



**Solid fuel boiler
for central
heating**

STROPUS

**TECHNICAL PASSPORT,
INSTALLATION AND
MAINTENANCE
INSTRUCTION**



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ATTENTION! Before installing and using the heating boiler, carefully read the instruction. It will help you correctly install and effectively use the product while also preventing possible incidents.

1 TECHNICAL SPECIFICATIONS

Solid fuel water heating boiler “Stropus” (hereafter boiler) designed for various rooms, which are equipped with a central heating system, radiator, boilers preparing domestic hot water, floor coils, heaters, or all mentioned, heating. The system can be with natural and forced circulation and have an open or closed system.

JSC “Stropuva ir ko” produces three types of boilers:

- Firewood (firewood);
 - “U” universal (firewood, coal, peat and sawdust briquettes, pellets, woodchips);
 - “BIO” (firewood, sawdust briquettes, pellets, wood chips);
- with three 20 kW; 30 kW; 40kW power capacities. Boilers “Stropus” can be used to heat premise area ranging from 100 to 400 m².

1.1 MAIN TECHNICAL SPECIFICATIONS

Fuel used: firewood, wood residue, sawdust briquettes, peat briquettes, coal, pellets.
Recommended fuel moisture up to 30 %.

Model of boiler	S20	S30	S40	S20 BIO	S30 BIO	S40 BIO	S20 U	S30 U	S40 U
Power (kW) *	20	30	40	20	30	40	20	30	40
Heated area (m ²) **	100- 200	150- 300	200- 400	100- 200	150- 300	200- 400	100- 200	150- 300	200- 400
Fuel capacity (dm ³)	210	295	360	210	295	360	230	260	320
Maximum firewood amount (kg)	50	65	80	50	65	80	50	65	80
Maximum pellet amount (kg)	-	-	-	130	180	220	130	180	220
Maximum briquette amount (kg)	-	-	-	60	80	100	60	80	100
Maximum coal amount (kg)	-	-	-	-	-	-	130	180	220
Burning time of firewood, minimum mode. Maximum mode. ***	31,5 6,1	31,5 6,1	31,5 6,1	31,5 6,1	31,5 6,1	31,5 6,1	31,5 6,1	31,5 6,1	31,5 6,1
Burning time of briquettes, minimum mode Maximum mode ***	-	-	-	72 14	72 14	72 14	72 14	72 14	72 14

Model of boiler	S20	S30	S40	S20 BIO	S30 BIO	S40 BIO	S20 U	S30 U	S40 U
Burning time of pellets, minimum mode.				96	96	96	96	96	96
Maximum mode. ***	-	-	-	24	24	24	24	24	24
Burning time of coal, minimum mode.									
Maximum mode. ***	-	-	-	-	-	-	130 32	130 27	130 27
Firewood length up to (cm)	45	55	55	45	55	55	45	55	55
Boiler water amount (l)	40	42	52	40	42	52	40	42	52
Efficiency (%)	84	84	84	84	84	84	84	84	84
Pressure safety valve (bar)	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5
Chimney draught (mbar)	0,12	0,12	0,12	0,12	0,12	0,12	0,12	0,12	0,12
Maximum heated water flow (l/h)	500	800	1000	500	800	1000	500	800	1000
Boiler water temperature (°C)	85	85	85	85	85	85	85	85	85
Minimum chimney flue area (cm ²)	250	330	330	250	330	330	250	330	330
Chimney diameter (mm)	180	200	200	180	200	200	180	200	200
Distance between ground and the chimney (mm)	1418	1285	1394	1418	1285	1394	1477	1285	1474
Dimensions (mm)									
h	1960	1790	1960	1960	1790	1960	1960	1790	1960
d	550	670	670	550	670	670	550	670	670
Weight (kg)	206	258	288	220	280	310	228	298	322

* Power depends on the quality of fuel and time: at the beginning of burning power output is higher than indicated in the table, boiler puts out smoke that is hotter than 300 °C, therefore raisin residues burn out, flue gets warmed up and draft increases (in some models, direct channel to flue is opened). While burning, power of boiler decreases because the surface of heat dissipation increases and draft decreases, but when a house becomes warm the power is sufficient and additional valve is opened in order to further decrease the power of boiler.

** Power of boiler is selected according to area of premise. For example, if in Stropus S20 solid fuel boiler built in 200 m² building with one load burns 24 hours than one load of firewood in Stropus S40 solid fuel boiler would burn for almost 48 hours.

*** Burning duration depends on fuel quality, inner and outer temperature, thermal resistance, boiler power, manual compliance (installation, heated water flow, water temperature maintenance).

2 BOILER STRUCTURE

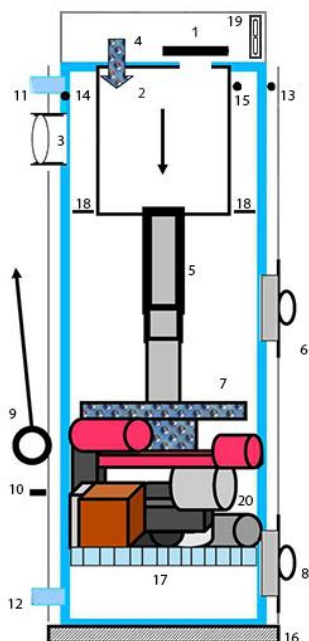


Figure 1

1. Air valve
2. Air heating chamber
3. Smoke outlet
4. Switch valve (only for U boilers)
5. Telescopic air supply pipe
6. Fuel loading opening
7. Air distributor
8. Ash removal opening
9. Lifting cord with ring
10. Hook
11. Hot water pipe
12. Returning water pipe
13. Thermometer coupling
14. Pressure relief valve coupling 1,5 bar.
15. Traction regulator coupling
16. Bottom
17. Fire grate (only for U and BIO boilers)
18. Deflectors
19. Air supply ventilator
20. Fuel

ATTENTION! It is forbidden to change the construction of the boiler.

2.1 DESCRIPTION OF BOILER STRUCTURE

Boiler – is a steel cylinder, enveloped in a larger diameter steel cylinder, which provides thermal insulation. Heated water resides between these two cylinders. There is a draft regulator on the front side of the boiler. The construction has fuel loading (6), ash removal (8) openings and a smoke outlet (3), as well as water supply (11 - 12), thermometer (13) and pressure relief valve (14) openings. An air heating chamber is installed in the upper part of the combustion chamber to improve the combustion quality and heat transfer (2). The chamber holds a telescopic air supply pipe (5), at the end of which an air distributor is attached.

“U” boiler, is designed to burn peat briquettes or coal, has a switch valve (4), complemented with fire grate (17) and air supply ventilator (19).

“BIO” boiler, designed to burn firewood, pellets, sawdust briquettes or wood chips, complemented with fire grate (17) and air supply ventilator (19).

At the upper part of the chamber there's an air opening and air valve (1). On the right side of the boiler, in front of the door, there is a lifting cord with ring (9) responsible for lifting the air supply mechanism and hook (10) for fixation of the cord.

3 BOILER PARTS

3.1 AIR SUPPLY VENTILATOR

When burning pellets, briquettes, damp firewood or other type of wood and its residue, we recommend using an air supply ventilator (Fig. 2). Air supply ventilator is mandatory when burning coal or peat. All models come with an air supply ventilator.

Air supply ventilator is connected into electrical network after igniting and closing the door.



Figure 2

3.2 AIR DISTRIBUTOR

Air distributor's (3 pav.) purpose is to correctly distribute air in generation zones, located below and

next to air distributor, as well as in combustion zones located near and above the distributor. Air distributor (7) (Fig. 1) rests upon the non-flammable edges. The distributor (7) (Fig. 1) must not be moved during combustion: raising and lowering the air distributor - it turns and falls deep into combustion area, making the boiler operate wastefully, wearing of quickly.

When burning fuel a small ring* is used (Fig. 4), which reduces air supply towards boiler's center. When burning firewood we recommend attaching the distributor so that

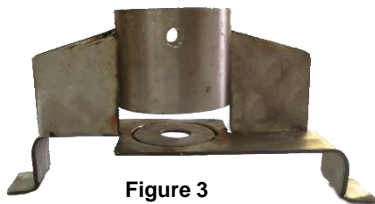


Figure 3

there is a gap between telescopic pipe and air distributor, (Fig. 5). When burning coal the additional ring has to be removed to increase air supply towards the center. We recommend attaching the air distributor without the gap between telescopic pipe and air distributor when burning with coal (Fig. 6).

*Only for Universal boilers.

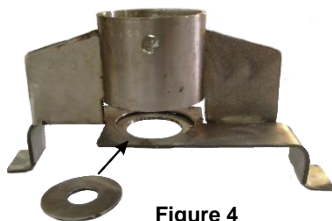


Figure 4

Burning fuel, under air distributor, accumulates ash, but if it does not interfere with combustion process, on the contrary – protects the part from heat.

Manufacturer retains the right to alter air distributor and improve upon its design

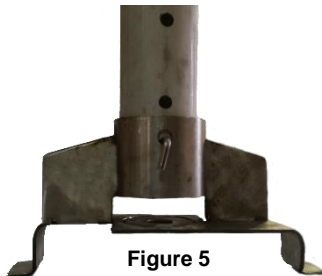


Figure 5

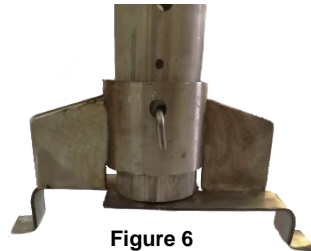


Figure 6

3.3 FIRE GRATE

Use fire grate (17) (Fig. 1); (Fig. 7), when burning pellets, coal, peat and sawdust briquettes. It needs to be hanged on the hook, located at the bottom of the boiler, inside the lower doors (8) (Fig. 1). Fire grates (17) (Fig. 1); (Fig. 7.) can be found by opening the ash removal doors (8) (Fig. 1). This part is attached in "U" boiler for additional air to go through the air channel, which is required when burning coal or peat briquettes. In the "BIO" boiler, it is used, to completely burn the formed cinder. Put the fire grate (17) (Fig. 1); (Fig. 7), at the bottom of universal and "BIO" when burning firewood. When buying universal and "BIO" solid fuel boiler "Stropus" this part is included. Important to know when changing the fire grate is that it is composed of two separate parts.

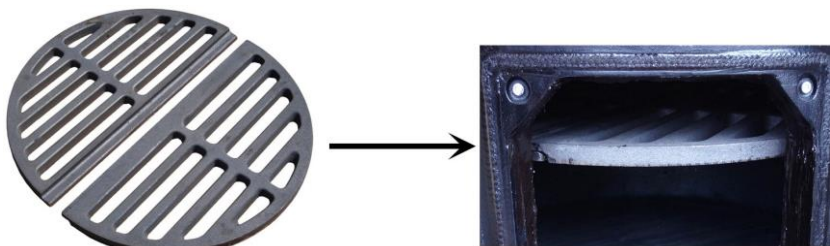


Figure 7

3.4 DEFLECTORS

Deflectors (crescents) 2 units (Fig. 8) are designed to increase efficiency of the boiler. After installing the boiler, we recommend putting deflectors (18) (Fig. 1) through the upper fuel loading door (6) (Fig. 1) on the bottom edge of the air heating tank.

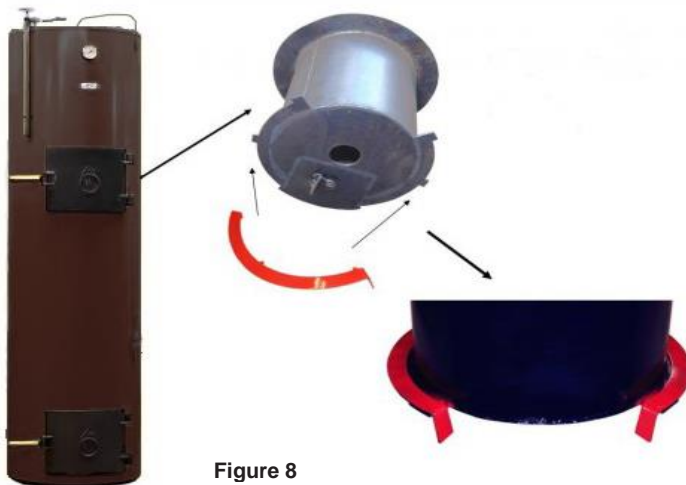


Figure 8

3.5 SAFETY VALVE 1.5 BAR

Valve is designed to protect solid fuel boilers from overheating. When water pressure reaches critical levels, the valve opens up, releasing the heated water into the sewerage, at the same time adding cold water through the automatic system.

Valve has to be mounted at the upper boiler part (14) (Fig. 1) near the flue (see 6.2; 6.3; 6.4 in connection diagrams No. 23). Cold water flowing from the water supply is connected to the automatic replenishment system, which is mounted to heating system's water return line, near the boiler.



Figure 9

ATTENTION! It is necessary to review the function of the safety valve once a month

4 TRANSPORTATION AND STORAGE

Loose boilers are allowed to be transported only in horizontal position. During good weather seasons the boilers can be transported by open transport, otherwise the products need to be covered. When transporting in vertical position additional safety measures have to be taken in account to prevent turning or scratching. The boilers are allowed to be stored in dry areas, which do not contain chemically active substance vapor.

5 BOILER INSTALLATION

Boiler must be installed in premises that meet the governmental requirements. Boiler installation area has to be at least 215 cm high and must have concrete flooring (at least in the place where boiler is installed). The room must be isolated from heated living rooms and have a vertical ventilation channel and a window or an opening in outer wall, so that air from the outside could easily get into boiler or ventilation channel.

The flue must be clean. It must not have openings into hollow layers or nearby enclosures. The flue has to be inspected to make sure that it has no openings on the outside, which would allow parasitic air inside, which would cool the flue and reduce its traction. All cracks, openings and boiler connection point to the chimney flue must be sealed. In the case of inner openings of flue to the layers or to nearby shafts which cannot be sealed, oval or cylindrical liner of stainless steel will have to be used (Rectangular liners are not as reliable because openings caused by temperature changes appear at the connections).

Boiler is placed directly on concrete floor. When carrying the boiler, some parts may experience deformation, therefore after installing the boiler in the flue and closing all the doors, check if top valve's uniformly fits with air intake surface and if the door is tight enough by using candle flame or matches.

5.1 FIRE PREVENTION REQUIREMENTS

Boiler must be placed on non-flammable surface.

Boiler metal connection near the chimney must be made out of metal that is no thinner than 1,5 mm and covered with heat insulation.

Condition of flue must be checked once a month (by visually inspecting it with a mirror through the cleaning opening), it must be cleaned if need be, because accumulated resins and soot can catch fire in flue, releasing sparks, causing fire hazard, overheating and damaging the liner. When using branded flues (made of stainless steel and ceramic) user instructions must be understood well and requirements met, especially for periodic maintenance. After cleaning the flue, horizontal flue pipe, which is between boiler and flue, must be cleaned as well.

5.2 FLUE REQUIREMENTS

Diameter of flue opening can be 10 percent smaller as shown in main technical specifications, but not larger. The boiler needs a separate flue - no other device can be connected to it. Flue pipe from boiler to the flue must be horizontal, not longer than 1,5 m and not shorter than 0,20 m, it must be well sealed at connection areas and covered with

heat insulation. Flue pipe and flue must be cleaned periodically in accordance to already mentioned fire prevention requirements.

We recommend:

- Install stainless steel liner inside the chimney - correctly installed liner protects the chimney from condensation and moisture;
- Liner should not significantly reduce the diameter of chimney's opening;
- Parts of the liner must be well connected between each other (using stainless steel rivets);
- Ash collecting device must be installed at the bottom; collecting device must be installed 15- 20 cm lower than where flue pipe enters the flue, than it will allow easy access to clean the flue;
- Space between liner and the walls of chimney, must be filled with inflammable heat insulation material, at least at the outer part of chimney. Opening must be hermetically plastered and tin coated at the top while forming a slope (going from the opening towards the edge of chimney);
- In cold attics, chimney must be insulated using fireproof heat insulation material.

5.3 REQUIREMENTS FOR CONNECTION TO THE HEATING SYSTEM

Our boilers can only be installed by qualified technicians who are aware of all requirements, can guarantee the quality of their work and who review the construction of our boiler before every installation.

We recommend few simple and proven diagrams. We don't recommend building accumulative heat tanks because our boiler is more efficient while working in preservation mode than while charging accumulative tank in maximum power mode.

Before installing additional elements please read the requirements of manufacturer and act accordingly:

1. Preliminary flow adjustment nuts must be adjusted according to requirements of heating system project while observing the requirements of manufacturer of thermo-valves (if not present than at 1,5 or 1).
2. Do not exceed the temperature of floor heating flow with floor heating elements (manufacturer recommendation 28-35 °C)
3. When building three-way or four-way mixing valves, circulation pump must be connected to large ring of house heating system. It is recommended to install it on return flow pipe.
4. Do not install boiler and heating elements parallel to tank connected to boiler. (When tank is connected in parallel position, balance valve is needed.)
5. Retain the temperature which is sufficient for good operation of boiler (70 – 85 °C).
6. Stick to the requirements of flue liner manufacturers.
7. Flue closing damper must not be installed. To reduce the traction - use our or other manufacturers' automatic air supply damper.
8. Ensure good ventilation in boiler room.
9. Before every installation of our solid fuel boiler, read the technical passport (you may find helpful additions and recommendations).

6 HEATING SYSTEM DIAGRAM

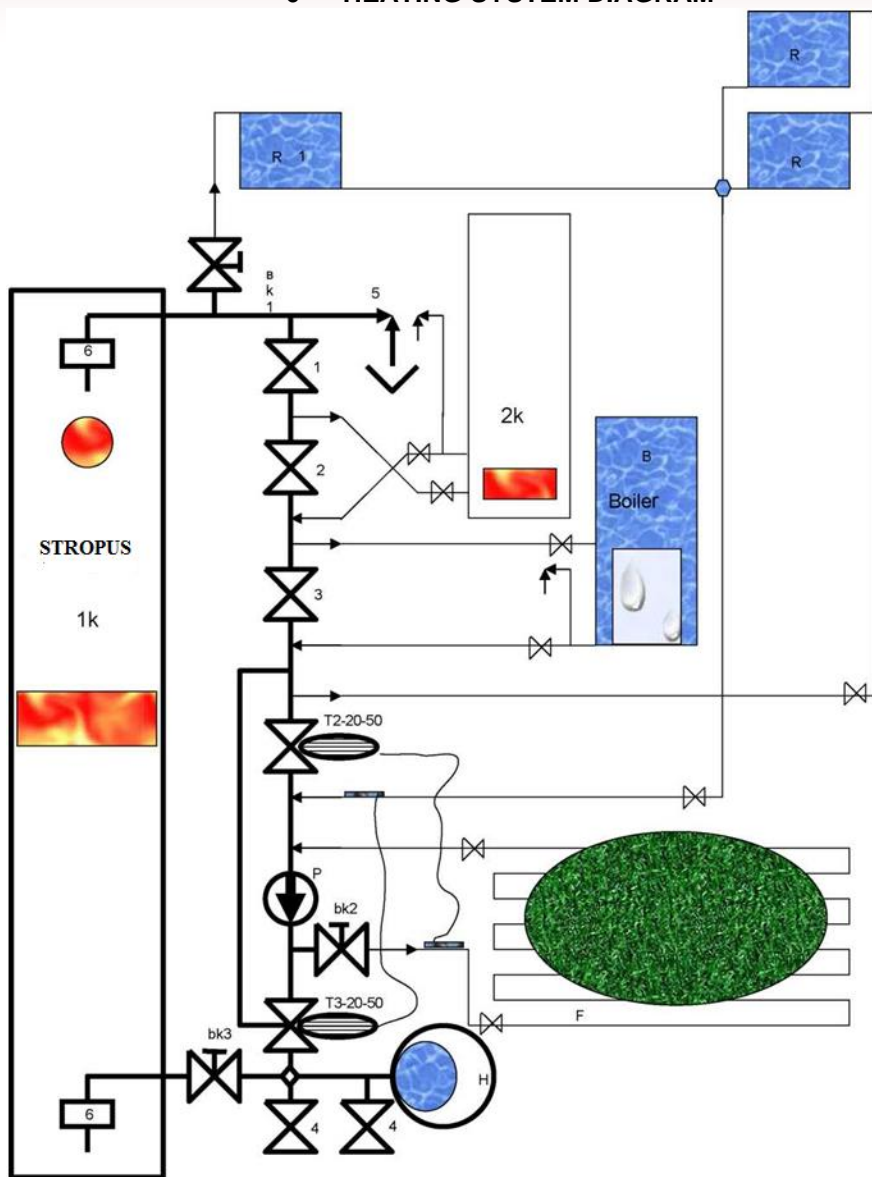


Figure 10

6.1 DIAGRAM OPERATION EXPLANATION

Pump (P) pulls water from heating elements and pushes it through boiler and into heating elements. Through balance tap (bk1) hot water goes to the closest radiator which can operate in self-contained way in order to protect the boiler in case of power loss (radiator has no temperature valve).

Hot water further flows through the boiler of non-solid fuel 2k (if it is present), which turns on when boiler 1k stops burning or when 1k is turned on using inner automatics and 2k is turned off. If boiler 2k is present in the system, valve (2) is shut, if it is not present valve is open.

Hot water further flows through heater of water (B) and valve (3). If inputs of heater are of sufficient diameter, valve (3) is shut – more water is heated when flow goes only through heater.

After heating the household water, thermofication water flow to the radiator system and through thermostat valve (T2-20-50), if needed, into floor heating system. Sensor of thermostat valve opens the valve when water that is flowing into floor becomes colder than selected value (around 35 °C) – and closes the valve when flowing water is warmer than selected value.

Thanks to this pump (P) water loudly circulates through coil-pipes (F) of floor heating, also flows to boiler through distribution valve (T-3-20-50), which, when water from radiators is warmer than the selected value (recommended 40 °C), directs part of colder flow to radiator system thanks to the sensor, therefore temperature of premises is stable because even without thermo-valves floor is still protected from overheating. (bk2) and (bk3) are closing valves (not ball taps) or further valves for adjusting the flow, which distributes the flow in such manner that it would be sufficient for floor heating and suitable for boiler. Overall amount of flow depends on circulation pump, but it also can be adjusted by changing the speed of pump. If system has no floor heating, you should cover T2 with a cap – thermostat is not necessary. During summer, when boiler is turned on for heating the water tank, radiators and floor collectors must be closed and T2 must be opened by unscrewing the cap or removing the thermostat.

10 kW boiler can be paired with 25 – 60 W circulation pump.

20 kW boiler – with 40 – 80 W

40 kW boiler – with 50 – 100 W

(bk–1) – balance valve of safety gravity operated radiator – flow must be adjusted to such value that return pipe of radiator would be 40 °C colder than supplied.

(6) - separable connectors - after they are loosened - node can be rotated to the other side.

6.2 Connection diagram of "Stropus" boiler to another boiler, water heater and floor heating

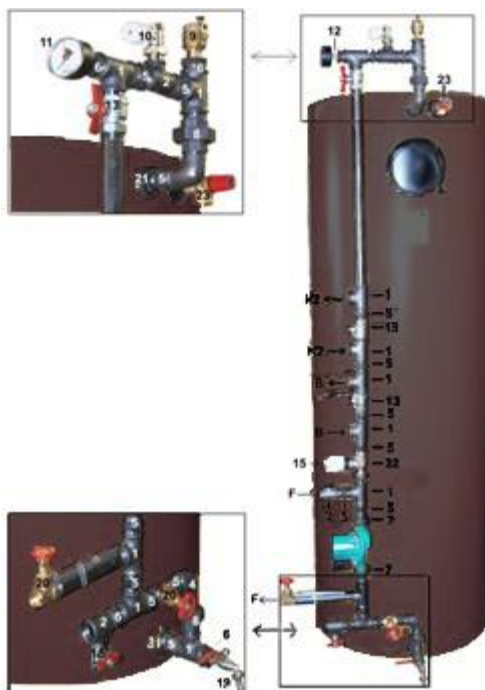


Figure 11

1. Triple D25	- 10 pcs.	18. Filling valve i/i 1/2"	- 1 pcs.
2. Triple D25 x D15	- 3 pcs.	19. Release valve 1/2"	- 1 pcs.
4. Elbow D25 V/i	- 2 pcs.	20. Brass disc valve V/V 1"	- 2 pcs.
5. Nipple D25	- 15 pcs.	21. Adapter D32 x D25	- 2 pcs.
6. Adapter D25 x D15	- 3 pcs.	22. Thermostatic valve	- 1 pcs.
7. Circulation pump installation kit D25	- 1 pcs.	23. Valve 1,5 bar	- 1 pcs.
8. Separable connection D25 V/i	- 2 pcs.		
9. Automatic bleeding device	- 1 pcs.	F - to/out of floor heating	
10. Balance valve D25 V/i	- 1 pcs.	B - to/out of water tank	
11. Horizontal monometer 1/4"	- 1 pcs.	K2 - to/out of other boilers	
12. Adapter D15 x 1/4"	- 1 pcs.		
13. Ball valve V/i 1"	- 3 pcs.		
14. Circulation pump	- 1 pcs.		
15. Thermostatic head 20 - 50 °C	- 1 pcs.		

For boilers S20, S20 BIO and S20U, nodes are assembled from parts D20. For boilers S30, S30 BIO and S30U, S40, S40 BIO, S40U nodes are assembled from parts D25.

6.3 Connection diagram of "Stropus" boiler to another boiler, water heater, radiator, floor heating

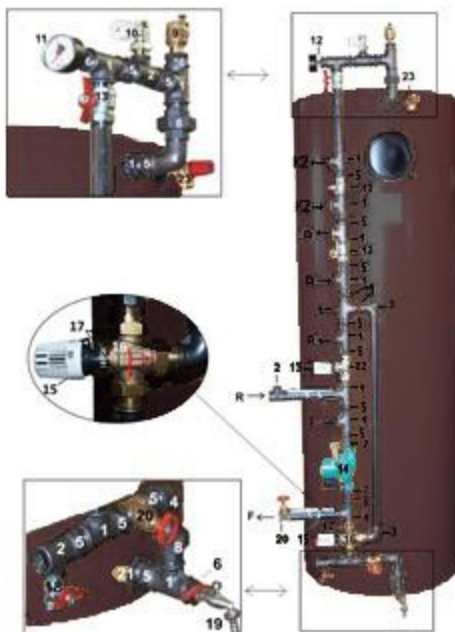


Figure 12

1. Triple D25	- 13 pcs.	16. Three directional distribution valve	- 1 pcs.
2. Triple D25 x D15	- 3 pcs.	17. Threaded tip DN2 25	- 3 pcs.
3. Elbow D25 V/V	- 2 pcs.	18. Filling valve i/i 1/2"	- 1 pcs.
4. Elbow D25 V/i	- 2 pcs.	19. Release valve 1/2	- 1 pcs.
5. Nipple D25	- 17 pcs.	20. Brass disc valve V/V 1"	- 2 pcs.
6. Adapter D25 x D15	- 3 pcs.	21. Adapter D32 x D25	- 2 pcs.
7. Circulation pump installation kit D25	- 1 pcs.	22. Thermostatic valve	- 1 pcs.
8. Separable connection D25 V/i	- 2 pcs.	23. Valve 1,5 bar	- 1 pcs.
9. Automatic bleeding device	- 1 pcs.	F - to/out of floor heating	.
10. Balance valve D25 V/i	- 1 pcs.	B - to/out of water tank	.
11. Horizontal monometer 1/4"	- 1 pcs.	K2 - to/out of other boilers	.
12. Adapter D15 x 1/4"	- 1 pcs.	R - to/out of radiator	.
13. Ball valve V/i 1"	- 3 pcs.		.
14. Circulation pump	- 1 pcs.		.
15. Thermostatic head 20 - 50 °C	- 2 pcs.		.

For boilers S20, S20 BIO and S20U, nodes are assembled from parts D20. For boilers S30, S30 BIO and S30U, S40, S40 BIO, S40U nodes are assembled from parts D25.

6.4 Connection diagram of "Stropus" boiler to another boiler, water heater, and radiator

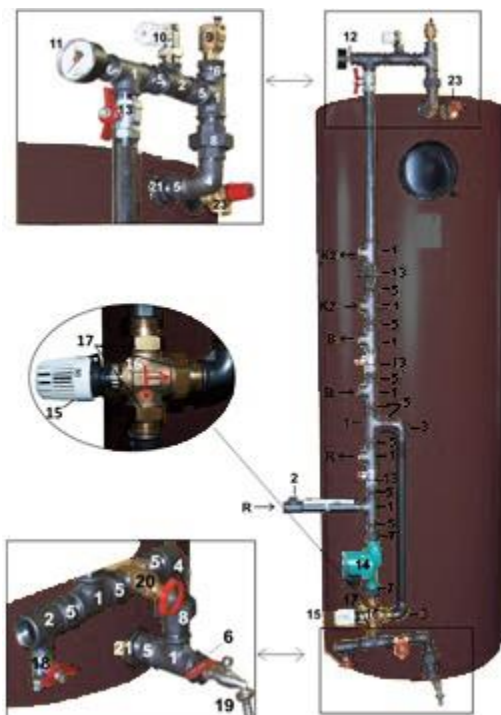


Figure 13

1. Triple D25	- 11 pcs.	13. Ball valve V/i 1"	- 4 pcs.
2. Triple D25 x D15	- 3 pcs.	14. Circulation pump	- 1 pcs.
3. Elbow D25 V/V	- 2 pcs.	15. Thermostatic head 20 - 50 °C	- 1 pcs.
4. Elbow D25 V/i	- 2 pcs.	16. Three directional distribution valve	- 1 pcs.
5. Nipple D25	- 15 pcs.	17. Threaded tip DN2 25	- 3 pcs.
6. Adapter D25 x D15	- 3 pcs.	18. Filling valve i/i 1/2"	- 1 pcs.
7. Circulation pump installation kit D25	- 1 pcs.	19. Release valve 1/2	- 1 pcs.
8. Separable connection D25 V/i	- 2 pcs.	20. Brass disc valve V/V 1"	- 1 pcs.
9. Automatic bleeding device	- 1 pcs.	21. Adapter D32 x D25	- 2 pcs.
10. Balance valve D25 V/i	- 1 pcs.	23. Valve 1,5 bar	- 1 pcs.
11. Horizontal monometer 1/4"	- 1 pcs.		
12. Adapter D15 x 1/4"	- 1 pcs.		
		B - to/out of water tank	
		K2 - to/out of other boilers	
		R - to/out of radiator	

For boilers S20, S20 BIO and S20U, nodes are assembled from parts D20. For boilers S30, S30 BIO and S30U, S40, S40 BIO, S40U nodes are assembled from parts D25.

7 FIRING AND FUELING THE BOILER

7.1 FUEL BURNS MOST EFFICIENTLY WHEN COMBUSTION CHAMBER IS FULLY LOADED

Stropus "U" boiler has a switch valve (4) (Fig. 1), which, when burning coal must be raised on the support (Fig. 14), when burning firewood – lowered. Firewood boiler and "BIO" does not come with such a valve (4) (Fig. 1). When loading fuel, it is mandatory to lift the air distributor (7) (Fig. 1). To do this you must take the ring at the end of the cord, (9) (Fig. 1), which is hanging above the fuel loading doors, pull it down and hang it on the hook (10) (Fig. 1). Stack the firewood horizontally, with longer pieces in the middle and shorter ones on the sides. Do not let vertical pieces get in the middle. It is advisable to fill up remaining openings with sawdust or smaller wood residues.

Fire grate (17) (Fig. 1) must be used when loading coal, briquettes, pellets. It is opened by lifting up the switch valve, for coal and peat (4) (Fig. 1). Formed ash and resin has to be

cleaned before loading. Use pieces of coal, if larger than half a litre – chop the pieces. Do not mix any other fuel when using coal, only add about 2 kg of dry, shredded, small piece firewood. The boiler works at 50 – 70% lower mode, thus use fine coal during warmer days. When loading peat, use mostly large briquettes till the load is almost full, only adding some



fine pieces of peat at the end.

Figure 14

After loading firewood, pellets and sawdust briquettes immediately ignite – so that the load of fuel would not be ignited by leftover ember.

Before igniting the boiler carefully read the instruction of traction regulator (see section 7.3).

Ignite the very top of the load, closing the door partially (6) (Fig. 1), leaving a 2-5 cm gap. Close the door (6) (Fig. 1) when fuel begins to burn and unhook the ring with lifting cord (9) (Fig. 1), from the hook (10) (Fig. 1). Flammable liquid designed for igniting furnaces and fireplaces can be used for igniting the fuel, but do not use it when boiler is already burning. In no circumstances, should the air travel through the lower ash cleaning doors (8) (Fig. 1).

When boiler is burning, a window or special opening in an outer wall of boiler room must be present so that the boiler can pull air from the outside.

It is not allowed to keep adding fuel when burning coal. When using firewood, pieces can be added to boiler together with larger wood residues at the time of burning: before doing that, you must first lift the air distributor (7) (Fig. 1) open the doors (6) (Fig. 1). When boiler is running, it is dangerous to instantly open the door widely (6) (Fig. 1.) - fire can burn your face. So, at first, open the fuel loading doors, leaving a 2-3 cm gap, without looking and keeping distance (6) (Fig. 1.) and after 20-30 seconds open the doors completely (6) (Fig. 1) and load firewood, but not more than two layers (20-30 cm), close the doors (6) (Fig. 1) and lower the air distributor (7) (Fig. 1).

After adding fuel, quality of burn and efficiency will decrease for short time, so such addition is recommended only to extend the time of fuel burn till the next ignition.

When using pellets, saw dust briquettes, damp wood or other wood fuel or its residues, we recommend using air supply ventilator (Fig. 2), and for enhancing burn stability we recommend putting other fuel in between firewood layers in specific areas. Air supply ventilator (Fig. 2) is necessary when using pellets, sawdust briquettes, coal and peat. Any type of fuel must always be loaded through upper doors (6) (Fig. 1).

When using calorific coal, we recommend leaving air distributor in lifted position and when half a load is left - to let it rest on the fuel. This will enhance the longevity of the air distributor.

ATTENTION!

7.2 RECOMMENDATIONS WHEN FIRING UNIVERSAL "STROPUS" BOILER

Air valve that lets air flow under fire grate (17) (Fig. 1) is controlled with the help of switch valve (4) (Fig. 1) which is located on the boiler's top of the flue side. Switch valve has: a) handle (bolt for fixing the primary valve position) and b) valve opening support.

After loading coal, it is recommended to open the bottom doors (8) (Fig. 1) and to clean small fallen coal pieces from the bottom through the fire grate (17) (Fig. 1). At the beginning, you can also load smaller pieces of firewood on fire grate (17) (Fig. 1), so that small pieces of coal would not be able to fall down to the bottom. Coal load must not be larger than up to the fuel loading door (6) (Fig. 1). Put firewood (about 2 kg) on top of coal and ignite it.

After ignition, switch valve (4) (Fig. 1) must be lifted of the support – so that switch valve (4) (Fig. 1) would be closed and burning would proceed from the top. Depending on fuel type (various briquettes, soft and hard coal, damp firewood, pellets) quality burn will last from 3 to 24 hours. Later (when power is lacking) lift the switch valve (4) (Fig. 1) on support. After an hour check the smoke, if it is black and thick, gradually close the switch valve (lower the bolt every 5 minutes) (4) (Fig. 1). Smoke should be grey and clearly visible (after setting these parameters it can disappear).

7.3 BOILER THERMOSTATIC DRAUGHT REGULATOR CONFIGURATION



Thermostatic draught regulator Honeywell (or its equivalent) is screwed into a welded $\frac{3}{4}$ coupling located on the side the boiler.

One end of a chain must be attached to the air valve. Light the fuel in the boiler. When thermometer, located in the boiler's front, reaches 70 °C temperature, fully close the valve. Set the draught regulator's head at 70 °C. Attach the free end of the chain to traction regulator's rod bolt. The chain must be tightened and valve completely closed. When temperature starts to drop, draught regulator automatically opens the valve, when it reaches set 70 °C it closes again.

During transportation air supply, valve can fall out of the frame. Therefore, it is required to unscrew the lid at the top of the boiler and check the position of the valve, if necessary - insert it into the frame.

Figure 15

In the event of an emergency, the valve needs to be closed manually by turning the draught regulator in the direction of decreasing gradation or by uncoupling the chain from the bolt of the air draught regulator rod, thus allowing the valve to close by itself. In this way, air no longer enters the combustion chamber, the combustion process is forcibly stopped.

7.4 ASSESSMENT OF BOILER OPERATION

a) If after ignition, boiler works correctly, but later decreases in power and draft, meaning, that the flue is not sealed properly: check if flue cleaning door is closed or if there are any other openings - eliminate them.

b) If after igniting fuel you hear rhythmic noise and occasionally see smoke coming out it means that flue traction is too strong – boiler is unable to attain its power and works very inefficiently: in this case, you need to let some air into the flue through special opening on horizontal connection. Metal band flue ring must be pushed till the pulsation of boiler disappears (see Fig. 10).

c) If the fuel is burning well, but temperature increases very slowly and there is condensation leaking out of flue it means that there is an excessive flow of heated water going through the boiler. Set circulation pump to the lowest position and reduce the flow with help of boilers balance tap or reduce the flows in heating elements till there is no more condensation leaks and thermometer shows 70 – 80 °C.

7.5 CLEANING AND MAINTAINING THE BOILER

When using firewood, you must remove the ashes every month. When using peat and coal, ash must be removed each time before firing. Naturally some resin accumulates inside the boiler, amount of resin increases when flue draft is incorrect; when air gets in through bottom or through bottom ash removal doors (8) (Fig. 1); when at the time of burning, fuel is added constantly and air distributor is lifted; when heated water flow is too high.

If draft decreases, openings between air heating chamber (2) (Fig. 1) and inner boiler walls need to be inspected and cleaned. They can be cleaned with a flexible brush through inner smoke opening (3) (Fig. 1) above fuel loading doors (6) (Fig. 1). It is most convenient to clean through the smoke outlet (3) (Fig. 1) (after dismantling the connection with flue), or through special opening in the connection itself (Fig. 4). **Boiler will not become clogged up if heating system is correctly installed, flue is well preserved and used according to instructions.**

Air distributor (7) (Fig. 1) can scoop some ash when it is lowered, so its openings sometimes need to be checked and cleaned.

Lifting cord mechanism (9) (Fig. 1), must be oiled so that it wouldn't wear out and distributor (7) (Fig. 1), would be lifted more easily. We also recommend oiling the closing door hooks.

Sometimes it needs to be checked if the doors seals uniformly. In order to make doors seal uniformly, gasket needs to be changed or lock tabs need to be adjusted.

8 SAFETY EQUIPMENT REQUIREMENTS

Boiler room is a zone of increased hazard. Irresponsible behaviour can lead to injuries, poisoning, fire, damage to boiler or the heating system.

Safety requirements and warnings	Consequences for not adhering to the safety requirements and instructions
1. Do not let the water in boiler reach the boiling point. Do not fire the boiler without water. Do not let the pressure of system exceed 1,5 bar. Do not freeze the water in the boiler or heating system.	1. After water boils out, boiler will overheat and crack up. If temperature is rising in the boiler without known reason, immediately close the top air supply valve, lift the air distributor, set the water pump to maximum speed, open the door while keeping your face away and load sand, dirt or other inflammable material.
2. Boiler room ventilation is necessary.	2. Boiler operates poorly.
3. Do not allow air in trough the bottom door and do not ignite fuel from the bottom.	3. Condensate will leak, you will use up more wood. Water in boiler will start to boil and coal will fall out.
4. Do not store fuel inside boiler (after loading the firewood it has to be ignited).	4. Firewood will ignite from leftover ember at the bottom and will burn out while leaving condensate and raisins.
5. While boiler is burning do not lift the air distributor.	5. If you hit air distributor, which has softened from heat, against the firewood you will bend it and if it will stick deeper into fuel its lifespan will be reduced significantly.
<u>Most common installation mistakes</u>	<u>Consequences</u> <u>Troubleshooting</u>
1. Installed using other boiler manufacturer diagrams.	1. High flow cools the walls of combustion chamber and smoke opening enough for humidity to appear. When boiler is heated, humidity disappears, but it makes the ash stick to the walls and therefore boiler and flue becomes clogged up periodically. Recommended flow must be achieved – moisture will accumulate at a lower point than centre of combustion – smoke openings will stay clean.
2. Circulation pump, together with boiler, is installed in on old gravity circulation system, which has no element adjustment	2. Large amounts of condensate are produced because of high flow of cold water, boiler room will acquire poisonous smell of condensate. Boiler works very inefficiently and it lacks power. Balance tap must be installed before boiler, or boiler room should be built according to figure 7 diagram.
<u>Most common operation mistakes</u>	<u>Consequences</u> <u>Troubleshooting</u>
1. Boiler is fired while flue draft is too high.	1. Pulsation can be heard in a boiler. Air valve sometimes jumps. Boiler operates very inefficiently - condensate is leaking and there is a lack of power. Extraneous air must be supplied through the flue ring. If your boiler has no flue connection, you will only have to do "U" form cut in a sill and gradually unbend this newly created plate until the boiler starts working normally. Alternatively, you can install a draught regulator.
2. Lifting cord of air distributor is not oiled.	2. Air distributor is difficult to lift, cord wears excessively. Must be lubricated using WD - 40.
3. Plastic material, cardboard boxes are being burnt in the boiler.	3. Cardboard boxes obstruct the burn and burning plastic package leftovers is dangerous, because produced gasses cannot burn evenly quickly, and excessive gasses explode inside chimney and damage the connections of the flue.

9 RISK ASSESSMENT

9.1 HEAT HAZARDS

Touching hot elements of boiler can cause burns. Boiler's surface area, which heats up to 40 °C and other parts are thermally isolated given the technical possibilities, but there are other parts such as door handles which get even hotter and are dangerous to humans. Such places are marked with an international hazard sign. After hydraulic test, hot water pipes of the heating system must be thermally insulated.

9.2 PRESSURE HAZARDS

Pressure can get higher: in case of power loss when circulation pump stops working, boiler is not filled with cold water from heating system and temperature rises to the critical point, then draft regulator is turned on, closing the valve at the selected temperature, causing the air to not be supplied and extinguishing the boiler. Water in boiler won't boil because firewood is extinguished fairly quickly as there is only one layer burning. If air inlet valve is damaged or because of other breaches of exploitation rules (for example, ash removal doors are left open) the water inside the boiler can begin to boil. Therefore, safety valve (Fig. 9) of 1,5 bar must be used; it is mounted at the top of boiler, next to the flue (see 6.2; 6.3; 6.4 in connection diagrams). According to Figure 10 we recommend connecting gravity controlled radiator (a radiator without thermos-valve). Hot water goes through balance tap (bk1) (Fig. 10) to the nearest radiator which can work in gravity circulation mode so that in case of power loss the boiler would be protected from overheating. (bk1) – safety gravity circulating radiator balancing tap must be such that radiator return pipe would be 40 °C colder than supply pipe.

9.3 POSSIBILITY OF POISONING

When flue is clogged up or when cleaning ashes, carbon monoxide can accumulate in the boiler room, therefore natural ventilation with air pull is needed, air inlet ventilation is needed for it to work – it can be an opening or open window in outer wall of the building. If there is no inlet ventilation, boiler will not work. So, don't forget about inlet ventilation in boiler room, this ventilation must be directly connected to the outside. Boiler room doors must be shut tightly, so that when kitchen ventilations or compulsory connection nodes are turned on, work of the boiler would not be interfered with and dust or carbon monoxide would not be able to get into the living quarters.

9.4 ELECTRICAL CONNECTION REQUIREMENTS

Circulation pumps that are installed in the system use electric energy. They must be connected by a qualified electrician that has permission for the job.

Possible effect of electric current on human beings.

Electrical installation must be carried out according to governmental requirements.

10 ACCESSORIES

Accessories for the boiler must be ordered separately.

10.1 PELLETT BURNER

Per request of a client a pellet burner with all needed equipment can be connected to every solid fuel boiler "Stropus". **You won't have to buy a new boiler** - all it takes is to modernize the older boiler "Stropus". The boiler retains the ability to use firewood, briquettes and coal.



Figure 16

These are possibly **the cheapest pellet boilers** which do not require maintenance and can alternatively use **any solid fuel and assure long burning time**.

Benefits:

- No need to move the boiler and repeatedly connect to the chimney or heating system;
- Usually no need to make changes in the heating system;
- This solutions allows a **complete automatization of firing process** – automatic ignition of fuel, selection of work parameters, precise temperature control, remote control;
- You will have **comfortable alternative – pellets**. No need to prepare this fuel in advance. Ash needs to be removed only every two weeks. Pellets completely burn in burners. **99% efficiency can be achieved**;
- Boiler has a large surface area of heat dissipation, heat exchanger and effective construction which can assure **maximum heat transfer**.

Pellet burning time depends on:

- Pellet hopper capacity (a desired size can be chosen)
- Pellet properties (dampness, calorific value)
- Air temperature
- Home heat demand

11 PACKAGE CONTENT

PACKAGE CONTENT (Firewood boiler)

- Solid fuel boiler "STROPUS" – 1 pcs.
- Safety pressure valve 1,5 bar – 1 pcs.
- Thermometer – 1 pcs.
- Deflectors – 2 pcs.
- Air supply ventilator – 1 pcs.
- Air distributor – 1 pcs.
- Technical passport – 1 pcs.

PACKAGE CONTENT ("U" - universal boiler)

- Solid fuel boiler "STROPUS" – 1 pcs.
- Safety pressure valve 1,5 bar – 1 pcs.
- Thermometer – 1 pcs.
- Deflectors – 2 pcs.
- Air supply ventilator – 1 pcs.
- Air distributor – 1 pcs.
- Fire grate – 1 pcs.
- Technical passport – 1 pcs.

PACKAGE CONTENT ("BIO" boiler)

- Solid fuel boiler "STROPUS" – 1 pcs.
- Safety pressure valve 1,5 bar – 1 pcs.
- Thermometer – 1 pcs.
- Deflectors – 2 pcs.
- Air supply ventilator – 1 pcs.
- Air distributor – 1 pcs.
- Fire grate – 1 pcs.
- Technical passport – 1 pcs.

We recommend purchasing a backup generator for those that are experiencing power outage.

12 PRODUCT WARRANTY CONDITIONS

Manufacturer guarantees that this product meets the requirements of technical documentation.

During the warranty period manufacturer takes on the responsibility to repair any malfunctions which arise due to manufacturers fault.

Works of system adjustment, installation, cleaning of boiler, starting the product are not part of the warranty services.

By purchasing this product consumer undertakes the responsibility:

- To install the boiler and use it according to the requirements of this manual;
- With the help of specialists to carry out the prophylactic procedures, inspection of boiler and control elements at least once a year;
- To preserve warranty agreement and its entries.

We recommend that the installation assessment, the first start-up / adjustment of the boiler be performed by certified UAB “Stropuva ir ko” specialist.

Manufacturer cannot be held responsible for the operation of boiler and consequences arising out of using it, and is not providing warranty in such cases:

- Purchase document is not presented / warranty agreement is not fully filled out;
- Boiler capacity does not correspond to the energy needs of the facility;
- Boiler is installed without adherence to the requirements of this manual / technical passport;
- Boiler is operated without adherence to the requirements of this manual/ technical passport;
- Boiler fails because of incorrect supply of electric energy and current fluctuatio

13 WARRANTY CERTIFICATE

MANUFACTURER:	JSC "Stropuva ir ko", Company code 300149972 Address: Kęstučio g. 1A, Lentvaris, Trakų distr. LT-25144 Lithuania tel.: +370 525 51763
Boiler model:	
Product number:	
Date of sale / Signature / Stamp	
SELLER:	
Date of sale / Signature / Stamp	
PERSON RESPONSIBLE FOR INSTALLATION:	
Installation address:	
Date / Name Surname/ Signature / Stamp	
SPECIALIST performed the assessment of installed heating system and commission of the boiler	
Notes	
Date / Name Surname/ Signature / Stamp	



WARRANTY / POST WARRANTY SERVICE			
Date	Work carried out, replace parts	Organization	Name / Surname / Signature

The boiler has a one-year warranty*

*If the heat exchanger is broken, seller has to fix the boiler on its own expense, but if other components are broken not due to the fault of the end user, customer has to disassemble the part and the seller has to change the part without installation or the seller suggests paid qualified services.



DECLARATION OF PERFORMANCE / EKSPLOATACINIŲ SAVYBIŲ DEKLARACIJA

No. Nr. DOP 001

- Unique identification code of the product type /
Produkto tipo unikalūs identifikavimo kodas: S7; S10; S26; S40
- Intended use /
Naudotinis paskirtis: Solid fuel boiler / Kieto kuro katilas
- Manufacturer /
Gamintojas: JSC "Stropuva ir ko" / UAB "Stropuva ir ko"
Daruiama ir Gietimo g. 81, Vilnius m., Vilniaus m. sav., LT-02189
- Authorized representative /
Įgaliojamas atstovas: —
- System of AVCP /
Eksploatacinių savybių patvirtimo vertinimo ir tikrinimo sistema: System 4/ Sistema 4
- Harmonised standard /
Dėmusio standartas: EN 303-5; EN 10204 - 3.1; EN 15614 - 1
- Notified body /
Notifikacinis įstaiga: Notified Body number : 1399
- Declared performance(s) /
Deklaruojama (-os) eksploatacinė (-ės) savybė (-ės): —

Essential characteristics/ Eksploatacinės savybės	Performance / Dėmusio rodikliai	Harmonised technical Specification / Dėmusio techninė specifikacija
Pr (bar)	1.5	EN 303-5; EN 10204 - 3.1; EN 15614 - 1
T _h (°C)	95	
Terpe (l/hd)	Vanduo 2 grupė (water 2 group)	
Volume (m)	15, 22, 40, 52	
Prado Nr. (Ames Nr)	15/26-6	

The performance of the product identified above is in conformity with the set of declared performance(s). This declaration of performance is issued, in accordance with Regulation (EU) No 305/2011, under the sole responsibility of the manufacturer identified above. / Nurodytu produkto eksploatacinių savybių atitikimą visais deklaruotais eksploatacinių savybių. Ši deklaratavimą savybių deklaratavimą patvirtinama vadovaujantis Reglamentu (ES) Nr. 305/2011, atitakomybė at jai turiu teikia tik joga nurodytas gamintoja.

Signed for and on behalf of the manufacturer by / Pasirašyta (gamintojo ir jo vardas):

Naldas Stramlauskas

name / vardas ir pavardė

2015 04 14
date of issue / išdavimo data



signature / parašas



DECLARATION OF PERFORMANCE / EKSPLOATACINIŲ SAVYBIŲ DEKLARACIJA

No. Nr. DOP 002

- Unique identification code of the product type /
Produkto tipo unikalūs identifikavimo kodas: S10H; S20H; S40H
- Intended use /
Naudotinis paskirtis: Solid fuel boiler / Kieto kuro katilas
- Manufacturer /
Gamintojas: JSC "Stropuva ir ko" / UAB "Stropuva ir ko"
Daruiama ir Gietimo g. 81, Vilnius m., Vilniaus m. sav., LT-02189
- Authorized representative /
Įgaliojamas atstovas: —
- System of AVCP /
Eksploatacinių savybių patvirtimo vertinimo ir tikrinimo sistema: System 4/ Sistema 4
- Harmonised standard /
Dėmusio standartas: EN 303-5; EN 10204 - 3.1; EN 15614 - 1
- Notified body /
Notifikacinis įstaiga: Notified Body number : 1399
- Declared performance(s) /
Deklaruojama (-os) eksploatacinė (-ės) savybė (-ės): —

Essential characteristics/ Eksploatacinės savybės	Performance / Dėmusio rodikliai	Harmonised technical Specification / Dėmusio techninė specifikacija
Pr (bar)	1.5	EN 303-5; EN 10204 - 3.1; EN 15614 - 1
T _h (°C)	95	
Terpe (l/hd)	Vanduo 2 grupė (water 2 group)	
Volume (m)	15, 22, 40, 52	
Prado Nr. (Ames Nr)	15/26-6	

The performance of the product identified above is in conformity with the set of declared performance(s). This declaration of performance is issued, in accordance with Regulation (EU) No 305/2011, under the sole responsibility of the manufacturer identified above. / Nurodytu produkto eksploatacinių savybių atitikimą visais deklaruotais eksploatacinių savybių. Ši deklaratavimą savybių deklaratavimą patvirtinama vadovaujantis Reglamentu (ES) Nr. 305/2011, atitakomybė at jai turiu teikia tik joga nurodytas gamintoja.

Signed for and on behalf of the manufacturer by / Pasirašyta (gamintojo ir jo vardas):

Naldas Stramlauskas

name / vardas ir pavardė

2015 04 14
date of issue / išdavimo data



signature / parašas



DECLARATION OF PERFORMANCE / EKSPLOATACINIŲ SAVYBIŲ DEKLARACIJA

No. Nr. DOP 003

- Unique identification code of the product type /
Produkto tipo unikalūs identifikavimo kodas: S7BIO; S10BIO; S20BIO; S40BIO
- Intended use /
Naudotinis paskirtis: Solid fuel boiler / Kieto kuro katilas
- Manufacturer /
Gamintojas: JSC "Stropuva ir ko" / UAB "Stropuva ir ko"
Daruiama ir Gietimo g. 81, Vilnius m., Vilniaus m. sav., LT-02189
- Authorized representative /
Įgaliojamas atstovas: —
- System of AVCP /
Eksploatacinių savybių patvirtimo vertinimo ir tikrinimo sistema: System 4/ Sistema 4
- Harmonised standard /
Dėmusio standartas: EN 303-5; EN 10204 - 3.1; EN 15614 - 1
- Notified body /
Notifikacinis įstaiga: Notified Body number : 1399
- Declared performance(s) /
Deklaruojama (-os) eksploatacinė (-ės) savybė (-ės): —

Essential characteristics/ Eksploatacinės savybės	Performance / Dėmusio rodikliai	Harmonised technical Specification / Dėmusio techninė specifikacija
Pr (bar)	1.5	EN 303-5; EN 10204 - 3.1; EN 15614 - 1
T _h (°C)	95	
Terpe (l/hd)	Vanduo 2 grupė (water 2 group)	
Volume (m)	15, 22, 40, 52	
Prado Nr. (Ames Nr)	15/26-6	

The performance of the product identified above is in conformity with the set of declared performance(s). This declaration of performance is issued, in accordance with Regulation (EU) No 305/2011, under the sole responsibility of the manufacturer identified above. / Nurodytu produkto eksploatacinių savybių atitikimą visais deklaruotais eksploatacinių savybių. Ši deklaratavimą savybių deklaratavimą patvirtinama vadovaujantis Reglamentu (ES) Nr. 305/2011, atitakomybė at jai turiu teikia tik joga nurodytas gamintoja.

Signed for and on behalf of the manufacturer by / Pasirašyta (gamintojo ir jo vardas):

Naldas Stramlauskas

name / vardas ir pavardė

2015 04 14
date of issue / išdavimo data



signature / parašas

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