. The sensor should be installed at least 2 m above the ground far away from windows, chimneys and other sources of heat.

To connect use wire with diameter at least 0,5mm2 up to 25m long. Polarization of wires is not essential. Second end should be connected to terminals of controller according to Pic.19 or properly to used kind of controller.

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



Pic. 20 Weather sensor connection CT4-P.

12.9 WEATHER SENSORS CHECKING

Temperature sensors CT4/CT4-P can be checked by measuring their resistance in given temperature. In case of big differences between measured resistance value and values in table below, the sensor should be replaced with a new one.

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

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

CT4-P (weather)			
Temp. [°C]	Min. [Ω]	Nom. [Ω]	Max. [Ω]

-30	609	**624**	638
-20	669	**684**	698
-10	733	**747**	761
0	802	**815**	828
10	874	**886**	898
20	950	**961**	972

12.10 OPTICAL SENSOR CONNECTION

Connect the sensor accordingly to point 12.6. Readings of data from optical sensor is possible in menu:

Information→ Flame

12.11 MIXERS ROOM TEMPERATURE CONNECTION

Room thermostat after disconnecting wires reduces preset temperature in mixer circuit. Parameter is in menu:

Mixer settings 1-5 – Mixer room temperature

Value of parameter should be chosen in such a way that after activating room thermostat, temperature in the room should decrease. Other settings according to point 8.17.

In case of room panel Room Control and Room Control TOUCH make sure that this parameter is correctly chosen *Thermostat selection*:

Service settings – Mixer settings 1-5 – Mixer room thermostat

12.12 BOILER ROOM THERMOSTAT CONNECTION

Room thermostat for boiler circuit can switch off the burner operation or switch off the CH boiler pump. In order to thermostat switch off boiler operation select *Thermostat selection* for *universal* or *ecoSTERT1* (if room panel Room Control/ Room Control TOUCH is connected)

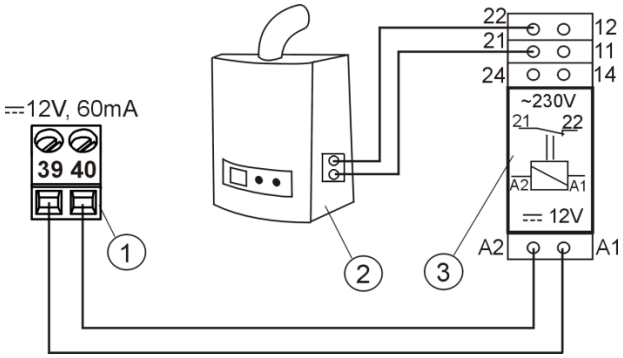
Service settings → Boiler settings → Thermostat selection

For thermostat switch on the CH boiler pump (without switching off the boiler) set the parameter *Thermostat pump deactivating* on *YES*

Service settings → Boiler settings → Pump off by thermostat

12.13 RESERVE BOILER CONNECTION

The controller can control work of additional (gas or oil) boiler. It is not necessary then to manually activate or deactivate this boiler. Additional boiler will be activated when boiler for pellet loses temperature and will deactivate when pellet boiler reaches its proper temperature. Connection to additional boiler should be done by a qualified installer, according to technical data of this boiler. The additional (spare) boiler should be connected by relay with terminals 39-40.



Pic. 21 Sample scheme of system for additional boiler connection to the controller, where: 1 – controller, 2 – additional boiler (for oil or gas), 3 – relay RM 84-2012-35-1012 and holder GZT80 RELPOL.

The controller is not equipped with transmitter as standard option.

Assembly of relay should be done by a person with proper qualifications. According to valid norms and regulations.

Control of reserve boiler by setting the Output H mod A on *Reserve boiler*.

Menu → Service settings → Output H mode A

Additionally to activate control over reserve boiler set the parameter on value different than zero in:

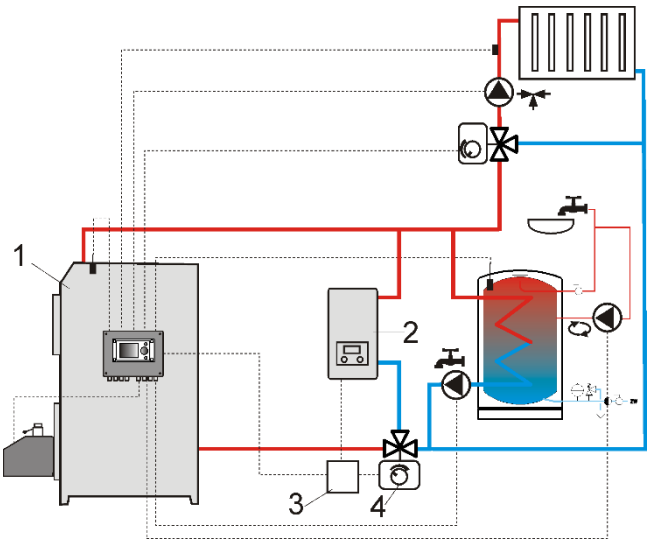
Service settings → Boiler settings → Reserve boiler

Deactivating control over additional boiler is done after setting zero value of switching off for this parameter.

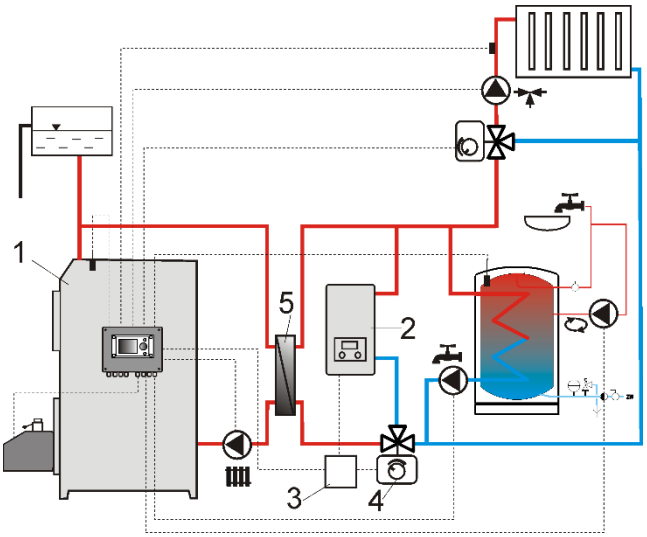
Controlling extension of the boiler is shared with alarm extension. Deactivating additional boiler control will cause that this extension will be controlled by module of controlling alarms.

When pellet boiler is fired-up, and its temperature exceeded preset value i.e. 25ºC, then controller switches off additional boiler (it will give constant power DC +12V for terminals 39-40). It will power the coil of relay and disconnecting its joints. After decreasing boiler temperature below parameter temperature of additional boiler switching off the controller stops giving power to joints 39-40 which should activate the additional boiler.

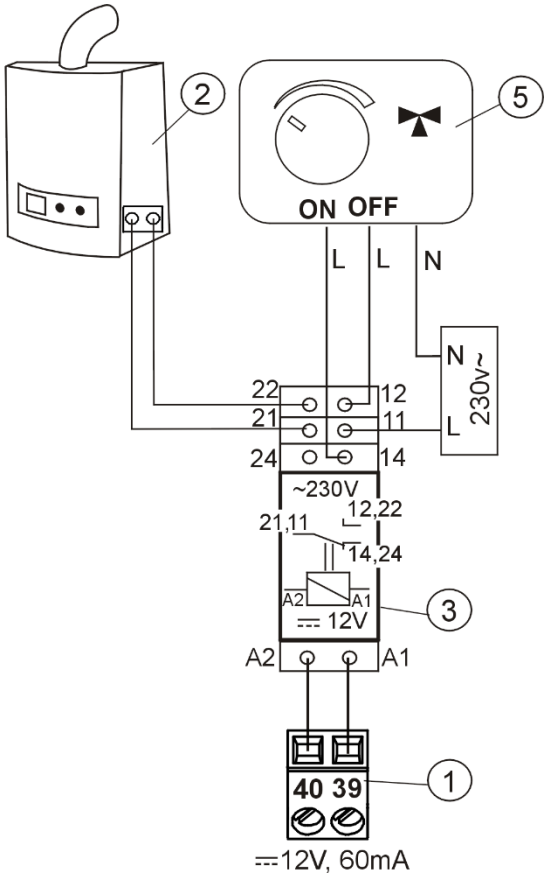
Switching the controller into STAND-BY mode causes deactivating the additional boiler.



Pic. 22[4] Hydraulic scheme with additional boiler in open – closed circuit, where: 1- controller, 2- additional boiler, 3- relay, 4- switching valve (with end switchers)



Pic. 23[5] Hydraulic scheme with additional boiler in open – closed circuit, where: 1- controller, 2- additional boiler, 3- relay, 4- switching valve (with end switchers), 5- heat exchanger, recommended setting: priority HUW = deactivated, heat exchanger = YES



Pic. 24 Electrical scheme of controlling the switching valve of additional boiler, where: 1- controller, 2- additional boiler, 3- relay, 5- servomotor of switching valve (with end switchers), attention: terminals 22, 21, 24 must be separated by galvanizing from terminals 12, 11, 14.

12.14 ALARMS SIGNAL CONNECTION

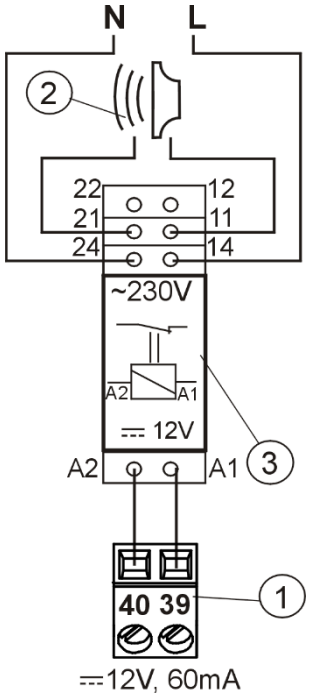
The controller can report alarms by activating external devices like ring or GSM device to short messages SMS sending. Device for reporting alarms should be connected according to Pic.25 by relay. Because this extension is shared with extension for controlling additional boiler, in order to activate there alarm functions additional boiler control should be deactivated. To do so, take following steps in menu:

[4] Presented hydraulic scheme does not replace project of central heating and is only a sample!

[5] Presented hydraulic scheme does not replace project of central heating and is only a sample!

Service settings → Boiler settings → Reserve boiler

Set zero value of its deactivating temperature.



Pic. 25 External alarm device connection, where: 1 – controller, 2- external alarm device, 3- relay

Enabling alarms by setting the Output H mod A on *Alarms*:

Menu → Service settings → Output H mod A

Then in order to operate correctly set proper code for active alarms signal in menu:

Service settings → Boiler settings → Alarms

12.15 MIXER CONNECTION

During assembly works for mixer servomotor pay attention not to overheat the boiler. This may happen when there is a limited flow of water from the boiler. It is recommended to check the location of valve in maximum opening before starting work, to ascertain heat acceptance from the boiler by opening the valve to maximum.

The controller cooperates only with servomotors of mixing valves equipped with end switchers. Using other servomotors is forbidden. Servomotors with full circle scope of 30 to 255s can be used.

Connecting mixer description:

- Connect mixer temperature sensor
- Connect electrical mixer pump
- Activate the controller and select in service menu proper *mixer service*

Service settings → Mixer 1 settings

Set in mixer service settings proper time of *valve opening* (time should be written on data plate of servomotor, i.e. 120s).

- Connect electrical power of the controller and activate it so the mixer pump is working,
- Choose the direction in which servomotor opens and closes. To do so, switch the button to manual control and find position in which temperature in mixer circuit is maximal (in controller it is position 100% ON) and value position when temperature of mixer circuit is minimal (in controller it is position 0% OFF). Remember the position in order to later verification of proper connection,
- Disconnect the electrical power to the controller
- Connect electrical power to mixer servomotor with the controller, according to point 12.4 and value servomotor producer's documentation. Do not confuse opening direction with closing direction,
- Connect electrical power to the controller and switch it into STAND-BY mode
- Check if wires for mixer opening and closing are not swapped. Go into:

Manual control and open mixer by selecting Mixer 1 Opening = ON. By opening servomotor temperature on the mixer sensor should increase. If not, disconnect the power and swap wires. (attention: another cause may be incorrectly connected valve! – check the producer's documentation if it is properly connected).

- **Calibration of valve indicator position**

Indicator of valve position is in the menu: Information. For mixer 1 after some time it will calibrate automatically. In order to make the valve position indicator displaying

quicker the right value, disconnect the electrical power of the controller, than in cover of the controller switch the button into manual control. Turn the cap of the valve into closed position, then again switch the button in the cover into AUTO. Connect the electrical power to the controller - % indicator of valve opening is calibrated.
Attention, in mixers No 2,3,4,5 calibration is automatic after connecting electrical power. In case of these mixers wait until indicator of valve opening is calibrated in %. During calibration the servomotor is closed through *Valve opening time.*

12.16 CIRCULAR PUMP CONNECTION

The circulation pump can be connected to the boiler regulator after connecting additional module C or Output H to the regulator's executive module. You must set the support **Output H mod A** or **Output H mod B/C** on *Circulation pump*.

12.17 TEMPERATURE LIMITER CONNECTION STB

In order not to overheat the boiler due to the controller breakdown it is obligatory to use STB safety temperature limiter or any other one suitable for given boiler. Limiter STB should be connected to terminals 1-2. When limiter is activated, blowing is stopped as well as engine of fuel feeder.

Safety temperature limiter must have nominal voltage at least 230V and should have valid admission documents

In case of not installing the limiter terminals 1-2 are to be connected by a bridge. The bridge must be made with insulated wire, with diameter at least 0,75mm^2 .With insulation which is thick enough to meet safety standards of the boiler.

12.18 ROOM PANEL CONNECTION

It is possible to equip the controller with room panel Room Control/Room Control TOUCH, which has following functions:

- Room thermostat (controls up to 3 thermostats),
- Alarm signal,
- Fuel level indicator.

- **4-wire connection**

Connect according to the electric diagram.

- **2-wire connection**

2 wire connection requires usage of power supply feeder +5V or +12V of direct current with nominal current minimum 400mA. Points of powering Room Control: GDN and +VCC connect to external power supply feeder. The feeder is not a standard option for the controller. Lines D+ and D- connect in such a way as shown on scheme, point 12.6.
Maximum length of wires in the additional panel should not exceed **30m**, their diameter should not be lower than **0,5mm^2**.

12.19 Access to the controller parameters for Internet network

When using additional module Internet Net Control device allows for remote online access to the data contained in the device through WiFi or LAN. The controller then through a standard web browser installed on stationary equipment, or by the convenient mobile application ecoNET.APK.

13. STRUCTURE – SERVICE MENU

Service settings
Burner settings
Boiler settings
CH and HUW settings
Buffer settings*
Mixer 1-5 settings *
H output
H output mod B/C*
Show advanced setup
Service counters
Restore default settings

Burner settings
Fire-up
• Ignition test time
• Flame detection
• Firing-up airflow
• Firing-up time
• Blow-in after firing up
• Blow-in time after firing up
• Ingiter period
• Stabilization time
• Correction of starting dose
• Exhaust fan*
• Vacuum*
Operation setup
• Work mode ON/OFF
• Blow-in increase
• Feeder 2 work
• Feeder 2 min operation time
• Feeder efficiency
• Energy density
• Tank capacity
Burning off
• Burning max. time
• Burning off min. time
• Air flush intensity
• Air flush periody
• Air flush interval
• Air flush start flame
• Air flush stop flame
• Exhaust fan*
• Vacuum*
Cleaning
• Cleaning time firing up
• Cleaning time burning off
• Cleaning blow-in
• Exhaust fan*
• Vacuum*
Supervision
• Burner power
• Supervision time
Grate*
• Grate mode
• Fan - GRATE
• Blow-in power
• Blow-in pause
Lambda probe*
• Operation with Lambda probe
• Dynamics
• Reaction time
• Blowing correction range
Other
• Blow-in min. power
• Fuel detection time
• Max. burner temperature
• Max. fumes temperature
• Additional feeder time
Exhaust fan:
• Exhaust fan
• Min. power of exhaust fan*
• Exhaust fan (6.0kW)*
• Exhaust fan (16.0kW)*
• Exhaust fan (24.0kW)*
• Exhaust fan (32.0kW)*
• Exhaust fan (40.0kW)*
Vacuum sensor: No/Huba 401.93000/DPT250-R8-AZ - Min. vacuum* - Max. vacuum* - Vacuum correction* - Vacuum–blow-in correction
• Feeder calibration

Boiler settings
Return protection
• Work mode
• Return hysteresis
• Minimum return temperature
• Valve closing
Min. boiler temperature
Max. boiler temperature
Reserve boiler*
Alarm signaling
Boiler cooling temperature
Parameters A,B,C FL*
Pump off by thermostat
Boiler efficiency

CH and HUW settings
CH activation temp.
CH stop during HUW loading
Min HUW. temperature
Max HUW. temperature
Boiler increase HUW and Mixer
HUW operation extension
Circulation standstill time*

Circulation operation time*
Exchanger*
HUW heat source*
• Boiler
• Buffer

Buffer settings*
Buffer support
Loading start temperature
Loading end temperature
Start heating system

H output H output mod B/C*
Reserve boiler
Alarms
Circulation pump*
Signaling of operation *

Mixer settings 1-5
Mixer service
• Off
• CH on
• Floor on
• Pump only
Minimum mixer temperature
Maximum mixer temperature
Valve opening time

Pump off by thermostat
Mixer input dead zone *

*Not available if proper sensor not attached, extension module or parameter is hidden.

14. SERVICE SETTINGS

14.1 BURNER

Firing up	Description
• Ignition test time	Time for checking if furnace is hot. Only fan is operating.
• Flame detection	Threshold of flame detection in % of light, when the controller deems the furnace as hot. It is also used for detection of lack of fuel and end of burning off.
• Firing- up airflow	% of blowing when firing up. Too big value prolongs the firing up process or causes failed attempt of firing up.
• Firing- up time	Time of following firing up attempts (3 attempts). After that time the controller goes to another firing up attempt.
• Blowing after firing up	% of fan blowing after flame detection.
• Blowing time after firing up	Fan operation time with power *Blowing after firing up*. It enables better lighting of the fire before entering the mode STABILIZATION.
• Igniter period	Igniter warming up time before engaging the fan. It should not be too long as to not damage the heater. After this time the heater works still until detecting the flame.
• Stabilization time	Duration of the STABILIZATION operating mode.
• Correction of starting dose	Value correction starting doses of fuel during firing-up.
• Exhaust fan	Power exhaust fan during firing-up. It should not be too large so as not to hinder fire up the furnace.
• Vacuum	The value of the permissible vacuum in the combustion chamber during firing up of the furnace.
Operation setup	
• Work mode ON/OFF	Switches the burner into THERMOSTAT mode, i.e. for working in bakery. The burner operates with maximum power without modulation of power. Boiler temperature sensor does not influence feeder operation.
• Blow-in increase	Value of the increase of the airflow power at a time when feeder is working in the burner.
• Feeder 2 operation/ Feeder 2 minimum operation time	An additional opportunity to enable or disable the operation of the second fuel feeder. After *Feeder 2 min. operation* tray is stopped despite opening contacts fuel level sensor.
• Feeder efficiency	Feeder fuel efficiency in kg/h.
• Energy density	Fuel calorific in kWh/kg.
• Tank capacity	Fuel tank capacity used to calculate the fuel level. Introduction of the appropriate value will release the user from the necessity to calibrate the fuel level. The controller will use the data if no fuel level calibration has been carried out. After a successful fuel level calibration, the value is not used.
Burning off	
• Burning off max. time	After this time the controller goes to PAUSE mode, in spite of the fact that the controller detects flame.
• Burning off min. time	Burning off will last at least this time in spite of the fact that flame sensor indicated lack of flame.
• Air flush intensity	Fan power during blowing while burning off in %.
• Air flush period	Duration of blowing when burning off fuel and burning off.
• Air flush interval	Break between airflows while burning off the fuel in burning off process.
• Air flush start flame	Flame brightness with which airflow starts while burning off the fuel.

• Air flush stop flame	Flame brightness with which airflow starts when burning off the fuel in burning off process.
• Exhaust fan	Power exhaust fan during burning off.
• Vacuum	The value of the permissible vacuum in the combustion chamber during burning off of the furnace.
Cleaning	
• Cleaning time firing up	Fan operation time during funace firing up.
• Cleaning time burning off	Fan operation time during furnace burning off
• Cleaning blow-in	Fan power in % during furnace cleaning in burning off and firing up
• Exhaust fan	Power exhaust fan during cleaning funace.
• Vacuum	The value of the permissible vacuum in the combustion chamber during cleaning of the furnace.
Supervision	
• Burner power	Burner power in kW, in the SUPERVISION mode.
• Supervision time	After this time, when the controller is in SUPERVISION mode, the controller automatically starts burner burning off. By settings = 0, SUPERVISION mode is deactivated.
Grate	
• Grate mode	Operate the control of the grate on and off the automatic feeding of fuel.
• Fan-GRATE	Power blow fan when operation on the grate.
• Blow-in power	The duration of the fan blower in the supervision in grate mode. The value should not be too large so as not to cause excessive heating of the water in the boiler.
• Blow-in pause	Interval between blows in the supervision in grate mode. The value should not be too small so as not to cause excessive heating of the water in the boiler.
Lambda probe	
• Operation with Lambda probe	If the parameter is set to "ON", the controller will operate using the lambda probe readings. The amount of air supplied to the furnace will be adjusted automatically to maintain the preset oxygen content in the flue gas. If the parameter is set to "OFF", the lambda probe readings will have no influence on the operation of the controller.
• Dynamics	It has an impact on the rate of the adjustment of oxygen content in the flue gas to reach the preset value and on the stability of the oxygen content in the flue gas. It is not recommended to modify the parameter if the adjustment time and the stability of the preset oxygen content are as required.
• Reaction time	It has an impact on the rate of the adjustment of oxygen content in the flue gas to reach the preset value and on the stability of the oxygen content in the flue gas. It is not recommended to modify the parameter if the adjustment time and the stability of the preset oxygen content are as required.
• Blowing correction range	Defines the allowed range for the blowing rate variability when operating with the lambda probe.
Other	
• Blow-in min. power	Minimum power blower fan in % selectable by the controller user. It is used only to limit the available blower power range. It is not used for the blower control algorithm and should be as low as possible to ensure slow and smooth blower rotation without "buzzing".
• Fuel detection time	The time countdown starts after the flame brightness has dropped below the value of the *Flame detection* parameter. After the countdown is finished, the controller attempts to ignite the burner and should it fail

	three times, an alarm message of “ignition failure" is indicated.
• Max. burner temperature	Defines the maximum feeder temperature. Should the value be exceeded, the "maximum burner temperature exceeded" alarm is generated.
• Max. flumes temperature	Defines the maximum flumes temperature. Should the value be exceeded, the "maximum flumes temperature exceeded" alarm is generated.
• Additional feeder operation time	Defines the additional feeder (bunker feeder) operation time. The feeder is attached to the additional B module. After that time, the additional feeder operation is stopped despite the fuel level sensor contacts are open. The fuel level sensor contacts are located in the additional B module.
Exhaust fan	Activates the operation of the exhaust fan.
Min. power of exhaust fan	Minimum exhaust fan power in % selectable by the user. It is used only to limit the available fan power range. It is not used for the fan control algorithm and should be as low as possible to ensure slow and smooth fan rotation and unrestricted flumes extraction.
Exhaust fan (6.0kW), (16.0kW), (24.0kW), (32.0kW), (40.0kW)	Settings power in kW for exhaust fan.
• Vacuum sensor	Activates the operation mode with the vacuum sensor. Once the mode is activated, the rotational speed of the exhaust fan is set by the controller to reach the required value of the vacuum in the combustion chamber.
Min. vacuum	Defines the minimum value of the vacuum in the combustion chamber. Should the value be exceeded, the "minimum vacuum exceeded" alarm is generated.
Max. vacuum	Defines the maximum value of the vacuum in the combustion chamber. Should the value be exceeded, the "maximum vacuum exceeded" alarm is generated.
Vacuum correction	Corrects the vacuum sensor readings.
Vacuum – blow-in correction	Defines the allowed exhaust fan blowing power variability range for operation with the vacuum sensor.
• Feeder calibration	Calibrates the efficiency of the feeder. Requires boiler shutdown.

14.2 BOILER

Return protection	
• Work mode	This parameter turns on/off the boiler return protection function, which is being done by mixing valve together with electric actuator. Attention: do not activate this function when there is no actuator installed on the valve!
• Return hysteresis	The electric actuator will return to its normal operation with return temperature ≥ *min. return temperature + return hysteresis.*
• Min. return temperature	The boiler return temperature below which the electric actuator will close the mixing valve.
• Valve closing	It is a value % for opening the mixing valve during active return protection function. This value is given in percentage. This value should be set in such way, that the return temperature can raise. Attention: the return protection function will work only in case when the set boiler temperature will be set on sufficiently high value, otherwise there will be too many lock ups of the actuator. Attention: The valve is locking up with the +-1% of precision.
Min. boiler temp.	Minimum preset boiler temperature which can be set in user menu and minimum temp. which can be set automatically by controller, i.e. from night reductions etc.
Max. boiler temp.	Maximum preset boiler temperature which can be set in user menu and minimum temp. which can be set automatically by controller, i.e. from night reductions etc.
Reserve boiler	Description in point 12.13

Alarm signaling	Configuration of the alarm output so that it is activated if one or more selected alarms occur.
Boiler cooling temperature	Temperature of boiler cooling off. Above this temperature the controller activates HUW pump and opens mixer cycles to allow boiler cooling off. The controller activates HUW pump if this temperature exceeds maximum value. The controller will not open mixer cycle when *mixer setting = floor active*
Parameter A FuzzyLogic **Parameter B FuzzyLogic** **Parameter C FuzzyLogic**	Applicable to FuzzyLogic mode. It has an impact on the time necessary for the boiler to reach the preset value and the stability of the boiler temperature. It is not recommended to modify the parameters if the adjustment time and the stability of the preset temperature are as required.
Pump off by thermostat	Options available • NO (CH boiler pump is not activated when room thermostat starts operation), • YES (CH boiler pump is deactivated when room thermostat starts operating)
Boiler efficiency	Determination of the% efficiency of the boiler.

14.3 CH and HUW

CH activation temperature	Parameters determines the temperature at which CH boiler pump is activated. It protects the boiler against watering due to cooling off with cold water returning from installation. Attention: Deactivating boiler pump only does not guarantee boiler protection against watering and consequently corrosion. Additional automatics should be used, i.e. 4 way valve or 3 way thermostatic valve.
CH stop during HUW loading	Available after connecting HUW sensor. Prolonged feeding of HUW container during priority HUW deactivated may cause to overcooling of the CH installation, because CH pump is deactivated. Parameter CH pump pause during feeding HUW prevents against periodical activating CH pump during feeding HUW container. CH pump after this time will activate on constant, programmed time of 30s.
Min. HUW temperature	Available after CH sensor connecting. It is a parameter by which it can be reduced setting too low preset HUW temperature.
Max. HUW temperature	Available after connecting HUW sensor. Parameter determines to what maximum temperature HUW container will be heated during cooling the boiler in alarm situations. It is a very important parameter, because setting too high value of it may cause risk of scalding with HUW. Too low value of parameter will cause that during boiler overheating it will not be possible to cool off the boiler to the HUW container. During design of HUW installation, it is necessary to take into account risk of damaging the controller. Due to breakdown of the controller water in the container can heat up to dangerous temperature. It is necessary to use additional protection in the form of thermostatic valves.
Boiler Increase HUW and Mixer	Parameter determines how high the boiler temperature will be increased to load HUW container, buffer and mixer cycle. Temperature increase is only realizing when it is necessary. When preset boiler temperature is at sufficient level then controller will not change it due to the fact of feeding the HUW container, buffer or mixer cycle.
HUW operation extension	Available after connecting HUW sensor. After feeding HUW container and deactivating HUW pump may be a risk of boiler overheating. It happens in case when preset HUW temperature was higher than boiler preset temperature. This issue is exceptionally important in HUW pump operation in SUMMER mode, when pump is deactivated. To cool off the boiler HUW pump operation can be prolonged by *HUW operation extension*.

Circulation standstill time	Pausing time between periods of circulation pump operation is defined with value of parameter *Circulation standstill time* (recommended setting 15-40 min.). Circular pump operates constantly during *Circulation operation time* (recommended setting 60-120s).
Circulation operation time	
Exchanger	Parameter available after activating option display advanced = YES. It only refers to hydraulic installation with heat exchanger between open and closed circuit. Available options: • YES (boiler pump operates constantly in short circuit boiler – exchanger, it is not excluded i.e. from SUMMER function or HUW priority) • NO (pump operates normally)
HUW heat source	The ability to choose a source of heat for the HUW tank - boiler or buffer.

14.4 BUFFER

Buffer support	Parameter serves to activating buffer operating mode. Available after connecting additional module B and buffer temperature sensors.
Loading start temperature	Parameter *Loading start temperature* defines high temperature below which buffer feeding starts. Buffer feeding process is finished when low temperature reaches value defined in parameter *Loading end temperature*.
Loading end temperature	
Start heating system	The temperature below which the heating system is deactivated, measured at the upper part of the buffer.

14.5 MIXER

Mixer service	
• Off	Mixer serwomotor and pump are not active
• CH on	Applicable when mixer cycle powers heating installation of CH. Maximum temperature of mixer cycle is not limited, mixer is fully opened during alarms i.e. boiler overheating. Attention: do not activate this option when installation is made of pipes sensitive to high temperature. In such situations it is recommended to set mixer service on FLOOR.
• Floor on	Is used when mixer cycle powers floor installation. Maximum power of mixer cycle is limited to value of parameter max preset mixer temperature. Attention: After choosing option FLOOR, it is necessary to set parameter max mixer preset temperature on such a value to not damage the floor and avoid scalding risk.
• Pump only	When mixer cycle temperature exceeds value set in parameter mixer preset temperature, feeding of mixer pump is stopped. After decreasing temperature of circuit by 2ºC pump is reactivated. This option is normally used to control floor heating pump in situation when it cooperates with thermostatic valve without servomotor. By such action is not recommended. It is recommended to use standard heating cycle in floor heating, which consists of valve, servomotor and mixer pump.
Minimum mixer temperature	Using this parameter it is possible to restrict Chance of setting to low preset mixer circuit temperature. Automatic control (i.e. periodical temperature reduction) also will not cause reduction in preset temperature below value set in this parameter.
Maximum mixer temperature	Parameter serves two functions: - allows restricting setting too high mixer preset temperature. Automatic control also will not cause exceeding preset temperature above value set in this parameter. - with parameter mixer setting = activated FLOOR is also limit temperature of mixer sensor when mixer pump is deactivated. For floor heating set the value below 45ºC – 50ºC or other if producer of

	materials used for floor or CH installation designer state differently.
Valve opening time	Set full valve opening time given at the plate of valve servomotor, i.e. 140s.
Pump off by thermostat	Setting the parameter on “YES” value causes closing of mixer servomotor and deactivating mixer pump after disconnecting joints of room thermostat. This is not recommended because the heated room can be too cool.
Mixer input dead zone	Setting parameter determining value of temperature dead zone for mixer controlling circuit. The controller regulates mixer in such a way to keep the temperature of mixer cycle equal to preset value. However, avoid too frequent movements of servomotor, which can shorten its long-life usage. Regulation is undertaken only when measured temperature of mixer cycle will be higher or lower than preset value by the value bigger than *Mixer input dead zone*.

14.6 OTHERS

Show advanced setup	Options available: • YES (displays hidden parameters which edition is not recommended). • NO (hides hidden parameters).
Output H mod A **Output H mod B/C**	Output H mod A: • Boiler reserve – output 39-40 controls the reserve boiler. • Alarms – the alarm output is activated 39-40. It allows to select the alarm on which the output H mod A it react. • Circulation pump - output 39-40 controls the circulation pump. • Signaling of operation – output 39-40 voltage is applied continuously in all operating modes of the controller. The voltage is taken only when the controller is switched off. Output configuration H (mod B / C) is only available when connecting additional modules B and C.
Restore service settings	Restoring service settings settings from main menu are restored.

15. ALARMS DESCRIPTIONS

15.1 FUMES MAX. TEMP. EXCEEDING

The alarm occurs after exceeding the maximum fumes temperature. Turns off the fan. It aims to protect the fumes temperature sensor from damage due to the impact of temperature exceeding the strength of the sensor. Once the temperature drops, the regulator resumes normal operation.

15.2 BOILER MAX. TEMP. EXCEEDING

Protection against boiler overheating is done in 2 steps. In the first step , after exceeding *Boiler cooling off temperature,* the controller tries to reduce boiler temperature by dropping excess of heat to the HUW container and by opening mixer servomotors (only when *mixer service = activated CH*). If temperature measured by HUW sensor exceeds value *Max. temp. of HUW* then HUW pump is deactivated, what is done to protect users against scalding. If boiler temperature decreases, then the controller returns to normal operation. If the temperature will still increase (reaches 95 degrees C) then constant alarm will be activated of boiler overheating joined with sound signal.
The alarm can be deleted by pressing „TOUCH and PLAY" button or activating and deactivating power to the controller.

Attention: locating temperature sensor outside water coat of burner i.e. on exhaust pipe is not beneficial, because it may cause delay in detecting boiler overheating state!

15.3 BURNER MAX. TEMP. EXCEEDING

Alarm appears after exceeding burner temperature above service parameter:
Service settings → Burner settings → Other → Max. burner temp.
If the burner temperature increases above this value the controller will begin burning off procedure.
Alarm is deleted automatically after burner temperature decrease by 10°C.

Function which protects against back fire does not work when The controller has no electrical power.

The controller can not be used as sole protection of boiler against back fire. Additional protecting automatics is to be used.

15.4 BOILER TEMP. SENSOR DAMAGE

Alarm appears by boiler sensor damage and by exceeding measuring scope of this sensor. When alarm appears the boiler is activated. Deleting is done by pressing TOUCH and PLAY button or by deactivating and activating the controller. The sensor is to be checked and replaced if necessary.

Checking the temperature sensor is described in point 12.9

15.5 BURNER TEMP. SENSOR DAMAGE

Alarm appears when burner sensor is damaged or by exceeding measuring scope of this sensor. After alarm the boiler is burnt off.
Deleting is done by pressing TOUCH and PLAY button or by deactivating and activating electrical power to the controller.
It is necessary to check the sensor and replace it if necessary.

Checking temperature sensor is described in point 12.9.

The controller can operate by disconnected feeder temperature sensor, after setting parameter *Max. burner temperature =0*
However it is not recommended, because it causes deactivation of boiler protection function against back-firing to fuel container.

15.6 COMMUNICATION LOSS

Controlling panel is connected to remaining electronics by digital communication joint RS485. In case of damage of this wire on the screen following information will be displayed: *Lack of communication*
The controller does not deactivate regulation and operates normally with previously programmed parameters. In case of alarm

situation it will undertake action accordingly to given alarm.
It is necessary to check the wire connecting controlling panel with given alarm, then mend it or replace it if necessary.

15.7 FAN DAMAGE

Alarm occurs when damage to the speed sensor or the fan on the basis of the load voltage at the output of the fan control. The controller turns off the fan.

15.8 MIN. OR MAX. VACUUM EXCEEDING

Alarm occurs when exceeding the threshold min. or max. the vacuum in the combustion chamber is enabled to use the vacuum sensor.

15.9 FIRING UP FAILED ATTEMPT

Alarm will appear after third failed attempt of automatic furnace firing up. In case of alarm all pumps are deactivated in order to not cause excessive cooling of the boiler. Deleting is done by pressing TOUCH and PLAY button or by activating or deactivating the controller. The cause of these alarms can be broken igniter or lack of fuel in the container.

16. OTHER

16.1 POWER STOPPAGE

In case of power stoppage the controller returns to operation mode in which it was before stoppage.

16.2 ANTIFREEZING PROTECTION

When temperature of the boiler decreases below 5ºC CH pump will be activated enforcing circulation of boiler water. It will delay the process of freezing water, however in case of very low temperatures or by lack of electrical power it may not protect the installation against freezing.

16.3 PUMP ANTI STANDSTILL FUNCTION

The controller does the function of CH, HUW and Mixer pumps protection against getting stale.

16.4 NETWORK FUSE REPLACEMENT

Circuit fuse is positioned inside the controller's cover. The fuse can only be replaced by a person holding proper qualifications and after disconnecting electrical power. Porcelain fuses 5x20mm and time-lag fuses with nominal current 6,3A should be used. In order to take out the fuse unscrew the fuse cover and remove the fuse.

16.5 CONTROL PANEL REPLACEMENT

It is not recommended to replace the panel itself as the program in panel must be compatible with program in other part of the controller.

17. LAMBDA PROBE

Burner efficiency can be increased by connecting additional lambda sensor module. Connect the module according to point 12.6. Lambda sensor is to be activated in:
Service settings → Burner settings – Lambda probe
If parameter *Operation with Lambda probe* is set on "ON" then the controller will operate using lambda sensor readings. The amount of air provided to the furnace will be automatically set in such a way to obtain preset amount of air in fumes. If this parameter is set on "OFF" then Lambda Sensor readings will not have influence on controller's operation. Amounts of air for given burner power are set in:
Boiler settings → Output modulation
Description of remaining parameters related to Lambda sensor: Parameter *Blowing correction range* sets permissible scope of variability of airflow power by work using lambda sensor. Parameters *Dynamics* and *Reaction time* have influence on regulation time of air amount in fumes to preset amount and on stability of air in fumes. It is not recommended to change these parameters if regulation time and stability of keeping preset amount of air on required level.
The controller will calibrate the Lambda probe automatically after the predefined burner operation time. It is also possible to perform the calibration on request. To calibrate the probe, the boiler must be

deactivated first. To ensure proper calibration, the fire in the furnace must be completely extinguished. The below parameter is used to start the calibration:

Boiler settings → Lambda probe calibration

The calibration process takes about 8 minutes.

18. POSSIBLE FAULTS DESCRIPTION

Symptoms	Tips
There are no signs of operation of device despite connection to the network.	Check: ▪ If line fuses are not blown, replace if necessary ▪ If the wire connecting panel with the executive module is plugged correctly and if module is not damaged.
Preset boiler temperature on the display is different from the required one.	Check: ▪ If in this time the HUW container is not loaded and if preset temperature is set above the preset boiler temperature. If so then the difference in readings will disappear after heating the HUW container or reduce the preset HUW temperature. ▪ If time periods are activated – then deactivate time periods.
CH pump is not working.	Check: ▪ If boiler exceeded temperature above parameter *CH activating temp.* – wait or reduce value of this parameter. ▪ If *HUW priority* is activated which blocks CH pump – deactivate priority be setting *HUW pump mode* on *No priority,* ▪ If CH pump is damaged or blocked.
Fan does is not working.	▪ Check if plug jumper is installed for the limiter of safety temperature STB on terminals 1-2, (the jumper should only be installed only in case when temperature limiter is not connected). ▪ If producer of the boiler has equipped it with temperature limiter STB with manual return to original position, it should be unlocked by untwisting the cover and twisting the button according to documentation of boiler producer, ▪ Check the fan and replace it if necessary.
Additional feeder is not working (module B).	▪ Check if feeder wires are correctly connected to terminals, ▪ Check if there is a jumper on terminals 1-2 of module B, ▪ Check if feeder engine is not damaged, ▪ In case when engine work can be heard and fuel is not provided check the feeder with its user manual.
Fuel feeder is not working / does not provide fuel	▪ Check if feeder wires are correctly connected to terminals, ▪ If temperature limiter STB is connected to terminals 1-2, then check if the circuit is not cut off due to boiler overheating, ▪ Check if feeder engine is not broken or damaged, ▪ In case when engine work can be heard and fuel is not provided check the feeder with its user manual.
Fuel is not burnt off completely, there are not burnt remnants in ashes. Fuel burns with big amount of smoke, burner fades	▪ Check settings output modulation in menu: Boiler settings → Output modulation.
Temperature is not measured correctly.	▪ Check if there is a good thermo contact between the temperature sensor and measured surface, ▪ Check if sensor wire not goes too closely to network wire, ▪ Check if sensor is connected to terminal, ▪ Check if sensor is not broken – check with point 12.9.
In HUW mode = SUMMER heaters are hot, boiler is overheated.	▪ Increase value of parameter *HUW operation extension* to cool off the boiler.
HUW pump is not working, even if HUW container is loaded	▪ Set the parameter *HUW operation extension = 0*

In hydraulic installation with mixing valve and servomotor – mixer is not opening.	▪ The cause may be HUW container loading when HUW priority is activated. Wait until HUW is loaded or activate the HUW priority. ▪ The cause may be active function SUMMER. ▪ The cause may be activation of function return protection. If function return protection is activated – check if return sensor of water return to container is isolated thermally from surroundings. By usage thermoleading paste improve thermal contact of the sensor with pipe. Improve preset temperature of the boiler to ensure power for heating returning water. Check if hydraulic installation is correctly made, after closing the valve, return temperature must increase above value of parameter *Minimum return temperature*. ▪ The cause may be calibration of mixer valve, wait until calibration is finished. Active calibration is marked "CAL" in menu INFORMATION.

19. CONTROLLER CONFIGURATION BY BOILER PRODUCER

The producer of boiler / burner should adjust program parameters in controller to given type and power of the burner. The most important parameters are those related to Firing up, Operation and Burning off. The controller is able to change the default settings depending on power and type of the burner. Default settings for given boilers / burners should be consulted with Company PellasX. In order to load new parameters go to:
Menu – service settings – [special password] and choose proper boiler/burner. Default settings can also be loaded by special software provided by Company PellasX.

CHANGES REGISTER:
V1.4 – 07-2016 - current issue. The change in the description of the parameters and customize the software from 9.XX.XX.

P R O D U C E R
PELLAS X Sp. z o.o. Sp.k.
Poland, 64-920 Piła
ul. Szybowników 39/10
tel.: +48 67 213 80 40
NIP: PL764-266-44-90
info-en@pellasx.eu
www.pellasx.eu

pellasX®
PELLET BURNERS

OPERATION AND INSTALLATION MANUAL

S.Control TOUCH
burner controller

for boilers fuelled with pellets

RoHS CE

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1 SAFETY PRECAUTIONS

Safety requirements are described in following sections of this user's manual. Apart from them please obey requirements described below.

- Before installing, mending or maintenance and during any connecting works it is absolutely necessary to disconnect the network power and to make sure if the connections and wires are not electrically powered
- After disengaging the controller by keyboard there may still be a dangerous electrical power on its connections.
- The controller must be used in accordance with its destination
- The controller must be covered with the box
- Additional automatic device must be used to protect the boiler, central heating and hot water installations against the results of controller breakdown or faults in its hardware.
- It is essential to adjust parameters to the given boiler time and to the fuel type. All the conditions of usage the installation must be considered. Faults in adjusting the parameters may cause boiler emergency mode (overheating, backfire to the feeder, etc.)
- The controller is for boiler producers. The boiler producer before its use should check if the cooperation between the controller and the boiler is correct and is not dangerous.
- The controller is not a spark-safe device. It means that in emergency mode may be the source of a spark or high temperature which together with dust or flammable gases can cause fire or explosion.
- The controller must be installed by the boiler producer, in accordance with valid norms and regulations
- Modification of programmed parameters should only be carried by a person acquainted with this user's manual
- The controller can only be used in heating installations made in accordance with valid norms and regualations
- The electrical circuit in which the controller works should be protected with a fuse proper for voltage used.
- The controller can not be used with damaged cover box
- On no condition can any alterations to the controller's construction be made
- The controller is equipped with an electronic disconnector of connected devices (working type 2Y in accordance to PN-EN 60730-1) and microdisconnector (working type 2B in accordance to PN-EN 60730-1).
- Children should not be allowed access to the controller.

2 GENERAL INFORMATION

The controller is a modern electronic device designed to handling the work of the pellet boiler using help of optical flame brightness sensor. The device is compactly build, easy to install.
It can control the work of central heating and hot water circuits and also control the work of 5 mixing heating circuits. The required temperature of heating circuits can be set on the basis of data obtained from the main sensor. The possibility of cooperation with room thermostats, separate for each heating circuit is beneficial for maintaining comfortable temperature in heating rooms. Moreover, the device turns on the spare boiler (gas or oil one)
The controller can cooperate with additional steering panel located in living rooms and additional modul of lambda λ sensor.
Handling of the controller is easy and intuitive. The controller can be used within the household and in small industrial buildings.

3 DATA REFFERING TO DOCUMENTATION

The user's manual of the controller is a complementation of boiler documentation. In particular it is necessary to apply the boiler documentation. The user's manual of the controller is divided into two parts: for the user and for the installer. However in both parts vital information concerning safety is included. That is why the user should get acquainted with both parts of the user's manual. We do not take responsibility for damages caused by failing to observe the following user manual.

4 DOCUMENTATION STORAGE

We advise you to keep carefully this user manual of installation and maintenance and all other valid documentation, for immediate use when needed. In case of removal or selling the device all the documentation should be handed to new user or owner.

5 SYMBOLS AND MARKINGS USED

Following graphic symbols and markings are used in the user manual:

-for relevant information and tips,

-for vital information related with issues of property damage, health and life risk of humans or domestic animals,

Attention: by these symbols vital information is marked. It is to allow easy understanding of the user manual. User and installer is however required to observe recommendations not expressed by graphic symbols!

6 WEE 2002/96/EG ELECTRICITY AND ELECTRONICS BILL

- The packaging and product is to be utilized at the end of using period by a proper recycling company.
- The product can not be disposed together with ordinary wastes.
- The product can not be burned.

USER MANUAL OF THE CONTROLLER

S.Control TOUCH

7 USER MENU STRUCTURE

Main menu
Information
Boiler settings
Settings of HUW *
Summer/Winter
Mixer settings 1-5*
General settings
Manual control
Alarms
Service settings

Boiler settings
Preset boiler temperature
Boiler weather control *
Boiler heating curve *
Parallel movement of curve *
Room temperature ratio
Power modulation
• Blowing correction for maximum power
• Oxygene correction for maximum power
• Hysteresis H2
• Blowing correction for medium power
• Oxygen correction for medium power
• Hysteresis H1
• Blowing correction for min. power
• Oxygen correction for minimum power
• Boiler hysteresis
• Blowing power - grate *
• Fumes exhaust fan power in grate operating mode *
• Underpressure - grate *
Boiler work mode
• Pellet
• Grate
Regulation mode
• Standard
• FuzzyLogic
• Lambda FuzzyLogic*
Fuel selection
• Pellet
• Agripellets
Cleaning level *
• Normal
• Increased
• Intensive
Fuel level
• Alarm level
• Calibration of fuel level
Burner cleaning
Lambda sond calibration *
Boiler night time decrease
• On
• Schedule

Settings of HUW
Preset temperature of HUW
HUW pump working mode
• Switched off
• Priority
• Without priority
Hysteresis of HUW container
HUW disinfection
HUW container night time decrease
• On
• Reduction value
• Schedule
Circulation pumps night time decrease*

Summer/Winter
SUMMER mode
• Winter
• Summer
• Auto*
Temp. of SUMMER mode activating
Temp. of SUMMER mode deactivation

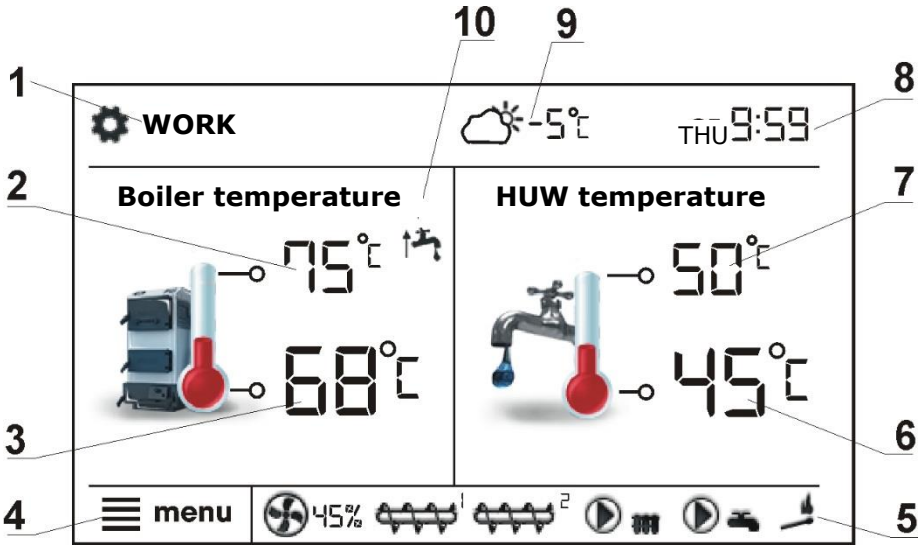
Mixer settings 1,2,3,4,5*
Preset temperature
Mixer 1-5 room thermostat
Boiler heating curve
Parallel movement of curve
Room temperature ratio
Mixer night time decrease
• On
• Reduction value
• Schedule

General settings
Clock/Data
Screen brightness
Sound/ Language
Software update
WiFi*

* Not available if proper sensor or additional module not connected or the parameter is hidden.

8 CONTROLLER MAINTENANCE

8.1 Main display window description



Pic. 1 Main display window.

Key:

1. Operation modes: IGNITION, STABILIZATION, OPERATION, DEACTIVATION, CLEANING, SUPERVISION, STANDBY,
2. Boiler preset temperature,
3. Boiler measured temperature,
4. „Menu" enter list key
5. Information area:

- Fan,
- Feeder 1,
- Feeder 2 (additional),
- Pumps,
- Igniter,
- Operation on grid,

6. Measured temperature of hot water boiler (HUW),
7. Preset hot water (HUW) boiler temperature,
8. Clock and weekday
9. External (weather) temperature,
10. Functions having influence on preset boiler temperature. Following symbols signal respectively:

- reduction of the preset boiler temperature from the opening of the room thermostat contacts– the preset room temperature is reached;
- Preset boiler temperature decrease due to activated time spans;
- Increase boiler preset temperature during loading the hot water boiler (HUW);
- Boiler preset temperature increase from mixer circulation;
- weather control switch on for boiler circulation;
- Preset temperature increase to load the buffer.

Both right and left window on main screen can display different information. It is possible to change information between: mixer circuits (1, 2, 3, 4, 5), info, HUW or fuel level window.

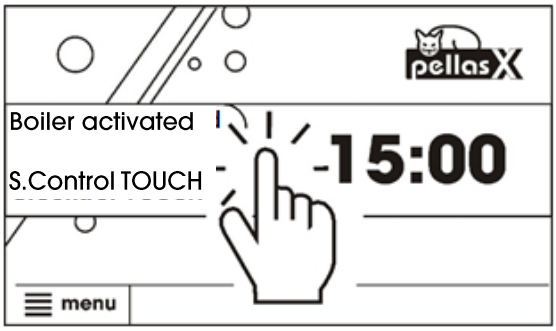
To display the fuel level view, set parameters correctly. Details are shown in point 8.19.

To display the fuel level adjustment should be made by point 8.19. Note: The fuel level

can be seen in the room panel Room Control TOUCH.

8.2 BOILER START UP - Switching on and off of the boiler

After making sure that fuel is in the silo, and the hatch is closed – the boiler can be switched on. To activate boiler press the screen "Boiler activated", then "activate controller?" sign will appear.



Pic. 2 Boiler start up

After accepting, boiler will go into firing up mode. There is another way to activate boiler, Press MENU and then find and press in round menu button: .

To switch off the boiler press MENU button and then find and press button: . Attention: the controller will go to burning off process. Right after its finish a sign will appear: "boiler switched off".

8.3 BOILER PRESET TEMPERATURE SETTINGS

The preset boiler temperature and preset circuits temperature can be set in the menu (Possible temperatures are restricted with range of respective service parameters of the controller).

Boiler settings →Preset boiler temperature.

Mixer settings 1,2,3,4 → Preset mixer temperature

Value of parameter: *The preset boiler temperature*, is omitted by the controller when preset boiler temperature is controlled by weather sensor. Independently, the preset boiler temperature is automatically raised in order to load the HUW buffer and to load heating circuits of mixers.

8.4 FIRING UP

FIRING UP mode is for automatic firing up of furnace in boiler. Total time of firing up process is depended on controller's settings (feeder operation time, heater operation time, etc.) and on boiler's condition before firing up. Parameters influencing firing up process are in the menu:

Service settings → Burner settings→ Burning up

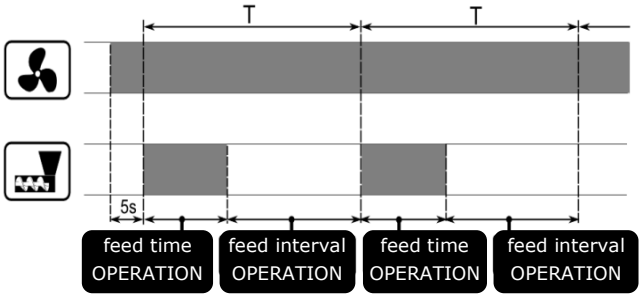
In case of failed attempt of firing up the furnace, another attempts are taken during which amount of fuel (feeding time) is reduced to 10% of first attempt's dose.

Another attempts of firing-up are numbered next to the symbol of an igniter .

After three failed firing up attempts an alarm Failed firing up attempt is reported. Boiler's operation is then stopped. It is not possible to automatically continue boiler's operation. Service intervention is required. After finding and solving the cause of firing up failure the boiler should be fired up again.

8.5 WORK

The fan operatres constantly – see Pic. 3 Fuel feeder is engaged periodically. One period consists of feeder operating time and pause in feeding time.



Pic. 3 Fan and feeder operation periods.

There are two control modes available which are responsible for the stabilization of the preset boiler temperature: *Standard* and *Fuzzy Logic*:

Boiler settings → Control mode

Standard mode operation:

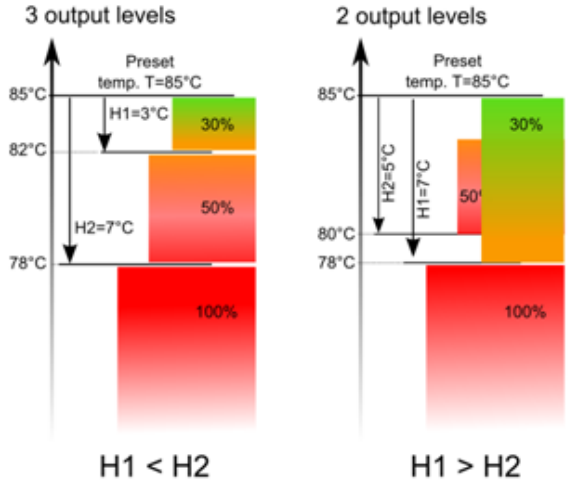
If the boiler's temperature reaches preset one then the controller switches of to SUPERVISION mode.

Controller is equipped with boiler's power modulation mechanism – which allows for gradual power reduction when approaching the preset temperature.
There are three power levels:

- Maximal power 100
- Medium power 50
- Minimum power 30

Values for the individual power levels can be set in the menu:
Service settings → Burner settings → Operation

The controller regulates burner's power with which it operates depending on preset temperature and defined hysteresis *Hysteresis H2* and *Hysteresis* H1. Pic. 4 *Hystereses H1* and *H2 of* power modulationIt is possible to configure volumes H1 and H2 in such a way that modulation is done without intermediate position. That means switching from 100% to 30% with omission of 50% power.



Pic. 4 Hystereses H1 and H2 of power modulation

Operation in Fuzzy Logic mode:

In Fuzzy Logic mode the controller automatically regulates burner power to allow boiler operation in such a way to maintain its temperature on preset level. The controller uses power levels defined in Standard mode. In this mode the parameters *Hysteresis H2* and *Hysteresis H1* do not have to be set.
The Fuzzy Logic mode unlike the Standard mode is not faulty in respect of failing to reach the preset boiler temperature due to incorrect adjustment of *Hysteresis H2* and *Hysteresis H.* It also allows for quicker reach the preset temperature.

☞ Attention: If the boiler operates without heat buffer and controller is switched into SUMMER mode than Standard mode operation of the controller is recommended.

After exceeding the preset temperature by 5 C degrees the controller switches into SUPERVISION mode.

8.6 SUPERVISION

SUPERVISION mode is applicable either in regulation in STANDARD and Fuzzy Logic mode.
The controller switches into SUPERVISION mode automatically without user's intervention: - in Standard regulation mode – after reaching the boiler preset temperature, - in Fuzzy Logic steering – after exceeding boiler preset temperature by 5 C degrees.

In SUPERVISION mode the controller oversees the furnace, keeping it from burning off. To do so, the burner operates with very low power, what together with properly adjusted parameters do not cause further increase in temperature. Burner's power in SUPERVISION mode and other parameters of Supervision are grouped in menu:

Service settings → Burner settings → Supervision

Maximum time of boiler's operating in supervision mode is defined in parameter *Supervision time*. If after this time (in Supervision mode) there is no need to restart the boiler then the controller starts the process of boiler's burning off.

☞ For setting **Supervision time** = 0 the controller omits SUPERVISION mode and goes directly to BURNING OFF.

8.7 BURNING OFF

In burning off mode the leftovers of pellet are burnt and the boiler is prepared to pause or deactivation.

All the parameters influencing burning off process are grouped in menu:

Service settings →Burner settings → Burning off

The controller stops feeding fuel and makes periodical blowings to burn off remnants of fuel. After decrease of flame brightness or maximum time of burning off expiration the controller turns into PAUSE mode.

8.8 PAUSE

In PAUSE mode the boiler is being burnt off and awaits the signal to start operation. The following can be a signal to start operation:

- Decrease of preset boiler temperature below preset temperature diminished by boiler hysteresis (*Boiler hysteresis*),
- By boiler operation configuration with the buffer decrease of top buffer temperature below preset value (*Temperature when start buffer feeding*).

8.9 GRID

Some boilers have an additional grate to burn other fuels such as wood waste, etc. To activate the grid, move the parameters available in the:

Boiler settings → Boiler work mode

from "pellet" to "grid". In the grid mode fuel feeder is turned off. The combustion process is regulated by the fan. Fan power, when working with grid, is set in:

Boiler settings → Power modulation → Blowing power – Grid

The values of parameters such as:

Boiler settings → Preset boiler temperature

Boiler settings → Power modulation → Boiler hysteresis

Service settings → Burner settings → Fuel detection time

are individually adjusted for the "grid". This allows you to define different properties of boiler operation for operation modes "grid" and "pellets".

When using the grid an alarm "No fuel" can appear. This alarm occurs when a temperature drops below the value of the parameter:

Service settings → CH and HUW settings → Temperature of activating the CH pump

and then for a period of 10 minutes there has been no growth.

8.10 HUW SETTINGS

The controller regulates temperature of the silo of Hot Water HUW, providing that the temperature sensor is connected. When the sensor is disconnected – the information about it is displayed in the main window. By selecting:

HUW settings → HUW pump working mode the user is able to:

- Deactivate feeding the silo, parameter *Deactivated*,
- Setting HUW priority, by parameter *Priority* – then CH pump is deactivated to feed the HUW boiler quicker,
- Set simultaneous operation of CH and HUW pump with the parameter *No priority*,
- Activate function *Summer*.

8.11 HUW TEMPERATURE SETTINGS

Preset temperature HUW is defined by parameter:

Settings of HUW → Pre-set HUW temperature

8.12 HYSTERESIS OF HOT WATER FEEDER

Below temperature *Preset temperature of HUW – Hysteresis of HUW container* the HUW pump will activate to feed the HUW silo.

By small hysteresis value HUW pump will activate faster after HUW temperature decrease.

8.13 ACTIVATION SUMMER FUNCTION

To activate SUMMER function which allows feeding the HUW tank during summer, without necessity to activate CH installation and mixers periods, it is required to set the *SUMMER mode* for *Summer.*

Summer/Winter → SUMMER mode

In SUMMER mode, all heat consumers can be switched off so before turning it on, make sure that the boiler will not overheat.

If the weather sensor is connected SUMMER function can be activated automatically with the *Auto* parameter with additional settings at which the function is to be switched on / off depending on the outside temperature of the set parameters: *Activated temperature SUMMER, Deactivated temperature SUMMER.*

8.14 HUW FEEDER DISINFECTION

The controller can automatically, periodically make HUW silo warm up to 70 degrees C. It is done to remove bacterial flora.

It is absolutely important to inform all the inmates about activating the disinfection function. There is a danger of scalding with HUW hot water.

Once a week at night between Sunday and Monday at 2 a.m. the controller increases temperature of HUW silo. After 10 minutes of keeping the silo at 70 degrees C the HUW pump is deactivated and the silo returns to its normal operation. It is not advisable to activate disinfection function while the service of HUW is deactivated.

8.15 MIXER CIRCLE SETTINGS

Settings of first mixer circle are in the menu:

Menu → Mixer settings 1

Settings for other mixers are in following sections of the menu and are identical in each cycle.

Mixer settings without weather sensor

It is required to set manually desired temperature in mixer's heating cycle using parameter *Preset temperature of mixer,* e.g. 50 degrees C. Such should be a value to provide required room temperature.

After connecting a room thermostat, value of decline in preset mixer temperature from thermostat should be set. (parameters *Mixer room thermostat* e.g. 5 degrees C. This value should be chosen experimentally. A room thermostat can be a traditional one or a room panel Room Control TOUCH. After activating the thermostat, mixer preset temperature will be reduced. When this value is reduced correctly then room temperature increase will be stopped.

Mixer with weather sensor setting without room panel Room Control TOUCH

Set parameter *Weather control of mixer* in position on. Adjust weather curve according to point 8.16

Using parameter *Parallel movement of curve* set required room temperature according to formula:

Required room temperature = 20°C + heating curve parallel movement.

Example.

To reach room temperature 25°C value of heating curve movement must be set for 5°C. To reach room temperature 18°C value of heating curve parallel movement must be set for -2°C.

In this configuration a thermostat can be connected. It will level inaccuracy of heating curve adjustment in case when its value will be too big. In such case value of decrease of preset mixer room temperature from thermostat should be set i.e. for 2°C. After disconnecting thermostat plugs preset mixer cycle temperature will be reduced. By correct adjustment of this reduction will stop temperature increase of temperature in heated room.

Mixer with weather sensor and room panel Room Control TOUCH settings

Set parameter *Weather control of mixer*. In position off.

Adjust weather curve according to point 8.16

Controller Room Control TOUCH automatically moves the heating curve depending on preset room temperature. The controller relates adjustments to 20 degrees C, i.e. for preset room temperature = 22 degrees C the controller will move heating curve by 2 degrees C, for preset room temperature = 18 degrees C the controller will move heating curve by -2 degrees C. In some cases described in point 8.16 it can be

necessary to adjust heating curve movement.
In this configuration room thermostat Room Control TOUCH is able to:
- reduce temperature of heating cycle by a constant value, when preset temperature in a room will be reached. Similarly like it was described in previous point (not recommended), or
- automatically, constantly correct heating cycle temperature.

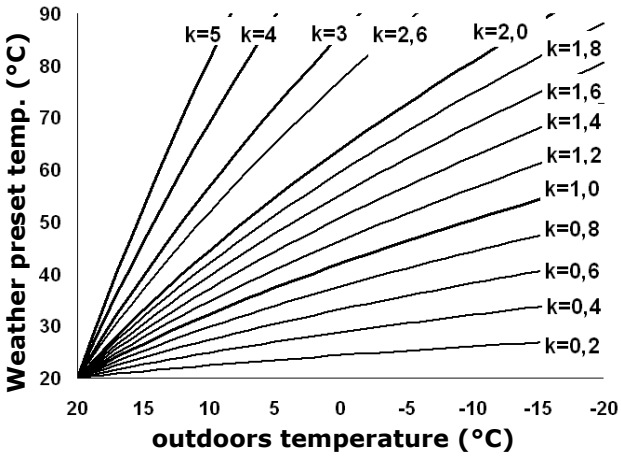
<u>It is not recommended to use both these possibilities at the same time.</u>

Automatic correction of room temperature is done according to formula:
Correction = (preset room temperature – measured room temperature) x Room temperature ratio / 10
Example.
Preset temperature in heating room (set in Room Control TOUCH) = 22 degrees C. Measured temperature in room (using Room Control TOUCH) = 20 degrees C. *room temperature ratio* = 15
Preset mixer temperature will be increased by (22 degrees C – 20 degrees C) x 15/10 = 3 degrees C. Correct value of parameter must be found Room temperature ratio. Scope: 0…50. The bigger value of factor the bigger correction of preset boiler temperature factor. When set on value "0" preset mixer temperature is not corrected. Attention: setting too high value of room temperature ratio may cause cyclic room temperature fluctuations.

8.16 WEATHER CONTROL

Depending on measured outside temperature, automatically controlled can be either preset boiler temperature and mixer cycles temperatures. By correct adjustment of heating curve temperature of heating circuits is counted automatically depending on value of external temperature. Thanks to that by choosing proper heating curve for given building, room temperature remains approximately the same – no matter what outside temperature.
In case of connected room panel Room Control TOUCH set additionally *room temperature ratio* = 0

Guidelines for correct heating curve settings:
- floor heating 0,2 -0,6
- radiator heating 1,0 - 1,6
- buffer 1,8 - 4



Pic. 5 Heating curves.

Tips for choosing proper heating curve:
If by falling outer temperature room temperature is increasing, then value of chosen heating curve is too big,
If by decreasing outer temperature, room temperature is also decreasing, then value of chosen heating curve is too low,
If by frosty weather room temperature is appropriate and in warmer time is too low – it is recommended to increase parameter *Parallel movement of heating curve* and then choose lower heating curve,
If by frosty weather room temperature is too low and in warmer time too high – it is recommended to reduce *Parallel movement of heating curve* and choose higher heating curve.
Buildings which are poorly isolated require setting heating curve with higher values, and for better isolated buildings heating curve will have lower value.

Preset temperature, counted according to heating curve can be decreased or increased by controller when it goes beyond scope of limits of temperatures for given cycle.

8.17 NIGHT DECREASE SETTINGS DESCRIPTION

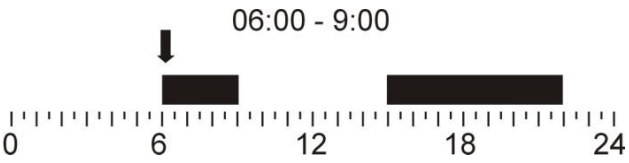
<u>Night time decreases for heating circuits, HUW tank and circulation pump operation</u>:

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

To activate time intervals, set the parameter: *Night time decrease* for the given heating circuit to *ON*. The parameter *Reduction value* set the temp. the reduction, one for all time intervals.

Decrease night can be defined separately for every day of the week set *Schedule*.

Select the lowering of the temperature set point and the beginning and end of a given time interval.



Boiler night time decreases

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

8.18 CIRCULAR PUMP CONTROL

Attention: functionality of circular pump is available only after connecting additional module C.

Settings are in:

Settings of HUW → Night reductions of circulation pump

and

Service settings → CH and HUW settings

Settings of time control of circular pump are analogical to settings of night reductions. In defined time periods circular pump is deactivated. The circulation pump is running in the *Circulation running time* in the periods which have not been mentioned above.

8.19 FUEL LEVEL CONFIGURATION

Fuel level indicator activating

To activate displaying fuel level following parameters are to be set

Boiler setting → fuel level → alarm level

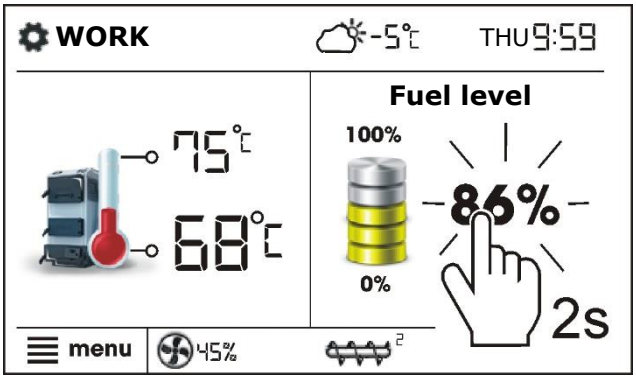
On value bigger than "0", i.e. 10%

Touching left or right window in main window fuel level can be shown.

Tip: fuel level can also be seen in room panel Room Control TOUCH (room panel is not a standard option of the controller).

Fuel level indicator service

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



Pic. 6 Fuel level service.

After choosing and accepting „YES" fuel level will be set for 100%. Attention: Fuel can be refilled anytime, that means it is not needed to wait till the silo is empty. However fuel should be filled up to the level corresponding to 100% and set the controller level as described above.

Description of activity

The controller measures fuel level on the basis of its current consumption. Factory settings will not always correspond to actual fuel consumption , so to work correctly this method needs level calibration by controller's user. No additional fuel sensors are required.

Calibration

Fill the silo to the level which corresponds to full level of fuel, then set value of parameter:

Boiler settings → Fuel level → Calibration of fuel level → fuel level 100%

In main window the indicator will be set on 100%. The calibration process is marked with a pulsating fuel level indicator. The

indicator will pulsate until programming point referring to minimum fuel level. Decreasing level of fuel in the silo should be monitored constantly. When fuel level reaches expected minimum, parameter value should be set this way:

Boiler settings → Fuel level → Calibration of fuel level → Fuel level 0%

8.20 COOPERATION WITH ADDITIONAL FEEDER

After connecting additional B module the controller can cooperate with low fuel level sensor in silo. After activating sensor , for *Additional feeder working time* controller will connect auxiliary feeder to refill basic fuel level. This parameter can be found in:

Service settings → Burner settings → Others

8.21 INFORMATION

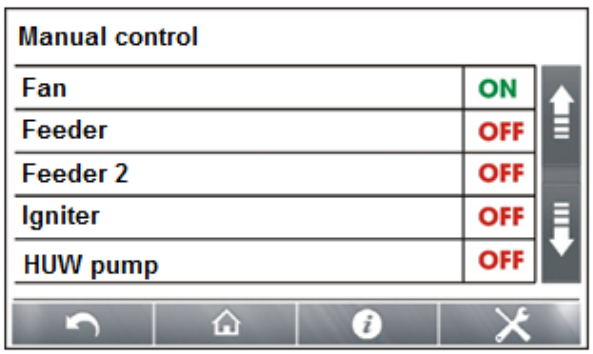
Menu information enables view to measured temperatures and allows to check which of devices are currently activated.

☞ After connecting extension module of mixers information about auxiliary mixers are displayed.

8.22 MANUAL CONTROL

In the controller it is possible to manually activate devices like i.e. pumps, feeder engine, or blower engine. It enables to check if the device is operating correctly and if it is connected properly.

☞ Attention: Entering manual control is possible only in STAND-BY mode, when boiler is switched off



Pic. 7 Manual control window view, when OFF – means that the device is off, ON – activated

⚠ Long lasting activating of fan, feeder or other device may cause danger.

8.23 MENU FAVORITE

In menu, on a lower stripe of the screen there is a button: . After its selection fast choice menu appears. Parts in this menu are added by pressing for a while the right icon in a round menu.

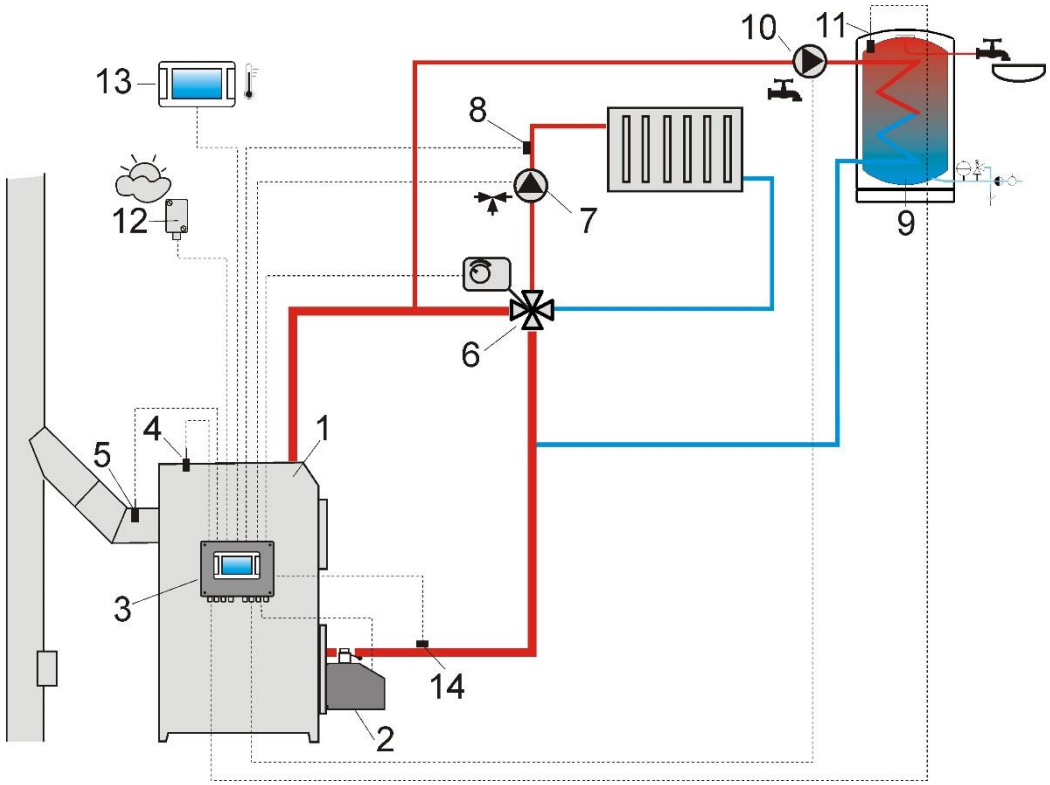
To delete selected position from favorites menu it is needed to press it for a longer while and accept its removal.

USER MANUAL OF CONTROLLER INSTALLATION AND SERVICE SETTINGS

S.Control TOUCH

9. HYDRAULIC SCHEMES

9.1 Scheme 1



Pic. 8 **Scheme with 4 way steering valve controlling central heating circuit[1],** where: 1 – boiler, 2 – burner, 3 – controller, 4 – boiler temperature sensor, CT4, 5 – fumes temperature sensor, 6 – servomotor of 4 way valve, 7 – mixer cycle pump, 8 – mixer cycle temperature sensor, 9 – silo of hot water, 10 – hot water pump, 11 – hot water sensor, 12 – weather temperature sensor CT4-P, 13 – room panel Room Control TOUCH or standard room thermostat, 14 – return temperature sensor (is not necessary to operate the system).

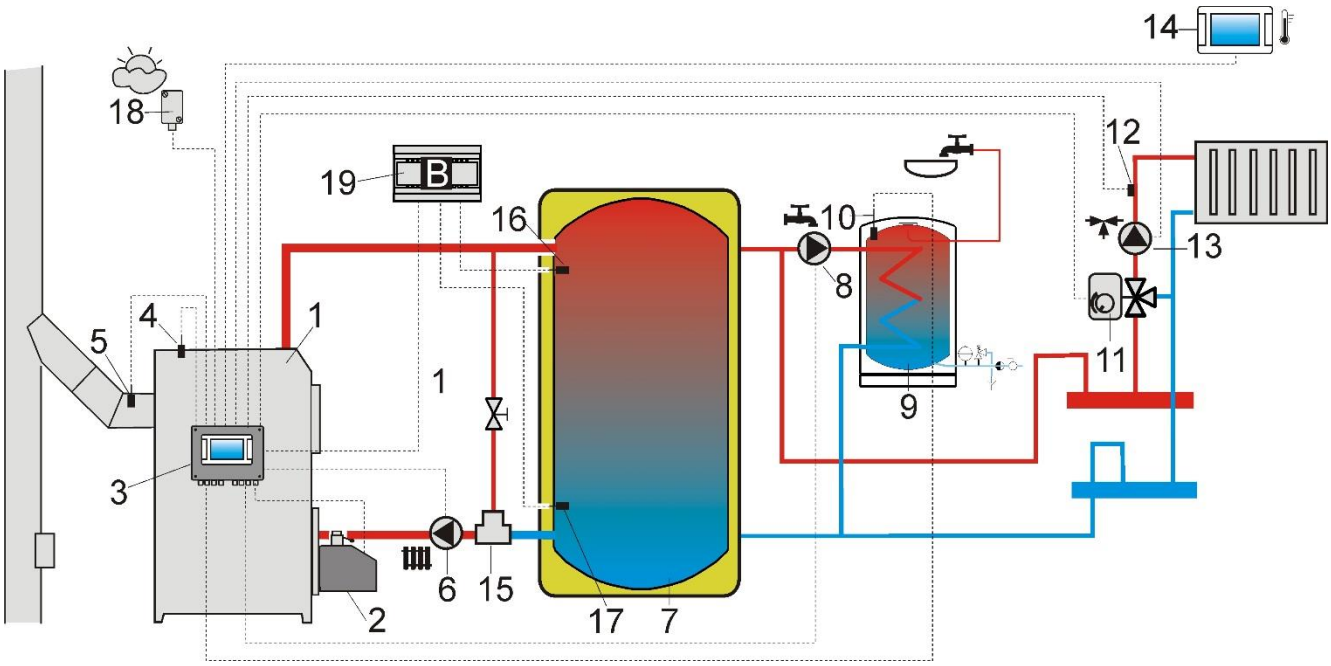
⚠	To improve water circulation in gravity cycle it is necessary to use large nominal profiles DN of a pipe and 4 way valve, not to use large amount of knees and profile narrowings. Use other rules referring to gravity installations. If return sensor is installed closely, it is necessary to isolate it thermally from surroundings and improve thermal contact with pipe. Preset silo temperature must be set so high to ensure thermal power for mixer cycle when at the same time heating water returning to the silo.

RECOMMENDED SETTINGS:

Parameter	Setting	MENU
Preset boiler temperature	75-80°C	boiler settings
Mixer handling 1	CH activated	service settings→ mixer settings 1
Max. Preset mixer temperature 1	70°	service settings→ mixer settings 1
Mixer heating curve 1	0.8 – 1.4	mixer heating 1
Mixer Weather control 1	activated	mixer setting 1

[1]Shown hydraulic scheme does not replace the project of central heating and serves only as a sample!

9.2 Scheme 2



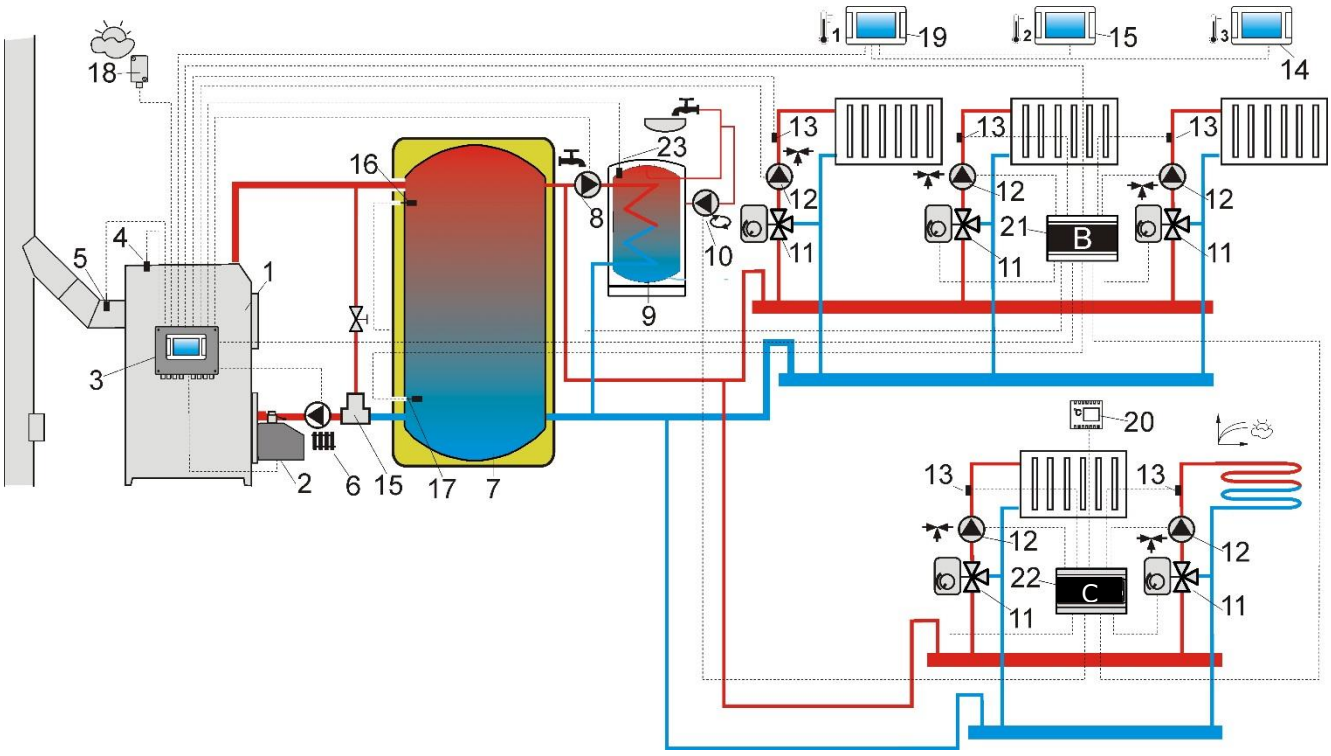
Pic. 9 **Scheme with heating buffer[2],** where:1 – boiler, 2 – burner, 3 – controller, 4 – boiler temperature sensor, 5 – fumes temperature sensor, 6 – boiler pump, 7 – heating buffer, 8 – hot water pump, 9 – hot water silo, 10 – hot water temperature sensor, 11 – servomotor of mixing valve, 12 – room mixer temperature sensor, 13 – mixer pump, 14 – room panel Room Control with room thermostat function, 15 – thermostatic 3 way valve for return protection, 16 – buffer higher temperature sensor, 17 – buffer lower temperature sensor, 18 – weather temperature sensor, 19 – additional module B.

RECOMMENDED SETTINGS:

Parameter	Setting	MENU
Preset boiler temperature	80°C	boiler settings
CH pump activating temperature	55°C	service settings→ CH and HUW settings
Activating operation (buffer service)	activated	service settings→ buffer settings
Buffer loading start temperature	50	service settings→ buffer settings
Buffer loading stop temperature	75	service settings→ buffer settings
Mixer service 1	activated CO	service settings→mixer settings 1
Max mixer preset temperature 1	70°	service settings→mixer settings 1
Mixer heating curve 1	0.8 – 1.4	mixer settings 1
Mixer weather control 1	activated	mixer settings 1
Mixer thermostat selection 1	ecoSTER T1	service settings→ mixer settings 1

[2] Shown hydraulic scheme does not replace the project of central heating and serves only as a sample!

9.3 Scheme 3



Pic. 10 **Scheme with heating buffer and 5 mixing heating circuits[3],** where: 1 – boiler, 2 – burner, 3 – controller, 4 – boiler temperature sensor CT4, 5 – fumes temperature sensor CT2S, 6 – boiler pump, 7 – heating buffer, 8 – hot water pump, 9 – hot water silo, 10 – circular pump, 11 – 3 way valve with servomotor, 12 – mixer cycle pump, 13 – mixer cycle sensor CT4, 14 – room sensor Room Control TOUCH, 15 – room sensor Room Control TOUCH, 16 – higher sensor of buffer CT4 temperature, 17 – lower sensor of buffer CT4 temperature, 18 – weather temperature sensor CT4-P, 19 – room panel Room Control TOUCH, 20 – standard room thermostat, 21 – additional module B, 22 – additional module C, 23 – hot water room temperature sensor.

RECOMMENDED SETTINGS:

Parameter	Settings	MENU
Boiler preset temperature	80°C	boiler settings
CH pump start temperature	55°C	service settings→ HUW and CH settings
Activate operating (buffer service)	active	service settings→ buffer settings
Buffer loading start temperature	50	service settings→ buffer settings
Buffer loading stop temperature	75	service settings→ buffer settings
Mixer service 1,2,3,4	active CH	service settings→mixer settings 1…4
Max. Mixer preset temperature 1,2,3,4	70°	service settings→mixer settings 1…4
Mixer heating curve 1,2,3,4	0.8 – 1.4	mixer settings 1…4
Mixer weather control 1,2,3,4	active	mixer settings 1…4
Mixer thermostat selection 1	ecoSTER T1	service settings→ mixer settings 1
Mixer thermostat selection 2	ecoSTER T2	service settings→ mixer settings 2
Mixer thermostat selection 3	ecoSTER T3	service settings→ mixer settings 3
Mixer thermostat selection 4	universal	service settings→ mixer settings 4
Mixer service 5	Activate floor	service settings→mixer settings 5
Max. Mixer preset temperature 5	50°	service settings→mixer settings 5
Mixer heating curve 5	0.2 – 0.6	mixer settings 5
Mixer weather control 5	active	mixer settings 5

[3]Shown hydraulic scheme does not replace the project of central heating and serves only as a sample!

10. Technical data

Power		230V~; 50Hz;
Current consumed by controller		0,04 A[4]
Maximum nominal current		6 (6) A
Controller's level of protection		IP20
Outer temperature		0...50 °C
Storage temperature		0...65 °C
Relative humidity		5 - 85% without condensation of water steam
Measuring scope of sensors' temperature CT4		0...100 °C
Measuring scope of sensors' temperature CT4-P		-35...40 °C
Accuracy of measuring temperature with sensors CT4 and CT4-P		2 °C
Clamps	For network and signal	Screw, cable section to 2.5mm2, tightening torque 0,4Nm, isolation length 7mm
	Protecting	Screw, cable section to 2,5mm^2 , tightening torque 0,5Nm, isolation length 6mm
Display		Colorful, graphic, 480x272 with touch panel
Dimensions		224x200x80 mm
Weigth		1,4 kg
Norms		PN-EN 60730-2-9 PN-EN 60730-1
Software class		A
Protection class		For installing to devices class I
Level of contamination		2 wg PN-EN 60730-1

11. STORAGE AND TRANSPORT CONDITIONS

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

During transport the controller cannot be exposed to vibrations bigger than typical for transport of boilers.

12. CONTROLLER INSTALLATION

12.1 ENVIRONMENTAL CONDITIONS

Due to fire risk it is forbidden to use the controller in proximity of explosive gases or dust. Moreover the controller can not be used in conditions of water steam condensation or be exposed to effects of water.

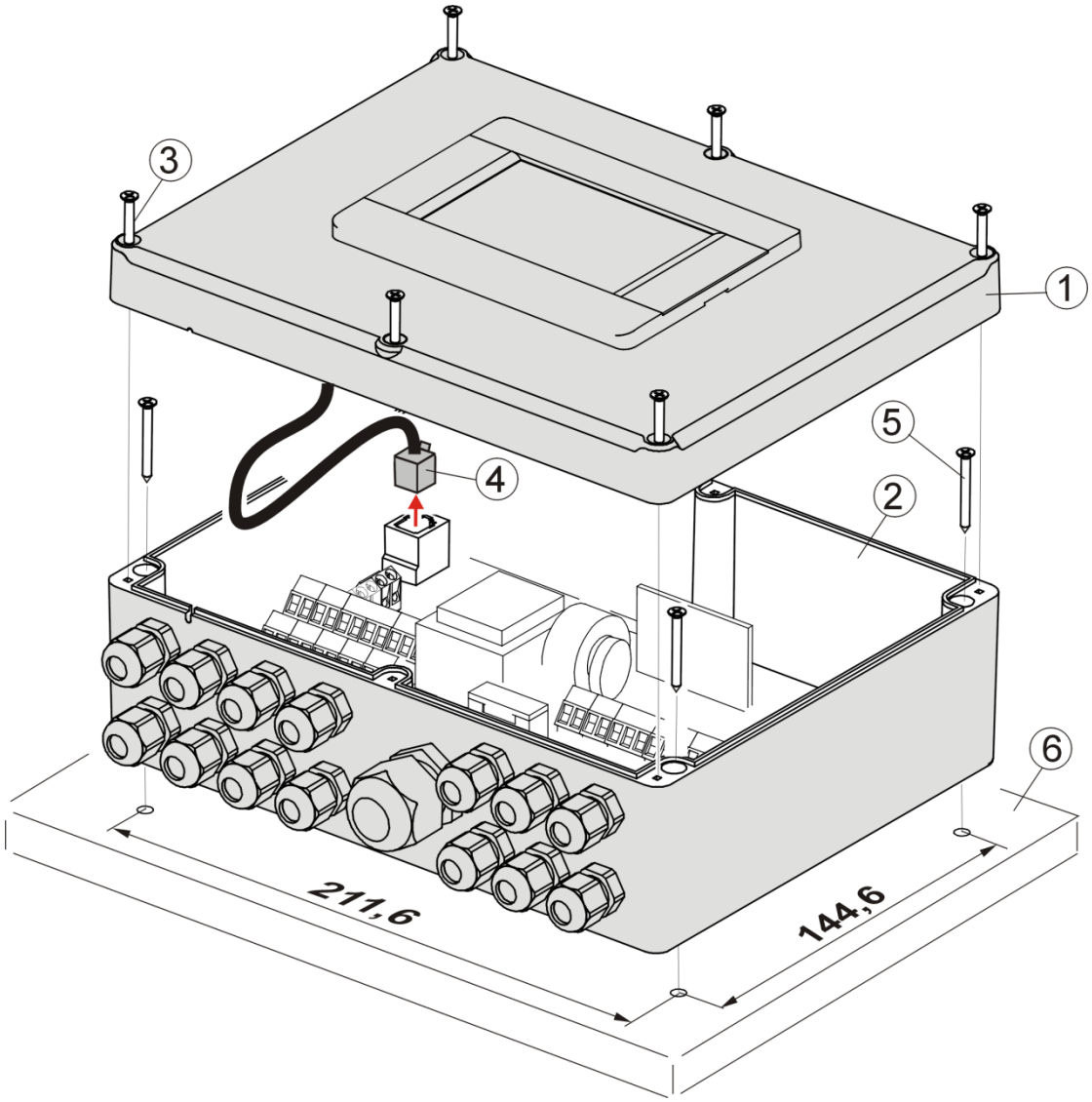
12.2 INSTALLATION REQUIREMENTS

The controller should be installed by a qualified and authorized installer, in accordance with current norms and regulations. The producer is not responsible for damages caused by failing to observe valid law and this user manual. The controller is designed to be built-in. This means that it is attached to flat and stable part of a boiler or a wall. It cannot be used as a separate device. Leave free space at each partition of the controller (save for assembly partition) at least 50mm. Leave free space allowing for setting wires without bending them, at least 100mm from back partition of the controller. Outer temperature and assembly surface should be within scope of 0 – 50 degrees C.

[4] It is a current collected by the controller (when connected 2 executive modules and a panel). Total electricity consumption depends on devices which are connected to the controller.

12.3 INSTALLATION

The controller is adapted to be installed on flat assembly surface. In order to screw it to assemble surface please undo the screws (3) and carefully lift the cover (1), then undo the plug (4). Then remove the cover (1) in a safe place. Using screws (5) stuck through holes in the cover (2) screw the controller to assembly surface (6).



Pic. 11 Embedding controller on assembly surface, where: 1 – cover, 2 – base, 3 – screw for cover, 4 – plug, 5 – screw for assembly surface, 6 – assembly surface.

12.4 ELECTRIC CIRCUIT CONNECTION

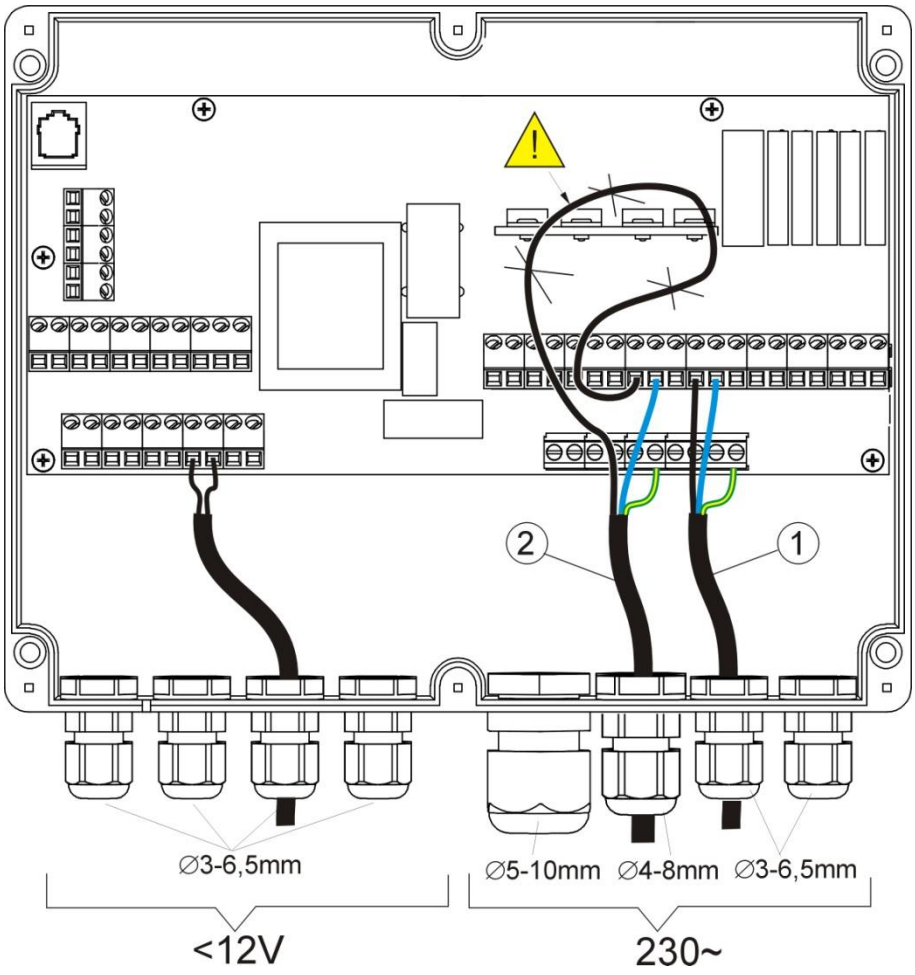
The controller is adapted to current 230V~, 50Hz. Features of installation:

- 3 way (with protecting wire),
- made according with valid law.

Attention: After deactivating the controller with the keypad, there still can be a dangerous voltage on the connections. Before starting assembly works it is obligatory to disconnect the electrical power and make sure that there is no danger electrical power on claps and wires.

Connecting wires should not touch with surfaces with temperatures exceeding nominal temperature of their work. Claps on the right side of the device are marked as L, N, 1-19 are designed to connect devises powered with current 230V~.
Claps 20-40, D+, D- and RJ are designed to cooperate with low voltage devices (below 12V)

Connecting current 230V to claps 20 – 40 and transmission connections causes damage to the controller and brings danger of electrical shock!



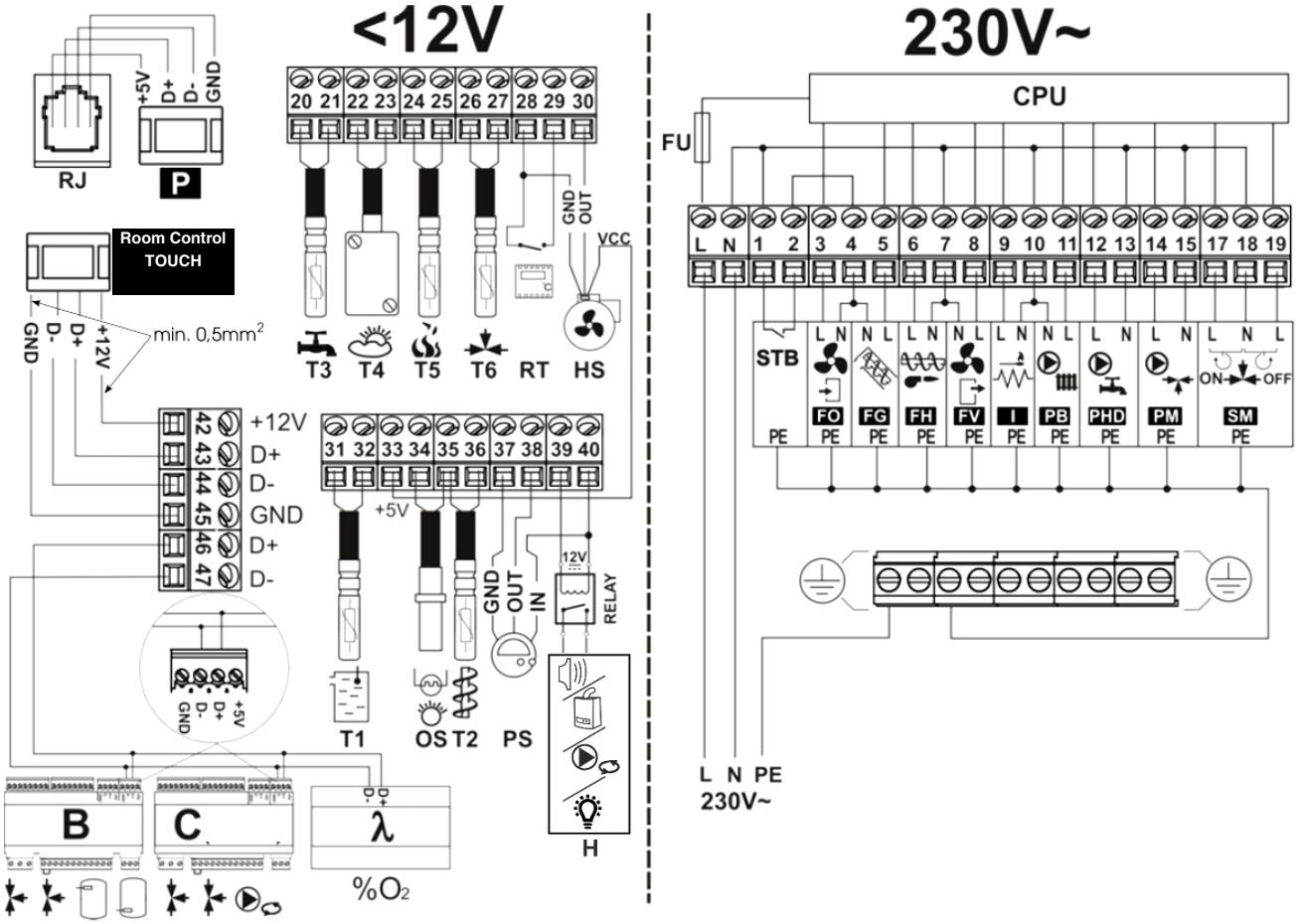
Pic. 12 Wire connection, where 1 – correctly connected wire, 2 – incorrectly connected wire (it is not acceptable to twist wires inside the device)

Wires inside the controller should be led through cable glands. Cable glands should be screwed. Make sure that glands are correctly screwed by pulling wire. Length of isolation of external tire of wires should be minimal, maximum 60mm. If it is necessary to longer isolate the wire tire they should be connected with each other or other wires close to the connector. In this case when a wire gets loose from the connector it is not in contact with dangerous parts. Isolation length of wires entering connections are shown in the table in point 0. It is not acceptable to twist wires and leaving unconnected wires inside the controller (risk of contact with hot parts and parts with dangerous voltage).

12.5 SAFETY CONNECTIONS

Safety wires are to be connected with terminals marked with this symbol ⏚.

12.6 ELECTRIC SCHEME



Pic. 13 **Controller wiring diagram**, where: **T1** – CT4 boiler temperature sensor, OS – optical flame sensor, **T2** – feeder temperature sensor, **PS** - vacuum sensor, **H** – voltage output to signaling alarms or signaling controller operation mode or control the reserve boiler or control the circulation pump, **T3** - CT4 hot water temperature sensor, **T4** – CT4-P weather temperature sensor , **T5** – CT2S fumes temperature sensor, **T6** – CT4 mixer temperature sensor, **RT** – boiler room thermostat input, **HS** – fan rotation sensor, **P** – Room Control TOUCH control panel– room panel with a room thermostat feature (replaces RT), **D-D+** - connector for additional modules, **B** – module adding the control of another two mixers and a heat buffer, **C** – module adding the control of another two mixers and circulating pump, **λ** – Lambda probe module,
L N PE - 230V AC mains power supply, **FU** – mains fuse, **STB** – safety temperature limiter input, **FO** – burner blower, **FG** – main feeder, **FH** – burner feeder or rotary grate cleaning mechanism, **FV** – boiler exhaust fan, **I** – igniter, **PB** – boiler or buffer pump, **PHD** – hot water pump, **PM** – mixer pump, **SM** – mixer cylinder, **CPU** – control.

12.7 TEMPERATURE SENSORS CONNECTION

Wires of the sensors can be extended by wires with diameter not smaller than 0,5mm^2. Total length of wires in each sensor should not exceed 15m.

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

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

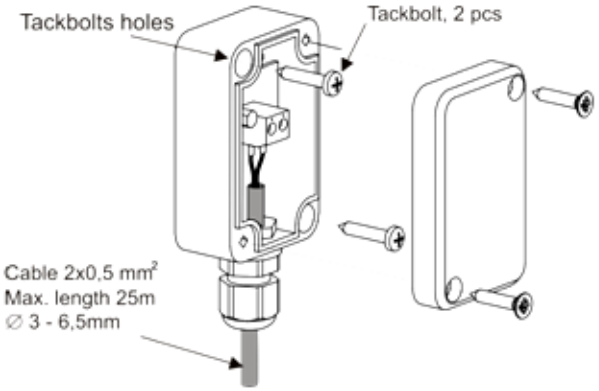
Good thermo contact should be maintained between sensors and measured surface. To this purpose thermoleading paste should be used. It is not acceptable to lubricate sensors with water or oil. Wires of sensors should be separated from network electrical wires. In such a case wrong readings of temperature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

12.8 WEATHER SENSORS CONNECTION

The controller cooperates solely with weather sensor type CT4-P. The sensor should be installed on the coolest wall of the building. Usually it is the northern wall, under the roof. The sensor should not be exposed to direct sunrays and rain. The sensor should be installed at least 2 m above the ground far away from windows, chimneys and other sources of heat.

To connect use wire with diameter at least 0,5mm2 up to 25m long. Polarization of wires is not essential. Second end should be connected to terminals of controller.

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



Pic. 14 Weather sensor connection CT4-P.

12.9 WEATHER SENSORS CHECKING

Temperature sensors CT4/CT4-P can be checked by measuring their resistance in given temperature. In case of big differences between measured resistance value and values in table below, the sensor should be replaced with a new one.

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

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

CT4-P (weather)			
Weather temperature °C	Min. Ω	Nom. Ω	Max. Ω
-30	609	**624**	638
-20	669	**684**	698
-10	733	**747**	761
0	802	**815**	828
10	874	**886**	898
20	950	**961**	972

12.10 OPTICAL SENSOR CONNECTION

Connect the sensor accordingly to point 12.6. Readings of data from optical sensor is possible in menu:

Information→ Flame

12.11 MIXERS ROOM TEMPERATURE CONNECTION

Room thermostat after disconnecting wires reduces preset temperature in mixer circuit. Parameter is in menu:

Mixer settings 1,2,3,4,5 – Mixer room thermostat

Value of parameter should be chosen in such a way that after activating room thermostat, temperature in the room should decrease. Other settings according to point 8.15.

In case of room panel Room Control TOUCH make sure that this parameter is correctly chosen *Thermostat selection*:

Service settings – Mixer settings 1,2,3,4,5 – Mixer room thermostat

12.12 BOILER ROOM THERMOSTAT CONNECTION

Room thermostat for boiler circuit can switch off the burner operation or switch off the CH boiler pump. In order to thermostat switch off boiler operation select *Thermostat selection* for *universal* or *ecoSTERT1* (if room panel Room Control/Room Control TOUCH is connected)

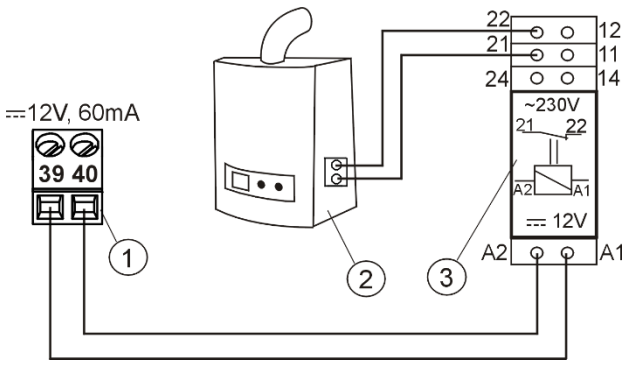
Service settings → Boiler settings → Thermostat selection.

For thermostat switch on the CH boiler pump (without switching off the boiler) set the parameter *Thermostat pump deactivating* on *YES*

Service settings → Boiler settings → Thermostat pump deactivation

12.13 RESERVE BOILER CONNECTION

The controller can control work of additional (gas or oil) boiler. It is not necessary then to manually activate or deactivate this boiler. Additional boiler will be activated when boiler for pellet loses temperature and will deactivate when pellet boiler reaches its proper temperature. Connection to additional boiler should be done by a qualified installer, according to technical data of this boiler. The additional (spare) boiler should be connected by relay with terminals 39-40.



Pic. 15 Sample scheme of system for additional boiler connection to the controller, where: 1 – module, 2 – additional boiler (for oil or gas), 3 – relay RM 84-2012-35-1012 and holder GZT80 RELPOL

The controller is not equipped with transmitter as standard option.

Assembly of transmitter should be done by a person with proper qualifications. According to valid norms and regulations.

Control of reserve boiler by setting the Output H1 A on *Reserve boiler*.

Menu → Service settings → Output H1

Additionally to activate control over reserve boiler set the parameter *Reserve boiler activation temperature* on value different than zero in:

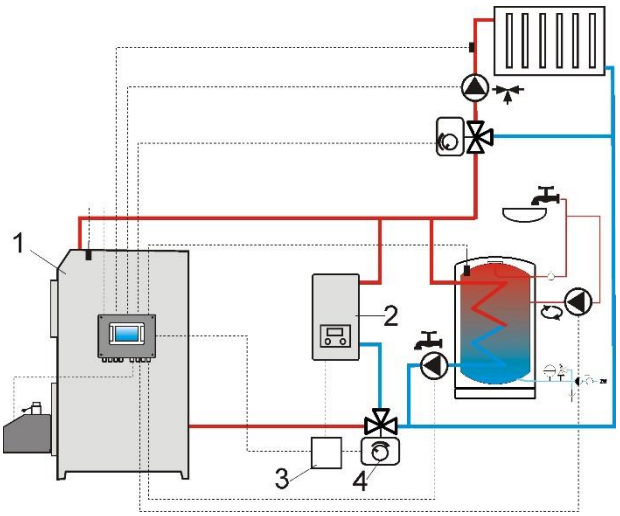
Service settings → Boiler settings → Reserve boiler

Deactivating control over additional boiler is done after setting zero value of switching off for this parameter.

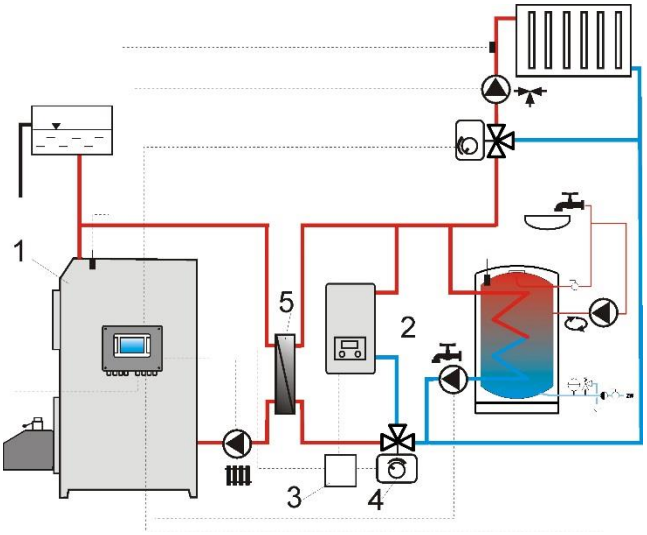
Controlling extension of the boiler is co-shared with alarm extension. Deactivating additional boiler control will cause that this extension will be controlled by module of controlling alarms.

When pellet boiler is fired-up, and its temperature exceeded preset value i.e. 25 degrees C, then controller switches off additional boiler (it will give constant power AC 12V for terminals 39-40). It will power the coil of transmitter and disconnecting its joints. After decreasing boiler temperature below parameter temperature of additional boiler switching off the controller stops giving power to joints 39-40 which should activate the additional boiler.

Switching the controller into STAND-BY mode causes deactivating the additional boiler.



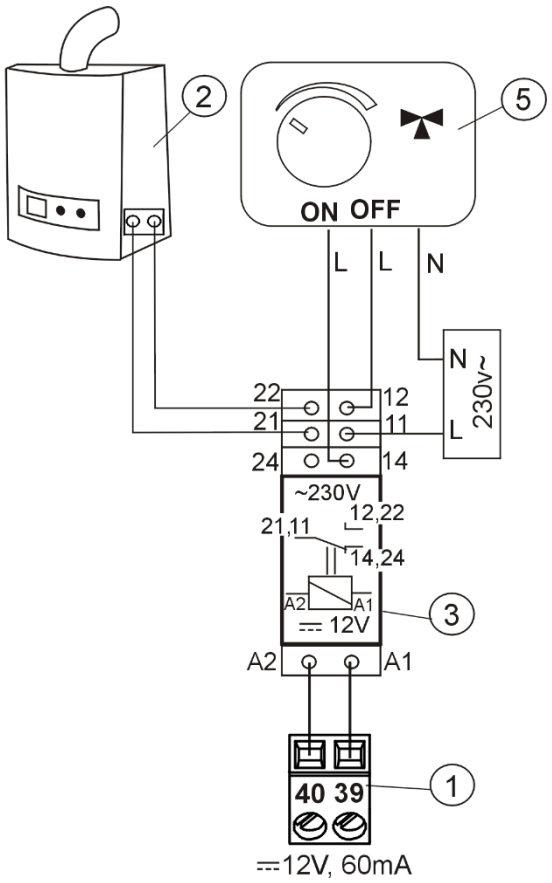
Pic. 16[5] Hydraulic scheme with additional boiler in open – closed circuit, where: 1- controller, 2- additional boiler, 3- relay, 4- switching valve (with end switchers).



Pic. 17[6] Hydraulic scheme with additional boiler in open – closed circuit, where: 1- controller, 2- additional boiler, 3- relay, 4- switching valve (with end switchers), 5- heat exchanger, recommended setting: priority HUW = deactivated, heat exchanger = YES.

[5] Presented hydraulic scheme does not replace project of central heating and is only a sample!

[6] Presented hydraulic scheme does not replace project of central heating and is only a sample!



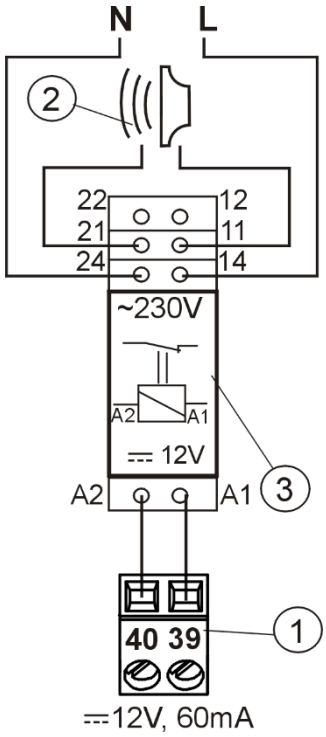
Pic. 18 Electrical scheme of controlling the switching valve of additional boiler, where: 1- controller, 2- additional boiler, 3- relay, 5- servomotor of switching valve (with end switchers), attention: terminals 22, 21, 24 must be separated by galvanizing from terminals 12, 11, 14.

12.14 ALARMS SIGNAL CONNECTION

The controller can report alarms by activating external devices like ring or GSM device to short messages SMS sending. Device for reporting alarms should be connected according to Pic. 19 by transmitter. Because this extension is shared with extension for controlling additional boiler, in order to activate there alarm functions additional boiler control should be deactivated. To do so, take following steps in menu:

Service settings → Boiler settings → Reserve boiler

Set zero value of its deactivating temperature.



Pic. 19 External alarm device connection, where: 1 – controller, 2- external alarm device, 3- relay.

Assembly of the transmitter must be performed by a qualified person in accordance with current legislation.

Enabling alarms by setting the Output H1 on *Alarms*:

Menu → Service settings → Output H1

There is possibility to set the alarm output to be accompanied by the occurrence of one or more selected alarms (AL1-AL9) on the menu:

Service settings → Boiler settings → Alarms

12.15 MIXER CONNECTION

During assembly works for mixer servomotor pay attention not to overheat the boiler. This may happen when there is a limited flow of water from the boiler. It is recommended to check the location of valve in maximum opening before starting work, to ascertain heat acceptance from the boiler by opening the valve to maximum.

The controller cooperates only with servomotors of mixing valves equipped with end switchers. Using other servomotors is forbidden. Servomotors with full circle scope of 30 to 255s can be used.
Connecting mixer description:

- Connect mixer temperature sensor
- Connect electrical mixer pump
- Activate the controller and select in service menu proper *mixer service*

SERVICE SETTINGS → Mixer settings 1
Set in mixer service settings proper time of *Valve opening time* (time should be written on data plate of servomotor, i.e. 120s).

- Connect electrical power of the controller and activate it so the mixer pump is working,
- Choose the direction in which servomotor opens and closes. To do so, switch the button to manual control and find position in which temperature in mixer circuit is maximal (in controller it is position 100% ON) and value position when temperature of mixer circuit is minimal (in controller it is position 0% OFF). Remember the position in order to later verification of proper connection,
- Disconnect the electrical power to the controller
- Connect electrical power to mixer servomotor with the controller, according to point 12.4 and value servomotor producer's documentation. Do not confuse opening direction with closing direction,
- Connect electrical power to the controller and switch it into STAND-BY mode
- Check if wires for mixer opening and closing are not swapped. Go into: **Manual control** and open mixer by selecting *Mixer 1 Opening* **=** *ON*. By opening servomotor temperature on the mixer sensor should increase. If not, disconnect the power and swap wires. (attention: another cause may be incorrectly connected valve! – check the producer's documentation if it is properly connected),
- Set other parameters of the mixer according to point 0

Calibration of valve indicator position:
Indicator of valve position is in the menu: **Information**. For mixer 1 after some time it will calibrate automatically. In order to make the valve position indicator displaying quicker the right value, disconnect the electrical power of the controller, than in cover of the controller switch the button into manual control. Turn the cap of the valve into closed position, then again switch the button in the cover into AUTO. Connect the electrical power to the controller - % indicator of valve opening is calibrated.
During calibration the servomotor is closed through *valve opening time.*

12.16 CIRCULAR PUMP CONNECTION

The circulation pump can be connected to the boiler regulator after connecting additional module C or Output H to the regulator's executive module. You must set the support **Output H1** or **Output H2 and H3** on *Circulation pump*.

12.17 STB TEMPERATURE LIMITER CONNECTION

In order not to overheat the boiler due to the controller breakdown it is obligatory to use STB safety temperature limiter or any other one suitable for given boiler. Limiter STB should be connected to terminals 1-2. When limiter is activated, blowing is stopped as well as engine of fuel feeder.

Safety temperature limiter must have nominal voltage at least 230V and should have valid admission documents

In case of not installing the limiter terminals 1-2 are to be connected by a bridge. The bridge must be made with insulated wire, with diameter at least 0,75mm^2 .With insulation which is thick enough to meet safety standards of the boiler.

12.18 ROOM PANEL CONNECTION

It is possible to equip the controller with room panel Room Control TOUCH, which has following functions:

- Room thermostat (controls up to 3 thermostats)

- Controlling panel for the boiler
- Alarm signal
- Fuel level indicator

Attention: diameter of wires for connecting Room Control TOUCH should be at least 0,5mm^2

Maximum length of wires to Room Control TOUCH panel should not exceed 30m. This length can be bigger when wires with bigger diameter than 0,5mm2 are used.

4-wire connection:

Attention: properly connect the power cord VCC of the room panel to the controller terminal according to 12.6.

2-wire connection:

2-wire connection requires usage of power supply feeder +5V or +12V of direct current with nominal current minimum 200mA. Points of powering Room Control TOUCH: GDN and +VCC connect to external power supply feeder.[7] The feeder is not a standard option for the controller. Lines D+ and D- connect in such a way as shown on scheme, point 12.6.

12.19 CONTROLLER PARAMETERS ACCESS BY INTERNET NETWORK

With an additional module NET Control internet device allows on remote access to the data contained in the device via WiFi and LAN. Then the controller is operating through standard web page browser WWW installed in stationary and mobile devices.

[7] Charger is not a standard equipment of the controller

13. STRUCTURE- SERVICE MENU

Service settings
Burner settings
Boiler settings
CH and HUW settings
Buffer settings *
Mixer settings 1-5*
Output H1
Output H2 and H3*
Display advanced
Service counters
Restore the default settings

Burner settings
Burning up
Firing up test time
Flame detection
Blowing for firing up
Time of firing up
Burning up
Firing up test time
Flame detection
Blowing for firing up
Time of firing up
Blowing after firing up
Blowing time after firing up
Heating up time
Operation time with minimum power
Exhaust fan *
Underpressure *
Work
Thermostat mode
Blowing power increase *
Feeder 2 work*
Minimum time of feeder 2 work*
Feeder efficiency
Fuel calorific
Maximum power of burner
Medium burner power
Minimum power of burner
Capacity of hopper
Burning off
Maximum time of burning off
Minimum time of burning off
Blowing power
Blowing time
Blowing pause
Blowing start
Blowing stop
Exhaust fan *
Underpressure *
Cleaning
Cleaning time before firing up
Cleaning time after burning off
Cleaning blowing
Exhaust fan *
Underpressure *
Supervision
Boiler power
Supervision time
Grate *
Blowing power - supervision
Blowing pause
Lambda sond *
Work with Lambda probe
Dynamics
Reaction time
Range of blowing correction
Other
Minimum blowing power
Fuel detection time
Maximum burner temperature
Maximum temperature of fumes
Additional feeder working time
Exhaust fan
Minimum power of fumes exhaust fan
Underpressure sensor
Minimum underpressure
Maximum underpressure
Underpressure correction
Underpressure - blowing correction
Feeder calibration

Boiler settings
Thermostat selection
Minimum boiler temperature
Maximum boiler temperature
Reserve boiler
Alarms
Temperature of chilling down

the boiler
Parameter A,B,C FL
Thermostat pump deactivation

CH and HUW settings
Temperature of activating the CH pump
CH pump pause during loading HUW *
Minimum temperature of HUW *
Maximum temperature of HUW *
Increase of boiler temperature from HUW and mixer
Prolongation of HUW work *
Circular pump pause time
Circular pump work time
Heat exchanger *

Buffer settings
Buffer support
Loading start temperature
Loading end temperature
Start heating system*

Mixer settings 1,2,3,4,5*
Mixer 1-5 service
Switched off
CH switched on
Floor switched on
Only pump
Thermostat selection *
Universal
ecoSTER
Minimum mixer 1-5 temperature
Maximum mixer 1-5 temperature
Range of proportionality *
Constant integration time *
Valve opening time
Thermostat pump deactivation
Indifference of mixer 1-5*

Output H1 Output H2 and H3 *
H1 output configuration
Boiler reserve
Alarms
Circulation pump
Signaling operation mode
H2 and H3 output configuration*
Boiler reserve
Alarms
Circulation pump
Signaling operation mode

* not available if proper sensor not attached, extension module or parameter is hidden

14. SERVICE SETTINGS

14.1 BURNER SERVICE SETTINGS

Firing up	Description
• Ignition test time	Time for checking if furnace is hot. Only fan is operating
• Flame detection	Threshold of flame detection in % of light, when the controller deems the furnace as hot. It is also used for detection of lack of fuel and end of burning off.
• Firing- up airflow	% of blowing when firing up. Too big value prolongs the firing up process or causes failed attempt of firing up.
• Firing- up time	Time of following firing up attempts (3 attempts). After that time the controller goes to another firing up attempt.
• Blowing after ignition	% of fan blowing after flame detection
• Blowing period after ignition	Fan operation time with *Blowing after ignition* power. Allows better furnace ignition before entering the STABILIZATION mode.
• Igniter period	Igniter warming up time before engaging the fan. It should not be too long as to not damage the heater. After this time the heater works still until detecting the flame.
• Stabilization time	Duration of the STABILIZATION operating mode.
• Exhaust fan	% of the exhaust fan blowing rate during the ignition. Excessive value will make the ignition process longer or result in a failure to ignite the fuel.
• Vacuum	Pre-set value of the vacuum in the combustion chamber during the ignition.
Operation	
• Thermostat mode	Switches the burner into THERMOSTAT mode, i.e. for working in bakery. The burner operates with maximum power without modulation of power. The burner deactivates with disconnecting thermostat joints 28-29. Boiler temperature sensor does not influence feeder operation.
• Airflow increase	Value of the increase of the airflow power at a time when feeder is working in the burner.
• Operation of feeder 2 / Min. operation time of feeder 2	Additional possibility to run the second fuel feeder / Time after which the feeder operation is stopped despite the fact that the fuel level sensor contacts are open.
• Feeder efficiency	Feeder fuel efficiency in kg/h
• Energy density	Fuel calorific in kWh/kg.
• Max. burner power	Max. burner power in kW. The parameter is used to modulate the burner power.
• Intermediate burner power	Intermediate burner power in kW. The parameter is used to modulate the burner power.
• Min. burner power	Min. burner power in kW. The parameter is used to modulate the burner power.
• Tank capacity	Fuel silo capacity for counting fuel level. When correct amount is put, the user is not obliged to calibrate fuel level. The controller process this data if calibration process of fuel level was not done. After successful calibration of fuel level the controller does not process this value.
Burning off	
• Burning off maximum time	After this time the controller goes to PAUSE mode, in spite of the fact that the controller detects flame
• Burning off minimum time	Burning off will last at least this time in spite of the fact that flame sensor indicated lack of flame
• Air flush intensity	Fan power during blowing while burning off in %
• Air flush period	Duration of blowing when burning off fuel and burning off

• Air flush interval	Break between airflows while burning off the fuel in burning off process
• Air flush start	Flame brightness with which airflow starts while burning off the fuel
• Air flush stop	Flame brightness with which airflow starts when burning off the fuel in burning off process
• Exhaust fan	% of the exhaust fan blowing rate during the deactivation.
• Vacuum	Pre-set value of the vacuum in the combustion chamber during the deactivation.
Cleaning	
• Firing up cleaning time	Fan operation time during cleaning the furnace while firing up
• Burning off cleaning time	Fan operation time during furnace burning off
• Cleaning airflow	Fan power in % during furnace cleaning in burning off and firing up
• Exhaust fan	% of the exhaust fan blowing rate during the deactivation.
• Vacuum	Pre-set value of the vacuum in the combustion chamber during the deactivation.
Supervision	
• Supervision time	After this time, when the controller is in SUPERVISION mode, the controller automatically starts burner burning off. By settings = 0, SUPERVISION mode is deactivated.
• Boiler power	Boiler power in the SUPERVISION mode.
Grate	
Flush time SUPERVISION	The duration of the fan blow in the supervision in grid mode
Flush period SUPERVISION	Interval between blows in the supervision in grid mode
Lambda probe	
Operation with a Lambda Probe	If a parameter is set on “ON” then controller will operate using information from lambda probe. Amount of air supplied to furnace will be automatically adjusted in order to get preset amount of air in fumes. If this parameter will be set on “OFF” then indications of lambda probe will not have influence on operation of a controller.
Dynamics	Has influence on speed of oxygen amount regulation in fumes in relation to preset amount and on stability of maintaining oxygen amount in fumes. It is not recommended to change this parameter if quickness of regulation and stability of maintaining preset value of oxygen is on expected level.
Reaction time	Has influence on quickness of regulation of amount of oxygen in relation to preset value and on stability of amount of oxygen in fumes. It is not recommended to change this parameter if quickness of regulation and stability of maintaining the preset value of oxygen is on expected level.
Blow correction range	Settles permittable range of variability of power of blow by operation with usage of lambda probe.
Other	
Min. blowing rate	Minimum blower power in % selectable by the controller user. It is used only to limit the available blower power range. It is not used for the blower control algorithm and should be as low as possible to ensure slow and smooth blower rotation without "buzzing".
No fuel detection time	The time countdown starts after the flame brightness has dropped below the value of the *Flame detection %*. After the countdown is finished, the controller attempts to ignite the burner and should it fail three times, an alarm message of 'ignition failure" is indicated.
Max. burner temperature	Defines the maximum feeder temperature. Should the value be exceeded, the "maximum feeder temperature exceeded" alarm is

	generated.
Max. flue gas temperature	Defines the maximum flue gas temperature. Should the value be exceeded, the "maximum flue gas temperature exceeded" alarm is generated.
Additional feeder operation time	Defines the additional feeder (bunker feeder) operation time. The feeder is attached to the additional B module. After that time, the additional feeder operation is stopped despite the fact that the fuel level sensor contacts are open. The fuel level sensor contacts are located in the additional B module.
Exhaust fan	Activates the operation of the exhaust fan.
Min. exhaust fan power	Minimum exhaust fan power in % selectable by the user. It is used only to limit the available fan power range. It is not used for the fan control algorithm and should be as low as possible to ensure slow and smooth fan rotation and unrestricted flue gas extraction.

14.2 BOILER SERVICE SETTINGS

Thermostat selection	Options to choose from: • Deactivated (deactivates room thermostat influence on boiler operation) • Universal (activates room thermostat for boiler) • ecoSTER T1 (option available after connecting room panel Room Control TOUCH, boiler operation is dependent on room thermostat No1 in Room Control) • ecoSTER T2 (option available after connecting room panel Room Control TOUCH, boiler operation is dependent on room thermostan No 2 in Room Control – on sensor CT7) • ecoSTER T3 (option available after connecting room panel Room Control TOUCH, boiler operation is dependent on room thermostat No3 in Room Control TOUCH – on sensor CT7)
Min. boiler temp.	Minimum preset boiler temperature which can be set in user menu and minimum temp. which can be set automatically by controller, i.e. from night reductions etc.
Max. boiler temp.	Maximum preset boiler temperature which can be set in user menu and minimum temp. which can be set automatically by controller, i.e. from night reductions etc.
Reserve boiler	Description in point 12.13
Alarm indication	Configuration of the alarm output so that it is activated if one or more selected alarms occur.
Boiler cooling temperature	Temperature of boiler cooling off. Above this temperature the controller activates HUW pump and opens mixer cycles to allow boiler cooling off. The controller activates HUW pump if this temperature exceeds maximum value. The controller will not open mixer cycle when *mixer setting* = *floor active*
Parameter A FuzzyLogic Parameter B FuzzyLogic Parameter C FuzzyLogic	Refer to FuzzyLogic mode. They have influence on quickness of reaching boiler temperature to preset value and on stability of maintaining this temperature. It is not recommended to change those parameters if quickness of regulation and stability of maintaining preset temperature is on expected level.
Pump off by thermostat	Options available • NO (CH boiler pump is not activated when room thermostat starts operation), • YES (CH boiler pump is deactivated when room thermostat starts operating)

14.3 CH and HUW SERVICE SETTINGS

CH activation temperature	Parameters determines the temperature at which CH boiler pump is activated. It protects the boiler against watering due to cooling off with cold water returning from installation. Attention: Deactivating boiler pump only does not guarantee boiler protection against watering and consequently corrosion. Additional automatics should be used, i.e. 4 way valve or 3 way thermostatic valve.
CH pause when HUW loading*	Available after connecting HUW sensor. Prolonged feeding of HUW silo during priority HUW deactivated may cause to overcooling of the CH installation, because CH pump is deactivated. Parameter CH pump pause during feeding HUW prevents against periodical activating CH pump during feeding HUW silo. CH pump after this time will activate on constant, programmed time of 30s.
Min. HUW temperature	Available after CH sensor connecting. It is a parameter by which it can be reduced setting too low preset HUW temperature.
Max .HUW. temperature	Available after connecting HUW sensor. Parameter determines to what maximum temperature HUW silo will be heated during cooling the boiler in alarm situations. It is a very important parameter, because setting too high value of it may cause risk of scalding with HUW. Too low value of parameter will cause that during boiler overheating it will not be possible to cool off the boiler to the HUW silo. During design of HUW installation, it is necessary to take into account risk of damaging the controller. Due to breakdown of the controller water in the silo can heat up to dangerous temperature. It is necessary to use additional protection in the form of thermostatic valves.
Boiler temp. Increase by HUW and Mixer	Parameter determines how high the boiler temperature will be increased to load HUW silo, buffer and mixer cycle. Temperature increase is only realizing when it is necessary. When preset boiler temperature is at sufficient level then controller will not change it due to the fact of feeding the HUW silo, buffer or mixer cycle. Increasing preset boiler temperature during feeding HUW silo is signaled with letter “C” in main window of displayer
Prolonging of HUW operation*	Available after connecting HUW sensor. After feeding HUW silo and deactivating HUW pump may be a risk of boiler overheating. It happens in case when preset HUW temperature was higher than boiler preset temperature. This issue is exceptionally important in HUW pump operation in SUMMER mode, when pump is deactivated. To cool off the boiler HUW pump operation can be prolonged by *HUW pump working mode prolongation*.
Circulation standstill time	Parameters available after connecting additional module C. Pausing time between periods of circulation pump operation is defined with value of parameter *Circular pump pause time* (recommended setting 15-40 min.) Circular pump operates constantly during *circulation operation time*. (recommended setting 60-120s)
Circulation operation time	
Exchanger	Parameter available after activating option display advanced = YES. It only refers to hydraulic installation with heat exchanger between open and closed circuit, point 12.2. Available options: • YES (boiler pump operates constantly in short circuit boiler – exchanger, it is not excluded i.e. from SUMMER function or HUW priority) • NO (pump operates normally)

14.4 BUFFER SERVICE SETTINGS

Buffer support	Parameter serves to activating buffer operating mode. Available after connecting additional module B and buffer temperature sensors.

Loading start temperature	Parameter buffer loading start temperature defines high temperature below which buffer feeding starts. Buffer feeding proces is finished when low temperature reaches value defined in parameter buffer feeding end temperature.
Loading end temperature	
Start heating system	The temperature below which the heating system is deactivated, measured at the upper part of the buffer.

14.5 MIXER SERVICE SETTINGS

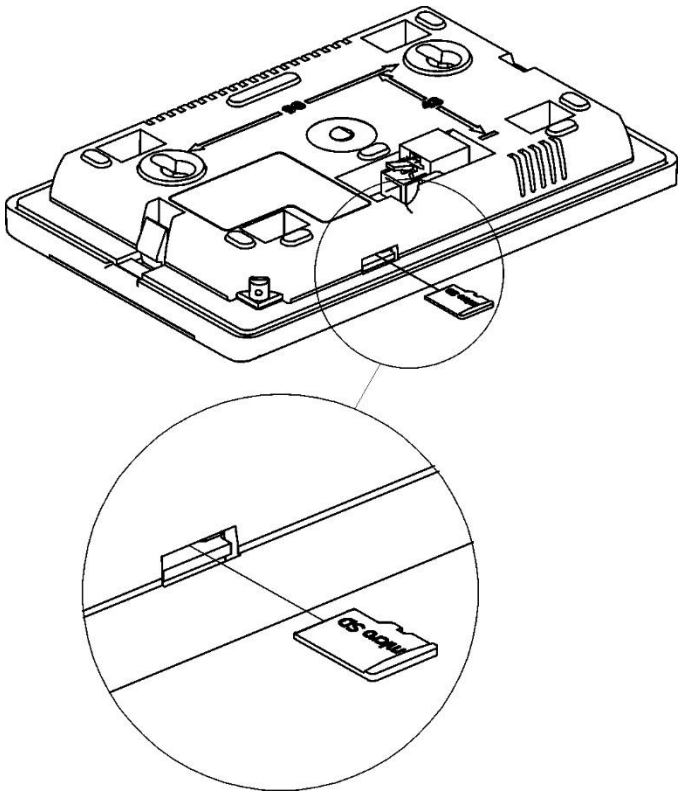
Mixer support	
• Off	Mixer servomotor and pump are not active
• CH on	Applicable when mixer cycle powers heating installation of CH. Maximum temperature of mixer cycle is not limited, mixer is fully opened during alarms i.e. boiler overheating. Attention: do not activate this option when installation is made of pipes sensitive to high temperature. In such situations it is recommended to set mixer service on FLOOR
• Floor on	Is used when mixer cycle powers floor installation. Maximum power of mixer cycle is limited to value of parameter max preset mixer temperature. Attention: After choosing option FLOOR, it is necessary to set parameter max mixer preset temperature on such a value to not damage the floor and avoid scalding risk.
• Pump only	When mixer cycle temperature exceeds value set in parameter *Preset temperature of mixer*, feeding of mixer pump is stopped. After decreasing temperature of circuit by 2 degrees C – pump is reactivated. This option is normally used to control floor heating pump in situation when it cooperates with thermostatic valve without servomotor. By such action is not recommended. It is recommended to use standard heating cycle in floor heating, which consists of valve, servomotor and mixer pump.
Thermostat selection*	Parameter available only after connecting to room panel Room Control TOUCH. This option allows change of room thermostat for mixer cycle. Options available: • Universal – standard thermostat connected to terminals 28-30 for mixer 1, for mixers 2,3,4,5 use proper terminals in additional modules. • ecoSTERT1 – thermostat 1 in Room Control, • ecoSTERT2 – thermostat 1 in Room Control, • ecoSTERT3 – thermostat 1 in Room Control, If Room Control TOUCH is not connected then the controller cooperates with standard room thermostat.
Minimum mixer temperature	Using this parameter it is possible to restrict Chance of setting to low preset mixer circuit temperature. Automatic control (i.e. periodical temperature reduction) also will not cause reduction in preset temperature below value set in this parameter.

Maximum mixer temperature	Parameter serves two functions: - allows restricting setting too high mixer preset temperature. Automatic control also will not cause exceeding preset temperature above value set in this parameter. - with parameter *Mixer service = activated FLOOR* is also limit temperature of mixer sensor when mixer pump is deactivated. For floor heating set the value below 45 degrees C – 50 degrees C or other if producer of materials used for floor or CH installation designer state differently.
Range of proportionality	Parameter has influence on movement of mixer's servomotor. Increase of its value causes quicker reaching preset mixer's temperature. Too high value of parameter causes deregulation of temperature and unnecessary movements of servomotor. Correct value is adjusted experimentally. It is recommended to set parameter in range 2-6 [3].
Constant of integration time	The higher is the value of this parameter, the slower is reaction of servomotor on loss of temperature. Setting to small values may cause unnecessary movements of servomotor, too big value prolongs finding preset temperature. Correct amount is adjusted experimentally. It is recommended to set this parameter in the range 100 – 180 [160].
Valve opening time	Set full valve opening time given at the plate of valve servomotor, i.e. 140s.
Pump off by thermostat	Setting the parameter on YES value causes closing of mixer servomotor and deactivating mixer pump after disconnecting joints of room thermostat. This is not recommended because the heated room can be too cool.
Mixer input dead zone *	Setting parameter determining value of temperature dead zone for mixer controlling circuit. The controller regulates mixer in such a way to keep the temperature of mixer cycle equal to preset value. However, avoid too frequent movements of servomotor, which can shorten its long-life usage. Regulation is undertaken only when measured temperature of mixer cycle will be higher or lower than preset value by the value bigger than mixer dead zone.

14.6 OTHERS

Show advanced setup	Options available: • YES (displays hidden parameters which edition is not recommended) • NO (hides hidden parameters)
Default settings restore	Restoring service settings settings from main menu are restored.
Touch panel calibration	Calibration of the touch screen panel
Output H1 **Output H2 and H3**	H1 output configuration: • boiler reserve – output 39-40 controls the reserve boiler. Specifies the boiler temperature above which deactivated or is activated reserve boiler. • alarms – the alarm output is activated 39-40. It allows to select the alarm on which the H output it react. • circulation pump - output 39-40 controls the circulation pump. H2 and H3 output configuration is only available when connecting additional modules B or C.

15. SOFTWARE REPLACEMENT



Software replacement can be made by a micro memory card only **microSD HC**.

Attention: replacement of the software can only be done by a qualified person, observing every safety means related to danger of electricity shock!

To replace the program, it is needed to disconnect electricity from the controller and disassembly the TOUCH panel from the cover of the controller, put the memory card into given socket. On memory card should be written new software in *.pfc format as two files: file with a panel program and a file with a program to module A of a controller. New software insert directly on memory card, not attaching the data in a sub catalogue. Then re-assembly the panel in the cover of the controller and connect the electricity. Then go to: **Menu→ General settings→ Software update** and perform software replacement, first in module A of a controller and then in a panel of a controller.

16. ALARMS DESCRIPTIONS

16.1 FUMES MAX. TEMP. EXCEEDING

The alarm occurs after exceeding the maximum fumes temperature. Turns off the fan. It aims to protect the fumes temperature sensor from damage due to the impact of temperature exceeding the strength of the sensor. Once the temperature drops, the regulator resumes normal operation.

16.2 BOILER MAX. TEMP. EXCEEDING

Protection against boiler overheating is done in 2 steps. In the first step , after exceeding *Temperature of chilling down the boiler,* the controller tries to reduce boiler temperature by dropping excess of heat to the HUW silo and by opening mixer servomotors (only when *mixer service = activated CH*). If temperature measured by HUW sensor exceeds value *Maximum temperature of HUW* then HUW pump is deactivated, what is done to protect users against scalding. If boiler temperature decreases, then the controller returns to normal operation. If the temperature will still increase (reaches 95 degrees C) then constant alarm will be activated of boiler overheating joined with sound signal.

The alarm can be deleted by pressing button on the screen or activating and deactivating power to the controller.

Attention: locating temperature sensor outside water coat of burner i.e. on exhaust pipe is not beneficial, because it may cause delay in detecting boiler overheating state!

16.3 BURNER MAX. TEMP. EXCEEDING

Alarm appears after exceeding burner temperature above service parameter:

Service settings → Burner settings → Max. burner temp.

If the burner temperature increases above this value the controller will begin burning off procedure.

Alarm is deleted automatically after burner temperature decrease by 10°C.

Alarm is deleted automatically after burner temperature decrease by 10°C.

Function which protects against back fire does not work when The controller has no electrical power.

The controller can not be used as sole protection of boiler against back fire. Additional protecting automatics is to be used.

16.4 BOILER TEMP. SENSOR DAMAGE

Alarm appears by boiler sensor damage and by exceeding measuring scope of this sensor. When alarm appears the boiler is activated. Deleting is done by pressing button on the screen or by deactivating and activating the controller. The sensor is to be checked and replaced if necessary.

Checking the temperature sensor is described in point 12.9.

16.5 BURNER TEMP. SENSOR DAMAGE

Alarm appears when burner sensor is damaged or by exceeding measuring scope of this sensor. After alarm the boiler is burnt off.

Deleting is done by pressing button on the screen or by deactivating and activating electrical power to the controller.

It is necessary to check the sensor and replace it if necessary.

Checking temperature sensor is described in point 12.9.

The controller can operate by disconnected burner temperature sensor, after setting parameter *Maximum burner temperature =0*

However it is not recommended, because it causes deactivation of boiler protection function against back-firing to fuel silo.

16.6 COMMUNICATION LOSS

Controlling panel is connected to remaining electronics by digital communication joint RS485. In case of damage of this wire on the screen following information will be displayed: *Attention! Lack of communication*
The controller does not deactivate regulation and operates normally with previously programmed parameters. In case of alarm situation it will undertake action accordingly to given alarm.
It is necessary to check the wire connecting controlling panel with given alarm, then mend it or replace it if necessary.

16.7 FAN DEMAGE

Alarm occurs when damage to the speed sensor or the fan on the basis of the load voltage at the output of the fan control. The controller turns off the fan.

16.8 MIN. OR MAX. VACUUM EXCEEDING

Alarm occurs when exceeding the threshold min. or max. the vacuum in the combustion chamber is enabled to use the vacuum sensor.

16.9 FIRING UP FAILED ATTEMPT

Alarm will appear after third failed attempt of automatic furnace firing up. In case of alarm all pumps are deactivated in order to not cause excessive cooling of the boiler. Deleting is done by pressing button on the screen or by activating or deactivating the controller. The cause of these alarms can be broken igniter or lack of fuel in the silo.

17. OTHER

17.1 POWER STOPPAGE

In case of power stoppage the controller returns to operation mode in which it was before stoppage.

17.2 ANTIFREEZING PROTECTION

When temperature of the boiler decreases below 5 degrees C CH pump will be activated enforcing circulation of boiler water. It will delay the process of freezing water, however in case of very low temperatures or by lack of electrical power it may not protect the installation against freezing.

17.3 PUMP ANTI STANDSTILL FUNCTION

The controller does the function of CH, HUW and Mixer pumps protection against getting stale. It is about periodical turning on (every 167h for several seconds). It protects pumps against stopping due to accumulating residue on boiler. That is why during pause in using a boiler, power supply of a controller should be disconnected. Function is realized also during deactivated controller (on keyboard press "Boiler switched off").

17.4 NETWORK FUSE REPLACEMENT

Circuit fuse is positioned inside the controller's cover. The fuse can only be replaced by a person holding proper qualifications and after disconnecting electrical power. Porcelain fuses 5x20mm and time-lag fuses with nominal current 6,3A should be used. In order to take out the fuse unscrew the fuse cover and remove the fuse.

17.5 CONTROL PANEL REPLACEMENT

It is not recommended to replace the panel itself as the program in panel must be compatible with program in other part of the controller.

18. LAMBDA SENSOR λ

Burner efficiency can be increased by connecting additional lambda sensor module. Connect the module according to point 12.6. Lambda sensor is to be activated in:

Service settings → Burner settings → Lambda probe

If parameter *Work with Lambda probe* is set on "ON" then the controller will operate using lambda sensor readings. The amount of air provided to the furnace will be automatically set in such a way to obtain preset amount of air in fumes. If this parameter is set on "OFF" then Lambda Sensor readings will not have influence on controller's operation. Amounts of air for given burner power are set in:

Boiler settings → Power modulation

Description of remaining parameters related to Lambda sensor: Parameter *Range of blowing correction scope* sets permissible scope of variability of airflow power by work using lambda sensor. Parameters *Dynamics* and *Reaction time* have influence on regulation time of air amount in fumes to preset amount and on stability of air in fumes. It is not recommended to change these parameters if regulation time and stability of keeping preset amount of air on required level.

Periodical calibration of Lambda sensor readings can be necessary. To conduct Lambda sensor calibration it is necessary to extinguish the boiler. To make a successful calibration the furnace in boiler must be completely extinguished. To start up the calibration use the parameter:

Boiler settings → Lambda probe calibration

Calibration process lasts approximately 8 minutes.

19. POSSIBLE FAULTS DESCRIPTION

Symptoms	Tips
There are no signs of operation of device despite connection to the network.	Check: ▪ If line fuses are not blown, replace if necessary ▪ If the wire connecting panel with the executive module is plugged correctly and if module is not damaged.
On the screen of the Room Control TOUCH controlling panel appears: "initializing" after which screen is reset.	Check: ▪ Check if the wires have required profile in accordance to point 12.18. The symptom indicates decrease in voltage below critical value.
Preset boiler temperature on the display is different from the required one.	Check: ▪ If in this time the HUW silo is not loaded and if preset temperature is set above the preset boiler temperature. If so then the difference in readings will disappear after heating the HUW silo or reduce the preset HUW temperature. ▪ If time periods are activated – then deactivate time periods.
CH pump is not working.	Check: ▪ If boiler exceeded temperature above parameter *temperature of activating CH pump* – wait or reduce value of this parameter. ▪ If *HUW priority* is activated which blocks CH pump – deactivate priority be setting *HUW pump operation mode* on *No priority,* ▪ If CH pump is damaged or blocked.
Fan is not working.	▪ Check if plug jumper is installed for the limiter of safety temperature STB on terminals 1-2, (the jumper should only be installed only in case when temperature limiter is not connected). ▪ If producer of the boiler has equipped it with temperature limiter STB with manual return to original position, it should be unlocked by untwisting the cover and twisting the button according to documentation of boiler producer, ▪ Check the fan and replace it if necessary.
Additional feeder is not working (module B).	▪ Check if feeder wires are correctly connected to terminals, ▪ Check if there is a jumper on terminals 1-2 of module B, ▪ Check if feeder engine is not damaged, ▪ In case when engine work can be heard and fuel is not provided check the feeder with its user manual.
Fuel feeder is not working / does not provide fuel	▪ Check if feeder wires are correctly connected to terminals, ▪ If temperature limiter STB is connected to terminals 1-2, then check if the circuit is not cut off due to boiler overheating, ▪ Check if feeder engine is not broken or damaged, ▪ In case when engine work can be heard and fuel is not provided check the feeder with its user manual.
Fuel is not burnt off completely, there are not burnt remnants in ashes. Fuel burns with big amount of smoke, burner fades	▪ Check settings *power modulations* in: menu → boiler settings → power modulation.
Temperature is not measured correctly.	▪ Check if there is a good thermo contact between the temperature sensor and measured surface, ▪ Check if sensor wire not goes too closely to network wire, ▪ Check if sensor is connected to terminal, ▪ Check if sensor is not broken – check with point 12.9.

In HUW pumps mode = SUMMER heaters are hot, boiler is overheated.	▪ Increase value of parameter *Prolongation of HUW work* to cool off the boiler.

HUW pump is not working, even if HUW silo is loaded	▪ Set the parameter *Prolongation of HUW work = 0*
In hydraulic installation with mixing valve and servomotor – mixer is not opening.	▪ The cause may be HUW silo loading when HUW priority is activated. Wait until HUW is loaded or activate the HUW priority. ▪ The cause may be active function SUMMER. ▪ The cause may be activation of function return protection (menu – service settings – boiler settings – return protection). If function return protection is activated – check if return sensor of water return to silo is isolated thermically from surroundings. By usage thermoleading paste improve thermal contact of the sensor with pipe. Improve preset temperature of the boiler to ensure power for heating returning water. Check if hydraulic installation is correctly made, after closing the valve, return temperature must increase above value of parameter *Minimum temperature of return*. ▪ The cause may be calibration of mixer valve, wait until calibration is finished. Active calibration is marked "CAL" in menu INFORMATION.

20. CONTROLLER CONFIGURATION BY BOILER PRODUCER

The producer of boiler / burner should adjust program parameters in controller to given type and power of the burner. The most important parameters are those related to Firing up, Operation and Burning off. The controller is able to change the default settings depending on power and type of the burner. Default settings for given boilers / burners should be consulted with Company PellasX. In order to load new parameters go to **Menu – service settings – [special password]** and choose proper boiler/burner. Default settings can also be loaded by special software provided by Company PellasX.

CHANGES REGISTER:

P R O D U C E R
PELLAS X Sp. z o.o. Sp.k.
Poland, 64-920 Piła
ul. Szybowników 39/10
tel.: +48 67 213 80 40
NIP: PL764-266-44-90
info-en@pellasx.eu
www.pellasx.eu