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Wkłady z płaszczem wodnym (PL)

Instrukcja obsługi i karta gwarancyjna

ver. 7

Operating manual of fireplaces with water jacket/Guarantee Card **(EN)**

Kamineinsatze wasserführend/Bedienungsanleitung und Garantiekarte **(DE)**

Камины с водяной рубашкой/Инструкция по эксплуатации **(RU)**

Foyer chaudières pour chauffage central/Manuel d'installation et Carte de garantie **(FR)**

EN

1.Initial information

In some countries this appliance may not be the only source of heat for your building.

NOTE: To avoid the risk of fire, the installation of this appliance should comply with all relevant Health and Safety Regulations for your area and the Technical Instructions contained in this manual. The design of the Fireplace and installation should be prepared by a qualified professional. The chimney should be checked by a chimney sweep prior to the installation of the appliance. Following the installation, both a technical and Safety test should be carried out on the unit and signed off on by qualified specialists.

You are recommended to read carefully the whole of the manual to make the best of the fireplace insert with water jacket and be satisfied with your purchase. The a user is liable for the results of the failure to observe the guidelines of the assembly manual. It is recommended that you read the complete manual carefully in order that you get the most out of your purchase. Failure to comply with the guidelines in the manual leaves the owner/user liable.

The fireplace insert with water jacket should be installed in accordance with this operating manual. Particular attention should be paid to:
- assembling the components of the fireplace insert with water jacket in accordance with their intended use;
- connecting the fireplace insert with water jacket to the flue gas evacuation duct and the chimney flue;
- providing required ventilation to the room where the fireplace insert with water jacket is installed;
- properly connecting the fireplace insert with water jacket to the central heating system and/or hot water circulation system.

Detailed information related to installing the fireplace insert with water jacket is included in further sections of this manual.

Requirements related to the conditions and principles of installations of such hearths as the fireplace inserts with water jacket can be found in the standards valid in each country as well as in state and local regulations. The provisions included in them must be observed.

Within the territory of Poland the following legislative acts are in force:
- the Regulation of the Minister of Infrastructure dated 12 April 2002 on tech- nical conditions that buildings and their location should meet (Dz.U. no. 75 dated 15.06.2002 Chapter 4;
- PN-91/B-02413 standard Heat industry and heat engineering;
- PN-EN 13229:2002 standard Insert appliances including open fires fired by solid fuels. Requirements and test methods; PN-EN 13229:2002/A1:2005 In- sert appliances including open fires fired by solid fuels. Requirements and test methods;
- PN-EN 13229:2002/A2:2005 (U) Insert appliances including open fires fired by solid fuel.

Requirements and test methods

You are recommended to strictly observe the requirements included in the above regulations.

2. Intended use

Fireplace inserts with water jacket are designed to be fired with deciduous wood. They are used to heat flats and rooms where they are installed. They may be used as an additional source of heat. They may also be used in conjunction with a storage water heater or may be used as a source of heating for central heating.

The insert structure should be constructed in such a way so as to ensure assembly and disassembly of the fireplace insert with water jacket without its destruction or damage. Moreover, it should ensure the access of air necessary for burning and ventilation by the use of air grates on both sides of a fireplace in the lower part of the insert structure and a bigger-sized outlet grate (in the upper part of the housing) as well as constant access to operate a flue gases throttle or a chimney draft controller (damper).

3. Description of the appliance
Drawing 1. General construction diagram of the fireplace insert Zuzia with a vertical air heater with water jacket.
Drawing 2. General construction diagram of the fireplace insert with water jacket.
Drawing 3. General construction diagram of the free-standing fireplace with water jacket.
(at the end of manual)

The main component of the fireplace insert with water jacket is its steel water jacket (16) where the combustion chamber (1) is located. The front wall of the combustion chamber is the cast iron door (2) equipped with a homogenous heat-resistant glass ceramics (3) and a locking bolt (4). The door is settled in a cast iron frame (5) screwed to the water body. From the bottom the combustion chamber (1) is limited by a cast iron base (6) screwed to the water body where an ashpan chamber is located. Above the base there is a cast iron grate (10) where fuel is burnt. The grate should be placed with its finning faced upwards. An ashpan cast iron guard (11) protects against spilling of incandescent fuel from the combustion chamber after opening the door (2) Ashpan waste: ash and residues of unburnt fuel are accumulated in a sliding ashpan drawer (7) located under the grate. In the front part of the ashpan drawer a window (8) equipped with a controllable throttle with a handle (9) for controlling the amount of primary air needed to burn fuel. The secondary air needed to reheat gases arising from fuel burning and protecting against the blackening of the heat-resistant glass (3) is supplied by the slot in the upper part of the glass. Over the combustion chamber there are smoke tubes (17) whose diameter depends on the insert power, welded to lateral inner walls of the water body constituting natural convection ducts for flue gases flow and simultaneously intensifying the exchange of heat. During the operation after the fire-up of fuel flue gases flow along the combustion chamber walls between the smoke tubes to the vent connector (12) then through the flue to the chimney. In the vent connector there is a starting rotationally controlled damper (13). A knob (15) is used to adjust the angle of the damper opening by a special mechanism (14).
The inlet of circulating water from the system to the fireplace insert with water jacket takes place by a lower stub pipes (18). The discharge of heated water from the fireplace insert to the central heating system (with water set) takes place also by upper stub pipe (19).
The rest of stub pipes (20) are used to fix the temperature sensor (MSK), (21) coil pipe, (22) thermal valve sensor.

3.1. Selection of the thermal power of central heating system or domestic hot water system
The primary criterion for the selection of the system thermal power is the maximum transient power of the fireplace insert water jacket. A central heating system or domestic hot water system may carry the rated (average) power of the water jacket declared by its Producer when its takeoff power is equal or close to the maximum transient power of the water jacket. Relevant technical data are included in table 1.

4. Assembly and installation of the fireplace insert with water jacket
The fireplace insert should be installed by a person having required qualifications. Before starting to connect the fireplace insert with water jacket to the central heating and smoke removal system, read carefully this manual and check the completeness of the appliance equipment.
Before placing the fireplace insert with water jacket, prepare a foundation minimum 30cm above the floor (not relevant in all countries, depending on the material and construction of the floor) of the room where the fireplace insert with water jacket is to be operated. The appliance placed on the floor should be carefully leveled and then it should be connected to the central heating and smoke removal duct, the fittings of the fireplace insert with water jacket should be assembled.

4.1. The principles of safe installation of the fireplace insert with water jacke
Health and safety rules, principles of correct and safe assembly of the fireplace in- sert with water jacket, ventilation and connection to the flue gas removal system are defined in the Regulation of the Minister of Infrastructure dated 12 April 2002 DZ.U. no. 75 dated 15 June 2002 in chapter 6 § 265 p.1; § 266 p.1; § 267 p.1.

In accordance with these principles:

- The fireplace insert with water jacket should be installed on a minimum 15 cm thick-incombustible surface. The easily combustible floor near the fireplace door must be protected with a minimum 30cm wide-strip of incombustible material reaching at least 30 cm away from the edges of doors on each side.
- The fireplace insert with water jacket, connecting pipes and openings for cleaning should be away from the unprotected easily combustible parts of a building, at a distance of at least 60 cm and from the ones protected by 25mm-thick-plaster or other equivalent lining - at least 30cm.
- The room where the fireplace insert with water jacket is installed fresh air inflow must be ensured for burning fuel in the fireplace and for ventilation.
- The flue gas ducts and smoke ducts as well as ventilation ducts in the room where the fireplace with water jacket will be installed must be made of certificated non-combustible materials. (vary from country to country).

4.2. Assembly principles of the flue gas extraction system

The primary condition of safe and economic operation of the fireplace insert with water jacket is the chimney flue in working order and appropriately selected in terms of cross section. The technical condition of the chimney should be assessed by a chimney sweeper. The chimney flue should be free from connections of other appliances.

The section of the chimney is determined acc. to the following formula:

$$\mathbf{F = 0{,}003 \times \frac{Q}{\sqrt{h}}\ [m^2]}, \text{ where}$$

F - section of the chimney [m²],
Q - rated thermal power of the fireplace insert [kW],
h - chimney height [m].

The vent connector of the fireplace insert with water jacket should be connected to the chimney by means of a steel pipe, made of certificated material, that should be placed on the vent connector outlet and settled in the chimney.

The chimney should be made on non-combustible materials enabling the maintenance of constant temperature. Otherwise the chimney should be lined with an isolative material or a two-jacket-chimney should be installed (in the part protruding over the roof). The chimney and chimney flues should be tested for air-tightness, no leaks are permissible. The chimney may have a circular or square section with the cross section not smaller than 14 x 14 cmor diameter ø150 mm for fireplaces with fume outlet size up to 0.25 m 2 in the case of larger fume outlet size, chimney dimension 14 x 27 cm or diameter ø180 mm. The section of the chimney flue should be the same all along its he ight, there should be no sudden narrowings or flue gas flow direction changes. Only one heating appliance may be connected to one chimney flue.

4.3. Assembly principles of the central heating system

NOTE: The fireplace inserts with water jackets within the territory of Poland are designed to works as a source of heating in the gravitational or pump water heating system of the open system secured in accordance with PN-91/B-02413 standard, in which the permissible water temperature does not exceed 100°C, the permissible working pressure is not higher than the pressure for the applainces used, the circulating water can be used exclusively for heating purposes and cannot be collected from the system.

The fireplace insert with water jacket should be connected with the central heating system by means of pie union joints or collars. The fireplace and central heating system should be refilled with water outside the area of the fireplace insert (not closer than 1.0m) on the return water duct.

The installation and commissioning of the fireplace insert with water jacket should be carried out by a qualified assembly team.

5. Fuel

5.1. Recommended fuel

- the producer recommends to use logs of decidueus trees such as: beech, hornbeam, oak, alder, birch, ash-tree etc. of the following dimensions of logs or chips: ca. 30 cm long and from 30 cm to 50 cm in circumference and lignite briquette.
- the moisture content of the wood used for firing the appliance should not exceed 20% which corresponds to the wood seasoned for two years after felling, stored under a roof.

5.2. Unrecommended fuel

The appliance should not be fired with logs or chips with the moisture content exceeding 20% as it may result in failure to achieve declared technical parameters - lower calorific value.
It is not recommended to use too small logs or chips to fire the appliance as it may result in sudden increase of water temperature - boiling of water as well as significant increase of flue gas temperature and fire of the chimney.
It is not recommended to use coniferous or resinous wood logs or chips since they cause excessive dirt of the appliance and necessity of frequent cleaning of the appliance and the chimney flue.

5.3. Prohibited fuel

It is prohibited to burn in the appliance any waste, particularly chemical one, due the emission of toxic substances in the process of burning.

6. Working principle

6.1. Fire-up and fuel charge

a) Open the starting damper (13) with a knob (15);
b) Open the door (2) with a bolt (4);
c) Open to the maximum the air throttle with a handle (9);
d) Put some paper or special tinder on the grate (10), place small twigs, than bigger pieces of ca. 3-5 diameter,
e) Ignite the paper and close the door (2),
f) Once the tinder is fired up close the damper (13),
g) When the heat fire-up layer (ca. 2cm thick) is ready, fill up the hearth with appropriate fuel. Each time when you fill up the hearth with fuel remember to do as follows:
- open the starting damper (13),
- set ajar and then open the door (2) gently,
- in needed remove ash and fill the hearth up with fuel, - close the door(2),
- once the fuel is ignited, close the starting damper (13);

h) The desired burning intensity is obtained by controlling the primary air throttle by means of the handle (9),
i) During the first few hours of the appliance operation future users are recommended to operate the fireplace insert with water jacket at low loads of ca. 30-50% of rated load due to too big thermal stress that may lead to its excessive use and even cause damage to the appliance.

It is not allowed to pour, soak wood with easily combustible liquids like petrol, fuel oil, solvent etc. or to add these materials to the hearth to speed up the fuel fire-up.
Vapours of these liquids are a strong explosive mixture!!!

6.2. Normal operation of the fireplace insert with water jacket

To fire the fireplace insert with water jacket use the logs or chips of deciduous trees of the following dimensions: ca. 30 cm long and from 30 cm to 50 cm in circumference or lignite briquette.
To achieve the rated thermal power of the fireplace insert with water jacket fill up the hearth with 4-5 wood logs and uncover completely the air throttle (9).
To achieve the thermal power that is lower than the rated power fill up the hearth with 3-5 bigger wood logs and cover the air throttle (9) as needed.

6.3. Operation with minimum power in extended time

The fireplace insert with water jacket may operate with minimum thermal power and the burning

duration exceeds 3 hours in case of filling up with 3 bigger logs and completely closed air throttle (9) at ca. 6 Pa chimney flue (the bigger the diameter of round timber the lower thermal load).

If necessary (the chimney makes a too high draft) to control the chimney draft, equip the flue in its lower part with a draft arrester - be careful with the smoke.

6.4. Recommendations related to normal operation of the fireplace insert with water jacket

During the operation of heating appliances the following principles in particular should be observed:

1. Before firing up the fireplace insert with water jacket:
- check if the system is filled with water appropriately,
- check up the chimney flue with accessories (draft arrestor, washout holes etc.),
- check if the expansion vessel with inlet and outlet pipes is in working order and free from obstacles.
2. When using the fireplace insert with water jacket use appropriate tools and protective gloves.
3. If your system is going to be out of use for a period during the winter/cold weather, it is advisable to drain the water down. Failure to do so may result in burst pipes or even the unit itself due to freezing.
4. Ensure proper ventilation supply in the room where you are going to install a fireplace insert with water jacket.
5. Remove any easily combustible and caustic materials from the surroundings of the fireplace insert with water jacket.
6. Do not use a mechanical exhaust ventilation.
7. Use water as the heating medium (purified water if possible). In the regions where big drops of temperature occur anti-freezing liquid may be added to the water.
8. A few practical pieces of advice facilitating the operation and increasing the safety of users of the fireplace inserts with water jacket:
- The glass will get very hot during normal operation (>100°C) - be very careful, it relates mainly to children,
- Never use water for extinguishing fire in fireplaces with water jacket
- the hearth when radiating emits lots of thermal energy. Do not leave any easily combustible and objects in the distance smaller than 100 cm from the glass,
- Removing the ash from the fireplace should be done with a metal or non-combustible container. Remember that even seemingly cooled down ash may be very hot and cause fire, to ensure optimal operation of the appliance a ventilation system for the room it is installed must be provided. In each room where the appliance is installed predict the gravitational flow of air required for combustion – usually there is a clearance of ca. 2 cm under the entrance door; an opening covered by a blind can be made to ensure inflow of air, in case of fire close the primary air throttle with the handle (9), close the damper (13) with a knob (15) and the draft arrester (if installed) and call the fire service.

Due to the safety of the insert use during its operation the removal of a handle is recommended.

6.5. Cleaning the ashpan and chimney flues

For the purpose of efficient burning of fuel in the appliance, the combustion chamber (1), grate (10), vent connector (17) and chimney flues should be cleaned periodically.

The smoke gas ducts should be cleaned with a wire brush. Chimney flues should be cleaned mechanically a few times a year, obligatorily once per a heating season. The chimney flues should be cleaned by a specialist chimney sweep company.

When cleaning the chimney :
- check the condition of the appliance and in particular of the elements ensuring tightness: seals and closures,
- check the condition of the chimney flues and the connecting pipe,
- all connectors should show good mechanical resistance and tightness.

7. Spare parts

The Company kratki.pl guarantees the delivery of spare parts throughout the whole period of the appliance operation. For this purpose contact our trading department or nearest point of sale.

8. Guarantee conditions

The use of the fireplace insert with water jacket, its connection to the chimney and operating conditions must be in compliance with this operating manual. Any reconstructions or modifications to the structure of the fireplace insert are prohibited. The producer gives a 5-year-guarantee of its effective operation from the moment of the insert purchase. The buyer of the fireplace insert is obliged to read the manual of the fireplace insert, the conditions of the guarantee, which he should confirm with his entry in the guarantee card in the moment of purchase. When submitting a claim a User of the fireplace insert is obliged to present a claim report, a filled-in guarantee card and a bill. Submitting the above mentioned documentation is necessary for any claims to be considered. A claim consideration should be carried out within 14 days as of the date of its written claim submitting. Any processing, modifications and changes to the insert structure result in immediate loss of a producer's guarantee.

The guarantee covers:

- cast iron elements;
- movable elements of the mechanisms to control a vent connector flap and a comb of the ashpan housing;
- fire grate and insulations of the fireplace for the period of 1 year as of the moment of purchase.

The guarantee does not cover:

- fireplace lining (vermiculite, chamotte etc);
- fire-resistant glass (resistant to the temperature up to 800°C);
- any defects arising from the failure to observe the provisions of the operating manual, in particular related to the fuel and tinder to be used,
- any defects arising during the installation, enclosing and commissioning of the fireplace insert,
- damages caused by thermal stresses of the fireplace insert (related to the operation of the fireplace insert inconsistent with the manual provisions).

The guarantee is extended by the period starting from the moment of claim submission and ending on the day of notifying the buyer of the repair completion. This time will be confirmed in the guarantee card. Any defects attributable to incorrect operation, storage, incompetent maintenance, inconsistent with the conditions defined in the operating manual and caused by other reasons not attributable to the producer result in the loss of the guarantee, if such defects have contributed to quality changes of the fireplace insert.

The use of coal as fuel in all our inserts is prohibited. Firing the insert with coal in any case results in the loss of guarantee for the hearth. A client notifying of a defect within the guarantee is obliged each time to sign a declaration that coal or any other prohibited fuels have not been used in our fireplace insert. If a suspicion of the use of above mentioned fuels arises, the fireplace will be subject of an expertise to test the presence of prohibited substances. If in the course of the analysis it is found that such substances have been used the client loses any guarantee right and is obliged to incur all costs related to the claim (also the expertise costs).

This guarantee card serves as the basis of the provision of guarantee repairs free of charge. The guarantee card without a date, seal, signatures as well as with amendments introduced by unauthorized persons is no longer valid.

Guarantee duplicates shall not be issued!!!

Appliance serial number .....

Appliance type. .....

SAFETY DURING THE OPERATION OF THE FIREPLACE INSERT WITH WATER JACKET

When using the fireplace insert with water jacket the following principles need to be observed:

- the fireplace insert with water jacket cannot work without water;
- do not pour water over the fire in the combustion chamber;
- the fire-resistant ceramics of front sets during fuel burning in the fireplace insert with water jacket may reach the temperature exceeding 100°C;
- free natural inflow of air indispensable for fuel burning and room ventilation should be ensured in

the room where the fireplace insert with water jacket is installed;
- do not fill up the combustion chamber with too much fuel, particularly with too shredded one, as it may result in damage to the elements of front set and disturbances within the operation of the fireplace insert with water jacket.

TO ENSURE SAFETY OF THE FIREPLACES INSERT WITH WATER JACKET THE PRODUCER RECOMMENDS THE USE OF:
- Microprocessor Fireplace Controller
- Microprocessor Pomp Controller
- Emergency Power Supply Unit ZZA-400-S
- Emergency Power Supply Unit ZZA-300-A

9. The latest version - fireplace insert with safety coil pipe
To prevent water from overheating in the central heating system a built-in cooling coil pipe can be used. In such case inside the water jacket a cool coil is installed. This coil is made of a copper pipe of 12mm section. Both tips of the coils are led outside the fireplace.
To ensure best performance of the heat exchanger the safety device of the operation of the fireplace insert itself (the process of heating up the water in the fireplace) with a thermostatic valve is at the same time fitted. For this purpose the thermostatic valve is best. The thermostatic valve is not controlled by pressure, it is controlled by water temperature. This valve is placed into the water inflow pipe from the waterline to the coil. The thermostatic valve is connected with the temperature sensor by means of a 1.3m-long-copper tube. The temperature sensor is settled on a stub pipe (23) prepared spe- cially for this purpose; thanks to which it submerges directly in water that fills the water jacket, consequently the thermostatic valve on the other end of the copper tube is controlled by the water temperature. When the water in the fireplace reaches the temperature of 97°C the valve opens and cold water from the water line flows through the coil tube. This way the water in the fireplace water jacket is cooled. Such solution has one more advantage, namely the thermal safety-device of the fireplace operation does not need current. Cold water from the water line may flow through the cooling coil both ways and it has no impact on the effectiveness of the heat exchanger operation.

Maintenance
If the thermostatic valve is not tight, the water from the feeding system all the time flows in through the coil tube regardless of the temperature of water in the water jacket. In regular conditions the valve seat and head should be just cleaned from time to time from deposit and dirt by pressing the red button a few times and rinsing the above mentioned parts with a stream of water. However, if it is not enough, the following actions should be taken:
1. Screw on the ball valve cutting off the water form the water line. This valve should always be under the service connection with the thermostatic valve (i.e. under the pipe supplying water to the coil of the heat exchanger).
2. Screw off the hexagonal screw and pull out the valve conical head.
3. Clean all elements of the thermostatic valve, in particular the valve seat, with the stream of running water.
4. Put together the thermostatic valve and finally screw on quite tightly the hexagonal screw.

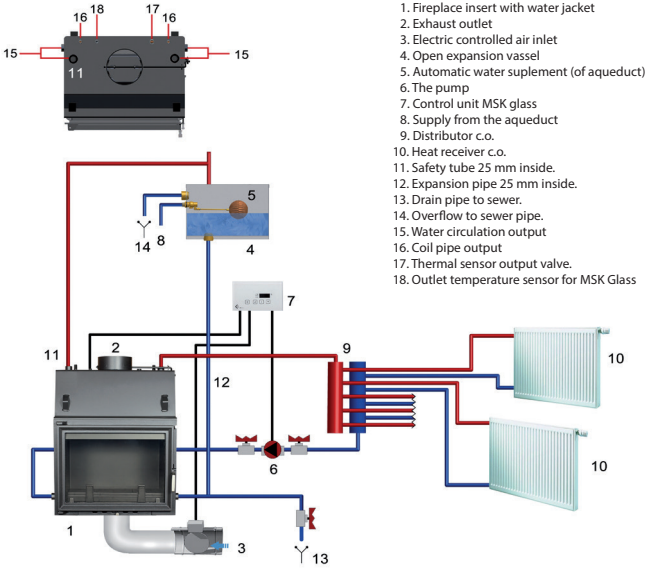
Condensation
Condensation inside the firebox is as a result of improper operation of your stove.
The effect of this can be:
- Condensation forming on the inner walls of the firebox/stove and in extreme cases leakage out of the unit,
- Smoke exiting the stove back in to the room,
- Dirty Glass and dirty combustion chamber,
- Loss of Damper control due to sticking.

In order to avoid the above, we would recommend using the guidelines as set out below:
- Set temperature to between 70 and 75°C,
- Set the circulation pump thermostat to 55°C.

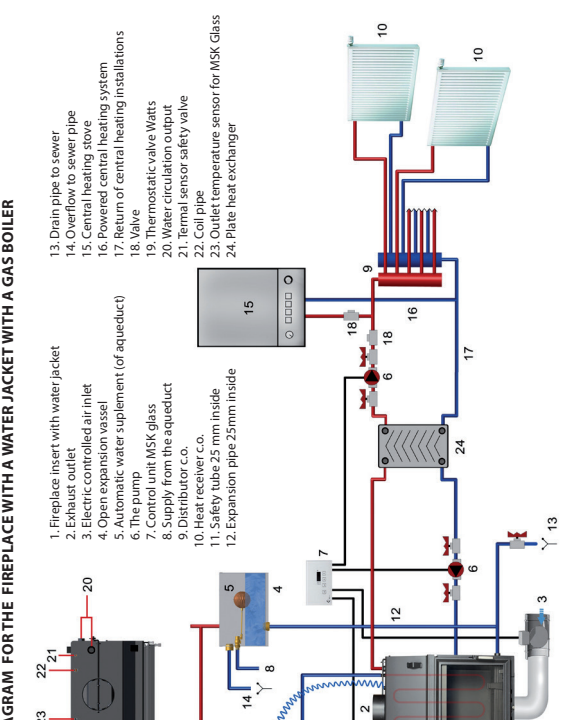
Setting the thermostat at this level will allow the installation to heat up faster.
The water temperature difference between the desired working temperature, and the return water temperature should not differ by more than 20°C and also that the return water temperature be not less than 50°C. That the wood moisture content is no more than 20%. This is related to the dew point temperature (release of water vapour from the timber) of 48°C. Proper combustion of fuel is essential. The preferred fuel is seasoned wood e.g. beech, birch with a moisture content of no more than 20%. Regular cleaning of the combustion chamber/Firebox and exhaust duct is recommended, especially if there is a noticeable carbon build up.

10. Graphic connection diagram

CONNECTION DIAGRAM FIREPLACE WITH WATER JACKET IN OPEN SYSTEM



1. Fireplace insert with water jacket
2. Exhaust outlet
3. Electric controlled air inlet
4. Open expansion vassel
5. Automatic water suplement (of aqueduct)
6. The pump
7. Control unit MSK glass
8. Supply from the aqueduct
9. Distributor c.o.
10. Heat receiver c.o.
11. Safety tube 25 mm inside.
12. Expansion pipe 25 mm inside.
13. Drain pipe to sewer.
14. Overflow to sewer pipe.
15. Water circulation output
16. Coil pipe output
17. Thermal sensor output valve.
18. Outlet temperature sensor for MSK Glass



11. Fireplace inserts Eko Aqua

Construction scheme of the fireplace with water jacket. **Drawing 4, 5, Table 2, 3**.

Construction scheme of the fireplace with water jacket.

What constitutes a crucial part of the fireplace insert with the water feature is the steel water jacket (19) located above the combustion chamber (1). At the front wall of the combustion chamber there is a little iron door (2) with a plain fire-proof glass window (3) and a locking bolt with a handle (4).

The handle is loosely fitted so that it is possible to take it off to prevent it from overheating. The door is fitted in an iron frame (5) screwed onto the body of the water feature. The steel water jacket (19) with the iron front is fitted in an iron base (6) which includes an ash chamber. The fuel combustion takes place on the cast iron grate (11) which is installed at the base of the unit. This grate should be used with the ribs facing upwards. The iron fence (12) protects against embers falling out of the combustion chamber. Combustion wastes such as ash and left-overs of unburnt wood are gathered in the sliding drawer of the ash pan (7) located under the grate. The front part of the drawer makes up the ash pan's front (8) that features a regulated damper with a handle (9). The damper is designed to regulate the amount of primary air required for fuel combustion.
Turning the handle (16) maximally to the left cuts off the primary air inlet, whereas moving the handle to the right fully opens the primary air inlet.
Regulation of the secondary air (10) required for burning of the gases produced during fuel combustion is possible thanks to the holes located under the ash pan's drawer. The air which is delivered there is directed to the back of the fireplace's combustion chamber. The outlet is located in the back wall of the fireplace chamber.
The lower damper is located under the deflectors in the lower section. It regulates the flow of hot gasses through the two deflectors. The damper's mechanism (17) is controlled by the lower damper's handle (18). The lower vermiculite deflector (29) is situated over the combustion chamber. Above it there is the upper deflector made of steel (28). The vertical fire tubes (20) of the heater core are welded to the upper internal walls of the water heater (21). The steel deflector (28) and the vertical fire tubes of the heater core constitute a natural convection channel for the flow of hot gasses , which intensifies heat transfer. While the fireplace insert is in use, after the fuel has been set on fire, the hot gasses sweep along the walls of the fireplace chamber (1) covered with vermiculite board (30) and then go under the lower and upper deflectors and pass around the water heater (21), rapidly giving away heat to the water in the jacket. Next, they go to the flue (13) and reach the chimney through the smoke tract. The flue features a damper (14). The damper position is regulated by means of a mechanism (15) which features an aesthetic handle (16). Pulling out the damper's mechanism by means of the knob (16) opens the fumes outlet (13).
The water jacket (19) features fixed stub pipes which make it possible to attach a heated water circuit, thermal detector and an excessive heat absorption system in form of a coil (27). Central heating circuit should be attached to the stub pipes with (22) 1 inch internal threads (G1") – fixed in the lower part of the water jacket feature (19). They are dedicated to connecting the return of water from the installation. The stub pipes (23) located in the upper part of the jacket should be used for connecting the outlet of heated water into the central heating installation. A safety pressure valve should be installed right next to the outlet stub pipe.
Stub pipes with ½ inch external thread (26) are the endings of the coil (27). The connector with a ½ inch internal thread (25) is meant for connecting a thermal detector of the safety valve, which controls the opening of the water flow through the coil (27). The coil is an element that protects the water jacket against overheating. If the heat absorbed by the central heating installation is smaller than the generated power, the temperature of the water in the water jacket might increase to a dangerous level. In such case, when the temperature is higher than 97°C, the thermal valve opens the water flow through the coil and cools the water in the jacket.

12. AQUARIO insert

Construction diagram of a fireplace insert with the water system. **Drawing 6.**

The main part of the fireplace insert with a water system is the steel water jacket (16) located above the combustion chamber (1). The steel door (2) equipped with a uniform heatproof glass (3) and a closing lock with a handle (4) constitutes the front wall of the combustion chamber (1).
The door is mounted in the frame (5). The combustion chamber (1) is inlaid with Acumotte forms (27). The double-jacket floor whose construction also constitutes the air supply chamber (6) serves as the base of the system. Air supply is performed by means of the outdoor air supply stub pipe with the

The lower vermiculite deflector (26) is located above the combustion chamber. The upper steel deflector (25) is located above it. The vertical water heater fire tubes (17) are welded onto the upper inside walls of the water heater (18). The steel deflector (25) and the vertical water heater fire tubes constitute the natural convection channel for fume flow, intensifying heat exchange. During the burning process inside the insert, fumes wash the combustion chamber (1) walls, then pass under the lower and upper deflectors and flow through the vertical fire tubes (17) and then sweep the water heater (18), intensively transmitting heat to the water. Next, they flow to the flue (10) and through the smoke channel leading to the chimney.
An adjustable damper (11) is installed in the flue. The position of the damper is adjusted by means of the damper mechanism (12). Pulling the damper mechanism out by means of the damper handle (13) is equivalent to opening the fume outlet cover (11). The lower damper (14) is an integral part of the insert. It is located directly above the combustion chamber (1) and it constitutes an extension of the upper steel deflector (25) along its entire length. Opening it in the preliminary phase of the burning process makes the path of the fumes to the chimney short, which automatically generates better draught. Closing it by means of the lower damper handle (15) means directing the fumes between the two deflectors – the lower (26) and the upper (25) one (smoke shelf), which makes the fume path longer. Drawing 7.; thanks to which the burning of fuel particles which have not been burned earlier in the combustion chamber (1) takes place in the space between the deflectors and above the steel deflector. Additional heat gained in that way is transmitted to the vertical water heater fire tubes (17) and to the water jacket (system) (16). Damper (13) handles (15) are equipped with gradual damper position adjustment.

The water jacket (system) (16) is equipped with fixed stub pipes which are used to connect it to the heated water central heating system, thermal sensors and the excessive heat transmission system – the heating coil (24). The stub pipes (20) and (19) with 1 inch female thread (G1") are intended for connecting the insert to the central heating system (the right and the left side of the insert – cross connection for supply/return recommended). The stub pipes (19) with 1 inch female thread (G1") fitted in the lower part of the water jacket (system) (16) are intended for connecting water return from the central heating installation. The stub pipes (20) fitted in the upper part of the jacket are intended for connecting heated water outlet to the central heating installation (the right and the left side of the insert – cross connection for supply/return recommended).

Stub pipes with male thread (G1/2") (23) constitute the heating coil (24) ends. The stub pipe of the thermal valve sensor (22) with female thread (G1/2") is intended for connecting the capillary tube of the safety valve thermal sensor which controls water flow activation through the heating coil (24). The heating coil (24) is an element that protects the water jacket against overheating. If heat transmission through the central heating installation is lower than the capacity generated by the insert, the water temperature in the water jacket may rise to a dangerous level. In such a case, when the temperature of 95ºC +/- 2 ºC is exceeded, the thermal valve opens water flow through the heating coil, which cools the water in the water jacket (system). The element (21) is the mounting socket of the fireplace controller thermal valve, which controls the operation of the system (central heating pumps) and of the optional air throttling valve. Such a throttling valve is mounted in the air supply channel from outside of the building and controls the amount of air drawn through the fireplace; it provides optimization of the burning process.