MANUAL

FOR INSTALLATION, OPERATION AND MAINTENANCE OF HOT WATER SOLID FUEL BOILER FROM SERIES BISOLD COMFORT 03/04/05

CONTENT page.

1. IMPORTANT INFORMATION ABOUT SYSTEM OPERATION

Dear BiSolid Comfort 03/04/05 hot water boiler owners,

We would like to congratulate you for your new ecological boiler system. By purchasing this quality product from the manufacturer you have chosen a system that ensures higher comfort level and optimized fuel consumption in environmentally protecting way and natural resource saving. Your hot water boiler is manufactured under strict ISO 9001 standards.

On the next pages we have introduced specific information and important advices about the system operation, its functions and methods of maintenance. Please pay special attention to this manual. Good knowledge of this document content will give you the pleasure of long-term and trouble-free operation of the system.

We wish you all the best with Your Bisolid BiSolid Comfort boiler!

1.1. SAFETY INSTRUCTIONS

The hot water boiler from series BiSolid Saver and its accessories correspond to all applicable directions for safety techniques. Your hot water boiler and all of its accessories operate under variable electricity 220-230 V. Improper electrical installation or repair may endanger user's life from electrical shock. Installation works must be performed only by qualified technicians.

This manual is intended for authorized servicing specialists only. It is important to know that:

- Works on the heating installation should be performed only by technicians who had acquired such rights by law.
- Works on the electrical installation should be performed by qualified electricians only.
- Initial operation start up including installation visual checks, adjustments and starting must be performed by the manufacturer authorized personal.

Legal provisions

While operating with the appliance please observe:

- Legal provisions for safety techniques.
- Legal provisions for environment protection.
- Provisions for proper installation.
- Applicable provisions of European community.

Safety instructions

Please observe these safety instructions in order to prevent the people from risks and harms, as well as damage to properties and environment.

Safety instructions explanation.

Please exude attention to the following symbols in this manual:

Danger

This symbol warns for harmful risks or danger to people.

Warning

This symbol warns for risks of damage to properties and environment.

Direction
Information marked with this symbol contains additional data.

Works or activities for setting the appliance in proper technical working order

Warning
Repairs of constructional elements which functions are related to the technical safety may compromise the safely operation of the installation. Damaged or faulty elements must be replaced with genuine spare parts provided by the manufacturer.

User behavior when smells flue gas smoke

Danger
Intake of flue gas may lead to life-threatening or harmful poisoning. In case of danger:
Switch off the heating installation.
Ventilate the place where the installation is positioned.
Close all doors to living premises.

1.2. PURPOSE OF THE BOILER

The hot water boiler from series BiSolid Comfort 03/04/05 are cast-iron section boilers for firing wood pellets or wood logs. The hot water boilers are designated for heating of small domestic and company dwellings, as well as for hot domestic water.

Hot water boilers from BiSolid Comfort 03/04/05 series and its standard equipped pellet burner from BiSolid GP series provides opportunity for quick and easy change of the used fuel type – wood logs or wood pellets, according to the user specific needs.

1.3. FUEL

Your boiler from BiSolid Comfort 03/04/05 series is designed to utilize the following main fuels:

- Chopped firewood with maximum diameter 40-100 mm. The wood logs length depends on the boiler's number of sections.
- The wood logs must be stored in dry place.
- To reach the boiler nominal output, the water content in the firewood should not exceed 20%.
- The boiler has to be refueled manually.

The boilers from series BiSolid Comfort 03/04/05 are able to utilize wood pellets according to standard EN 14961-2, category ENplus-A1 with the following characteristics:

Table 1. Wood pellets main parameters.

Parameter	Dimension	Value
Diameter	mm	6;8
Length	mm	3.5-40
Water content	%	10
Ash content	%	0.7
Mechanical durability	%	97.5
Caloricity	MJ/kg	16.5
Bulk density	kg/m^3	600

Wood pellets must be stored in dry premises, so they can be transported without problems and also in order to achieve trouble-free operation with optimum combustion and maximum efficiency.

Warning
The boiler is not designed for firing every type of wastes.

1.4. BOILER OVERALL DIMENSIONS

Overall dimensions of boilers from BiSolid Comfort 03/04/05 series are presented in Table 2.

Table 2. Overall dimensions of the boilers.

Description	Dimension	Comfort 03		Comfort 04		Comfort 05	
Number of sections	Pcs	3	3	4	4	5	5
Fuel	-	Wood	Pellets	Wood	Pellets	Wood	pellets
Length	mm	636	976	736	1076	836	1176
Height	mm	1053	1053	1053	1053	1053	1053
Width	mm	490	490	490	490	490	490

Dimensions of the boiler, together with its package, from BiSolid Comfort 03/04/05 series are presented in Table 3.

Table 3. Dimensions of the boiler with package.

Description	Dimension	Comfort 03	Comfort 04	Comfort 05
Number of sections	Pcs	3	4	5
Length	mm	680	780	870
Height	mm	1097	1097	1097
Width	mm	534	534	534

1.5. BOILERS TECHNICAL DATA

The boilers from BiSolid Comfort 03/04/05 series are specialized for firing wood logs and wood pellets. The cast-iron construction of the boiler guarantees long-term and reliable operation of the appliance and with pellet burner BiSolid GP high efficiency and low levels of

harmful emissions released into the atmosphere. The boilers are designed for heating one or two floor single-family houses or small company buildings, as well as for heating hot domestic water.

Outer view of hot water boiler from series BiSolid Comfort is presented in Figure 1.

Figure 1. Outer view of hot water boiler BiSolid Comfort.

The main advantages of the boilers from series BiSolid Comfort 03/04/05 are:

- The pellet burners from series BiSolid GP are fully automated – ignition, flame control, combustion chamber blowing. They are also equipped with intuitive LCD display for easy operation.
- Automatic adjustment of fresh air and fuel feed rates according to the selected operating temperature, which feature provides high efficiency of the appliance at minimum fuel consumption.
- The combustion chamber of the burner is made from fire resistance steel, which guarantees reliable and long-term operation.
- Automatic modulation of the burning process decreasing the number of stops and ignitions, respectively fuel and electricity consumption.
- Availability for wide range regulation of the heat carrier (water) temperature.
- Availability for operation with room thermostat and weekly programmer.
- Circulations pump control according to the heat carrier (water) temperature.
- Availability for control of extraction fan.
- Self operation optimization depending on the building and system inertia.
- Quiet operation and low electric power consumption.
- Protection from back-fire and from heat carrier (water) freezing.

Table 4 presents technical data of hot water boiler from series BiSolid Comfort 03/04/05 operating with wood logs and wood pellets.

Table 4. Technical data of hot water boiler from series BiSolid Comfort03/04/05.

Description	Dimension	Comfort 03		Comfort 04		Comfort 05	
Number of sections	pcs.	3	3	4	4	5	5
Fuel	-	Wood	Pellets	Wood	Pellets	Wood	Pellets
Wood pellets category according to EN 14961-2	-		ENplus-A1		ENplus-A1		ENplus-A1
Nominal heating output	kW	20	18	25	24	32	30
Working pressure	MPa	0.4	0.4	0.4	0.4	0.4	0.4
Fuel consumption at nominal heating output	kg/h	9.6	4.2	12.2	5.6	15.6	7.0
Chimney draught	Pa	15-20	15-20	15-20	15-20	15-20	15-20
Efficiency	%	75-81	90	75-80	89	75-80	89
Boiler water volume	l	19.4	19.4	23.8	23.8	28.2	28.2
Fuel hopper volume	l	33.7	33.7	49.0	49.0	64.3	64.3
Weight	kg	187	203	221	237	255	271
Length	mm	636	976	736	1076	836	1176
Height	mm	1053	1053	1053	1053	1053	1053
Width	mm	490	490	490	490	490	490

2. INTRODUCTION

2.1. BOILER GENERAL REQUIREMENTS

The boiler and its accompanying equipment must be installed and used in accordance to the designed heating installation, all applicable legal norms, technical standards and manufacturer instructions. The boiler should be used only for the subscribed purposes.

The boiler must be installed only for the purposes for which is designed. If the boiler is delivered and installed to the customer by the same person, then the whole accompanying documentation must be provided as well (especially the user manual book). The boiler's genuine package should be kept until its initial operation start up, in case the boiler should be transported again.

After installation the boiler operation must be initiated by servicing organization, authorized by the manufacturer.

The boiler corresponds to the applicable EU legal provisions. If the boiler should be used in countries outside the EU, all deviations from local laws and legal provisions must be identified and corrected.

In case of faults in the boiler please contact a servicing organization authorized by the manufacturer. Every incompetent intervention might damage the boiler (and possibly the accompanying equipment).

The servicing technician initializing the boiler start up for first time must show the customer all of its main components, different boiler systems and how to control the boiler. The technician must present the boiler's safety elements and signalization, and respectively the relevant user reaction. If the boiler is delivered and installed to the customer by the same person, then he must ensure that boiler's genuine package is kept, in case the boiler should be transported again.

Please check the delivery of the boiler's standard accompanying equipment.

Please check if the delivered model and type of the boiler corresponds to the usage requirements.

If you are not sure how to manage the boiler, please carefully read the relevant instructions in this manual for operation and installation, and respectively continue as prescribed.

Please never take/stick off or damage the marks and signs on the boiler. Please keep the boiler genuine package until its initialization to operation, in case the boiler should be transported again.

If doing a boiler repair, you must always use genuine spare parts only!

It is forbidden to make any changes to the internal installation of the boiler or to change anything in any way.

At the end of the boiler's life cycle, it should be packed together with its parts and disposed in an environmentally safe way.

The manufacture company is not responsible for damage or harms caused by non-compliance with:

- Terms and conditions stated in this manual for operation and installation.
- Applicable standards and legal provisions.
- Procedures for installation and operation.
- Terms and conditions presented in the product warranty card.

Situations which are possible to occur in real-time practice and precaution measures that should be taken:

- Switch off the boiler if there are any flammable or explosive vapors in the boiler room, that may mix with the ambient air which is fed for firing in the boiler (for example from paint while painting, spraying or laying molten substances, gas leakage, etc.).
- If it is necessary to drain the water out of the boiler or from the entire system, as the water should not be dangerously hot.
- If there is any leakage from the boiler's heat-exchanger or when the heat-exchanger is choked up, do not try to start the boiler until normal operation conditions are recovered.

2.2. ENSURING PEOPLE AND EQUIPMENT SAFETY

The boiler and all of its parts are in compliance with the safety requirements of the relevant EU legal regulations.

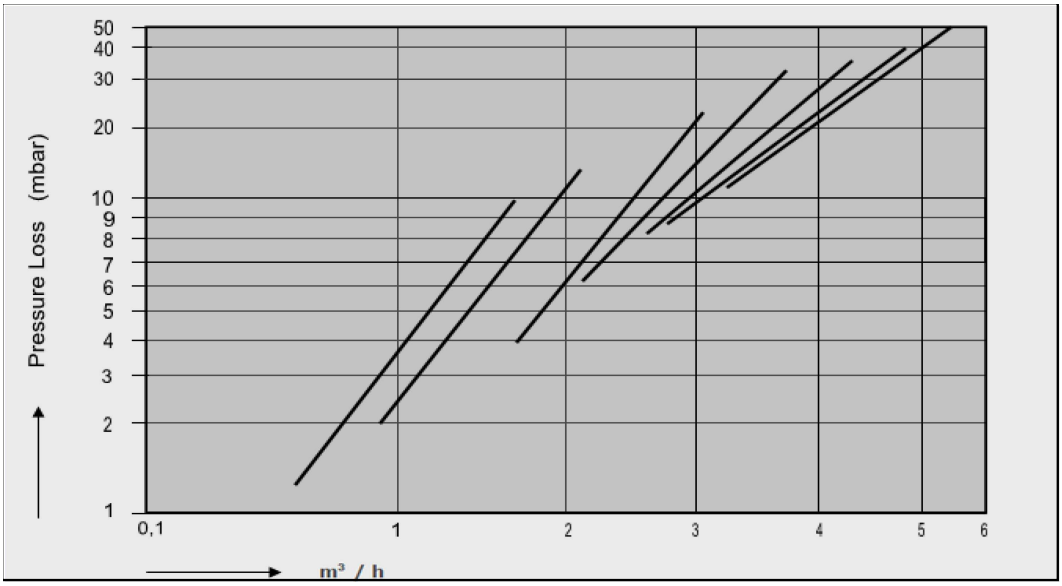
In order to install and operate the boiler in real-time conditions and in compliance with its usage designation (stated below only as usage), is necessary also to observe the additional requirements, as most important of them (those that should not be missed) are presented in the relevant regulation documents. In addition to the above mentioned documents for the usage of the boiler it is also necessary to comply with this operation and installation manual and the product accompanying documentation supplied by the manufacture company.

Any intervention over the boiler's operation from children and persons under the influence of narcotic substances, psychiatric abnormalities and etc., must be prevented.

2.3. PRESSURE LOSSES

The pressure losses in the boiler's combustion chamber, depending on the burning air supply, are presented in Figure 2.

Figure 2. Pressure losses in the combustion chamber.



3. OPERATION INSTRUCTIONS

3.1. OVERALL CHARACTERISTICS OF HOT WATER BOILER FROM BISOLID COMFORT SERIES

The solid fuel boilers from BiSolid Comfort 03/04/05 series are designed for heating of domestic and industrial buildings.

Preconditions for proper functioning of the hot water boiler are not only its professional installation, but also the needed chimney draught and its correct operation.

The solid fuel hot water boiler from Bisolid Comfort series is designated for heating systems which are suitable for systems with forced water circulations.

The hot water boilers from series BiSolid Comfort are offered in three output models (defined by the number of sections: 3, 4 and 5) with heating capacity from 18 to 32 kW.

The cast-iron boiler body consists of sections and serves as combustion chamber (including for flue gas extraction) and in the same time as water heat-exchanger. There are three types of sections - integrated front and rear and from 1 to 3 middle sections (same type), which are between them. The boiler body required size is built during the assembly (combustion chamber and water heat-exchanger), with a suitable number of sections. The assembled boiler body is equipped with the necessary pipe elements for connecting to the water-supply system.

The boiler body is also equipped with brackets for installation of thermostat sensors and brackets on the legs for fixing the boiler to a floor base. Steel plate covers are mounted on the boiler body and are filled inside with heat-isolation.

In order to guarantee the boiler's proper operation and that it will operate economically, it is important to know that its nominal heating output is equal to the heat losses of the heated premises.

Choosing a boiler with insufficient heating output will lead to unadequate heating of the premises and by such terms not providing of the heating comfort.

Choosing a boiler with unnecessarily high heating output will lead to terms in which the boiler will not operate at its full ouput power and as consequences to excesive condensation and tar deposits.

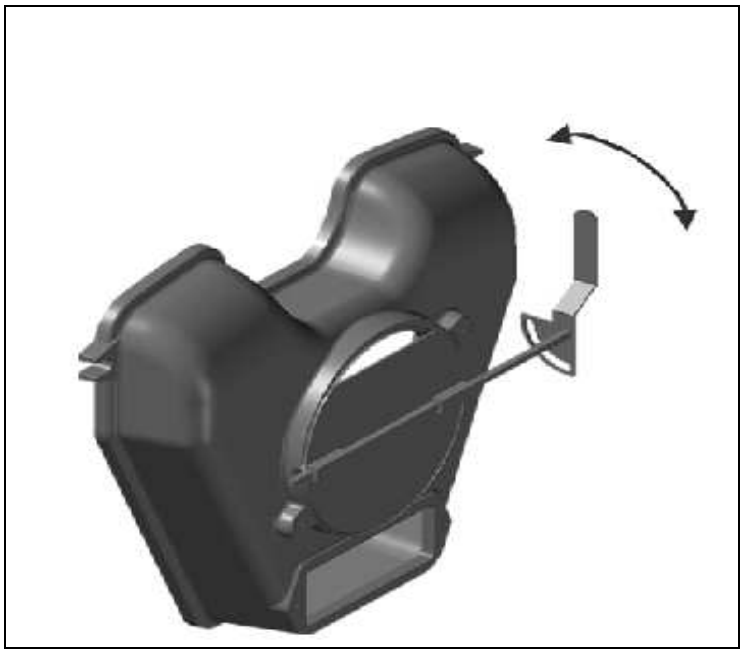
3.2. SAFETY AND CONTROL DEVICES

The hot water solid fuel boilers from series BiSolid Comfort 03/04/05 are equipped with two main control components:

- Chimney (flue) flap.
- Thermo-regulating valve (TRV).

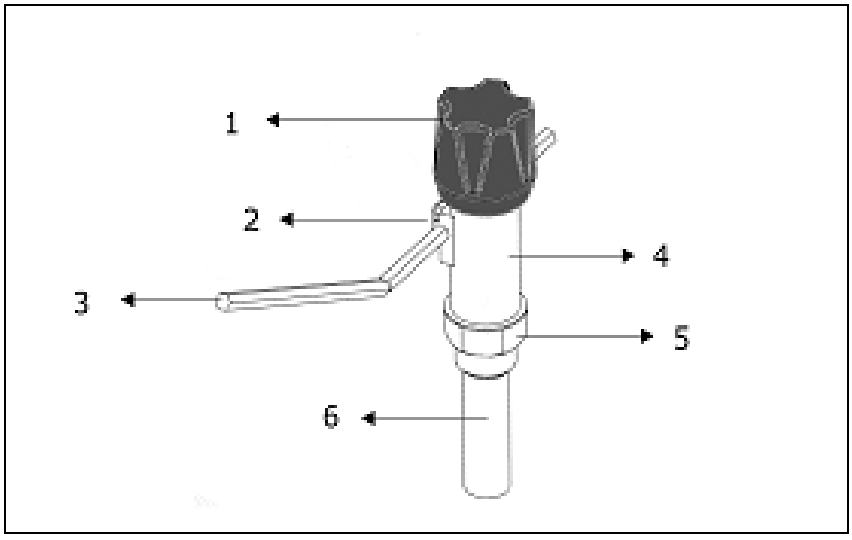
The chimney flap (Figure 3) is element which supports the chimney draught regulation, i.e. exctracting the flue gasses to the chimney. The flap is situated in the boiler's flue back side and is controlled manually.

Figure 3.Chimney (flue) flap for draught regulation.



Another element for regulation of the boiler draught is the thermo-regulating valve (Figure 4). The regulator is situated on the cast-iron body exit. It regulates the primary air quantity, used for firing, under the boiler fire-grate by opening or closing a flap, situated on the ash-tray door.

Figure 4. Thermo-regulating valve (TRV).



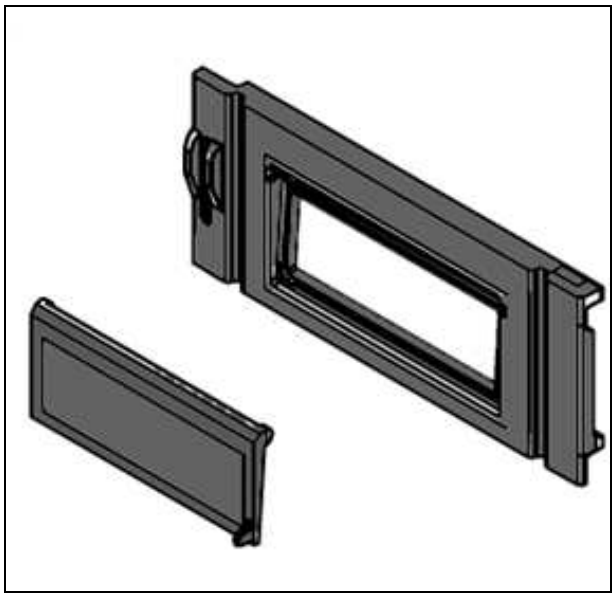
1. Regulator head
2. Holder
3. Handle
4. Regulator body
5. Hex key
6. Hollow shaft

Danger

When installing the elements for safety and control please do not forget that all installation works must comply with the safety labor principles. If thermo-regulation valve or other safety element replacement is necessary, please use the recommended devices. In case of using any other type of devices you should ask the supplier first. The thermo-regulating valve must be checked by authorized specialist once per year.

The change of the flap position controls the burning intensity and by that the boiler heating output (when operating with wood logs). The thermo-regulating valve is connected to the control flap by a chain. The chain is connected to the flap in such way that the thermo-regulating valve tensioning can be adjusted (Figure 5).

Figure 5. Control flap.



Warning

When the boiler operates with wood pellets the chain must be disconnected from the flap. The necessary air for firing is supplied by the pellet burner fresh air fan.

Danger

Keep any objects away from the regulating flap and from the grooves providing primary air intake.

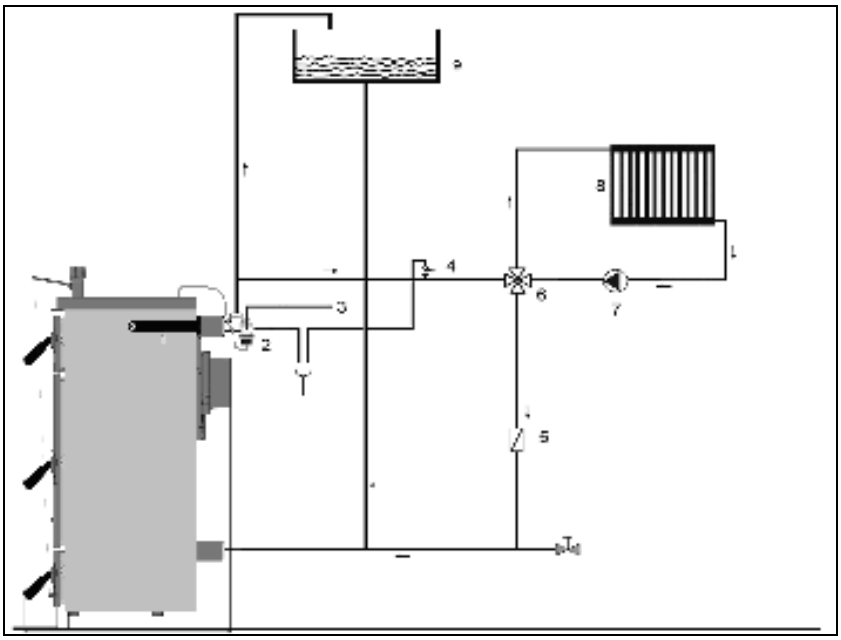
The hot water temperature can be measured by thermometer (Figure 6), which is situated on the front boiler panel, over the fuel feeding door.

Figure 6. Termometer.

Hydraulic scheme

It is presumed that the hydraulic system is opened type and has to be built in accordance to the following scheme (Figure 7).

Figure 7. Schematic hydraulic diagram.



1. Safety heat-exchanger
2. Safety valve (TS 131, STC 20)
3. Water supply
4. Safety valve (3 bar - 1/2")
5. Stopping valve
6. Four-way mixing valve
7. Pump
8. Heating device / Heater
9. Open type expansion tank

The open type expansion tank must be installed on the highest place in the entire hydraulic system.

The expansion tank must be chosen properly, complying with the water volume changes resulting from its heating and cooling.

The expansion tanks and their pipe connection lines must be protected against freezing.

The drain pipe diameter must be chosen properly, so the risk of overfilling to be eliminated.

4. BOILER INITIALIZATION TO OPERATION

4.1. BOILER CHECK-UPS BEFORE INITIALIZATION FOR OPERATION

Before initializing the boiler for operation the service technician must check:

- If the installation complies with the project.
- Boiler must be filled with water, to be under pressure and to check the entire heating system for leakages.
- Boiler connection to chimney – flue pipe connection lines must be approved by authorized service technician.
- Heating regulators functionality.

Warning

The service technician must train the user how to operate and manage the boiler and also to fill in the exact start of operation date in the warranty card of the product.

4.2. FILLING AND DRAINING THE HEATING SYSTEM

The system can be filled or drained with water only if the water corresponds to EN standards values. The water must be clean, with no color, no suspended particulates, oils and chemically aggressive and corrosive substances, and also it should not be acid (pH factor must be higher than 7.0). At first place a comprehensive rinsing of the entire heating system should be performed.

Warning

Water quantity in the system should not be decreased or drained except in the cases when the boiler is being repaired or there is risk of freezing. An antifreeze fluid can be added against freezing, with a volume of 15% from the total liquid quantity (please see the anti-freezing fluid supplier usage instructions).

Warning

Not fulfilling the above mentioned requirement might result in clogging the heat-exchanger of the boiler and cracking the cast-iron sections. During the heating season the water volume in the heating system must be kept constant. If refilling with water you must be careful to not intake air into the system. The circulation water should never be drained out from the boiler or the heating system, except if it is absolutely necessary, for example when doing repairs and etc. Draining and refilling the system with water increases the risk of corrosion and boiling stone (scale).

Warning

Filling or topping up water into the heating system must be done only when the boiler is cold or cooled, in other case the cast-iron sections of the boiler may crack.

5. BOILER OPERATION AND CONTROL WITH WOOD LOGS

5.1. BOILER FIRING

Before firing a hot water boiler from BiSolid Comfort 03/04/05 series check the manometer and wether there is enough water in the heating system. Open the stopping valve, located between the boiler and the heating system. Spread paper over the cleaned fire-grate and then put over it enough quantity of chopped wood pieces. Open the flue flap and close the fuel feeding door. Ignite the paper through the ash cleaning door and fully open the regulating flap, located on the same door. When the fire has ignited enough layer of the main fuel, a smooth burning should be observed. When the fire has enough power, add more fuel up to the lower edge of the fuel feeding door.

Ensure equal layer of fuel on the whole boiler depth. When the boiler has reached the needed heating output, then it is necessary to part or half close the chimney flap, in order ro prevent exctraction of heat to the chimney.

Danger

- Do not start the boiler if it's not connected to a chimney.
- Before starting the boiler check its connection with the chimney.
- Check the chimney draught. If it is above the recommended values a draught regulator has to be installed.

5.2. HEATING WATER TEMPERATURE ADJUSTMENT

When the desired heating water temperature is 60°C, you can heat the water in the boiler for example with 5°C higher than the desired temperature of 60°C (it is measured by the boiler thermometer). This is possible if you turn the thermo-regulating valve's head to 65°C and check if the regulating chain is streched and the regulating flap is completely closed. This position of the flap regulating chain can be adjusted by turning the regulating valve's head. Then the process of adjustment works out. When the water temperature decreases, the regulating flap will start to open by the force applied from the chain. When the water temperature suddenly increases, the regulating flap will start to close. In such way the air fed in the burning zone can be regulated, respectively the water temperature in the boiler.

5.3. REFUELING THE BOILER

First close the regulating flap, this action will cut the air supply needed for firing in the boiler. After that, open the chimney (flue) flap completely. Gradually open the fuel feeding door and wait until all gasses are led out from the burning chamber to the chimney. Only then you can open the fuel feeding door completely and start to refuel the boiler. After closing the fuel feeding door, you should again restore the chimney flap position and the regulating flap function.

Danger

- Boiler doors must not be opened when it operates continuously.
- When refueling the boiler ensure minimum distance of 5 cm between the loaded fuel highest point and the combustion chamber top surface.

5.4. BOILER HEATING MODE DURING THE NIGHT

This mode is used when you want to keep the fire in the boiler burning, for example during the night. First scrape all the ash from the combustion chamber, with completely opened chimney flap. After that refuel the boiler and close the fuel feeding door. After that, close the chimney and the regulating flaps. This will lead to chimney draught decreasing and will limit the firing air supply. Then close the rosset for secondary air supply. To restore the needed boiler heating ouput open the chimney flap and partially open the regulating flap, until reaching the needed boiler heating output.

5.5. CLEANING THE ASH

The cleaning is performed by removing and emptying the ash-tray, positioned in the ash drawer under the fire-grate. This action must be performed regularly, in order to prevent ash depositing and blocking the air supply to the combustion chamber.

5.6. CONDENSATION AND TARS

When firing a cold boiler the water condenses over the walls and flows down in the ash drawer, which causes doubt that the boiler “leaks”. The condensation will disappear when the inside walls of the boiler get warmed. When the boiler operates with low water temperature, usually under 65°C or when the used fuel is wet, then the water condenses in the flue gasses and the condense leaks down over the cold boiler walls. The low temperature heating mode reduces the chimney life-time also. Therefore it is recommended to equip the boiler with four-way mixing valve, which guarantees that the inlet water will not be below 50°C. The tar depositing occurs in similar conditions (lack of air for firing, boiler clogging). To prevent from condensation and tars we recommend to start the boiler at water temperatures higher than 65°C or to choose a boiler which corresponds to the needed heating output. The oversized boiler operates inefficiently, because it has to operate at low temperatures.

Warning

Condensation is possible at initial boiler firing. This should not embarrass the user, because it is normal event – especially when firing wood with higher water content. The boiler “dries” when it reaches normal operation mode.

5.7. BOILER SWITCH OFF

We do not recommend you to accelerate the burning process in the boiler. The fuel must burn completely by itself over the fire-grate.

5.8. BOILER SHORT-TERM SWITCH OFF

After switching off the boiler, clean it, take out all burned wastes, empty its ash-tray, clean the contact surfaces of the feeding door and the ash drawer, and after that close the boiler’s fuel feeding and ash drawer doors.

5.9. BOILER LONG-TERM SWITCH OFF

When switching the boiler off for long period of time (at the end of the heating season), it must be completely cleaned from all unburned accumulations (soot, ash and deposits). Otherwise the accumulation of moisture in the unburned gasses leads to excessive boiler corrosion.

Warning

The boiler can be operated only by adult people who are well introduced with the current manual for operation.
Switch off the boiler every time when there is any (even momentary) danger by the presence of flammable or explosive vapors situated in the same room from which the boiler intakes air for burning (for example painting paint, spraying or laying molten substances, gas leakage, etc.).
Boiler initial firing with explosive substances is strictly forbidden.
Boiler overheating is forbidden.
The boiler and the chimney have to be completely cleaned at the end of the heating season. Also grease all hinges, chimney flap mechanism and other moving parts.

5.10. BOILER MAINTENANCE

Maintenance of the boilers from series BiSolid Comfort 03/04/05 has to be performed daily, periodically or early.

During the daily maintenance the user must clean the unburned residues in the combustion chamber, to clean the ash gathered in the combustion chamber and to dump the ash from the drawer.

It is important that the user performs periodical maintenance of the appliances, in order to achieve effective usage, prevention of possible problems with its operation and optimum boiler life cycle. We recommend periodical check on every 3 months. Such checks have to be performed by authorized servicing technicians and should include the following activities:

- Check boiler's combustion chamber and flue pipe, including the chimney. They should be cleaned if necessary.
- Check for leakages of incoming or outgoing water, in and out of the boiler, water pipe links as well.
- Check valves, fittings and accessories.
- Check circulation pumps.
- Visual check of the fire-grate.
- Perform operation control check for safety of the hydraulic system and the boiler.

The yearly maintenance (prophylaxis) of the boiler must be performed only by authorized technicians, before the start of the heating season. Before calling the servicing technicians the user has to provide already cleaned flue pipes and chimney. During the yearly prophylaxis the authorized technicians perform the following checks and activities:

- Position of the combustion chamber shaft, isolation and isolation ropes.
- Boiler test at operating pressure for adjustment of the burning, by measuring flue gas parameters if necessary.
- Check and clean the boiler's fire-grate and surfaces from soot and ash.
- Test boiler connections for leakages.
- Check fittings including muffs, mixing valves, pressure valves for reliability.

- Test and if necessary clean the water filter.
- Check expansion tank (buffer) and clean it if necessary.
- Test pressure sensor. Clean or replace it if necessary.
- Perform operation control check for safety of the hydraulic system and the boiler.

5.11. BOILER CLEANING

After continues operation of the boiler amounts of soot and ash accumulate to its walls, mainly over the heat-exchanger sections and the flue outlet, which decrease the heat-exchanging rate and the boiler heating ouput. The amounts of soot and tar depend on the operation conditions and the types of used fuel. This may also lead to inadequate chimney draught. Boiler cleaning has to be performed regularly, at least once per month, usually by using steel brush through opened boiler door.

All inside walls of the boiler in the combustion chamber and the flue gasses passage channels must be cleaned. If there is bigger quantity of tars over the combustion chamber inside walls, then it must be removed by using a scraper or burned by firing hard wood at maximum operation temperature.

Direction

The ash must be stored (the ash has to be taken out by using gloves) in fireproof reliable containers and to be transported to opened spaces. Other garbage or wastes should not be stored in these containers.

5.12. BOILER REPAIR

The boiler must be repaired only by authorized servicing technician or servicing organization. The user or owner is allowed to perform only normal maintenance and to replace only a few parts, for example sealing of insulating rope.

Warning

Always use only genuine spare parts when repairing the boiler.

5.13. WARRANTY AND WARRANTY CONDITIONS

The hot water boilers from series BiSolid Comfort 03/04/05 are available with warranty, presented in the warranty card and the operation and installation manual (part introduction, boiler installation).

5.14. BOILER PACKAGE KIT AT DELIVERY

All hot water boilers from series BiSolid Comfort 03/04/05 are delivered fully assembled and functionality tested. The full accompanying delivery kit for the boilers is presented in Table 5.

Table 5. Delivery kit of boiler BiSolid Comfort.

Pos.	Description	Pcs
1	Hot water boiler Bisolid Comort	1
2	Wood pellet burner Bisolid GP	1
3	Pellet auger Bisolid	1
4	Ash-tray	1
5	Electrical control panel	1
6	TRV – thermo-regulating valve	1
7	Cleaning tool – scraper	1
8	Cleaning tool – steel brush	1
9	Operation manual	1
10	Warranty card	1

6. BOILER OPERATION AND CONTROLS WITH WOOD PELLETS

6.1. BOILER FIRING

Before firing the boiler from series BiSolid Comfort 03/04/05 when utilizing wood logs please comply with the instructions in part 5.1, presented in the current manual for operation.

When operating boilers from series BiSolid Comfort 03/04/05 with wood pellets, the user has to use the additional front door on which a pellet burner from series Bisolid GP can be installed. The boilers from series BiSolid Comfort 03/04/05 are equipped with control panel, so quickly and easily (for less than a minute) you can switch from wood logs to wood pellets and contrariwise.

The burners from series BiSolid GP can burn wood pellets with diameter ∅ 6-8 mm and category of wood pellets according to EN 14961-2 - ENplus-A1. Switching the boiler operation from wood logs to wood pellets must be performed manually, by switching on the installed pellet burner from series BiSolid GP.

Warning

When operating with wood pellets the user must be familiar in details with the BiSolid GP pellet burner manual for installation, operation and maintenance.

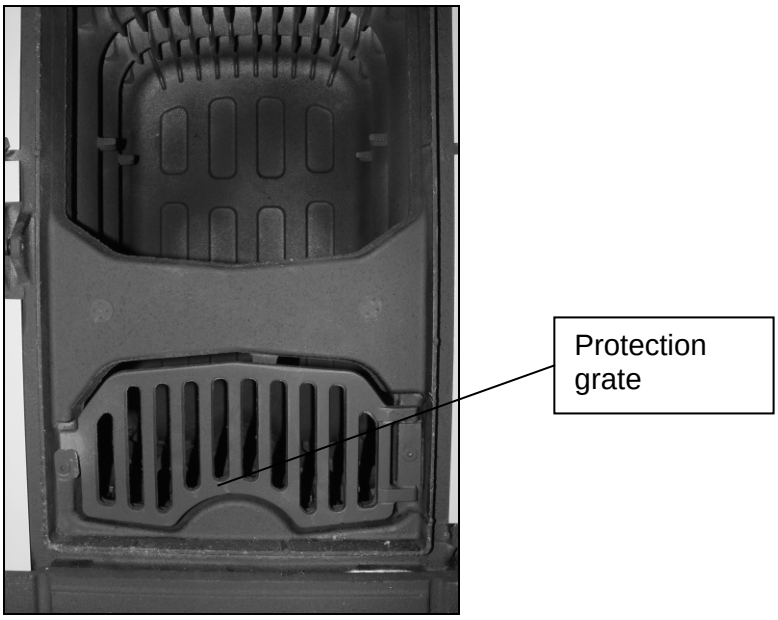
When the boiler is operating with pellet burner you have to first switch on the main switch button, which powers the burner control panel.

Warning

It is strongly recommended that starting of the pellet burner is done by the key “Start” located on the electrical control panel (Please read the operation, installation and maintenance manual of the pellet burner).

When a hot water boiler from series BiSolid Comfort 03/04/05 operates with wood pellets, the user must first remove the protection grate located in the front side of the boiler (Figure 8).

Figure 8. Boiler protection grate.



Warning

When using a pellet burner from BiSolid GP series, remove the protection grate by unscrewing its fixing bolts.

Warning

When using wood logs it is obligatory to install the protection grate.

6.2. BOILER SWITCH OFF

Switching off hot water boilers from series BiSolid Comfort 03/04/05 operating with wood logs must be performed in the appropriate way according to the instructions in parts 5.7, 5.8 and 5.9, presented in the current manual for operation. When operating with wood pellets the pellet burner switching off must be performed according to the instructions presented in the pellet burner BiSolid GP manual for operation.

Warning

Stopping the pellet burner is again performed by key “Start” positioned on the electrical panel. Such stopping ensures burner normal switching off and complete burning of the remaining pellets. It is not allowed to stop the burner through its main power supply switch!

6.3. BOILER SERVICING

When servicing hot water boilers from series Comfort 03/04/05 operating with wood logs, please observe the instructions in part 5.10 from the current manual for operation. When operating with wood pellets servicing of the pellet burner must be performed according to the BiSolid GP burner series manual for operation.

6.4. BOILER CLEANING AND MAINTENANCE

When cleaning and maintaining hot water boilers from series BiSolid Comfort 03/04/05 operating with wood logs, please observe the instructions presented in part 5.11 from the current manual for operation. When operating with wood pellets cleaning of the burner must be performed in accordance to the BiSolid GP manual for operation.

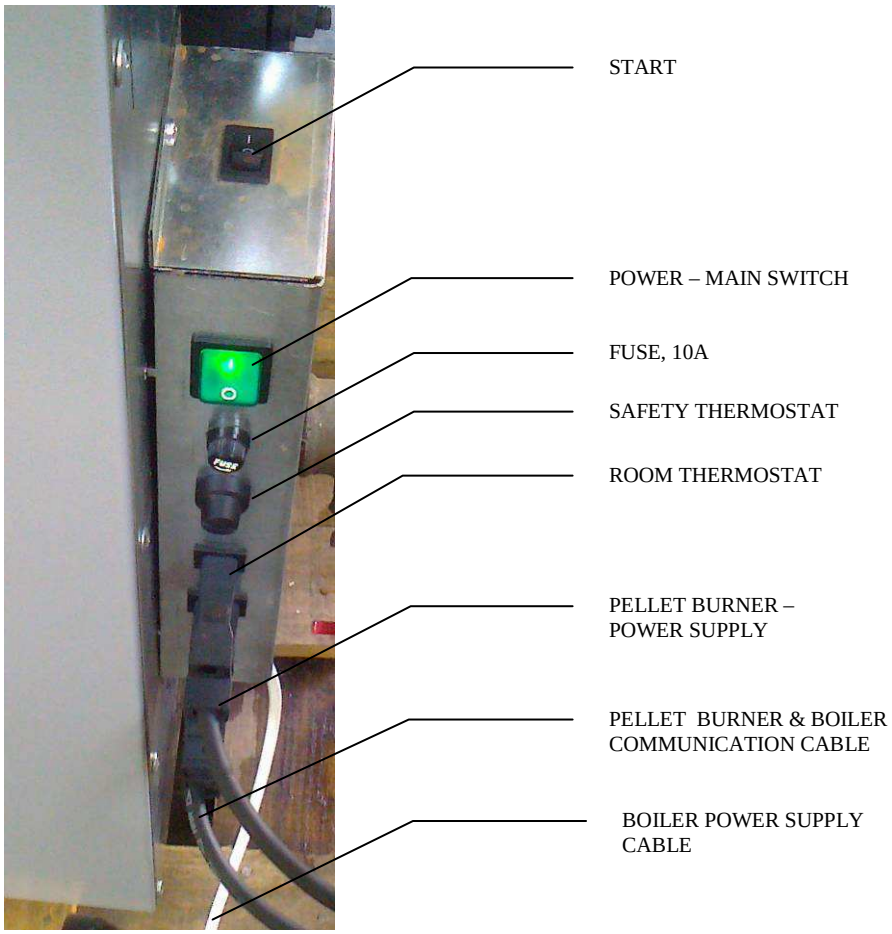
6.5. BOILER REPAIR

Repairs of hot water boilers form series BiSolid Comfort 03/04/05 operating with wood logs must be performed according to the instructions presented in part 5.12 from the current operation manual. When operating with wood pellets repair works must be performed in accordance to the BiSolid GP pellets burner manual for operation.

6.6. BOILER CONTROL PANEL

The electrical control panel of boilers BiSolid Comfort 03/04/05, operating with pellet burners BiSolid GP, is presented in Figure 9.

Figure 9. Electrical control panel of the boiler.



Warning

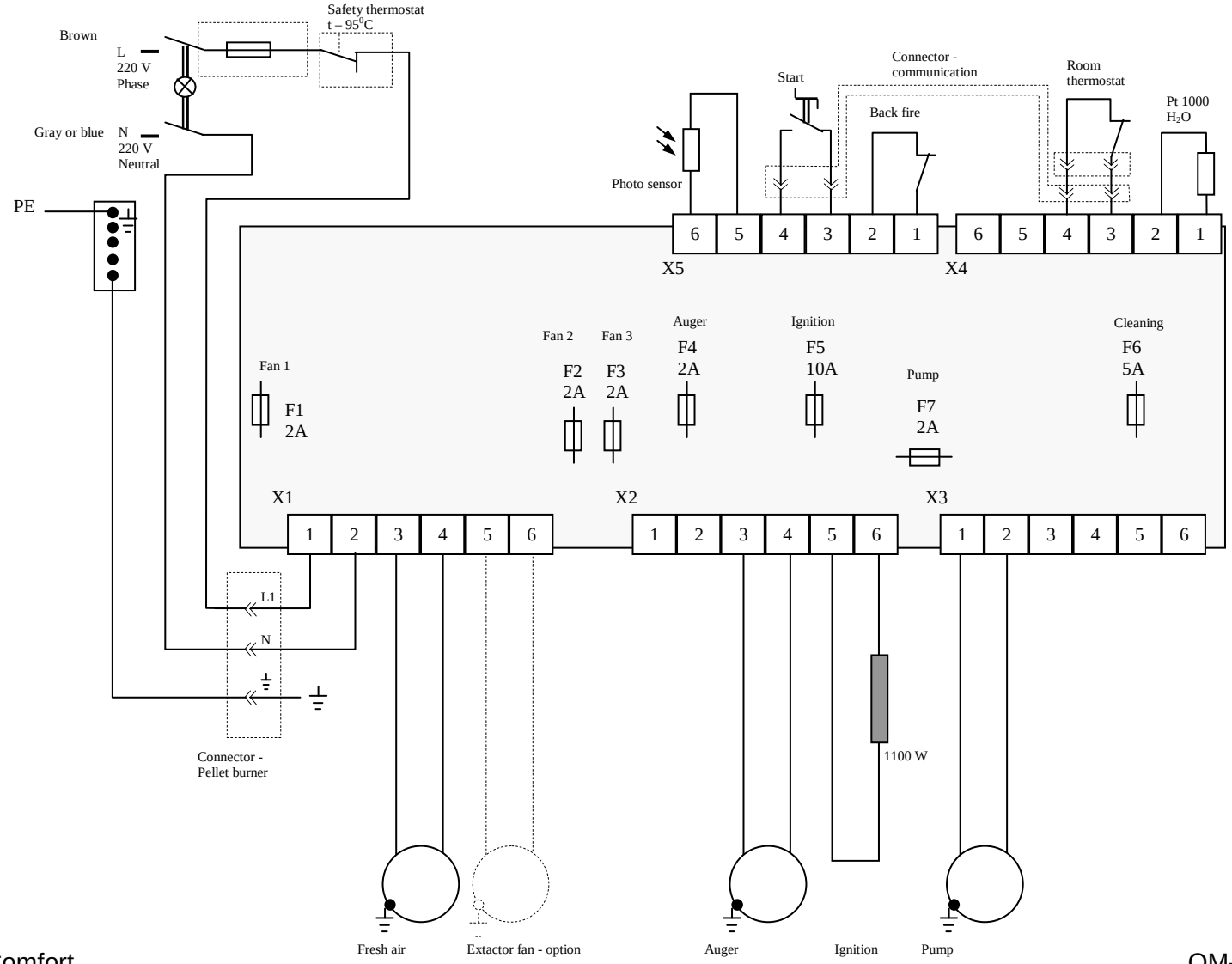
All works and activities over the electrical wiring of the burner or adjustments, where is necessary to remove its covers and other elements, that protect from contact with the electrical parts, must be performed by authorized person.

Warning

The burner must be connected to the electrical installation of the relevant appliance (boiler) by observing all safety techiques. The main power supply cable must be used in complinace with the attached wiring diagram for connecting to the main power supply and to burner's control module.

6.7. BOILER WITH PELLET BURNER WIRING DIAGRAM

Figure 10. Boiler with pellet burner – wiring diagram.

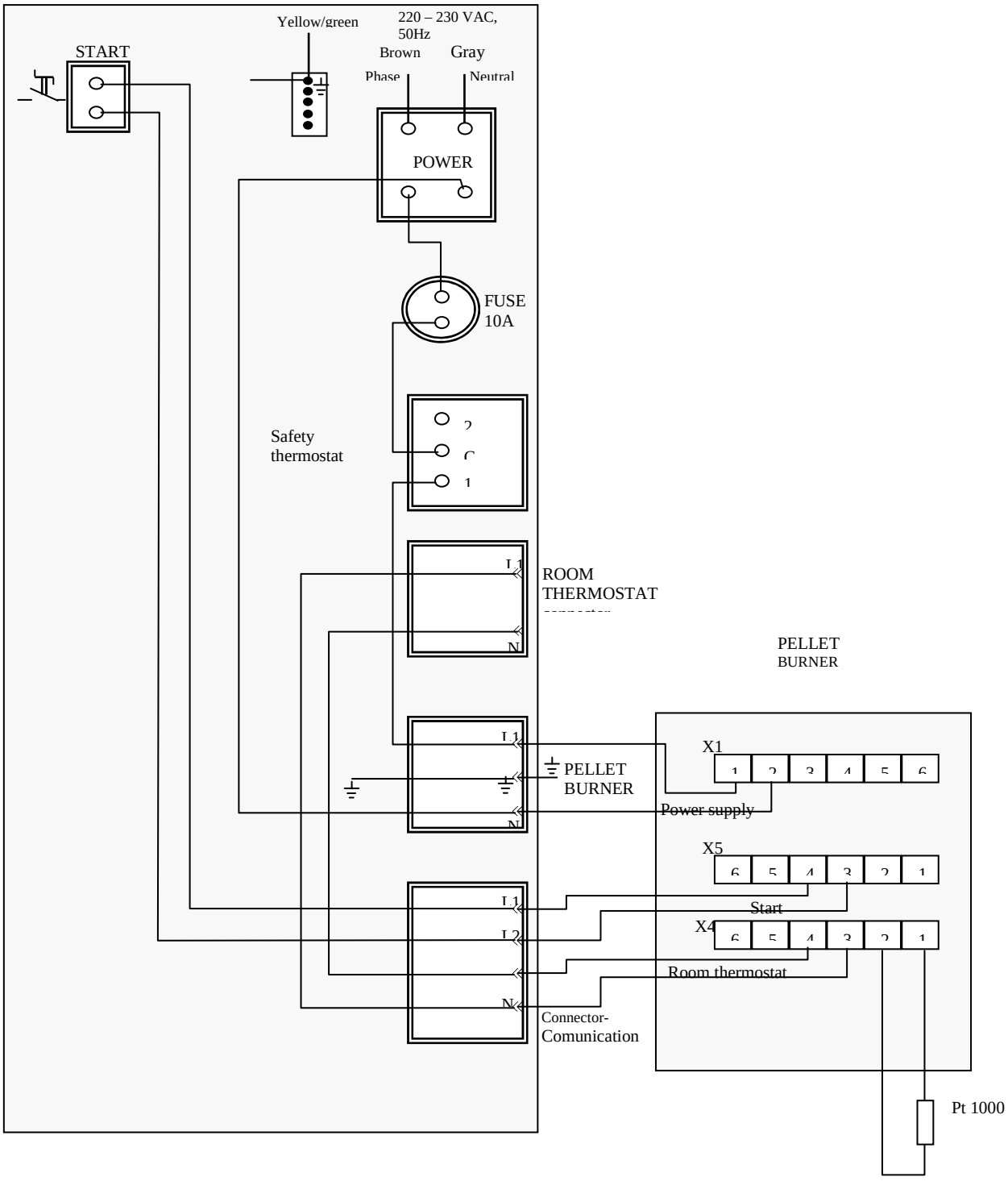


Warning

When operating with wood logs or wood pellets do not interrupt the boiler power supply, because the circulation pump must operate until the boiler cools down. In all wiring types the circulation pump must always operate when the boiler looses heat for unloading purposes.

6.8. CONTROL PANEL WITH CONNECTORS FOR PELLET BURNER

Figure 11. Control panel with connectors for pellet burner wiring diagram.



Warning

Connecting a room thermostat: Before connecting the room thermostat to the connector (moving part) for ROOM THERMOSTAT (positioned on the back of the boiler's side cover panel), remove the factory installed bridge, located in the connector. Use only room thermostat contact without external voltage! Please see the wiring diagram!

7. BOILER INSTALLATION INSTRUCTIONS

7.1. BOILER INSTALLATION – OVERAL INFORMATION

The hot water boilers from series BiSolid Comfort 03/04/05 must be initianted into operation by authorized servicing technicians. The existing network of authorized servicing organizations which comply with this condition is able to take responsibility for all boiler installations, their initialization in operation and warranty repairs.

The boiler is designed to supply heating systems with pressure up to 400 kPa by using water, which must compy to the standard requirements (under no circumstances the water can be acidic, i.e. it must have hydrogen exponent pH>7 and minimum carbon hardness). The heating system must be designed in such way that the hot water circulates at least through some of the radiators at all times.

We do not recommend the usage of antifreeze liquids because of their unsuitable properties. Such liquids have decreased heat-exchanging capabilities, high volume expansion and harmfull components.

Before final installation, the distribution pipelines of the heating system must be rinsed several times with water under pressure. In old, already used systems, the rinsing has to be performed in opposite direction to the heated water circulation. In new systems all radiators have to be cleaned from erosive materials and rinsed with warm water under pressure.

We recommend installation of precipitant on the boiler entrance (i.e. on the boiler's hot water return pipeline). The precipitant should be designed with availability for emptying on regular intervals, without necessity of draining too much hot water. The precipitant can be combined with filter, but the filter itself is not enough to secure adequate protection.

Warning

The system must be connected to open type expansion tank, for safety reasons.
Any of the stopping fittings must not be connected to the inlet or the safety outlet pipelines.
For increasing the system safety a bypass line must be installed on the inlet and outlet line of the circulations pump, as presented on the diagrams.
The bypass line valve must be closed when the boiler operates normally.
The bypass line valve can be used when there are problems with the power supply and must be opened if there is any risk of heating system water overheating, caused by power supply failure or another problem.
The pipelines diameter installed in the bypass line must be at least equal of the water supply pipeline.
UPS (uninterruptible power supply) can be used for prevention of power supply failures.

Warning

All problems (faults) with the boiler caused by clogging with dirt from the heating system or faults caused by clogging are not covered by the product warranty.

Warning
The filter, as well as the precipitant must be checked and cleaned regularly.

7.2. BOILER WATER REQUIREMENTS

The boiler water requirements are presented in the European standards. If the sum of calcium and magnesium content in the water exceeds 1,8 mmol/l without additional chemical processing, then for calcareous depostis prevention special measures must be performed (for example processing with magnetic or electrostatic field).

7.3. BOILER POSITIONING

The hot water boilers from series BiSolid Comfort 03/04/05 can be positioned in rooms that comply with the acting legal local provisions. The boiler room must have constant fresh air intake, needed for the burning process. The air has to be clean, without halogen hydrocarbons, corrosive vapors and should not be too wet and dusty. The room must be protected against freezing and with no more than 80% relative humidity of the air.

In order to comply with the fire provisions the boiler must be installed:

- Over flooring from inflammable material.
- Over surface from inflammable material, under-covering the boiler with 20 mm pitch from every side and covering the entire width of the boiler body.
- If the boiler is installed in the basement, we recommend that it is positioned over fundament with at least 50 mm height, as the boiler is positioned in the middle.

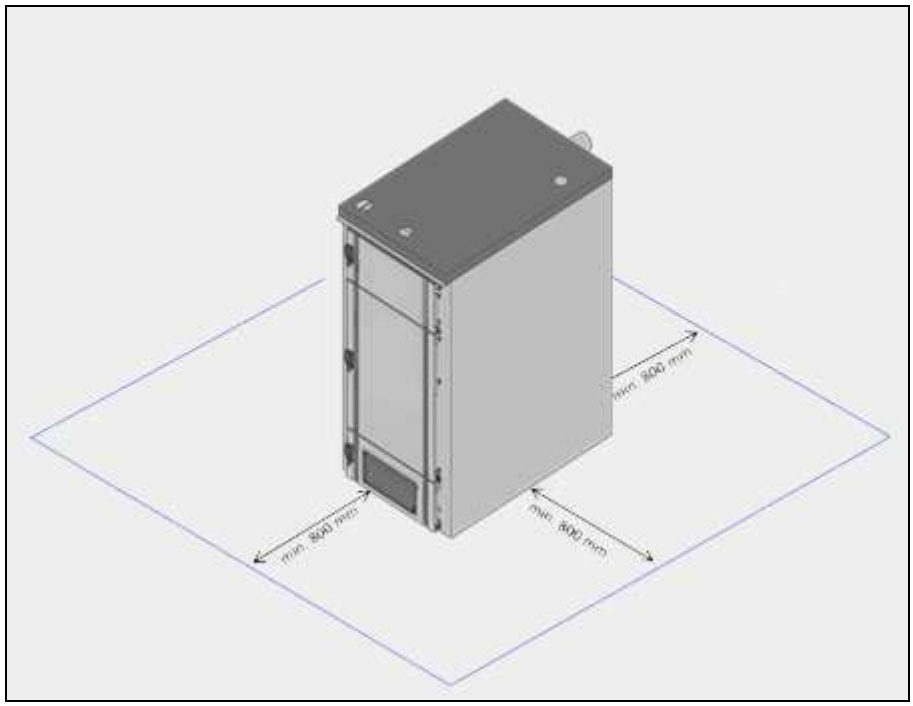
In compliance with the servicing standards it is necessary to leave space with at least 600 mm length at the boiler front side. The minimum distance between the boiler back and the wall must be also 600 mm. It is also necessary to leave free space of at least 600 mm between the boiler sides and the wall, in order to provide access to the boiler back side. The fuel must not be positioned close to the boiler, as the minimum distance is at least 800 mm.

If there are two boilers in the room it is not allowed to position any fuel between them. It is recommended to keep minimum distance of 800 mm between the boiler and the fuel (Figure 12), or to store the fuel in a premise different from the boiler room.

Danger
Do not put flammable materials over the boiler's top side or near it within the safety distance.

7.4. MINIMUM DISTANCES

Figure 12. Minimum distances between the boiler and the fuel.



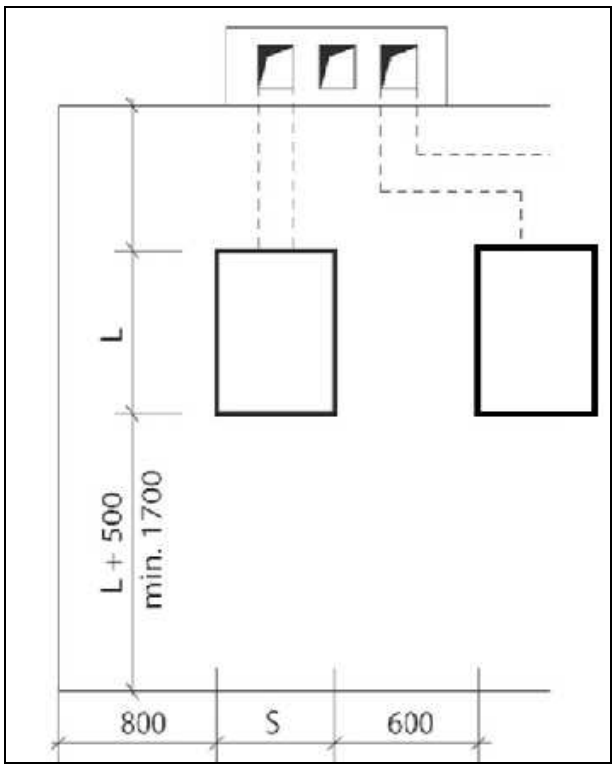
7.5. POSITIONING IN THE BOILER ROOM

Figure 13 presents the minimum distances which must be observed in order to guarantee safe operation in the boiler room and availability to perform servicing, cleaning and refueling.

The distance between the boiler front side and the wall has to be at least the boiler length plus 500 mm.

The minimum distances between the boiler from back and side have to be 800 mm, as the distance in the back is determined by how the boiler is connected to the chimney.

Figure 13. Minimum distances in the boiler room.



Danger

When the boiler operates do not touch any hot water pipe lines or flue pipes.

7.6. INSTALLATION PROCEDURE

- Position the boiler over inflammable material surface.
- Install the temperature safety valve. During its installation make sure that the arrow direction shows the water flow direction.
- After connecting the boiler to the heating system screw the boiler's filling and draining stop cocks at its back side.
- Install the flue pipe with the boiler's flue flap for extracting the flue gasses.
- Place the flue pipeline end in the chimney connection orifice. The boiler flue diameter is 150 mm.
- Mount the thermo-regulating valve in the orifice at the front section top side.
- We recommend installation of hot water stopping valves at the inlet and outlet pipes, before draining the entire heating system, so they can clean before the filter.
- Any stop fittings should be installed between the boiler and the expansion tank.

7.7. BOILER SPARE PARTS

The spare parts for hot water boilers from series BiSolid Comfort 03/04/05 are presented in Figure 14 and Figure 15.

Figure 14. Spare parts of the boiler.

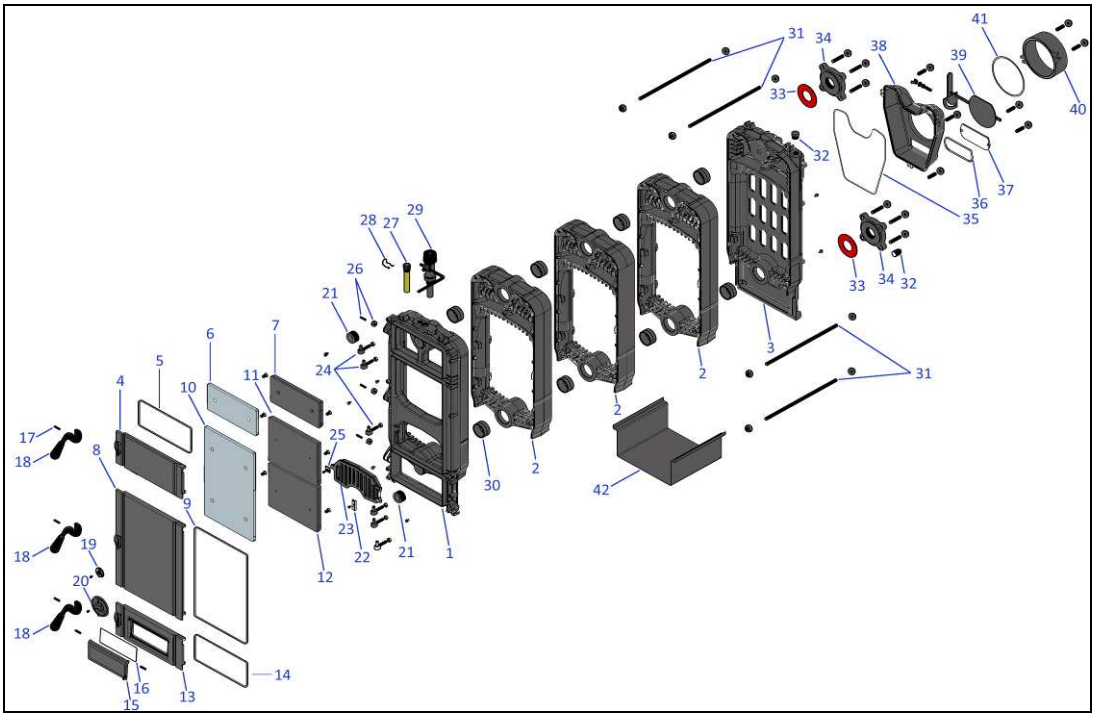


Figure 15. Spare parts of the boiler.

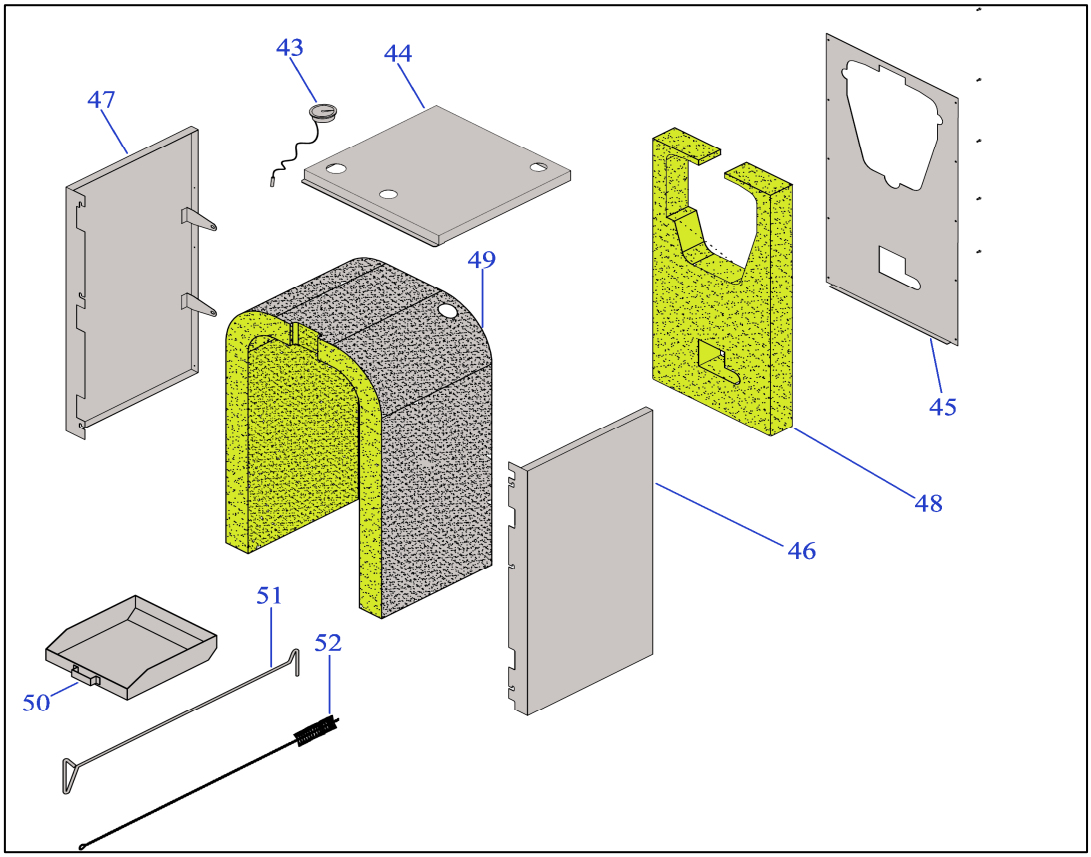


Table 6 presents the list of spare parts for cast iron boilers from series BiSolid Comfort 03/04/05.

Table 6. Spare parts list.

No.	Description	Serial No. BiSolid		
		Comfort03	Comfort04	Comfort05
1	Front section	SN 060	SN 060	SN 060
2	Middle section	SN 050	SN 050	SN 050
3	Back section	SN 070	SN 070	SN 070
4	Cleaning door	SN 010	SN 010	SN 010
5	Cleaning door insulation rope	SN 011	SN 011	SN 011
6	Gleaning door insulation	SN 012	SN 012	SN 012
7	Gleaning door insulation covet	SN 013	SN 013	SN 013
8	Stocking door	SN 022	SN 022	SN 022
9	Stocking door insulation rope	SN 015	SN 015	SN 015
10	Stocking door insulation	SN 020	SN 020	SN 020
11	Stocking door insulation cover UP	SN 021	SN 021	SN 021
12	Stocking door insulation cover DOWN	SN 024	SN 024	SN 024
13	Ashtray door	SN 040	SN 040	SN 040
14	Ashtray door insulation rope	SN 023	SN 023	SN 023
15	Regulation hatch	SN 041	SN 041	SN 041
16	Regulation hatch insulation rope	SN 041	SN 041	SN 041
17	Notched pin	SN 014	SN 014	SN 014
18	Door handle	SN 041	SN 041	SN 041
19	Air rosette UP	SN 090	SN 090	SN 090
20	Air rosette DOWN	SN 092	SN 092	SN 092
21	Stopper 1 1/4"	SN 091	SN 091	SN 091
22	Grid lock hinge	SN 085	SN 085	SN 085
23	Grid	SN 110	SN 110	SN 110
24	Lock hinge	SN 123	SN 123	SN 123
25	Grid lock socket	SN 140	SN 140	SN 140
26	Door lock cylinder	SN 131	SN 131	SN 131
27	Thermostat bulb	SN 215	SN 215	SN 215
28	Thermostat bulb segment	SN 300	SN 300	SN 300
29	Thermostat regulator	SN 400	SN 400	SN 400
30	Nipple	SN 401	SN 401	SN 401
31	Connection rods	SN 482	SN 483	SN 484
32	Stopper 1/2"	SN 403	SN 403	SN 403
33	Flange gasket	SN 404	SN 404	SN 404
34	Water inlet-outlet flange	SN 405	SN 405	SN 405
35	Chimney adapter insulation rope	SN 450	SN 450	SN 450
36	Chimney cleaning door insulation rope	SN 451	SN 451	SN 451
37	Chimney cleaning door	SN 061	SN 061	SN 061
38	Chimney adapter	SN 140	SN 141	SN 141
39	Chimney flap	SN 601	SN 603	SN 603
40	Chimney	SN 651	SN 653	SN 653
41	Chimney insulation rope	SN 701	SN 703	SN 703
42	Middle section cover	SN 910	SN 911	SN 912
43	Thermometer	SN 160	SN 160	SN 160
44	Top caver panel	SN 753	SN 754	SN 755
45	Rear cover panel	SN 763	SN 763	SN 763
46	Right side cover panel	SN 160	SN 161	SN 161
47	Left side cover panel	SN 160	SN 161	SN 161
48	Rear cover panel insulation	SN 803	SN 803	SN 803
49	Casting body insulation	SN 903	SN 904	SN 905
50	Ashtray	SN 773	SN 774	SN 775
51	Mixing rod	SN 774	SN 775	SN 776
52	Cleaning brush	SN 784	SN 785	SN 786

7.8. BOILER OPERATION WITH ACCUMULATING TANK

In some cases the heat energy can be delivered to the consuming devices by accumulating tank. The formula for determining the minimum needed water quantity for accumulation tank is given below.

$$V_{sp} = 15T_b \times Q_N \left(1\text{-}0{,}3 \times (Q_H/Q_{min}) \right)$$

V_{sp} – Volume of the accumulation tank, litters.
Q_N - Nominal heating output, kW.
T_b - Burning time, h.
Q_H - Premises heating load, kW.
Q_{min} – Minimum heating output, kW.

The heating boiler, which uses not only one fuel type, should operate with accumulation tank, dimensioned in compliance with the used fuel type requiring highest accumulation tank volume. Usage of accumulation tank is not necessary when the defined volume is lower than 300 litres.

7.9. TRANSPORTATION AND STORAGE

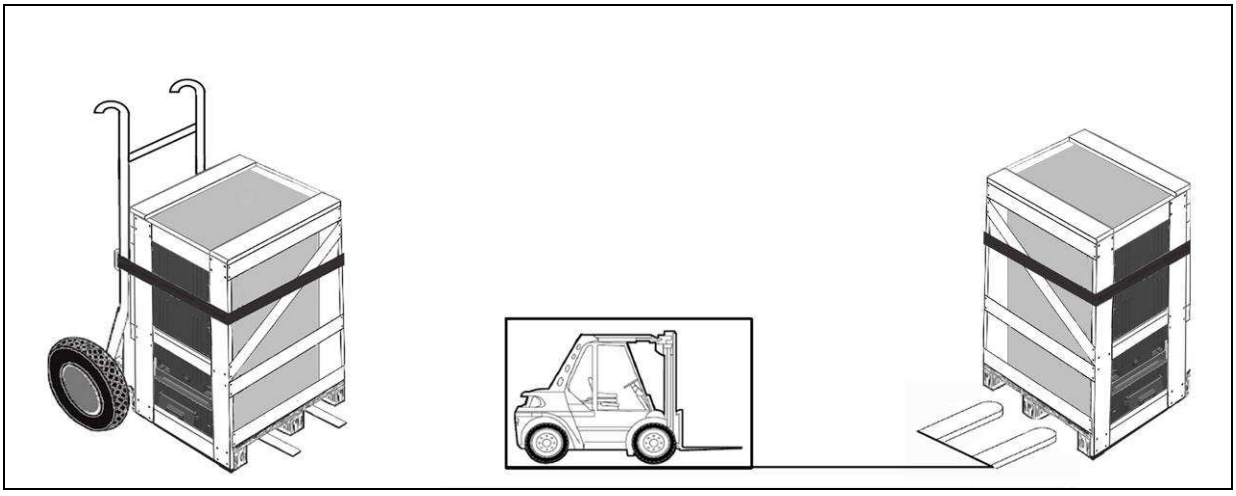
The boilers for expedition are offered by the manufacturer on a wooden pallet and secured against moving with cap bolts. The boilers should not be transported in position different from their base (normal operating position).

It is necessary to ensure at least the minimum conditions for preservation of the boilers during their storage and transportation.

During transportation and storage the boilers packages and cover panels should not be pressed.

Danger
The boilers should not be moved or transported without using forklifts, transport carts or other wheel based transport utilities.

Figure 16. Boiler transportation.

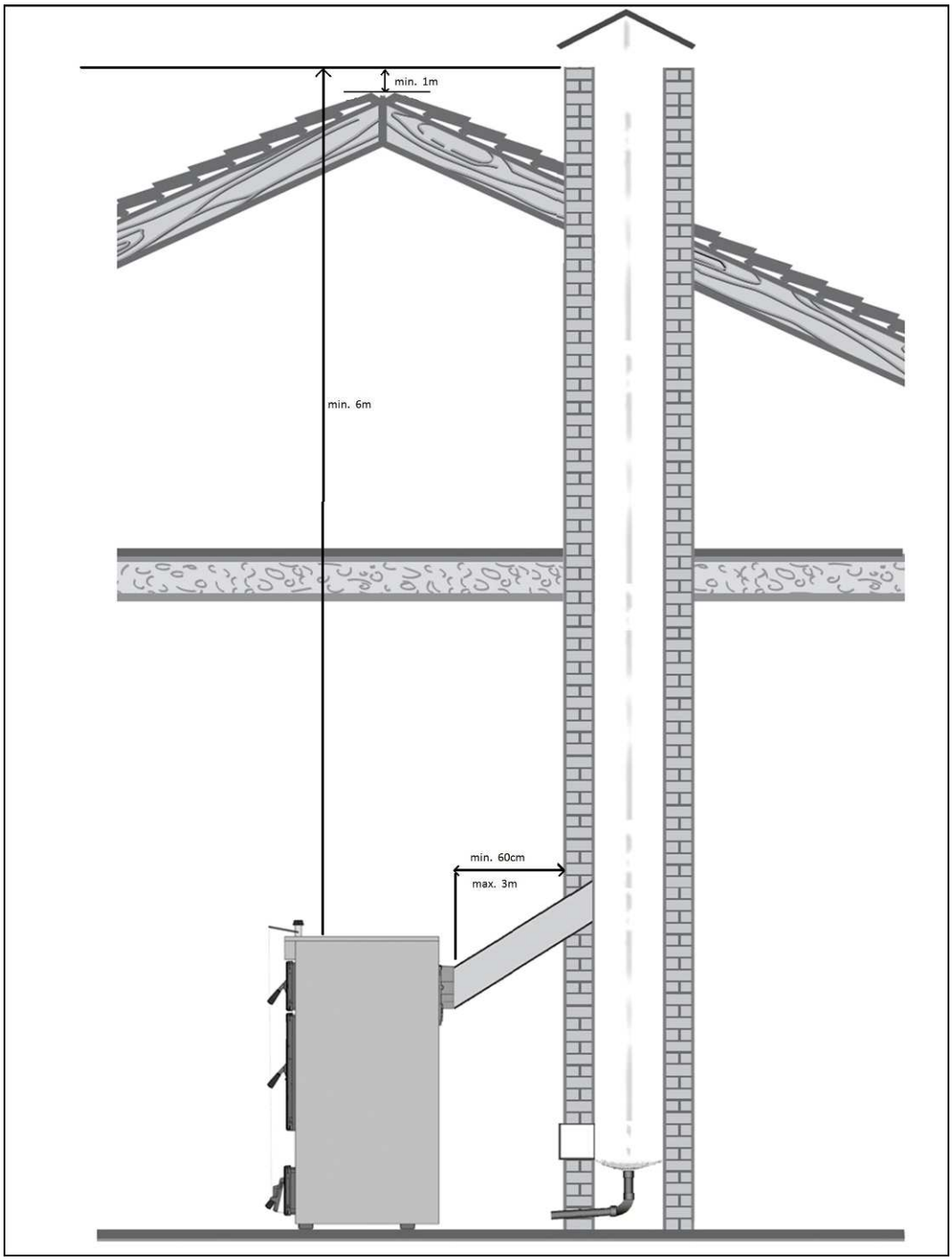


7.10. FLUE OUTLET PIPELINE INSTALLATION

Figure 17 presents the correct connecting of the boiler flue pipeline to the chimney, by additional pipe connection. Please observe the following rules when installing the flue pipelines to the chimney:

- Install the flue pipelines (pipe connection) to the chimney by checking the cleaning manhole.
- Fix the pipeline to the boiler flue outlet.
- Install the flue gasses pipe to the chimney, by using the shortest track, without using excessive number of bends. Avoid undesirable coupling sections, especially with 90 ° connection angle.
- Fix the pipelines reliably by using enough number of supports (especially for long flue pipelines).
- The flue pipeline (pipe connection) must be installed carefully in order not to loosen, because it is fixed only to the chimney inlet.
- Use parts and components for connecting the boiler flue outlet to the chimney that are made only from inflammable materials.

Figure 17. Flue pipeline installation.



7.11. CHIMNEYS AND ADVICES FOR CONNECTING TO CHIMNEYS

It is enough to have a drawing for connecting the boiler flue outlet to the chimney, as main condition for the boiler correct functioning. This requirement is essential and determines the efficiency and correct operation of the system. Therefore the following features should be noticed when connecting the boiler flue outlet to the chimney:

- Have in mind that the boiler must be connected to the chimney system (to flue gasses) in accordance to the local legal conditions.
- When connecting the boiler to the chimney it is necessary to ask professional installer for consultation and installation, because all activities must conform to the regulations for installation and the manufacturer instructions.
- The boiler can be correctly connected to the chimney by using a chimney system project and technical specification.
- The chimney system design sizing (flue gas pipelines system) must be based on the flue gasses mass flow rate, at maximum heating output of the boiler.
- The effective height of flue gas chimney is determined by the coupling point of the boiler flue outlet to the chimney.
- Make sure that the chimney system sizing and the flue connection to the chimney is performed by qualified specialist.
- If the boiler is not connected properly to the chimney, the product warranty will be considered as invalid.

The presented dimensions in Figure 18 are only tentative. The operation scheme depends on the diameter, height, chimney wall roughness and temperature difference between the combustion products and the outside air temperature. We recommend the usage of chimney with integrated metal insert.

Usually for more accurate calculations, performed by heating specialist or installer of the chimney system, the below formula is used for determining the chimney cross-section area.

$$F = \frac{a.Q_N}{\sqrt{H}}$$

F - Chimney cross-section area, cm^2.
a – Coefficient (a = 0.041 for wood logs).
$\mathbf{Q_N}$ – Boiler heating outlet, kCal/h.
H – Chimney height, m

8. TROUBLESHOOTING

Failure	Reason	Solution
The boiler does not generate hot water	The fuel quality is low due to high water content.	Try using fuel with higher caloricity and lower water content.
	Operation instructions are not observed.	Check the chimney draught, chimney flap position, inlet water temperature.
	Tar deposits over the heat-exchanger surface.	Clean the heat-exchanger with a brush, supplied by the manufacturer or with similar.
	Caused by improper burner operation.	See the burner BiSolid GP operation manual.
Excesive boiler condensation and black liquid formation	The used fuel is with high water content.	Use proper quality fuel.
	Low outlet water temperature.	Try to operate the boiler with flue gas temperature of 160°C over the ambient temperature.
The boiler outlet water temperature can not be adjusted	The boiler lower door is not or is incorrectly sealed while closing.	Check the lower door sealing or replace it with new.
	The water temperature gauge does not function.	Check the temperature gauge working order.
The boiler generates hot water but the radiators are cold.	The circulations pump does not function or the water circulation is blocked (for example closed valve).	Check the circulation system working order, especially the water pump.
	Presence of air in the heating system.	Bleed (air-free) the heating installation.

In all other cases removing of eventual failures must be performed by the manufacturer or authorized servicing company.

Supplier:	
Address:	
City.	
Str.	
Tel.:	
Fax.:	
http://	

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