



Strojírenský zkušební ústav, s.p., Brno, Česká republika
Engineering Test Institute, Public Enterprise, Czech Republic

OSVĚDČENÍ O ZKOUŠCE CERTIFICATE OF TEST

Číslo
Number **O-B-01224-24**

Výrobce – *Manufacturer*

BLAZE HARMONY s.r.o.
Trnávka 37
751 31 Lipník nad Bečvou VII
Česká republika – *Czech Republic*

Výrobek – *Product*

Kotel teplovodní – *Hot-water boiler*

Typové označení – *Type designation*

**BLAZE GREEN COMBI 18,
BLAZE GREEN COMBI 26,
BLAZE GREEN COMBI 33**
Nařízení Komise (EU) č. 2015/1189, příloha II, čl. 1
Commission Regulation (EU) No. 2015/1189, Annex II, Art. 1
Nařízení Komise (EU) č. 2015/1187
Commission Regulation (EU) No. 2015/1187

Požadavky na ekodesign – *Ecodesign requirements*

ČSN EN 303-5+A1:2023

Metoda zkoušek – *Test method*

Ruční – *Manual*

Způsob topení – *Heating method*

Dřevo – *Wood*

Preferované palivo – *Preferred fuel*

Výsledky – *Results*

Typ – *type*

**BLAZE GREEN
COMBI 18**

**BLAZE GREEN
COMBI 26**

**BLAZE GREEN
COMBI 33**

Jmenovitý výkon – *Nominal output*

CO (10% O ₂)	mg/m ³	28	25	35
OGC (10% O ₂)	mg/m ³	1	2	5
Prach – <i>Dust</i> (10% O ₂)	mg/m ³	17 / 1.9*)	20 / 2.0*)	16 / 1.6*)
NO _x (10% O ₂)	mg/m ³	156	149	173
Účinnost – <i>Efficiency</i>	%	91.5	92.2	93.3
Užitečná účinnost – <i>Useful efficiency</i>	%	83.9	84.5	85.7

Snížený výkon – *Minimal output*

CO (10% O ₂)	mg/m ³	157	149	417
OGC (10% O ₂)	mg/m ³	4	4	9
Prach – <i>Dust</i> (10% O ₂)	mg/m ³	5 / 1.8*)	3 / 1.6*)	6.0 / 1.4*)
NO _x (10% O ₂)	mg/m ³	130	111	84
Účinnost – <i>Efficiency</i>	%	92.5	92.3	93.6
Užitečná účinnost – <i>Useful efficiency</i>	%	84.8	84.6	86.0

*) Měřené hodnoty emisí prachu s elektrostatickým odlučovačem - The measured dust emission values with an electrostatic precipitator





Typ – type

BLAZE GREEN
COMBI 18

BLAZE GREEN
COMBI 26

BLAZE GREEN
COMBI 33

Sezonní emise – Seasonal emissions

CO (10% O ₂)	mg/m ³	138	131	360
OGC (10% O ₂)	mg/m ³	3	4	8
Prach – Dust (10% O ₂)	mg/m ³	6 / 1.8 *)	6 / 1,6 *)	8 / 1.4*)
NO _x (10% O ₂)	mg/m ³	134	116	97
η _{son}	%	84.7	84.6	86.0
F1	%	3.0	3.0	3.0
F2	%	1.2	1.0	1.0

Sezonní energetická účinnost – Seasonal space heating energy efficiency

η _s	%	81	81	82
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Index energetické účinnosti – Energy Efficiency Index

EEI		119	119	121
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Třída energetické účinnosti – Energy Efficiency Class

A+

A+

A+

*) Měřené hodnoty emisí prachu s elektrostatickým odlučovačem - The measured dust emission values with an electrostatic precipitator

Podklad pro vydání osvědčení
Basis for Certificate issue

Protokol č. - Report No.
30-17252/T a protokoly navazující - and follow-up reports,
vydané Zkušební laboratoří č. 1045.1, akreditovanou ČIA o.p.s.,
číslo osvědčení o akreditaci 106/2024
issued by Testing Laboratory No. 1045.1, accredited by CAI,
Accreditation Certificate No. 106/2024

Strojírenský zkušební ústav, s.p. tímto osvědčením o zkoušce potvrzuje, že u předmětného výrobku provedl zkoušky a výpočty s výše uvedenými výsledky.

The Engineering Test Institute certifies by this Certificate of Test to have conducted for the given product the test and calculation with above stated results.

Brno, 2024-07-18



Ing. Stanislav Buchta
zástupce manažera sekce spalovacích zařízení
Deputy Section Manager of Combustion Equipment



Strojférenský zkušebnf ústav, s.p., Brno, Republika Czeska
Engineering Test Institute, Przedsiębiorstwo Publiczne, Republika Czeska

CERTYFIKAT TEST

Nr. 0-**B-01224-24**

Výrobce - Producent

BLAZE HARMONY s.r.o.
Trnávka 37
751 31 Lipník nad Bečvou VII Republika
Czeska - Czechy

Výrobek - Produkt

Kocíol grzewczy - Kocíol grzewczy

Oznaczenie typu - Oznaczenie typu

BLAZE GREEN COMBI 18,
BLAZE GREEN COMBI 26,
BLAZE GREEN COMBI 33
Rozporządzenie Komisji (UE) nr 2015/1189, filar II, art. 1
Rozporządzenie Komisji (UE) nr 2015/1189, załącznik II, art. 1
Rozporządzenie Komisji (UE) nr 2015/1187
Rozporządzenie Komisji (UE) nr 2015/1187

Wymogi dotyczące ekoprojektu - Wymogi dotyczące ekoprojektu

Metoda testowa - test Melhoda

EN 303-5+A1:2023

Metoda ogrzewania

Podręcznik - /Uanua/

Preferowane paliwo

Drewno - Drewno

Wyniki - Wyniki

Typ - typ

BLAZE GREEN
COMBI 18

BLAZE GREEN
COMBI 26

BLAZE GREEN
COMBI 33

Wyjście nominalne - Wyjście nominalne

CO (10% O')	mg/Mn3	28	25	35
OGC (10% Oz)	mg/Mn3	1	2	5
Pył (10% O2)	mg/FFln ³	17 / 1.9*)	20 / 2.0*)	16 / 1.6*)
NOx (10% Oz)	mg/m *	156	149	173
Wydajność - Wydajność	%	91.5	92.2	93.3
Przydatna wydajność	%	83.9	84.5	85.7

Zmniejszona wydajność - Minimalna wydajność

CO (10% O2)	mg/m **	157	149	417
OGC (10% Oz)	mg/m *	4	4	6
Pył - Dt/h (10% O2)	mg/m **	5 / 1.8*)	3/ 1.6")	6.0 / 1.4")
NOx (10% Oz)	mg/mn*	130	111	84
Wydajność - Wydajność	%	92.5	92.3	93.6
Przydatna wydajność - Przydatna wydajność	%	84.8	84.6	86.0

") Zmierzone wartości emisji pyłu za pomocąelektrofiltru





(typ) (-)typ		BLAZE GREEN COMBI 18	BLAZE GREEN COMBI 26	BLAZE GREEN COMBI 33
Emisje sezonowe - Emisje sezonowe				
CO (10% Oz)	mg/ITIn ³	138	131	360
OGC (10 ^o /m Oz)	mg/ITIn [*]	3	4	8
Pył - RPM (10 ^o / 02)	mg/ITIn ³	6 / 1.8 *)	6 / 1,6 ")	8 / 1.4*)
NOx (10% 02)	MQ/ITn [*]	134	116	97
η _{son}	%	84.7	84.6	86.0
F1	%	3.0	3.0	3.0
F2	%	1.2	1.0	1.0
Sezonowa efektywność energetyczna - Sezonowa efektywność energetyczna uzdrowiania przestrzeni				
η _{ts}	%	81	81	82
Wskaźnik efektywności energetycznej				
EEL		119	119	121
Klasa efektywności energetycznej - efektywność energetyczna C/ass				
		A+	A+	A+
") Zmierzone wartości emisji pyłu za pomocąelektrofiltru				

Podstawa wydania potwierdzenia
Podstawa wydania certyfikatu

Nr protokołu - Nr raportu
30-17252/T oraz raporty uzupełniające, wydane przez Laboratorium Badawcze
nr 1045.1, akredytowane przez CIA o.p.s., numer certyfikatu akredytacji
106/2024.
wydany przez Laboratorium Badawcze nr 1045.1, akredytowane przez CAI,
Certyfikat Akredytacji nr 106/2024

Inżynier Badań Mechanicznych, s.p. niniejszym potwierdza niniejszym świadectwem badań, że przeprowadził badania i obliczenia na
wyżej wymienionym produkcie z wyżej wymienionymi wynikami.
Engineering Test Institute zaświadcza niniejszym certyfikatem, że przeprowadził dla danego produktu test i obliczenia z podanymi
powyżej wynikami.

Brno, 2024-07-18

Ing. Stanislav Buchtá
Zastępca kierownika sekcji urządzeń do spalania
Zastępca kierownika sekcji urządzeń do spalania



Strojírenský zkušební ústav, s.p.
(Engineering Test Institute, Public Enterprise)
Hudcova 424/56b, Medlánky, 621 00 Brno, Česká republika
Testing Laboratory 1045.1 accredited by the CAI pursuant to ČSN EN ISO/IEC 17025:2018

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INITIAL TYPE TEST REPORT

30-17252/T

Product: Combined hot-water boilers for wood and wood pellets

Type designation: BLAZE GREEN COMBI 18,
BLAZE GREEN COMBI 26,
BLAZE GREEN COMBI 33

Customer: BLAZE HARMONY s.r.o.
Trnávka 37
751 31 Lipník nad Bečvou VII
Czech Republic
IČO: 27816273

Manufacturer: BLAZE HARMONY s.r.o.
Trnávka 37
751 31 Lipník nad Bečvou VII
Czech Republic

Report issue date: 2024-07-17

Distribution list: 1 copy to the Customer
1 copy to the Engineering Test Institute

The tests were performed based on these documents:

- Order of 2024-05-03 (Order reg. no. B-82532, received on 2024-06-27)
- Contract B-82532/30

I. Description of product tested

Combined hot-water boilers BLAZE GREEN COMBI burning log wood or wood pellets are intended for heating of residential houses, apartment buildings, cottages, business buildings, smallish workshops and similar objects. These are gasification boilers that are based on the principle of two-stage combustion. The boiler can be operated in automatic mode with a pellet burner (BLAZE HARMONY XS) located through the lower door.

The boiler body is welded from steel sheets with a thickness of 3-8 mm. The walls of the stoking chamber are equipped with steel protective shell made of several segments, interconnected by locking joints. The bottom of the stoking chamber is funnel-shaped and is lined with ceramic fittings. The nozzle consists of radially distributed slits in the bottom of the gasification chamber, which continue through sloping channels into a combiner leading into the combustion chamber. Secondary air inlets open into the nozzle. The combustion chamber is also lined with ceramic fittings. The heat exchange surfaces of the boiler are formed by side walls of the combustion chamber and a rear tube exchanger.

The lower door of the boiler contains a window with ceramic glass. The upper stoking door is equipped with a safety catch to secure any opening position.

An air distribution panel is located in the front part of the boiler under the front cover. In its lower part there are 3 combustion air supply openings equipped with flaps. The openings are equipped with a sliding screen to regulate the ratio of secondary air. A detection arm of a permanent heat layer with an axis of rotation in the front wall of the stoking chamber is located in the stoking chamber. A balancing arm located in the space of the air distribution panel is firmly connected to the detection arm. A permanent heat detection sensor is located under the balancing arm. The arm lock is a mechanism consisting of a compression arm and a compression spring.

The rear flue gas exchanger contains mechanical turbulators operated by a lever. The water inlet nozzle opens into an internal distributor, from where water enters the water space of the boiler through a number of small openings. The water temperature control thermostat is placed into the inlet spout.

The boiler is equipped with a cooling loop for emergency after-cooling, with an inlet and outlet nozzle and a pocket for the sensor of the safety cooling valve.

The regulator control panel is located on the upper door. The control unit (model ecoMAX 860DP3-HB) and the exhaust fan are located on the rear wall of the boiler. The boiler is equipped with a lambda probe to control the combustion process.

The boiler is equipped with insulation from mineral fibres with a thickness of 30 mm. The outer surface consists of sheet steel covers.

In terms of air supply, the manufacturer has specified the product as a **category 1** based on the standard ČSN EN 303-5+A1:2023 (EN 303-5+A1:2022).

Further detailed descriptions of individual assembly groups are provided in the enclosed technical documentation to Tasks 30-17252.

II. Sample tested

Boiler output versions that are the subject of the proceedings:

Table 1

Type designation	Nominal heat output [kW]	Minimum heat output [kW]	Test fuel	Maximum allowable operating pressure [bar]	Maximum allowable operating temperature [°C]
BLAZE GREEN COMBI 18	18.0	9.0	Wood (ČSN EN ISO 17225-5:2022)	3.0	95.0
BLAZE GREEN COMBI 26	26.0	13.0			
BLAZE GREEN COMBI 33	32.5	16.0			
BLAZE GREEN COMBI 18	15.0	4.1	Wood pellets (ČSN EN ISO 17225-2:2022)		
BLAZE GREEN COMBI 26	20.0	5.8			
BLAZE GREEN COMBI 33	20.0	5.8			

The visual inspection, tests and verification were carried out by Ing. Stanislav Buchta (in August 2023) and Ing. Vladimír Foit (in December 2023) in BLAZE HARMONY s.r.o., Trnávka 37, 751 31 Lipník nad Bečvou VII, Czech Republic.

- Number of samples: 3
- Date of submission or sampling: 2023-08-22, 2023-12-04
- Reg. number: -
- Serial number: prototyp1-3

The tests were carried out with the use of validly calibrated measuring and test equipment.

III. Measuring and test equipment:

Table 2

No.	Description	Inventory number	Calibration valid until	Accuracy
1.	Combustion product analyser, Horiba, type ENDA-680P	022394	calibration prior to each measurement	see CRM 190/16 see CRM 103000414644
2.	Weighing machine	022331	03/2025	see 6051-KL-H0317-23
3.	Induction flow meter	MaR10_Pr1	08/2026	see 6015-KL-P0612-22
4.	Temperature measurement set	022435/T1	06/2025	see KL-T-0109-22
5.	Thermometer, Moisture meter	116258	11/2024	see 9640/2021
6.	Barometer	111985	05/2024	see 6013-KL-K0005-19
7.	Draught gauge	MaR11-Tah	08/2025	see KL-P-0086-23
8.	Electronic stop watch	990760	11/2025	see 2955E-20
9.	Gravimat SHC 501	022328	06/2024	see KL-P-0039-21
10.	Analytic weighing machine Sartorius	021682	03/2025	see 6051-KL-H0313-23
11.	Electronic thermometer	022320/7	08/2024	see KL-T-0080-21
12.	Electrometer	022389-A/4	05/2025	see 039/15/E
13.	Induction flow meter	116238	04/2024	see Q0216/2018
14.	Weighing machine	022151	03/2025	6051-KL-H0328-23
15.	Weighing machine	022211	03/2025	see 6051-KL-H0321-23
16.	Tape measure	ME 477	10/2027	see 8800/2022

IV. Methods, results of tests and verifications

Table 3

No.	Requirement	Standard or technical regulation applied	Source materials	Test evaluation*
1.	Pressurized component tightness and strength test (1.1*)	ČSN EN 303-5+A1:2023 Art. 5.4, 5.4.1, 5.4.2	Page 6	+
2.	Test of hydraulic pressure drop (1.1*)	ČSN EN 303-5+A1:2023 Art. 5.10	Page 7	+
3.	Test for gas side soundness (1.1*)	ČSN EN 303-5+A1:2023 Art. 4.3.8, 5.16.6, 5.18.1	Page 8	+
4.	Surface temperature test (1.1*)	ČSN EN 303-5+A1:2023 Art. 5.11, 5.16.4, 4.3.7	Pages 9 - 12	+
5.	Test of heat output, input and efficiency (1.1*) Test of combustion product temperature (1.1*)	ČSN EN 303-5+A1:2023 Art. 4.4.2, 4.4.3, 5.2, 5.3, 5.6 to 5.9	Pages 13 - 26	+
6.	Electrical consumption (1.73*)	ČSN EN 303-5+A1:2023 Art. 5.7.7 ČSN EN 15456:2008 Art. 5	Page 27	+
7.	Combustion efficiency test – emissions (1.1 *)	ČSN EN 303-5+A1:2023 Art. 4.4.7, 5.6.3, 5.6.4, 5.8, 5.9.4	Pages 28 - 41	+
8.	Test of control, regulation and safety elements (1.1*) Combustion efficiency test – emissions (1.1*)	ČSN EN 303-5+A1:2023 Art. 5.13, 5.14, 5.16.1, 5.16.2, 5.16.3, 5.17 ČSN EN 303-5+A1:2023 Art. 5.8, 5.9.4	Pages 42 - 45	+
9.	Test of device for dissipating excess heat (1.1*)	ČSN EN 303-5+A1:2023 Art. 4.1, 5.15	Pages 46 - 47	+
*) Evaluation / statement of conformity: +Requirement fulfilled -Requirement not fulfilled				
			0Not applicable xNot evaluated	

Note:

The stated extended measurement uncertainties are calculated as a factor of the measurement uncertainty and the extension coefficient $k=2$, corresponding to the coverage certainty of 95% as regards standard classification.

If a statement of conformity is provided, the decision rule pursuant to ILAC-G8:09/2019, Art. 4.2.1 - binary statement for the simple acceptance rule shall apply.

Accredited test
number:

1.1* Test title: **Pressurized component tightness and strength test**

Test method:

ČSN EN 303-5+A1:2023
Čl. 5.4, 5.4.1, 5.4.2

Sample tested:

BLAZE GREEN COMBI 33

Measuring equipment used:

Chapter III - Measuring and test equipment

Test results:

Requirement	Requirement specification	Test evaluation	Note
Pressure test for boilers of sheet or sheet metal of non-ferrous metal	ČSN EN 303-5+A1:2023 Art. 5.4		
Tests to be carried out before production The type test pressure is $2 \times PS$ using hydraulic pressure where PS is the maximum permissible operating pressure. The test period shall be at least 10 min and if it is to apply to a range of boilers, the test shall be carried out on at least 3 boiler sizes (smallest, medium, and largest size). No leakage or noticeable permanent deformation shall occur during the test. A record shall be made of the test, including the following details: - exact description of the boiler tested by stating the drawing number; - test pressure in bar and duration of the test; - test result; - place and date of the test, including the names of persons carrying out the test.	ČSN EN 303-5+A1:2023 Art. 5.4.1	+ + + + +	
Test during production Each boiler shall be tested during the production and the test pressure shall be at least $1.43 \times PS$. NOTE A hydraulic test is recommended as it is safer than a pneumatic test.	ČSN EN 303-5+A1:2023 Art. 5.4.2	+	Enclosed technical doc.

Measurement results:

Boiler Type		BLAZE GREEN COMBI 33
Test pressure	[bar]	6.0
Maximal operation pressure	[bar]	3.0
Ambient temperature	[°C]	24.1
Humidity	[%]	22.9
Air pressure (kPa)	[kPa]	98.9
Time	[min]	30
Test medium		water
Test date		2023-12-07

Test evaluation:

No leakages or visible permanent deformations appeared during the test.

Accredited test
number:

1.1* Test title: **Test of hydraulic pressure drop**

Test method: ČSN EN 303-5+A1:2023 Čl. 5.10

Sample tested: BLAZE GREEN COMBI 18, BLAZE GREEN COMBI 26

Measuring equipment used: Chapter III - Measuring and test equipment

Requirement	Requirement specification	Test evaluation	Note
Water side resistance of the boiler The water side resistances are to be determined for those flows which correspond to the nominal heat output with two temperature differences of 10 K and 20 K between the flow and return connections of the boiler. The results are to be stated in mbar for each boiler size and shall correspond to the values indicated by the manufacturer.	ČSN EN 303-5+A1:2023 Čl. 5.10	+	

Note:
+ Compliant
- Non-compliant
0 Not applicable

Measurement results: BLAZE GREEN COMBI 18

No.	Q	ΔP
[-]	[m ³ ·h ⁻¹]	[mbar]
differences of 20 K	0.771	1.65
differences of 10 K	1.543	6.14

Note: Testing date and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

Measurement results: BLAZE GREEN COMBI 26

No.	Q	ΔP
[-]	[m ³ ·h ⁻¹]	[mbar]
differences of 20 K	1.114	1.19
differences of 10 K	2.229	4.75

Note: Testing date and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

Accredited test
number:

1.1* Test title: **Test for gas side soundness**

Test method:

ČSN EN 303-5+A1:2023
Čl. 4.3.8, 5.16.6

Sample tested:

BLAZE GREEN COMBI 18, BLAZE GREEN COMBI 26,
BLAZE GREEN COMBI 33,

Measuring equipment used:

Chapter III - Measuring and test equipment

Test results:

Requirement	Requirement specification	Test evaluation	Note
Leakage of the boilers category 1 For boilers designed to operate with a positive pressure in the combustion chamber when tested in accordance with Art. 5.5.2.4 at a test-pressure of 1,2 times the gas side resistance at nominal heat output, the leakage rate based on mass flow shall not exceed 2 % of the flue gas mass flow at the nominal heat output. The gas side resistance shall be determined for manual stoked boilers with the fuel chamber filled to maximum capacity (as specified by the manufacturer). These requirements are fulfilled for positive pressure boilers category 3. <i>NOTE: For boilers designed to operate with negative pressure, the leakage rate measured according to Art. 5.6 characterizes the boiler.</i>	ČSN EN 303-5+A1:2023 Art. 4.3.8	0	
Test for gas side leakage This test is for boilers with positive pressure in the combustion chamber (category 1) and boilers category 2 and 3. The actual leakage rate of the boiler is determined using air at ambient temperature and using a test rig in accordance with (for example) Figure 2. Exhaust connection and connection to the fuel line shall be sealed tightly for boilers category 1, and the doors set as in normal use. The test rig is connected to the air input of the test boiler. For boilers category 2 and category 3 the joint to the air supply duct and flue gas evacuation system shall be part of the leakage test setup. The leakage rates measured are to be converted in accordance with the standard test condition (0°C, 1013 mbar). The requirements of 4.2.5.2 or 4.3.8 shall be met. The test shall be performed after safety and performance test (5.7 to 5.18) NOTE The test for boilers category 1 operating with negative pressure can be performed under a pressure of 20 Pa (see Figure 2, measuring point 10).	ČSN EN 303-5+A1:2023 Art. 5.16.6	0 +	Category 1, negative pressure operation

Note:	+	Compliant
	-	Non-compliant
	0	Not applicable

Accredited test
number:

1.1* Test title: **Surface temperature test**

Test method:

ČSN EN 303-5+A1:2023
Art. 5.11, 5.16.4, 4.3.7

Sample tested:

BLAZE GREEN COMBI 18, BLAZE GREEN COMBI 26,
BLAZE GREEN COMBI 33,

Measuring equipment used:

Chapter III - Measuring and test equipment

Test results:

Requirement	Requirement specification	Test evaluation	Note
Surface temperature The mean surface temperature shall be measured at nominal heat output. In order to do this, a minimum of 5 points on each boiler surface shall be measured. Under the same conditions, the critical temperatures (e.g. boiler doors, operating levers) shall be measured.	ČSN EN 303-5+A1:2023 Art. 5.11	+	
The surface temperature on the outside of the boiler (including the bottom and doors but not including the flue gas outlet and maintenance openings of natural draft boilers) shall not exceed the room temperature by more than 60 K when tested in accordance with 5.12. The requirement for the bottom is not applicable for instances when the manufacturer declares that the boiler is to be installed on a (70/50 °C)combustible base. When tested in accordance with 5.12, the surface temperature of operating levers and all parts which shall be touched by hand during operation of the boiler shall not exceed the following values according to EN ISO 13732-1: - 51 °C for metals and similar materials; - 56 °C for porcelain and similar materials; - 60 °C for plastics and similar materials.	ČSN EN 303-5+A1:2023 Art. 4.3.7	+	
Resistance to thermal conductance Temperature measurement shall be performed on the surface of the stoking device at the place next to the fuel line but within a maximum distance which shall be less than 1 m against the feeding direction from the inner wall of the combustion chamber. For boilers with integrated hopper, the temperature measurement shall be performed on the surface of the stoking device at the place next to the integrated hopper but within a maximum distance which shall be less than 1 m against the feeding direction from the inner wall of the combustion chamber. In addition, the highest surface temperature of the hopper shall be measured.	ČSN EN 303-5+A1:2023 Art. 5.16.4	+	

Measurement results: BLAZE GREEN COMBI 18

Average temperatures of boiler walls, doors and covers (°C):				
Boiler type	BLAZE GREEN COMBI 18			
Fuel type	Wood		Wood pellets	
Heat output	Nominal	Minimum	Nominal	Minimum
Test date	2023-08-22	2023-08-22	2023-08-24	2023-08-24
ambient temperature (°C)	25.3	26.3	27.0	27.5
humidity (%)	43.3	43.4	49.0	47.5
air pressure (kPa)	99.2	99.3	98.8	98.6
Front wall	36.2	33.0	41.9	35.6
Rear wall	41.5	39.3	34.1	32.3
Right wall	33.3	30.8	35.2	31.6
Left wall	33.4	31.2	36.3	34.8
Upper wall	35.6	31.8	33.1	29.9
Lower wall	43.9	34.9	35.2	28.6
Temperatures of control elements (°C):				
Handle of upper door (metallic)	32.0		31.0	
Handle of lower door (metallic)	40.0		37.0	
Control panel (plastic)	31.0		32.0	
Main switch (plastic)	-		32.0	
Primary air control (metallic)	-		36.0	
Secondary air control (metallic)	32.0		-	
Safety temperature limiter - STB (plastic)	27.0		34.0	
Feeding screw (metallic)	-		-	
Control lever (metallic)	48.0		31.0	

Measurement uncertainty: 2 °C for temperatures within the range of (0 ÷ 200) °C

"The above-specified extended measurement uncertainties are calculated as a factor of the measurement uncertainty and the extension coefficient, $k=2$, corresponding to the coverage certainty of 95% as regards standard classification. The uncertainties do not reflect the impact of sample taking and lack of homogeneity. The standard uncertainty was determined in accordance with Document EA 4-02."

Test evaluation: The specified temperature rise values have not been exceeded.

Measurement results: BLAZE GREEN COMBI 26

Average temperatures of boiler walls, doors and covers (°C):				
Boiler type	BLAZE GREEN COMBI 26			
Fuel type	Wood		Wood pellets	
Heat output	Nominal	Minimum	Nominal	Minimum
Test date	2023-08-23	2023-08-23	09/2022	09/2022
ambient temperature (°C)	26.4	27.1	25.7	26.8
humidity (%)	47.1	47.0	41.9	40.3
air pressure (kPa)	99.8	99.9	98.54	98.37
Front wall	38.7	41.7	42.2	36.4
Rear wall	39.2	35.0	35.8	32.4
Right wall	35.1	33.8	34.7	30.9
Left wall	35.1	33.8	35.0	32.7
Upper wall	32.9	32.7	33.3	30.3
Lower wall	64.1	53.8	39.4	28.9
Temperatures of control elements (°C):				
Handle of upper door (metallic)	32.0		34.0	
Handle of lower door (metallic)	43.0		39.0	
Control panel (plastic)	33.0		33.0	
Main switch (plastic)	-		33.0	
Primary air control (metallic)	-		43.0	
Secondary air control (metallic)	35.0		-	
Safety temperature limiter - STB (plastic)	32.0		32.0	
Feeding screw (metallic)	-		31.0	
Control lever (metallic)	49.0		-	

Measurement uncertainty: 2 °C for temperatures within the range of (0 ÷ 200) °C

"The above-specified extended measurement uncertainties are calculated as a factor of the measurement uncertainty and the extension coefficient, $k=2$, corresponding to the coverage certainty of 95% as regards standard classification. The uncertainties do not reflect the impact of sample taking and lack of homogeneity. The standard uncertainty was determined in accordance with Document EA 4-02."

Test evaluation: The specified temperature rise values have not been exceeded.

Measurement results: BLAZE GREEN COMBI 33

Average temperatures of boiler walls, doors and covers (°C):				
Boiler type	BLAZE GREEN COMBI 33			
Fuel type	Wood		Wood pellets	
Heat output	Nominal	Minimum	Nominal	Minimum
Test date	2023-12-07	2023-12-04	09/2022	09/2022
ambient temperature (°C)	24.1	24.9	25.7	26.8
humidity (%)	22.9	20.8	41.9	40.3
air pressure (kPa)	98.95	98.79	98.54	98.37
Front wall	31.0	30.3	42.2	36.4
Rear wall	37.8	37.5	35.8	32.4
Right wall	33.1	31.9	34.7	30.9
Left wall	31.0	30.1	35.0	32.7
Upper wall	30.4	29.8	33.3	30.3
Lower wall	48.5	46.5	39.4	28.9
Temperatures of control elements (°C):				
Handle of upper door (metallic)	31.0		34.0	
Handle of lower door (metallic)	41.0		39.0	
Control panel (plastic)	31.0		33.0	
Main switch (plastic)	-		33.0	
Primary air control (metallic)	-		43.0	
Secondary air control (metallic)	30.0		-	
Safety temperature limiter - STB (plastic)	27.0		32.0	
Feeding screw (metallic)	-		31.0	
Control lever (metallic)	59.0		-	

Measurement uncertainty: 2 °C for temperatures within the range of (0 ÷ 200) °C

"The above-specified extended measurement uncertainties are calculated as a factor of the measurement uncertainty and the extension coefficient, k=2, corresponding to the coverage certainty of 95% as regards standard classification. The uncertainties do not reflect the impact of sample taking and lack of homogeneity. The standard uncertainty was determined in accordance with Document EA 4-02."

Test evaluation: The specified temperature rise values have not been exceeded.

Accredited test number: 1.1* Test title: **Test of heat output, input and efficiency
Test of combustion product temperature**

Test method: ČSN EN 303-5+A1:2023
Art. 4.4.2, 4.4.3, 5.2, 5.3, 5.6 to 5.9

Sample tested: BLAZE GREEN COMBI 18, BLAZE GREEN COMBI 26,
BLAZE GREEN COMBI 33,

Measuring equipment used: Chapter III - Measuring and test equipment

Test results: BLAZE GREEN COMBI 18

Average measured and calculated values (solid fuels):

Test (period of burning):	I.	II.	III.
Boiler type:	BLAZE GREEN COMBI 18		
Test date:	2023-08-22		2023-08-22
Output tested:	Nominal I. period	Nominal II. period	Minimum
Fuel type:	Wood		
Combustion period, (manual) stoking	Minimally 2 x 3 hours		2 hours
Nominal heat output (specified by manufacturer) [kW]	18.0	18.0	18.0
Flue gas temperature [°C]	102.3	101.9	69.4
Fuel mass added [kg.h ⁻¹]	4.243	4.268	2.240
Inlet water temperature [°C]	59.4	57.7	52.2
Outlet water temperature [°C]	74.0	72.4	70.2
Cooling water temperature [°C]	20.5	22.2	22.3
Cooling water flow rate [m ³ .h ⁻¹]	1.0000	0.9999	0.4323
Draught [Pa]	7	5	6
Ambient temperature [°C]	25.2	25.3	26.3
Relative air humidity [%]	43.2	43.3	43.4
Barometric pressure [kPa]	99.2	99.2	99.3

Analysis of combustion products:

Test (period of burning):	I.	II.	III.
Oxygen O ₂ [%]	10.05	10.11	11.45
Carbon dioxide CO ₂ [%]	10.19	10.03	8.82
Carbon monoxide CO [ppm]	28	17	109
Higher hydrocarbons THC/OGC [ppm]	1	1	2
Nitrogen oxides NO _x [ppm]	76	75	55
Sulfur oxides SO ₂ [ppm]	< 1	< 1	< 1

Auxiliary combustion values (solid fuels):

Test (period of burning):		I.	II.	III.
Stoichiometric oxygen volume	[m ³ .kg ⁻¹]	0.797	0.797	0.794
Stoichiometric air volume	[m ³ .kg ⁻¹]	3.795	3.795	3.782
Stoichiometric volume of dry combustion products	[m ³ .kg ⁻¹]	3.785	3.785	3.772
Maximum content of CO ₂	[%]	20.78	20.78	20.78
Stoichiometric air multiple	[-]	1.92	1.93	2.19
Volume of dry combustion products. actual	[m ³ .kg ⁻¹]	7.718	7.842	8.878
Content of H ₂ O in combustion air	[m ³ .kg ⁻¹]	0.054	0.058	0.069
Content of H ₂ O in combustion products	[m ³ .kg ⁻¹]	0.769	0.773	0.784
Flue gas mass flow	[kg.s ⁻¹]	0.01295	0.01322	0.008

Calculated values - thermal overview

Test (period of burning):		I.	II.	Average	III.
Loss of sensible heat of combustion	[%]	5.8	5.8	5.8	3.6
Loss of gas underburning	[%]	0.0	0.0	0.0	0.1
Loss of mechanical underburning	[%]	0.1	0.1	0.1	0.4
Loss of heat transfer into environment	[%]	2.0	2.0	2.0	3.0
Total loss	[%]	7.9	7.9	7.9	7.1
Efficiency – indirect method	[%]	92.1	92.1	92.1	92.9
Fuel mass added - actual	[kg.h ⁻¹]	4.259	4.284	4.272	2.251
Heat input	[kW]	18.3	18.4	18.4	9.7
Heat output	[kW]	16.7	16.8	16.8	8.9
Uncertainty of determining heat output	[kW]	0.7	0.7	0.7	0.4
Output / nominal output	[%]	92.9	93.5	93.5	49.7
Efficiency (NCV) – direct method	[%]	91.5	91.5	91.5	92.5
Useful efficiency (GCV)	[%]	83.9	83.9	83.9	84.8
Seasonal efficiency	[%]			84.7	
Seasonal space heating energy efficiency	[%]			81	
Energy efficiency index	[-]			119	
Energy Efficiency Class	[-]			A+	

At nominal and minimum output, BLAZE GREEN COMBI 18 when burning **wood**, the boiler efficiency meets the requirements applicable to **Class 5** as per ČSN EN 303-5+A1:2023, Fig. 1.

BLAZE GREEN COMBI 18 – Wood, meets the seasonal space heating energy efficiency requirements as per ČSN EN 303-5+A1:2023 Art. 4.4.2.4.

Test evaluation:

The measured heat output is within the ± 8% tolerance;
Boiler class 5;
At nominal output, combustion product temperature is less than 160 K above the ambient temperature;
When burning wood, the period of burning is 2 x 3 hours.
The minimum heat output is less than 50% of nominal heat output.

Test results: BLAZE GREEN COMBI 26

Average measured and calculated values (solid fuels):

Test (period of burning):	I.	II.	III.
Boiler type:	BLAZE GREEN COMBI 26		
Test date:	2023-08-22		2023-08-23
Output tested:	Nominal I. period	Nominal II. period	Minimum
Fuel type:	Wood		
Combustion period, (manual) stoking	Minimally 2 x 2 hours		2 hours
Nominal heat output (specified by manufacturer) [kW]	26.0	26.0	26.0
Flue gas temperature [°C]	101.3	102.1	64.2
Fuel mass added [kg.h ⁻¹]	6.115	6.120	3.185
Inlet water temperature [°C]	56.2	60.9	55.9
Outlet water temperature [°C]	76.8	81.6	70.0
Cooling water temperature [°C]	22.5	23.5	24.9
Cooling water flow rate [m ³ .h ⁻¹]	1.0290	1.0289	0.7855
Draught [Pa]	11	9	6
Ambient temperature [°C]	26.2	26.5	27.1
Relative air humidity [%]	47.1	47.1	47.0
Barometric pressure [kPa]	99.8	99.8	99.9

Analysis of combustion products:

Test (period of burning):	I.	II.	III.
Oxygen O ₂ [%]	7.33	7.37	9.76
Carbon dioxide CO ₂ [%]	12.85	12.64	10.37
Carbon monoxide CO [ppm]	31	19	122
Higher hydrocarbons THC/OGC [ppm]	1	1	3
Nitrogen oxides NO _x [ppm]	97	83	55
Sulfur oxides SO ₂ [ppm]	< 1	< 1	< 1

Auxiliary combustion values (solid fuels):

Test (period of burning):	I.	II.	III.
Stoichiometric oxygen volume [m ³ .kg ⁻¹]	0.794	0.794	0.792
Stoichiometric air volume [m ³ .kg ⁻¹]	3.782	3.782	3.772
Stoichiometric volume of dry combustion products [m ³ .kg ⁻¹]	3.773	3.773	3.762
Maximum content of CO ₂ [%]	20.78	20.78	20.78
Stoichiometric air multiple [-]	1.53	1.54	1.87
Volume of dry combustion products, actual [m ³ .kg ⁻¹]	6.100	6.202	7.531
Content of H ₂ O in combustion air [m ³ .kg ⁻¹]	0.041	0.041	0.059
Content of H ₂ O in combustion products [m ³ .kg ⁻¹]	0.756	0.756	0.774
Flue gas mass flow [kg.s ⁻¹]	0.01512	0.01536	0.00954

Calculated values - thermal overview

Test (period of burning):	I.	II.	Average	III.
Loss of sensible heat of combustion [%]	4.6	4.7	4.7	2.7
Loss of gas underburning [%]	0.0	0.0	0.0	0.1
Loss of mechanical underburning [%]	0.4	0.4	0.4	0.6
Loss of heat transfer into environment [%]	2.4	2.4	2.4	3.9
Total loss [%]	7.4	7.5	7.5	7.3
Efficiency – indirect method [%]	92.6	92.5	92.6	92.7
Fuel mass added - actual [kg.h ⁻¹]	6.146	6.151	6.149	3.205
Heat input [kW]	26.4	26.4	26.4	13.8
Heat output [kW]	24.3	24.3	24.3	12.7
Uncertainty of determining heat output [kW]	1.0	1.0	1.0	0.5
Output / nominal output [%]	93.5	93.6	93.6	48.8
Efficiency (NCV) – direct method [%]	92.2	92.2	92.2	92.3
Useful efficiency (GCV) [%]	84.5	84.5	84.5	84.6
Seasonal efficiency [%]			84.6	
Seasonal space heating energy efficiency [%]			81	
Energy efficiency index [-]			119	
Energy Efficiency Class [-]			A+	

At nominal and minimum output, BLAZE GREEN COMBI 26 when burning **wood**, the boiler efficiency meets the requirements applicable to **Class 5** as per ČSN EN 303-5+A1:2023, Fig. 1.

BLAZE GREEN COMBI 26 – Wood, meets the seasonal space heating energy efficiency requirements as per ČSN EN 303-5+A1:2023 Art. 4.4.2.4.

Test evaluation:

The measured heat output is within the $\pm 8\%$ tolerance;
Boiler class 5;
At nominal output, combustion product temperature is less than 160 K above the ambient temperature;
When burning wood, the period of burning is 2 x 2 hours.
The minimum heat output is less than 50% of nominal heat output.

Test results: BLAZE GREEN COMBI 33

Average measured and calculated values (solid fuels):

Test (period of burning):	I.	II.	III.
Boiler type:	BLAZE GREEN COMBI 33		
Test date:	2023-12-07		2023-12-04
Output tested:	Nominal I. period	Nominal II. period	Minimum
Fuel type:	Wood		
Combustion period, (manual) stoking	Minimally 2 x 3 hours		2 hours
Nominal heat output (specified by manufacturer) [kW]	32.5	32.5	32.5
Flue gas temperature [°C]	101.3	103.8	75.8
Fuel mass added [kg.h ⁻¹]	7.450	7.505	3.937
Inlet water temperature [°C]	51.8	53.7	51.8
Outlet water temperature [°C]	70.2	72.1	70.6
Cooling water temperature [°C]	-	-	-
Cooling water flow rate [m ³ .h ⁻¹]	1.4360	1.4458	0.7460
Draught [Pa]	9.1	7.7	12.1
Ambient temperature [°C]	23.7	24.1	24.9
Relative air humidity [%]	24.5	22.9	20.8
Barometric pressure [kPa]	98.94	98.95	98.79

Analysis of combustion products:

Test (period of burning):	I.	II.	III.
Oxygen O ₂ [%]	7.41	7.37	7.20
Carbon dioxide CO ₂ [%]	13.34	13.56	13.74
Carbon monoxide CO [ppm]	27	42	418
Higher hydrocarbons THC/OGC [ppm]	4	4	7
Nitrogen oxides NO _x [ppm]	107	102	51
Sulfur oxides SO ₂ [ppm]	< 1	< 1	< 1

Auxiliary combustion values (solid fuels):

Test (period of burning):	I.	II.	III.
Stoichiometric oxygen volume [m ³ .kg ⁻¹]	0.838	0.838	0.838
Stoichiometric air volume [m ³ .kg ⁻¹]	3.992	3.992	3.990
Stoichiometric volume of dry combustion products [m ³ .kg ⁻¹]	3.973	3.973	3.972
Maximum content of CO ₂ [%]	20.62	20.62	20.62
Stoichiometric air multiple [-]	1.54	1.54	1.52
Volume of dry combustion products. actual [m ³ .kg ⁻¹]	6.141	6.038	5.940
Content of H ₂ O in combustion air [m ³ .kg ⁻¹]	0.045	0.043	0.041
Content of H ₂ O in combustion products [m ³ .kg ⁻¹]	0.754	0.752	0.750
Flue gas mass flow [kg.s ⁻¹]	0.019	0.018	0.010

Calculated values - thermal overview

Test (period of burning):	I.	II.	Average	III.
Loss of sensible heat of combustion [%]	4.7	4.8	4.8	3.0
Loss of gas underburning [%]	0.0	0.0	0.0	0.2
Loss of mechanical underburning [%]	0.1	0.1	0.1	0.1
Loss of heat transfer into environment [%]	1.2	1.2	1.2	2.5
Total loss [%]	6.0	6.1	6.1	5.8
Efficiency – indirect method [%]	94.0	93.9	94.0	94.2
Fuel mass added - actual [kg.h ⁻¹]	7.471	7.526	7.499	3.949
Heat input [kW]	32.4	32.7	32.6	17.1
Heat output [kW]	30.3	30.4	30.4	16.0
Uncertainty of determining heat output [kW]	0.3	0.3	0.3	0.2
Output / nominal output [%]	93.2	93.5	93.5	49.2
Efficiency (NCV) – direct method [%]	93.4	93.2	93.3	93.6
Useful efficiency (GCV) [%]	85.8	85.6	85.7	86.0
Seasonal efficiency [%]			86.0	
Seasonal space heating energy efficiency [%]			81	
Energy efficiency index [-]			119	
Energy Efficiency Class [-]			A+	

At nominal and minimum output, BLAZE GREEN COMBI 33 when burning **wood**, the boiler efficiency meets the requirements applicable to **Class 5** as per ČSN EN 303-5+A1:2023, Fig. 1.

BLAZE GREEN COMBI 33 – Wood, meets the seasonal space heating energy efficiency requirements as per ČSN EN 303-5+A1:2023 Art. 4.4.2.4.

Test evaluation:

The measured heat output is within the $\pm 8\%$ tolerance;

Boiler class 5;

At nominal output, combustion product temperature is less than 160 K above the ambient temperature;

When burning wood, the period of burning is 2 x 3 hours.

The minimum heat output is less than 50% of nominal heat output.

Test results: BLAZE GREEN COMBI 18

Average measured and calculated values (solid fuels):

Test (period of burning):	I.	II.
Output tested:	Nominal	Minimum
Boiler type:	BLAZE GREEN COMBI 18	
Fuel type:	Wood pellets	
Combustion period, (automatic) stoking	Minimally 6 hours	
Test date:	2023-08-24	2023-08-24
Nominal heat output (specified by manufacturer) [kW]	15.0	15.0
Flue gas temperature [°C]	69.2	51.6
Fuel mass added [kg.h ⁻¹]	3.157	0.958
Inlet water temperature [°C]	54.5	64.0
Outlet water temperature [°C]	75.2	73.3
Cooling water temperature [°C]	26.2	27.1
Cooling water flow rate [m ³ .h ⁻¹]	0.6000	0.3999
Draught [Pa]	13	11
Ambient temperature [°C]	27.0	27.5
Relative air humidity [%]	49.0	47.5
Barometric pressure [kPa]	98.8	98.5

Analysis of combustion products:

Test (period of burning):	I.	II.
Oxygen O ₂ [%]	7.89	11.82
Carbon dioxide CO ₂ [%]	12.06	8.24
Carbon monoxide CO [ppm]	57	95
Higher hydrocarbons THC/OGC [ppm]	1	2
Nitrogen oxides NO _x [ppm]	88	55
Sulfur oxides SO ₂ [ppm]	<1	<1

Auxiliary combustion values (solid fuels):

Test (period of burning):	I.	II.
Stoichiometric oxygen volume [m ³ .kg ⁻¹]	0.933	0.937
Stoichiometric air volume [m ³ .kg ⁻¹]	4.445	4.461
Stoichiometric volume of dry combustion products [m ³ .kg ⁻¹]	4.381	4.397
Maximum content of CO ₂ [%]	19.83	19.83
Stoichiometric air multiple [-]	1.59	2.27
Volume of dry combustion products. actual [m ³ .kg ⁻¹]	7.201	10.572
Content of H ₂ O in combustion air [m ³ .kg ⁻¹]	0.127	0.176
Content of H ₂ O in combustion products [m ³ .kg ⁻¹]	0.879	0.929
Flue gas mass flow [kg.s ⁻¹]	0.0092	0.0039

Calculated values - thermal overview

Test (period of burning):		I.	II.
Loss of sensible heat of combustion products	[%]	2.7	2.2
Loss of gas underburning	[%]	0.0	0.1
Loss of mechanical underburning	[%]	0.4	0.1
Loss of heat transfer into environment	[%]	2.1	4.4
Total loss	[%]	5.3	6.7
Efficiency – indirect method	[%]	94.7	93.3
Fuel mass added - actual	[kg.h ⁻¹]	3.171	0.961
Heat input	[kW]	15.1	4.6
Heat output	[kW]	14.2	4.2
Uncertainty of determining heat output	[kW]	0.6	0.2
Output / nominal output	[%]	94.9	28.3
Efficiency (NCV) – direct method	[%]	94.3	92.8
Useful efficiency (GCV)	[%]	86.8	85.4
Seasonal efficiency	[%]	85.6	
Seasonal space heating energy efficiency	[%]	81	
Energy efficiency index	[-]	119	
Energy Efficiency Class	[-]	A+	

At nominal and minimum output, BLAZE GREEN COMBI 18 when burning **wood pellets**, the boiler efficiency meets the requirements applicable to **Class 5** as per ČSN EN 303-5+A1:2023, Fig. 1.

BLAZE GREEN COMBI 18 - Wood pellets, meets the seasonal space heating energy efficiency requirements as per ČSN EN 303-5+A1:2023 Art. 4.4.2.4.

Test evaluation:

The measured heat output is within the $\pm 8\%$ tolerance;

Boiler class 5;

At nominal output, combustion product temperature is less than 160 K above the ambient temperature;

When burning wood pellets, the period of burning is more than 6 hours;

The minimum heat output is less than 30% of nominal heat output.

Test results: BLAZE GREEN COMBI 26
Average measured and calculated values (solid fuels):

Test (period of burning):		I.	II.
Output tested:		Nominal	Minimum
Boiler type:		BLAZE GREEN COMBI 26	
Fuel type:		Wood pellets	
Combustion period, (automatic) stoking		Minimally 6 hours	
Test date:		09/2022	09/2022
Nominal heat output (specified by manufacturer)	[kW]	20.0	20.0
Flue gas temperature	[°C]	81.0	58.3
Fuel mass added	[kg.h ⁻¹]	4.232	1.303
Inlet water temperature	[°C]	54.7	63.9
Outlet water temperature	[°C]	75.1	72.6
Cooling water temperature	[°C]	23.2	25.4
Cooling water flow rate	[m ³ .h ⁻¹]	0.8140	0.5839
Draught	[Pa]	7.1	9.3
Ambient temperature	[°C]	25.7	26.8
Relative air humidity	[%]	41.9	40.3
Barometric pressure	[kPa]	98.54	98.37

Analysis of combustion products:

Test (period of burning):		I.	II.
Oxygen O ₂	[%]	7.58	11.58
Carbon dioxide CO ₂	[%]	12.59	8.60
Carbon monoxide CO	[ppm]	62	98
Higher hydrocarbons THC/OGC	[ppm]	1	3
Nitrogen oxides NO _x	[ppm]	94	65
Sulfur oxides SO ₂	[ppm]	<1	<1

Auxiliary combustion values (solid fuels):

Test (period of burning):		I.	II.
Stoichiometric oxygen volume	[m ³ .kg ⁻¹]	0.937	0.937
Stoichiometric air volume	[m ³ .kg ⁻¹]	4.460	4.460
Stoichiometric volume of dry combustion products	[m ³ .kg ⁻¹]	4.397	4.396
Maximum content of CO ₂	[%]	19.83	19.83
Stoichiometric air multiple	[-]	1.56	2.21
Volume of dry combustion products. actual	[m ³ .kg ⁻¹]	6.923	10.128
Content of H ₂ O in combustion air	[m ³ .kg ⁻¹]	0.099	0.145
Content of H ₂ O in combustion products	[m ³ .kg ⁻¹]	0.851	0.897
Flue gas mass flow	[kg.s ⁻¹]	0.0118	0.0052

Calculated values - thermal overview

Test (period of burning):		I.	II.
Loss of sensible heat of combustion products	[%]	3.4	2.7
Loss of gas underburning	[%]	0.0	0.1
Loss of mechanical underburning	[%]	0.1	0.1
Loss of heat transfer into environment	[%]	1.9	3.7
Total loss	[%]	5.4	6.6
Efficiency – indirect method	[%]	94.6	93.4
Fuel mass added - actual	[kg.h ⁻¹]	4.243	1.307
Heat input	[kW]	20.2	6.2
Heat output	[kW]	19.0	5.8
Uncertainty of determining heat output	[kW]	0.8	0.2
Output / nominal output	[%]	95.1	28.9
Efficiency (NCV) – direct method	[%]	94.2	93.1
Useful efficiency (GCV)	[%]	86.8	85.7
Seasonal efficiency	[%]	85.9	
Seasonal space heating energy efficiency	[%]	81	
Energy efficiency index	[-]	120	
Energy Efficiency Class	[-]	A+	

At nominal and minimum output, BLAZE GREEN COMBI 26 when burning **wood pellets**, the boiler efficiency meets the requirements applicable to **Class 5** as per ČSN EN 303-5+A1:2023, Fig. 1.

BLAZE GREEN COMBI 26 - Wood pellets, meets the seasonal space heating energy efficiency requirements as per ČSN EN 303-5+A1:2023 Art. 4.4.2.4.

The measured heat output is within the $\pm 8\%$ tolerance;

Boiler class 5;

At nominal output, combustion product temperature is less than 160 K above the ambient temperature;

When burning wood pellets, the period of burning is more than 6 hours;

The minimum heat output is less than 30% of nominal heat output.

Test evaluation:

Test results: BLAZE GREEN COMBI 33
Average measured and calculated values (solid fuels):

Test (period of burning):	I.	II.
Output tested:	Nominal	Minimum
Boiler type:	BLAZE GREEN COMBI 33	
Fuel type:	Wood pellets	
Combustion period, (automatic) stoking	Minimally 6 hours	
Test date:	09/2022	09/2022
Nominal heat output (specified by manufacturer) [kW]	20.0	20.0
Flue gas temperature [°C]	81.0	58.3
Fuel mass added [kg.h ⁻¹]	4.232	1.303
Inlet water temperature [°C]	54.7	63.9
Outlet water temperature [°C]	75.1	72.6
Cooling water temperature [°C]	23.2	25.4
Cooling water flow rate [m ³ .h ⁻¹]	0.8140	0.5839
Draught [Pa]	7.1	9.3
Ambient temperature [°C]	25.7	26.8
Relative air humidity [%]	41.9	40.3
Barometric pressure [kPa]	98.54	98.37

Analysis of combustion products:

Test (period of burning):	I.	II.
Oxygen O ₂ [%]	7.58	11.58
Carbon dioxide CO ₂ [%]	12.59	8.60
Carbon monoxide CO [ppm]	62	98
Higher hydrocarbons THC/OGC [ppm]	1	3
Nitrogen oxides NO _x [ppm]	94	65
Sulfur oxides SO ₂ [ppm]	<1	<1

Auxiliary combustion values (solid fuels):

Test (period of burning):	I.	II.
Stoichiometric oxygen volume [m ³ .kg ⁻¹]	0.937	0.937
Stoichiometric air volume [m ³ .kg ⁻¹]	4.460	4.460
Stoichiometric volume of dry combustion products [m ³ .kg ⁻¹]	4.397	4.396
Maximum content of CO ₂ [%]	19.83	19.83
Stoichiometric air multiple [-]	1.56	2.21
Volume of dry combustion products. actual [m ³ .kg ⁻¹]	6.923	10.128
Content of H ₂ O in combustion air [m ³ .kg ⁻¹]	0.099	0.145
Content of H ₂ O in combustion products [m ³ .kg ⁻¹]	0.851	0.897
Flue gas mass flow [kg.s ⁻¹]	0.0118	0.0052

Calculated values - thermal overview

Test (period of burning):		I.	II.
Loss of sensible heat of combustion products	[%]	3.4	2.7
Loss of gas underburning	[%]	0.0	0.1
Loss of mechanical underburning	[%]	0.1	0.1
Loss of heat transfer into environment	[%]	1.9	3.7
Total loss	[%]	5.4	6.6
Efficiency – indirect method	[%]	94.6	93.4
Fuel mass added - actual	[kg.h ⁻¹]	4.243	1.307
Heat input	[kW]	20.2	6.2
Heat output	[kW]	19.0	5.8
Uncertainty of determining heat output	[kW]	0.8	0.2
Output / nominal output	[%]	95.1	28.9
Efficiency (NCV) – direct method	[%]	94.2	93.1
Useful efficiency (GCV)	[%]	86.8	85.7
Seasonal efficiency	[%]	85.9	
Seasonal space heating energy efficiency	[%]	81	
Energy efficiency index	[-]	120	
Energy Efficiency Class	[-]	A+	

At nominal and minimum output, BLAZE GREEN COMBI 33 when burning **wood pellets**, the boiler efficiency meets the requirements applicable to **Class 5** as per ČSN EN 303-5+A1:2023, Fig. 1.

BLAZE GREEN COMBI 33 - Wood pellets, meets the seasonal space heating energy efficiency requirements as per ČSN EN 303-5+A1:2023 Art. 4.4.2.4.

The measured heat output is within the $\pm 8\%$ tolerance;

Boiler class 5;

At nominal output, combustion product temperature is less than 160 K above the ambient temperature;

When burning wood pellets, the period of burning is more than 6 hours;

The minimum heat output is less than 30% of nominal heat output.

Test evaluation:

Fuel analysis

Fuel type	Wood (08/2023)			
Analytical indicator	Symbol	Unit	Value	Uncertainty
Higher heating value	Qs	[MJ.kg-1]	16.89	0.22
Lower heating value	Qj	[MJ.kg-1]	15.45	0.22
All water in original condition	Wrt	[% by weight]	12.00	0.01
Ash	A	[% by weight]	0.33	0.01
Carbon	C	[% by weight]	42.55	0.24
Hydrogen	H	[% by weight]	5.10	0.20
Nitrogen	N	[% by weight]	0.06	0.14
Sulphur	S	[% by weight]	0.014	0.001
Chlorine	Cl	[% by weight]	0.015	0.008
Oxygen – calculation for 100%	O	[% by weight]	39.94	

Note: Sample in original condition

Fuel analysis

Fuel type	Wood pellets (09/2022)			
Analytical indicator	Symbol	Unit	Value	Uncertainty
Higher heating value	Qs	[MJ.kg-1]	18.60	0.22
Lower heating value	Qj	[MJ.kg-1]	17.13	0.22
All water in original condition	Wrt	[% by weight]	6.45	0.02
Ash	A	[% by weight]	0.22	0.03
Carbon	C	[% by weight]	47.18	0.24
Hydrogen	H	[% by weight]	6.06	0.20
Nitrogen	N	[% by weight]	0.10	0.14
Sulphur	S	[% by weight]	0.023	0.001
Chlorine	Cl	[% by weight]	0.034	0.001
Oxygen – calculation for 100%	O	[% by weight]	39.93	
Conversion factor femis for emissions in [mg/m3] to [mg/MJ]	femis	[-]	0.25719	

Fuel analysis

Fuel type	Wood (12/2023)			
Analytical indicator	Symbol	Unit	Value	Uncertainty
Higher heating value	Qs	[MJ.kg-1]	17.02	0.22
Lower heating value	Qj	[MJ.kg-1]	15.63	0.22
All water in original condition	Wrt	[% by weight]	12.08	0.01
Ash	A	[% by weight]	0.25	0.01
Carbon	C	[% by weight]	44.31	0.24
Hydrogen	H	[% by weight]	5.04	0.20
Nitrogen	N	[% by weight]	0.06	0.14
Sulphur	S	[% by weight]	0.019	0.001
Chlorine	Cl	[% by weight]	0.014	0.004
Oxygen – calculation for 100%	O	[% by weight]	38.23	

Measurement uncertainty: Specified in Measurement results

"The above-specified extended measurement uncertainties are calculated as a factor of the measurement uncertainty and the extension coefficient, $k=2$, corresponding to the coverage certainty of 95% for standard classification. The uncertainties do not reflect the impact of sample taking and lack of homogeneity. The standard uncertainty was determined in accordance with Document EA 4-02."

Accredited test
number:

1.73* Test title: **Electrical consumption**

Test method:

ČSN EN 303-5+A1:2023 Art. 5.7.7
ČSN EN 15456:2008 Art. 5

Sample tested:

BLAZE GREEN COMBI 18, BLAZE GREEN COMBI 26,
BLAZE GREEN COMBI 33

Measuring equipment used:

Chapter III - Measuring and test equipment

Test results:

Requirement	Requirement specification	Test evaluation	Note
Electrical consumption The auxiliary electricity consumption at nominal heat output (e_{lmax}), the auxiliary electricity consumption at 30% part load (e_{lmin}) and auxiliary electricity consumption in standby mode (PSB) shall be measured according to EN 15456. The measurement shall include all components within the system boundary defined in the scope of this standard excluding any circulation pump supplying the water heating system. Any electricity consumption of fuel line outside the system boundary supplied by the boiler control shall be omitted and measured separately. The average electrical power consumption during standby shall be measured for a minimum duration of 10 min and shall be stated in watts. In cases where control operations influence the intrinsic energy consumption, a longer duration might be necessary.	ČSN EN 303-5+A1:2023 Art. 5.7.7	+	

Test results:

Typ kotle	BLAZE GREEN COMBI 18	BLAZE GREEN COMBI 26	BLAZE GREEN COMBI 33
Test fuel	Wood		
Electrical input at nominal heat output	46 W	54 W	61 W
Electrical input at minimum heat output	43 W	57 W	47 W
Electrical input for STAND BY mode	3 W	3 W	3 W

Note: Test date and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

Typ kotle	BLAZE GREEN COMBI 18	BLAZE GREEN COMBI 26	BLAZE GREEN COMBI 33
Test fuel	Wood pellets		
Electrical input at nominal heat output	61 W	67 W	67 W
Electrical input at minimum heat output	37 W	45 W	45 W
Electrical input for STAND BY mode	3 W	3 W	3 W

Note: Test date and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

Accredited test
number:

1.1* Test title: **Combustion efficiency test - emissions**

Test method:

ČSN EN 303-5+A1:2023
Art. 4.4.7, 5.6.3, 5.6.4, 5.8, 5.9.4

Sample tested:

BLAZE GREEN COMBI 18, BLAZE GREEN COMBI 26,
BLAZE GREEN COMBI 33

Measuring equipment used:

Chapter III - Measuring and test equipment

Requirement	Requirement specification	Test evaluation	Note
Emission limits Combustion shall be of low-emission. This requirement shall be satisfied if the emission values shown in Table 7 are not exceeded when operating at nominal heat output or, in the case of boilers with heat output range, when operating at nominal heat output and minimum heat output, determined in accordance with the requirements mentioned in 5.8 and calculated in accordance with 5.9.4.	ČSN EN 303-5+A1:2023 Art. 4.4.7.1	+	

Table 7

Stoking	Fuel	Nominal heat output	Emission limits								
			CO			OGC/THC			PM (dust)		
			mg/m³ at 10% O₂								
		kW	Class	Class	Class	Class	Class	Class	Class	Class	Class
		3	4	5	3	4	5	3	4	5	
Manual	Biogenic	≤ 50	5000	1200	700	150	50	30	150	75	60
		> 50 ≤ 150	2500			100					
		> 150 ≤ 500	1200			100					
	Fossil	≤ 50	5000			150			125		
		> 50 ≤ 150	2500			100					
		> 150 ≤ 500	1200			100					
Automatic	Biogenic	≤ 50	3000	1000	500	100	30	20	150	60	40
		> 50 ≤ 150	2500			80					
		> 150 ≤ 500	1200			80					
	Fossil	≤ 50	3000			100			125		
		> 50 ≤ 150	2500			80					
		> 150 ≤ 500	1200			80					

NOTE The dust values in this Table are based on the experience of the gravimetric filter method. The method used needs to be referred to in the test report. The particulate matter emission measured according to this document does not include condensable organic compounds which may form additional particulate matter when the flue gas is mixed with ambient air. The values are therefore not directly comparable with values measured by dilution tunnel methods. Neither can they be directly translated into ambient air particulate concentrations.

^a Referred to dry exit flue gas, 0 °C, 1013 mbar.

^b Boilers of class 3 for non-woody biomass fuels according to 1.2 and marked with the classification non-woody biomass fuels do not need to fulfil the requirements for the dust emissions. The actual value shall be stated in the technical documentation and shall not exceed 200 mg/m³ at 10 % O₂.

Seasonal Space Heating Emissions limits For the seasonal space heating emissions see EU 2015/1189: The solid fuel boilers shall comply with the following requirements in Table 8: These requirements shall be met for the preferred fuel and for any other suitable fuel for the solid fuel boiler. Boilers tested only for fuels type non-woody biomass do not have to meet the requirements in Table 8. The calculation of the seasonal space heating emissions shall be done according to 5.9.4.4.	ČSN EN 303-5+A1:2023 Art. 4.4.7.2	+	
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Table 8

Stoking	Fuel	Nominal heat output kW	Seasonal space heating emissions limits			
			CO _s	OGC _s	PM _s	NO _x _s
			Seasonal emissions in mg/m ³ at 10 % O ₂ ^a			
manual	biogenic	≤ 500 kW	700	30	60	200
	fossil	≤ 500 kW	700	30	60	350
automatic	biogenic	≤ 500 kW	500	20	40	200
	fossil	≤ 500 kW	500	20	40	350
NOTE The PM (dust) values in this Table are based on the experience of the gravimetric filter method. The method used needs to be referred to in the test report. The particulate matter emission measured according to this document does not include condensable organic compounds which may form additional particulate matter when the flue gas is mixed with ambient air. The values are therefore not directly comparable with values measured by dilution tunnel methods. Neither can they be directly translated into ambient air particulate concentrations.						
^a Referred to dry exit flue gas, 0 °C, 1013 mbar.						

Measurement results: BLAZE GREEN COMBI 18 - Wood

Boiler output	Average values									
	Measured values						Converted values O ₂ =10%			
	O ₂ [%]	CO ₂ [%]	CO [ppm]	OGC/THC [ppm]	NO _x [ppm]	Dust [mg.m ⁻³]	CO [mg.m ⁻³]	OGC/THC [mg.m ⁻³]	NO _x [mg.m ⁻³]	Dust [mg.m ⁻³]
Nominal	10.08	10.11	23	1	76	17/1,9*)	28	1	156	17/1,9 *)
Minimum	11.45	8.82	109	2	55	4/1,6*)	157	4	130	5 / 1,8 *)
Seasonal space emission values							138	3	134	6 / 1.8 *)

Note: Test date and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

*) value of dust during boiler operation with an electrostatic precipitator

Test evaluation:

BLAZE GREEN COMBI 18 - Wood, meets at nominal and minimum output the emission requirements for **Class 5**, as per ČSN EN 303-5+A1:2023 Table 7.

BLAZE GREEN COMBI 18 - Wood, meets the requirements seasonal space heating emissions limits, as per ČSN EN 303-5+A1:2023 Table 8.

Measurement results: BLAZE GREEN COMBI 18 - Wood

Boiler output	Average values									
	Measured values						Converted values O ₂ =13%			
	O ₂ [%]	CO ₂ [%]	CO [ppm]	OGC/THC [ppm]	NO _x [ppm]	Dust [mg.m ⁻³]	CO [mg.m ⁻³]	OGC/THC [mg.m ⁻³]	NO _x [mg.m ⁻³]	Dust [mg.m ⁻³]
Nominal	10.08	10.11	23	1	76	17/1.9*)	21	1	114	12/ 1.4 *)
Minimum	11.45	8.82	109	2	55	4/1.6*)	114	3	95	3 / 1.3 *)

Note: Test date and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

*) value of dust during boiler operation with an electrostatic precipitator

Measurement results: BLAZE GREEN COMBI 18 - Wood

Boiler output	Average values								
	Measured values					Converted values O ₂ =0%			
	O ₂ [%]	CO [ppm]	NO _x [ppm]	OGC/THC [ppm]	Dust [mg.m ⁻³]	CO [mg.MJ ⁻¹]	NO _x [mg.MJ ⁻¹]	OGC/THC [mg.MJ ⁻¹]	Dust [mg.MJ ⁻¹]
Nominal	10,08	23	76	1	17/1,9*)	13	73	1	8 / 0,9 *)
Minimum	11,45	109	55	2	4/1,6*)	73	61	2	2 / 0,9 *)

Note: Test date and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

*) value of dust during boiler operation with an electrostatic precipitator

Measurement results: BLAZE GREEN COMBI 18 - Wood

Boiler output	Average values			
	Measured values	Converted values (based on reference test fuel N content)		
	NO _x [ppm]	NO _x [ppm]	NO _x (O ₂ =10%) [mg.m ⁻³]	NO _x (O ₂ =13%) [mg.m ⁻³]
Nominal	76	86	179	130
Minimum	55	63	148	108

Note: Test date and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

Measurement results: BLAZE GREEN COMBI 26 - Wood

Boiler output	Average values									
	Measured values						Converted values O ₂ =10%			
	O ₂ [%]	CO ₂ [%]	CO [ppm]	OGC/THC [ppm]	NO _x [ppm]	Dust [mg.m ⁻³]	CO [mg.m ⁻³]	OGC/THC [mg.m ⁻³]	NO _x [mg.m ⁻³]	Dust [mg.m ⁻³]
Nominal	7.35	12.75	25	1	90	24/2.5*)	25	2	149	20/ 2.0 *)
Minimum	9.76	10.37	122	3	55	3/1.6*)	149	4	111	3 / 1.6 *)
Seasonal space emission values							131	4	116	6 / 1.6 *)

Note: Test date and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

*) value of dust during boiler operation with an electrostatic precipitator

Test evaluation:

BLAZE GREEN COMBI 26 - Wood, meets at nominal and minimum output the emission requirements for **Class 5**, as per ČSN EN 303-5+A1:2023 Table 7.

BLAZE GREEN COMBI 26 - Wood, meets the requirements seasonal space heating emissions limits, as per ČSN EN 303-5+A1:2023 Table 8.

Measurement results: BLAZE GREEN COMBI 26 - Wood

Boiler output	Average values									
	Measured values						Converted values O ₂ =13%			
	O ₂ [%]	CO ₂ [%]	CO [ppm]	OGC/THC [ppm]	NO _x [ppm]	Dust [mg.m ⁻³]	CO [mg.m ⁻³]	OGC/THC [mg.m ⁻³]	NO _x [mg.m ⁻³]	Dust [mg.m ⁻³]
Nominal	7.35	12.75	25	1	90	24/2.5*)	18	1	108	14/ 1.5 *)
Minimum	9.76	10.37	122	3	55	3/1.6*)	109	4	80	2 / 1.1 *)

Note: Test date and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

*) value of dust during boiler operation with an electrostatic precipitator

Measurement results: BLAZE GREEN COMBI 26 - Wood

Boiler output	Average values									
	Measured values					Converted values O ₂ =0%				
	O ₂ [%]	CO [ppm]	NO _x [ppm]	OGC/THC [ppm]	Dust [mg.m ⁻³]	CO [mg.MJ ⁻¹]	NO _x [mg.MJ ⁻¹]	OGC/THC [mg.MJ ⁻¹]	Dust [mg.MJ ⁻¹]	
Nominal	7.35	25	90	1	24/2.5*)	12	69	1	9 / 0.9 *)	
Minimum	9.76	122	55	3	3/1.6*)	70	52	2	2 / 0.7 *)	

Note: Test date and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

*) value of dust during boiler operation with an electrostatic precipitator

Measurement results: BLAZE GREEN COMBI 26 - Wood

Boiler output	Average values			
	Measured values	Converted values (based on reference test fuel N content)		
	NO _x [ppm]	NO _x [ppm]	NO _x (O ₂ =10%) [mg.m ⁻³]	NO _x (O ₂ =13%) [mg.m ⁻³]
Nominal	90	102	169	123
Minimum	55	63	126	91

Note: Test date and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

Measurement results: BLAZE GREEN COMBI 33 - Wood

Boiler output	Average values									
	Measured values						Converted values O ₂ =10%			
	O ₂ [%]	CO ₂ [%]	CO [ppm]	OGC/THC [ppm]	NO _x [ppm]	Dust [mg.m ⁻³]	CO [mg.m ⁻³]	OGC/THC [mg.m ⁻³]	NO _x [mg.m ⁻³]	Dust [mg.m ⁻³]
Nominal	7.39	13.45	35	4	104	20/2,0*)	35	5	173	16/ 1,6 *)
Minimum	7.20	13.74	418	7	51	8/1,7*)	417	9	84	6 / 1,4 *)
Seasonal space emission values							360	8	97	8 / 1.4 *)

Note: Test date and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

*) value of dust during boiler operation with an electrostatic precipitator

Test evaluation:

BLAZE GREEN COMBI 33 - Wood, meets at nominal and minimum output the emission requirements for **Class 5**, as per ČSN EN 303-5+A1:2023 Table 7.

BLAZE GREEN COMBI 33 - Wood, meets the requirements seasonal space heating emissions limits, as per ČSN EN 303-5+A1:2023 Table 8.

Measurement results: BLAZE GREEN COMBI 33 - Wood

Boiler output	Average values									
	Measured values						Converted values O ₂ =13%			
	O ₂ [%]	CO ₂ [%]	CO [ppm]	OGC/THC [ppm]	NO _x [ppm]	Dust [mg.m ⁻³]	CO [mg.m ⁻³]	OGC/THC [mg.m ⁻³]	NO _x [mg.m ⁻³]	Dust [mg.m ⁻³]
Nominal	7.39	13.45	35	4	104	20/2.0*)	25	4	126	12/ 1.2 *)
Minimum	7.20	13.74	418	7	51	8/1.7*)	303	7	61	5 / 1.0 *)

Note: Test date and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

*) value of dust during boiler operation with an electrostatic precipitator

Measurement results: BLAZE GREEN COMBI 33 - Wood

Boiler output	Average values									
	Measured values					Converted values O ₂ =0%				
	O ₂ [%]	CO [ppm]	NO _x [ppm]	OGC/THC [ppm]	Dust [mg.m ⁻³]	CO [mg.MJ ⁻¹]	NO _x [mg.MJ ⁻¹]	OGC/THC [mg.MJ ⁻¹]	Dust [mg.MJ ⁻¹]	
Nominal	7.39	35	104	4	20/2.0*)	17	84	3	8 / 3.1 *)	
Minimum	7.20	418	51	7	8/1.7*)	202	41	4	3 / 2.6 *)	

Note: Test date and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

*) value of dust during boiler operation with an electrostatic precipitator

Measurement results: BLAZE GREEN COMBI 33 - Wood

Boiler output	Average values			
	Measured values	Converted values (based on reference test fuel N content)		
	NO _x [ppm]	NO _x [ppm]	NO _x (O ₂ =10%) [mg.m ⁻³]	NO _x (O ₂ =13%) [mg.m ⁻³]
Nominal	104	118	196	143
Minimum	51	58	95	69

Note: Test date and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

Measurement results: BLAZE GREEN COMBI 18 - Wood pellets

Boiler output	Average values									
	Measured values						Converted values O ₂ =10%			
	O ₂ [%]	CO ₂ [%]	CO [ppm]	OGC/THC [ppm]	NO _x [ppm]	Dust [mg.m ⁻³]	CO [mg.m ⁻³]	OGC/THC [mg.m ⁻³]	NO _x [mg.m ⁻³]	Dust [mg.m ⁻³]
Nominal	7.89	12.06	57	1	88	17/2.1*)	60	1	152	14/ 1.8 *)
Minimum	11.82	8.24	95	2	55	20/1.8*)	142	3	135	24/ 2.1 *)
Seasonal space emission values							130	3	138	23/ 2.0 *)

Note: Test date and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

*) value of dust during boiler operation with an electrostatic precipitator

Test evaluation:

.BLAZE GREEN COMBI 18 - Wood pellets, meets at nominal and minimum output the emission requirements for **Class 5**, as per ČSN EN 303-5+A1:2023 Table 7.

.BLAZE GREEN COMBI 18 - Wood pellets, meets the requirements seasonal space heating emissions limits, as per ČSN EN 303-5+A1:2023 Table 8.

Measurement results: .BLAZE GREEN COMBI 18 - Wood pellets

Boiler output	Average values									
	Measured values						Converted values O ₂ =13%			
	O ₂ [%]	CO ₂ [%]	CO [ppm]	OGC/THC [ppm]	NO _x [ppm]	Dust [mg.m ⁻³]	CO [mg.m ⁻³]	OGC/THC [mg.m ⁻³]	NO _x [mg.m ⁻³]	Dust [mg.m ⁻³]
Nominal	7.89	12.06	57	1	88	17/2.1*)	43	1	110	10/ 1.3 *)
Minimum	11.82	8.24	95	2	55	20/1.8*)	103	3	98	17/ 1.6 *)

Note: Test date and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

*) value of dust during boiler operation with an electrostatic precipitator

Measurement results: .BLAZE GREEN COMBI 18 - Wood pellets

Boiler output	Average values									
	Measured values					Converted values O ₂ =0%				
	O ₂ [%]	CO [ppm]	NO _x [ppm]	OGC/THC [ppm]	Dust [mg.m ⁻³]	CO [mg.MJ ⁻¹]	NO _x [mg.MJ ⁻¹]	OGC/THC [mg.MJ ⁻¹]	Dust [mg.MJ ⁻¹]	
Nominal	7.89	57	88	1	17/2.1*)	29	74	1	7 / 0.9 *)	
Minimum	11.82	95	55	2	20/1.8*)	70	66	2	12 / 1.1 *)	

Note: Test date and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

*) value of dust during boiler operation with an electrostatic precipitator

Measurement results: .BLAZE GREEN COMBI 18 - Wood pellets

Boiler output	Average values			
	Measured values	Converted values (based on reference test fuel N content)		
	NO _x [ppm]	NO _x [ppm]	NO _x (O ₂ =10%) [mg.m ⁻³]	NO _x (O ₂ =13%) [mg.m ⁻³]
Nominal	88	77	133	97
Minimum	55	48	118	86

Note: Test date and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

Measurement results: .BLAZE GREEN COMBI 26 - Wood pellets

Boiler output	Average values									
	Measured values						Converted values O ₂ =10%			
	O ₂ [%]	CO ₂ [%]	CO [ppm]	OGC/THC [ppm]	NO _x [ppm]	Dust [mg.m ⁻³]	CO [mg.m ⁻³]	OGC/THC [mg.m ⁻³]	NO _x [mg.m ⁻³]	Dust [mg.m ⁻³]
Nominal	7.58	12.59	62	1	94	21/2.2*)	63	1	157	17/ 1.8 *)
Minimum	11.58	8.60	98	3	65	14/1.6*)	143	5	155	16/ 1.9 *)
Seasonal space emission values							131	5	155	16/ 1.9 *)

Note: Test date and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

*) value of dust during boiler operation with an electrostatic precipitator

Test evaluation:

.BLAZE GREEN COMBI 26 - Wood pellets, meets at nominal and minimum output the emission requirements for **Class 5**, as per ČSN EN 303-5+A1:2023 Table 7.

.BLAZE GREEN COMBI 26 - Wood pellets, meets the requirements seasonal space heating emissions limits, as per ČSN EN 303-5+A1:2023 Table 8.

Measurement results: .BLAZE GREEN COMBI 26 - Wood pellets

Boiler output	Average values									
	Measured values						Converted values O ₂ =13%			
	O ₂ [%]	CO ₂ [%]	CO [ppm]	OGC/THC [ppm]	NO _x [ppm]	Dust [mg.m ⁻³]	CO [mg.m ⁻³]	OGC/THC [mg.m ⁻³]	NO _x [mg.m ⁻³]	Dust [mg.m ⁻³]
Nominal	7.58	12.59	62	1	94	21/2.2*)	46	1	115	13/ 1.3 *)
Minimum	11.58	8.60	98	3	65	14/1.6*)	104	4	113	12/ 1.4 *)

Note: Test date and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

*) value of dust during boiler operation with an electrostatic precipitator

Measurement results: .BLAZE GREEN COMBI 26 - Wood pellets

Boiler output	Average values									
	Measured values					Converted values O ₂ =0%				
	O ₂ [%]	CO [ppm]	NO _x [ppm]	OGC/THC [ppm]	Dust [mg.m ⁻³]	CO [mg.MJ ⁻¹]	NO _x [mg.MJ ⁻¹]	OGC/THC [mg.MJ ⁻¹]	Dust [mg.MJ ⁻¹]	
Nominal	7.58	62	94	1	21/2.2*)	31	77	< 1	8 / 0.9 *)	
Minimum	11.58	98	65	3	14/1.6*)	70	76	3	8 / 0.9 *)	

Note: Test date and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

*) value of dust during boiler operation with an electrostatic precipitator

Measurement results: .BLAZE GREEN COMBI 26 - Wood pellets

Boiler output	Average values			
	Measured values	Converted values (based on reference test fuel N content)		
	NO _x [ppm]	NO _x [ppm]	NO _x (O ₂ =10%) [mg.m ⁻³]	NO _x (O ₂ =13%) [mg.m ⁻³]
Nominal	94	82	139	101
Minimum	65	57	136	99

Note: Test date and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

Measurement results: BLAZE GREEN COMBI 33 - Wood pellets

Boiler output	Average values									
	Measured values						Converted values O ₂ =10%			
	O ₂ [%]	CO ₂ [%]	CO [ppm]	OGC/THC [ppm]	NO _x [ppm]	Dust [mg.m ⁻³]	CO [mg.m ⁻³]	OGC/THC [mg.m ⁻³]	NO _x [mg.m ⁻³]	Dust [mg.m ⁻³]
Nominal	7.58	12.59	62	1	94	21/2.2*)	63	1	157	17/ 1.8 *)
Minimum	11.58	8.60	98	3	65	14/1.6*)	143	5	155	16/ 1.9 *)
Seasonal space emission values							131	5	155	16/ 1.9 *)

Note: Test date and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

*) value of dust during boiler operation with an electrostatic precipitator

Test evaluation:

.BLAZE GREEN COMBI 33 - Wood pellets, meets at nominal and minimum output the emission requirements for **Class 5**, as per ČSN EN 303-5+A1:2023 Table 7.

.BLAZE GREEN COMBI 33 - Wood pellets, meets the requirements seasonal space heating emissions limits, as per ČSN EN 303-5+A1:2023 Table 8.

Measurement results: .BLAZE GREEN COMBI 33 - Wood pellets

Boiler output	Average values									
	Measured values						Converted values O ₂ =13%			
	O ₂ [%]	CO ₂ [%]	CO [ppm]	OGC/THC [ppm]	NO _x [ppm]	Dust [mg.m ⁻³]	CO [mg.m ⁻³]	OGC/THC [mg.m ⁻³]	NO _x [mg.m ⁻³]	Dust [mg.m ⁻³]
Nominal	7.58	12.59	62	1	94	21/2.2*)	46	1	115	13/ 1.3 *)
Minimum	11.58	8.60	98	3	65	14/1.6*)	104	4	113	12/ 1.4 *)

Note: Test date and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

*) value of dust during boiler operation with an electrostatic precipitator

Measurement results: .BLAZE GREEN COMBI 33 - Wood pellets

Boiler output	Average values								
	Measured values					Converted values O ₂ =0%			
	O ₂ [%]	CO [ppm]	NO _x [ppm]	OGC/THC [ppm]	Dust [mg.m ⁻³]	CO [mg.MJ ⁻¹]	NO _x [mg.MJ ⁻¹]	OGC/THC [mg.MJ ⁻¹]	Dust [mg.MJ ⁻¹]
Nominal	7.58	62	94	1	21/2.2*)	31	77	< 1	8 / 0.9 *)
Minimum	11.58	98	65	3	14/1.6*)	70	76	3	8 / 0.9 *)

Note: Test date and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

*) value of dust during boiler operation with an electrostatic precipitator

Measurement results: .BLAZE GREEN COMBI 33 - Wood pellets

Boiler output	Average values			
	Measured values	Converted values (based on reference test fuel N content)		
	NO _x [ppm]	NO _x [ppm]	NO _x (O ₂ =10%) [mg.m ⁻³]	NO _x (O ₂ =13%) [mg.m ⁻³]
Nominal	94	82	139	101
Minimum	65	57	136	99

Note: Test date and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

Accredited test
number:

1.1*

Test title: **Function test of control, regulation and safety elements
Combustion efficiency test - emissions**

Test method:

ČSN EN 303-5+A1:2023
Art. 5.13, 5.14, 5.16.1, 5.16.2, 5.16.3, 5.17
ČSN EN 303-5+A1:2023
Art. 5.8, 5.9.4

Sample tested:

BLAZE GREEN COMBI 33

Measuring equipment used:

Chapter III - Measuring and test equipment

Test results:

Requirement	Requirement specification	Test evaluation	Note
Function check of the temperature controller and safety temperature limiter at the boiler The water-side flow rate shall comply with that specified for the nominal heat output test. The flow temperature of 75 °C shall not be exceeded at the start of the test. Adjust the firing so that it corresponds to the nominal heat output P_N of the boiler. A steady state condition shall be reached and the outlet pressure at the flue gas section shall be according to the nominal heat output setting. For manual stoked boilers, the boiler shall be refuelled after reaching steady state with a full batch before starting the test. The dissipated output shall be reduced to $(40 \pm 5) \%$ of the nominal heat output of the boiler; circulating pump running in continuous operation; temperature controller adjusted to maximum set value. When the temperature controller is operating normally, the measured flow temperature shall not exceed 100 °C; the safety temperature cut out or limiter or the device for dissipating excess heat shall not trigger. Repeat the test with the temperature controller out of function. This time, check if the safety temperature limiter/detector switches off the firing system at the highest value specified by the boiler manufacturers and if all hazardous operation states are avoided (see 4.2).	ČSN EN 303-5+A1:2023 Art. 5.13	+	

Requirement	Requirement specification	Test evaluation	Note
Function test for the rapidly disconnectable firing system – Sudden absence of heat dissipation The water-side flow rate shall comply with that specified for the nominal output test. The flow temperature of 75 °C shall not be exceeded at the start of the test. Adjust the firing so that it corresponds to the nominal heat output P_N of the boiler, a steady state condition is reached and the outlet pressure at the flue spigot is according to the rated heat output. The heat consumption is set to 0; water circulation in the boiler is permitted; temperature controller is adjusted to manufacture recommended maximum set value. Check if the safety temperature limiter or the temperature controller switches off the firing system and all hazardous operation states are avoided. - Loss of the electrical power supply The water-side flow rate shall comply with that specified for the nominal heat output test. The flow temperature of 75 °C shall not be exceeded at the start of the test. Adjust the firing so that it corresponds to the nominal heat output P_N of the boiler, a steady state condition is reached and the outlet pressure at the flue gas section is according to the rated heat output. The electrical supply including the circulation is cut off, check that no hazardous operation conditions occur. For the evaluation of the temperatures and the CO-concentrations, only mean values at a maximum average time of one minute shall be considered.	ČSN EN 303-5+A1:2023 Art. 5.14	+	
Safety test of consequences of fuel overload and effect of a blockage of the fuel supply The safety of the boiler shall be checked at continuous operation of the boiler with the fuel feed rate of the stoking device set at possible maximum capacity, taking into account failures according to the risk analyses and the electrical safety. If other fuel feed rates lower than the maximum are categorised as critical by the risk analysis, these shall also be tested. The functionality of the safety device for the shut-down of the fuel line shall occur by prevention of the ignition after release of fuel if no or insufficient combustion in the combustion chamber occurs. The test for blocked fuel line shall be achieved by deactivating the stoking device. The requirements specified in 4.3.5 shall be satisfied.	ČSN EN 303-5+A1:2023 Art. 5.16.2	+	

Requirement	Requirement specification	Test evaluation	Note
Loss of combustion air supply The safety of the heating boiler shall be checked at maximum heat input under the following conditions: – failure of combustion air fan; – failure to close of the adjustable combustion air supply. In each case, only one failure shall be simulated. The CO concentrations in the boiler shall not exceed 5 % volume. The measurement of CO concentration shall be carried out in the flue gas measuring section.	ČSN EN 303-5+A1:2023 Art. 5.16.3	+	
Check of safety for condensing operation The boiler is operated at nominal load. The condensate drainage is blocked. The measurement of CO concentration shall be carried out in the flue gas measuring section. Increased condensate formation can be simulated by adding water to the condensation system. It shall be checked and recorded whether the boiler shuts down or reaches the steady-state condition.	ČSN EN 303-5+A1:2023 Art. 5.17	0	

Note:

+	Compliant
-	Non-compliant
0	Not applicable
x	Not assessed

Measurement results: BLAZE GREEN COMBI 33

Temperature controller		
Temperature	[°C]	Note:
Pre-set	95 °C	Temperature set on the operating thermostat regulator
Regulation	96 °C	The flaps have closed and fan switched off
Restoration of operation	93 °C	The flaps have opened and fan switched on

Note: Testing date and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

Temperature limiter (manual restoration of temperature) STB		
Temperature	[°C]	Note:
Pre-set	95 °C	Temperature set on the temperature limiter
Shutdown	104 °C	Fan switched off
Restoration of operation	The boiler irreversibly switched off. In order to restore operation, a manual intervention required, after the temperature drops under the limiter switching temperature.	

Note: Testing date and ambient conditions – see Test No. 1.1* (Test of heat output, input and efficiency)

Test evaluation:

Proper functioning of safety elements has been verified.

Accredited test
number:

1.1* Test title: **Test of device for dissipating excess heat**

Test method:

ČSN EN 303-5+A1:2023
Čl. 4.1.1, 5.15

Sample tested:

BLAZE GREEN COMBI 33

Measuring equipment used:

Chapter III - Measuring and test equipment

Test results:

Requirement	Requirement specification	Test evaluation	Note
Function test on the device for dissipating excess heat (partly or non-disconnectable firing system) Adjust the firing so that it corresponds to the nominal heat output QN of the boiler, a steady state condition is reached and the outlet pressure at the flue gas section is according to the nominal heat output. Put the temperature controller out of function. Maintain the function of the safety temperature limiter. The heat consumption is set to 0; water circulation in the boiler is permitted. Check if the safety temperature limiter switches off the firing system and the device for dissipating excess heat works properly and all hazardous operation states are avoided. The cold water shall be kept at a temperature of $(10 \pm 5) ^\circ\text{C}$ and a pressure of maximum 2 bar. (Deviations are permissible if they are specified in the installation instructions.) For the evaluation of the temperatures and the CO-concentrations, only mean values at a maximum average time of one minute shall be considered.	ČSN EN 303-5+A1:2023 Čl. 5.15	+	
The heat carrier (water) does not become heated to a dangerous extent ($\leq 110 ^\circ\text{C}$).	ČSN EN 303-5+A1:2023 Čl. 4.1.1	+	

Note:
+ Compliant
- Non-compliant
0 Not applicable
x Not assessed

Test results: BLAZE GREEN COMBI 33

Measured and calculated values:	Unit	Value	Limit	Note
Outlet water temperature - max	°C	109	110	
Water cooling temperature – inlet from safety valve	°C	9		
Water cooling temperature – outlet from safety valve	°C	33		
Outlet water temperature during open the valve for cooling water	°C	108		
Water flow rate through the cooling device	m ³ /h	1.554		

Test evaluation:

During the safety temperature regulator test, the water temperature at the output from the boiler did not exceed 110°C.

Tested by: Ing. Vladimír Foit Date: 2024-07-17 Signed: 

Reviewed and approved by: Ing. Vladimír Foit Date: 2024-07-17 Signed: 

V. A list of referenced documents

- Order of 2024-05-03 (Order reg. no. B-82532, received on 2024-06-27)
- Contract B-82532/30
- ČSN EN 15456:2008 - Heating boilers - Electrical power consumption for heat generators - System boundaries - Measurements
- ČSN EN 303-5+A1:2023 - Heating boilers - Part 5: Heating boilers for solid fuels, manually and automatically stoked, nominal heat output of up to 500 kW - Terminology, requirements, testing and marking
- ČSN ISO 80000-1:2023 Quantities and units – Part 1: General

Test Report compiled by:

Ing. Vladimír Foit

Test Report approved by:

P.P. 

Milan Holomek
Combustion Equipment Manager



– End of Test Report –