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Notified Body according Regulation (EC) 305/2011
Identification number: 1879
DIN CERTCO Registration No: PL211

TEST REPORT

For initial type test of a residential space heating appliance fired by wood pellets in compliance with EN 14785:2006

No of test report: **NB 1879 – K – 22 – 2016**

Object for testing: a residential space heating appliance fired by wood pellets EN 14785:2006

Model:	"HANUMA 11" Serial No 201611001
Kind of the heating appliance:	an appliance with continuous burning for operation with closed door
Purpose:	for heating of house rooms without hot water tank
Burning material:	wood pellets

Producer: "Lafat Komerc" d.o.o., Industrijska Zona BB, 75260 Kalesija, Bosna and Herzegovina

Applicant's name: "Biodom 27" d.o.o., OIC HRPELJE 4A, 6240 Kozina, Slovenia

Request: No 13 / 04.07.2016

Range of request: Initial type test within the methods for assessment of CE conformity and assessment of the appliance regarding the meeting of requirements in compliance with EN 14785:2006 and BImSchV step 2.

Duration of test: 18.07.2016 ÷ 22.07.2016

Place for testing: Testing laboratory "Kontrol 94" Ltd., Gorna Oryahovitsa

Head of Laboratory: .....
/ Dipl. Eng. Goran Gadjonov /

Date: 25.07.2016
Gorna Oryahovitsa

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1. Description of tested appliance

1.1 Construction

♦ A heating appliance, consisting of a combustion chamber and a flue gas collector, connected with sucking pipe to a fan sucking the flue gases out of combustion chamber, and a pellet auger feed, and an igniter, and a device for automatic control of the pellet stove through a control panel equipped with the necessary sensors for controlling the process and pellet auger feed, and igniter, and flue aspirator and convection fan;
♦ The combustion chamber door made of sheet steel and has an in-built fireproof glass at the front. The door and glass are sealed with insulation rope. The door closed the combustion chamber and ashtray.
♦ Automatic regulation of the primary air;
♦ Automatic pellet feeding from the pellet tank by inbuilt in hopper a pellet auger. The hopper is positioned behind the combustion chamber and has a capacity - 15 kg;
♦ The walls of combustion chamber are made of sheet steel;
♦ At the bottom of the combustion chamber is mounted on a steel box, in which is placed a retort;
♦ A rectangular retort made of steel sheet with dimensions 125.0 x 92.0 x 72.0 mm (width x depth x height) with orifices (59 – on the bottom with Ø6 mm; 2 – on the right side with Ø5 mm and three rectangular openings with dimensions 5 mm x 8 mm; 2 – on the left side with Ø5 mm and three rectangular openings with dimensions 5 mm x 8 mm; 9 – front with Ø6 mm; 3 – back with Ø6 mm; 4 with Ø4 mm and hole for lighter);
♦ The ashtray is made of sheet steel with capacity of 1.45 dm^3;
♦ In the space for the collection and evacuation of flue gases placed a steel screen;
♦ Operation is permissible only with a closed door;
♦ There is a built-in electronic controller (PLC) "LuciFire" to operate in different modes;
♦ Vertical safety device - integral part of the retort.
For additional data the wiring diagram, drawings and instructions presented by the producer have to be used.

1.2 Overall dimensions in cm: 43.8 x 47.3 x 101.0 cm
(width **x** depth **x** height)

1.3 Air for burning

1.3.1 Primary air: combustion air which enters through a metal pipe having an inner diameter Ø38 mm and the cross-sectional area is 11.34 cm^2. The tube directs air to the combustion chamber, entering under the grate of the retort. The exhaust fan creates a negative pressure in the combustion chamber, which is regulated by its speed. This is necessary for supplying combustion air.

1.4 Leading out the flue gases and connecting with the chimney: Above the burning chamber (the place for burning) the flue gases changes their direction of movement when reaching a shield of steel and through flue channels go to the flue gas fan. From the fan the flue gases go out of a horizontally installed tubular extension with Ø80 mm. There are sensors for chamber temperature, exhaust gasses temperature and the safety pressure switch.

1.5 Marking: A printed design is presented at the moment of issuing the protocol for the appliance plate. The data on the appliance plate has to be fulfilled by the producer in accordance with the data in this test report. The plate of the appliance has to be clearly and durably marked and it has to be mounted on such a place that the marking is preserved.

1.6 Electric safety: Declarations of conformity and Certificate of Conformity.

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2. Required documentation for testing:

2.1 Grounds for testing: Requestor's documentation for the testing
2.2 Normative documents for the testing:
2.2.1 EN 14785:2006 "Residential space heating appliances fired by wood pellets – requirements and test methods"
2.2.2 CEN / TS 15883:2009 "Residential solid fuel burning appliances – Emission test methods".

3. Performance determined in the test

Based on the submitted request for testing, initial type testing has been carried out in compliance with EN 14785:2006 regarding:

- Fire safety;
- Product emissions from burning;
- Surface temperature;
- Temperature of the flue gases;
- Heat capacity / energy efficiency;

As according to the presented documents (certificates) during the appliance manufacturing, materials are used which are not expected to release dangerous substances. The producer has to keep this information as a proof.

4. Summary results of the measurement and calculation of the performance of the appliance

Model:	**"HANUMA 11"**	**Serial №**	201611001
	Unit	***Nominal heating output***	***Reduced heating output***
Fuel	-	wood pellets	
Fuel consumption	kg/h	2.292	0.767
Heating output	kW	9.52	3.37
The mean CO at 13%O_2	%	0.0090	0.0086
Efficiency	%	91.21	96.39
Flue gases temperature	°C	138	57
Mass of the flue gases	g/s	6.01	2.86
Draught	Pa	10.5	9.0
Minimum distances of the heating appliance to burning materials:			
At the rear	mm	300	
At the side	mm	400	
At the front	mm	1000	
At the floor - legs	mm	30	
The mean value of dust in the flue gas at 13% O_2	mg/Nm^3	28.7	-

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The description of testing stages and the received results are given in Appendixes A of the Test report.

5. A list of enclosed documents

A1 – Verification of conformity of materials, design and construction.
A2 – Test requirements for safety.
A3 – Conditions and requirements for measuring performance.
A4 – Verification of compliance with the instructions of the appliance.
A5 – Verification of conformity marking the appliance.
A6 – Test fuels and list of technical means used for test and measurement during the test.
A7.1 and **A7.2** – Test conditions and results obtained from the measurement of performance at nominal and reduced heat.
A7.3 – Temperature safety test at nominal heat output and the results from measurement.
A8 – Requirements for BImSchV step 2 and the results.
A9 – Photos of product.
Plans (drawings) and specifications
Instruction for mounting and operation

CONCLUSION!

The basic characteristics of the appliance have been tested in compliance with EN 14785:2006 when using wood pellets as fuelling in conformity with the producer's instruction for exploitation. The test showed that the requirements to the stove for heating with closed door of the burning chamber are met.

The requirements, given in the instruction for mounting and operation as well as all legal national norms concerning the appliance, have to be observed.

The initial type testing within the range of usage of the CE assessment methods – the conformity ended positively.

ATTENTION!

The results from the test refer only to the tested sample.
Reproducing the present test report is allowed only in a complete form from "Kontrol 94" Ltd.

Appendix A1

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Verification of conformity of materials, design and construction, according to item 4

Requirement	Requirement in compliance with	Requirement is met
EN 14785:2006		
1	**2**	**3**
Production documentation	4.1	
♦ Documentation and plans (drawings), and electrical circuit diagrams		Yes
♦ Material specifications		Yes
♦ The nominal and reduced heat output using fuels recommended by the manufacturer		Yes
♦ The welding process used in the manufacture of the boiler shell (suffice it to indicate a symbol of the used welding)		NA
♦ Permissible maximum operating water temperature, °C		NA
♦ Permissible maximum operating pressure, bar		NA
♦ Test pressure, bar		NA
♦ The water heating output in kW		NA
General construction requirements	4.2	
♦ To ensure reliable and safe operation of the appliance.		Yes
♦ Not to allow release of toxic gases and falling out of embers in the room where the appliance is mounted.		Yes
♦ The maximum surface temperatures of the appliance components (covers, operating controls, safety devices and electrical accessories) not to exceed the allowable values.		Yes
♦ Not to use harmful materials as asbestos and soldering materials containing cadmium.		Yes
♦ Parts which need to be changed periodically have to be marked properly.		NA
♦ Parts which form the packing, have to be positioned safely with the help of bolts, gaskets or welding in order to prevent leakage of air/water or products of burning.		NA
♦ When using fireproof cement for packing, it has to be maintained by adjacent surface.		NA
♦ If the appliance is fitted with a boiler it shall meet the requirements given in 4.12.		NA
♦ The boiler, if fitted, shall be capable of operating safety at the permissible maximum operating pressure and shall meet the requirements of the type pressure test described in 5.8.		NA

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Verification of conformity of materials, design and construction, according to item 4

1	2	3
Flue spigot or socket	4.3	
♦ Safe and hermetic connection		Yes
♦ Length of connection where the flue gas connector fits an outlet spigot		
> 25 mm at chimney diameter < 160 mm		Yes
> 40 mm at chimney diameter > 160 mm		NA
♦ Length of connection where the flue gas connector fits into a socket, the insertion depth shall be a minimum of 25 mm.		NA
Combustion control device	4.4	
♦ The device shall be easily accessible and permanently marked.		Yes
♦ Their position in relation to their function shall be clearly recognizable.		Yes
Flueways	4.5	
♦ Minimum width. Not to be < 40 mm.		NA
♦ It shall be permissible to reduce it not to be <15 mm and available opening for cleaning.		Yes
♦ It shall be possible to clean the flueways completely using commercially available tools.		Yes
♦ The brushes or tools are provided by the manufacturer.		NA
Cleaning tools	4.6	
♦ Internal chimneys can be cleaned with ordinary tools (e.g. brushes)		Yes
♦ Special tools are provided by the producer		NA
Firedoors	4.7	
♦ Firedoors shall be designed to prevent accidental opening and to facilitate positive closure.		Yes

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Verification of conformity of materials, design and construction, according to item 4

1	2	3
Combustion air supply	4.8	
Primary air inlet control	4.8.1	
♦ The appliance shall be fitted with either a thermostatically or a manual primary air inlet control.		Yes
♦ The adjusting control shall be clearly visible or shall be permanently marked so that its operation is readily understandable.		Yes
♦ The ash or unburned fuel cannot prevent the movement or closure of the air inlet control.		Yes
♦ Where an appliance is designed for multi-fuel use a means shall be provided for the user to identify the correct set position of the primary air inlet control for each fuel type.		NA
♦ The method of adjustment of the air inlet control shall be described in the user instructions.		Yes
♦ Appliances fitted with a boiler shall be fitted with a water temperature actuated, thermostatically controlled fuel and air supply.		NA
Secondary air inlet control	4.8.2	NA
♦ Where a secondary air inlet control is provided of air entry shall be so designed that the passage of air is not restricted when the firebox is fitted to the manufacturer's recommended capacity.		
♦ To minimize the risk of condensation and the accumulation of combustion gases.		
Internal flue gas diverter	4.9	NA
♦ The position is well visible and durably marked.		
♦ Position can be fixed.		
♦ Not to close completely the outlet for the flue gases.		
♦ Correct mounting to be possible if the diverter is removable.		

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Verification of conformity of materials, design and construction, according to item 4

1	2	3
Retort ♦ Correct mounting to be ensured where the retort is removable. ♦ Device for removal of ashes.	4.10	 Yes NA
Ashpan and ash removal ♦ To effectively collect what is left from the burning under the grate (it shall be capable of containing the residue from two full charges of fuel). ♦ It does not obstruct the free passage of primary air. ♦ It can be easily and safely withdrawn, carried and emptied when hot, using the tool provided.	4.11	 Yes Yes NA
Integral boiler General requirements to the construction ♦ To be made of cast iron and/or steel and to be able to operate at the maximum permissible pressure, specified by the producer. ♦ The materials and size of the water heater have to meet the specifications given in table 2 to table 7. Nominal minimum wall thickness (steel) ♦ The minimum permissible wall thickness has to meet the requirements in table 2. ♦ Permissible deviations – in compliance with EN 10029:1991. Welding and welding materials ♦ The used materials have to be proper for welding. Minimum permissible wall thicknesses (cast iron) ♦ The minimum permissible wall thickness has to meet table 3. Cast iron subject to water pressure ♦ The mechanic features of cast iron parts, subject to pressure, have to meet the values, specified in table 4.	4.12 4.12.1 4.12.2 4.12.3 4.12.4 4.12.5	NA

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Verification of conformity of materials, design and construction, according to item 4

1	2	3
Venting of the water sections ♦ Venting of the water heater has to be possible. ♦ No undue boiling occurs when heating the water.	4.12.6	
Water tightness ♦ The openings for screws, used for mounting and demounting of parts, should not pass through the water channels or other spaces, provided for water transporting.	4.12.7	
Water side connections ♦ The connections pipe threading – in compliance with table 5. ♦ Tapered threading – in compliance with ISO 7-1:2000 and EN 10226-3. ♦ Parallel threading – in compliance with EN ISO 228-1:2003 and EN ISO 228-2:2003. ♦ The design and position of flow tapings shall be such that air will not be retained within the boiler shell. ♦ If the water connections' pipes are equipped with reducing bushes, they have to be eccentric and to be fixed in such a way that the reduced re-leasing opening to be on top. ♦ Minimum length of the connections' pipe or threading – table 6. ♦ If the water heater has a plug for drainage, it needs to have a minimum threading size from ½" and to be in conformity with ISO 7-1 and EN 10226-3 or EN ISO 228-1 and EN ISO 228-2:2003.	4.12.8	
Boiler internal waterways	4.12.9	
Design of all boiler waterways ♦ The water boiler construction has to ensure free movement of water through all of its parts. In order to reduce the accumulation of sediment, channels with down pointed sharp or V-shaped forms have to be avoided.	4.12.9.1	

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Verification of conformity of materials, design and construction, according to item 4

1	2	3
♦ When there are revision openings for checking or cleaning of the water channels, they have to be of a minimum size of 70 mm x 40 mm or minimum diameter Ø 70 mm. These openings have to be tightly closed. Water heater channels of indirect water system ♦ The minimum inside dimensions of the water channels should not be less than 20 mm In the cases when the water channels have to be narrower in order to facilitate the production or at the places where there is no direct contact with fire, their width can be reduced to no less than 14 mm. Water heater channels of direct water system ♦ The minimum inside dimensions of the water channels should not be less than 25 mm if there is possible contact with burning fuel, and not less than 12 mm if there is not possible contact with burning fuel.	4.12.9.2 4.12.9.3	
Control of flue gas If a flue damper is fitted: ♦ It does not block the flue totally. ♦ It has to be easily controllable and in closed position to ensure a light section with area no less than 20 cm^2 or 3% of the chimney area. ♦ The position of the damper shall be recognizable from costumers. The flue damper shall not be fitted to an appliance having a forced fan air supply.	4.13	NA
Cleaning of the heating surfaces ♦ All heating surfaces have to be accessible for cleaning. ♦ When the maintenance and cleaning of the water boiler requires special instruments, they have to be provided by the producer of appliance.	4.14	Yes NA

Appendix A2

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Test requirements for safety, according item 5

Requirement	Requirement in compliance with	Requirement in compliance with	Requirement is met
	EN 14785:2006		
1	2	3	4
Safety requirements	5		
Temperatures of adjacent combustible materials ♦ The temperature of the bottom, walls and/or ceiling of the tested corner should not exceed the room temperature by more than 65 K.	5.1	A.4.7/A.4.9	Yes
Operating tools ♦ The measured temperatures of the operating tools should not exceed the temperature of the room by more than: - 35 K for metal; - 45 K for porcelain, enamel and other similar materials; - 60 K for plastic, rubber or wood. If these temperatures are higher, the producer has to provide a special device. It has to be delivered with the appliance (A suitable glove is regarded as a tool).	5.2	A.4.7	Yes Yes
Release of exhaust gases and falling out of embers ♦ No release of harmful exhaust gases. ♦ No falling out of embers and ashes.	5.3	A.4.7/A.4.9	Yes Yes
Temperature in the fuel hopper ♦ The temperatures measured in the integral fuel storage container shall not exceed the ambient room temperature by more then 65K.	5.4	A.4.9.1	Yes

Appendix A2

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Test requirements for safety, according item 5

1	2	3	4
Safety against back burning through the fuel conveyor system ♦ The back burning from the retort to the fuel hopper shall not occur. ♦ The temperature in the hopper shall not exceed the ambient temperature by more than 65K ♦ If electrical power failure the appliance shall remain safe. ♦ Operation of any of the safety system shall stop the supply of fuel from the hopper.	5.5	A.4.9 A.4.9.1	There is a hermetic closed hopper with pressure switch Yes Yes Yes Yes
Safety against overheating the boiler water ♦ The function which stops the operation of burner if the temperature of the boiler water exceeds 105°C or lesser value specified by the manufacturer.	5.6		NA
Thermal discharge control ♦ For appliances with a water heater with an in-built thermal discharge control, designed to work in sealed system, the discharge control has to start working when the temperature at the output of the hot water reaches 105°C or at a lower one, indicated by the producer.	5.7	A.4.9.3	NA
Strength and leak tightness of boiler shells ♦ The boiler shell and its parts should not leak or stay deformed for a long time after testing under pressure and during testing at nominal heat output.	5.8	A.4.9.2/A.4.7	NA
Electric safety ♦ When there is electric equipment built in the appliance, it has to meet the requirements for electric safety in compliance with EN 60335-2-102.	5.9	EN 60335-2-102	Certificate of Conformity

Appendix A3

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Conditions and requirements for measuring performance, according item 6

Requirement	Requirement in compliance with	Requirement in compliance with	Requirement is met
EN 14785:2006			
1	2	3	4
Flue draught ♦ The values of the flue draught have to be (12±2) Pa for appliances up to 25 kW. ♦ The appliances having a nominal heat output greater than 25 kW shall be tested at flue draught given by the manufacturer. ♦ The safety test is carried out at the same draught. ♦ For the partial load test all appliances shall be tested at a flue draught of (10±2) Pa or at such draught as declared by the manufacturer.	6.1	A.4.7	Yes NA Yes Yes
Flue gas temperature ♦ The flue gas temperature shall be measured and recorded during the performance test at nominal and reduced heat output test in accordance with A.4.7 or A.4.8	6.2	A.4.7/A.4.8	Yes
Carbon monoxide emission ♦ Average concentration of carbon monoxide, calculated to 13%O_2 in the flue gases at least two results, has to be no more than 0.04% at nominal heat output and 0.06% at reduced head output.	6.3	A.4.7/A.4.8	Yes
Energy efficiency ♦ When the appliance is operated as specified by the manufacturer, burning the specified test fuels representing the recommended fuels listed in the appliance operating instructions, it shall meet the requirements of 6.4.2. ♦ The energy efficiency has to be at least 75% at nominal heat output and 70% at reduced heat output.	6.4 6.4.1 6.4.2	A.4.7/A.4.8	Yes Yes

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Conditions and requirements for measuring performance, according item 6

1				2	3	4
♦ Interval for refueling:						
Kind of appliance	**Kind of test**	**Kind of fuel**	**Minimum intervals for refueling**			
Appliance with continuous burning	At nominal output	Wood pellets	3.0 h		A.4.7	Yes
	At reduced burning	Wood pellets	6.0 h		A.4.8	Yes
Appliance with intermittent burning	At nominal output	Wood pellets	No require		A.4.7	NA
	At reduced burning	Wood pellets	No require		A.4.8	NA
Nominal heat output ♦ The nominal heat output declared by the manufacturer has to be less than or equal to the measured.				6.5	A.4.7	Yes
Reduced heat output ♦ The reduced heat output declared by the manufacturer has to be less than or equal to the measured.				6.6	A.4.8	Yes
Water heating output ♦ The water heating output declared by the manufacturer has to be less than or equal to the measured.				6.7	A.4.7	NA
Space heating output ♦ The space heating output declared by the manufacturer has to be less than the test space heating output.				6.8	A.4.7	Yes
Hopper capacity ♦ The hopper capacity shall be maintain reduced heat output over at least 6h and nominal heat output over at least 3h without refilling.				6.9	A.4.2	Yes
User operations ♦ All operations which the user carries out, including loading and emptying of the appliance, adjusting controls and de-ashing, shall be easy, safe and efficient.				6.10		Yes

Appendix A4

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Verification of compliance with the instructions of the appliance, according item 7

Requirement	Requirement in compliance with	Requirement is met
EN 14785:2006		
Appliance instructions General ♦ The instructions have to be written in the language of the respective country for which the appliance is meant. ♦ They have to accompany the appliance as they describe its mounting, operation, maintenance and if necessary its way of assembling. ♦ The instructions should not contradict the requirements or results from the tests in compliance with this standard.	7 7.1	 Yes Yes Yes
Installation instructions ♦ Check of requirements The installation instruction has to include at least all requirements under item 7.2. (If the requirements under item 7.2 are not met, see below *1).	7.2	Yes
Operating instructions ♦ Check of requirements The instruction for operation has to include at least all requirements under item 7.3. (If the requirements under item 7.3 are not met, see below *2).	7.3	Yes
*1 The following requirements under item 7.2 have not been met: there are no such		
*2 The following requirements under item 7.3 have not been met: there are no such		

Appendix A5

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Verification of conformity marking the appliance, according item 8

Requirement	Requirement in compliance with	Requirement is met
EN 14785:2006		
Marking on the appliance ♦ The marking has to be durable, clear and placed on a visible spot. ♦ The plate has to be durable and indelible. ♦ There should be no damages, caused by the testing. ♦ The information on the plate of the appliance has to be complete – check of information. (if the requirements under item 8 are not met, see below *1)	8	 Yes Yes Yes Yes
*1 The following data is missing: there is no such		

Appendix A6

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TEST FUELS

Analysis and calorific value for test fuel, according to table B.1							
Test fuel	**Wet** **W, %**	**Carbon** **C, %**	**Hydrogen** **H, %**	**Volatile matter** **%**	**Ash** **A, %**	**Calorific value** **Hu, kJ/kg**	**Size: Length/Diameter** **mm**
Wood pellets[1)]	8.76	50.24	6.09	82.03	0.37	16400	4÷23/6
1) According Test report № 1984 issued by the "Eurotest-Control"							

List of technical means used for test and measurement during the test:

№	Name of technical equipment for testing and measuring	Identification number
1	Combustion product analyzer Model "ECOM" J2KN	3041
2	Digital thermometer "TESTO 925" with thermocouple K No 1 and No 2 and measuring probe surface temperature	33712219/512
3	Digital thermometer AT 4532 Multi-channel Temperature meter with thermocouple No 003 and No 032	453201311060
4	Digital – Manometer/Draught gauge and flow meter „Testo 512"	AD111330/403
5	Thermo-anemometer HD2303.0 with hot-wire wind speed measurement probe AP471S1 and temperature sensor PT 100	DO 4-1211/ 12028167/12110594
6	The electronic weighbridge "WPT 150/300"	445556
7	The analytical balance "WTB 200"	238611
8	The electronic balance GAB 30K0.2N	WF1425618
9	Electronic stopwatch Q&Q	159/07
10	Tape measure TOP MASTER	P-01
11	Digital thermo-hygrometer "TESTO 608-H1"	34863016
12	Micro-manometer „MP55"	1P150928532

Appendix A7.1

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Test conditions for the measurement of performance at nominal heat

The test at nominal heat, according to EN 14785:2006, A.4.7 and CEN/TS 15883:2009		
	Respond to EN	**Test conditions**
Fuel type	Table B1	Wood pellets
Fire box		Closed
Burning process		continuous burning
Nominal heat		Position 5
Thermostat	A.4.7.1	shut off
Position of control devices:		
- Primary air		Open / Automatic
- Secondary air		NA
- Flue gas damper		NA
- Flue by-pass device		NA

Results obtained from the measurement of performance at nominal heat

Results obtained from the measurement	**Unit**	**Respond to EN**	**Test 1**	**Test 2**	**Average between 2**	**Require-ments executed**	**Uncer-tainty ± *U***
The mean flue draught	Pa	6.1	10.5	10.5	10.5	Yes	-
The mean ambient room temperature	°C		29.0	27.0	28.0		-
The mean cross-draught	m/s	A.1.2	< 0.20			Yes	-
Atmospheric pressure	mbar		995.1	993.4	994.3		-
Fuel burned during test	kg	A.4.2	6.850	6.900	6.875		-
The mean flue gas temperature	°C	6.2	136	140	138		-
The mean CO_2 emission	%		11.66	11.69	11.68		-
The mean CO emission	ppm		142	130	136		-
The mean CO emission at 13%O_2	%	6.3	0.0094	0.0086	0.0090	Yes	-
The mean CO emission at 13%O_2	mg/m^3		118	107	113		-
The mean NOx emission at 13%O_2	mg/MJ		92.67	95.94	94.31		-
The mean OGC emission at 13%O_2	mg/MJ		57.24	37.08	47.16		-
Minimum refueling interval – t_b	h	6.6/A.4.8.3	3.00				-
Duration of test periods	h		3.00	3.00	3.00	Yes	-
Fuel load	kg/h		2.283	2.300	2.292		-
Heat load	kW		10.40	10.48	10.44		-
Proportion of losses through specific heat in the flue gases - q_a	%	A.4.4	8.28	8.73	8.50		-
Proportion of losses through latent heat in the flue gases - q_b	%		0.09	0.08	0.08		-
Proportion of heat losses through combustible constituents in the residues – q_r	%	A.4.6	0.2	0.2	0.2		-
Efficiency – η	%	6.4	91.43	90.99	91.21	Yes	-
Nominal heating output (from the test)	kW		9.51	9.53	9.52	Yes	-
Nominal heating output (manufacturer declared)	kW	6.5	9.50				-
Difference from the mean value for the heat output test results	%	A.5	± 10			Yes	-
Flue gas mass flow	g/s	A.6.2.5	6.00	6.03	6.01		-
The mean value of dust in the flue gas at 13%O_2	mg/Nm^3		25.0	29.5	31.6	28.7		-
Boiler - NA							
Water temperature out	°C	A.2.5					-
Water temperature in	°C						-
Rate of input water	m^3/h						-
Water heating output	kW	6.7					-

Appendix A7.2

Test Report No NB 1879 – K – 22 – 2016

Test conditions for the measurement of performance at reduced heat

The test at reduced heat, according to EN 14785:2006, A.4.8 and CEN/TS 15883:2009		
	Respond to EN	**Test conditions**
Fuel type	Table B1	Wood pellets
Fire box		Closed
Burning process		continuous burning
Reduced heat		Position 1
Thermostat	A.4.7.1	shut off
Position of control devices:		
- Primary air		Open / Automatic
- Secondary air		NA
- Flue gas damper		NA
- Flue by-pass device		NA

Results obtained from the measurement of performance at reduced heat

Results obtained from the measurement	Unit	Respond to EN	Test 1	Require-ments executed	Uncer-tainty ± *U*
The mean flue draught	Pa	6.1	9.0	Yes	-
The mean ambient room temperature	°C		26.0		-
The mean cross-draught	m/s	A.1.2	< 0.20	Yes	-
Atmospheric pressure	mbar		994.1		-
Fuel burned during test	kg	A.4.2	4.600		-
The mean flue gas temperature	°C	6.2	57		-
The mean CO_2 emission	%		7.86		-
The mean CO emission	ppm		88		-
The mean CO emission at 13%O_2	%	6.3	0.0086	Yes	-
The mean CO emission at 13%O_2	mg/m^3		108		-
Minimum refueling interval – t_b	h	6.6/A.4.8.3	6.00		-
Duration of test periods	h		6.00	Yes	-
Fuel load	kg/h		0.767		-
Heat load	kW		3.49		-
Proportion of losses through specific heat in the flue gases - q_a	%	A.4.4	3.33		-
Proportion of losses through latent heat in the flue gases - q_b	%		0.08		-
Proportion of heat losses through combustible constituents in the residues – q_r	%	A.4.6	0.20		-
Efficiency – η	%	6.4	96.39	Yes	-
Reduced heating output (from the test)	kW		3.37	Yes	-
Reduced heating output (manufacturer declared)	kW	6.5	3.00		-
Difference from the mean value for the heat output test results	%	A.5	± 10	Yes	-
Flue gas mass flow	g/s	A.6.2.5	2.86		-
Boiler - NA					
Water temperature out	°C	A.2.5			-
Water temperature in	°C				-
Rate of input water	m^3/h				-
Water heating output	kW	6.7			-

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Test conditions in measuring of temperature safety test at nominal heat output, according item A.4.9

	Respond to	Test conditions	Requirement fulfilled
Fire box		closed	Yes
Thermostat	A.4.9.1.1	NA	-
Fuel	Table B1	wood pellets	Yes
Operating tools		Device (glove)	Yes

Results obtained from the measurement temperature safety test at nominal heat output, according item A.4.9

	Unit	Respond to	Results of the test at nominal heat			Requirement fulfilled	Uncertainty of the test ± *U*
The mean of ambient temperature	°C	A.1.1	27.0			Yes	
The mean flue draught	Pa	6.1	10.5			Yes	
Maximum temperature to the operating components			**Metals**	**Porcelain, vitreous enamel**	**Plastics, rubber or wood**		
			< 35K	< 45K	< 60K		
Handle fire door	°C	5.2	64	-	-	-	-
Handle fuel hopper	°C		-	-	43	Yes	-
Display	°C		-	-	39	Yes	-
Knob on / off	°C		-	-	32	Yes	-
Temperature of adjacent combustible materials - < 65 K							
- rear wall of the trihedron - appliances safe distance	°C mm	5.1/A.4.9.1.2	45.0 300			Yes	-
- side wall of the trihedron - appliances safe distance	°C mm	5.1/A.4.9.1.2	44.0 400			Yes	-
- in front build in glass - appliances safe distance	°C mm	5.1/A.4.9.1.2	56.0 1000			Yes	-
- at the floor of the trihedron - appliances safe distance - legs	°C mm	5.1/A.4.9.1.2	53.0 30			Yes	-
- hearth of the trihedron	°C	5.1/A.4.9.1.2	NA			-	-
- top of the trihedron - appliances safe distance	°C mm	5.1/A.4.9.1.2	NA			-	-
Maximum temperature in the fuel hopper	°C	5.4/A.4.9.1.2	54.0			Yes	-
Maximum temperature in the fuel conveyor system	°C	5.4/A.4.9.1	68.0			Yes	-
Maximum temperature in the blower motor	°C	< 185	69.0			Yes	-
Maximum temperature in the conveyor system motor	°C	5.4/A.4.9.1	55.0			Yes	-
Maximum temperature on the wires - bus wire - conductors	°C °C	< 105 < 155	65.0 51.0			Yes Yes	-
Maximum temperature in the remount control of PLC	°C		69.0			Yes	-

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	Unit	Respond to	Results of the test at nominal heat	Requirement fulfilled	Uncertainty of the test ± *U*
Safety against back burning - < 65K					
Maximum temperature in the fuel hopper when the electrical power failure	°C	5.5/A.4.9.1	72.0	Yes	-
Maximum temperature in the takeoff chute when the electrical power failure according to NB-CPD-SG03-WG2-10-033	°C	5.5/A.4.9.1	81.0	Yes	-
Back burning		5.5	not occur		
Operation of the safety systems		5.5	It is working properly		
Caused residual crippling in appliance from the test: not be!					

The following test had be carried out together with nominal heat output test, because the setting for nominal heat output and those for maximum heat output do not differ - PLC' position 5.

Testing carried out by:

1. .....
/ Dipl. Eng. M. Raev /

2. .....
/ Dipl. Eng. Z. Yordanov /

Head of Laboratory:

.....
/ Dipl. Eng. Goran Gadjonov /

Appendix A9

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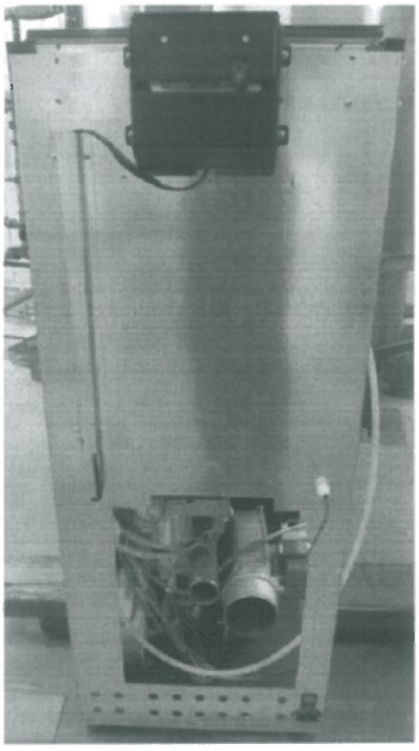
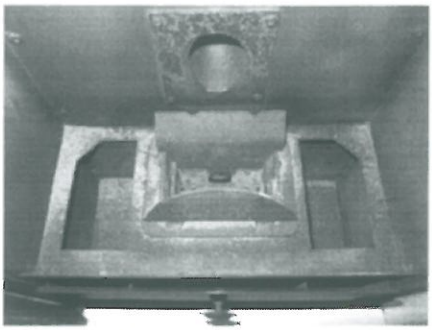
Product photos:

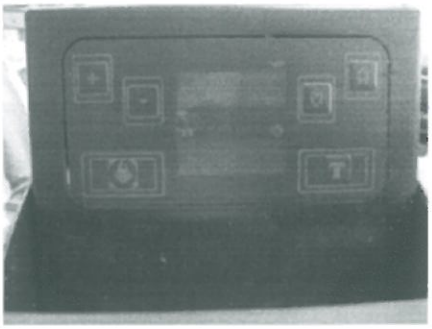
The front view



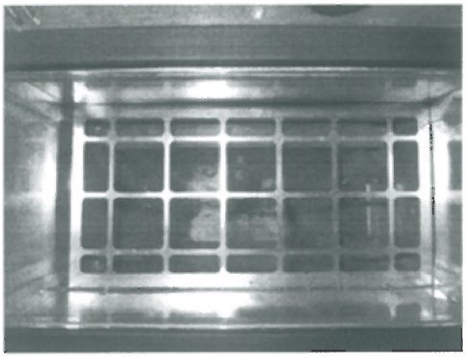
The back view



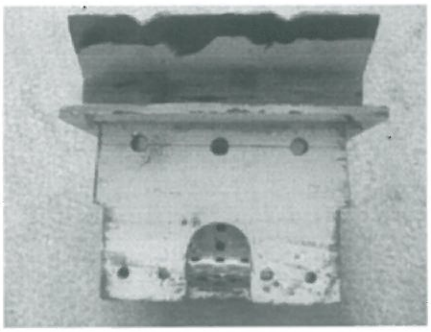
The bottom of combustion chamber



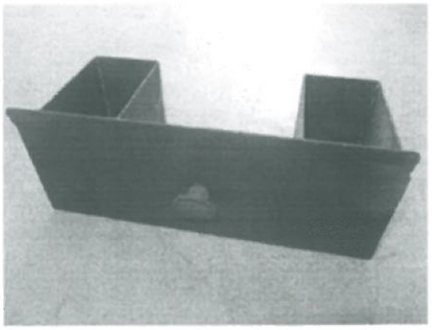
PLC "LuciFire" - control panel



The fuel hopper



The retort – back view



The ash pen

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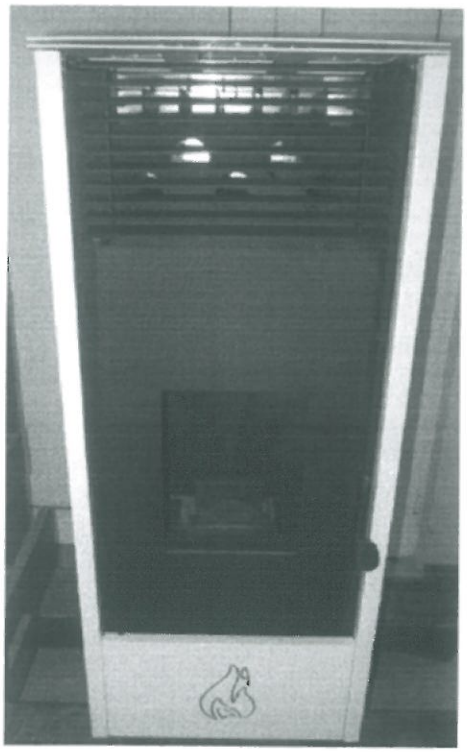
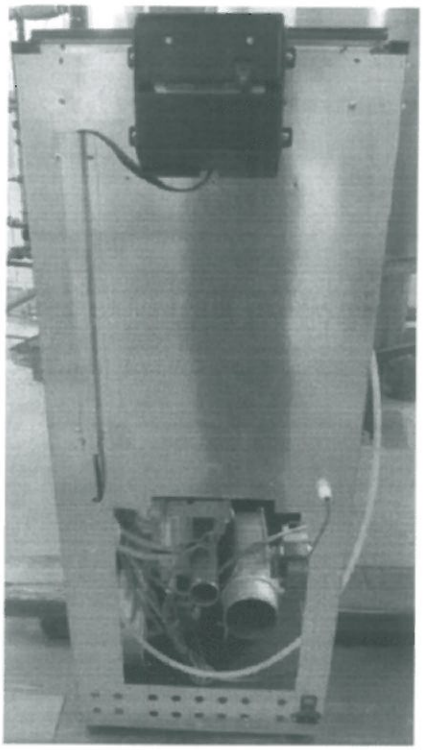
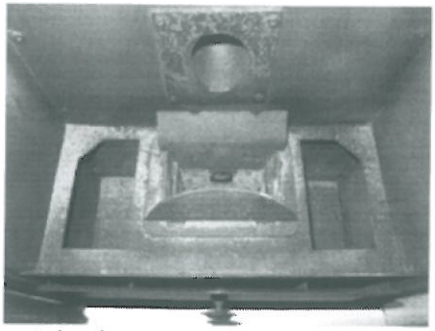
Product photos:



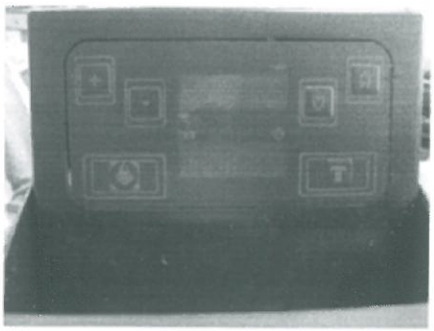
The front view



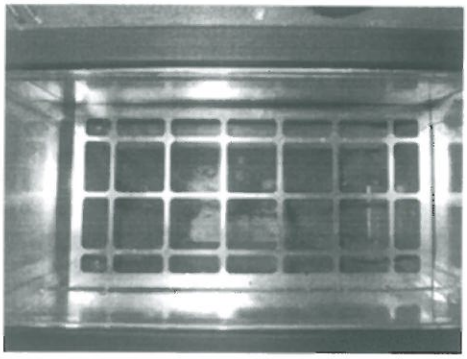
The back view



The bottom of combustion chamber

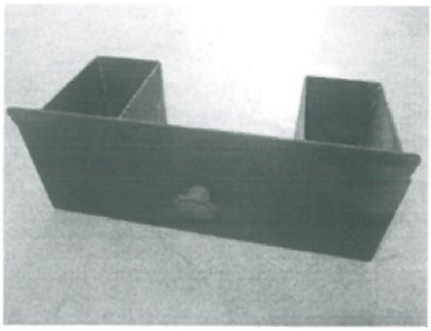


PLC "LuciFire" - control panel



The fuel hopper

The retort – back view



The ash pen