БЕЛКОМІН

Hot water steel boiler on solid fuel

TIS PELLET,
TIS DUO PELLET

Installation and operation manual

TIS GROUP

Attention!!!

- Avoid overpressure in the boiler higher than indicated in the technical documentation (the boiler instruction manual).
- Never leave the boiler with water at an ambient temperature below 5 °C.
- Do not operate the boiler without heat carrier or if the water froze in the boiler.
- Never install isolation valves on the hot water supply line from the boiler to the fitting position of the safety valve. The safety valve is placed before the isolation valve and it is designed for the pressure no more than 0,15 MPa for the open-type heating systems and 0,25 MPa for the closed-type heating systems.
- Forbidden to use the boiler without the safety valve.
- The instruction manual is for all the boilers TIS PELLET/DUO PELLET models, no matter what their outfit and heat productivity are.
- Buying the boiler check the outfit and frontage of the boiler with the seller. After selling producer do not accept any complaints about the wrong outfit and mechanical damage.

CONTENTS.

1.0 Introduction

LLC «BelKomin» company thanked for choosing our heating appliance.
Multifunctional boilers TIS PELLET and TIS DUO PELLET are designed for burning pellets and other types of solid fuels (wood, coat, peat) on an additional grille (only in DUO PELLET models). Due to the innovating mechanism and usage of the latest achievements in steel processing within the manufacturing process, we created a cheap energy source system suitable for houses, enterprises and outbuildings up to 1000 m².

Producing the boilers TIS PELLET and TIS DUO PELLET models, we wanted to satisfy the needs of any consumer, so we based on many years observations and comments.
This leads to the creation of the easy-to-use and highly effective appliance.
ECE is no more than 92%. Before the installation and operation read the instruction manual carefully.
The guarantee of the correct and prolonged work of the appliance is obligatory following all the directions and recommendations of the producer.

2.0 BOILERS USAGE.

2.1 TIS PELLET / TIS DUO PELLET are steel low-temperature water heating boilers designed for the heating of objects with the heat demand 8-99 kVt. They can also function together with the water heater when following the instruction manual. The main function of the boilers is heat supply of individual houses and domestic buildings with the forced circulation heating systems of open and closed types.

2.2 The boiler is located in the closed heating premises with natural or forced ventilation and air temperature from +5 to +50 C.

3.0 BOILERS WORK DESCRIPTION.

Pellets are submitted automatically with the help of feed auger and combusted into the burner device of the boiler. There is an additional grille for the burning alternative fuel (wood, briquettes, coal) in the TIS DUO PELLET model, in such case the loading is done manually. All the processes of the boiler work and additional devices are controlled by electronic control unit. Fuel combustion on the additional grille (DUO version) is not the main work of the boiler!
The fuel gets into the burner from the loading device, where the burning process occurs with the help of the forced air ventilator. The inflow and outflow boiler heat carrier circulate through pipes with the external thread G 1 ½ or 2. Boiler chimney with the outer diameter 159 mm or 220 mm is located at the back and it is the continuation of the boiler inner tube (heat exchanger). For feeling or pouring off of the heat carrier from the boiler there is a drain pipe the screw-thread ¾", the pipe is at the bottom of the rear case.
ATTENTION: For qualitative and reliable operation of the equipment, setting optimal parameters of the regulator, conclude an agreement with the customer service in your region. All the information is available on the website www.belkomin.com, or at the seller.

4.0 TIS PELLET MAIN DIMENSIONS AND TECHNICAL DATA

Technical data	Power	Max. operating temperature	Water volume in the boiler	Min. chimney draught	Connections	Chimney diameter	Boiler weight	A	B	C	D	E	V
Boiler model	kw	C	L	Pa	‘’	mm	kg	cm	cm	cm	cm	cm	cm
TIS pellet 15	8-20	85	75	18	1½”	159	378	53	63	126	106	20	6
TIS pellet 25	10-30	85	85	18	1½”	159	413	53	73	126	106	20	6
TIS pellet 35	15-40	85	95	20	1½”	159	542	68	72	139	120	20	6
TIS pellet 45	20-50	85	105	20	1½”	159	580	68	77	139	120	20	6
TIS pellet 55	25-60	85	120	22	2”	220	623	68	77	146	123	20	6
TIS pellet 65	30-70	85	130	22	2”	220	643	68	82	146	123	20	6
TIS pellet 75	35-80	85	160	22	2”	220	667	68	87	146	123	20	6
TIS pellet 95	45-99	85	180	22	2”	220	852	74	130	132	110	27	40

*socket hight heat carrier outlet 60 mm from boiler cover

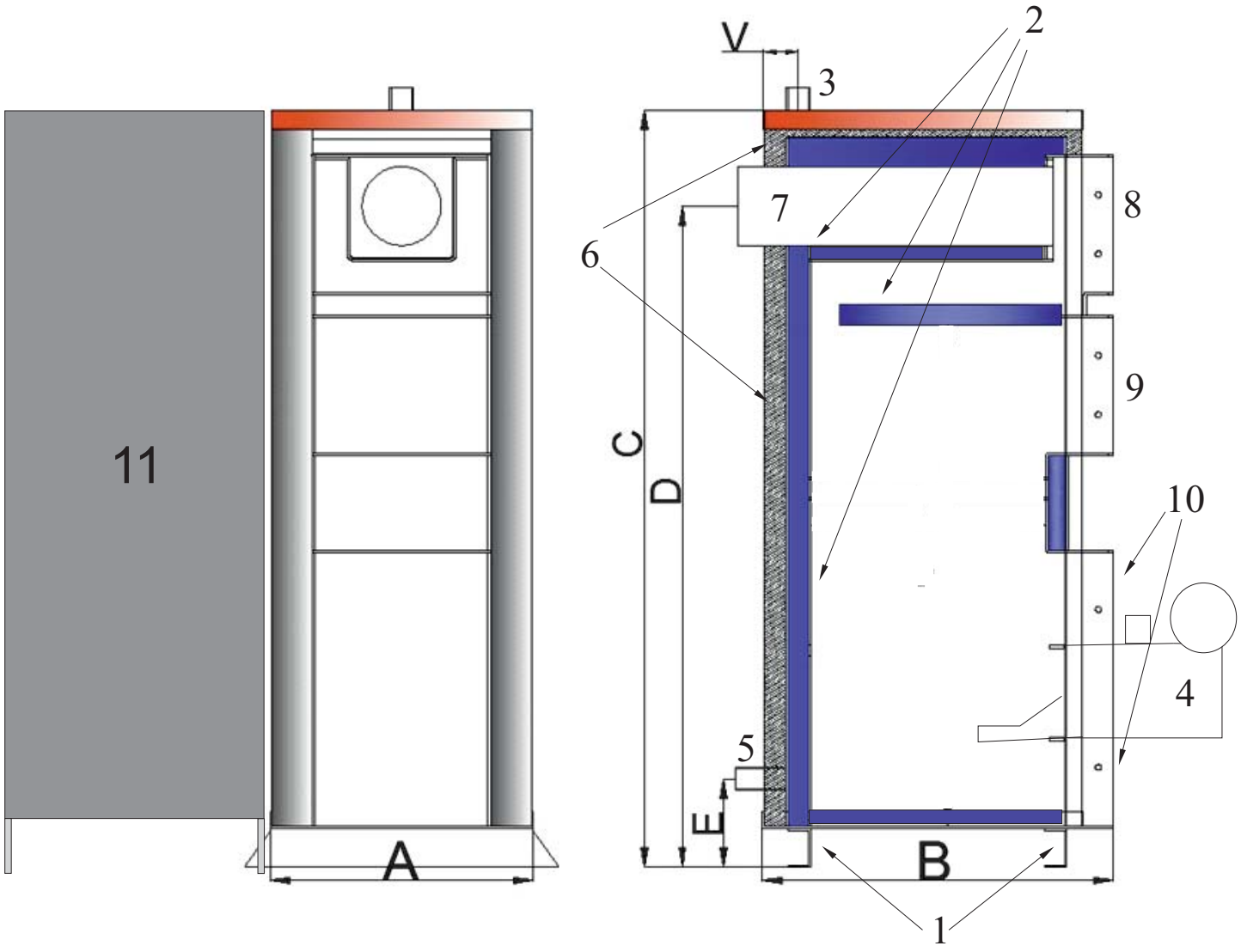
*All dimensions can vary by +/- 5 %!

5.0 TIS PELLET BOILER BUNKERS VOLUMES

Boiler model	Width, mm	Length, mm	Height, mm	Volume, dm^3
Pellet 15	600	900	1260	350
Pellet 25	600	900	1260	350
Pellet 35	600	900	1400	400
Pellet 45	600	900	1400	400
Pellet 55	796	950	1450	700
Pellet 65	796	950	1450	700
Pellet 75	796	950	1450	700
Pellet 95	796	950	1450	700

Installing the bunker on the left of the boiler specify at seller or producer door opening side of the boiler!!!
Fn.: The producer reserves the right to make changes to the boilers and completing parts construction without impairing the product quality.

6.0 TIS PELLET BOILER DESIGN.



Boiler TIS PELLET 15-95.

1 – boiler legs; 2 – water heat exchanger; 3 – socket heat transfer outlet; 4 – automatic pellet burner; 5 – socket heat carrier return; 6 – seal; 7 – chimney; 8 - chimney maintenance door; 9 – combustion chamber door; 10 - ash removal door and access to the burner; 11 – hopper.

7.0 TIS DUO PELLET MAIN DIMENSIONS AND TECHNICAL DATA

Technical data	Power	Max. operating temperature	Water volume in the boiler	Min. chimney draught	Connections	Chimney diameter	Boiler weight	A	B	C	D	E	V	Technical data	Power
Boiler model	kw	C	L	Pa	‘’	mm	kg	cm	cm	cm	cm	cm	cm	Boiler model	kw
TIS duo pellet 15	8-20	85	75	18	1½”	159	389	53	63	126	106	20	26	38	6
TIS duo pellet 25	10-30	85	85	18	1½”	159	427	53	73	126	106	20	26	48	6
TIS duo pellet 35	15-40	85	95	20	1½”	159	566	68	72	139	120	20	45	48	6
TIS duo pellet 45	20-50	85	105	20	1½”	159	606	68	77	139	120	20	45	53	6
TIS duo pellet 55	25-60	85	120	22	2”	220	649	68	77	146	123	20	45	53	6
TIS duo pellet 65	30-70	85	130	22	2”	220	672	68	82	146	123	20	45	58	6
TIS duo pellet 75	35-80	85	160	22	2”	220	699	68	87	146	123	20	45	63	6
TIS duo pellet 95	45-99	85	180	22	2”	220	916	74	130	132	110	27	59	40	40

*socket hight heat carrier outlet 60 mm from boiler cover

*All dimensions can vary by +/- 5 %!

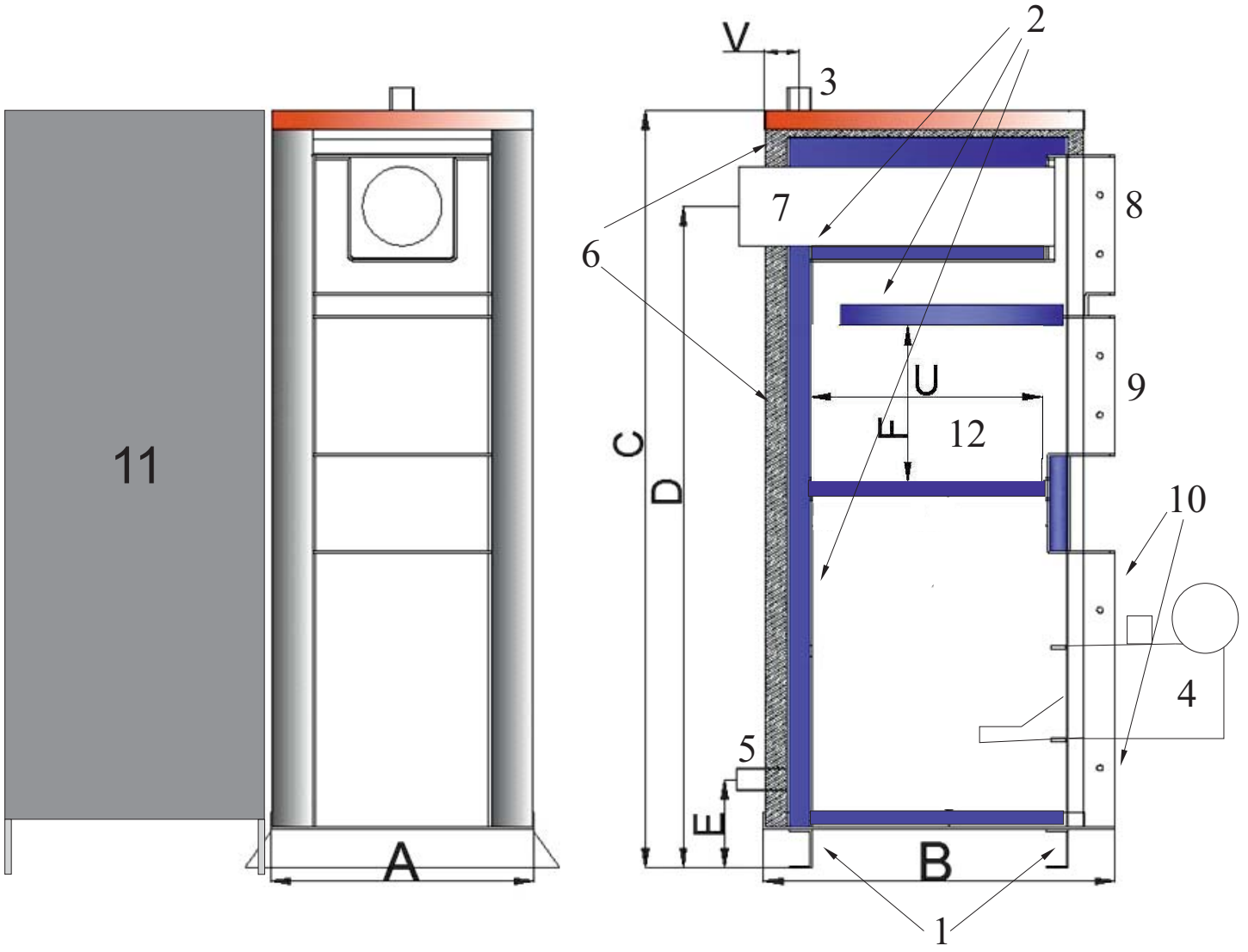
8.0 TIS DUO PELLET BOILER BUNKERS VOLUMES

Boiler model	Width, mm	Length, mm	Height, mm	Volume, dm^3
Duo Pellet 15	600	900	1260	350
Duo Pellet 25	600	900	1260	350
Duo Pellet 35	600	900	1400	400
Duo Pellet 45	600	900	1400	400
Duo Pellet 55	796	950	1450	700
Duo Pellet 65	796	950	1450	700
Duo Pellet 75	796	950	1450	700
Duo Pellet 95	796	950	1450	700

Installing the bunker on the left of the boiler specify at seller or producer door opening side of the boiler!!!

Fn.: The producer reserves the right to make changes to the boilers and completing parts construction without impairing the product quality.

9.0 . TIS DUO PELLET BOILER DESIGN



Boiler TIS DUO PELLET 15-95.

1 – boiler legs; 2 – water heat exchanger; 3 – socket heat transfer outlet; 4 – automatic pellet burner; 5 – socket heat carrier return; 6 – seal; 7 – chimney; 8 - chimney maintenance door; 9 – combustion chamber door; 10 - ash removal door and access to the burner; 11 – hopper.

10.0 HEATING AND BOILER INSTALATION

Requirements:

- connect the boiler to the heating system according to the project developed by highly qualified and experienced specialists in thermal mechanics;
- in order to avoid condensation, install the return water temperature no less than 50 C if the supplying heat carrier temperature is at least 65 C.

10.1 Heating system filling.

Filling the heating system with water, check the water is clear and clean, without any impurities of aggressive substances with the hardness no more than 2 mEq / dm3.

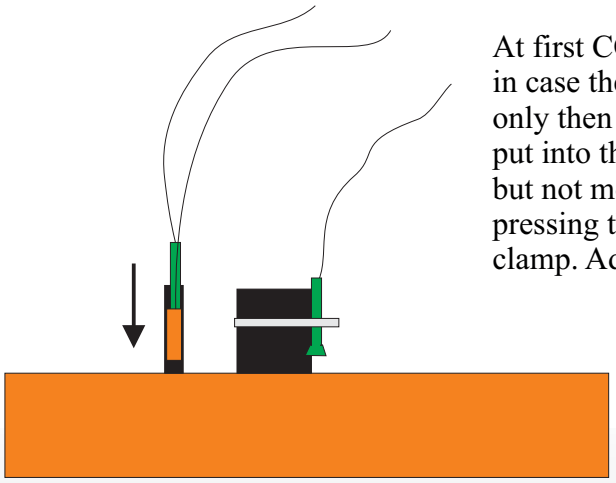
Hard water causes scrum in the boiler which reduces its heat productivity and can cause premature boiler breakdown. Fn.: boiler breakdown due to the scrum is not covered by the warranty.

- Process the water if its hardness of water does not meet the required standards. 1 mm scrum deposit (chalk -stone) reduces the heat transfer from the metal to the heat carrier onto 10 %.
- Remain the constant volume of the heat carrier during the whole heating season. Do not forget to monitor the pressure.
- Top the water up to the heating system at the temperature of the boiler no less than 70 C.
- Do not use any liquids inappropriate for the heating systems as a heat carrier.

10.2 Boiler position with the regard to the required servicing space

- Leave the space no less than 1,5 m in front of the boiler.
- Leave 500 mm distance between the boiler and the wall of the premises.
- Leave 500 mm space from the sides to provide access to the boiler.

Fig. 1.



At first CO measuring sensor put into the immersion sleeve in case there is only one immersion sleeve in the boiler, and only then put the seal. Another variant: CO measuring sensor put into the immersion sleeve and the seal install heating pipe, but not more than 10 cm from the pipe exit from the boiler, pressing the boiler to the pipe must be performed by the metal clamp. Adding any liquids to the immersion sleeve is forbidden!

11. RECOMMENDED INSTALATION SCHEME

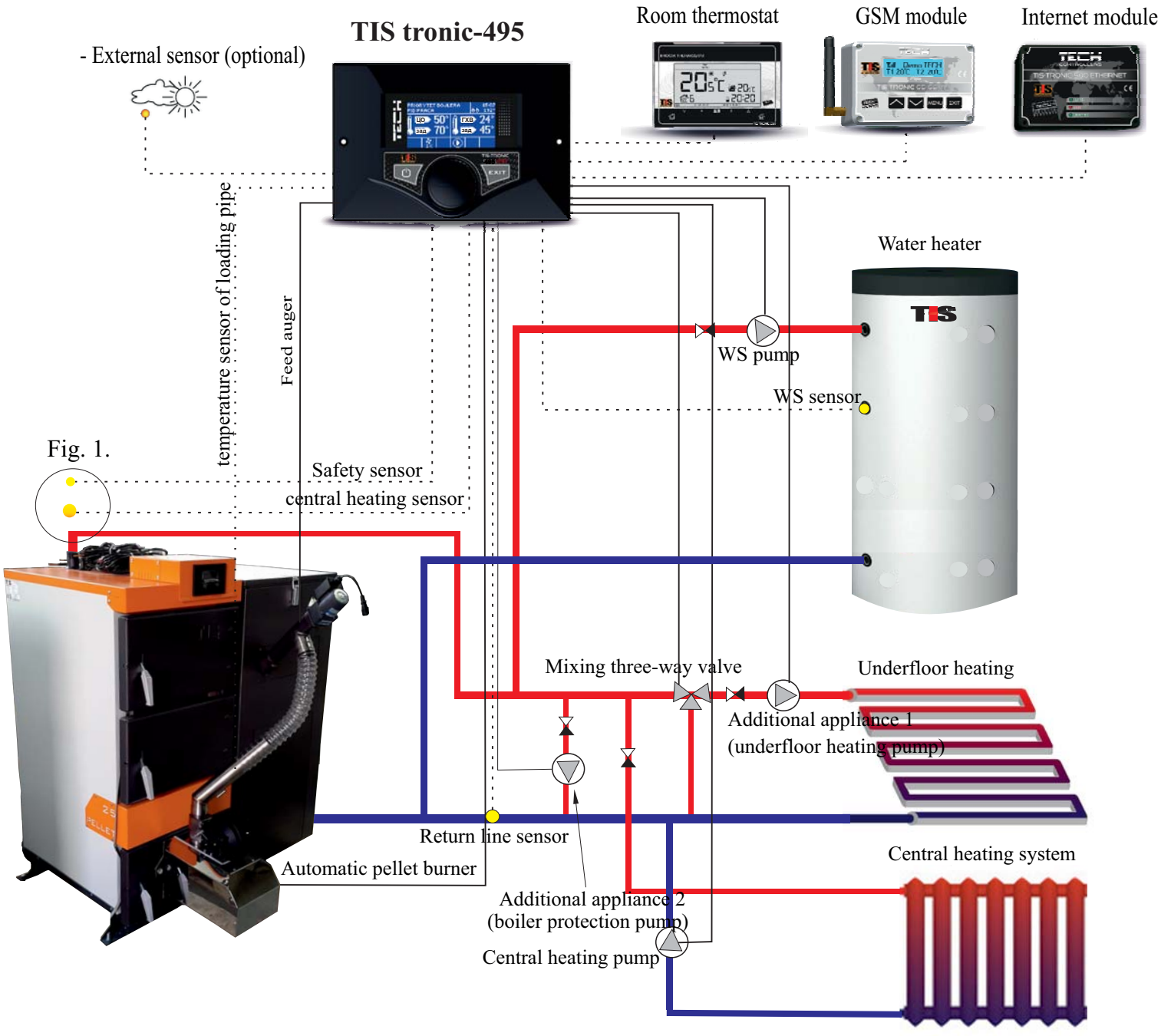


Fig. 1.

* Wiring plan (shown diagram is just a simplified example).

12.0 RECOMMENDATIONS FOR BOILER INSTALATION AND OPERATION:

12.1 Install the boilers with an open expansion tank or membrane in the open and closed heating systems. The expansion tank volume depends on the heating system volume. For the correct prolonged and trouble proof boiler operation three- or four-way valve should be placed for the increasing the return water temperature and controlling the heat carrier in the heating system. This helps to avoid the process of condensation and liquefying the resin in the combustor. The use of the mixing valve leads to the fuel consumption reduction, makes the operation easy and extends the life of the boiler.

12.2. The pressure in the closed heating system type must not exceed the maximum working pressure of the water in the boiler (0,25 MPa) in an operation state with the maximum temperature of the water in the boiler of 85 °C.

12.3. Place the safety valve on the feed line between the boiler and the stop valve.

12.4. Place the check valve before the stopcock of the nourishing branch pipe if the filling and replenishment of the boiler from the plumbing are provided. Fill the system under the pressure no more than the boiler maximum working pressure.

12.5. Make the heating system test (test of the pipes, heaters) when the boiler is disconnected, the pressure must be no more than the maximum working pressure indicated in the mechanical part of the heating system project. The heating system project must be worked out by the specialized institution which is eligible to perform such work.

12.6 Requirements to the connection of the boiler electrical part:

- a person who has qualified as an electrician and has admission to perform such work can plug the boiler electrical part.
- wiring works should be done under PSD.

13.0 REQUIREMENTS FOR THE CHIMNEY:

- The chimney diameter must be no less than the diameter of the boiler flue outlet.
- The chimney must be made from acid resistant stainless steel (single wall – in brick channel, double-walled (insulated) – detached) and under GS EN 1856-1-2013 « Smoke flues. Requirements to the metal smoke flues. Part 1. The smoke flues details», GS EN 1856-2-2013 « Smoke flues. Requirements to the metal smoke flues. Part 2. Metal lining and connecting pipes». The pipe should be putted rigidly and tightly on the boiler to avoid uncontrolled exhaust of smoke gases. The connection to the chimney must fit the current rules and it must be performed by a specialist (organization).

13.1 Maintenance of the boiler and smoke flues:

Attention: Soot and condensate are formed in the chimney during the boiler operation which can lead to the traction deterioration and cause a fire hazard. The chimney serviceability must be provided for the boiler effective and safe operation. The chimney must be smooth inside. The chimney must not lead to the accumulation of moisture and soot and not let to gases output and combustion products. The number of tube bends should be as small as possible. Choosing a chimney is necessary to take into account its compatibility with the boiler, type of fuel and ease of assembly and dismantling for the maintenance and fire safety standards matching.

14.0 BOILER IGNITION AND ADJUSTMANT

Before boiler ignition check the condition of the electronic control unit, temperature detector, isolation valves, pumps, safety valve, pressure in the heating system, mixer work, chimney, burner device, feed auger and the bunker.

Boiler ignition procedure:

1. Check the fuel presence in the bunker (supplemented if necessary). Bunker fuel filling should be done not less than 1.3 container volume. Avoid getting non-fuel objects (ropes, hobnails, wood waste, packing bags and other packaging, etc.). Check the fuel presence in the feed auger.
2. For DUO version remove extra cast iron fire grates.
3. Through the «manual mode» function fill the main feed auger with the fuel (pellets);
4. Carry out the automatic settings based on the boiler power, fuel type and heating system peculiarities;
5. Place the loading hose on the burner and connected it to the main feed auger.
6. Turn on the power of the remote control, put the main switch to «ON».
7. Through the «manual mode» function check burner operation mechanisms in the following **order: «»«Fan», «Lighter», «Stoker», «Belimo ON» «Belimo OFF».** After checking go to the main menu pressing «EXIT».
8. Activate at the electronic control unit **«Fire UP»** function.

Producer settings must be changed for each boiler individually if necessary (ask in the service centers).

Using alternative fuel in DUO models:

1. Place the cast iron fire grate into the boiler;
2. Download the fuel onto the fire grate;
3. Ignite the fuel.
4. Activate at the electronic control unit «manual operation» function;

Attention!!! Do not use flammable liquids at the boiler ignition!!!

- Instructions for the people responsible for boiler operation and maintenance:
- People acquainted with the mechanism and service regulations of such equipment are accepted to the boiler operation and maintenance;
- Timely inspect the appliances, regularly clean the boiler and chimney.

Soot and ash deposits on the smoke channel cases reduce the heat transfer. Deposits, resin formation and condensation depend on the fuel used, chimney draft and operating mode.

Boiler and burner cleaning are recommended to be done in the cold state once a week. Boiler and burner cleaning can be also made when contaminated.

- Remove ash from the boiler daily. Check the boiler external condition, burner, electronic control unit, detectors and wiring. Clean them all if necessary.
- Clean boiler heating surfaces daily with a poker. Clean the burner. Clean the upper heat exchanger from the soot with a scrubber, then remote soot through the access panels.
- Make the repairing, preventive maintenance, cleaning and etc. when the boiler is blown out and then switched off.

If there are any malfunctions in electrical equipment (short circuit to the boiler case, insulation failure in cables and etc.) switch off the boiler promptly and call the service representative.

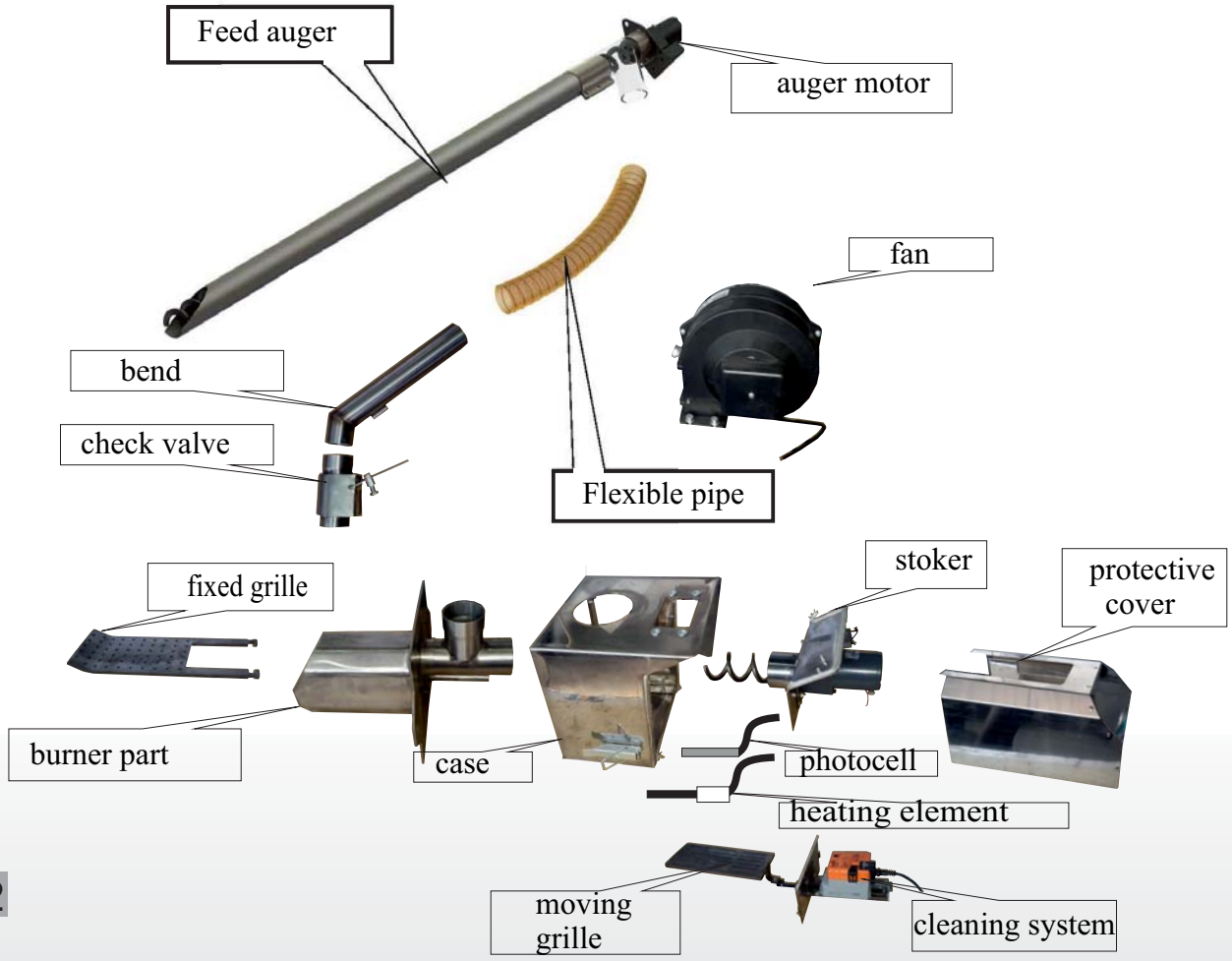
Check the existence of draft in the chimney by putting a paper strip to the ashpit (the paper strip should turn to the ashpit side). Watch for the ventilation openings for air inflow and exhaust not to be reduced or closed.

- Use the exhaust hoods for smoke removing within premises where the boiler is placed.

15.0 GENERAL RECOMMENDATIONS REGARDING THE PELLET CHOISE
The right choice of the pellet type and class provides:
- boiler trouble-free operation;
- high efficiency of the burner work and fuel economy up to 15 % compared with fuel of a lower quality;
- reduction of harmful chemicals emission into the atmosphere.
Recommendations for the fuel used (pellets):
- energy released by combustion – 5 kW / kg;
- humidity remnant – 8-12 %;
- ash content, maximum 3 %;
- length 5-50 mm;
- density 1200-1400 kg / m3;
- diameter 6-8 mm.

The combustion of 1 ton of pellets is released as much thermal energy as the combustion:
-1600 kg of wood;
-475 m3 of gas;
-500 l of diesel fuel;
-685 l of fuel oil.
16.0 FUEL STORAGE .
- Do not store fuel near the boiler at a distance of less than 1000 mm.
- Store fuel in a dry heated premises.

When changing the type of the pellets or provider remote control changeovers should be made. Do it by your selves or with the help of the services!
17.0. BURNER DEVICE DESCRIPTION



18.0 MALFUNCTIONS AND TROUBLESHOOTING

№	Possible malfunction	Malfunction cause	Troubleshooting (made by the producer)
1	Poor fuel combustion	Bad chimney draft Raw poor quality fuel	Clean the flue pipe and gas outlet of soot and ash, check the correct installation (according to the instruction manual).
		Raw Fuel	Replace the fuel.
2.	Good combustion in the boiler, the heat carrier is boiling in the boiler, but is not heated in the heater.	Bad circulation of the heat carrier in the heating system.	Check the correct installation of the heating system (the presence of the slope, the absence of air plugs, etc.)
		Circulation pump does not operate.	Troubleshoot or replace the pump.
		The leak of the heat carrier in the system. The air presence in the system.	Eliminate the leak. Energize the system, bleed the air.
3.	The appearance of the smoke in the premises.	Chimney is not warmed (stale cold air in the chimney).	Restore the chimney draft burning some paper, straw, sawdust, etc. in the cleaning hatch
4.	No combustion in the boiler	No fuel supply, malfunction in the incendiary element, boiler breakdown.	Check the fuel level in the hopper, fuel supply to the loading tank, the burner.
5.	Water inside the boiler (condensate).	Condensate from the chimney.	Check the condensate drain. Insulate the chimney. Regulate the combustion process.
		Low temperature of the heat carrier in the boiler.	Maintain the heat carrier temperature of the boiler 65-80 C.

In case of failure to troubleshoot contact the service center!

19.0 GUARANTEE.

The manufacturer provides a full guarantee of the product in accordance with the terms and conditions described warranty. Initial commissioning and equipment maintenance produced by
LLC «Belkomin» must be carried out by qualified specialist. In the case of non-compliance of this manual, will not accept warranty claims. Each complaint should be immediately transmitted after malfunctions detection in written form to the seller or producer.

ATTENTION!!!

Ask the sellers and adjustment organizations to fill in the warranty card correctly.

20.0 GUARANTEE OBLIGATIONS.

LLC «Belkomin» (producer) warrants the product produced;
The producer is responsible for the guarantee if the defect appears in the device due to producer fault;
The producer decides independently to remedy the defect or replace the whole unit;
The warranty is only valid if the warranty card has boiler serial number, boiler brand and seller's mark;
The warranty is only valid if the warranty card is correctly filled and has a note of commissioning date, stamp of the organization or installer who instructed the customer and put the boiler into operation;
Warranty repairs are free;
Warranty repairs may be done only by a specialized organization, installer or service center accredited by the producer;
The warranty only covers the unit, installed in accordance with the instruction manual and the rules written in it;
The warranty period for the boiler drum is 60 months from the sale date;
The warranty period for the control elements, burner, load tank, electronic regulator is 12 months from the sale date;
The guarantee does not cover the boiler expendable material components: door seal, cast iron grate, handles, screws, screw-nuts, incendiary element, scrubber, poker;
The warranty expires in case of improper installation or use of the device inappropriately;
The producer is not responsible for the mechanical damage during shipping;
The whole unit or its parts that have lost their marketability on the consumer's fault cannot be exchanged or returned for warranty obligations;
TIS PELLET and TIS DUO PELLET boilers are subjected to compulsory grounding!
* Using open heating systems there is a risk of boiler corrosion.
BOILER IS PLACED ON THE VEHICLE ONLY IN AN UPRIGHT POSITION!!! (otherwise it will be removed from the warranty).
The boiler is shipped on a pallet or without it on customer's request but only in an upright position!
It is recommended that in upright position the boiler was transported as close to the installation place as possible, it minimizes the possibility of the damage to the boiler case.
When the boiler is shipped in another position the warranty removed.
•The package may also include various kinds of control devices (additional expanders) or some other automation devices depending on the purpose and the customer's wishes.

MANUFACTURER: Belarus, Grodno region, d. Novaya Gozha, 6.
OFFICE: 230008, Belarus, Grodno, Tavlaya st, 1.
Regarding the equipment quality contact:
Manufacturer: Phone/Fax 8(0152)77-35-10; Phone: 8(029) 617-00-77; E-mail: office@belkomin.com
Minsk office: Phone/Fax: 80173620808, 3620909; phone: 80293620808, 3620909; minsk@belkomin.com
Service center: E-mail: service@belkomin.com, service-m@belkomin.com.

21.0 RECYCLING.

- Upon reaching the limit state boiler burning heating surface, it must be disconnected from the heating system.
- After switching off the boiler presents no danger to the people's lives and health and the environment.
- Recycling - boiler housing and the grate can be remelted.

22.0 BOILER MANUFACTURING, ACCEPTANCE AND SALE CERTIFICATE.

Hot water heating steel TIS PELLET / DUO _____serial №_____

Correspond: ТУ BY 590831167.001-2013, ТР ТС 010/2011, ТР ТС 020/2011, ТР ТС 004/2011,

Declaration on conformity: № ТС BY/112 11,01, ТР010 042 00065 and recognized serviceable.

Manufacturing date: «_____» _____ 201_ .

Tested by water pressure 0,4 MPa.

Packager _____ producer L.S.
(Full name)

Selling date: «_____» _____ 201 _.

Seller's data and signature_____

_____

L.S.

Familiar with the terms of the boiler connection, operating conditions and the warranty.
Customer:_____

15.0 Installation information.
Address where the boiler is installed:_____
Installation date: _____
Boiler is installed by: _____

_____
Commissioning date:_____(name of organization)_____

L.S. Signature_____

23.0 ATTACHMENT

Boiler maintenance records

Date	Technical condition notes	Work performed	Full name, position and signature of responsible for maintenance

24.0. GUARANTEE CARD (remains in the data sheet) №1 boiler warranty repair Repairer (full name)_____ Company_____ _ Repairing date_____ L.S.(company)_____ Signature_____ Replacer parts_____ The works are fully implemented. Signature_____ Customer's full name_____	24.0. GUARANTEE CARD №1 boiler warranty repair Boiler serial number_____ Selling date «____»_____ 20____ L.S. (seller)_____ Shop address_____ Carried out works on troubleshooting _____ Repairer (full name)_____ Company_____ _ Repairing date_____ L.S.(company)_____ Signature_____
24.0. GUARANTEE CARD (remains in the data sheet) №2 boiler warranty repair Repairer (full name)_____ Company_____ _ Repairing date_____ L.S.(company)_____ Signature_____ Replacer parts_____ The works are fully implemented. Signature_____ Customer's full name_____	24.0. GUARANTEE CARD №2 boiler warranty repair Boiler serial number_____ Selling date «____»_____ 20____ L.S. (seller)_____ Shop address_____ Carried out works on troubleshooting _____ Repairer (full name)_____ Company_____ _ Repairing date_____ L.S.(company)_____ Signature_____

for notes

24.0. GUARANTEE CARD (remains in the data sheet) №1 boiler warranty repair Repairer (full name)_____ Company_____ _ Repairing date_____ L.S.(company)_____ Signature_____ Replacer parts_____ The works are fully implemented. Signature_____ Customer's full name_____	24.0. GUARANTEE CARD №1 boiler warranty repair Boiler serial number_____ Selling date «____»_____ 20____ L.S. (seller)_____ Shop address_____ Carried out works on troubleshooting _____ Repairer (full name)_____ Company_____ _ Repairing date_____ L.S.(company)_____ Signature_____
24.0. GUARANTEE CARD (remains in the data sheet) №2 boiler warranty repair Repairer (full name)_____ Company_____ _ Repairing date_____ L.S.(company)_____ Signature_____ Replacer parts_____ The works are fully implemented. Signature_____ Customer's full name_____	24.0. GUARANTEE CARD №2 boiler warranty repair Boiler serial number_____ Selling date «____»_____ 20____ L.S. (seller)_____ Shop address_____ Carried out works on troubleshooting _____ Repairer (full name)_____ Company_____ _ Repairing date_____ L.S.(company)_____ Signature_____

for notes

for notes

for notes

for notes

БЕЛКОМІН

www.belkomin.com

MANUFACTURER: Belarus, Grodno region, d. Novaya Gozha, 6.
OFFICE: 230008, Belarus, Grodno, Tavlaya st, 1.
Regarding the equipment quality contact:
Manufacturer: Phone/Fax 8(0152)77-35-10; Phone: 8(029) 617-00-77; E-mail: office@belkomin.com
Minsk office: Phone/Fax: 80173620808, 3620909; phone: 80293620808, 3620909; minsk@belkomin.com
Service center: E-mail: service@belkomin.com, service-m@belkomin.com.