MANUAL

FOR INSTALLATION, OPERATION AND MAINTENANCE OF A ROTARY TUBE PELLET BURNER SERIES BISOLID GP XX R TSC

http://www.bisolid.eu

CONTENT page.

1. IMPORTANT INFORMATION ABOUT THE PELLET BURNER OPERATION

Dear Bisolid GP xx R tsc tubeb pellet burner owners,

We would like to congratulate you for your new rotary tube pellet burner with self-cleaning 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 and natural resource saving way. Your pellet burner 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 pellet burner.

1.1. SAFETY INSTRUCTIONS

The rotary tube pellet burner from series Bisolid GP xx R tsc and its accessories correspond to all applicable directions for safety techniques. Your wood pellet burner and all of its accessories operate under variable electricity 230 VAC. 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 service 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 the European community.

Safety instructions

Danger
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 pay attention to the following symbols in this manual:

Danger
This symbol warns the user about health risks

Warning
This symbol warns the user about possible risks and harms to properties and environment.

Information
This symbol presents text with additional information for the user.

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

The current manual for operation, installation and maintenance uses notation Bisolid GP xx R tsc includes the models of rotary tube pellet burners with self-cleaning GP 25 R tsc, GP 35 R tsc, GP 45 R tsc and GP 60 R tsc.

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.

After carefully reading of the installation and operation manual, you will scquire all necessary information about design, controls and safety operation of the pellet burner. After unpacking the pellet burner please check its completeness and delivered elements. Check whether the pellet burner size corresponds to the desired designation.

If any failures or troubles occur the pellet burner must be led out from operation and removing of the faults/troubles must be provided by specialized company. For proper functioning, safe and long-term operation of the pellet burner, a regular check ups and prophylaxis must be performed at least once per year. Such technical care guarantees your investment.

Repairs should be performed only with genuine spare parts. In case of faults or troubles caused by unqualified installation, non-compliance with the requirements or the operation manual, the manufacturer company is not responsible and does not provide warranty for the product.

1.2. PURPOSE OF THE TUBE PELLET BURNER

The purpose of the rotary tube pellet burner series Bisolid GP xx R tsc in combination with hot water solid fuel boilers is for heating domestic housings with small and medium sizes. The pellet burner is very good solution for housings heated with wood logs boilers, because the installation of the pellet burner to such hot water boiler can be performed by standard assembly kit.

The burner's main advantages as automatic ignition, automatic adjusting of the heating output (in optimization mode for operation with room thermostat) and its multifunction control panel are making its usage easy and comfortable during the heating season

The automated pellet burner from series Bisolid GP xx R tsc can utilize wood pellets with diameter Ø 6-8mm, from classes A1, A2 and B according to standard EN ISO 17225-2:2014, or categories A, AB, B, BC and C according to the manufacture company's classification methodology.

The pellet burner's series Bisolid GP xx R tsc can be mounted to the hot water solid fuel boilers with sufficiently high efficiency.

The optimum functionality of the appliance depends either on the professionally designed heating installation or its precise handling.

The main advantages of the rotary tube pellet burner series Bisolid GP xx R tsc are:

- Innovative rotary combustion chamber - stable efficiency and low emissions with minimal user intervention.
- A system for mixing fuel into the combustion chamber, which increases the cleaning of the ash, improves the combustion process and relieves servicing.
- Ability to burn wood pellets with a diameter of 6-8 mm and low quality (high ash content), which is not possible with burners with air cleaning and / or compressed air.
- Completely compatible with automatic control of a wide range of solid fuel boilers. Suitable for installation of furnaces for bakery products.
- Precision modulation of heat output.
- The components of the burner are manufactured by well known and proved European companies from Germany, United Kingdom and others.
- High quality ignition element manufactured in Japan, that ensures over 37 000 ignitions.
- The combustion chamber is produced by special heat resistance steel, which ensures long service life.
- Manual test of all functions.
- Indication of the hot water temperature in the boiler.
- Photosensor for accurately detection and monitoring of the flame intensity.
- Possibility to save the current settings and to reset to factory default settings.
- Automatic start after voltage drop - preserving last settings.
- Password protected access levels - for the service technician and manufacturer.
- Ability to operate with a room thermostat.
- Possibility to control exhaust gas fan, which eliminates the problem with the draught into the chimney and guaranties the safety operation of the product.
- Special measures to increase the reliability and safety of the burner.
- A flexible pipe is made of a special plastic material to connect the burner to the auger which melts when there is a danger of back fire and do not supply fuel to the burner - in this case, the fuel is discharged outside from the danger zone.
- The standard equipment includes fuel transport auger for pellets.
- Ability to start and stop using the GSM module (optional).

The tube pellet burner with self-cleaning series Bisolid GP xx R tsc is equipped with the following components and systems:

- Controller, which controls the modules burner operation
- Display keyboard showing the mode of operation of the burner and through which makes adjustment of the operational parameters.
- Air fresh fan for primary and secondary air with Hall sensor, which monitors the frequency of rotation.

- Ceramic electric heater, which ignites the fuel.
- Automated auger for feeding fuel from the tank to the burner.
- Hrizontal feed auger built into the combustion chamber.
- Combustion chamber in which efficient combustion process is implemented.
- System for automatic cleaning of the combustion chamber.
- Security system that blocks the burner if the feed tube of pellets is heated due to emergency situations.
- Modulation system of the mode of its work, which ensures optimal operating conditions and low fuel consumption.
- Photosensor for dynamic monitoring of the combustion process.

1.3. FUEL

The rotary tube pellet burner from series Bisolid GP xx R tsc can utilize wood pellets with diameter Ø 6-8mm, from classes A1, A2 and B according to standard EN ISO 17225-2:2014, with the following characteristics shown in Table 1.

Table 1. Standard for wood pellets EN ISO 17225-2:2014

Parameter	Dimension	Class A1	Class A2	Class B
Length (L)	mm	3,15 ≤ L≤ 40	3,15 ≤ L≤ 40	3,15 ≤ L≤ 40
Diameter (D)	mm	6±1 8±1	6±1 8±1	6±1 8±1
Moisture (M)	%	< 10	< 10	< 10
Ash (A), dry	%	< 0,7	< 1,2	< 2,0
Buck density (BD)	kg/m^3	> 600	> 600	> 600
Mechanical durability (DU)	%	> 97.5	> 97.5	> 96.5
Net caloricity (Q)	MJ/kg kWh/kg	> 16,5 > 4.6	> 16,5 > 4.6	> 16,5 > 4.6
Chlorine Cl	%	< 0,02	< 0,02	< 0,03
Nitrogen (N)	%	< 0,3	< 0,5	< 1,0
Sulphur (S)	%	< 0,04	< 0,05	< 0,05
Arsenic (As)	mg/kg	< 1	< 1	< 1
Cadmium (Cd)	mg/kg	< 0.5	< 0.5	< 0.5
Chromium (Cr)	mg/kg	< 10	< 10	< 10
Copper (Cu)	mg/kg	< 10	< 10	< 10
Lead (Pb)	mg/kg	< 10	< 10	< 10
Mercury (Hg)	mg/kg	< 0.1	< 0.1	< 0.1
Nickel (Ni)	mg/kg	< 10	< 10	< 10
Zinc (Zn)	mg/kg	< 100	< 100	< 100

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.

Classification of wood pellets depending on the physical properties developed by the manufacturer is given in Table 2.

Table 2. Wood pellets classification depending on the physical properties according to a methodology developed and applied by the manufacturer

Pellets Category	A^D	DU
A	$A^d \leq 0.6\%$	$DU \geq 97.0\%$
AB	$A^d \leq 0.6\%$	$DU < 97.0\%$
B	$0.6 < A^d \leq 1.0\%$	$DU \geq 97.0\%$
BC	$0.6 < A^d \leq 1.0\%$	$DU < 97.0\%$
C	$1.0\% < A^d \leq 2.0\%$	$DU \geq 97.0\%$
CD	$1.0\% < A^d \leq 2.0\%$	$DU < 97.0\%$
D	$2.0\% < A^d \leq 3.0\%$	$DU \geq 97.0\%$
DE	$2.0\% < A^d \leq 3.0\%$	$DU < 97.0\%$
E	$A^d > 3.0\%$	$DU \geq 97.0\%$
EF	$A^d > 3.0\%$	$DU < 97.0\%$

The pellet burner series Bisolid GP xx R tsc is designated for burning only approved by its manufacturer fuel types.

1.4. TUBE PELLET BURNER DESCRIPTION

The rotary tube pellet burner series Bisolid GP xx R tsc is with steel made construction and is designed on the principle of feeding the wood pellets through a transport auger, then through flexible pipe over the burner's combustion chamber fire-grate, where the process of burning of the fuel and the oxidizer (air for firing) is achieved.

The burner operation is automatic, including: initial loading dose of fuel, ignition, run, combustion, parameters monitoring of the combustion process, controlled stops at the water temperature reaching and (or) signal from the room thermostat, final blow. In the optimization mode, at the operation with the room thermostat is carried optimized modulation based on the thermal characteristics of the site.

The pellet burner is equipped with display panel which shows information for the burner's current operation parameters and/or for adjustment of its operating parameters.

The current manual for operation, installation and maintenance uses notation Bisolid GP xx R tsc includes the models of rotary tube pellet burners with self-cleaning GP 25 R tsc, GP 35 R tsc, GP 45 R tsc and GP 60 R tsc.

The main module of rotary tube pellet burner series Bisolid GP xx R tsc with self-cleaning is presented in Figure 1.

Figure 2 shows the diagram for mounting and dismantling of internal and external rotary tube of the tube pellet burner with self-cleaning from series Bisolid GP xx R tsc.

Figure 1. View of the main module of the rotary tube pellet burner Bisolid GP xx R tsc

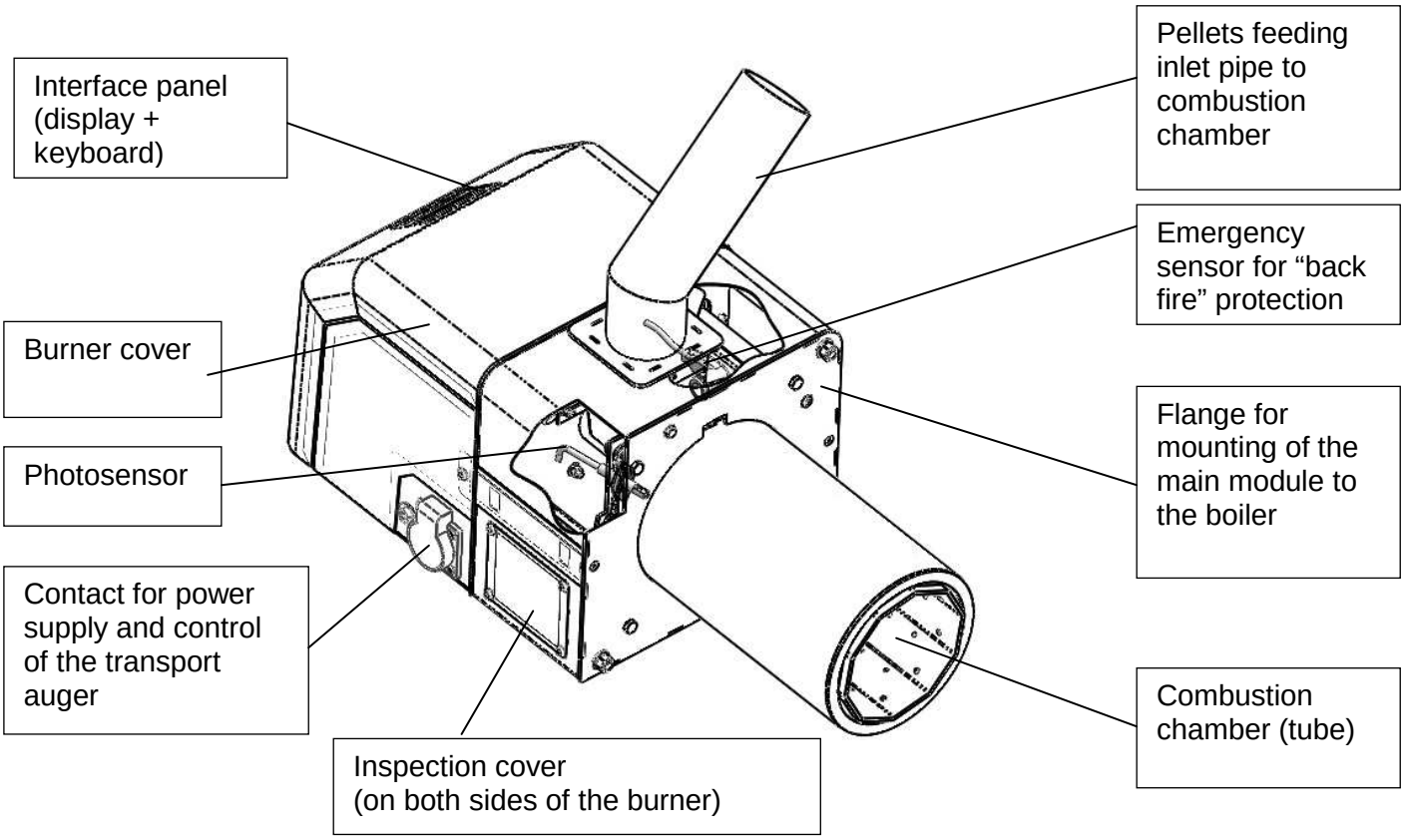


Figure 2. Diagram for mounting and dismantling of the internal and external rotary tube

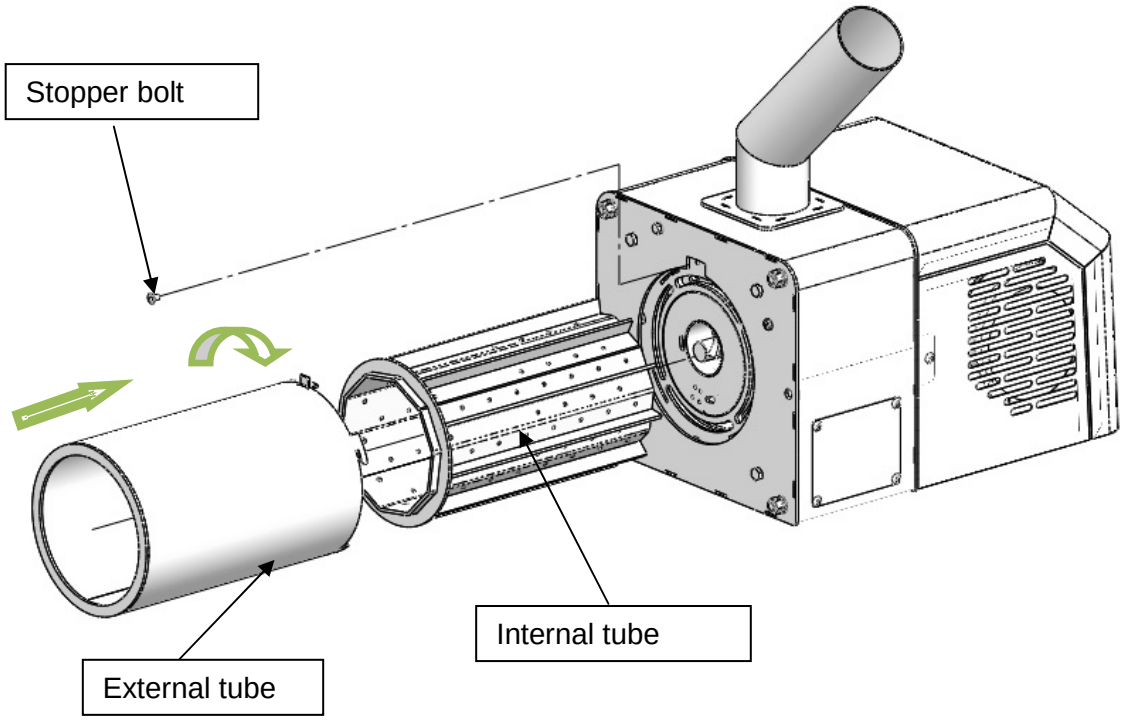
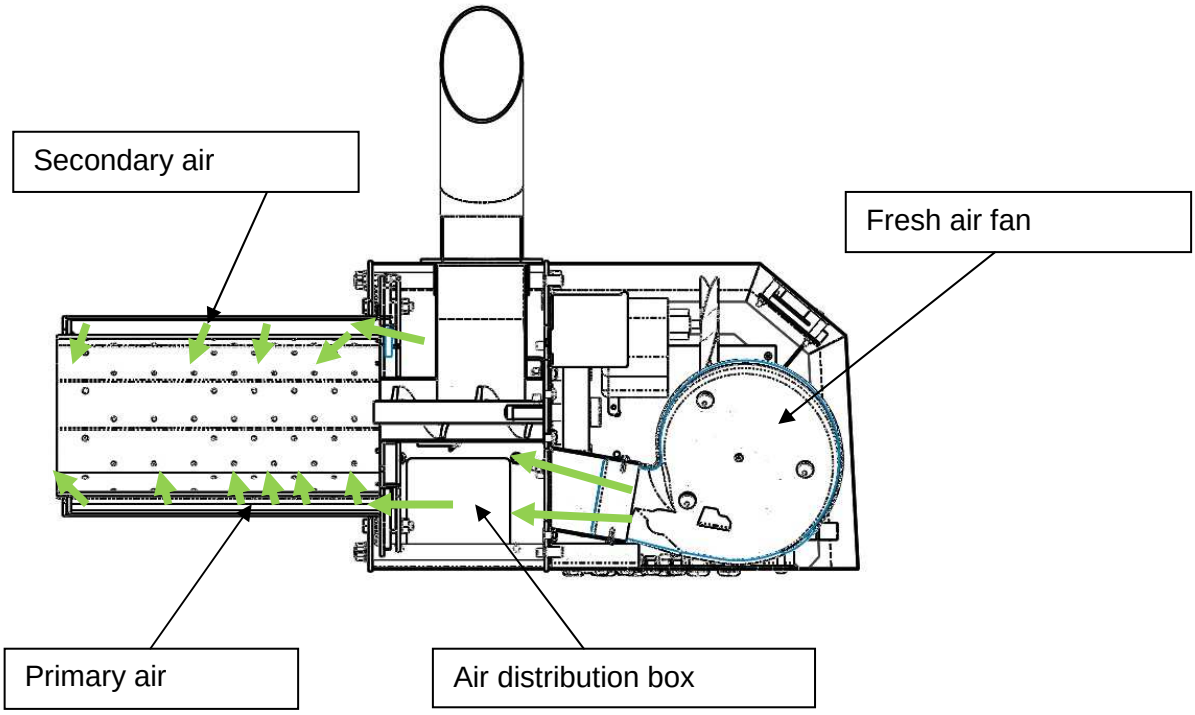


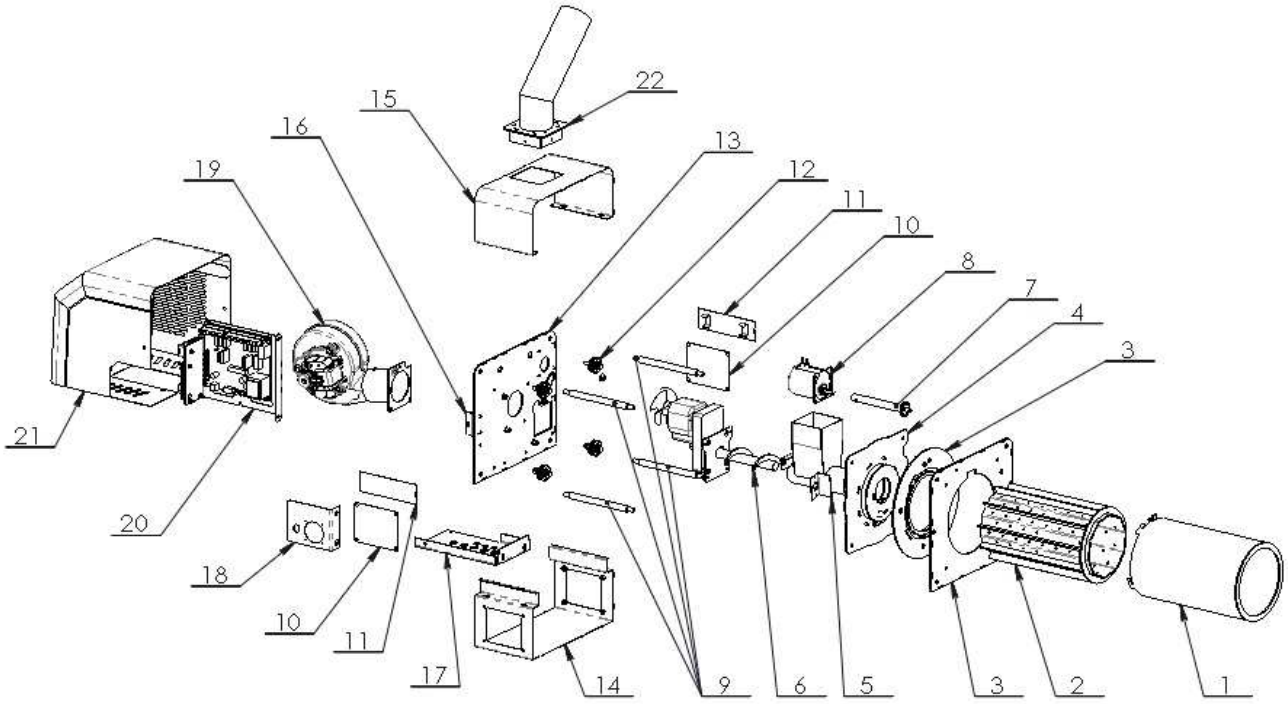
Figure 3 presents the diagram of primary and secondary air supplying in the rotary tube pellet burner with self-cleaning from series Bisolid GP xx R tsc.

Figure 3. Diagram for firing air supply in the burner



The diagram of the structure components of a rotary tube pellet burner with self-cleaning from series Bisolid GP xx R tsc is shown in Figure 4.

Figure 4. Diagram of the structure components of burner Bisolid GP xx R tsc



1. External tube - 1 pc.
2. Internal tube – 1 pc.
3. Front flange – 1 pc.
4. Combustion group – 1 pc.
5. Inlet pipe for pellets – 1pc.
6. Feeding group – 1 pc.
7. Drive shaft – 1 pc.
8. Motor-gear – 1 pc.
9. Restrictive axis – 4 pcs.
10. Lid – 2 pc.
11. Cover bracket – 2 pcs.
12. Poll – 4 pcs.
13. Main flange – 1 pc.
14. Main shield – 1 pc.
15. Shield cover 1 – 1 pc.
16. Stiffening profile – 2 pcs.
17. Supporting stiffening – 1 pc.
18. Contact profile – 1 pc.
19. Fan group – 1 pc.
20. PC board – 1 pc.
21. Cover– 1 pc.
22. Transition for pellets – 1 pc.

1.5. TUBE PELLET BURNER OVERALL DIMENSIONS

The overall dimensions of a rotary tube pellet burner Bisolid GP xx R tsc are presented in Figure 5 and Figure 6.

Figure 5. Overall dimensions of the tube pellet burner

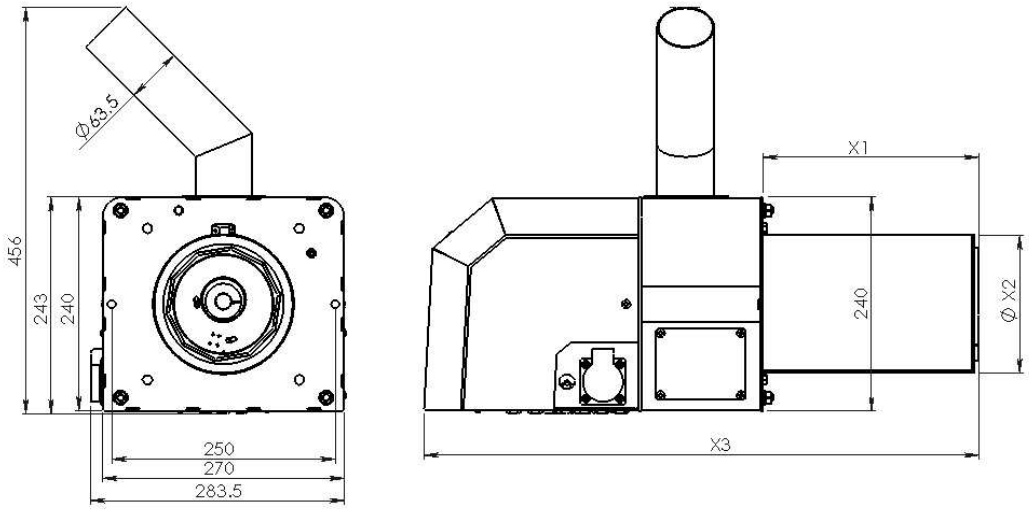
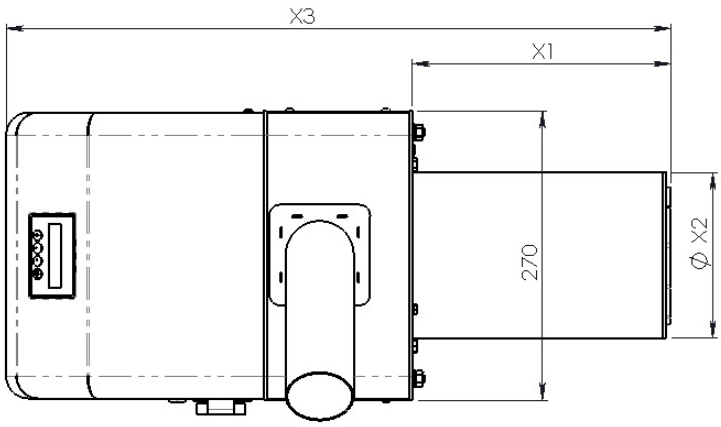


Figure 6. Overall dimensions of the tube pellet burner main module



The dimensions of the rotary tube X1 and ∅X2 and total length X3 for the different models of rotary tube pellet burners with self-cleaning series Bisolid GP xx R tsc are shown in Table 3.

Table 3. Overall dimensions of the rotary tube pellet burner's series Bisolid GP xx R tsc

Pellet burner model	Heating output kW	X1 mm	∅X2 (Diameter) mm	X3 (Length) mm	Height (With transition for pellets) mm	Height mm	Width mm
GP 25 R tsc	25	241	154.5	620	456	243	283.5
GP 35 R tsc	35	241	154.5	620	456	243	283.5
GP 45 R tsc	45	261	180	675	456	243	283.5
GP 60 R tsc	60	295	180	709	456	243	283.5

1.6. PELLET BURNER TECHNICAL DATA

The technical data for rotary tube pellet burner series Biolid GP xx R tsc are given in Table 4.

Table 4. Technical data for a rotary tube pellet burner series Bisolid GP xx R tsc

Parameter		Dimension	Value			
Pellet burner		-	Bisolid GP xx R tsc			
Model		-	GP 25 R tsc	GP 35 R tsc	GP 45 R tsc	GP 60 R tsc
Nominal heating output		kW	25	35	45	60
Heating output adjustment range (have to be made by service specialist)		kW	8-25	10-35	15-45	20-60
Recommended fuel		-	Woden pellets			
Wood pellets category according to standard EN ISO 17225-2:2014		-	A1, A2, B			
Used pellets categories (according to the manufacture company's classification)		-	A, AB, B, BC, C			
Wastes after complete fuel burning		Ash	The quantity depends on the pellets ash content and on the burner's operation mode			
Weight	Main module	kg	21.3	21.4	25.5	27.5
	Fuel feeding auger	kg	8.5			
Overali dimesions (WxLxH)	Main module	mm	283.5x620x243	283.5x620x243	283.5x675x243	283.5x709x243
	Fuel feeding auger	mm	184x1520x107			
Power supply voltage		-	L1, N, PE, 50Hz; 230VAC;			
Electrical consumption	In nominal mode	A	0.3			
	In ignition mode	A	5			
Electrical power		W	$< 100^{+500}$ (+ at ignition)			
Electrical protection		-	IP20			

2. INTRODUCTION

2.1. TUBE PELLET BURNER GENERAL REQUIREMENTS

The rotary tube pellet burner series Bisolid GP xx R tsc 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 pellet burner should be used only for the subscribed purposes.
The tube pellet burner must be installed only for the purposes for which is designed. If the pellet burner 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 pellet burner's genuine package should be kept until its initial operation start up, in case it should be transported again.
After installation the pellet burner operation must be initiated by service organization, authorized by the manufacturer.
The rotary tube pellet burner corresponds to the applicable EU legal provisions. If the pellet burner 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 pellet burner please contact a servicing organization, authorized by the manufacturer. Every incompetent intervention might damage the pellet burner (and possibly the accompanying equipment).
The servicing technician initializing the tube pellet burner start up for first time must show the customer all of its main components and modules, and also how to operate it. The technician must present the pellet burner's safety elements and signalization, and respectively the relevant user reaction. If the pellet burner is delivered and installed to the customer by the same person, then he must ensure that its genuine package is kept, in case the burner should be transported again.
Please check the delivery of the pellet burner standard accompanying equipment.
Please check if the delivered model and type of the tube pellet burner corresponds to the usage requirements.
If you are not sure how to manage the rotary tube pellet burner, 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 tube pellet burner and the fuel transport auger. Please keep the burner genuine package until its initialization to operation, in case it should be transported again.
If doing a repair, you must always use genuine spare parts only!
It is forbidden to make any changes to the internal installation of the tube pellet burner and fuel transport auger or to change anything in any way.
At the end of the pellet burner'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.

Switch off the rotary tube pellet burner 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 burner intakes air for burning (for example painting paint spraying or laying moltening substances, gas leakage, etc.).

2.2. ENSURING PEOPLE AND EQUIPMENT SAFETY

The rotary tube pellet burner 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 pellet burner 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 pellet burner 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 tube pellet burner's operation from children and persons under the influence of narcotic substances, psychiatric abnormalities and etc., must be prevented.

3. OPERATION INSTRUCTIONS

3.1. OPERATION OF TUBE PELLET BURNER BISOLID GP XX R TSC

The tube pellet burner series Bisolid GP xx R tsc must be handled only by adult people, which have been already introduced to the burner operation and its proper handling. The people operating the pellet burner must strictly comply with the installation and operation manual and they have rights only to:

- Clean the tube burner.
- Fill up the transport auger with fuel.
- Clean the photosensor periodically.
- Adjust the water temperature (operation without optimization with room thermostat).
- Change the optimization time (operation with room thermostat).
- Check photosensor lightness. Do not change its settings.
- Check for presence of alarm messages.
- Check and adjust temperature for start of water circulations pump.
- Switch on or off the pellet burner. It is recommended to do it by the key **Start**, located on the boiler's control panel.
- Check the pellet burner condition.

After initializing the tube pellet burner into operation the servicing technician is obligated to introduce the user with the operation and maintenance of the appliance. Attendance of children without supervision near the pellet burner is not allowed. Any interventions or activities over the burner construction that may endanger the life or health of the handling or attending personal are strictly forbidden.

Usage of flammable liquids for easier firing as well as any activities related to increase of the tube pellet burner's nominal heating output (overloading) are strictly forbidden. Positioning of flammable objects near the pellet burner is also not allowed.

In case of danger from penetration of flammable vapors or gasses in the boiler room or any activities that may lead to fire or explosion (gluing the flooring, varnishing with flammable paints or others), the pellet burner must be led out of operation before starting any of these activities.

3.2. SAFE OPERATION OF THE TUBE PELLET BURNER

All safety prescriptions must be observed when the rotary tube pellet burner series Bisolid GP xx R tsc is operating. The pellet burner must not be used for any other purposes except the ones introduced in this operation manual.

The surface of the tube pellet burner should be cleaned only with standard inflammable cleaners. Positioning of objects made of flammable materials over or near the pellet burner, at shorter than the safe distance is not allowed.

It is not allowed to store flammable materials (wood, paper, oil and other flammables) in the same room, where the tube pellet burner and the boiler are situated.

The recommended safe distance between the boiler, with installed rotary tube pellet burner series Bisolid GP xx R tsc, and the fuel must be minimum 1000 mm.

The minimum allowed distance between the tube pellet burner's outer parts and easy or medium flammable materials, also including fuel, must be at least 400 mm.

Removal of the ash remainings from the tube pellet burner should be performed by taking out the combustion chamber fire-grate. The fire-grate, where the ash deposits gather, must be emptied on time, before its complete filling. All activities related to removal of the ash from the pellet burner should be performed after cooling of the fire-grate, as the usage of metal pliers is strongly suggested. Please also use protection gloves as a safety measure.

When installing the tube pellet burner and the elements for safety and control please do not forget that all installation works must comply with the safety labor principles. If a pellet burner or fuel transport auger component replacement is necessary, please use the recommended elements. In case of using any other type of component you should ask the manufacturer company first. The rotary tube pellet burner and fuel transport auger functionallity must be checked by authorized servicing specialist once per year.

4. TUBE PELLET BURNER INITIALIZATION FOR OPERATION

4.1. PELLET BURNER CHECK-UPS BEFORE INITIALIZATION FOR OPERATION

Before initializing the pellet burner for operation the servicing technician must check:

- If the tube pellets burner series Bisolid GP xx R tsc is going to be installed on a solid fuel hot water boiler.
- If the installation, including the hot water boiler, complies with the project.
- If the wood pellets correspond to standard EN ISO 17225-2:2014, classes A1, A2, B.
- Electrical supply functionality and working order.

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

4.2. JOINT OPERATION OF TUBE PELLET BURNER AND SOLID FUEL BOILER

The rotary tube pellet burner series Bisolid GP xx R tsc is allowed for installation only to hot water boilers designed to use solid fuels. The possibility for parallel operation of solid fuel hot water boiler with automated rotary tube pellet burner series Bisolid GP xx R tsc is based on the fact that the burner manufacturer has performed multifunctional and precise tests and measurements over the tube pellet burner operation with certain type of hot water boilers.

The rotary tube pellet burner's series Bisolid GP xx R tsc can be mounted to the hot water solid fuel boilers with sufficiently high efficiency.

5. OPERATION AND CONTROL OF PELLET BURNER SERIES BISOLID GP XX R TSC

5.1. DESIGNATION OF THE PELLET BURNER CONTROLLER

The controller is designated to provide automatic control of the combustion process and adjustment of the tube pellet burner's heating output with two augers, depending on the building and premises heating needs.

5.2. OPERATION OF THE PELLET BURNER CONTROLLER

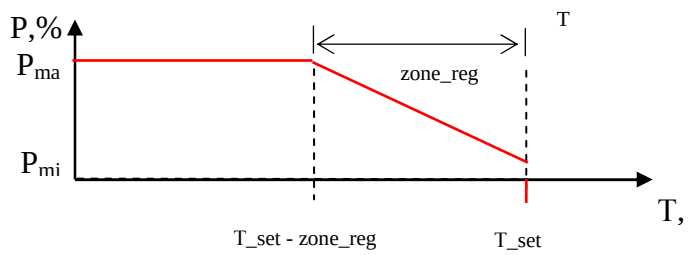
The device can control the following system modules:

- Fuel transport auger 1.
- Fuel transport auger 2.
- Fresh air and extraction fans.
- Electrical heating element for ignition of the pellets.
- Cleaner element for ash cleaning.
- Circulations pump for the boiler.

At primary switch on, as well as when switching the power supply off, the burner goes through stop procedure.

5.3. STARTING THE PELLET BURNER

When missing stop signal or in case of emergency situation and there is difference between the adjusted and the measured temperature from the **To** sensor, then the burner starting procedure initiates. The initial fuel doze is loaded and the ignition switches on. After establishing the presence of flame the burner heating output increases. When the modulation zone **„Zone_reg"** has been reached the burner heating output decreases and when the desired temperature has been reached the burner operates at its minimum heating ouput. When higher than the adjusted temperature has been reached, the system responds with stop procedure.



5.4. SWITCHING OFF THE PELLET BURNER

In presence of stop signal, emergency situation or measured temperature above the adjusted, system stop procedure initiates. It is nessesary to wait afterburning the last dose of fuel and switch on the cleaner of ash. It is next followed by ventilation time, during which the combustion chamber cools down and the remaining ash over the burner's tube is being blowed out.

5.5. STANDBY MODE

In measured temperature from sensor **To** in ranges **Tset<To<Tstb** and allowed mode **"Standby"**, the burner operates under minimal heating output to maintain the embers. The mode has separate settings - maximum temperature, time for feeding and pause, fan revolutions, brightness and duration (see section "Service Settings").

5.6. BURNER CONTROLL THROUGH GSM MODULE (OPTION)

The control of the burner trough GSM module is done by sending SMS commands. There is an opportunity to stop, start and review the current status. (See section "SMS commands").

5.7. METHODS FOR FORMING THE DESIRED TEMPERATURE

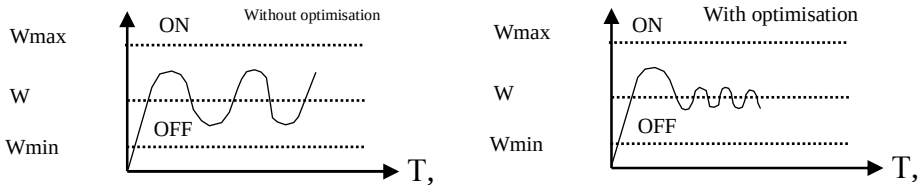
5.7.1. MANUAL DETERMINATION OF THE HEATING WATER ASSIGNMENT (Tb set)

In this case, the assignment is independent of other factors such as inside temperature and the room temperature and the value is selected to maintain. (See section "Service Settings").

5.7.2. DETERMINATION OF THE ASSIGNMENT FROM ROOM THERMO REGULATOR

Time for optimisation

Using of time for optimisation allows to reducing fluctuations in the assignment of the hot water, which leads to a better control of the hot water. It can choose from 0 to 60 min, in increments of 5 minutes. (See section "User settings").



This method is applicable only if is operating with contact room thermostats with "independent output" (See section "Service Settings").

When there are switches on and off from the room regulator and it operates without optimization (0), the heating water adjustment becomes:

- At start - maximum.
- At stop – minimum.

When there are switches on and off from the room regulator and it operates with optimisation (5-60 min.), the heating water adjustment becomes:

- At start – increase starts, as the maximum assigned temperature value is reached at the end of the optimization time, only in case there is no stop occured during this period.
- At stop – decrease starts, as the minimum assigned temperature value is reached at the end of the optimization time, only in case there is no start occurred during this period.

5.8. TEMPERATURE AND SECURITY RESTRICTIONS

When managing the rotary tube pellet burner series Bisolid GP xx R tsc it is necessary to consider the following temperature and security limitations:

- Minimum assignemt for inlet water temperature.
- Maximum assignemt for inlet water temperature.
- Water freezing protection.
- Boiler overheating and „back-fire” protection.
- Circulations pump blocking protection.

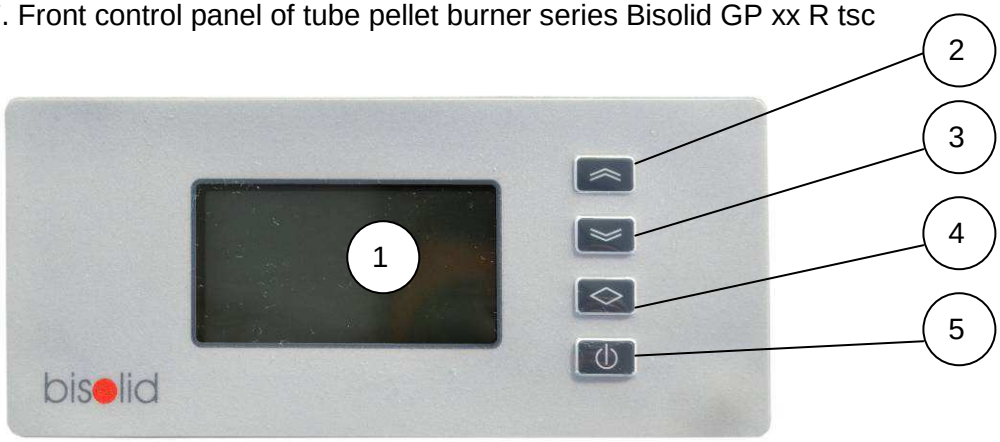
The minimum and the maximum assignment of the heating water temperature determinate the limits of the supplied water to the premises. (See section "Service Settings").

Water freezing protection – starts the burner when the temperature is below 5 °C. Boiler overheating and „back-fire” protection – input signal from the blocking thermostat, and when the signal contact is opened the burner stops.
Circulations pump blocking protection – drives/rotates the pump for 5 minutes, in case it has not been operating for at least 24 hours.

5.9. FRONT CONTROL PANEL OF THE PELLET BURNER

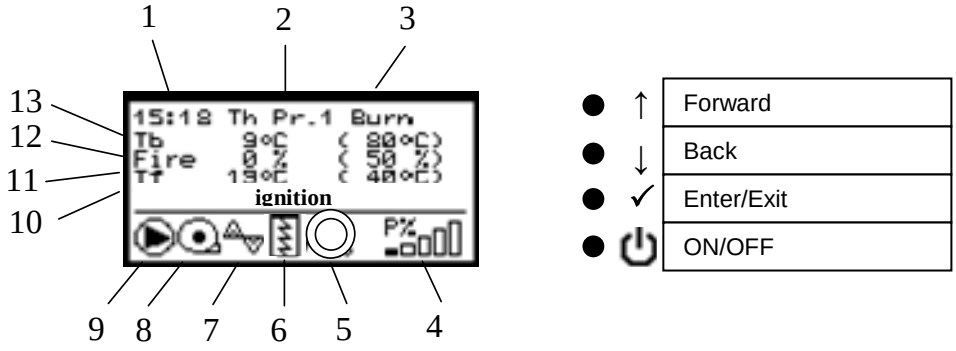
The front control panel is presented in Figure 7 – intuitive LCD display of rotary tube pellet burner series Bisolid GP xx R tsc. The indication of the pellet burner parameters is given in Figure 8.

Figure 7. Front control panel of tube pellet burner series Bisolid GP xx R tsc



1. Front panel indication – intuitive LCD display.
2. Changing button **"Forward"** / or manually switching on/off the pellets transport auger (if holded for 5 sec. together with additionally known conditions described below).
3. Changing button "**Back"**.
4. Button for **Enter/Exit** from programming mode (user settings), switch ON/OFF (if holded for 5 sec).
5. Button **ON/OFF**.

Figure 8. Displey indication of pellet burmer series Bisolid GP xx R tsc



In the basic state the display shows the following parameters:

1. Time and day of the week.
2. Execution of weekly program N ....
3. **Stop / Start / Burn** - performed procedure.
4. Current exploited power.
5. Indicator cleaner work / entry into cleaning.
6. Indicator ignitor operation, room thermostat or alarm .
7. Indicator work auger nimbers 1 and 2 blinks in manual switching.
8. Indicator working fans with nimbers 1 and 2.
9. Indicator working pump.
10. **Tfg** - temperature flue gas (assignment).
12. **Fire** - light sensor (assignment).
13. **Tb** - water temperature.

5.10. OPERATION (FUNCTIONING) OF THE PELLET BURNER

In this part of the operation manual is presented information only for the users. The information for servicing specialists is presented separately.

The controller of the tube pellet burner is swithcing on and off:

- By pressing and holding the button **ON/OFF**. When the burner is swithc off then appears **"Stopped"**.
- In the off position when on the display shows one of the above messages by pressing and holding for about 10 seconds on the button „✓" can be switched on and off in manual way pellet auger with aim filling when the auger is empty.

Before manually switching on of pellet burner you have to verify that the burner is burnt out.

With buttons **„↑"** or **„↓"** scroll until on the display is shown the menu with the desired parameters, then press **„✓"**:

- For choice of settings, scroll move the cursur **„*"** with buttons **„↑"** or **„↓"** to make change and return to choice of settings press button „✓".
- The setting which changes startsto blink, with buttons **„↑"** or **„↓"** you can change the net value.
- After completing the settings, select **„EXIT"** and press button **„✓"** to save the changes.

The controller (the pellet burner) can be switched on or off by the front panel or by the remote control electrical input. The remote control input is usually connected to a **START** key with two resistant positions. **WE RECOMMEND THAT THE BURNER IS SWITCHED ON OR OFF BY THIS START KEY!** The controller switches off no matter which source sends **STOP** command, but can be switched on only when there is **START** command on both places.

5.10.1. USER'S SETTINGS

User's Settings	
*Troom set	22°C
Fire set	50%
Tfg set	80°C
Tpump set	30°C

User's Settings	
time&d	08:30 Fr
Language	Eng
EXIT	

Table 5. Parameters of pellet burner user's settings

Name	Designation	Limmits	Factory setting
Assignment for: Water temperature (manual) Room thermostat – time for optimisation **(depends on „Type control")**	 Tb set Rth delay	 Tmin – Tmax °C 0 – 60 min	 80 °C 0 min
Assignment sensor light	Fire set	0 – 99 %	50 %
Assignment flue gases temperature	Tfg set	0 – 250 °C	40 °C
Assignment switch on pump	Tpump set	10 – 70 °C	10 °C
Current time and day	time&d	hh/mm/d	
Language	Language	Eng / Бъл	Eng

5.10.2. WEEKLY TIMER

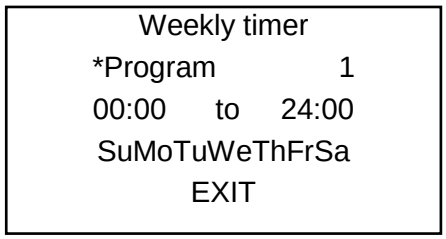


Table 6. Parameters of weekly timer settings

Name	Designation	Limmits
Program number	Program	1 - 4
Interval		00:00 – 24:00
Day of the week	SuMoTuWeThFrSa	Su – Sa (from Sunday to Saturday)

To operate the controller must be set interval to work at least one of the four programs. When set to the same start and end time of the interval program is inactive.

Switchng off on weekly timer is indicated by **Pr.0**, at work displays the number of the relevant active program (Pr.1 - Pr.4).

5.10.3. INFORMATION ON ALARM MESSAGES

The presence of an alarm message on the pellet burner is indicated by an icon .

Alarm	
No Fire	OK
Low Tb	OK
In BT	OK
Air flow	OK

Table 7. Information on alarm messages

Name	Designation	Condition	Recovery
No flame	No Fire	OK / Err	Switch off and on
Danger of frost	Low Tb	OK / Err	Increasing of temperature
Overheat (activated blocking thermostat)	In BT	OK / Err	Switch off and on
No airflow (device for flow)	Air flow	OK / Err	Switch off and on

OK – normal condition, **Err** – alarm message.

In case of a warning alarm message **Air flow**, meaning it is activated connected pressure switch or injured fan for fresh air.

In case of a warning alarm message for the failure of the pellet burner, the user **is obliged** to check for possible accumulation of fuel in the burner tube and fuel transport auger and in the presence of fuel to remove it.

5.11. SERVICE SETTINGS

When using the service controller settings of the pellet burner, access is performed by a password. The password is activated again after exiting of the menu, if within 15 sec. button is not pressed.

The procedures for service settings of the pellet burner are protected by password and can be used only for trained service specialists that have additional information.

5.11.1 COMMON SETTINGS

Common Settings	
*Tb lim	15 – 80 °C
Zone reg	10 °C
Type control	0
Flame sensor	0

Common Settings	
*Lose AC Restore	0
FC_delay	5
Fan1 pulse/rev	12
EXIT	

Table 8. Parameters of pellet burner common settings

Name	Designation	Limmits	Factory setting
Water limmits	Tb lim	5 – 90 °C	15 – 80 °C
Zone regulation	Zone reg	5 – 30 °C	10 °C
Type of control mode	Type control	0 – manual 1 – room thermostat	1
Choise of flame sensor	Flame sensor	0 – photo 1 – flue gases	0
Recovery from the loss of power	Lose AC Restore	0 – “Stop” 1 – “Burn”	0
Delayed of the reaction of the flow sensor	FC delay	1 – 240 s	30
Pulse/revolutions	Fan1 pulse/rev	0 – 12 0 – inactive	0

5.11.2 IGNITION SETTINGS

Ignition	
*Load	60 s
Blowing	2m
Fire time	8 m
Preheat	160 s

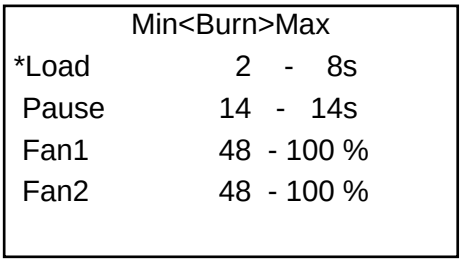
Ignition	
*Fan1	48 %
Fan 2	100 %
Inflame	120 s
Delay	5 s
EXIT	

Ignition	
*Tubus work	0 %
EXIT	

Table 9. Parameters in pellet burner ignition settings

Name	Designation	Limmits	Factory settings
Time for loading	Load	2 – 480 s	60 s
Blowing	Blowing	0 – 10 m	2 m
Time for the emergence of flame	Fire time	1 – 15 m	8 m
Preheating	Preheat	0 – 180 s	160 s
Fresh air fan	Fan1	20 – 100 %	48 %
Flue gases fan	Fan2	20 – 100 %	100 %
Time for fuel heated	Inflame	60 – 600 s	120 s
Delay before heated	Delay	1 – 240 s	5 s
Tubus work	Tubus work	0 – 100 %	0 %

5.11.3 SETTINGS IN BURN MODE



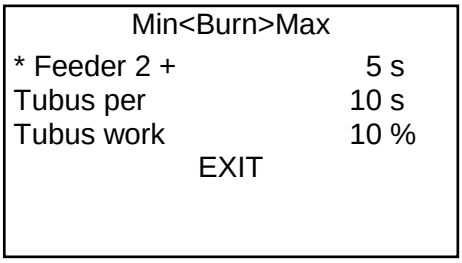


Table 10. Parameters of pellet burner settings in burn mode

Name	Designation	Limmits	Factory settings
Time for loading	Load	1 – 240 s	2 – 8 s
Time for burning	Pause	1 – 240 s	14 – 14 s
Fresh air fan	Fan1	20 – 100 %	48 – 100 %
Flue gases fan	Fan2	20 – 100 %	48 – 100 %
Auger 2 delay	Feeder 2 +	0 – 250 s	5 s
Tubus period	Tubus per	0 – 240 s	10 s
Tubus work	Tubus work	0 – 100 %	10 %

5.11.4 SETTINGS IN STOP MODE

Stop settings	
*Burn out	5 m
Flame stop	20 %
Cleaning	10 s
EXIT	

Table 11. Parameters of pellet burner settings in stop mode

Name	Designation	Limmits	Factory settings
Time for afterburning	Burn out	0 – 15 m	3 m
Flame stopp	Flame stop	0 – 100 %	20 %
Cleaning	Cleaning	0 – 240 s	10 s

5.11.5 STANDBY MODE SETTINGS

Standby settings	
*Load	1 s
Pause	1 s
Fan1	20 %
Fan2	20 %

Standby settings	
*Tstb	90 °C
Fire_set	20 %
Duration	30 m
EXIT	

Table 12. Parameters of pellet burner standby mode setings

Name	Designation	Limmits	Factory settings
Time for loading	Load	0 – 240 s 0 – forbidden	0 s
Time for burning	Pause	0 – 240 s	0 s
Fresh air fan	Fan1	20 – 100 %	30 %
Flue gases fan	Fan2	20 – 100 %	30 %
Maximum water temperature	Tstb	0 – 90 °C	90 °C
Photosensor assignment	Fire_set	0 – 99 %	20 %
Duration	Duration	0 – 60 m 0 – forbidden	0 m

5.12. SMS COMMANDS

GSM module is offered as an option, it connects to "CON7" the board with indication. When the module is available, display shows the symbol for GSM. SMS commands must be in Latin characters, as assuming only large or only small letters.

Example: BSTOP and bstop – correct, Bstop – wrong.

Table 13. Description of GSM commands for pellet burner control

Name	Designation	Action
Stop pellet burner	BSTOP	Burner stops – the same like with button ON / OFF
Start pellet burner	BSTART	Burner starts – the same like with button ON / OFF
Current condition	BINFO	Send SMS with the current condition
Telephone in an emergency	BPHONE	Recorded phone from which the message is sent if there is no flame, no air flow or the blocking thermostat is activated and sends alert

BSTOP and BSTART commands have the same effect as a button **ON/OFF**, as in switch on condition is executed the set weekly program.

In an emergency, if no recorded number is checked for the last sent SMS and if it is missing and he is not sent alert.

During the receiving of SMS command is returning SMS response to the number from which the command is recieved.

5.13. CONNECTING THE PELLET BURNER TO THE ELECTRICAL POWER SUPPLY

When connecting the rotary tube pellet burner series Bisolid GP xx R tsc to the electrical power supply installation it is necessary to have in mind the following technical characteristics (Table 14).

Table 14. Pellet burner technical characteristics

Description	Characteristic
Supply voltage	~230V; 50Hz
Ignition element output	~230V; 0.3kW
Circulations pump output	~230V; 0.35kW
Fans ouput (3 pices)	~230V; 0.25kW
Fuel transport auger output	~230V; 0.25kW
Cleaner/tube rotation output	~230V; 0.25kW
Heating water sensor	Pt 1000 (-50 to +250 °C)
Flue gases sensor	Pt 1000 (-50 to +250 °C)
Flame detecting sensor	Phototransistor
Room thermostat input	Independent contact
Block thermostat input	Independent contact
Flow sensor/revolutions input	Independent contact/Hall sensor
Measurment dimension	1 °C
Humidity	Up to 80.0%
Degree of protection	IP20

All works and activities with regards to connecting the pellet burner to the power supply system must be performed by certified trained person.

The pellet burner must be connected to the electrical installation of the appliance to which it is attached, by observing the safety technique rules.

5.14. WARRANTY AND WARRANTY CONDITIONS

We pay attention to customers that initializing into operation and technical servicing of all rotary tube pellet burner series Bisolid GP xx R tsc must be performed by specialized installation company. Otherwise any eventual warranty claims will not be accepted. Warranty issues must be claimed just after the defect has been discovered. The manufacturer reserves the right to make changes, related to the product technical optimization. The warranty period is presented in the pellet burner's warranty card, which is its main belonging and is determined by the precise observation of the instructions in the current manual for installation, operation and maintenance. The Buyer has to issue a warranty claim in written form and present it to the Seller or to an authorized servicing company.

5.15. PELLET BURNER PACKAGE KIT AT DELIVERY

All rotary tube pellet burner series Bisolid GP xx R tsc are delivered fully assembled and functionally tested. The package kit of tube pellet burners Bisolid GP xx R tsc at delivery is presented in Table 15.

Table 15. Package kit of tube pellet burners Bisolid GP xx R tsc

No.	Description	Bisolid GP xx R tsc
		(pc.)
1	Pellet burner Bisolid GP xx R tsc	1
2	Pellet auger Bisolid	1
3	Manual for installation, operation and maintenance	1
4	Warranty card	1

Spare parts and accessories for the rotary tube pellet burners can be ordered to the servicing technician who performed the installation or directly to the supplier.

5.16. TUBE PELLET BURNER CLEANING

The system for cleaning of a rotary tube pellet burner from series Bisolid GP xx R tsc consists of:

- Mechanism for tube rotation.
- Motor-gear for mechanism rotation.
- PC board that controls the mechanism.

Figure 9. Self-cleaning mechanism of a tube pellet burner Bisolid GP xx R tsc

The cleaning of the rotary tube pellet burner is carried out in a certain algorithm, in the combustion process.

The adjustment of the automatic cleaning system of a rotary tube pellet burner from series Bisolid GP xx R tsc must be performed by a certified staff.

The number and frequency of cleaning of the burner depend largely on the quality of the wood pellets. Fuel is necessary to meet the standard EN ISO 17225-2:2014, classes A1, A2 and B.

In case of a warning alarm message for the failure of the pellet burner, the user **is obliged** to check for possible accumulation of fuel in the burner tube and fuel transport auger and in the presence of fuel to remove it.

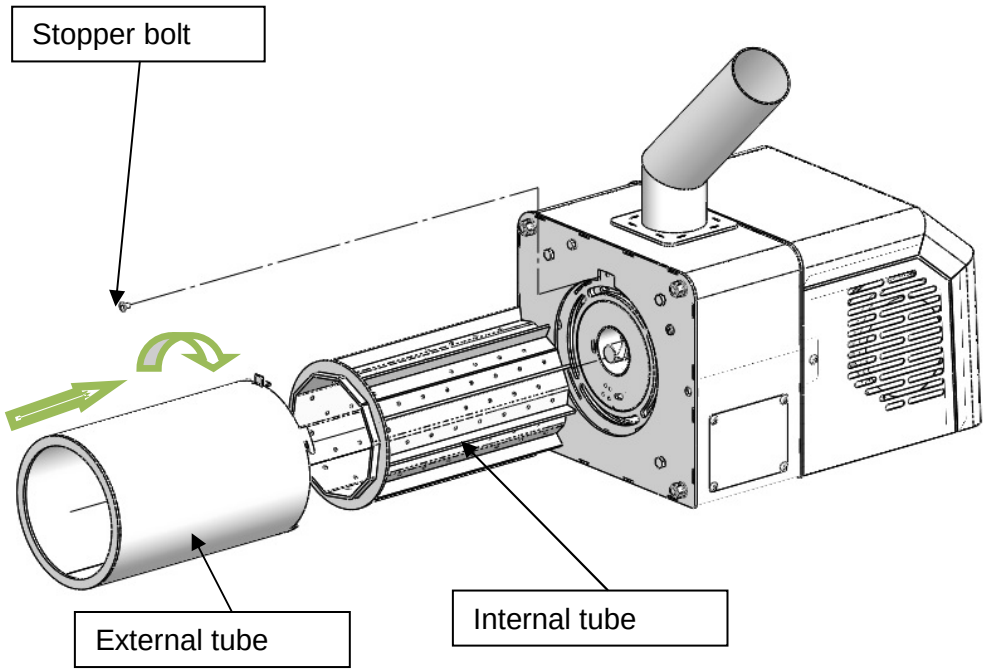
5.17. DISMANTLING AND MOUNTING OF A PELLET BURNER ROTATION TUBE

The time for cleaning (rotating tube) of the combustion chamber of rotary tube pellet burner Bisolid GP xx R tsc and cleaning the tube itself depends on the type and quality of the used fuel.

Before taking action on cleaning, servicing and repair, the pellet burner must be switch off from the electricity supply.

When cleaning the tube of pellet burner Bisolid GP xx R tsc need to be removed combustion head of the burner, as shown in the diagram in the following figure.

Figure 10. Diagram of the burner main module with dismantling tube

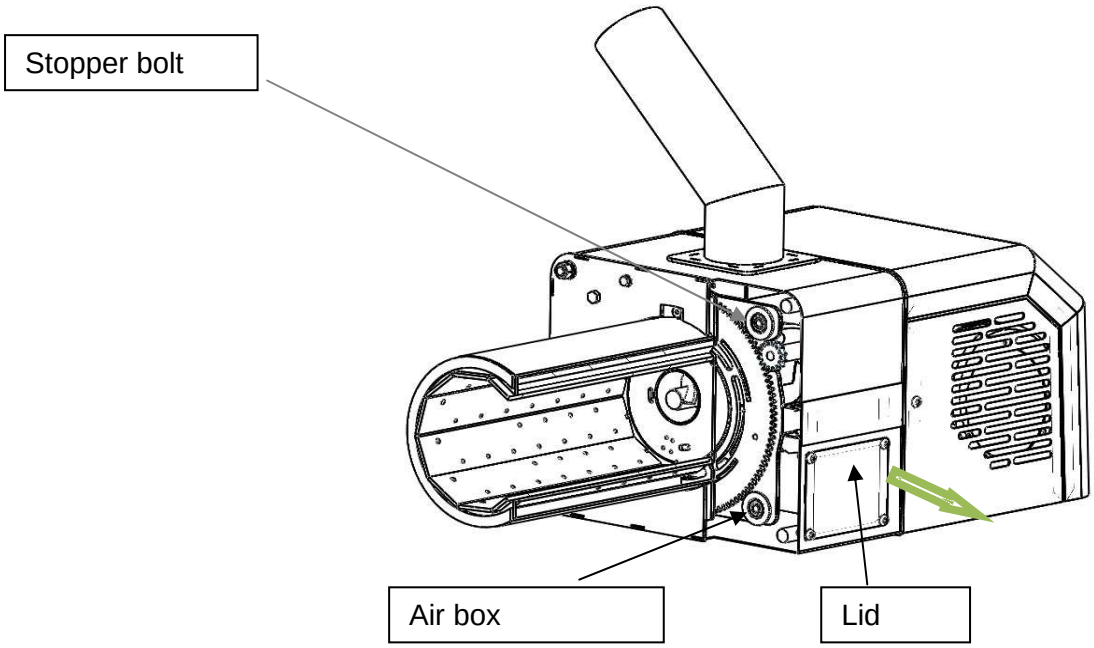


The tube of pellet burner is removed after cooling of the base module so that be safety in tube handling in its cleaning. During the cleaning should pay particular attention to overall cleaning of the holes through which air supply and that provides efficient combustion process and optimum cooling.

The ash cleaning from the burner and boiler and also removal of the ash container must be performed by personal safety means (cloves and cuffs). We recommend in dismantling and mounting works to be used respective tools.

The burner tube is positioned against the stopper bolt supporting the tube to the main part of the burner. The dismantling of the stopper bolt is done by developing of the bolt, after which the tube is rotated in the direction counterclockwise to the front part of the burner and pull out.

Figure 11. Cross-sectional view of the burner tube, showing the position of the tube relative to the main part of the burner



It is carrying out inspection and cleaning of the air box of the tube pellet burner whose cover is shown in the diagram in Figure 11. Access to the air box is possible from both sides of the burner due to the presence of two lids.

The maintenance of a boiler should only be performed by adult persons who are familiar with the instructions of the equipment operation.

5.18. PELLET BURNER SERVICING

The regular pellet burner servicing by the user guarantees efficient, economic and reliable operation of the appliance.

Before taking action on cleaning, servicing and repair, the pellet burner must be switch off from the electricity supply.

During the cleaning of a tube pellet burner the user must use personal protective means (gloves and cuffs).

The user has to periodically, at least once per day or longer, depending on the fuel ash content, but no longer than five days of operation, to switch off the burner. This measure guarantees effective after-burning of the fuel and combustion chamber cooling.

After the pellet burner cools down the ash and/or slag must be cleaned from the combustion chamber fire-grate. The flexible pipe connecting the fuel transport auger and the burner fuel inlet pipe must be cleaned from dust at least once per week.

Dust depositing on the flexible pipe walls can lead to distortion of the fuel feeding, ignting the dust as a result of emergency situation, in consequence of which hot flue gasses might pass through it.

It is necessary that the user is fully introduced with the information presented in the current operation manual, in connection with the pellet burner operation, its control and servicing.

6. INSTALLATION INSTRUCTIONS FOR PELLET BURNER SERIES BISOLID GP XX R TSC

6.1. TUBE PELLET BURNER INSTALLATION – COMMON INFORMATION

The rotary tube pellet burner series Bisolid GP xx R tsc must be installed only by specialized company, authorized for such activities. The pellet burner installation must be performed depending on the solid fuel hot water boiler with sufficiently high efficiency, the preliminary designed project and acting legal provisions.

The existing networks of authorized service organizations comply with these conditions and are able to take responsibility for all pellet burners Bisolid GP xx R tsc (models GP 25 R tsc, GP 35 R tsc, GP 45 R tsc and GP 60 R tsc), installations, their initialization in operation and warranty repairs.

Installation of the rotary tube pellet burner must comply with the acting regulations and directives as well as to the operation and installation manual. The manufacturer is not responsible for failures or damages caused by unqualified installation.

The rotary tube pellet burner series Bisolid GP xx R tsc must be connected to the power supply only by qualified authorized person.

All problems (failures) caused by incorrect installation of the rotary tube pellet burner are not covered by the pellet burner's warranty cards.

The manufacturer makes the following recommendations during installation of the control elements:

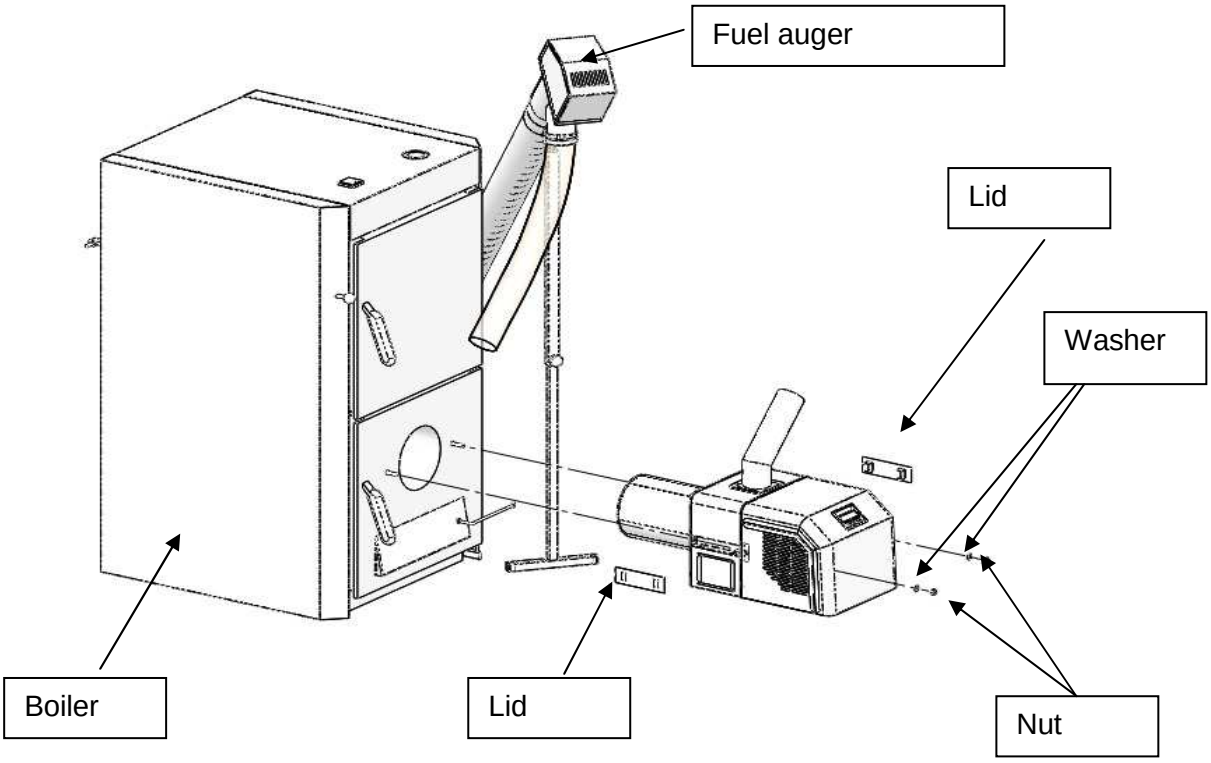
- Temperature sensor **To** of heating water, have to be mounted on the outlet hot water pipe from the boiler.
- Temperature sensor for flue gases **T_flue gas**, have to be installed at the exit from the boiler gas duct pipe to the chimney.
- Room thermostat, have to be installed in the room in places protected from direct sunlight and internal heat sources (household appliances, audio - video equipment, etc.).

The main module of rotary tube pellet burner with self-cleaning series Bisolid GP xx R tsc is mounted in the position showns in Figure 12 to the equipment that will consume heat energy (boiler), generated by fuel combustion.

Before taking action on cleaning, servicing and repair, the pellet burner must be switch off from the electricity supply.

During the servicing of a rotary tube pellet burner the end user must use personal protective means (gloves) and the relevant technical tools.

Figure 12. Installation diagram of a rotary tube pellet burner series Bisolid GP xx R tsc



Depending on the equipment it is necessary to be prepared technical evaluation of the project for installation of the main module, so as to ensure its reliable operation, easy cleaning, servicing and maintenance. The main module of pellet burner is mounted to the equipment - heat consumer using thermal insulation.

The transport auger for fuel is placed near the burner so that it can be connected to the main module by the flexible pipe through which the fuel from the auger will be transported. It is also advisable to position the angle between the horizontal plane and the axis of the auger is 45^{o}, which will ensure optimal operating conditions for the electric motor of the auger and the combustion process.

Change of the auger's tilting angle leads to changes in the fuel consumption and respectively to the burner's heating output:

- Decreasing the auger's tilting angle leads to increased fuel consumption, respectively to increased heating output.
- Increasing the auger's tilting angle leads to decreased fuel consumption, respectively to decreased heating output.

6.2. CHOOSING OF A ROTARY TUBE PELLET BURNER

The choice of suitable rotary tube pellet burner series Bisolid GP xx R tsc is necessary to be made accordingly to the heating output of the different types and models solid fuel hot water boilers. The correctly chosen pellet burner used for installation to the mentioned hot water solid fuel boilers guarantees economic and optimum operation of the system boiler – burner.

The choice of pellet burner with too high nominal heating output, compared to the boiler's output, leads to increased consumption and fuel expences.

The choice of pellet burner with much lower nominal heating output, compared to the boiler's output, leads to impossibility for reaching the boiler's nominal parameters and low efficiency.

6.3. POSITIONING OF THE ROTARY TUBE PELLET BURNER

The rotary tube pellet burner series Bisolid GP xx R tsc can be installed on hot water boilers, which are positioned in uninhabitable premises (for example boiler room, basement).

The tube pellet burner and 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, with ambient temperature in the range from +5°C to +35°C and with no more than 80% relative humidity of the air.

Safe 200 mm distance must be kept in the cases when the flammability level of the material is unknown. The same safety distance must be kept also for domestic objects, flammable materials and fuels situated in the room, where the burner is positioned.

Do not put flammable materials over burner's main module top side or near it within the safety distance.

The main module of the rotary tube pellet burner series Bisolid GP xx R tsc must be installed in horizontal position towards a suitable solid fuel hot water boiler. The pellet burner position has to be considered so it can provide its reliable operation, easy cleaning, handling and servicing. Correct positioning during the pellet burner installation guarantees reliable and efficient parallel operation of the burner and the hot water boiler.

The fuel transport auger must be installed near to the already installed pellet burner, in order to secure its good connection, through the flexible pipe, with the burner's main module fuel supply pipe.

If the fuel transportation auger's angle changes, then the wood pellet consumption changes respectively depending on the pellet burner heating ouput.

The fuel transport auger and the wood pellets hopper, where it is located, positions are recommended to be situated in a way that provides easy access to the pellet burner, for the purposes of adjustment, cleaning and servicing.

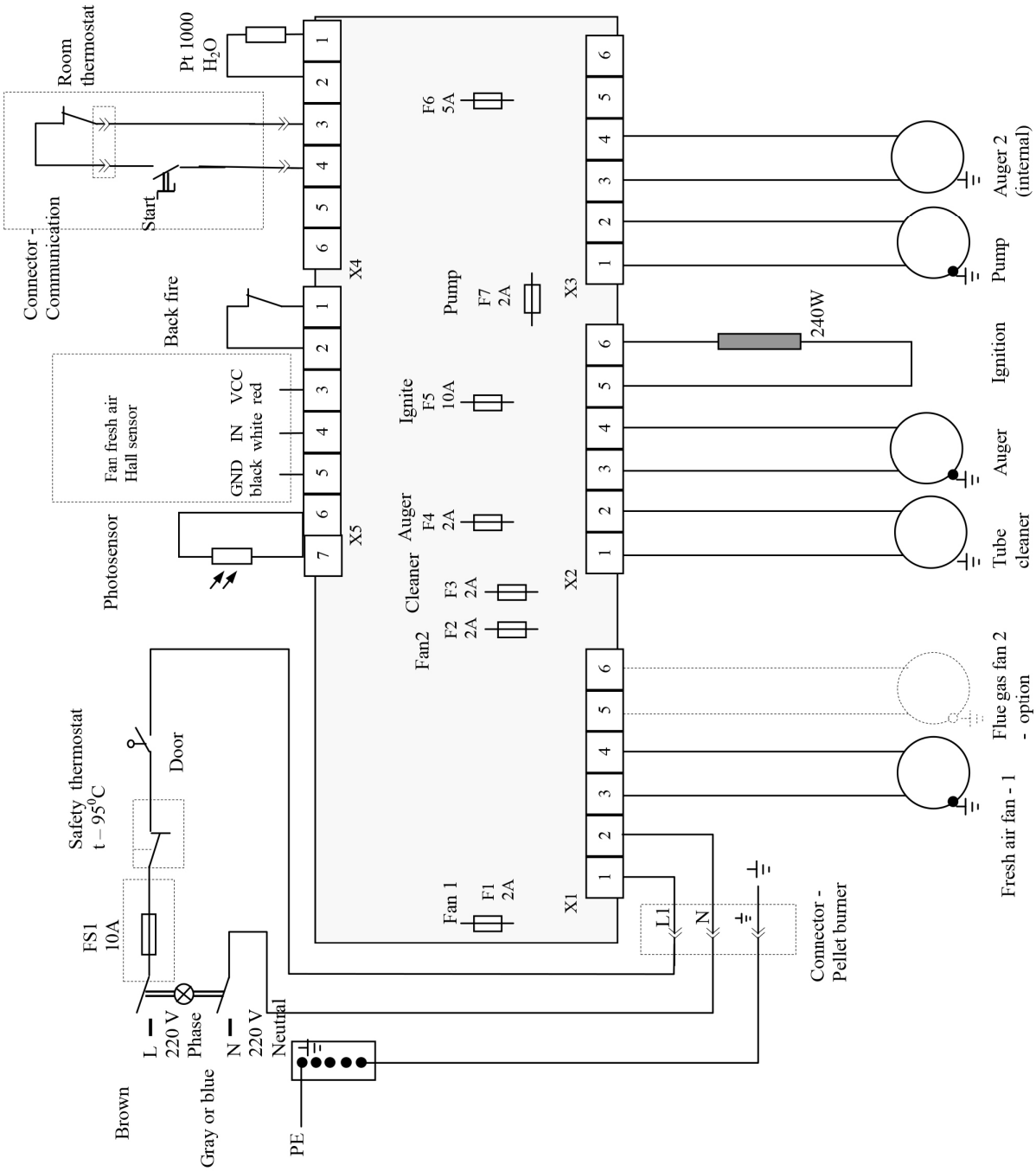
6.4. TRANSPORTATION AND STORAGE

The rotary tube pellet burners for expedition are offered by the manufacturer in carton packages and are secured against moving. The pellet burners can not be transported in position different from their base (normal operating position).

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

7. TUBE PELLET BURNER WIRING DIAGRAM

Figure 13. Wiring diagram of a rotary tube pellet burner series Bisolid GP xx R tsc



8. TROUBLESHOOTING

The burner is installed on a heating boiler, but the temperature in the rooms is low.	Insufficient heating output.	It is necessary to increase the burner's heating output level.
	Low assigned water temperature.	It is necessary to increase the water temperature assignment. It is also necessary to chek the circulation water assignment, adjusted in the burner controller.
	Low assigned temperature by the room thermostat (if connected).	It is necessary to increase the temperature assignment by the room thermostat.
The burner is installed on a heating boiler and the temperature in the rooms is high.	Heating output, exceeding the heat consumption.	It is necessary to decrease the burner's heating output.
	High adjusted temperature.	It is necessary to decrease the assigned value (recommended decrease to minimum 60^{o}C) or the assigned circulation water temperature, defined in the controller.
	High assigned temperature by the room thermostat (if connected).	It is necessary to decrease the temperature assignment by the room thermostat.
The burner is switched on, but there is no burning process.	There is no assignment for operation.	Check the operation assignment from the burner control module.
Difficult fuel ignition.	The used wood pellets are with low quality.	It is necessary to change the pellets, as possibly their water content is higher than the normal needed for the burner operation.
The fuel ignition is accompanied by untypical noises.	Insufficient chimney draught.	It is necessary to check the chimney and the appliance condition, to which the burner is installed and to clean the ash deposits. After cleaning is possible to adjust the burner operating parameters – ask for service assist.
Hot water boiler overheating – to which the burner is installed.	Lack of heating load or incorrect heating ouput adjustment of the boiler and the burner.	It is necessary to check the correct operation of the system boiler-burner and eventual adjustment of the operating parameters – to be performed by a specialist. After boiler cooling and failure removal the emergency thermostat has to be deactivated (unscrew protection cover, press the button and screw the cover againg). Start the burner by restarting it.
Fuel does not ignite.	No wood pellets in the fuel hopper.	The fuel hopper, from which the transport auger takes fuel, must be refilled.
	No fuel in the burner combustion chamber.	The process of initial firing can be renewed by restarting the burner.
	Presence of fuel over the burner tube, but is not fired or it is burned and there is still lack of burning process.	Clean the gathered fuel over the burner tube. If the ignition heating element is out of order or inactive, then it must be replaced.
	Incorect operation of the photo-sensor used for burning process	The photo-sensor used for burning process monitoring must be adjusted

	monitoring.	or repaced – to be performed by servicing specialist only.
The burner does not start or stops operation.	No power supply.	Check if the burner display and its indication operate. Check working order of the appliance power supply, to which the burner is installed and powers it with voltage 230 VAC, 50 Hz – to be performed by servicing technician. Check burner correct wiring, according to the presented wiring diagram. Check for loose electrical connections – to be performed by servicing technician.
	No start signal to the burner.	Check if the burner has received start signal and if the module, providing signal for operation to the burner, wiring is in working order – to be performed by servicing technician. Check for loose electrical connections. Check the working order of the burner operation control module, which provides voltage and necessary signals.
	The burner does not operate even if there is operation signal.	Check for activated emergency alarm – check the alarm messages.
	Blown fuses.	**To be performed by servicing technician:** check the fuses condition and if there is necessity for replacement, then change the fuses with the same corresponding parameters (**Warning**: the fuses are fast-reacting).
The flame from the burning process is “dim”and the chimney smokes much.	Wood pellets with low quality.	It is necessary to change the pellets, as possibly their water content is higher then the normal needed for the burner operation.
	Unsuitable adjustment of the burner parameters.	Adjustment of the appliance operating parameters is necessary – to be performed by specialist.
The burner starts but it can not reach to stabilized condition.	Incorrectly positioned photo-sensor.	Change the photo-sensor, used for burning process monitoring, position by rotating it around its longitudinal axis.
	The photo-sensor surface is dirty.	Clean the dirts carefully.
	The photo-sensor is damaged – there are burnout traces on its surface.	It is necessary to replace the photo-sensor with new one – ask for service assistance. Reason – incorrect burner switch off.
Unstable operation of the burner.	Photo-sensor failure.	Check photo-sensor working order.
	Controller operation settings are changed.	Check the burner heating output level setting.
		Check the controller settings – to be performed by servicing technician.
Excess heating of the burner’s pellet inlet pipe.	Insufficient chimney draught or presence of dirt.	It is necessary to clean the appliance and the chimney if necessary. Possible solution is to install flue gas extractor fan or/and change the chimney.
Heating of the burner’s pellet inlet pipe and emergency thermostat	Low chimney draught or the appliance is contaminated with dust particles.	It is necessary to clean the appliance and the chimney, if necessary. It is necessary to restart the burner.

activation.		Possible solution is to install flue gas extractor fan or/and change the chimney line.
Dirty and/or melted photo-sensor.	Incorrect burner switching off.	It is necessary to clean the photo-sensor surface or to replace it with new one. It is necessary to observe the burner switch off procedure, presented in the manual guide.
Presence of unburned fuel over the combustion tube.	Inefficient fuel combustion.	It is necessary to adjust the appliance operation parameters – it is necessary to ask for consultation or adjustment by authorized technician.
Slag deposits over the combustion tube.	The used fuel is with high ash content and does not comply with the appliance requirements.	Change the fuel with other one, complying with the burner requirements for reliable operation.
	Burner operation mode over its nominal heating output.	Decrease the burner heating output by changing its heating output level.
Failure, showed on the controller display	Problem in the burner operation.	It is possible to ask for servicing assistance/consulation.
The burner has stopped, but after new start it operates.	The photo-sensor sends wrong information to the controller.	Check the fuel quantity over the burner fire-grate. Ask for assistance for adjustment or consultation by servicing technician.
High flue gas temperature (if thermometer is installed).	Dirty heat-exchanging surfaces, depending on the appliance type and operation mode.	It is necessary to clean the heat-exchanging surfaces of the appliance.
Smoke presence in the boiler room after a period of operation.	Dirty or clogged with ash flue-gas line inside the appliance – which consumes the heat energy.	Clean the appliance from the ash deposits – which consumes the heat energy.
Failure of the device for cleaning the burner	The cleaning can not be performed correctly	What is needed is a competent consultation and / or intervention service technician
Other, not described above failures.		It is necessary to ask servicing technician for consultation or/and for his intervention.

In all other cases, the removal of eventual failures and damages must be performed by the manufacturer or by authorized servicing company.

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Reserved rights for technical changes!