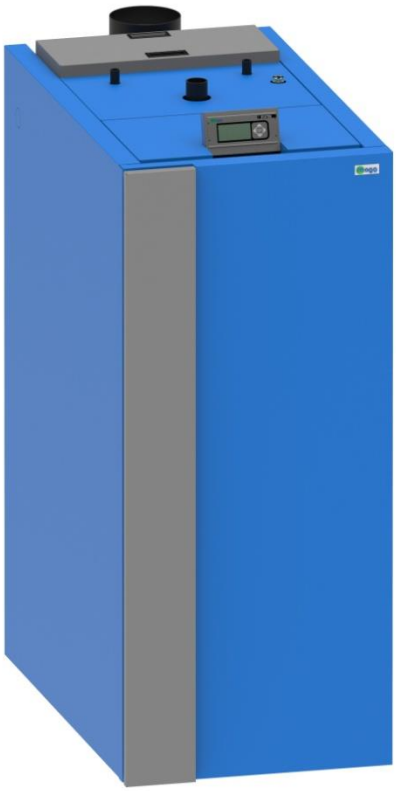
SLOVAKIAN WOOD and PELLET BOILER MANUFACTURER

MANUAL FOR INSTALATION AND OPERATION OF

Wood-gasification boiler MA-N28, MA-N38



Dear customer, thank you for the purchasing of our product. Please, follow the manual in order to be 100% satisfied with its operation and maintenance.

Team MAGA

Manual Version 2021/ 1.1

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CONTENT

INTRODUCTION

Dear Customer,

Thank you for the trust you have shown by the purchasing of our product, Wood-gasification boiler MA-N28/38. We wish you a long and reliable boiler service. One of the prerequisites for reliable and correct function is its correct operation and therefore it is necessary to read these operating instructions carefully. The instructions are compiled to respect the correct function of the boiler.

The correct function of the boiler is conditioned in particular by:
- choosing the right type and output of the boiler,
- perfect start-up,
- proper operation,
- regular professional maintenance,
- reliable service,
- using the right fuel,
- protecting the boiler against the low-temperature corrosion.

1. GENERAL

Name: Wood-gasification boiler
Type: MA-N28/MA-N 38
Max. operating pressure: 200 kPa (2 bar)
Electr. connection: 230 V/50 Hz/10 A
Electr. Power consumption (electronic controller): 60W/90W
Fuel: Dry wood with
Calorific value: 15 - 17 MJ/kg,
Moisture: 12 - 20%,
Diameter: 80 - 120 mm
Fuel according EN 303-5: 2012: Biogenic Type A
Nominal power: 28 kw/38 kw

The MA-N wood gasification boiler is designed for economical and environmentally friendly heating of family houses, cottages, workshops and similar buildings. The required fuel for is dry wood, in the form of logs or split pieces in length according to the type of boiler. The boiler works with a LAMBDA PROBE, it has 2 actuators for controlling the air supply. The water temperature in the cooling circuit should be 8 - 12 ° C. The water pressure is determined from min. 2.5 bar

after max. 6 bar. The MA-N boiler works in a closed system and in non-condensing operation. It works in overpressure operation behind the connection socket to the chimney.

Manufacturer MAGA, s.r.o. reserves the right to make technical changes to the products without prior notice.

This manual uses the following warning signs to illustrate the severity of the hazard and important safety warnings:

⚠ **WARNING:** Dangerous situation is imminent and, if not taken correctly, can lead to serious damage to health or property. Follow the instructions below!

⚠ **WARNING:** This can result in a hazardous situation which, if not avoided, could result in death or serious injury. Work with extreme caution!

⚠ **CAUTION:** A hazardous situation can occur and, if not avoided, can result in personal injury or property damage.

2. IMPORTANT INFORMATION

• During gasification, tar and condensates (acids) are formed in the fuel tank. Therefore, a mixing device must be installed behind the boiler in order to maintain a minimum return water temperature to the boiler of 60 °C. The operating temperature of the water in the boiler must be in the range of 75 - 85 °C.
• The boiler must not be operated continuously in the output range of less than 50%.
• Boiler operation is most environmentally friendly at rated output.
• Installation of a boiler with a storage tank and mixing device is necessary. It guarantees fuel savings of 20 - 30%, longer life of the boiler and chimney and more comfortable operation.
• We recommend connecting the boiler together with the accumulation tank, the volume of which should be at least 70 l per 1 kW of boiler output (ie min. 2000 l for type MA-N28 or 2700 l for MA-N38)
• Use only dry fuel with 12 to 20% humidity (with higher fuel humidity, the boiler output decreases and its consumption increases).
• Choosing the right size of the boiler resp. its heat output is a very important condition for economical operation and proper function of the boiler. The boiler must be selected in order that its rated output corresponds to the heat loss of the heated object.
• Placing boilers in the living space (including corridors) is strictly forbidden!

WARNING: The boiler may only be used for the purpose for which it is intended and only as described in this manual.

WARNING: After disconnecting the boiler from the mains, combustion continues in the setback mode. Do not open the boiler door until the boiler temperature drops below 40 ° C. Protect from children!

The boiler is not covered by the warranty if:

• is not operated with the prescribed fuel,

• the Laddomat 21-60, 21-100 or MAGAMAT 60 ° C mixing device will not be installed in the system, which ensures a return water temperature to the boiler of at least 60 ° C during operation,

• a functional thermostatic valve will not be installed on the aftercooling circuit of the boiler connected to the cooling water source, (eg aftercooling valve BVTS 3/4)

• the boiler is not installed according to the technical requirements stated in this manual, such as e.g. correct dimensions of the chimney, etc.

• is not adequately cleaned according to the instructions in this manual.

This appliance is not intended for use by persons (including children) with physical, sensory or mental disabilities or lack of experience and knowledge of safe use, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.

If the power cord is damaged, it must be replaced with the correct type of cord!

Be careful when working with the appliance! The lambda probe works at high temperatures (300 °C) and there is a risk of burns if handled carelessly!

TECHNIC DESCRIPTION

The boiler is designed for wood combustion, on the principle of gasification with the use of an exhaust fan, which creates a forced flow in the elbow and sucks flue gases from the boiler. The boiler body is made as a weldment from 6 mm thick steel sheets. In the upper part of the boiler there is a loading chamber, equipped with dry jacket technology, which reduces the formation of condensate and thus prolongs the life of the boiler. In the lower part of the loading chamber there is a refractory concrete nozzle with a longitudinal hole for the passage of wood gas into the combustion chamber. Secondary air is supplied in the nozzle, which, when mixed with wood gas, produces combustion in the combustion chamber. Combustion residues (ash) accumulate in the combustion chamber. The ashtray is located under the combustion chamber. In the rear part of the boiler body, the tubular exchanger is equipped with combined turbulators (flue gas brakes), which are used to clean the exchanger and increase the efficiency of the boiler. Turbulators with cleaning springs are controlled by a lever on the side of the boiler. In the upper part of the boiler there is a boiler control, which controls the wood gasification process and provides all important information about the operation of the boiler. The extraction of flue gases during application is solved by an exhaust channel in the upper part of the combustion chamber and opens directly into the chimney, which bypasses the exchanger. The boiler is designed for a long combustion time depending on the output, and therefore it is necessary to connect it with the buffer tank.

Power (nominal)	kW	28	38
Fuel consumption	kg/h	7,24	9,21
Flue draft required	Pa	22	20
Flue output diameter	Mm	160	160
Flue gas mass flow Qmax	g/s	15,916	24,861
Connection		G 6/4"	G 6/4"
Weight of the boiler	Kg	560	565
Water volume	L	150	150
Heating exchanging surface	m^2	3,6	3,6
Heat efficiency	%	91,3	91,75
Energy class		A+	A+
Load chamber volume	L	105	105
Wood log length	Mm	500	500
Max. operating pressure	MPa	0,2	0,2
Testing pressure	MPa	0,4	0,4
Max. operating water temperature	°C	85	85
Min. input water temperature	°C	60	60
Input voltage	V	230	230
Max. electric input	W	60	90
Electric input by boiler nominal power	W	60	90
Electric. Input STAND BY mode	W	3	3
El. protection		IP 20	IP20
Emission boiler class EN 303-5:2012		5	5
Efficiency boiler class EN 303-5:2012		5	5

3. FUEL

Recommended fuel for the MA-N28 / 38 boiler is soft and hard chopped firewood with a calorific value in the range of 15 to 17 MJ / kg. The most suitable wood is especially beech, oak, fir, spruce, pine, poplar, alder, willow, birch, ash, hornbeam, agate with a humidity in the range of 12 to 20%. The recommended field diameter is in the range of 70 to 110 mm. The maximum length of the logs must not exceed 500 mm in order to prevent the wood from jamming in the loading chamber.

Fuel according to EN 303-5: 2012: Biogenic Type A

CAUTION: Improper moisture or wood size can cause reduced performance, low flue gas temperature, excessive condensation, or interruption of the gasification process.

Recommended storage and drying of wood
Hardwood: 2 years stored in a dry environment
Soft wood: stored in a dry environment for 1 year
Wood must be protected from rain during storage (drying). You can achieve more efficient wood drying by placing wood with the largest possible air gaps so that air can flow between the individual pieces of wood. When drying, choose places where the wind acts on the wood. This will speed up the drying of the wood. If possible, store the wood in a warm and dry place for at least 1 day before loading it into the boiler. Preheat it to increase combustion efficiency.

CAUTION: Illegal types of fuels increase the demands on cleaning and lead to the accumulation of aggressive sedimentation and condensation, which can ultimately lead to reduced functionality, damage to the boiler and void the warranty. The use of illicit fuels can cause incorrect and uncontrollable combustion.

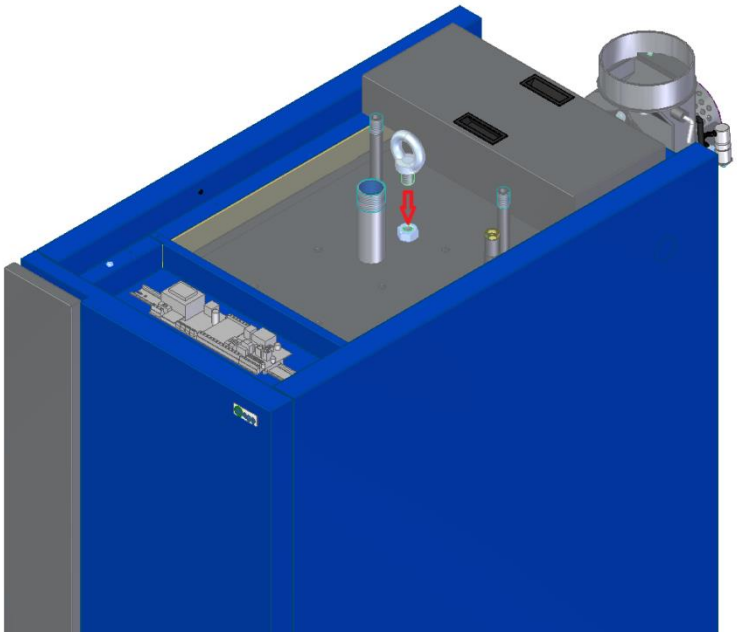
4 ASSEMBLING AND INSTALLATION

The boiler may only be installed by a person with a valid authorization for the installation and assembly of heating equipment. A project that complies with the applicable regulations must be prepared for the installation. Before installing the boiler, the installer is obliged to check whether the data on the boiler nameplate agree with the data in the project and in the accompanying documentation of the boiler. The boiler connection must comply with the applicable regulations, standards, ordinances and these operating instructions.

NOTICE: The manufacturer is not liable for damage caused by incorrect wiring or incorrect operation!

4.1 MANIPULATION

The boiler is delivered placed on a pallet. Always handle the boiler on a pallet until the boiler is removed from the pallet immediately at the installation site. This can be done with the help of a handling truck or with a crane and a lifting eye, which is not part of the delivery (recommended specification: hanging eye M20 DIN 580). The suspension eye is screwed into a pre-prepared nut welded on the top of the boiler intended for hanging the boiler. Before hanging the boiler on the hanging eye, it is necessary to remove the upper lid of the boiler.



Method of handling the boiler using a hanging eye

4.2 REGULATIONS AND DIRECTIVES

The heating system must be filled with water that meets the requirements of STN 07 7401: 1992 and its hardness must not exceed the required parameters.

Water hardness

Hardness	mmol/l	1
Ca^{2+}	mmol/l	0,3
Total concentration of Fe + Mn	mg/l	0.3 (recommended value)

a) Heating system

STN 06 0310 Central heating, design and installation.

STN 06 0830 Security devices for central heating and hot water.

STN 07 7401 Water and steam for thermal energy equipment with a working steam pressure up to 8 MPa.

STN EN 303-5 :2012 Central heating boilers - Part 5: Central heating boilers for solid fuels, with manual or automatic supply, with a rated thermal input not exceeding 500 kW - Terminology, requirements, testing and marking

b) Chimney

STN 06 1610 Parts of flues for household appliances
STN 73 4201 Design of chimneys and flues.

c) Fire regulations

STN 06 1008 Fire safety of heating devices
STN 73 0823 Fire-technical properties of materials. Degrees of flammability of building materials.
STN 73 0861 Fire safety of buildings. Flammability testing of building materials. Non-combustible materials.

d) electric

STN 33 0160 Electrotechnical regulations for marking terminals el. subjects. Implementing rules
STN 33 2000-4-41 Protection against electric shock.
STN 33 2000-5-51 Electrotechnical regulations. El. devices. Part 5: Construction of el. equipment.
STN 33 2030 Electrotechnical regulations. Protection against the dangerous effects of static electricity.
STN 33 2130 Electrotechnical regulations. Internal electrical wiring.
STN 33 2180 Connection of electrical devices and appliances.
SNT 33 2320 Electrical regulations. Regulations for electrical equipment in places with a risk of explosion of flammable gases and vapors
STN 33 2350 Regulations for electrical equipment in difficult climatic conditions.

STN EN 60 335-1 Safety of household and similar electrical appliances.

4.3 PLACEMENT

In addition to the above, the boiler room must meet the following conditions:

• There must be no potentially explosive atmosphere in the boiler room, as the boiler is not suitable for use in such environments.

• The temperature in the boiler room must not fall below freezing.

• The boiler itself does not provide any lighting. The customer must provide a sufficient light source according to local standards and regulations.

• If the boiler will be installed at an altitude exceeding 1800 m, it is necessary to consult such installation with the manufacturer.

• The boiler room must have a secured opening for sufficient ventilation as well as the supply of the required amount of combustion air, but at least 10 cm2 / kW of boiler output. The opening should be designed so that the external weather does not affect its function (rain, snow, wind).

Location of the boiler in relation to the electrical network

- The boiler must be positioned so that the plug to the 230V / 50Hz socket is always accessible. The boiler is connected to the electrical network firmly by a flexible supply connection terminated by a standardized plug.
- The boiler must be connected to a plug circuit with 10 and an electrical circuit breaker according to STN EN.
- Protection against electric shock must be provided in accordance with the valid STN EN

Location of the boiler with respect to fire regulations

- Location on the floor made of non-combustible material:
- The boiler must be placed on a non-flammable thermal insulation pad exceeding the floor plan of the boiler on the sides by 20 mm.
- If the boiler is located in the basement, we recommend placing it on a concrete slab min. 50 mm high. The boiler must be horizontal.

Safe distance from flammable materials

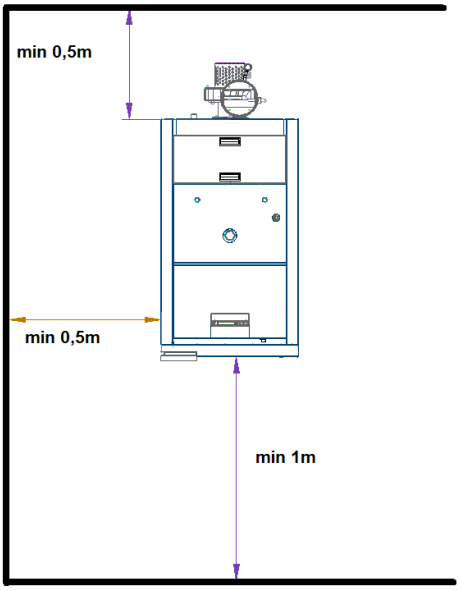
When installing and operating the boiler, it is necessary to observe a safety distance of 200 mm from flammable materials of flammability class B, C, and D (according to STN EN 13501-1) (Tab.) for highly flammable substances of grade E, F, which burn quickly and burn themselves even after removal of the ignition source (eg paper, cardboard, cardboard, asphalt and tar cardboard, wood and fibreboard, plastics, floor coverings), the safety distance is doubled, ie. to 400 mm, the safety distance must also be doubled if the degree of flammability of the building material is not proven.

Tab.1 Degrees of flammability of building materials and products

Degree of flammability of building materials and products	Building materials and products classified into flammability levels (selection from STN EN 13501-1)
A1 - non-combustible	granite, sandstone, concrete, bricks, ceramic tiles, mortars, fireproof plasters, ...
A2– not easily flammable	isumin, heraclite, lignos, plates and basalt felts, glass fiber plates, ...
B - hardly combustible	beech, oak, OSB boards, plywood, umakart, sirkolit, ...
C, D - medium combustible	spruce wood, chipboard and cork boards, rubber flooring, ...
E, F - highly flammable	asphalt cardboard, fibreboard, cellulose materials, polyurethane, polystyrene, polyethylene, PVC, ...

Boiler location with respect to the required handling space:

- basic environment AA5 / AB5 according to STN 33 2000-3
- in front of the boiler there must be a handling space of min. 1000 mm
- the minimum distance between the rear part of the boiler and the wall is 500
- minimum distance from the side wall 500 mm
- above the boiler at least 1000 mm for the possibility of cleaning the exchanger



Fuel placement:

- dry fuel must be used for proper combustion in the boiler.
- it is forbidden to store fuel behind the boiler, store it next to the boiler at a distance of less than 400 mm.
- the manufacturer recommends keeping the distance between the boiler and the fuel min. 1,000 mm or place the fuel in a room other than the installed boiler.
- When connecting the boiler to the heating system, the drain valve must be located at the lowest point and as close as possible to the boiler.

4.4 FUME OUTLET FROM THE BOILER

The flue must have an outlet to the chimney flue. If it is not possible to connect the boiler to the chimney flue directly, the relevant flue extension must be as short as possible, not longer than 1 m, without an additional heating surface and must rise towards the chimney. The flue should be suitably insulated so that a sufficient flue gas temperature is reached in the chimney, so that condensation of the chimney does not occur. The flues must be mechanically strong (we recommend installing the flue on the boiler and screwing it tight) and tight against the penetration of flue gases and cleanable inside.

The inner cross-section of the flue must not taper towards the chimney. The use of knees is not appropriate. The flue must be connected to the T-shaped chimney so that the condensate from the chimney does not flow into the boiler but into the container provided.

4.5 BOILER CONNECTION TO CHIMNEY

The connection of the appliance to the chimney flue must always be made with the consent of the relevant chimney sweep. The chimney flue must always develop sufficient draft and reliably discharge the flue gases into the open air for all practically possible operating conditions. For the correct function of the boiler, it is necessary that the separate chimney flue is correctly dimensioned, because its draft depends on the combustion, output and service life of the boiler. The draft of the chimney directly depends on its cross-section, height and roughness of the inner wall. No other appliance may be connected to the chimney to which the boiler is connected. The diameter of the chimney must not be smaller than the boiler outlet. The chimney draft must reach the prescribed value. However, it must not be extremely high so as not to reduce the efficiency of the boiler and not disturb its combustion (it does not break the flame). If the draft is too high, install a throttle valve or chimney draft regulator in the chimney flue between the boiler and the chimney.
Minimum height of chimney: **8m**!

For the correct function of the boiler is min. Chimney height 8m
Prescribed cross-section and chimney height values:
20 × 20 cm min. height 7 m
Ø 20 cm min. height 8 m
15 × 15 cm min. height 11 m
Ø 16 cm min. height 12 m

The exact size of the chimney is determined by STN 73 42 10. The prescribed draft of the chimney is given in the Technical parameters. If your chimney does not reach the prescribed chimney parameters, it is possible to install an additional MAX FAN 160 fan behind the boiler, which can create the required chimney parameters. When choosing the type of chimney or boiler operation, keep in mind that the stainless steel insulated chimney (usually led externally along the building envelope) has the best properties in terms of the onset of the chimney draft after heating, because it heats up quickly along its entire length. A chimney lined with a stainless steel insert has worse properties in terms of the onset of the chimney draft, because it heats up more slowly than an insulated chimney. An unloaded chimney (for example, brick or ceramic) has the worst properties in terms of the onset of the chimney draft, because its accumulation to the operating temperature takes longer. Therefore, if heating or boiler start-up is problematic, consider the reconstruction of the chimney and its equipment with a stainless steel insert.

4.6 METHOD OF CONNECTION OF CONTROLS AND SAFETY ELEMENTS

The boiler is supplied with basic equipment with regulating and control elements. These must be supplemented by elements that are not part of the boiler delivery, but must be installed in the heating circuit. These are, in particular, a safety valve against exceeding the permissible pressure in the heating system (we prescribe 2.5 bar), a valve for the after-cooling loop of the boiler for the removal of excess heat from the boiler to the waste and a vent valve for the correct operation of the boiler. The expansion tank in the system must have a sufficient volume, which is determined by the designer of the heating system according to the valid regulations. The electrical installation associated with the boiler's additional equipment must be carried out by a specialist in accordance with the applicable standards.

WARNING! *The heating system must be equipped with a safety valve against exceeding the pressure in the boiler (2.5 bar). If the safety valve does not work, the excess pressure will have nowhere to escape and the boiler may explode!*

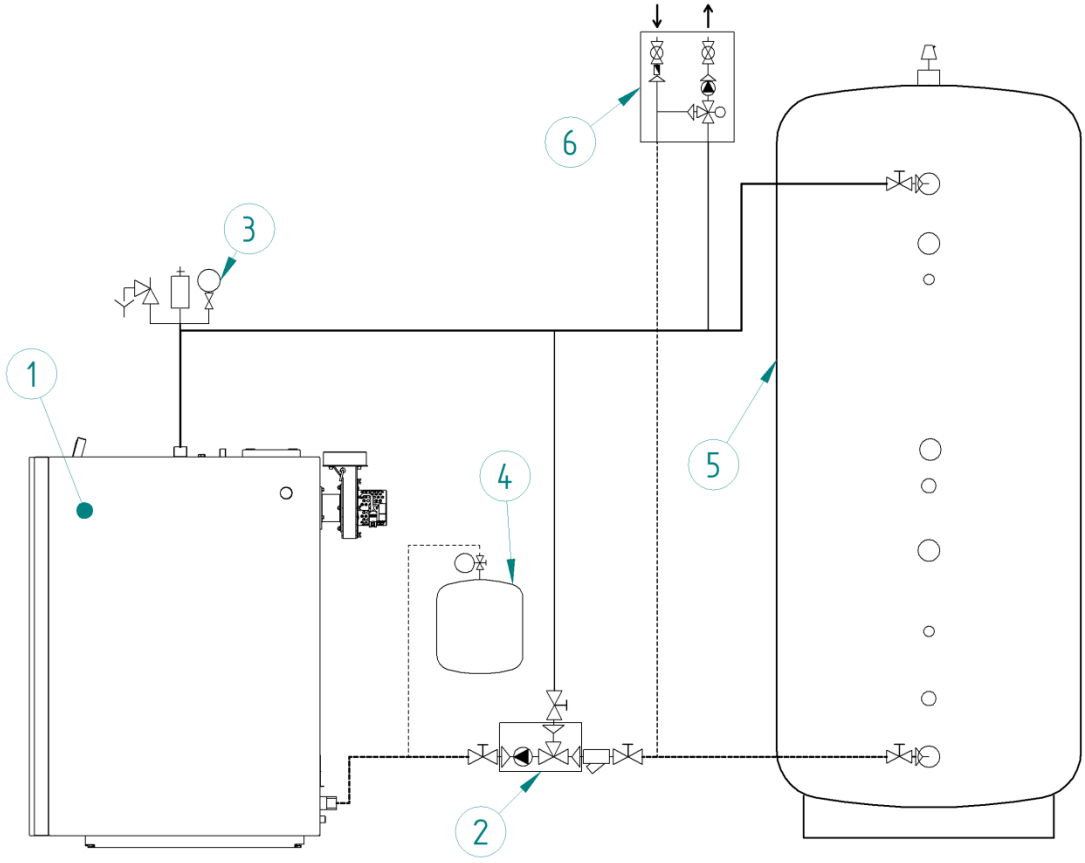
BOILER PROTECTION AGAINST OVERHEATING Each wood gasification boiler must be equipped with a functional cooling circuit. The correct valve to provide this function can be ordered as an accessory.

WARNING! *The cooling circuit against overheating of the boiler must not be used according to EN 303-5 for purposes other than protection of the boiler against overheating. The valve on the cooling water supply to the boiler cooling circuit must be permanently open and the boiler cooling circuit must be connected to a functional cooling water distribution (eg cold water distribution) at a temperature of 10 to 20 °C and a working overpressure of 2 - 6 bar ensuring safe operation even in the event of a power failure.*

Recommended installation schema

The connection system consists in heating the water in the storage tank, from where the accumulated heat is gradually taken according to the requirements of the heated space.

1- boiler
2- Laddomat
3- Safety group
4- expansion vessel
5- accumulation tank
6- mixing group



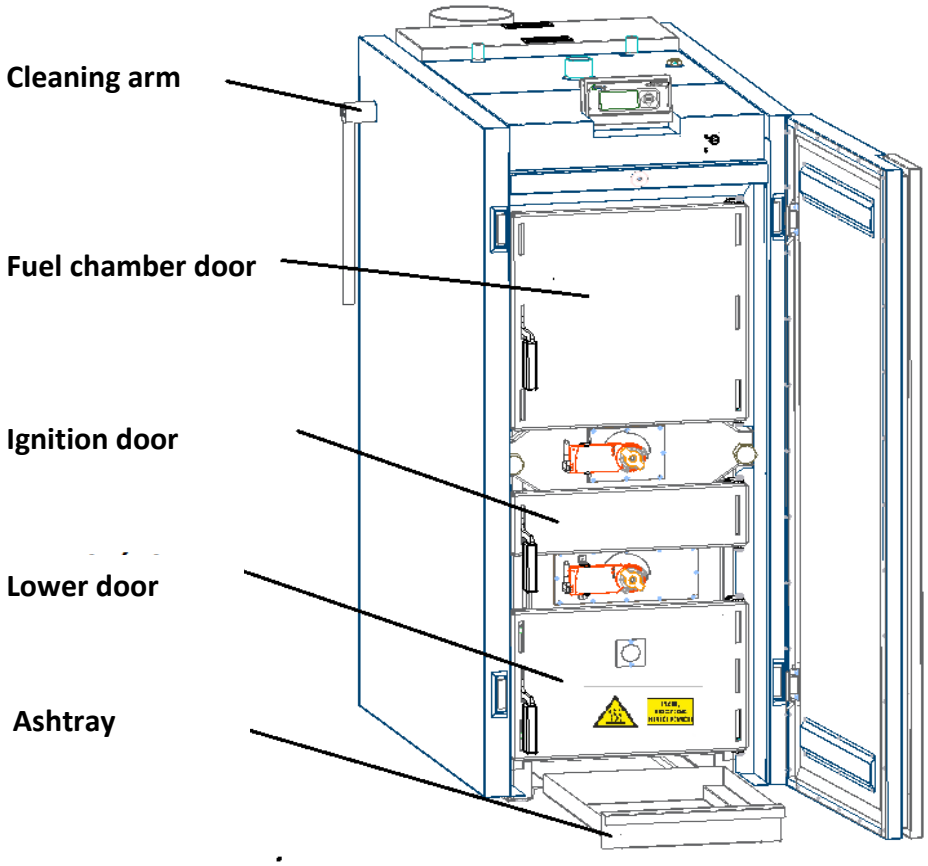
5 BOILER USE

5.1 PREPARING THE BOILER FOR OPERATION

Before the start of the boiler operation, make sure that the system is filled with water, vented and that the heating water pressure does not drop. Check that the chimney pipe is firmly connected and that there is no smoke leakage. Check that the boiler and safety thermostat sensors are located in the boiler wells and that they show real values. The boiler must be operated in accordance with the instructions given in this manual in order to achieve correct operation. Operation may only be performed by an adult trained person.

If the boiler has been out of operation for a long time (switched off, faulty), it is necessary to take extra care when restarting it. When the boiler is shut down for a long time, the pump may be blocked, water may leak from the system or the boiler may freeze in the winter

5.2 HEATING, OPERATION AND REFUELING



1. Open the loading door. Check the height of the ash in the loading chamber. If the height of the ash exceeds 50 mm from the bottom of the chamber, clean the loading chamber. If there are wooden carbons in the chamber, it is not necessary to remove them, they will facilitate heating. However, the ash must always be removed. For cleaning, it is ideal to use a brush and collect the ash towards the nozzle so that it falls into the combustion chamber of the boiler. Always clean the combustion chamber before each additional heating of the boiler!

WARNING! If the combustion chamber is not sufficiently cleaned, the volume of the combustion chamber
will be rapidly reduced, which can lead to imperfect combustion and dangerous conditions. Under no circumstances operate the boiler without a cleaned combustion chamber!
2. Insert one layer of medium-thick fields (approx. 40 mm – 60 mm) into the loading chamber on the refractory fitting so that neither air access to the nozzle nor primary air is blocked.
3. Place paper or cardboard or other suitable wood-burning agents (eg solid alcohol lighter) on the wood thus prepared.
4. Finely place chips on cardboard or paper, which after firing will form a base layer (carbons) for firing piece wood
5. Start the controller.
6. Ignite the prepared layer at the bottom front and close the door to approx. 15 mm.
7. Wait 10-15 minutes for the base layer to burn sufficiently to allow the piece of wood to be applied
8. We attach the piece of wood complete
9. Close the door. Heating is complete. If you are not sure whether the heating was successful, monitor the flue gas temperature. If the heating has been carried out correctly, the flue gas temperature will rise.

5.3 OPERATION

The boiler is controlled according to several parameters in normal operation. The boiler is ideally always operated so that it goes at 100% output, which achieves the highest efficiency, combustion stability, minimal combustion residues and trouble-free operation. Such operation is most easily achieved when the boiler is connected to a storage tank of suitable volume, which it gradually accumulates. Here, the rule must be observed that the difference between the set boiler temperature and the return temperature is at least 15 °C, so that the boiler does not reach the set boiler temperature during charging of the storage tank and thus does not switch to attenuation mode before the storage tank is charged. Boiler operation and control is explained in more detail below.

5.4 REFUELING

WARNING! During operation, you must open the loading chamber door gradually so that any smoke coming out of the chamber does not catch your eyes. We always refuel only when the

wood is almost completely consumed and only carbon remains in the loading chamber. We do not recommend replenishing wood during normal operation, when there is more than 20% of the volume of the chamber in the loading chamber, because pyrolysis takes place in the loading chamber without access to oxygen, which creates smoke and it cannot be well aspirated after opening the door. The application itself is done by opening the door to about 15 mm, waiting for the smoke to be sucked out and opening the door completely. Then we put the wood into the chamber as quickly as possible. The wood must move freely in the loading chamber and there must be gaps of at least 1 to 2 cm between the individual logs. After loading the wood into the chamber, we can close the door.

6.4 PROTECTIVE EQUIPMENT FOR WORKING WITH THE BOILER

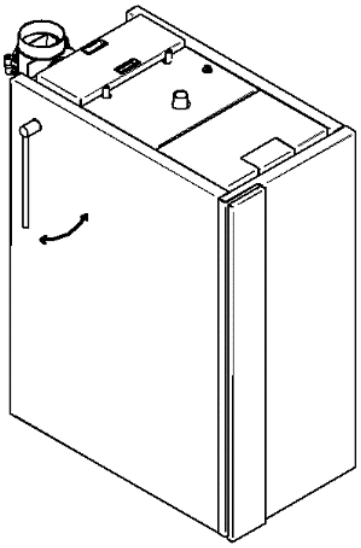
When working with the boiler, it is necessary to use protective equipment in accordance with the applicable rules of safety and health at work. Particular care must be taken to protect health when operating, cleaning and inspecting the boiler. It is necessary to use gloves with increased heat resistance, suitable clothing and sturdy shoes.

5.5 BOILER CLEANING

In order for the boiler to work properly and achieve the required comfort and durability, it must be cleaned regularly.

NOTICE: Clean the boiler after switching it off and after disconnecting it from the mains. Always clean the boiler thoroughly and regularly. Thorough or irregular cleaning can lead to incorrect combustion and reduced boiler life. A boiler that is not cleaned regularly and sufficiently is void!

WARNING! Both the combustion chamber and the refractory fitting will remain hot for several hours after the boiler has been switched off!



Turbulators with cleaning springs are controlled by a lever on the side of the boiler. Boiler cleaning must be done regularly and thoroughly every 3 - 5 days, because sedimentation

deposited in the loading or combustion chamber together with condensates and tar significantly reduces the life, performance and efficiency of the boiler. With a larger amount of ash, there is not enough space to burn the fuel and the ceramic nozzle holder and thus the entire boiler can be damaged. To clean the boiler, first turn on the fan, open the filling door and sweep the ash into the lower space with a slit. Leave long pieces of unburned fuel in the hopper.

Remove the ash and soot after opening the lower cleaning hole. After opening the lower door, clean the lower space of dirt. The cleaning interval depends on the quality of the wood (humidity) and the intensity of the heating, the chimney draft and other circumstances. We recommend cleaning the boiler once a week. Do not pull out the fireclay fitting when cleaning.

CAUTION: Regular and thorough cleaning is important to ensure continuous boiler performance and life. Insufficient cleaning can damage the boiler and void the warranty.

The cleaning interval of individual boiler parts is given in the table below:

Čleaning*	Daily	Weekly	Annually
Lever heat exchanger cleaning	1x		
Ash removal	1×		
Space around the ashtray		1×	
Space under the tube heat exchanger		1×	
Flue gas duct			4×
Fan space			4×
Circulation. fan wheel			4×
Slats in the loading chamber komore			2 x

Minimum recommended cleaning intervals. Depending on the intensity of traffic, they may also be more frequent.

List of spare parts which, if damaged, may affect the health and safety of the operator:

- Sealing cord on the door

- Door handles

- Power cord

6 POSSIBLE MALFUNCTION REASONS

MALFUNCTION	REASON	SOLUTION
Display does not work	No voltage Improperly plugged in Damaged cable	Check Check Exchange the cable
The boiler does not reach the required parameters	Low water in the system High pump power Boiler output is not sufficiently dimensioned for the given system Poor quality fuel Small chimney draft Large chimney draft Long heating Insufficiently cleaned boiler Clogged air inlet to the combustion plant.	Add Adjust power Project matter Use dry and chopped wood New chimney, improper connection Place the draft regulator in the flue Use thinner wood when ignited Clean up Clean up
The door is leaking	Damaged sealing cord The nozzle is clogged Small chimney draft	Exchange it, Do not use small wood pieces, Improper or damaged chimney
The fan does not rotate or it is noisy	When using (STB) a non-return safety thermostat, disconnection occurs during overheating Impeller clogged Faulty capacitor Faulty engine Contact-problem in the motor	Press in the STB button Clean up the fan Exchange the capacitor Exchange the engine Check the contacts

7 WARRANTY AND GUARANTEE

Warranty and after-warranty reparations are made by Manufacturer:

MAGA s.r.o.
S. Kollára 86
979 01 Čerenčany
Slovak Republic

Tel: +421 4756 34798
Mobil: +421 917 465 298
e-mail: servis@magasro.sk
www.magasro.sk

LETTER OF GUARANTEE

This letter of guarantee substitutes certificate of quality and integrity of the product. Producer confirms that the boiler meets requirements of demanded quality, is complete in an extent specified by documentation and is in accordance with EN 303-5: 2012.

Product:.....

Serial number:.....

Production date: .....

Stamp and signature of the producer

Date of sale: .....

Stamp and signature of the seller

Date of putting into operation: .....

Stamp and signature

Letter of guarantee is not valid unless properly filled in and confirmed by the seller or when rewritten! (in this case guarantee expires)

Customer is obliged to control all the documents!

By purchasing the product customer fully agrees with all the conditions for guarantee and complaints of the product. Instructions for customer: Warranty and guarantee conditions are inseparable part of the letter of guarantee.

WARRANTY AND GUARANTEE CONDITIONS

1) The claim for completeness of delivery is applied in accordance with the Commercial and Civil Code at the suppliers country.

2) The manufacturer provides a product warranty 24 months from the date of sale to the final consumer, with a return temperature of at least 60 °C during operation. The boiler body has a warranty of 36 months from the date of sale of the product to the final consumer (the 36-month warranty covers the boiler body faults when the boiler is operated in a storage tank system).

The warranty period begins on the day the product is sold to end customer, regardless of when the product was put into operation.

3) The warranty does not cover errors that have arisen:

Failure to observe the operating and maintenance instructions of the boiler, improper maintenance and operation, or the product being used for a purpose other than normal, low temperature boiler corrosion, maltreatment or improper handling or combustion of illicit fuels, failures caused by the use of components other than Recommended by the manufacturer or supplier as well as repairs or modifications by persons other than those authorized by the manufacturer or supplier as well as defects caused by the accidental or intentional penetration of liquid, insects, animals or foreign objects into the product's body.

4) Should a component fail, this component will be repaired or replaced under a warranty, after delivery of a faulty part and reimbursement of the eligible shipping costs.

5) The warranty remains valid if the product is used as written and specified in the warranty card, unless the instructions are followed, the warranty expires, as well as damage caused during transport which was not provided by the means of transport of the manufacturer and his drivers. For this reason, it is necessary to check this product properly and report any defects or errors to the seller when taking the product.

6) The customer loses its warranty in the event of faults caused by improper connection of the product (failure to observe the wiring included in the instructions for use), overload due to high voltage or voltage changes, or due to the use of fuel not intended for this type of product .

All the materials subject to normal wear and tear are excluded from the warranty: seals and sealing lines, fiberglass fittings and fillers, sibling fillings. The warranty will not be granted and recognized if the customer fails to meet the agreed payment terms within the due date of the seller.

Small color, varnish, or dimensional deviations do not give rise to a complaint. The service technician's transport does not fall under the warranty repair and the customer pays it in full.

7) Eventual complaints of any kind must be made by the final user of the product in writing, but no later than three working days from the day of learning of the defect, by mail or fax or electronic means, and provide the supplier with all the required information; A report of any defect that has been sent, other than via mail, must be subsequently confirmed by letter, not later than three days. The authorized person is obliged to prove the damage caused by the defect of the product to the supplier without undue delay, but not later than three working days after

the supplier's request. The manufacturer is required to make a statement in writing by the user within 30 days of making the complaint, and in case of a claim recognition, remove the error.

The cost of unjustified complaints, defects caused by the user's failure to comply with the instructions for use, improperly executed assembly, resulting in malfunctioning of the product or reduced performance, are covered by the end user of the product.

Rights of Product Liability for which the warranty period applies shall expire if they have not been applied within the warranty period.

The customer was familiar with the operation and operation of the boiler when buying the product.

The manufacturer disclaims any liability for damage to health or property, whether direct or indirect, including consequential damages.

Claims for defects in products do not affect the claim for damages caused by a causal link with the defect of the product. The manufacturer reserves the right to change the product's in-product conversion, which may not be included in this manual.

In case of interference with the boiler electrical parts other than a service technician, or by professionally trained workers, the warranty expires.

All the products manufactured by MAGA, s.r.o. are certified according to valid standards and regulations. Technic and design modifications of the products are reserved. Company MAGA, s.r.o. is not responsible for printing errors.

RECORD OF GUARANTEE REPAIRS

Record of performed repairs within and after guarantee period			
Date of the record	**Performed activity**	**Organization (signature, stamp)**	**Signature of the customer**