INSTALLATION INSTRUCTIONS

CONVERSION KIT

FOR COMBI BOILERS

with ecoMAX860 controller

BLAZE HARMONY s.r.o.
Trnávka 37, 751 31 Lipník nad Bečvou
Czech Republic
E-mail: prodej@blazeharmony.com
www.blazeharmony.com



As this manual is only a supplement to the boiler manual and the controller manual, it is therefore necessary (in addition to the instructions in this manual) to follow the above mentioned instructions!



Before starting any installation work related to the installation of the conversion kit to the boiler, it is absolutely necessary to disconnect the mains power supply and make sure that no terminals and electrical wires are live. Risk of electric shock!



The installation of the conversion kit, including its electrical wiring, must be carried out by a qualified person in accordance with local regulations.



The manufacturer accepts no liability for damage caused by failure to follow these instructions.

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1 Using the conversion kit

This set is designed for conversion of gasifying boilers BLAZE GREEN, BLAZE PRAKTIK or BLAZE HARMONY burning only wood chunks to the variant of combined boilers BLAZE GREEN COMBI, BLAZE PRAKTIK COMBI or HYBRID BIOMASS, which can burn wood pellets in the rotary burner.
The control of the boiler itself and the entire heating system is provided by the ecoMAX860 controller, including automatic switching from burning lump wood to burning wood pellets.

2 Completeness check of the conversion kit

a) Check for any hidden damage that may have occurred during shipping even though the conversion kit packaging was not damaged. If damage is found, please send the information together with photo documentation to the e-mail immediately: prodej@blazeharmony.com

b) Check the contents of the conversion kit package:
   - Lower door
   - PX burner
   - PX burner flange
   - Sealing insulation of the burner
   - Burner gasket
   - Buckle (2 pcs)
   - Module P of the ecoMAX 860 controller including connecting cable with module A
   - Connecting cable between burner and regulator
   - Feeder to controller connection cable
   - U-shaped handle (6 pcs)
   - SD card with software
   - Operating and installation instructions for BLAZE GREEN COMBI, BLAZE PRAKTIK COMBI or HYBRID BIOMASS
   - User manual for the ecoMAX 860DP controller
   - Service book for PX burner
   - Switchboard for LAMBDA module (if the boiler is equipped with lambda probe)

3 Boiler location in the boiler room

The boiler must be installed within the conversion to the COMBI variant in such a way that the requirements of the ČSN 06 1008 standard - Fire safety of thermal equipment are met.

There must be a minimum clearance around the boiler (see Figure 1) for operation, maintenance or servicing.

To facilitate access to the control unit, it can be mounted from the rear wall of the boiler to the side wall or to the boiler room wall.

The boiler shall be placed on a non-combustible, thermally insulating base, extending at least 300 mm beyond the front of the boiler and at least 100 mm beyond the other sides.

The minimum permissible distances of the outer contours of the boiler from combustible materials (see EN 13501-1) must be at least 400 mm. Objects made of combustible materials must not be placed on the appliance and at a distance less than the safe distance from it.

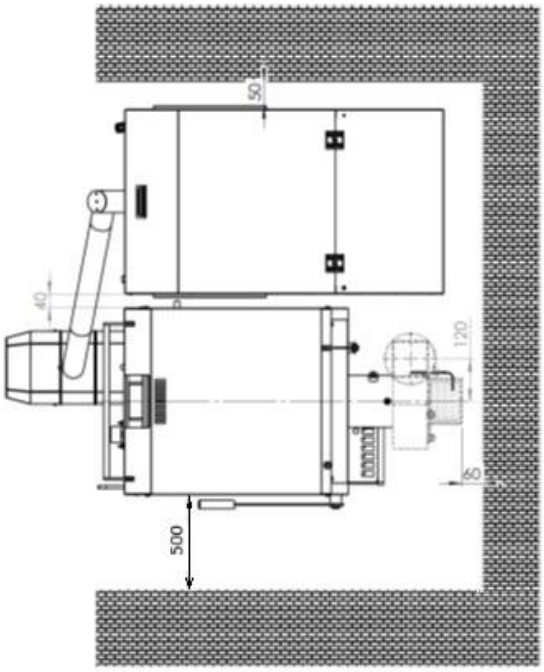


Image 1. Minimum dimensions for boiler placement

4 Pellet burner installation procedure

4.1 Replacing the boiler bottom door

a) <u>Dismantling the original door</u>

- Remove the boiler front cover (be careful not to damage the door sensor!).
- Open the bottom door fully.
- Lift the door upwards (1) and slide it off the top hinge. Swing outwards (2) and remove from the bottom hinge (3).



Image 2. Disassembly of the boiler bottom door (illustration photo)

b) Installation of new door (with opening for pellet burner)
   - Fitting the new door follows the opposite procedure.
   - First, slide the bottom hinge of the door, fold the door upright and slide the top hinge onto the hinge.

c) Changing the door opening, fine-tuning the hinges
   - If it is necessary to reverse the orientation of the door, the hinges must be adjusted so that the door seals properly.
   - The leak test can be done by inserting a paper between the door and the frame on the boiler. When the door is closed, the paper must stick, it must not be able to be pulled out.

4.2 Installing the burner on the door

The procedure for installing the pellet burner on the bottom door is shown in Figure 3.

- Insert sealing insulation (2) into the front cut-out of the door (1).
- Slide the spacer flange (3) onto the bolts in the door and secure with the M8 extension nuts (4).
- Screw the buckles (5) onto the spacer flange (3). These are included in the accessories.
- Attach the burner seal (6) and burner (7) to the spacer flange (3) and secure it against movement with buckles (5) on both sides of the burner.

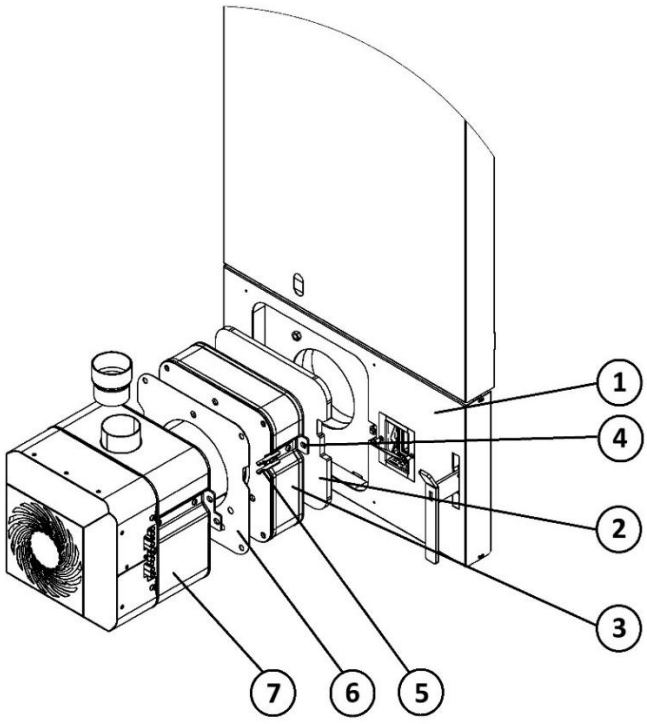


Image 3. Installation of the pellet burner in the boiler door

Where: 1 - bottom door of the boiler
2- sealing insulation
3 - spacer flange
4 - extension nut M8
5 - buckle
6 - burner gasket
7 - burner

4.3 Installing and connecting the P module

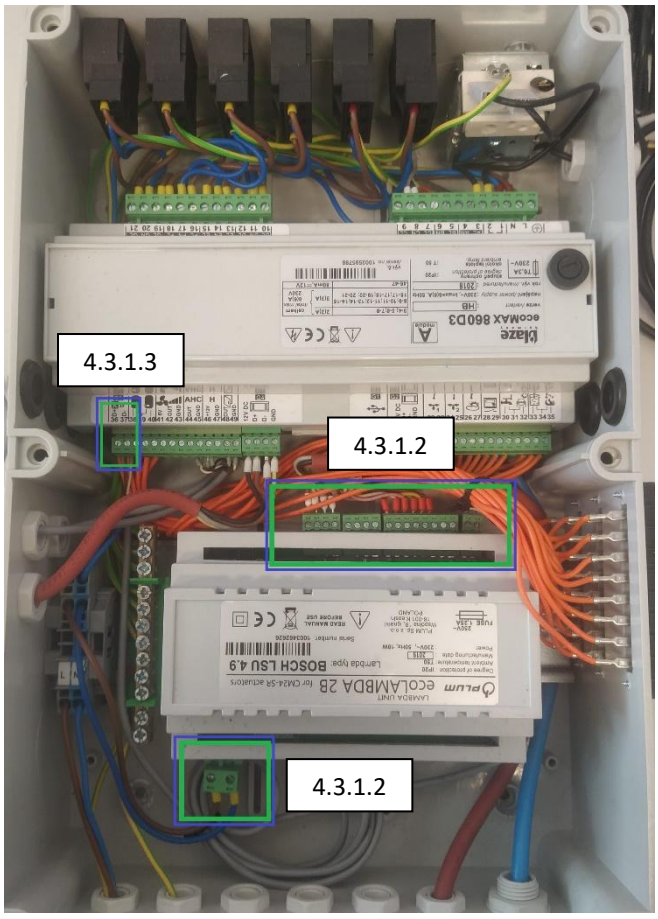
In order for the ecoMAX860 controller to be able to control a pellet burner in addition to burning lump wood, it must be equipped with the P add-on module.

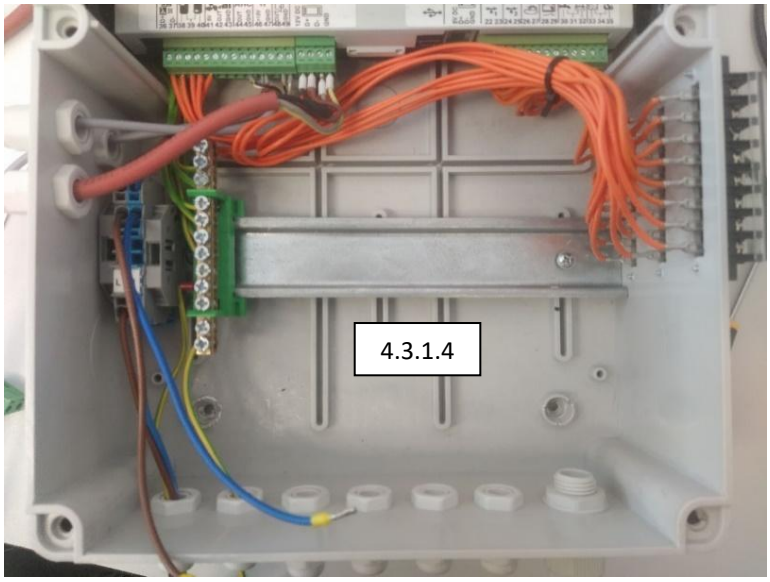
4.3.1 Removing the LAMBDA module from the substation

This chapter applies only to boilers with lambda sensor. For a boiler without a lambda probe, see chapter 4.3.2.

4.3.1.1 Unscrew the plastic screws from the distributor cover.
4.3.1.2 Disconnect all wires from the LAMBDA terminals.
4.3.1.3 Disconnect the grey signal cable from module A (terminals 36-37).
4.3.1.4 Remove the LAMBDA module from the DIN rail.
4.3.1.5 Slide the cable from the lambda sensor and the red actuator cable out of the grommets.









Images 4. Removing the LAMBDA module from the substation

4.3.2 Installation and connection of the P module to the substation

4.3.2.1 Install module P on the DIN rail in the control panel next to module A.

4.3.2.2 Pull the grey 10-core burner cable through the PG11 grommet.

4.3.2.3 Connect the power wires (brown, blue, yellow-green) to the terminal block.

4.3.2.4 Connect the grey signal cable (to the existing orange wires).

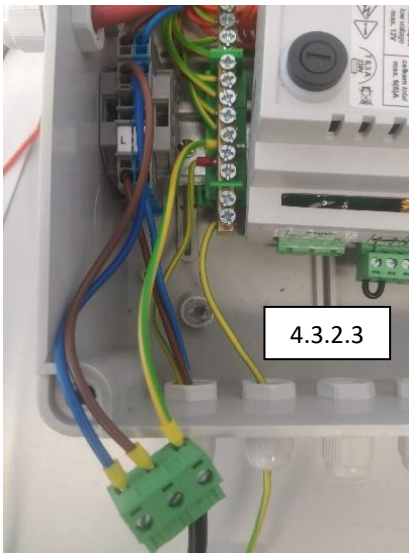
Gray signal cable conductor:	Number of the terminal in the controller:
Brown	36 D+ (module A)
White	37 D- (module A)
Brown	G1 RS485 D+ (module P)
White	G1 RS485 D- (module P)

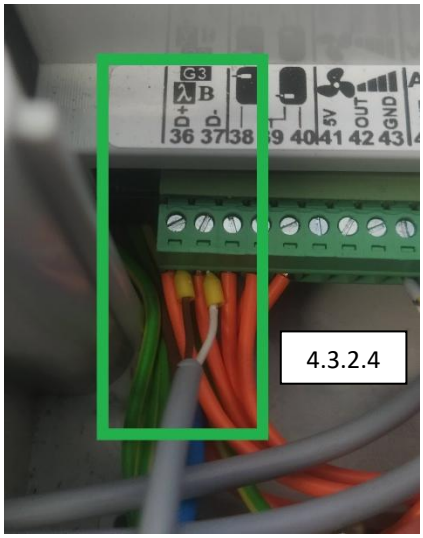
4.3.2.5 Connect the orange jumper wire. (On module A, it connects to the existing orange wire.)

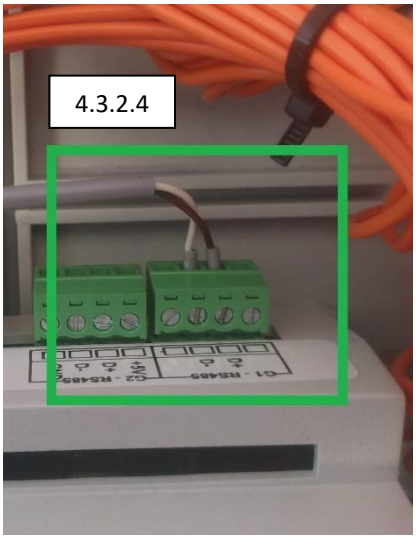
Interconnecting wire:	Number of the terminal in the controller:
Orange	16 (module P)
Orange	31 (module A)

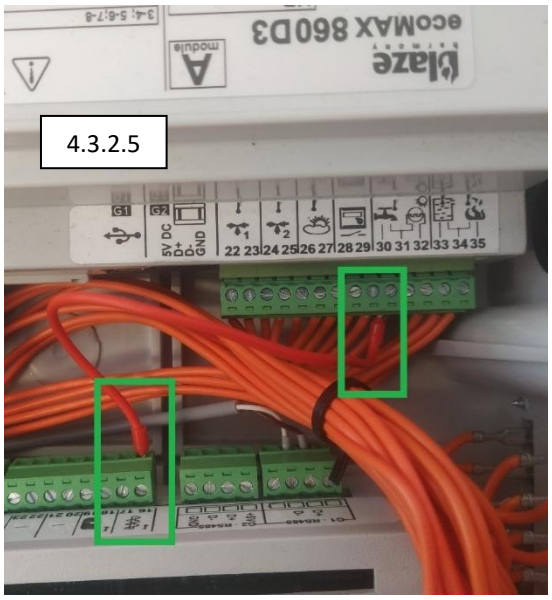
4.3.2.6 Connect the grey 10-core burner cable according to the diagram - see chapter 4.4.











Images 5. Installation and connection of the P module to the substation

4.4 Connecting the burner cable to the controller

The pellet burner is connected to the regulator by one 10-wire signal cable. This cable provides power to the individual burner elements (push fan, feeder 2, ignition, rotary cleaning drive, optical flame detection sensor and burner temperature safety sensor).

The following table and image 6 define the burner cable connection method:

Burner cable wire number:	Number of the terminal in the controller:	Burner element:
1	5 (module A)	Pressure fan
2	5 (module P)	Ignition
3	42 (module A)	Hall sensor - IN
4	3 (module P)	Rotary cleaning
5	17 (module P)	Burner temperature sensor
6	32 (module A)	Optical sensor
7	43 (module A)	Hall sensor - GND
8	41 (module A)	Hall sensor - 12V power supply
9	6 (module A)	Common zero 230 V
PE	Grounding bridge	Earthing

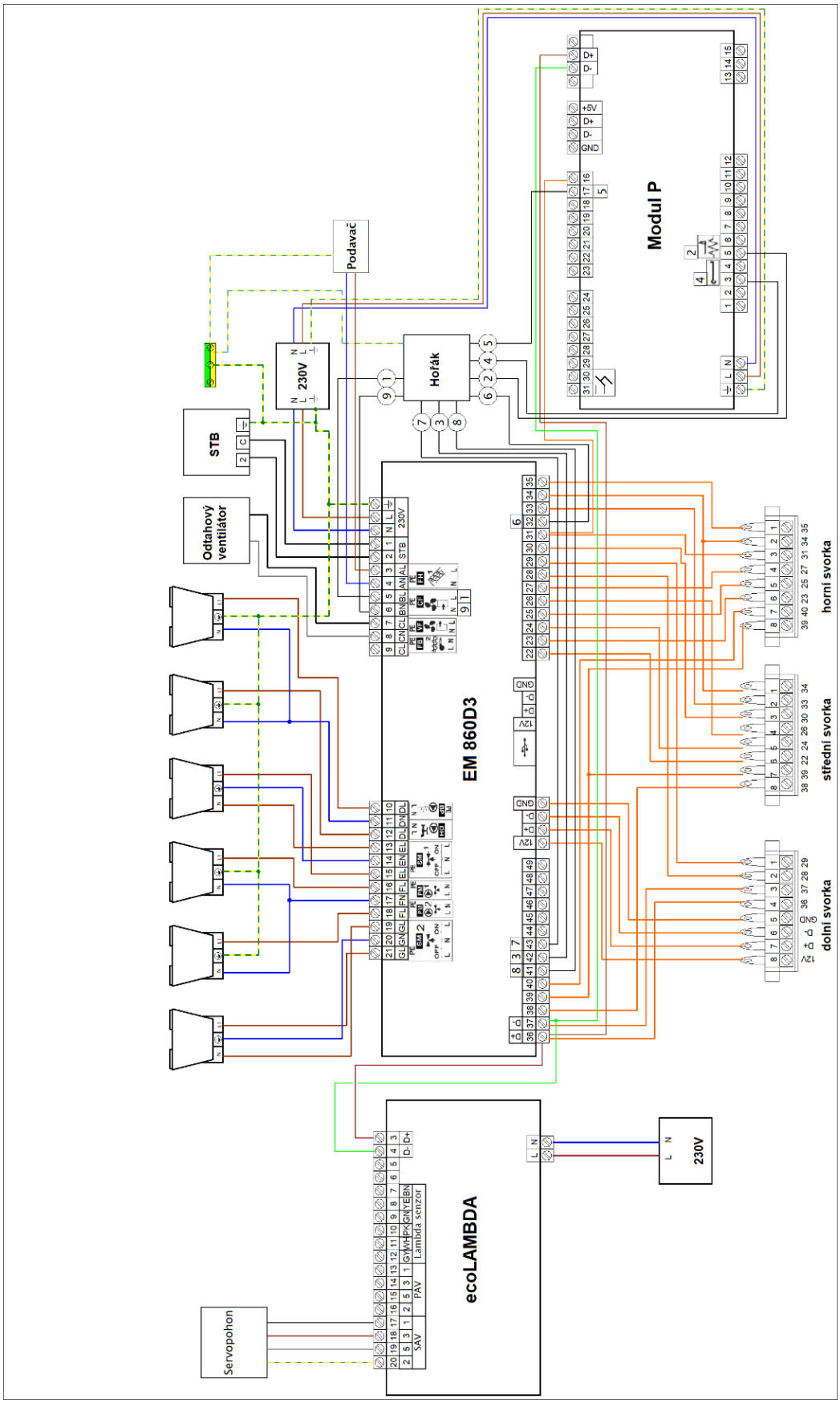


Image 6. Wiring diagram of the burner and feeder signal cable

4.5 Installation and connection of the LAMBDA module to the new substation



This chapter applies only to boilers with lambda sensor.

4.5.1.1 Mount the LAMBDA module on the DIN rail in the new switchboard (supplied as part of the conversion kit).

4.5.1.2 Pull the grey cable of the lambda sensor through the grommet and connect it to the LAMBDA module.

Lambda sensor cable lead:	Number of the terminal in the controller:
Grey	7 (LAMBDA module)
Black	8 (LAMBDA module)
Red	9 (LAMBDA module)
White	10 (LAMBDA module)
Brown	11 (LAMBDA module)
Blue	12 (LAMBDA module)

4.5.1.3 Pull the red cable of the actuator through the grommet and connect it to the LAMBDA module.

Actuator cable lead:	Number of the terminal in the controller:
Black	17/1 (LAMBDA module)
Grey	18/3 (LAMBDA module)
Yellow-green	19/5 (LAMBDA module)
Brown	20/2 (LAMBDA module)

4.5.1.4 Pull the power cable through the grommet and plug it into the LAMBDA module.

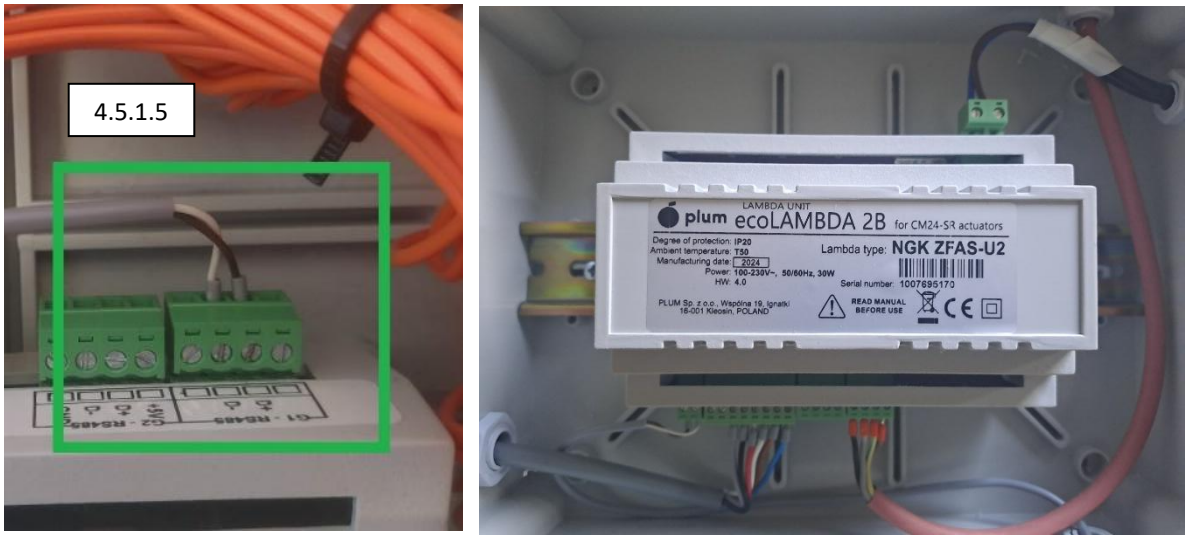
The power cord conductor:	Number of the terminal in the controller:
Brown	L (LAMBDA module)
Blue	N (LAMBDA module)

4.5.1.5 Connect the LAMBDA module and the P module with the grey signal cable.

Signal cable conductor:	Number of the terminal in the controller:
Brown	3 D+ (LAMBDA module)
White	4 D- (LAMBDA module)
Brown	G1 RS485 D+ (module P)
White	G1 RS485 D- (module P)

4.5.1.6 Mount the switchboard with the LAMBDA module on the boiler.

4.5.1.7 Close the distributor with the LAMBDA module with the lid and secure with plastic screws.



Images 7. Installation and connection of the LAMBDA module to the new **substation**

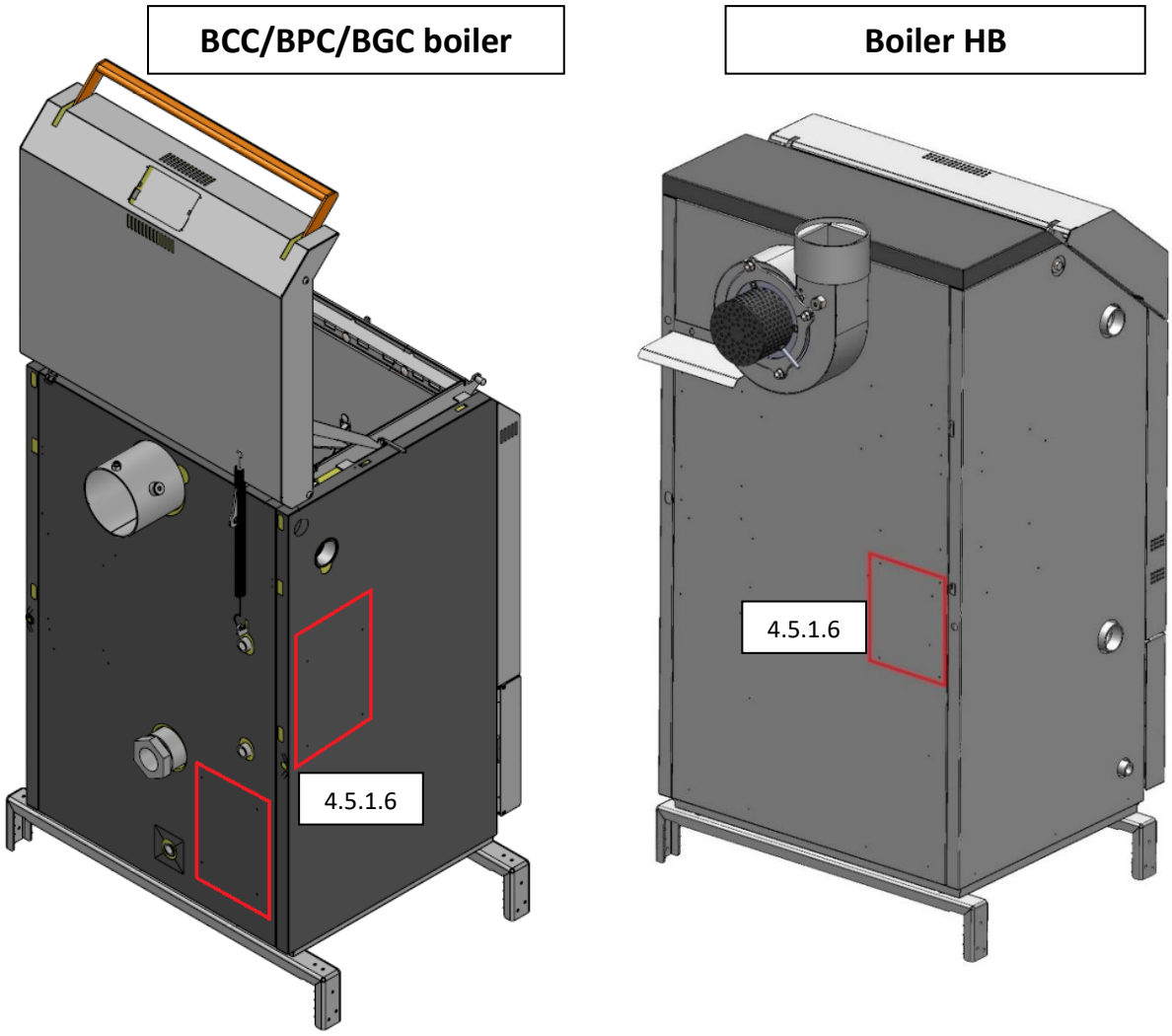


Image 8. Location of the new LAMBDA module switchboard on the boiler

4.6 Connecting the connector to the burner

Connect the 10-pin connector to the burner as shown in Figure 9. Be careful to tuck it properly into the burner all the way in.

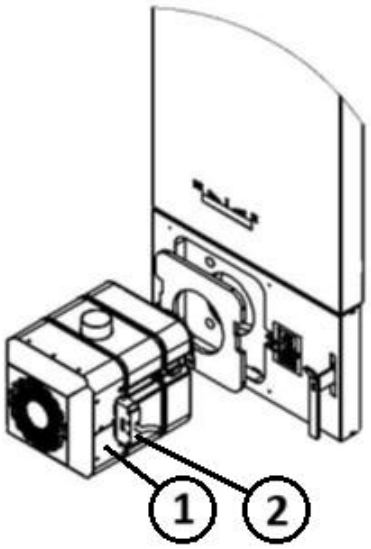


Image 9. Connecting the connector to the burner

Where: 1 - burner
2 - burner connector

4.7 Connecting the fuel feeder cable to the controller

The fuel feeder is connected to the controller by a 3-wire cable. The feeder cable is disconnectable via a PC connector (IEC C14/IEC C13).
The following table and image 6 define the wiring of the fuel feeder cable:

Feeder cable lead:	Number of the terminal in the controller:
Brown	3 (module A)
Blue	4 (module A)
Yellow-green	Grounding bridge

5 Fuel tank with feeder

The fuel tank and feeder are not part of the COMBI conversion kit. It is ordered separately with regard to its required volume and appearance. The following options are available:

- Galvanised hopper (capacity 330 l, 440 l, 820 l or 1200 l)
- Design hopper (volume 370 l)

5.1 Galvanised tray

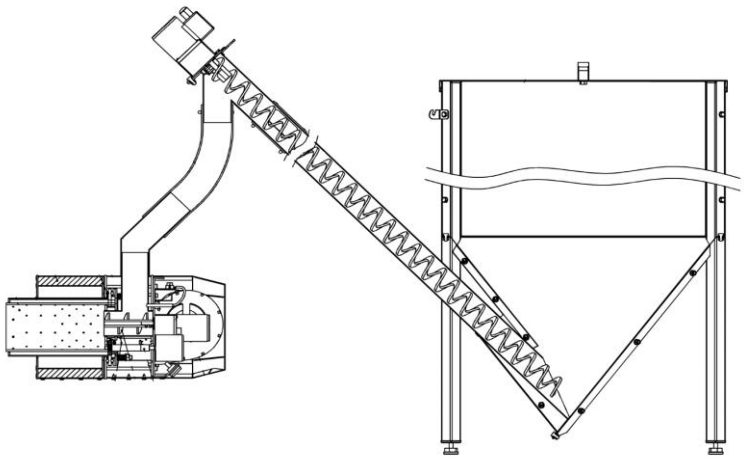
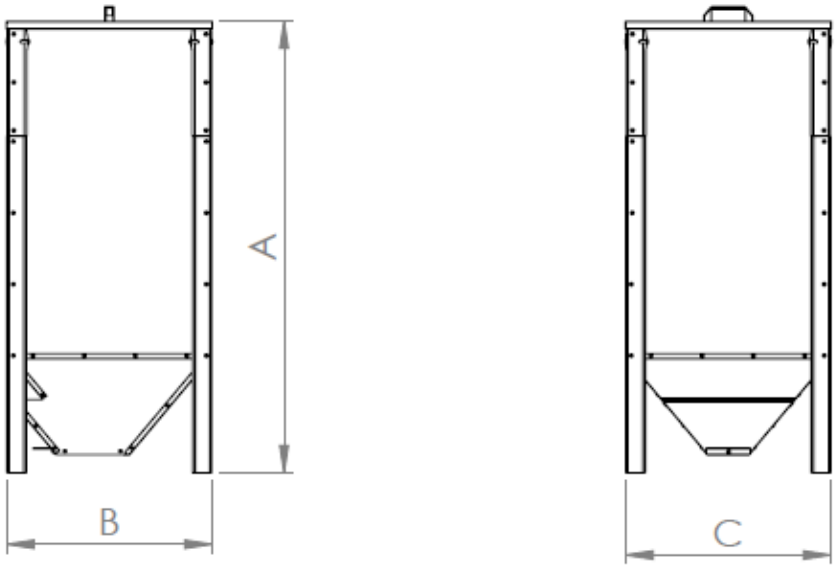


Image 10. Schematic of fuel transport from the hopper to the burner (illustration)

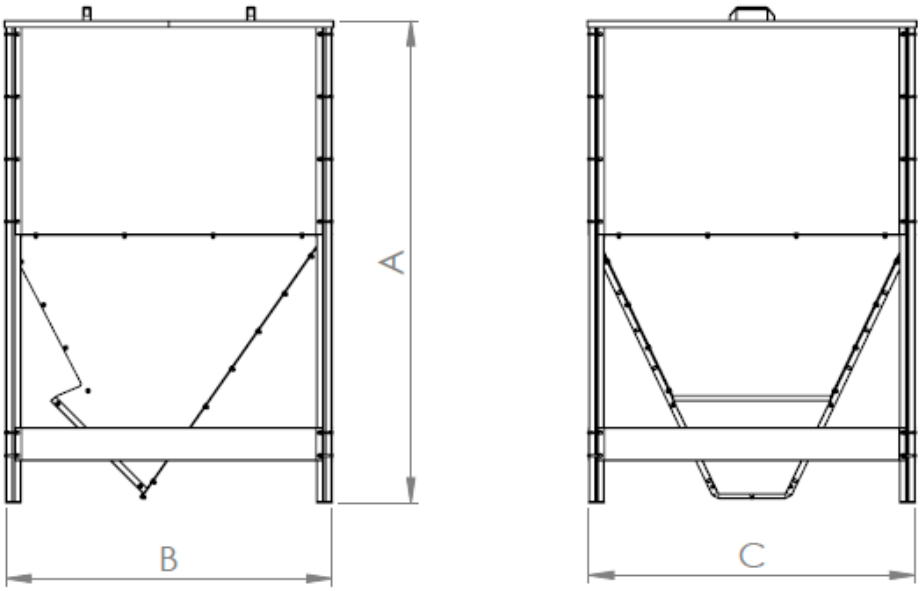
- The angle between the feeder and the floor must be between 30° and 60° (ideally 45°).
- Secure the feeder at the desired inclination via the chain and hooks included in the package. The hooks are attached to the lugs in the tray legs.
- The flexible hose connecting the feeder to the burner must be of such a slope and stretch that the conveyed pellets fall reliably into the burner. If this is not the case, the hose must be shortened proportionally using a sharp knife (the plastic part of the hose) and a pair of cutters (the sealed steel wire in the hose).
- Secure the ends of the flexible hose on the feeder and burner against kinking with metal clips.

Image 11. Basic dimensions of the galvanized 330 l and 440 l storage tank



The volume of the container:	330 l	440 l
A [mm]	1260	1385
B [mm]	575	635
C [mm]	575	635

Image 12. Basic dimensions of the 820 l and 1200 l galvanized storage tank

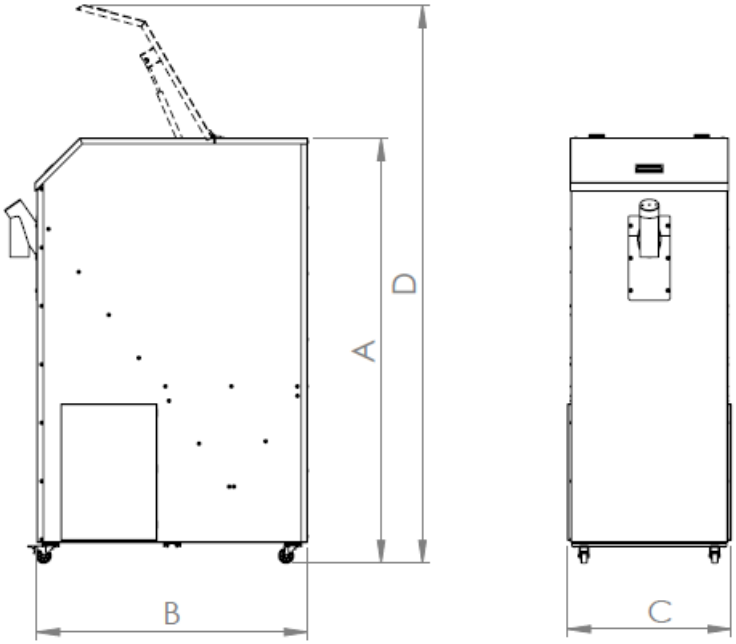


The volume of the container:	820 l	1200 l
A [mm]	1457	1870
B [mm]	995	995
C [mm]	995	995

5.2 Design hopper 370 l

- The flexible hose connecting the feeder to the burner must be of such a slope and stretch that the conveyed pellets fall reliably into the burner. If this is not the case, the hose must be shortened proportionally using a sharp knife (the plastic part of the hose) and a pair of cutters (the sealed steel wire in the hose).
- Secure the ends of the flexible hose on the feeder and burner against kinking with metal clips.

Image 13. Basic dimensions of the 370 l design tank



The volume of the container:	370 l
A [mm]	1420
B [mm]	905
C [mm]	545
D [mm]	1970

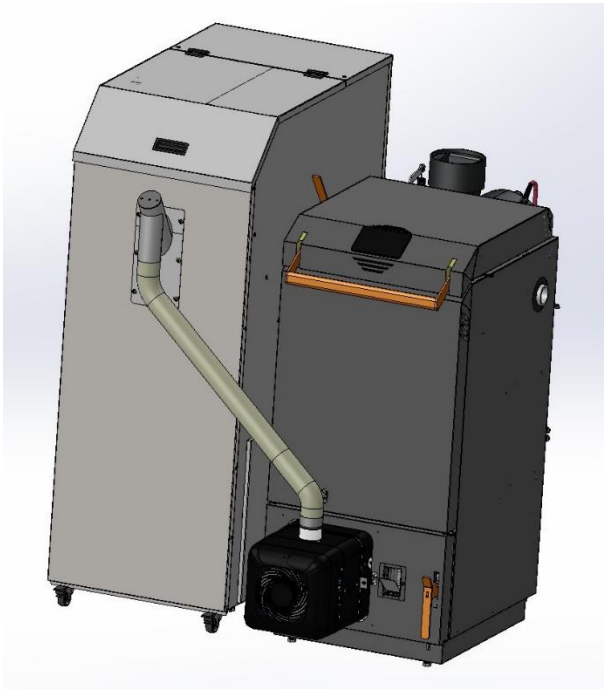


Image 14. Overall view of the COMBI boiler with design tank (370 l)

6 Activities before the first start-up

Connect the boiler to the mains. The controller display shows *"Boiler off"* and the current time.

6.1 Installing new software via microSD card

- A microSD card containing the relevant software (file for module A + file for the panel) is included.
- It must be updated according to the following procedure:
    - There is a port for inserting a microSD card at the bottom of the display.

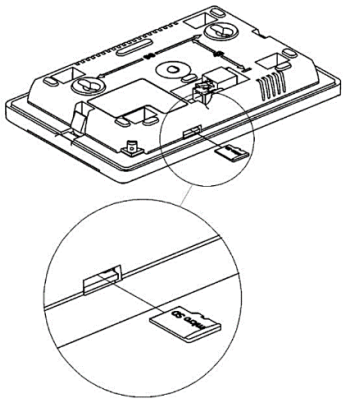


Image 15. Inserting a microSD card into the panel

- When the card is inserted into the display, the software update should load automatically. If not, select: ***Menu - General Settings - Software Update***.
- The first thing to do is to update Module A. When the update is complete, the message *"Update successful"* will appear.
- The following is a panel update.
- If an error occurs after the update, please repeat the update. If it occurs only at the panel, install only the software on the panel.
- SW playback is done only on Module A and Panel!
- In the service menu (password 0000) select *"Restore factory settings"*.
- After restoring the factory settings, it is recommended to restart the controller by unplugging it and plugging it back in.
- After the complete installation it is necessary to select the correct type and output of the COMBI boiler via the service menu (password 4096) - see the following table.

Type of installed boiler:	Manufacturer's choice:	Choice of boiler type:
BGC18	BLAZE GREEN	BCC15
BGC26	BLAZE GREEN	BCC25
BGC33	BLAZE GREEN	BCC33
BPC25	BLAZE HARMONY	BPC25
BPC40	BLAZE HARMONY	BPC40
BCC15	BLAZE HARMONY	BCC15
BCC20	BLAZE HARMONY	BCC20
BCC25	BLAZE HARMONY	BCC25
BCC30	BLAZE HARMONY	BCC30
HB12 LAMBDA	BLAZE HARMONY	HB12
HB18 LAMBDA	BLAZE HARMONY	HB18
HB25 LAMBDA	BLAZE HARMONY	HB25
HB33 LAMBDA	BLAZE HARMONY	HB33

- The software update is now complete.

6.2 Activation of the pellet burner

- Enter the service menu (password 0000): ***Service settings -> Pellet burner*** and select "***ON***" to activate its use.
- It is also recommended to activate the automatic changeover function from burning lump wood to burning wood pellets. It is set in the service menu (password 0000).
- Finally, adjust the ***Flame Detection*** parameter from the original value of 5% to the new value of 20%. This is set in the service menu (password 0000): ***Service Settings -> Burner Settings -> Ignition -> Flame Detection***.

6.3 Filling the fuel feeder with pellets

- Remove the flexible pipe with the connecting metal sleeve from the burner and place it in the prepared container.
- Enter the menu: ***Service Settings -> Manual Control -> Feeder***
- Activate this function and wait until the feeder is completely filled with pellets.
- Once the entire feeder is full, keep the feeder running for another 2-3 minutes to ensure that the feeder is actually full.
- Put the flexible pipe with the connecting metal sleeve back on the burner.



ATTENTION! Complete filling of the feeder with pellets is necessary for successful ignition of the pellets in the burner. Manual filling of the external feeder must be carried out before the first start-up or if the last operation completely emptied the hopper.

6.4 Fuel feeder calibration

- Before starting the calibration, make sure that the external feeder is properly filled with pellets - see chapter 6.2.
- Remove the end of the flexible pipe with the metal sleeve from the burner and place it in a suitable container.
- Enter the menu: ***Menu -> Boiler Settings -> Settings - Pellet Burner -> Feeder -> Feeder Performance Test***
- Start the test by selecting START. The feeder test takes 6 minutes. During this time the pellets are fed continuously. At the end of the test, the feeder switches off automatically.
- Weigh the net (!!!) weight of the pellets that the feeder delivers to the container during the test.
- Enter the menu: ***Menu -> Boiler Settings -> Settings - PELET BURNER -> Feeder -> Fuel weight for performance test*** and enter this data here.
- Put the free end of the flexible hose back on the burner.



Failure to consistently calibrate the fuel feeder according to these instructions may result in improper boiler operation. A different quantity of pellets than required will be delivered to the burner.



Calibration of the fuel feeder must be carried out each time before using a new type of pellets or after changing the inclination of the feeder from the hopper.



For a detailed procedure and more information on calibrating the fuel feeder - see the controller operating instructions (separate document).

6.5 Fan power setting

The fan power setting is done in:

Menu -> Boiler Settings -> Settings - Pellet burner

- The fan power is adjustable for 3 levels: minimum, medium and maximum burner power.
- The fan parameters are factory preset, but depending on the type of stack, pressure losses, etc., these settings sometimes need to be fine-tuned.
- The ideal solution for a given installation is to adjust the fan using a flue gas analyser (by measuring CO emissions).
- Another method can be a visual test, where the colour of the smoke leaving the chimney is evaluated during stable operation of the burner (after at least 1 h of burner operation):
    - grey to black - a sign of lack of air during combustion - increase fan power.
    - invisible - the flue gases flying out of the chimney cause air waves - the gas humidity is above the dew point - the fan is set correctly.
    - white - this is the result of vapour condensation, which means that the CO value is low - the fan is set correctly.
- A non-smelly, light yellow flame coming from the combustion chamber of the burner is also a sign that the combustion parameters have been set correctly.

7 Testing flood

- Carry out a test flood.

8 Service and maintenance of the burner



The scope and maintenance intervals of the burner are described in detail in the document "Burner Service Book".

9 Disposal of transport packaging

- Take the polyethylene sheeting to the plastic container
- Dismantle and burn the wooden transport pallet

10 Disposal of the boiler at the end of its service life

- Clean and disassemble the boiler into its individual parts
- Take metal parts to a scrap metal collection centre
- Ceramic parts can be disposed of as household waste or used as building material
- Dispose of insulation boards and sealing cords as household waste

BLAZE HARMONY s.r.o.
Trnávka 37, 751 31 Lipník nad Bečvou
Czech Republic
E-mail: prodej@blazeharmony.com, www.blazeharmony.com

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