

# Bio Kompakt

Pellet fuel boiler



## User manual

Maintenance and installation

# Bio Kompakt

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## Safety provisions



**During the use of the boiler, its individual parts: chimney, door, individual points of the body – can heat up and cause burns if touched.**



**Do not allow children to touch or use the boiler without adult supervision.**



**The boiler can be operated by a capable adult who has carefully familiarized himself with this instruction.**



**Only a qualified specialist can install the boiler and connect it to the heating and electrical systems.**



**If you suspect that the boiler has malfunctioned, please contact the organization that installed the boiler or the manufacturer's representative. Do not under any circumstances use a malfunctioning boiler.**



**Improperly connected and used boiler can cause injury or death.**

# Bio Kompakt

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## 1. Introduction

### 1.1. General information

The **Bio Kompakt** boiler models are characterized by a large heat exchanger, which allows to achieve an efficiency of more than 90 percent, and very good automatic rotary pellet burners with wide control options.

Before connecting the boiler to the heating system carefully read this manual to ensure that all boiler components and equipment are working properly.

**Bio Kompakt** boilers are designed for heating private residential houses, commercial and auxiliary premises. The boilers belong to the so-called low-temperature boilers category, i.e. the average temperature of the heat carrier cannot exceed 90°C, and the maximum operating pressure – 1.5 bar.

The manufacturer has the right to make minor changes that do not significantly affect the quality of the combustion process and the operation of the boiler.

### 1.2. Standards and regulations

The boiler must be installed and operated in compliance with the legal requirements of the country to which it is supplied. It must be installed in accordance with the requirements of the maintenance and installation instructions.

Otherwise, the manufacturer assumes no responsibility and does not guarantee repair for any defects.

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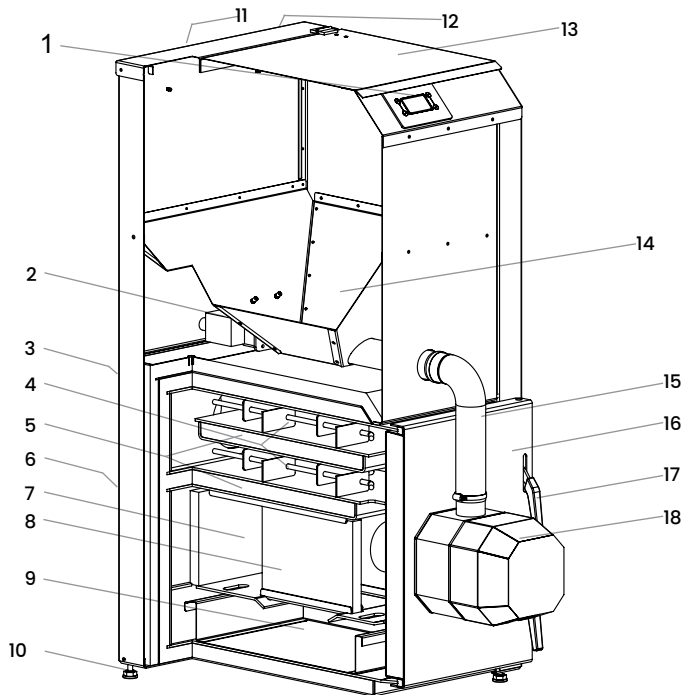
## 2. Technical parameters

Models and power output		12 kW	16 kW	20 kW
Heated area	Max m <sup>2</sup>	120	160	200
Combustion chamber load	l/dm <sup>3</sup>	120	160	190
Rotary modulated pellet burner	kW	4-12	4-16	4-18
Heat exchanger area	m <sup>2</sup>	1,7	2,0	2,4
Horizontal heat exchanger number	pcs	2	2	2
Volume of water in the boiler	l	44	50	58
Weight	kg	155	175	195
Lowest operating temperature		60° C		
Highest operating temperature		90° C		
Heating efficiency		90%		
Chimney inner-outer diameter		130/140 mm		
Hydraulic connections size		G 1 1/4 inch		
Highest operating pressure		1,5 bar		
Required draft in the chimney		15-20 Pa		

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## 3. Construction

### 3.1 Boiler components



- 1. Control panel
- 2. Pellet feeder
- 3. Chimney
- 4. Turbulators
- 5. Heat exchanger
- 6. Branch pipes
- 7. Flame deflector
- 8. Ceramic flame chamber
- 9. Ash box
- 10. Adjustable legs

- 11. Control unit
- 12. Boiler thermal fuse
- 13. Pellet chamber lid
- 14. Granule chamber
- 15. Flexible pellet feeding hose
- 16. Doors
- 17. Door handle
- 18. Rotary burner

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## 3. Construction

### 3.2 Boiler

The boiler heat exchanger consists of three main zones. Two horizontal heat exchangers (5) and turbulators (4) are placed in the upper zone to increase heating efficiency. In the middle zone there is a combustion chamber with a ceramic flame deflector (7), which serves as a catalyst and protects the rear wall from overheating. In the middle zone there are ceramic plates (8) that improve the combustion process and a rotary burner (18) that is installed in the door (16). A pull-out ash box (9) is placed in the lower area for ash removal. The boiler control panel (1) is installed in the front part of the boiler, and the electronic control unit (11) is installed in the rear part. The internal heat exchanger body of the boiler is made of bent and welded heat-resistant steel sheets, and the finish is made of powder-coated sheets. Under the boiler finish is an insulating layer of glass wool, which protects against heat loss through the boiler's outer walls. The double doors are sealed with heat-insulating material and painted with heat-resistant paint. The gases produced during combustion are removed through the chimney pipe (3) installed in the rear part of the boiler. The burner and boiler control unit (11) is installed in the rear part of the boiler, to which all boiler control sensors are connected. An emergency thermal fuse (STB) (12) is installed on the side of the control unit. **When the boiler overheats, it disconnects the supply of pellets and the operation of the fan. All other functions remain active.**



**The STB can only be reset by manually pressing the fuse button.**



**Reset the STB only after finding out and eliminating the fault.**

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## 3. Construction

### 3.3 Pellet chamber

The fuel chamber (14) is mounted on top of the boiler. It is filled with pellets by opening the lid of the chamber (13) at the top. The fuel in the chamber falls down to the bottom, where it is supplied to the burner with the help of a screw-type feeder (2) through a protective hose (15).

### 3.4. Burner

**Bio Kompakt** boilers use a „Kipi Rot Power“ rotary pellet burner, which can burn pellets of lower quality. This is a high-quality, long-lasting burner of the new generation with an automatic ignition and cleaning system. The combustion chamber of the burner has a rotating mechanism. Thanks to this design, slag is not allowed to form in the burner, it is easier to remove slag, and the combustion chamber of the burner works over the entire area. The burner has a mechanism for regulating the ratio of primary and secondary air, which greatly increases the efficiency of the burner. Reliable construction, quality components and quality ceramic spark plugs will allow you to use this burner for a long time. More information is available in the burner manual.



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## 3. Construction

### 3.5 Controller

The boilers are equipped with the latest „Plum“ controller.

The controller is a modern electronic device designed to control the operation of a pellet boiler, using the display of an optical flame intensity sensor. The device is compact and easy to install. It can control central heating and hot water circuits and the operation of up to 5 heating circuits. The temperature of the heating circuits can be determined by the data received from the main temperature sensor or by separate room temperature sensors for each of the circuits. Also, the compatibility with standard room thermostats allows you to maintain a comfortable temperature in all premises (rooms). The controller can turn on the backup boiler (gas or liquid fuel).

The controller can operate according to preset parameters or „Fuzzy logic“ operating principle.

An additional control panel located in the living room or another room and an additional module with a Lambda sensor can be connected to the boiler controller.

Controlling the boiler is easy and simple. The controller can be used in households and small industrial facilities. It is possible to monitor and control the combustion process of the boiler by connecting to the controller via the Internet.

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## 3. Construction

### Module A. Standard equipment



Control of fan, smoke pump, automatic supply and ignition of pellets, control of heating and water circuit pumps, control of mixing pump and valve, control of room and outdoor temperature sensors, control of smoke temperature sensor, summer and winter mode, emergency shutdown, possibility to connect Lambda sensor, additional boiler control, audible emergency signal, possibility to set working time modes.

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### Module B. (Additional)



Management of storage capacity and additional circuit.

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### Module C. (Additional)



Control of two additional contours.

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## 4. Boiler installation

### 4.1 Boiler assembly

The **Bio Kompakt** boiler models are delivered to the buyer fully assembled. The boiler is delivered packed on a pallet, attached to the soles of the pallet with screws. The burner, the pellet feeding mechanism and the control unit are delivered packed in a cardboard package. The boiler control panel is installed in the factory and ready to be connected to the control unit.

Standard equipment

1. Pellet boiler Bio Kompakt
2. Burner „Kipi Rot Power“
3. „Plum 920“ controller and 3 m long boiler sensor
4. Flexible pellet feeding hose

Bio Kompakt boilers are only sold complete with „Kipi Rot Power“ burner and „Plum“ controller.

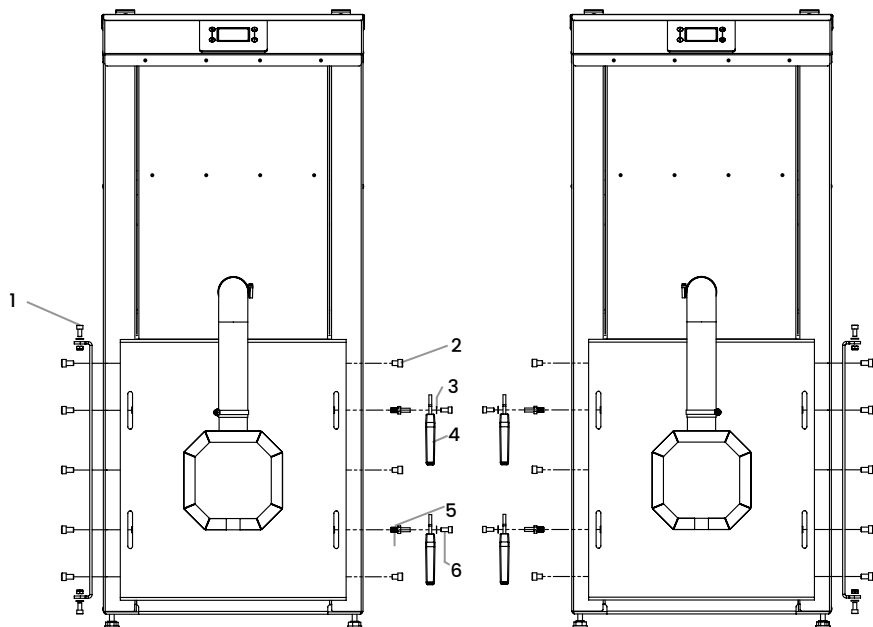
### 4.2 Location and position of the boiler

The boiler must stand on a hard, smooth and non-flammable dry surface. It should be convenient to access the rotary burner, control unit, pellet container, screw feeder, ash collector and other mechanisms. The door opening direction can be changed.

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## 4. Boiler installation

### 4.3 Changing the door direction



1. Screw DIN 912 M10x16

2. Screw DIN 912 M10x12

3. Spring washer

4. Door handle

5. Eccentric M10

6. Screw DIN 912 M8x16

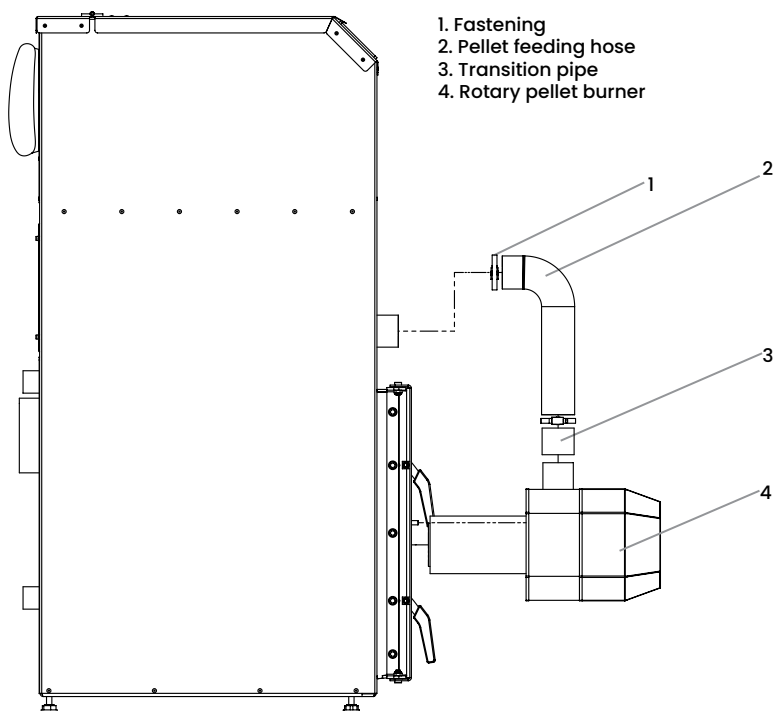
The direction of the door is changed by turning the door away from the hinge. The hinge is unscrewed from the boiler body and screwed on the opposite side of the boiler. The door is screwed to the hinge, and the door handle is unscrewed from the door and screwed back to the opposite side of the door.

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## 4. Boiler installation

### 4.4 Installation of a rotary pellet burner



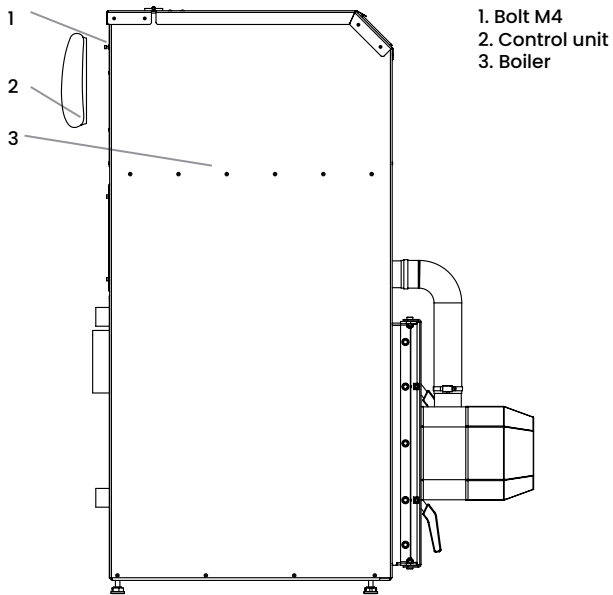
The rotary pellet burner (4) is supplied with components in a cardboard box. The burner is fixed on the door with M8 nuts. The pipe (3) and the pellet feed hose (2) are inserted, the pellet feed hose is tightened with clamps (1).

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## 4. Boiler installation

### 4.5 Installation of the control



The control unit (2) is installed in the rear part of the boiler by hooking it on M4 screws (1).

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## 4. Boiler installation

### 4.6 Connecting the boiler to the chimney

The chimney must be installed to meet the requirements of the country where it is installed. The recommended chimney draft is 15–20 Pa. If there is too much draft in the chimney, a draft regulator should be installed. The boiler flue pipe must be connected to the flue itself with a rigid steel connection of suitable cross-section and shape.

The connection of the solid fuel boiler to the chimney must be properly insulated to prevent burns.

### 4.7 Connecting the boiler to the central heating system



**Dedicate the work of connecting the boiler to properly qualified specialists.**

In order to extend the service life of the boiler and to ensure adequate comfort of use, it is necessary to follow such an installation scheme that ensures the maintenance of the working temperature of the boiler not below 60°C.

With the help of a specialist, make sure that the condition of the boiler, automation, plumbing connections, flue tightness and components are working properly.

In a closed heating system, there must be a thermal expansion compensation vessel of suitable capacity (at least 10% of the total liquid volume in the system).

Safety valves or valves that restrict flow in this system are prohibited.

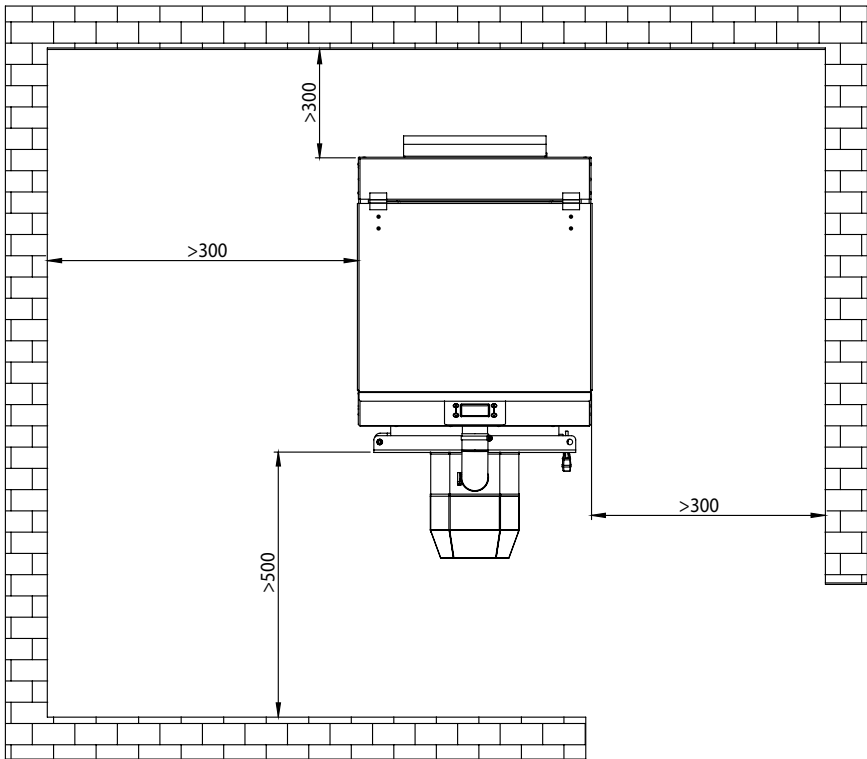
Recommended connection schemes are presented in subsection 4.8.

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## 4. Boiler installation

### 4.8 The distance of the boiler from the walls of the

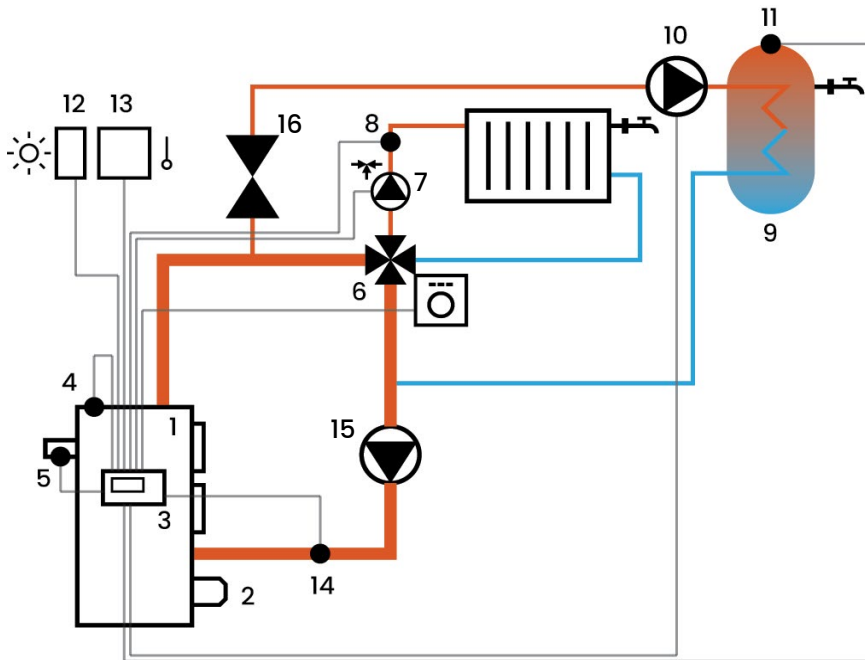




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## 4. Boiler installation

### 4.9 Recommended connection diagrams



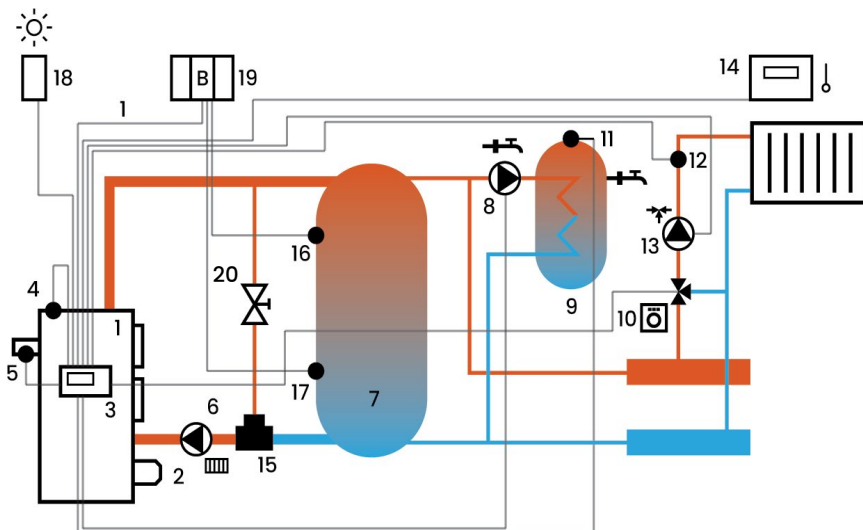
Scheme with a four-way valve controlling the circuit of the heating system.

- |  |                                  |
|--|----------------------------------|
| 1. Boiler  | 7. Heating circuit pump          |
| 2. Burner  | 8. Circuit temperature sensor    |
| 3. Controller  | 9. Hot water reservoir           |
| 4. Boiler temperature sensor CT4                                   | 10. Hot water pump               |
| 5. Smoke temperature sensor  | 11. Hot water sensor             |
| 6. Four-valve engine   | 12. Air temperature sensor CT4-P |
| 13. Room thermostat ecoSTER200 or standard room thermostat         |                                  |
| 14. Return temperature sensor (not necessary for system operation) |                                  |
| 15. Boiler fan   |                                  |
| 16. Reverse valve  |                                  |

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## 4. Boiler installation

### 4.9 Recommended connection diagrams



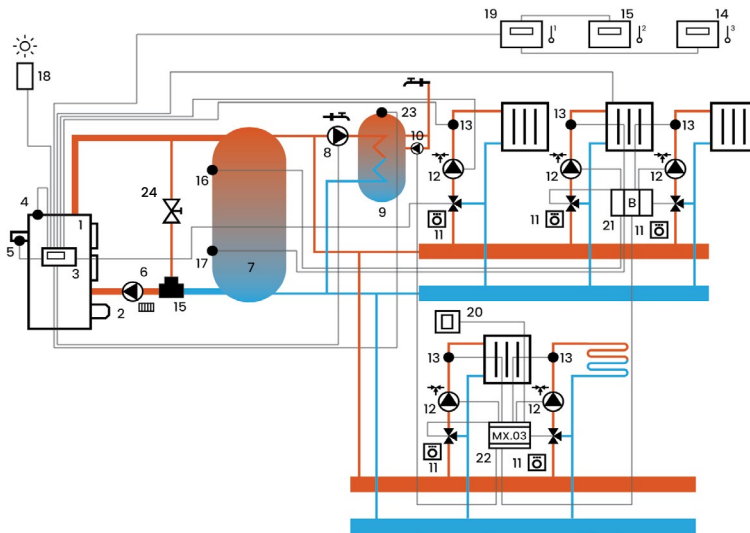
Scheme with storage capacity.

- |  |                        |
|--|------------------------|
| 1. Boiler  | 6. Boiler pump         |
| 2. Burner  | 7. Storage reservoir   |
| 3. Controller  | 8. Hot water pump      |
| 4. Boiler temperature sensor                                 | 9. Hot water reservoir |
| 5. Smoke temperature sensor                                  | 10. Mixing valve motor |
| 11. Hot water temperature sensor                             |                        |
| 12. Room circuit temperature sensor                          |                        |
| 13. Perimeter pump   |                        |
| 14. Room thermostat ecoSTER200 with room thermostat function |                        |
| 15. Thermostatic three-way valve for backflow protection     |                        |
| 16. Accumulator reservoir high temperature sensor            |                        |
| 17. Accumulator reservoir low temperature sensor             |                        |
| 18. Air temperature sensor                                   |                        |
| 19. Additional module B.                                     |                        |
| 20. Balance valve  |                        |

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## 4. Boiler installation

### 4.9 Recommended connection diagrams



Scheme with storage tank and 5 mixing heating circuits

- |   |                                |
|---|--------------------------------|
| 1. Boiler   | 8. Hot water pump              |
| 2. Burner   | 9. Hot water reservoir         |
| 3. Controller   | 10. Circulation pump           |
| 4. Boiler temperature sensor CT4                                      | 11. Three-way valve with motor |
| 5. Smoke temperature sensor CT2S                                      | 12. Perimeter mixer pump       |
| 6. Boiler pump  | 13. Perimeter sensor           |
| 7. Storage reservoir  | 14. Room sensor CT7            |
|   |                                |
| 15. Room sensor CT7   |                                |
| 16. Accumulator reservoir high temperature sensor                     |                                |
| 17. Accumulator reservoir low temperature sensor                      |                                |
| 18. Air temperature sensor CT4-P                                      |                                |
| 19. Room thermostat ecoSTER200 with room thermostat function          |                                |
| 20. Standard room thermostat  |                                |
| 21. Additional module B   |                                |
| 22. Additional module MX.03   |                                |
| 23. Hot water temperature sensor / accumulator low temperature sensor |                                |
| 24. Balance valve   |                                |

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## 4. Boiler installation

### 4.10 Installing the controller



**Installation, commissioning and tuning of the controller can only be performed by certified specialists.**

The controller is delivered fully assembled at the rear of the boiler, and the controller panel is mounted at the front of the boiler.

The electrical wiring diagrams of the controller are provided together with the controller manual.



**The temperature sensor is installed in the socket at the back of the boiler. When installing the temperature sensor in the boiler, it is necessary to lock the sensor in the sleeve to prevent accidental removal. If the temperature sensor falls out of the sleeve, the boiler may boil.**

### 4.11 Starting the burner and controller



**When starting up the boiler for the first time, a certified specialist must train the user on how to use the heating system.**

**During the start-up, the „Act“ for the operation of the burner is drawn up and the „Guarantee“ sheet is filled out.**

**„Kipi Rot Power“ carries out pellet burner start-up, warranty and post-warranty service JSC „Degus“, [info@protingasiluma.lt](mailto:info@protingasiluma.lt), +370 602 07 868.**

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## 5. Using the boiler

### 5.1 General information and safety

**Bio Kompakt** boilers are designed to use pellets in automatic mode. Pellets are ignited with the help of a ceramic burner.



**Use the boiler safely and follow the basic safety and boiler operation rules.**

- Check the operation of the safety valve (no more than 1.5 bar) and open the shut-off valves between the heating boiler and the heating system.
- Check the water pressure in the system.
- The heating system must be filled with water and bled.
- Do not use flammable liquids such as gasoline, paint thinners etc. when igniting solid fuel.
- Do not burn plastic, rubber and other air-polluting waste.
- The smoke extraction system must be reliably connected and tight.
- Unmaintained chimney, insufficient draft can cause carbon monoxide poisoning.
- Carry out maintenance work on the boiler only after it has cooled down.



**If you suspect that the boiler or the heating system is not working properly, stop using it and contact a specialist.**

### 5.2 Boiler fuel

Pellets  
Wood pellets

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## 5. Using the boiler

### 5.3 Using the boiler in automatic mode

A properly connected boiler can operate autonomously, in fully automatic mode, taking into account the current heat demand. The combustion process is controlled according to the data captured by the burner photodetector.

The burning intensity of the burner is automatically regulated, the temperature of the boiler is changed according to the preset parameters.

It is possible to control the burner depending on the time of day, outdoor temperature, hot water demand, summer or winter time etc.

Control is carried out with the help of the controller panel, or remotely by connecting to the controller via the Internet.

In order to set the fully automatic mode when burning with pellets, select: Menu->Boiler settings->Operating mode and select the „Pellets“ parameter.

During continuous autonomous pellet burning, it is recommended to remove cast iron grates from the combustion chamber of the boiler.

More information about the controller can be found in the controller manual.

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## 5. Using the boiler

### 5.4 Maintenance

#### Boiler maintenance

Boiler maintenance and cleaning is carried out periodically. Cleaning frequency is determined by the need. With a well-balanced system, the boiler is cleaned once a month. The heat exchanger is cleaned by disconnecting the plastic pipe from the burner, opening the door and pulling out the turbulators.

Ash cleaning from the ashtray is carried out as needed, depending on the type of fuel used and ash content. Overfull ashtray can interfere with the correct operation of the burner.

#### Burner maintenance

**Cleaning the tube blower chamber.** When the burner is operating, some combustion products can enter the space between this tube and the outer tube through the vents in the burner tube. Depending on the type of fuel used, this component should be cleaned approximately every six months.

The burner maintenance steps are described in the burner manual.

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## 6. Boiler warranty card

Model

Designated power output

Serial No.

Production year

Boiler start-up date

Comments



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## 7. Burner warranty card

Burner type/model \_\_\_\_\_

Serial No. \_\_\_\_\_

Purchase date \_\_\_\_\_

Comments  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
Signature, stamp

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## 7. Burner warranty card

(Service entries)

Service and repair by the protocol of the burner

Maintenance/ service date	Specification	Signature and stamp of the representative of the seller

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## 8. Warranty conditions

When selling the boiler, the seller must familiarize the buyer with the terms of the warranty.

1. The manufacturer provides:

- 5-year warranty for the tightness of the boiler heat exchanger.
- 3-year warranty for the burner.
- 2-year warranty for electrical and electronic devices.
- 2-year warranty for the included parts.

2. The boiler installation scheme must ensure the return water temperature is not less than 60° C.

3. Boiler installation must be performed only by a qualified specialist.

4. During the warranty period, the manufacturer undertakes to carry out free of charge elimination of malfunctions, if they occurred due to the fault of the manufacturer.

5. The warranty does not apply to:

- Failure to submit purchase documents and a stamped warranty sheet.
- Violation of installation, operating instructions or warranty conditions requirements.
- In case of mechanical damage to the boiler.
- After determining that the boiler has been repaired by an outsider.
- In case of natural disasters.

6. Defects detected during the warranty period will be eliminated within 21 working days from the date of the complaint.

7. Costs related to service calls and repairs, if it is determined that the warranty conditions have been violated, are covered by the buyer.

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## 9. Efficiency and emissions

Ecodesign 2015/1189

Bio Kompakt 20							
Automatic ignition - the boiler should be used with a hot water tank of at least x* liters							
Condensing boiler [no]		Solid fuel cogeneration boiler [no]		Combined boiler [no]			
Fuel	Most suitable fuel	Other suitable fuel	$\eta_s$ [x%]:	Seasonal space heating emissions			
				SP	GOC	CM	NO <sub>x</sub>
				[x]mg/m³			
Wood pellets	Yes	No	82±3	36±10	12±5	363±10%	180±5%
Characteristics when burning only the most suitable fuel							
Useful heat release				Heat utility			
Parameter	Symbol	Value	Unit	Parameter	Symbol	Value	Unit
At nominal heat output	P <sub>n</sub>	17,5	kW	At nominal heat output	$\eta_n$	87,1	%
At [30%/50%] rated heat output, if applicable	P <sub>p</sub>	5,0	kW	At [30%/50%] rated heat output, if applicable	$\eta_p$	83,3	%
List of equivalent models				Bio Kompakt 12, Bio Kompakt 16			

SP – solid particles, GOC – Gaseous organic compounds, CM – carbon monoxide  
 NO<sub>x</sub> – nitrogen oxides,  $\eta_s$  – Seasonal energy consumption efficiency for space heating  
 (Efficiency factor – 3%)

$\eta_n$  – Seasonal energy consumption efficiency for space heating at maximum power

$\eta_p$  – Seasonal energy consumption efficiency for space heating at 30% capacity

X – Chamber volume =  $45 \times Pr \times (1 - 2.7/Pr)$  or 300 liters, whichever is greater, Pr is expressed in kilowatts (kW)

Y – Chamber volume =  $20 \times Pr$ , Pr is expressed in kilowatts (kW)

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## 9. Efficiency and emissions

### Additional electricity consumption

At nominal heat output	el <sub>max</sub>	0,058	kW
At [30%/50%] nominal heat transfer, if applicable	el <sub>min</sub>	0,031	kW
Secondary abatement equipment installed, if applicable		Non applicable	kW
When operating in standby mode	P <sub>SB</sub>	0,024	kW

## 10. Disposal of the boiler



**The boiler must be disposed of in accordance with the requirements of the country where it is disposed of.**

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## Notes

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