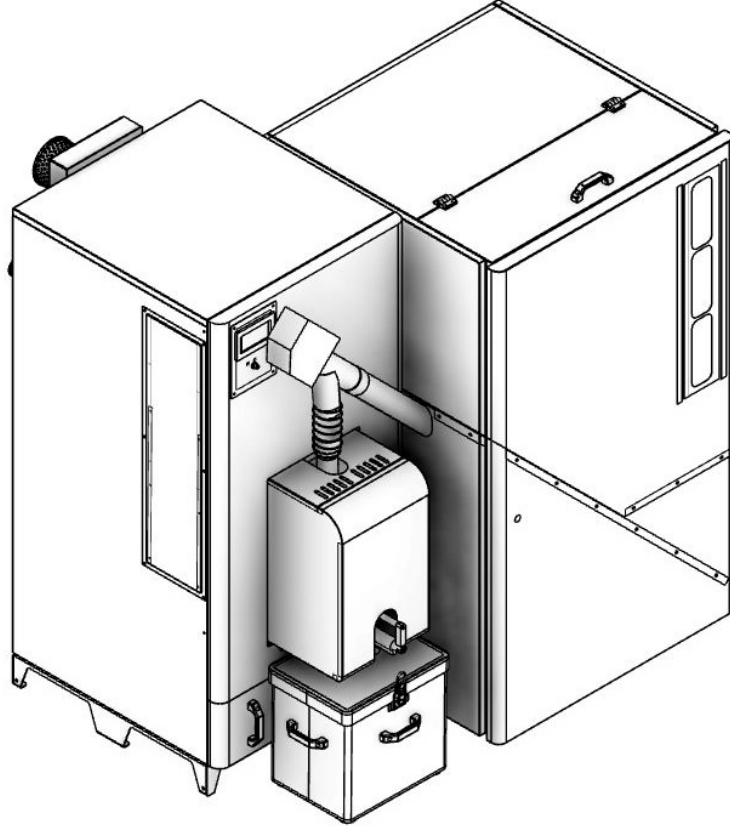




CARIA SERIES FULL AUTOMATIC PELLET BOILER



CP-12, CP-23, CP-40, CP-60, CP-80, CP-100, CP-150

OPERATION, USE AND MAINTENANCE MANUAL  
WITH ADVANCED TOUCH PANEL CONTROLLER

Rev F: August 2020

## CONTENTS

1. INTRODUCTION .....	2
2. WARNINGS AND CAUTIONS .....	3
3. DECLARATION OF CONFORMITY .....	8
4. GUARANTEE AND SERVICE .....	10
5. GENERAL INFORMATION .....	13
6. TECHNICAL SPECIFICATION .....	14
6.1 Main Parts .....	14
6.2 Boiler Specifications .....	16
6.3 Fuel Specification .....	17
6.4 Operating Principles .....	18
6.5 Safety Systems .....	18
7. INSTALLATION .....	20
7.1 Boiler Placement .....	20
7.2 Hydraulic Connections .....	23
7.3 Chimney Connection .....	25
7.4 Boiler Room Ventilation .....	27
7.5 Power Supply and Polarity .....	28
8. FUEL CALIBRATION .....	28
9. CONTROL SYSTEM .....	32
9.1 Controller .....	32
9.2 Touch Panel .....	33
9.3 Main Menu Structure .....	35
9.4 Service Menu Structure .....	40
9.5 Setting the Parameters .....	40
9.6 Timer Schedule (Night Time Function) .....	43
9.7 Function of protecting pumps against stagnation .....	44
9.8 Anti-freezing protection .....	44
9.9 Electrical Connections .....	45
9.9.1 Main Control Unit (Module A) .....	45
9.9.2 Extension Unit (Module B) .....	46
9.9.3 Adding Outside Weather Sensor .....	47
9.9.4 H-Output Connections .....	47
10. START-UP .....	49
11. ALARM CODES & TROUBLESHOOTING .....	50
12. CONNECTING YOUR BOILER TO INTERNET .....	53
13. UPDATING FIRMWARE .....	57
14. MAINTENANCE & SERVICE .....	59
15. DISPOSAL OF THE APPLIANCE (EUROPEAN DIRECTIVE 2012/19 / EU) .....	65
16. COMMISSIONING FORM .....	66
17. GUARANTEE CERTIFICATE .....	67

Dear Customer,

Welcome to the Caria Series family which is product of ARIKAZAN MAK. SAN. TIC. A S. Thank you to considerably contribution leaving clean world for the future by choosing environmentally friendly pellet boiler that help to reach the ideal comfort level thanks to its high efficiency and ease of use.



**DANGER!**  
Risk to life and safety!



**CAUTION!**  
Potentially hazardous situation for product and environment!



**NOTE!**  
Recommendation for users!

## 1. INTRODUCTION

Thank you for selecting the ARIKAZAN MAK. SAN. TIC. A.S Caria wood pellet hot water boiler; this manual must be read carefully before using the boiler for the first time so as to ensure its safe and correct use.

This manual comprises the information concerning the operation, use and maintenance of CARIA "CP" Model hot water boilers with pellet burners. This manual alone is not sufficient for correct installation, operation and use, installers, services and user must obey the rules specified in current EN + current Local norms, current EC directives and current Local codes. This manual gives the supplementary information and precautions.

Keep this booklet near the appliance in a safe place in the boiler room for future reference.

Due to the continuous development in the methods, design and the manufacturing, the contents of this document may change at any time and without prior notice. Producer or distributors do not accept any responsibility for errors or damage of any kind that might be attributed to this publication.

**PLEASE READ THE MANUAL VERY CAREFULLY IN ORDER TO BE ABLE TO OPERATE THE BOILER SAFELY AND WITH HIGH EFFICIENCY FOR A LONG PERIOD.**

## 2. WARNINGS AND CAUTIONS

Ø These safety guidelines should be read before operating the system, to avoid incorrect usage that might lead to personal injury or damage to the system.

Ø This boiler must be installed in accordance with the local and international rules in force, only in a well ventilated and frost-free space, indoor but other than living areas.

Ø All installation, first commissioning, assembly and maintenance, repair, replacement of components must be carried out exclusively by a fully trained, professionally qualified service technician and must conform with this manual and the local codes and requirements of the authority having jurisdiction, or in the absence of such requirements, apply to the EEC directives and European norms (EN).

After commissioning; the repair and maintenance work are under the responsibility of the user and must be done by a qualified service technician.

Ø The boiler should not be used for purposes other than specified in this booklet. Incorrect installation, commissioning or use, can cause a fire or explosion which may result in property damages, personnel injury, or loss of life.

Ø Boiler is designed for hot water operation only (max 80 °C) and the system pressure must be according to the limited operating pressure specified on the boiler name plate (3 bars [43 psig] standard). Heat transfer medium is water.

Ø Boilers must be fired by fuels specified in this manual. Use only those fuels recommended by us - wood pellets pursuant to EN 14961-2, Class A1+ A2 (Ø 6 mm). Only in this way low-emission, economic, and trouble-free operation of your pellet heating system can be ensured. Non-compliance will result in voiding of the guarantee.

Ø Boilers must be fired only by its original burner and screw feeder.

Ø Recommendation: For long burner running times, in order to reduce the start-stop emissions and to reduce maintenance costs, the boiler should be fitted with a buffer storage tank, thermos-siphon buffer storage tank or combination storage tank. In practice, buffer capacities between 40 and 75 liters/kW have proven successful. Be sure to take into account the country-specific requirements regarding buffer storage tanks.

Ø This heating boiler is adjustable within an output range of 30% to 100% of the rated output. The units should be operated if possible, in the middle and upper output range (adjusted to the respective heat requirement), in order to avoid unnecessary emissions in low load operation.

Ø If technical changes are undertaken independently, we assume no liability for damages that may result thereof.

Ø Any procedure undertaken by persons other than those authorized by us, and non-compliance with these general considerations and the safety notices described by local standards and/or EN standards, codes and directives, shall result in immediate voiding of any warranty claim as well as the guarantee.

Ø Damaged parts and unit components must be replaced only with original replacement parts.

Ø The generally applicable rules of heating technology must be observed for protection against Legionella.

Ø Please note that you must observe the prescribed servicing intervals during the warranty period!

Ø The mandatory maintenance of the system must be done by authorized technicians at least two times a year but no later than when reaching 1500 hours of operation. If no service is performed, the warranty claim or the warranty is void!

Ø In the course of maintenance work on the pellet heating system, all wear parts are replaced and billed.

Ø Foreign bodies in the fuel can result in damage to the system and guarantee will be void.

Ø If there is no local rules, the regulations pursuant to A-Norm M 7136 (Transport and Storage Logistics) and M 7137 (Pellet Storage Requirement) must be observed.

Ø Properties that require a high degree of security for heat supply (the hotel business, process heating, etc.) are to be equipped with dual boiler and/or dual fuel systems. If this requirement is not met, we will deny any claims for consequential damage based on a faulty heating source. In a biomass heating system, it is essential to take appropriate care (caretaker, porter, etc.) so that the stipulated maintenance tasks are carried out regularly!

When installing, commissioning, operating or maintaining the boiler, it is imperative that warning and cautions as detailed in this section are strictly adhered to.

WARNINGS are used to identify dangers that could potentially cause injury or fatality to technicians or users of the boiler; CAUTIONS are used to identify issues that could potentially cause damage to the boiler or other equipment within the heating system.



#### WARNINGS

THIS USER MANUAL SHOULD BE READ BEFORE OPERATING THE SYSTEM TO AVOID MISUSE THAT MAY CAUSE PERSONAL INJURY OR DAMAGE TO THE BOILER.

ALL INSTALLATION, COMMISSIONING AND MAINTENANCE OF THE BOILER MUST BE CARRIED OUT BY FULLY TRAINED AND QUALIFIED SERVICE TECHNICIANS IN COMPLIANCE WITH LOCAL CODES AND REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION, OR IN THE ABSENCE OF SUCH REQUIREMENTS, TO EEC DIRECTIVES AND EUROPEAN NORMS (EN).

AN APPROPRIATE LIFTING DEVICE MUST BE USED WHEN MOVING THE BOILER; FAILURE TO USE A LIFTING DEVICE MAY CAUSE PERSONAL INJURY OR DAMAGE TO THE BOILER.

INCORRECT INSTALLATION OR COMMISSIONING, OR MISUSE OF THE BOILER MAY CAUSE FIRE OR EXPLOSION, AND IN TURN DAMAGE TO PROPERTY, PERSONAL INJURY OR LOSS OF LIFE.

THE MAIN POWER SUPPLY MUST BE CUT OFF BEFORE CARRYING OUT SERVICES OR MAINTENANCE WORKS. ELECTRICAL COMPONENTS AND COVERS MAY ONLY BE REMOVED BY FULLY TRAINED AND COMPETENT TECHNICIANS. FAILURE TO DO SO MAY CAUSE PERSONAL INJURY OR LOSS OF LIFE.

THE BOILER MUST NOT BE OPERATED BY CHILDREN.

THE ELECTRICAL INSTALLATION MUST COMPLY WITH BS 7671-2008. FAILURE TO COMPLY WITH THE REQUIREMENTS FOR ELECTRICAL INSTALLATIONS

THE ELECTRICAL INSTALLATION MUST COMPLY WITH *CEC* (Canadian Electrical Code). FAILURE TO COMPLY WITH THE REQUIREMENTS FOR ELECTRICAL INSTALLATIONS MAY CAUSE PERSONAL INJURY OR LOSS OF LIFE, OR DAMAGE TO THE BOILER PLANT AND EQUIPMENT.

WE RECOMMEND THAT A SUITABLE BS5839 COMPLIANT FIRE EXTINGUISHER, E.G. DRY POWDER WITH LABELLING AND IDENTIFICATION, BE LOCATED ADJACENT TO THE BOILER.

IN THE EVENT OF A FIRE, FOLLOW LOCAL PROCEDURES (WITH LOCAL RISK ASSESSMENTS TO BE COMPLETED BY THE CLIENT). IF POSSIBLE, ATTEMPT TO ISOLATE THE BOILER FROM THE ELECTRICAL SUPPLY; DO NOT ACCESS THE BOILER UNDER ANY CIRCUMSTANCES UNTIL THE SITUATION IS UNDER CONTROL AND AN ASSESSMENT HAS BEEN COMPLETED BY A SUITABLY QUALIFIED PERSON.

IF THE BOILER LOCKS OUT FOLLOWING A HIGH TEMPERATURE ALARM, AS INDICATED ON THE BOILER CONTROL PANEL, DO NOT INITIATE A MANUAL RESET UNTIL THE RESET INSTRUCTIONS HAVE BEEN FOLLOWED.

DO NOT TOUCH THE FLUE GAS EXIT AND FLUE BOX WHEN THE BOILER IS IN OPERATION; THESE COMPONENTS OPERATE AT HIGH TEMPERATURES AND MAY CAUSE PERSONAL INJURY.

DO NOT OPEN ANY OF THE ASH BOXES, BOTTOM DOORS, OR REMOVE ANY ACCESS PANELS WHILE THE BOILER IS IN OPERATION. EXPOSURE TO HOT FLUE GASES, SPARKS AND DUST PARTICLES MAY CAUSE A FIRE, PERSONAL INJURY OR DAMAGE TO LONG-TERM HEALTH.



## WARNINGS

BEFORE MAINTENANCE OR CLEANING PROCESS ELECTRICAL CONNECTION OF BOILER MUST BE CUT OFF.

BEFORE CARRYING OUT MAINTENANCE OR CLEANING WAIT AT LEAST 2 HOURS FOR THE BOILER TO COOL DOWN OR UNTIL THE BOILER TEMPERATURE IS BELOW 40°C BEFORE OPENING THE CABINET DOOR. THESE COMPONENTS OPERATE AT HIGH TEMPERATURES AND MAY CAUSE PERSONAL INJURY.

WHEN PERFORMING MAINTENANCE, ALWAYS WEAR IMPACT PROTECTION GOGGLES (NOT WRAPAROUND GLASSES), OVERALLS, STOUT SHOES/BOOTS, HIGH TEMPERATURE GLOVES, DUST MASKS AND ALL OTHER PERSONAL PROTECTIVE EQUIPMENT (PPE) AS PER LOCAL RISK AND METHOD STATEMENTS BY CLIENT

FLAMMABLE LIQUIDS OR GASES MUST NEVER BE USED IN THE COMBUSTION CHAMBER. USE OF FLAMMABLE LIQUIDS OR GASES MAY CAUSE FIRE OR EXPLOSION, AND IN TURN DAMAGE TO PROPERTY, PERSONAL INJURY OR LOSS OF LIFE.



## CAUTIONS

The location and the installation of the boiler, plant and equipment is the responsibility of the designer. The boiler is designed to be located within an interior location, a dedicated plant room. The boiler is not designed for domestic internal use in living areas.

The designer of the installation will be responsible for the location of the boiler plant and equipment compliant with all regulations applicable, for its type and use.

The boiler must not be installed where flammable vapors and materials or high levels of dust or halogenated hydrocarbons (e.g. spray can propellants, cleaning agents) are present. The boiler must be installed on a suitable surface.

There must be access or potential for access to outside air in the boiler room, such as a fixed opening must be provided and must be open always. Never obstruct the ventilation openings to the boiler room for a safe and efficient operation. For proper combustion, the boiler needs continuous fresh air supply. (min. 300 cm<sup>2</sup>). Please refer to CSA B365 that provides information on air for combustion and ventilation.

The boiler flue system will be designed to meet the current regulations and compliant with EN 1856 – 1: 2009. The appliance type B22 must ensure the flue has an adequate min draught of -2 to -8 Pa without any leakage to the boiler room. Installation of a carbon monoxide detector is recommended. Attachment of the boiler to the flue must be carried out by an authorized technician. There will be a requirement for the design to be submitted for planning on almost every installation, this will be the responsibility of the client and designer. The chimney system used must be listed to the ULC S629 requirement. This boiler is equipped with an exhaust fan that can create positive pressure in the venting system if the natural draft of the system is poor.

Another important requirement is that the chimney and connecting pipe need to be insulated for safety and to prevent condensation and a reduction in the draft caused when the gas in the chimney cools too much.

It is essential that an appropriate pump is fitted in the circulation system which must be kept in operation at all the times when the boiler in use. The system must be designed to include a shunt pump and primary heating pump(s) (designed by others); a flow rates, pressure drops, and ventilation table in Section 6 is provided as “Technical Information” in this manual.

Do not use any radiant floor heat tubing that does not have an oxygen barrier otherwise you must use a heat exchanger between the hard piping of the boiler and the radiant floor heat tubing.

Do not use self-contained non-electric zone valves on the main heating zone as it is to be used as the overheat/dump zone. Such a valve would prevent the overheat control from cooling the boiler when necessary. Do not to store fuel within the appliance installation clearances or within the space required for fueling, ash removal, and other routine maintenance operations



Standard operational procedures will apply for restarting under power failure, as where consideration is given for back-up power, this should not only include the boiler but all associated equipment.

A backup power supply such as a UPS (battery-based Uninterruptible Power Supply) is required to operate the primary loop pump and dump zone valve if it is of the electrically operated variety.

On completion of the installation, the boiler must be commissioned by a QMRE approved technician or an authorized technician approved by the manufacturers.

The service and maintenance required shall also be required to be carried out by a QMRE approved technician or an authorized technician approved by the manufacturers.

The boiler is designed for a low temperature hot water system, operating within the parameters as per the design. Commonly the operating ranges up to 85°C with additional high limit protection.

To protect the boiler against low-temperature corrosion and tar accumulation in the boiler, the end-user should assure return temperature does not reach lower than 55°C. Installing a three-way mixing valve or anti-condensation valve group (load valve for buffer tank) can solve this. If the wood log humidity is higher, higher than 55°C of return temperature can be needed.

The boiler control system devices must be functional and operating within their specified limits. If a device is not functioning, immediately switch the boiler OFF before calling an authorized service technician.

The system water quality must comply with the specifications given in this manual (please refer to section 7.2). Long term water treatment is essential to ensure effective operation and prolonged service life of both new and refurbished heating systems.

The fuel for the boiler shall comply with both the manufacturer's recommendations to meet current standard regulations (EN Plus A1/A2 for all fuel grades). The client is required to keep a record of all fuel procured for the boiler, including the dates and amounts used, and the provider.

The boiler is equipped with an automatic ignition device. Do not try to light the fuel manually. The boiler must be fired only by its original burner and screw feeder.

Do not use the boiler if any part has been submerged in water; immediately call an authorized service technician to inspect the boiler prior to reuse. Do not clean the boiler with water

Do not carry out adjustments or maintenance to the boiler, other than for operations specified in this manual. The parameters of the regulator are all pre-programmed. Do not change any parameter without consulting an authorized service technician.

The boiler must be connected to a heating system with a capacity equal to that of the boiler's output.

In no circumstances can the design of the regulator be modified.

Incorrect selection of the parameters can cause malfunction and serious problems of the boiler (e.g. overheating of the boiler, etc.).

The programmed parameters should only be altered by an authorized service technician.

Keep the regulator out of reach of children.

The electric system in which the regulator operates must be protected by means of a fuse, selected appropriately to the applied loads.

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



Recycle the product and the packaging at the end of the operational use period in an appropriate manner.

When disposing of the boiler all local waste and disposal directives will apply at the time of action.

Do not dispose of the product together with normal waste,

Do not burn the product.

If fans are used in the fuel storage area, they should be installed so as not to create negative pressure in the room where the solid-fuel-burning appliance is located.

All covers plates, enclosures and guards must be maintained in place at all time, except during maintenance and servicing

Keep the firing and ash pit doors closed and maintain seals in good conditions.

When wood is burned slowly, it produces tar and other organic vapors, which combine with expelled moisture to form creosote. The creosote vapors condense in the relatively cool chimney flue of a slow-burning fire. As a result, creosote residue accumulates on the flue lining. When ignited this creosote makes an extremely hot fire. The chimney connector and chimney should be inspected at least twice monthly during the heating season to determine if a creosote buildup has occurred. If creosote has accumulated it should be removed to reduce the risk of a chimney fire. Please refer "MAINTENANCE AND SERVICING" section for cleaning of the unit and chimney system, and the procedure to follow in case of a creosote chimney fire



### 3. DECLARATION OF CONFORMITY

We hereby make the following declaration under our sole responsibility with regard to the appliance trademark CARIA, models CP12, CP23, CP40, CP60, CP80, CP100, CP150 are in conformity with the requirements of the directives that;

- The material used in this appliances have been selected that safety and proper performance of these appliances are ensured and that the materials are resistant to chemical, mechanical and thermal influences to which the appliances will be exposed during their expected service life;
- For gas-carrying parts no soft soldered joints are applied;
- Settings that should not be altered have been sealed;
- Asbestos has not been used in the construction of the boiler;
- The components of the appliance which come into contact with food and/or water used for sanitary purposes do not impair the quality of this food and/or water;
- All components used in the construction of the boiler are CE approved;
- The installation and user's instructions, type plate and packaging inscriptions are translated into the official language of the country of destination, taking into account the national installation regulation of the country concerned;
- The boiler is manufactured in our ISO 9001-2015 registered factory.
- Please check if there is a latest version copy of the boiler and burner manual in the boiler room, if not please leave a copy.
- Boilers must not be installed in areas where inflammable vapors and materials are likely to be present. To avoid damage to the boilers, contamination of the combustion air by high levels of dust or halogenated hydrocarbons (e.g. Solvents, spray can propellants, cleaning agents, adhesives, etc.) must be avoided. The humidity level must not be too high in the pellet burning boiler rooms.
- It is recommended that you have a tested and approved fire extinguisher with the appropriate capacity on hand in the boiler room.



CE Konformitätserklärung

CE Declaration of Conformity

CE Déclaration de conformité

Wir

We Arikazan Makina Sanayi ve Ticaret A.S. - 06800 Ankara

Neus

Erklären in alleiniger Verantwortung, dass die Heizkessel-Reihe

Declare under our sole responsibility that the boiler series

Déclarons sous notre seule responsabilité que le serie des chaudières

Pellet Boilers: Caria CP-12, CP-23, CP-40, CP-60, CP-80, CP-100, CP-150

conform ist mit den Anforderungen der Richtlinie

is in conformity with the requirements of the directives

est conforme aux exigences des directives

Richtlinie Directive Directive	Norm Standard Norme	Bemerkung Remark Remarque
2014/68/EU Pressure Equipment Directive	EN 12953-1, EN 12953-2, EN 12953-3, EN 12953-4, EN 12953-5, EN 12953-6 EN 12953-9, EN 12953-12	-
2014/35/EU Low voltage directive	EN 60335-2-102 EN 60335-2-15	-
2014/30/EU Electromagnetic Compatibility	EN 60730-2-5 EN 60730-2-9 EN 60730-2-6 EN 60730-2-14	-

- No part of boiler contains a material to be known as deleterious.
- The documentation (instructions for operation and installation) delivered together with the product shall be issued in the language of destination country

## 4. GUARANTEE AND SERVICE

Provided that the principles, warnings and standards set out in the operation in this manual and taking into account the national installation regulation of the country (in the absence or of such requirements, they shall be referred to EN norms, directives and codes) are complied with, your boiler shall be under the warranty for a period of 2 (two) years starting from the date of dispatch (from manufacturer) against any faults of material and workmanship.

The certificate of guarantee shall be filled out by seller and the verification of installation and commissioning by a qualified (by the seller) service technician must be filled out and forwarded to seller for warranty purposes.

Wrong installation, maintenance and use will not be covered by guarantee.

The boiler guarantee will be invalid if the boiler waterways and system water pipes are covered with debris, lime and/or carbonate deposits from the system water and/or boiler heat exchanger parts fails because of corrosion caused by the system water.

The minimum service life for these boilers are 10 (ten) years. The producer and the suppliers undertake to provide service and spare parts to the boilers during said period.

The guarantee does not apply for the boiler if it is operated with wood exceeding 20% moisture content or with fuel not prescribed by the manufacturer.

Boiler must be fired by fuels specified in this manual. Use only those fuels recommended by us - wood pellets pursuant to EN 14961-2, Class A1+ A2 (Ø 6 mm). Only in this way low-emission, economic, and trouble-free operation of your pellet heating system can be ensured. Non-compliance will result in voiding of the guarantee.

### Exclusions

Our warranty does not cover every day wear and tear. Additionally, ARIKAZAN MAK. SAN.TIC. A.S. will not accept liability and our warranty will be voided in the event:

- § the boiler has been incorrectly installed, poorly maintained or in any way misused,
- § the control system for the boiler has in any way been interfered with,
- § that waterways and system water pipes to which the boiler is connected contain debris, lime scale or carbonate deposits from the system water,
- § the heat exchanger components for the boiler fail as a consequence of corrosion caused by the system water,
- § the boiler is using a non-prescribed fuel,
- § Any procedure performed by other than those authorized by ARIKAZAN MAK.SAN.TIC.A.S, and any non-compliance with these general terms & conditions and safety notices described below, shall result in refusal of any warranty claim as well as termination of the remaining warranty period for the product.

- (1) An approved installer will be required for the installation; assembly and/or commissioning in order to legitimately commence a valid warranty period.
  - a. The certificate of warranty document will be issued on commissioning from the initial start-up date.
  - b. The verification of installation and commissioning form must be completed by an authorized technician.
  - c. All documentation must be forwarded to ARIKAZAN MAK. SAN. TIC. A.S. for warranty conditions to apply.
- (2) As stated on the commissioning form for the warranty, it must be ensured that the return temperature never drops below 55°C. Fitting of a self-acting control valve is a warranty condition
- (3) The periodical maintenance of the system must be performed at least once a year or no later than the system reaching 1,500 hours of operation. Maintenance must be done by authorized technicians. If regular services are not performed, and or cannot be proven by valid documents, repair costs will be charged, and the warranty will be void.
- (4) Incorrect installation of the system and components will not be covered by this warranty; neither will any effected causes/effects of these failures to the boiler plant. Maintenance should be done by authorized technicians. If installation forms and the system installed do not match in actuality, the warranty will be void.
- (5) The maintenance procedures are as defined in this Manual; if these are not completed and recorded correctly the warranty will be void.
- (6) Warranty will be void if the flue design is non-compliant with EN1856.1: 2009. There must be minimum -2 pa and maximum -8 pa vacuum in the boiler top when the system fan is not working.
- (7) The warranty will be invalid if the boiler and heat exchanger surfaces are damaged and/or do not function properly, because of corrosion by improper water properties / accumulation of debris and/or carbonate deposits in waterways and system water pipes of the system. The requirement for system water values are defined in this Manual.
- (8) The warranty certificate will be issued on completion of the commissioning in accordance with compliance, as per warranty details.
- (9) Low quality of the fuel can damage your system and the environment as well. Use only those fuels recommended by ARIKAZAN MAK.SAN. TIC. A.S. and Caria range of boilers are designed to burn fuel to ENplus A1 grade of 6 mm wood pellet.
- (10) Fuels used outside of this range will result in termination of the warranty. It is essential to ensure that the fuel used is approved by ARIKAZAN MAK. SAN. TIC. A.S.
- (11) If Customer Service intervention is necessary as a result of failure due to poor quality fuel, the user will be charged even if the system is within a valid warranty period. In such cases, the costs for repairing the system will be charged to the user.
- (12) Using fuel which does not comply with ARIKAZAN MAK. SAN. TIC. A. S. will render any claim under warranty void.
- (13) The electrical installation shall be compliant with local norms and/or CEC (Canadian Electrical Code) in respect of limitation of +/- voltages. All voltages outside of these requirements where damage is caused is not covered by this warranty.

- (14) Damaged parts and unit components must be replaced only with original replacement parts. Alternative solutions will render this warranty void.
- (15) The unnecessary calls for service for user failures such as “out of fuel” or “system is not plugged into power” and similar “user induced problems” will be charged to the customer.
- (16) For pellet burning systems, the regulations pursuant to A-Norm M 7136 (Transport and Storage Logistics) and M 7137 (Pellet Storage Requirement) must be followed.
- (17) Facilities that require a high degree of dependence on sustainable heat supply (hotels, hospitals, schools, process heating etc.) should be equipped with dual boiler systems for backup purposes. ARIKAZAN MAK.SAN. TIC. A.S. will not accept any claims for consequential damage based on the design of the overall system and selection of plant.
- (18) The air vents in the boiler rooms must be open at all times. This warranty will not cover damages or service costs due to the insufficient oxygen supply to the boiler due to vents that are obstructed, covered or are not designed adequately.
- (19) If the design of the system in respect of water flow rates are not as per intended design, fitted either with or without buffer consideration and performance, failures of the boiler are not warranted.
- (20) For all boiler installations, all essential mechanical and electrical safety items must be installed to the heating system in compliance with local regulations and standards. ARIKAZAN MAK.SAN. TIC. A.S. shall not be responsible for any damage, loss and any undesired outcomes of such negligence. In such a case, warranty will be cancelled. The boiler is covered by warranty for a period of 2 (two) years beginning from the date of commissioning; the steel body of the boiler is covered by warranty for a period of 5 (five) years from the date of commissioning. The warranty covers any faults of material and workmanship, provided that warnings, cautions, operating and maintenance instructions as specified in this manual have been followed, taking into account applicable national installation regulations (or in the absence of such requirements, EN norms, directives and codes).

## 5. GENERAL INFORMATION

The CARIA boilers are a complete unit with, hot water boiler, pellet burner, control unit, flue gas aspirator, external pellet hopper and pellet feed screw. Do NOT attempt to change any item.

The boilers are reverse flame, 2-pass, dry back, cylindrical shell type, hot water, pellet fired and B22 steel boilers with automatic boiler flue gas pipe cleaning system.

Pellet burners have PID control systems, mono block box type, external pellet hopper, over feed, automatic ignition and automatic grate ash cleaning system.

They are manufactured by an ISO 9001-2015 registered company.

Air-fuel ratio is controlled by PID systems.

The boilers have been specially designed and produced to perform efficient combustion with the specified wood pellet fuels.

Wide water galleries and the return water connection from the back bottom side provide excellent natural circulation and safe heat transfer.

The boilers have a low combustion chamber loading for a clean combustion with low nitrogen oxide emissions.



The cylindrical burner combustion head is manufactured from high temperature stainless steel. The burner grate is manufactured from high temperature stainless steel; both items will withstand all normally occurring chemical, mechanical and thermal stresses.

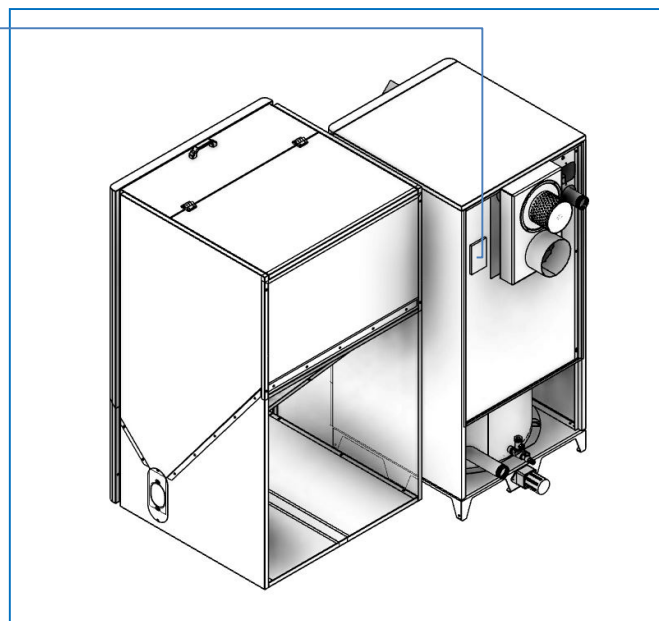
The quality of the material, form and dimensioning of the components ensures that the boiler and burner will operate safely and have a long economic life.

Primary and secondary combustion air supply is separated from each other.

The burner is equipped by an automatic grate cleaning system. Automatic ash discharge and heat exchanger cleaning systems are all included to the Caria series pellet boiler

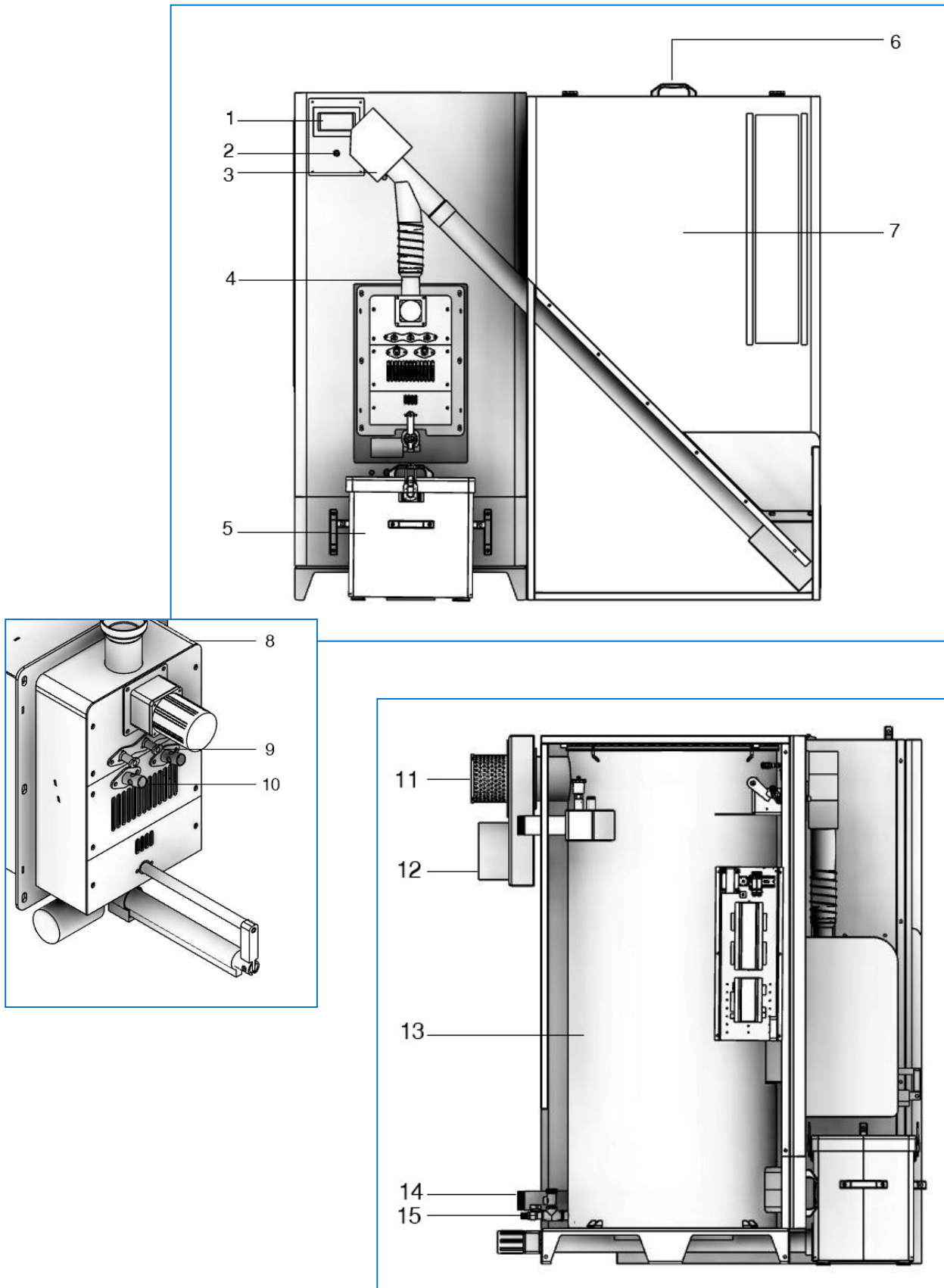
The nameplate is positioned on the rear panel of the casing of the boiler and shows the technical information and performance data of the appliance as required by the legislation in force.

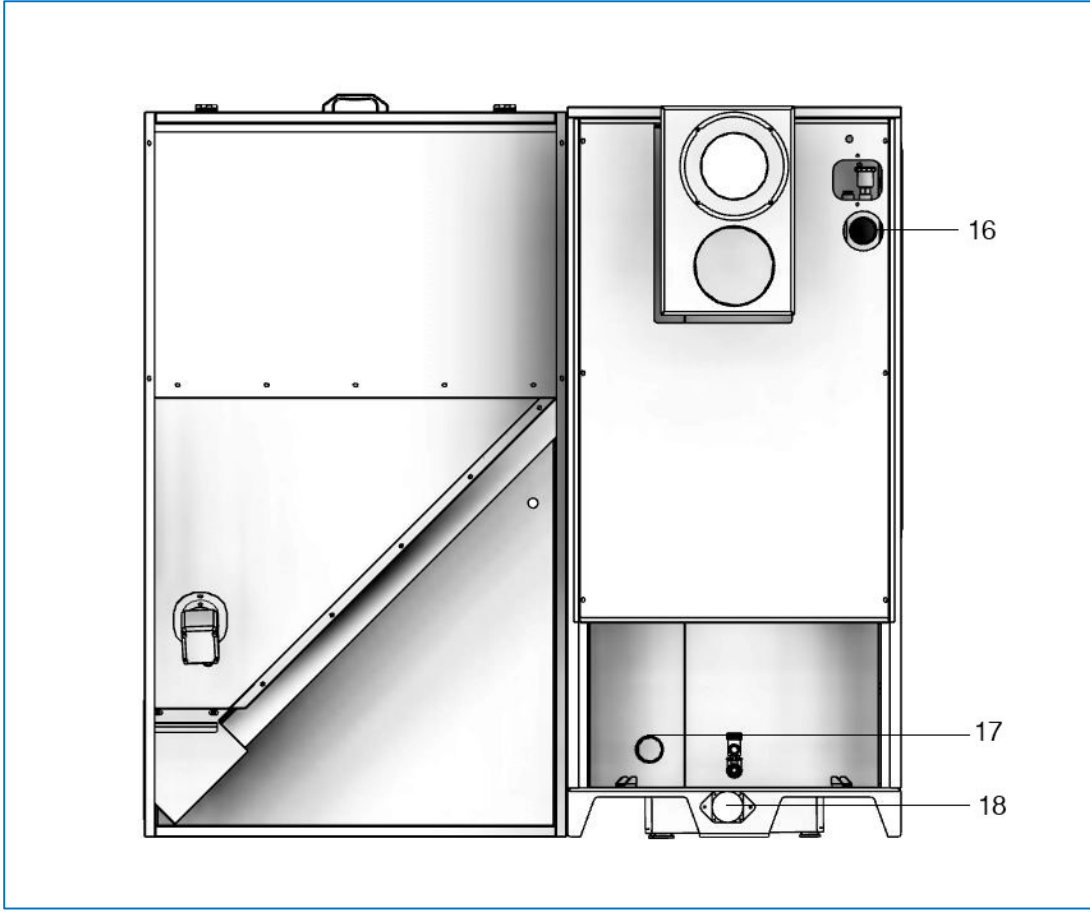
<b>Arkazan a.ş.</b> 	
<b>Full Automatic Pellet Fired Solid Fuel Boilers</b>	
<b>Model</b>	<b>CARIA CP-23</b>
<b>Fuel Type</b>	<b>Pellet</b>
<b>Capacity</b>	<b>23 kW</b>
<b>Min-Max. Operating Pressure</b>	<b>1-3 bar</b>
<b>Min-Max. Operating Temp.</b>	<b>55-90 °C</b>
<b>Test Pressure</b>	<b>4.5 bar</b>
<b>Date of Test</b>	<b>/ / 20</b>
<b>Date of Manufacture</b>	<b>/ / 20</b>
<b>Boiler Class</b>	<b>5</b>
<b>Fluid Group</b>	<b>2</b>
<b>Water Content</b>	<b>91 lt</b>
<b>Safety Valve</b>	<b>3/4"- 3 bar</b>
<b>Electrical Connections</b>	<b>230 Vac, 50 Hz</b>
<b>Max. Power Consumption</b>	<b>2.9 A, 640 W</b>
<b>Serial No</b>	<input type="text"/>
 Address : Konyalı Yolu 29.km Çiğdem Mah. Kurumlar Cad. No:4 06830 Gölbaşı/MK04047R Phone : +90 (312) 815 51 11 Fax : +90 (312) 815 50 66 E-mail : info@arkazan.com	



## 6. TECHNICAL SPECIFICATION

### 6.1 Main Parts



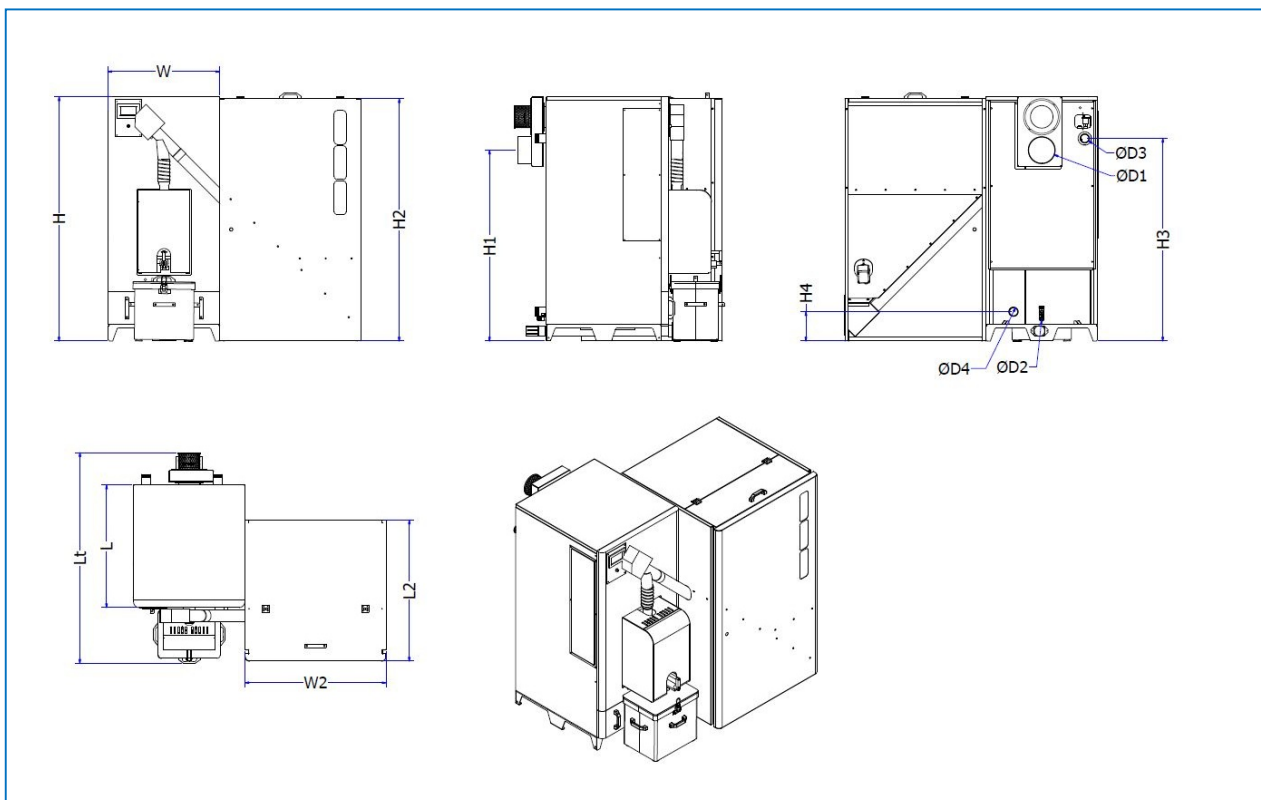


1	Touch Panel	10	Ceramic Igniter
2	Safety Limit Thermostat, STB	11	Vacuum Fan
3	Main Auger	12	Flue Exit
4	Burner Limit Thermostat	13	Boiler Body
5	Ash Box	14	Pressure Safety Valve
6	Fuel Silo Handle	15	Filling & Discharge
7	Pellet Silo	16	Hot Water Outlet
8	Burner	17	Return Water Inlet
9	Photocell	18	Ash Discharge Motor



## 6.2 Boiler Specifications

TECHNICAL SPECIFICATION OF CARIA BOILERS		Unit	BOILER TYPE						
			CP-12	CP-23	CP-40	CP-60	CP-80	CP-100	CP-150
CAPACITY	Nominal - Minimum Heat Output	kW	12 - 3,6	23 - 6,9	40 - 12	60 - 18	80 - 24	100 - 30	150 - 45
		kcal/h	10.320 - 3.096	19.780 - 5.934	34.400 - 10.320	51.600 - 15.480	68.800 - 20.640	86.000 - 25.800	129.000 - 38.700
	Direct Efficiency in Full Load	%	93,5	93,2	93,4	92,8	92,0	91,0	
OPERATING CONDITIONS	Boiler Class	°C	CLASS 5 acc. To EN 303-5						
	Safety Limit Temperature	°C	95						
	Setting Range for Operating Temperature	°C	80 - 65						
	Min. Water Return Temperature	°C	55						
	Operating & Test Pressure	bar	3 - 4,5						
	Electrical Connection	-	230 V <sub>ac</sub> , 50 Hz						
	Average Electricity Consumption	W	120	100	120	140	210	210	320
Recommended Fuel Types	-	Ø6 mm high quality pellet, EN Dm PLUS A1, A2							
MAIN DIMENSIONS	Cabin Width, W	mm	700		750		750		
	Height, H	mm	1395		1495	1695	1695		1710
	Cabin Depth, L	mm	800		825		825		1275
	Total Boiler Depth ± 2, L <sub>1</sub>	mm	1285	1295	1330	1330	1420		1935
	Stack Size, (Outer, ØD <sub>1</sub> - Inner Diameter)	mm	130-125		150-146		180-176		200-196
	Height of Stack Connection, H <sub>1</sub>	mm	1058		1155	1355	1420		1210
	Water Content	lt	99	91	116	140	117		250
	Empty Weight	kg	295	315	404	444	450		625
	Filling & Drain Connections	ØD <sub>2</sub>	inch	½"			½"		
	Hot Water Outlet Connections	ØD <sub>3</sub>	inch	1", Male		1 ½", Male		2", Male	
		H <sub>3</sub>	mm	1115		1218	1418	1365	
Water Inlet Connections	ØD <sub>4</sub>	inch	1", Male		1 ¼", Male		2", Male		
	H <sub>4</sub>	mm	245		255		197		215
SILO	Fuel Container Type	-	PS300		PS500	PS800			
	Net Volume	lt	325		507	800			
		kg	200		330	520			
Silo Dimensions	W <sub>2</sub> x L <sub>2</sub> x H <sub>2</sub>	mm	600x850x1433		850x850x1433		950x950x1633		



### 6.3 Fuel Specification



CAUTION: DO NOT USE CHEMICALS OR FLUID TO START THE FIRE

CAUTION: DO NOT BURN GARBAGE, GASOLINE, NAPHTA, ENGINE OIL OR OTHER INOPPROPRIATE MATERIALS, BURN WOOD PELLET ONLY

CARIA boilers can be fired with high quality wood pellet; Ø6 mm x 30 mm long, with moisture level less than 10%. Never try to change fuel without qualified service technician approval.

Use only those fuels recommended by in below specifications - wood pellets pursuant to EN 14961-2, Class A1+ A2 (Ø 6 mm) (DIN EN Plus A1-A2 quality)

Diameter (mm)	Ø6
Length (mm)	10-30
Humidity (%)	< 10
Ash Rate (%)	< 1
Involatile material (%)	< 1
Lower Calorific Value (MJ/kg)	> 17



Pellets should be stored in a dry and cool place to achieve good combustion. Poor quality pellets and pellets that do not meet the above specifications can cause damage to the boiler and the chimney.

#### EN – PELLET DEFINITION

Property class	Unit	ENplus-A1	ENplus-A2	EN-B	analysis according to
Diameter	mm	6 (± 1)			-
Length	mm	3.15 < L < 40 <sup>3)</sup>			-
Bulk density	kg/m <sup>3</sup>	600			EN 15103
Net calorific value	MJ/kg	16.5 < Q < 19	16.3 < Q < 19	16.0 < Q < 19	EN 14918
Moisture content	w-%	< 10			EN 14774-1
Fines (< 3.15mm)	w-%	< 1			EN 15149-2
Mechanical durability	w-%	97.5 <sup>4)</sup>		96.5	EN 15210-1
Ash content	w-% <sup>1)</sup>	< 0.7	" 1.5	" 3.0	EN 14775
Ash melting behavior	(DT) °C	1200	1100		EN 15370-1
Chlorine content	w-% <sup>1)</sup>	< 0.02	" 0.02	" 0.03	EN 15289
Sulfur content	w-% <sup>1)</sup>	< 0.03		" 0.04	EN 15289
Nitrogen content	w-% <sup>1)</sup>	< 0.3	" 0.5	" 1.0	EN 15104
Copper content	mg/kg <sup>1)</sup>	< 10			EN 15297
Chromium content	mg/kg <sup>1)</sup>	< 10			EN 15297
Arsenic content	mg/kg <sup>1)</sup>	< 1			EN 15297
Cadmium content	mg/kg <sup>1)</sup>	< 0.5			EN 15297
Mercury content	mg/kg <sup>1)</sup>	< 0.1			EN 15297
Lead content	mg/kg <sup>1)</sup>	< 10			EN 15297
Nickel content	mg/kg <sup>1)</sup>	< 10			EN 15297
Zinc content	mg/kg <sup>1)</sup>	< 100			EN 15297

<sup>1)</sup> In water-free condition (wf).

<sup>2)</sup> Diameter must be indicated.

<sup>3)</sup> Maximum 1% of the pellets longer than 40 mm, max length 45 mm.

<sup>4)</sup> If measured by the Lignotester, the threshold value is 97.7 w-%.

<sup>5)</sup> The corresponding CEN standard is currently being finalized.

Table 2: Essential quality parameters and the corresponding threshold values; until the standards finally go into effect, the respective pre-norms apply.

## 6.4 Operating Principles

The boilers have been designed to heat hot water and must be connected to a heating plant and/or a domestic hot water plant within the limits of its performance and output.

The boilers have a maximum outlet temperature of 90°C (set point is max. 80°C) and a maximum allowable operation pressure of 3 bar gauge. Return water temperatures must not be lower than 55°C. If the humidity in fuel and surrounding atmosphere is high than return water temperature must be higher in order to prevent condensation and tar problem.

The boilers are not suitable for use as a direct water heater. Where potable or sanitary hot water is required, a matching indirect heat exchanger must be provided in the system.

The boiler must be fired by its original burner and pellet feeding screw.

The boiler is suitable for use in an open vented or closed expansion vessel heating systems. The system must have a matching expansion system. Make sure that the open vented expansion vessel and pipes are protected against frost.

Second pass heat transfer combustion gas pipes have turbulator to maximize heat transfer to water and to clean the pipe inner surfaces. NEVER remove any of the turbulator, since this will cause loss of efficiency and damage to the boiler. The installation of an automatic low temperature control valve is a requirement to prevent anti-condensation within the boiler. The warranty is void if this is not fitted and operated at 55°C.

The user and basic operational controls allow the time and temperature settings of the boiler and plant controlled from the boiler to be appropriately set by the client for the intended use of the building.

The designer is responsible for the auxiliary plant and equipment, and its design and selection while ensuring correct selection of boiler plant.

## 6.5 Safety Systems

The following safety systems are included in the control system of the unit:

Back burn control:

- Ø A non-combustible drop shaft protects against back burn.
- Ø A temperature sensor in the drop shaft gives a reading, which shuts down and locks out the burner when the temperature exceeds 85°C.
- Ø A flexible tube between the external screw and the burner screw is constructed of a special plastic material, which melts at high temperatures and breaks the contact between the pellet feeder screw and burner.
- Ø After the flexible tube, the burner pellet screw is kept empty to avoid back burn.
- Ø With a stack fan fitted, the burner boiler and burner system are under vacuum for normal working conditions. A forced draught fan is NOT fitted for the primary air supply.
- Ø The boiler will be fitted with an isolator so as to comply with BS7671 – 2008 regulations for isolation and switching. The rotary type of isolator with a lock off facility is preferred.
- Ø An on-board EMC filter is fitted on electronic control board.
- Ø A 2.5 or 3 bar spring type high pressure safety relief valve is fitted to the boiler body on the water side.

- Ø An optional pressure sensor on the boiler flue gas outlet chamber monitors the system pressure on the boiler gas side, together with the fan speed.
- Ø If there is either insufficient or no combustion in the burner head, a flame detection photo resistor stops the fuel supply.
- Ø In the ignition phase, if the system cannot ignite (flame) after 15 minutes the system will shut down and the burner will lock out. (Nonvolatile shut down). A manual reset is required to restart the system.
- Ø A 150 or 300 watt ignition device is fitted, having a very low surface power intensity which eliminates the risk of overheating both the burner and the ignition device.
- Ø The fuel hopper is made of non-combustible material (steel)
- Ø Normal use allows for a voltage variation of 230 VAC +10%, -15%. The supplied voltage must be at least 180 Vac to enable the execution of the starting cycle. If the main voltage falls below 170 Vac, the device will execute a regulation stop. The re-execution of the starting cycle (automatically) will only be allowed when the supply voltage rises above 180 VAC.
- Ø The ambient operating temperatures for electronic items are -20°C to +60°C.
- Ø Automatic restart of the burner after a power failure is only permitted when self-checking of the burner control system has verified that all the safety systems functioning correctly.
- Ø Intermittent functioning: regulation and self-diagnostic stop for all control items is performed randomly every 18 to 24 hours.
- Ø Before every start up, the system is purged to prevent unburned gas deposition in the burner and boiler.
- Ø After every stop request, a no flame + post-ventilation phase (post-combustion) is initiated to completely burn the pellet residues.
- Ø In the event of missing ignition (within a 15 - 30 minute safety period) the control board executes a non-volatile blockage stop; the voltage supplies to the screw feeder and the ignition devices are shut down and the post-ventilation phase is initiated.
- Ø In the event of a flame failure occurring during normal working conditions while the appliance is under steady state working conditions, the boiler will repeat the starting cycle (maximum of 4 repetitions); the fourth consecutive extinction of flame will cause a blockage stop.
- Ø If a parasite flame signal is present for more than 10 minutes a blockage stop will be executed.
- Ø Under steady state conditions, the burner and boiler system is under defined negative pressure (vacuum) so as to ensure that there will be no significant leakage of combustion products into the surroundings.
- Ø The loss of combustion air supply will be measured immediately by the pressure sensor and the burner will lock out.

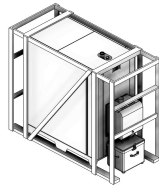
## 7. INSTALLATION

### 7.1 Boiler Placement

All installation, assembly and maintenance work must be carried out exclusively by fully trained, professionally qualified personnel and must conform with this manual and the local codes and requirements of the authority having jurisdiction, or in the absence of such requirements, apply to the EEC directives and European norms (EN).

This boiler must be installed in accordance with the rules in force and only in a well ventilated and frost-free spaces, indoor but other than living areas. Top and bottom ventilation openings must be according to local codes.

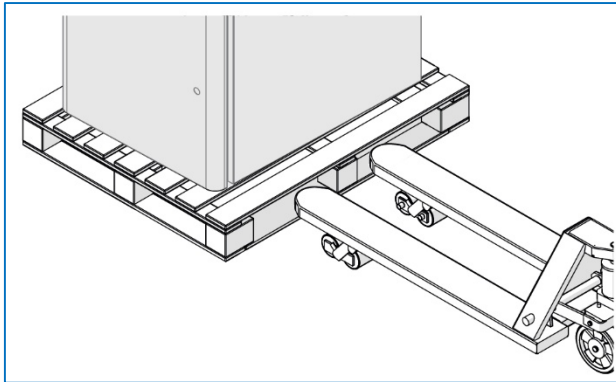
Caria pellet boilers are supplied in a single package protected by wooden crate placed on a pallet.



The wooden case includes fuel silo, auger ash box, and cleaning tools in separately packed carton boxes. The fuel silo has to be mounted at the site according to the instructions in below:

The document envelope is attached to the boilers which contain:

- instruction manual
- final test certificate



Caria boiler should be transported with appropriate equipment according to its dimensions and weight.

If the transport is to be carried out manually, the maximum weight per person must not be exceeded.

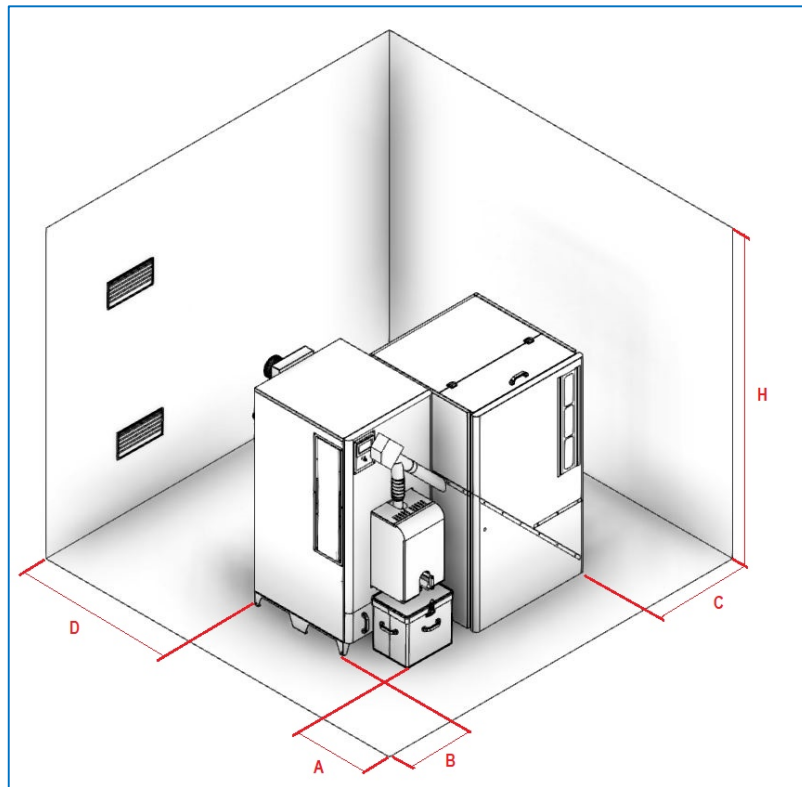


Use adequate safety equipment for both removing the packaging and moving the boiler.

The boiler placement must be set on a non-combustible, such as concrete, tile, stone, and marble floor

It is recommended that the boiler be placed on masonry blocks if space permits, to allow easier fueling and to keep the boiler above any water in the basement. These blocks should extend approximately 25 mm (1") on all sides of the boiler for support and stability.

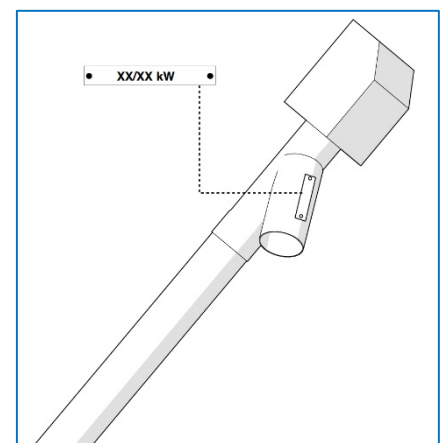
Clearances: The boiler is to be installed in accordance with all the applicable National Building Codes or local regulations. Enough clearances for maintenance, servicing and cleaning must be provided. Recommended clearances are shown in below table:

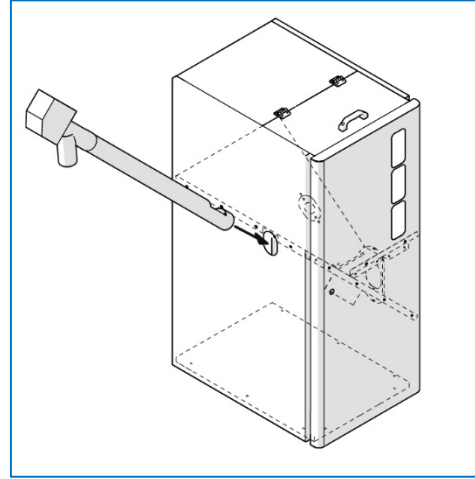
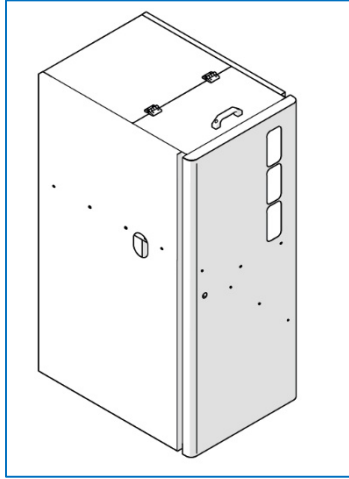


Front Space	A	1.5 m (60")
Left Side	B	1 m (40")
Right Space	C	0.6 m (24")
Back Space	D	1 m (40")
Height	H	2.5 m (100")

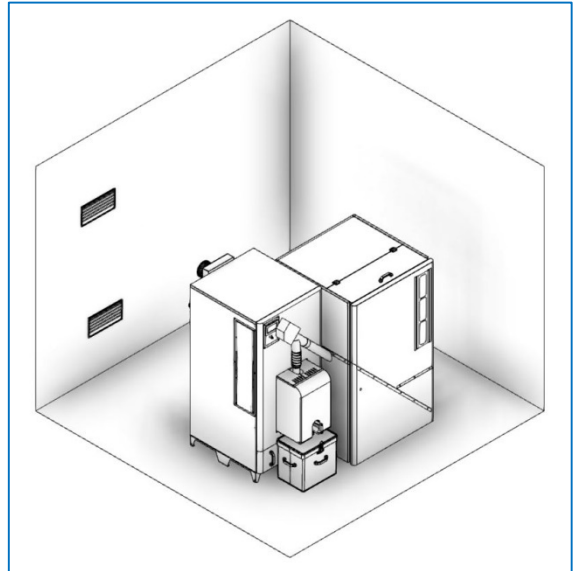
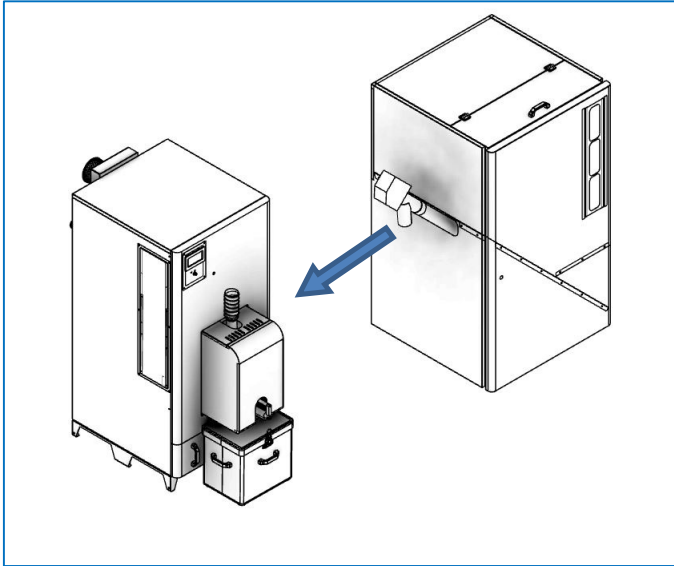
The minimum indicative spaces are shown in the above table. Consider the space necessary for connecting the smoke outlet, the buffer and HUW tank, for maintenance and for any repairs.

After removing the packaging, check that the boiler model with which the auger must be combined is written on the plate. This ensures that the auger is usable for the boiler's heat output.





To assemble the tank, follow the specific instructions provided with the product. Insert the main auger to the silo properly. It should be placed to the bottom box of the silo completely.

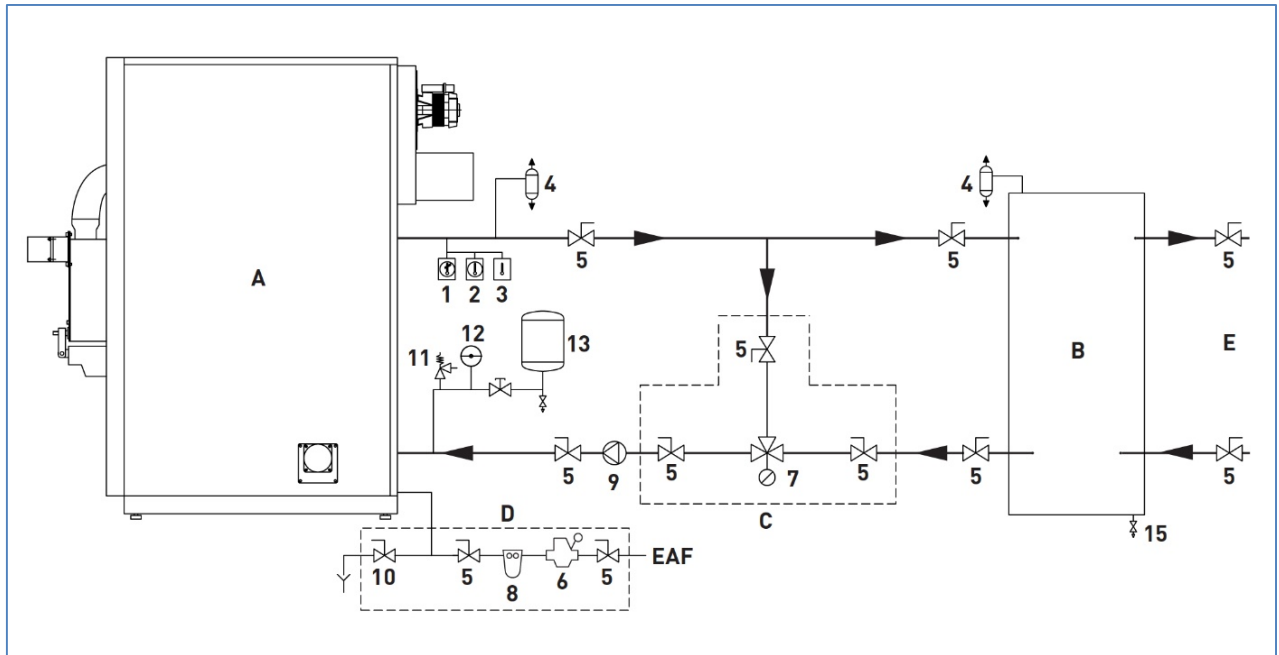


Pull up the pellet silo to the boiler by aligning the auger to the burner feeding line. Connect the plastic tube between the auger and the burner

The installation room of the Caria boilers must comply with the Technical Standards and with the national and local legislation in force and equipped with suitably sized ventilation openings.

## 7.2 Hydraulic Connections

Boiler return water temperature must be always above 55 °C otherwise the guarantee will be void. Below diagram can be a good solution which is already proven.



### LEGENDS:

A Pellet Boiler	5 Ball Valve
B Buffer Tank	6 Pressure Regulator
C Load (Anti-condensation) Valve Group	7 Load Valve
D Filling & Discharge Connection	8 Filter
E Heating System Connections	9 Circulation Pump
EAF Water Inlet	10 Filling & Discharge Valve
1 Manual Reset Safety Limit Thermostat	11 Safety Pressure Valve (3 bars [43 psig])
2 Boiler Temperature Probe	12 Manometer
3 Digital Control Panel	13 Expansion Tank
4 Automatic Air Purge Valve	15 Filling & Discharge Valve



WARNING!

It is prohibited to obstruct the vent at any time. The vent to the atmosphere of open systems shall never block  
**CAUTION: DO NOT PLUG, BLOCK OR SEAL VENT OPENING. SEALING CAN RESULT IN A DANGEROUS BUILDUP OF PRESSURE**



CARIA PELLET BOILER'S HYDRAULIC ITEM RECOMMENDATIONS				
SPECIFICATION	BOILER CAPACITY			
	12 kW	23 kW	40 kW	60 kW
Boiler Water Feed and Return Pipes	Pipe : 1" Flow : 516 l/h Velocity : 0.3 m/sec Pressure Loss : 45 Pa/m	Pipe : 1" Flow : 989 l/h Velocity : 0.45 m/sec Pressure Loss : 100 Pa/m	Pipe : 1 1/2" Flow : 1720 l/h Velocity : 0.3 m/sec Pressure Loss : 45 Pa/m	Pipe : 1 1/2" Flow : 2580 l/h Velocity : 0.5 m/sec Pressure Loss : 70 Pa/m
High Pressure Security Valve	DN 15	DN 15	DN 15	DN 20
Closed Expansion Tank	Under Floor Heating : 24 lt Radiator Heating : 50 lt	Under Floor Heating : 24 lt Radiator Heating : 50 lt	Under Floor Heating : 50 lt Radiator Heating : 80 lt	Under Floor Heating : 50 lt Radiator Heating : 80 lt
Open Expansion Tank	Tank : 30 lt Feed Pipe : 3/4" Return Pipe : 3/4" Level Info Pipe : 3/4"	Tank : 50 lt Feed Pipe : 3/4" Return Pipe : 3/4" Level Info Pipe : 3/4"	Tank : 100 lt Feed Pipe : 1" Return Pipe : 3/4" Level Info Pipe : 1"	Tank : 150 lt Feed Pipe : 1" Return Pipe : 1" Level Info Pipe : 1"
Anti-Condens Valve	ESBE - VTC 531 25-8 RP 1" 55 °C 51025600	ESBE - VTC 531 25-8 RP 1" 55 °C 51025600	ESBE - VTC 531 25-8 RP 1 1/4" 55 °C 51026100	ESBE - VTC 531 50-12 RP 2" 55 °C 51027100
Heating Circulation Pump	0.52 m <sup>3</sup> /hour flow 2-4 meter Pressure Head (according to the installation)	1 m <sup>3</sup> /hour flow 2-4 meter Pressure Head (according to the installation)	1.8 m <sup>3</sup> /hour flow 2-5 meter Pressure Head (according to the installation)	2.6 m <sup>3</sup> /hour flow 2-5 meter Pressure Head (according to the installation)
Anti Condensation Pump	0.52 m <sup>3</sup> /hour flow 2-3 meter Pressure Head (according to the installation)	1 m <sup>3</sup> /hour flow 2-3 meter Pressure Head (according to the installation)	1.8 m <sup>3</sup> /hour flow 2-3 meter Pressure Head (according to the installation)	2.6 m <sup>3</sup> /hour flow 2-3 meter Pressure Head (according to the installation)

CARIA PELLET BOILER'S HYDROULIC ITEM RECOMMENDATIONS				
SPECIFICATION	BOILER CAPACITY			
	70 kW	80 kW	100 kW	150 kW
Boiler Water Feed and Return Pipes	Pipe : 1 1/2" Flow : 3010 l/h Velocity : 0.58 m/sec Pressure Loss : 85 Pa/m	Pipe : 2" Flow : 3440 l/h Velocity : 0.5 m/sec Pressure Loss : 55 Pa/m	Pipe : 2" Flow : 4300 l/h Velocity : 0.58 m/sec Pressure Loss : 70 Pa/m	Pipe : 2" Flow : 6450 l/h Velocity : 0.87 m/sec Pressure Loss : 110 Pa/m
High Pressure Security Valve	DN 20	DN 20	DN 20	DN 25
Closed Expansion Tank	Under Floor Heating : 80 lt Radiator Heating : 100 lt	Under Floor Heating : 80 lt Radiator Heating : 100 lt	Under Floor Heating : 100 lt Radiator Heating : 150 lt	Under Floor Heating : 200 lt Radiator Heating : 200 lt
Open Expansion Tank	Tank : 200 lt Feed Pipe : 1" Return Pipe : 1" Level Info Pipe : 1"	Tank : 200 lt Feed Pipe : 1" Return Pipe : 1" Level Info Pipe : 1"	Tank : 250 lt Feed Pipe : 1 1/4" Return Pipe : 1" Level Info Pipe : 1 1/4"	Tank : 400 lt Feed Pipe : 1 1/4" Return Pipe : 1" Level Info Pipe : 1 1/4"
Anti-Condens Valve	ESBE - VTC 531 50-12 RP 2" 55 °C 51027100	ESBE - VTC 531 50-12 RP 2" 55 °C 51027100	ESBE - VTC 531 50-12 RP 2" 55 °C 51027100	ESBE - VTC 531 50-12 RP 2" 55 °C 51027100
Heating Circulation Pump	3.2 m <sup>3</sup> /hour flow 2-6 meter Pressure Head (according to the installation)	3.5 m <sup>3</sup> /hour flow 2-6 meter Pressure Head (according to the installation)	4.5 m <sup>3</sup> /hour flow 2-6 meter Pressure Head (according to the installation)	6.5 m <sup>3</sup> /hour flow 2-6 meter Pressure Head (according to the installation)
Anti Condensation Pump	3.2 m <sup>3</sup> /hour flow 2-3 meter Pressure Head (according to the installation)	3.5 m <sup>3</sup> /hour flow 2-3 meter Pressure Head (according to the installation)	4.5 m <sup>3</sup> /hour flow 2-3 meter Pressure Head (according to the installation)	6.5 m <sup>3</sup> /hour flow 2-3 meter Pressure Head (according to the installation)

All given specifications are only quick reference assumptions, real values must be calculated by a specialist according to real conditions.

- Ø Please control all the system control and security devices are present and installed according to the current regulations and they are functioning properly.
- Ø At starting a new installation all the fuel and water pipes, boiler and all the other heating system items must be flushed and free from deposits.
- Ø Before filling the system with water, control the expansion tank pre charge pressure in sealed systems.
- Ø Open all the necessary valves for filling
- Ø Fill the heating system with water (with the specifications given below) very slowly according to the air bleeding capacity of the components.
- Ø In open vented systems fill the system up to expansion cistern's proper level. In sealed systems fill the system up to the predefined pressure. In sealed systems there must be an additional safety system for overheating approved by local authorities.
- Ø Bleed all the air in the water side. Be sure that any air blockage has been eliminated.
- Ø Run the circulating pumps and control that they are working properly.
- Ø Control all the possible water leakage points.
- Ø Check all security and operation items are working properly and set to system needs. If the safety valve is not factory adjusted, set it according to system need and be sure that it is working properly.

## BOILER WATER AND MAKE UP WATER FOR HOT WATER BOILERS

According to EN 12953-10:2003 (Shell boilers: Requirements for feed water quality)

Parameter	Unit	Make up Boiler Water	Boiler water
Operating pressure	Bar	Total range	
Appearance	-	Clear, free from suspended solids, no stable foam	
Direct conductivity at 25 °C	µS/cm	< 1500	
pH value at 25 °C	-	>7.0	9.0 to 11,5 <sup>a</sup>
Total hardness (Ca + Mg)	mmol/l	< 0,05	
Iron concentration	mg/l	< 0,2	
Composite alkalinity	mmol/l	-	<5
Oil/grease concentration	mg/l	<1	-
Organic substances (as TOC)	-	See footnote <sup>b</sup>	

If non-ferrous materials are present in the system, e.g aluminum, they may require lower pH value and direct conductivity, however, the protection of the boiler has priority.

Organic substances are generally a mixture of several different compounds. The composition of such mixtures and the behavior of their individual components under the conditions of boiler operation are difficult to predict. Organic substances may be decomposed to form carbonic acid or other acidic decomposition products which increase the acid conductivity and cause corrosion or deposits. They also may lead to foaming and/or priming which shall be kept as low as possible.

Note: During boiler economic life, the total makeup water volume cannot be more than 3 times of the total system water.

Guarantee will not be valid, if the boiler is out of service because of corrosion, sludge formation and deposits

Before installing the appliance either in new installations or in place of a heat generator in already existing installations, it is essential to thoroughly clean the installation to eliminate sludge, slag, impurities, processing residues, etc.

In the case of existing installations, before removing the old generator, it is recommended:

- add a descaling additive to the water of the installation.
- operate the installation with the generator activated for a few days.
- empty the dirty water from the installation and wash it once or several times with clean water.

### 7.3 Chimney Connection

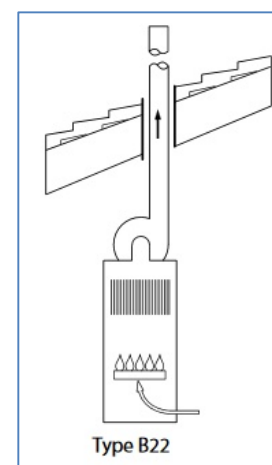
Caria type pellet boilers are **B<sub>22</sub>** type appliance so the flue gases must be connected to an adequate draught chimney, the draught rate should be in the range of -0.2 to -0.8 mmWC (-0.02 to -0.08mbar) when the fan is not working without any flue gas leakage to the boiler room.

To measure the draught, a gauge is needed to show negative pressure in the appropriate measurement units. Place a 6 mm (1/4") hole between the boiler and the draft regulator (if applicable) to evaluate the draught.

**CAUTION:** A flue draught exceeding the maximum recommended value could cause a solid fuel fire to burn out of control.

**UNSAFE TO ADJUST FLUE DRAFT HIGHER THAN 60 Pa (0.24 inches water column), where applicable. Note: For recommended installation practice, see CSA B365.**

Attachment of the appliance to the flue must be always done with approval of authorized chimney sweeping company. There must always be enough draft in the flue and flue gas must be draught to the atmosphere in all possible operation conditions. For the right operation of the boiler, the independent flue must be dimensioned in the right way, the draught is influenced by the section of flue, height, and roughness of the internal wall. Into the flue where the boiler is attached, no other appliance can be attached. Flue draught must have the specified values, but it must not be too high so as not to decrease the efficiency of boiler and interrupt burning. If the draught is too strong, install a draft regulator to the bottom part of chimney (60 cm below the boiler flue tube connection point). The chimney must be ULC-S629 listed. All interior portions of chimney and connections must be sealed with appropriate high temperature sealant.



If there is are local codes or norms for solid fuel chimney, please obey those rules. If there are no local norms, please refer to EN 13384. Below figures are given for a quick reference and these values can vary according to geographic conditions so below **figures cannot guarantee a proper operation.**

CARIA	FLUE TUBE Boiler to Chimney	Chimney Height: 6 to 10 meter
12 kW	125 mm in Diameter	125 – 150 mm in Diameter
23 kW	125 mm in Diameter	125 – 150 mm in Diameter
40 kW	150 mm in Diameter	150 - 180 mm in Diameter
60 kW	150 or 180 mm in Diameter	180 – 200 mm in Diameter
80 kW	180 or 200 mm in Diameter	200 – 220 mm in Diameter
100 kW	180 or 200 mm in Diameter	200 – 220 mm in Diameter
150 kW	200 or 250 mm in Diameter	250 – 280 mm in Diameter

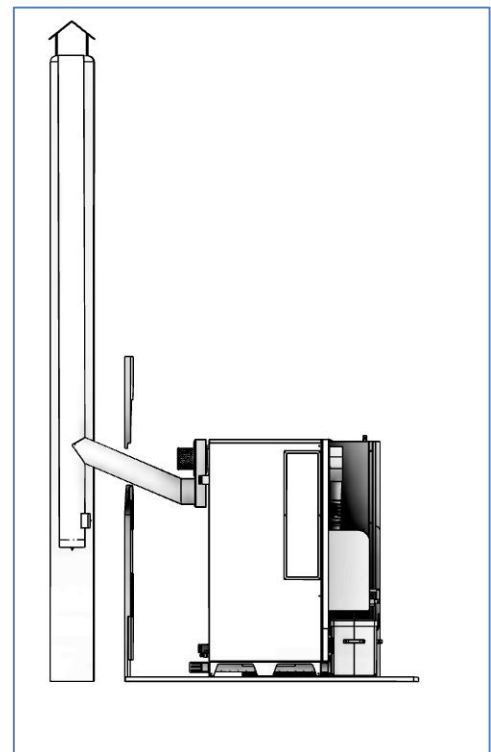
The chimney should meet all applicable requirements for solid-fuel-fired appliances regarding to the local codes. The chimney should be low heat masonry or listed type HT pre-fab.

**WARNING!** The chimney, the flue pipe and the draft inducer (if applicable) must always be kept clean and in good conditions.

**WARNING!** Do not connect the boiler to a chimney or flue pipe serving another appliance.

Space must be provided around the flue pipe and the back of the Caria Boiler to allow for easy access and cleaning. Flue pipe must not be lighter than 24-gauge black steel. All flue pipe must be properly supported and securely fastened with at least three (3) sheet metal screws at every joint.

Exact dimensions of flue must be calculated according to local codes. Flue draught is specified in technical parameters. Exhaust pipe must have the outlet into the chimney. If the boiler cannot be attached to the chimney directly, the exhaust pipe must be without heating surface and it must rise to the flue. Exhaust pipes must be tight and resistant against flue gas leakage and clean-able from inside. Exhaust pipes must not come through home and utility spaces and the internal section of the exhaust pipe must not be narrowing to the flue. Using of 90° bends is not suitable. It is not advised the usage of chimney that has less than 150 mm in diameter.



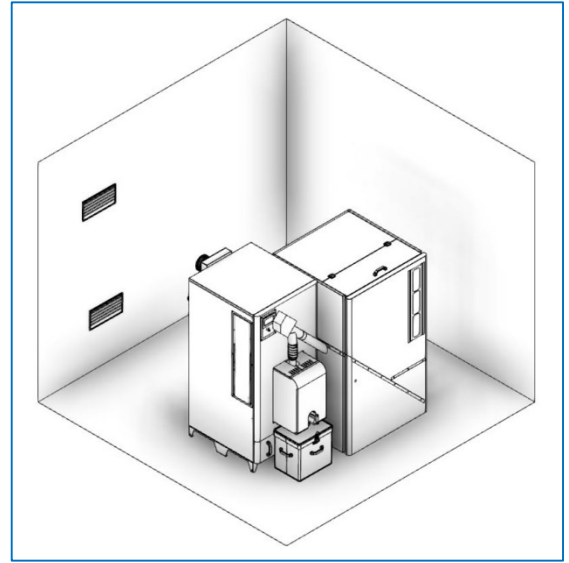
When you reach to the boiler house, look at the chimney from outside. Try to estimate the approximate height of the chimney from boiler flue gas tube connection. Try to see the outlet of chimney if there is a problem or not. Look to the roof highest point and chimney position. Ask the customer if the area is windy or not. If there is too much wind, advise them special chimney end cover which will help to prevent wind blockage.

- Double wall, isolated, stainless steel flue tubes and chimneys are advised.
- From the boiler flue gas outlet to the chimney, the flue tube can be max 2.5 meter straight or maximum length can be  $\frac{1}{4}$  of the chimney height with 2 x 45° bends.
- Boiler to chimney minimum boiler outlet diameter must be used.
- From Boiler to Chimney maximum 2 x 45° bend can be used. Do not use 90° bends.
- From Boiler to Chimney the flue tube must be always upward slope
- Condense outlet for chimney and for flue tubes must be provided so that no condensation water can flow into the boiler
- Minimum 1 meter higher than the roof maximum level.
- Every boiler must be connected to a separate, adequate chimney with separate flue connections. Gas explosions can occur if two or more boilers connect to same flue outlet.
- Draft regulator is advised.
- The chimney condensate drain must be maintained, and it should be free from any materials that could obstruct it.

## 7.4 Boiler Room Ventilation

The boiler must be installed in accordance with the rules in force, only in a well-ventilated and frost free space, indoor but except the living areas.

Control the ventilation openings are adequate or not. Told to customer, never obstruct the ventilation openings to the boiler room for a safe and efficient operation. An adequate air supply for combustion and ventilation must be provided at all times, if there is no enough oxygen in the boiler room there will be bad combustion, efficiency loss, tar and soot deposition in the boiler and chimney, and also gas explosions can happen and can cause dangerous conditions.



Recommended ventilation openings  
(If local codes are not present apply please below table)

Area of Openings cm <sup>2</sup>	12 kW	23 kW	40 kW	60 kW	80 kW	100 kW	150 kW
Upper Ventilation cm <sup>2</sup>	200	200	200	200	200	215	275
Lower ventilation cm <sup>2</sup>	300	300	300	325	375	425	550

Used Formula:

Up to 50 kW lower vent net area is 300 cm<sup>2</sup> and for every excess 1 kW add 2.5 cm<sup>2</sup>. , Upper vent is minimum 1/2 of lower vent, not less than 200 cm<sup>2</sup> net area.

Ex: 80 kW boiler Lower vent (air in) = 300 + 2.5\*(80-50) = 375 cm<sup>2</sup>

Upper vent (air out) = 375/2 = 188 choose minimum as 200 cm<sup>2</sup>

Please note that these are net open areas



Note:

Every combustibile (burnable) material requires a certain amount of oxygen and an according amount of air (theoretic air requirement) for its complete combustion. For the complete combustion of wood theoretically 1.39 kg of oxygen is required, (according to 0.97 m<sup>3</sup> at 20 °C and 1013 hPa). Thus, air containing 21% oxygen requires 4.62 m<sup>3</sup> of air for the combustion of 1 kg of wood derived fuel. A 40-kW boiler is burning 9 kg/h of pellet so needs 42 m<sup>3</sup> air. If the boiler room is 3x4x2.7 meter = 32.7 m<sup>3</sup> which means in 46 minutes all the oxygen will finish in the boiler room if the air vents are blocked. When the O<sub>2</sub> is finished or very less pellets will start to produce unburned hydrocarbons mainly CH<sub>4</sub> which is natural gas, highly explosive, boiler can have serious gas explosion which can cause serious damages, some semi burned carbons which are soot and tar (asphalt – bitumen) can stick to boiler heat exchange surfaces and guarantee will be void.

## 7.5 Power Supply and Polarity

Variation of the electrical power supply shall not prohibit the use of the burner or lead to a dangerous situation. Loss of power supply, extremely high voltage peaks or exceptionally low voltage supply to the burner shall not cause bad combustion, back burning or smoke passing out through the pellet burner. Loss of power can cause uncontrolled boiler water temperature increase as the circulation pumps stop and pellets are burning with chimney natural draught. High voltage peaks can damage the electronic cards and sensors, and the software present in the main control card. Power regulators and external power supplies are highly recommended.

The boiler is connected to the mains of 230 Vac, 50 Hz by a supply cord and plug. The voltage is of A or B type and when replaced, the same type must be used by a service organization. The appliance must be located in such a way that the plug is within the reach of the attendance.

Normal use under voltage variation between 230 Vac, +8%, -15% the supplied voltage must be at least 200 Vac in order to enable the execution of the starting cycle. If the main voltage goes below 170 Vac the main board will execute a regulation stop. The re-execution of the starting cycle (automatically) will be allowed only if the supply voltage increments again more than 180 VAC.

Install necessary power supply to the boiler control panel. Control the polarity of the boiler electric panel power supply. Also measure the present AC voltage and note to commissioning report.

Make necessary wiring for ash screw, circulating pumps and validate their rotation directions when they first start to run.

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

## 8. FUEL CALIBRATION

The first calibration must be performed by the service technician. The service you will use will make the necessary adjustments after the first calibration process according to the calorific value of the pellet and boiler capacity. But if you change the pellet you are using and you experience a decrease in performance, you will have to perform a calibration again and change the parameters given below.

First, be sure the right boiler type is selected matching with your product. For that purpose, press the menu button and then select the service settings icon



enter "4096" as password. Choose the burner capacity.



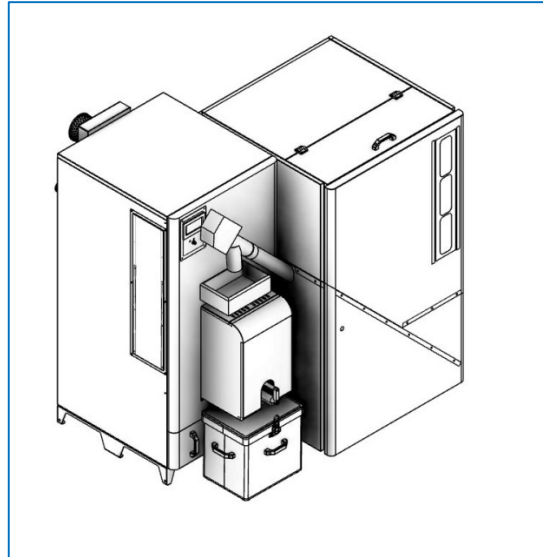
**WARNING!**

Selecting improper capacity will cause wrong feeding rate and inefficient burning. This operation should be proceed only by a service technician.

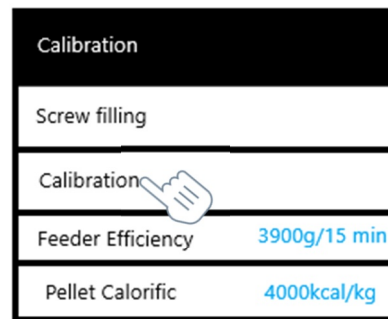
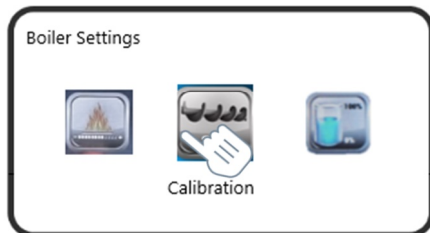
Enter the service setting again and select "Restore Factory Settings"

Now you are ready to make a calibration of the auger.

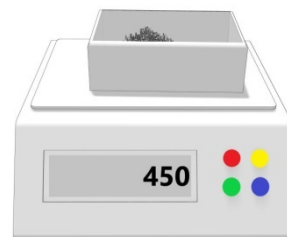
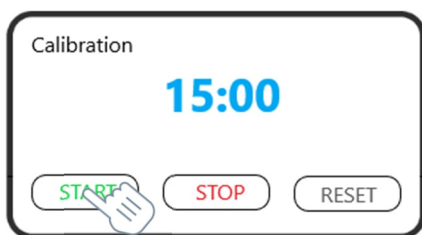
- 1- While the boiler is in the cold and closed position, remove the flex hose flange on the burner and place the ash pan.

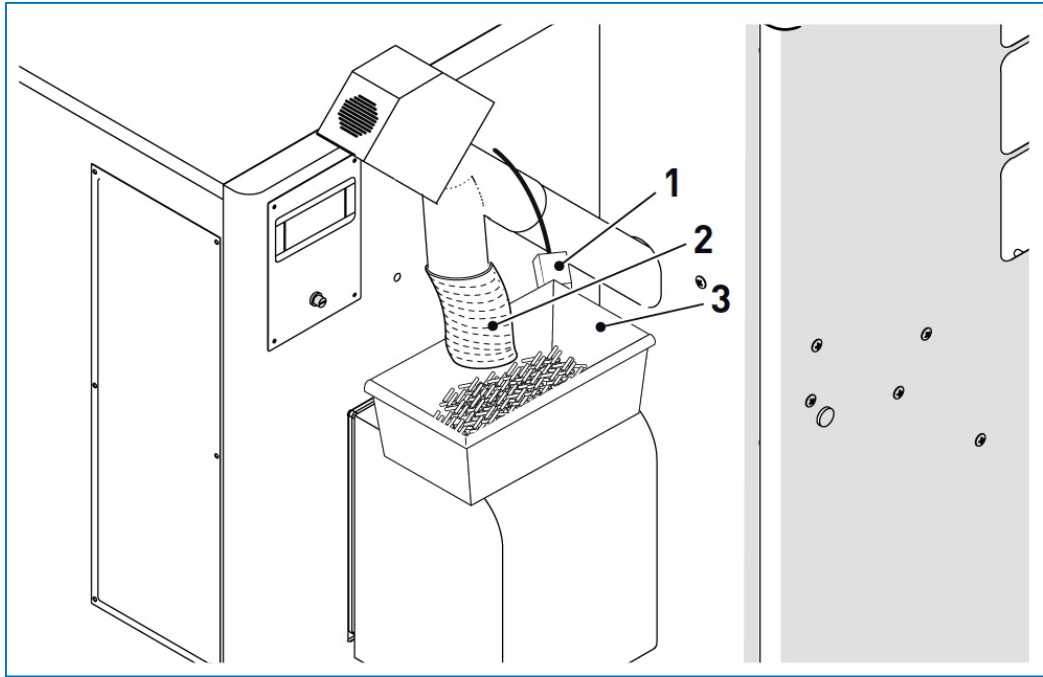
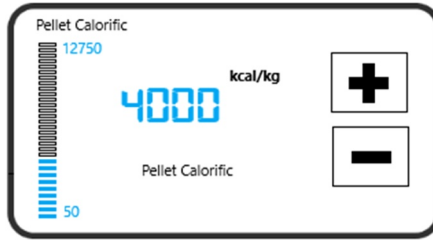


- 2- Press Menu button to go to the "Boiler Settings" and then "Calibration" submenu. If you are using your burner for the first time, then you should use "Screw filling" option for an accurate calibration. Only after this filling process you can go for "Calibration" by pressing on it. For the first commissioning, you should be sure auger pipe is filled full of the pellet.
- 3- Press "Screw Filling" button to run auger. After the first pellets come out of the fuel supply port, let the auger motor continue to run for a few minutes more to make sure the pipe is fully filled, then you can stop operation.

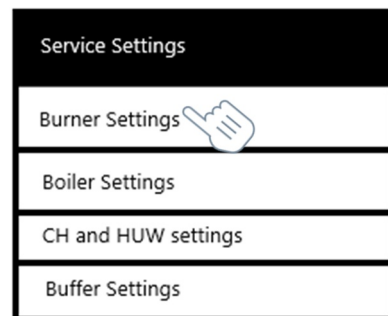


- 4- The calibration process can be done now to an empty pan. Press the "Calibration" and then "Start" button respectively to feed the pellet continuously for 15 minutes. After timer count-down is finished, the screen menu automatically switches to the next menu. Weigh the pellets that were accumulated in the pan and enter the net weighted value to the panel in grams. Enter the calorific value of the pellet in the unit of kcal/kg.





- 5- If you don't make any selection the default value of fuel type is defined as "EN plus A1- A2". To change the fuel type, press "Service Settings" from main menu and enter the password as "1000" and check if it is selected like that or not.



- 6- If you are using high humidity or out of standard pellet your service can select other suitable fuel type. It is not recommended, and we have to remind that using that type of pellet is not covered by warranty. Only a qualified service staff should change this parameter. The amount of all air values will be increased automatically.



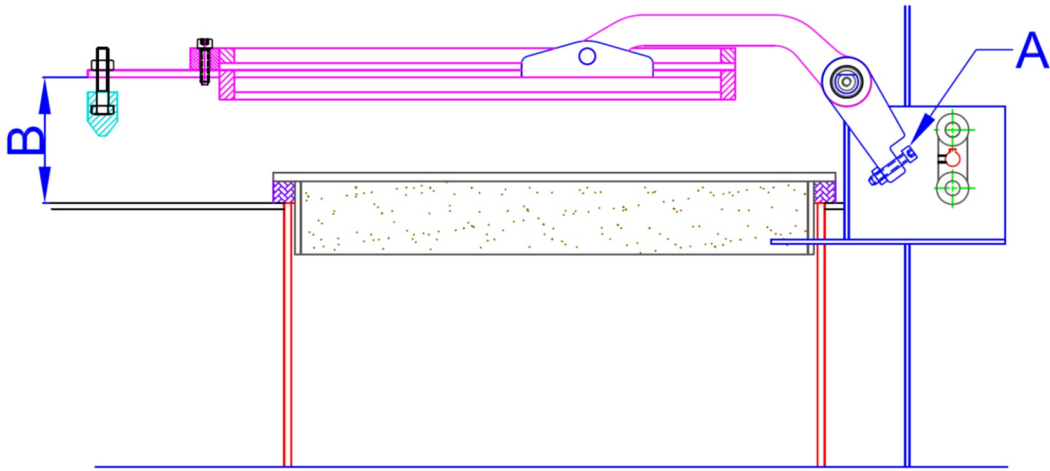


Note:

The calibration procedure should be repeated whether the pellet type, size, supplier changed or if you notice a performance drop

## CONTROL OF THE BOILER & BURNER.

Please open the boiler top cover and control all the tabulators are in place and present. Run the boiler from main switch and measure the turbulator vertical movement height. If necessary, please change it to necessary height. Minimum height must be at least equal or 5 mm more than turbulator pitch.

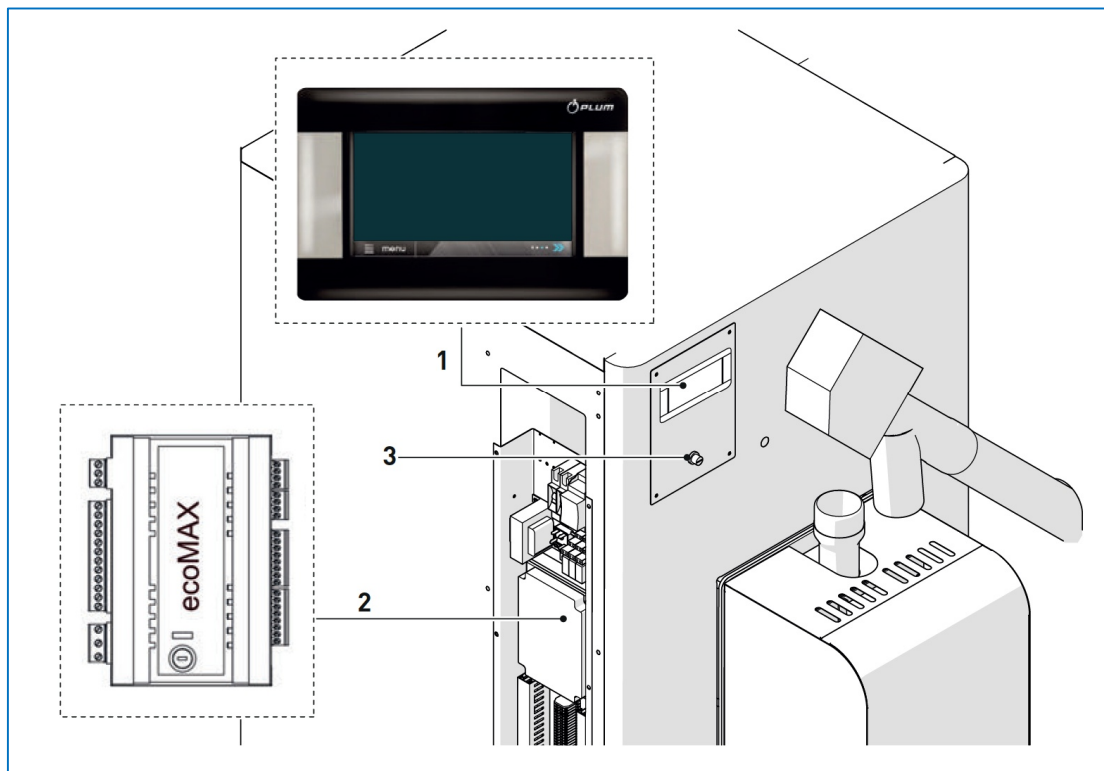


- Ø The turbulator pitch can be vary between 35-50 mm so please adjust the stroke to 50 mm to ensure complete tube cleaning
- Ø Control all the boiler doors are closed and the door gaskets are in good condition.
- Ø Control the ash box is in place.
- Ø Take the burner out and control that the burner is clean and burner grate is moving **easily**



## 9. CONTROL SYSTEM

### 9.1 Controller

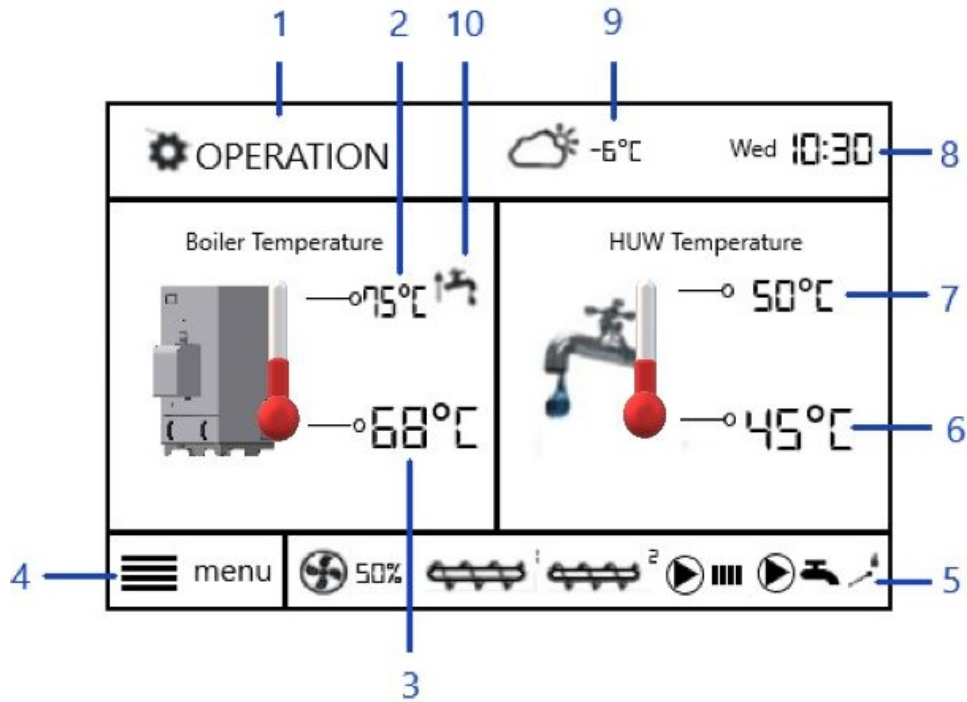







1 Control panel with display allows selecting and setting all the functional elements of the system on the display, such as operating modes, parameters, etc.

2 CPU control regulates the burner and control heating system with Fuzzy logic and PID control system.

3 Safety thermostat (STB) The thermal safety thermostat turns off the boiler when the water temperature exceeds the limit (between 94 and 100 ° C) and generates a lockout (non-volatile). Once the boiler temperature has dropped to a safe value, the thermostat can be manually reset to restore normal operation.

9.2 Touch Panel



				
Exit a chosen Menu position or cancel a parameter setting	Return back to main screen	Quick access to menus	Menu information concerning the selected Menu position	Select technical menu (password needs)







1-Mode of regulator operation: FIRING UP, OPEARTION, SUPERVISION, BURNING OFF, STANDSTILL

2-Preset boiler temperature

3-Measured boiler temperature

4-Key to enter "Menu" list

5-Information fields

					
Fan	Feeder 1 (External Auger)	Feeder 2 (Burner Auger)	Boiler Pump	HUW Pump	Igniter Active






6-Measured temperature of HUW container,

7-Preset temperature of HUW container,










8-Clock time and weekday,

9-Outside temperature (weather)

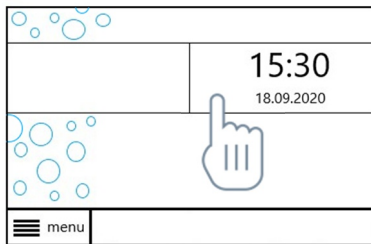
10-Field of functions, which modify preset boiler temperature-meaning of the symbols:

-  Opening of room thermostat contacts – preset room temperature has been reached
-  Of preset boiler temperature for active time intervals
-  Increase of preset boiler temperature for the time of HUW container filling
-  Increase of preset boiler temperature by mixer circuit
-  Increase of preset temperature for buffer loading

Both, left and right windows may display different information. By touching the screen, you may navigate between displayed information: mixer circuit information window, HUW window, fuel level window.

	Boiler on/off- Enables remote activation or deactivation of the boiler controller from the room thermostats.
	Technical assistance service settings
	Information concerning software versions used in the boiler controller panels and additional modules.
	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 ecoMAX boiler control.
	HUW- Enables setting a preset temperature and work mode of the hot utility water tank.
	Summer/Winter-Enables changing the “Summer/Winter” work mode in the boiler controller.
	General Settings- Enables changing the language, screen brightness, date, Wi-Fi settings, updating software and activating/deactivating sound
	Manual Control-Enables motor, fan etc. to check connections.
	Alarm history (display only)

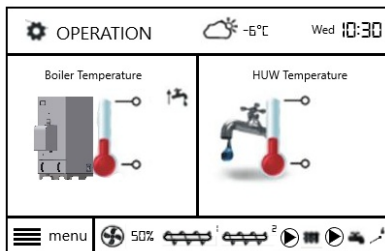
### 9.3 Main Menu Structure


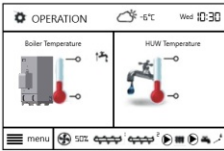

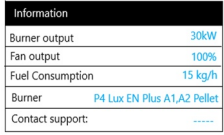



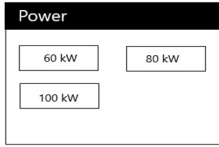

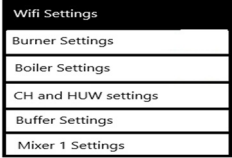




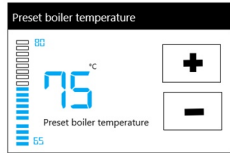

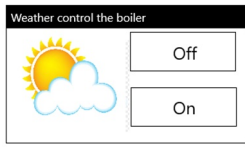

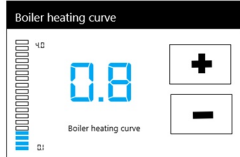

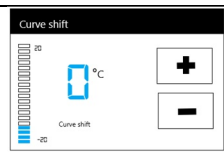

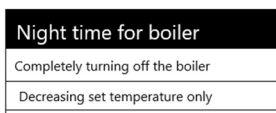


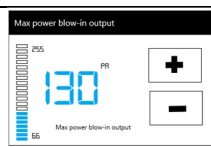

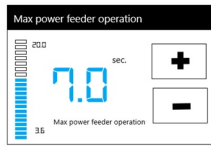

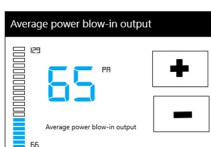

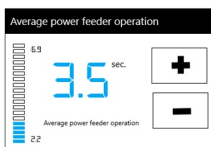

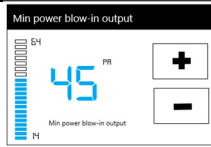
The "Menu" icon should be in the middle of the screen. (e.g. in the figure)



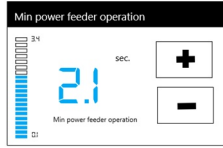

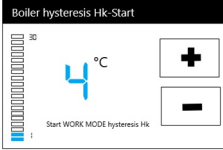


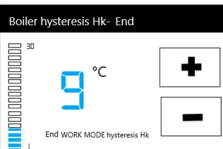

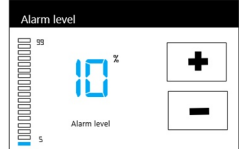

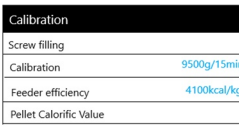


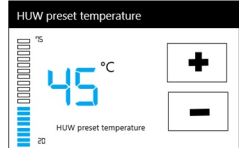

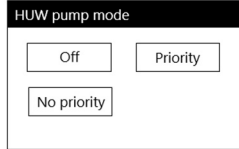

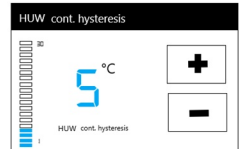


If the interested icon is not present on the screen:



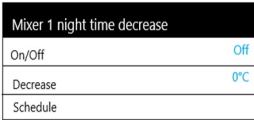


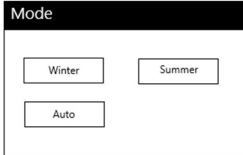


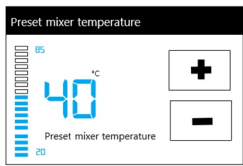

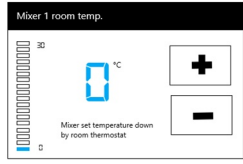

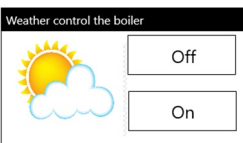

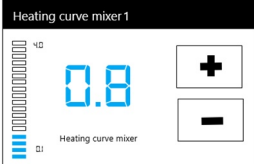

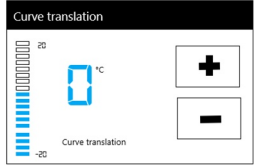


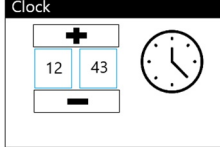
- Touch the any side of screen; the icons scroll, and the other available icons are displayed.
- To enter submenus, touch the icon of the interested menu.
- Then touch the interested icon in the submenu.



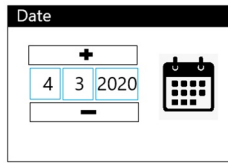

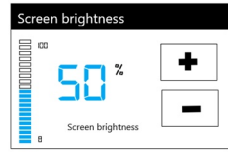

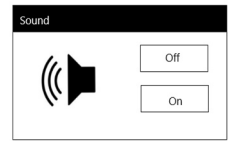

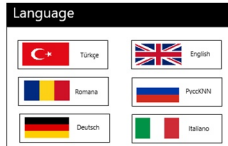

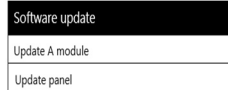

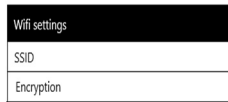

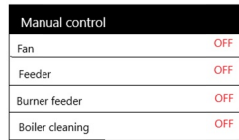

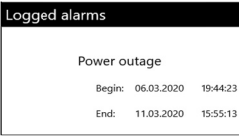


MENU				
	Turn on/off boiler and control panel			
	Information			8-9 pages information
	Service Settings	 Password 4096, Enter		Select boiler power. All parameters are set automatically.
		 Password for user 1000, Enter (Password for ONLY service 0000, Enter)		Select

	<b>Boiler Settings</b>	 <p>Preset Boiler Temperature</p>			
		 <p>Weather Control the Boiler</p>	 <p>Select</p>		
		 <p>Boiler Heating Curve</p>		Only with external probe	
		 <p>Curve Shift</p>			
		 <p>Night Time for Boiler</p>			
		 <p>Output Modulation</p>	 <p>100%</p> <p>Max power blow-in output</p>		
			 <p>100%</p> <p>Max power feeder operation</p>		
			 <p>50%</p> <p>Average power blow-in output</p>		
			 <p>50%</p> <p>Average power feeder operation</p>		
			 <p>30%</p> <p>Min power blow-in output</p>		

	Boiler Settings	 <p>Min power feeder operation</p>		
		 <p>Boiler hysteresis Hk-Start</p>		
		 <p>Output Modulation</p>	 <p>Boiler hysteresis Hk-End</p>	
		 <p>Alarm Level</p>		
		 <p>Calibraton</p>		
	HUW Settings	 <p>HUW preset temperature</p>		
		 <p>HUW pump mode</p>		
		 <p>HUW cont. hysteresis</p>		
		 <p>HUW disinfection</p>		

	HUW Settings	 <p>Night time decrease HUW</p>		
	Winter/Summer	 <p>Mode</p>		
	Mixer 1 Settings	 <p>Preset mixer 1 Temperature</p>		
		 <p>Mixer 1 room therm.</p>		
		 <p>Mixer 1 weather control</p>		
		 <p>Heating curve mixer 1</p>		
		 <p>Curve translation</p>		
	General Settings	 <p>Clock</p>	 <p>Adjustment</p>	

	General Settings	 <p>Date</p>	 <p>Adjustment</p>	
		 <p>Screen brightness</p>	 <p>Adjustment</p>	
		 <p>Sound</p>	 <p>Adjustment</p>	
		 <p>Language</p>	 <p>Select</p>	
		 <p>Software update</p>		
		 <p>Wifi settings</p>		
	Manual Control		<p>Scroll and change the status(On/Off)</p>	
	Alarms		<p>Scroll the pages</p>	



## 9.4 Service Menu Structure

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

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

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

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

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

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

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

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

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

## 9.5 Setting the Parameters

You should adjust the parameters of the panel according to the system you build.

Using a buffer tank;

You must activate the buffer tank option to be able to use and control the buffer tank.

- To be able to activate the buffer tank settings both temperature sensors of the buffer tank must be connected.
- Service settings ->Buffer Settings->Activate operation-> Yes
- When activated controller continuously checks the buffer tank temperatures.
- When “upper buffer tank temperature” drops less then “Preset buffer temperature + Hysteresis start loading” the controller goes to fire up mode and starts the pump.

- When the “upper buffer tank temperature” reaches “Preset buffer temperature + Hysteresis end loading” and the difference between upper and lower buffer tank temperatures is less than “Delta T” the controller goes to burning off mode. Stops pellet feeding. Waits “Load extension” minutes and then stops the pump.

Using a HUW tank;

The device controls temperature of the hot utility water - HUW – tank, provided that a HUW temperature sensor is connected. If the sensor is disconnected, the menu will disappear from the controller. For HUW controls;

- [Menu → HUW settings > HUW pump mode](#) allows the user to:
  - *disable* filling of the tank, parameter off,
  - set HUW priority, using the *priority*
- The regulator has a function of automatic, periodic heating of HUW container to 70 °C to eliminate bacterial flora from the container. Keep the tenants informed of activating the disinfection function as there is risk of being burnt with hot usable water.

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

- *Setting preset DHW temperature*

Preset DHW temperature is defined by parameter: HUW [settings > Huw preset temp.](#)

- *HUW tank hysteresis*

Below temperature HUW preset temp. Reduced by HUW tank hysteresis, the HUW pump is activated in order to fill the HUW tank. When value of hysteresis is set too low, the DHW pump will start faster after decrease in DHW temperature.

- *Enabling the SUMMER function*

○ In order to activate the SUMMER function, which enables to load the HUW tank in the summer, without the need for activating the CH system and mixer cycles, set the parameter Winter/Summer->Mode-> “Summer” or “Auto”(if you have an outside temperature sensor connected.)

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

Using mixer valves and pumps for zone control:

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

Menu → Mixer 1 settings

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

- *Settings for mixer (without weather sensor)*

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

After connecting room thermostat, it is necessary to set a value of decrease in preset mixer temperature by thermostat (parameters Mixer room therm.) e.g. at 5°C. This value should be selected by trial and error. The room thermostat can be a traditional thermostat. Upon activation of the thermostat, the preset mixer circuit temperature will be decreased, which, if proper decrease value is selected, will stop growth of temperature in the heated room.

Using Weather Sensor

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

Set parameter Weather contr.mixer to on. Select weather curve.

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

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

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

- Settings for mixer with weather sensor and with room thermostat.

Set parameter Weather cont. Mixer to on. Select weather curve as per point.

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

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

Example.

Preset temperature in the heated room = 22 °C. Temperature measured in the room =20 °C. Room temp. coeff. = 15.

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

It is necessary to find appropriate value of the Room temp. coeff. Range: 0...50. The higher the coefficient, the greater the correction of preset boiler temperature. If the setting is "0", the preset mixer temperature is not corrected. Note: setting a value of the room temperature coefficient too high may cause cyclical fluctuations of the room temperature!

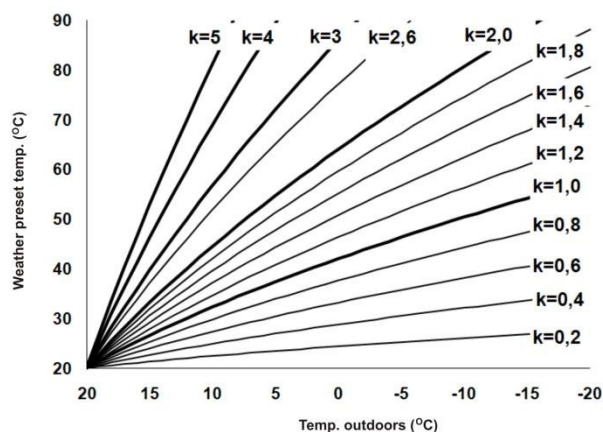
· Weather controlled operation Depending on the temperature measured outside the building, both preset boiler temperature and temperatures of mixer circuits can be controlled automatically. If proper heating curve is selected, the temperature of the circuits is calculated automatically, depending on the outdoor temperature. Thus, if the selected heating curve is appropriate for the given building, the room temperature stays more or less the same, regardless of the temperature outside.

Note: during trial and error selection of appropriate heating curve, it is necessary to exclude influence of the room thermostat on regulator operation (regardless of whether the room thermostat is connected or not), by setting the parameter:

Mixer 1 settings > Mixer room therm. To "0".

If a room panel is connected, it is also necessary to set the parameter Room temp. coeff. to "0".

Guidelines for proper setting of the heating curve:



Heating curves.

Guidelines for selection of appropriate heating curve:

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

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

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

The recommended choice of the climatic curve K is:

on the floor 0.2 ~ 0.6

with radiators 1,2 ~ 1,6

with boiler 1,8 ~ 4

#### 9.6 Timer Schedule (Night Time Function)

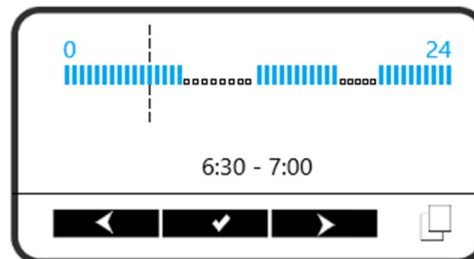
Night time decreases for heating circuits, HUW container and circulation pump operation. The intervals can be used to define time periods at which lower preset temperature may be set e.g. for a night time or when the user is not at home (e.g. he/she left for a work/school). This feature enables automatic reduction of preset temperature without compromising the heat comfort and reduces fuel consumption. Select "Night time for boiler" to make desired adjustment.



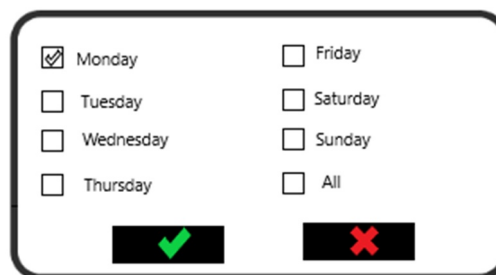
Here, you can see that there are two different options in the night time module which can be used both together, or separately according to your needs. For sure, turning off is a dominant choice according to decreasing set temperature. So if these two different states are set between the same time intervals on related day, boiler will go to burning-off.

Decreasing set temperature only	
On/Off	On
Decrease	10°C
Schedule	

After your selection, next screen will show up as above. Here you can make a working schedule for your boiler and assign a temperature value which specify how many degrees (°C) will decrease. A quick reminding; boiler has specific max and min temperature values and boiler temperature can be set only between this allowable interval. Therefore, if  $T_{set} - T_{decrease} < T_{min}$  the boiler will just stop or go to burning-off. When you select "Off" mode, the controller ignore the schedule.



The boiler operates in selected time intervals. Outside of the selected intervals, the boiler is off or works with decreased temperature value. In another way, we can say that, blue zones represent a normal working time interval.



Once you made a daily working schedule you can copy it to other days one by one or completely.

### 9.7 Function of protecting pumps against stagnation

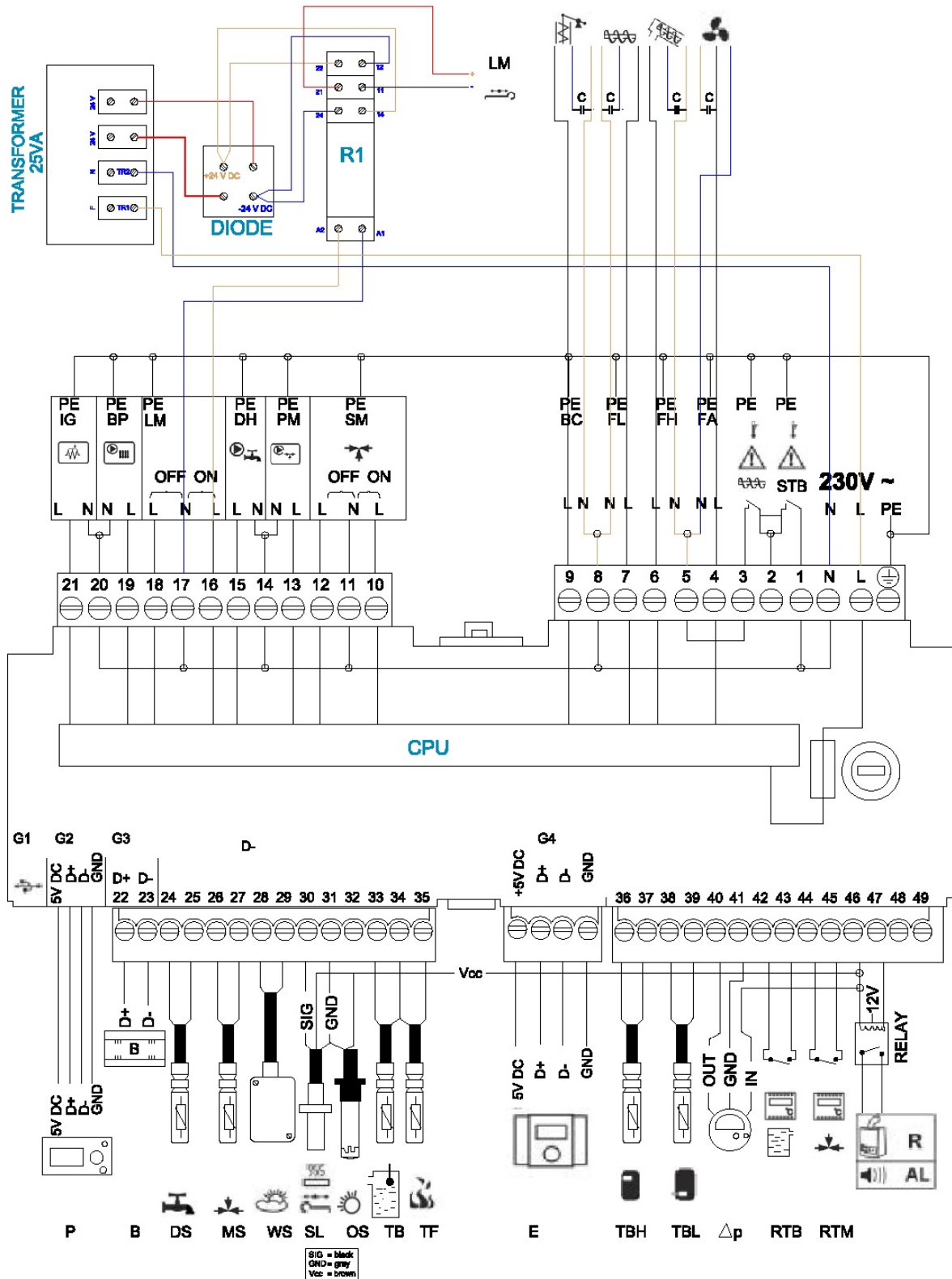
The regulator protects the CH, HUW and mixer circuit pumps against stagnation. It does so by activating them periodically (every 167 h for several seconds). This protects the pumps against immobilization due to sedimentation of boiler scale. For this reason, the regulator power supply should be connected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

### 9.8 Anti-freezing protection

In case the boiler temperature has fallen below 5 °C, CH pump is activated to force boiler water circulation. It delays water freezing process, but in case of very low temperature or lack of power it may not be sufficient to protect the equipment from freezing. If even after 20 minutes of circulation the temperature of boiler is still less than 5°C then the boilers starts itself, increases the boiler temperature higher than 70°C, runs 20 minutes more than stops the boiler. Runs the pumps until the temperature is below 55°C.

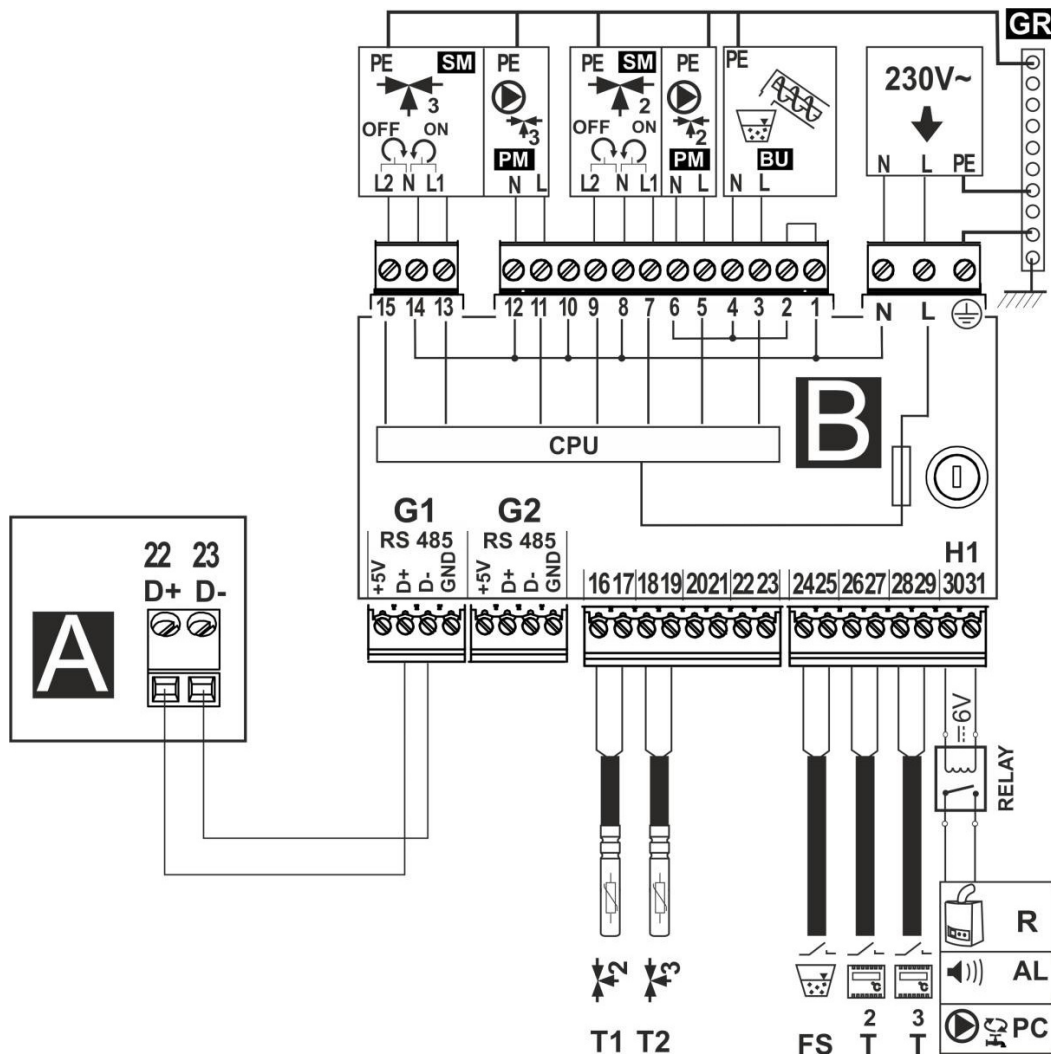
9.9 Electrical Connections

9.9.1 Main Control Unit (Module A)



<p>Connections made in the factory</p> <p>CPU: Control Unit  FU: Fuse  IG: Ignitor  LM: Grate Servo Motor  FH: Loading Auger  FL: Buner Grate Cleaning Motor  FA: Fan  STB: Safety Thermostat (with manual reset)  P: Boiler Control Panel (touch)  SL: Grate Servo Motor Limit Switch  OS: Flame Detector  TB: Boiler Probe  TF: Flue Gas Temperature  ΔP: Boiler Pressure Switch (*)  BC: Exchanger Cleaning and Ass Discharge Motor</p>	<p>Connections by installer</p> <p>BP: Boiler Pump or Loading Pump (**)  DH: Domestic Water Pump (**)  PM: Mix System Pump (**)  SM: Mix Valve Servo Motor (**)  FH: Pellet Loading Screw Motor  L N PE: Power Supply 230V~50Hz  B: Module for Additional Heating Circuit (*)  DS: Sanitary Water Probe (*)  MS: Mix System Probe (*)  WS: External Temperature Probe (*)  E: Room Thermostat (*)  TBH: Buffer Temperature Probe (high) (*)  TBL: Buffer Temperature Probe (low) (*)  RTB: Heating System Room Thermostat (*)  RTM: Mix System Room Thermostat (*)  R/AL: Alarm Signal</p> <p>(*): Optional  (**): Component not supplied</p>
--	---

### 9.9.2 Extension Unit (Module B)



T1 – mixer 2 temperature sensor CT4, T2 – mixer 3 temperature sensor CT4, T – room thermostat, FS – fuel level sensor for feeder BU, AL – alarm annunciator, R – reserve boiler, PC – HUW circulation pump, RELAY – relay, L N PE – power supply 230V~, PM2/3 – mixer 2/3 pump, SM2/3 – mixer 2/3 servo, BU – fuel feeder (bunker to boiler container), CPU – control unit, A – ecoMAX860P1-K regulator module A.

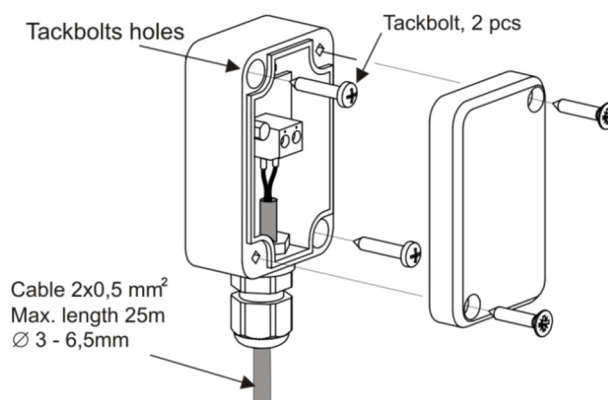


### 9.9.3 Adding Outside Weather Sensor

The regulator cooperates only with a weather sensor of the CT4-P type. The sensor should be installed on the coldest wall of the building; usually this is the northern wall, under a roof. The sensor should not be exposed to direct sunlight and rain. The sensor should be fitted at least 2 m above the ground, far from windows, chimneys and other heat sources which could disturb the temperature measurement (at least 1.5 m).

Connect the sensor using cable of 0.5 mm<sup>2</sup> cross-section, up to 25 m long. Polarity of the leads is insignificant. Connect the other end of the cable to the regulator.

Attach the sensor to the wall using tack bolts. To access the tack bolts holes, unscrew the sensor lid.



### 9.9.4 H-Output Connections

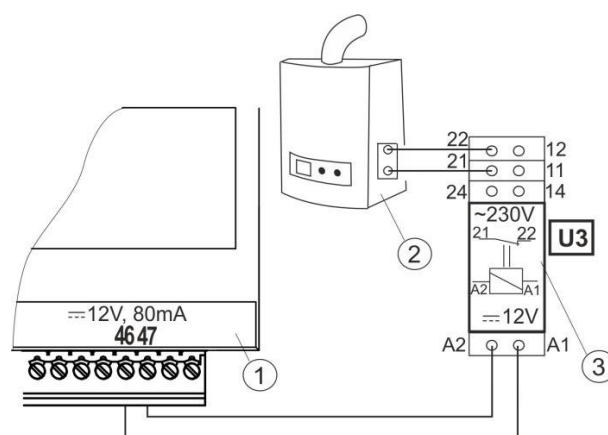
H-Out of the controller is a low voltage (12 Vdc) output which can be used for either activating a reserve boiler (gas- or oil-fired) eliminating the necessity of enabling or disabling this boiler manually, or for alarm signalling

If it's function is selected as Reserve boiler, it will be enabled if the temperature of the boiler drops below parameter:

- [Menu → Service Settings → H-output → Reserve boiler activation temperature](#)

Connection to a reserve boiler, should only be made by a qualified installer, in accordance with the technical documentation of this boiler.

The reserve boiler should be connected via relay to terminals 46-47 as shown in below figure.



The regulator is not equipped with a relay. You have to perform assembly and installation of the module by yourself, in conformity with the applicable standards.

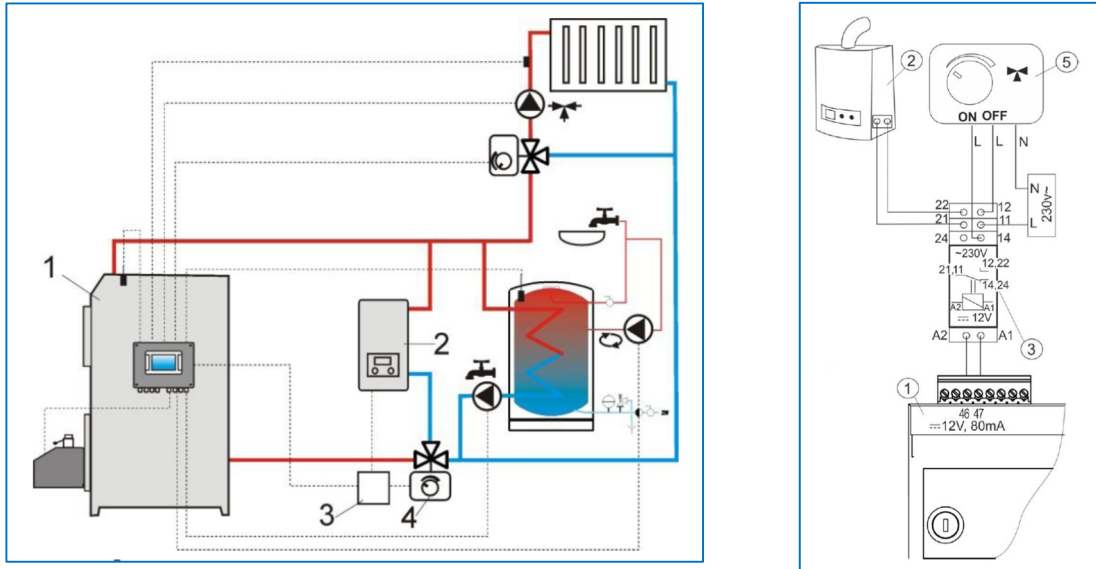


Reserve boiler control is switched off upon setting the H-output function to the reserve boiler.

- [Menu](#) → [Service Settings](#) → [H-output](#) → [Reserve Boiler](#)

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

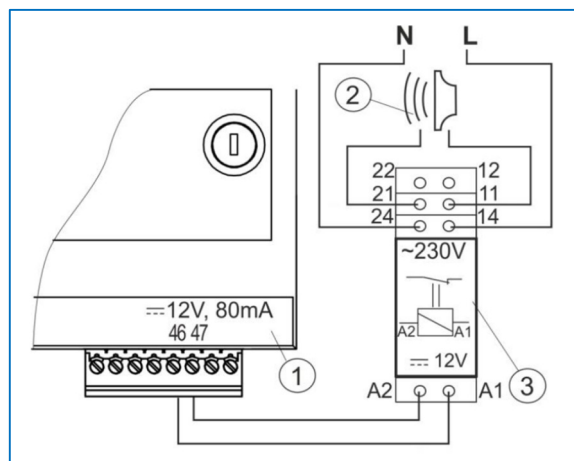
When the regulator enters the STAND-BY mode (OFF), the reserve boiler is automatically switched on. The heating system does not operate.



Hydraulic diagram with reserve boiler,  
1- regulator, 2 – reserve boiler, 3 – relay, 4 – switching valve (with limit switches), 5 - switching servo valve

If H-Out function is selected as Alarm signaling, the regulator may announce alarm conditions by activating an external device (e.g. a bell or GSM device to send a text message). Connect alarm annunciator as shown in figure through the relay.

- [Menu](#) → [Service Settings](#) → [H-output](#) → [H-output function](#) → [Alarms](#)



1- regulator , 2 – external alarm annunciator, 3 – relay.

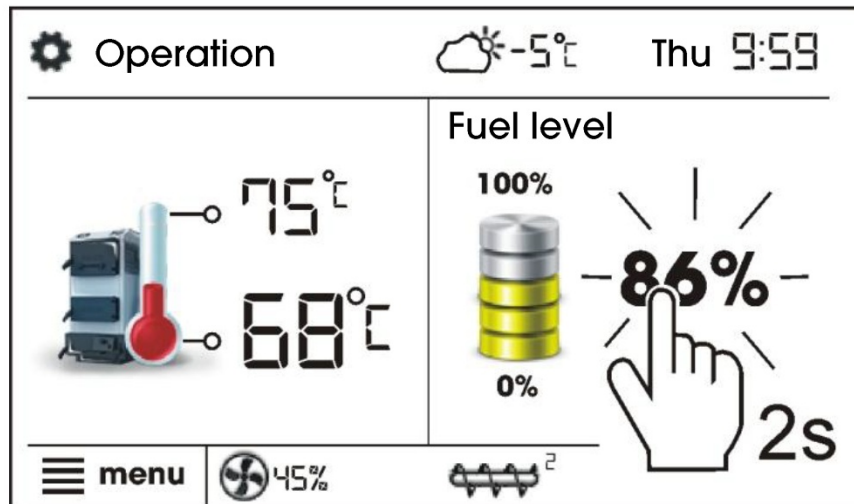
Then, select the alarms for which the signal output should be activated for the system to operate correctly:

- [Menu](#) → [Service Settings](#) → [H-output](#) → [Alarms](#)

## 10. START-UP

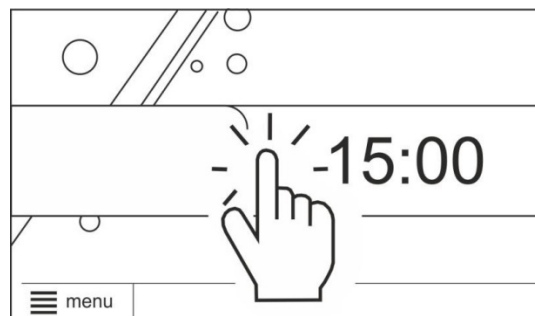
Make sure fuel is present in the tank and tank hatch is closed.

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





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

Now boiler may be switched on. To start the boiler, press at any place on the screen. The message: " ACTIVE REGULATOR?" appears.



Boiler activation window

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

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

## 11. ALARM CODES & TROUBLESHOOTING

### ALARM 1 – Maximum Boiler Temperature Exceeded

When the boiler temperature exceeds “boiler cooling temperature” set value (93°C as default value) the boilers give the alarm and starts cooling mode. Runs all the connected pumps until the temperature set points are reached in the related pumps zone (HUW up to set temperature, Buffer Tank up to 105°C, if floor heating enabled until set temperature else until boiler cooled with central heating pump)

### ALARM 2 – Boiler temperature sensor failed

If the temperature sensor reads values out of its range (which is not possible with the boiler) means boiler temperature sensor might be broken and should be replaced. The water temperature sensors can be checked by measuring their resistance at the given temperature. In the case of finding significant differences between the value of measured resistance and the values presented in the table below, the sensor must be changed

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

### ALARM 3 – Pressure sensor failed

If the pressure sensor reads values out of its range (which is not possible with the boiler) means boiler pressure sensor might be broken and should be replaced.

### ALARM 4 – No Ignition

If the burner cannot ignite the pellets in 15 minutes it makes 2 more attempts to ignite. In the second attempt it adds more pellets which is given in “Feeding 2<sup>nd</sup> attempt” parameter in service settings->Burner Settings->Run->Fire-up menu and increases the air to “Blow in second attempt” parameter. On the last try it only increases the air to “Blow in 3<sup>rd</sup> attempt” parameter and tries again. After all these 3 attempts if it cannot ignite the pellets it gives Alarm 4.

Possible reasons:

- a- Igniters are broken: Stop the burner let it cool down, then stop the main energy, disassemble wiring of the igniters, and measure them separately one by one. For Ceramic igniter one igniter will have ~72 ohms (two ceramic will have ~36 ohms. If they are broken please change them. If you cannot measure ohms, you can feed 230 volts to igniters (2-3 min.) and control them is heated or not.
- b- Igniter tube end near to combustion chamber is blocked by sticky ash: If the igniter outer tube (tube which we mount the igniter) end is covered with ash the hot air cannot heat the pellets and you cannot have ignition. Please control the igniter tubes, if they are blocked please clean them properly.
- c- Ignition quantity pellet is too less or too much: Make the pellet calibration process. Pellet feeding quantity can change when you change the pellet. It is too much dependent to the diameter and length of the pellet. And also you must know that; after some working period, some small fine particles of pellet can accumulate at the first inlet of the pellet screw, which will decrease the feeding capacity of the screw. So if you see that

pellet feeding is to less according to original figures, please control the screw inlet by opening the small cover on the screw side, down part of pellet silo. If you unscrew only the down screw + unscrew the top screw a little and then turn the small cover to up position, cleaning will be easier. If you clean entire screw, before making pellet calibration you must fill the screw complete. Run the screw for 10 minutes up to it is completely full again, in order to make the calibration correct and have the correct amount of first ignition quantity.

Recommended Pellet ignition quantities;

6 mm Pellets		12 kW	23 kW	40 kW & 60 kW	80 kW & 100 kW	150 kW
Caria	Minimum	150 gram	250 gram	600 gram	1100 gram	1400 gram
	Optimum	180 gram	275 gram	700 gram	1200 gram	1500 gram
	Maximum	225 gram	300 gram	800 gram	1300 gram	1600 gram

#### ALARM 5 – ID fan pressure cannot be reached

The need of pressure and amount of air are different for each process. So, if the fan pressure cannot reach to proper values for Fire-up, Stabilization, Purge, Burning off module etc. processes Alarm 5 will be given by the controller. (You can check the fan if it is working to be sure that if it is a mechanical problem or not. Also, you can look up the fan pressure values from “Service Settings” under the main menu and check if they set out of range. Also check if the pressure sensor is in place, connections are made, and if it is broken or not)

#### ALARM 6 – Burning off error

When the case is “Burning off, controller makes some sequential process and after waiting specific period it checks condition of flame. If flame is still on it gives Alarm 6. (Maybe waiting period is too short you should check “Burning of maximum time”. Also please check if the photocells are in their slots or not)

#### ALARM 7 – Photocell sensor failed

Before “operation” mode, photocell signal is checked. If the signal is getting worse or stay same meanwhile flue gas temperature stays same or changing, controller gives Alarm 7 because it is stated that the flame is false up to these circumstances. (-check photocells are in place, they are clean or not. Else replace the photocells)

#### ALARM 8 – Linear Actuator Blocked

Check the burner grate position, the linear actuator motor might be blocked because of any slag formation inside the combustion pot or any deformation at the burner. The motor itself might be broken. Check the 24 Vdc transformer, diode whether is working properly.

#### ALARM 9 – Work parameters error. Check parameters and fuel quantity

If flame loses while boiler in operation condition, controller stops the fan and after a certain time period it checks two things, flame condition and flue gas temperature. Normally, if flame on after the time period that means flame was lost due to one or some of these reasons; photocell was blocked because of too much pellet, air is not enough for the amount of feeding pellet or fuel humidity is too high. So controller increase full load of air up to three times if it cannot reach a stabilized area it gives Alarm 9.

In addition to this if flue gas temperature is decreasing, it means fuel is finished because of few pellets or too much air. In this case controller increases the pellet quantity up to three times and if at the end of 3<sup>rd</sup> try, flue gas temperature is still decreasing It gives Alarm 9.

**ALARM 11 – STB is disabled. Manuel reset is needed when boiler temperature  $\leq 65$  °C**

Safety limit thermostat is on after state  $T_{Boiler} \geq 100$  °C it stops fan and feeding and give Alarm 11. It should be manually reset from limit thermostat swich.

**ALARM 12 – Pellet feeding line temperature  $> 85$  °C**

If  $T_{burner\ feeding\ pipe} > 85$  °C controller stops fan and feeding for precaution of back burn risk and gives Alarm 12.

**ALARM 13 – Flue gas sensor failed**

If the flue gas sensor reads values out of its range (which is not possible with the boiler) means flow temperature sensor might be broken and should be replaced.

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

**ALARM 14 – Power outage**

When the energy is cut while the boiler is in an operation mode this alarm is saved into the alarm logs. After energy is back the boiler will return to previous operation mode.

## 12. CONNECTING YOUR BOILER TO INTERNET

EcoNET 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:

ecoNET integrated WWW server enabling remote control of operation of the boiler within a local network without Internet access,

Cooperation with [www.econet24.com](http://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,

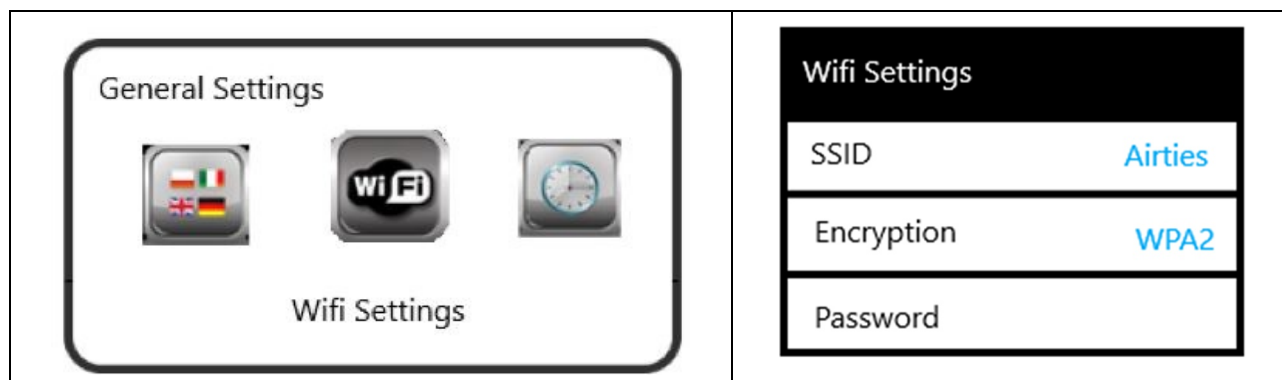
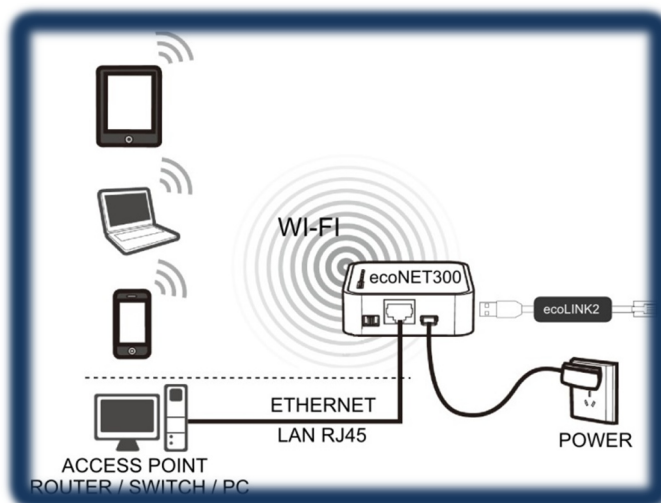
Preview and edition options of most (user and service) parameters of the controller,

Registration of operation parameters and alarm conditions of the controller,

Possibility of e-mail notifications concerning alarm conditions of the controller.

Connect adapter plug to a mini USB Port socket and 3G USB Port to the ecoLINK interface. Connect with RJ45 Ethernet Port with Ethernet cable, e.g. with ADSL router, switch and modem. A socket must be use in case of Wi-Fi wireless network access. Mode switch can be set in any position.

If you will connect Econet via wireless network you need to enter the SSID, Encryption Method and password. From the information menu you can see the connection, the signal strength and IP address of your controller.



WWW server incorporated in ecoNET300 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.

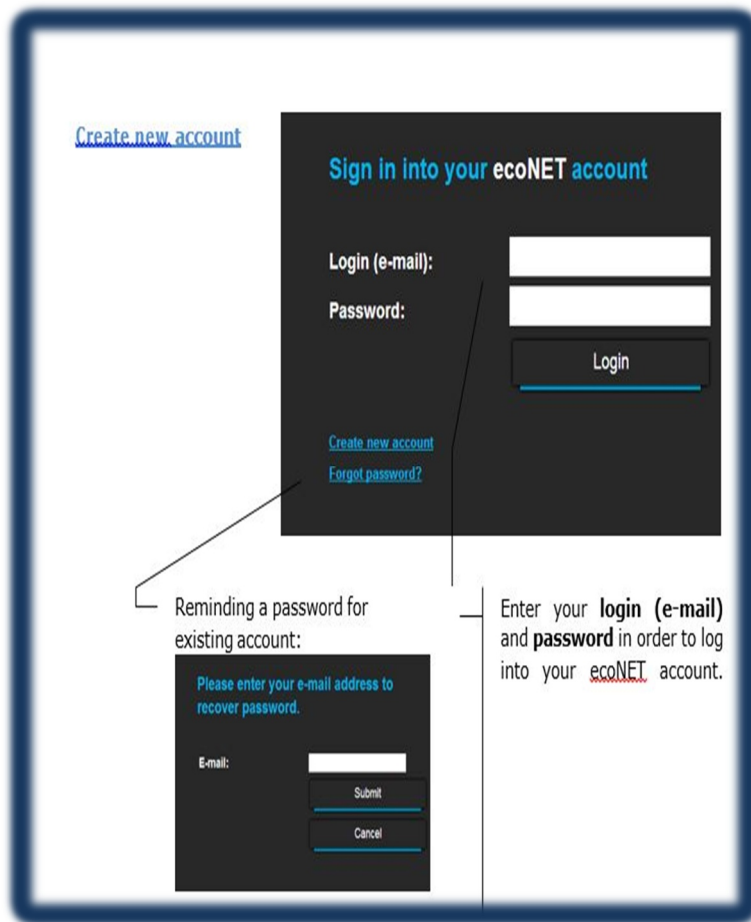
Where: can be read out from the boiler controller menu in information tab page :

Activated page will ask for user and password. Default settings are:

User: admin

Password: admin

## LOGGING INTO ECO NET ACCOUNT VIA INTERNET:



The screenshot shows a login interface for the ecoNET account. It features a dark background with white text and input fields. The main heading is "Sign in into your ecoNET account". Below this, there are two input fields: "Login (e-mail):" and "Password:". A "Login" button is positioned below the password field. At the bottom left of the login form, there are two links: "Create new account" and "Forgot password?".

Callouts provide additional information:

- A callout points to the "Forgot password?" link, stating: "Reminding a password for existing account:".
- A callout points to the "Login" button, stating: "Enter your **login (e-mail)** and **password** in order to log into your ecoNET account."

The "Forgot password" callout also includes a sub-form with the text: "Please enter your e-mail address to recover password." and an "E-mail:" input field with "Submit" and "Cancel" buttons below it.

EcoNET300 internet module cooperates with external server which is available under [www.econet24.com](http://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](http://www.econet24.com) into an address field of the web browser. In case of first logging, select:

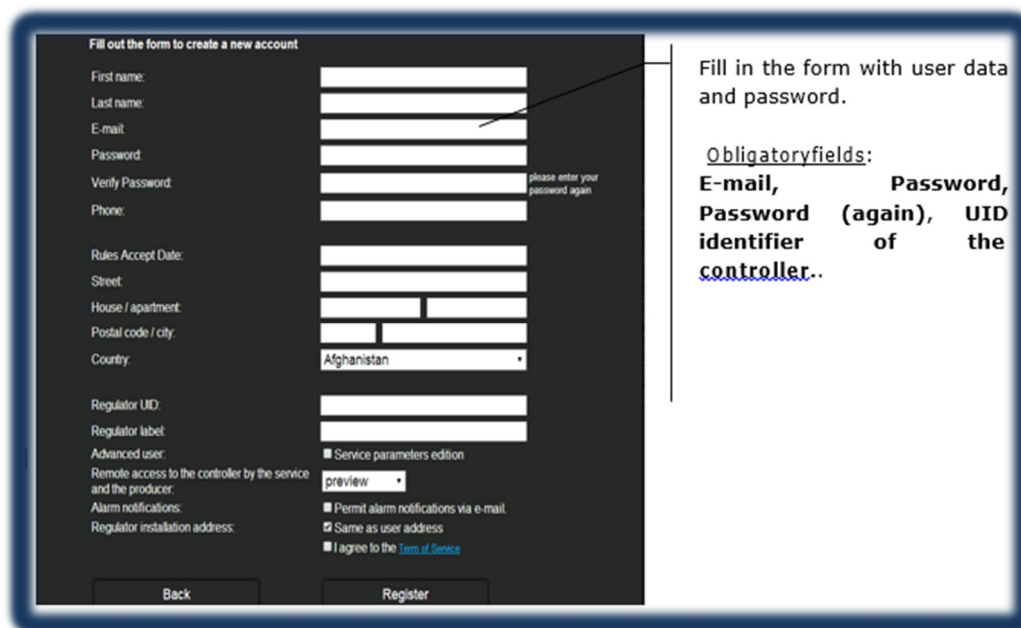
Select [Forgot your password](#), enter e-mail address and press Send.

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 ecoNET internet module.

EcoNET300 module should be connected to the Internet and be logged into the external server ("server connection" indicator is active).





In a form field:

*Regulator not available, try other UID or check if regulator is connected to the Internet*). UTD 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*). EcoNET24 server verifies whether UTD number is correct.

*Controller 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 require

*Service access (Enable remote access of the controller)* – enables to access and edit controller parameters via service and boiler manufacturer.].

*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.

*Controller installation address (Similar as user address)* – Check this field if the controller address is the same as residential address.

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

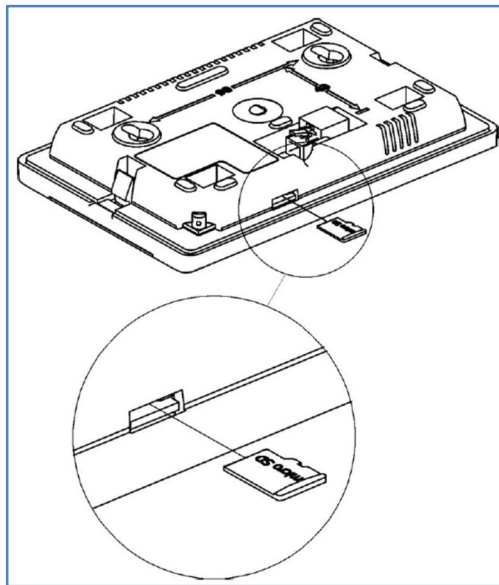
Press [Register]

### 13. UPDATING FIRMWARE

To upgrade the TOUCH version software, use micro SD memory card or the ecoLINK II interface. In this section, software upgrade in the TOUCH version using memory card is described.

Note: software may be upgraded by authorized personnel only. All electric shock preventive measures must be applied!

To upgrade the software, disconnect power supply of the regulator and remove ecoTOUCH control panel from the regulator housing. Insert memory card into indicated slot. Memory card should contain new software stored in the \*.pfc format (two files: one with software for touch panel, and the other one with software for module "A" of the regulator). Upload new software directly to the memory card. Do not nest data in sub-directory. Re-install the control panel in regulator housing and connect power supply.



Inserting a microSD card

To update ecoMAX860 controller and Touch screen by a microSD-card, please follow the below procedures:

1 - First of all, you should load interested files to a SD card by using copy and paste options. These files consist of two separate extensions which are pfi and pfc (one of them is for the controller and the other one is for the touch screen (It can be send by e-mail etc. for sure)).

2 - You should remove the panel gently by a screw driver.



3 - You should check the slot for the SD card and insert it in it properly.

4- After the third step, you will see Update screen from panel. On this screen, there are 2 options "Update A module" and "Update panel" which are related to controller and panel respectively. It is highly recommended that you should start with "Update a module" firstly. Touch that and approve the question, it will start to update controller. After update procedure is finished a brief information screen will be displayed as shown in the below picture.

5- Similarly update screen firmware by pressing "Update panel" button.



6- After update, you can mount the screen to the boiler. The screen will return the main menu after confirmation.

## 14. MAINTENANCE & SERVICE



Warning

For safety reasons, all cleaning and maintenance operations **MUST** be carried out with the appliance cold and wearing suitable Personal Protective Equipment. If a vacuum cleaner is used, it must also be suitable for vacuuming even hot ash.



Warning

Do not open any part on the boiler or burner when the system is running. Please stop the burner and wait up to no flame condition, after 30 minutes disconnect the power supply and always wait until all the parts are cooled down before cleaning and servicing operations.

Periodic maintenance, in addition to being required by legislation, is essential for the safety, comfort, performance and durability of the appliance. Careful maintenance allows to reduce consumption, polluting emissions and keeps the product reliable over time.

It must be carried out at least **ONCE A YEAR** by professionally qualified personnel and in any case before putting the appliance into operation after a long period of inactivity.

The manufacturer is not responsible for decays or malfunctions of the appliance due to poor maintenance.

Cleaning period depends on plant features, fuel and combustion parameters so after first commissioning please control the burner and boiler heat exchange surfaces once a month, if they need any cleaning. After few controls you can decide the period of cleaning you will need. The suggested periods are shown as below table:

Operation	Period
Cleaning the ash drawer	weekly
Smoke exhaust system	annual
Combustion chamber	weekly
Cleaning the pellet tank and screw conveyor	weekly
Cleaning the heat exchanger	annual
Fan cleaning	annual
Electric parts and electronic components	annual
Check of all elements subject to wear	annual
Ventilation system	annual


These cleaning intervals are indicative and can be reduced or extended according to the quality of the fuel and the operating conditions (eg repeated starting and stopping).

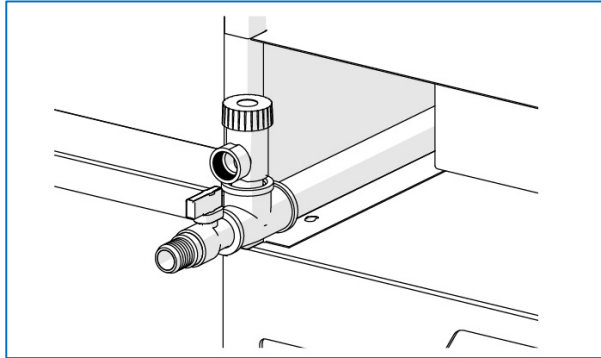
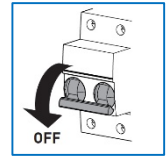
In order to extend the lifetime and increase efficiency at every heating season or once a year please call your authorized service to;

- Clean the boiler heat exchanger surfaces
- Check the combustion parameters
- Check the security and operational devices
- Check the adequate chimney draught

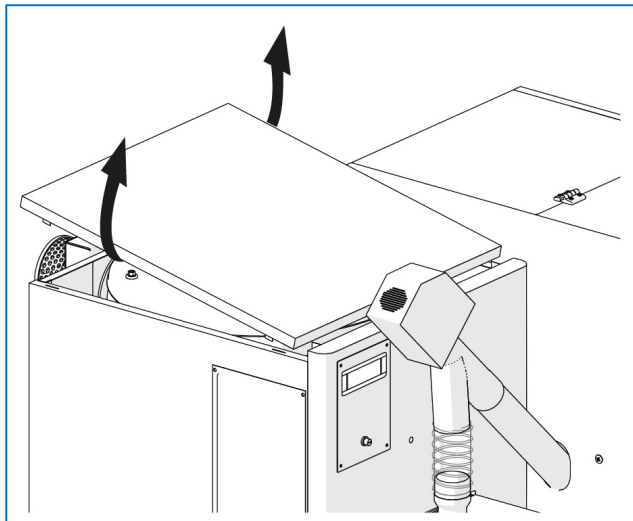
To clean the casing, use cloths moistened with water mixed with denatured alcohol or with specific non-abrasive products. Dry the surfaces well after cleaning

Before starting maintenance and boiler cleaning:

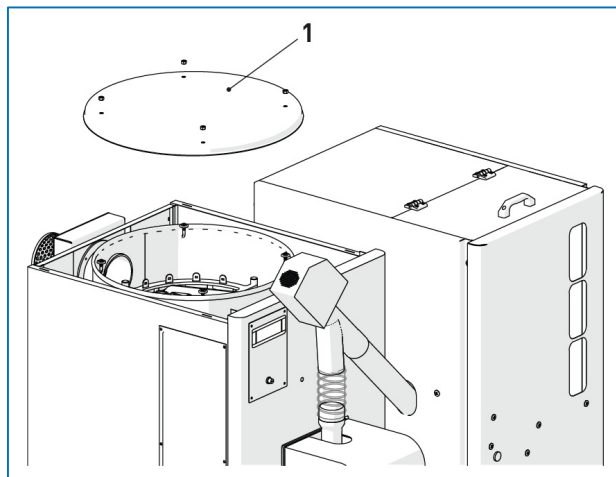
- switch off the boiler, deactivate the control panel by  pressing the button.
- After at least 60 minutes from the extinguishing of the flame, check that it is possible to disconnect the power supply and turn the main system switch to "OFF". Wait until all parts have cooled down further.
- Close the boiler flow and return valves.



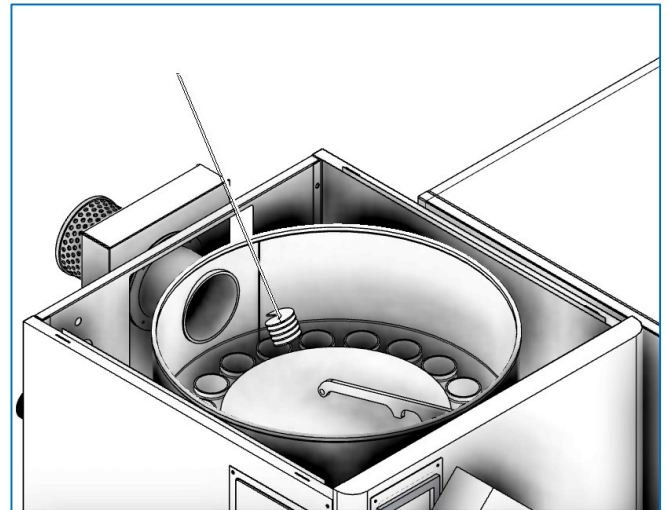
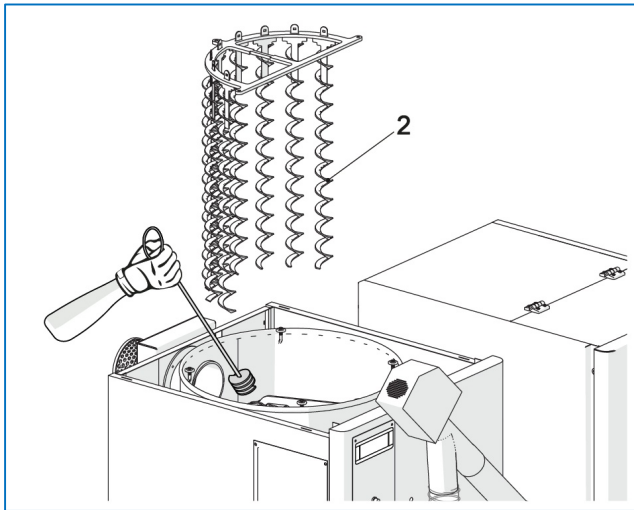
- To remove the upper panel of the casing: - use a screwdriver and lift it.



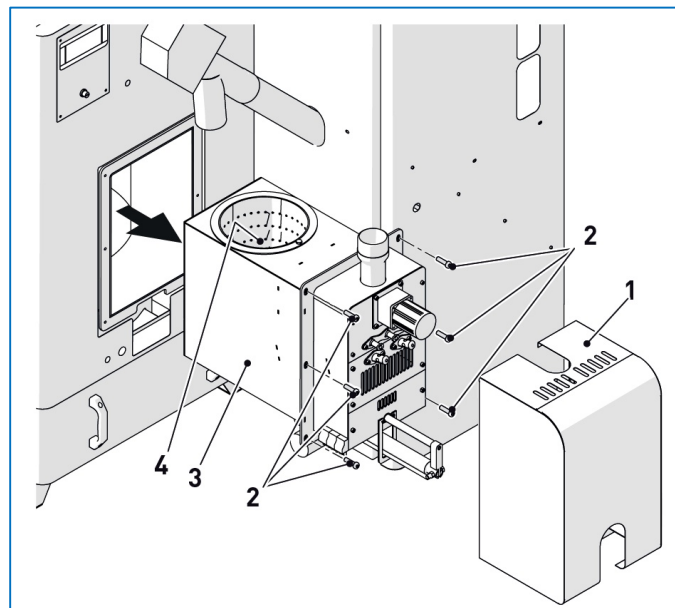
- Remove the lid of the combustion chamber (1)



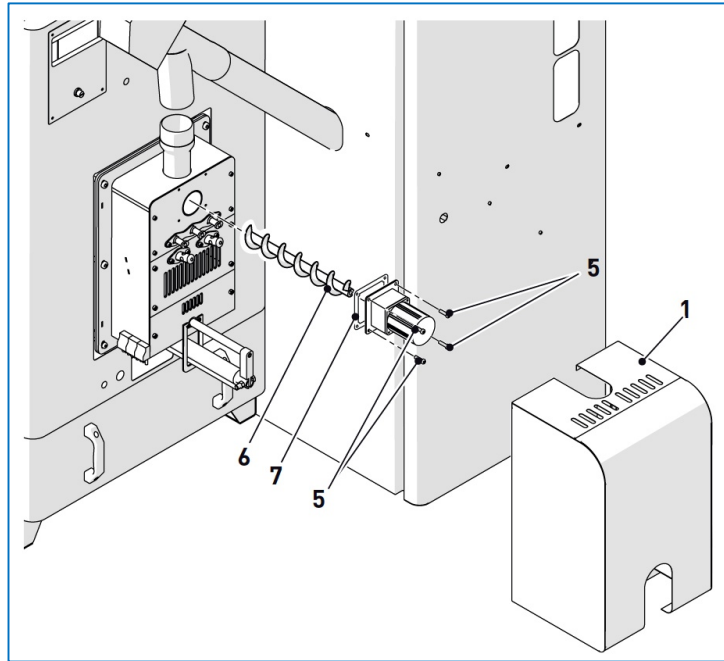
- lift and extract, with suitable equipment, the lever / turbulator unit (2). - clean the turbulators, the smoke pipes and the combustion chamber with a brush and the brush supplied with the boiler.



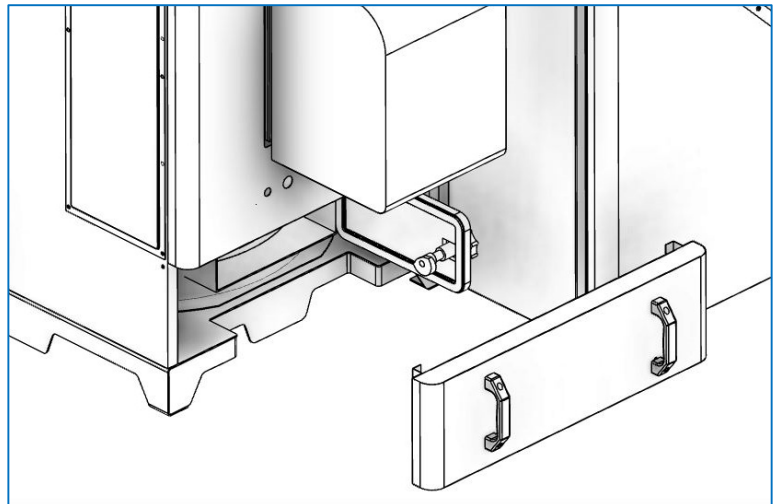
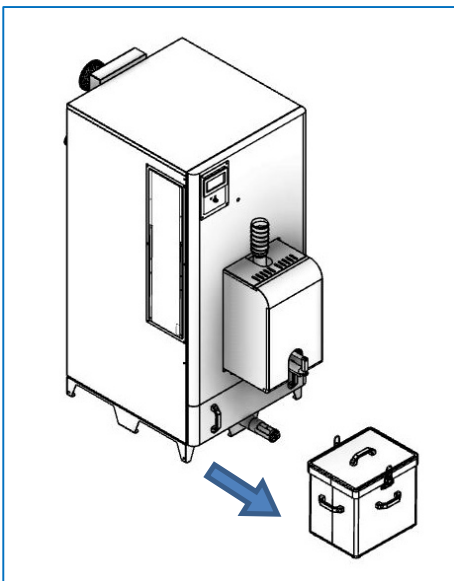
- Disconnect the hose and all the electrical connections (e.g.: connector between burner and auger, photocell, heater)



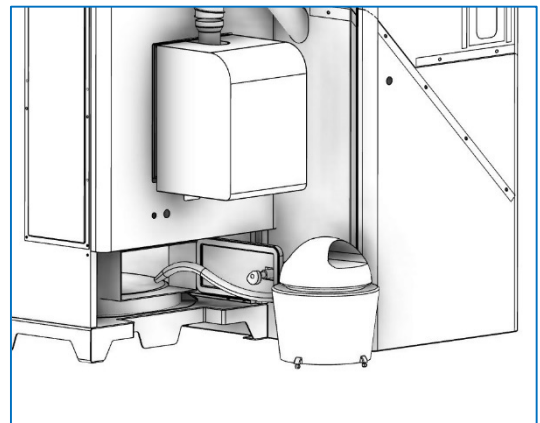
- remove the burner cover (1)
- remove the fixing screws (2) of the burner to the boiler and extract it
- clean the combustion head (3) and the grate (4)
- check the state of wear of the components and replace them if necessary
- Electrically disconnect the motor of the burner auger
- remove the burner cover (1)
- unscrew the fastening screws (5) of the auger to the boiler
- remove the auger (6), without damaging the seal (7) and clean it with a brush
- reassemble the auger (6) by positioning the sealing gasket (7) correctly
- reassemble the auger and fix it by tightening the screws (5), removed previously
- restore the electrical connection of the motor.



- take out the ash box, and discharge the accumulated ashes, remove the lower part of casing and open the ash door of the boiler.



- clean the ash compartment with suitable equipment (e.g. brush, vacuum cleaner)





- After cleaning, reassemble, in the correct position, all the parts previously disassembled by proceeding in reverse order to what has been described and restore the electrical connections of all the components.
- Open the previously closed boiler flow and return valves.
- And run the system.

Again, once a year call your authorized service for checking the combustion parameters, security and operational devices.

Do not alter the security devices preset values

Reset the burner fault maximum 3 times and still not firing call your authorized service

If the flue gas seals in any part of the boiler and flue gas exhaust is not functioning properly and there is a flue gas leakage stop the burner and please call an authorized service for repair or replacement.

Check the makeup water analysis periodically to avoid the formation of scale and corrosion which initially reduces the system efficiency and in long term will permanently damage the boiler.

Periodically check the safety and operational equipment.

During the long shut off periods run the circulation pump(s) and anti-condensation pump 5 min/month in order to avoid pump shaft lock-out. The regulator has both the anti-freeze and anti-clogging functions, therefore never disenergize the controller even the boiler won't run for a long period.

Frequent make up water need should be nonexistent it is a symptom of leakage which should be repaired as soon as possible. Adding water to the system will shorten the life of the boiler dramatically.

System water never fully drained if it is not necessary. Corrosion is very rapid in empty systems. New water filling means adding new scale and oxygen to the system. Both reasons cause to shorten the boiler service life and cause loss of efficiency.

System water level must be checked minimum once a month. At the first installation it needs regular check because of air discharge from the system.

Chimney must be cleaned periodically according to the national regulations minimum once a year.

If the system will be shut off for long periods in winter time please take precautionary actions for freezing the system water.

Water filters shall be cleaned regularly according the system need.

Please be sure that the boiler cannot suck extra air from any opening. Control all the doors are closed tight and gaskets are not damaged.



Ash screw outlet point (between ash screw pipe and ash screw outlet flange) must be sealed by the help of silicon

Before the heating season starts, please buy only 150-250 kg of pellets according to specifications given, and after seeing that you do not have any problem, please buy the rest of the pellets you will need for that heating season. Small changes in the pellet specifications can affect your system parameters.



Chimney is also very important part of the heating system. You must have always negative pressure ( -2 / -8 Pa) when the boiler fan is not running. Positive pressure can carry back the hot poisonous flue gases to boiler house. Too much negative pressure will also cause problem. Boiler fan may not control the set pressure under very high vacuum. If you have high vacuum in the chimney, please use draught stabilizer.

Please install a standard temperature indicator to the hot water return line to the boiler. You can check the condensation risk (return temperature must be > 55°C) and also you can control your circulation pump capacity. (Feed and return temperature difference must be between 16 – 22 °C if it is more than 26 °C it means that your pump is small for the system).

Solid-fuel-burning appliances need to be cleaned frequently because soot, creosote an ash can accumulate.

It is suggested to

- Establish a routine for the storage of fuel, care of the appliance and firing technique
- Check daily for creosote buildup until experience shows how often cleaning is necessary
- Be aware that the hotter the fire, the less creosote is deposited, and that weekly cleanings can be necessary in mild weather, even though monthly cleanings can be enough in the coldest months
- Have a clearly understood and appropriate plan to handle a chimney fire

Cleaning period depends on plant features, fuel and combustion parameters so after first commissioning please control the boiler heat exchange surfaces once a month, if they need any cleaning. After few controls you can decide the period of cleaning you will need.

## 15. DISPOSAL OF THE APPLIANCE (EUROPEAN DIRECTIVE 2012/19 / EU)

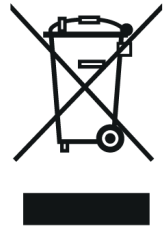
IT IS FORBIDDEN



dispose of the product together with urban waste.

For Caria CP-12, 23

At the end of their life, boilers and electrical and electronic equipment from private households must not be disposed of with normal mixed urban waste, but must be disposed of, in accordance with the law, based on directives 2012/19 / EU and Legislative Decree . 49/2014, in specific re-throwing and collection systems. For more information on authorized collection centers, you are invited to inquire at the municipality of your residence or at the retailer. Each country can also determine specific rules for the treatment of electrical and electronic waste.



Before giving the appliance, consult the regulations in force in your country.

For Caria CP-40, 60, 80, 100, 150



The boilers and electrical and electronic equipment coming from professional units or those that can be classified as professional waste, at the end of their life, must not be disposed of with normal mixed urban waste but, in accordance with the law, based on directives 2012/19 / EU and Legislative Decree 49/2014. Ask your distributor for their possible withdrawal or replacement, in case the product is replaced with a similar one.

Although your product is designed and manufactured to minimize its impact on the environment and health, it contains components that, if poorly managed, can be harmful. Your role as a buyer, in the management of end-of-life equipment, is essential to reduce the impact of waste on the environment, on people's health and promote the recycling chain. The symbol (slashed bin), reproduced here and also shown on your appliance, means that the latter, at the end of its life, must not be disposed of as a normal mixed urban waste, but rather managed, in accordance with by law, as a refusal of electrical and electronic equipment. Each country can also determine specific rules for the treatment of electrical and electronic waste.

Before giving the appliance, consult the regulations in force in your country.

## 16. COMMISSIONING FORM



Konya Yolu 29. Km Oğulbey Mah. Kumludere Cad. No:4 06830

GOLBASI/ANKARA

Tel: +90 (312) 615 51 11

Fax: +90 (312) 615 50 56

<http://www.arikazan.com> - [info@arikazan.com](mailto:info@arikazan.com)

COMMISSIONED DATE: ..... / ..... / .....

COMMISSIONED BY:

NAME:

TEL:

INITIAL SET VALUES

Fuel type:

Calibration Weight: ..... grams / 15 mins

Max Load Air Speed: ..... % / .....Pa

Average Load Air Speed: ..... % / .....Pa

Min Load Air Speed: ..... % / .....Pa

## MEASURED EMISSION DATA

Dates			
O <sub>2</sub> (%)			
CO (ppm)			
T Flue gas (°C)			
Chimney Draught (Pa)			

## 17. GUARANTEE CERTIFICATE

CERTIFICATE OF WARRANTY  
GARANTİ SERTİFİKASI

Konya Yolu 29. Km Oğulbey Mah. Kumludere Cad.  
No:4 06830 GOLBASİ/ANKARA  
Tel: +90 (312) 615 51 11  
Fax: +90 (312) 615 50 56  
<http://www.arikazan.com> - [info@arikazan.com](mailto:info@arikazan.com)

The warranty conditions of each model are attached to the instruction manuals accompanying the product.  
Tüm modeller için garanti şartları size gelen kullanım kitapçığının içinde verilmiştir.

MODEL:	CAPACITY/KAPASİTE:
SERİ NUMARASI:	
FIRST START UP DATE:	SIGNATURE OF TECHNICAL STAFF:
İLK KURULUM TARİHİ:	YETKİLİ GÖREVLİ İMZASI:
ANNUAL MAINTENANCE SERVICE YILLIK BAKIM SERVİSİ	ANNUAL MAINTENANCE SERVICE YILLIK BAKIM SERVİSİ
DATE: TARİH:	DATE: TARİH:
SIGNATURE OF TECHNICAL STAFF YETKİLİ GÖREVLİ İMZASI	SIGNATURE OF TECHNICAL STAFF YETKİLİ GÖREVLİ İMZASI

MODEL:	CAPACITY/KAPASİTE:	FUEL TYPE:
CUSTOMER..... MÜŞTERİ:	TLF:.....	
ADDRESS:..... ADRES:	CITY:..... ŞEHİR:	
INSTALLER:..... KURUCU:	TLF:.....	
ADDRESS:..... ADRES:	CITY:..... ŞEHİR:	
E MAIL:.....		
FIRST START UP DATE:..... İLK KURULUM TARİHİ:	CUSTOMER AGREEMENT MÜŞTERİ ONAYI	